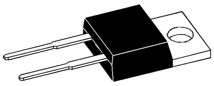
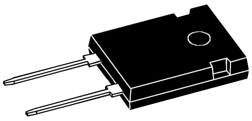
Package style

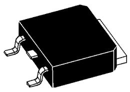
1 TO-220 AC



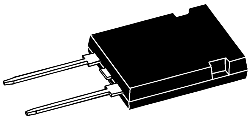
2 TO-247 AD



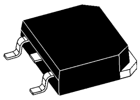
3 TO-252AA (DPAK)



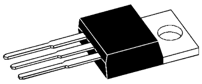
2a ISOPLUS 247™



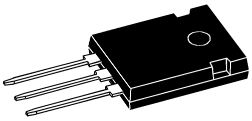
4 TO-268 AA



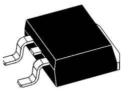
5 TO-220 AB



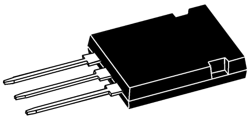
7 TO-247 AD



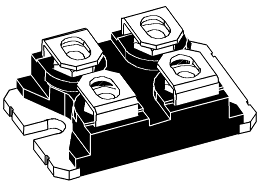
6 TO-263 AB

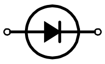
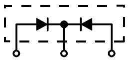
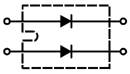
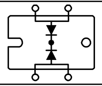


7a ISOPLUS 247™



8 SOT-227 B, miniBLOC



Package style	Voltage V_{RRM} V	Current I_{FAV} A	t_{rr} ns	Type	Circuit Diagram	Page D4 -
1	**200**	8	25	**DSEP 8-02A**		2
1	**300**	10	30	**DSEP 8-03A**		3
1	**300**	15	30	**DSEP 15-03A**		5
1	**300**	30	30	**DSEP 29-03A**		7
2	**300**	30	30	**DSEP 30-03A**		9
2	**300**	60	30	**DSEP 60-03A**		11
2	**400**	30	30	**DSEP 30-04A**		13
3	**600**	6	20	**DSEP 6-06AS**		15
1	**600**	10	35	**DSEP 8-06A/B**		17/19
1	**600**	15	35	**DSEP 15-06A**		20
1	**600**	30	35/30	**DSEP 29-06A/B**		22
2 / 2a	**600**	30	35/30	**DSEP 30-06A/B/BR**		25
2 / 4	**600**	60	35	**DSEP 60-06A/AT**		28
1	**1200**	10	40	**DSEP 8-12A**		30
1	**1200**	15	40	**DSEP 12-12A**		32
1	**1200**	30	40	**DSEP 29-12A**		34
2	**1200**	30	40	**DSEP 30-12A/AR**		36
2	**1200**	60	40	**DSEP 60-12A**		38
5	**200**	2x 5	25	**DSEC 10-02A**		40
5	**200**	2x 8	25	**DSEC 16-02A**		41
6	**200**	2x 15	25	**DSEC 29-02AS**		42
7	**200**	2x 15	30	**DSEC 30-02A**		43
7	**300**	2x 15	30	**DSEC 30-03A**		44
7 / 7a	**300**	2x 30	30	**DSEC 60-03A/AR**		46
5	**400**	2x 30	30	**DSEC 60-04A**		48
5	**600**	2x 10	35	**DSEC 16-06A**		50
7	**600**	2x 15	35	**DSEC 30-06A**		52
7	**600**	2x 30	35/30	**DSEC 60-06A/B**		54
7	**1200**	2x 10	40	**DSEC 16-12A**		57
7	**1200**	2x 15	40	**DSEC 30-12A**		59
7	**1200**	2x 30	40	**DSEC 60-12A**		61
8	**300**	2x 30	30	**DSEP 2x31-03A**		63
8	**300**	2x 60	30	**DSEP 2x61-03A**		65
8	**300**	2x 90	30	**DSEP 2x91-03A**		67
8	**400**	2x30	30	**DSEP 2x31-04A**		69
8	**400**	2x100	30	**DSEP 2x101-04A**		71
8	**600**	2x 30	35/30	**DSEP 2x31-06A/B**		72
8	**600**	2x 60	35	**DSEP 2x61-06A**		75
8	**600**	2x 90	35	**DSEP 2x91-06A**		77
8	**1200**	2x 30	40	**DSEP 2x31-12A**		79
8	**1200**	2x 60	40	**DSEP 2x61-12A**		81
8*	**400**	2x 120	30	**DSEC240-04A**		83
8*	**600**	2x 120	35	**DSEC240-06A**		84
Dimensions						85-86

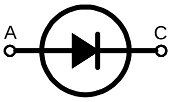
***** Non isolated base plate

HiPerFRED™ Epitaxial Diode with soft recovery

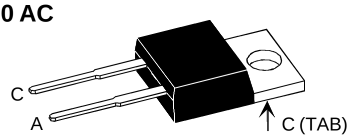
Preliminary Data

I_{FAV} = 8 A
V_{RRM} = 200 V
t_{rr} = 25 ns

V_{RSM} V	V_{RRM} V	Type
200	**200**	**DSEP 8-02A**



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Test Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 150°C; rectangular, d = 0.5	8	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	80	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2 A; L = 180 µH	0.5	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Symbol	Test Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		50	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.2	mA
V_F ②	I_F = 8 A; T_{VJ} = 150°C		0.94	V
	T_{VJ} = 25°C		1.30	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	25		ns
I_{RM}	V_R = 100 V; I_F = 10 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		4.1	A

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

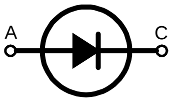
008

IXYS **DSEP 8-03A**

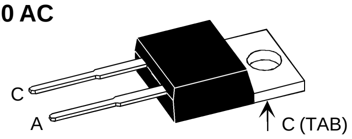
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 10 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 8-03A



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 130°C; rectangular, d = 0.5	10	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	60	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2 A; L = 180 µH	0.5	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		60	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.25	mA
V_F ②	I_F = 10 A; T_{VJ} = 150°C		1.29	V
	T_{VJ} = 25°C		1.75	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		2.4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

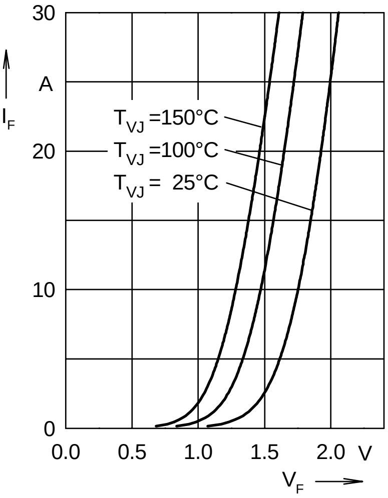


Fig. 1 Forward current I_F versus V_F

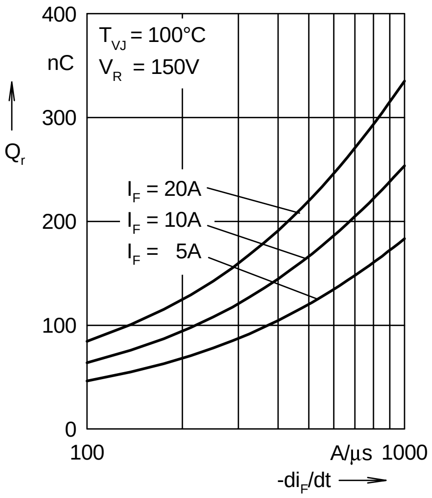


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

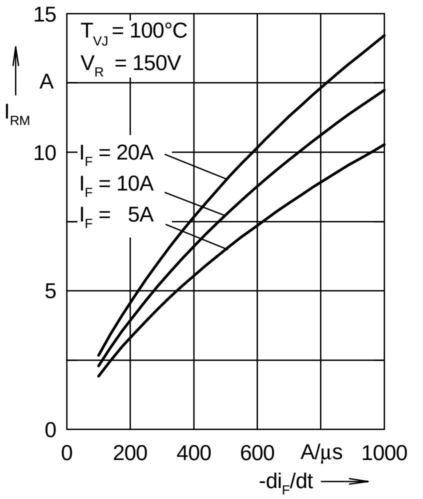


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

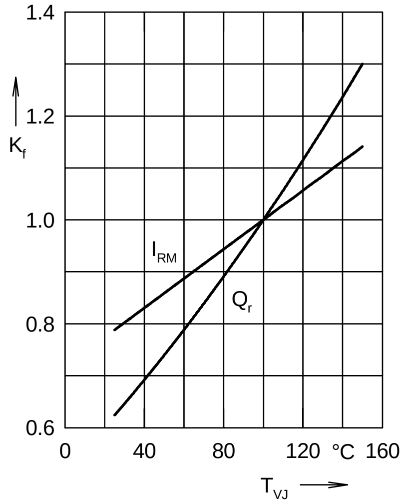


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

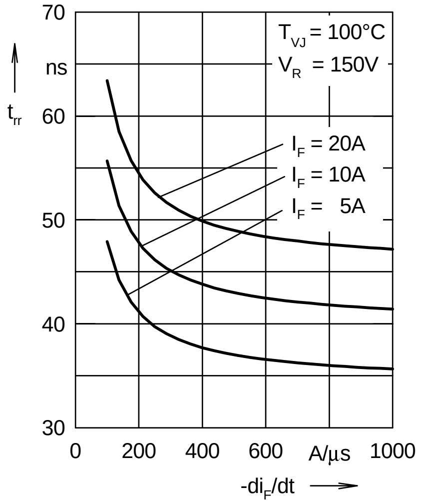


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

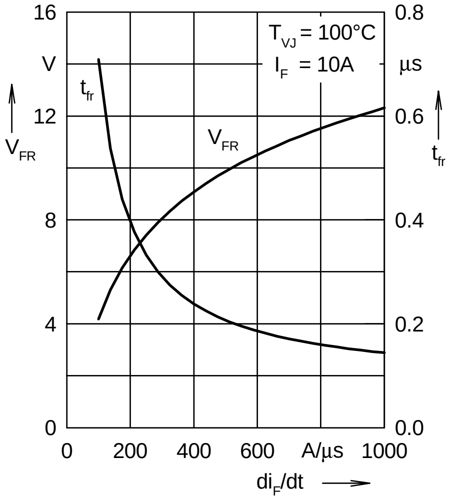


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

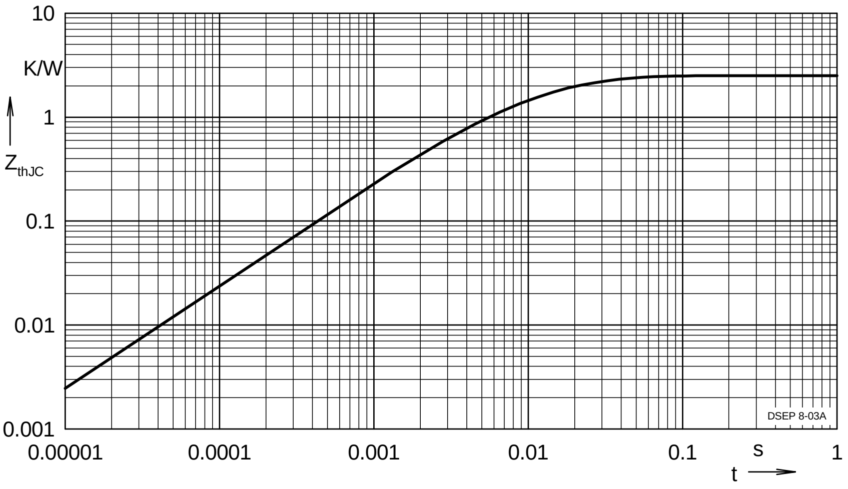


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	1.449	0.005
2	0.558	0.0003
3	0.493	0.017

025

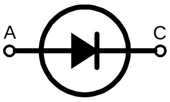
NOTE: Fig. 2 to Fig. 6 shows typical values

IXYS **DSEP 15-03A**

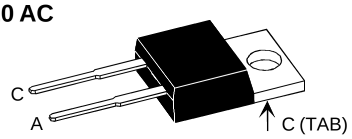
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 15 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 15-03A



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 135°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	140	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2.5 A; L = 180 µH	0.8	mJ
I_{AR}	$V_A = 1.5 \cdot V_{R\,typ.}$; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		100 0.5	µA mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C T_{VJ} = 25°C		1.21 1.68	V V
R_{thJC}			1.6	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 25 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		2.7	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

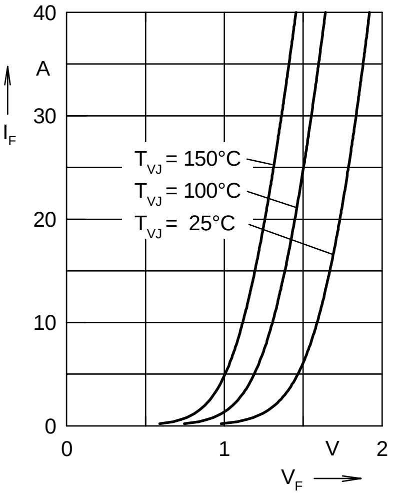


Fig. 1 Forward current I_F versus V_F

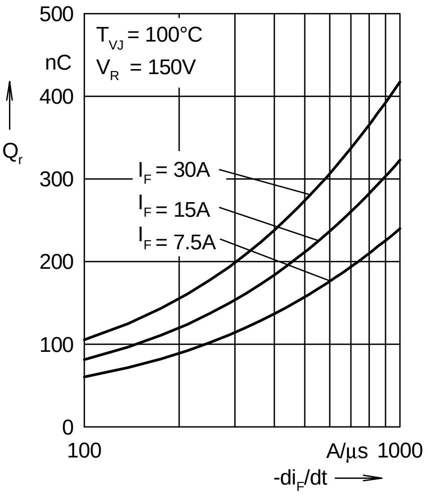


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

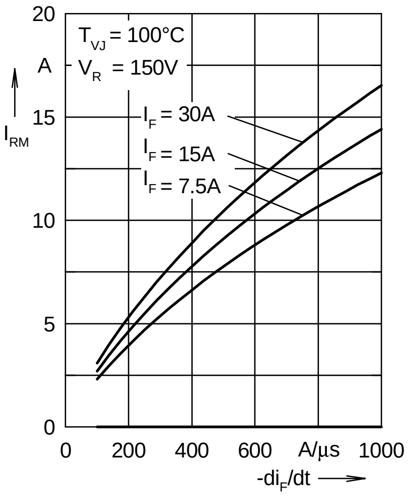


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

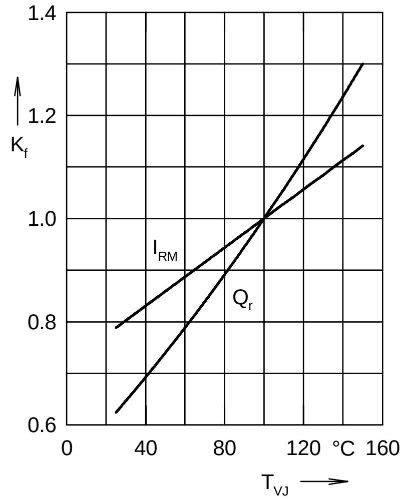


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

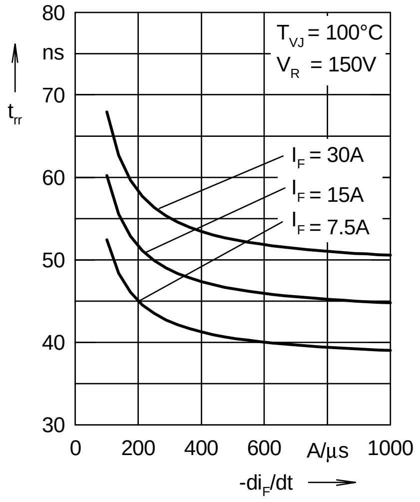


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

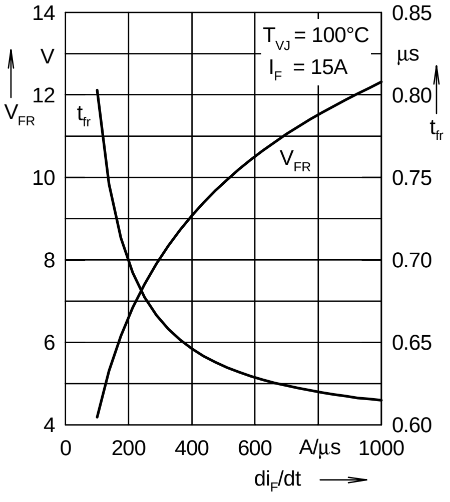


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

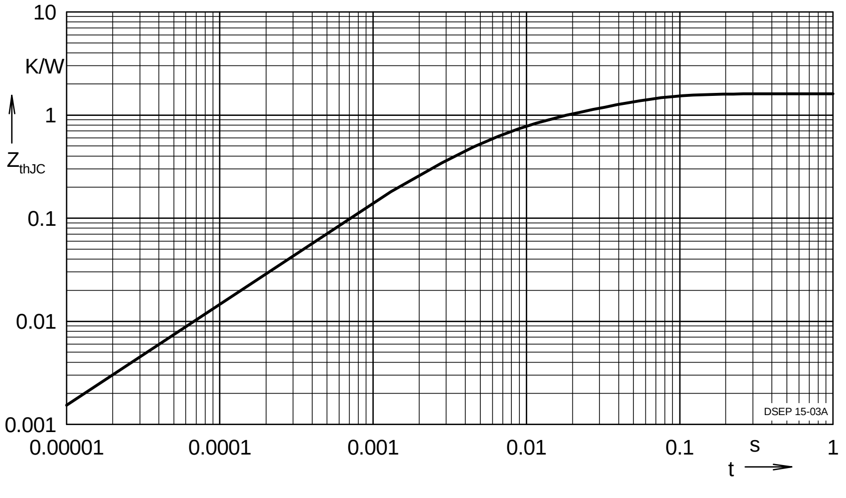


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.908	0.005
2	0.35	0.0003
3	0.342	0.017

025

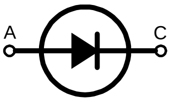
NOTE: Fig. 2 to Fig. 6 shows typical values

IXYS **DSEP 29-03A**

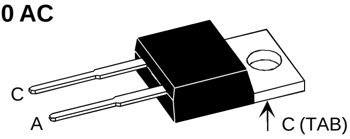
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 30 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 29-03A



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 145°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	300	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 3 A; L = 180 µH	1.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		0.93	V
	T_{VJ} = 25°C		1.26	V
R_{thJC}			0.9	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		7	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

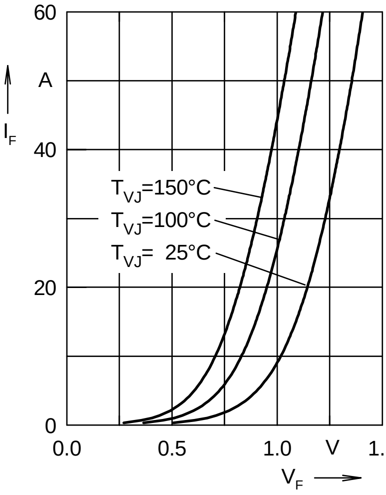


Fig. 1 Forward current I_F versus V_F

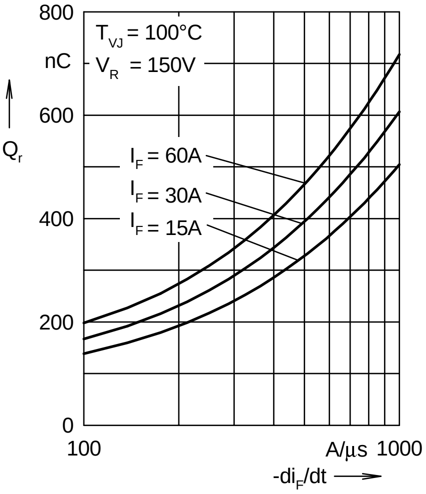


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

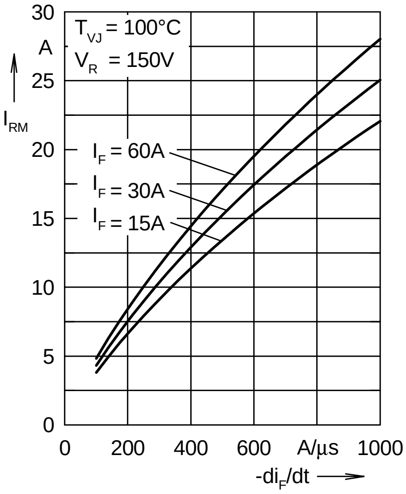


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

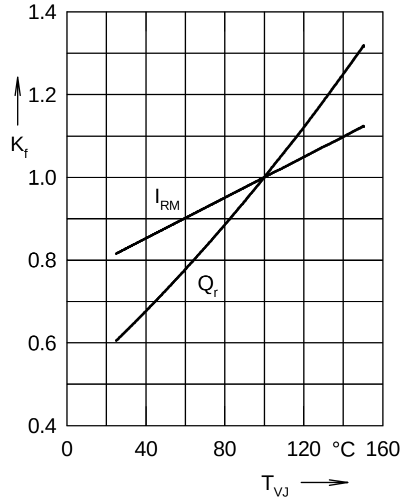


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

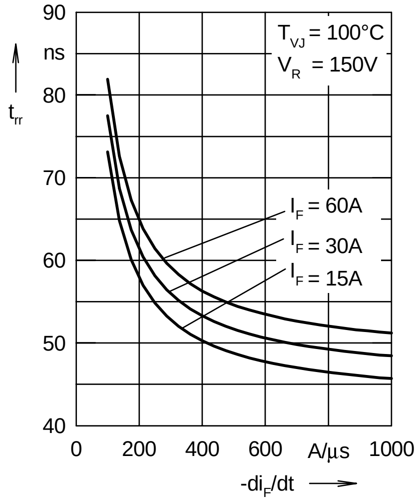


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

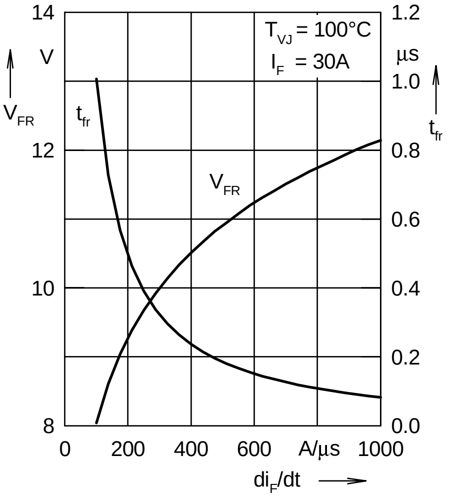


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

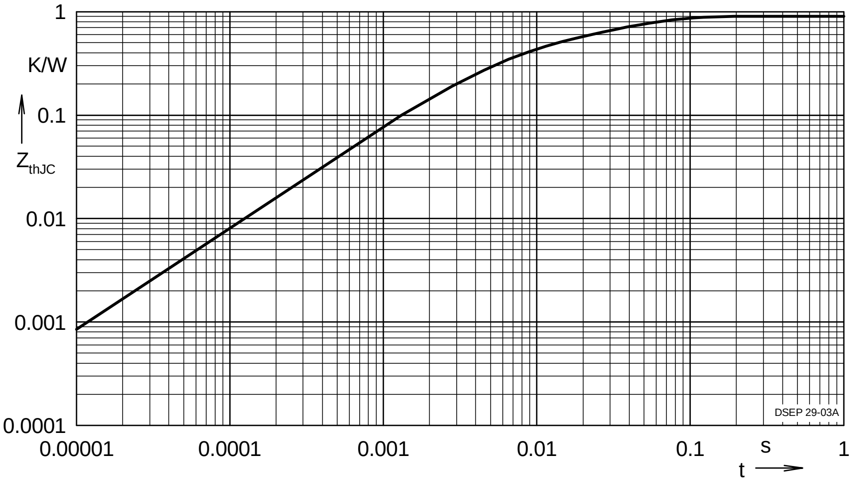


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

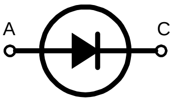
i	R_{thi} (K/W)	t_i (s)
1	0.502	0.005
2	0.193	0.0003
3	0.205	0.016

NOTE: Fig. 2 to Fig. 6 shows typical values

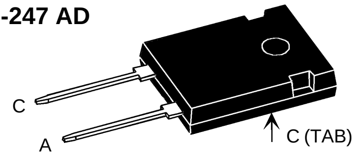
HiPerFRED^{TM} Epitaxial Diode
with soft recovery

I_{FAV} = 30 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 30-03A



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 145°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	300	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 3 A; L = 180 µH	1.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		0.91	V
	T_{VJ} = 25°C		1.25	V
R_{thJC}			0.9	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		7	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

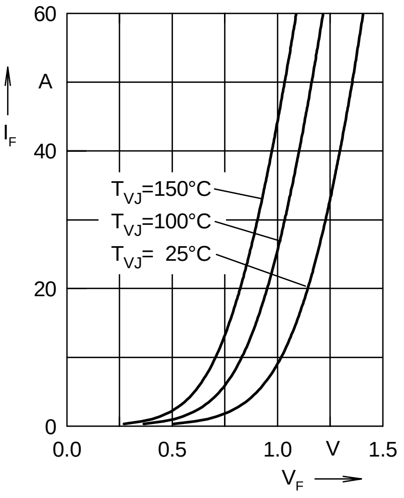


Fig. 1 Forward current I_F versus V_F

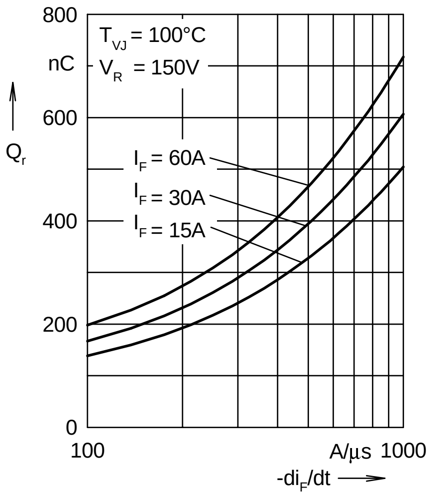


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

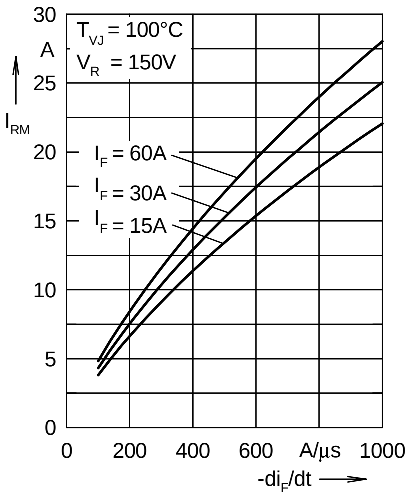


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

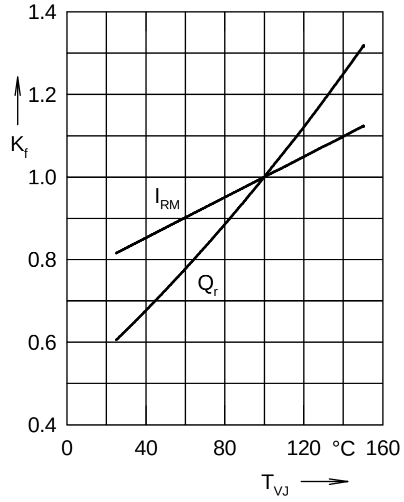


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

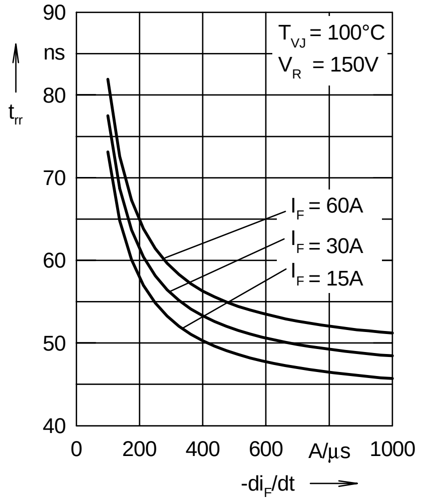


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

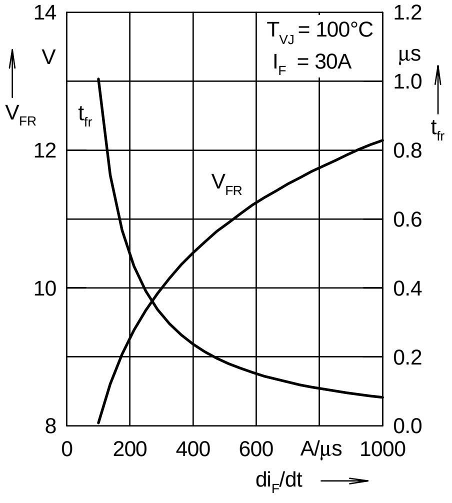


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

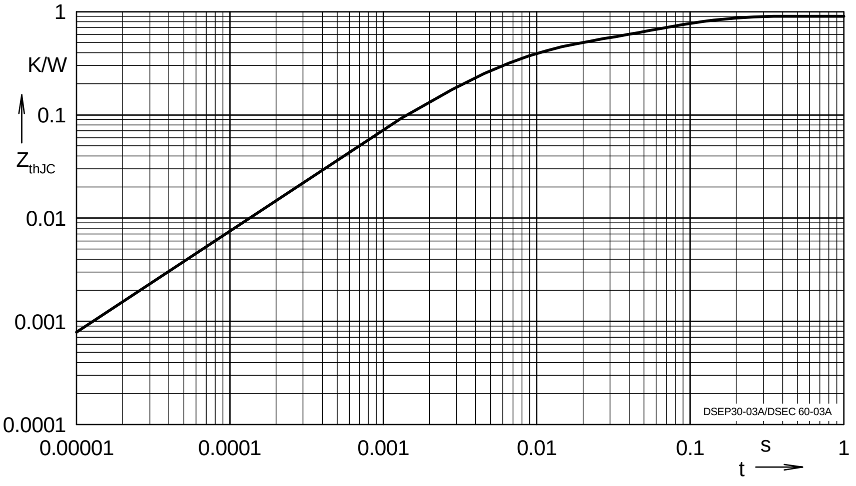


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.005
2	0.179	0.0003
3	0.256	0.04

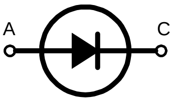
NOTE: Fig. 2 to Fig. 6 shows typical values

IXYS **DSEP 60-03A**

HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 60 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 60-03A



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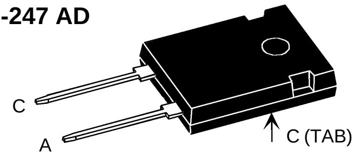


A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 110°C; rectangular, d = 0.5	60	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	700	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 3.5 A; L = 180 µH	1.6	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.4	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	230	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	 max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		650	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		2.5	mA
V_F ②	I_F = 60 A; T_{VJ} = 150°C		1.25	V
	T_{VJ} = 25°C		1.71	V
R_{thJC}			0.65	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 130 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		4.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

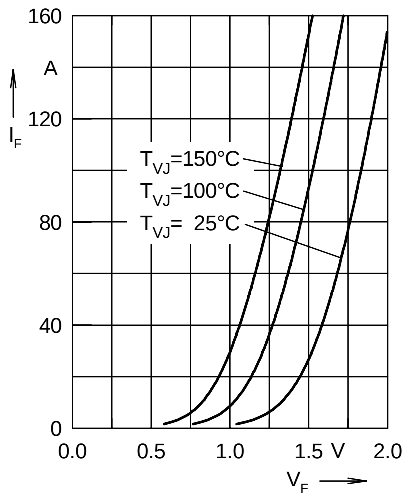


Fig. 1 Forward current I_F versus V_F

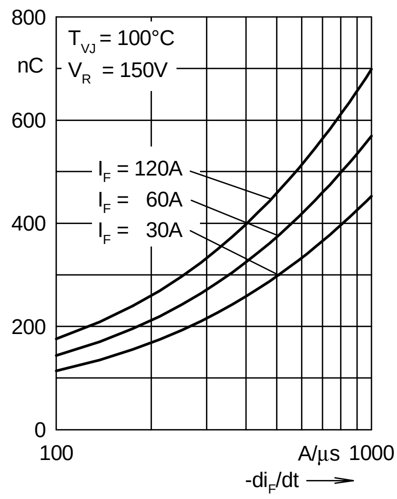


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

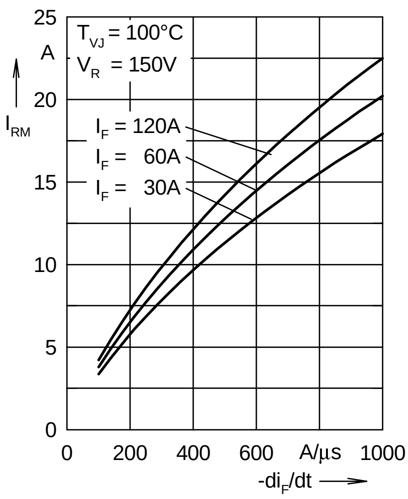


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

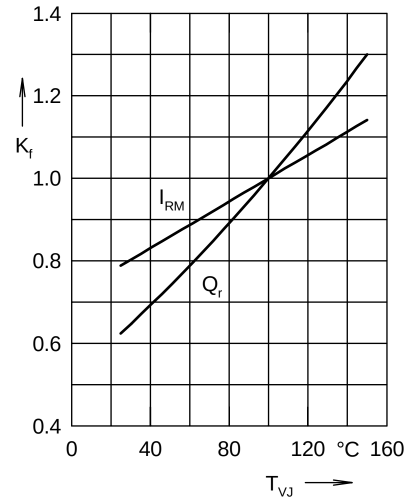


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

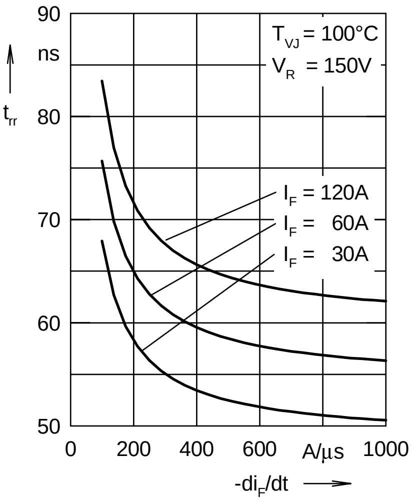


Fig. 5 Recovery time t_{rr} versus -di_F/dt

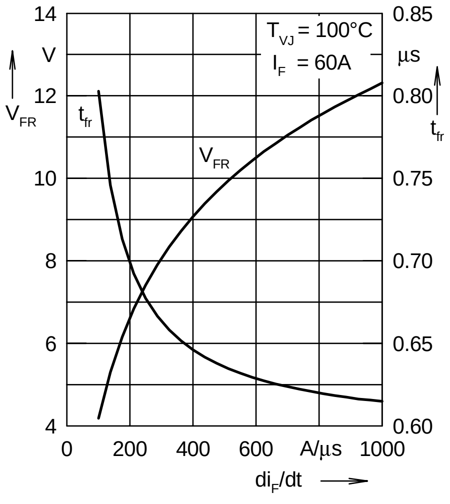


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

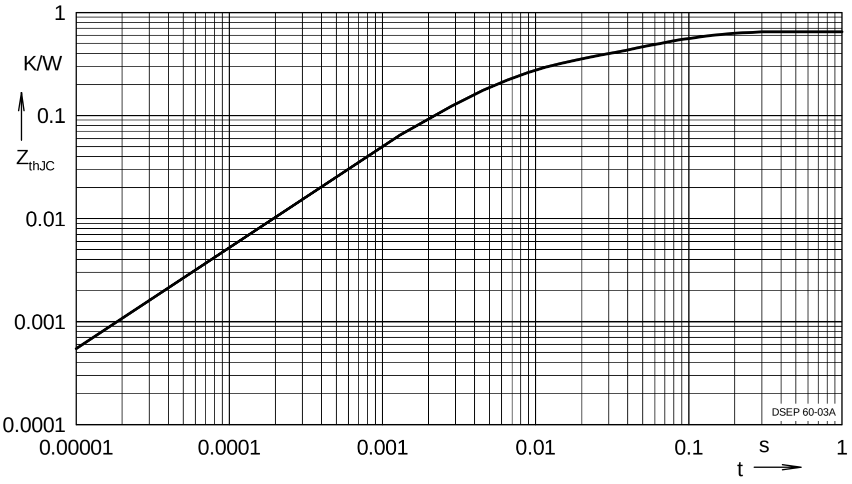


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.324	0.005
2	0.125	0.0003
3	0.201	0.038

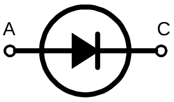
NOTE: Fig. 2 to Fig. 6 shows typical values

IXYS **DSEP 30-04A**

HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 30 A
V_{RRM} = 400 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
400	400	DSEP 30-04A



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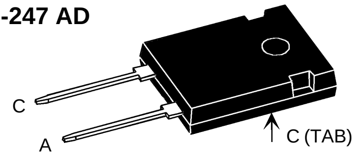

A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 140°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	tbd	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = tbd A; L = tbd µH	tbd	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	tbd	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		1.11	V
	T_{VJ} = 25°C		1.46	V
R_{thJC}			0.9	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	5.5	6.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

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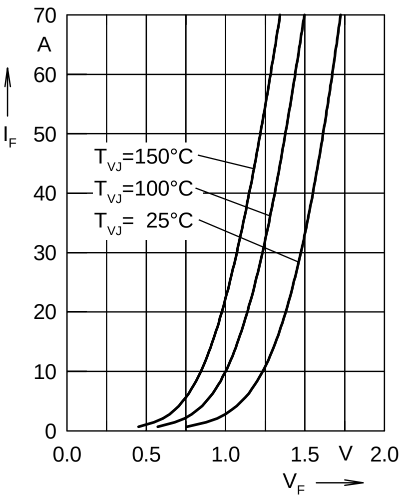


Fig. 1 Forward current I_F versus V_F

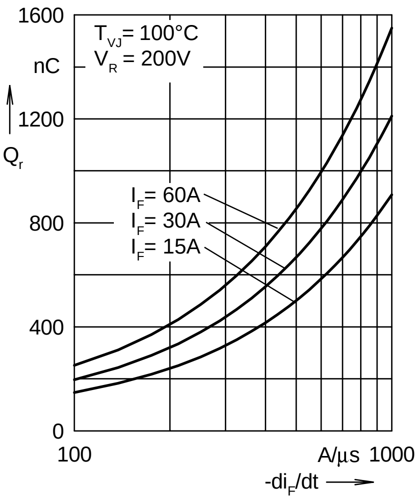


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

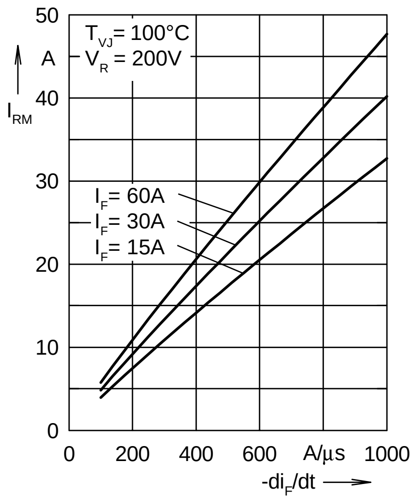


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

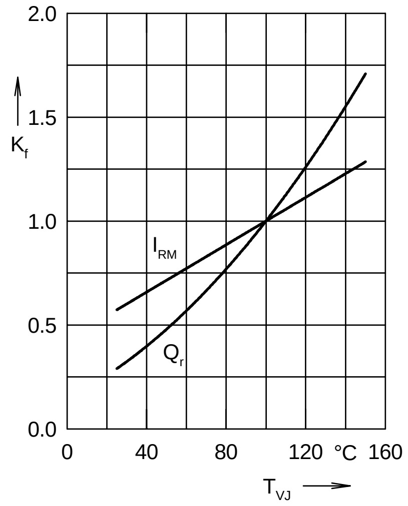


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

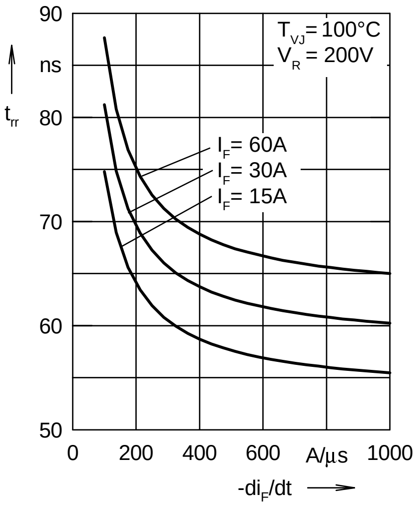


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

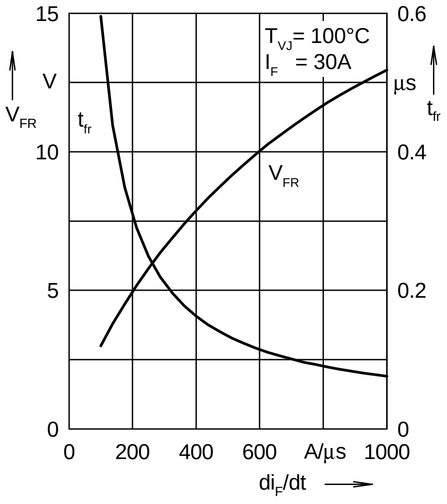


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

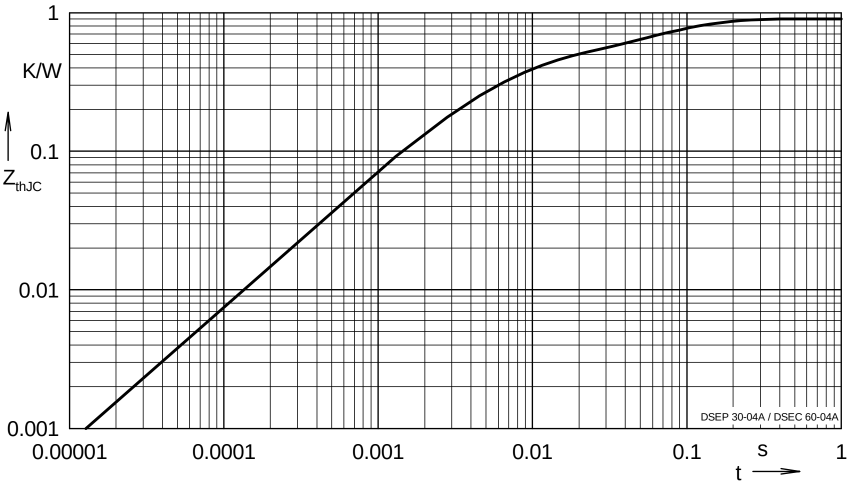


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0396

NOTE: Fig. 2 to Fig. 6 shows typical values

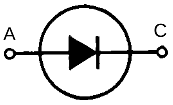
IXYS **DSEP 6-06AS**

HiPerFRED™ Epitaxial Diode
with soft recovery

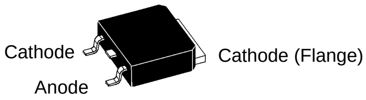
I_{FAVM} = 6 A
V_{RRM} = 600 V
t_{rr} = 20 ns

Preliminary Data

V_{RSM} V	V_{RRM} V	Type	Marking on product
600	600	DSEP 6-06AS	6P060AS



TO-252AA (DPAK)



Symbol	Conditions	Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$	26	A
I_{FAVM} ①	T_C = 152°C; rectangular, d = 0.5	6	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	12	A
I_{FSM} A	T_{VJ} = 45°C; t = 10 ms	(50 Hz), sine	40
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 0.8 A; L = 180 µH	0.1	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-40...+175	°C
T_{VJM}		175	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	55	W
Weight	**typ.**	0.3	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		50	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.2	mA
V_F	I_F = 6 A; T_{VJ} = 150°C		1.33	V
	T_{VJ} = 25°C		2.02	V
R_{thJC}			2.8	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	20	tbd	ns
I_{RM}	V_R = 100 V; I_F = 10 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	3.5	4.4	A

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.6\ V_{RRM}$, duty cycle d = 0.5

Data according to IEC 60747

Features

- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Anti saturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching
- Low losses
- Operating at lower temperature or space saving by reduced cooling

Dimensions see pages D4 - 85-86

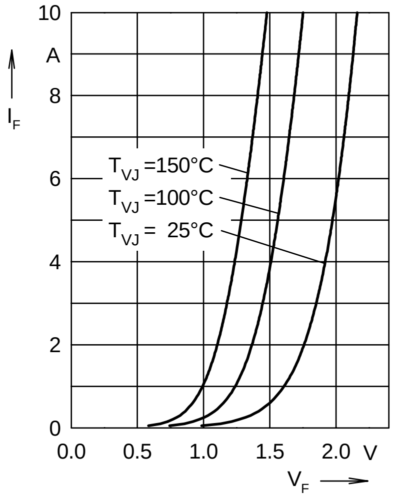


Fig. 1 Forward current I_F versus V_F

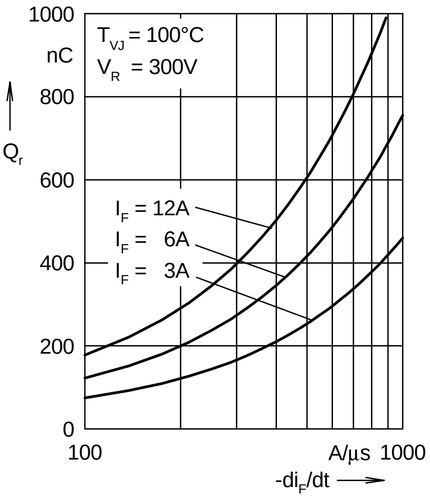


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

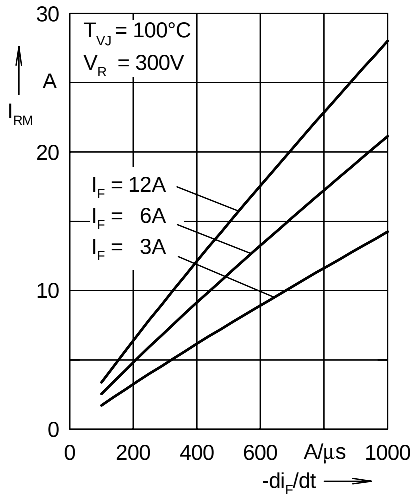


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

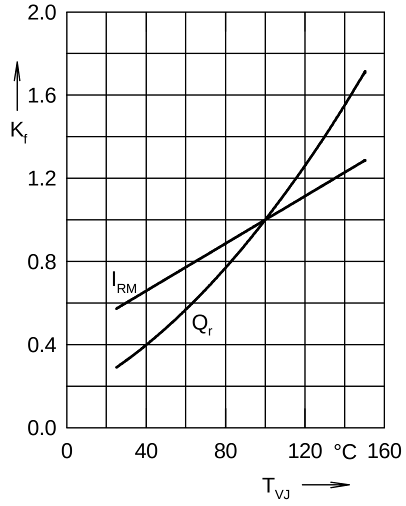


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

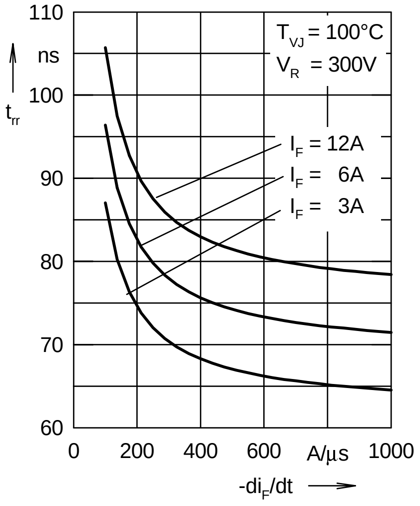


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

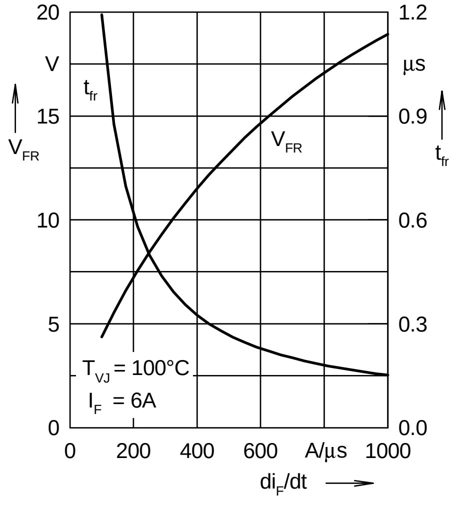


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

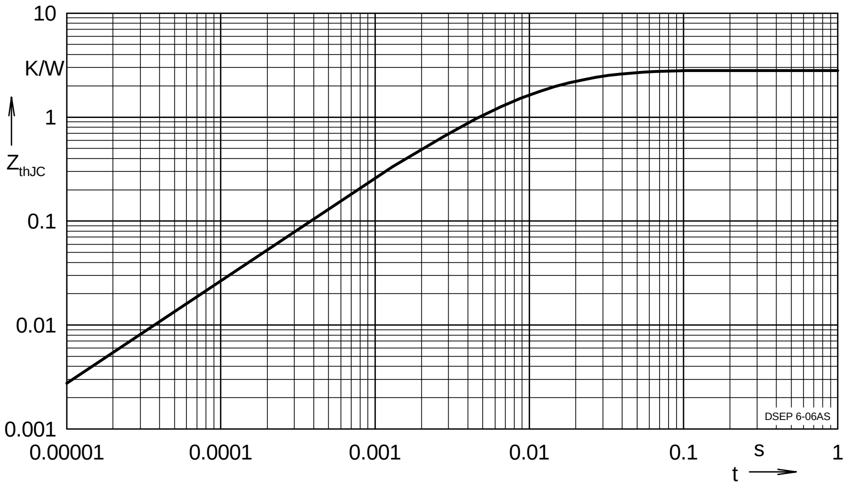


Fig. 7 Transient thermal resistance junction to case

NOTE: Fig. 2 to Fig. 6 shows typical values

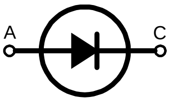
030

IXYS **DSEP 8-06A**

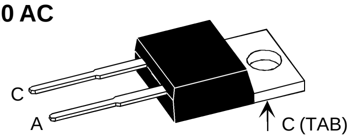
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 10 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 8-06A



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 135°C; rectangular, d = 0.5	10	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	50	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 0.9 A; L = 180 µH	0.1	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		60	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.25	mA
V_F ②	I_F = 10 A; T_{VJ} = 150°C		1.42	V
	T_{VJ} = 25°C		2.10	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	V_R = 100 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		4.4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

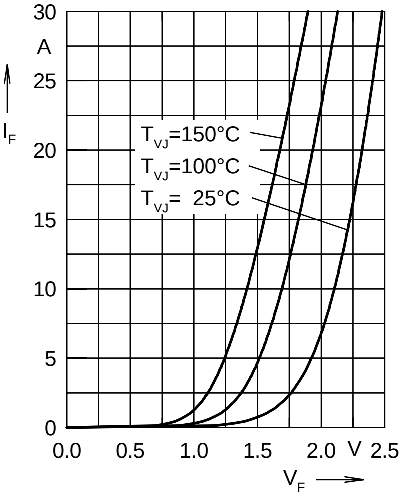


Fig. 1 Forward current I_F versus V_F

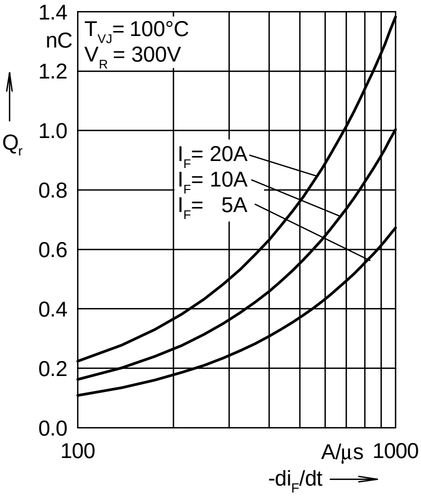


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

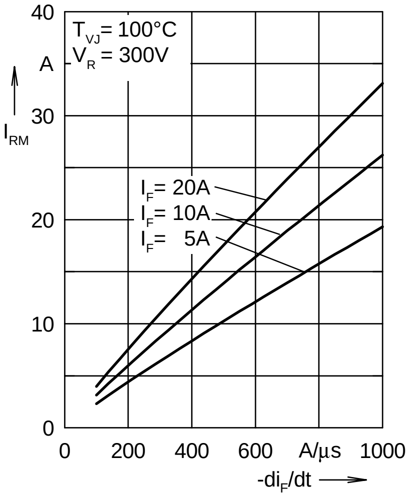


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

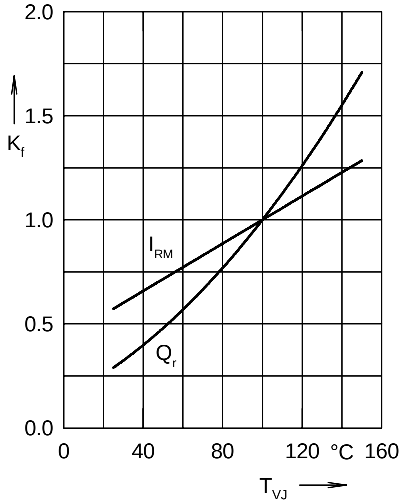


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

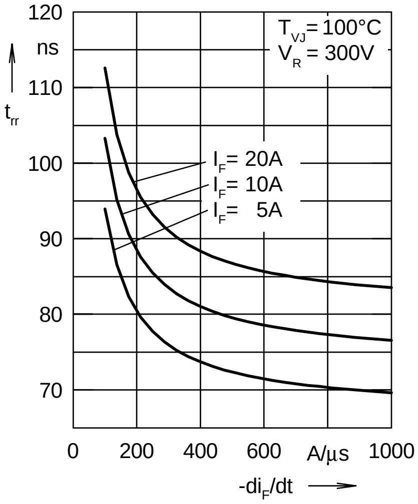


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

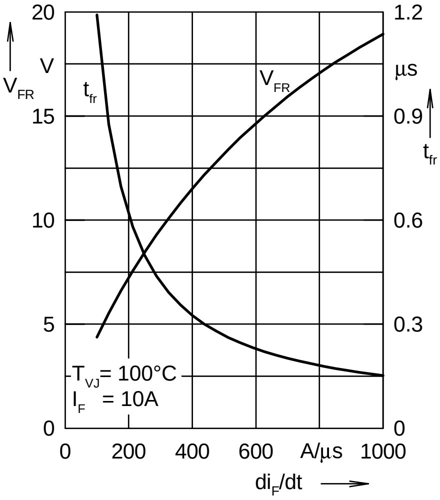


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

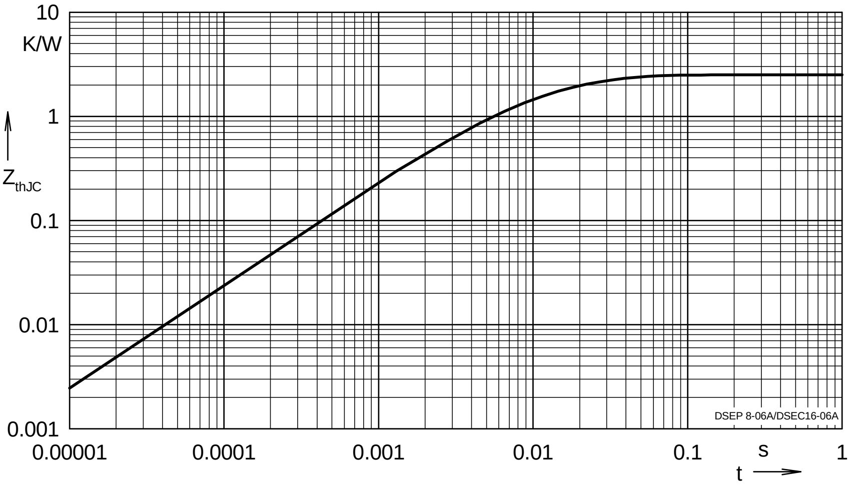


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	1.449	0.0052
2	0.5578	0.0003
3	0.4931	0.0169

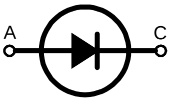
NOTE: Fig. 2 to Fig. 6 shows typical values

HiPerFRED™ Epitaxial Diode with soft recovery

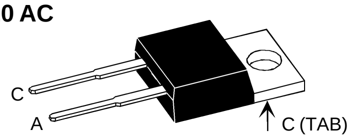
I_{FAV} = 10 A
V_{RRM} = 600 V
t_{rr} = 30 ns

Preliminary Data

V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 8-06B



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 135°C; rectangular, d = 0.5	10	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	50	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 0.9 A; L = 180 µH	0.1	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		60	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.25	mA
V_F ②	I_F = 10 A; T_{VJ} = 150°C		1.66	V
	T_{VJ} = 25°C		2.66	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		1.9	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

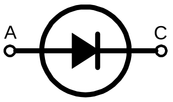
014

IXYS **DSEP 15-06A**

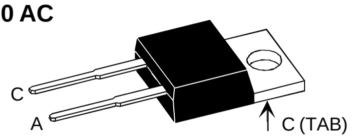
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 15 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 15-06A



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 140°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	110	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 1 A; L = 180 µH	0.1	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		100	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.5	mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C		1.35	V
	T_{VJ} = 25°C		2.04	V
R_{thJC}			1.6	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	V_R = 100 V; I_F = 25 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		4.9	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

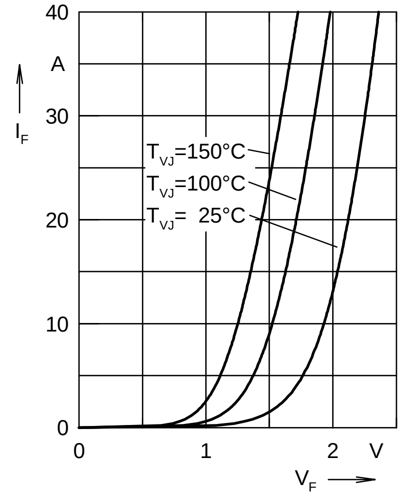


Fig. 1 Forward current I_F versus V_F

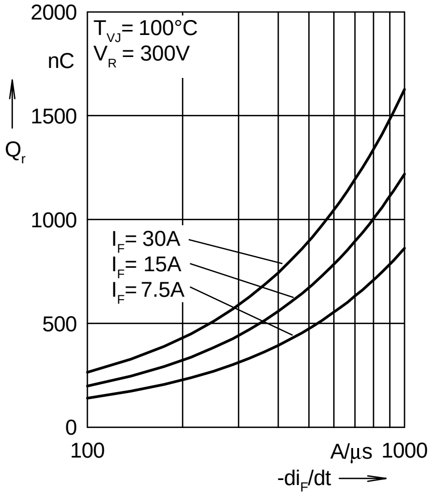


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

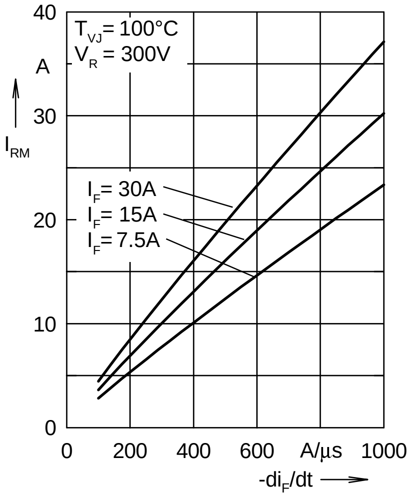


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

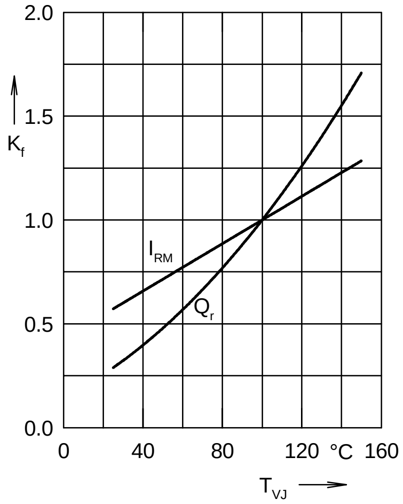


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

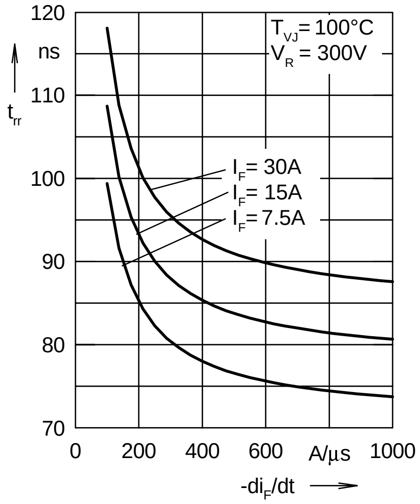


Fig. 5 Recovery time t_{rr} versus -di_F/dt

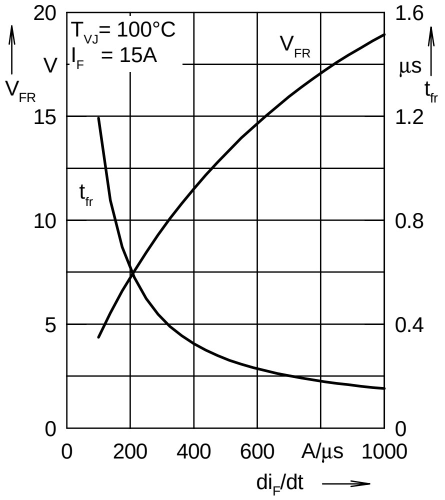


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

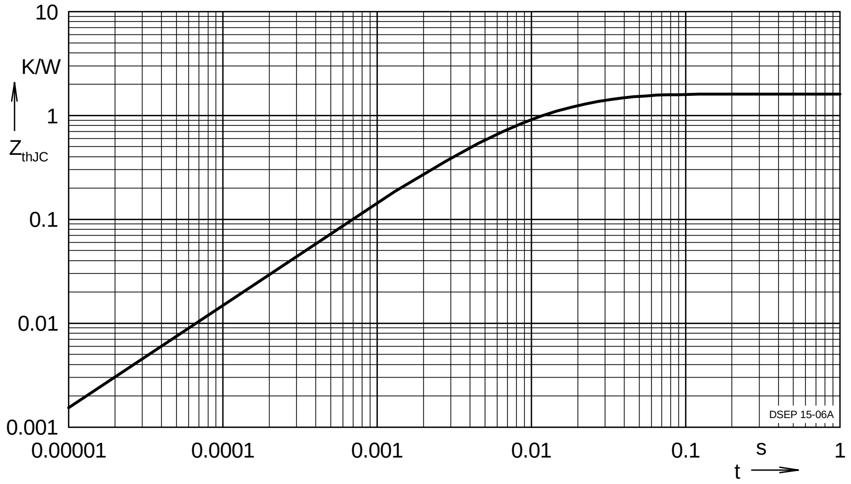


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.908	0.0052
2	0.35	0.0003
3	0.342	0.017

NOTE: Fig. 2 to Fig. 6 shows typical values

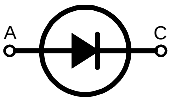
IXYS

DSEP 29-06A
DSEP 29-06B

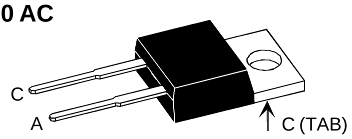
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 30 A
V_{RRM} = 600 V
t_{rr} = 30/35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 29-06A
600	600	DSEP 29-06B



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	rect., d = 0.5; T_C (Version A) = 135°C T_C (Version B) = 125°C	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	250	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 1.3 A; L = 180 µH	0.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic max. Values Version A	Version B	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$	250	250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$	1	2	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C	1.26	1.58	V
	T_{VJ} = 25°C	1.61	2.52	V
R_{thJC}		0.9	0.9	K/W
R_{thCH}	typ.	0.5	0.5	K/W
t_{rr} typ.	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	35	30	ns
I_{RM} typ.	V_R = 100 V; I_F = 50 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	6	4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

906

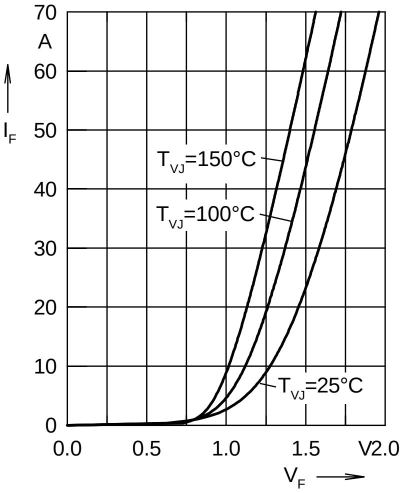


Fig. 1 Forward current I_F versus V_F

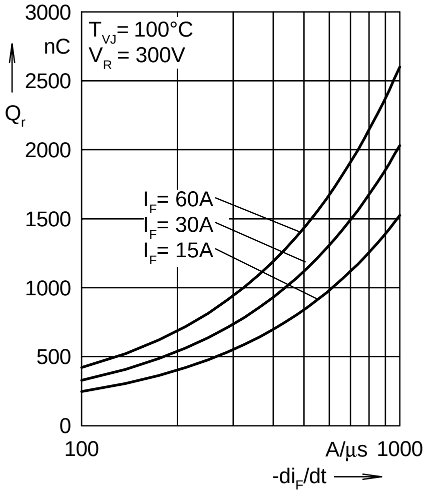


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

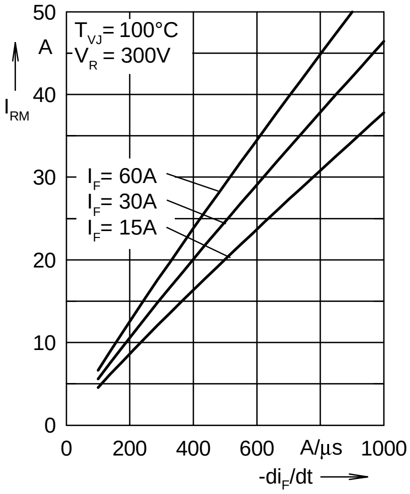


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

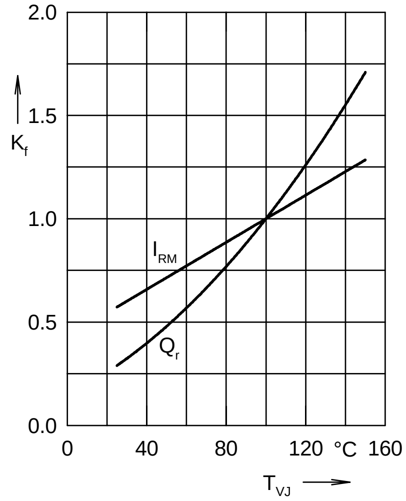


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

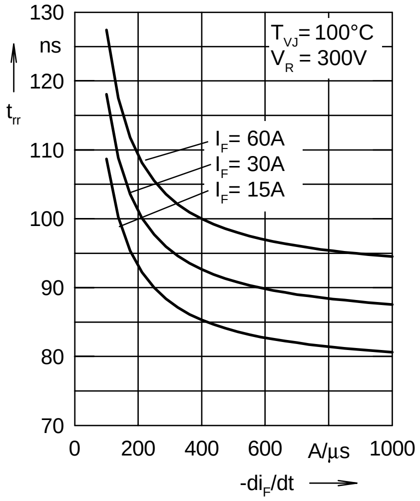


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

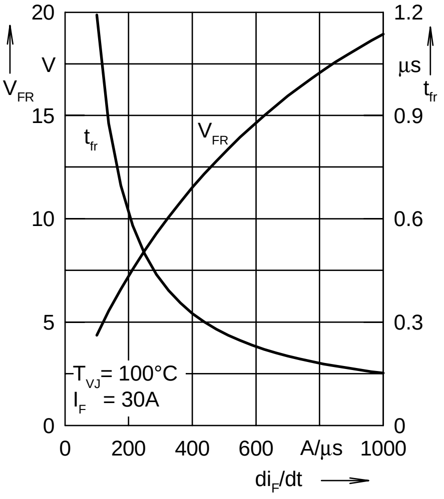


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

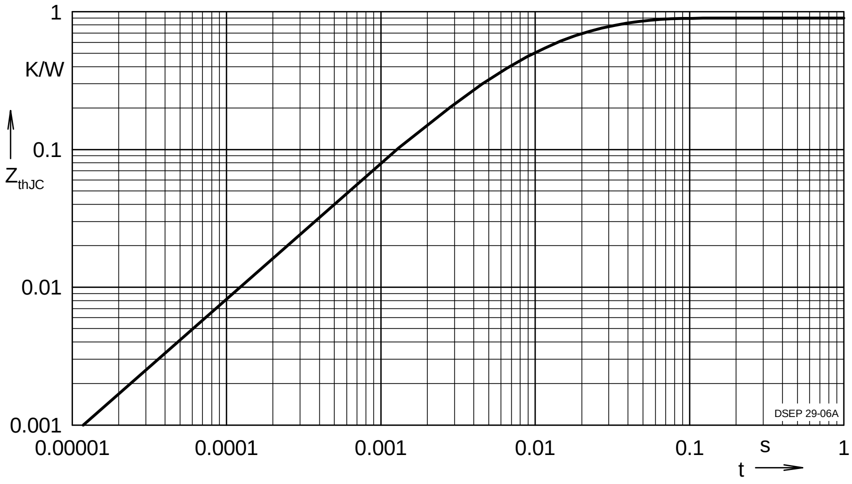


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.502	0.0052
2	0.193	0.0003
3	0.205	0.0162

NOTE: Fig. 2 to Fig. 6 shows typical values

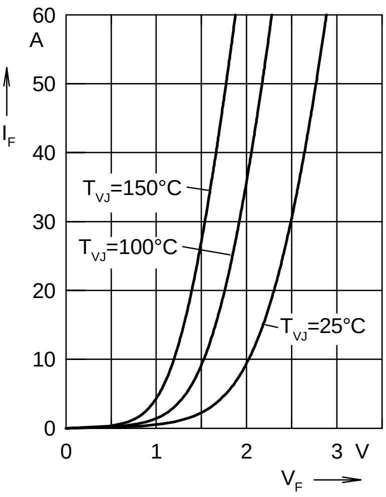


Fig. 1 Forward current I_F versus V_F

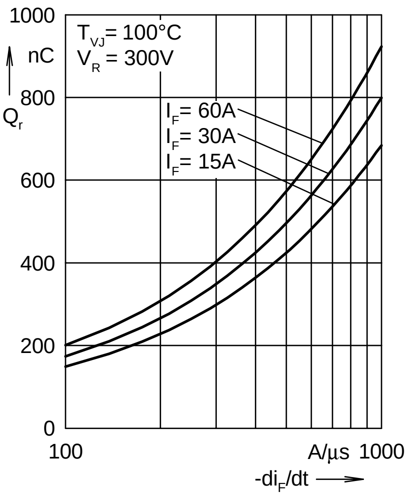


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

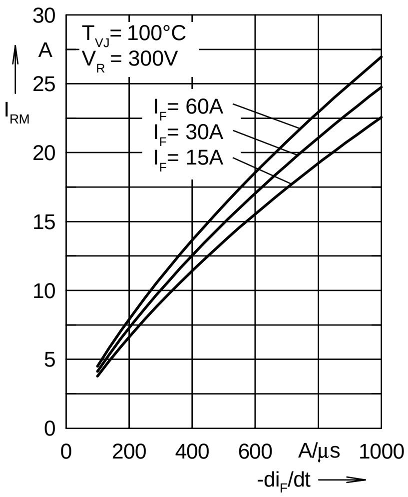


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

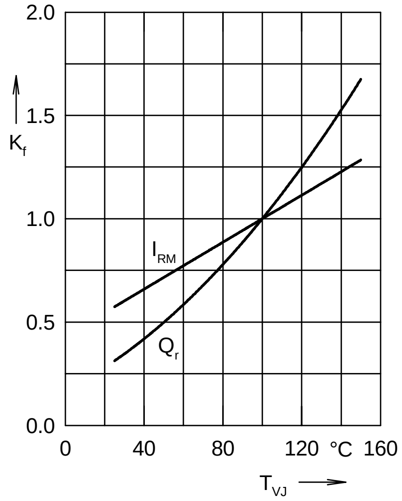


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

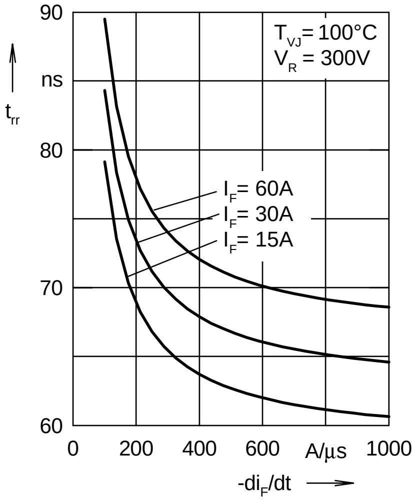


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

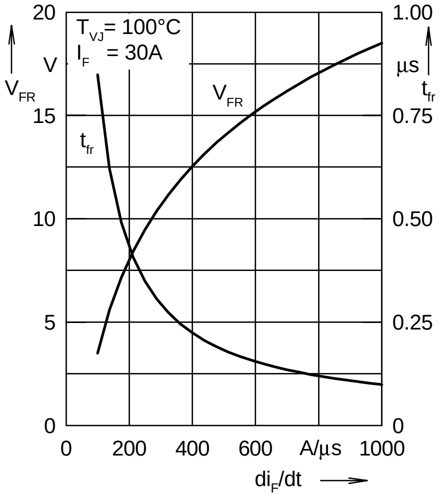


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

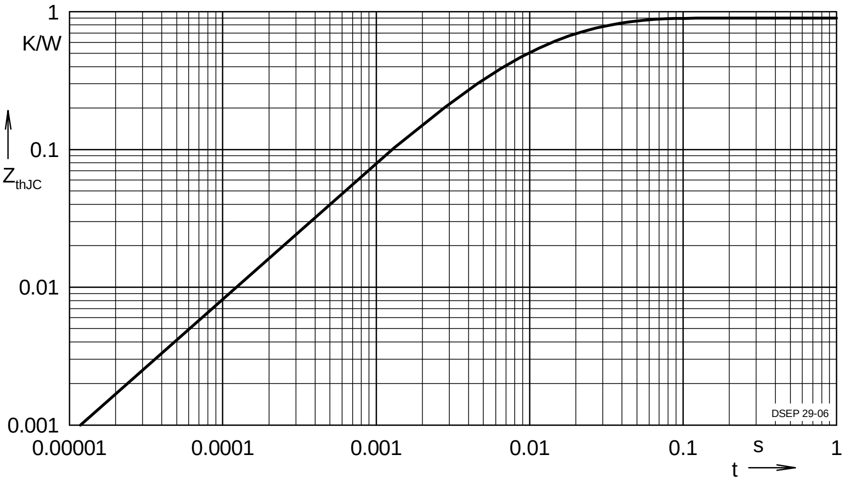


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.502	0.0052
2	0.193	0.0003
3	0.205	0.0162

906

NOTE: Fig. 2 to Fig. 6 shows typical values

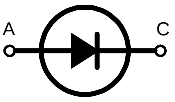
IXYS

DSEP 30-06A
DSEP 30-06BR DSEP 30-06B

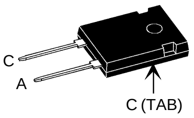
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 30 A
V_{RRM} = 600 V
t_{rr} = 30/35 ns

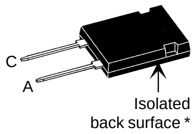
V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 30-06A
600	600	DSEP 30-06B
600	600	DSEP 30-06BR



TO-247 AD
Version A



ISOPLUS 247™
Version BR



A = Anode, C = Cathode

* Patent pending

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	rect., d = 0.5; T_C (Vers. A) = 135°C T_C (Vers. B) = 125°C; T_C (Vers. BR) = 115°C	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	250	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 1.3 A; L = 180 µH	0.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
	(Vers. BR)	135	W
M_d*	mounting torque	0.8...1.2	Nm
F_C	mounting force with clip	20...120	N
V_{ISOL} **	50/60 Hz, RMS, t = 1 minute, leads-to-tab	2500	V~
Weight	typical	6	g

* Verson A only; ** Version BR only

Symbol	Conditions	Characteristic max. Values Vers. A	Vers. B	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$	250	250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$	1	2	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C	1.25	1.56	V
	T_{VJ} = 25°C	1.60	2.51	V
R_{thJC}		0.9	0.9	K/W
R_{thJC}	Version BR		1.1	K/W
R_{thCH}	typ.	0.25	0.25	K/W
t_{rr} typ.	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	35	30	ns
I_{RM} typ.	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	6	4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0
- Version ..R isolated and UL registered E153432

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

031

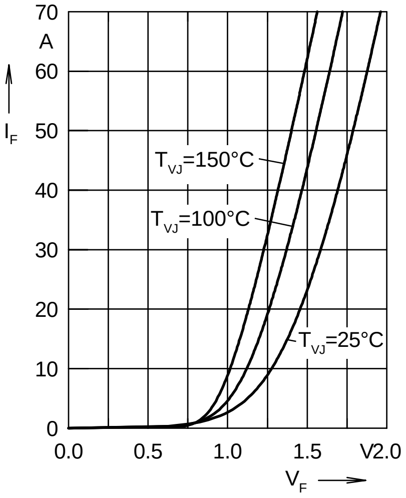


Fig. 1 Forward current I_F versus V_F

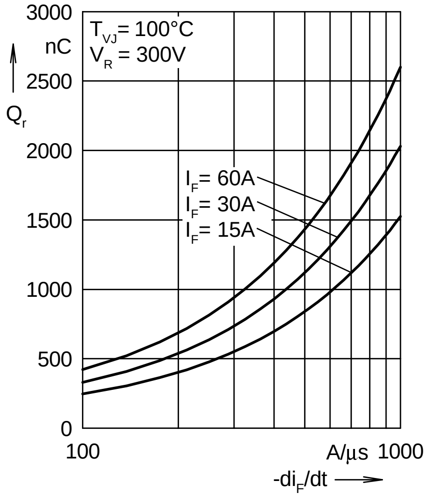


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

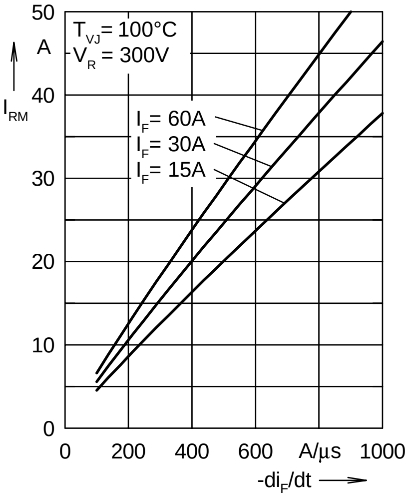


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

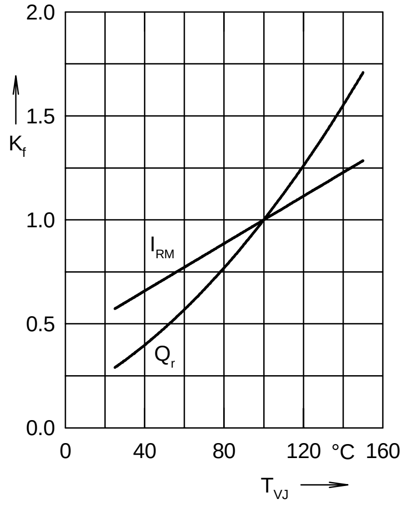


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

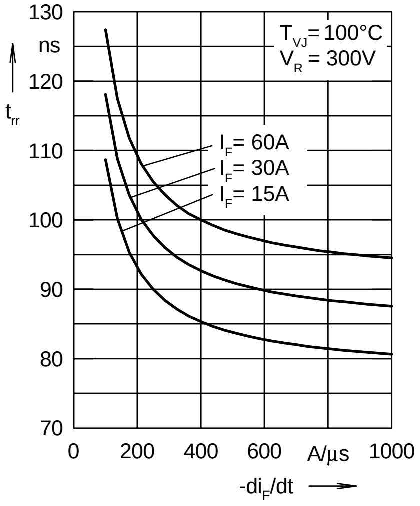


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

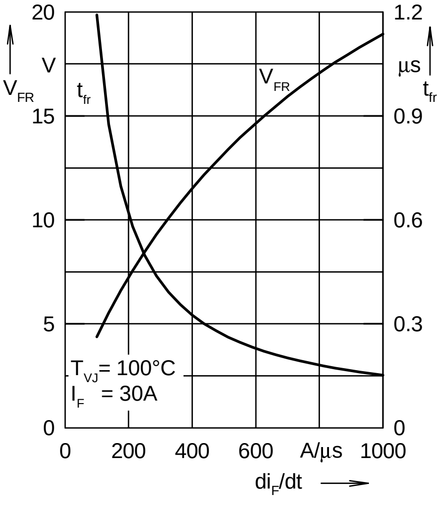


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

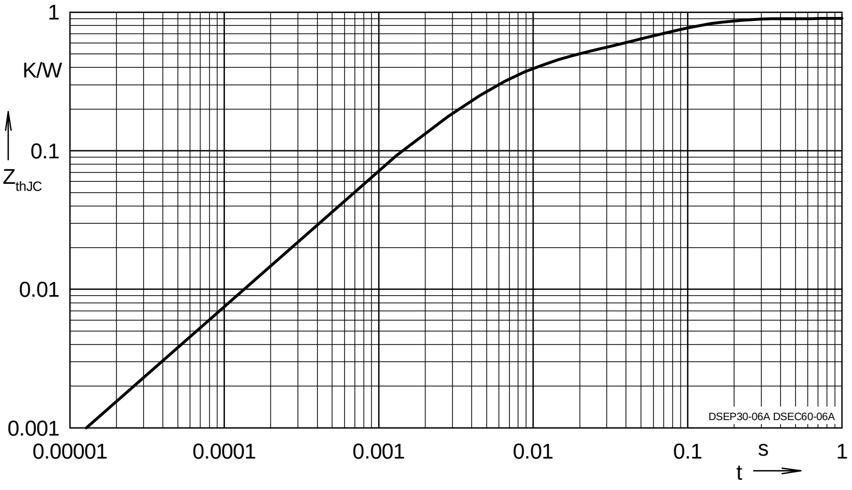


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0396

NOTE: Fig. 2 to Fig. 6 shows typical values

018

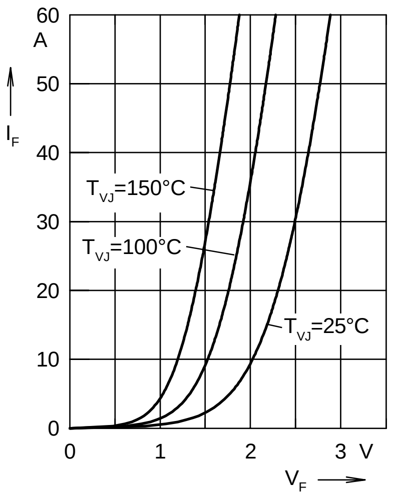


Fig. 1 Forward current I_F versus V_F

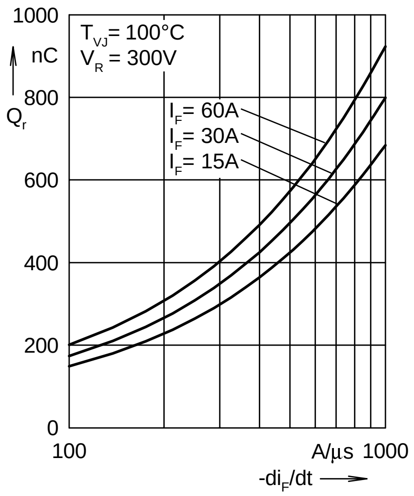


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

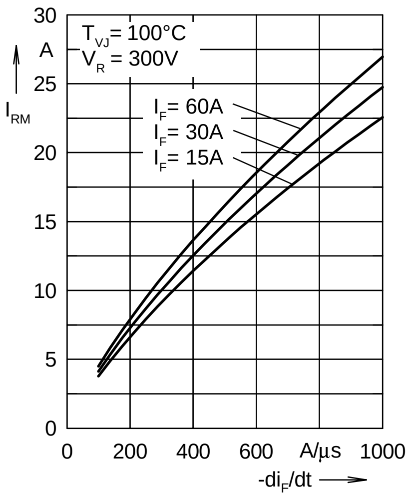


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

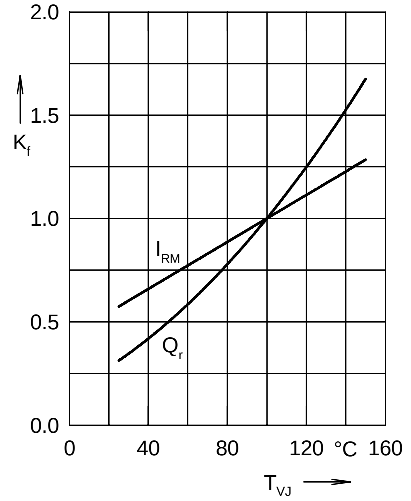


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

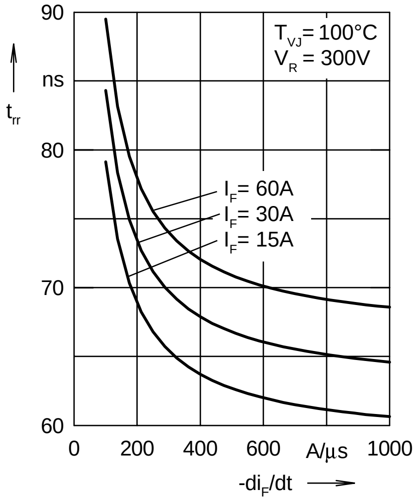


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

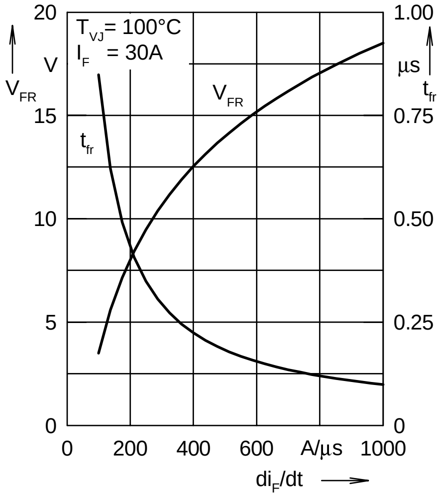


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

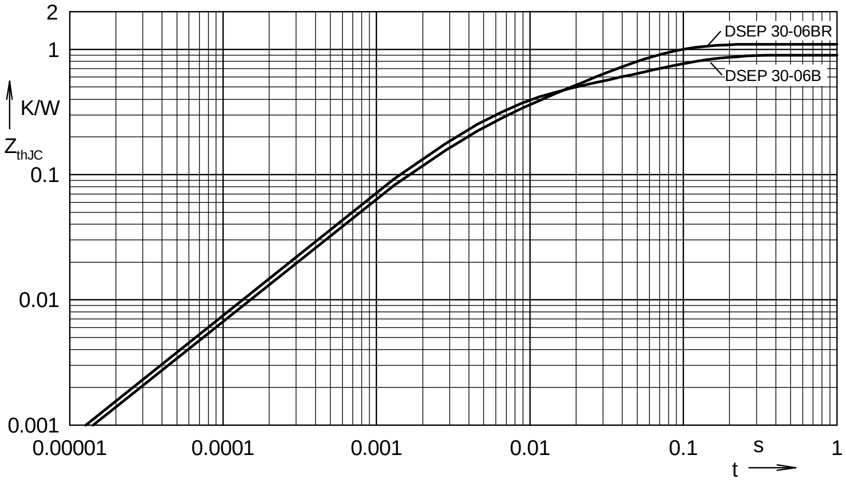


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation ..B:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0397

Constants for Z_{thJC} calculation ..BR:

i	R_{thi} (K/W)	t_i (s)
1	0.368	0.0052
2	0.1417	0.0003
3	0.0295	0.0004
4	0.5604	0.0092

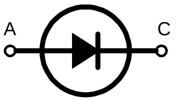
NOTE: Fig. 2 to Fig. 6 shows typical values

DSEP 60-06A
DSEP 60-06AT

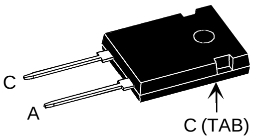
HiPerFRED^{TM} Epitaxial Diode
with soft recovery

I_{FAV} = 60 A
V_{RRM} = 600 V
t_{rr} = 35 ns

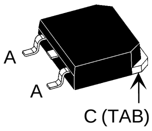
V_{RSM} V	V_{RRM} V	Type	
600	600	DSEP 60-06A	DSEP 60-06AT



TO-247 AD
(A-Type)



TO-268 AA
(AT-Type)



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$	70	A
I_{FAVM}	T_C = 110°C; rectangular, d = 0.5	60	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	600	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 1.6 A; L = 180 µH	0.3	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	230	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		650	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		2.5	mA
V_F ②	I_F = 60 A; T_{VJ} = 150°C		1.39	V
	T_{VJ} = 25°C		2.04	V
R_{thJC}			0.65	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	V_R = 100 V; I_F = 130 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		8.3	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

018

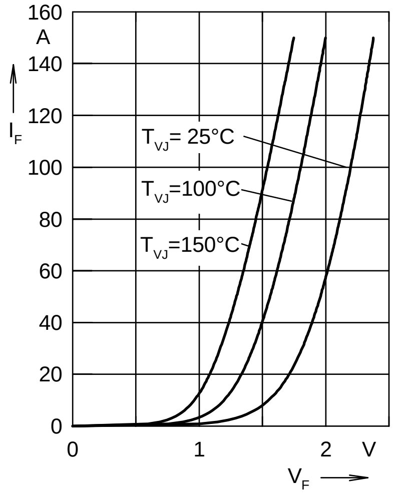


Fig. 1 Forward current I_F versus V_F

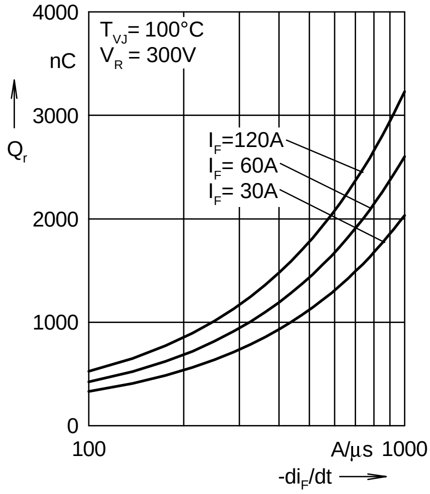


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

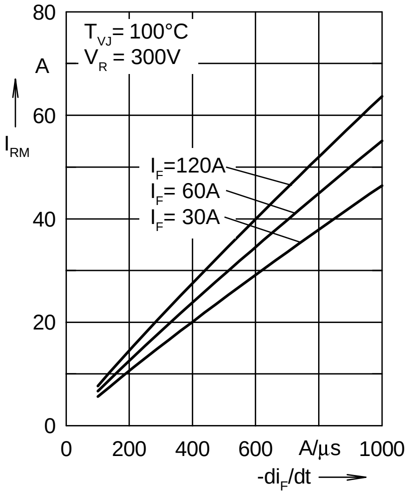


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

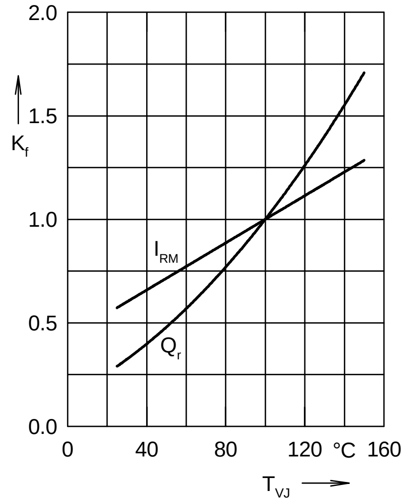


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

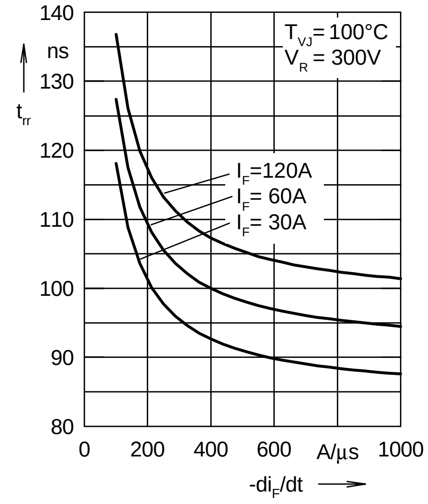


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

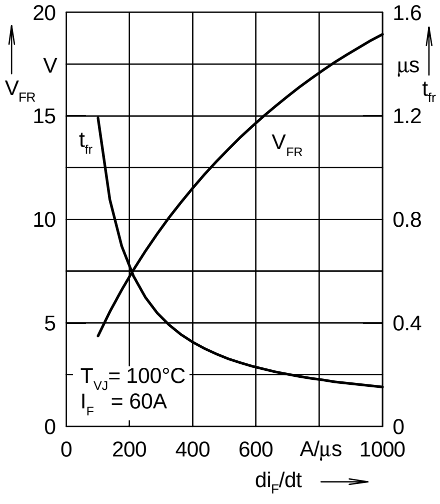


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

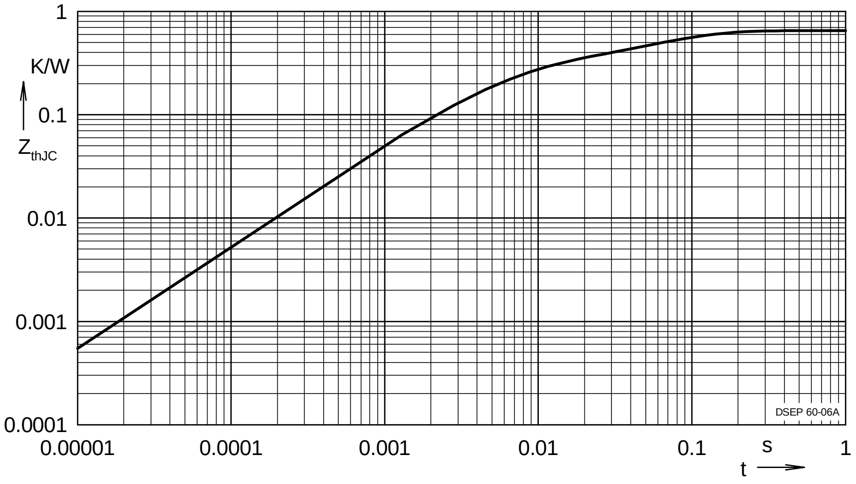


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.324	0.0052
2	0.125	0.0003
3	0.201	0.0385

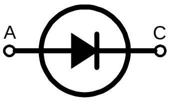
NOTE: Fig. 2 to Fig. 6 shows typical values

018

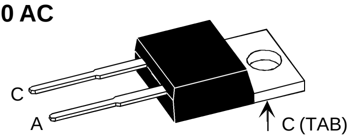
HiPerFRED™ Epitaxial Diode with soft recovery

I_{FAV} = 10 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEP 8-12A



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 115°C; rectangular, d = 0.5	10	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	40	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 8 A; L = 180 µH	6.9	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.8	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		60	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.25	mA
V_F ②	I_F = 10 A; T_{VJ} = 150°C		1.96	V
	T_{VJ} = 25°C		2.94	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 12 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	4		A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

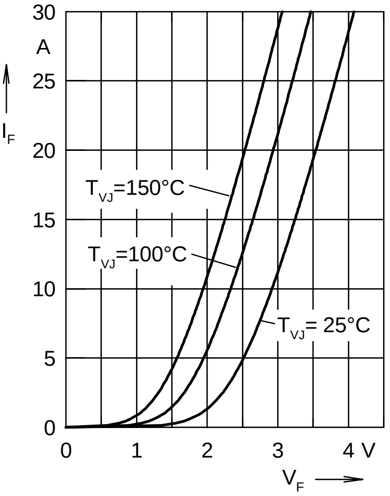


Fig. 1 Forward current I_F versus V_F

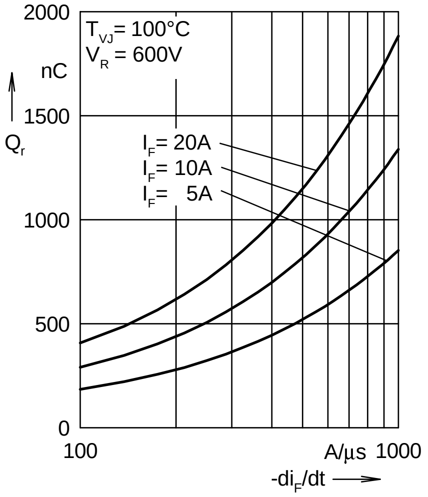


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

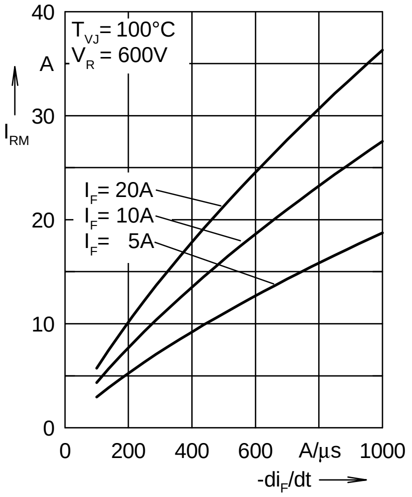


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

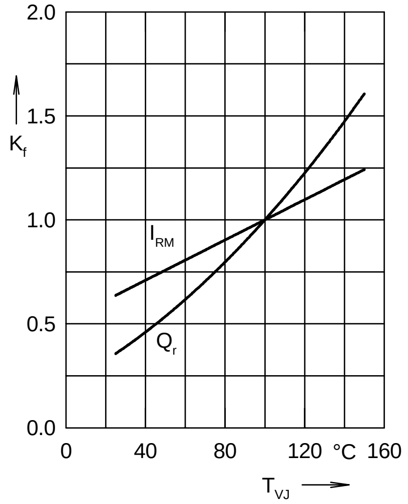


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

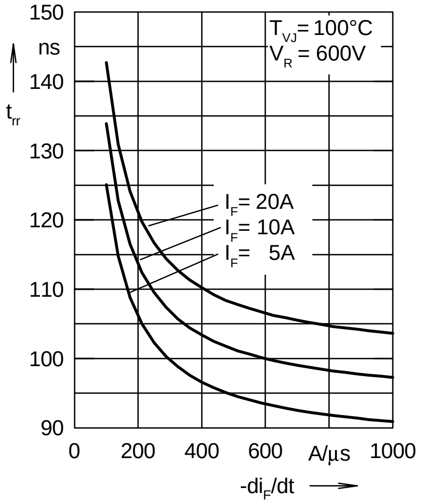


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

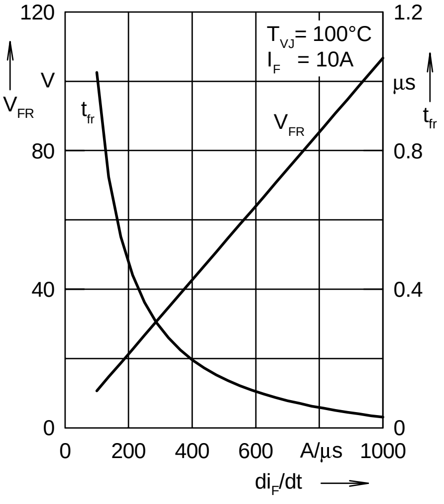


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

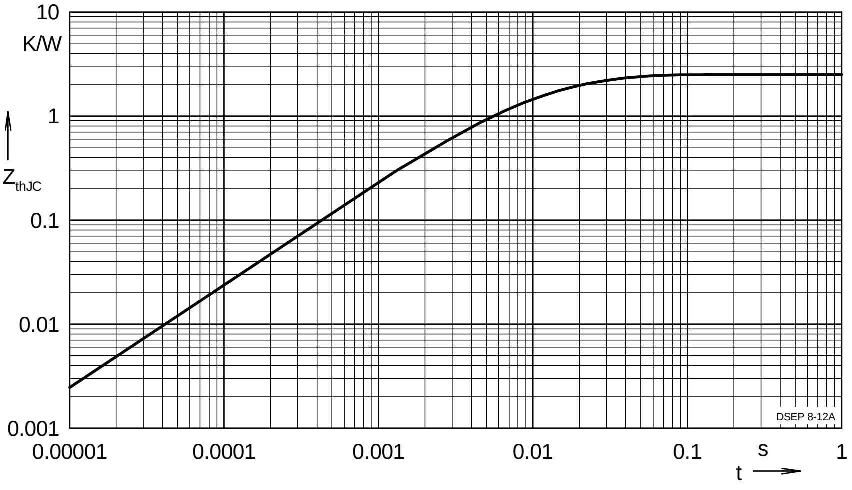


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	1.449	0.0052
2	0.558	0.0003
3	0.493	0.017

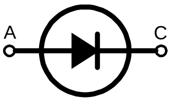
NOTE: Fig. 2 to Fig. 6 shows typical values

IXYS **DSEP 12-12A**

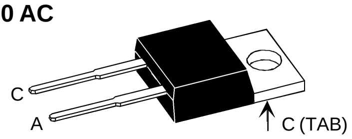
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 15 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEP 12-12A



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 125°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	90	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 9 A; L = 180 µH	8.7	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.9	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		100	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.5	mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C		1.79	V
	T_{VJ} = 25°C		2.75	V
R_{thJC}			1.6	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 25 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	4.5		A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

008

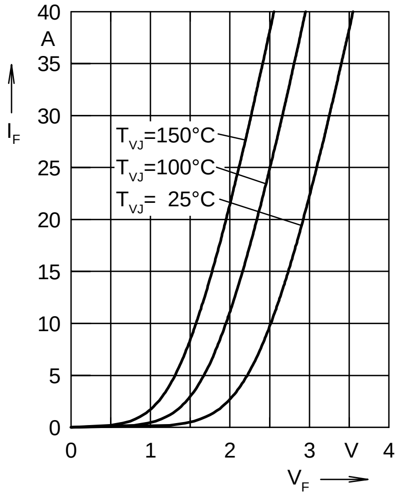


Fig. 1 Forward current I_F versus V_F

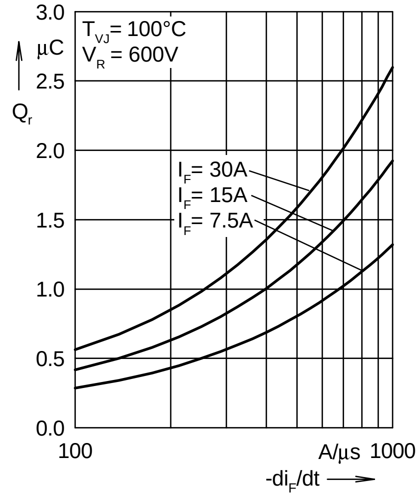


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

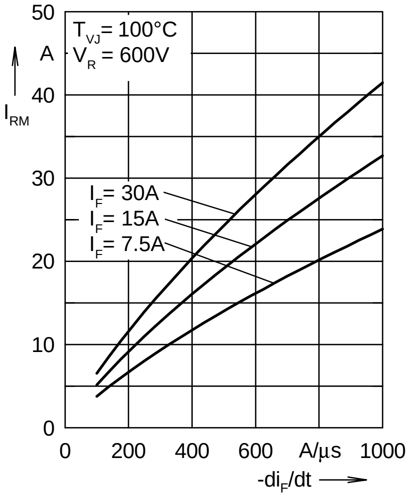


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

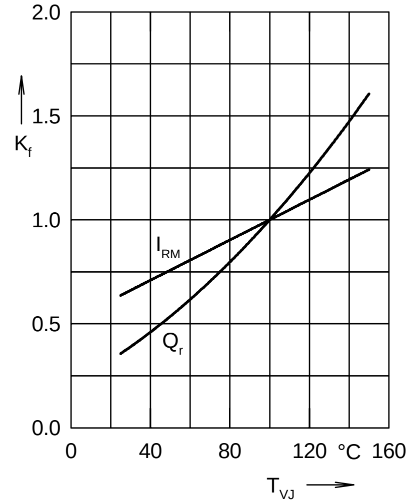


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

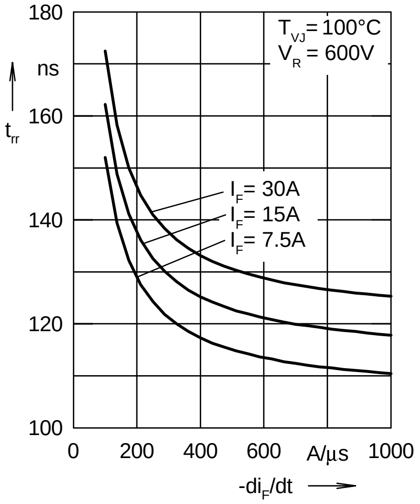


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

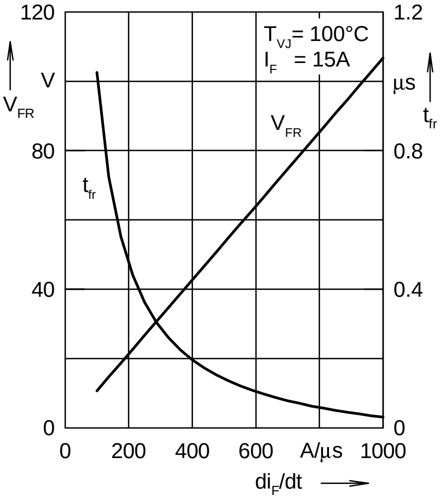


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

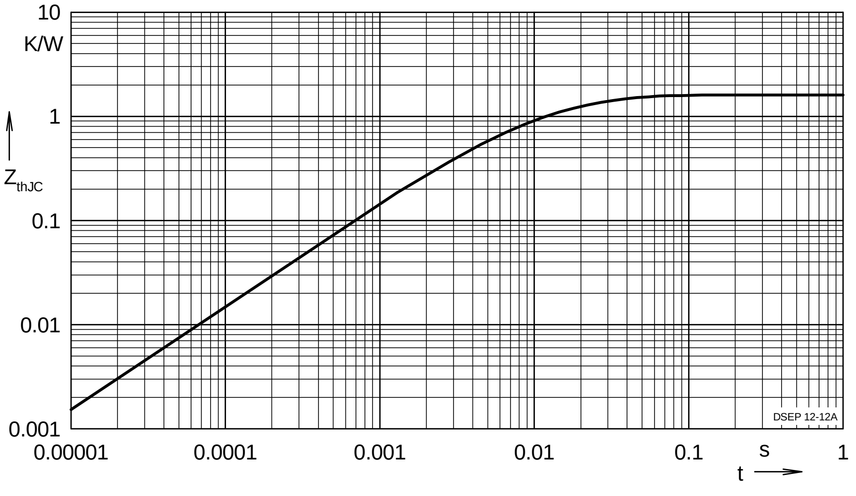


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.9084	0.0052
2	0.3497	0.0003
3	0.3419	0.0165

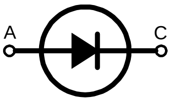
NOTE: Fig. 2 to Fig. 6 shows typical values

008

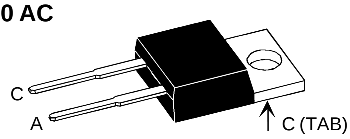
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 30 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	**1200**	**DSEP 29-12A**



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 115°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	200	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 11.5 A; L = 180 µH	14	mJ
I_{AR}	V_A = 1.25·V_R typ.; f = 10 kHz; repetitive	1.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C V_R = V_{RRM}		250	µA
	T_{VJ} = 150°C V_R = V_{RRM}		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		1.81	V
	T_{VJ} = 25°C		2.75	V
R_{thJC}			0.9	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 50 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	5.5		A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

800

Preliminary Data

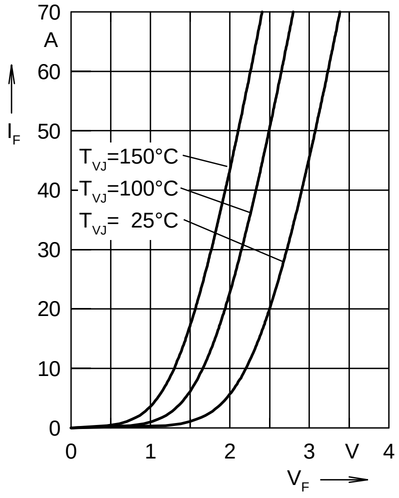


Fig. 1 Forward current I_F versus V_F

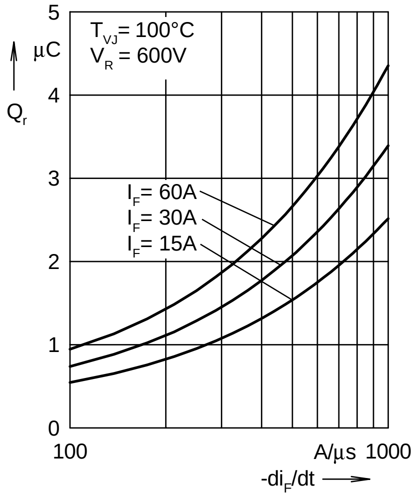


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

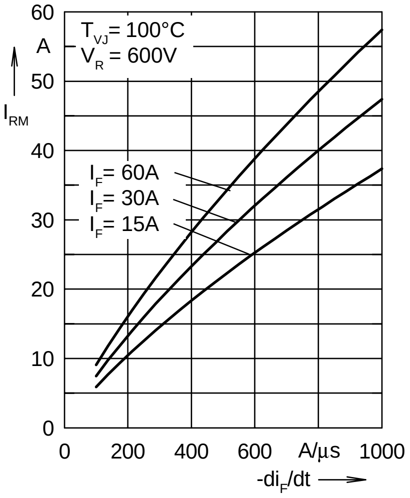


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

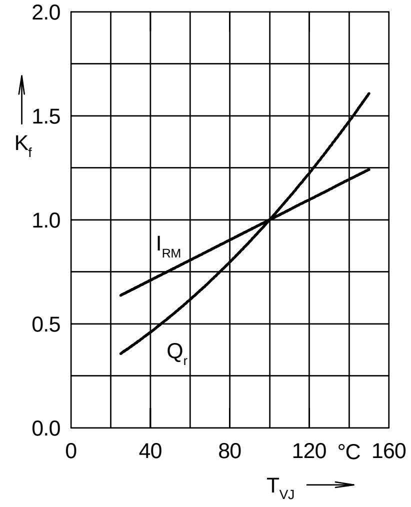


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

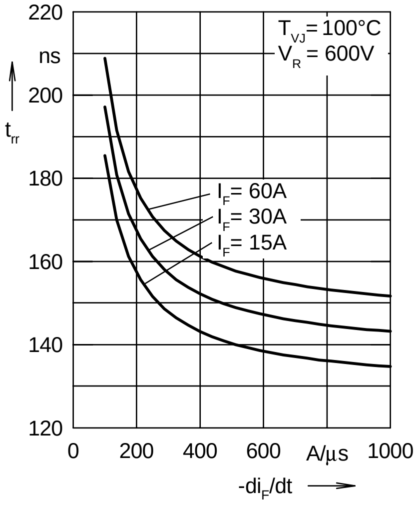


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

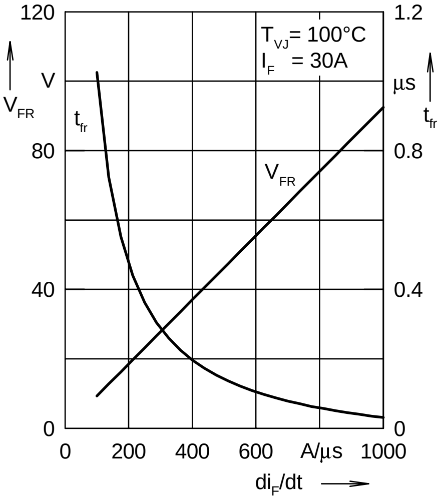


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

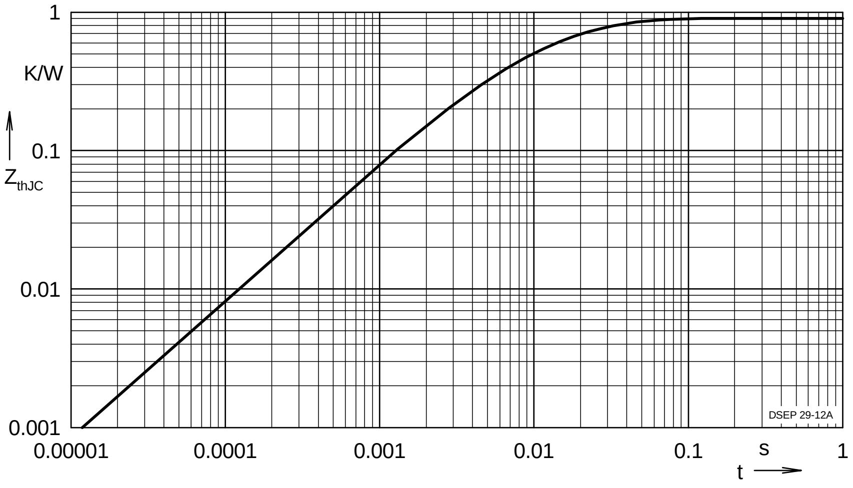


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.502	0.0052
2	0.193	0.0003
3	0.205	0.0162

NOTE: Fig. 2 to Fig. 6 shows typical values

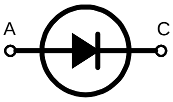
IXYS

DSEP 30-12A
DSEP 30-12AR

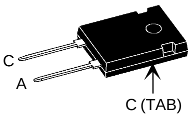
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 30 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

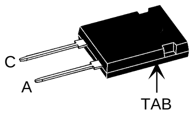
V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEP 30-12A
1200	1200	DSEP 30-12AR



TO-247 AD
Version A



ISOPLUS 247™
Version AR



A = Anode, C = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	rectangular, d = 0.5; T_C (Vers. A) = 115°C T_C (Vers. AR)= 105°C	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	200	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 11.5 A; L = 180 µH	14	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	1.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C; Version A	165	W
	Version AR	135	W
M_d *	mounting torque	0.8...1.2	Nm
F_C	mounting force with clip	20...120	N
V_{ISOL} **	50/60 Hz RMS; $I_{ISOL} \leq 1$ mA; leads-to-tab	2500	V~
Weight	typical	6	g

* Version A only; ** Version AR only

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C; $V_R = V_{RRM}$		250	µA
	T_{VJ} = 150°C; $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		1.78	V
	T_{VJ} = 25°C		2.74	V
R_{thJC}	Version A		0.9	K/W
	Version AR		1.1	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	5.5	11.4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0
- Version ..R isolated and UL registered E153432

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

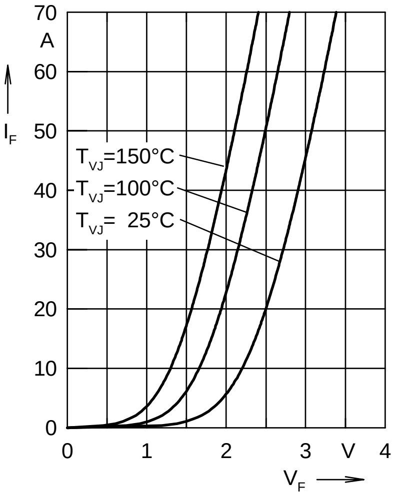


Fig. 1 Forward current I_F versus V_F

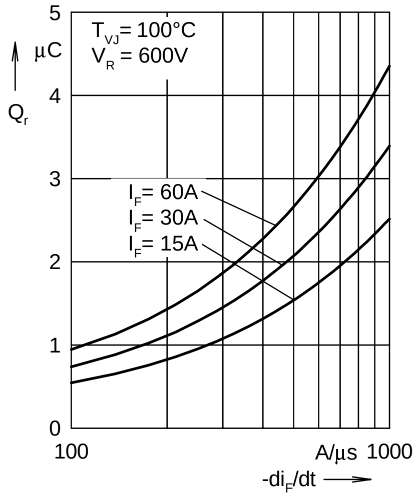


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

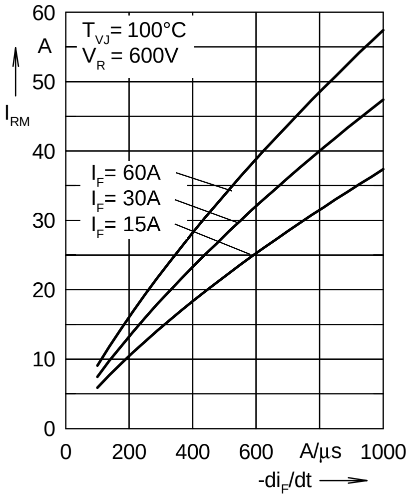


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

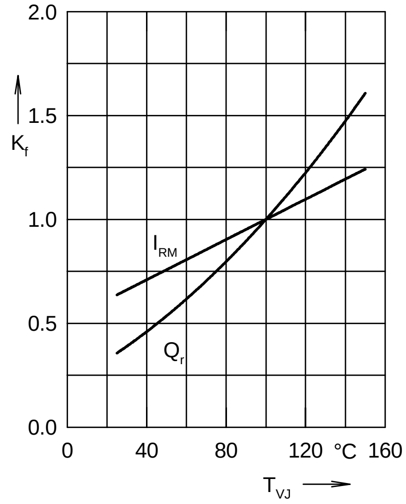


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

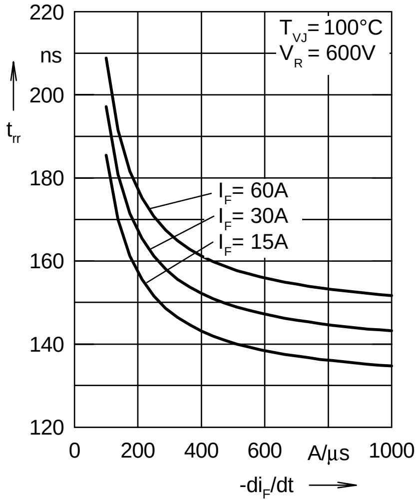


Fig. 5 Recovery time t_{rr} versus -di_F/dt

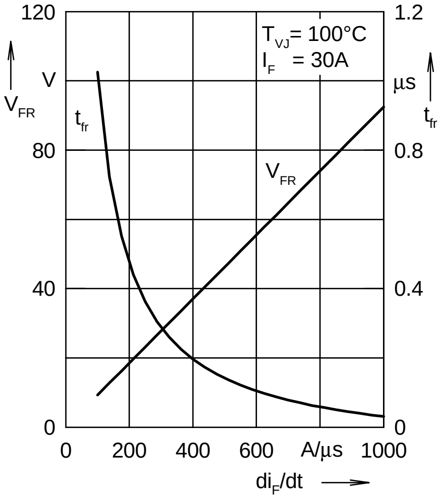


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

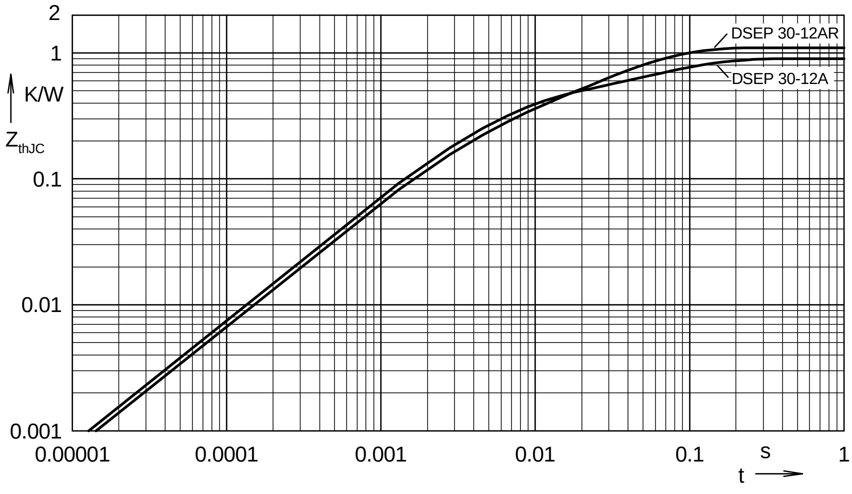


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation ..A:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0397

Constants for Z_{thJC} calculation ..AR:

i	R_{thi} (K/W)	t_i (s)
1	0.368	0.0052
2	0.1417	0.0003
3	0.0295	0.0004
4	0.5604	0.0092

NOTE: Fig. 2 to Fig. 6 shows typical values

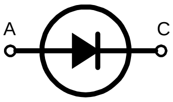
018

IXYS **DSEP 60-12A**

HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 60 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEP 60-12A



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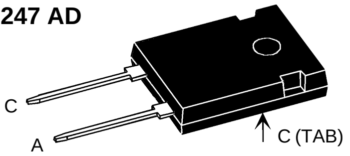


A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 90°C; rectangular, d = 0.5	60	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	500	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 14.5 A; L = 180 µH	23	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	1.5	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	230	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		650	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		2.5	mA
V_F ②	I_F = 60 A; T_{VJ} = 150°C		1.74	V
	T_{VJ} = 25°C		2.66	V
R_{thJC}			0.65	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 130 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	7	14.3	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

008

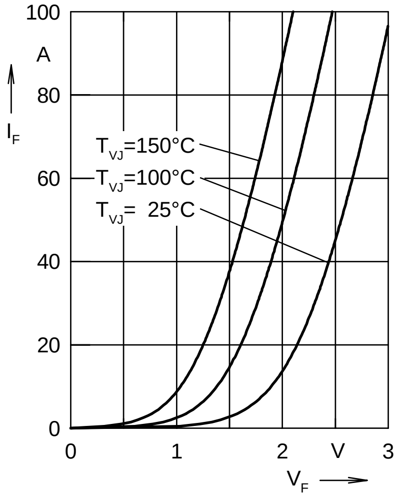


Fig. 1 Forward current I_F versus V_F

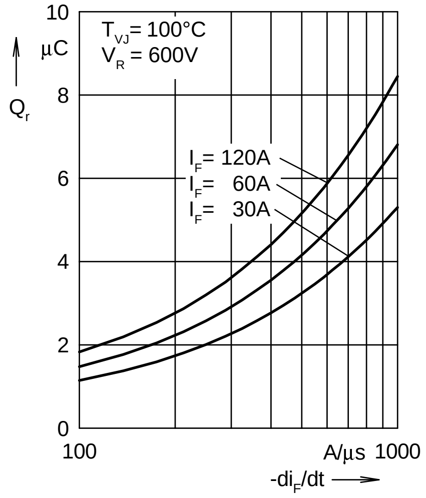


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

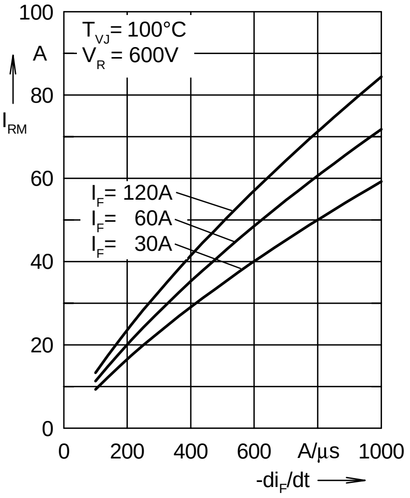


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

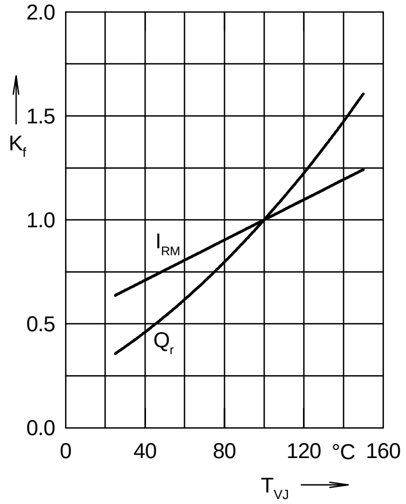


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

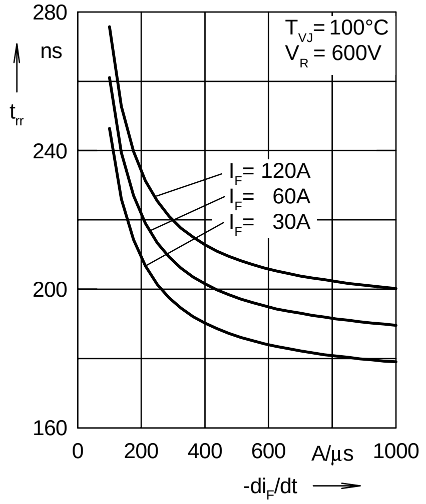


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

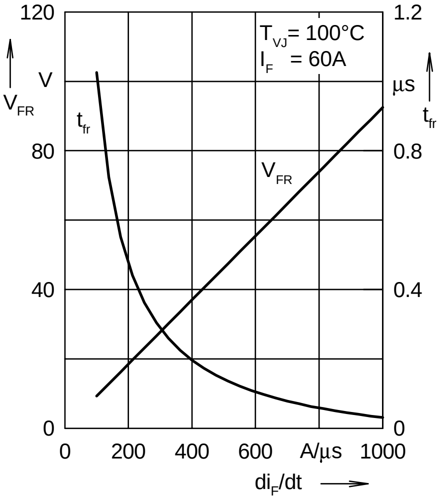


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

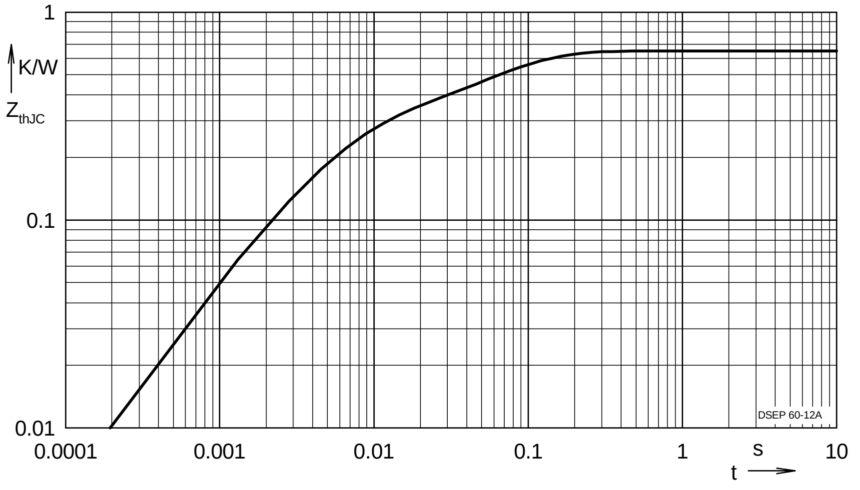


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.324	0.0052
2	0.125	0.0003
3	0.201	0.038

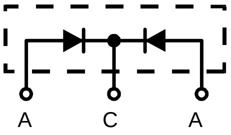
NOTE: Fig. 2 to Fig. 6 shows typical values

914

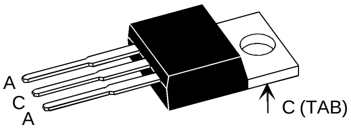
HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 5 A
V_{RRM} = 200 V
t_{rr} = 25 ns

V_{RSM} V	V_{RRM} V	Type
200	200	DSEC 10-02A



TO-220 AB



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 160°C; rectangular, d = 0.5	5	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	tbd	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	80	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2 A; L = 180 µH	0.5	mJ
I_{AR}	V_A = 1.5·V_R typ.; f = 10 kHz; repetitive	0.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C V_R = V_{RRM} T_{VJ} = 150°C V_R = V_{RRM}		50 0.2	µA mA
V_F ②	I_F = 5 A; T_{VJ} = 150°C T_{VJ} = 25°C		0.81 1.23	V V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	25		ns
I_{RM}	V_R = 100 V; I_F = 10 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		2.0	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

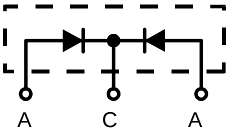
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

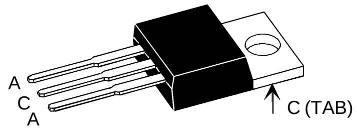
HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 8 A
V_{RRM} = 200 V
t_{rr} = 25 ns

V_{RSM} V	V_{RRM} V	Type
200	200	DSEC 16-02A



TO-220 AB



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 150°C; rectangular, d = 0.5	8	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	tbd	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	80	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2 A; L = 180 µH	0.5	mJ
I_{AR}	V_A = 1.5·V_R typ.; f = 10 kHz; repetitive	0.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C V_R = V_{RRM}		50	µA
	T_{VJ} = 150°C V_R = V_{RRM}		0.2	mA
V_F ②	I_F = 8 A; T_{VJ} = 150°C		0.94	V
	T_{VJ} = 25°C		1.30	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	25		ns
I_{RM}	V_R = 100 V; I_F = 10 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		4.1	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

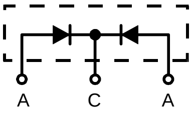
IXYS **DSEC 29-02AS**

HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

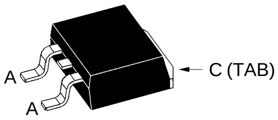
Preliminary Data

I_{FAV} = 2x 15 A
V_{RRM} = 200 V
t_{rr} = 25 ns

V_{RSM} V	V_{RRM} V	Type
200	200	DSEC 29-02AS



TO-263 AB
(AS-Type)



A = Anode, C = Cathode , TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 150°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	140	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2.5 A; L = 180 µH	0.8	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.45...0.55 4...5	Nm lb.in.
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C; $V_R = V_{RRM}$		100	µA
	T_{VJ} = 150°C; $V_R = V_{RRM}$		0.5	mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C		0.86	V
	T_{VJ} = 25°C		1.06	V
R_{thJC}			1.6	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	25		ns
I_{RM}	V_R = 100 V; I_F = 25 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	3.5	4.4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

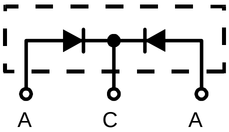
009

HiPerFRED™ Epitaxial Diode with common cathode and soft recovery

I_{FAV} = 2x 15 A
V_{RRM} = 200 V
t_{rr} = 30 ns

Preliminary Data

V_{RSM} V	V_{RRM} V	Type
200	200	DSEC 30-02A



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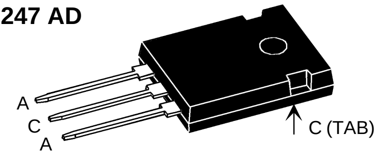


A = Anode, C = Cathode, TAB = Cathode

Symbol	Test Conditions	Maximum Ratings	
I_{FRMS}		50	A
I_{FAVM}	T_C = 150°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	140	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2.5 A; L = 180 µH	0.8	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.45...0.55 4...5	Nm lb.in.
Weight	typical	6	g

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Symbol	Test Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		100 0.5	µA mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C T_{VJ} = 25°C		0.85 1.05	V V
R_{thJC}			1.6	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	25		ns
I_{RM}	V_R = 100 V; I_F = 25 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	3.5	4.4	A

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

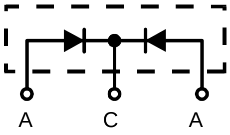
945

IXYS **DSEC 30-03A**

HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 15 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEC 30-03A



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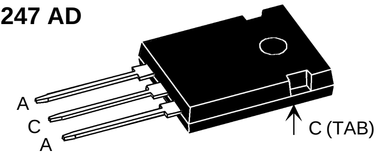


A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		50	A
I_{FAVM}	T_C = 140°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	110	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2.5 A; L = 180 µH	0.8	mJ
I_{AR}	V_A = 1.5·V_R typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C V_R = V_{RRM}		100	µA
	T_{VJ} = 150°C V_R = V_{RRM}		0.5	mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C		1.20	V
	T_{VJ} = 25°C		1.67	V
R_{thJC}			1.6	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 25 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		2.7	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

008

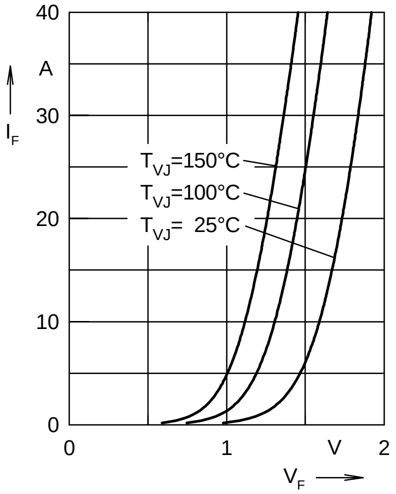


Fig. 1 Forward current I_F versus V_F

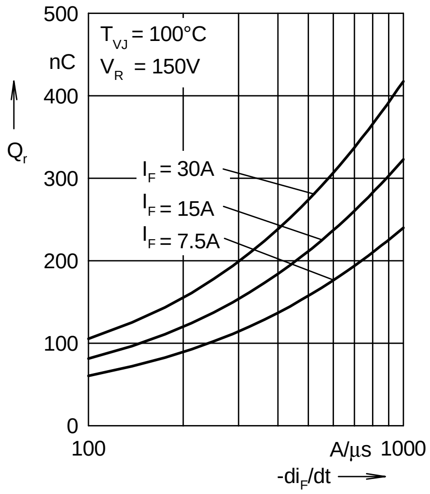


Fig. 2 Reverse recovery charge Q_r

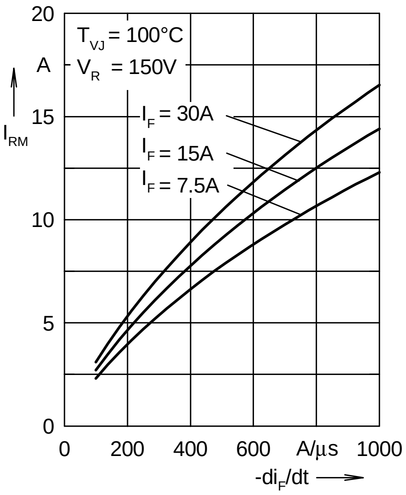


Fig. 3 Peak reverse current I_{RM}

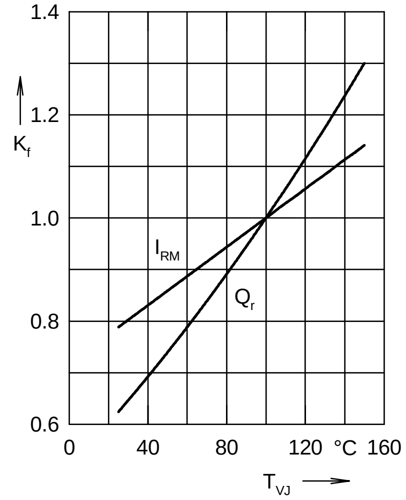


Fig. 4 Dynamic parameters Q_r, I_{RM}

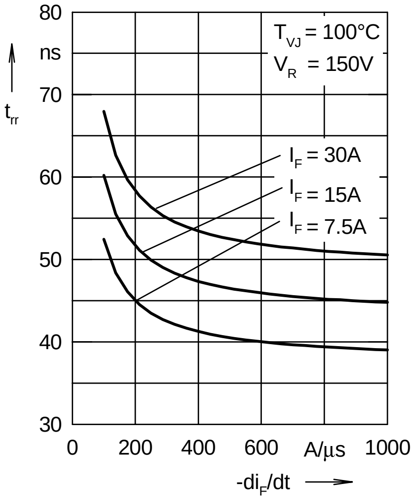


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

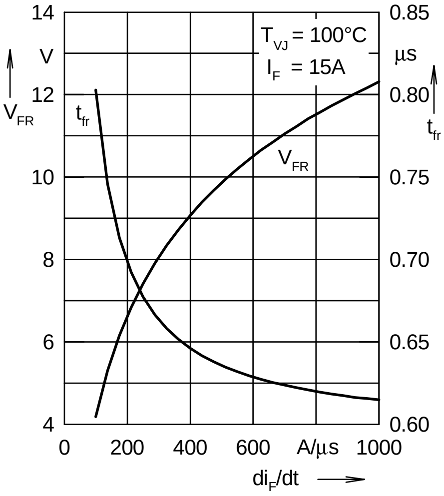


Fig. 6 Peak forward voltage V_{FR} and t_{fr}

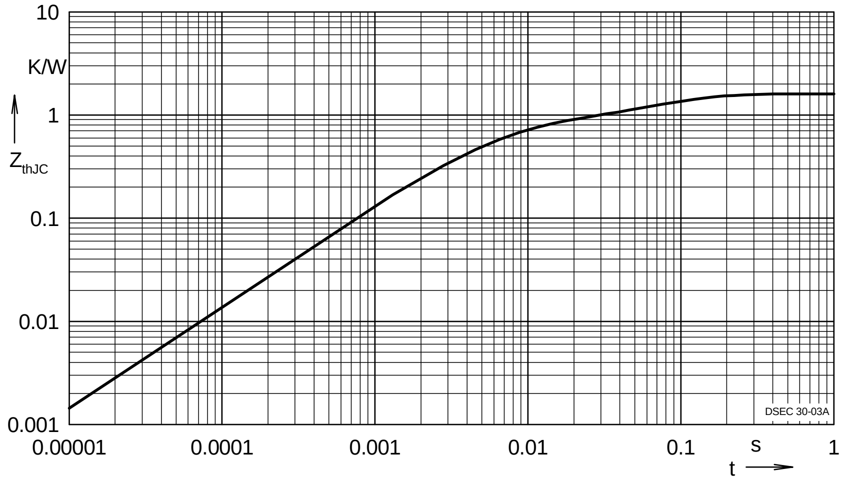


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.851	0.005
2	0.328	0.0003
3	0.421	0.041

NOTE: Fig. 2 to Fig. 6 shows typical values

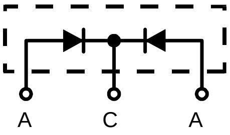
IXYS

DSEC 60-03A
DSEC 60-03AR

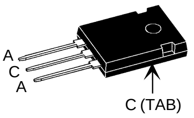
HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 30 A
V_{RRM} = 300 V
t_{rr} = 30 ns

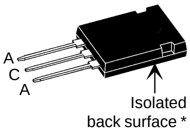
V_{RSM} V	V_{RRM} V	Type
300	300	DSEC 60-03A
300	300	DSEC 60-03AR



TO-247 AD
Version A



ISOPLUS 247™
Version AR



A = Anode, C = Cathode

* Patent pending

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 145°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	300	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 3 A; L = 180 µH	1.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d *	mounting torque	0.8...1.2	Nm
F_C	mounting force with clip	10...50	N
V_{ISOL} **	50/60 Hz, RMS, t = 1 minute, leads-to-tab	2500	V~
Weight	typical	6	g

* Verson A only; ** Version AR only

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		0.91	V
	T_{VJ} = 25°C		1.25	V
R_{thJC}			0.9	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		7	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0
- Version AR isolated and UL registered E153432

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

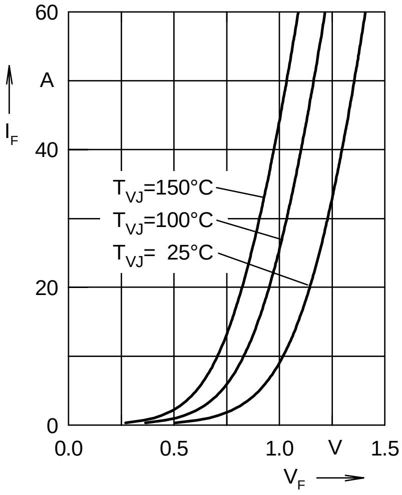


Fig. 1 Forward current I_F versus V_F

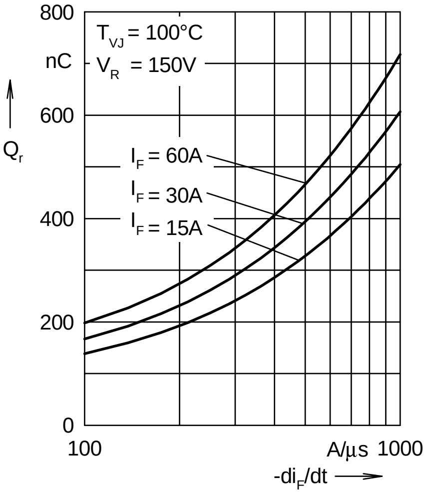


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

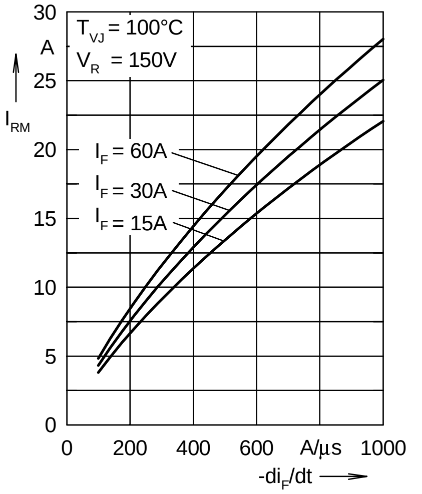


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

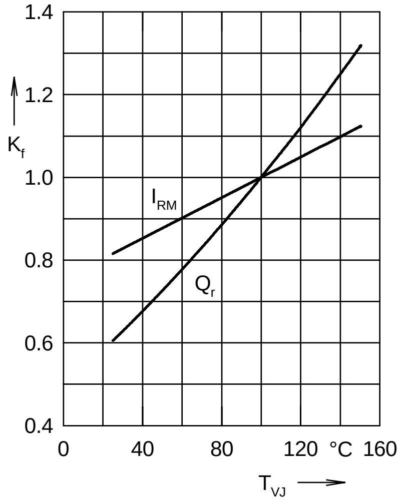


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

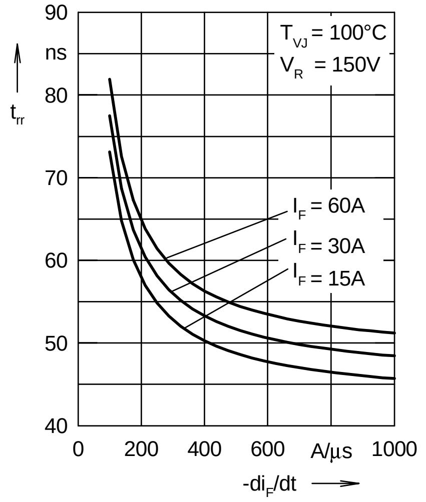


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

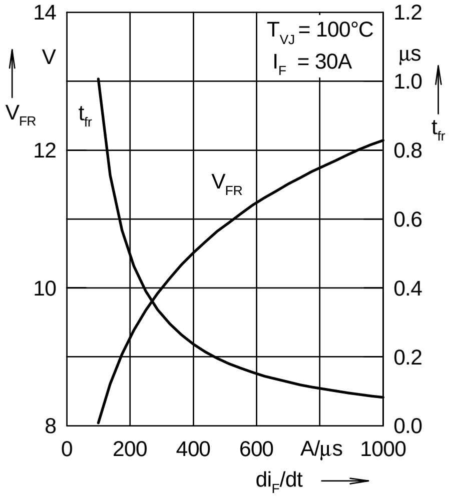


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

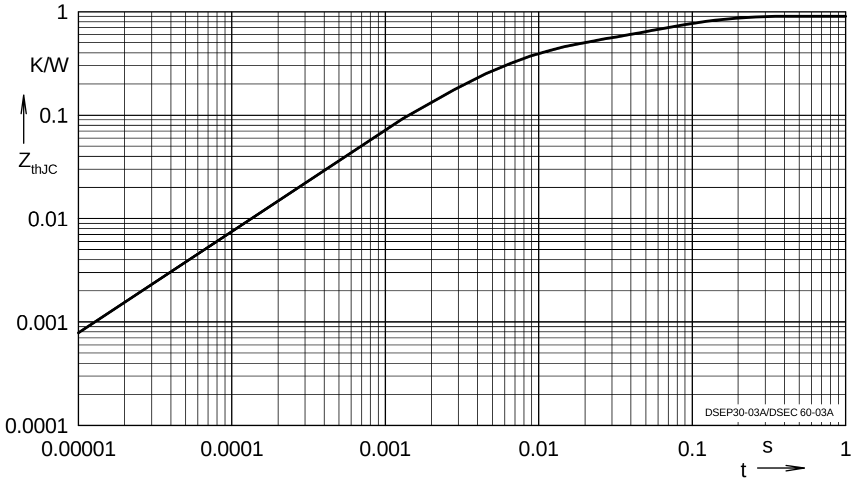


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.005
2	0.179	0.0003
3	0.256	0.04

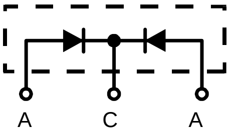
NOTE: Fig. 2 to Fig. 6 shows typical values

HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

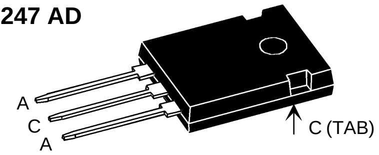
Preliminary Data

I_{FAV} = 2x 30 A
V_{RRM} = 400 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
400	**400**	**DSEC 60-04A**



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 140°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	tbd	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = tbd A; L = tbd µH	tbd	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	tbd	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		250 1	µA mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C T_{VJ} = 25°C		1.09 1.49	V V
R_{thJC}			0.9	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	5.5	6.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

008

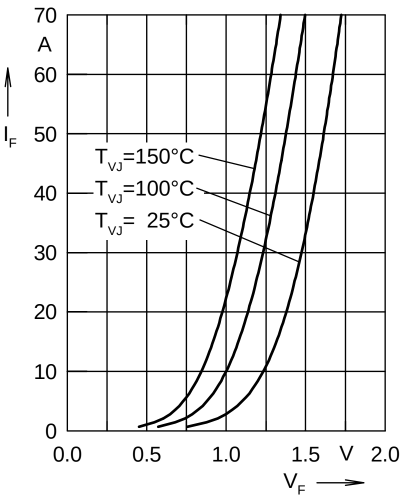


Fig. 1 Forward current I_F versus V_F

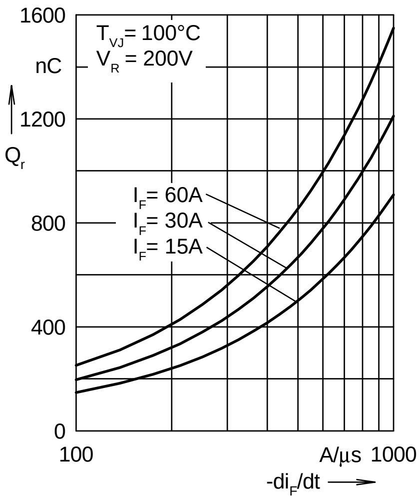


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

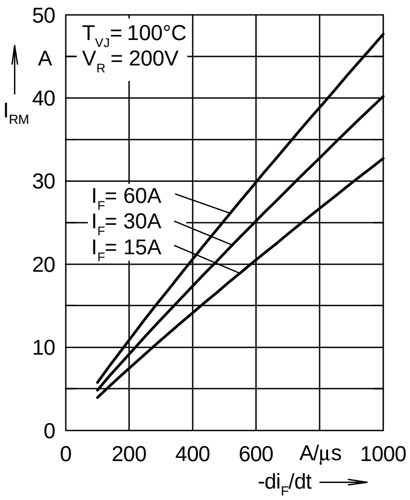


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

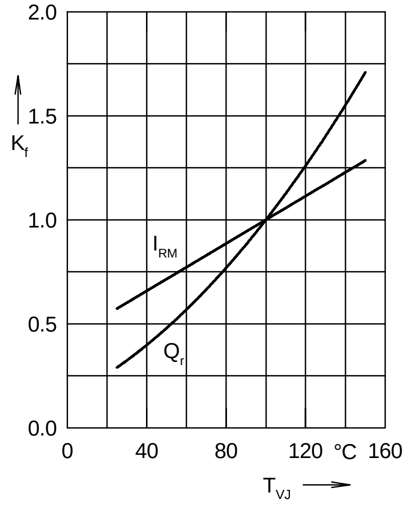


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

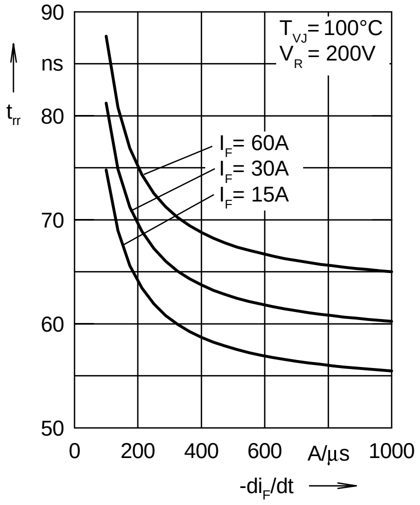


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

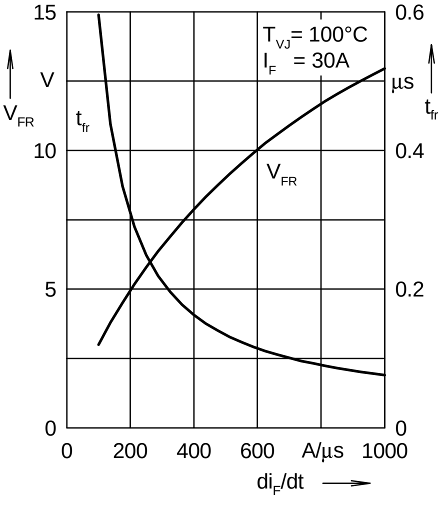


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

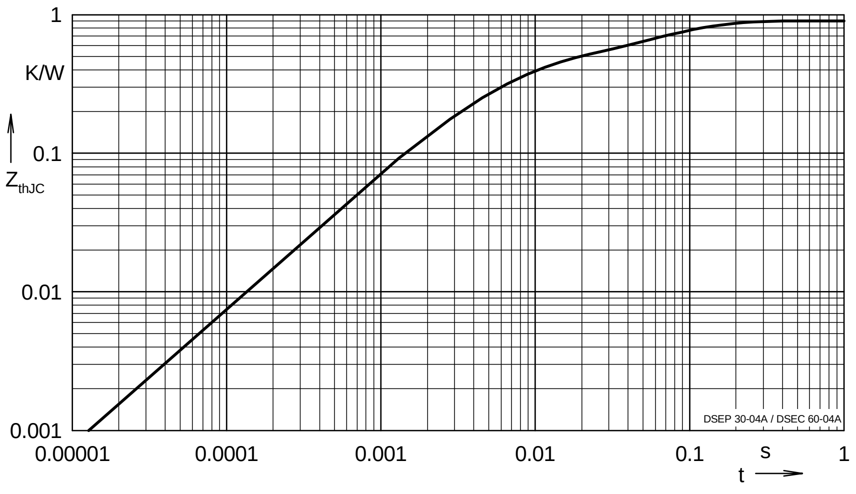


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0396

NOTE: Fig. 2 to Fig. 6 shows typical values

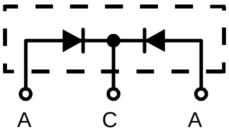
008

IXYS **DSEC 16-06A**

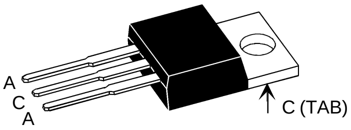
HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 10 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEC 16-06A



TO-220 AB



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		35	A
I_{FAVM}	T_C = 135°C; rectangular, d = 0.5	10	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	50	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 0.9 A; L = 180 µH	0.1	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		60	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.25	mA
V_F ②	I_F = 10 A; T_{VJ} = 150°C		1.42	V
	T_{VJ} = 25°C		2.10	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	V_R = 100 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		4.4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

008

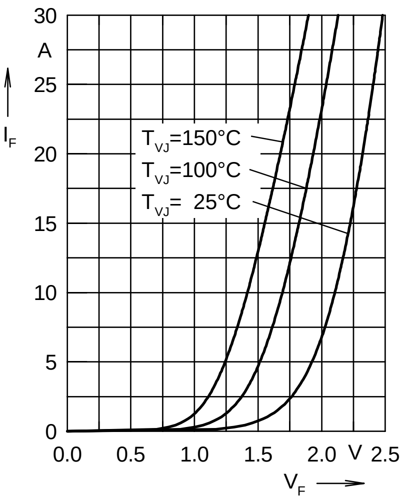


Fig. 1 Forward current I_F versus V_F

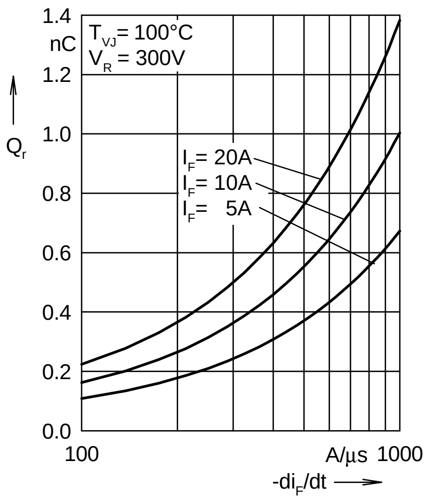


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

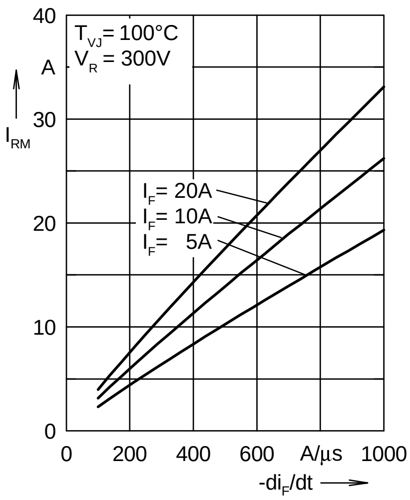


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

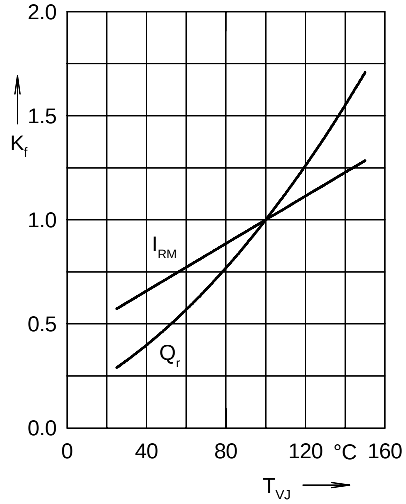


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

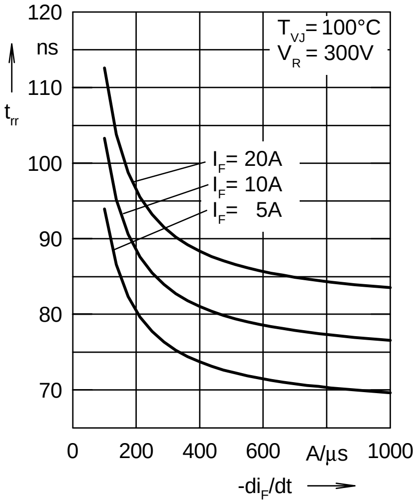


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

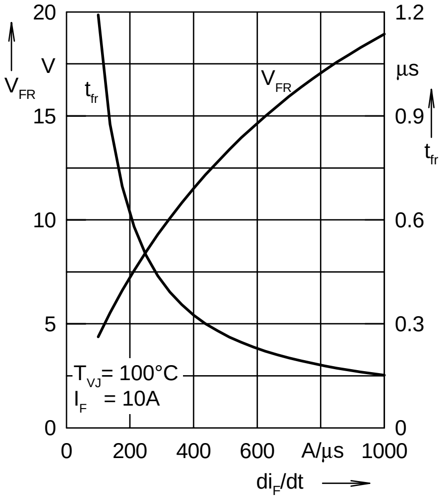


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

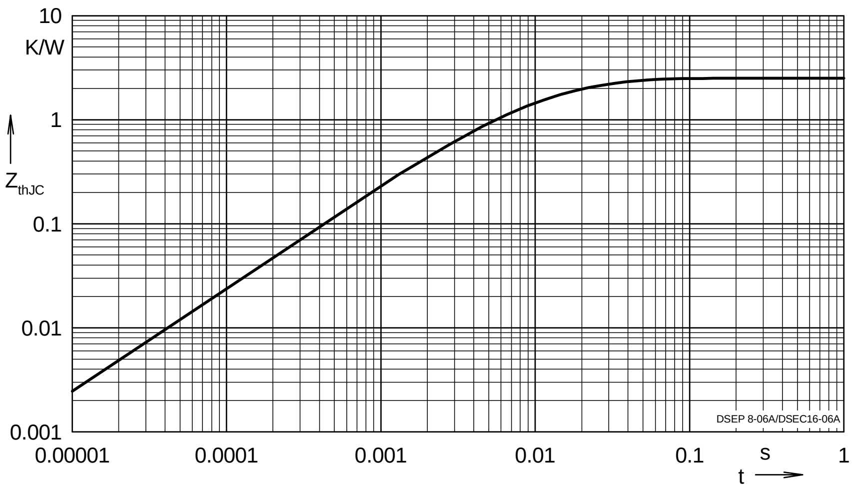


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	1.449	0.0052
2	0.5578	0.0003
3	0.4931	0.0169

NOTE: Fig. 2 to Fig. 6 shows typical values

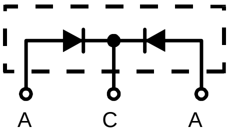
800

IXYS **DSEC 30-06A**

HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 15 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEC 30-06A



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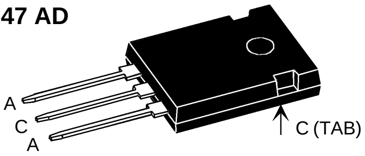


A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		50	A
I_{FAVM}	T_C = 140°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	110	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 1 A; L = 180 µH	0.1	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		100	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		0.5	mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C		1.34	V
	T_{VJ} = 25°C		2.03	V
R_{thJC}			1.6	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	V_R = 100 V; I_F = 25 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		4.9	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

008

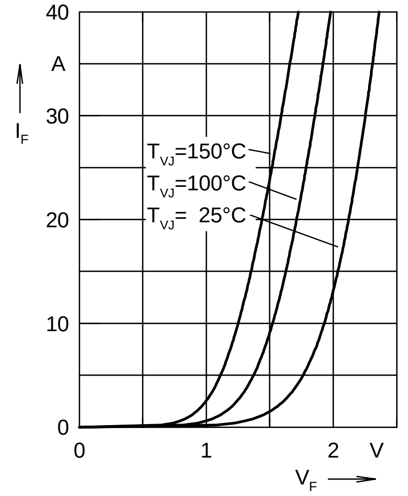


Fig. 1 Forward current I_F versus V_F

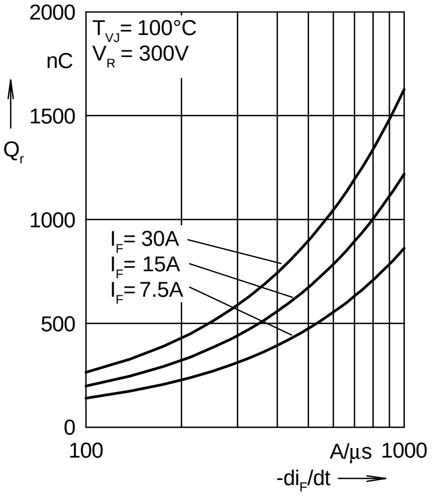


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

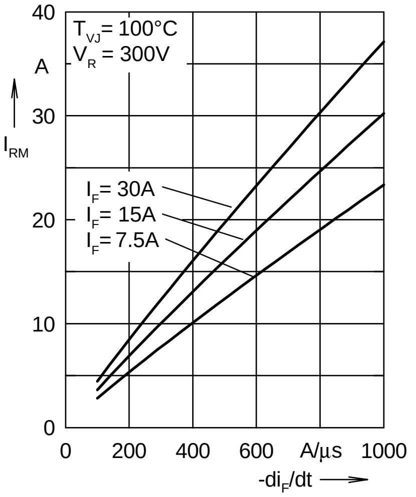


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

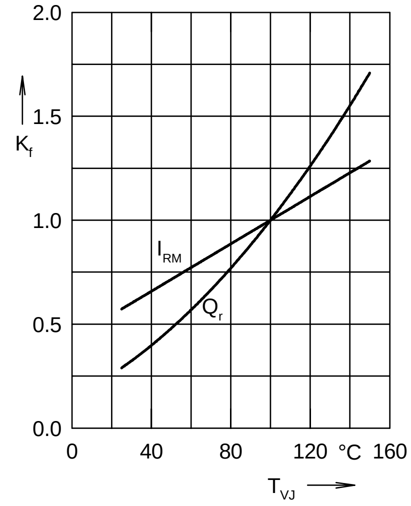


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

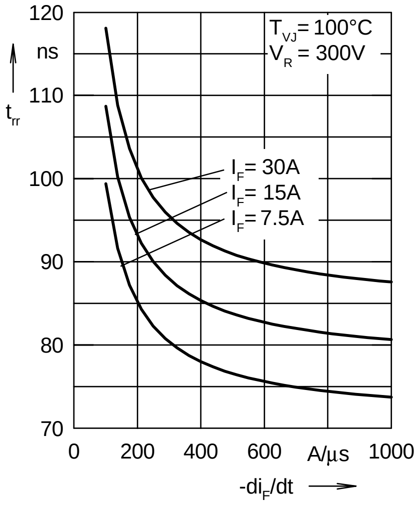


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

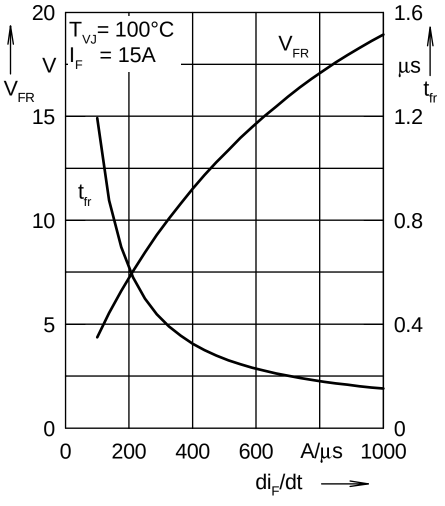


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

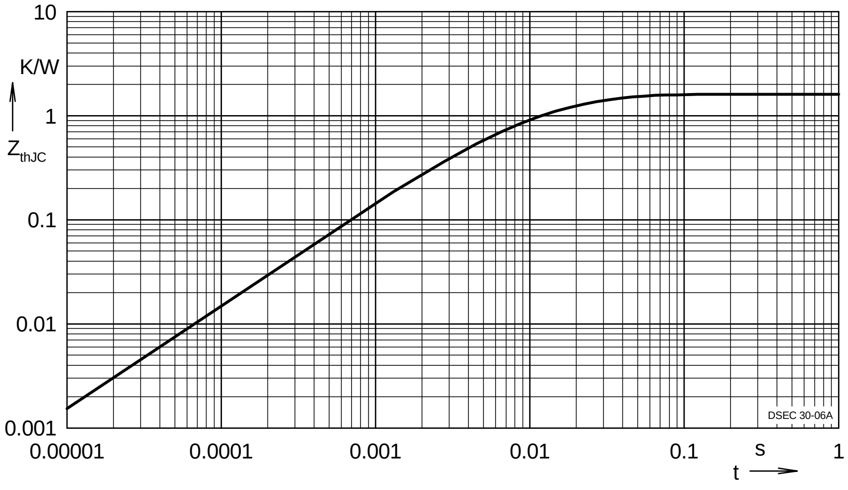


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.908	0.0052
2	0.35	0.0003
3	0.342	0.017

NOTE: Fig. 2 to Fig. 6 shows typical values

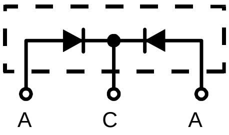
IXYS

DSEC 60-06A
DSEC 60-06B

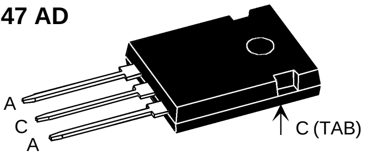
HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 30 A
V_{RRM} = 600 V
t_{rr} = 30/35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEC 60-06A
600	600	DSEC 60-06B



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Both Versions Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	rect., d = 0.5; T_C (Vers. A) = 135°C T_C (Vers. B) = 125°C	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	250	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 1.3 A; L = 180 µH	0.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic max. Values Vers. A	Vers. B	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$	250	250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$	1	2	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C	1.25	1.56	V
	T_{VJ} = 25°C	1.60	2.51	V
R_{thJC}		0.9	0.9	K/W
R_{thCH}		0.25	0.25	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	typ. 35	typ. 30	ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	typ. 6	typ. 4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

800

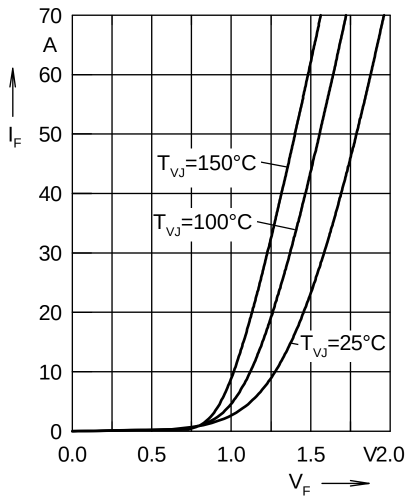


Fig. 1 Forward current I_F versus V_F

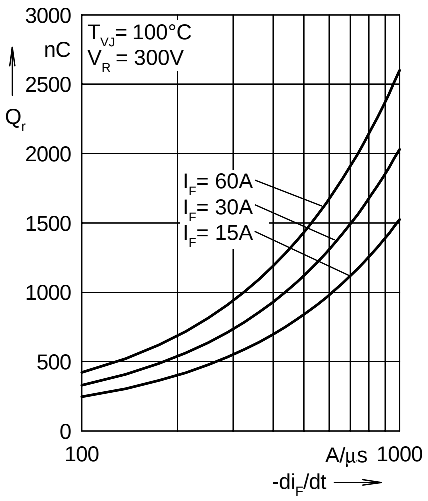


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

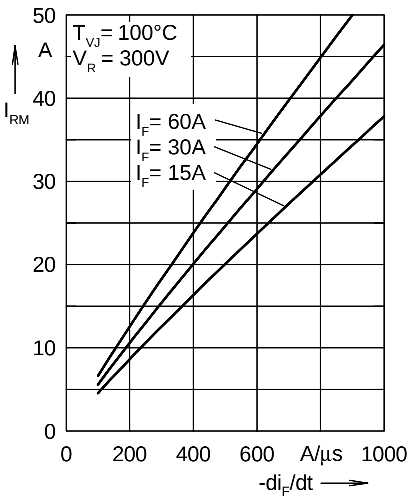


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

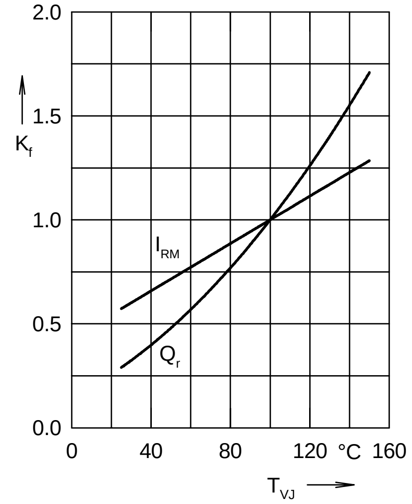


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

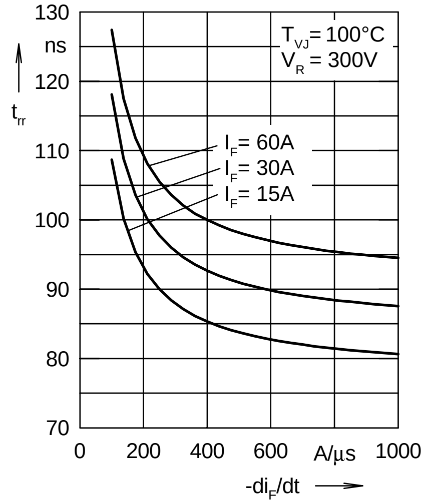


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

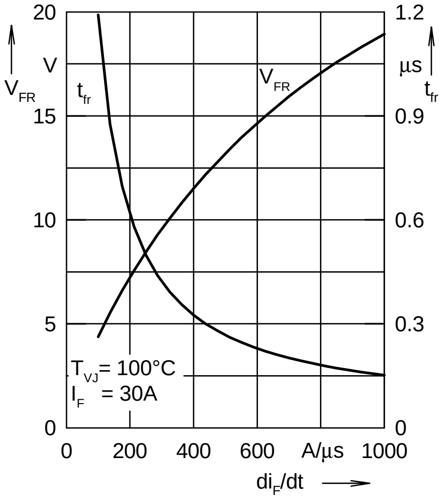


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

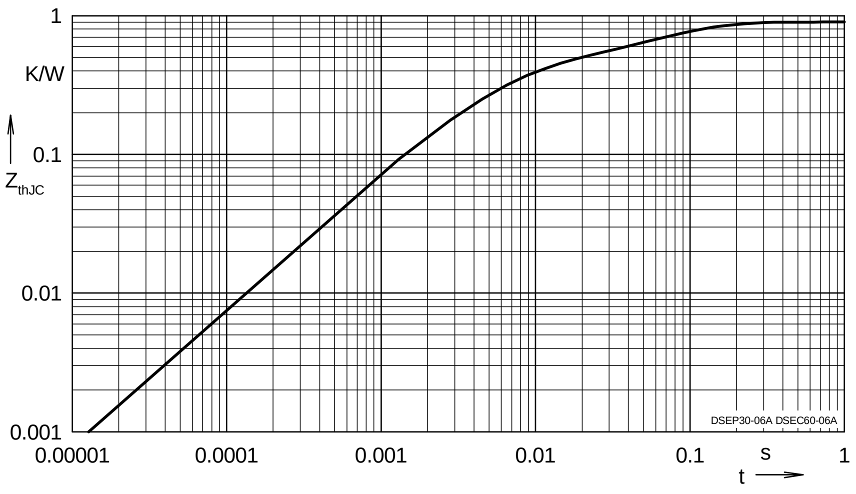


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0396

NOTE: Fig. 2 to Fig. 6 shows typical values

Preliminary Data

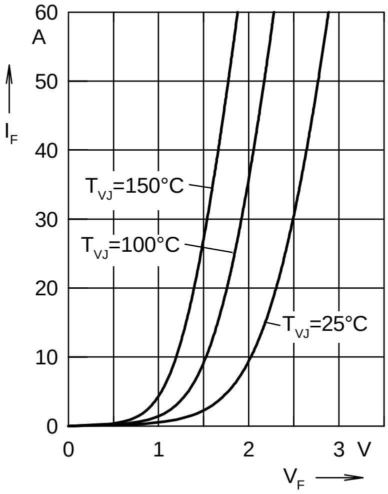


Fig. 1 Forward current I_F versus V_F

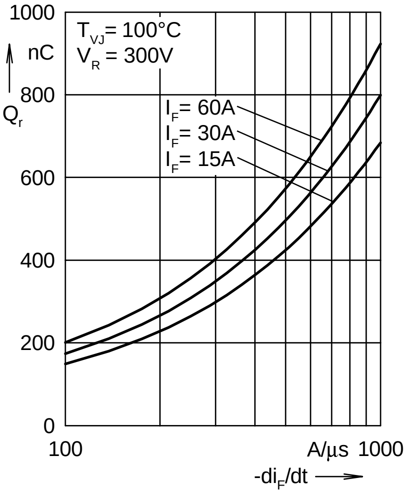


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

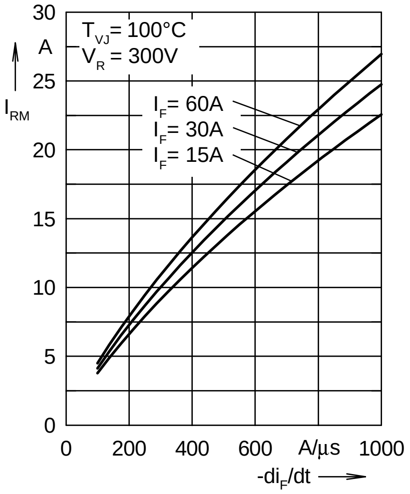


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

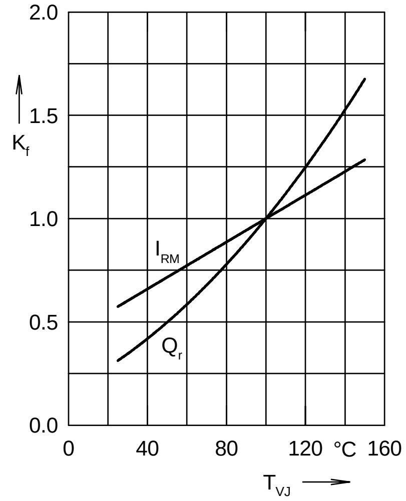


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

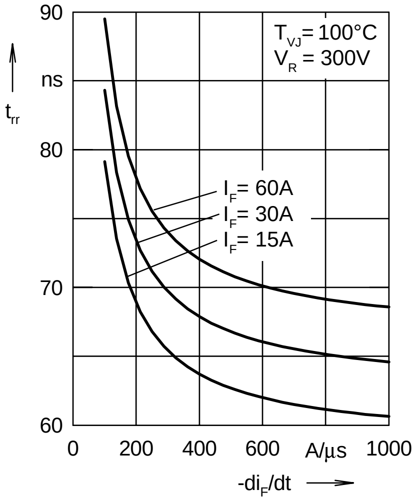


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

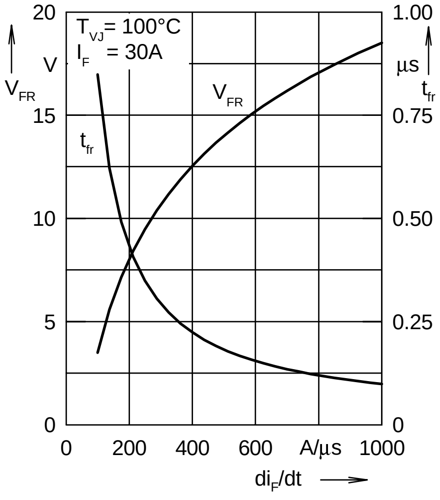


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

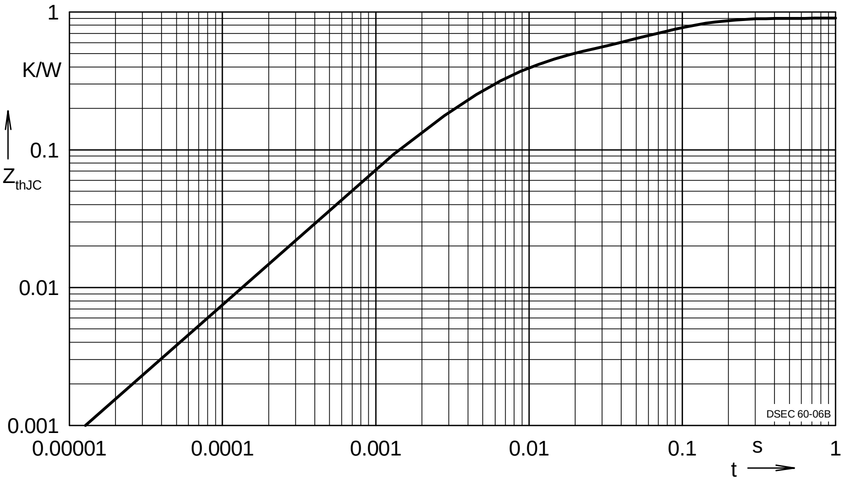


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0396

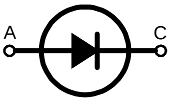
NOTE: Fig. 2 to Fig. 6 shows typical values

906

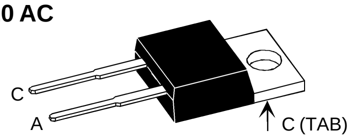
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 2x 10 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	**1200**	**DSEC 16-12A**



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Test Conditions	Maximum Ratings	
I_{FRMS}		14	A
I_{FAVM}	T_C = 115°C; rectangular, d = 0.5	10	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	40	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 8 A; L = 180 µH	6.9	mJ
I_{AR}	V_A = 1.25·V_R typ.; f = 10 kHz; repetitive	0.8	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	60	W
M_d	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

Symbol	Test Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C V_R = V_{RRM}		60	µA
	T_{VJ} = 150°C V_R = V_{RRM}		0.25	mA
V_F ②	I_F = 10 A; T_{VJ} = 150°C		1.96	V
	T_{VJ} = 25°C		2.94	V
R_{thJC}			2.5	K/W
R_{thCH}		0.5		K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 12 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		8.5	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

031

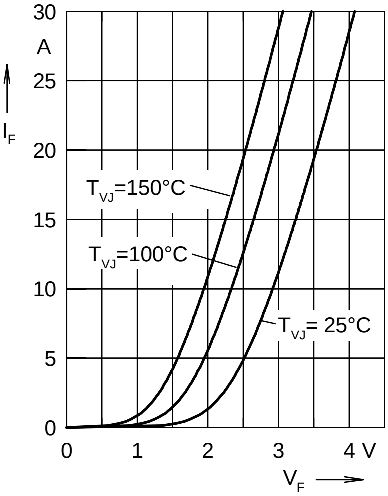


Fig. 1 Forward current I_F versus V_F

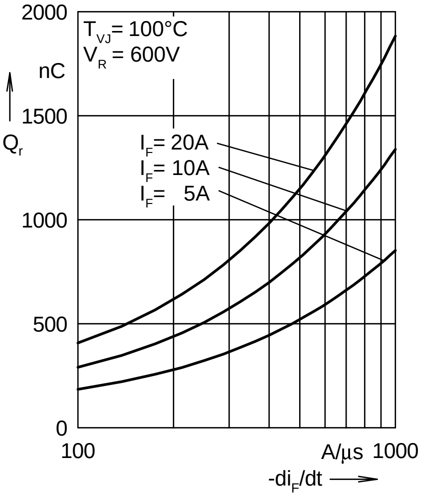


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

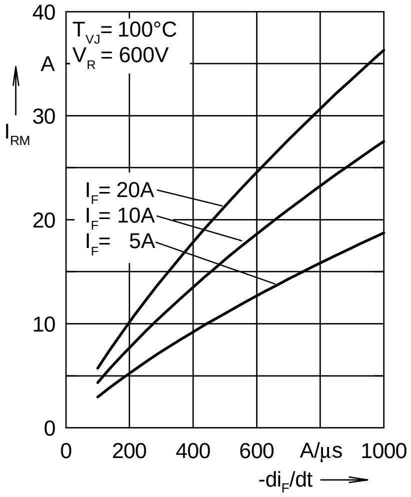


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

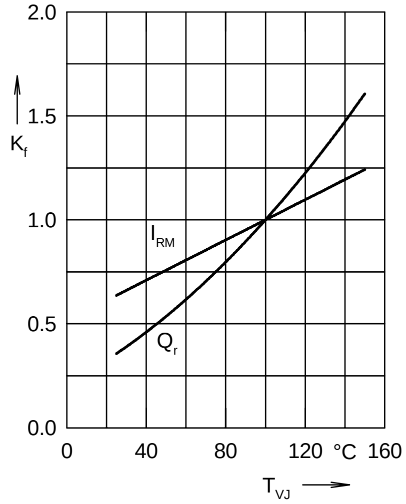


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

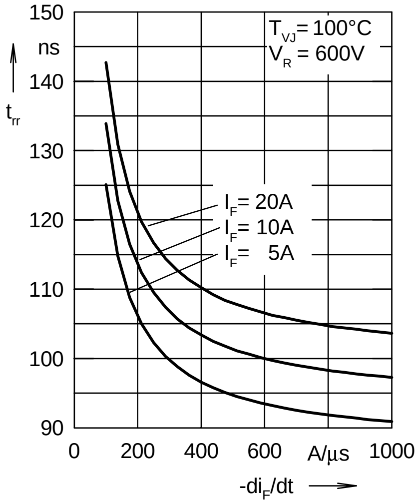


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

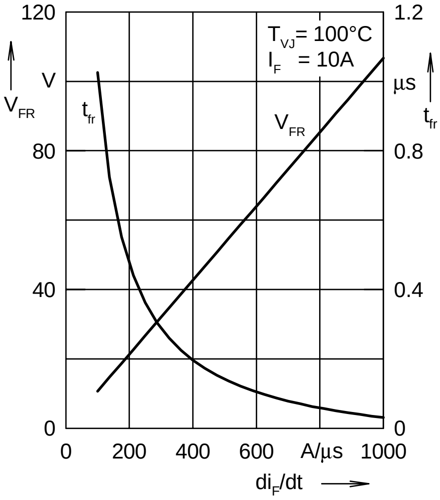


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

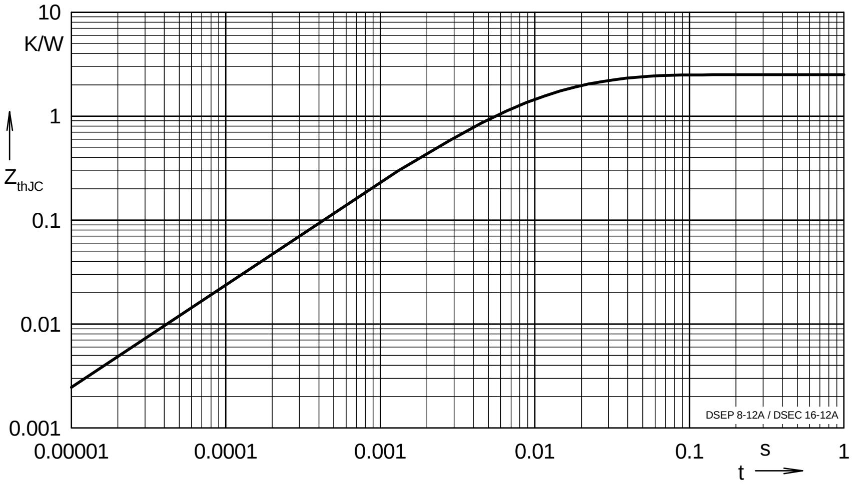


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

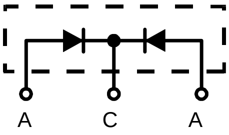
i	R_{thi} (K/W)	t_i (s)
1	1.449	0.0052
2	0.558	0.0003
3	0.493	0.017

IXYS **DSEC 30-12A**

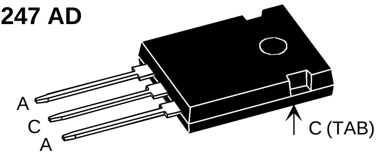
HiPerFRED^{TM} Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 15 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEC 30-12A



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		50	A
I_{FAVM}	T_C = 125°C; rectangular, d = 0.5	15	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	90	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 9 A; L = 180 µH	8.7	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.9	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	95	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		100 0.5	µA mA
V_F ②	I_F = 15 A; T_{VJ} = 150°C T_{VJ} = 25°C		1.78 2.74	V V
R_{thJC}			1.6	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 25 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	4.5		A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

008

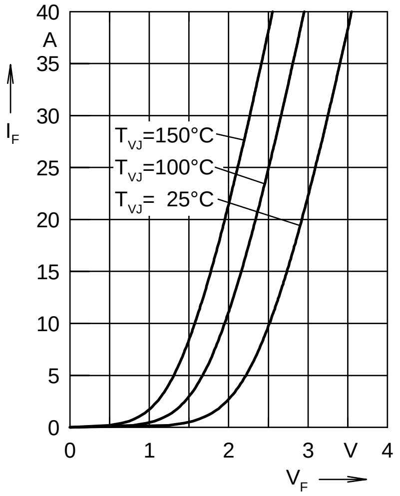


Fig. 1 Forward current I_F versus V_F

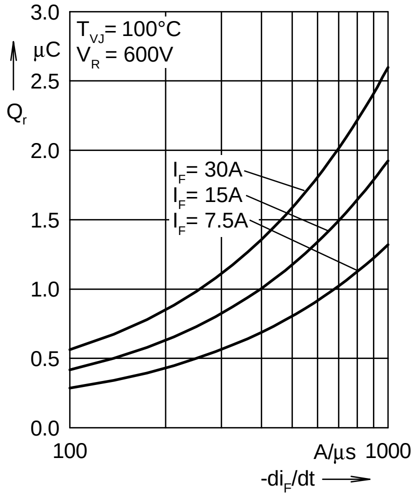


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

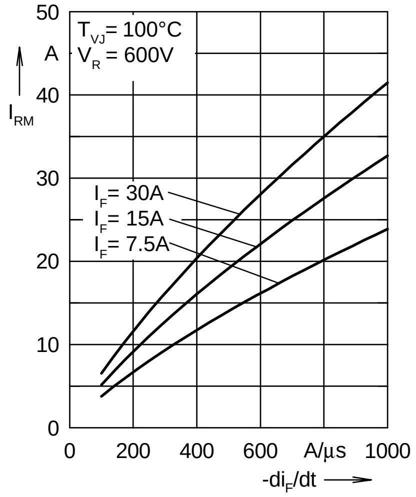


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

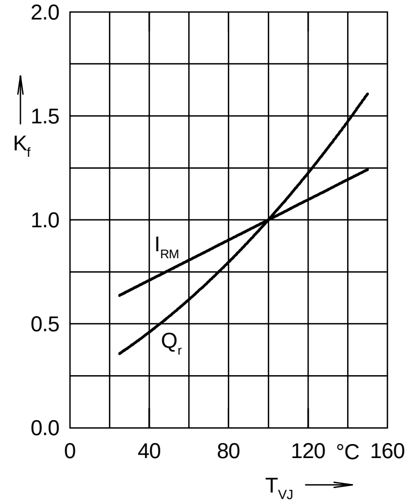


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

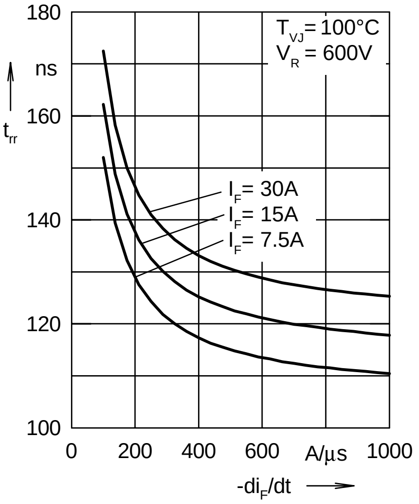


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

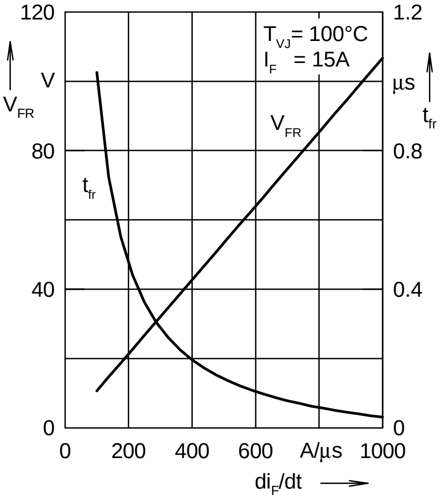


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

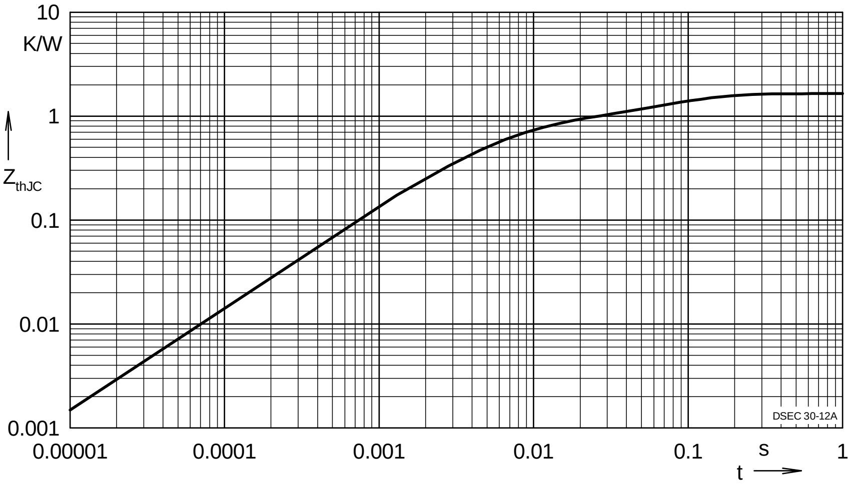


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.08512	0.0052
2	0.3277	0.0003
3	0.4211	0.0409

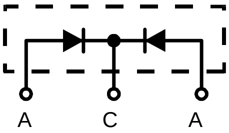
NOTE: Fig. 2 to Fig. 6 shows typical values

008

HiPerFRED™ Epitaxial Diode
with common cathode and soft recovery

I_{FAV} = 2x 30 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEC 60-12A



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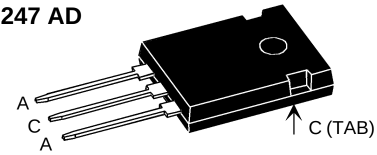


A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 115°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	200	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 11.5 A; L = 180 µH	14	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	1.2	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		1.78	V
	T_{VJ} = 25°C		2.74	V
R_{thJC}			0.9	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 50 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C	5.5		A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

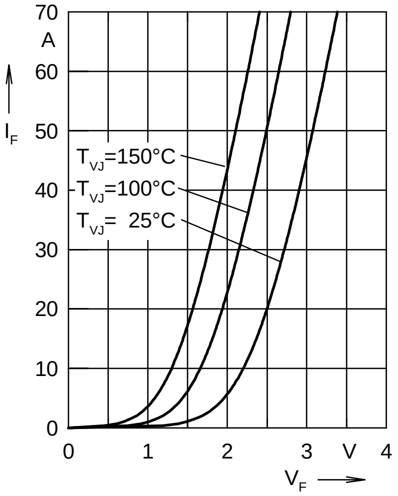


Fig. 1 Forward current I_F versus V_F

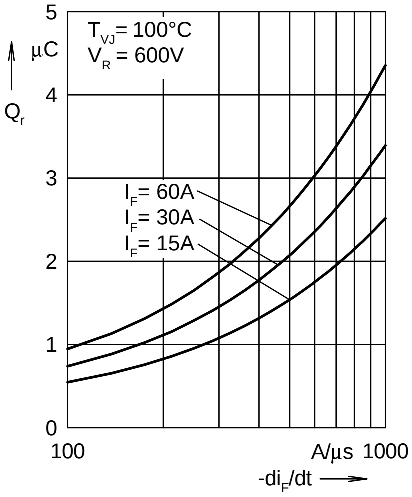


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

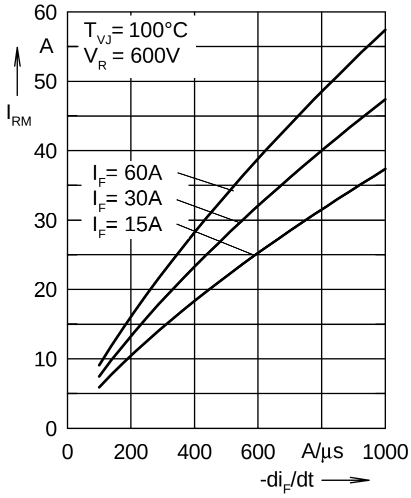


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

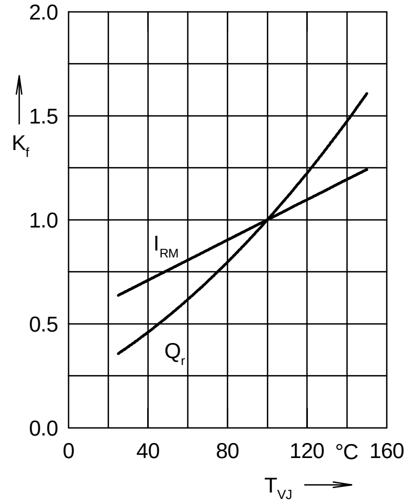


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

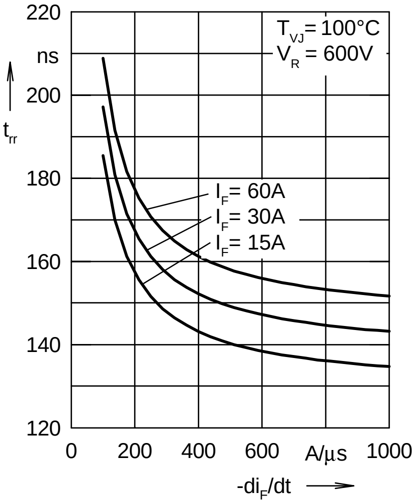


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

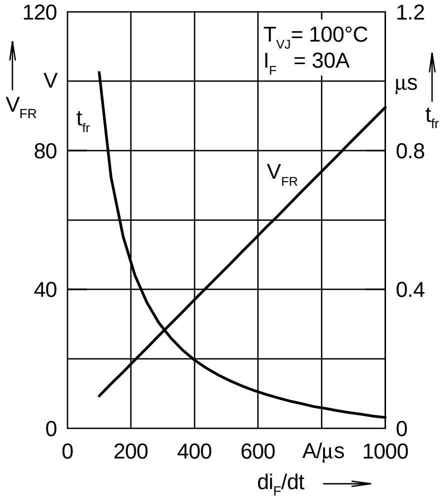


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

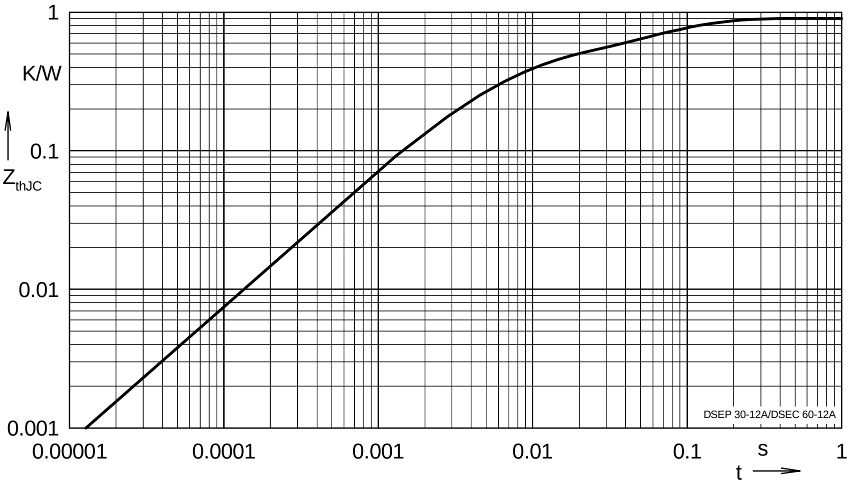


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0397

NOTE: Fig. 2 to Fig. 6 shows typical values

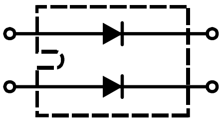
008

IXYS **DSEP 2x 31-03A**

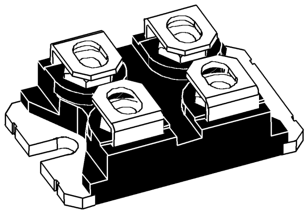
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 2x 30 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 2x 31-03A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS} I_{FAVM}	 T_C = 110°C; rectangular, d = 0.5	70 30	A A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	300	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 3 A; L = 180 µH	1.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ} T_{VJM} T_{stg}		-40...+150 150 -40...+150	°C °C °C
P_{tot}	T_C = 25°C	100	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4) terminal connection torque (M4)	1.1-1.5/9-13 1.1-1.5/9-13	Nm/lb.in. Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		0.25 1	mA mA
V_F ②	I_F = 30 A; T_{VJ} = 125°C T_{VJ} = 25°C		0.96 1.23	V V
R_{thJC} R_{thCH}		 0.1	1.15	K/W K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		7	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

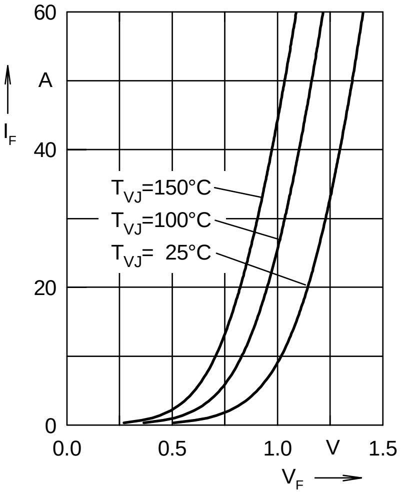


Fig. 1 Forward current I_F versus V_F

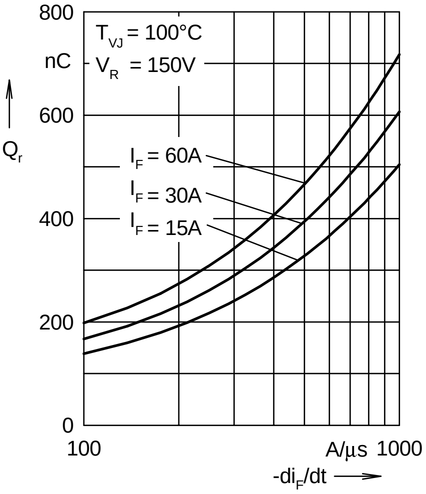


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

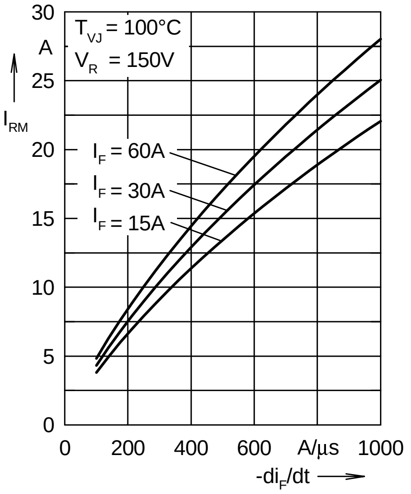


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

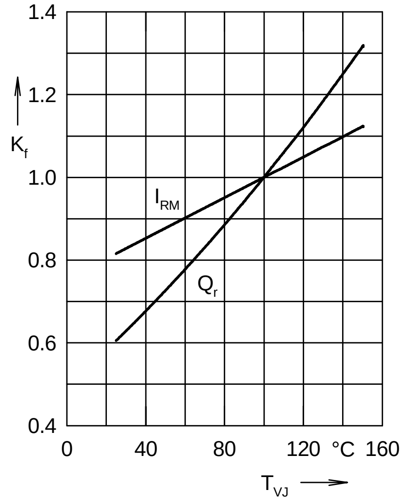


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

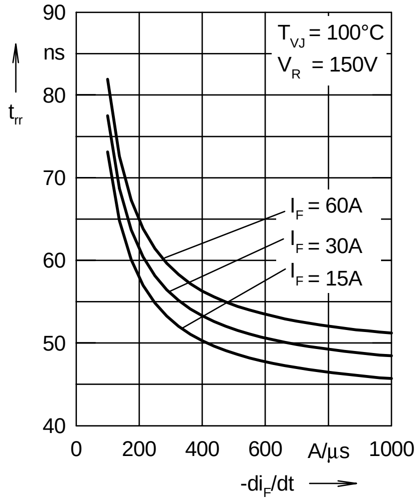


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

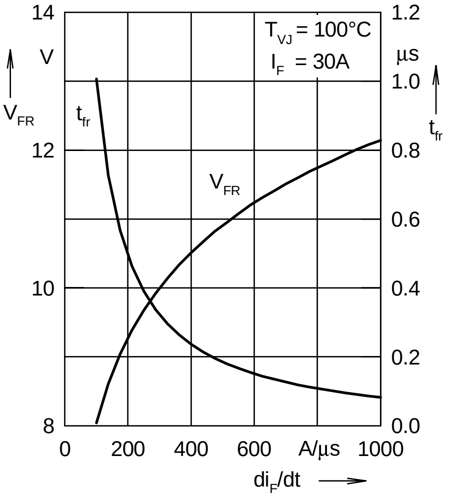


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

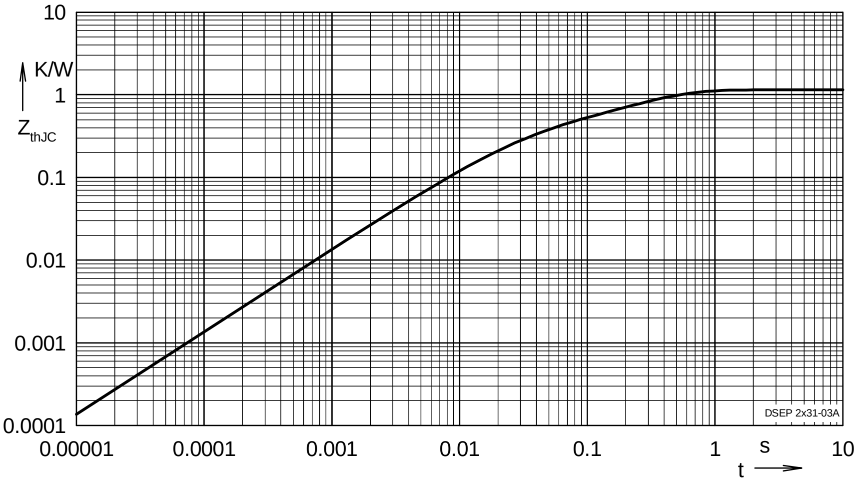


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

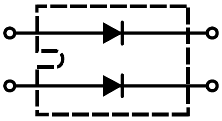
i	R_{thi} (K/W)	t_i (s)
1	0.436	0.0055
2	0.482	0.009
3	0.117	0.0007
4	0.115	0.042

NOTE: Fig. 2 to Fig. 6 shows typical values

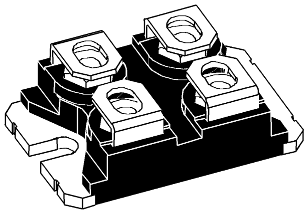
HiPerFRED™ Epitaxial Diode with soft recovery

I_{FAV} = 2x 60 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 2x 61-03A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		100	A
I_{FAVM}	T_C = 75°C; rectangular, d = 0.5	60	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	600	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 4 A; L = 180 µH	1.6	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.4	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	140	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4)	1.1-1.5/9-13	Nm/lb.in.
	terminal connection torque (M4)	1.1-1.5/9-13	Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		0.65	mA
	T_{VJ} = 150°C $V_R = V_{RRM}$		2.5	mA
V_F ②	I_F = 60 A; T_{VJ} = 125°C		1.26	V
	T_{VJ} = 25°C		1.68	V
R_{thJC}			0.85	K/W
R_{thCH}		0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 130 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		4.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

025

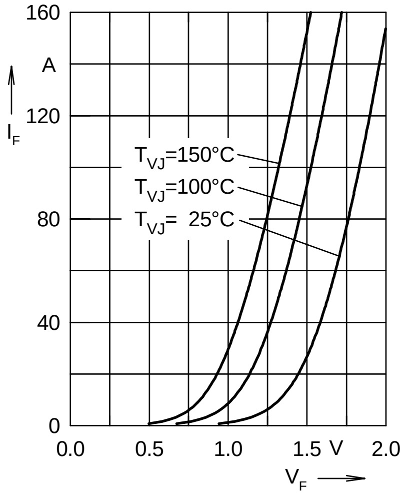


Fig. 1 Forward current I_F versus V_F

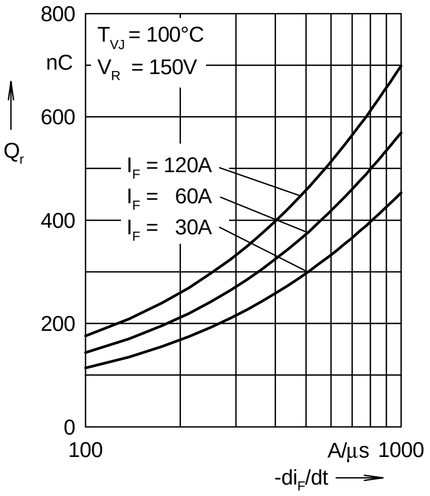


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

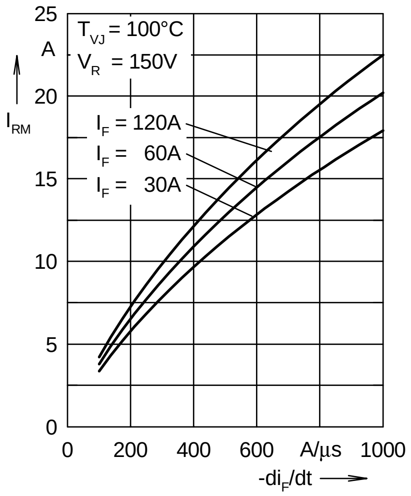


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

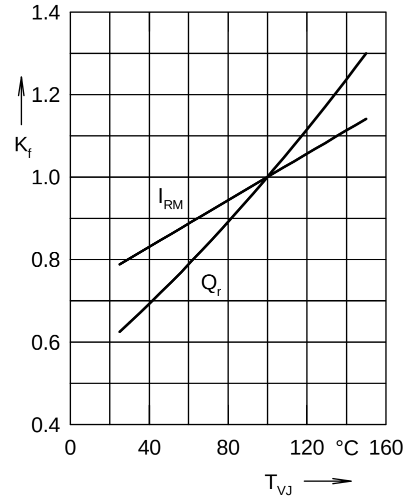


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

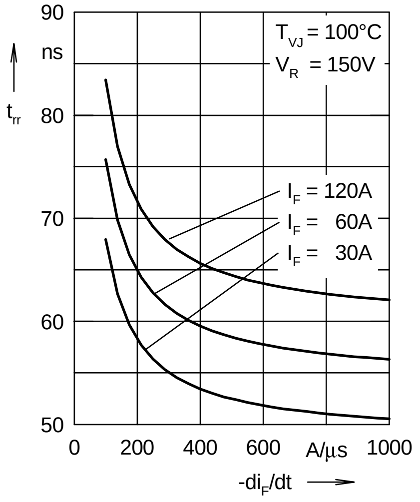


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

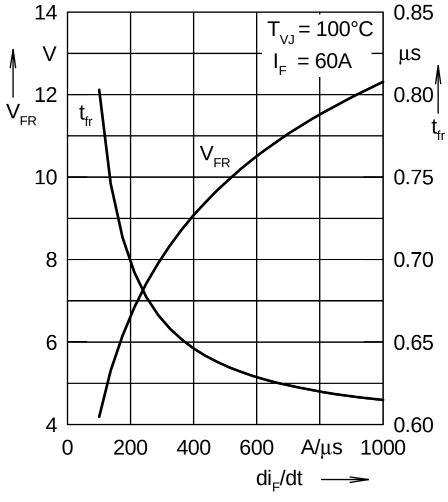


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

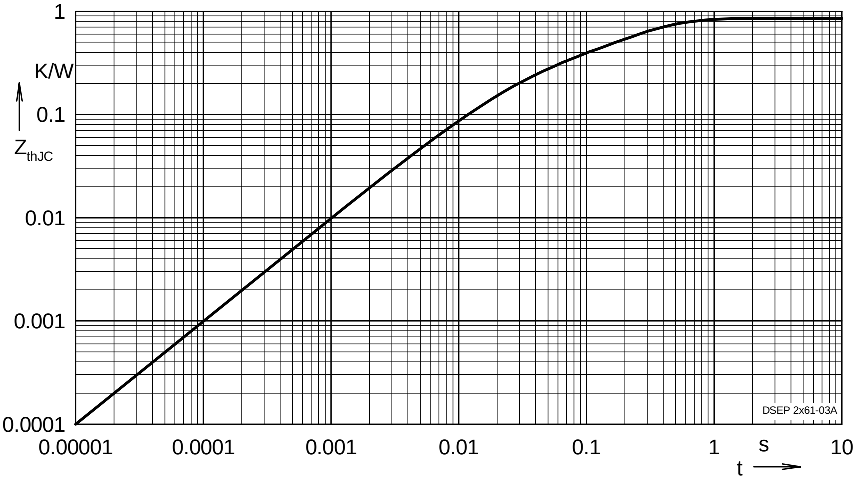


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.307	0.0055
2	0.353	0.009
3	0.089	0.0007
4	0.101	0.04

025

NOTE: Fig. 2 to Fig. 6 shows typical values

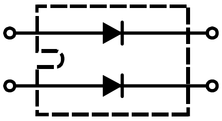
IXYS **DSEP 2x 91-03A**

HiPerFRED™ Epitaxial Diode with soft recovery

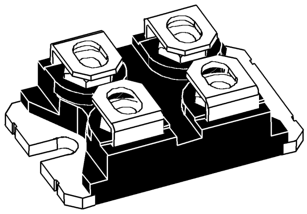
Preliminary Data

I_{FAV} = 2x 90 A
V_{RRM} = 300 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
300	300	DSEP 2x 91-03A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		100	A
I_{FAVM}	T_C = 65°C; rectangular, d = 0.5	90	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	1000	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 4 A; L = 180 µH	2.1	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.4	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	200	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4) terminal connection torque (M4)	1.1-1.5/9-13 1.1-1.5/9-13	Nm/lb.in. Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		1	mA
	T_{VJ} = 150°C $V_R = V_{RRM}$		4	mA
V_F ②	I_F = 90 A; T_{VJ} = 125°C		1.30	V
	T_{VJ} = 25°C		1.72	V
R_{thJC}			0.60	K/W
R_{thCH}		0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 200 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		5.4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

009

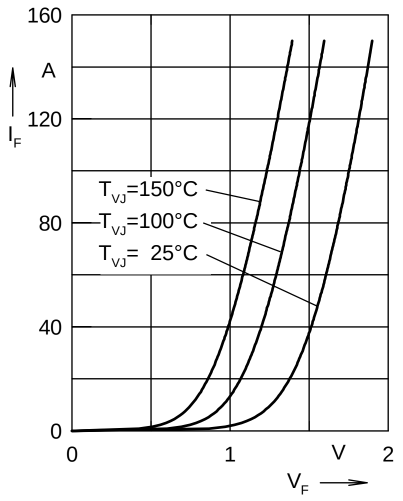


Fig. 1 Forward current I_F versus V_F

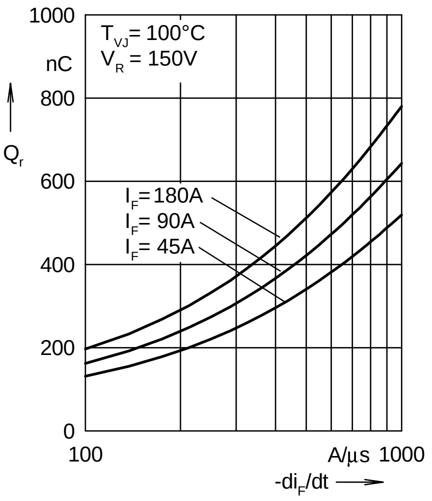


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

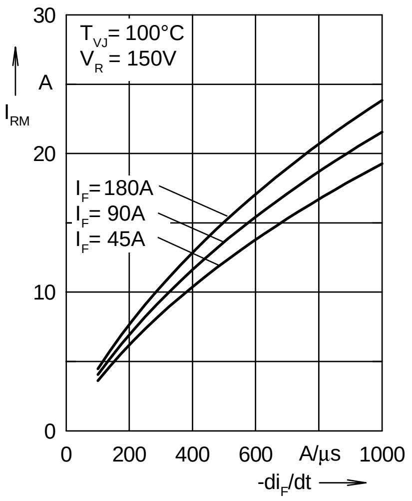


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

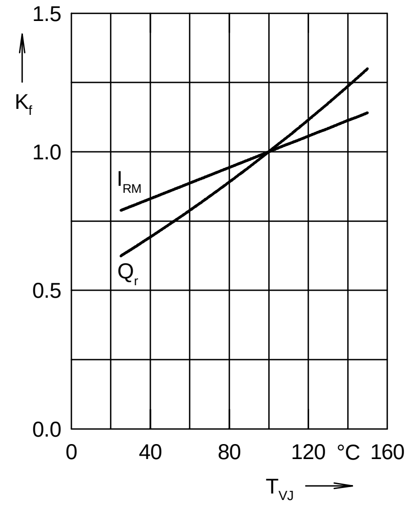


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

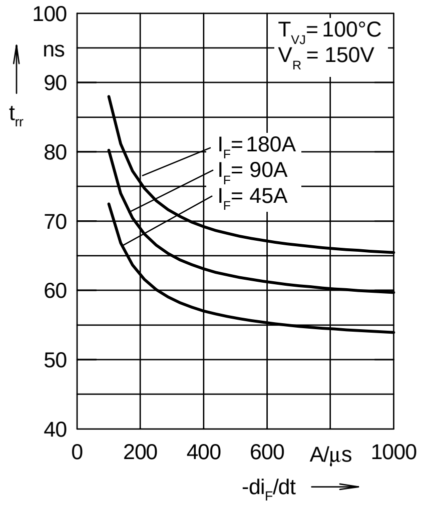


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

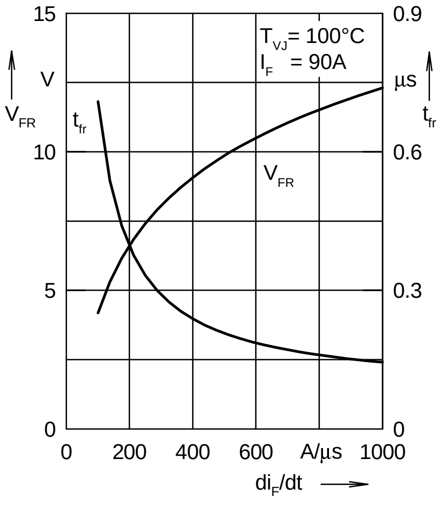


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

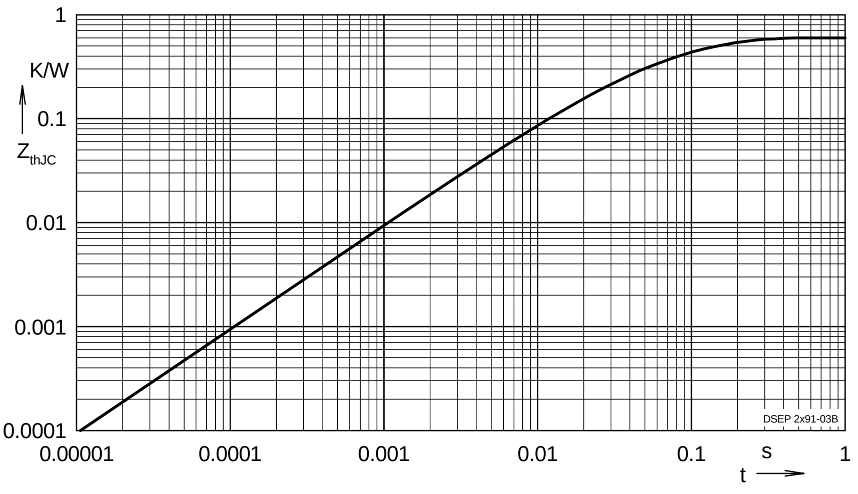


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.212	0.0055
2	0.248	0.0092
3	0.063	0.0007
4	0.077	0.0391

NOTE: Fig. 2 to Fig. 6 shows typical values

009

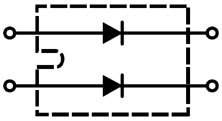
DSEP 2x 31-04A

HiPerFRED™ Epitaxial Diode
with soft recovery

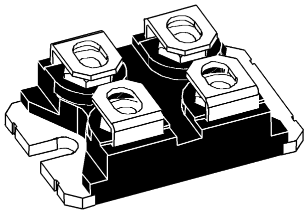
I_{FAV} = 2x 30 A
V_{RRM} = 400 V
t_{rr} = 30 ns

Preliminary Data

V_{RSM} V	V_{RRM} V	Type
400	400	DSEP 2x 31-04A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		100	A
I_{FAVM}	T_C = 105°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	tbd	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = tbd A; L = tbd µH	tbd	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	tbd	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	100	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4) terminal connection torque (M4)	1.1-1.5/9-13 1.1-1.5/9-13	Nm/lb.in. Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		0.25 1.0	mA mA
V_F ②	I_F = 30 A; T_{VJ} = 125°C T_{VJ} = 25°C		1.15 1.45	V V
R_{thJC}			1.15	K/W
R_{thCH}		0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		6.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

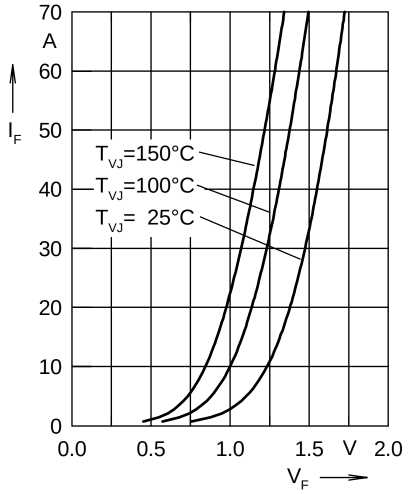


Fig. 1 Forward current I_F versus V_F

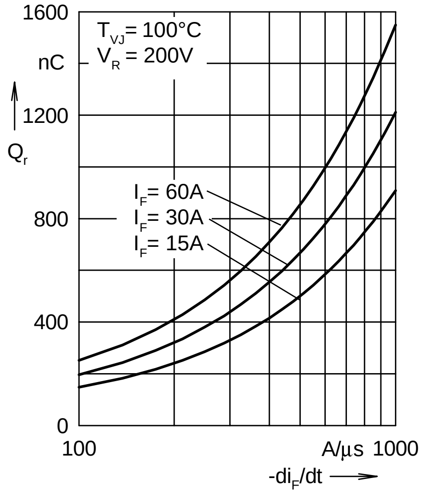


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

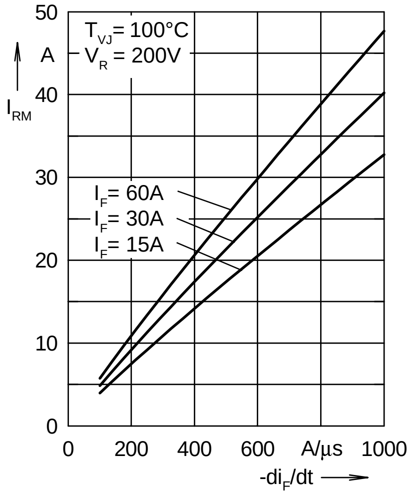


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

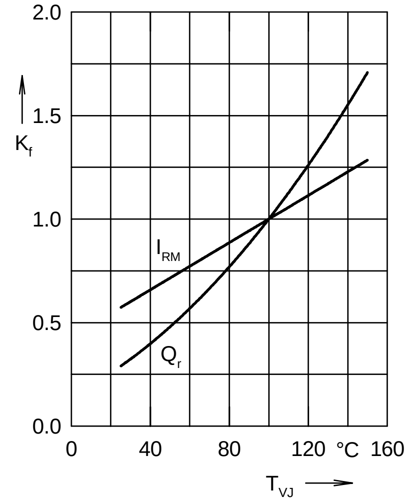


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

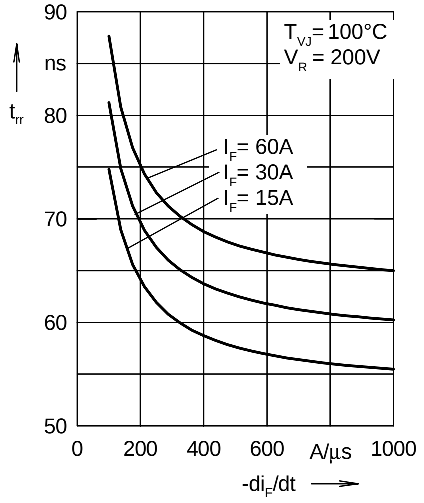


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

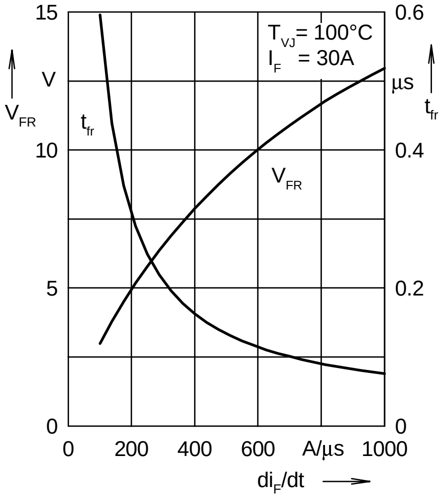


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

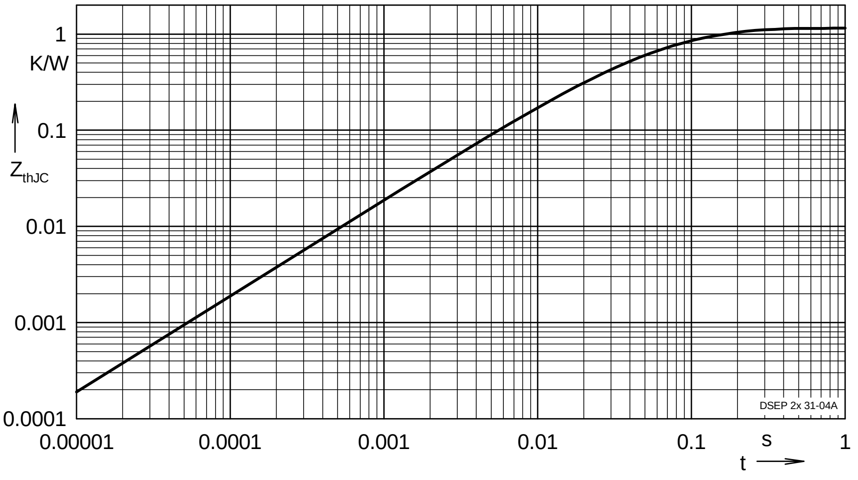


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.436	0.0055
2	0.482	0.0092
3	0.117	0.0007
4	0.115	0.0418

NOTE: Fig. 2 to Fig. 6 shows typical values

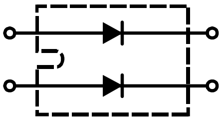
008

IXYS Advanced Technical Information **DSEP 2x 101-04A**

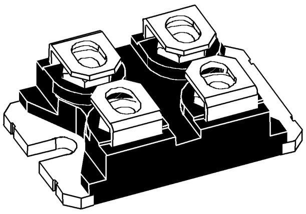
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 2x 100 A
V_{RRM} = 400 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
400	400	DSEP 2x 101-04A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		100	A
I_{FAVM}	T_C = 60°C; rectangular, d = 0.5	100	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	1000	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 4 A; L = 182 µH	2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.4	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	200	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4)	1.1-1.5/9-13	Nm/lb.in.
	terminal connection torque (M4)	1.1-1.5/9-13	Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	$V_R = V_{RRM}$; T_{VJ} = 25°C		1	mA
	T_{VJ} = 150°C		4	mA
V_F ②	I_F = 100 A; T_{VJ} = 150°C		1.24	V
	T_{VJ} = 25°C		1.54	V
R_{thJC}			0.6	K/W
R_{thCH}	with heatsink compound	0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 200 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	5.5	6.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
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- Low I_{RM}-values
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Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

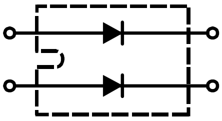
IXYS

DSEP 2x 31-06A
DSEP 2x 31-06B

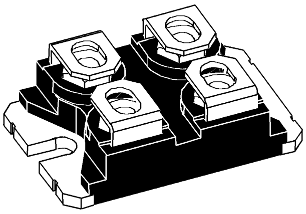
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 2x 30 A
V_{RRM} = 600 V
t_{rr} = 30/35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 2x 31-06A
600	600	DSEP 2x 31-06B



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	rect., d = 0.5; T_C (Vers. A) = 95°C T_C (Vers. B) = 85°C	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	250	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 1 A; L = 180 µH	0.2	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.1	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	100	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4) terminal connection torque (M4)	1.1-1.5/9-13 1.1-1.5/9-13	Nm/lb.in. Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic max. Values Vers. A	Vers. B	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$	0.25	0.25	mA
	T_{VJ} = 150°C $V_R = V_{RRM}$	1	2	mA
V_F ②	I_F = 30 A; T_{VJ} = 125°C	1.30	1.73	V
	T_{VJ} = 25°C	1.58	2.49	V
R_{thJC}		1.15	1.15	K/W
R_{thCH}		typ. 0.1	typ. 0.1	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	typ. 35	typ. 30	ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	typ. 6	typ. 4	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

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- Ultrasonic cleaners and welders

Advantages

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- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

914

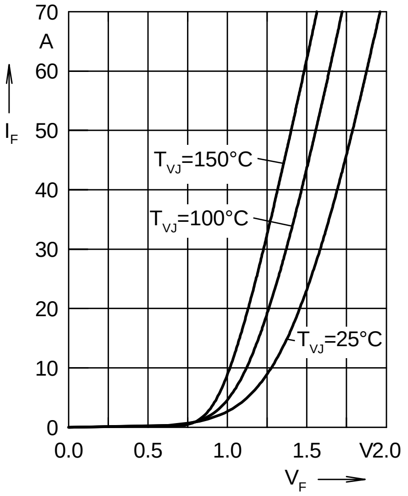

Fig. 1 Forward current I_F versus V_F

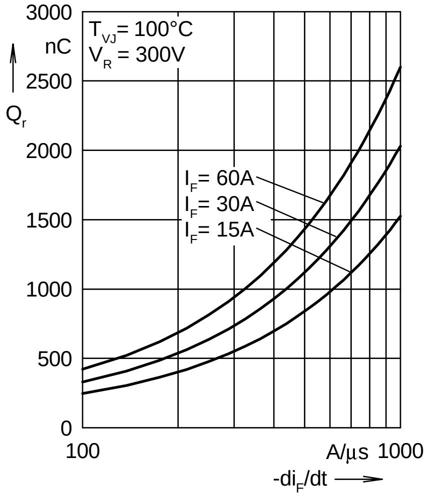

Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

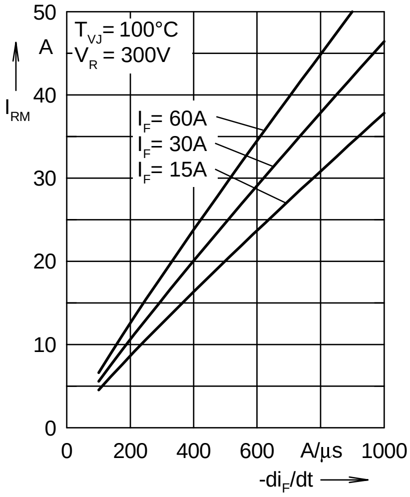

Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

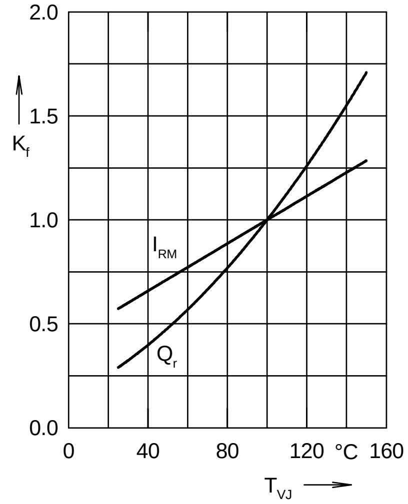

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

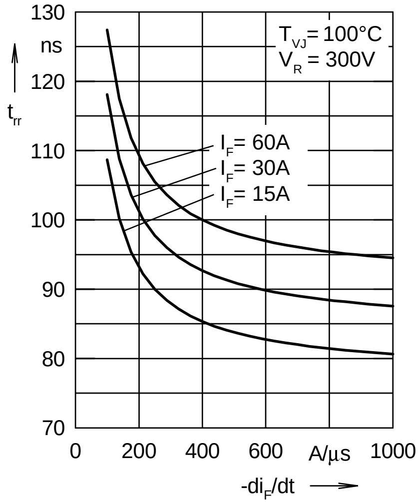

Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

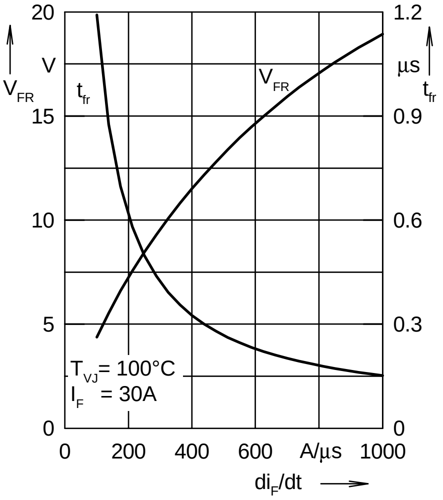

Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

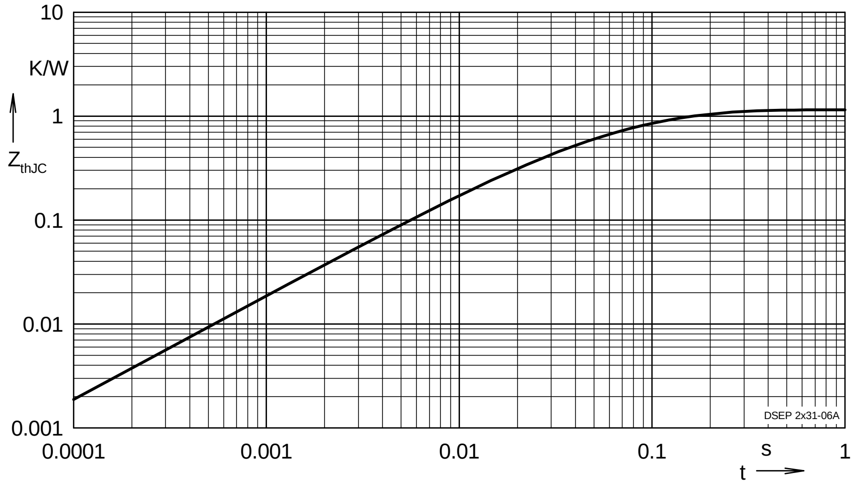

Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.436	0.0055
2	0.482	0.0092
3	0.117	0.0007
4	0.115	0.0418

NOTE: Fig. 2 to Fig. 6 shows typical values

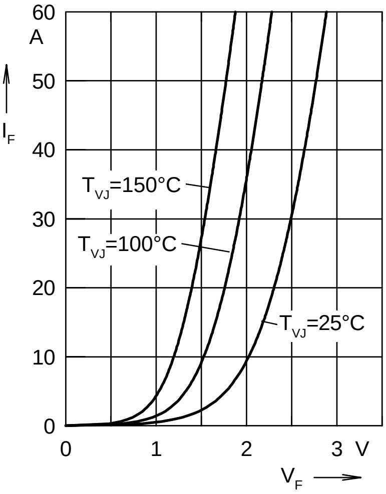

Fig. 1 Forward current I_F versus V_F

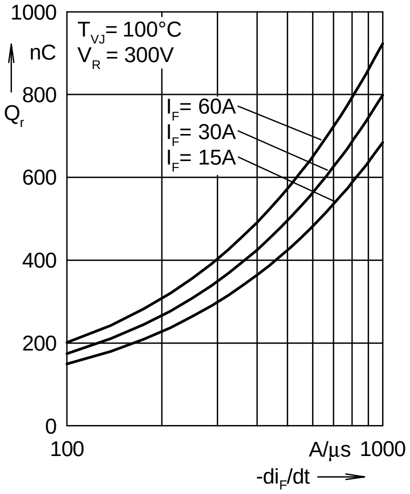

Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

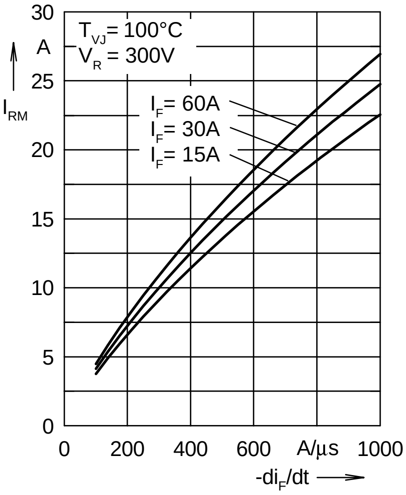

Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

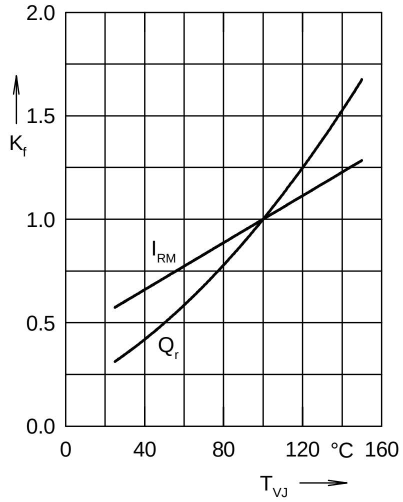

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

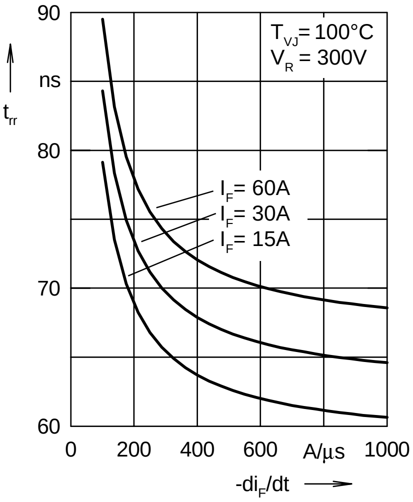

Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

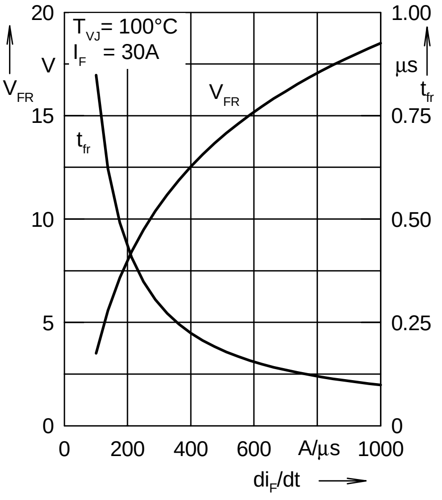

Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

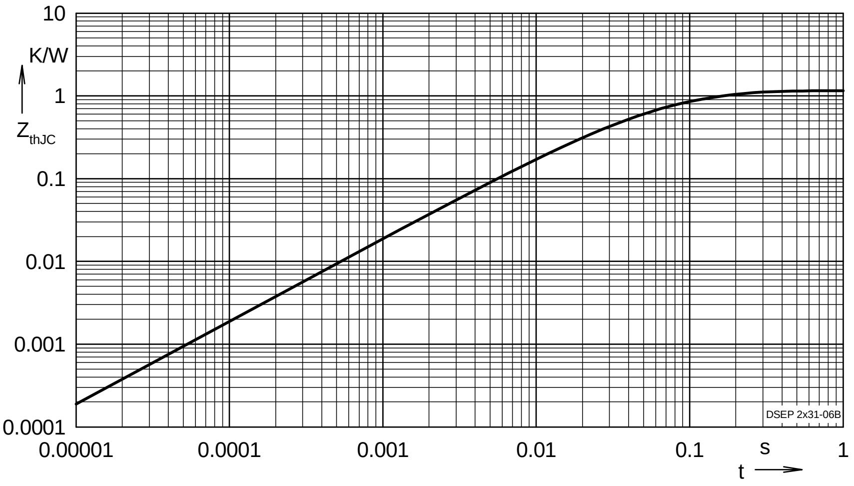

Fig. 7 Transient thermal resistance junction to case

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1	0.436	0.0055
2	0.482	0.0092
3	0.117	0.0007
4	0.115	0.0418

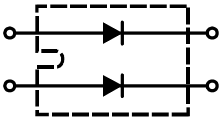
NOTE: Fig. 2 to Fig. 6 shows typical values

IXYS **DSEP 2x 61-06A**

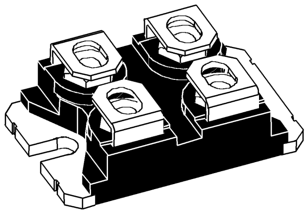
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 2x 60 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 2x 61-06A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		100	A
I_{FAVM}	T_C = 65°C; rectangular, d = 0.5	60	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	600	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2 A; L = 180 µH	0.3	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.2	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	140	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4)	1.1-1.5/9-13	Nm/lb.in.
	terminal connection torque (M4)	1.1-1.5/9-13	Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		0.65	mA
	T_{VJ} = 150°C $V_R = V_{RRM}$		2.5	mA
V_F ②	I_F = 60 A; T_{VJ} = 125°C		1.48	V
	T_{VJ} = 25°C		2.01	V
R_{thJC}			0.85	K/W
R_{thCH}		0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	V_R = 100 V; I_F = 130 A; -di_F/dt = 100 A/µs T_{VJ} = 100°C		8.3	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

912

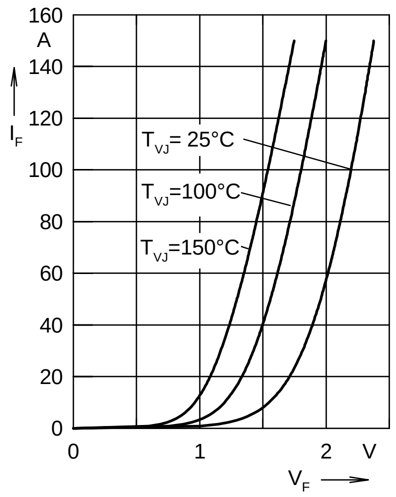


Fig. 1 Forward current I_F versus V_F

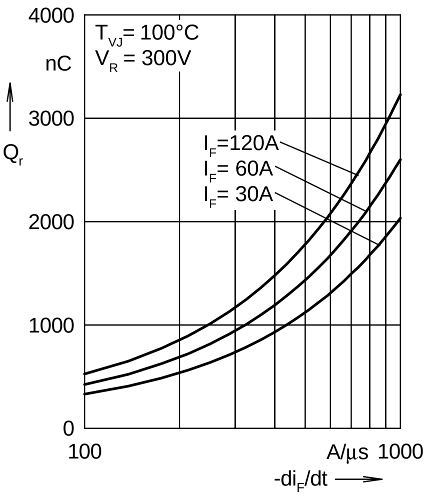


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

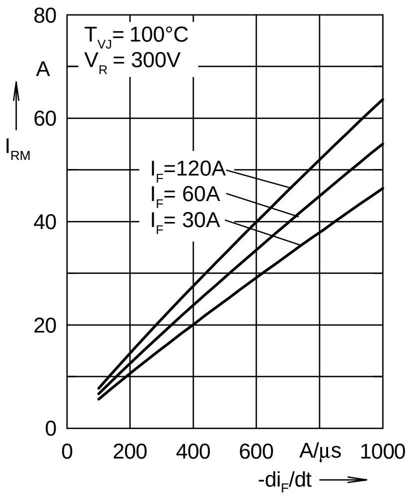


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

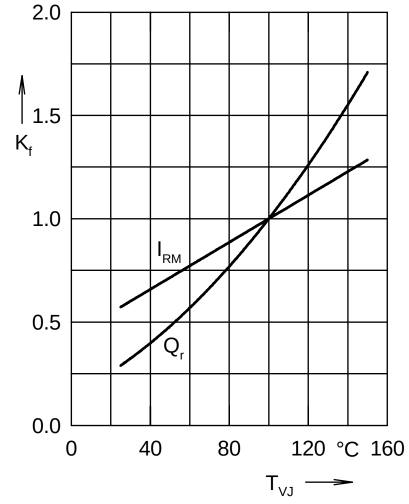


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

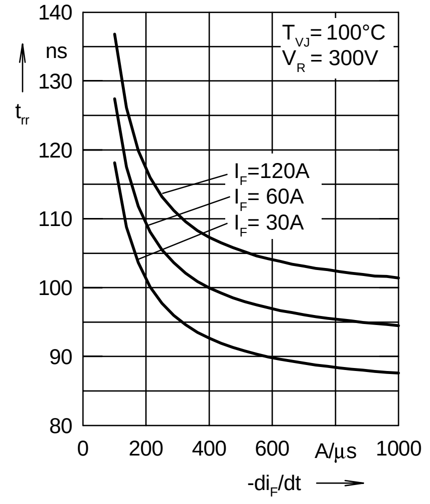


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

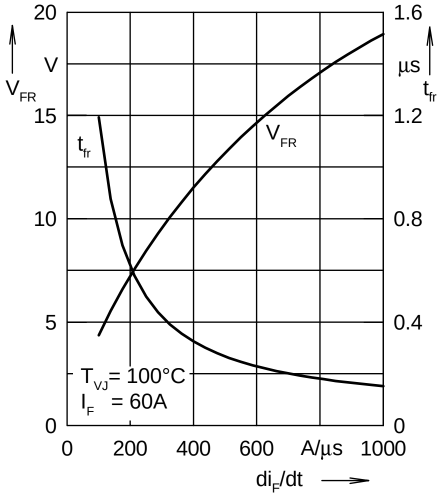


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

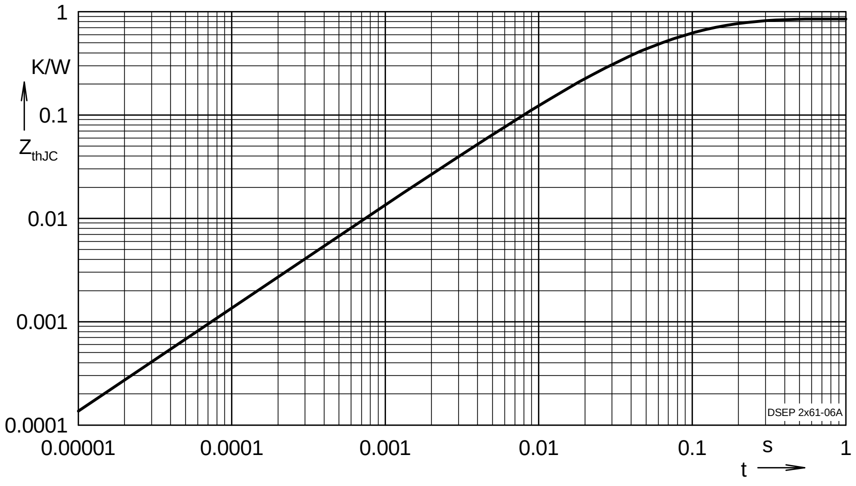


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.3073	0.0055
2	0.3533	0.0092
3	0.0887	0.0007
4	0.1008	0.0399

912

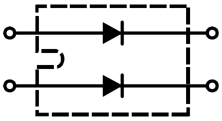
NOTE: Fig. 2 to Fig. 6 shows typical values

IXYS **DSEP 2x 91-06A**

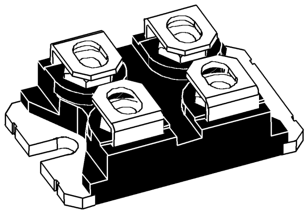
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 2x 90 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEP 2x 91-06A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		100	A
I_{FAVM}	T_C = 55°C; rectangular, d = 0.5	90	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	1000	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 2 A; L = 180 µH	0.4	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.2	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	200	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4) terminal connection torque (M4)	1.1-1.5/9-13 1.1-1.5/9-13	Nm/lb.in. Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		1 4	mA mA
V_F ②	I_F = 90 A; T_{VJ} = 125°C T_{VJ} = 25°C		1.52 2.05	V V
R_{thJC}			0.6	K/W
R_{thCH}		0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	V_R = 100 V; I_F = 200 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C		10.2	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

914

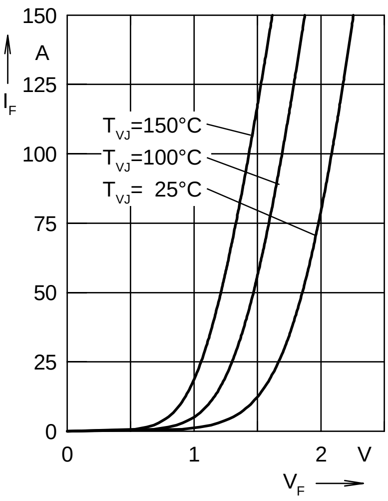


Fig. 1 Forward current I_F versus V_F

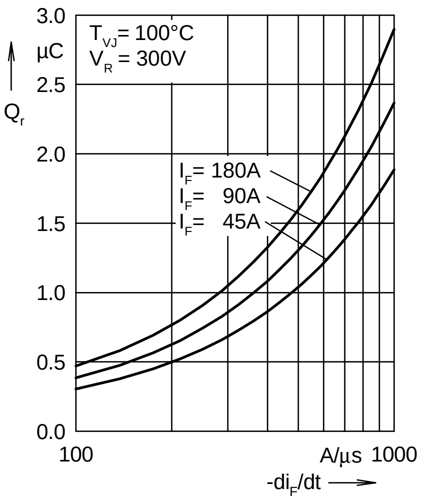


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

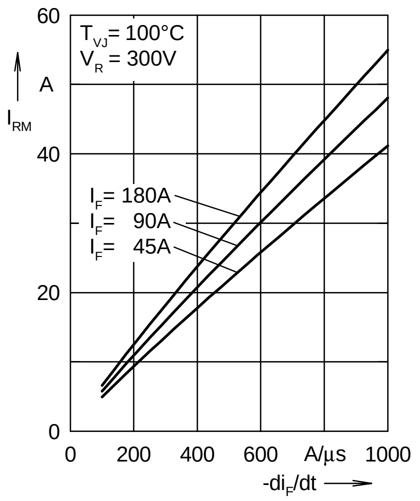


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

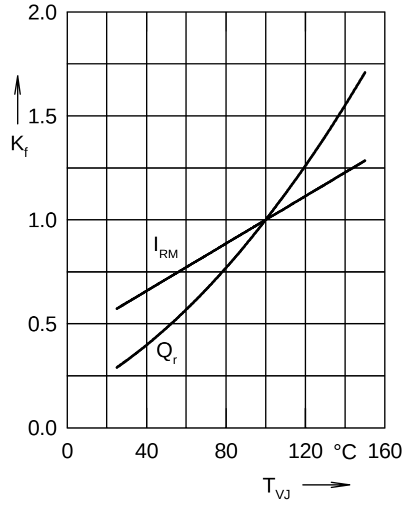


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

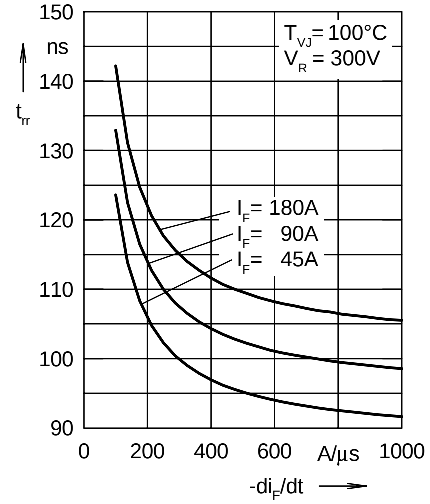


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

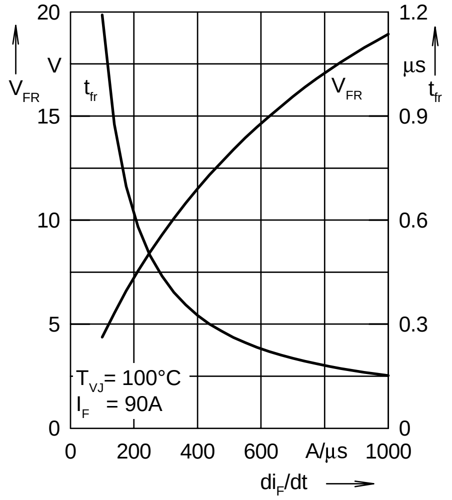


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

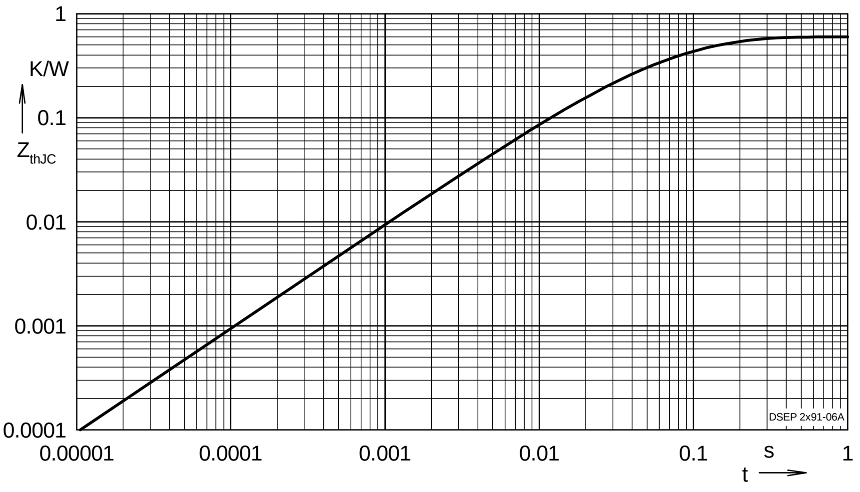


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.212	0.0055
2	0.248	0.0092
3	0.063	0.0007
4	0.077	0.0391

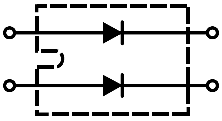
NOTE: Fig. 2 to Fig. 6 shows typical values

914

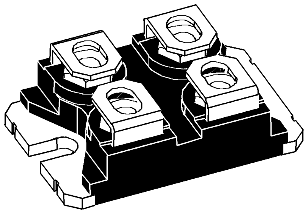
HiPerFRED™ Epitaxial Diode
with soft recovery

I_{FAV} = 2x 30 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	**1200**	**DSEP 2x 31-12A**



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 70°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	200	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 12 A; L = 180 µH	14	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	1.2	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	110	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4)	1.1-1.5/9-13	Nm/lb.in.
	terminal connection torque (M4)	1.1-1.5/9-13	Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		0.25	mA
	T_{VJ} = 150°C $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 125°C		1.96	V
	T_{VJ} = 25°C		2.72	V
R_{thJC}			1.15	K/W
R_{thCH}		0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	5.5		A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

Preliminary Data

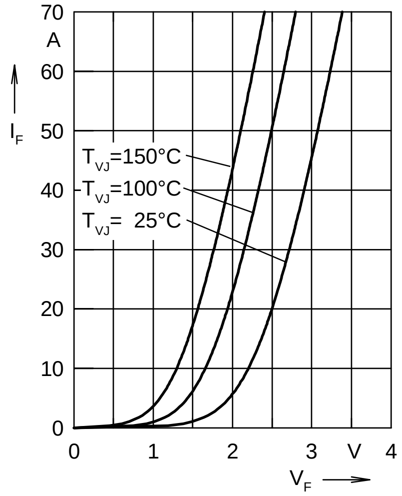


Fig. 1 Forward current I_F versus V_F

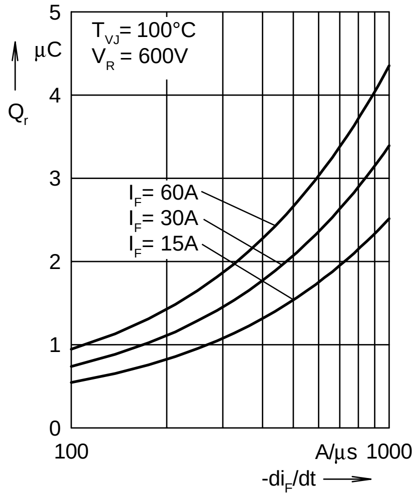


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

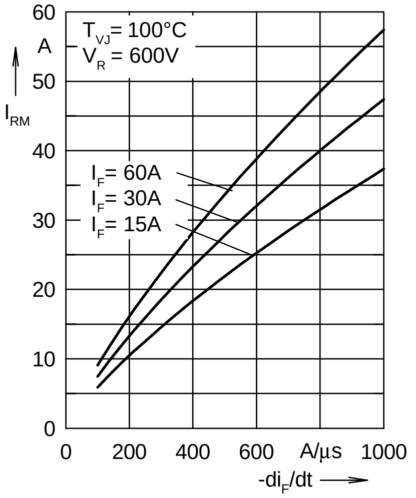


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

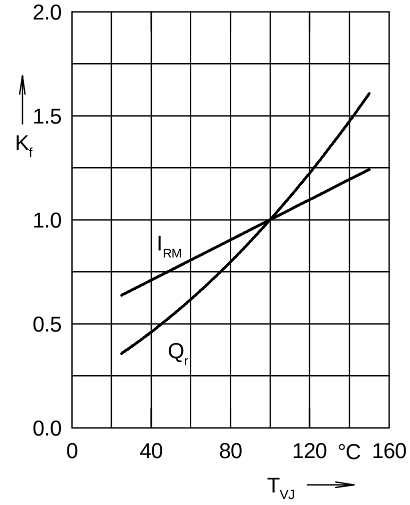


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

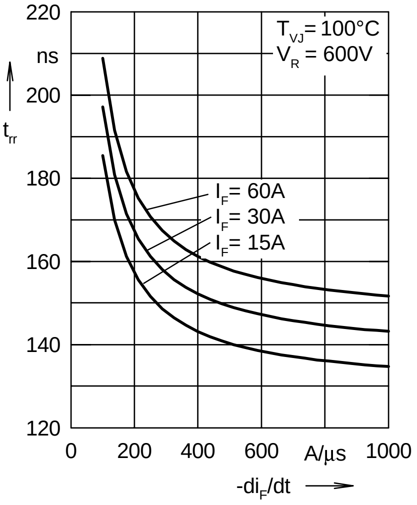


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

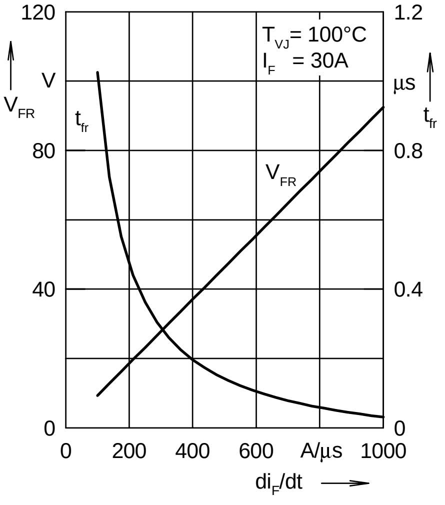


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

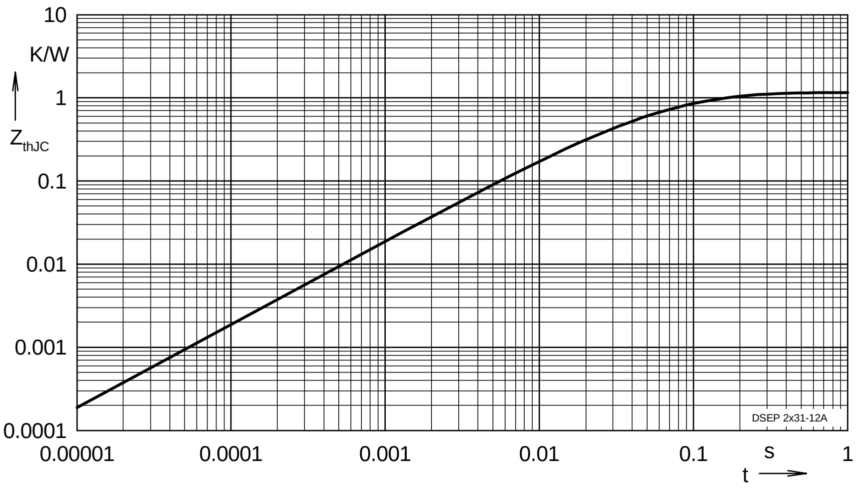


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.436	0.0056
2	0.482	0.0092
3	0.117	0.0007
4	0.115	0.0418

NOTE: Fig. 2 to Fig. 6 shows typical values

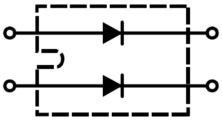
008

DSEP 2x 61-12A

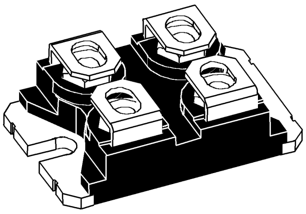
HiPerFRED™ Epitaxial Diode with soft recovery

I_{FAV} = 2x 60 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEP 2x 61-12A



miniBLOC, SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		100	A
I_{FAVM}	T_C = 80°C; rectangular, d = 0.5	60	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	800	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 16 A; L = 180 µH	28	mJ
I_{AR}	$V_A = 1.25 \cdot V_R$ typ.; f = 10 kHz; repetitive	1.6	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	200	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1$ mA	2500	V~
M_d	mounting torque (M4) terminal connection torque (M4)	1.1-1.5/9-13 1.1-1.5/9-13	Nm/lb.in. Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$ T_{VJ} = 150°C $V_R = V_{RRM}$		1 4	mA mA
V_F ②	I_F = 60 A; T_{VJ} = 125°C T_{VJ} = 25°C		1.70 2.42	V V
R_{thJC}			0.6	K/W
R_{thCH}		0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	40		ns
I_{RM}	V_R = 100 V; I_F = 200 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	8		A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Features

- International standard package miniBLOC
- Isolation voltage 2500 V~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

912

Preliminary Data

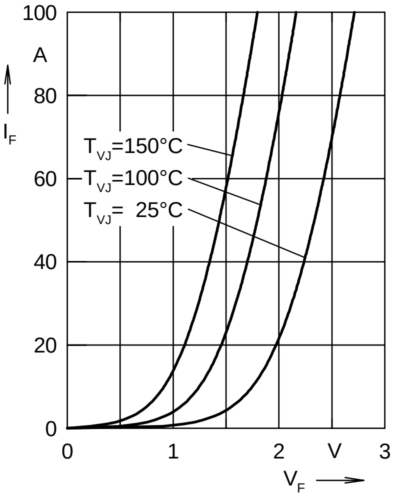


Fig. 1 Forward current I_F versus V_F

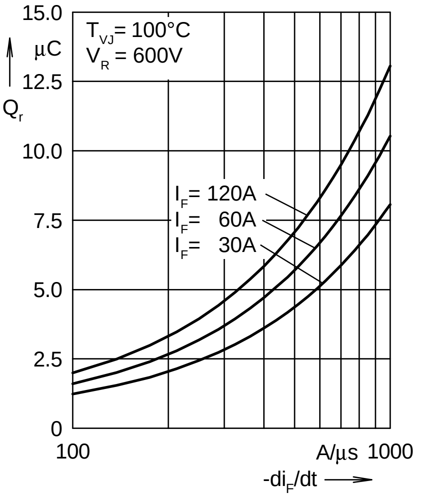


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

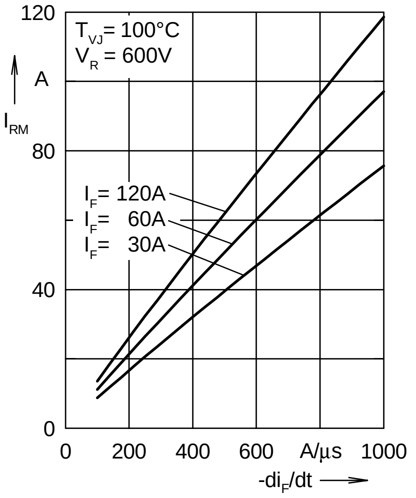


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

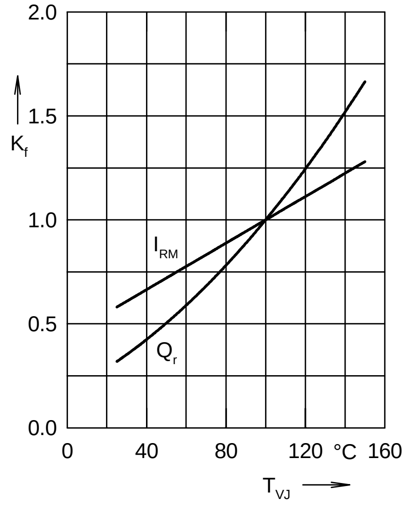


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

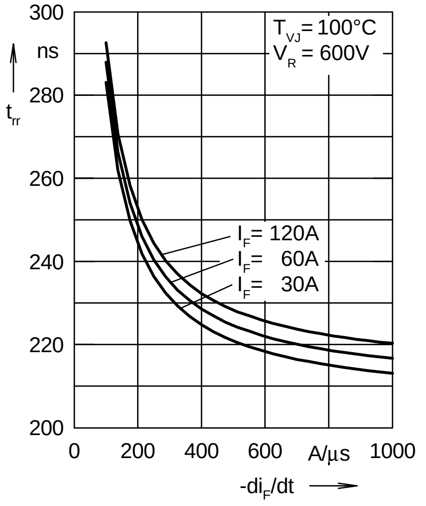


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

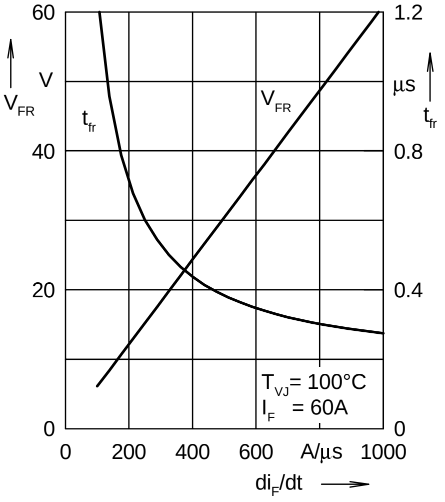


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

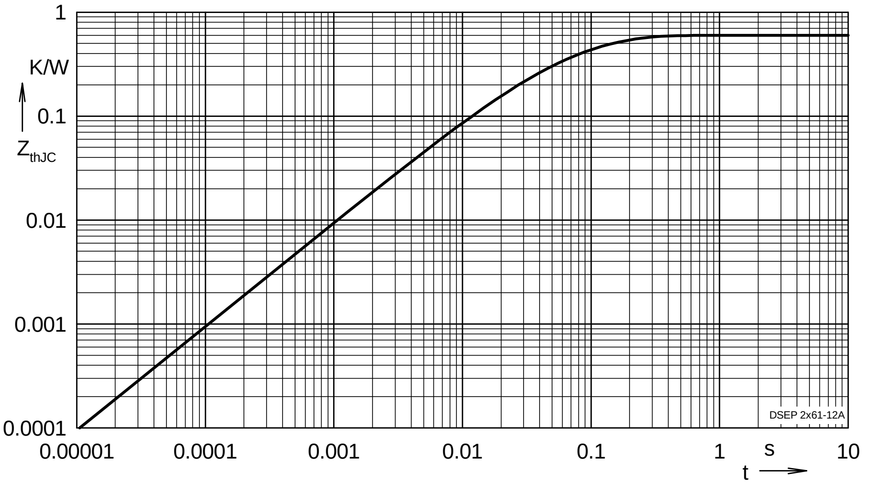


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.212	0.0055
2	0.248	0.0092
3	0.063	0.0007
4	0.077	0.0391

912

NOTE: Fig. 2 to Fig. 6 shows typical values

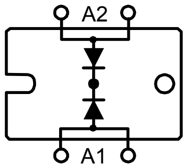
IXYS Advanced Technical Information **DSEC 240-04A**

HiPerFRED™ Epitaxial Diode
with soft recovery

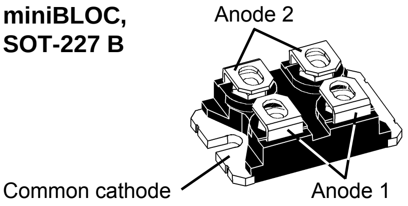
Non isolated

I_{FAV} = 2x 120 A
V_{RRM} = 400 V
t_{rr} = 30 ns

V_{RSM} V	V_{RRM} V	Type
400	400	DSEC 240-04A



miniBLOC,
SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		200	A
I_{FAVM}	T_C = 115°C; rectangular, d = 0.5	120	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	2000	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 6 A; L = 182 µH	4	mJ
I_{AR}	$V_A = 1.5 \bullet V_R$ typ.; f = 10 kHz; repetitive	0.6	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	620	W
M_d	mounting torque (M4)	1.1-1.5/9-13	Nm/lb.in.
	terminal connection torque (M4)	1.1-1.5/9-13	Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	$V_R = V_{RRM}$; T_{VJ} = 25°C		2	mA
	T_{VJ} = 150°C		8	mA
V_F ②	I_F = 120 A; T_{VJ} = 125°C		1.07	V
	T_{VJ} = 25°C		1.38	V
R_{thJC}			0.2	K/W
R_{thCH}	with heatsink compound	0.15		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	I_F = 200 A; $-di_F/dt$ = 100 A/µs V_R = 100 V; T_{VJ} = 100°C	5.5	6.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

Features

- International standard package miniBLOC
- Epoxy meets UL 94V-0
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Dimensions see pages D4 - 85-86

012

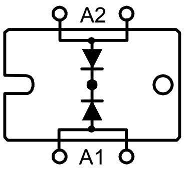
IXYS Advanced Technical Information **DSEC 240-06A**

HiPerFRED™ Epitaxial Diode
with soft recovery

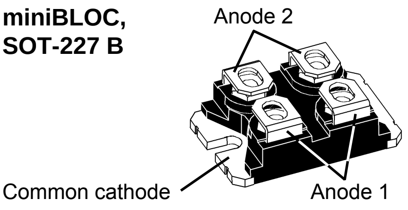
Non isolated

I_{FAV} = 2x 120 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEC 240-06A



miniBLOC,
SOT-227 B



Symbol	Conditions	Maximum Ratings	
I_{FRMS}		200	A
I_{FAVM}	T_C = 105°C; rectangular, d = 0.5	120	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	2000	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = 3 A; L = 180 µH	0.8	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	0.3	A
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	620	W
M_d	mounting torque (M4)	1.1-1.5/9-13	Nm/lb.in.
	terminal connection torque (M4)	1.1-1.5/9-13	Nm/lb.in.
Weight	typical	30	g

Symbol	Conditions	Characteristic Values		
		typ.	max.	
I_R ①	$V_R = V_{RRM}$; T_{VJ} = 25°C		2	mA
	T_{VJ} = 150°C		8	mA
V_F ②	I_F = 120 A; T_{VJ} = 125°C		1.39	V
	T_{VJ} = 25°C		1.91	V
R_{thJC}			0.2	K/W
R_{thCH}	with heatsink compound	0.15		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	35		ns
I_{RM}	I_F = 200 A; $-di_F/dt$ = 100 A/µs V_R = 100 V; T_{VJ} = 100°C	8	10.2	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Features

- International standard package miniBLOC
- Epoxy meets UL 94V-0
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Advantages

- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I_{RM} reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

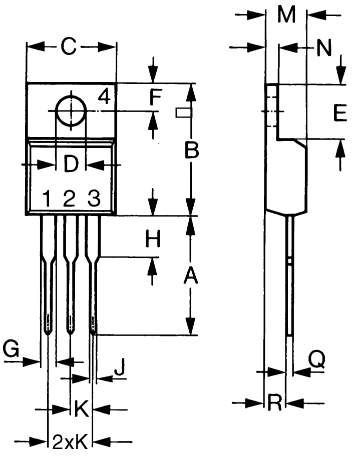
Dimensions see pages D4 - 85-86

IXYS reserves the right to change limits, test conditions and dimensions.

012

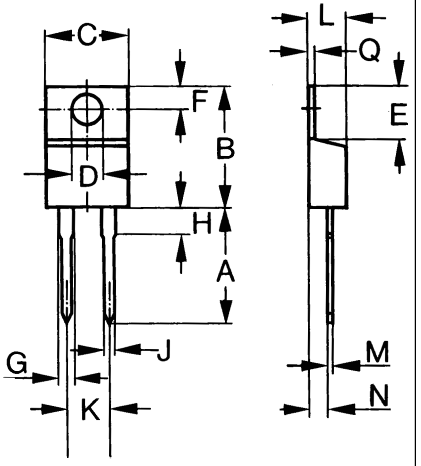
Dimensions

TO-220 AB



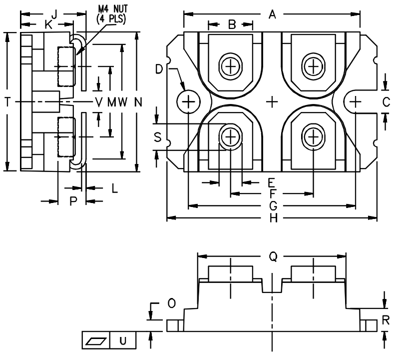
Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	12.70	13.97	0.500	0.550
B	14.73	16.00	0.580	0.630
C	9.91	10.66	0.390	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.270
F	2.54	3.18	0.100	0.125
G	1.15	1.65	0.045	0.065
H	2.79	5.84	0.110	0.230
J	0.64	1.01	0.025	0.040
K	2.54	BSC	0.100	BSC
M	4.32	4.82	0.170	0.190
N	1.14	1.39	0.045	0.055
Q	0.38	0.56	0.015	0.022
R	2.29	2.79	0.090	0.110

TO-220 AC



Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	12.70	14.73	0.500	0.580
B	14.23	16.51	0.560	0.650
C	9.66	10.66	0.380	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.420
F	2.54	3.42	0.100	0.135
G	1.15	1.77	0.045	0.070
H	-	6.35	-	0.250
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.190	0.210
L	3.56	4.82	0.140	0.190
M	0.38	0.56	0.015	0.022
N	2.04	2.49	0.080	0.115
Q	0.64	1.39	0.025	0.055

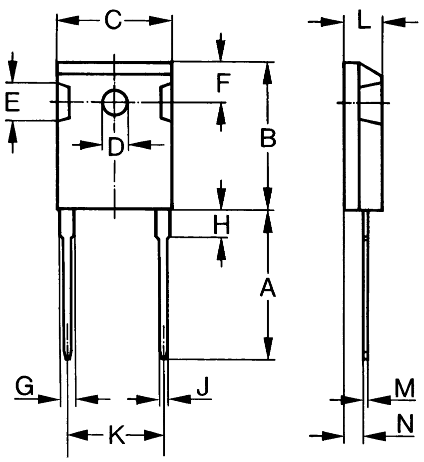
miniBLOC, SOT-227 B



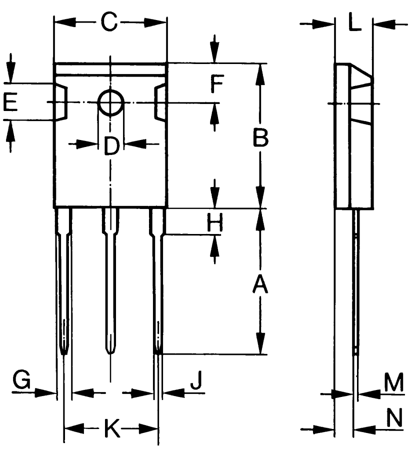
M4 screws (4x) supplied

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.20	1.489	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004
V	3.30	4.57	0.130	0.180
W	0.780	0.830	19.81	21.08

TO-247 AD and ISOPLUS 247™



TO-247 AD and ISOPLUS 247™

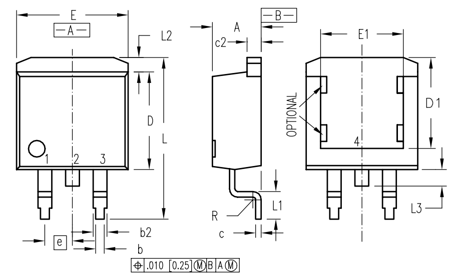


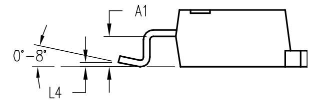
Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D*	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

* ISOPLUS 247™ without hole

Dimensions

TO-263 AB

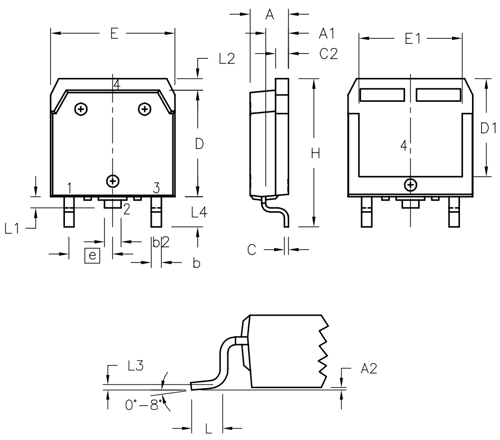




1. Gate
2. Collector
3. Emitter
4. Collector
   Botton Side

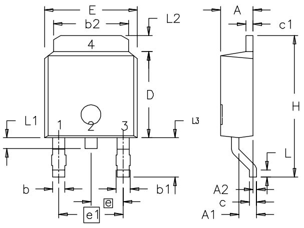
Dim.	Millimeter Min.	 Max.	Inches Min.	 Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	8.00	8.89	.315	.350
E	9.65	10.29	.380	.405
E1	6.22	8.13	.245	.320
e	2.54 BSC		.100 BSC	
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.20	0	.008
R	0.46	0.74	.018	.029

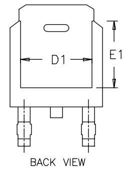
TO-268 AA



Dim.	Millimeter Min.	 Max.	Inches Min.	 Max.
A	4.9	5.1	.193	.201
A_1	2.7	2.9	.106	.114
A_2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b_2	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E_1	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L1	1.20	1.40	.047	.055
L2	1.00	1.15	.039	.045
L3	0.25 BSC		.010 BSC	
L4	3.80	4.10	.150	.161

TO-252 AA





1 Anode
2 NC
3 Anode
4 Cathode

Dim.	Millimeter Min.	 Max.	Inches Min.	 Max.
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
A2	0	0.13	0	0.005
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.32	5.21	0.170	0.205
E	6.35	6.73	0.250	0.265
E1	4.32	5.21	0.170	0.205
e	2.28 BSC		0.090 BSC	
e1	4.57 BSC		0.180 BSC	
H	9.40	10.42	0.370	0.410
L	0.51	1.02	0.020	0.040
L1	0.64	1.02	0.025	0.040
L2	0.89	1.27	0.035	0.050
L3	2.54	2.92	0.100	0.115