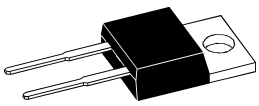
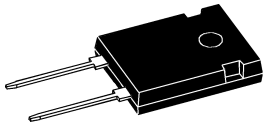
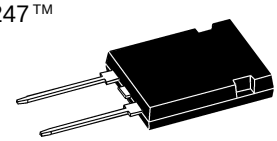
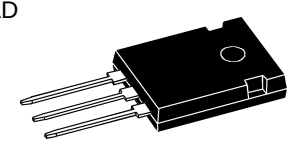
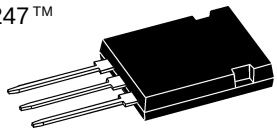
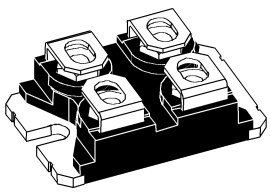
Fast Recovery Epitaxial Diodes (FRED)
Fast Recovery Diodes (FRD)

Contents

Package style		V_{RRM} V	I_{FAV} A	t_{rr} ns	Type	Page
1 TO-220 AC 	1	**600**	8	35	**DSEI 8-06A**	D5 - 2
	2	**600**	8	35	**DSEI 8-06AS**	D5 - 2
2 TO-263 AA 	1	**600**	14	35	**DSEI 12-06A**	D5 - 4
		1000	12	50	**DSEI 12-10A**	D5 - 6
		1200	11	50	**DSEI 12-12A**	D5 - 8
		1200	17	40	**DSEI 20-12A**	D5 - 10
	2	**600**	20	35	**DSEI 19-06AS**	D5 - 12
		600	35	35	**DSEI 36-06AS**	D5 - 13
3 TO-247 AD 	3	**600**	37	35	**DSEI 30-06A**	D5 - 14
	3/4	**1000**	30	35	**DSEI 30-10A/AR**	D5 - 16
	3	**1200**	26	40	**DSEI 30-12A**	D5 - 18
		200	69	35	**DSEI 60-02A**	D5 - 20
		600	60	35	**DSEI 60-06A**	D5 - 22
		1000	60	35	**DSEI 60-10A**	D5 - 24
4 ISOPLUS 247™ 		**1200**	52	40	**DSEI 60-12A**	D5 - 26
		1400	63	40	**DSDI 60-14A**	D5 - 28
		1600	63	40	**DSDI 60-16A**	D5 - 28
		1800	63	40	**DSDI 60-18A**	D5 - 28
5 TO-247 AD 		**600**	126	35	**DSEI 120-06A**	D5 - 29
		1200	109	40	**DSEI 120-12A**	D5 - 31
	5/6	**200**	2x34	35	**DSEI 60-02A / AR**	D5 - 33
	5	**600**	2x30	35	**DSEI 60-06A**	D5 - 35
	5	**1200**	2x26	40	**DSEI 60-12A**	D5 - 37
6 ISOPLUS 247™ 		**600**	1x31	35	**DSEI 1x31-06C**	D6 -39
		400	2x30	35	**DSEI 2x30-04C, DSEI 2x31-04C**	D5 - 41
		600	2x30	35	**DSEI 2x30-06C, DSEI 2x31-06C**	D5 - 41
		1000	2x30	35	**DSEI 2x30-10B, DSEI 2x31-10B**	D5 - 43
		1200	2x28	40	**DSEI 2x30-12B, DSEI 2x31-12B**	D5 - 45
7 SOT-227 B, miniBLOC 	7	**200**	2x71	35	**DSEI 2x61-02A**	D5 - 47
		400	2x60	35	**DSEI 2x61-04C**	D5 - 49
		600	2x60	35	**DSEI 2x61-06C**	D5 - 49
		1000	2x60	35	**DSEI 2x61-10B**	D5 - 51
		1200	2x52	40	**DSEI 2x61-12B**	D5 - 53
		200	2x123	35	**DSEI 2x121-02A**	D5 - 55
		600	2x96	35	**DSEI 2x101-06A**	D5 - 57
		1200	2x91	40	**DSEI 2x101-12A**	D5 - 59

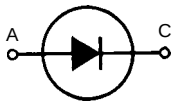
IXYS

Fast Recovery Epitaxial Diode (FRED)

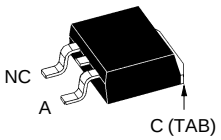
DSEI 8

I_{FAVM} = 8 A
V_{RRM} = 600 V
t_{rr} = 35 ns

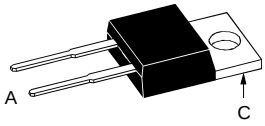
V_{RSM} V	V_{RRM} V	Type
640	600	DSEI 8-06A
640	600	DSEI 8-06AS



TO-263 AA
DSEI 8-06AS



TO-220 AC
DSEI 8-06A



A = Anode, C = Cathode, NC = No connection
TAB = Cathode

Symbol	Test Conditions	Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$	16	A
I_{FAVM} ①	T_C = 115°C; rectangular, d = 0.5	8	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	130	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	100	A
	t = 8.3 ms (60 Hz), sine	110	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	85	A
	t = 8.3 ms (60 Hz), sine	95	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	50	A^2s
	t = 8.3 ms (60 Hz), sine	50	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	36	A^2s
	t = 8.3 ms (60 Hz), sine	37	A^2s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	50	W
M_d	Mounting torque	0.4...0.6	Nm
Weight		2	g

Symbol	Test Conditions	Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		20	µA
	T_{VJ} = 25°C $V_R = 0.8 \cdot V_{RRM}$		10	µA
	T_{VJ} = 125°C $V_R = 0.8 \cdot V_{RRM}$		1.5	mA
V_F	I_F = 8 A; T_{VJ} = 150°C		1.3	V
	T_{VJ} = 25°C		1.5	V
V_{T0}	For power-loss calculations only		0.98	V
r_T	$T_{VJ} = T_{VJM}$		28.7	mΩ
R_{thJC}			2.5	K/W
R_{thCK}		0.5		K/W
R_{thJA}			60	K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	35	50	ns
I_{RM}	V_R = 350 V; I_F = 8 A; $-di_F/dt$ = 64 A/µs; L ≤ 0.05 µH; T_{VJ} = 100°C	2.5	2.8	A

Features
- International standard package JEDEC TO-220 AC & TO-263 AB
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

033

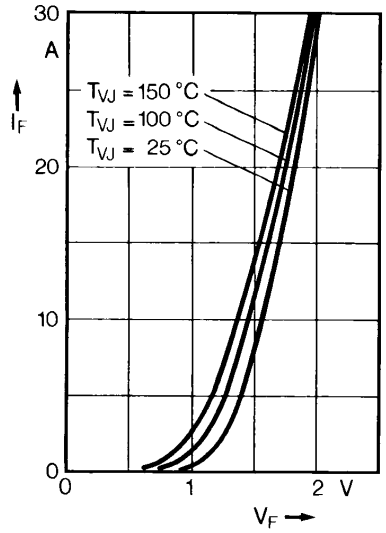


Fig. 1 Forward current versus voltage drop.

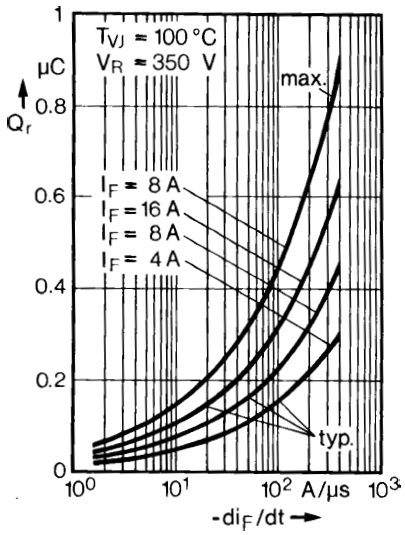


Fig. 2 Recovery charge versus $-di_F/dt$.

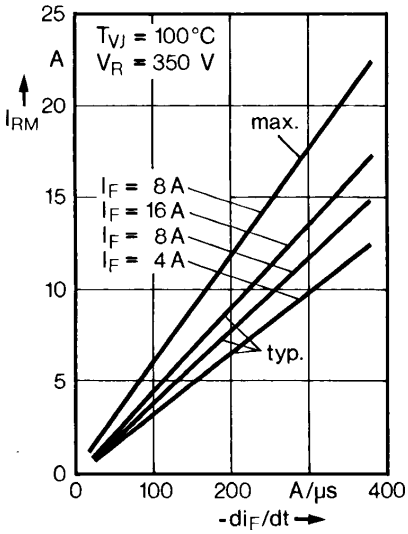


Fig. 3 Peak reverse current versus $-di_F/dt$.

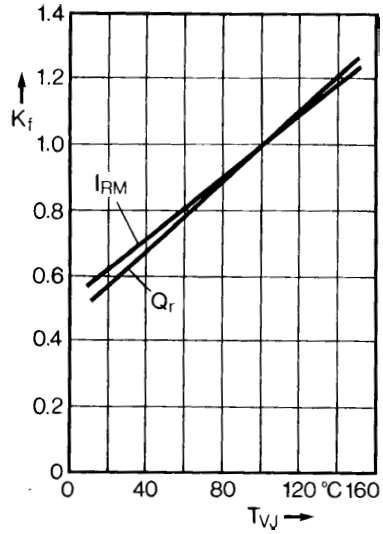


Fig. 4 Dynamic parameters versus junction temperature.

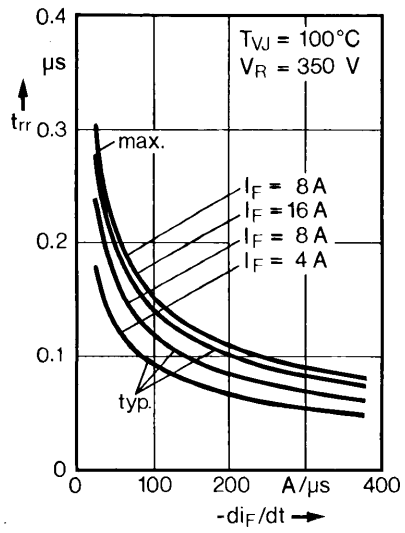


Fig. 5 Recovery time versus $-di_F/dt$.

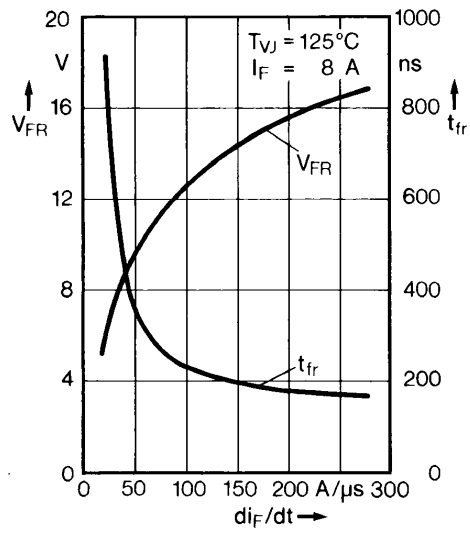


Fig. 6 Peak forward voltage versus di_F/dt.

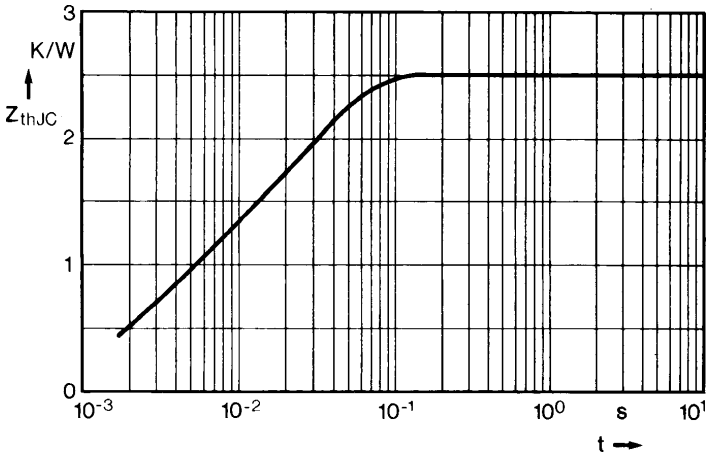
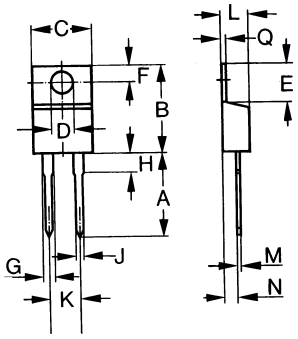


Fig. 7 Transient thermal impedance junction to case.

Dimensions 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

Dimension TO-263 AA see DSEI 19

033

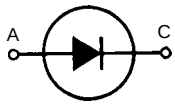
IXYS

Fast Recovery Epitaxial Diode (FRED)

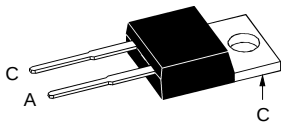
DSEI 12

I_{FAVM} = 14 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
640	600	DSEI 12-06A



TO-220 AC



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		25	A
I_{FAVM} ①	T_C = 100°C; rectangular, d = 0.5		14	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		150	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	100	A
		t = 8.3 ms (60 Hz), sine	110	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	85	A
		t = 8.3 ms (60 Hz), sine	95	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	50	A^2s
		t = 8.3 ms (60 Hz), sine	50	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	36	A^2s
		t = 8.3 ms (60 Hz), sine	37	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		62	W
M_d	Mounting torque		0.4...0.6	Nm
Weight			2	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		50	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		25	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		3	mA
V_F	I_F = 16 A;	T_{VJ} = 150°C		1.5	V
		T_{VJ} = 25°C		1.7	V
V_{T0}	For power-loss calculations only			1.12	V
r_T	$T_{VJ} = T_{VJM}$			23.2	mΩ
R_{thJC}				2	K/W
R_{thCK}			0.5		K/W
R_{thJA}				60	K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 350 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		4	4.4	A

Features

- International standard package JEDEC TO-220 AC
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

033

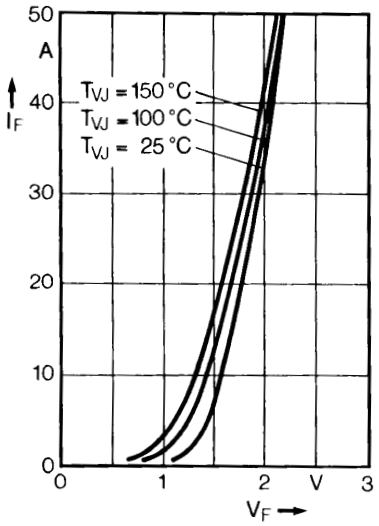


Fig. 1 Forward current versus voltage drop.

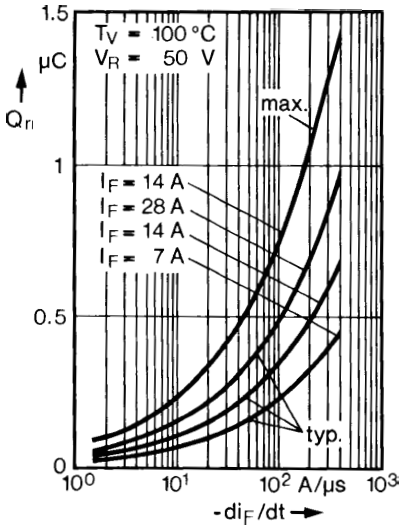


Fig. 2 Recovery charge versus $-di_F/dt$.

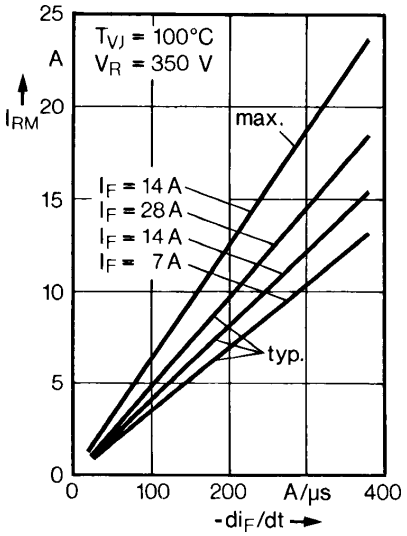


Fig. 3 Peak reverse current versus $-di_F/dt$.

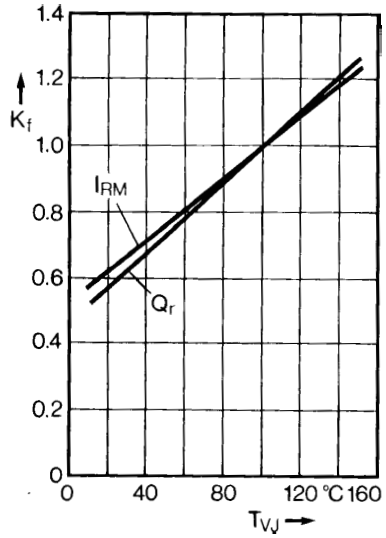


Fig. 4 Dynamic parameters versus junction temperature.

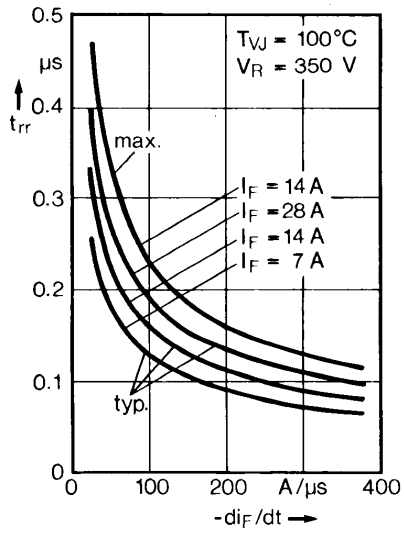


Fig. 5 Recovery time versus $-di_F/dt$.

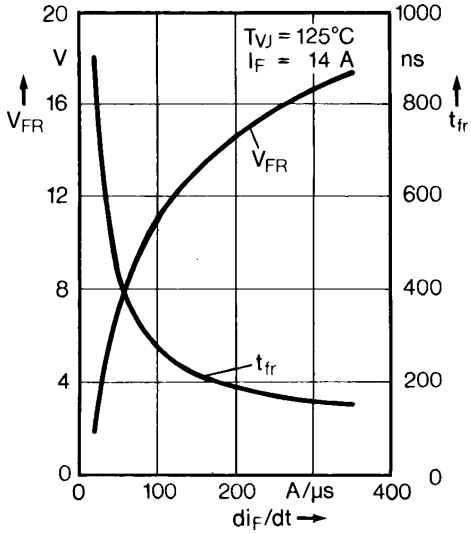


Fig. 6 Peak forward voltage versus di_F/dt.

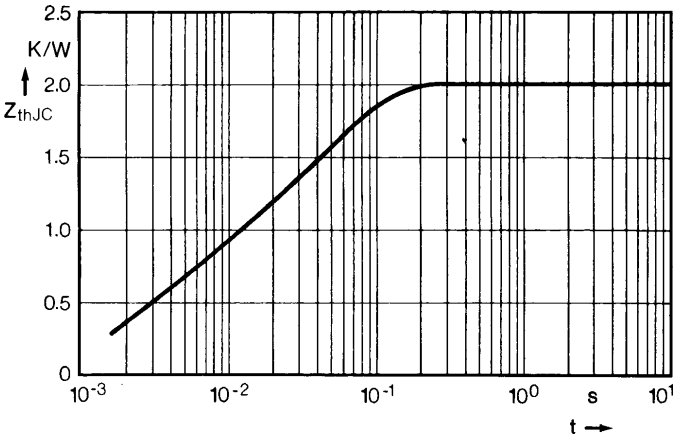
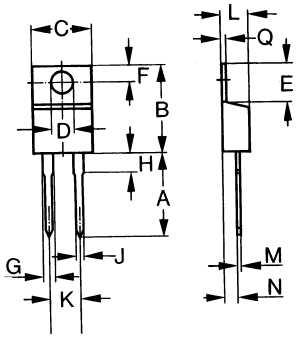


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	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

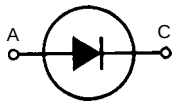
IXYS

Fast Recovery Epitaxial Diode (FRED)

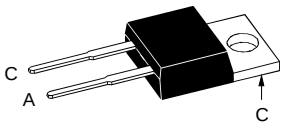
DSEI 12

I_{FAVM} = 12 A
V_{RRM} = 1000 V
t_{rr} = 50 ns

V_{RSM} V	V_{RRM} V	Type
1000	1000	DSEI 12-10A



TO-220 AC



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		25	A
I_{FAVM} ①	T_C = 100°C; rectangular, d = 0.5		12	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		150	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	75	A
		t = 8.3 ms (60 Hz), sine	80	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	65	A
		t = 8.3 ms (60 Hz), sine	70	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	28	A^2s
		t = 8.3 ms (60 Hz), sine	27	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	21	A^2s
		t = 8.3 ms (60 Hz), sine	20	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		78	W
M_d	Mounting torque		0.4...0.6	Nm
Weight			2	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		250	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		150	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		4	mA
V_F	I_F = 12 A;	T_{VJ} = 150°C		2.1	V
		T_{VJ} = 25°C		2.7	V
V_{T0}	For power-loss calculations only			1.67	V
r_T	$T_{VJ} = T_{VJM}$			33.6	mΩ
R_{thJC}				1.6	K/W
R_{thCK}			0.5		K/W
R_{thJA}				60	K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C		50	60	ns
I_{RM}	V_R = 540 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		6.5	7.2	A

Features

- International standard package JEDEC TO-220 AC
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

033

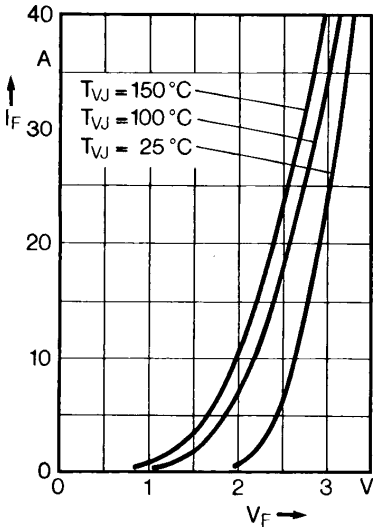


Fig. 1 Forward current versus voltage drop.

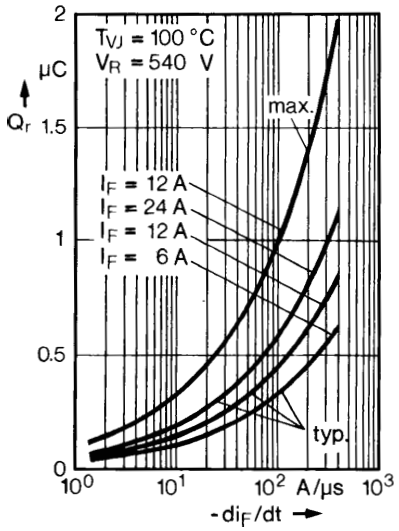


Fig. 2 Recovery charge versus $-di_F/dt$.

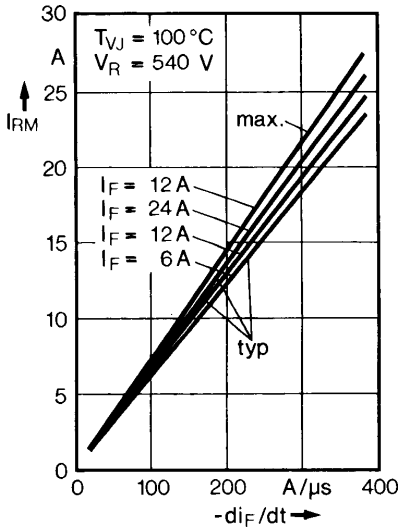


Fig. 3 Peak reverse current versus $-di_F/dt$.

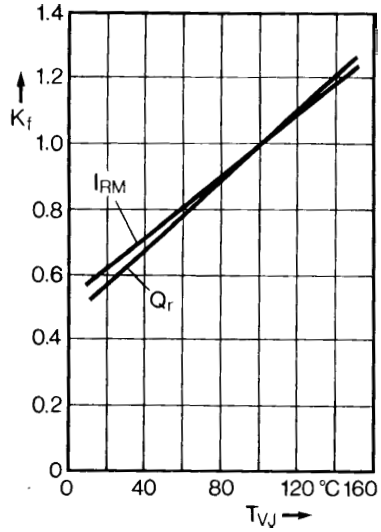


Fig. 4 Dynamic parameters versus junction temperature.

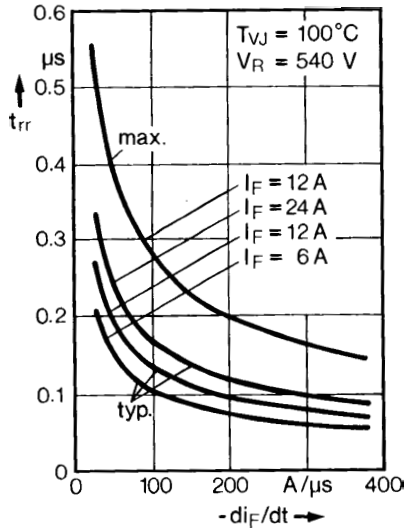


Fig. 5 Recovery time versus $-di_F/dt$.

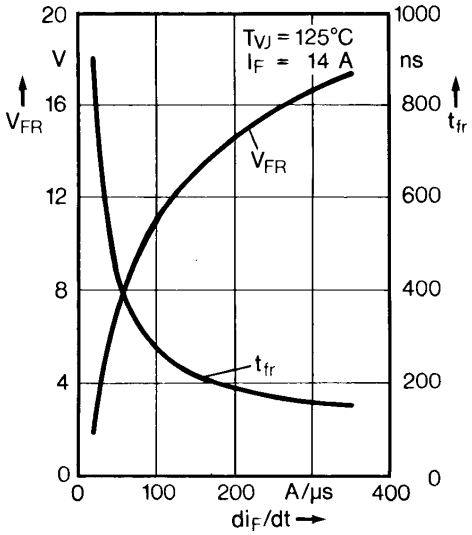


Fig. 6 Peak forward voltage versus di_F/dt.

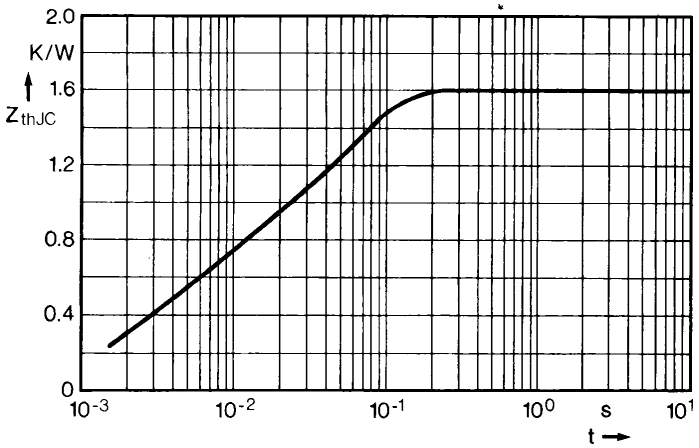
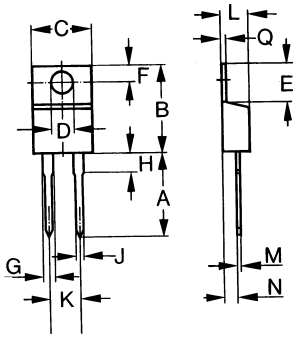


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	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

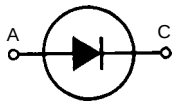
IXYS

Fast Recovery Epitaxial Diode (FRED)

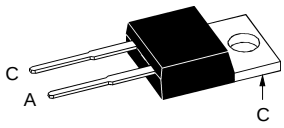
DSEI 12

I_{FAVM} = 11 A
V_{RRM} = 1200 V
t_{rr} = 50 ns

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



TO-220 AC



A = Anode, C = Cathode

Symbol	Test Conditions	Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$	25	A
I_{FAVM} ①	T_C = 100°C; rectangular, d = 0.5	11	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	150	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	75	A
	t = 8.3 ms (60 Hz), sine	80	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	65	A
	t = 8.3 ms (60 Hz), sine	70	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	28	A^2s
	t = 8.3 ms (60 Hz), sine	27	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	21	A^2s
	t = 8.3 ms (60 Hz), sine	20	A^2s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	78	W
M_d	Mounting torque	0.4...0.6	Nm
Weight		2	g

Symbol	Test Conditions	Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		250	µA
	T_{VJ} = 25°C V_R = 0.8 • V_{RRM}		150	µA
	T_{VJ} = 125°C V_R = 0.8 • V_{RRM}		4	mA
V_F	I_F = 12 A; T_{VJ} = 150°C		2.2	V
	T_{VJ} = 25°C		2.6	V
V_{T0}	For power-loss calculations only		1.65	V
r_T	$T_{VJ} = T_{VJM}$		46.2	mΩ
R_{thJC}			1.6	K/W
R_{thCK}		0.5		K/W
R_{thJA}			60	K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C	50	70	ns
I_{RM}	V_R = 540 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs; L ≤ 0.05 µH; T_{VJ} = 100°C	6.5	7.2	A

Features

- International standard package JEDEC TO-220 AC
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

033

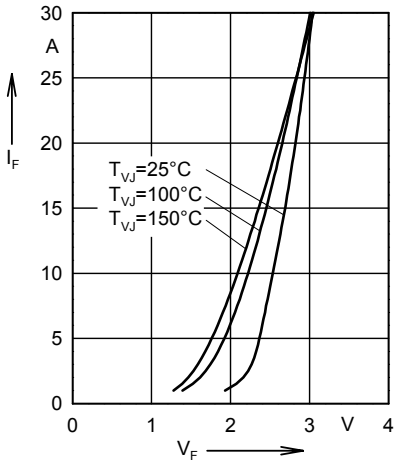


Fig. 1 Forward current versus voltage drop.

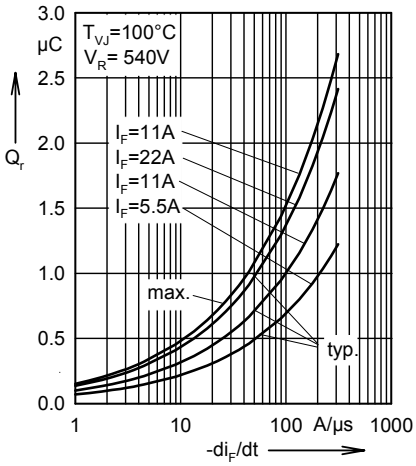


Fig. 2 Recovery charge versus $-di_F/dt$.

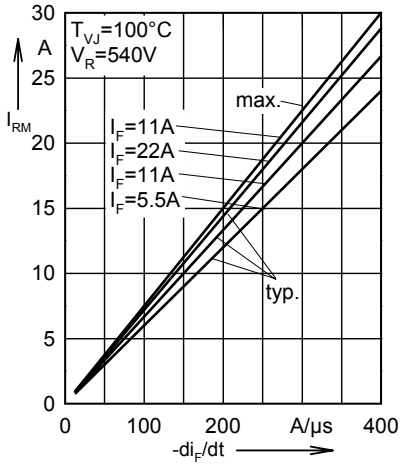


Fig. 3 Peak reverse current versus $-di_F/dt$.

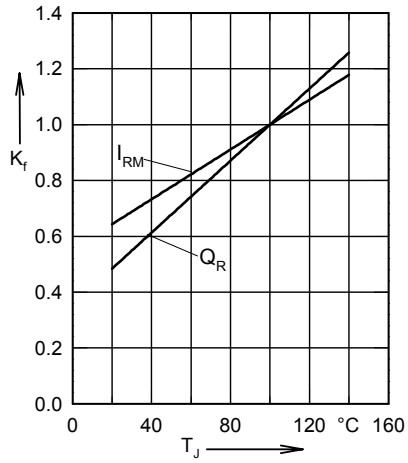


Fig. 4 Dynamic parameters versus junction temperature.

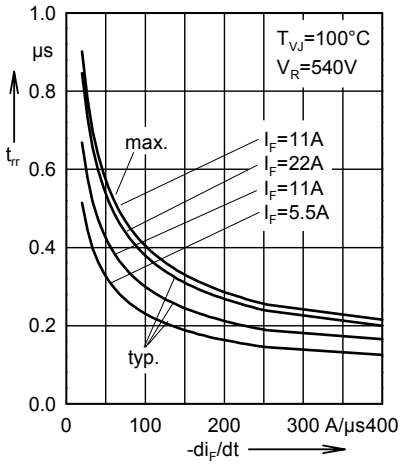


Fig. 5 Recovery time versus $-di_F/dt$.

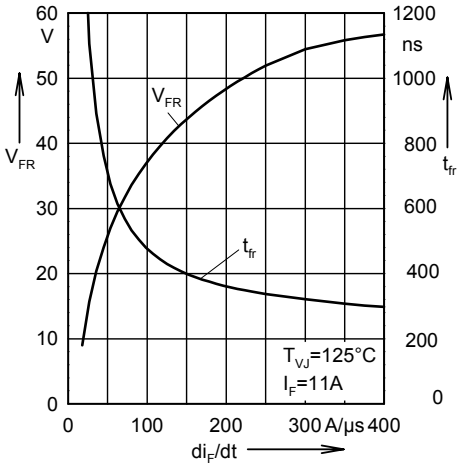


Fig. 6 Peak forward voltage versus di_F/dt.

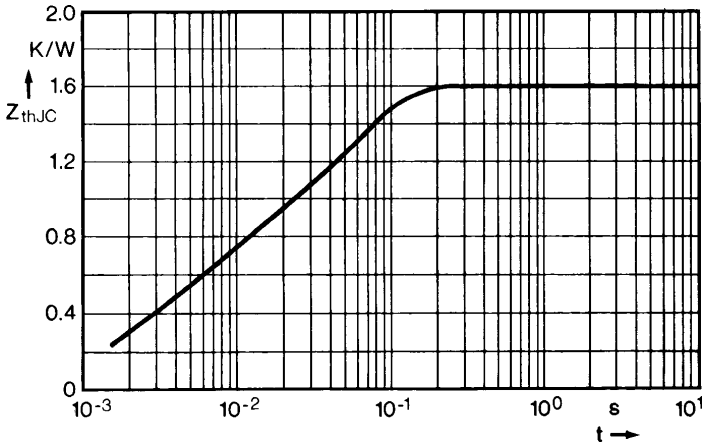
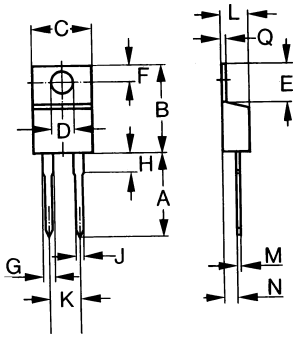


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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

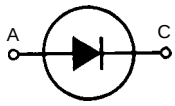
IXYS

Fast Recovery Epitaxial Diode (FRED)

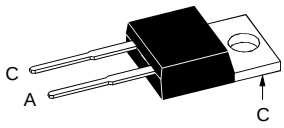
DSEI 20

I_{FAVM} = 17 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEI 20-12A



TO-220 AC



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		70	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		17	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		220	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	130	A
		t = 8.3 ms (60 Hz), sine	140	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	110	A
		t = 8.3 ms (60 Hz), sine	120	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	85	A^2s
		t = 8.3 ms (60 Hz), sine	80	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	60	A^2s
		t = 8.3 ms (60 Hz), sine	60	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		78	W
M_d	Mounting torque		0.4...0.6	Nm
Weight			2	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		750	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		250	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 12 A;	T_{VJ} = 150°C		1.87	V
		T_{VJ} = 25°C		2.15	V
V_{T0}	For power-loss calculations only			1.65	V
r_T	$T_{VJ} = T_{VJM}$			18.2	mΩ
R_{thJC}				1.6	K/W
R_{thJA}				60	K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		40	60	ns
I_{RM}	V_R = 540 V; I_F = 20 A; $-di_F/dt$ = 100 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		7		A

Features

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

Applications

- Antiparallel diode for high frequency switching devices
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

033

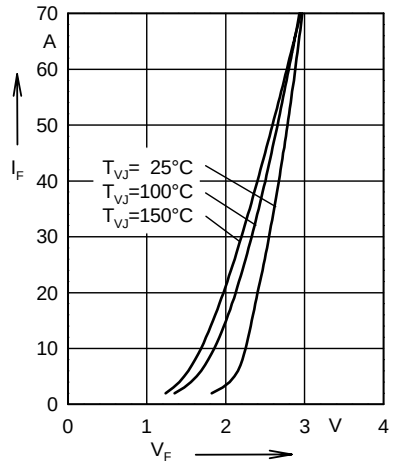


Fig. 1 Forward current versus voltage drop.

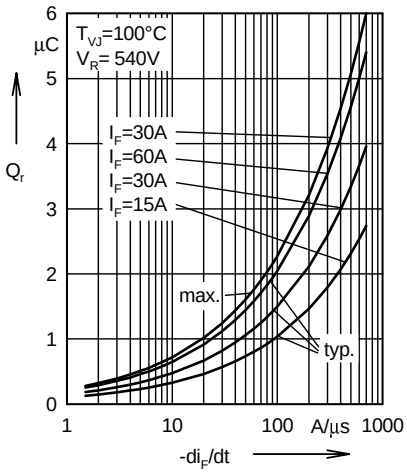


Fig. 2 Recovery charge versus $-di_F/dt$.

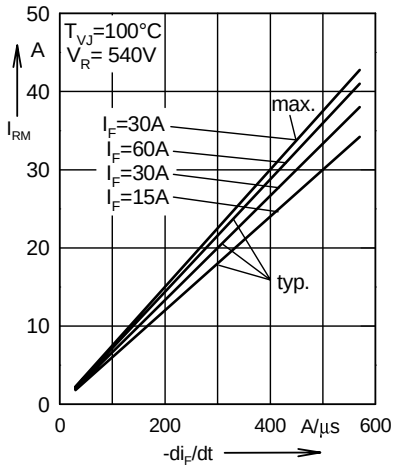


Fig. 3 Peak reverse current versus $-di_F/dt$.

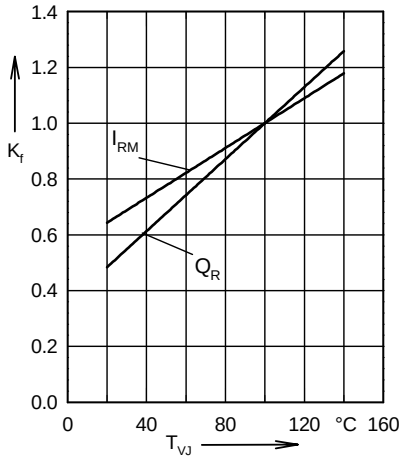


Fig. 4 Dynamic parameters versus junction temperature.

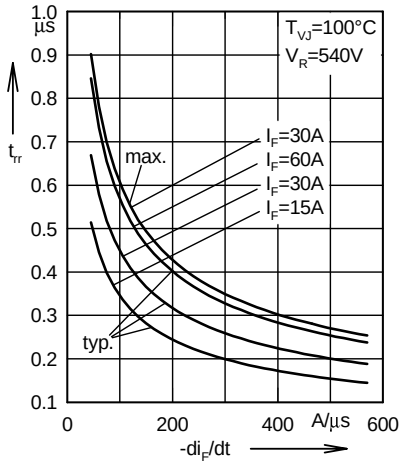


Fig. 5 Recovery time versus $-di_F/dt$.

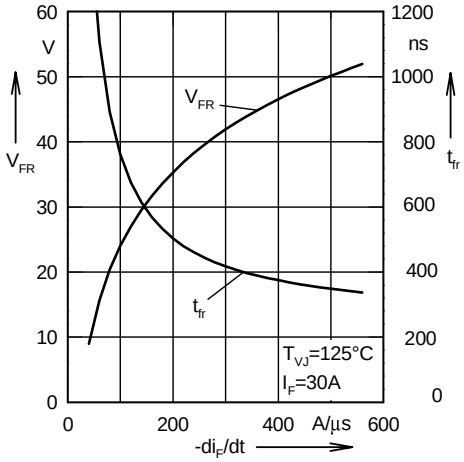


Fig. 6 Peak forward voltage versus di_F/dt.

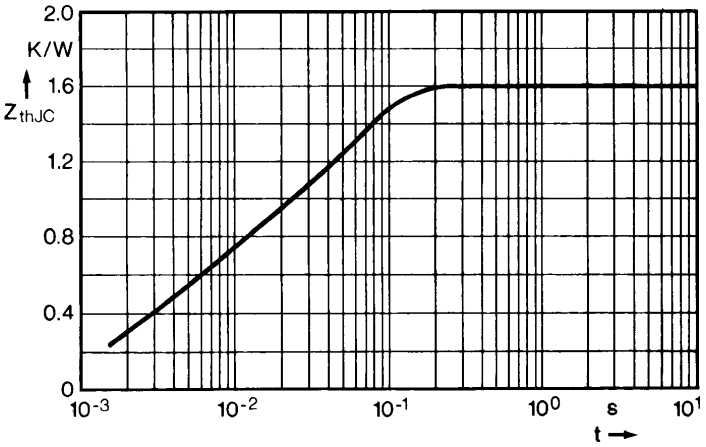
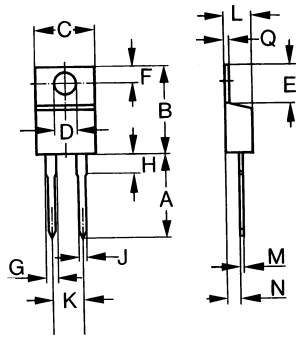


Fig. 7 Transient thermal impedance junction to case.

Dimensions



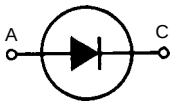
Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	12.70	14.73	0.500	0.580
B	14.23	16.51	0.560	0.650
C	9.66	10.66	0.380	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.420
F	2.54	3.42	0.100	0.135
G	1.15	1.77	0.045	0.070
H	-	6.35	-	0.250
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.190	0.210
L	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

Fast Recovery Epitaxial Diode (FRED)

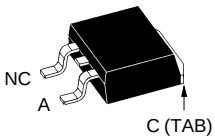
DSEI 19

V_{RRM} = 600 V
I_{FAVM} = 20 A
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEI 19-06AS



TO-263 AA



A = Anode, C = Cathode,
NC = No connection, TAB = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		25	A
I_{FAVM} ①	T_C = 65°C; rectangular, d = 0.5		20	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		150	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	100	A
		t = 8.3 ms (60 Hz), sine	110	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	85	A
		t = 8.3 ms (60 Hz), sine	95	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	50	A^2s
		t = 8.3 ms (60 Hz), sine	50	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	36	A^2s
		t = 8.3 ms (60 Hz), sine	37	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		61	W
Weight			2	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		50	µA
	T_{VJ} = 25°C	V_R = 0.8 • V_{RRM}		25	µA
	T_{VJ} = 125°C	V_R = 0.8 • V_{RRM}		3	mA
V_F	I_F = 16 A;	T_{VJ} = 150°C		1.5	V
		T_{VJ} = 25°C		1.7	V
V_{T0}	For power-loss calculations only			1.12	V
r_T	$T_{VJ} = T_{VJM}$			23.2	mΩ
R_{thJC}				2	K/W
t_{rr}	I_F = 1 A; -di/dt = 50 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 350 V; I_F = 12 A; $-di_F/dt$ = 100 A/µs; L ≤ 0.05 µH; T_{VJ} = 100°C		4	4.4	A

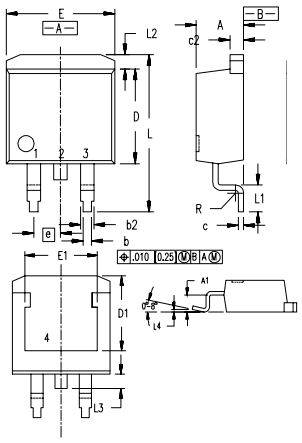
Characteristic curves are located in the data sheet DSEI 12-06

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features

- International standard surface mount package JEDEC TO-263 AA
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

TO-263 AA Outline



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	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.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	0.38	0	.015
R	0.46	0.74	.018	.029

800

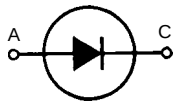
IXYS

Fast Recovery Epitaxial Diode (FRED)

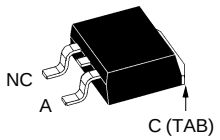
DSEI 36

V_{RRM} = 600 V
I_{FAVM} = 37 A
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEI 36-06AS



TO-263 AA



A = Anode, C = Cathode,
NC = No connection, TAB = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		70	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		37	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	300	A
		t = 8.3 ms (60 Hz), sine	320	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	260	A
		t = 8.3 ms (60 Hz), sine	280	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	450	A^2s
		t = 8.3 ms (60 Hz), sine	420	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	340	A^2s
		t = 8.3 ms (60 Hz), sine	320	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		125	W
Weight			2	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		100	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		50	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 37 A;	T_{VJ} = 150°C		1.4	V
		T_{VJ} = 25°C		1.6	V
V_{T0}	For power-loss calculations only			1.01	V
r_T	$T_{VJ} = T_{VJM}$			7.1	mΩ
R_{thJC}				1.0	K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 350 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		10	11	A

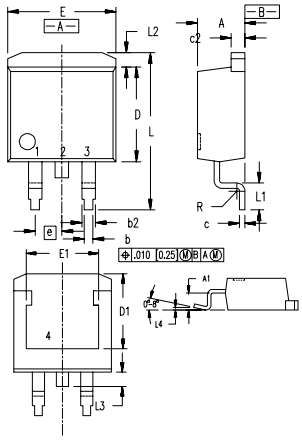
Characteristic curves are located in the data sheet DSEI 30-06A.

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features

- International standard surface mount package JEDEC TO-263 AA
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

TO-263 AA Outline



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	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.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	0.38	0	.015
R	0.46	0.74	.018	.029

800

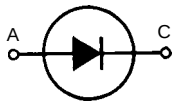
IXYS

Fast Recovery Epitaxial Diode (FRED)

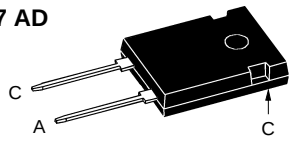
DSEI 30

I_{FAVM} = 37 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
640	600	DSEI 30-06A



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		70	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		37	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	300	A
		t = 8.3 ms (60 Hz), sine	320	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	260	A
		t = 8.3 ms (60 Hz), sine	280	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	450	A^2s
		t = 8.3 ms (60 Hz), sine	420	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	340	A^2s
		t = 8.3 ms (60 Hz), sine	320	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		125	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		100	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		50	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 37 A;	T_{VJ} = 150°C		1.4	V
		T_{VJ} = 25°C		1.6	V
V_{T0}	For power-loss calculations only			1.01	V
r_T	$T_{VJ} = T_{VJM}$			7.1	mΩ
R_{thJC}				1	K/W
R_{thCK}			0.25		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 350 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		10	11	A

Features

- International standard package JEDEC TO-247 AD
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

609

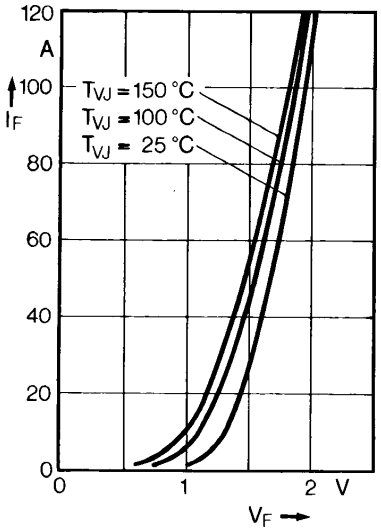


Fig. 1 Forward current versus voltage drop.

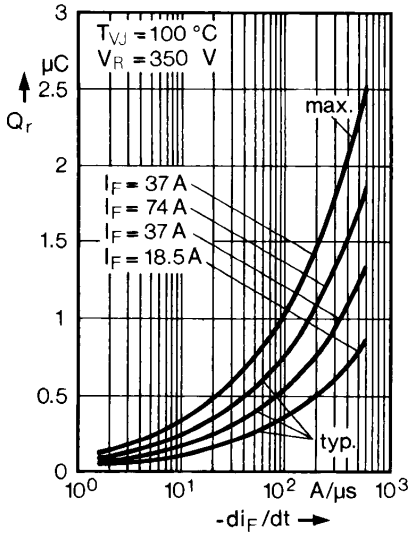


Fig. 2 Recovery charge versus $-di_F/dt$.

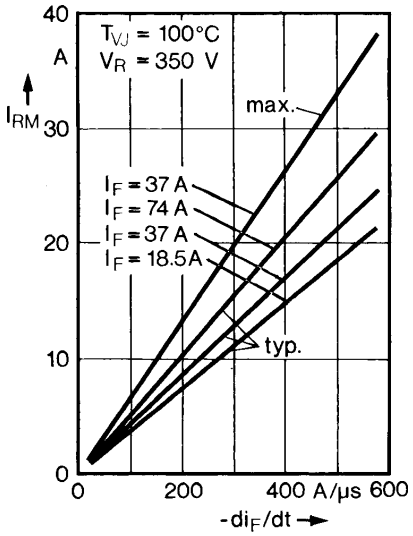


Fig. 3 Peak reverse current versus $-di_F/dt$.

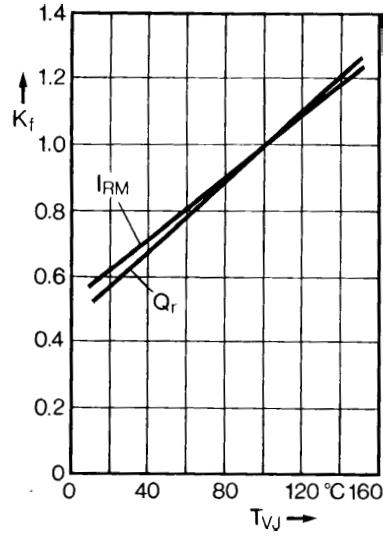


Fig. 4 Dynamic parameters versus junction temperature.

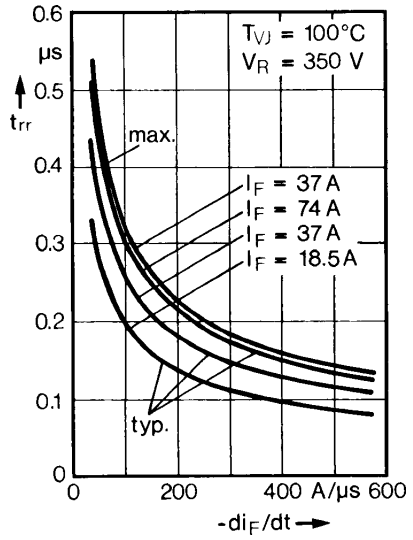


Fig. 5 Recovery time versus $-di_F/dt$.

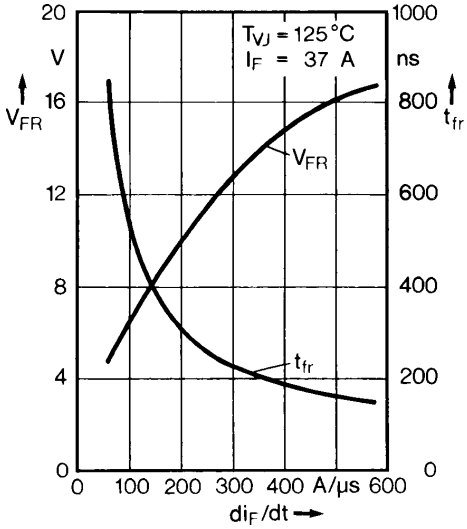


Fig. 6 Peak forward voltage versus di_F/dt.

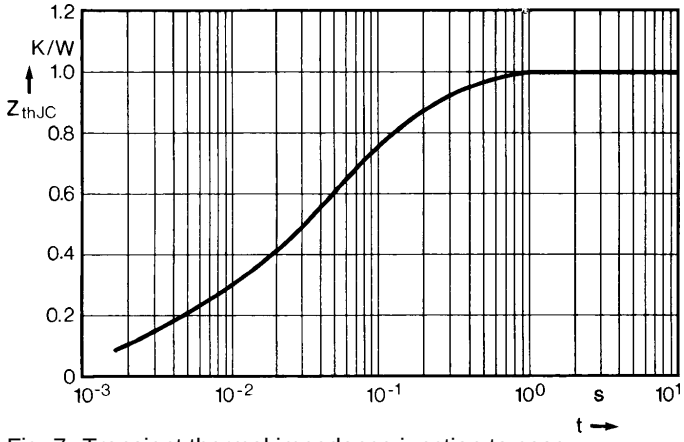
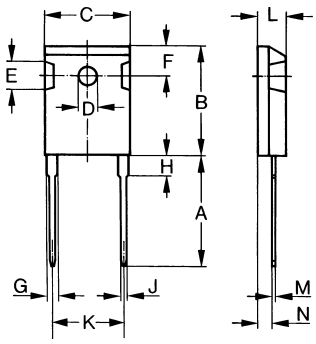


Fig. 7 Transient thermal impedance junction to case.

Dimensions



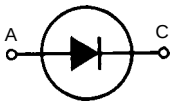
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	2.2	2.54	0.087	0.102

Fast Recovery Epitaxial Diode (FRED)

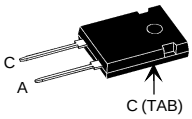
DSEI 30

I_{FAVM} = 30 A
V_{RRM} = 1000 V
t_{rr} = 35 ns

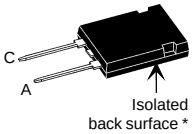
V_{RSM} V	V_{RRM} V	Type
1000	1000	DSEI 30-10A
1000	1000	DSEI 30-10AR



TO-247 AD
Version A



ISOPLUS 247™
Version AR



A = Anode, C = Cathode

* Patent pending

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		70	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		30	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	200	A
		t = 8.3 ms (60 Hz), sine	210	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	185	A
		t = 8.3 ms (60 Hz), sine	195	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	200	A^2s
		t = 8.3 ms (60 Hz), sine	180	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	170	A^2s
		t = 8.3 ms (60 Hz), sine	160	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		138	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			6	g

* Verson A only; ** Version AR only

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		750	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		250	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 36 A;	T_{VJ} = 150°C		2	V
		T_{VJ} = 25°C		2.4	V
V_{T0}	For power-loss calculations only			1.5	V
r_T	$T_{VJ} = T_{VJM}$			12.5	mΩ
R_{thJC}				0.9	K/W
R_{thCK}			0.25		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 540 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		16	18	A

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behavior
- Epoxy meets UL 94V-0
- Version AR isolated and UL registered E153432

Applications

- Antiparallel diode for high frequency switching devices
- 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

026

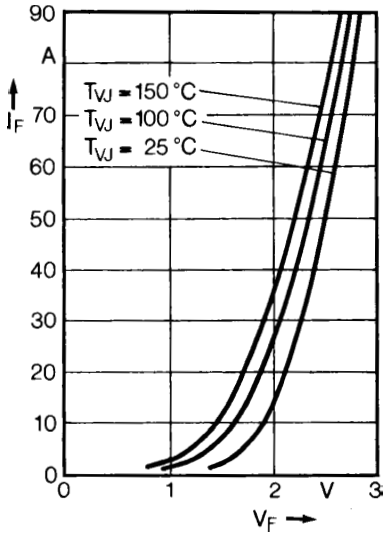


Fig. 1 Forward current versus voltage drop.

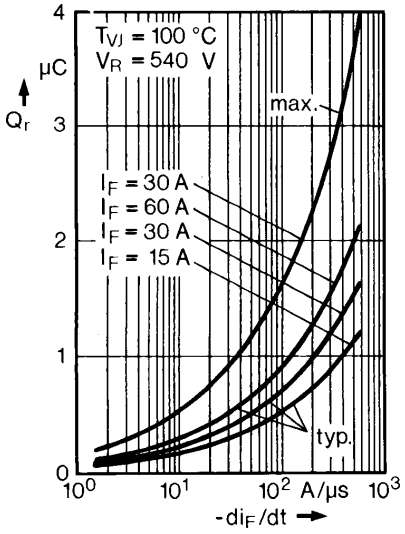


Fig. 2 Recovery charge versus $-di_F/dt$.

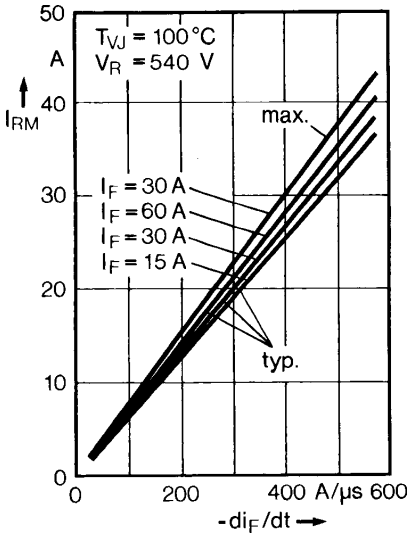


Fig. 3 Peak reverse current versus $-di_F/dt$.

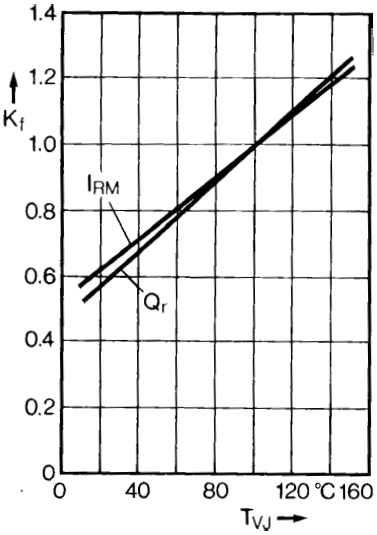


Fig. 4 Dynamic parameters versus junction temperature.

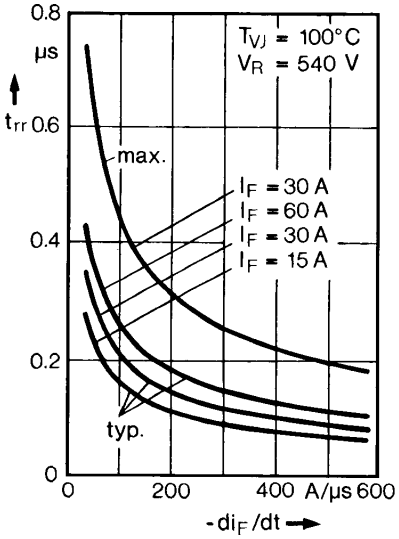


Fig. 5 Recovery time versus $-di_F/dt$.

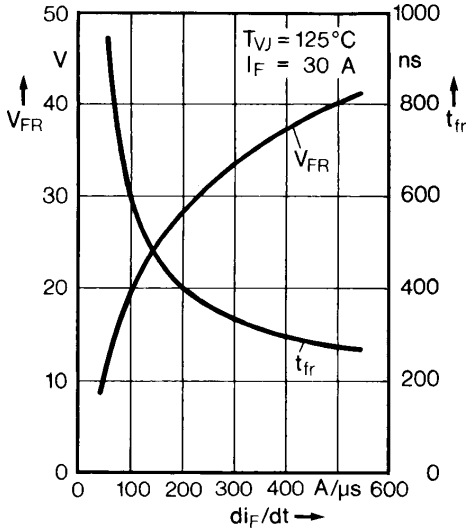


Fig. 6 Peak forward voltage versus di_F/dt.

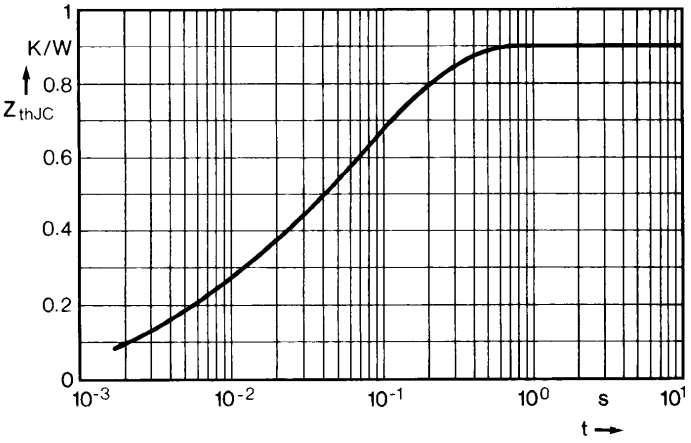
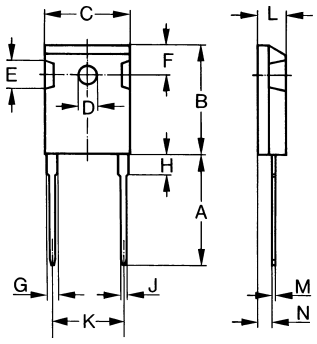


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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	2.2	2.54	0.087	0.102

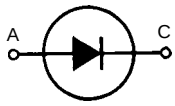
IXYS

Fast Recovery Epitaxial Diode (FRED)

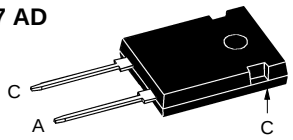
DSEI 30

I_{FAVM} = 26 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

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



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		70	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		26	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	200	A
		t = 8.3 ms (60 Hz), sine	210	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	185	A
		t = 8.3 ms (60 Hz), sine	195	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	200	A^2s
		t = 8.3 ms (60 Hz), sine	180	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	170	A^2s
		t = 8.3 ms (60 Hz), sine	160	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		138	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		750	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		250	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 30 A;	T_{VJ} = 150°C		2.2	V
		T_{VJ} = 25°C		2.55	V
V_{T0}	For power-loss calculations only			1.65	V
r_T	$T_{VJ} = T_{VJM}$			18.2	mΩ
R_{thJC}				0.9	K/W
R_{thCK}			0.1		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		40	60	ns
I_{RM}	V_R = 540 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		16	18	A

Features

- International standard package JEDEC TO-247 AD
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

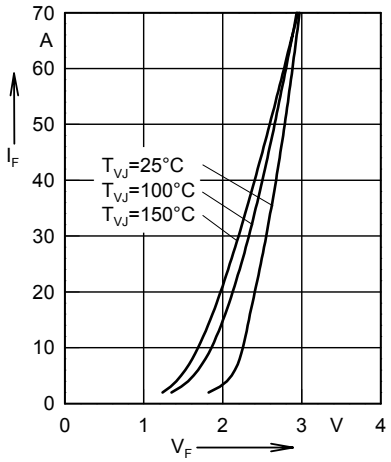


Fig. 1 Forward current versus voltage drop.

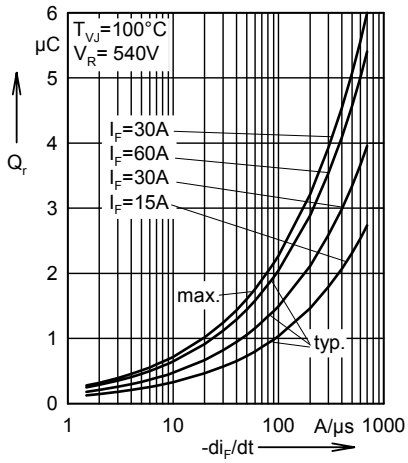


Fig. 2 Recovery charge versus $-di_F/dt$.

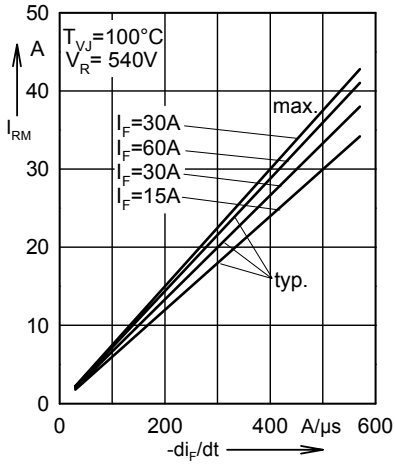


Fig. 3 Peak reverse current versus $-di_F/dt$.

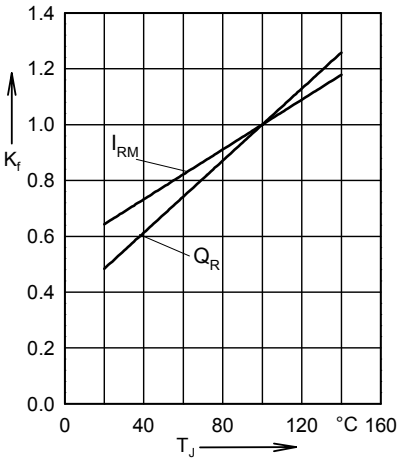


Fig. 4 Dynamic parameters versus junction temperature.

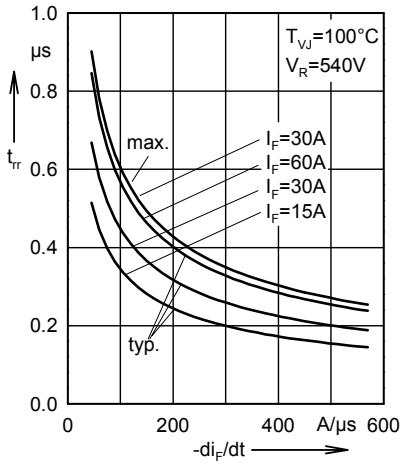


Fig. 5 Recovery time versus $-di_F/dt$.

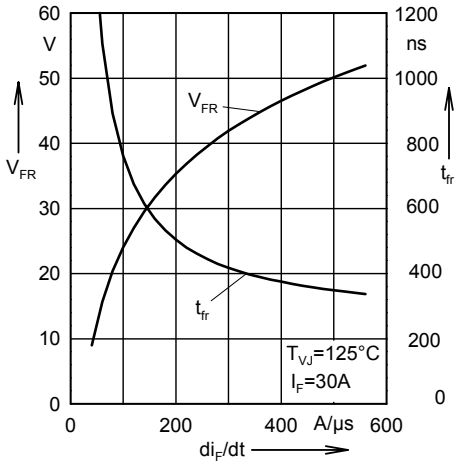


Fig. 6 Peak forward voltage versus di_F/dt.

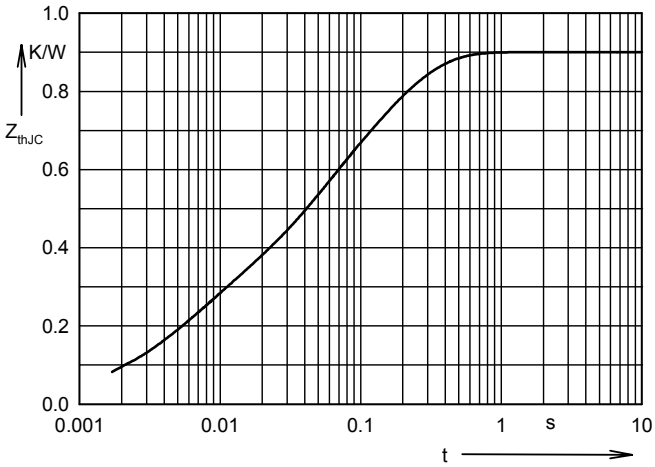
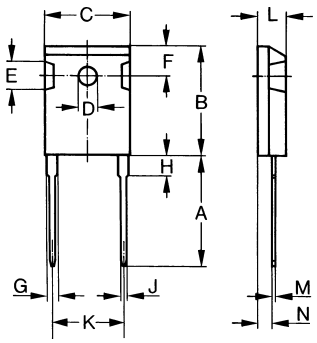


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter Min.	Max.	Inches Min.	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	2.2	2.54	0.087	0.102

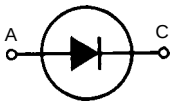
IXYS

Fast Recovery Epitaxial Diode (FRED)

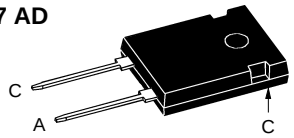
DSEI 60

I_{FAVM} = 69 A
V_{RRM} = 200 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
200	200	DSEI 60-02A



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		98	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		69	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		800	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	600	A
		t = 8.3 ms (60 Hz), sine	650	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	540	A
		t = 8.3 ms (60 Hz), sine	580	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1800	A^2s
		t = 8.3 ms (60 Hz), sine	1770	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1460	A^2s
		t = 8.3 ms (60 Hz), sine	1410	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		150	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		50	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		40	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		11	mA
V_F	I_F = 60 A;	T_{VJ} = 150°C		0.88	V
		T_{VJ} = 25°C		1.08	V
V_{T0}	For power-loss calculations only			0.70	V
r_T	$T_{VJ} = T_{VJM}$			4.0	mΩ
R_{thJC}				0.75	K/W
R_{thCK}			0.2		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 100 V; I_F = 60 A; $-di_F/dt$ = 200 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		8	10	A

Features

- International standard package JEDEC TO-247 AD
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

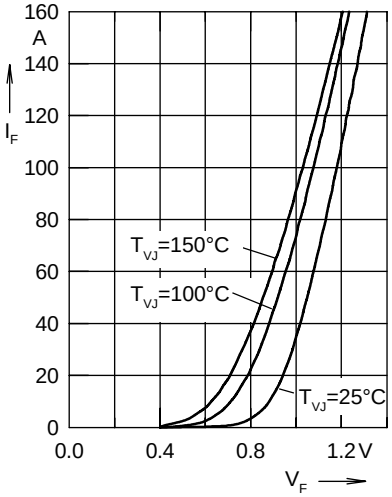


Fig. 1 Forward current I_F versus V_F

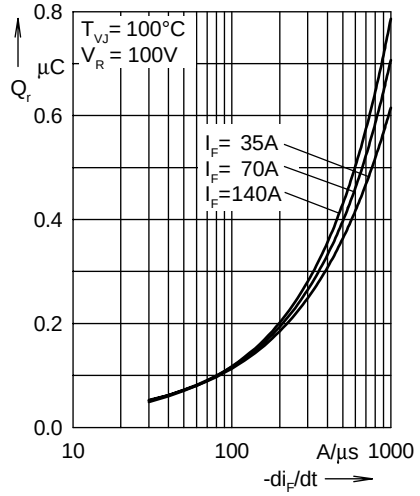


Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

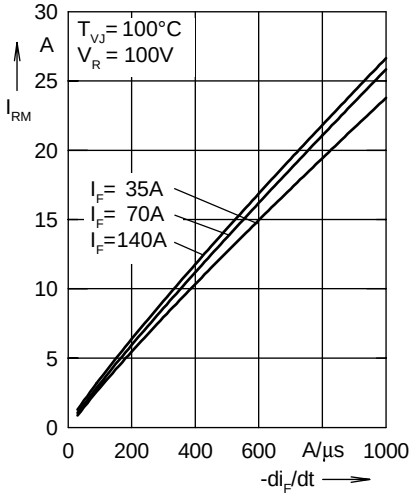


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

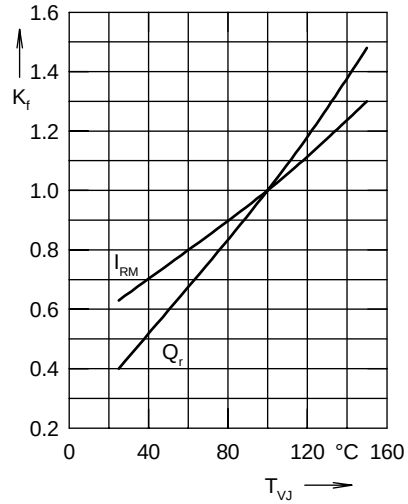


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

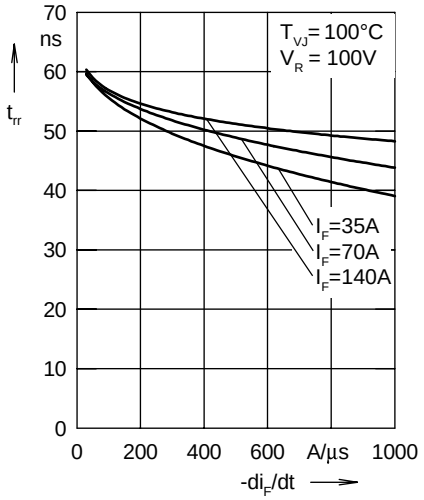


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

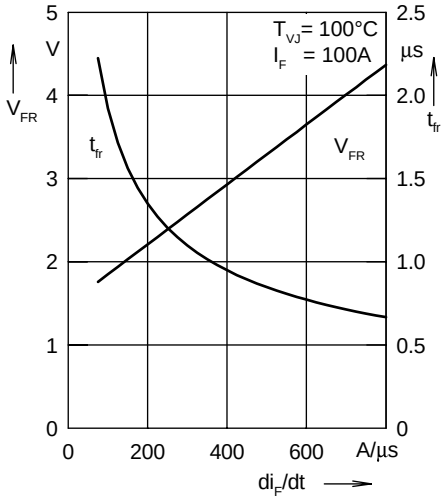


Fig. 6 Typ peak forward voltage V_{FR} and t_{fr} versus di_F/dt

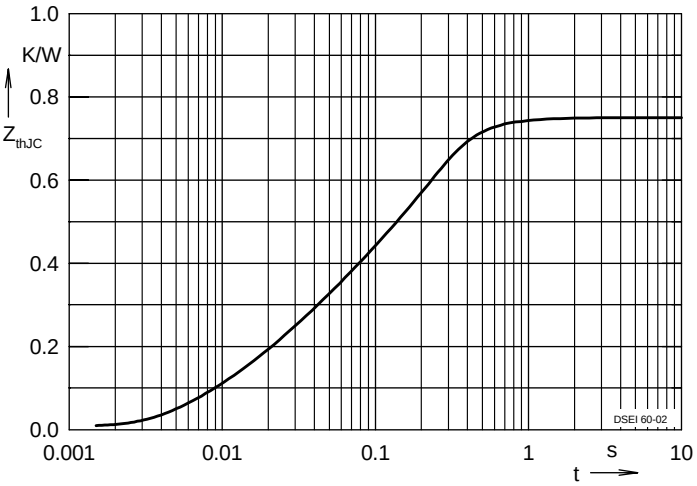
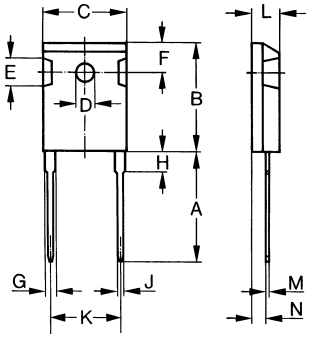


Fig. 7 Transient thermal impedance junction to case

Dimensions



Dim.	Millimeter Min.	Max.	Inches Min.	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	2.2	2.54	0.087	0.102

839

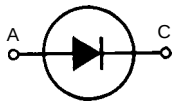
IXYS

Fast Recovery Epitaxial Diode (FRED)

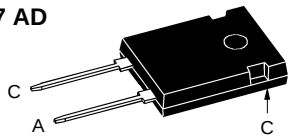
DSEI 60

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

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



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 70°C; rectangular, d = 0.5		60	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		800	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	550	A
		t = 8.3 ms (60 Hz), sine	600	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	480	A
		t = 8.3 ms (60 Hz), sine	520	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1510	A^2s
		t = 8.3 ms (60 Hz), sine	1490	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1150	A^2s
		t = 8.3 ms (60 Hz), sine	1120	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		166	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		200	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		100	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		14	mA
V_F	I_F = 70 A;	T_{VJ} = 150°C		1.5	V
		T_{VJ} = 25°C		1.8	V
V_{T0}	For power-loss calculations only			1.13	V
r_T	$T_{VJ} = T_{VJM}$			4.7	mΩ
R_{thJC}				0.75	K/W
R_{thCK}			0.2		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 350 V; I_F = 60 A; $-di_F/dt$ = 480 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		19	21	A

Features

- International standard package JEDEC TO-247 AD
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

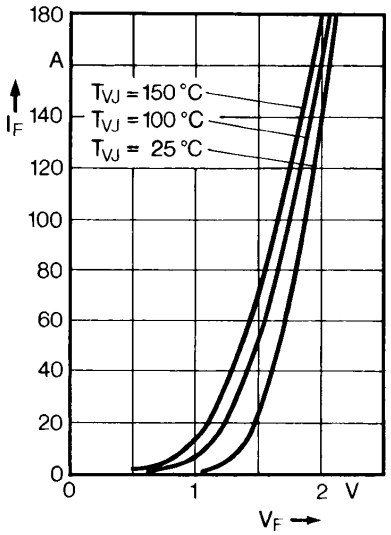


Fig. 1 Forward current versus voltage drop.

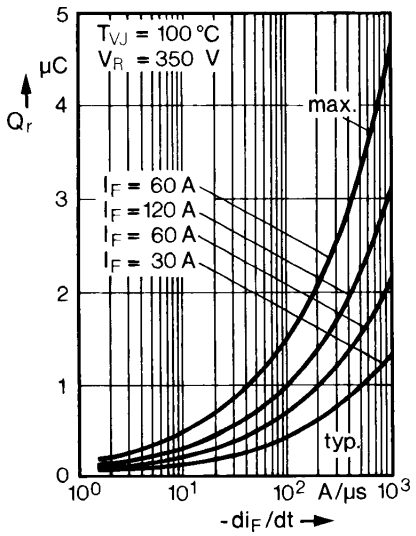


Fig. 2 Recovery charge versus $-di_F/dt$.

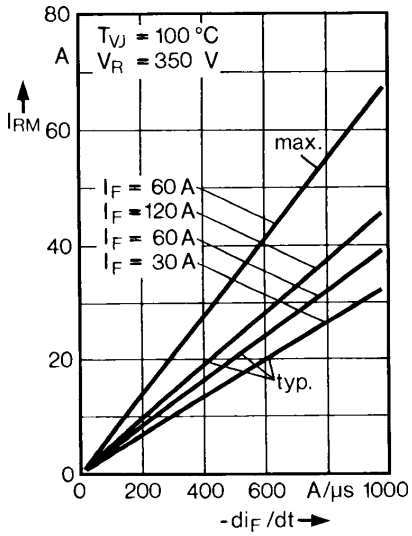


Fig. 3 Peak reverse current versus $-di_F/dt$.

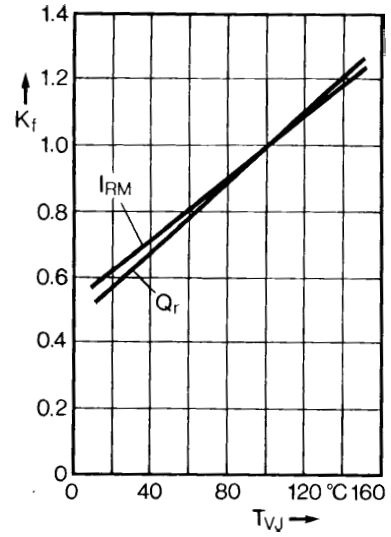


Fig. 4 Dynamic parameters versus junction temperature.

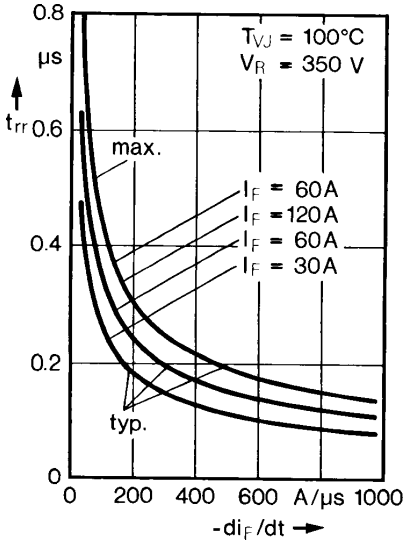


Fig. 5 Recovery time versus $-di_F/dt$.

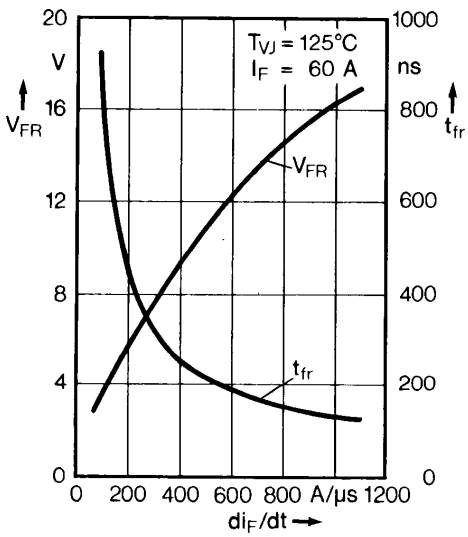


Fig. 6 Peak forward voltage versus di_F/dt.

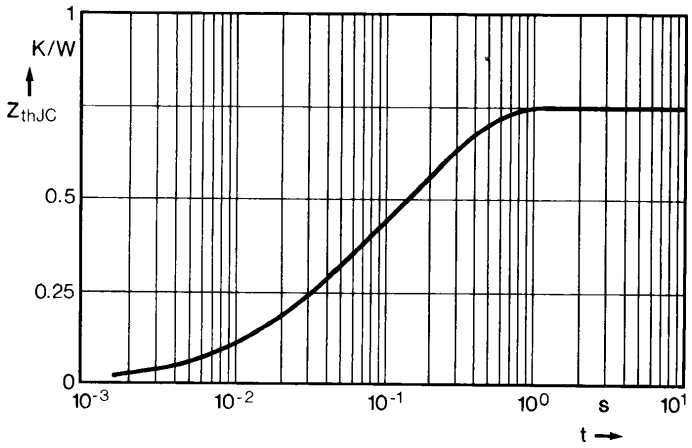
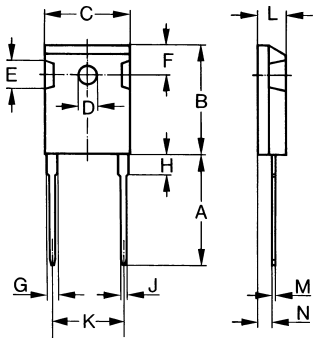


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter Min.	Max.	Inches Min.	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	2.2	2.54	0.087	0.102

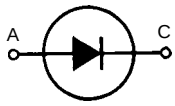
IXYS

Fast Recovery Epitaxial Diode (FRED)

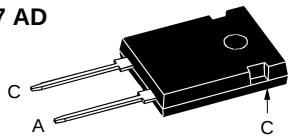
DSEI 60

I_{FAVM} = 60 A
V_{RRM} = 1000 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
1000	1000	DSEI 60-10A



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 60°C; rectangular, d = 0.5		60	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		800	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	500	A
		t = 8.3 ms (60 Hz), sine	540	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	450	A
		t = 8.3 ms (60 Hz), sine	480	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1250	A^2s
		t = 8.3 ms (60 Hz), sine	1200	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1000	A^2s
		t = 8.3 ms (60 Hz), sine	950	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		189	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		3	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		0.5	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		14	mA
V_F	I_F = 60 A;	T_{VJ} = 150°C		1.8	V
		T_{VJ} = 25°C		2.3	V
V_{T0}	For power-loss calculations only			1.43	V
r_T	$T_{VJ} = T_{VJM}$			6.1	mΩ
R_{thJC}				0.66	K/W
R_{thCK}			0.2		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 540 V; I_F = 60 A; $-di_F/dt$ = 480 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		32	36	A

Features

- International standard package JEDEC TO-247 AD
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

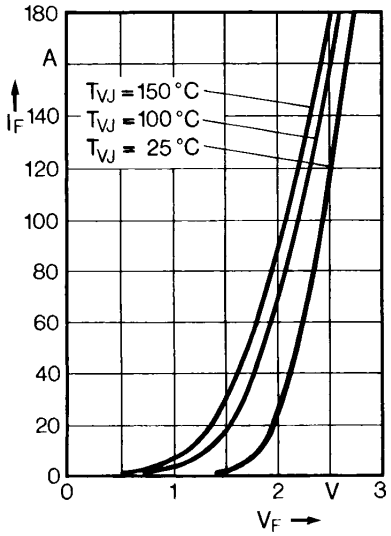


Fig. 1 Forward current versus voltage drop.

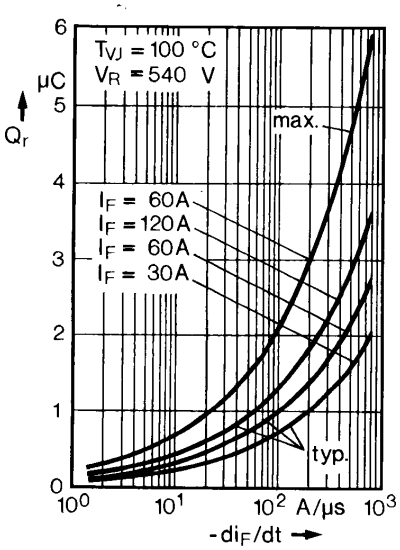


Fig. 2 Recovery charge versus $-di_F/dt$.

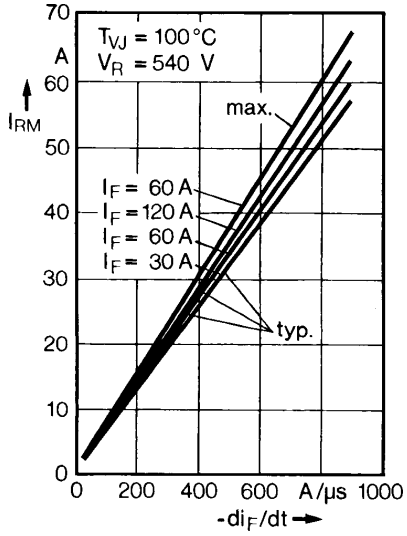


Fig. 3 Peak reverse current versus $-di_F/dt$.

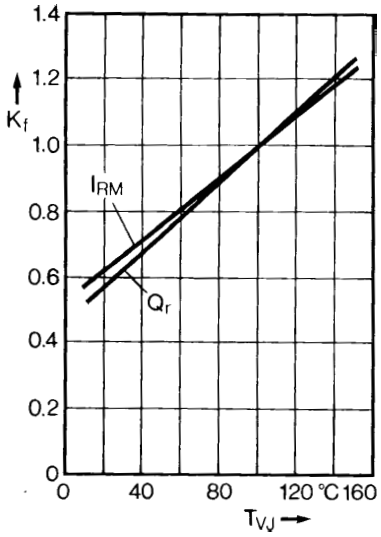


Fig. 4 Dynamic parameters versus junction temperature.

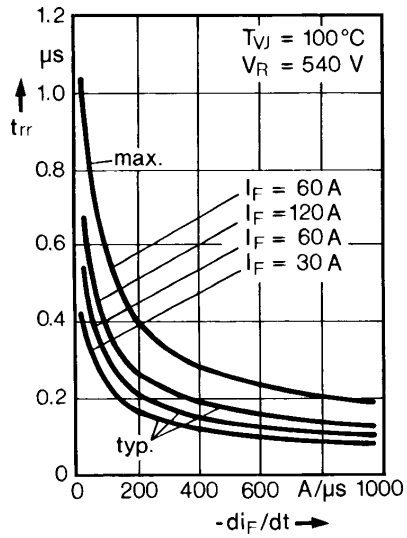


Fig. 5 Recovery time versus $-di_F/dt$.

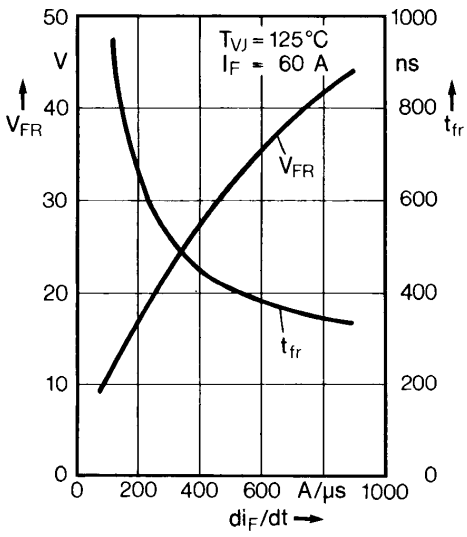


Fig. 6 Peak forward voltage versus di_F/dt.

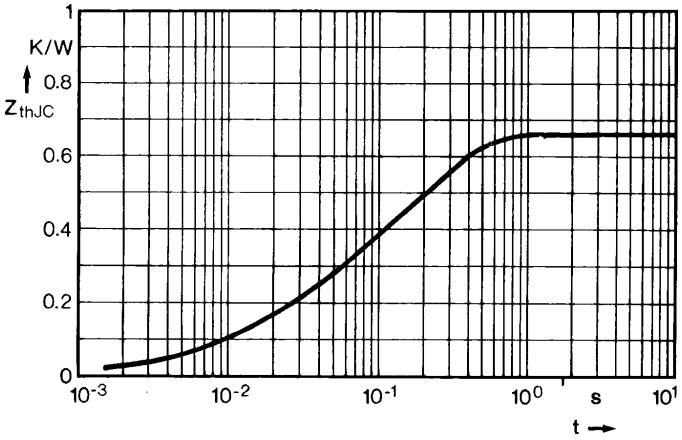
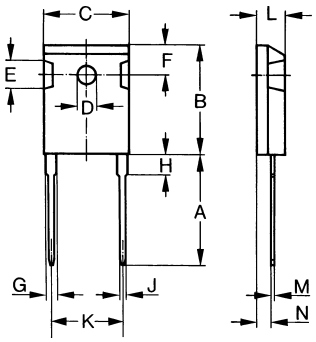


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	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	2.2	2.54	0.087	0.102

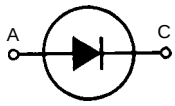
IXYS

Fast Recovery Epitaxial Diode (FRED)

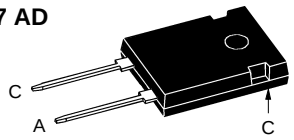
DSEI 60

I_{FAVM} = 52 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

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



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 60°C; rectangular, d = 0.5		52	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		800	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	500	A
		t = 8.3 ms (60 Hz), sine	540	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	450	A
		t = 8.3 ms (60 Hz), sine	480	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1250	A^2s
		t = 8.3 ms (60 Hz), sine	1200	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1000	A^2s
		t = 8.3 ms (60 Hz), sine	950	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		189	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		2.2	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		0.5	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		14	mA
V_F	I_F = 60 A;	T_{VJ} = 150°C		2.0	V
		T_{VJ} = 25°C		2.55	V
V_{T0}	For power-loss calculations only			1.65	V
r_T	$T_{VJ} = T_{VJM}$			8.3	mΩ
R_{thJC}				0.66	K/W
R_{thCK}			0.1		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		40	60	ns
I_{RM}	V_R = 540 V; I_F = 60 A; $-di_F/dt$ = 480 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		32	36	A

Features

- International standard package JEDEC TO-247 AD
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

609

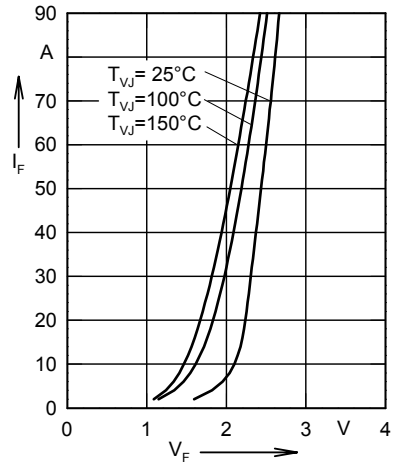


Fig. 1 Forward current versus voltage drop.

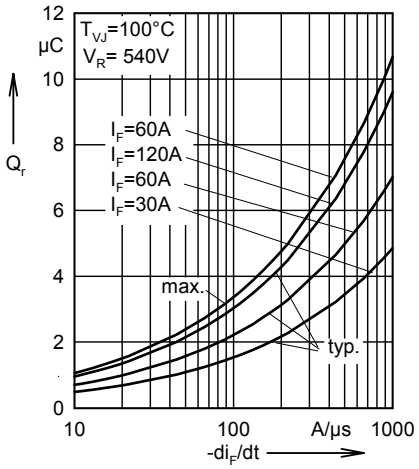


Fig. 2 Recovery charge versus $-di_F/dt$.

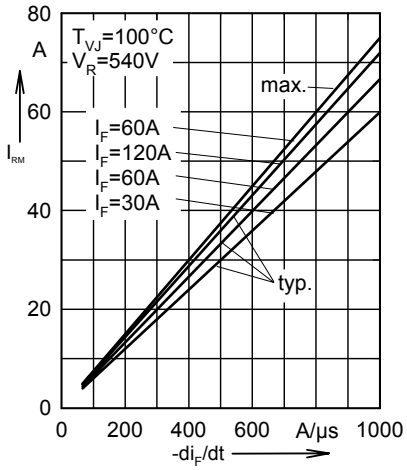


Fig. 3 Peak reverse current versus $-di_F/dt$.

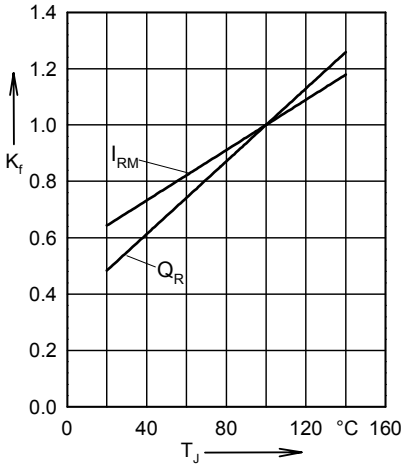


Fig. 4 Dynamic parameters versus junction temperature.

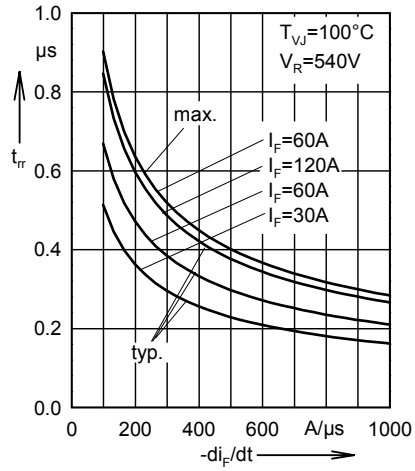


Fig. 5 Recovery time versus $-di_F/dt$.

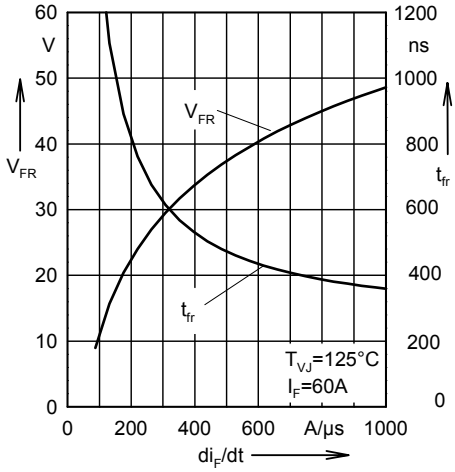


Fig. 6 Peak forward voltage versus di_F/dt.

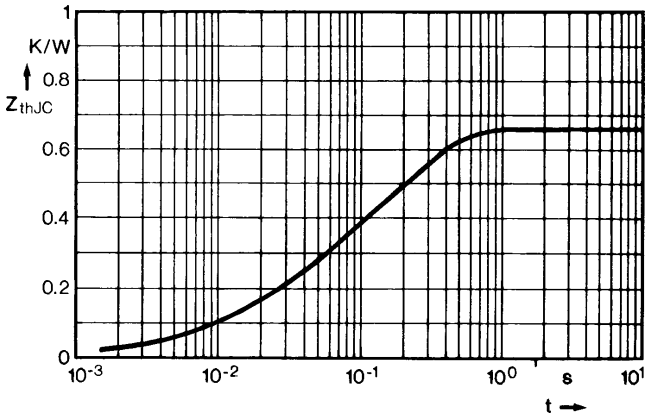
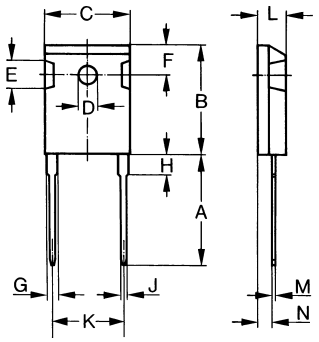


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter Min.	Max.	Inches Min.	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	2.2	2.54	0.087	0.102

IXYS

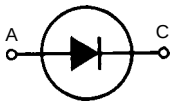
Super Fast Recovery Diode

DSDI 60

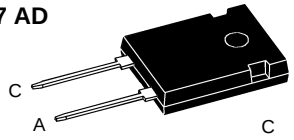
I_{FAVM} = 63 A
V_{RRM} = 1400-1800 V
t_{rr} = 40 ns

Preliminary Data

V_{RSM} V	V_{RRM} V	Type
1400	1400	DSDI 60-14A
1600	1600	DSDI 60-16A
1800	1800	DSDI 60-18A



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 60°C; rectangular, d = 0.5		63	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		800	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	500	A
		t = 8.3 ms (60 Hz), sine	540	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	450	A
		t = 8.3 ms (60 Hz), sine	480	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1250	A^2s
		t = 8.3 ms (60 Hz), sine	1200	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1000	A^2s
		t = 8.3 ms (60 Hz), sine	950	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		416	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$	1	2	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$	0.5		mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$	3		mA
V_F	I_F = 70 A;	T_{VJ} = 125°C	2.6		V
		T_{VJ} = 25°C		4.1	V
V_{T0}	For power-loss calculations only			1.9	V
r_T	$T_{VJ} = T_{VJM}$			10	mΩ
R_{thJC}				0.4	K/W
R_{thCK}			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
t_{rr}	I_F = 70 A; -di/dt = 500 A/µs; V_R = 1000 V;		300		ns
I_{RM}	T_{VJ} = 25°C		60		A
t_{rr}	I_F = 70 A; -di/dt = 500 A/µs; V_R = 1000 V;		400		ns
I_{RM}	T_{VJ} = 125°C		85		A

Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meets UL 94V-0
- Creepage distance between leads 8.5 mm

Applications

- Antiparallel diode for high frequency switching devices
- 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 DSEI 60-12 on page D5 - 27

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

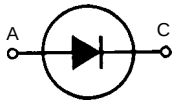
028

Fast Recovery Epitaxial Diode (FRED)

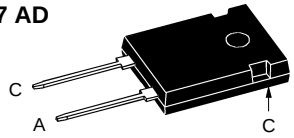
DSEI 120

I_{FAVM} = 126 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEI 120-06A



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 70°C; rectangular, d = 0.5		126	A
I_{FAV} ②	T_C = 110°C; rectangular, d = 0.5		77	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		tbd	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	600	A
		t = 8.3 ms (60 Hz), sine	660	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	540	A
		t = 8.3 ms (60 Hz), sine	600	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1800	A^2s
		t = 8.3 ms (60 Hz), sine	1800	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1450	A^2s
		t = 8.3 ms (60 Hz), sine	1500	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		357	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		3	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		0.75	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		20	mA
V_F	I_F = 70 A;	T_{VJ} = 150°C		1.12	V
		T_{VJ} = 25°C		1.3	V
V_{T0}	For power-loss calculations only			0.85	V
r_T	$T_{VJ} = T_{VJM}$			3.5	mΩ
R_{thJC}				0.35	K/W
R_{thCK}			0.25		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 350 V; I_F = 80 A; $-di_F/dt$ = 200 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		17	21	A

① Chip capability, ② limited to 70 A by leads

Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

028

Features

- International standard package JEDEC TO-247 AD
- 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
- 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 DSEI 60-12 page D5 - 27

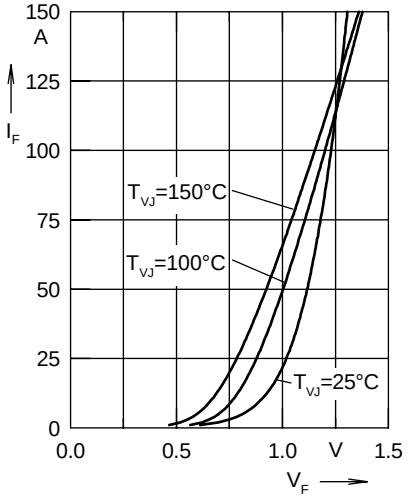


Fig. 1 Forward current I_F versus V_F

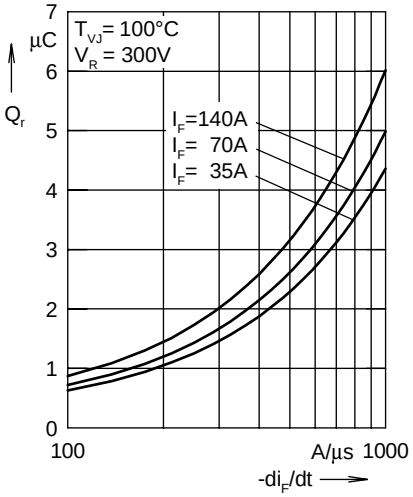


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

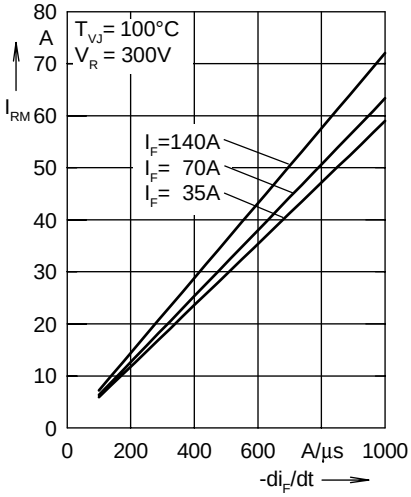


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

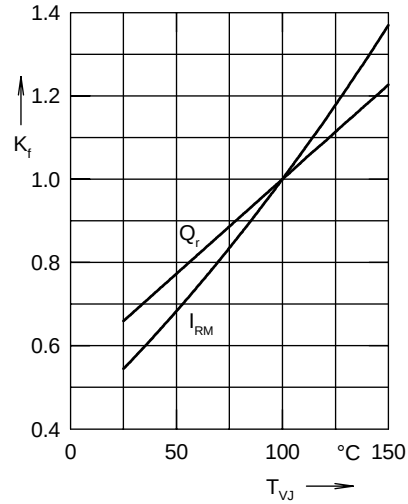


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

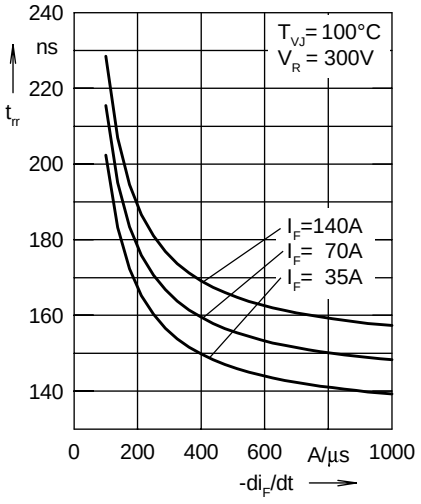


Fig. 5 Recovery time t_{rr} versus -di_F/dt

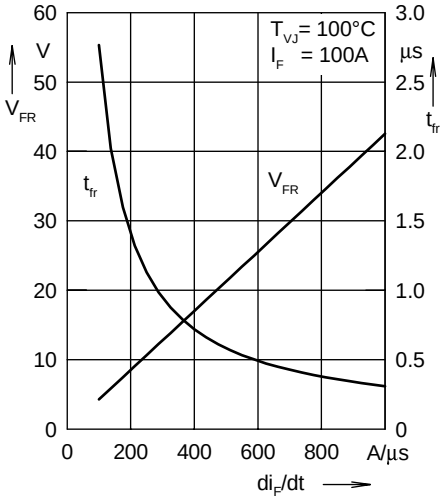


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

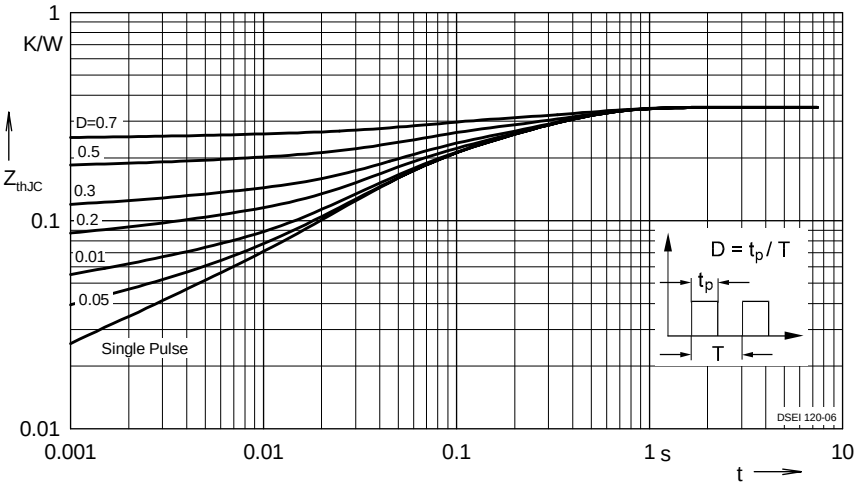


Fig. 7 Transient thermal resistance junction to case at various duty cycles

Constants for Z_{thJC} calculation:

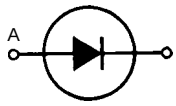
i	R_{thi} (K/W)	t_i (s)
1	0.017	0.00038
2	0.0184	0.0026
3	0.1296	0.0387
4	0.185	0.274

Fast Recovery Epitaxial Diode (FRED)

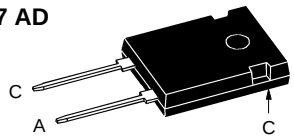
DSEI 120

I_{FAVM} = 109 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEI 120-12A



TO-247 AD



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 60°C; rectangular, d = 0.5		109	A
I_{FAV} ②	T_C = 95°C; rectangular, d = 0.5		75	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		tbd	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	600	A
		t = 8.3 ms (60 Hz), sine	660	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	540	A
		t = 8.3 ms (60 Hz), sine	600	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1800	A^2s
		t = 8.3 ms (60 Hz), sine	1800	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1450	A^2s
		t = 8.3 ms (60 Hz), sine	1500	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		357	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		3	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		1.5	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		20	mA
V_F	I_F = 70 A;	T_{VJ} = 150°C		1.55	V
		T_{VJ} = 25°C		1.8	V
V_{T0}	For power-loss calculations only			1.2	V
r_T	$T_{VJ} = T_{VJM}$			4.6	mΩ
R_{thJC}				0.35	K/W
R_{thCK}			0.25		K/W
R_{thJA}				35	K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		40	60	ns
I_{RM}	V_R = 350 V; I_F = 75 A; $-di_F/dt$ = 200 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		25	30	A

① Chip capability, ② limited to 70 A by leads

Features

- International standard package JEDEC TO-247 AD
- 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
- 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 DSEI 60-12 on page D5 - 27

Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

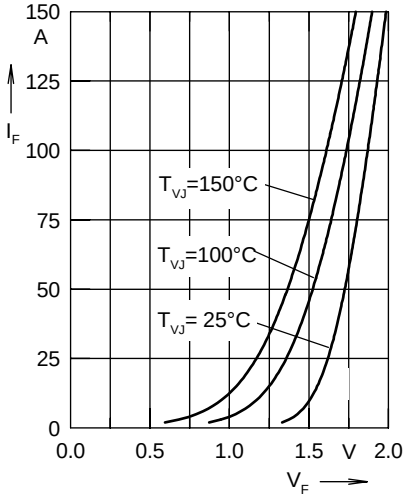


Fig. 1 Forward current I_F versus V_F

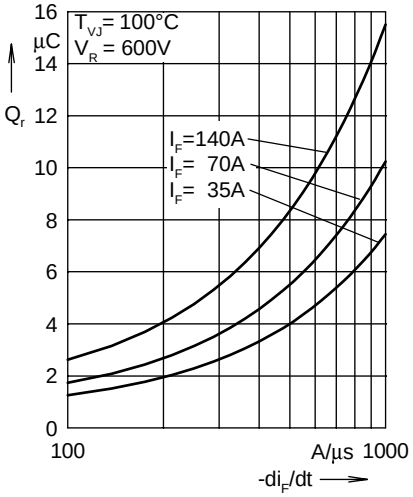


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

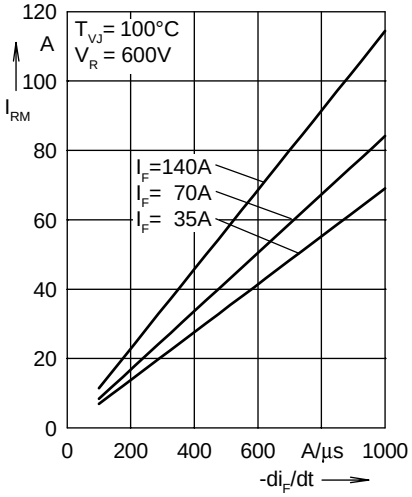


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

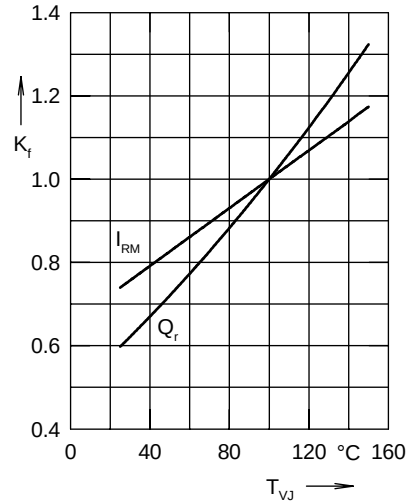


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

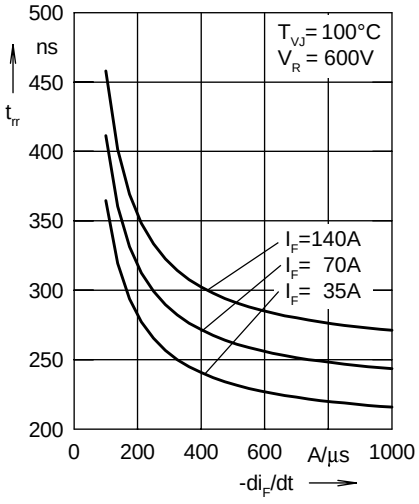


Fig. 5 Recovery time t_{rr} versus -di_F/dt

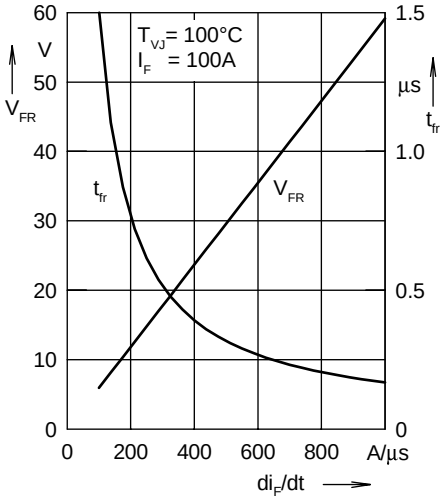


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

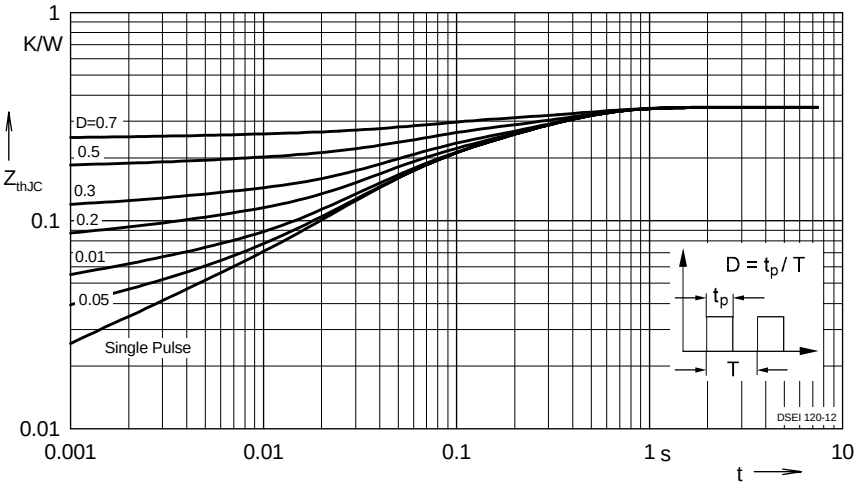


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.017	0.00038
2	0.0184	0.0026
3	0.1296	0.0387
4	0.185	0.274

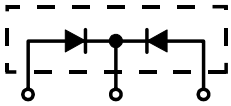
IXYS

Common Cathode Fast Recovery Epitaxial Diode (FRED)

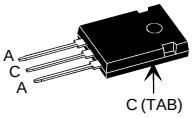
DSEK 60

I_{FAVM} = 2x 34 A
V_{RRM} = 200 V
t_{rr} = 35 ns

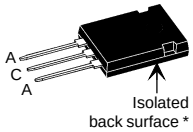
V_{RSM} V	V_{RRM} V	Type
200	200	DSEK 60-02A
200	200	DSEK 60-02AR



TO-247 AD
Version A



ISOPLUS 247™
Version AR



A = Anode, C = Cathode

* Patent pending

Symbol	Test Conditions	Maximum Ratings per leg	
I_{FRMS}	$T_{VJ} = T_{VJM}$	50	A
I_{FAVM} ①	T_C = 115°C; rectangular, d = 0.5	34	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	375	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	325	A
	t = 8.3 ms (60 Hz), sine	350	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	290	A
	t = 8.3 ms (60 Hz), sine	310	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	530	A^2s
	t = 8.3 ms (60 Hz), sine	510	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	420	A^2s
	t = 8.3 ms (60 Hz), sine	400	A^2s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	125	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		6	g

* Verson A only; ** Version AR only

Symbol	Test Conditions	Characteristic Values per leg typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		200	µA
	T_{VJ} = 25°C $V_R = 0.8 \cdot V_{RRM}$		50	µA
	T_{VJ} = 125°C $V_R = 0.8 \cdot V_{RRM}$		5	mA
V_F	I_F = 30 A; T_{VJ} = 150°C		0.85	V
	T_{VJ} = 25°C		1.10	V
V_{T0}	For power-loss calculations only		0.72	V
r_T	$T_{VJ} = T_{VJM}$		4.2	mΩ
R_{thJC}			1	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	50	ns
I_{RM}	V_R = 100 V; I_F = 30 A; $-di_F/dt$ = 100 A/µs; L ≤ 0.05 µH; T_{VJ} = 25°C	4	5	A

Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behavior
- Epoxy meets UL 94V-0
- Version AR isolated and UL registered E153432

Applications

- Rectifiers in switch mode power supplies (SMPS)
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747 refer to a single diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

026

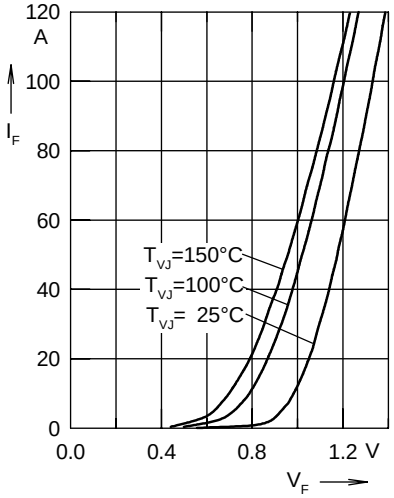


Fig. 1 Forward current I_F versus V_F

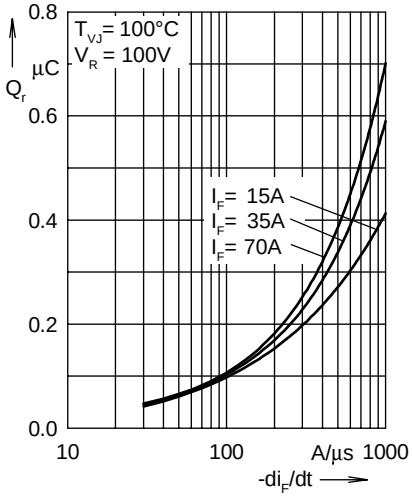


Fig. 2 Typ. reverse recovery charge Q_r versus -di_F/dt

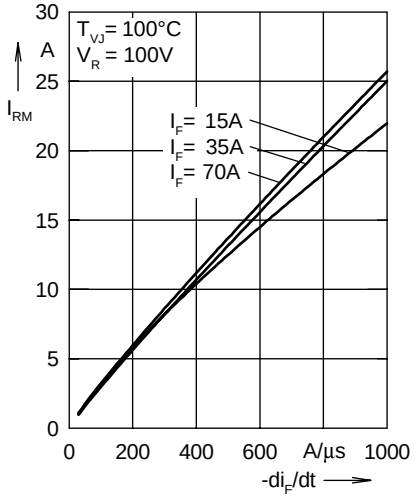


Fig. 3 Typ. peak reverse current I_{RM} versus -di_F/dt

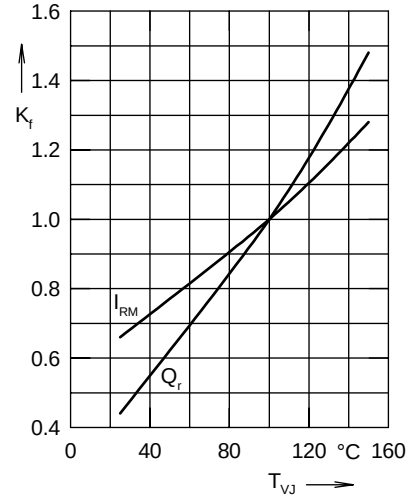


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

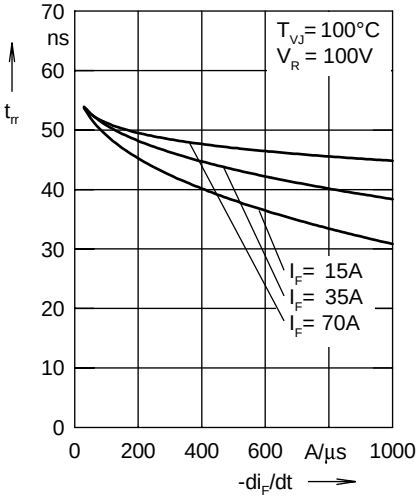


Fig. 5 Typ. recovery time t_{rr} versus -di_F/dt

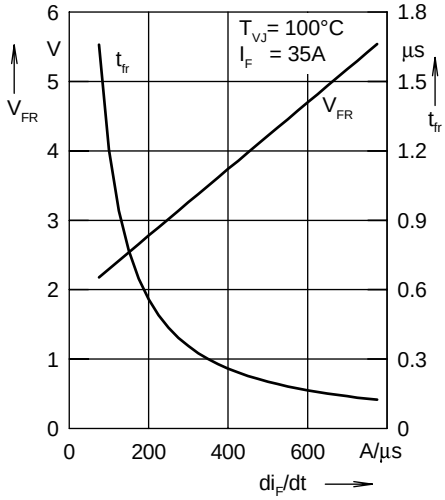


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

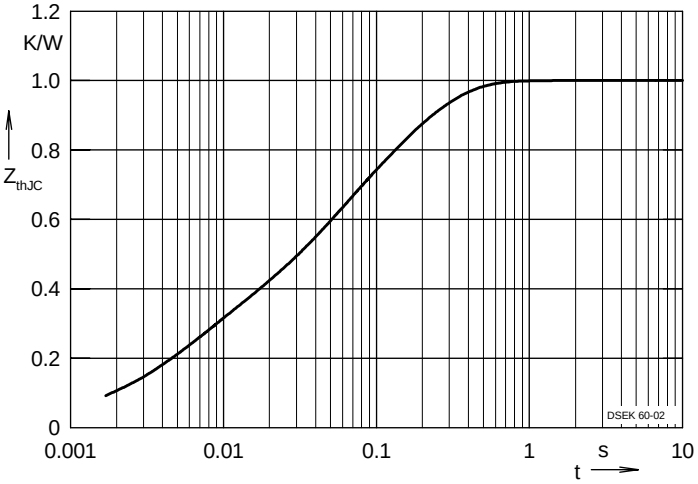
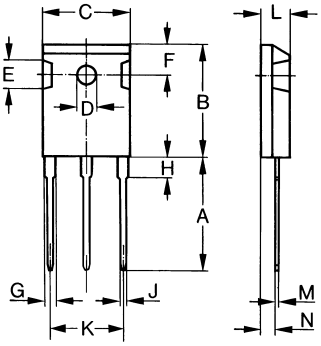


Fig. 7 Transient thermal impedance junction to case

Dimensions



Dim.	Millimeter Min.	Max.	Inches Min.	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	2.2	2.54	0.087	0.102

* ISOPLUS 247™ without hole

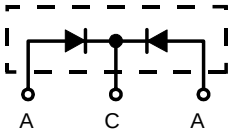
IXYS

Common Cathode Fast Recovery Epitaxial Diode (FRED)

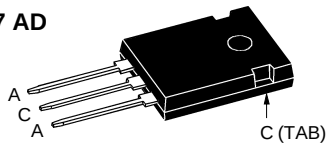
DSEK 60

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

V_{RSM} V	V_{RRM} V	Type
640	600	DSEK 60-06A



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		50	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		30	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	300	A
		t = 8.3 ms (60 Hz), sine	320	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	260	A
		t = 8.3 ms (60 Hz), sine	280	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	450	A^2s
		t = 8.3 ms (60 Hz), sine	420	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	340	A^2s
		t = 8.3 ms (60 Hz), sine	320	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		125	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		100	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		50	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 37 A;	T_{VJ} = 150°C		1.4	V
		T_{VJ} = 25°C		1.6	V
V_{T0}	For power-loss calculations only			1.01	V
r_T	$T_{VJ} = T_{VJM}$			7.1	mΩ
R_{thJC}				1	K/W
R_{thCK}			0.5		K/W
R_{thJA}				70	K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 350 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		10	11	A

Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behavior
- Epoxy meets UL 94V-0

Applications

- Rectifiers in switch mode power supplies (SMPS)
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747 and refer to a single diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

600

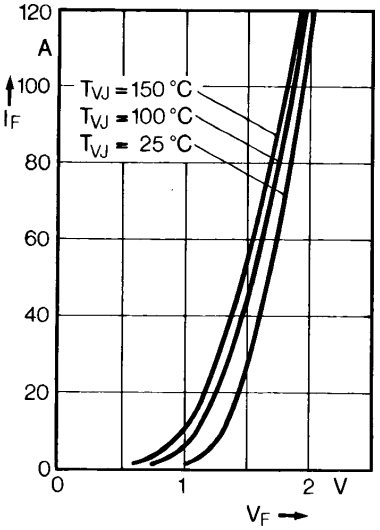


Fig. 1 Forward current versus voltage drop.

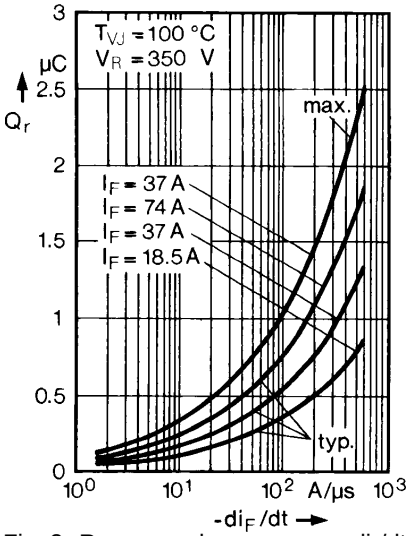


Fig. 2 Recovery charge versus $-di_F/dt$.

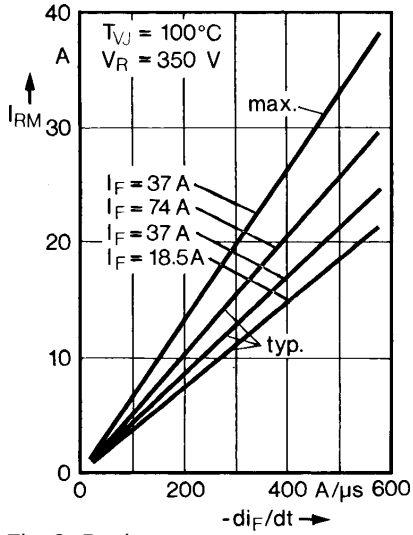


Fig. 3 Peak reverse current versus $-di_F/dt$.

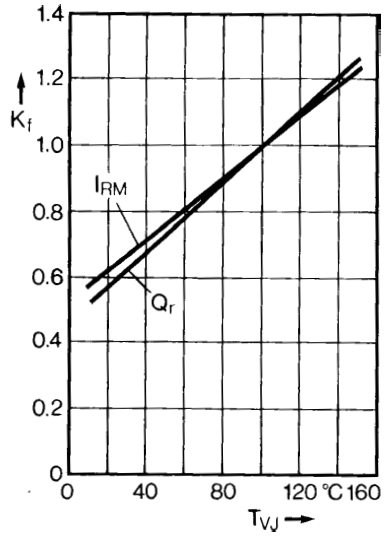


Fig. 4 Dynamic parameters versus junction temperature.

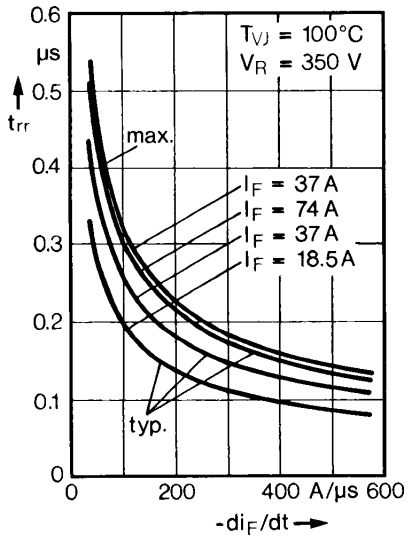


Fig. 5 Recovery time versus $-di_F/dt$.

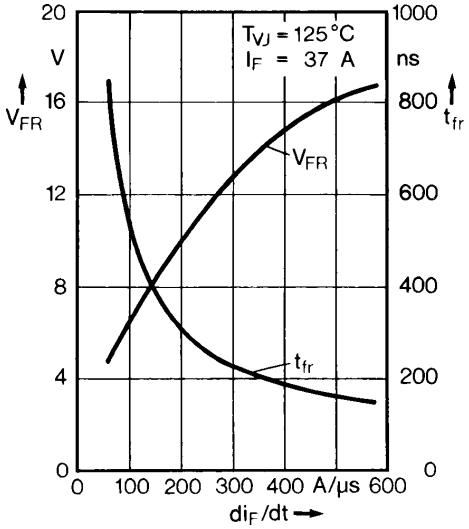


Fig. 6 Peak forward voltage versus di_F/dt.

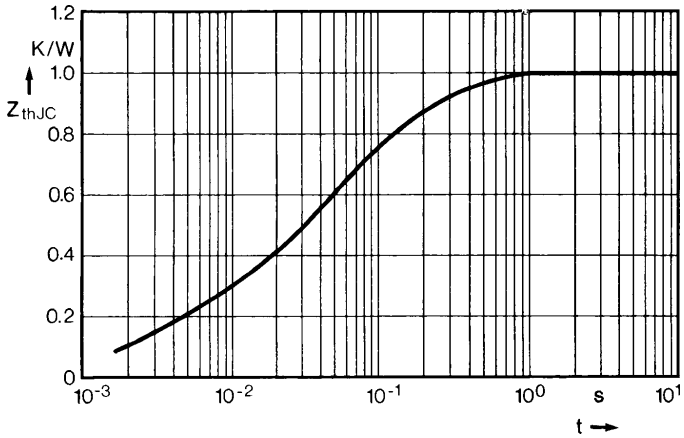
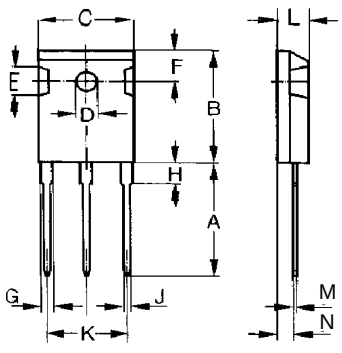


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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	2.2	2.54	0.087	0.102

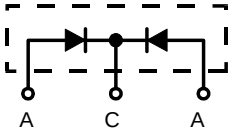
IXYS

Common Cathode Fast Recovery Epitaxial Diode (FRED)

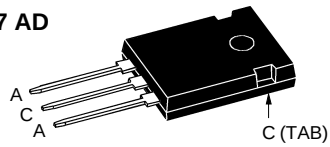
DSEK 60

I_{FAVM} = 2x 26 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

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



TO-247 AD



A = Anode, C = Cathode, TAB = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		50	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		26	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	200	A
		t = 8.3 ms (60 Hz), sine	210	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	185	A
		t = 8.3 ms (60 Hz), sine	195	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	200	A^2s
		t = 8.3 ms (60 Hz), sine	180	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	170	A^2s
		t = 8.3 ms (60 Hz), sine	160	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		125	W
M_d	Mounting torque		0.8...1.2	Nm
Weight			6	g

Symbol	Test Conditions		Characteristic Values typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		750	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		250	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 30 A;	T_{VJ} = 150°C		2.2	V
		T_{VJ} = 25°C		2.55	V
V_{T0}	For power-loss calculations only			1.65	V
r_T	$T_{VJ} = T_{VJM}$			18.2	mΩ
R_{thJC}				0.9	K/W
R_{thCK}			0.5		K/W
R_{thJA}				70	K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		40	60	ns
I_{RM}	V_R = 540 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		16	18	A

Features

- International standard package JEDEC TO-247 AD
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behavior
- Epoxy meets UL 94V-0

Applications

- Rectifiers in switch mode power supplies (SMPS)
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747 and refer to a single diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

600

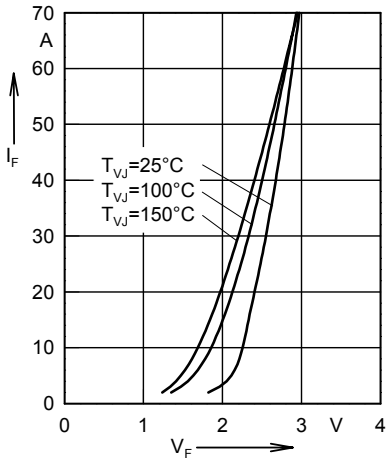


Fig. 1 Forward current versus voltage drop.

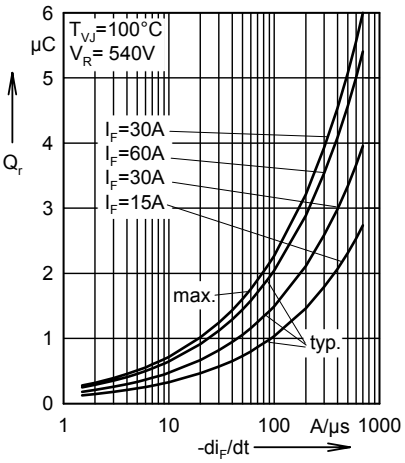


Fig. 2 Recovery charge versus $-di_F/dt$.

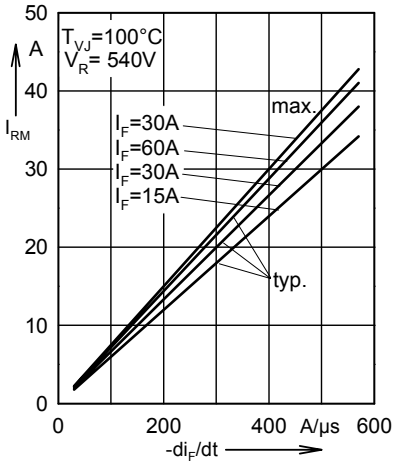


Fig. 3 Peak reverse current versus $-di_F/dt$.

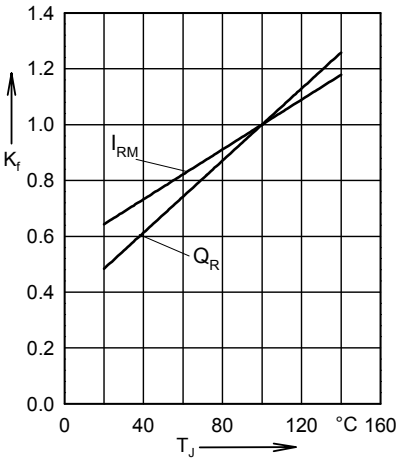


Fig. 4 Dynamic parameters versus junction temperature.

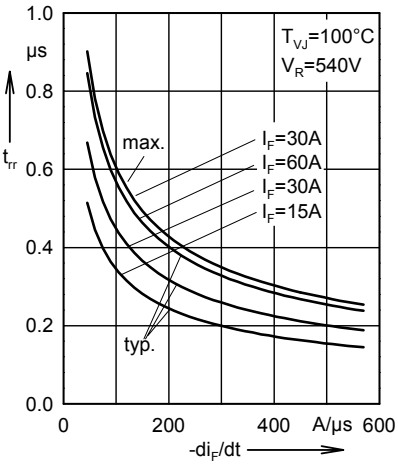


Fig. 5 Recovery time versus $-di_F/dt$.

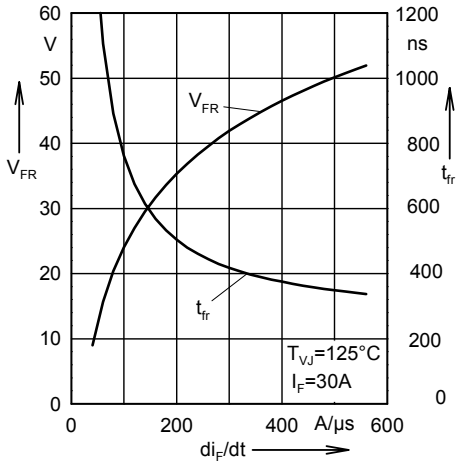


Fig. 6 Peak forward voltage versus di_F/dt.

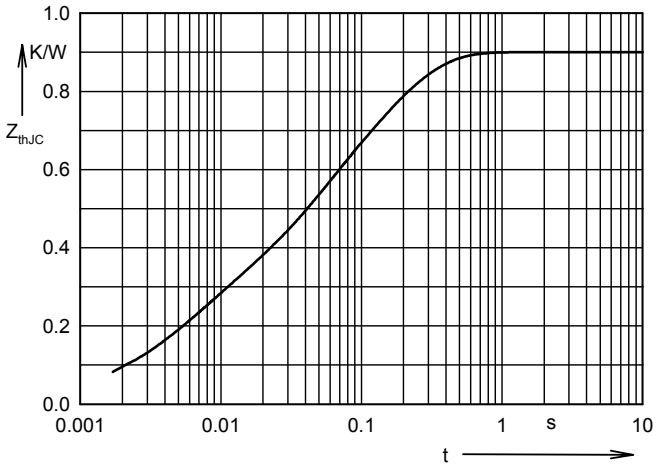
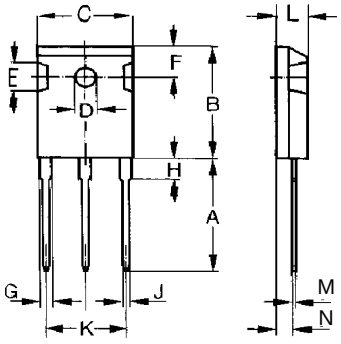


Fig. 7 Transient thermal impedance junction to case.

Dimensions



Dim.	Millimeter Min.	Max.	Inches Min.	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	2.2	2.54	0.087	0.102

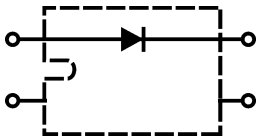
IXYS

Fast Recovery Epitaxial Diodes (FRED)

DSEI 1x 31

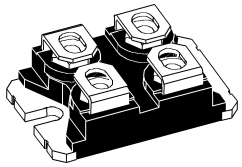
I_{FAVM} = 30 A
V_{RRM} = 600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
640	600	DSEI 1x 31-06C



DSEI 1x 31

miniBLOC, SOT-227 B



Symbol	Test Conditions	Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$	70	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5	30	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	375	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	300	A
	t = 8.3 ms (60 Hz), sine	320	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	260	A
	t = 8.3 ms (60 Hz), sine	280	A
$\int i^2dt$	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	450	A^2s
	t = 8.3 ms (60 Hz), sine	420	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	340	A^2s
	t = 8.3 ms (60 Hz), sine	320	A^2s
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	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions	Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		100	µA
	T_{VJ} = 25°C $V_R = 0.8 \bullet V_{RRM}$		50	µA
	T_{VJ} = 125°C $V_R = 0.8 \bullet V_{RRM}$		7	mA
V_F	I_F = 30 A; T_{VJ} = 150°C		1.4	V
	T_{VJ} = 25°C		1.6	V
V_{T0}	For power-loss calculations only		1.01	V
r_T	$T_{VJ} = T_{VJM}$		7.1	mΩ
R_{thJC}			1.25	K/W
R_{thCK}		0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	35	50	ns
I_{RM}	V_R = 350 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C	10	11	A

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to DIN/IEC 60747

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- UL registered E 72873
- 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
- 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

600

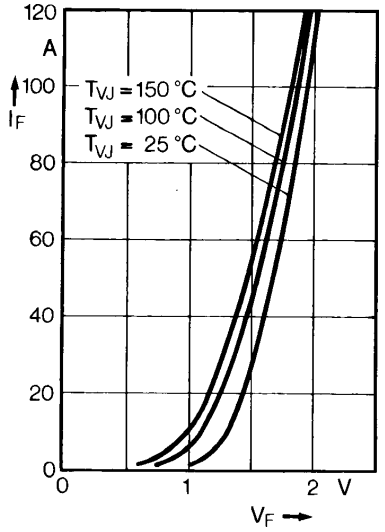


Fig. 1 Forward current versus voltage drop.

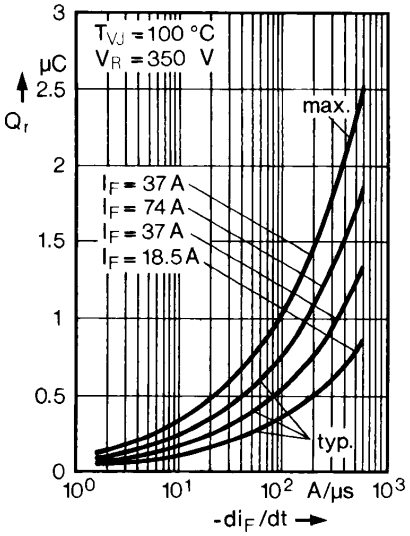


Fig. 2 Recovery charge versus $-di_F/dt$.

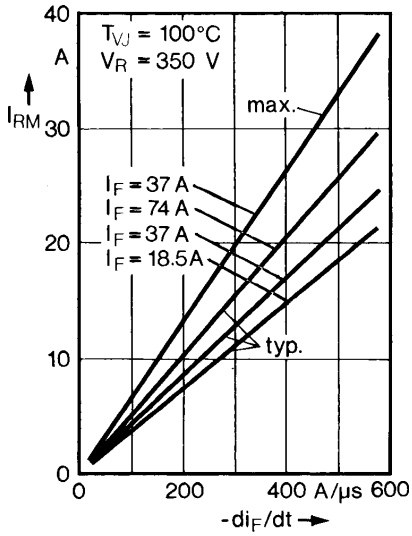


Fig. 3 Peak reverse current versus $-di_F/dt$.

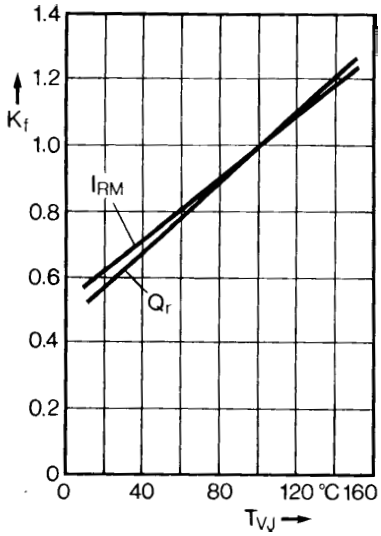


Fig. 4 Dynamic parameters versus junction temperature.

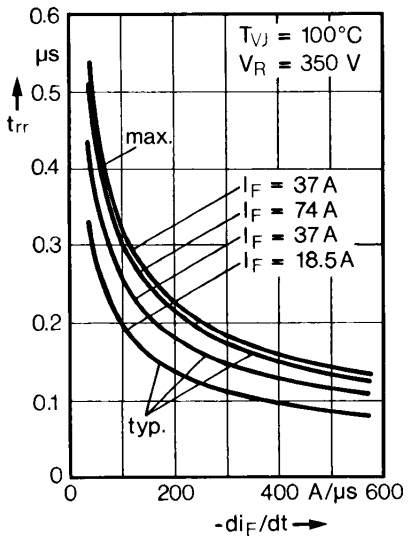


Fig. 5 Recovery time versus $-di_F/dt$.

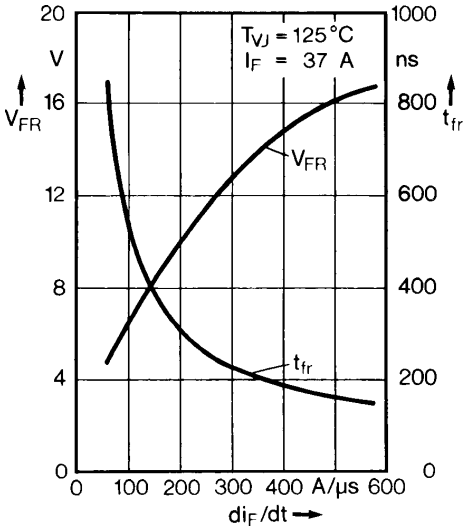


Fig. 6 Peak forward voltage versus $-di_F/dt$.

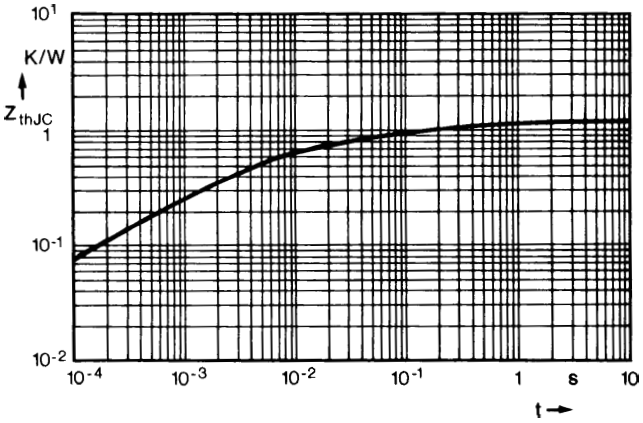
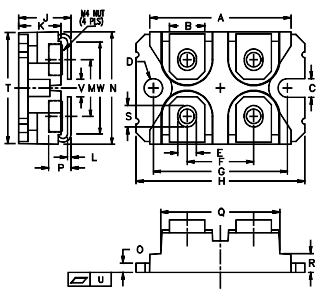


Fig. 7 Transient thermal impedance junction to case.

Dimensions



miniBLOC SOT-227 B
M4 screws (4x) supplied

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	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

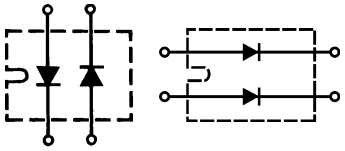
IXYS

Fast Recovery Epitaxial Diode (FRED)

DSEI 2x 30
DSEI 2x 31

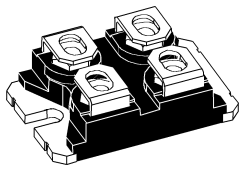
I_{FAVM} = 2x 30 A
V_{RRM} = 400/600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type	
440	400	DSEI 2x 30-04C	DSEI 2x 31-04C
640	600	DSEI 2x 30-06C	DSEI 2x 31-06C



DSEI 2x 30 DSEI 2x 31

miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions	Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$	70	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5	30	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	375	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	300	A
	t = 8.3 ms (60 Hz), sine	320	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	260	A
	t = 8.3 ms (60 Hz), sine	280	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	450	A^2s
	t = 8.3 ms (60 Hz), sine	420	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	340	A^2s
	t = 8.3 ms (60 Hz), sine	320	A^2s
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	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions	Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		100	µA
	T_{VJ} = 25°C $V_R = 0.8 \cdot V_{RRM}$		50	µA
	T_{VJ} = 125°C $V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 30 A; T_{VJ} = 150°C		1.4	V
	T_{VJ} = 25°C		1.6	V
V_{T0}	For power-loss calculations only		1.01	V
r_T	$T_{VJ} = T_{VJM}$		7.1	mΩ
R_{thJC}			1.25	K/W
R_{thCK}		0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C	35	50	ns
I_{RM}	V_R = 350 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C	10	11	A

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

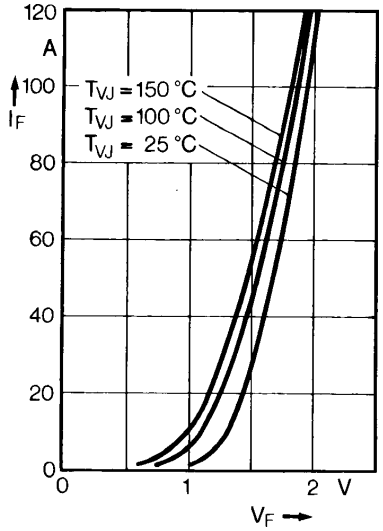


Fig. 1 Forward current versus voltage drop.

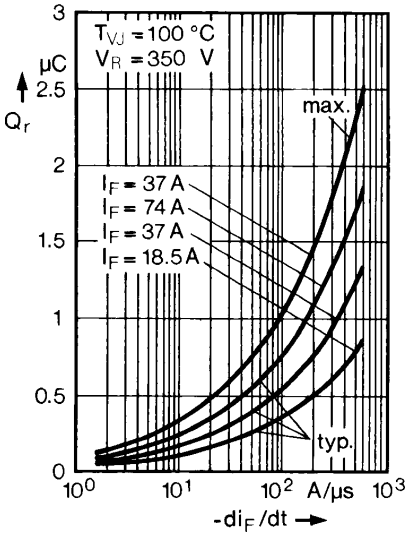


Fig. 2 Recovery charge versus $-di_F/dt$.

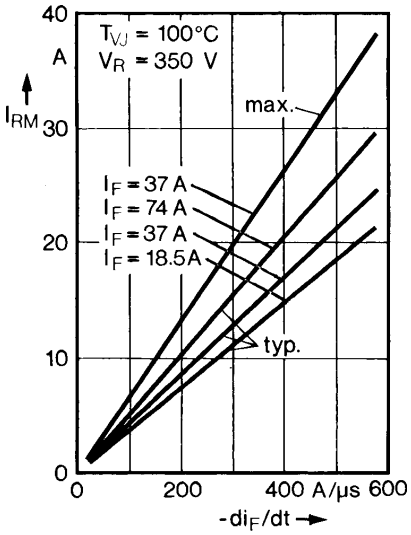


Fig. 3 Peak reverse current versus $-di_F/dt$.

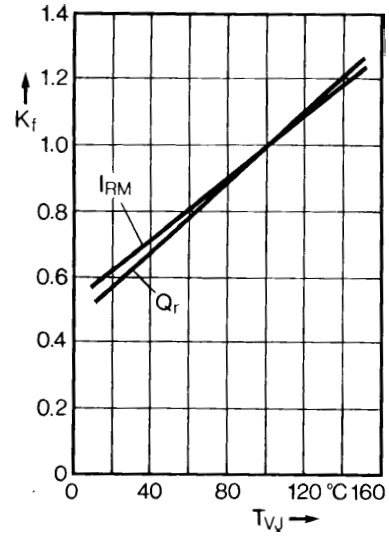


Fig. 4 Dynamic parameters versus junction temperature.

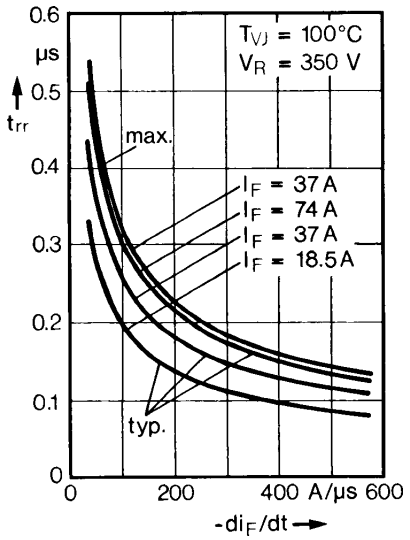


Fig. 5 Recovery time versus $-di_F/dt$.

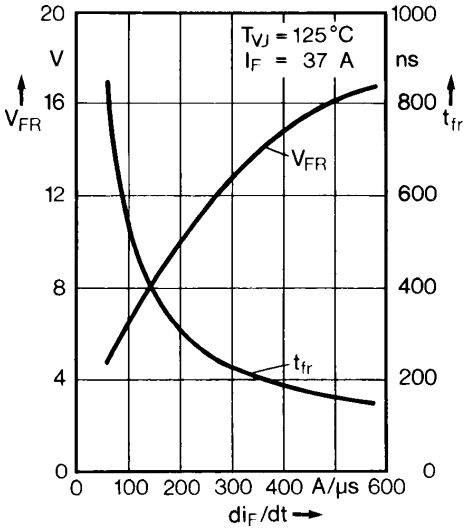


Fig. 6 Peak forward voltage versus di_F/dt.

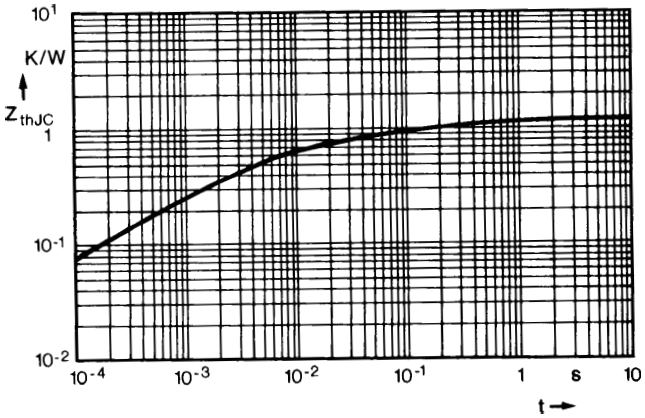
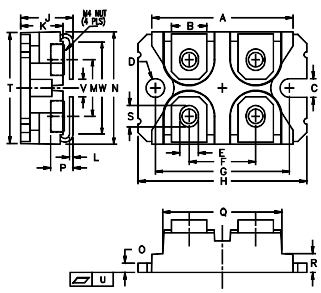


Fig. 7 Transient thermal impedance junction to case.

Dimensions



miniBLOC SOT-227 B
M4 screws (4x) supplied

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	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

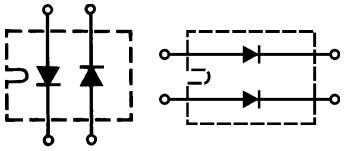
IXYS

Fast Recovery Epitaxial Diode (FRED)

DSEI 2x 30
DSEI 2x 31

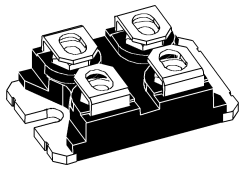
I_{FAVM} = 2x 30 A
V_{RRM} = 1000 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type	
1000	1000	DSEI 2x 30-10B	DSEI 2x 31-10B



DSEI 2x30 DSEI 2x31

miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		70	A
I_{FAVM} ①	T_C = 50°C; rectangular, d = 0.5		30	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	200	A
		t = 8.3 ms (60 Hz), sine	210	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	185	A
		t = 8.3 ms (60 Hz), sine	195	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	200	A^2s
		t = 8.3 ms (60 Hz), sine	180	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	170	A^2s
		t = 8.3 ms (60 Hz), sine	160	A^2s
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} ≤ 1 mA		2500	V~
M_d	Mounting torque		1.5/13	Nm/lb.in.
	Terminal connection torque (M4)		1.5/13	Nm/lb.in.
Weight			30	g

Symbol	Test Conditions		Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		750	µA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		250	µA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 30 A;	T_{VJ} = 150°C		2	V
		T_{VJ} = 25°C		2.4	V
V_{T0}	For power-loss calculations only			1.5	V
r_T	$T_{VJ} = T_{VJM}$			12.5	mΩ
R_{thJC}				1.25	K/W
R_{thCK}			0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 540 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		16	18	A

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

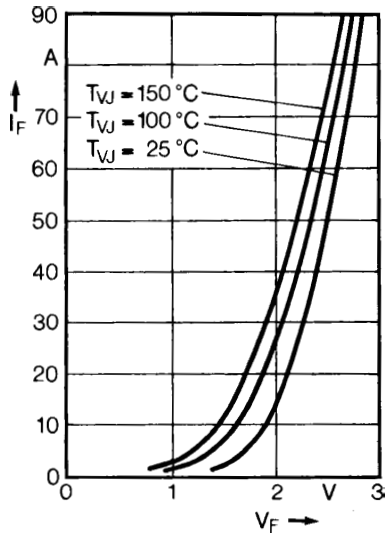


Fig. 1 Forward current versus voltage drop.

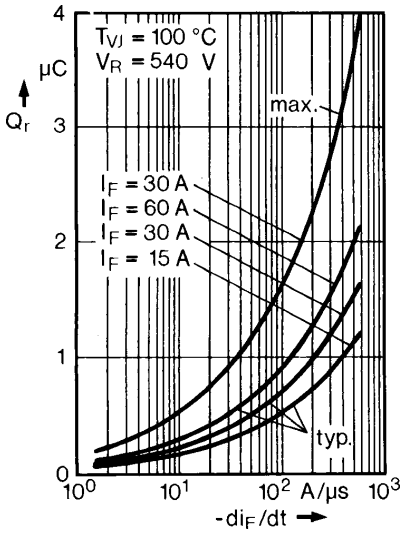


Fig. 2 Recovery charge versus $-di_F/dt$.

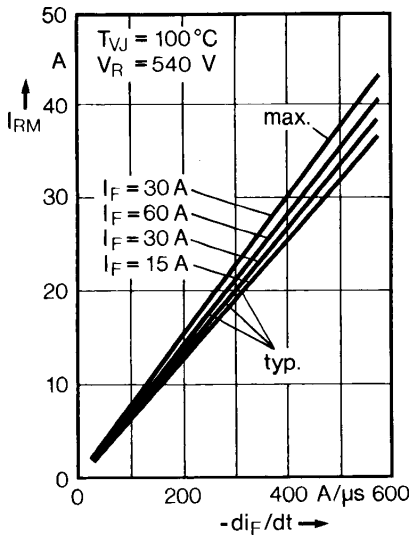


Fig. 3 Peak reverse current versus $-di_F/dt$.

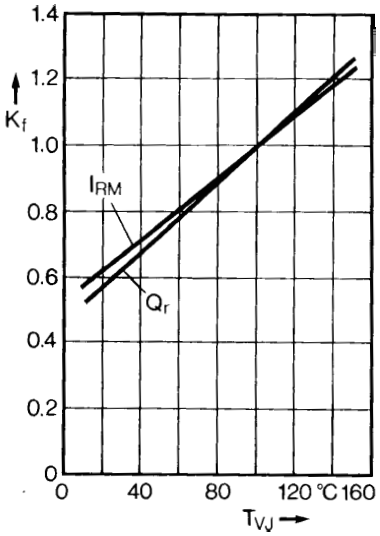


Fig. 4 Dynamic parameters versus junction temperature.

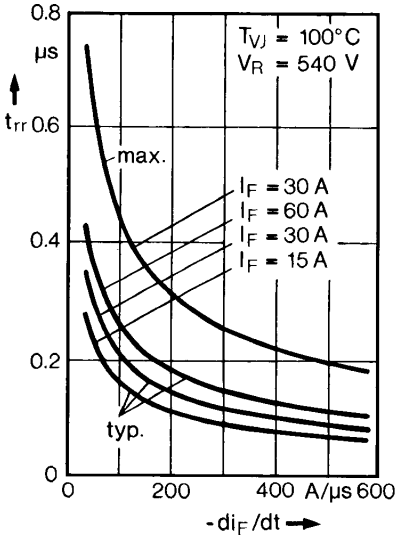


Fig. 5 Recovery time versus $-di_F/dt$.

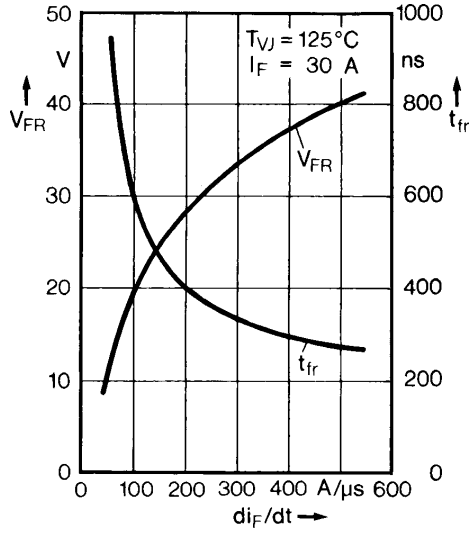


Fig. 6 Peak forward voltage versus di_F/dt.

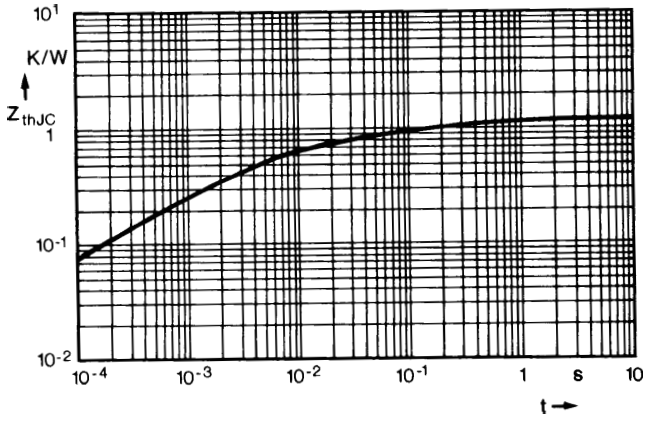
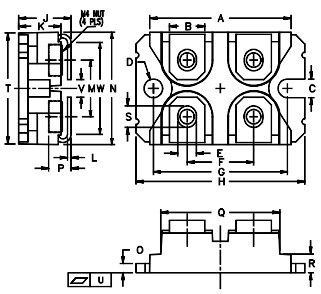


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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

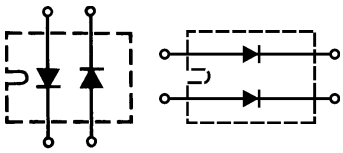
IXYS

Fast Recovery Epitaxial Diode (FRED)

DSEI 2x 30
DSEI 2x 31

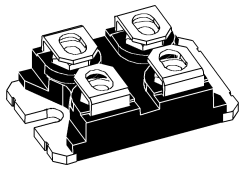
I_{FAVM} = 2x 28 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type	
1200	1200	DSEI 2x 30-12B	DSEI 2x 31-12B



DSEI 2x 30 DSEI 2x 31

miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		70	A
I_{FAVM} ①	T_C = 50°C; rectangular, d = 0.5		28	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		375	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	200	A
		t = 8.3 ms (60 Hz), sine	210	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	185	A
		t = 8.3 ms (60 Hz), sine	195	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	200	A^2s
		t = 8.3 ms (60 Hz), sine	180	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	170	A^2s
		t = 8.3 ms (60 Hz), sine	160	A^2s
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} ≤ 1 mA		2500	V~
M_d	Mounting torque		1.5/13	Nm/lb.in.
	Terminal connection torque (M4)		1.5/13	Nm/lb.in.
Weight			30	g

Symbol	Test Conditions		Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		0.75	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		0.25	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		7	mA
V_F	I_F = 30 A;	T_{VJ} = 150°C		2.2	V
		T_{VJ} = 25°C		2.55	V
V_{T0}	For power-loss calculations only			1.65	V
r_T	$T_{VJ} = T_{VJM}$			18.2	mΩ
R_{thJC}				1.25	K/W
R_{thCK}			0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 100 A/µs; V_R = 30 V; T_{VJ} = 25°C		40	60	ns
I_{RM}	V_R = 540 V; I_F = 30 A; $-di_F/dt$ = 240 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		16	18	A

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

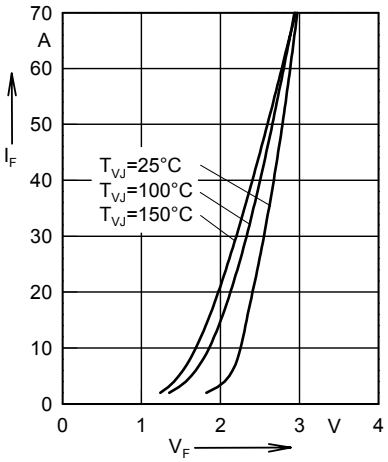


Fig. 1 Forward current versus voltage drop.

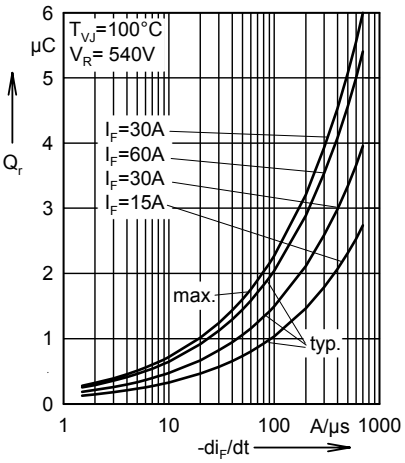


Fig. 2 Recovery charge versus $-di_F/dt$.

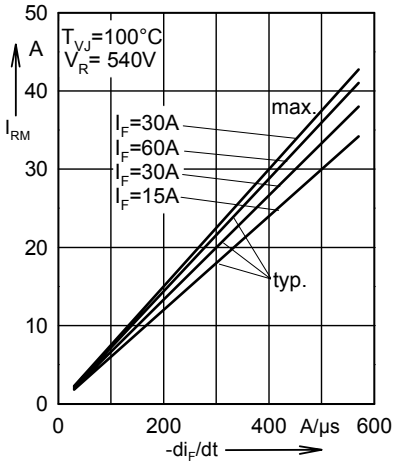


Fig. 3 Peak reverse current versus $-di_F/dt$.

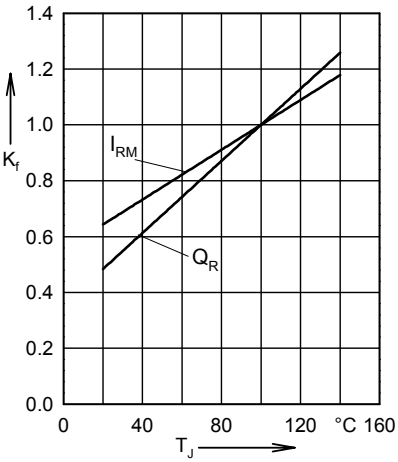


Fig. 4 Dynamic parameters versus junction temperature.

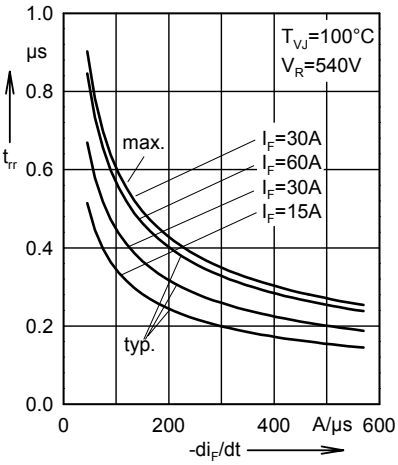


Fig. 5 Recovery time versus $-di_F/dt$.

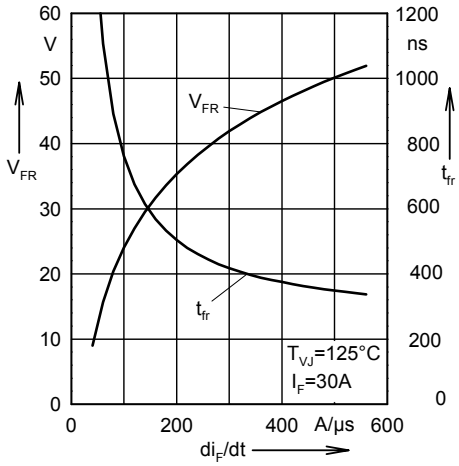


Fig. 6 Peak forward voltage versus di_F/dt.

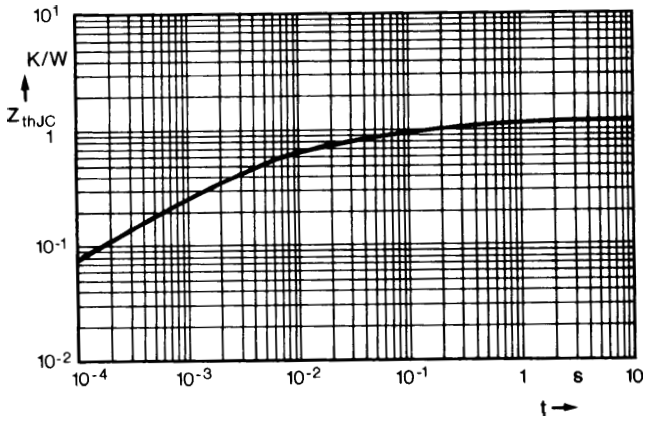
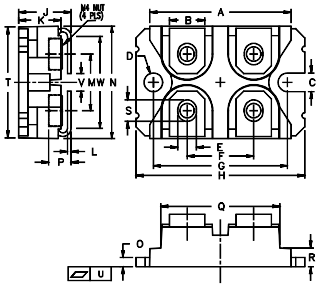


Fig. 7 Transient thermal impedance junction to case.

Dimensions



miniBLOC SOT-227 B
M4 screws (4x) supplied

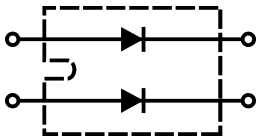
Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.20	1.489	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	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

Fast Recovery Epitaxial Diode (FRED)

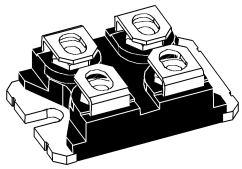
DSEI 2x 61

I_{FAVM} = 2x 71 A
V_{RRM} = 200 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
200	200	DSEI 2x 61-02A



miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 85°C; rectangular, d = 0.5		71	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		800	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	950	A
		t = 8.3 ms (60 Hz), sine	1020	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	800	A
		t = 8.3 ms (60 Hz), sine	870	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	4500	A^2s
		t = 8.3 ms (60 Hz), sine	4300	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	3200	A^2s
		t = 8.3 ms (60 Hz), sine	3140	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		150	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq$ 1 mA		2500	V~
M_d	Mounting torque		1.1-1.5/9-13	Nm/lb.in.
	Terminal connection torque (M4)		1.1-1.5/9-13	Nm/lb.in.
Weight			30	g

Symbol	Test Conditions		Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		50	µA
	T_{VJ} = 25°C	V_R = 0.8 • V_{RRM}		40	µA
	T_{VJ} = 125°C	V_R = 0.8 • V_{RRM}		11	mA
V_F	I_F = 60 A;	T_{VJ} = 150°C		0.88	V
		T_{VJ} = 25°C		1.08	V
V_{T0}	For power-loss calculations only			0.7	V
r_T	$T_{VJ} = T_{VJM}$			3.0	mΩ
R_{thJC}				0.8	K/W
R_{thCK}			0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 100 V; I_F = 60 A; $-di_F/dt$ = 200 A/µs L ≤ 0.05 mH; T_{VJ} = 100°C		8	10	A

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

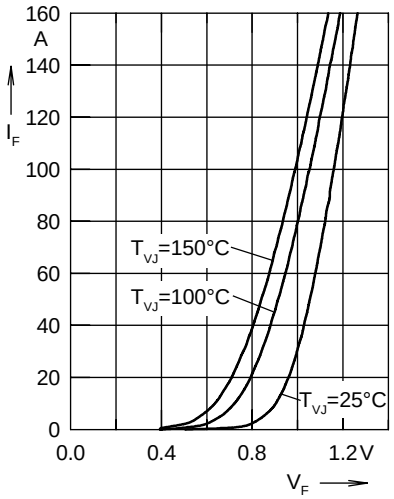


Fig. 1 Forward current I_F versus V_F

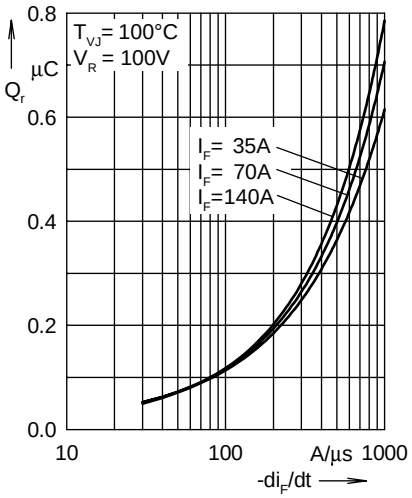


Fig. 2 Typ. reverse recovery charge Q_r versus -di_F/dt

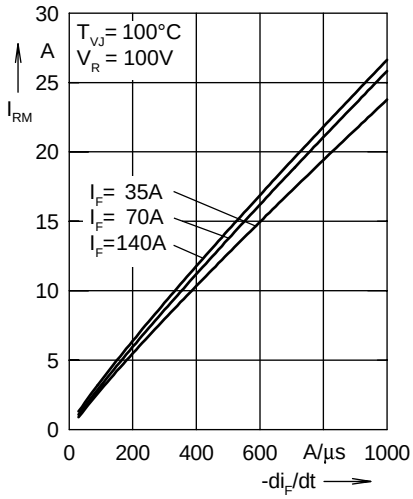


Fig. 3 Typ. peak reverse current I_{RM} versus -di_F/dt

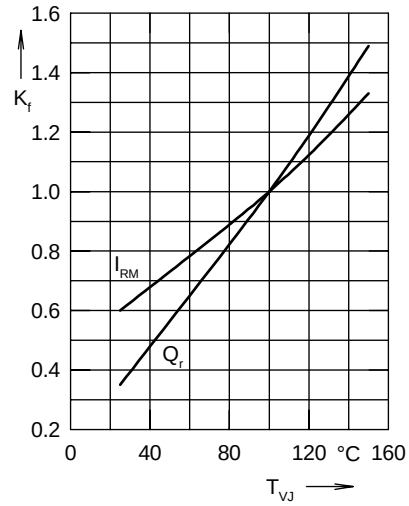


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

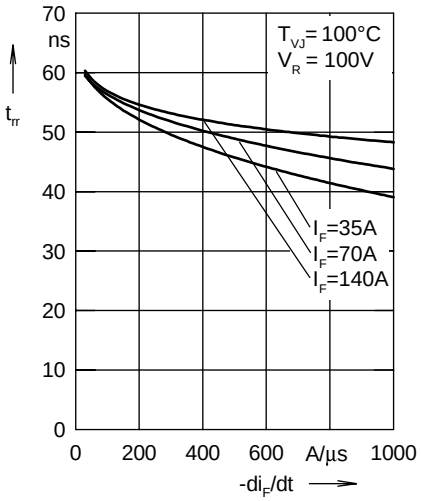


Fig. 5 Typ. recovery time t_{rr} versus -di_F/dt

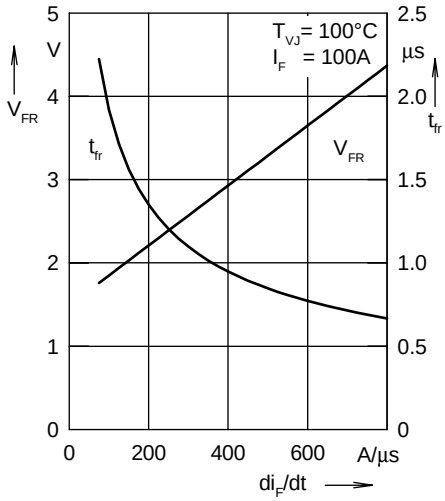


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

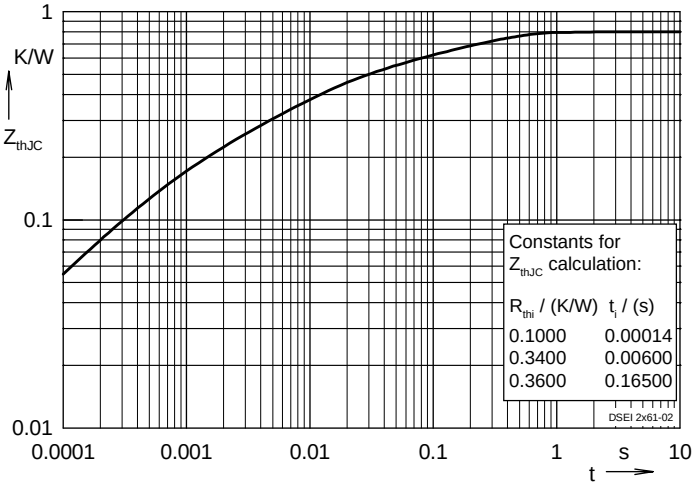
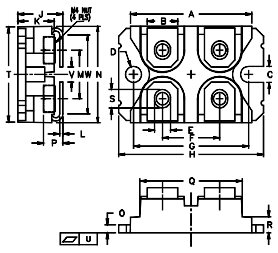


Fig. 7 Transient thermal impedance junction to case

Dimensions



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

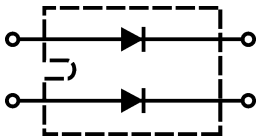
IXYS

Fast Recovery Epitaxial Diode (FRED)

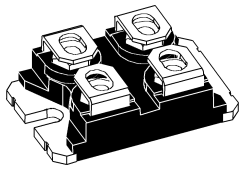
DSEI 2x 61

I_{FAVM} = 2x 60 A
V_{RRM} = 400/600 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
440	400	DSEI 2x 61-04C
640	600	DSEI 2x 61-06C



miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions	Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$	100	A
I_{FAVM} ①	T_C = 70°C; rectangular, d = 0.5	60	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	800	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	550	A
	t = 8.3 ms (60 Hz), sine	600	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	480	A
	t = 8.3 ms (60 Hz), sine	520	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	1510	A^2s
	t = 8.3 ms (60 Hz), sine	1490	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	1150	A^2s
	t = 8.3 ms (60 Hz), sine	1120	A^2s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	180	W
V_{ISOL}	50/60 Hz, RMS	2500	V~
	$I_{ISOL} \leq$ 1 mA		
M_d	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions	Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		200	µA
	T_{VJ} = 25°C $V_R = 0.8 \cdot V_{RRM}$		100	µA
	T_{VJ} = 125°C $V_R = 0.8 \cdot V_{RRM}$		14	mA
V_F	I_F = 60 A; T_{VJ} = 150°C		1.5	V
	T_{VJ} = 25°C		1.8	V
V_{T0}	For power-loss calculations only		1.13	V
r_T	$T_{VJ} = T_{VJM}$		4.7	mΩ
R_{thJC}		0.7		K/W
R_{thCK}		0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	35	50	ns
I_{RM}	V_R = 350 V; I_F = 60 A; $-di_F/dt$ = 480 A/µs	19	21	A
	L ≤ 0.05 µH; T_{VJ} = 100°C			

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

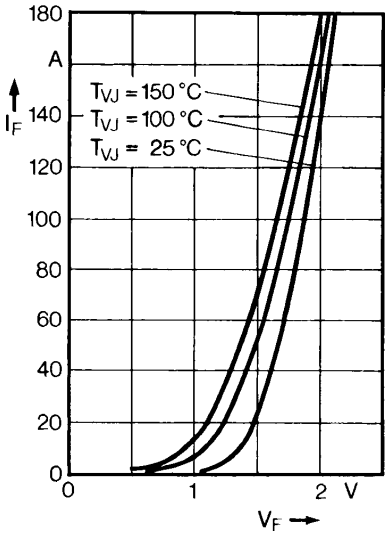


Fig. 1 Forward current versus voltage drop.

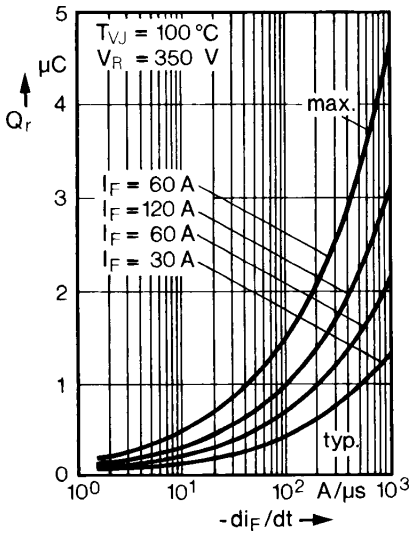


Fig. 2 Recovery charge versus $-di_F/dt$.

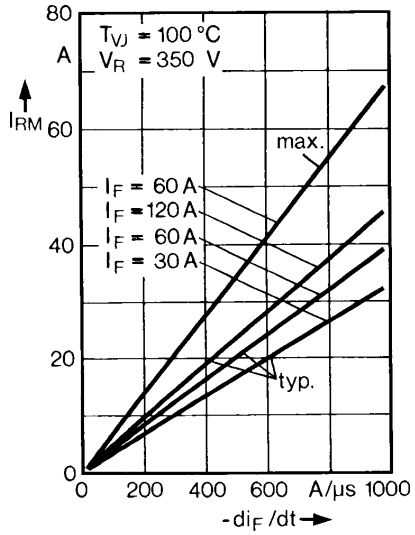


Fig. 3 Peak reverse current versus $-di_F/dt$.

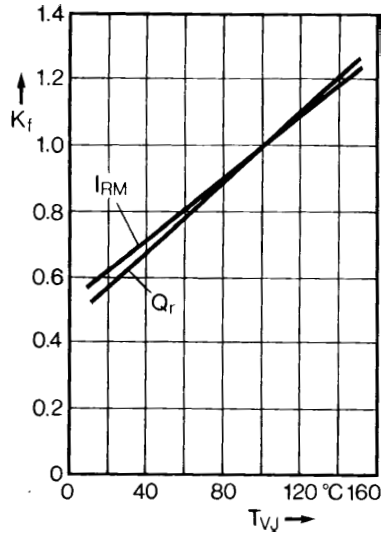


Fig. 4 Dynamic parameters versus junction temperature.

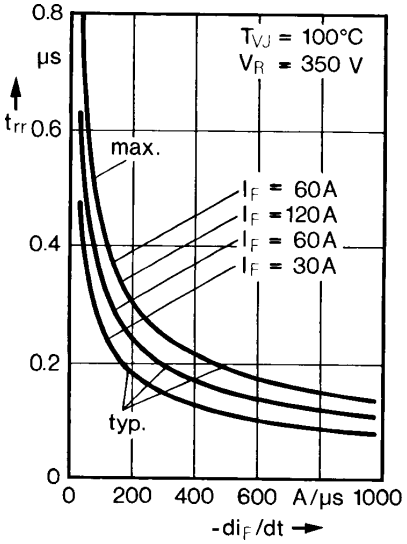


Fig. 5 Recovery time versus $-di_F/dt$.

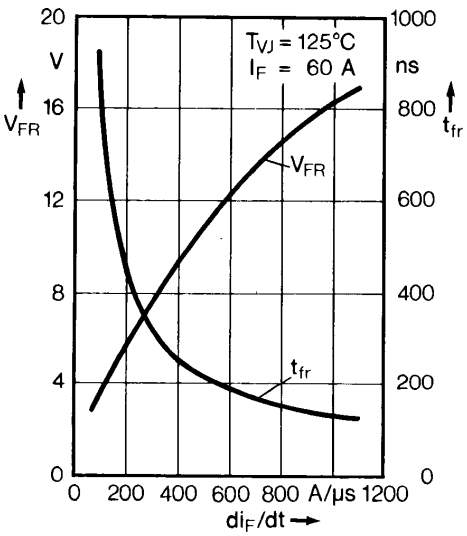


Fig. 6 Peak forward voltage versus di_F/dt.

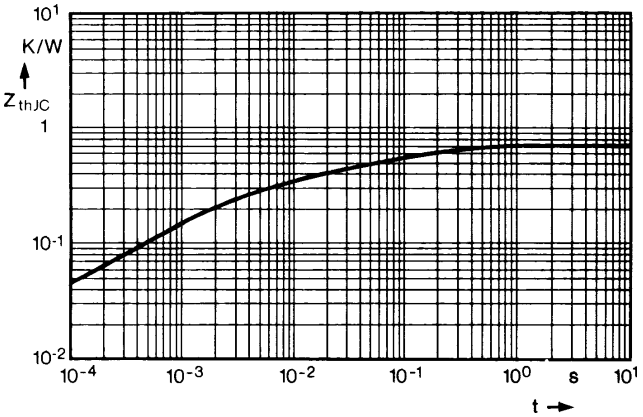
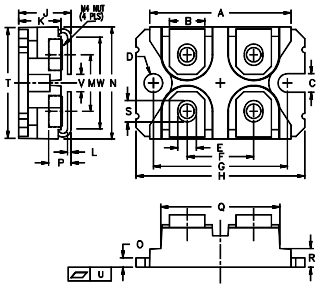


Fig. 7 Transient thermal impedance junction to case.

Dimensions



miniBLOC SOT-227 B
M4 screws (4x) supplied

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	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

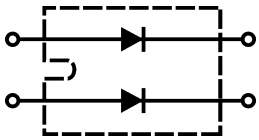
IXYS

Fast Recovery Epitaxial Diode (FRED)

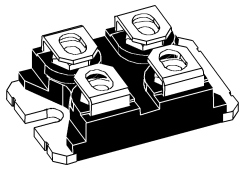
DSEI 2x 61

I_{FAVM} = 2x 60 A
V_{RRM} = 1000 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
1000	1000	DSEI 2x 61-10B



miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ①	T_C = 50°C; rectangular, d = 0.5		60	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		800	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	500	A
		t = 8.3 ms (60 Hz), sine	540	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	450	A
		t = 8.3 ms (60 Hz), sine	480	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1150	A^2s
		t = 8.3 ms (60 Hz), sine	1200	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1000	A^2s
		t = 8.3 ms (60 Hz), sine	950	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		180	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq$ 1 mA		2500	V~
M_d	Mounting torque		1.5/13	Nm/lb.in.
	Terminal connection torque (M4)		1.5/13	Nm/lb.in.
Weight			30	g

Symbol	Test Conditions		Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		3	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		0.5	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		14	mA
V_F	I_F = 60 A;	T_{VJ} = 150°C		1.8	V
		T_{VJ} = 25°C		2.3	V
V_{T0}	For power-loss calculations only			1.43	V
r_T	$T_{VJ} = T_{VJM}$			6.1	mΩ
R_{thJC}			0.7		K/W
R_{thCK}			0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 540 V; I_F = 60 A; $-di_F/dt$ = 480 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		32	36	A

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

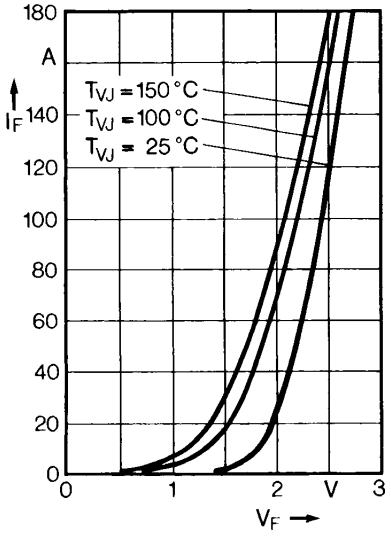


Fig. 1 Forward current versus voltage drop.

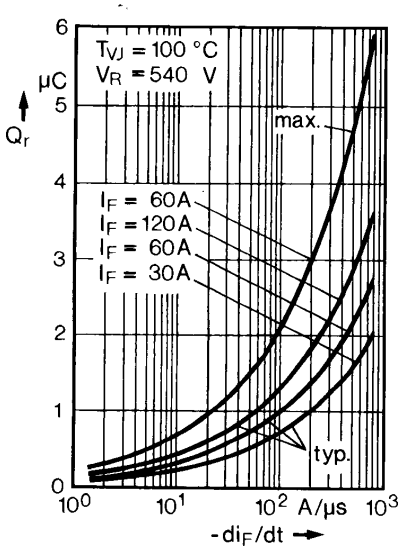


Fig. 2 Recovery charge versus $-di_F/dt$.

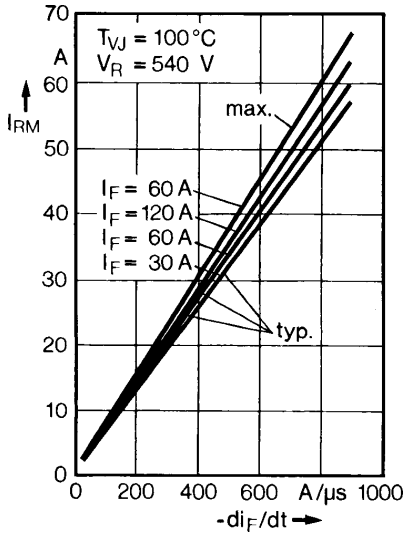


Fig. 3 Peak reverse current versus $-di_F/dt$.

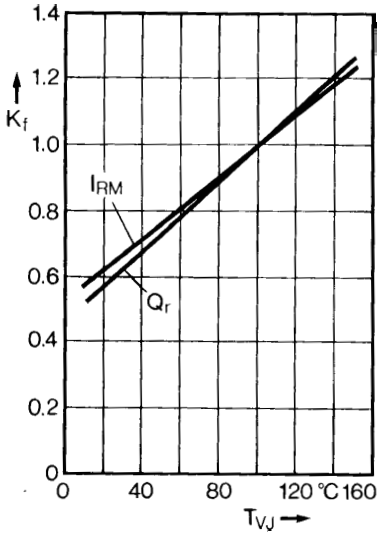


Fig. 4 Dynamic parameters versus junction temperature.

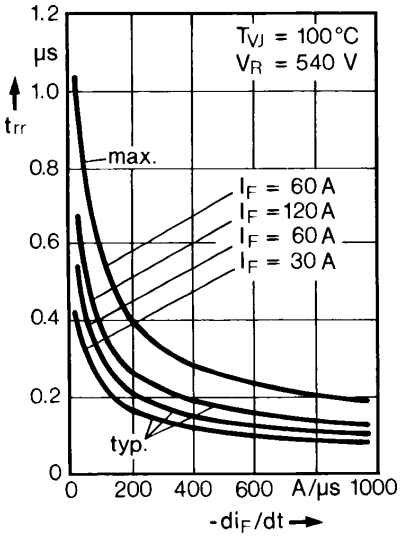


Fig. 5 Recovery time versus $-di_F/dt$.

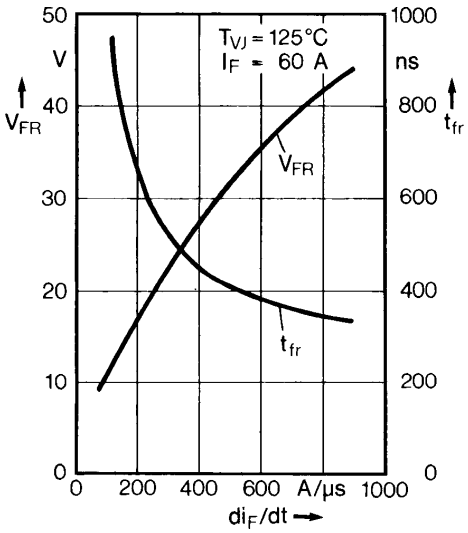


Fig. 6 Peak forward voltage versus di_F/dt.

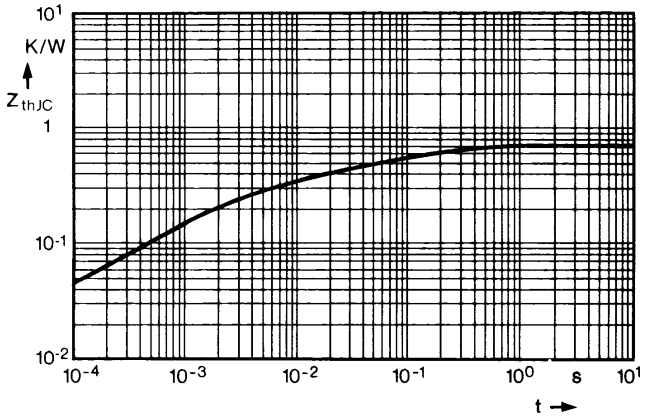
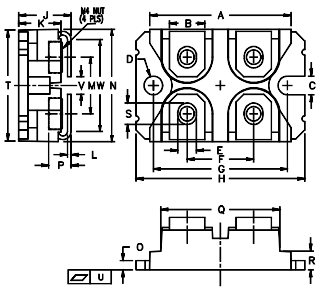


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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

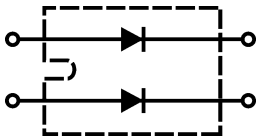
IXYS

Fast Recovery Epitaxial Diode (FRED)

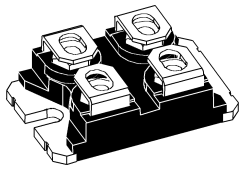
DSEI 2x 61

I_{FAVM} = 2x 52 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEI 2x 61-12B



miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions	Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$	100	A
I_{FAVM} ①	T_C = 50°C; rectangular, d = 0.5	52	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	700	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	450	A
	t = 8.3 ms (60 Hz), sine	500	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	400	A
	t = 8.3 ms (60 Hz), sine	440	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	1000	A^2s
	t = 8.3 ms (60 Hz), sine	1050	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	800	A^2s
	t = 8.3 ms (60 Hz), sine	810	A^2s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	180	W
V_{ISOL}	50/60 Hz, RMS	2500	V~
	$I_{ISOL} \leq$ 1 mA		
M_d	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions	Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		2.2	mA
	T_{VJ} = 25°C $V_R = 0.8 \cdot V_{RRM}$		0.5	mA
	T_{VJ} = 125°C $V_R = 0.8 \cdot V_{RRM}$		14	mA
V_F	I_F = 60 A; T_{VJ} = 150°C		2.15	V
	T_{VJ} = 25°C		2.50	V
V_{T0}	For power-loss calculations only		1.65	V
r_T	$T_{VJ} = T_{VJM}$		8.3	mΩ
R_{thJC}		0.7		K/W
R_{thCK}		0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 200 A/µs; V_R = 30 V; T_{VJ} = 25°C	40	60	ns
I_{RM}	V_R = 540 V; I_F = 60 A; $-di_F/dt$ = 480 A/µs	32	36	A
	L ≤ 0.05 µH; T_{VJ} = 100°C			

Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 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
- 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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

600

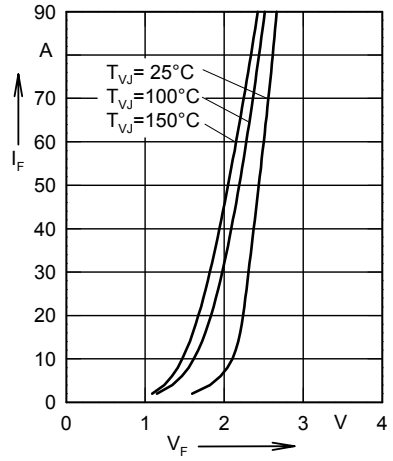


Fig. 1 Forward current versus voltage drop.

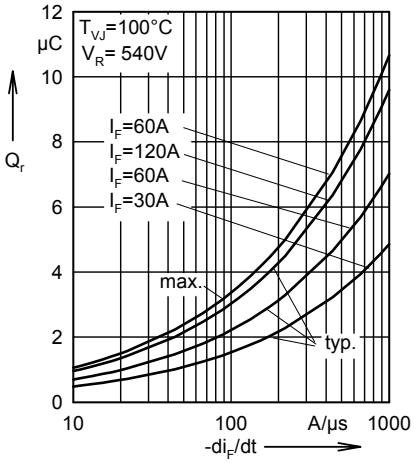


Fig. 2 Recovery charge versus $-di_F/dt$.

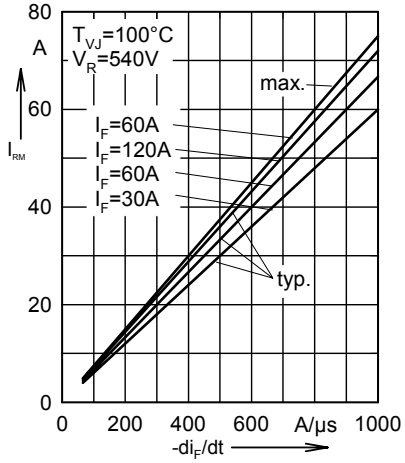


Fig. 3 Peak reverse current versus $-di_F/dt$.

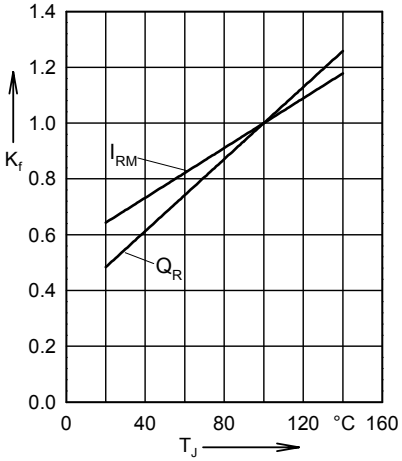


Fig. 4 Dynamic parameters versus junction temperature.

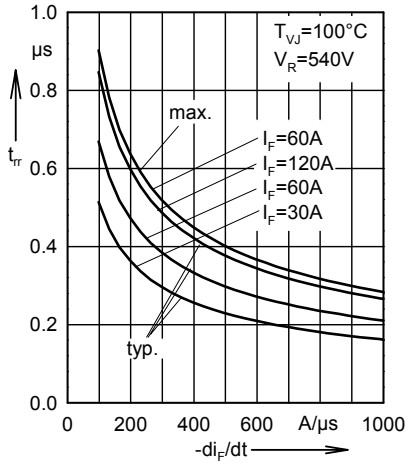


Fig. 5 Recovery time versus $-di_F/dt$.

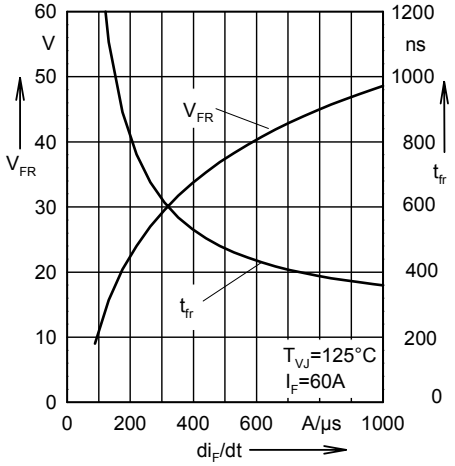


Fig. 6 Peak forward voltage versus di_F/dt.

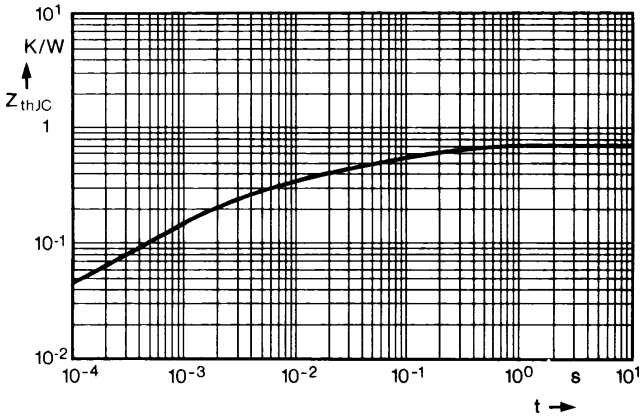
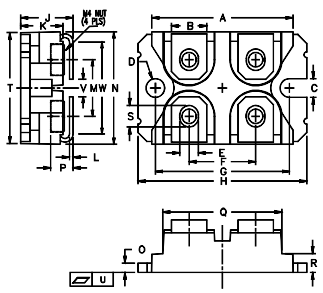


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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

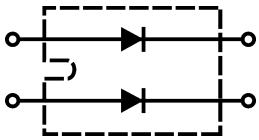
IXYS

Fast Recovery Epitaxial Diode (FRED)

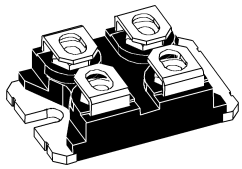
DSEI 2x 121

I_{FAVM} = 2x 123 A
V_{RRM} = 200 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
200	200	DSEI 2x 121-02A



miniBLOC, SOT-227 B
E72873



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		150	A
I_{FAVM} ①	T_C = 70°C; rectangular, d = 0.5		123	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}		600	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	1200	A
		t = 8.3 ms (60 Hz), sine	1300	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1080	A
		t = 8.3 ms (60 Hz), sine	1170	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	7200	A^2s
		t = 8.3 ms (60 Hz), sine	7100	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	5800	A^2s
		t = 8.3 ms (60 Hz), sine	5700	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		250	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq$ 1 mA		2500	V~
M_d	Mounting torque		1.5/13	Nm/lb.in.
	Terminal connection torque (M4)		1.5/13	Nm/lb.in.
Weight			30	g

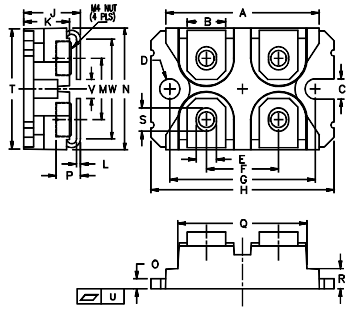
Symbol	Test Conditions		Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		1	mA
	T_{VJ} = 25°C	V_R = 0.8 • V_{RRM}		0.5	mA
	T_{VJ} = 125°C	V_R = 0.8 • V_{RRM}		20	mA
V_F	I_F = 120 A;	T_{VJ} = 150°C	0.89	0.95	V
		T_{VJ} = 25°C		1.10	V
V_{T0}	For power-loss calculations only			0.7	V
r_T	$T_{VJ} = T_{VJM}$			2.1	mΩ
R_{thJC}				0.5	K/W
R_{thCK}			0.1		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C		35	50	ns
I_{RM}	V_R = 100 V; I_F = 100 A; -di_F/dt = 200 A/µs L ≤ 0.05 µH; T_{VJ} = 100°C		12	15	A

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features

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

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

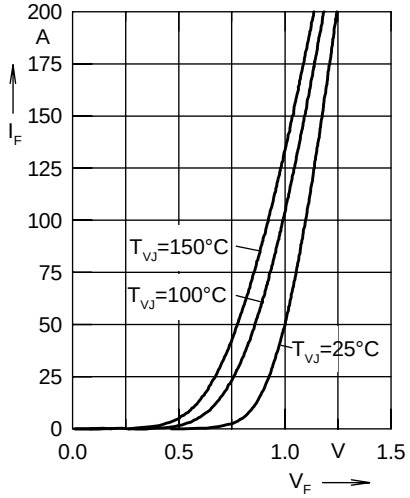


Fig. 1 Forward current I_F versus V_F

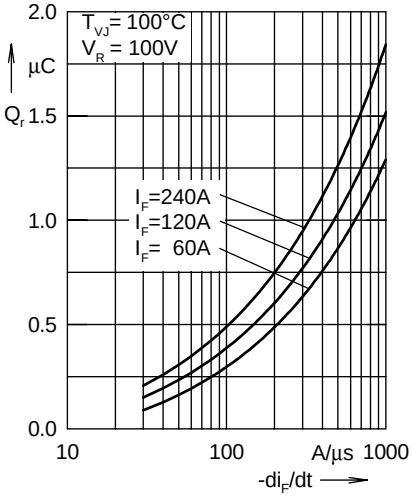


Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

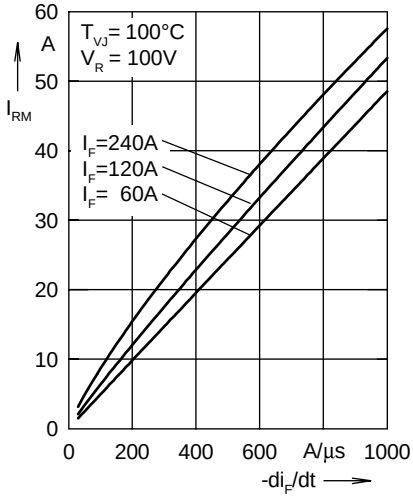


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

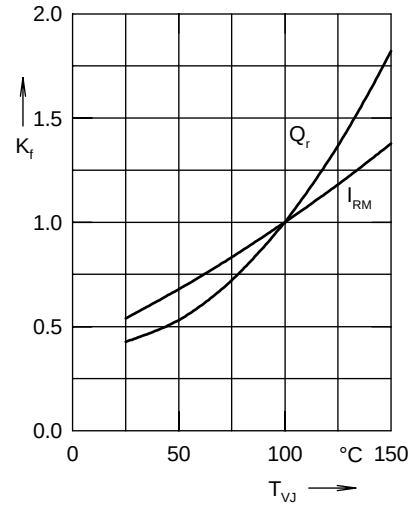


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

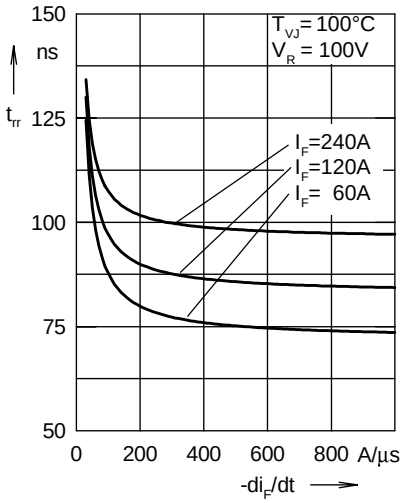


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

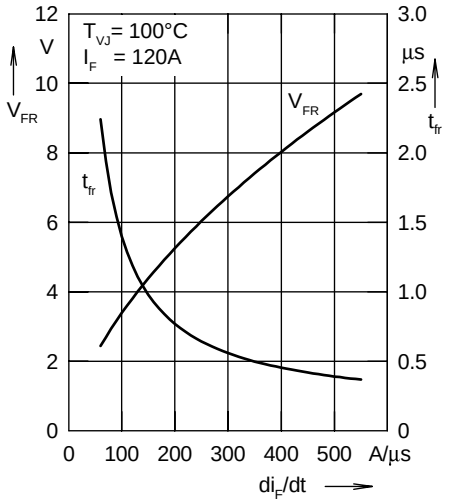


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

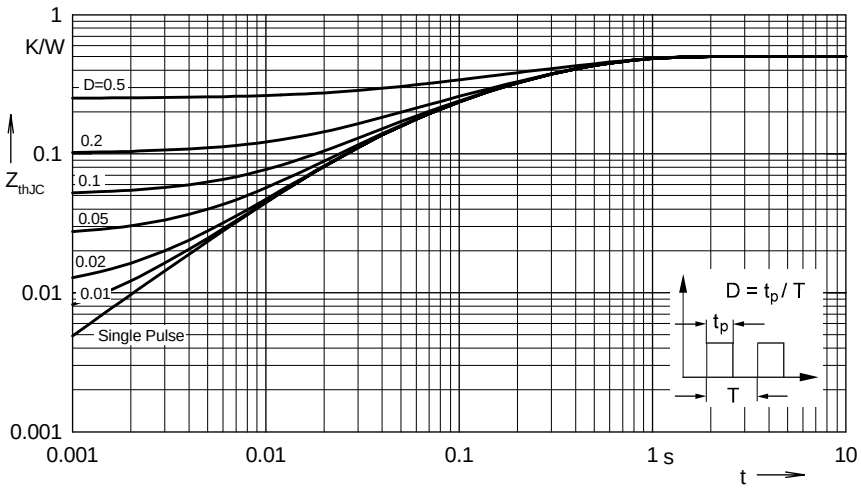


Fig. 7 Transient thermal impedance junction to case at various duty cycles

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0725	0.028
2	0.1423	0.092
3	0.2852	0.35

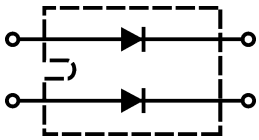
IXYS

Fast Recovery Epitaxial Diode (FRED)

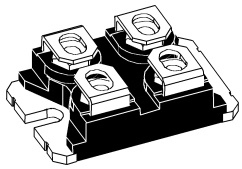
DSEI 2x 101

V_{RRM} = 600 V
I_{FAVM} = 2x 96 A
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
600	600	DSEI 2x 101-06A



miniBLOC, SOT-227 B
E72873

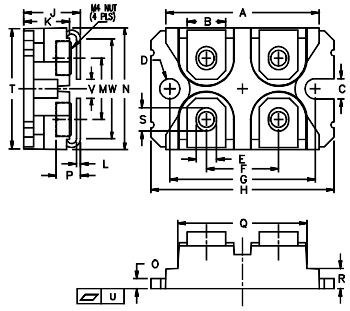


Features
- International standard package
- miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- matched diodes f. parallel operation
- Planar passivated chips
- two independent diodes
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Symbol	Test Conditions	Maximum Ratings (per diode)	
$I_{F(RMS)}$	$T_{VJ} = T_{VJM}$	150	A
$I_{F(AV)M}$ ①	T_C = 70°C; rectangular, d = 0.5	96	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	TBD	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	1200	A
	t = 8.3 ms (60 Hz), sine	1300	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	1080	A
	t = 8.3 ms (60 Hz), sine	1170	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	7200	A^2s
	t = 8.3 ms (60 Hz), sine	7100	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	5800	A^2s
	t = 8.3 ms (60 Hz), sine	5700	A^2s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	250	W
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq$ 1 mA	2500	V~
M_d	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions	Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		3	mA
	T_{VJ} = 25°C V_R = 0.8 • V_{RRM}		1	mA
	T_{VJ} = 125°C V_R = 0.8 • V_{RRM}		20	mA
V_F	I_F = 100 A; T_{VJ} = 150°C		1.17	V
	T_{VJ} = 25°C		1.25	V
V_{T0}	For power-loss calculations only		0.70	V
r_T			4.7	mΩ
R_{thJC}			0.5	K/W
R_{thCH}		0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	35	50	ns
I_{RM}	V_R = 100 V; I_F = 80 A; $-di_F/dt$ = 200 A/µs L ≤ 0.05 mH; T_{VJ} = 100°C	19	24	A

miniBLOC, SOT-227 B



M4 screws (4x) supplied

Dim.	Millimeter Min.	Max.	Inches Min.	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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

031

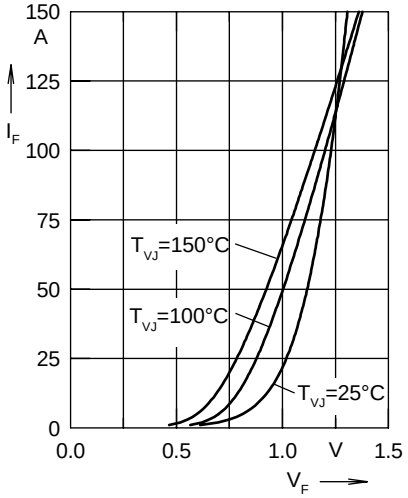


Fig. 1 Forward current I_F versus V_F

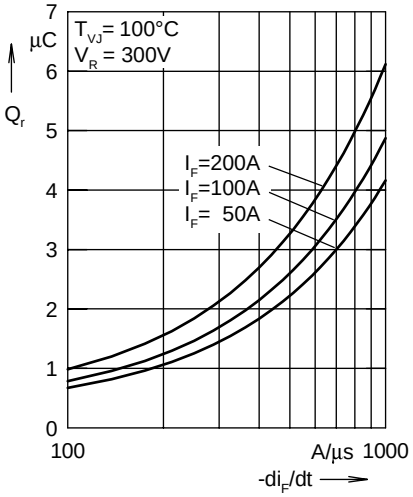


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

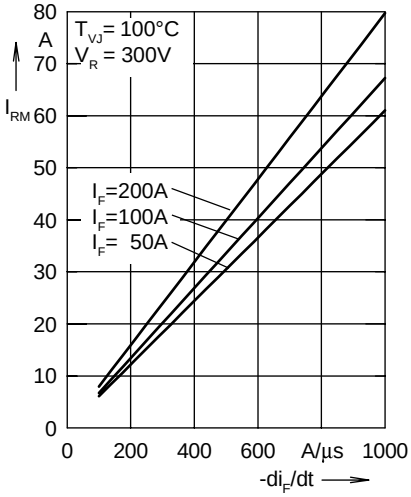


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

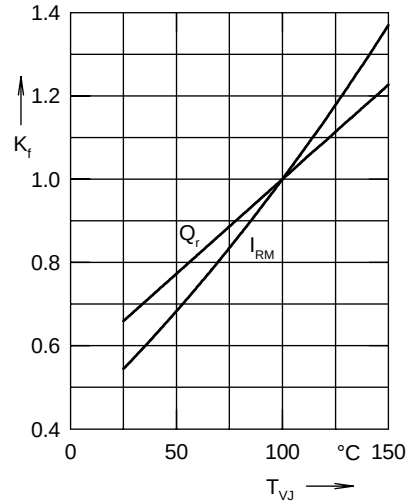


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

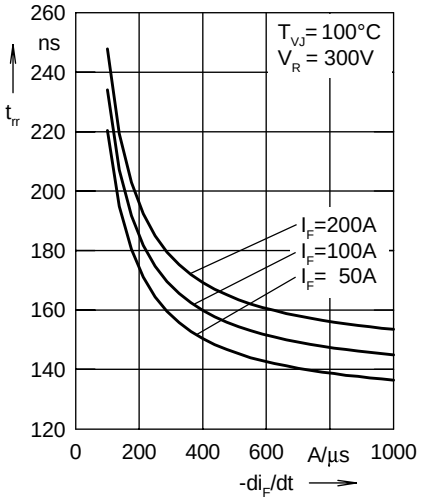


Fig. 5 Recovery time t_{rr} versus -di_F/dt

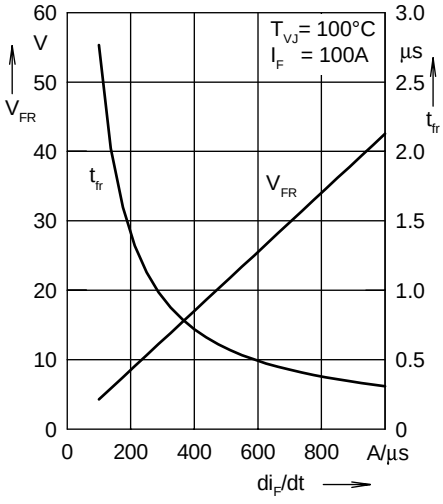


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

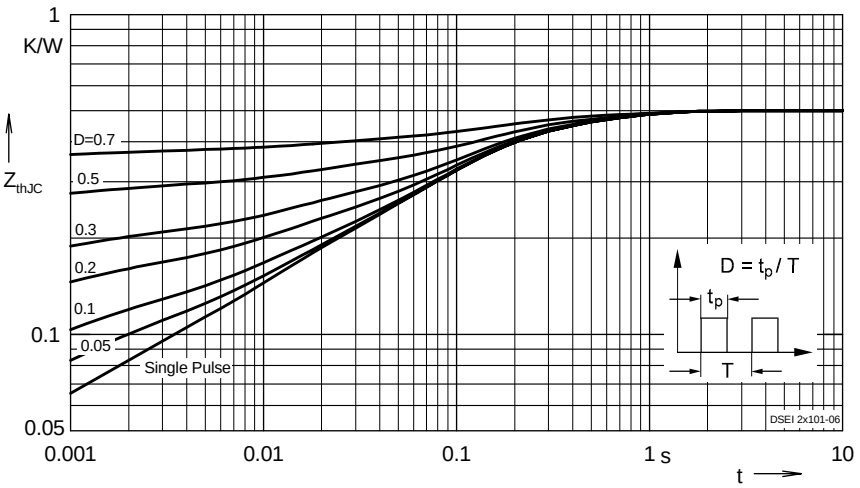


Fig. 7 Transient thermal impedance junction to case at various duty cycles

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.02	0.00002
2	0.05	0.00081
3	0.076	0.01
4	0.24	0.94
5	0.114	0.45

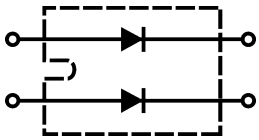
IXYS

Fast Recovery Epitaxial Diode (FRED)

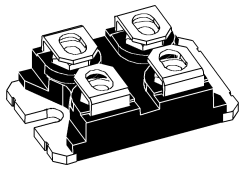
DSEI 2x 101

V_{RRM} = 1200 V
I_{FAVM} = 2x 91 A
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEI 2x 101-12A



miniBLOC, SOT-227 B
E72873

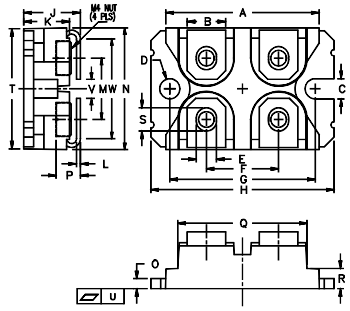


Features
- International standard package
- miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- matched diodes f. parallel operation
- Planar passivated chips
- two independent diodes
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Symbol	Test Conditions	Maximum Ratings (per diode)	
$I_{F(RMS)}$	$T_{VJ} = T_{VJM}$	130	A
$I_{F(AV)M}$ ①	T_C = 50°C; rectangular, d = 0.5	91	A
I_{FRM}	t_P < 10 µs; rep. rating, pulse width limited by T_{VJM}	TBD	A
I_{FSM}	T_{VJ} = 45°C; t = 10 ms (50 Hz), sine	900	A
	t = 8.3 ms (60 Hz), sine	970	A
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	810	A
	t = 8.3 ms (60 Hz), sine	870	A
I^2t	T_{VJ} = 45°C t = 10 ms (50 Hz), sine	4100	A^2s
	t = 8.3 ms (60 Hz), sine	4000	A^2s
	T_{VJ} = 150°C; t = 10 ms (50 Hz), sine	3300	A^2s
	t = 8.3 ms (60 Hz), sine	3200	A^2s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+150	°C
P_{tot}	T_C = 25°C	250	W
V_{ISOL}	50/60 Hz, RMS	2500	V~
	$I_{ISOL} \leq$ 1 mA		
M_d	Mounting torque	1.5/13	Nm/lb.in.
	Terminal connection torque (M4)	1.5/13	Nm/lb.in.
Weight		30	g

Symbol	Test Conditions	Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$		3	mA
	T_{VJ} = 25°C V_R = 0.8 • V_{RRM}		1.5	mA
	T_{VJ} = 125°C V_R = 0.8 • V_{RRM}		15	mA
V_F	I_F = 100 A; T_{VJ} = 150°C		1.61	V
	T_{VJ} = 25°C		1.87	V
V_{T0}	For power-loss calculations only		1.01	V
r_T			6.1	mΩ
R_{thJC}			0.5	K/W
R_{thCH}		0.05		K/W
t_{rr}	I_F = 1 A; -di/dt = 400 A/µs; V_R = 30 V; T_{VJ} = 25°C	40	60	ns
I_{RM}	V_R = 100 V; I_F = 75 A; $-di_F/dt$ = 200 A/µs	24	30	A
	L ≤ 0.05 mH; T_{VJ} = 100°C			

miniBLOC, SOT-227 B



M4 screws (4x) supplied

Dim.	Millimeter Min.	Max.	Inches Min.	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

① I_{FAVM} rating includes reverse blocking losses at T_{VJM}, V_R = 0.8 V_{RRM}, duty cycle d = 0.5
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

008

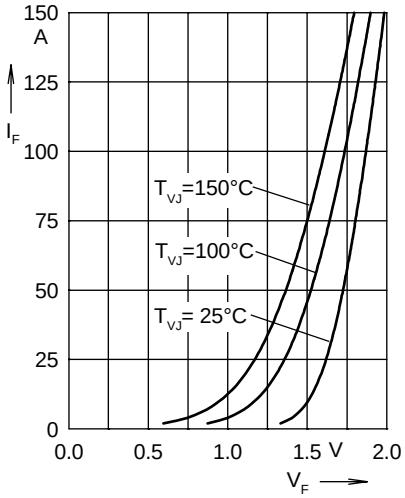


Fig. 1 Forward current I_F versus V_F

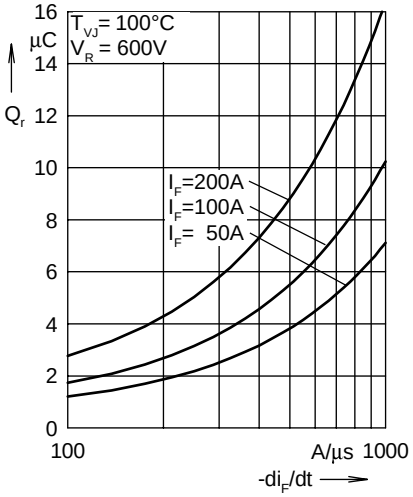


Fig. 2 Reverse recovery charge Q_r versus -di_F/dt

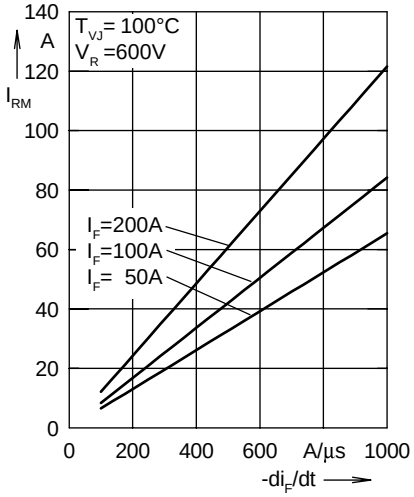


Fig. 3 Peak reverse current I_{RM} versus -di_F/dt

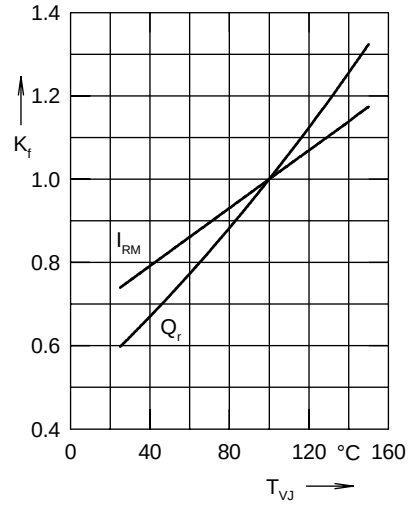


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

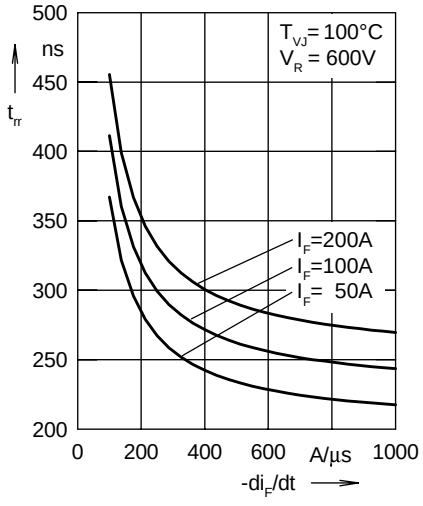


Fig. 5 Recovery time t_{rr} versus -di_F/dt

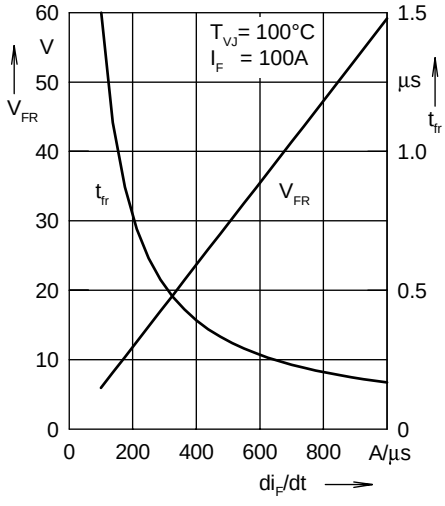


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

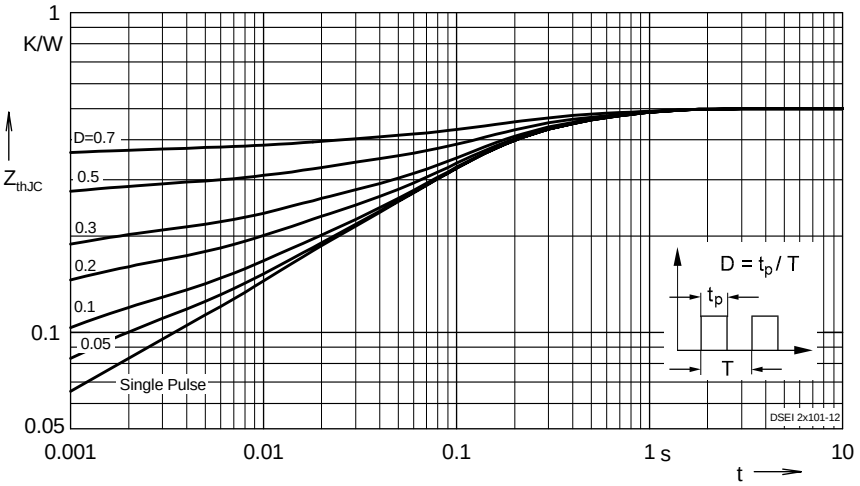


Fig. 7 Transient thermal impedance junction to case at various duty cycles

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.02	0.00002
2	0.05	0.00081
3	0.076	0.01
4	0.24	0.94
5	0.114	0.45