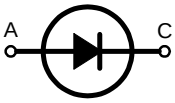
Contents

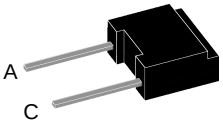
Rectifier Diode
Avalanche Diode

V_{RRM} = 1200-1800 V
$I_{F(RMS)}$ = 7 A
$I_{F(AV)M}$ = 2.3 A

V_{RSM} V	$V_{(BR)min}$ ① V	V_{RRM} V	Standard Type	Avalanche Types
1300	1300	1200	DS 1-12D	DSA 1-12D
1700	1750	1600		DSA 1-16D
1900	1950	1800		DSA 1-18D

① Only for Avalanche Diodes





A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	T_{VJ} = T_{VJM}		7	A
$I_{F(AV)M}$	T_{amb} = 45°C; R_{thJA} = 38 K/W; 180° sine		2.3	A
	T_{amb} = 45°C; R_{thJA} = 80 K/W; 180° sine		1.3	A
P_{RSM}	DSA types, T_{VJ} = T_{VJM}, t_p = 10 µs		1.6	kW
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	110	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	118	A
	T_{VJ} = T_{VJM}	t = 10 ms (50 Hz), sine	100	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	104	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	60	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	58	A^2s
	T_{VJ} = T_{VJM}	t = 10 ms (50 Hz), sine	50	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	45	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
Weight			0.8	g

Symbol	Test Conditions		Characteristic Values	
I_R	T_{VJ} = T_{VJM}; V_R = V_{RRM}	≤	0.7	mA
V_F	I_F = 7 A; T_{VJ} = 25°C	≤	1.3	V
V_{T0}	For power-loss calculations only		0.8	V
r_T	T_{VJ} = T_{VJM}		67	mΩ
R_{thJA}	Forced air cooling with 1.5 m/s, T_{amb} = 45°C		38	K/W
	Soldered on to PC board, T_{amb} = 45°C		80	K/W
d_S	Creepage distance on surface		8.5	mm
d_A	Strike distance through air		6.7	mm
a	Max. allowable acceleration		100	m/s^2

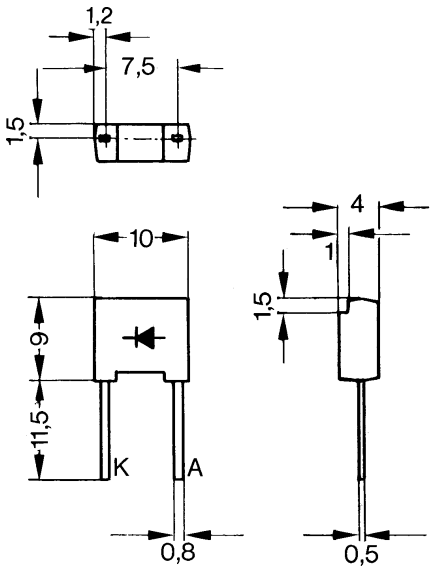
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features
- Plastic standard package
- Planar glassivated chips

Applications
- Low power rectifiers
- Field supply for DC motors
- Power supplies
- High voltage rectifiers

Advantages
- Space and weight savings
- Simple PCB mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")

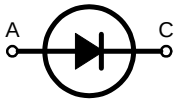


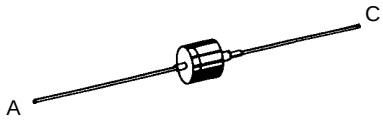
Rectifier Diode
Avalanche Diode

V_{RRM} = 800-1800 V
$I_{F(RMS)}$ = 7 A
$I_{F(AV)M}$ = 3.6 A

V_{RSM} V	$V_{(BR)min}$ ① V	V_{RRM} V	Standard Types	Avalanche Types
900		800	DS 2-08A	
1300	1300	1200	DS 2-12A	DSA 2-12A
1700	1750	1600		DSA 2-16A
1900	1950	1800		DSA 2-18A

① Only for Avalanche Diodes





A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
$I_{F(RMS)}$	T_{VJ} = T_{VJM}		7	A
$I_{F(AV)M}$	T_{amb} = 45°C; R_{thJA} = 30 K/W; 180° sine		3.6	A
	T_{amb} = 45°C; R_{thJA} = 115 K/W; 180° sine		1.2	A
P_{RSM}	DSA types, T_{VJ} = 25°C, t_p = 10 µs		2.5	kW
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	120	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	127	A
	T_{VJ} = T_{VJM}	t = 10 ms (50 Hz), sine	100	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	106	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	72	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	68	A^2s
	T_{VJ} = T_{VJM}	t = 10 ms (50 Hz), sine	50	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	47	A^2s
T_{VJM}			180	°C
T_{VJ}			-40...+180	°C
T_{stg}			-40...+180	°C
Weight			2.4	g

Symbol	Test Conditions		Characteristic Values	
I_R	T_{VJ} = 180°C; V_R = V_{RRM}	≤	2	mA
V_F	I_F = 7 A; T_{VJ} = 25°C	≤	1.25	V
V_{T0}	For power-loss calculations only		0.85	V
r_T	T_{VJ} = T_{VJM}		43	mΩ
R_{thJA}	Forced air cooling with 1.5 m/s, T_{amb} = 45°C		30	K/W
	Soldered between 2 cooling fins, T_{amb} = 45°C		37	K/W
	Soldered onto PC board (25 mm), T_{amb} = 45°C		75	K/W
	Free air cooling, T_{amb} = 45°C		115	K/W
d_S	Creepage distance on surface		2.25	mm
d_A	Strike distance through air		2.25	mm
a	Max. allowable acceleration		100	m/s^2

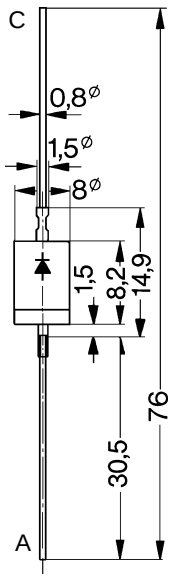
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features
- International standard package
- Axial wire connexions
- Planar glassivated chips

Applications
- Low power rectifiers
- Field supply for DC motors
- Power supplies
- High voltage rectifiers

Advantages
- Space and weight savings
- Simple PCB mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")



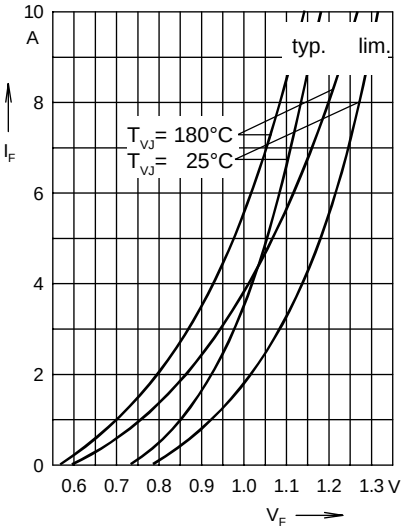


Fig. 1 Forward characteristics

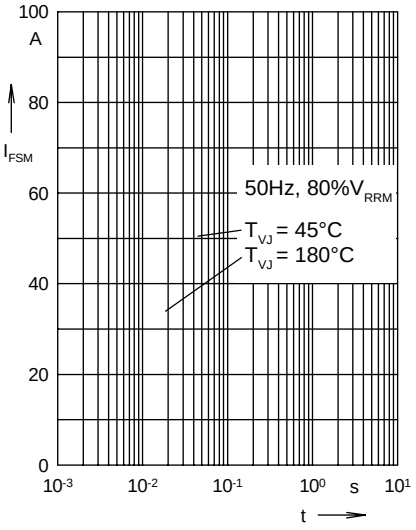


Fig. 2 Surge overload current
I_{FSM}: crest value, t: duration

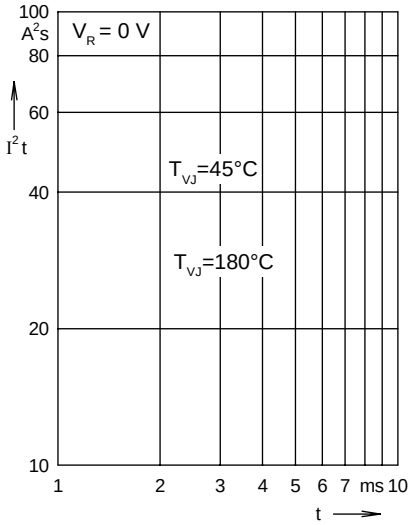


Fig. 3 I^2t versus time (1-10 ms)

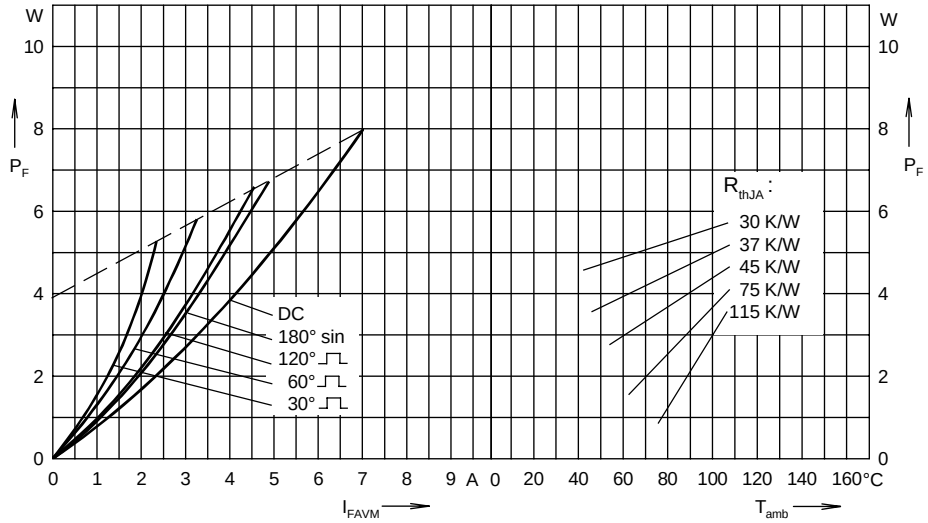


Fig. 4 Power dissipation versus forward current and ambient temperature

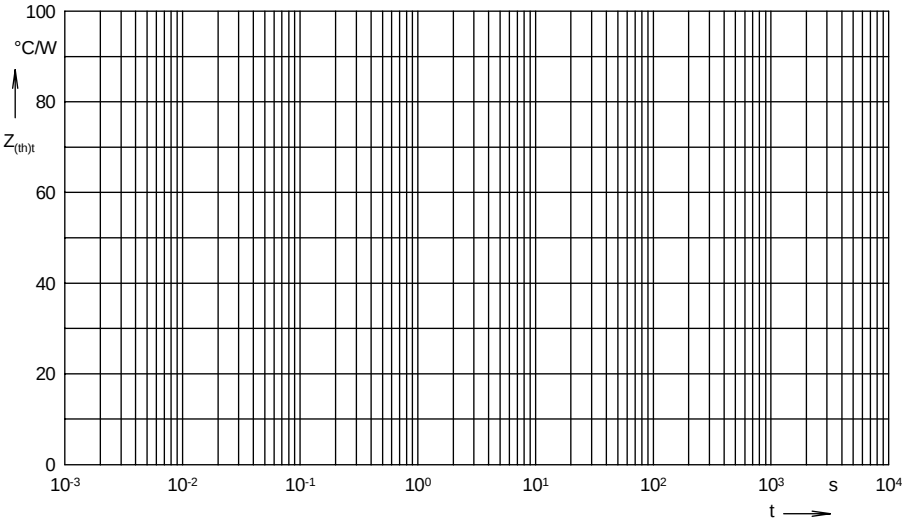


Fig. 5 Transient thermal impedance junction to ambient

R_{thJA} for various conduction angles d:

d	R_{thJA} (K/W)
DC	75
180°	75.7
120°	76.1
60°	76.7
30°	77.4

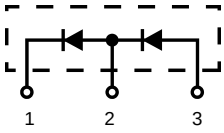
Constants for Z_{thJA} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.15	0.001
2	10.85	0.1
3	64	35

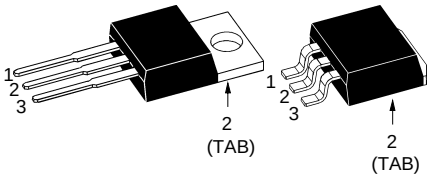
Phase-leg Rectifier Diode

V_{RRM} = 800/1200 V
$I_{F(RMS)}$ = 2 x 17 A
$I_{F(AV)M}$ = 2 x 11 A

V_{RSM} V	V_{RRM} V	TO-220 AB Type	TO-263 AA
900	800	DSP 8-08A	DSP 8-08AS
1300	1200	DSP 8-12A	DSP 8-12AS



TO-220 AB **TO-263 AA**



1 = Cathode, 2 = Anode/Cathode, 3 = Anode
TAB = Anode/Cathode

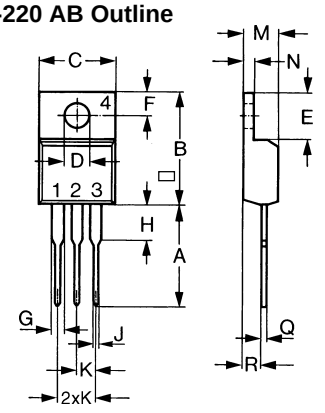
Symbol	Test Conditions			Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$			17	A
$I_{F(AV)M}$	T_{case} = 100°C; 180° sine			11	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms	(50 Hz), sine	100	A
		t = 8.3 ms	(60 Hz), sine	110	A
	T_{VJ} = 150°C;	t = 10 ms	(50 Hz), sine	90	A
		t = 8.3 ms	(60 Hz), sine	100	A
I^2t	T_{VJ} = 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	41	A^2s
		t = 8.3 ms	(60 Hz), sine	42	A^2s
T_{VJ}				-40...+180	°C
T_{VJM}				180	°C
T_{stg}				-40...+150	°C
M_d	Mounting torque			0.4...0.6	Nm
Weight			TO-263/TO-220	2/4	g

Symbol	Test Conditions		Characteristic Values	
I_R	T_{VJ} = 25°C $V_R = V_{RRM}$	≤	0.5	mA
V_F	I_F = 7 A; T_{VJ} = 25°C	≤	1.15	V
V_{T0}	For power-loss calculations only		0.8	V
r_T	$T_{VJ} = T_{VJM}$		40	mΩ
R_{thJC}	DC current		3.5	K/W
R_{thCK}	DC current (with heatsink compound)	typ.	0.6	K/W
a	Maximum allowable acceleration		100	m/s^2

Features

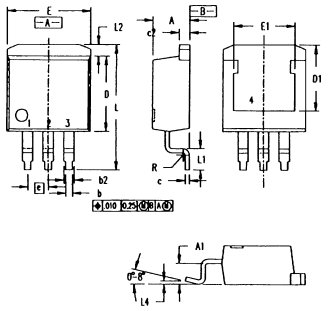
- International standard packages JEDEC TO-220 AB and TO-263 AA surface mountable
- For single and three phase bridge configuration
- Planar passivated chips
- Epoxy meets UL 94V-0 flammability classification

TO-220 AB Outline



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

TO-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
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

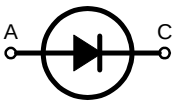
Data according to IEC 60747 and refer to a single diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

Rectifier Diode
Avalanche Diode

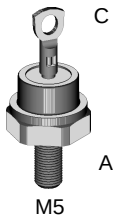
V_{RRM} = 800-1800 V
$I_{F(RMS)}$ = 18 A
$I_{F(AV)M}$ = 11 A

V_{RSM} V	$V_{(BR)min}$ ① V	V_{RRM} V	Standard Types	Avalanche Types
900		800	DS 9-08F	
1300	1300	1200	DS 9-12F	DSA 9-12F
1700	1750	1600		DSA 9-16F
1900	1950	1800		DSA 9-18F

① Only for Avalanche Diodes



DO-203 AA



A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
$I_{F(RMS)}$	$T_{VJ} = T_{VJM}$		18	A
$I_{F(AVM)}$	T_{case} = 150°C; 180° sine		11	A
P_{RSM}	DSA types, $T_{VJ} = T_{VJM}$, t_p = 10 µs		4.5	kW
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	250	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	265	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	200	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	220	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	310	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	295	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	200	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	190	A^2s
T_{VJ}			-40...+180	°C
T_{VJM}			180	°C
T_{stg}			-40...+180	°C
M_d	Mounting torque		2.2-2.8	Nm
			19-25	lb.in.
Weight			5	g

Symbol	Test Conditions		Characteristic Values	
I_R	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$	≤	3	mA
V_F	I_F = 36 A; T_{VJ} = 25°C	≤	1.4	V
V_{T0}	For power-loss calculations only		0.85	V
r_T	$T_{VJ} = T_{VJM}$		15	mΩ
R_{thJC}	DC current		2.0	K/W
	180° sine		2.17	K/W
R_{thJH}	DC current		3.0	K/W
d_S	Creepage distance on surface		2.0	mm
d_A	Strike distance through air		2.0	mm
a	Max. allowable acceleration		100	m/s^2

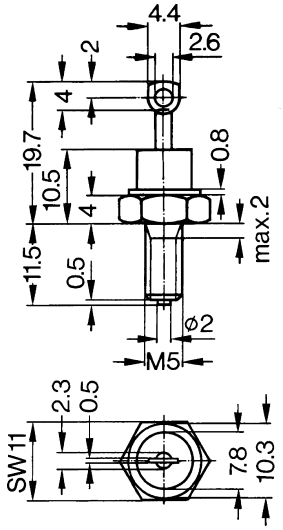
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features
- International standard package, JEDEC DO-203 AA
- Planar glassivated chips

Applications
- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

Advantages
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")



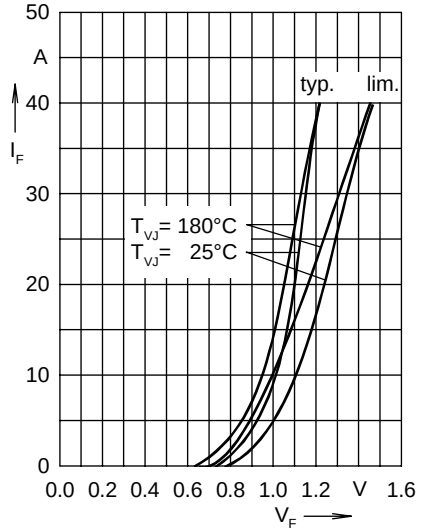


Fig. 1 Forward characteristics

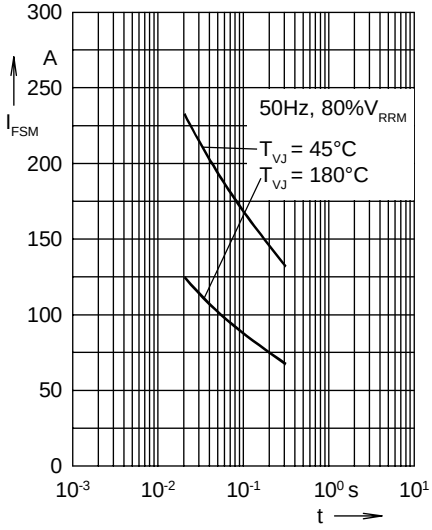


Fig. 2 Surge overload current
I_{FSM}: crest value, t: duration

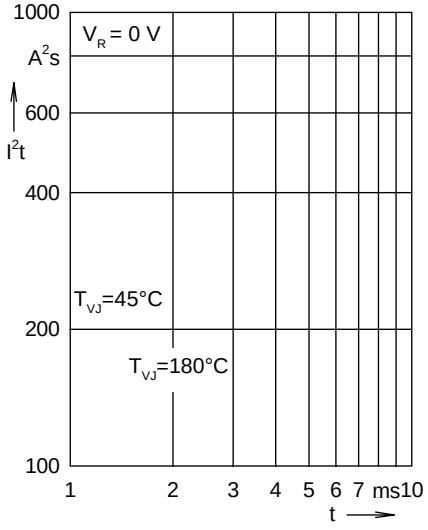


Fig. 3 I^2t versus time (1-10 ms)

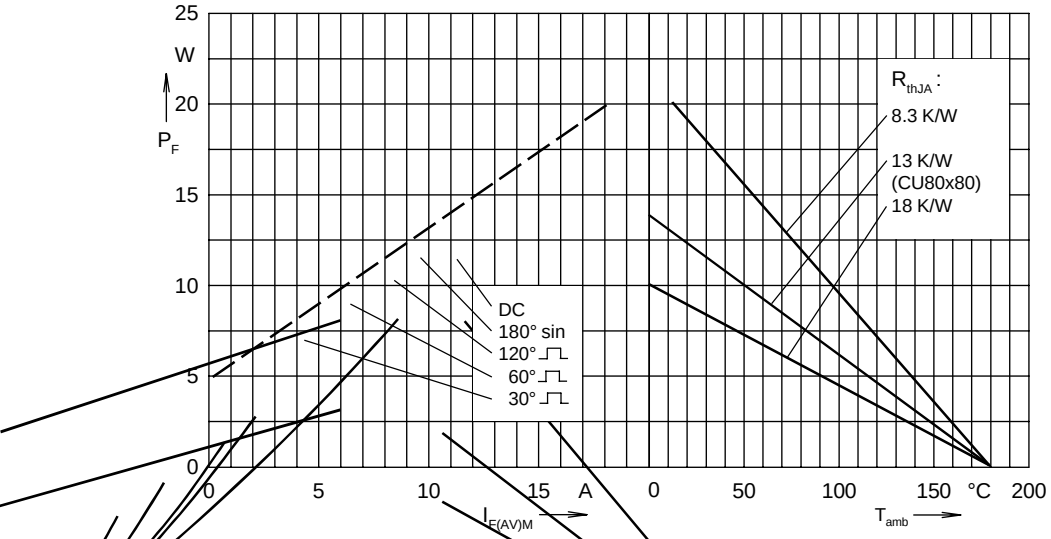


Fig. 4 Power dissipation versus forward current and ambient temperature

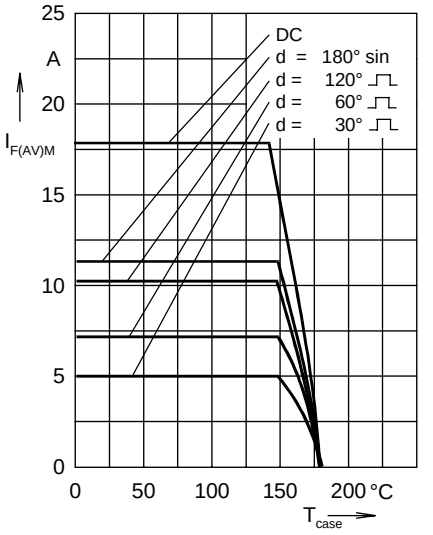


Fig. 5 Max. forward current at case temperature

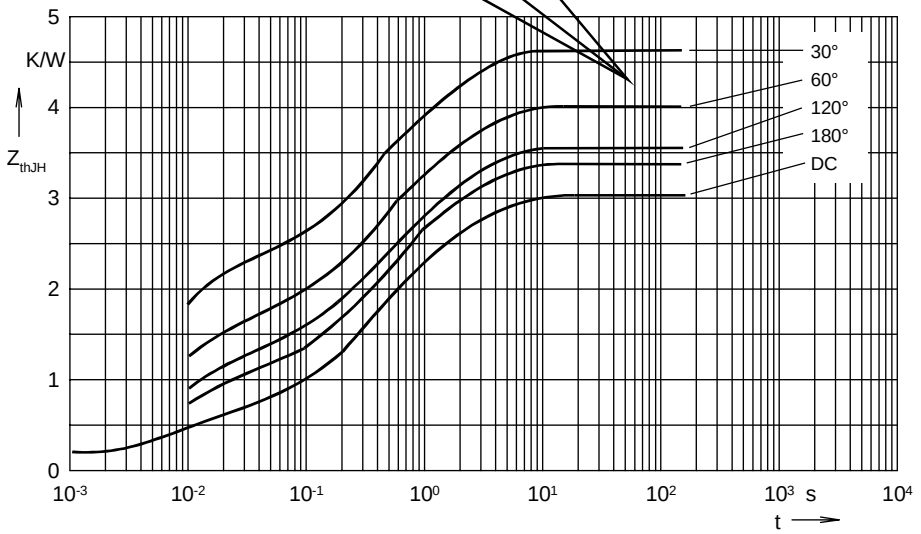


Fig. 6 Transient thermal impedance junction to heatsink

R_{thJH} for various conduction angles d:

d	R_{thJH} (K/W)
DC	3.0
180°	3.35
120°	3.56
60°	4.0
30°	4.64

Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.095	0.00032
2	0.515	0.0102
3	1.39	0.360
4	1.0	2.30

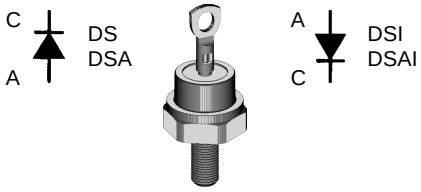
Rectifier Diode
Avalanche Diode

V_{RRM} = 800-1800 V
$I_{F(RMS)}$ = 40 A
$I_{F(AV)M}$ = 25 A

V_{RSM} V	$V_{(BR)min}$ ① V	V_{RRM} V	Anode on stud	Cathode on stud
900	-	800	DS 17-08A	DSI 17-08A
1300	-	1200	DS 17-12A	DSI 17-12A
1300	1300	1200	DSA 17-12A	DSAI 17-12A
1700	1750	1600	DSA 17-16A	DSAI 17-16A
1900	1950	1800	DSA 17-18A	DSAI 17-18A

① Only for Avalanche Diodes

DO-203 AA



A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
$I_{F(RMS)}$	$T_{VJ} = T_{VJM}$		40	A
$I_{F(AV)M}$	T_{case} = 125°C; 180° sine		25	A
P_{RSM}	DSA(I) types, $T_{VJ} = T_{VJM}$, t_p = 10 µs		7	kW
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	370	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	400	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	300	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	320	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	680	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	660	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	450	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	430	A^2s
T_{VJ}			-40...+180	°C
T_{VJM}			180	°C
T_{stg}			-40...+180	°C
M_d	Mounting torque		2.2-2.8	Nm
			19-25	lb.in.
Weight			6	g

Symbol	Test Conditions		Characteristic Values	
I_R	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$	≤	4	mA
V_F	I_F = 55 A; T_{VJ} = 25°C	≤	1.36	V
V_{T0}	For power-loss calculations only		0.85	V
r_T	$T_{VJ} = T_{VJM}$		8	mΩ
R_{thJC}	DC current		1.5	K/W
R_{thJH}	DC current		2.1	K/W
d_S	Creepage distance on surface		2.05	mm
d_A	Strike distance through air		2.05	mm
a	Max. allowable acceleration		100	m/s^2

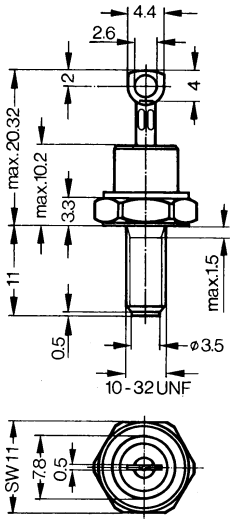
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

Features
- International standard package, JEDEC DO-203 AA (DO-4)
- Planar glassivated chips

Applications
- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

Advantages
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")



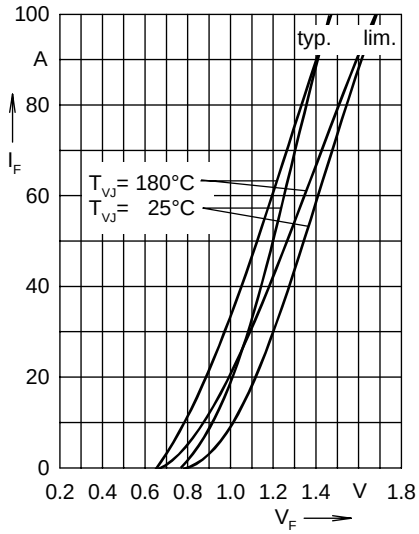


Fig. 1 Forward characteristics

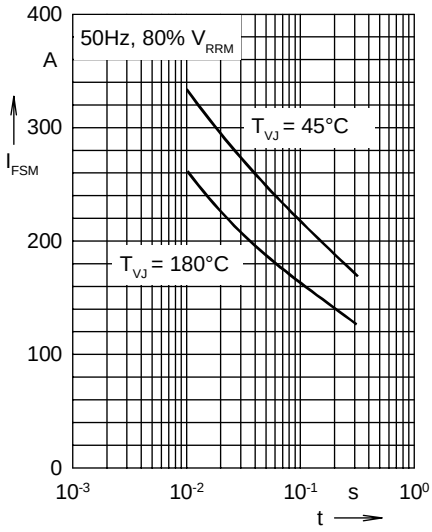


Fig. 2 Surge overload current
I_{FSM}: crest value, t: duration

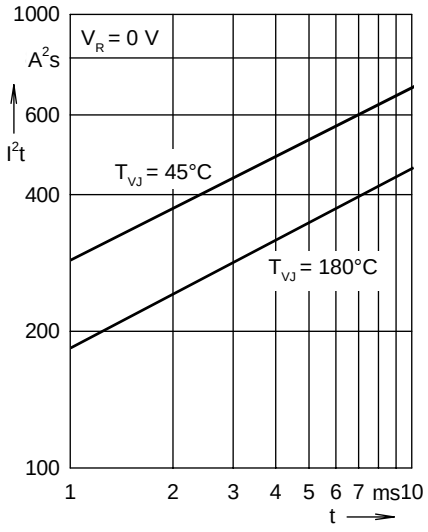


Fig. 3 I^2t versus time (1-10 ms)

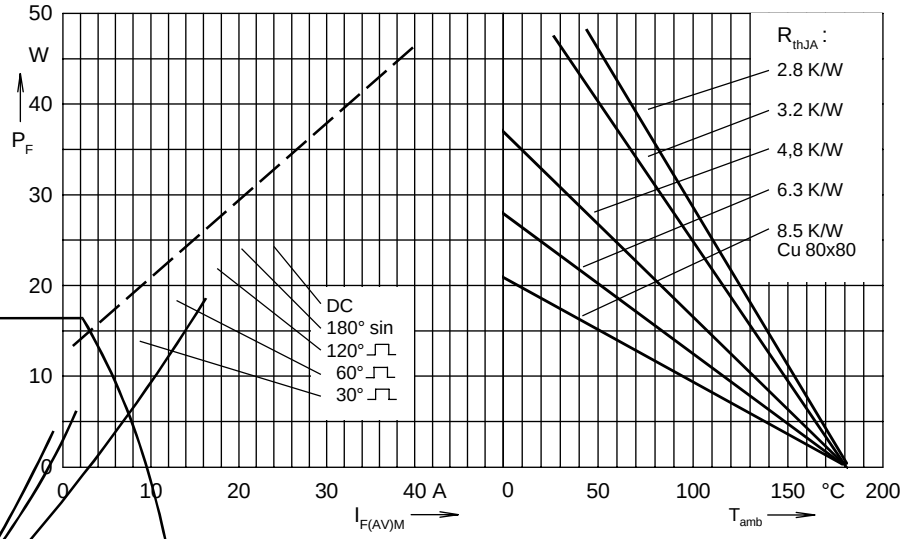


Fig. 4 Power dissipation versus forward current and ambient temperature

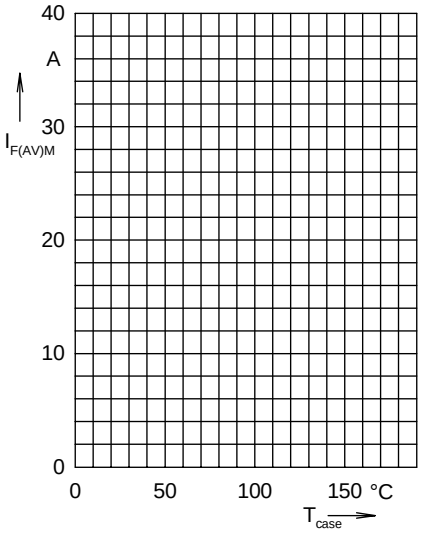


Fig. 5 Max. forward current at case temperature 180° sine

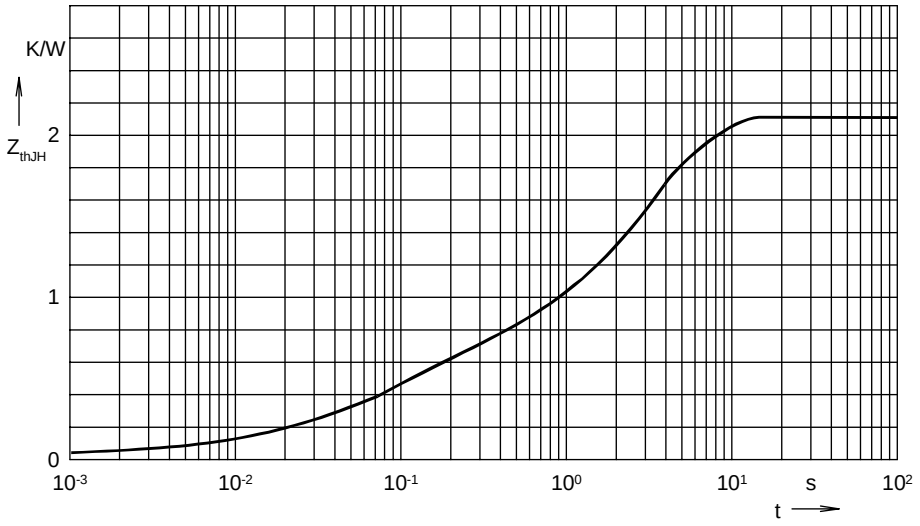


Fig. 6 Transient thermal impedance junction to heatsink

R_{thJH} for various conduction angles d:

d	R_{thJH} (K/W)
DC	2.10
180°	2.23
120°	2.33
60°	2.53
30°	2.72

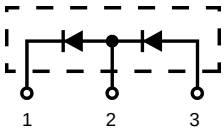
Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.1006	0.0021
2	0.5311	0.0881
3	0.8683	2.968
4	0.600	3.20

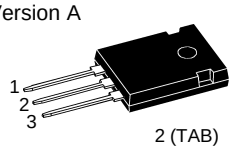
Phase-leg Rectifier Diode

V_{RRM} = 1200/1600 V
$I_{F(RMS)}$ = 2x43 A
$I_{F(AV)M}$ = 2x28 A

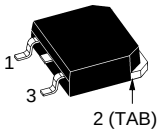
V_{RSM} V	V_{RRM} V	TO-247 AD Type	TO-268 AA	ISOPLUS 247 ™
1300	1200	DSP 25-12A	DSP 25-12AT	
1700	1600	DSP 25-16A	DSP 25-16AT	DSP 25-16AR



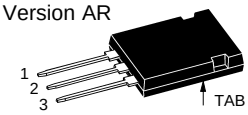
TO-247 AD
Version A



TO-268 AA
Version AT



ISOPLUS 247™
Version AR



1 = Cathode, 2 = Anode/Cathode, 3 = Anode

Symbol	Test Conditions			Maximum Ratings	
$I_{F(RMS)}$	$T_{VJ} = T_{VJM}$			43	A
$I_{F(AV)M}$	T_{case} = 100°C; 180° sine			28	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms	(50 Hz), sine	300	A
		t = 8.3 ms	(60 Hz), sine	330	A
	T_{VJ} = 150°C;	t = 10 ms	(50 Hz), sine	270	A
		t = 8.3 ms	(60 Hz), sine	300	A
I^2t	T_{VJ} = 45°C	t = 10 ms	(50 Hz), sine	450	A^2s
		t = 8.3 ms	(60 Hz), sine	450	A^2s
	T_{VJ} = 150°C;	t = 10 ms	(50 Hz), sine	340	A^2s
		t = 8.3 ms	(60 Hz), sine	325	A^2s
T_{VJ}				-40...+180	°C
T_{VJM}				180	°C
T_{stg}				-40...+150	°C
M_d *	mounting torque M3			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	TO-268 / TO-247			4 / 6	g

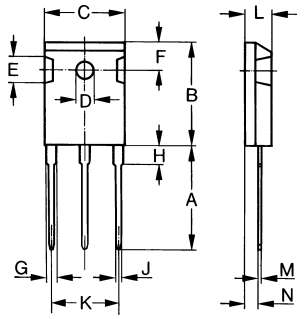
* Verson A only; ** Version AR only

Symbol	Test Conditions		Characteristic Values	
I_R	T_{VJ} = 150°C $V_R = V_{RRM}$	≤	2	mA
V_F	I_F = 55 A; T_{VJ} = 25°C	≤	1.6	V
V_{T0}	For power-loss calculations only		0.8	V
r_T	$T_{VJ} = T_{VJM}$		15	mΩ
R_{thJC}	DC current		1.5	K/W
R_{thCH}	DC current (with heatsink compound)		0.4	K/W
a	Maximum allowable acceleration		100	m/s^2

Features

- International standard packages JEDEC TO-247 AD and TO-268 AA surface mountable
- For single and three phase bridge configuration
- Planar passivated chips
- Epoxy meets UL 94V-0 flammability classification
- Version AR isolated and UL registered E153432

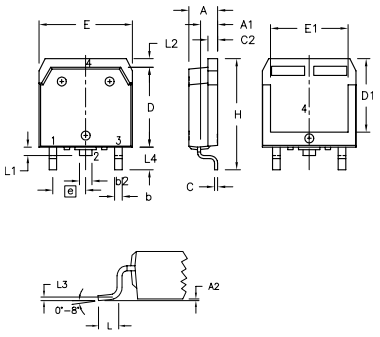
TO-247 AD and ISOPLUS 247™



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	1.5	2.49	0.087	0.102

* ISOPLUS 247™ without hole

TO-268 AA Outline



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

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

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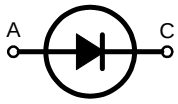
Rectifier Diode

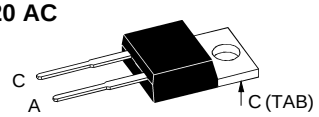
V_{RRM} = 800-1600 V
$I_{F(AV)M}$ = 30 A

V_{RSM} V	V_{RRM} V	TO-220	TO-263
900	800	DSI 30-08A	DSI 30-08AS
1300	1200	DSI 30-12A	DSI 30-12AS
1500	1400	DSI 30-14A	DSI 30-14AS
1700	1600	DSI 30-16A	DSI 30-16AS



TO-263 AA

TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

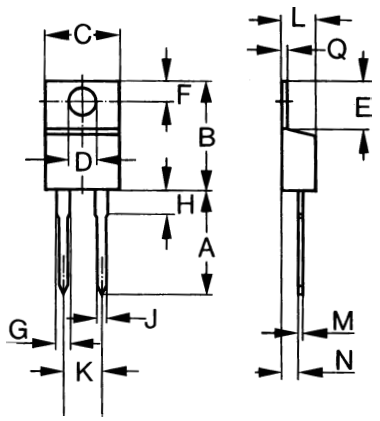
Features

- International standard packages JEDEC TO-263 AA surface mountable
- Planar passivated chips
- Epoxy meets UL 94V-0 flammability classification

Symbol	Conditions		Maximum Ratings	
$I_{F(AV)M}$	T_C = 95°C; 180° sine		30	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	300	A
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	330	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	270	A
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	300	A
I^2t	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	450	A^2s
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	460	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	365	A^2s
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	380	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
M_d	Mounting torque		0.4...0.6	Nm
Weight			2	g

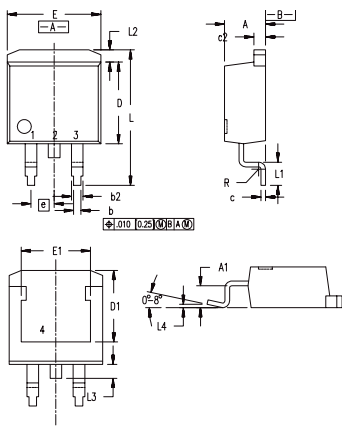
Symbol	Conditions	Characteristic Values		
I_R	T_{VJ} = T_{VJM}; V_R = V_{RRM}	≤	1	mA
V_F	I_F = 45 A; T_{VJ} = 25°C	≤	1.45	V
V_{T0}	For power-loss calculations only		0.85	V
r_T	T_{VJ} = T_{VJM}		13	mΩ
R_{thJC}	DC current		1.0	K/W

TO-220 Outline



Dim.	Millimeter Min.	Max.	Inches 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

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

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

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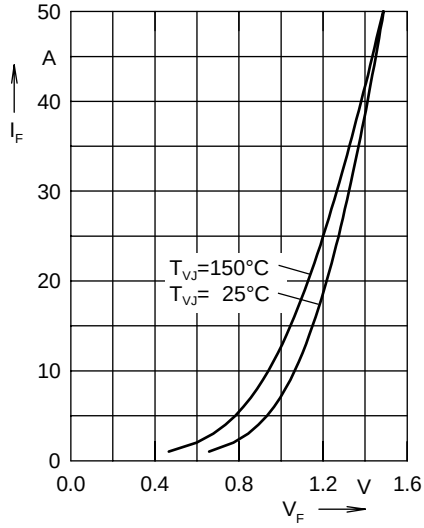


Fig. 1 Forward current versus voltage drop per diode

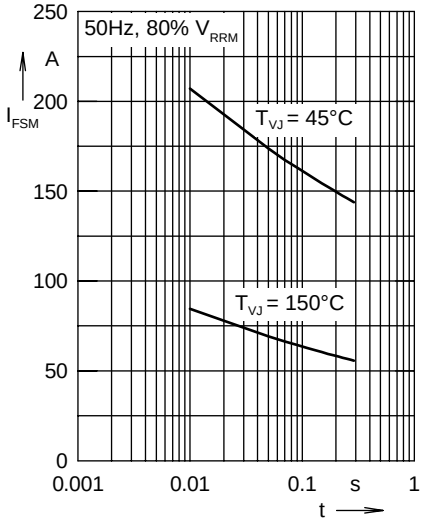


Fig. 2 Surge overload current

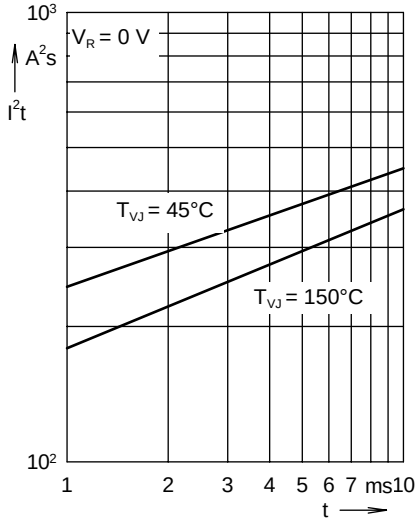


Fig. 3 I^2t versus time per diode

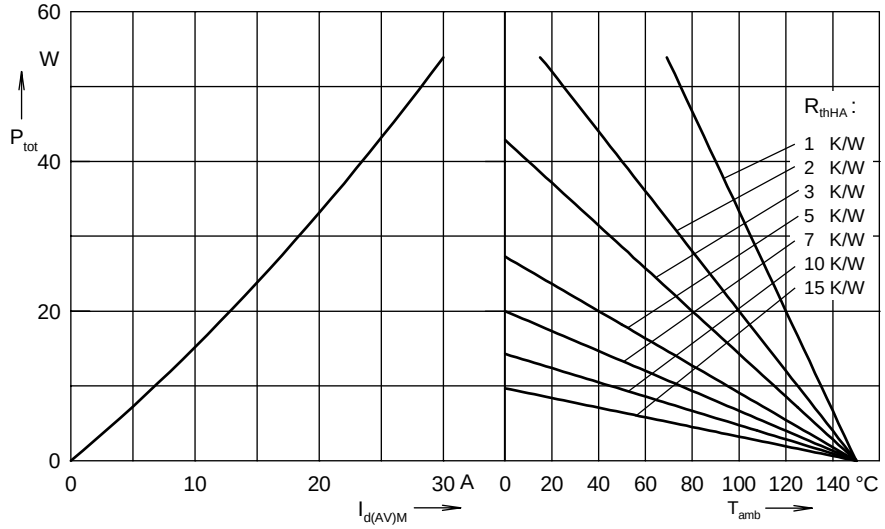


Fig. 4 Power dissipation versus direct output current and ambient temperature, sine 180°

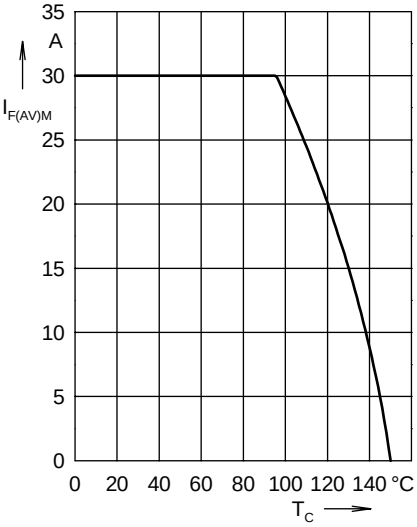


Fig. 5 Max. forward current versus case temperature

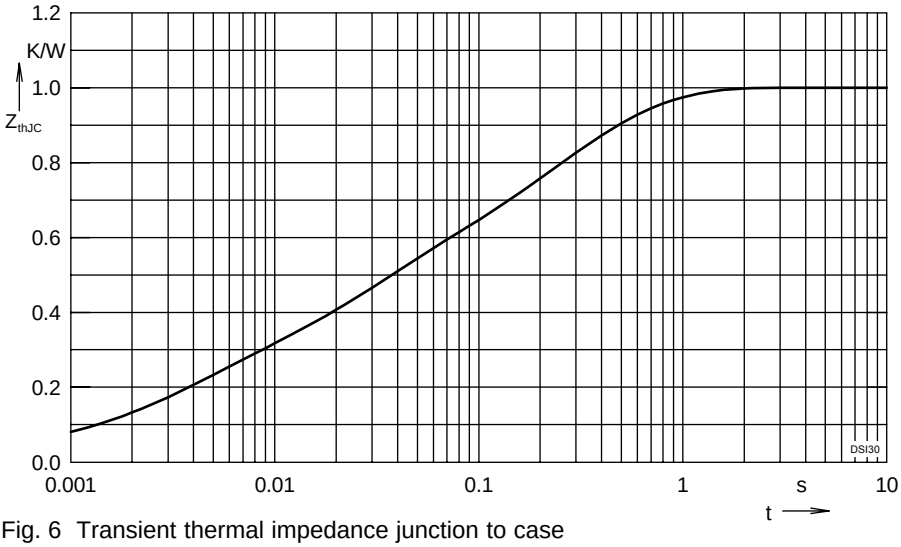


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.01362	0.0001
2	0.1962	0.00316
3	0.267	0.023
4	0.3052	0.4
5	0.218	0.15

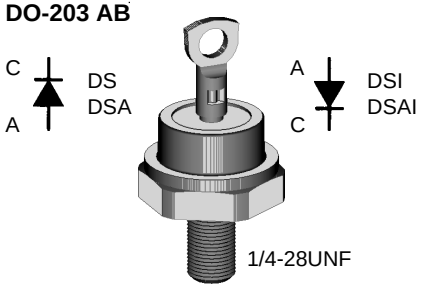
Rectifier Diode
Avalanche Diode

V_{RRM} = 800-1800 V
$I_{F(RMS)}$ = 80 A
$I_{F(AV)M}$ = 49 A

V_{RSM} V	$V_{(BR)min}$ ① V	V_{RRM} V	Anode on stud	Cathode on stud
900	-	800	DS 35-08A	DSI 35-08A
1300	-	1200	DS 35-12A	DSI 35-12A
1300	1300	1200	DSA 35-12A	DSAI 35-12A
1700	1750	1600	DSA 35-16A	DSAI 35-16A
1900	1950	1800	DSA 35-18A	DSAI 35-18A

① Only for Avalanche Diodes

DO-203 AB



A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
$I_{F(RMS)}$	$T_{VJ} = T_{VJM}$		80	A
$I_{F(AVM)}$	T_{case} = 100°C; 180° sine		49	A
P_{RSM}	DSA(I) types, $T_{VJ} = T_{VJM}$, t_p = 10 µs		11	kW
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	650	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	690	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	600	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	640	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	2100	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	2000	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	1800	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	1700	A^2s
T_{VJ}			-40...+180	°C
T_{VJM}			180	°C
T_{stg}			-40...+180	°C
M_d	Mounting torque		4.5-5.5	Nm
			40-49	lb.in.
Weight			15	g

Symbol	Test Conditions		Characteristic Values	
I_R	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$	≤	4	mA
V_F	I_F = 150 A; T_{VJ} = 25°C	≤	1.55	V
V_{T0}	For power-loss calculations only		0.85	V
r_T	$T_{VJ} = T_{VJM}$		4.5	mΩ
R_{thJC}	DC current		1.05	K/W
R_{thJH}	DC current		1.25	K/W
d_S	Creepage distance on surface		4.05	mm
d_A	Strike distance through air		3.9	mm
a	Max. allowable acceleration		100	m/s^2

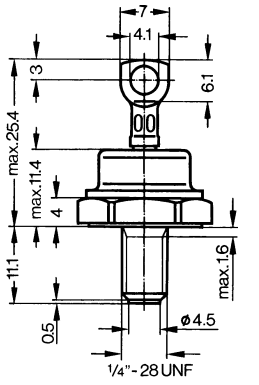
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

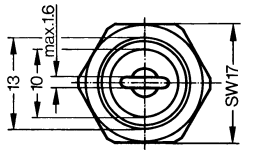
Features
- International standard package, JEDEC DO-203 AB (DO-5)
- Planar glassivated chips

Applications
- High power rectifiers
- Field supply for DC motors
- Power supplies

Advantages
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")





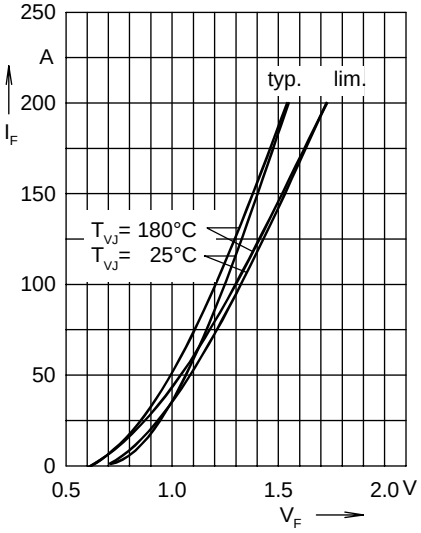


Fig. 1 Forward characteristics

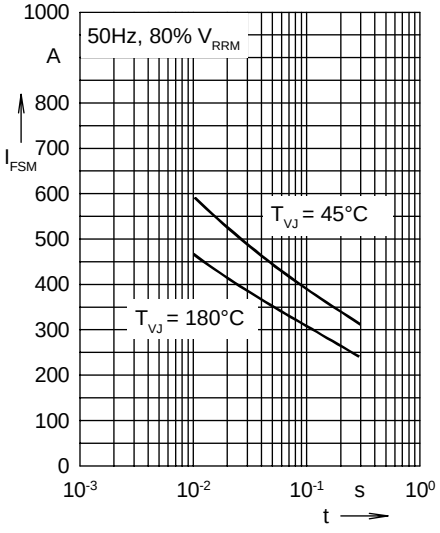


Fig. 2 Surge overload current
I_{FSM}: crest value, t: duration

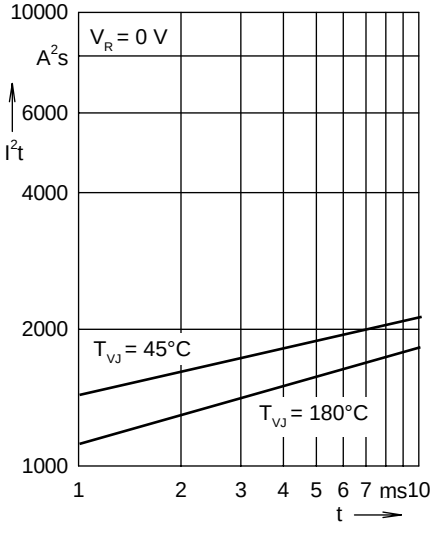


Fig. 3 I^2t versus time (1-10 ms)

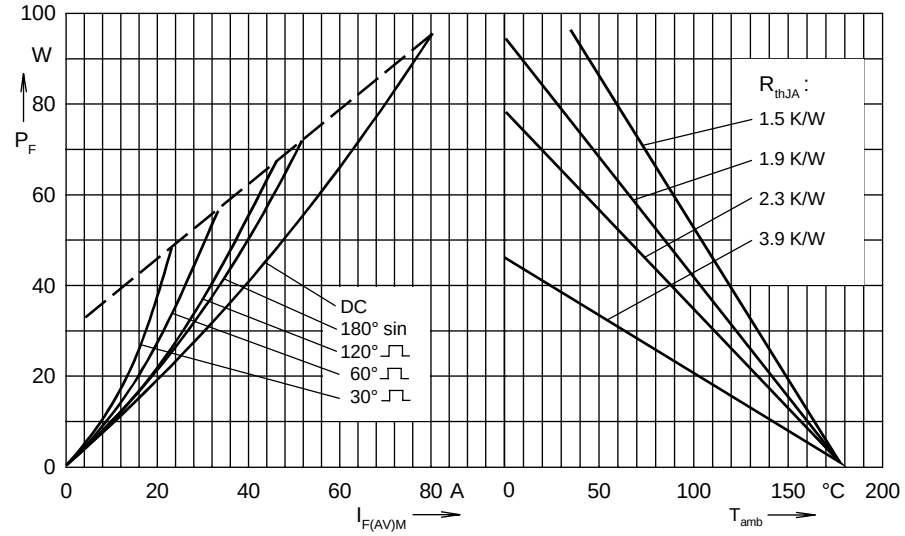


Fig. 4 Power dissipation versus forward current and ambient temperature

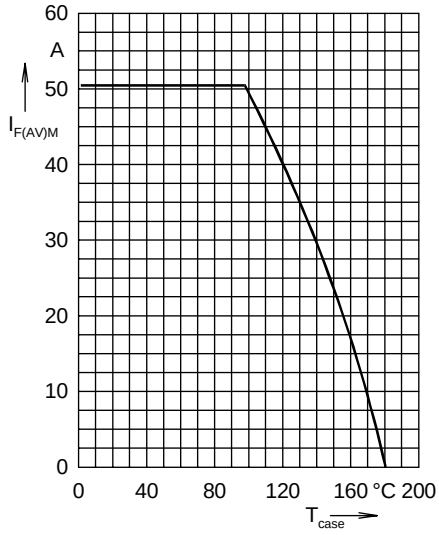


Fig. 5 Max. forward current at case temperature 180° sine

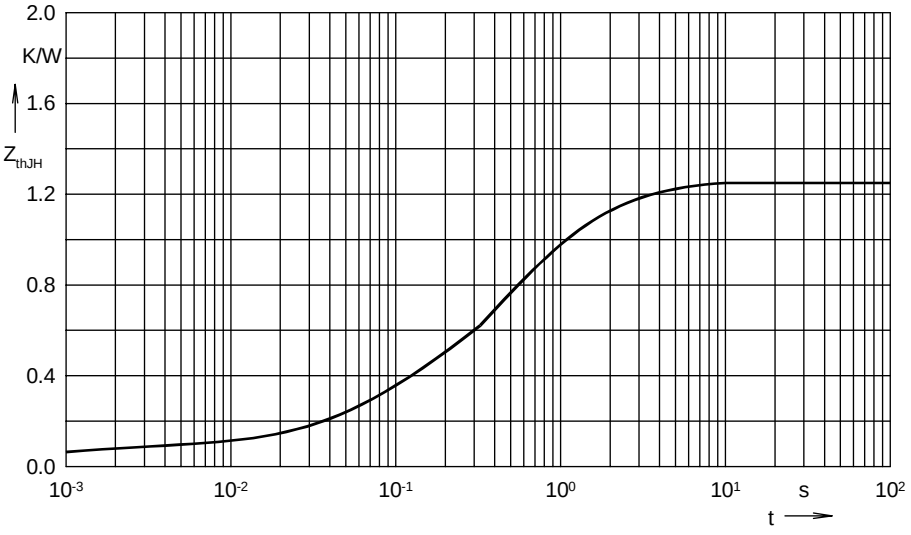


Fig. 6 Transient thermal impedance junction to heatsink

R_{thJH} for various conduction angles d:

d	R_{thJH} (K/W)
DC	1.25
180°	1.37
120°	1.47
60°	1.74
30°	2.08

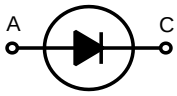
Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.10	0.0012
2	0.25	0.1181
3	0.70	0.6540
4	0.20	2.0

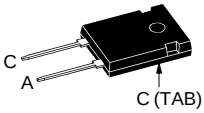
Rectifier Diode

V_{RRM} = 800-1600 V
$I_{F(AV)M}$ = 48 A

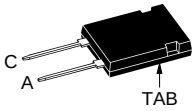
V_{RSM} V	V_{RRM} V	Type	
900	800	DSI 45-08A	
1300	1200	DSI 45-12A	
1700	1600	DSI 45-16A	DSI 45-16AR



TO-247 AD
Version A



ISOPLUS 247™
Version AR



A = Anode, C = Cathode

Symbol	Test Conditions		Maximum Ratings	
$I_{F(AV)M}$	T_C = 105°C; 180° sine		48	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	475	A
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	520	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	380	A
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	420	A
I^2t	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	1120	A^2s
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	1120	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	720	A^2s
	V_R = 0 V;	t = 8.3 ms (60 Hz), sine	720	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
M_d *	mounting torque		0.8...1.2	Nm
V_{ISOL} **	50/60 Hz, RMS, t = 1 minute, leads-to-tab		2500	V~
Weight	typical		6	g

* Verson A only; ** Version AR only

Symbol	Test Conditions		Characteristic Values		
I_R	T_{VJ} = T_{VJM}; V_R = V_{RRM}		≤	3	mA
V_F	I_F = 40 A; T_{VJ} = 25°C		≤	1.18	V
V_{T0}	For power-loss calculations only			0.8	V
r_T	T_{VJ} = T_{VJM}			8	mΩ
R_{thJC}	DC current			0.55	K/W
R_{thCH}	typical			0.2	K/W

Features

- International standard package
- Planar glassivated chips
- Version AR isolated and UL registered E153432
- Epoxy meets UL 94V-0

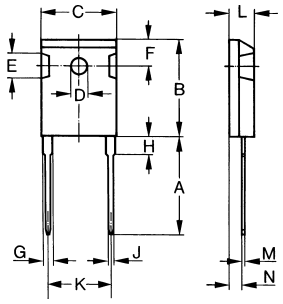
Applications

- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

Advantages

- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")



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	1.5	2.49	0.087	0.102

* ISOPLUS 247 ™ without hole

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

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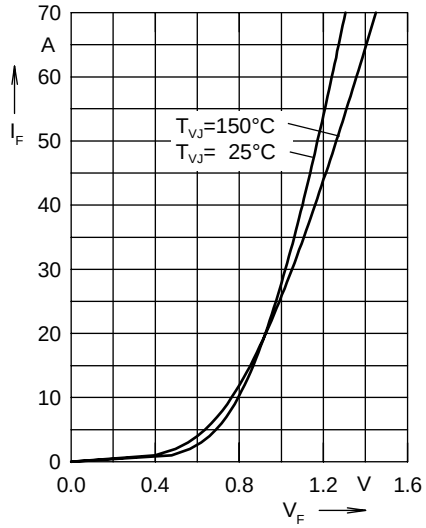


Fig. 1 Forward current versus voltage drop per diode

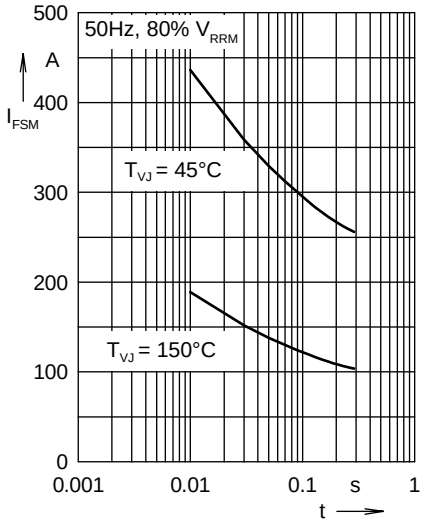


Fig. 2 Surge overload current

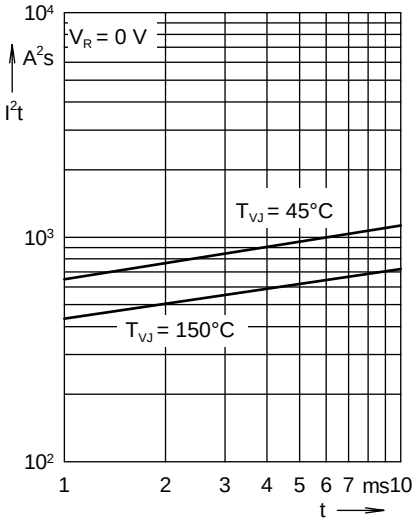


Fig. 3 I^2t versus time per diode

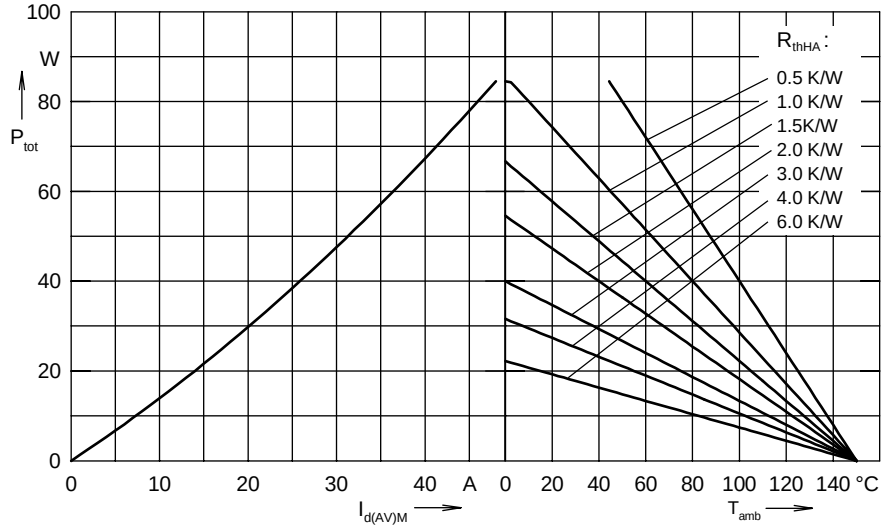


Fig. 4 Power dissipation versus direct output current and ambient temperature, sine 180°

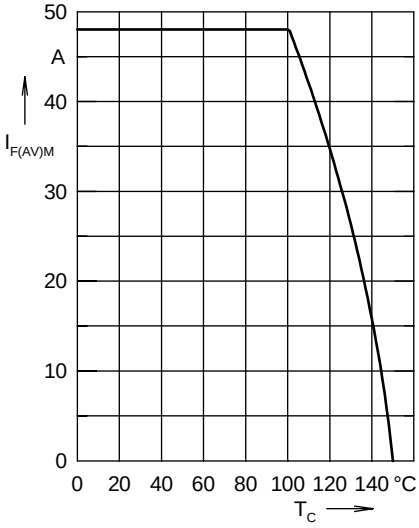


Fig. 5 Max. forward current versus case temperature

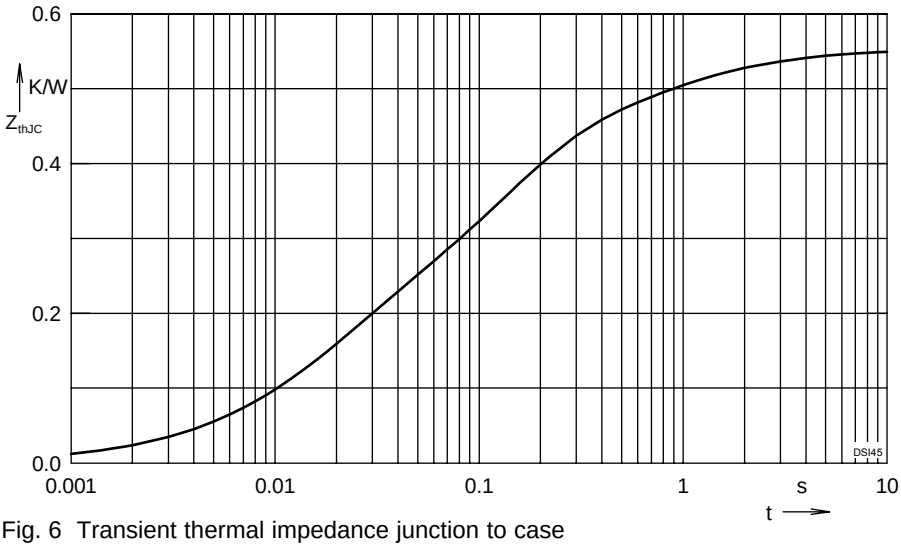


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

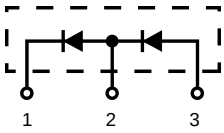
i	R_{thi} (K/W)	t_i (s)
1	0.1633	0.016
2	0.2517	0.118
3	0.0933	0.588
4	0.04167	2.6

Phase-leg Rectifier Diode

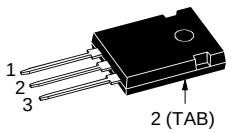
V_{RRM} = 1200/1600 V
$I_{F(RMS)}$ = 2x 70 A
$I_{F(AV)M}$ = 2x 45 A

Preliminary data

V_{RSM} V	V_{RRM} V	Type
1300	1200	DSP 45-12A
1700	1600	DSP 45-16A



TO-247 AD



1 = Cathode, 2 = Anode/Cathode, 3 = Anode

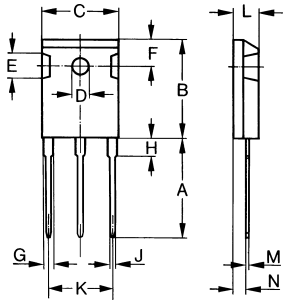
Symbol	Test Conditions			Maximum Ratings	
$I_{F(RMS)}$				70	A
$I_{F(AV)M}$	T_C = 130°C; 180° sine			45	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms	(50 Hz), sine	480	A
		t = 8.3 ms	(60 Hz), sine	510	A
	T_{VJ} = 150°C;	t = 10 ms	(50 Hz), sine	420	A
		t = 8.3 ms	(60 Hz), sine	450	A
I^2t	T_{VJ} = 45°C	t = 10 ms	(50 Hz), sine	1150	A^2s
		t = 8.3 ms	(60 Hz), sine	1090	A^2s
	T_{VJ} = 150°C;	t = 10 ms	(50 Hz), sine	880	A^2s
		t = 8.3 ms	(60 Hz), sine	850	A^2s
T_{VJ}				-40...+180	°C
T_{VJM}				180	°C
T_{stg}				-40...+150	°C
M_d	mounting torque M3			0.8...1.2	Nm
Weight				6	g

Symbol	Test Conditions		Characteristic Values	
I_R	T_{VJ} = 150°C V_R = V_{RRM}	≤	3	mA
V_F	I_F = 40 A; T_{VJ} = 25°C	≤	1.23	V
V_{T0}	For power-loss calculations only		0.8	V
r_T			11	mΩ
R_{thJC}	DC current		0.55	K/W
R_{thCH}	With heatsink compound	typ.	0.2	K/W
a	Maximum allowable acceleration		50	m/s^2

Features

- International standard package JEDEC TO-247 AD
- For single and three phase bridge configuration
- Planar passivated chips
- Epoxy meets UL 94V-0 flammability classification

Dimensions in mm (1 mm = 0.0394")



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	1.5	2.49	0.087	0.102

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

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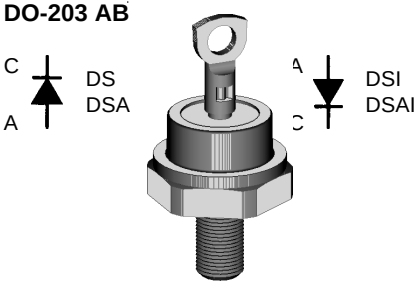
Rectifier Diode
Avalanche Diode

V_{RRM} = 800-1800 V
$I_{F(RMS)}$ = 160 A
$I_{F(AV)M}$ = 110 A

V_{RSM} V	$V_{(BR)min}$ ① V	V_{RRM} V	Anode on stud	Cathode on stud
900	-	800	DS 75-08B	DSI 75-08B
1300	-	1200	DS 75-12B	DSI 75-12B
1300	1300	1200	DSA 75-12B	DSAI 75-12B
1700	1760	1600	DSA 75-16B	DSAI 75-16B
1900	1950	1800	DSA 75-18B	DSAI 75-18B

① Only for Avalanche Diodes

DO-203 AB



1/4-28UNF

A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
$I_{F(RMS)}$	$T_{VJ} = T_{VJM}$		160	A
$I_{F(AV)M}$	T_{case} = 100°C; 180° sine		110	A
P_{RSM}	DSA(I) types, $T_{VJ} = T_{VJM}$, t_p = 10 µs		20	kW
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	1400	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	1500	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	1250	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	1310	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	9800	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	9450	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	7820	A^2s
	V_R = 0	t = 8.3 ms (60 Hz), sine	7210	A^2s
T_{VJ}			-40...+180	°C
T_{VJM}			180	°C
T_{stg}			-40...+180	°C
M_d	Mounting torque		2.4-4.5	Nm
			21-40	lb.in.
Weight			21	g

Symbol	Test Conditions		Characteristic Values	
I_R	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$	≤	6	mA
V_F	I_F = 150 A; T_{VJ} = 25°C	≤	1.17	V
V_{T0}	For power-loss calculations only		0.75	V
r_T	$T_{VJ} = T_{VJM}$		2	mΩ
R_{thJC}	DC current		0.5	K/W
R_{thJH}	DC current		0.9	K/W
d_S	Creepage distance on surface		4.05	mm
d_A	Strike distance through air		3.9	mm
a	Max. allowable acceleration		100	m/s^2

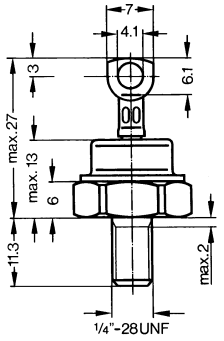
Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

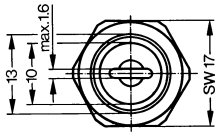
Features
- International standard package, JEDEC DO-203 AB (DO-5)
- Planar glassivated chips

Applications
- High power rectifiers
- Field supply for DC motors
- Power supplies

Advantages
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")





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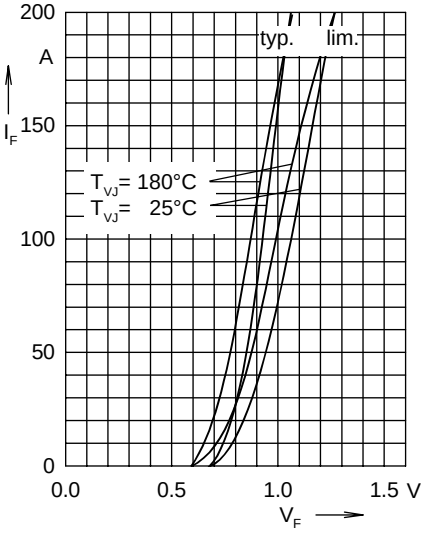


Fig. 1 Forward characteristics

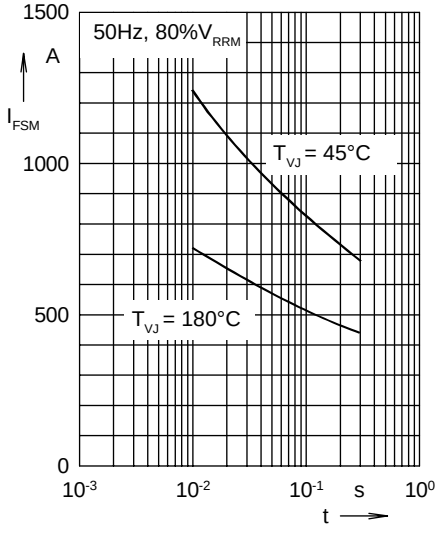


Fig. 2 Surge overload current
I_{FSM}: crest value, t: duration

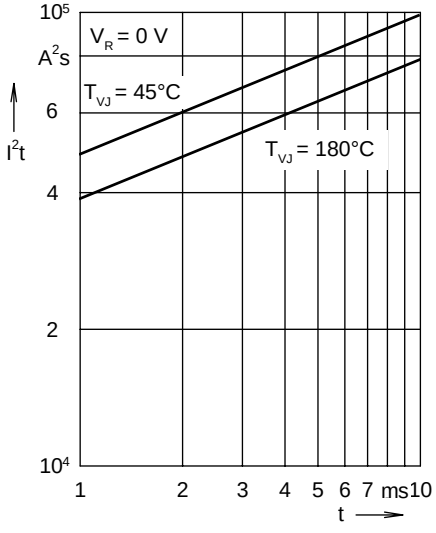


Fig. 3 I^2t versus time (1-10 ms)

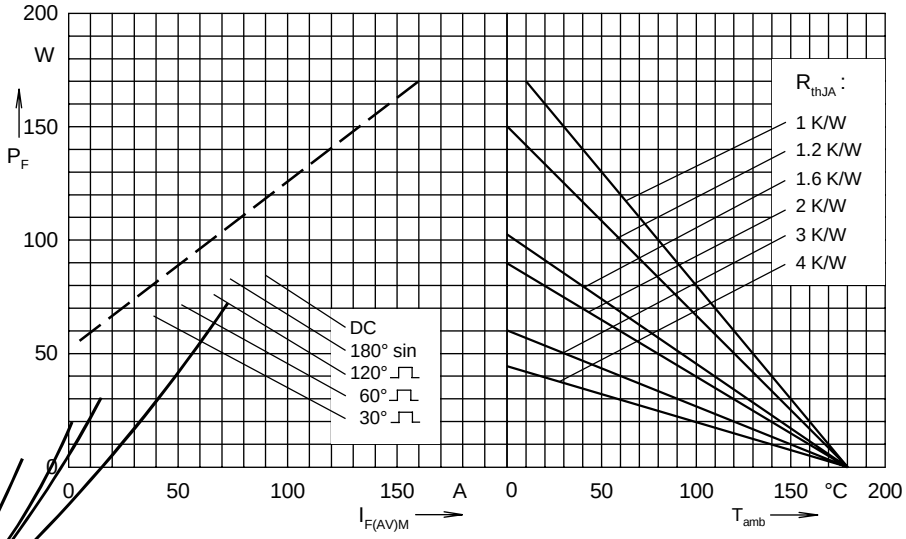


Fig. 4 Power dissipation versus forward current and ambient temperature

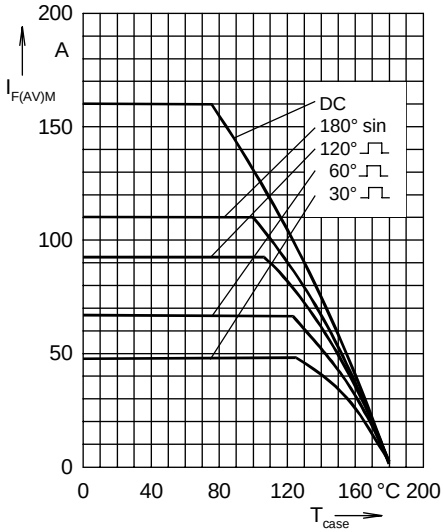


Fig. 5 Max. forward current at case temperature

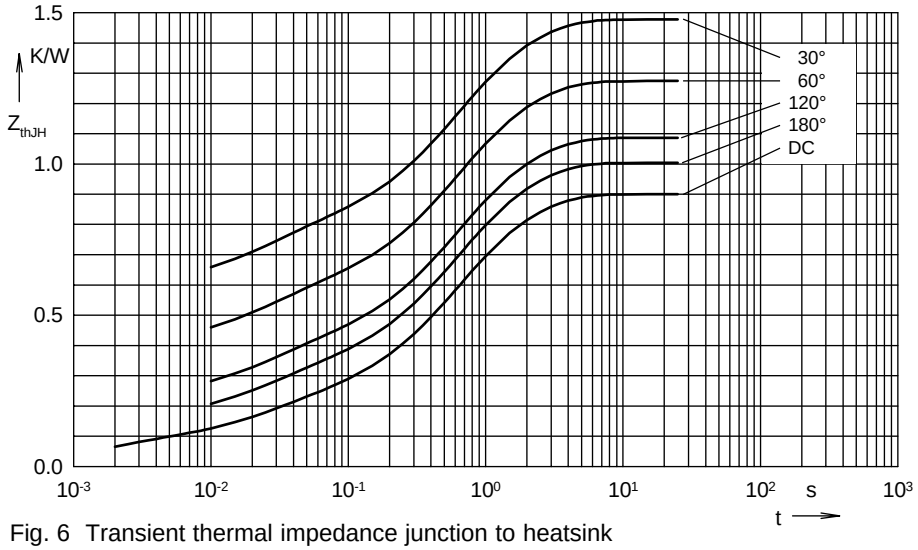


Fig. 6 Transient thermal impedance junction to heatsink

R_{thJH} for various conduction angles d:

d	R_{thJH} (K/W)
DC	0.900
180°	1.028
120°	1.085
60°	1.272
30°	1.476

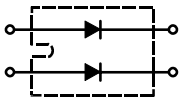
Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0731	0.0015
2	0.1234	0.0237
3	0.4035	0.4838
4	0.3000	1.5

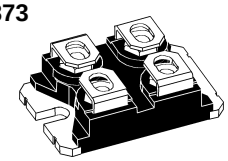
Rectifier Diode

$I_{F(AV)M}$ = 2x 56 A
V_{RRM} = 1200-1600 V

V_{RSM} V	V_{RRM} V	Type
1300	1200	DSI 2x55-12A
1700	1600	DSI 2x55-16A



miniBLOC, SOT-227 B
E72873



Features
- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- 2 independent rectifier diodes in one package
- Planar passivated chips

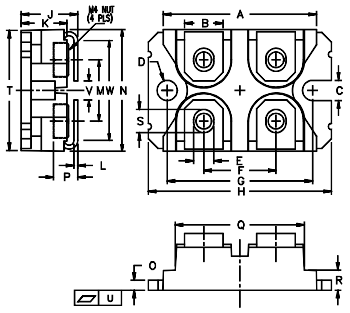
Applications
- Input rectifier diode
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating and melting
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

Symbol	Conditions		Maximum Ratings (per diode)	
I_{FRMS}			120	A
$I_{F(AV)M}$	T_C = 80°C; 180° sine		56	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	650	A
		t = 8.3 ms (60 Hz), sine	700	A
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	570	A
		t = 8.3 ms (60 Hz), sine	610	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	2210	A^2s
		t = 8.3 ms (60 Hz), sine	2060	A^2s
	T_{VJ} = 150°C;	t = 10 ms (50 Hz), sine	1620	A^2s
		t = 8.3 ms (60 Hz), sine	1560	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+150	°C
P_{tot}	T_C = 25°C		190	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	Conditions		Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		0.3	mA
	T_{VJ} = 150°C			5	mA
V_F	I_F = 60 A;	T_{VJ} = 125°C		1.25	V
		T_{VJ} = 25°C		1.20	V
V_{T0}	For power-loss calculations only			0.8	V
r_T	$T_{VJ} = T_{VJM}$			8	mΩ
R_{thJC}				0.65	K/W
R_{thCH}			0.1		K/W

Data according to IEC 60747

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

008

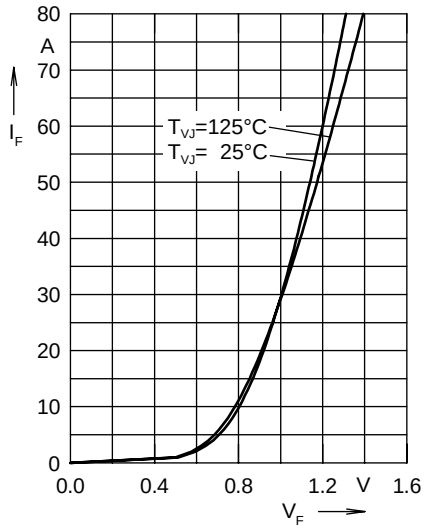


Fig. 1 Forward current versus voltage drop per diode

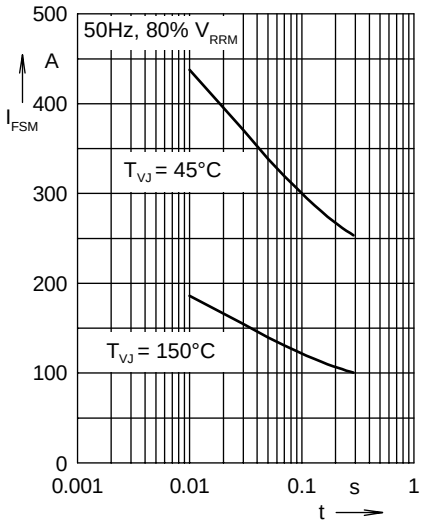


Fig. 2 Surge overload current

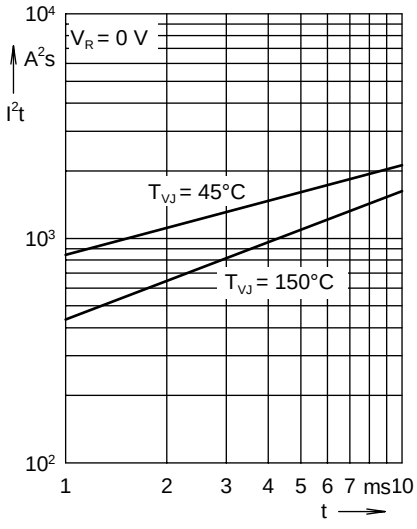


Fig. 3 I^2t versus time per diode

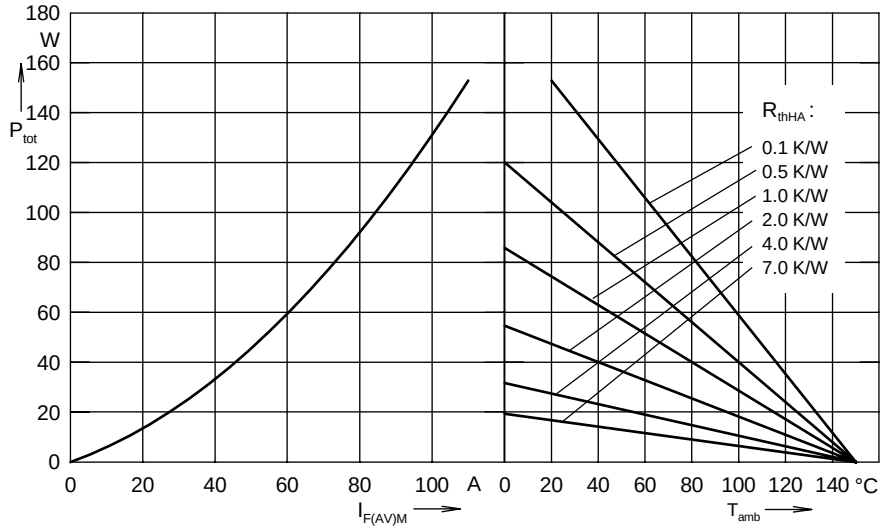


Fig. 4 Power dissipation versus direct output current and ambient temperature, sine 180°

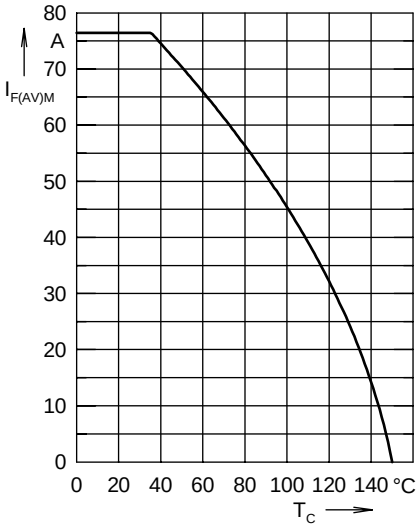


Fig. 5 Max. forward current versus case temperature, sine180°

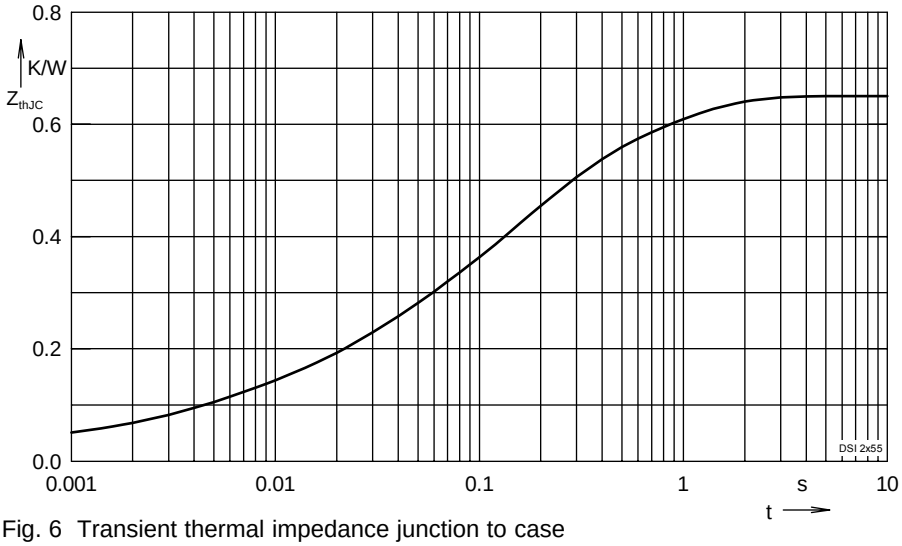


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.031	0.00024
2	0.0554	0.0036
3	0.114	0.0235
4	0.281	0.142
5	0.1686	0.7