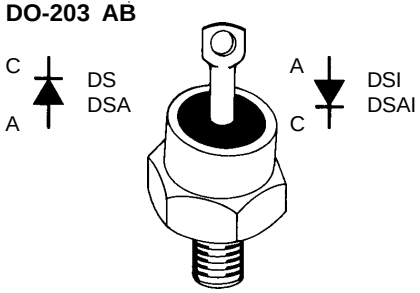
Rectifier Diodes
Avalanche Diodes

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



A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
$I_{F(RMS)}$	$T_{(vj)} = T_{(vj)m}$		160	A
$I_{F(AV)M}$	T_{case} = 100°C; 180° sine		110	A
P_{RSM}	DSA(I) types, $T_{(vj)} = T_{(vj)m}$, 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
	$T_{(vj)} = T_{(vj)m}$	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
	$T_{(vj)} = T_{(vj)m}$	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
$T_{(vj)m}$			180	°C
T_{stg}			-40...+180	°C
M_d	Mounting torque		3.5-4.5	Nm
			31-40	lb.in.
Weight			21	g

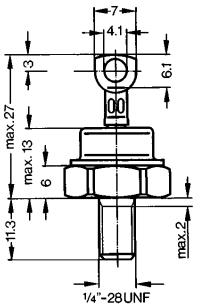
Features
- International standard package, JEDEC DO-203 AB (DO-5)
- Planar glassivated chips

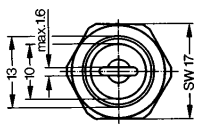
Applications
- High power rectifiers
- Field supply for DC motors
- Power supplies

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

Symbol	Test Conditions		Characteristic Values	
I_R	$T_{(vj)} = T_{(vj)m}$; $V_R = V_{RRM}$	≤	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	$T_{(vj)} = T_{(vj)m}$		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

Dimensions in mm (1 mm = 0.0394")





Data according to IEC 747-2
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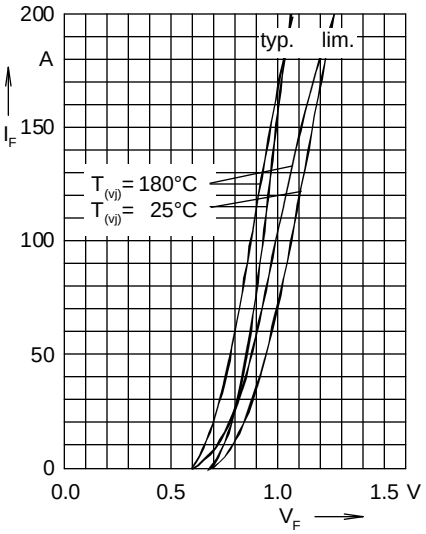


Fig. 1 Forward characteristics

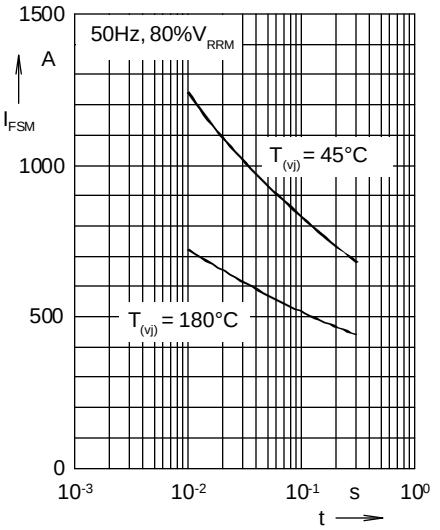


Fig. 2 Surge overload current
I_{FSM}: Crest value, t: duration

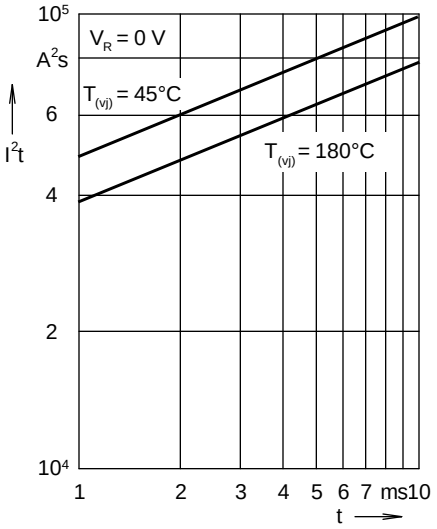


Fig. 3 I^2t versus time (1-10 ms)

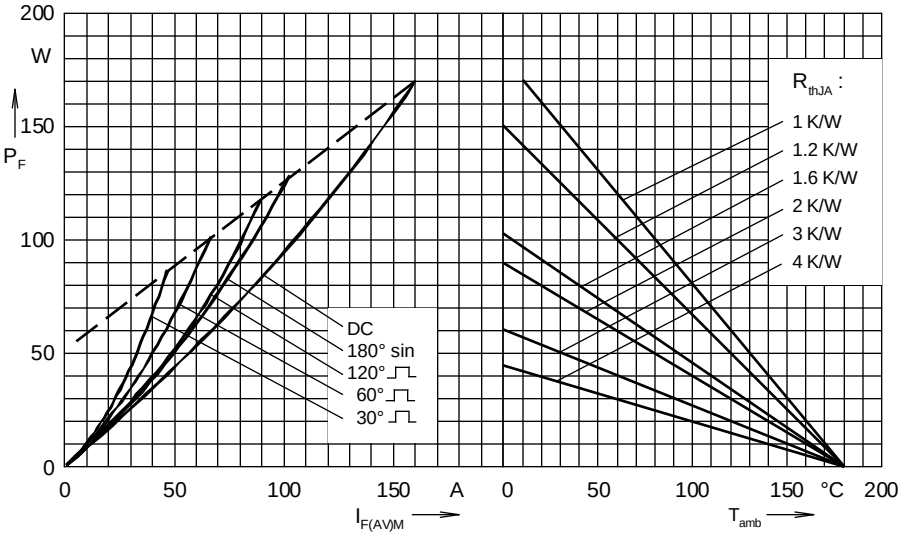


Fig. 4 Power dissipation versus forward current and ambient temperature

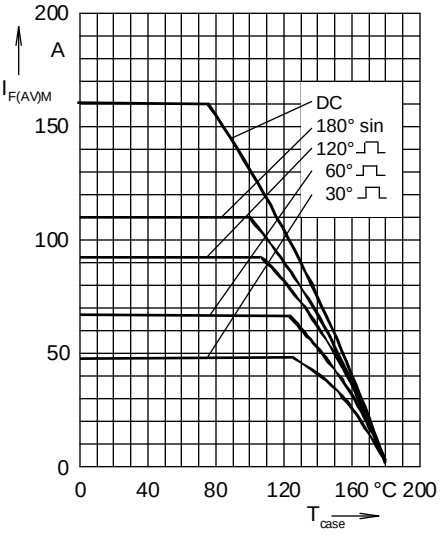


Fig. 5 Max. forward current at case temperature

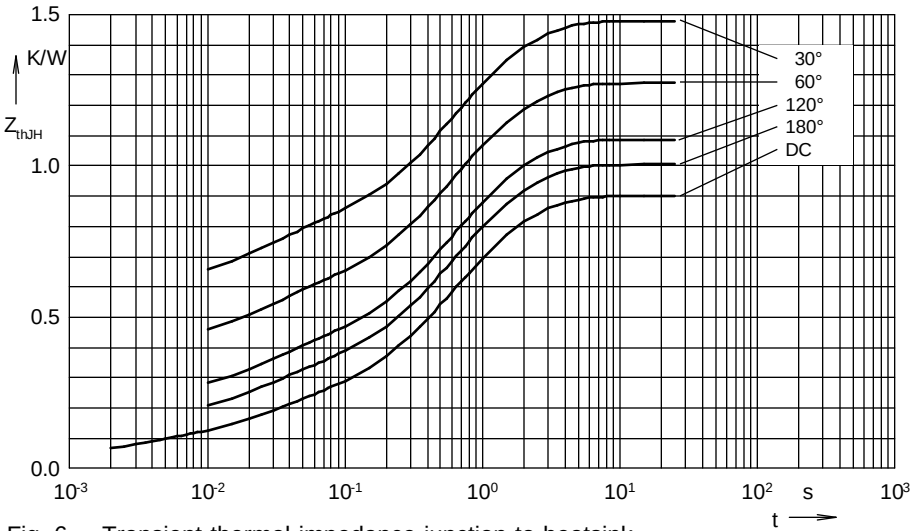


Fig. 6 Transient thermal impedance junction to heatsink

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

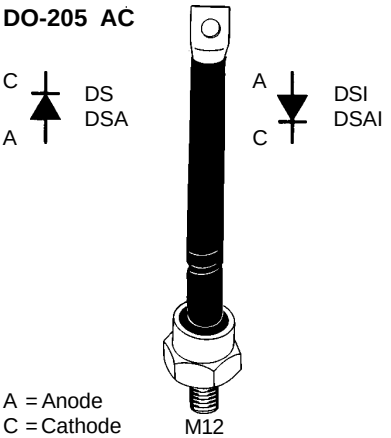
Rectifier Diodes
Avalanche Diodes

V_{RRM} = 800 - 1800 V
$I_{F(RMS)}$ = 250 A
$I_{F(AV)M}$ = 160 A

V_{RSM} V	$V_{(BR)min}$ ① V	V_{RRM} V	Anode on stud	Cathode on stud
900	-	800	DS 110-08F	DSI 110-08F
1300	-	1200	DS 110-12F	DSI 110-12F
1300	1300	1200	DSA 110-12F	DSAI 110-12F
1700	1750	1600	DSA 110-16F	DSAI 110-16F
1900	1950	1800	DSA 110-18F	DSAI 110-18F

① Only for Avalanche Diodes

DO-205 AC



Symbol	Test Conditions	Maximum Ratings	
$I_{F(RMS)}$	$T_{(vj)} = T_{(vj)m}$	250	A
$I_{F(AV)M}$	T_{case} = 100°C; 180° sine	160	A
P_{RSM}	DSA(I) types, $T_{(vj)} = T_{(vj)m}$, t_p = 10 µs	35	kW
I_{FSM}	$T_{(vj)}$ = 45°C; t = 10 ms (50 Hz), sine	3150	A
	V_R = 0 t = 8.3 ms (60 Hz), sine	3380	A
	$T_{(vj)} = T_{(vj)m}$ t = 10 ms (50 Hz), sine	2800	A
	V_R = 0 t = 8.3 ms (60 Hz), sine	3000	A
I^2t	$T_{(vj)}$ = 45°C t = 10 ms (50 Hz), sine	49 600	A^2s
	V_R = 0 t = 8.3 ms (60 Hz), sine	48 000	A^2s
	$T_{(vj)} = T_{(vj)m}$ t = 10 ms (50 Hz), sine	39 200	A^2s
	V_R = 0 t = 8.3 ms (60 Hz), sine	37 800	A^2s
$T_{(vj)}$		-40...+180	°C
$T_{(vj)m}$		180	°C
T_{stg}		-40...+180	°C
M_d	Mounting torque	16-20	Nm
		142-177	lb.in.
Weight		130	g

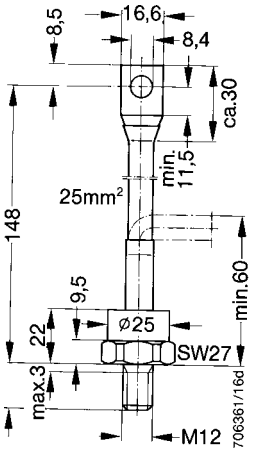
Symbol	Test Conditions	Characteristic Values		
I_R	$T_{(vj)} = T_{(vj)m}$; $V_R = V_{RRM}$	≤	10	mA
V_F	I_F = 500 A; $T_{(vj)}$ = 25°C	≤	1.4	V
V_{T0}	For power-loss calculations only		0.85	V
r_T	$T_{(vj)} = T_{(vj)m}$		1.1	mΩ
R_{thJC}	DC current		0.35	K/W
	180° sine		0.39	K/W
R_{thJH}	DC current		0.45	K/W
d_S	Creepage distance on surface		4.25	mm
d_A	Strike distance through air		4.25	mm
a	Max. allowable acceleration		100	m/s^2

Features
- International standard package, JEDEC DO-205 AC (~DO30)
- Planar glassivated chips

Applications
- High power rectifiers
- DC supplies
- 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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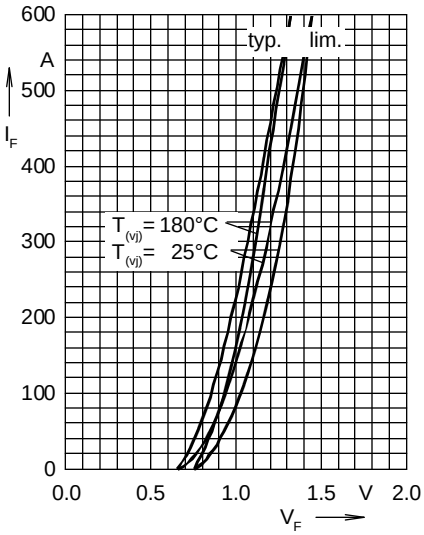


Fig. 1 Forward characteristics

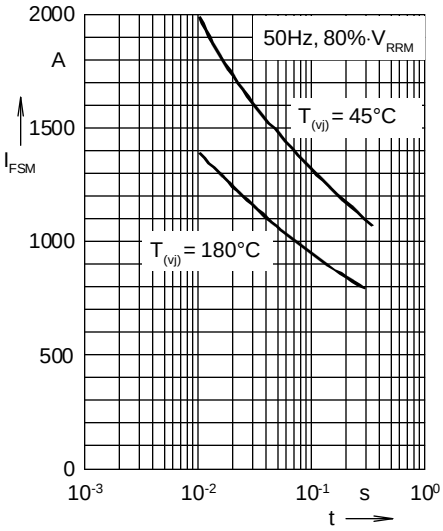


Fig. 2 Surge overload current
I_{FSM}: Crest value, t: duration

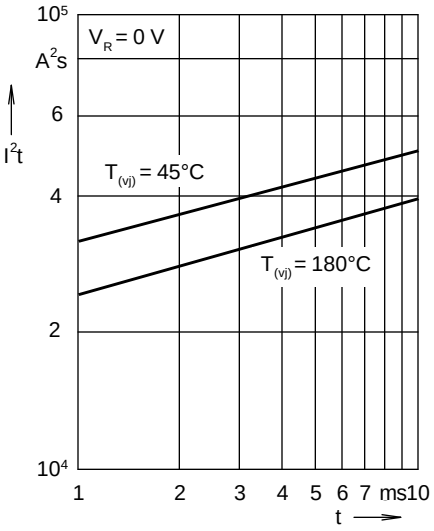


Fig. 3 I^2t versus time (1-10 ms)

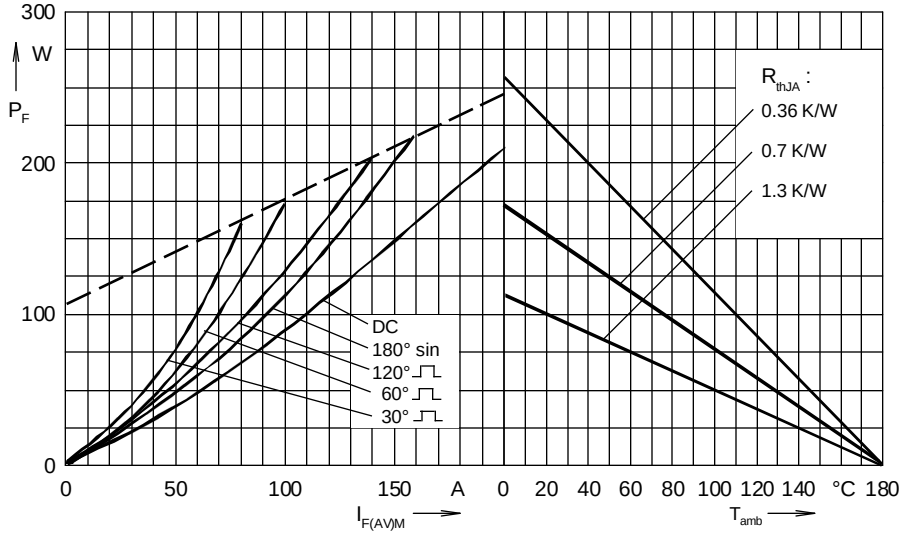


Fig. 4 Power dissipation versus forward current and ambient temperature

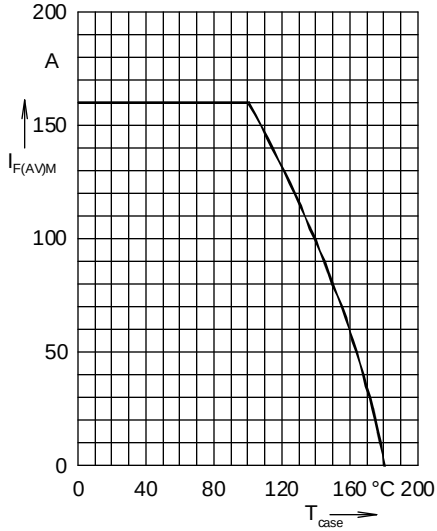


Fig. 5 Max. forward current at case temperature 180° sine

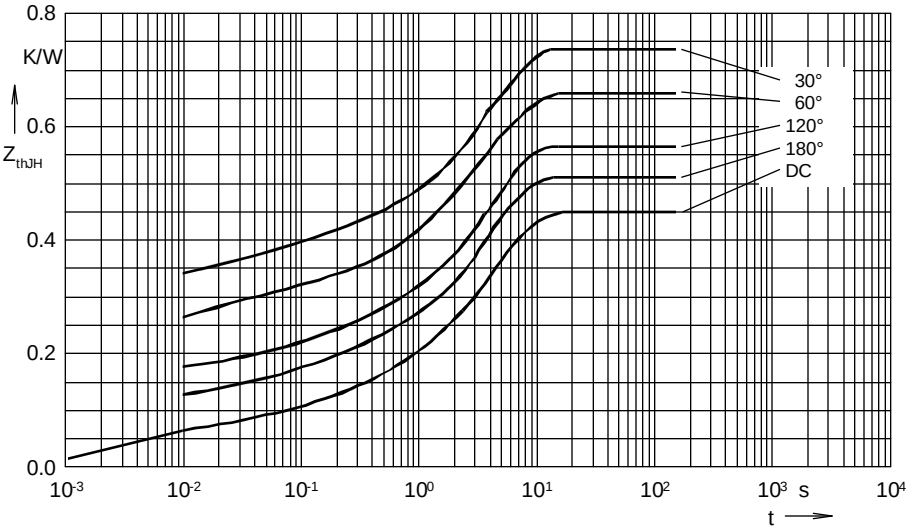


Fig. 6 Transient thermal impedance junction to heatsink

R_{thJH} for various conduction angles d:

d	R_{thJH} (K/W)
DC	0.45
180°	0.516
120°	0.567
60°	0.660
30°	0.733

Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.06713	0.003
2	0.06242	0.094
3	0.22045	3.846
4	0.10	3.2

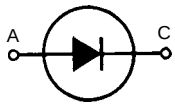
IXYS

Fast Recovery Epitaxial Diode (FRED)

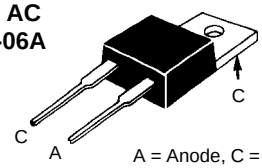
DSEI 8

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

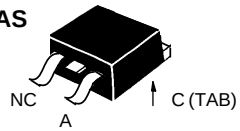


TO-220 AC
DSEI 8-06A



A = Anode, C = Cathode

TO-263 AA
DSEI 8-06AS



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

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		16	A
I_{FAVM} ★	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
$\int i^2dt$	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 with screw M3		0.45/4	Nm/lb.in.
	Mounting torque with screw M3.5		0.55/5	Nm/lb.in.
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
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour
- Epoxy meet 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

★ 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 747
IXYS reserves the right to change limits, test conditions and dimensions

93015B

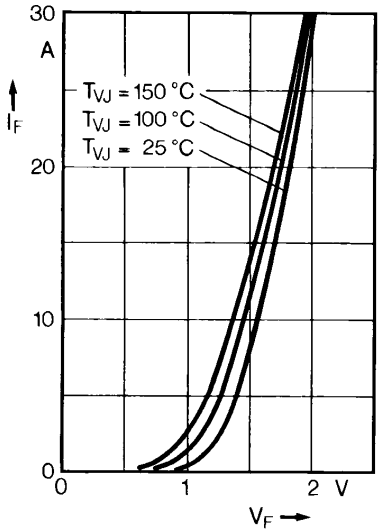


Fig. 1 Forward current versus voltage drop.

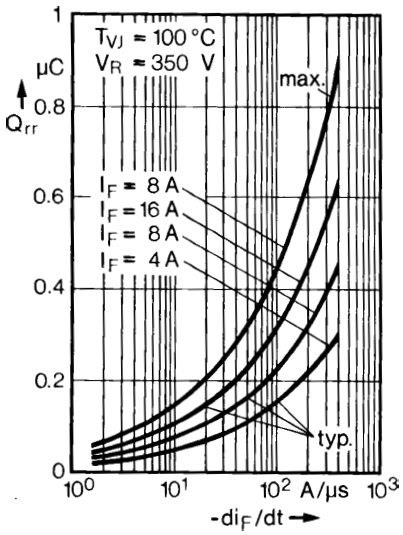


Fig. 2 Recovery charge versus $-di_F/dt$.

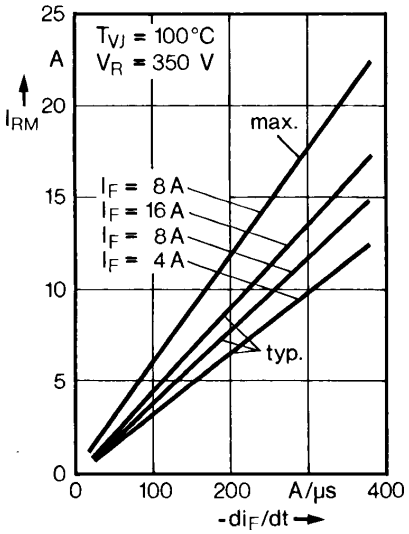


Fig. 3 Peak reverse current versus $-di_F/dt$.

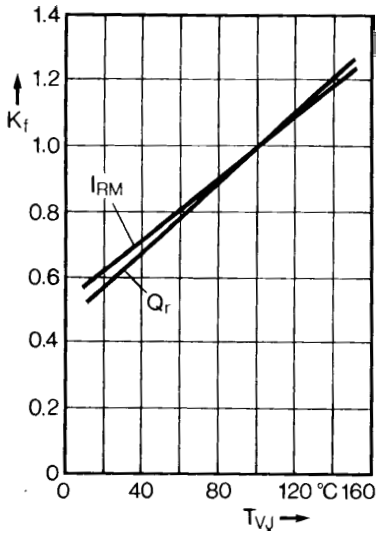


Fig. 4 Dynamic parameters versus junction temperature.

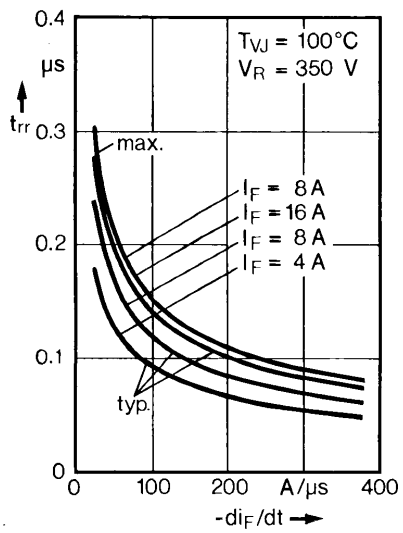


Fig. 5 Recovery time versus $-di_F/dt$.

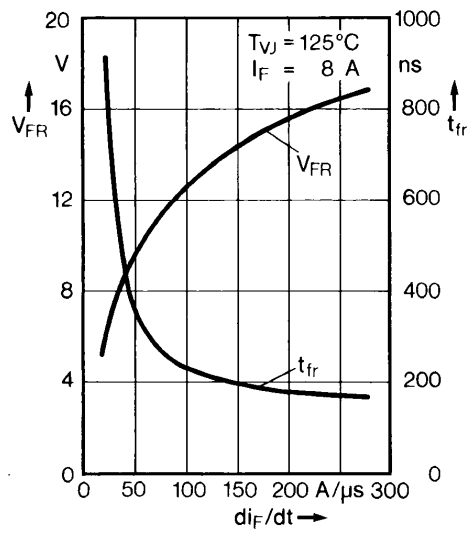


Fig. 6 Peak forward voltage versus $-di_F/dt$.

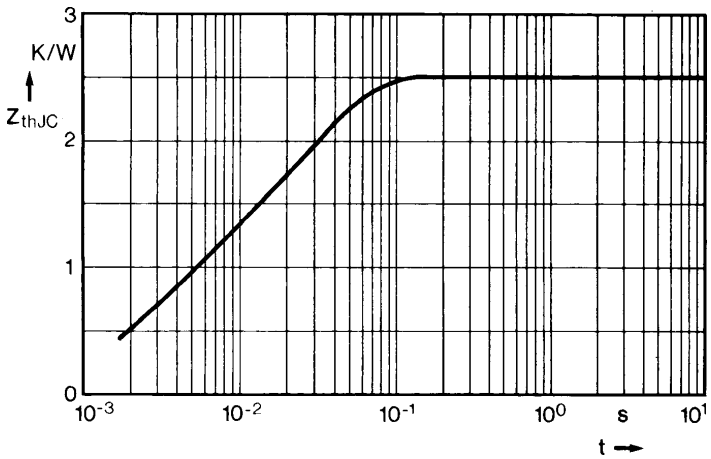
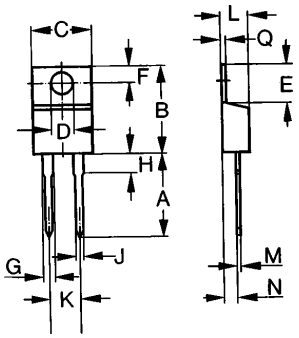


Fig. 7 Transient thermal impedance junction to case.

Dimensions TO-220 AC



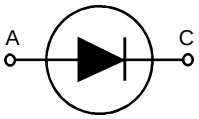
Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	12.70	14.73	0.500	0.580
B	14.23	16.51	0.560	0.650
C	9.66	10.66	0.380	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	2.300	0.420
F	2.54	3.42	0.100	0.135
G	1.15	1.77	0.045	0.070
H	-	6.35	-	0.250
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.190	0.210
L	3.56	4.82	0.140	0.190
M	0.51	0.76	0.020	0.030
N	2.04	2.49	0.080	0.115
Q	0.64	1.39	0.025	0.055

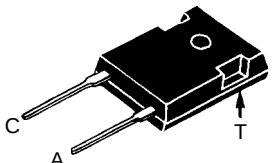
Dimension TO-263 AA see DSEI 19 page 17

Fast Recovery Exptaxial Diode (FRED)

I_{FRMS} = 75 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

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





TO-247 AD

A = Anode C = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}			75	A
I_{FAVM}	T_C = 92°C (Note 1)		53	A
I_{FRM}	t_p < 10µs; 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
$\int i^2dt$	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 with screw M3		0.45/4	Nm/lb.in.
	Mounting torque with screw M3.5		0.55/5	Nm/lb.in.
Weight			6	g

Symbol	Test Conditions		Characteristic Values Typ.	Max.	
I_R	V_R = V_{RRM}	T_{VJ} = 25°C		3	mA
	V_R = 0.8 V_{RRM}	T_{VJ} = 25°C		1.5	mA
	V_R = 0.8 V_{RRM}	T_{VJ} = 125°C		20	mA
V_F	I_F = 70A	T_{VJ} = 150°C		1.55	V
		T_{VJ} = 25°C		1.8	V
V_{TO}	For power-loss calculations only			1.16	V
r_F		T_{VJ} = T_{VJM}		4.16	mΩ
R_{thJC}				0.35	K/W
R_{thCK}			0.15		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}	I_F = 350V; I_F = 80 A; -di_F/dt = 200 A/µs		16	21	A
	L ≤ 0.05 µH	T_{VJ} = 100°C			

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

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

Advantages
- Low losses
- Low noise switching
- Highly reliable circuit operation
- Low voltage peaks for reduced protection circuits
- Lower temperature operation
- Space saving by reduced cooling

IXYS Corporation
3540 Bassett Street, Santa Clara,CA 95054
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Fig. 1 Forward current versus voltage drop

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

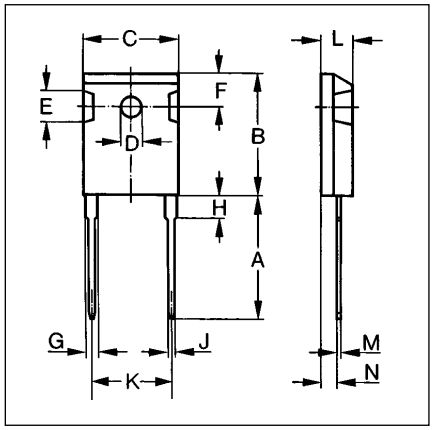
Fig. 3 Peak reverse current versus $-di_F/dt$.

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	1.5	2.49	0.087	0.102

① I_{FAVM} rating includes reverse blocking losses at T_{VJ} = 125°C, $V_R = 0.8\ V_{RRM}$, duty cycle d = 0.5.
Data according to DIN/IEC 747.
IXYS reserves the right to change limits, test conditions, and dimensions.

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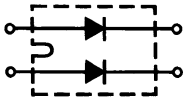
IXYS

Fast Recovery Epitaxial Diodes (FRED)

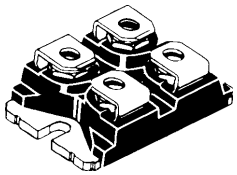
DSEI 2x61

I_{FAVM} = 2x60 A
V_{RRM} = 1000 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
1000	1000	DSEI 2x61-10B



miniBLOC, SOT-227 B



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ★	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
$\int i^2dt$	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 • V_{RRM}		0.5	mA
	T_{VJ} = 125°C	V_R = 0.8 • 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~
- UL registered E 72873
- 2 independent FRED in 1 package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low I_{RM}-values
- Soft recovery behaviour

Applications

- Antiparallel diode for high frequency switching devices
- 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

★ 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 747
IXYS reserves the right to change limits, test conditions and dimensions

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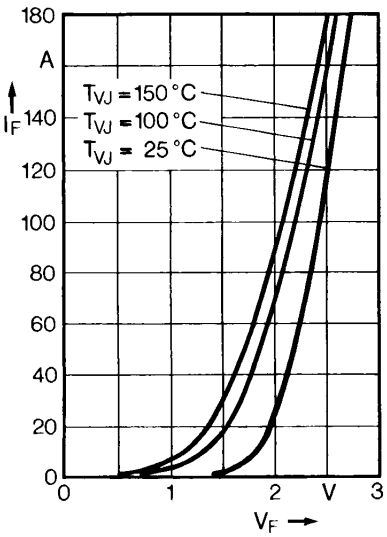


Fig. 1 Forward current versus voltage drop.

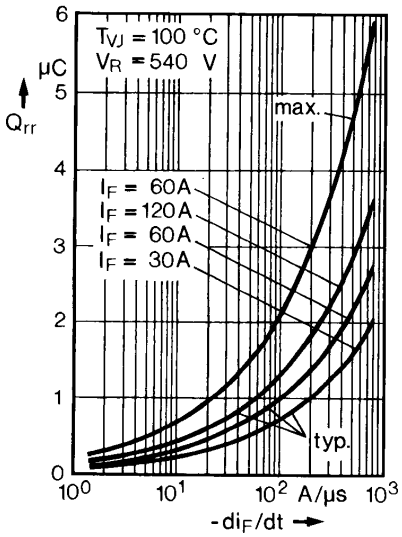


Fig. 2 Recovery charge versus $-di_F/dt$.

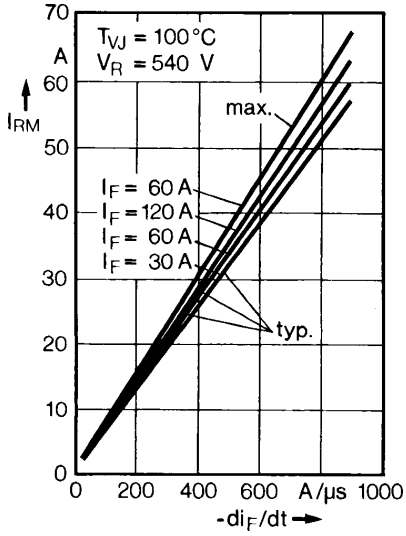


Fig. 3 Peak reverse current versus $-di_F/dt$.

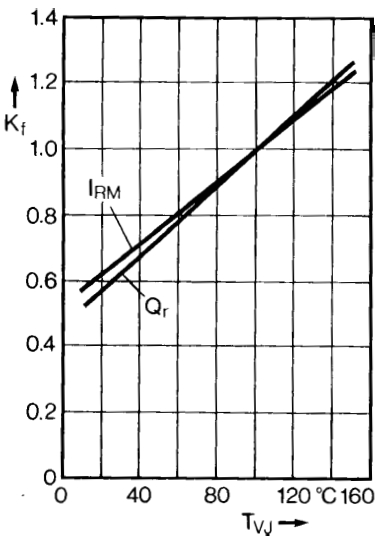


Fig. 4 Dynamic parameters versus junction temperature.

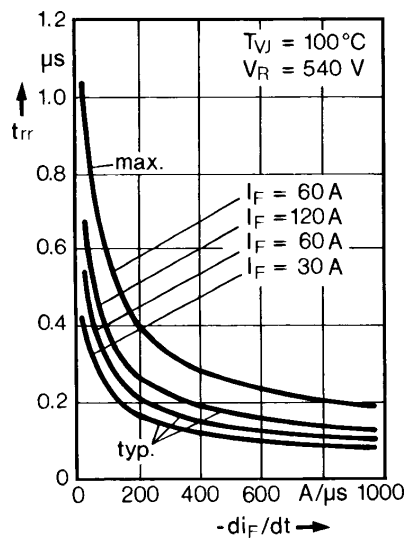


Fig. 5 Recovery time versus $-di_F/dt$.

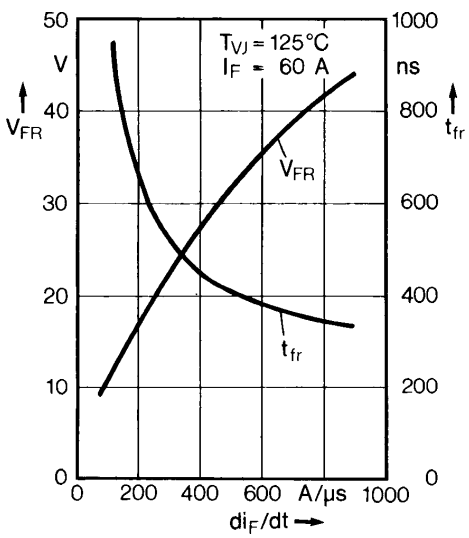


Fig. 6 Peak forward voltage versus $-di_F/dt$.

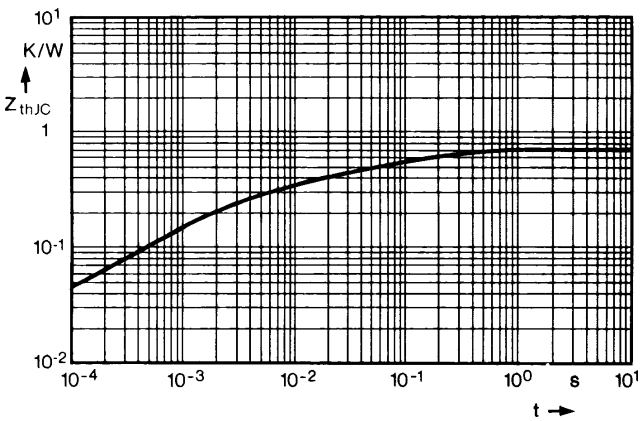
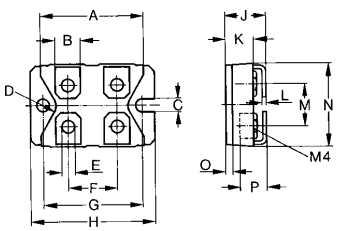


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	31.5	31.7	1.241	1.249
B	7.8	8.2	0.307	0.323
C	4.0	-	0.158	-
D	4.1	4.3	0.162	0.169
E	4.1	4.3	0.162	0.169
F	14.9	15.1	0.587	0.595
G	30.1	30.3	1.186	1.193
H	38.0	38.2	1.497	1.505
J	11.8	12.2	0.465	0.481
K	8.9	9.1	0.351	0.359
L	0.75	0.85	0.030	0.033
M	12.6	12.8	0.496	0.504
N	25.2	25.4	0.993	1.001
O	1.95	2.05	0.077	0.081
P	-	5.0	-	0.197

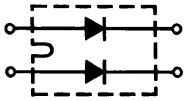
IXYS

Fast Recovery Epitaxial Diodes (FRED)

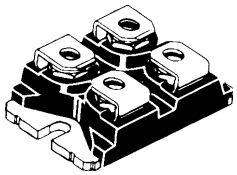
DSEI 2x61

I_{FAVM} = 2x52 A
V_{RRM} = 1200 V
t_{rr} = 40 ns

V_{RSM} V	V_{RRM} V	Type
1200	1200	DSEI 2x61-12B



miniBLOC, SOT-227 B



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		100	A
I_{FAVM} ★	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
$\int i^2dt$	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 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	$V_R = V_{RRM}$		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 L ≤ 0.05 µH; T_{VJ} = 100°C		32	36	A

Features

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

Applications

- Antiparallel diode for high frequency switching devices
- 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

★ 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 747
IXYS reserves the right to change limits, test conditions and dimensions

96509A

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 $-di_F/dt$.

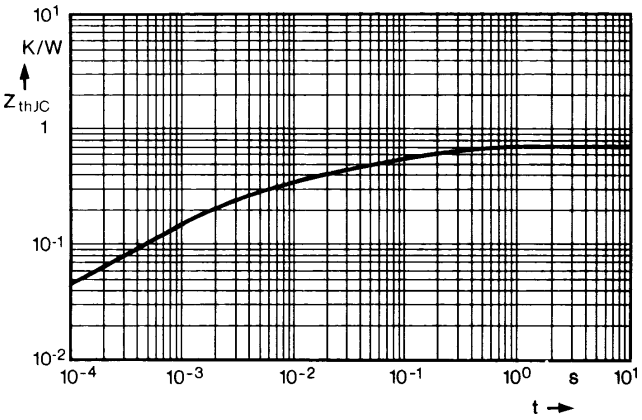
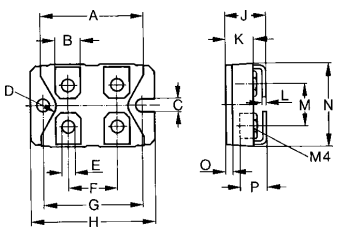


Fig. 7 Transient thermal impedance junction to case.

Dimensions



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

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	31.5	31.7	1.241	1.249
B	7.8	8.2	0.307	0.323
C	4.0	-	0.158	-
D	4.1	4.3	0.162	0.169
E	4.1	4.3	0.162	0.169
F	14.9	15.1	0.587	0.595
G	30.1	30.3	1.186	1.193
H	38.0	38.2	1.497	1.505
J	11.8	12.2	0.465	0.481
K	8.9	9.1	0.351	0.359
L	0.75	0.85	0.030	0.033
M	12.6	12.8	0.496	0.504
N	25.2	25.4	0.993	1.001
O	1.95	2.05	0.077	0.081
P	-	5.0	-	0.197

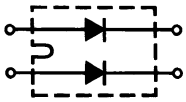
IXYS

Fast Recovery Epitaxial Diodes (FRED)

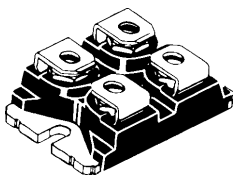
DSEI 2x121

I_{FAVM} = 2x123 A
V_{RRM} = 200 V
t_{rr} = 35 ns

V_{RSM} V	V_{RRM} V	Type
200	200	DSEI 2x121-02A



miniBLOC, SOT-227 B



Symbol	Test Conditions		Maximum Ratings (per diode)	
I_{FRMS}	$T_{VJ} = T_{VJM}$		150	A
I_{FAVM} ★	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
$\int i^2dt$	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 $I_{ISOL} \le$ 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

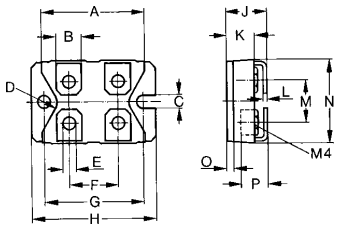
Symbol	Test Conditions		Characteristic Values (per diode) typ.	max.	
I_R	T_{VJ} = 25°C	$V_R = V_{RRM}$		1	mA
	T_{VJ} = 25°C	$V_R = 0.8 \cdot V_{RRM}$		0.5	mA
	T_{VJ} = 125°C	$V_R = 0.8 \cdot V_{RRM}$		20	mA
V_F	I_F = 120 A;	T_{VJ} = 150°C	0.89	0.95	V
		T_{VJ} = 25°C		1.10	V
V_{T0}	For power-loss calculations 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

★ 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 747
IXYS reserves the right to change limits, test conditions and dimensions

Features

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

miniBLOC, SOT-227 B



M4 screws (4x) supplied

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	31.5	31.7	1.241	1.249
B	7.8	8.2	0.307	0.323
C	4.0	-	0.158	-
D	4.1	4.3	0.162	0.169
E	4.1	4.3	0.162	0.169
F	14.9	15.1	0.587	0.595
G	30.1	30.3	1.186	1.193
H	38.0	38.2	1.497	1.505
J	11.8	12.2	0.465	0.481
K	8.9	9.1	0.351	0.359
L	0.75	0.85	0.030	0.033
M	12.6	12.8	0.496	0.504
N	25.2	25.4	0.993	1.001
O	1.95	2.05	0.077	0.081
P	-	5.0	-	0.197

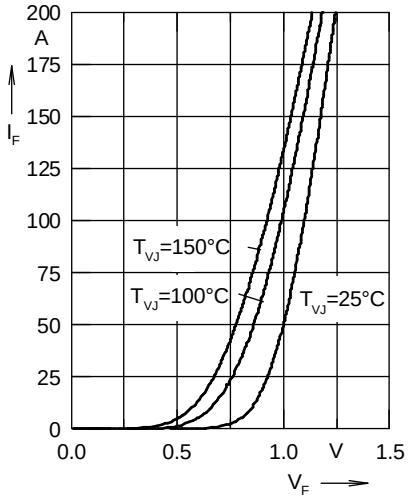


Fig. 1 Forward current I_F versus V_F

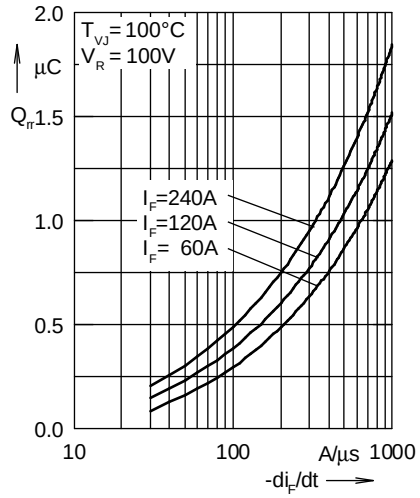


Fig. 2 Reverse recovery charge Q_{rr} versus $-di_F/dt$

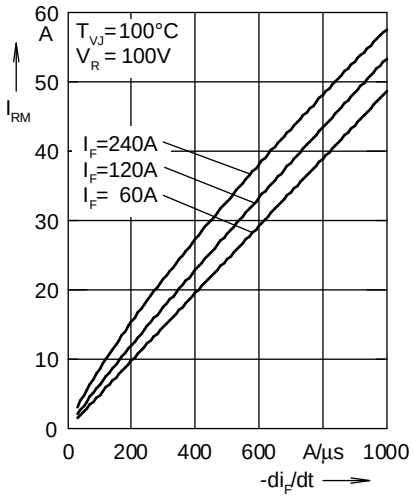


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

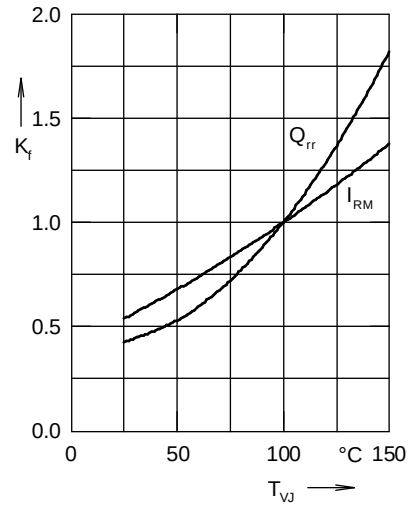


Fig. 4 Dynamic parameters Q_{rr}, I_{RM} versus T_{VJ}

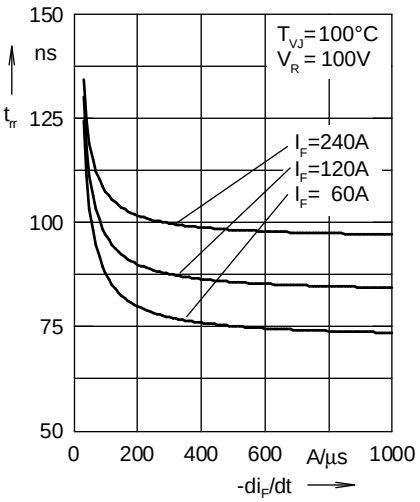


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

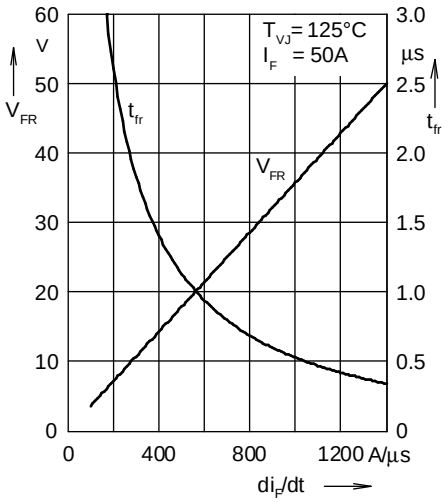


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

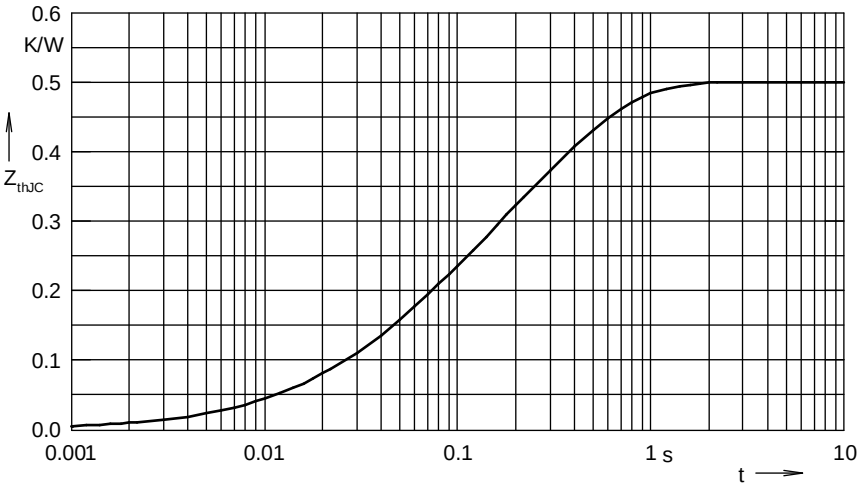


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJS} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.109	0.028
2	0.214	0.092
3	0.429	0.35

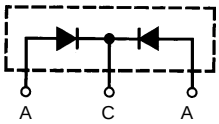
IXYS

Common Cathode Fast Recovery Epitaxial Diode (FRED)

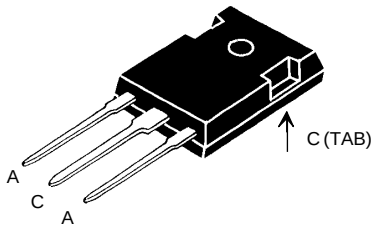
DSEK 30

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

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



TO-247 AD



A = Anode, C = Cathode , TAB = Cathode

Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		50	A
I_{FAVM} ★	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
$\int i^2dt$	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 with screw M3		0.45-0.55/4-5	Nm/lb.in.
	Mounting torque with screw M3.5		0.45-0.55/4-5	Nm/lb.in.
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 = 37 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 flammability classification

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

★ 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 747 and refer to a single diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

94538A

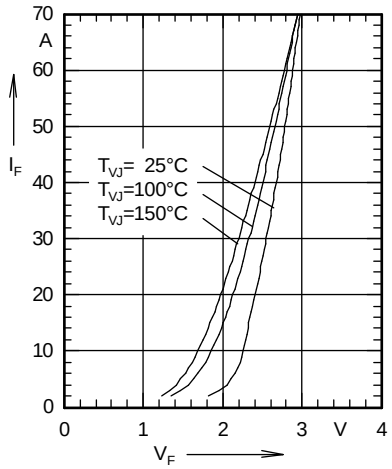


Fig. 1 Forward current versus voltage drop.

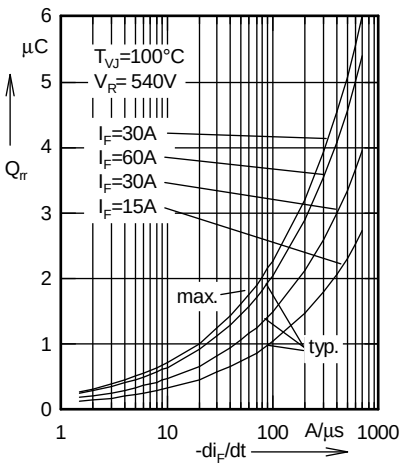


Fig. 2 Recovery charge versus $-di_F/dt$.

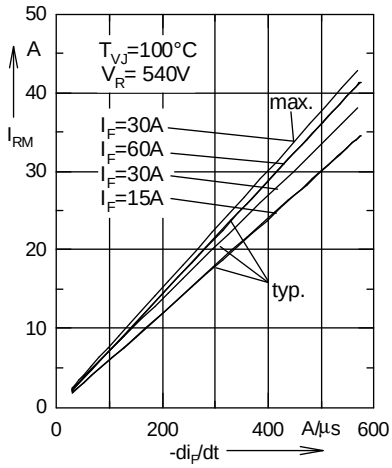


Fig. 3 Peak reverse current versus $-di_F/dt$.

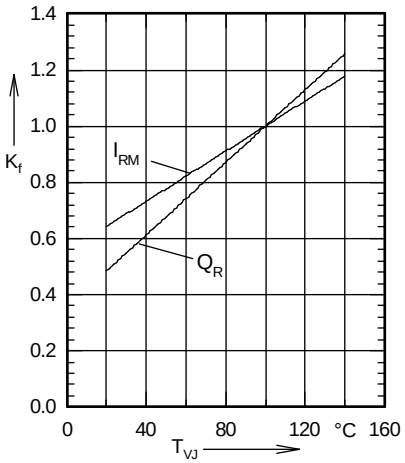


Fig. 4 Dynamic parameters versus junction temperature.

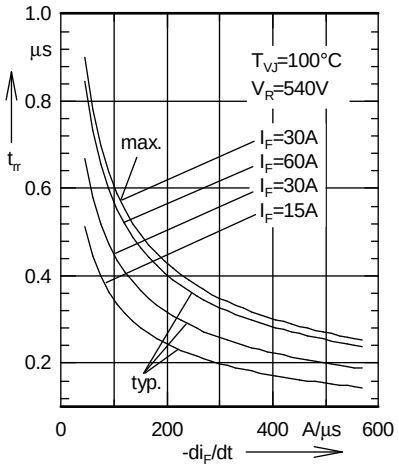


Fig. 5 Recovery time versus $-di_F/dt$.

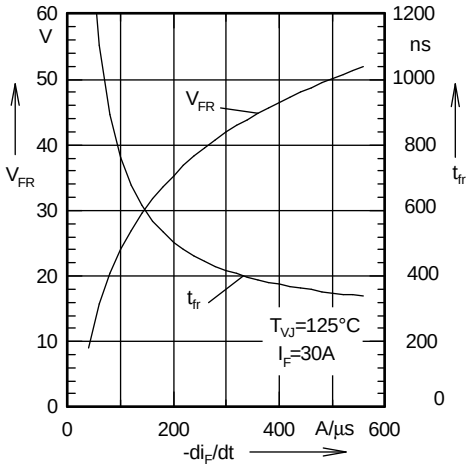


Fig. 6 Peak forward voltage versus $-di_F/dt$.

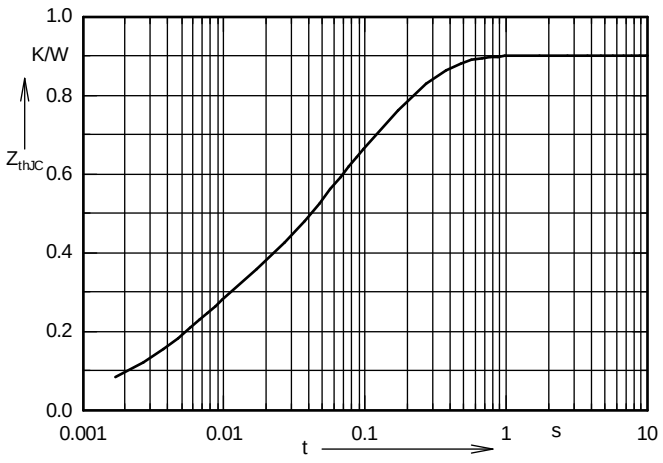
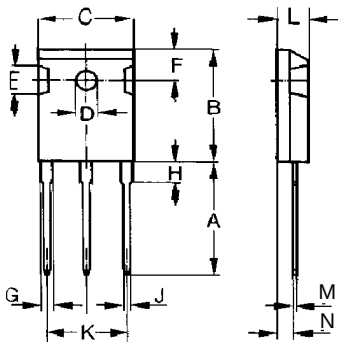


Fig. 7 Transient thermal impedance junction to case

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	1.5	2.49	0.087	0.102