

Standard Rectifier

$$V_{RRM} = 2 \times 1600 \text{ V}$$

$$I_{FAV} = 50 \text{ A}$$

$$V_F = 1.26 \text{ V}$$

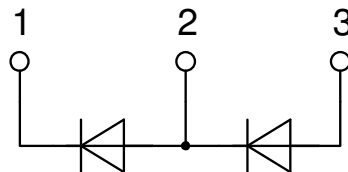
Phase leg

Part number

DMA50P1600HB



Backside: anode/cathode



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour
- High commutation robustness
- High surge capability

Applications:

- Diode for main rectification
- For single and three phase bridge configurations

Package: TO-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Terms and Conditions of Usage

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;

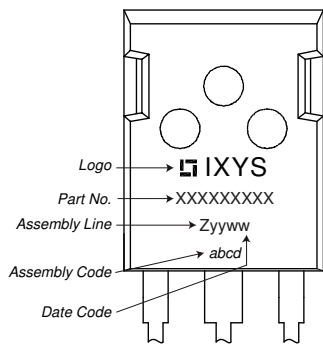
- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

Rectifier				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
V_{RSM}	max. non-repetitive reverse blocking voltage				1700	V	
V_{RRM}	max. repetitive reverse blocking voltage				1600	V	
I_R	reverse current	$V_R = 1600$ V			40	μ A	
		$V_R = 1600$ V			1.5	mA	
V_F	forward voltage drop	$I_F = 50$ A			1.30	V	
		$I_F = 100$ A			1.61	V	
		$I_F = 50$ A	$T_{VJ} = 150^\circ\text{C}$			1.26	V
		$I_F = 100$ A				1.66	V
I_{FAV}	average forward current	$T_C = 130^\circ\text{C}$ 180° sine			50	A	
V_{F0}	threshold voltage	} for power loss calculation only			0.81	V	
r_F	slope resistance				8.6	m Ω	
R_{thJC}	thermal resistance junction to case				0.45	K/W	
R_{thCH}	thermal resistance case to heatsink			0.25		K/W	
P_{tot}	total power dissipation				330	W	
I_{FSM}	max. forward surge current	$t = 10$ ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$		650	A	
		$t = 8,3$ ms; (60 Hz), sine	$V_R = 0$ V		700	A	
		$t = 10$ ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$		555	A	
		$t = 8,3$ ms; (60 Hz), sine	$V_R = 0$ V		595	A	
I^2t	value for fusing	$t = 10$ ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$		2.12	kA ² s	
		$t = 8,3$ ms; (60 Hz), sine	$V_R = 0$ V		2.04	kA ² s	
		$t = 10$ ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$		1.54	kA ² s	
		$t = 8,3$ ms; (60 Hz), sine	$V_R = 0$ V		1.48	kA ² s	
C_J	junction capacitance	$V_R = 400$ V; $f = 1$ MHz	$T_{VJ} = 25^\circ\text{C}$		19	pF	

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			70	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		150	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

Product Marking



Part description

- D = Diode
- M = Standard Rectifier
- A = (up to 1800V)
- 50 = Current Rating [A]
- P = Phase leg
- 1600 = Reverse Voltage [V]
- HB = TO-247AD (3)

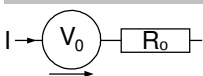
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA50P1600HB	DMA50P1600HB	Tube	30	522301

Similar Part	Package	Voltage class
DMA50P1200HB	TO-247AD (3)	1200

Equivalent Circuits for Simulation

* on die level

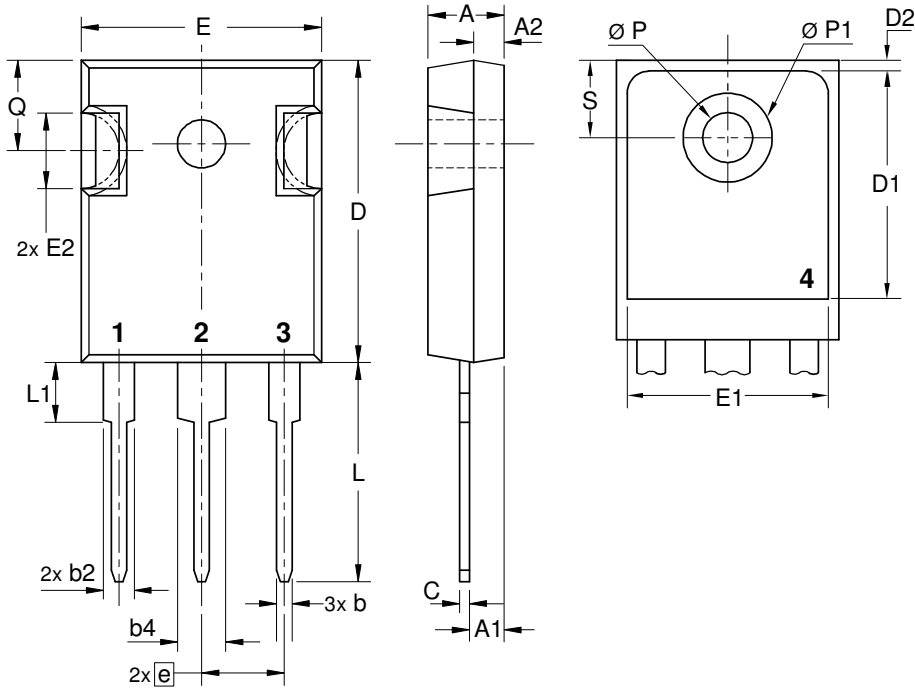
$T_{VJ} = 175\text{ °C}$



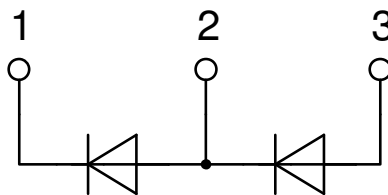
Rectifier

$V_{0\ max}$	threshold voltage	0.81	V
$R_{0\ max}$	slope resistance *	6	mΩ

Outlines TO-247



Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.215 BSC		5.46 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212		5.38	
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



Rectifier

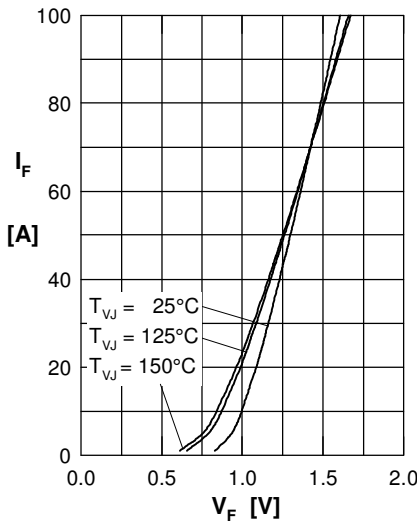


Fig. 1 Forward current versus voltage drop per diode

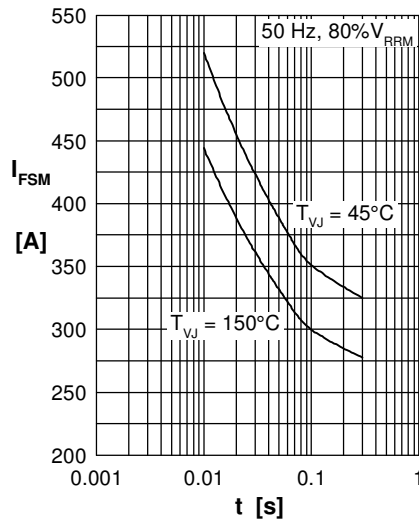


Fig. 2 Surge overload current versus time per diode

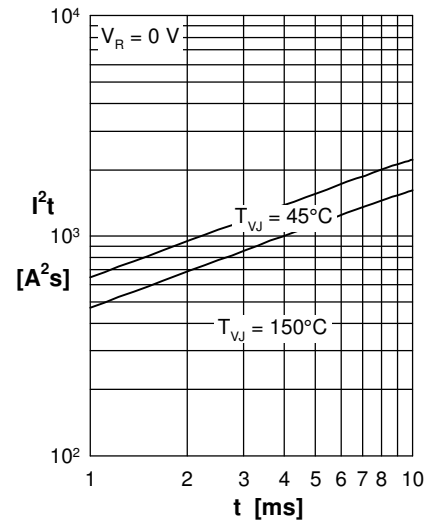


Fig. 3 I^2t versus time per diode

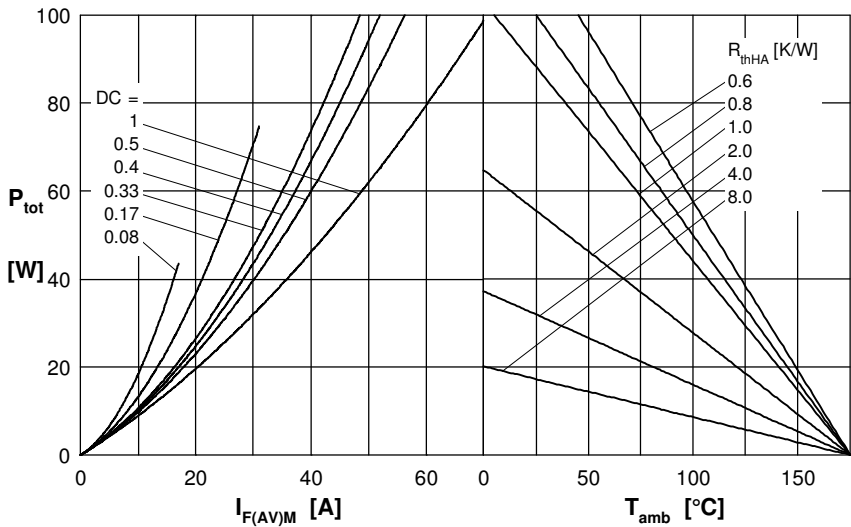


Fig. 4 Power dissipation versus direct output current and ambient temperature per diode

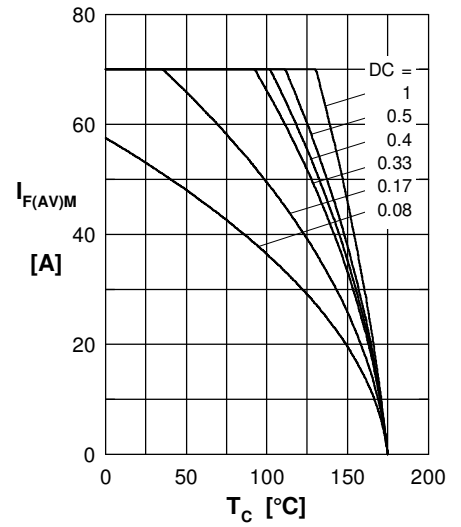


Fig. 5 Max. forward current versus case temperature per diode

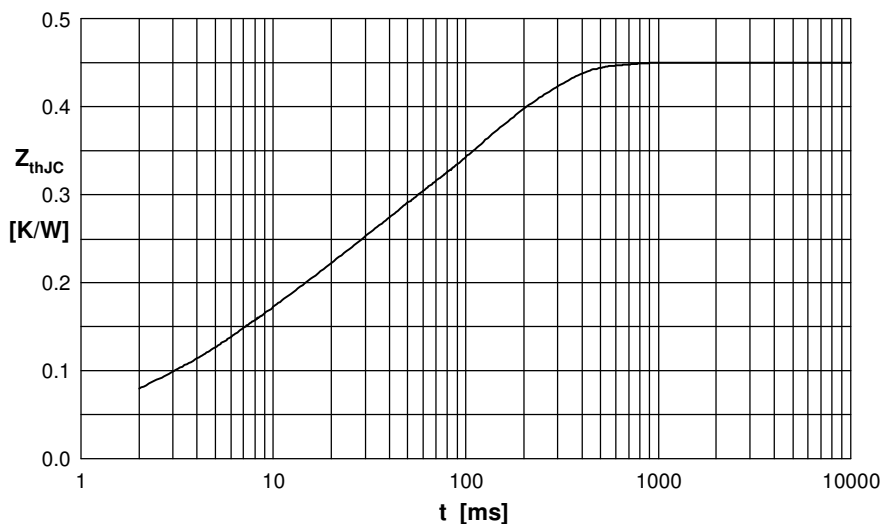


Fig. 6 Transient thermal impedance junction to case versus time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.033	0.0006
2	0.075	0.0038
3	0.124	0.0170
4	0.218	0.1400