

Standard Rectifier

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

$$I_{FAV} = 80 \text{ A}$$

$$V_F = 1.55 \text{ V}$$

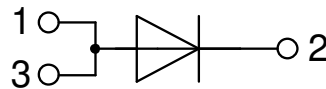
Single Diode

Part number

DMA80IM1600HB



Backside: 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

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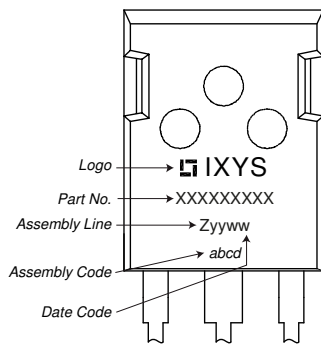


Rectifier				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
V_{RSM}	max. non-repetitive reverse blocking voltage				1700	V	
V_{RRM}	max. repetitive reverse blocking voltage				1600	V	
I_R	reverse current	$V_R = 1600\text{ V}$			40	μA	
		$V_R = 1600\text{ V}$			1.5	mA	
V_F	forward voltage drop	$I_F = 80\text{ A}$			1.17	V	
		$I_F = 160\text{ A}$			1.22	V	
		$I_F = 80\text{ A}$	$T_{VJ} = 150^\circ\text{C}$			1.55	V
		$I_F = 160\text{ A}$				1.59	V
I_{FAV}	average forward current	$T_C = 125^\circ\text{C}$ 180° sine			80	A	
V_{F0}	threshold voltage	} for power loss calculation only			0.82	V	
r_F	slope resistance				4.8	m Ω	
R_{thJC}	thermal resistance junction to case				0.35	K/W	
R_{thCH}	thermal resistance case to heatsink			0.25		K/W	
P_{tot}	total power dissipation		$T_C = 25^\circ\text{C}$		430	W	
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$		1.30	kA	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		1.41	kA	
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$		1.11	kA	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		1.20	kA	
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$		8.45	kA ² s	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		8.21	kA ² s	
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$		6.11	kA ² s	
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$		5.94	kA ² s	
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		43	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)
- 80 = Current Rating [A]
- IM = Single Diode
- 1600 = Reverse Voltage [V]
- HB = TO-247AD (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA80IM1600HB	DMA80IM1600HB	Tube	30	505616

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175\text{ °C}$



Rectifier

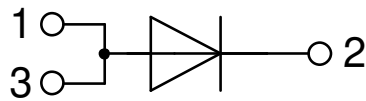
$V_{0\ max}$	threshold voltage	0.82	V
$R_{0\ max}$	slope resistance *	6	mΩ



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



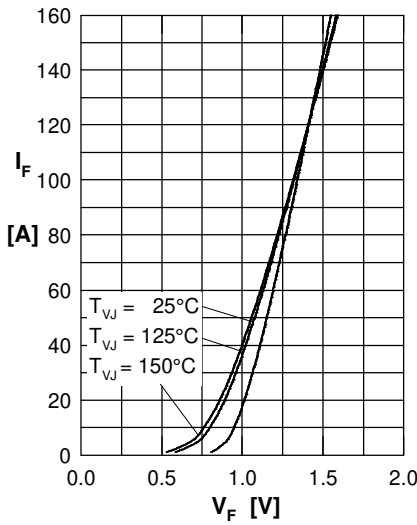
Rectifier


Fig. 1 Forward current versus voltage drop per diode

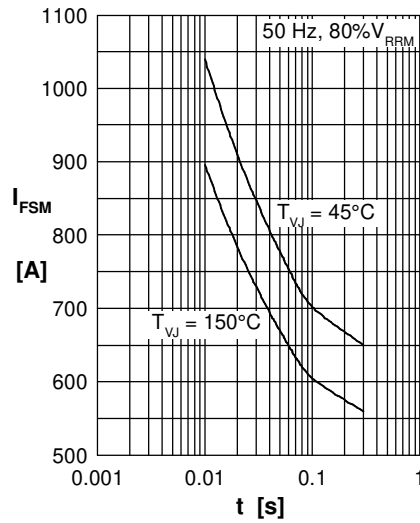


Fig. 2 Surge overload current versus time per diode

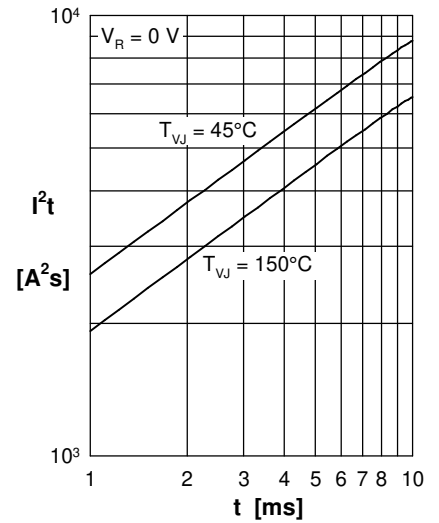
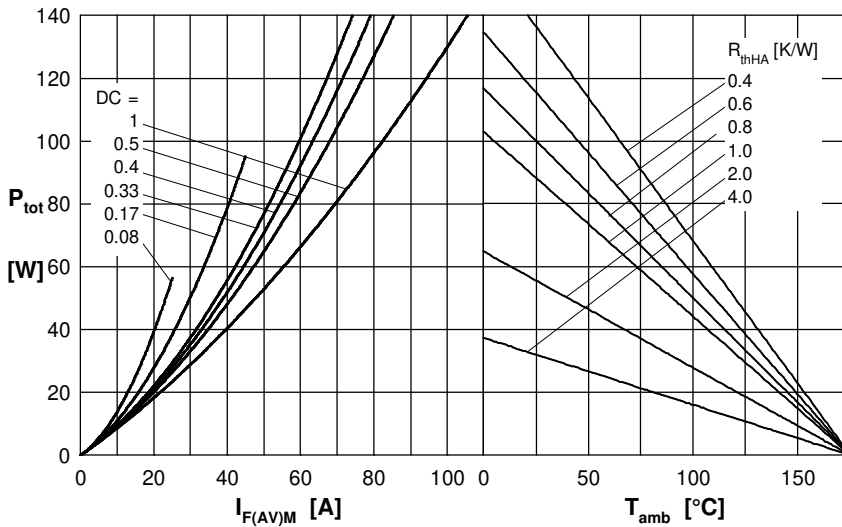

 Fig. 3 I^2t versus time per diode


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

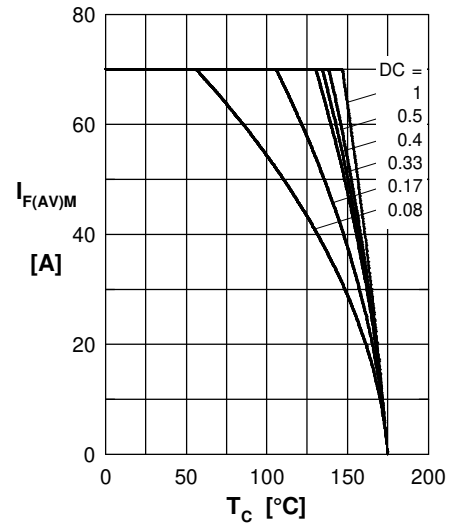


Fig. 5 Max. forward current versus case temperature per diode

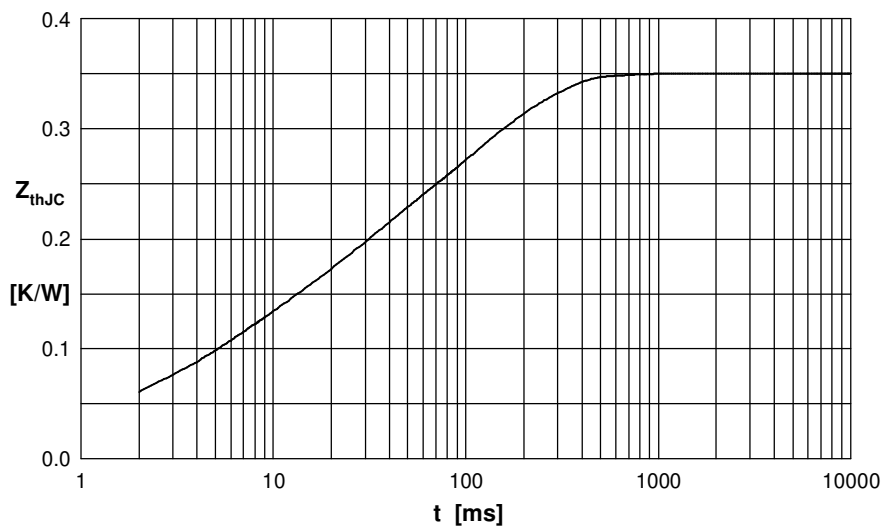


Fig. 6 Transient thermal impedance junction to case versus time per diode

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.023	0.0006
2	0.065	0.0038
3	0.094	0.0190
4	0.168	0.1300