preliminary

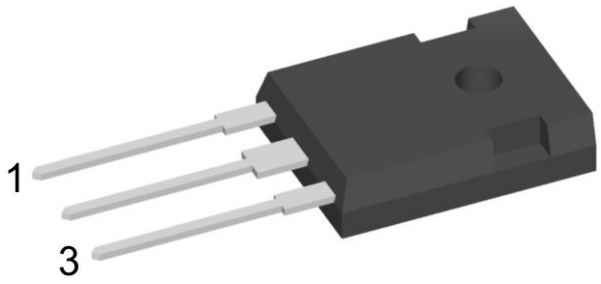
Standard Rectifier

V_{RRM} = 2x 1200 V
I_{FAV} = 50 A
V_F = 1.28 V

Phase leg

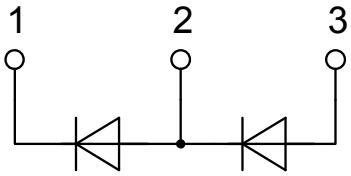
Part number

DMA50P1200HR



Backside: isolated

E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:

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

Package: ISO247

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

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Rectifier

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C				V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current*	V_R = 1200 V	T_{VJ} = 25°C			40	µA
		V_R = 1200 V	T_{VJ} = 150°C			1.5	mA
V_F	*forward voltage drop*	I_F = 50 A	T_{VJ} = 25°C			1.31	V
		I_F = 100 A				1.64	V
		I_F = 50 A	T_{VJ} = 150 °C			1.28	V
		I_F = 100 A				1.70	V
I_{FAV}	*average forward current*	T_C = 105°C	T_{VJ} = 175°C			50	A
		180° sine					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.82	V
r_F	*slope resistance* }					9	mΩ
R_{thJC}	*thermal resistance junction to case*					0.7	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.25		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			210	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			500	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			540	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			425	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			460	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1.25	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.22	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			905	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			880	A²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		18		pF

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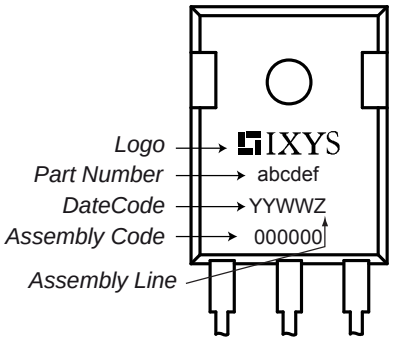
Package ISO247				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal				70	A
T_{stg}	*storage temperature*			-55		150	°C
T_{VJ}	*virtual junction temperature*			-55		175	°C
Weight					6		g
M_D	*mounting torque*			0.8		1.2	Nm
F_C	*mounting force with clip*			20		120	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	2.7			mm
$d_{Spb/Apb}$			*terminal to backside*	4.1			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3600			V
		t = 1 minute		3000			V

Product Marking

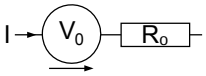


Part number

D = Diode
M = Standard Rectifier
A = (up to 1800V)
50 = Current Rating [A]
P = Phase leg
1200 = Reverse Voltage [V]
HR = ISO247 (3)

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA50P1200HR	DMA50P1200HR	Tube	30	512335

Equivalent Circuits for Simulation ** on die level* T_{VJ} = 175 °C



Rectifier

$V_{0\,max}$	*threshold voltage*	0.82	V
$R_{0\,max}$	*slope resistance **	6.4	mΩ

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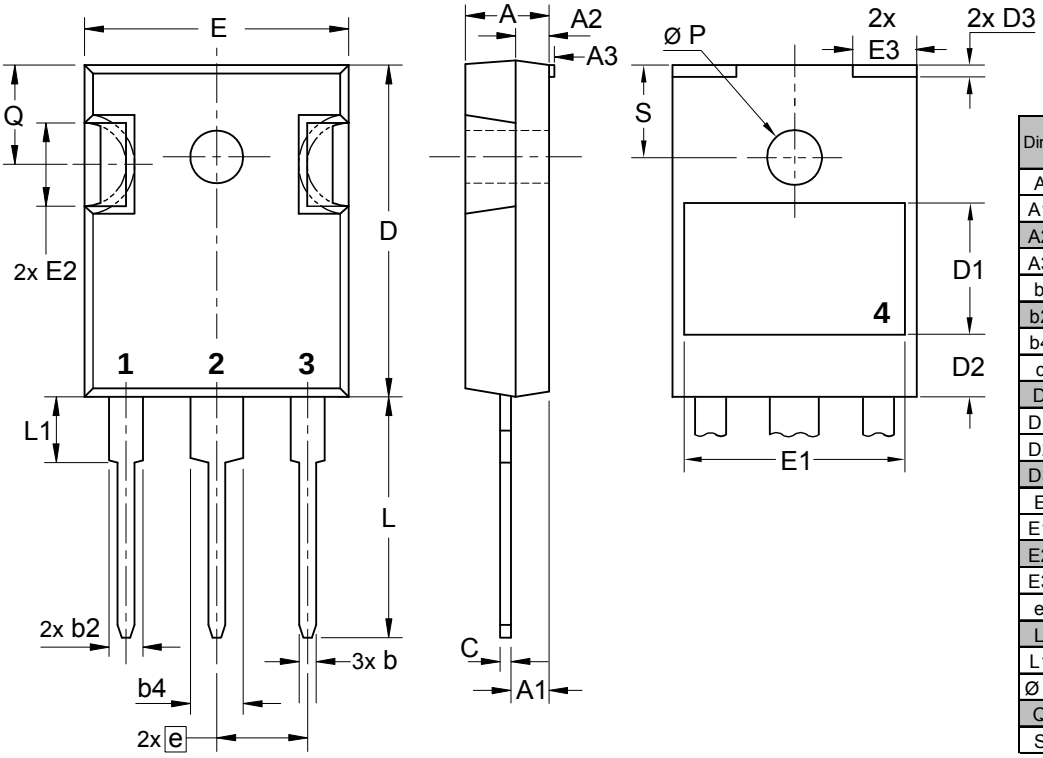
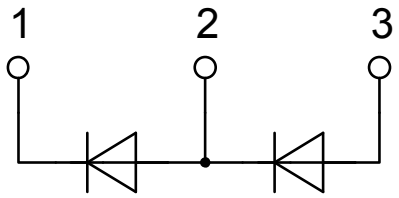
Outlines ISO247



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
A3	typ. 0.05		typ. 0.002	
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.844
D1	typ. 8.90		typ. 0.350	
D2	typ. 2.90		typ. 0.114	
D3	typ. 1.00		typ. 0.039	
E	15.49	16.24	0.610	0.639
E1	typ. 13.45		typ. 0.530	
E2	4.31	5.48	0.170	0.216
E3	typ. 4.00		typ. 0.157	
e	5.46 BSC		0.215 BSC	
L	19.80	20.30	0.780	0.799
L1	-	4.49	-	0.177
Ø P	3.55	3.65	0.140	0.144
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	



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Rectifier

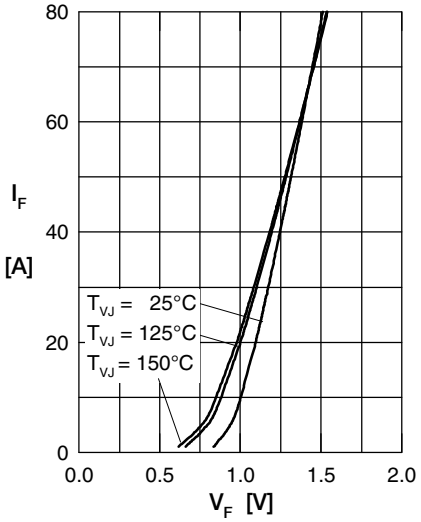

Fig. 1 Forward current versus voltage drop per diode

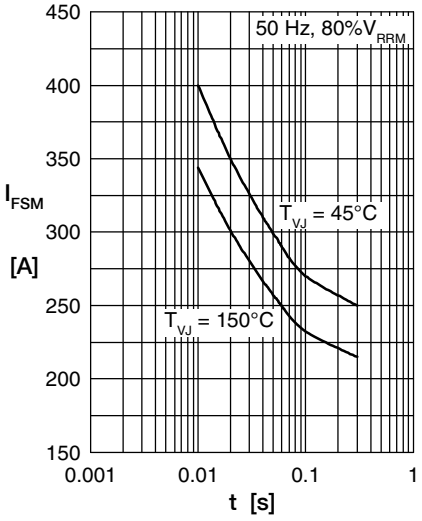

Fig. 2 Surge overload current versus time per diode

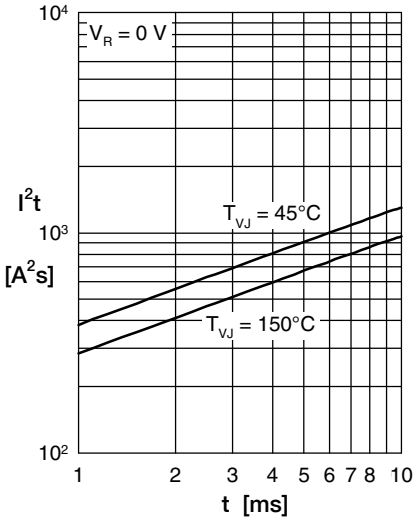

Fig. 3 I^2t versus time per diode

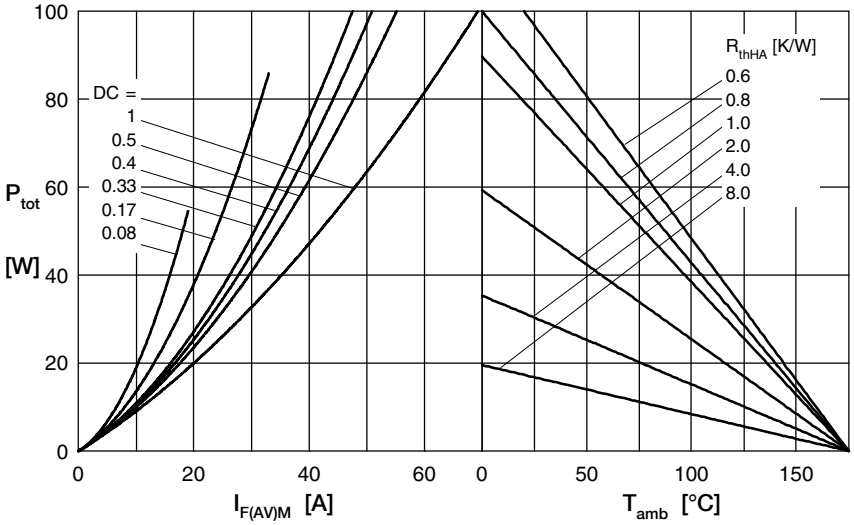

Fig. 4 Power dissipation versusdirect output current and ambient temperature per diode

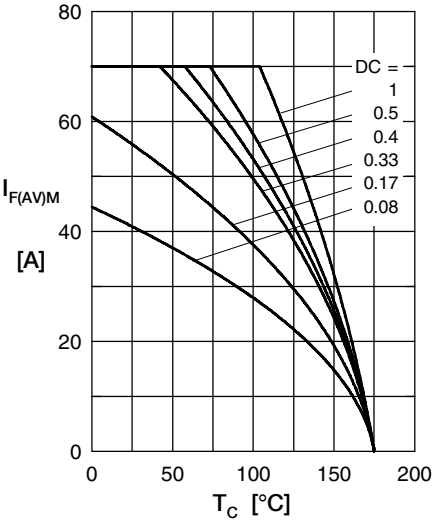

Fig. 5 Max. forward current vs. case temperature per diode

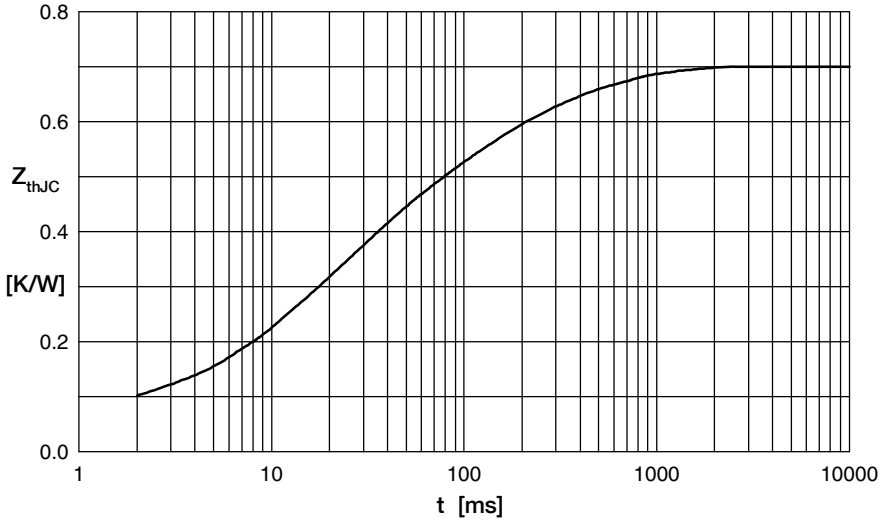

Fig. 6 Transient thermal impedance junction to case versus time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.06	0.0004
2	0.12	0.0100
3	0.20	0.0240
4	0.20	0.1000
5	0.12	0.4500

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