

Standard Rectifier

$$V_{RRM} = 2 \times 1200 \text{ V}$$

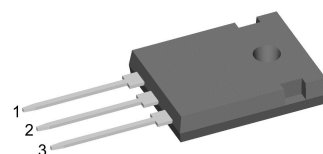
$$I_{FAV} = 50 \text{ A}$$

$$V_F = 1.28 \text{ V}$$

Phase leg

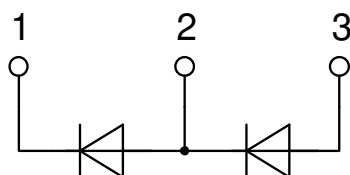
Part number

DMA50P1200HR



Backside: isolated

 E72873



Features / Advantages:

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

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				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1300	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V
I_R	reverse current	$V_R = 1200\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			40	μA
		$V_R = 1200\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1.5	mA
V_F	forward voltage drop	$I_F = 50\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.31	V
		$I_F = 100\text{ A}$				1.64	V
		$I_F = 50\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.28	V
		$I_F = 100\text{ A}$				1.70	V
I_{FAV}	average forward current	$T_C = 105^{\circ}\text{C}$	$T_{VJ} = 175^{\circ}\text{C}$			50	A
		180° sine					
V_{F0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}\text{C}$			0.82	V
r_F	slope resistance					9	m Ω
R_{thJC}	thermal resistance junction to case					0.7	K/W
R_{thCH}	thermal resistance case to heatsink				0.3		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			210	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	$V_R = 0\text{ V}$			700	A
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^{\circ}\text{C}$			555	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			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	$V_R = 0\text{ V}$			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	$V_R = 0\text{ V}$			1.48	kA ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		18		pF

Package ISO247			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
$d_{Spp/App}$	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	3600			V
		t = 1 minute	3000			V

Product Marking



Part description

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

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

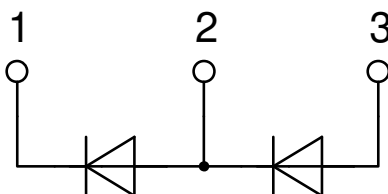
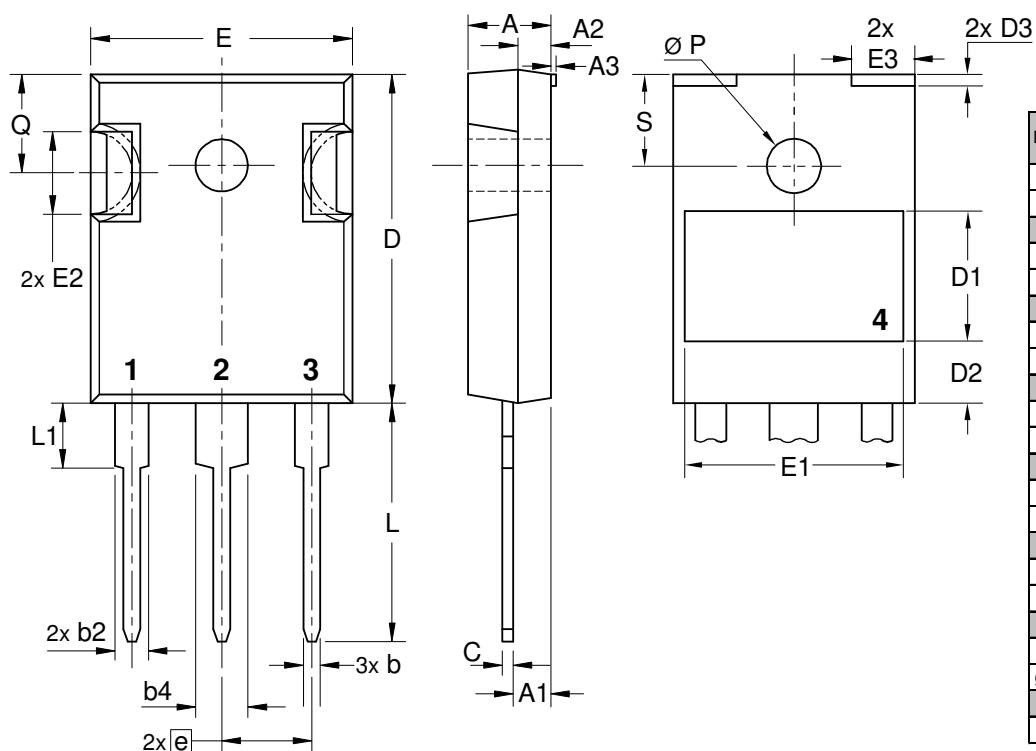
Similar Part	Package	Voltage class
DMA50P1200HB	TO-247AD (3)	1200

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175^{\circ}\text{C}$

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

Outlines ISO247


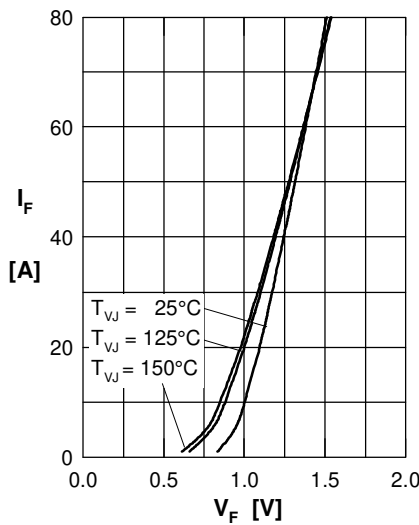
Rectifier


Fig. 1 Forward current versus voltage drop per diode

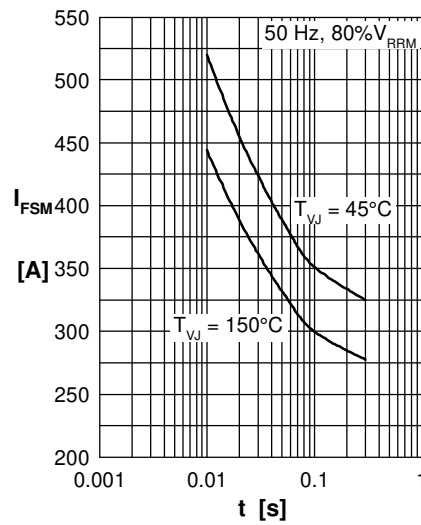


Fig. 2 Surge overload current versus time per diode

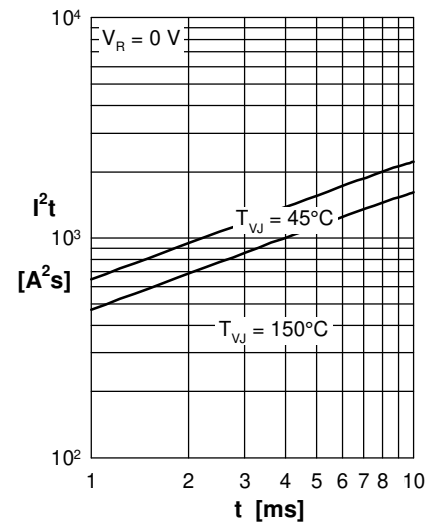
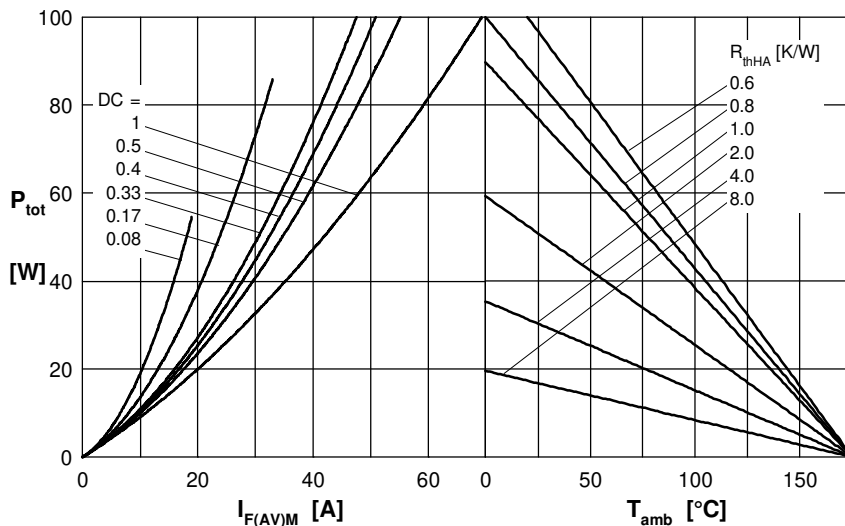

 Fig. 3 I^2t versus time per diode


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

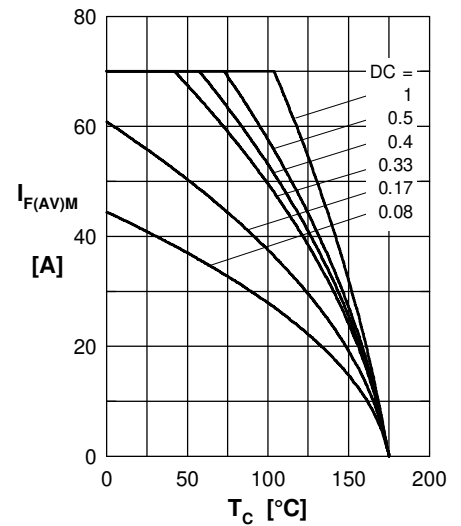


Fig. 5 Max. forward current vs. case temperature per diode

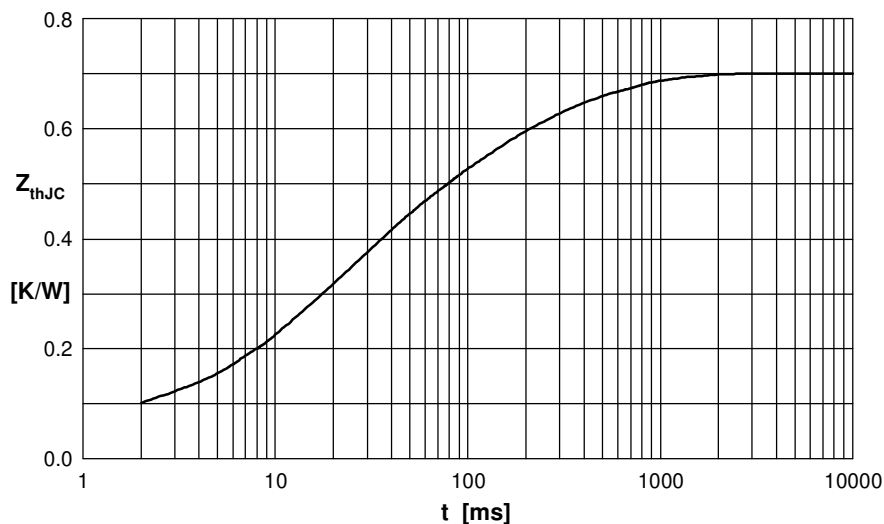


Fig. 6 Transient thermal impedance junction to case versus time per diode

 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