

Standard Rectifier

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

$$I_{FAV} = 10 \text{ A}$$

$$V_F = 1.18 \text{ V}$$

Phase leg

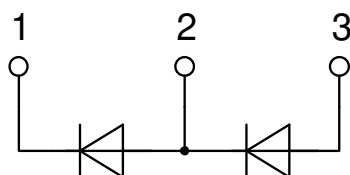
Part number

DMA10P1600HR



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				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1600	V
I_R	reverse current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			10	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			0.2	mA
V_F	forward voltage drop	$I_F = 10\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.23	V
		$I_F = 20\text{ A}$				1.46	V
		$I_F = 10\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.18	V
		$I_F = 20\text{ A}$				1.49	V
I_{FAV}	average forward current	$T_C = 145^{\circ}\text{C}$ rectangular	$T_{VJ} = 175^{\circ}\text{C}$			10	A
V_{F0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}\text{C}$			0.81	V
r_F	slope resistance					34	m Ω
R_{thJC}	thermal resistance junction to case					2	K/W
R_{thCH}	thermal resistance case to heatsink				0.3		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			75	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			120	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			130	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			100	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			110	A
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			72	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			70	A ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			50	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			50	A ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		4		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)
 10 = Current Rating [A]
 P = Phase leg
 1600 = Reverse Voltage [V]
 HR = ISO247 (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA10P1600HR	DMA10P1600HR	Tube	30	522535

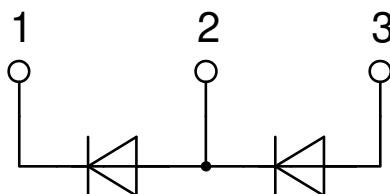
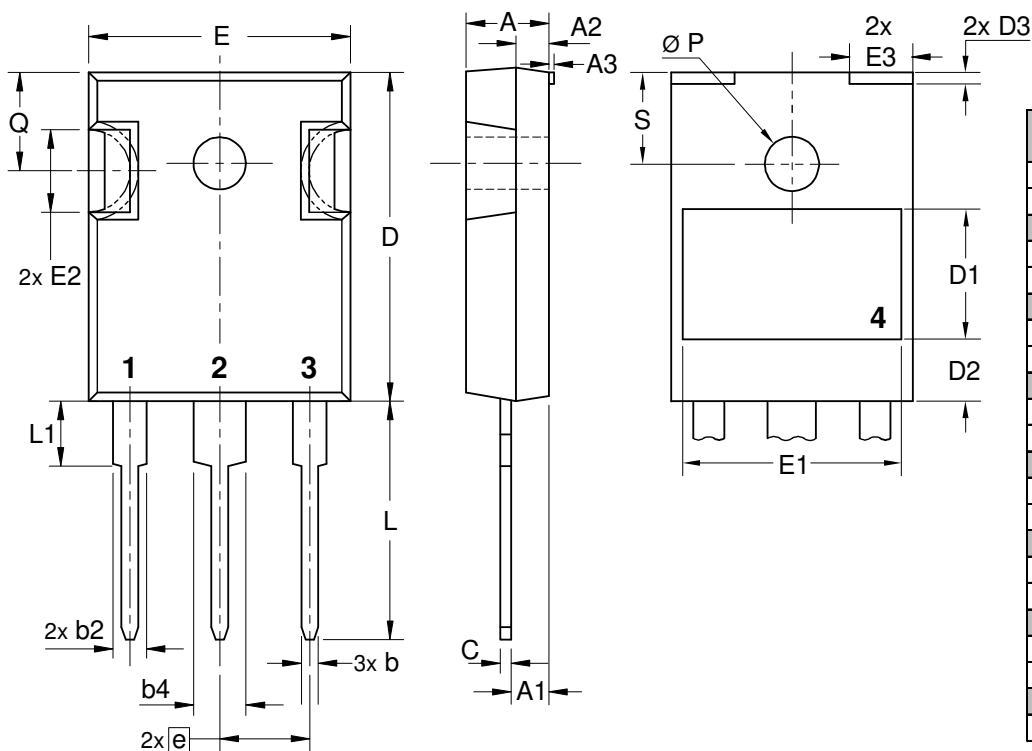
Similar Part	Package	Voltage class
DMA10P1200HR	ISO247 (3)	1200

Equivalent Circuits for Simulation

* on die level

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

		Rectifier	
$V_{0\max}$	threshold voltage	0.81	V
$R_{0\max}$	slope resistance *	31	mΩ

Outlines ISO247


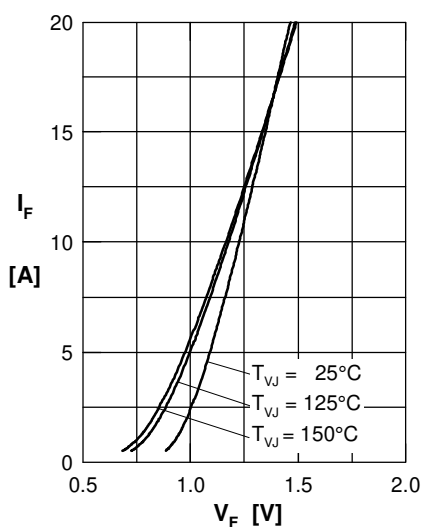
Rectifier


Fig. 1 Forward current versus voltage drop per diode



Fig. 2 Surge overload current

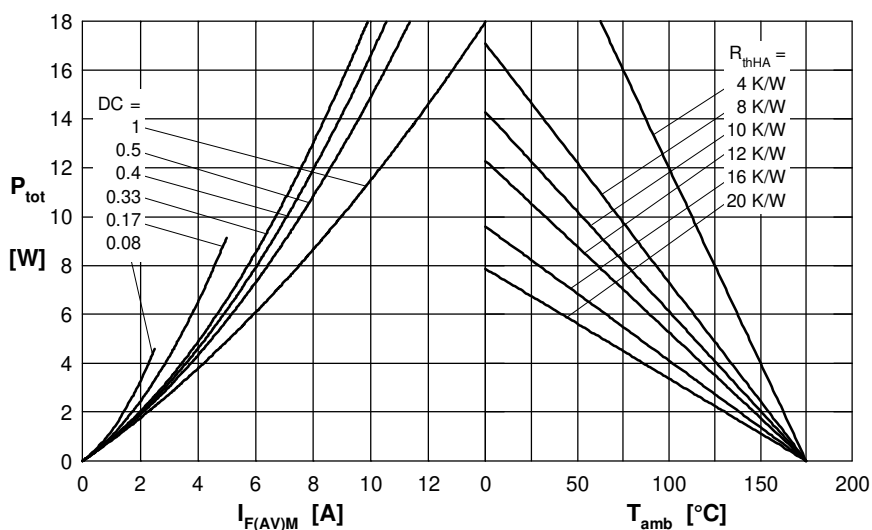

 Fig. 3 I^2t versus time per diode


Fig. 4 Power dissipation vs. direct output current and ambient temperature

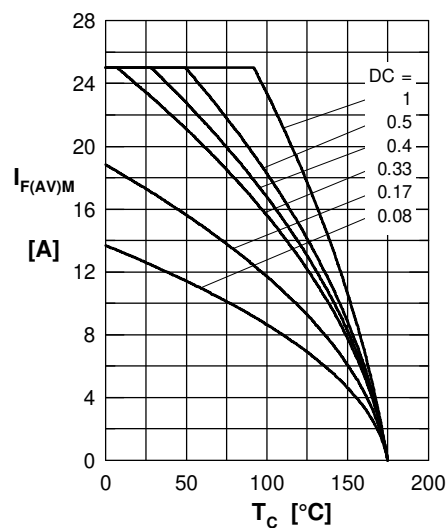


Fig. 5 Max. forward current vs. case temperature

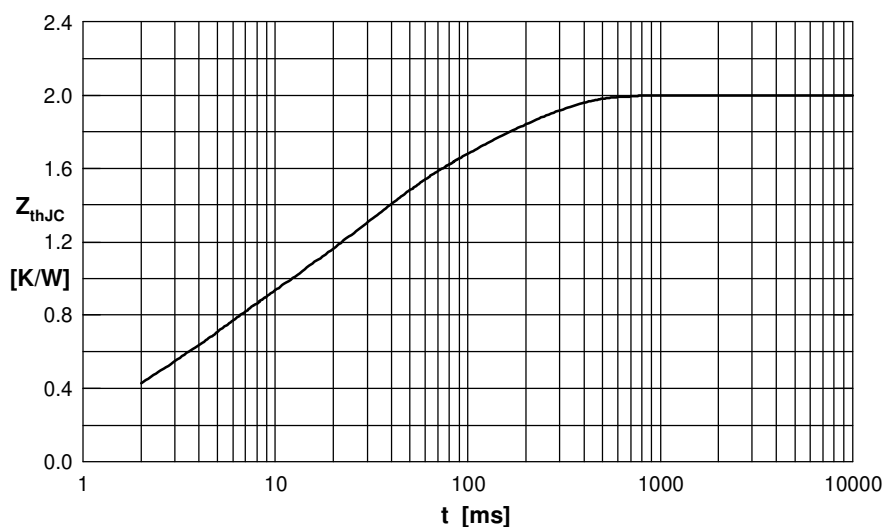


Fig. 6 Transient thermal impedance junction to case

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.06	0.0004
2	0.23	0.0020
3	0.40	0.0040
4	0.71	0.0240
5	0.60	0.1500