

Standard Rectifier

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

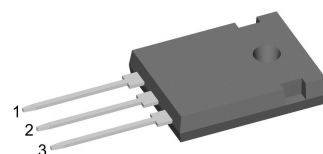
$$I_{FAV} = 30 \text{ A}$$

$$V_F = 1.23 \text{ V}$$

Phase leg

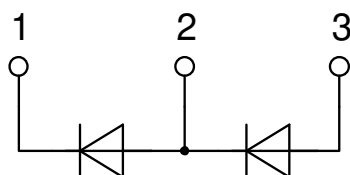
Part number

DMA30P1600HR



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

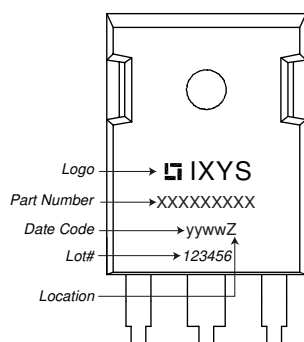
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1600	V
I_R	reverse current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			40	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1.5	mA
V_F	forward voltage drop	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.28	V
		$I_F = 60\text{ A}$				1.57	V
		$I_F = 30\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.23	V
		$I_F = 60\text{ A}$				1.63	V
I_{FAV}	average forward current	$T_C = 105^{\circ}\text{C}$	$T_{VJ} = 175^{\circ}\text{C}$			30	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					13.5	m Ω
R_{thJC}	thermal resistance junction to case					1.3	K/W
R_{thCH}	thermal resistance case to heatsink				0.3		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			115	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			300	A
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			325	A
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			255	A
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			275	A
I^2t	value for fusing	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			450	A ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			440	A ² s
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			325	A ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			315	A ² s
C_J	junction capacitance	$V_R = 400\text{ V; } f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		10		pF

Package ISO247				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal				50	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	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3600			V
		t = 1 minute		3000			V

Product Marking



Part description

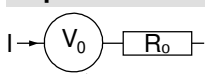
D = Diode
 M = Standard Rectifier
 A = (up to 1800V)
 30 = Current Rating [A]
 P = Phase leg
 1600 = Reverse Voltage [V]
 HR = ISO247 (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA30P1600HR	DMA30P1600HR	Tube	30	512442

Equivalent Circuits for Simulation

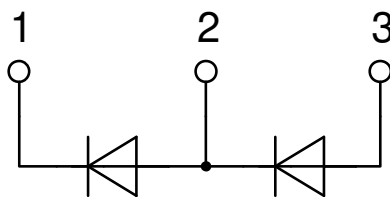
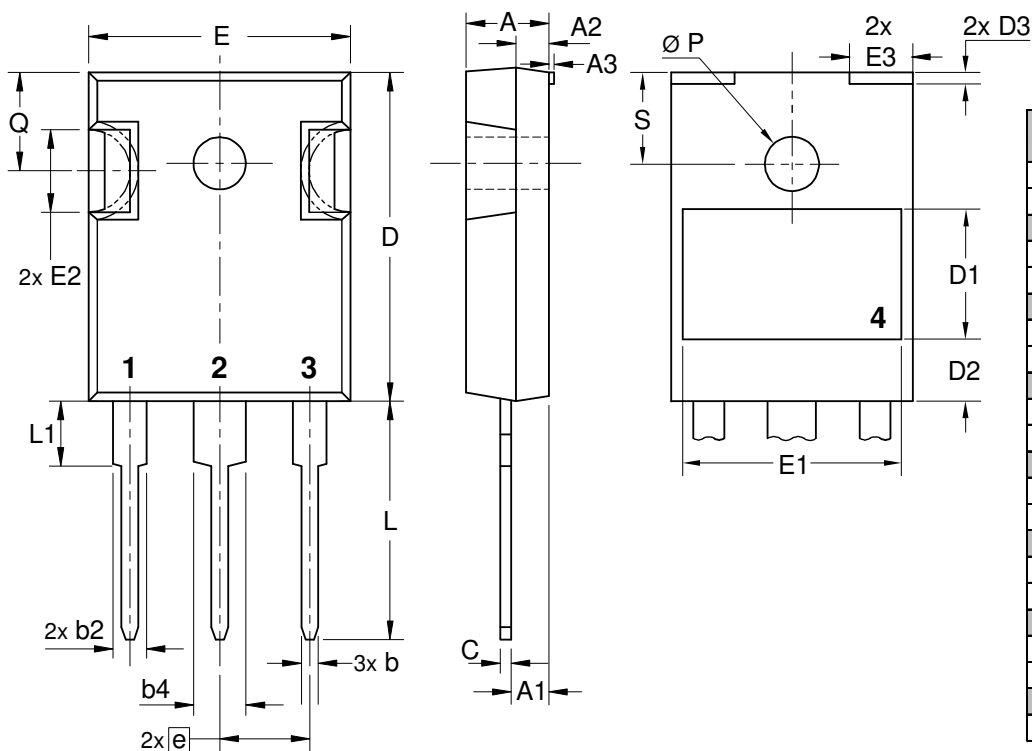
* on die level

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



Rectifier

$V_{0\max}$	threshold voltage	0.82	V
$R_{0\max}$	slope resistance *	10.9	mΩ

Outlines ISO247


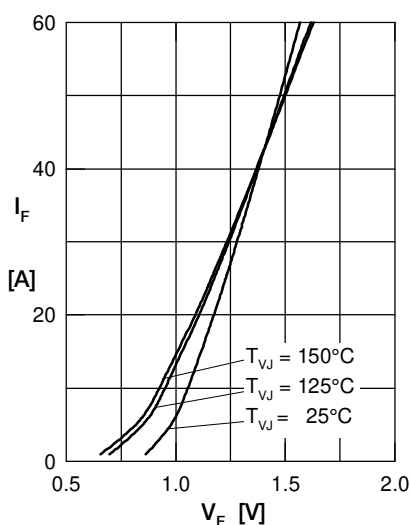
Rectifier


Fig. 1 Forward current versus voltage drop per diode

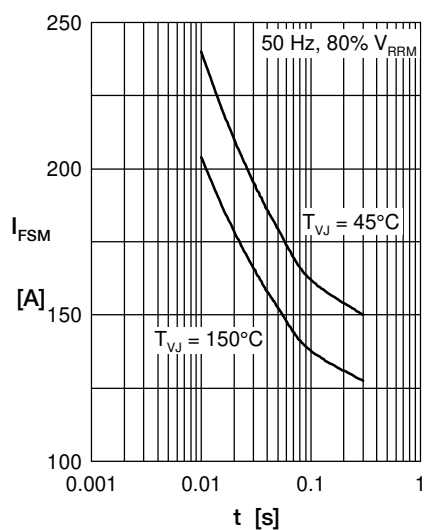


Fig. 2 Surge overload current vs. time per diode

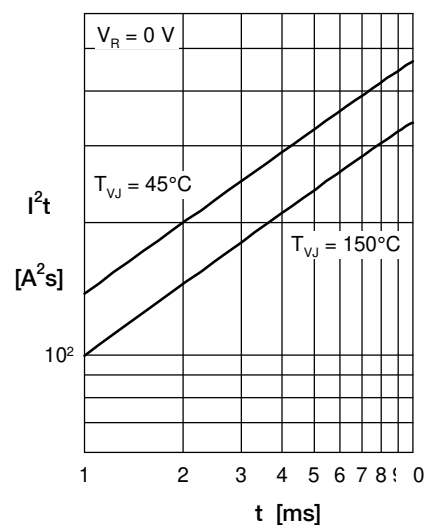


Fig. 3 I^2t versus time per diode

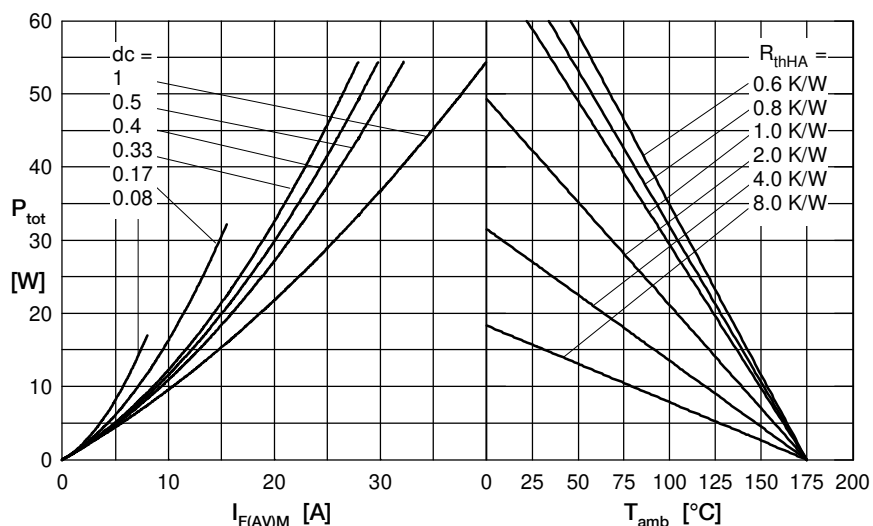


Fig. 4 Power dissipation vs. direct output current and ambient temperature per diode

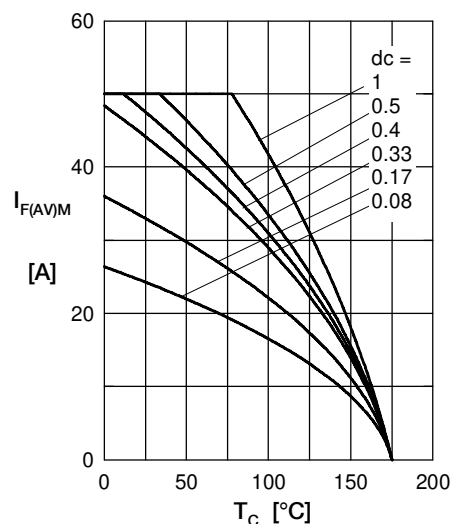


Fig. 5 Max. forward current vs. case temperature per diode

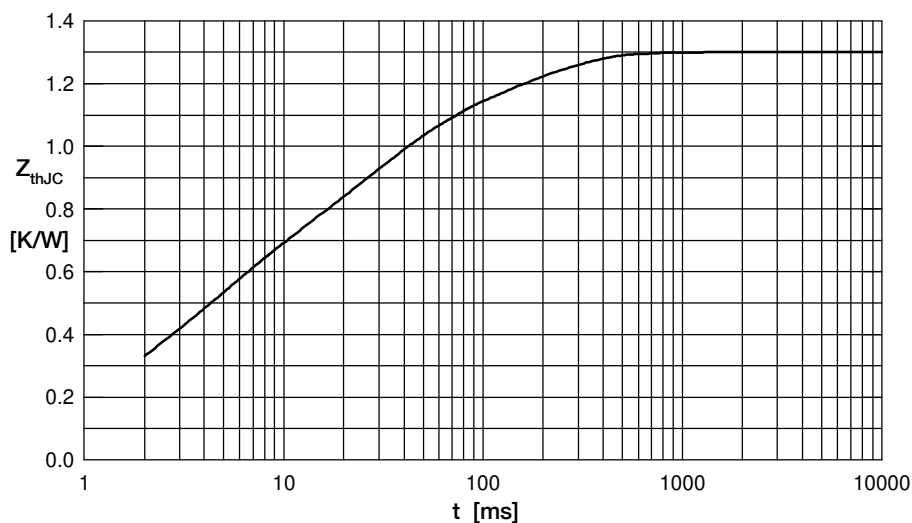


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.060	0.0004
2	0.170	0.0020
3	0.310	0.0040
4	0.470	0.0240
5	0.290	0.1500