

Standard Rectifier

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

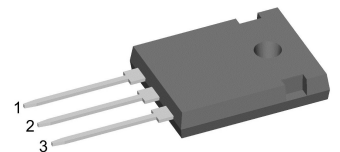
$$I_{FAV} = 30 \text{ A}$$

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

Phase leg

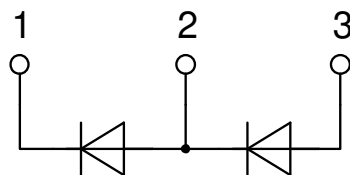
Part number

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

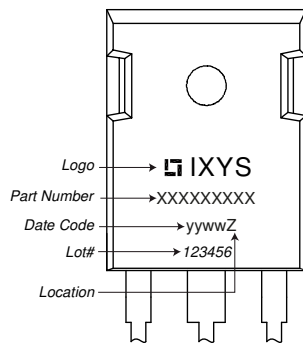
- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

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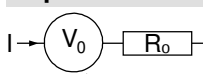
Rectifier				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1700	V	
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1600	V	
I_R	reverse current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}C$		40	μA	
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}C$		1.5	mA	
V_F	forward voltage drop	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}C$		1.28	V	
		$I_F = 60\text{ A}$			1.57	V	
		$I_F = 30\text{ A}$	$T_{VJ} = 150^{\circ}C$		1.23	V	
		$I_F = 60\text{ A}$			1.63	V	
I_{FAV}	average forward current	$T_C = 105^{\circ}C$ 180° sine	$T_{VJ} = 175^{\circ}C$		30	A	
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		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		$T_C = 25^{\circ}C$		115	W	
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}C$		300	A	
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$		325	A	
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}C$		255	A	
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$		275	A	
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}C$		450	A ² s	
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$		440	A ² s	
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}C$		325	A ² s	
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$		315	A ² s	
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}C$		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	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)

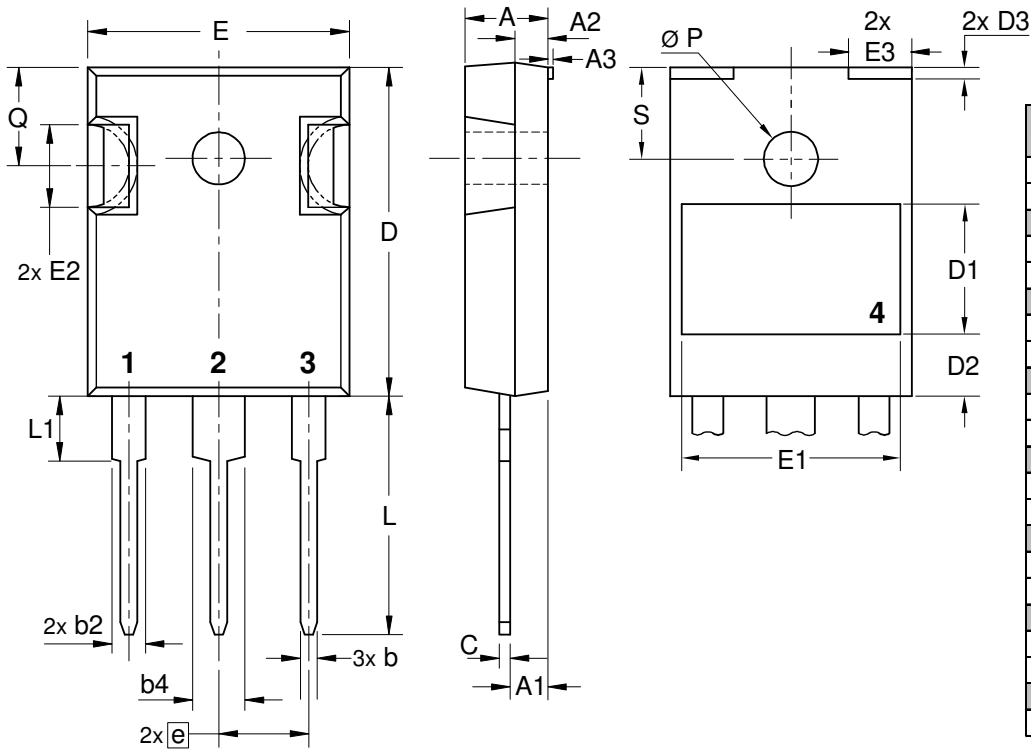
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DMA30P1600HR	DMA30P1600HR	Tube	30	512442

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



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	



Rectifier

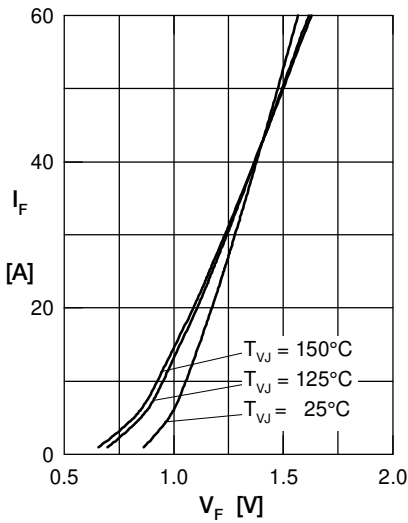


Fig. 1 Forward current versus voltage drop per diode

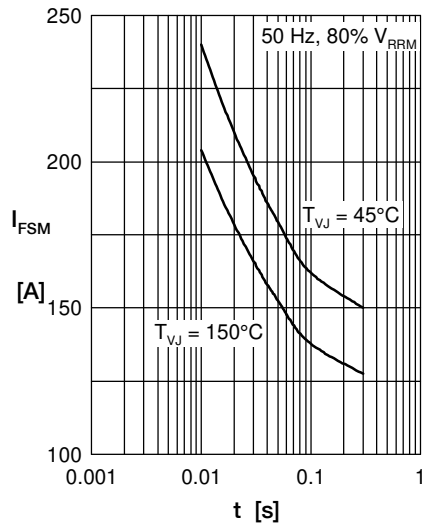


Fig. 2 Surge overload current vs. time per diode

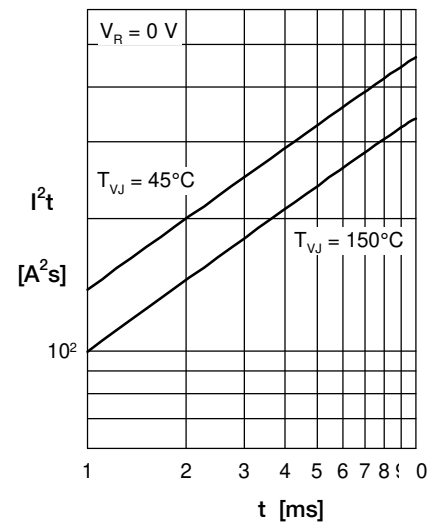


Fig. 3 I^2t versus time per diode

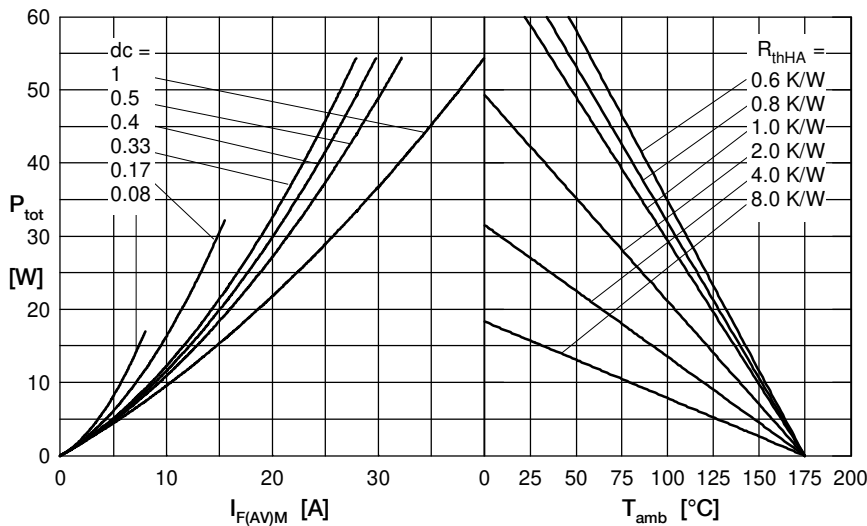


Fig. 4 Power dissipation vs. direct output current and ambient temperature per diode

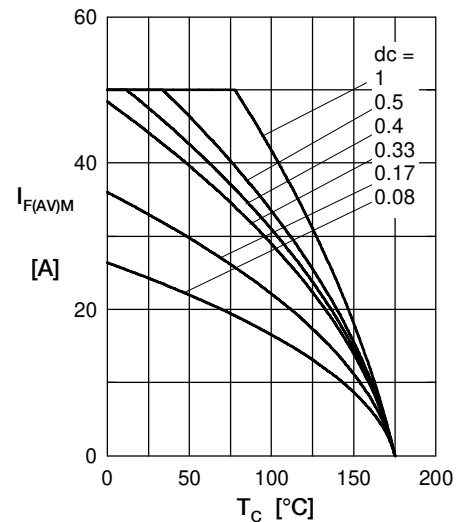


Fig. 5 Max. forward current vs. case temperature per diode

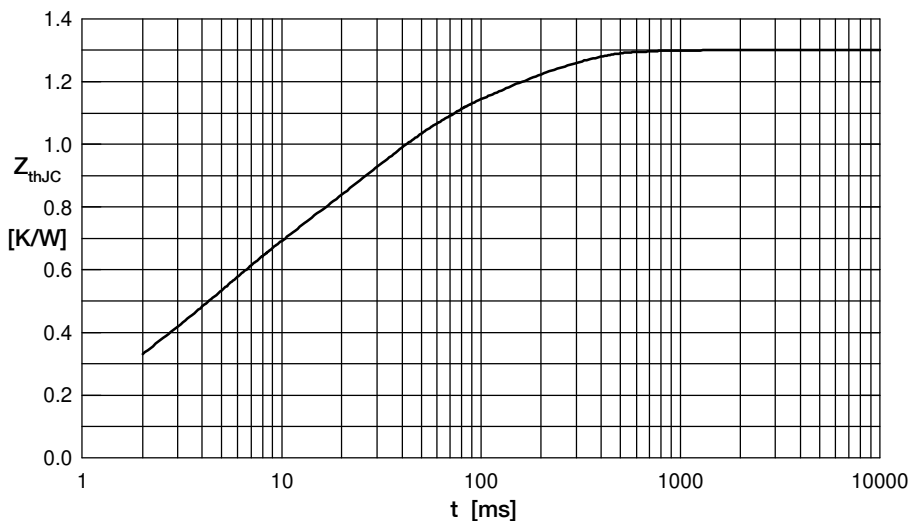


Fig. 6 Transient thermal impedance junction to case vs. time per diode

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