



MP02 XX 130 Series

Dual Diode Modules

Replaces December 1998 version, DS5100-3.0

DS5100- January 2000

FEATURES

- Dual Device Module
- Electrically Isolated Package
- Pressure Contact Construction
- International Standard Footprint
- Alumina (non-toxic) Isolation Medium

APPLICATIONS

- Rectifier Bridges
- DC Power Supplies
- Plating Rectifiers
- Traction Systems

VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages V_{RRM}	Conditions
MP02/130 - 25	2500	$T_{vj} = 150^{\circ}\text{C}$
MP02/130 - 22	2200	$I_{RM} = 30\text{mA}$
MP02/130 - 20	2000	$V_{RSM} = V_{RRM} + 100\text{V}$
MP02/130 - 18	1800	

Lower voltage grades available. For full description of part number see "Ordering Instructions" on page 3.

CURRENT RATINGS - PER ARM

Symbol	Parameter	Conditions	Max.	Units	
$I_{F(AV)}$	Mean forward current	Halfwave, resistive load	$T_{case} = 75^{\circ}\text{C}$	130	A
			$T_{case} = 85^{\circ}\text{C}$	116	A
			$T_{heatsink} = 75^{\circ}\text{C}$	114	A
			$T_{heatsink} = 85^{\circ}\text{C}$	101	A
$I_{F(RMS)}$	RMS value	$T_{case} = 75^{\circ}\text{C}$	204	A	

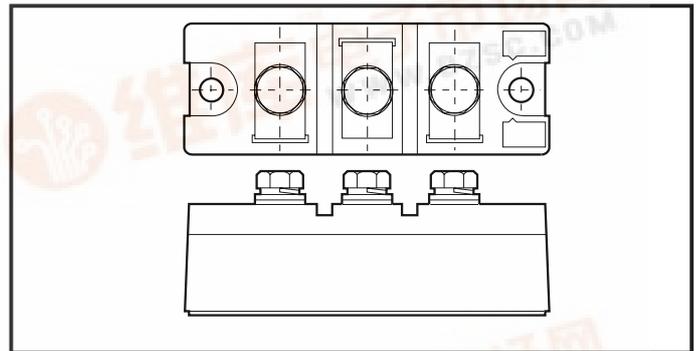
KEY PARAMETERS

V_{RRM}	2500V
I_{FSM}	2200A
$I_{F(AV)}$ (per arm)	130A
V_{isol}	2500V

CIRCUIT OPTIONS

Code	Circuit
HB	
G	
GN	

PACKAGE OUTLINE



Module outline type code: MP02.
See Package Details for further information



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SURGE RATINGS - PER ARM

Symbol	Parameter	Conditions		Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_j = 150^\circ\text{C}$	$V_R = 0$	2200	A
			$V_R = 50\% V_{RRM}$	1760	A
I^2t	I^2t for fusing	10ms half sine; $T_j = 150^\circ\text{C}$	$V_R = 0$	24200	A^2s
			$V_R = 50\% V_{RRM}$	15490	A^2s

THERMAL & MECHANICAL RATINGS

Symbol	Parameter	Conditions	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case per Diode	dc	0.37	$^\circ\text{C}/\text{W}$
		halfwave	0.38	$^\circ\text{C}/\text{W}$
		3 phase	0.39	$^\circ\text{C}/\text{W}$
$R_{th(c-hs)}$	Thermal resistance - case to heatsink per Diode	Mounting torque = 6Nm with mounting compound	0.07	$^\circ\text{C}/\text{W}$
T_{vj}	Virtual junction temperature		150	$^\circ\text{C}$
T_{sto}	Storage temperature range		-40 to 150	$^\circ\text{C}$
V_{isol}	Isolation voltage	Commoned terminals to base plate AC RMS, 1min, 50Hz	2.5	kV

CHARACTERISTICS

Symbol	Parameter	Conditions	Max.	Units
V_{FM}	Forward voltage	At 300A , $T_{case} = 25^\circ\text{C}$	1.53	V
I_{RM}	Peak reverse current	At V_{RRM} , $T_j = 150^\circ\text{C}$	30	mA
V_{TO}	Threshold voltage	At $T_{vj} = 150^\circ\text{C}$	1.10	V
r_T	On-state slope resistance	At $T_{vj} = 150^\circ\text{C}$	1.30	$\text{m}\Omega$

ORDERING INSTRUCTIONS

Part number is made up as follows:

MP02 HB 130 - 22

MP = Pressure contact module
02 = Outline type
HB = Circuit configuration code (see "circuit options" - front page)
130 = Nominal average current rating at $T_{\text{case}} = 75^{\circ}\text{C}$
22 = $V_{\text{RRM}}/100$

Examples:

MP02HB130 - 20
MP02G130 - 25
MP02GN130 - 18

Note: Preferred type is HB configuration. G and GN types are available for specific applications, only when requested.

MOUNTING RECOMMENDATIONS

- Adequate heatsinking is required to maintain the base temperature at 75°C if full rated current is to be achieved. Power dissipation may be calculated by use of V_{TO} and r_{T} information in accordance with standard formulae. We can provide assistance with calculations or choice of heatsink if required.
 - The heatsink surface must be smooth and flat; a surface finish of N6 ($32\mu\text{in}$) and a flatness within 0.05mm ($0.002''$) are recommended.
 - Immediately prior to mounting, the heatsink surface should be lightly scrubbed with fine emery, Scotch Brite or a mild chemical etchant and then cleaned with a solvent to remove oxide build up and foreign material. Care should be taken to ensure no foreign particles remain.
 - An even coating of thermal compound (eg. Unial) should be applied to both the heatsink and module mounting surfaces. This should ideally be 0.05mm ($0.002''$) per surface to ensure optimum thermal performance.
 - After application of thermal compound, place the module squarely over the mounting holes, (or 'T' slots) in the heatsink. Using a torque wrench, slowly tighten the recommended fixing bolts at each end, rotating each in turn no more than $1/4$ of a revolution at a time. Continue until the required torque of 6Nm (55lb.ins) is reached at both ends.
- It is not acceptable to fully tighten one fixing bolt before starting to tighten the other. Such action may DAMAGE the module.

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CURVES

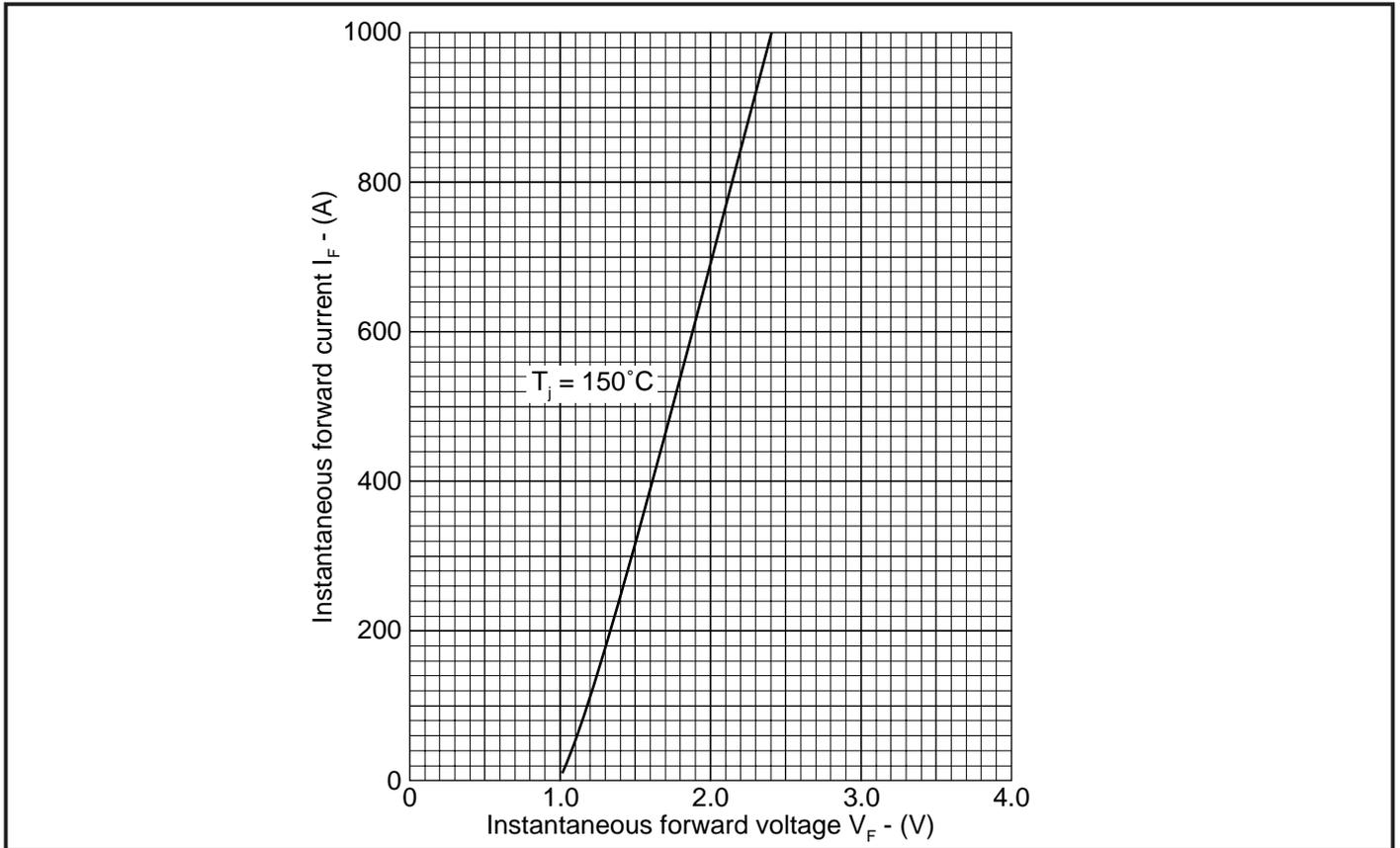


Fig. 1 Maximum (limit) forward characteristics (Per diode)

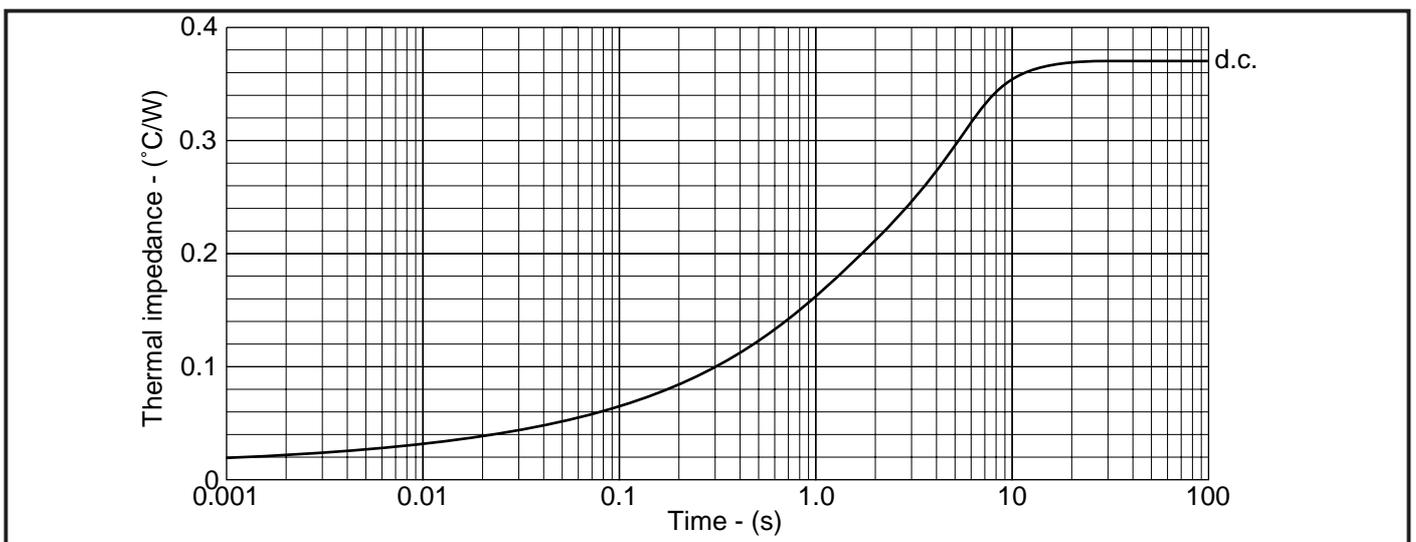


Fig. 2 Transient thermal impedance (DC) - (Per diode)

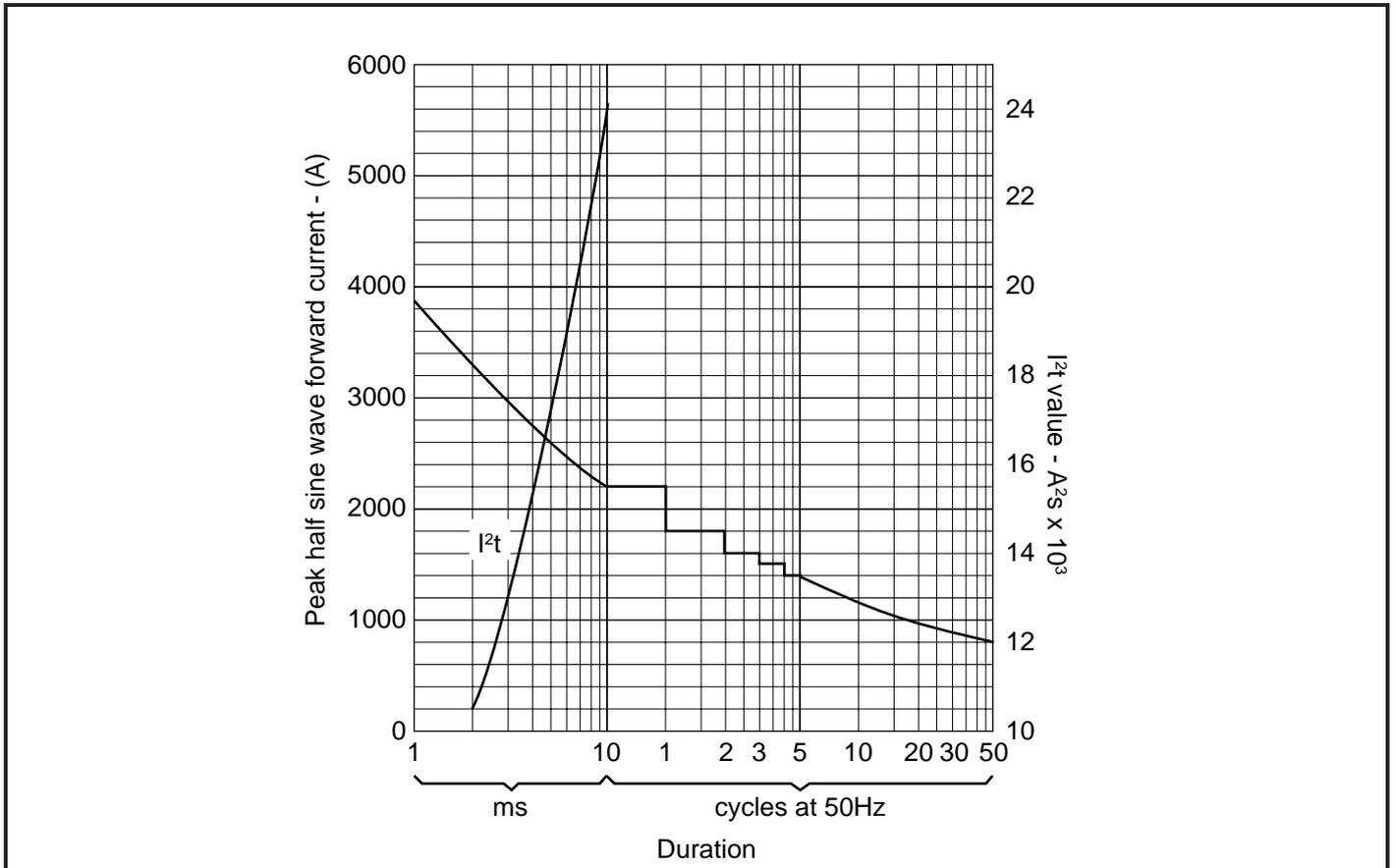


Fig. 3 Surge (non-repetitive) forward current vs time (with 0% V_{RRM} , $T_{case} = 150^\circ C$)

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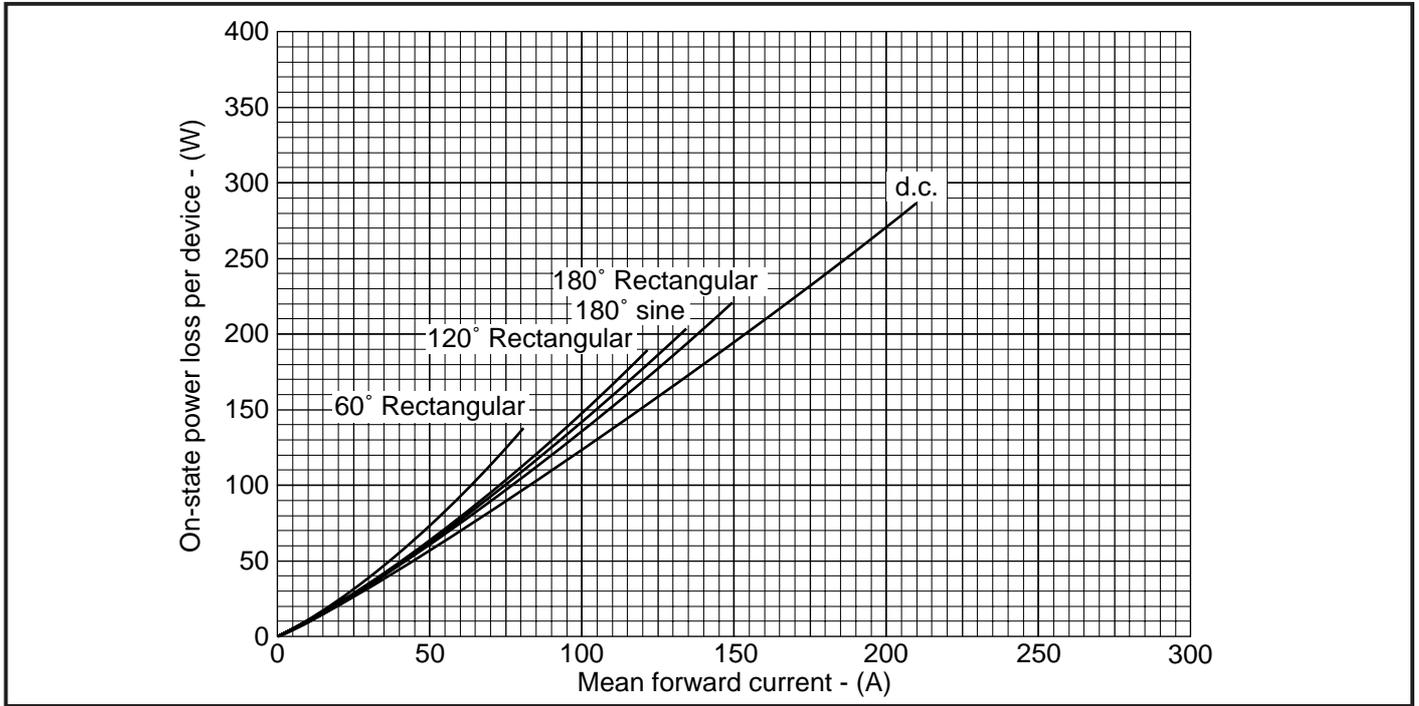


Fig. 4 On-state power loss per arm vs forward current at various conduction angles, 50/60Hz

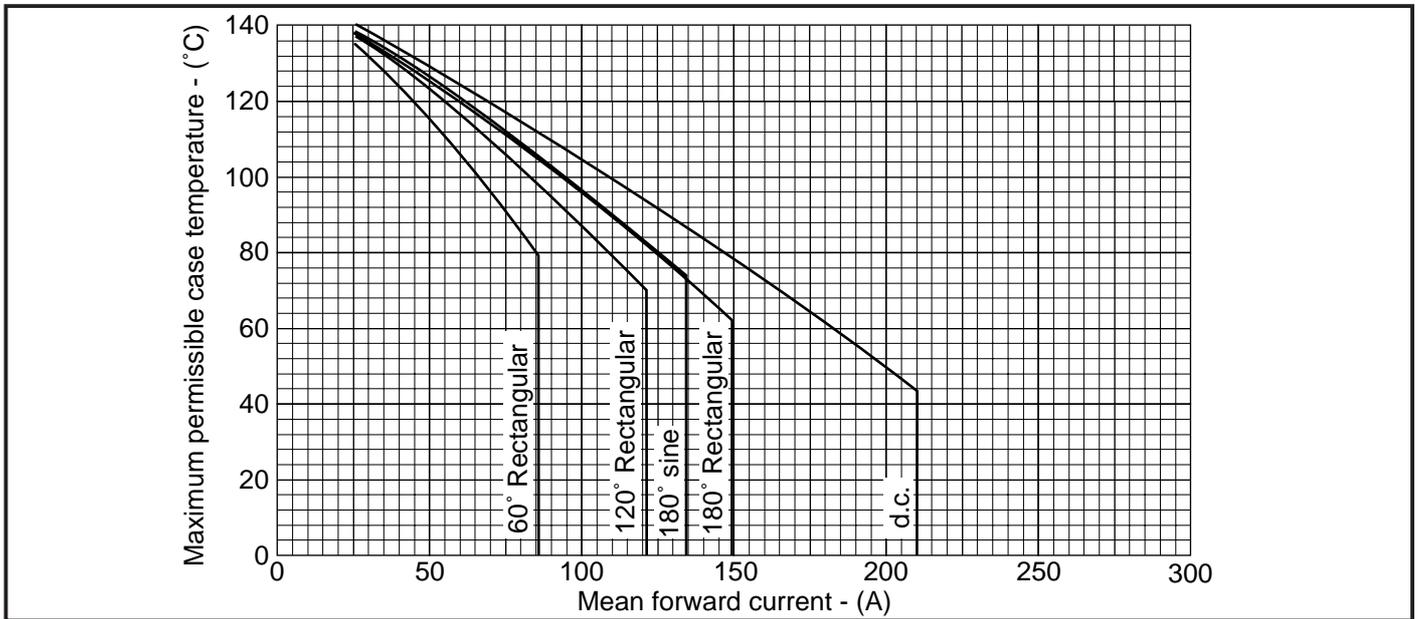


Fig. 5 Maximum permissible case temperature vs forward current per arm at various conduction angles, 50/60Hz

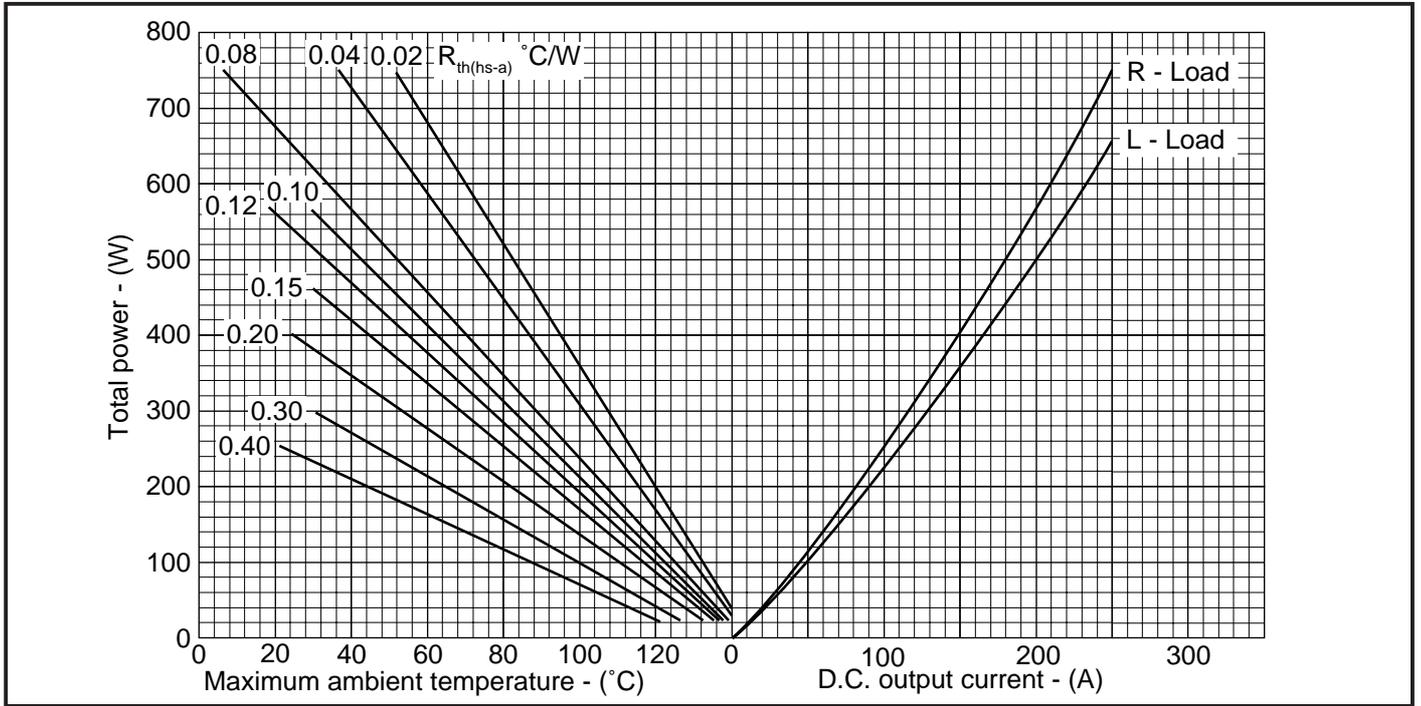


Fig. 6 50/60Hz single phase bridge dc output current vs power loss and maximum permissible ambient temperature for various values of heatsink thermal resistance.

(Note: $R_{th(hs-a)}$ values given above are true heatsink thermal resistances to ambient and already account for $R_{th(c-hs)}$ module contact thermal).

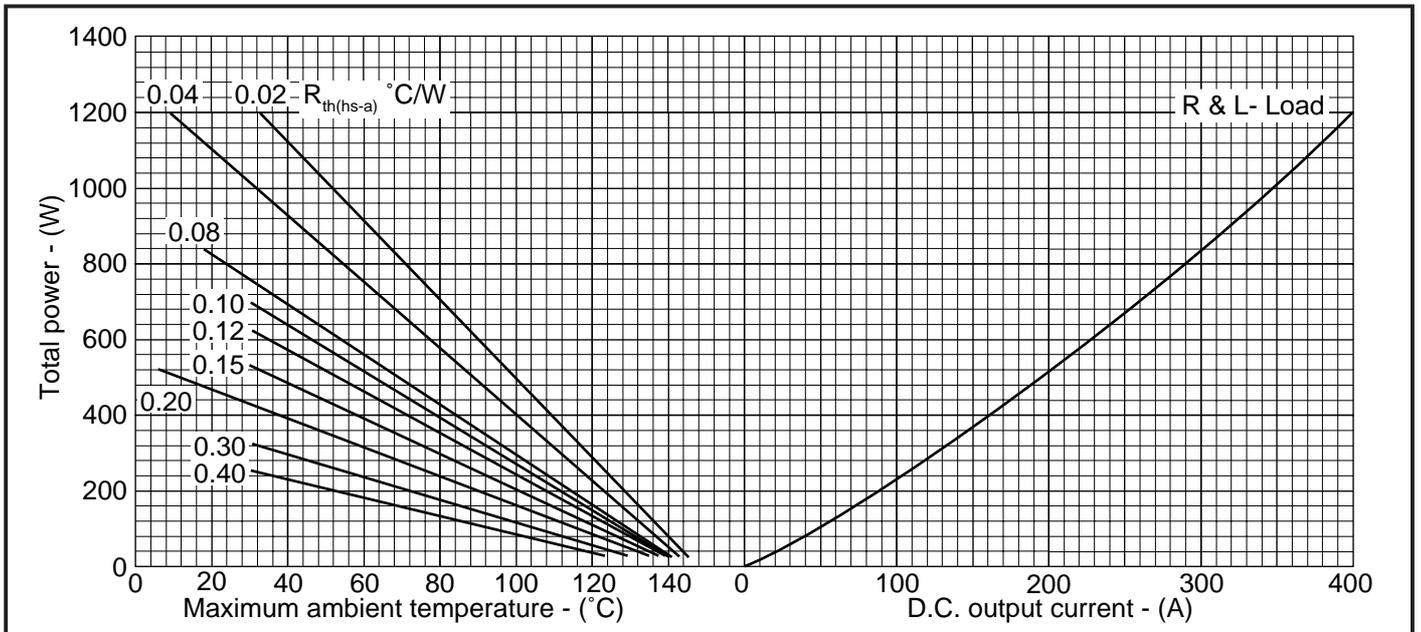


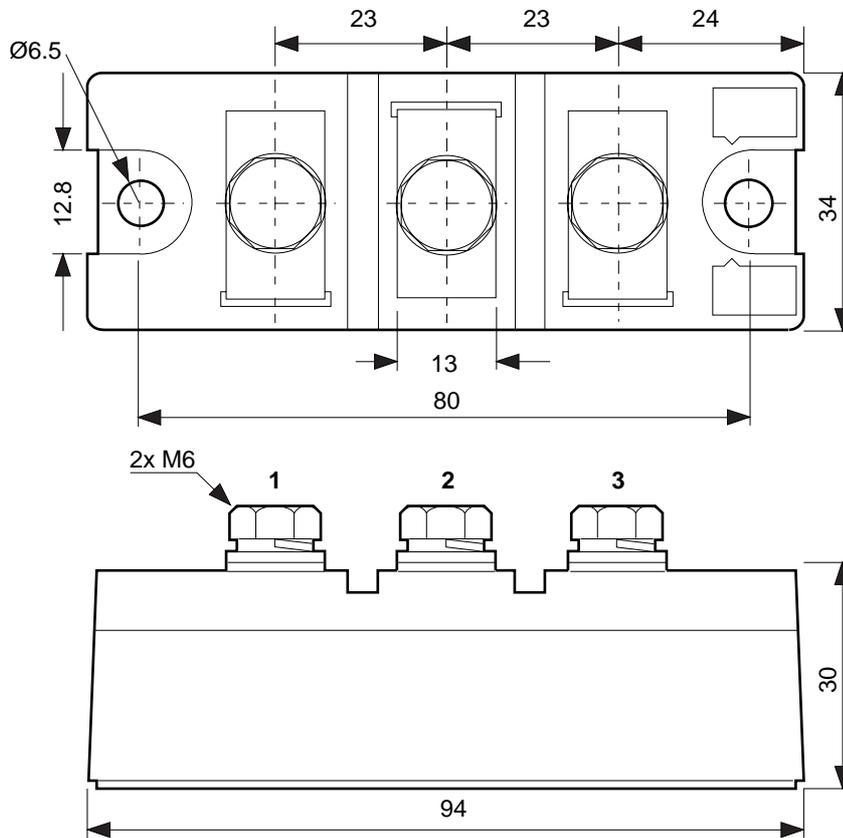
Fig. 7 50/60Hz 3- phase bridge dc output current vs power loss and maximum permissible ambient temperature for various values of heatsink thermal resistance.

(Note: $R_{th(hs-a)}$ values given above are true heatsink thermal resistances to ambient and already account for $R_{th(c-hs)}$ module contact thermal).

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PACKAGE DETAILS

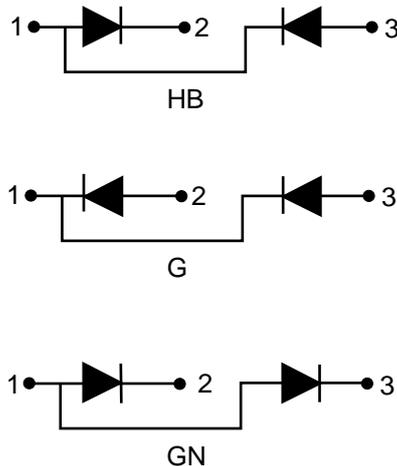
For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Nominal weight: 350g
Recommended fixings for mounting: M6 socket head cap screws
Recommended mounting torque: 6Nm (55lb.ins)
Recommended torque for electrical connections: 5Nm (44lb.ins)
Maximum torque for electrical connections: 8Nm (70lb.ins)

Module outline type code: MP02

CIRCUIT CONFIGURATIONS





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