

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
MP03/440 - 21	2100	$T_{vj} = 150^{\circ}\text{C}$
MP03/440 - 20	2000	$I_{RM} = 30\text{mA}$
MP03/440 - 18	1800	$V_{RSM} = V_{RRM} + 100\text{V}$
MP03/440 - 16	1600	respectively

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

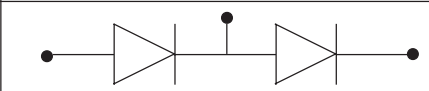
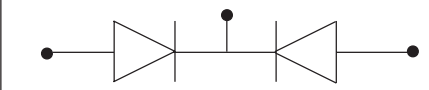
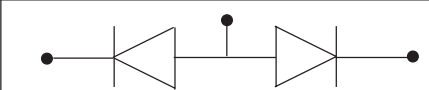
CURRENT RATINGS - PER ARM

Symbol	Parameter	Conditions	Max.	Units	
$I_{F(AV)}$	Mean forward current	Halfwave, resistive load	$T_{case} = 75^{\circ}\text{C}$	440	A
			$T_{case} = 85^{\circ}\text{C}$	390	A
			$T_{heatsink} = 75^{\circ}\text{C}$	340	A
			$T_{heatsink} = 85^{\circ}\text{C}$	300	A
$I_{F(RMS)}$	RMS value	$T_{case} = 75^{\circ}\text{C}$	690	A	

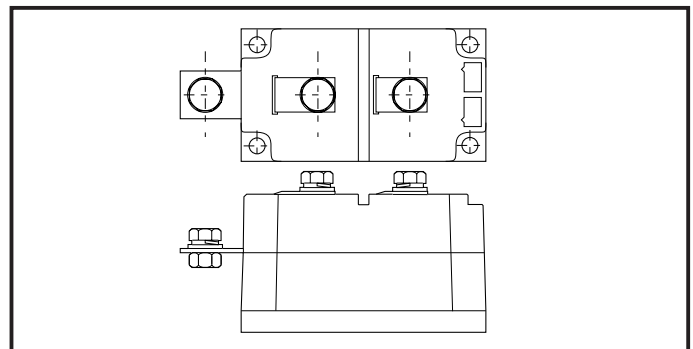
KEY PARAMETERS

V_{RRM}	2100V
I_{FSM}	11250A
$I_{F(AV)}$ (per arm)	440A
V_{isol}	2500V

CIRCUIT OPTIONS

Code	Circuit
HB	
G	
GN	

PACKAGE OUTLINE



Module outline type code: MP03.
See Package Details for further information.

MP03 XX 440 Series

SURGE RATINGS - PER ARM

Symbol	Parameter	Conditions		Max.	Units
I_{FSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_j = 150^\circ\text{C}$	$V_R = 0$	11250	A
			$V_R = 50\% V_{RRM}$	9000	A
I^2t	I^2t for fusing	10ms half sine; $T_j = 150^\circ\text{C}$	$V_R = 0$	630000	A^2s
			$V_R = 50\% V_{RRM}$	405000	A^2s

THERMAL & MECHANICAL RATINGS

Symbol	Parameter	Conditions	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case per Diode	dc	0.12	$^\circ\text{C}/\text{W}$
		halfwave	0.13	$^\circ\text{C}/\text{W}$
		3 phase	0.14	$^\circ\text{C}/\text{W}$
$R_{th(c-hs)}$	Thermal resistance - case to heatsink per Diode	Mounting torque = 5Nm with mounting compound	0.05	$^\circ\text{C}/\text{W}$
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 1000A, $T_{case} = 25^\circ\text{C}$	1.29	V
I_{RM}	Peak reverse current	At V_{RRM} , $T_j = 150^\circ\text{C}$	30	mA
V_{TO}	Threshold voltage	At $T_{vj} = 150^\circ\text{C}$	0.94	V
r_T	On-state slope resistance	At $T_{vj} = 150^\circ\text{C}$	0.32	$\text{m}\Omega$

ORDERING INSTRUCTIONS

Part number is made up as follows:

MP03 HB 440 - 18

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

Examples:

MP03HB440 - 21
 MP03G440 - 16
 MP03GN440 - 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 (32µin) 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 5Nm (44lb.ins) is reached at both ends.
- It is not acceptable to fully tighten one fixing bolt before starting to tighten the others. Such action may DAMAGE the module.

Curves

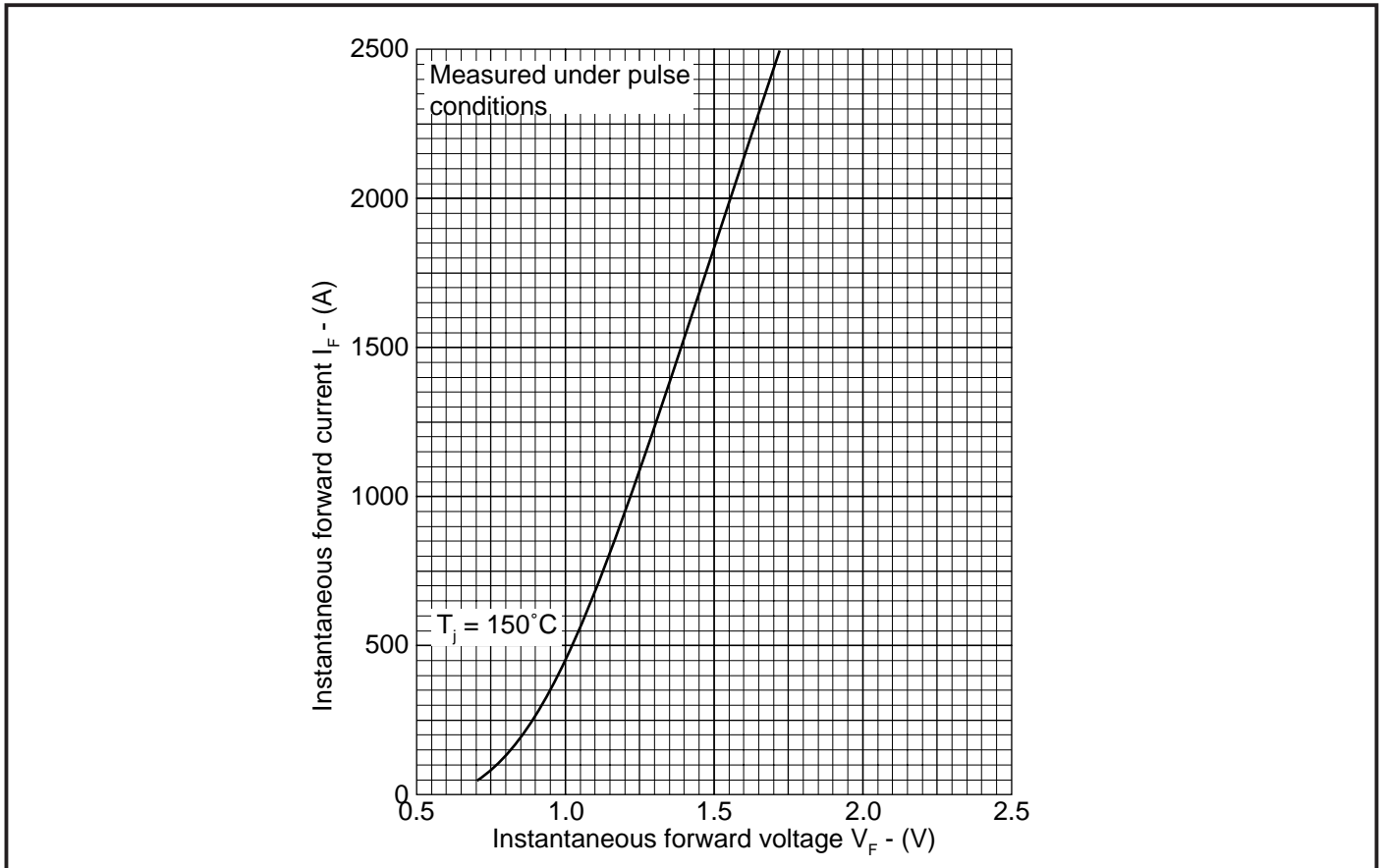


Fig. 1 Maximum (limit) forward characteristics (Per diode)

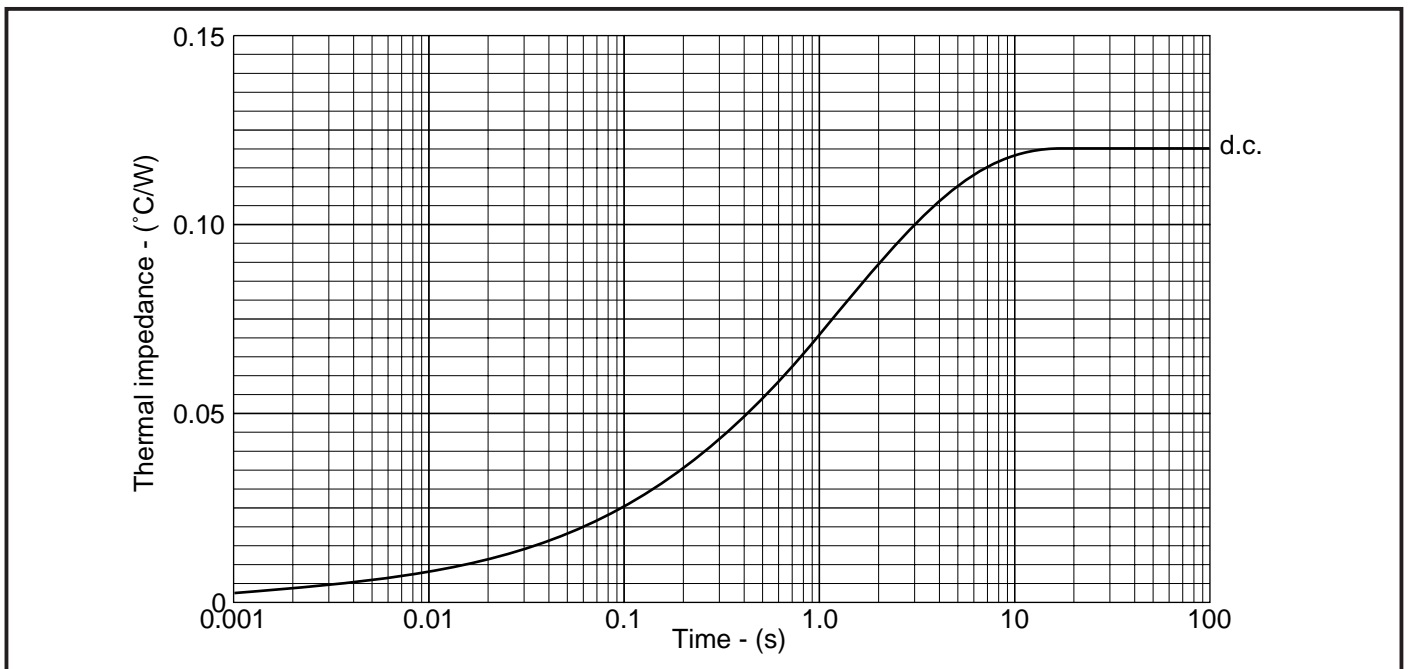


Fig. 2 Transient thermal impedance (DC) - (Per diode)

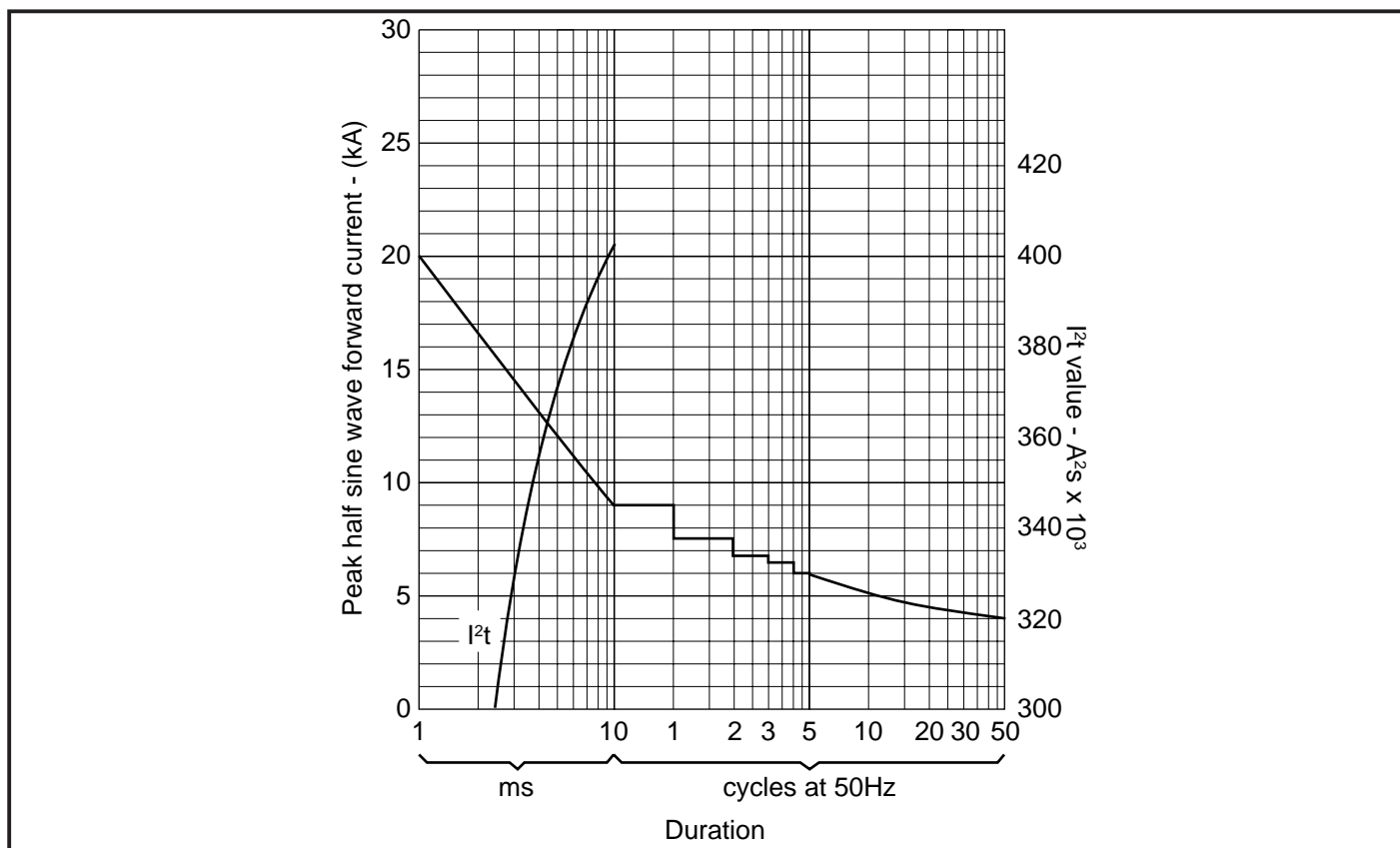


Fig. 3 Surge (non-repetitive) forward current vs time (with 0% V_{RRM} , $T_{case} = 150^\circ C$)

MP03 XX 440 Series

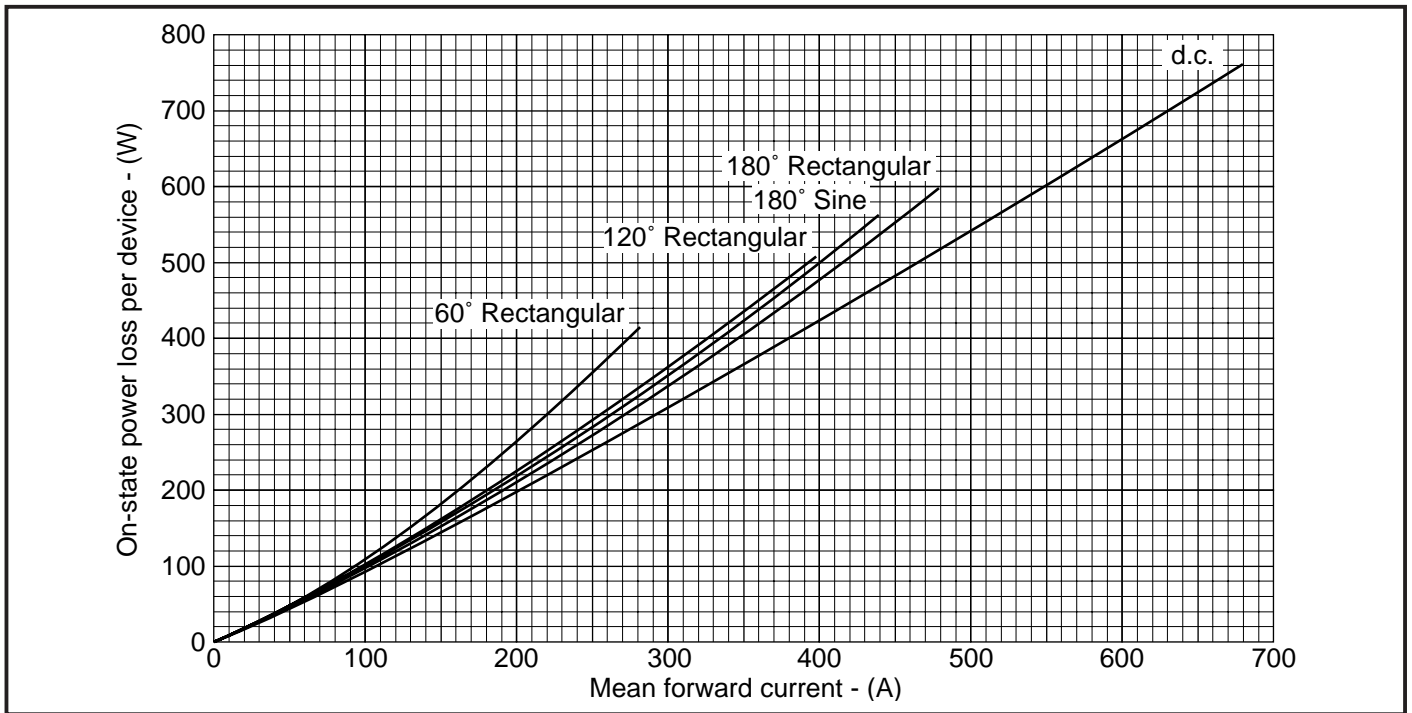


Fig. 4 On-state power loss per arm vs forward current at various conduction angles, 50/60Hz

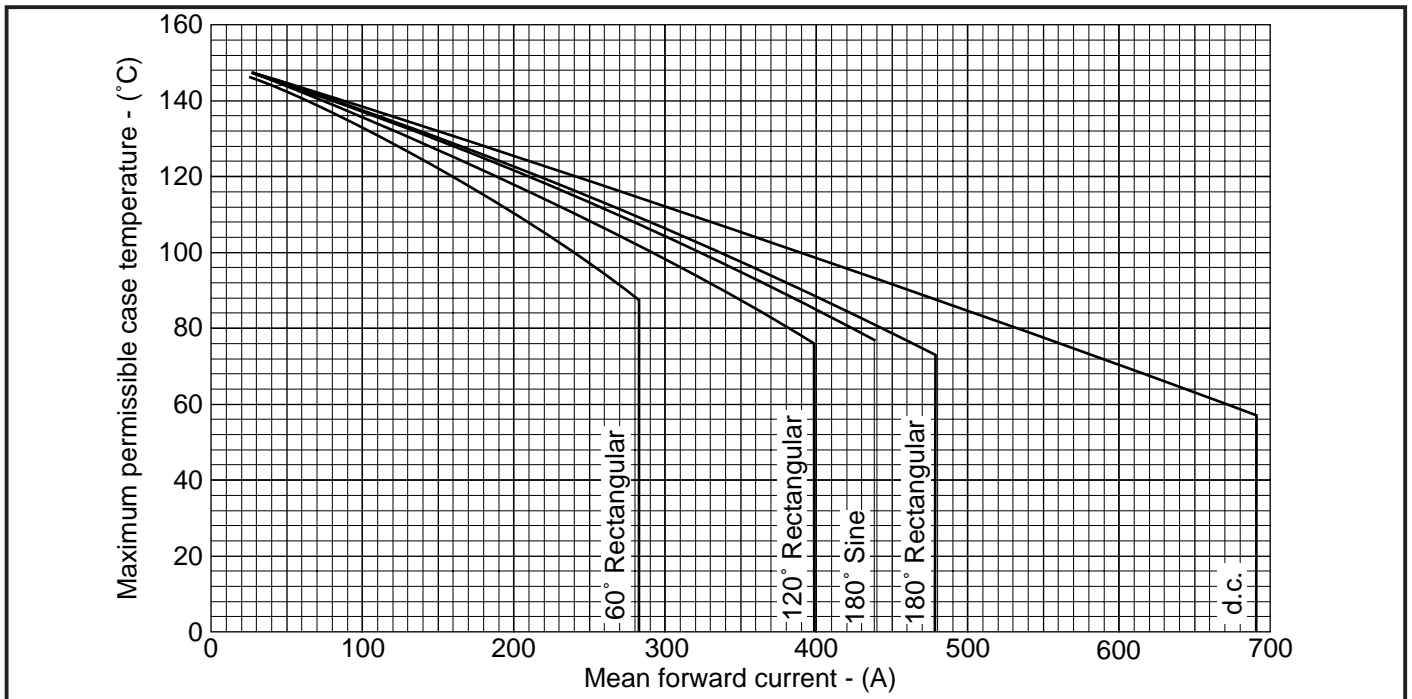


Fig. 5 Maximum permissible case temperature vs forward current per arm at various conduction angles, 50/60Hz

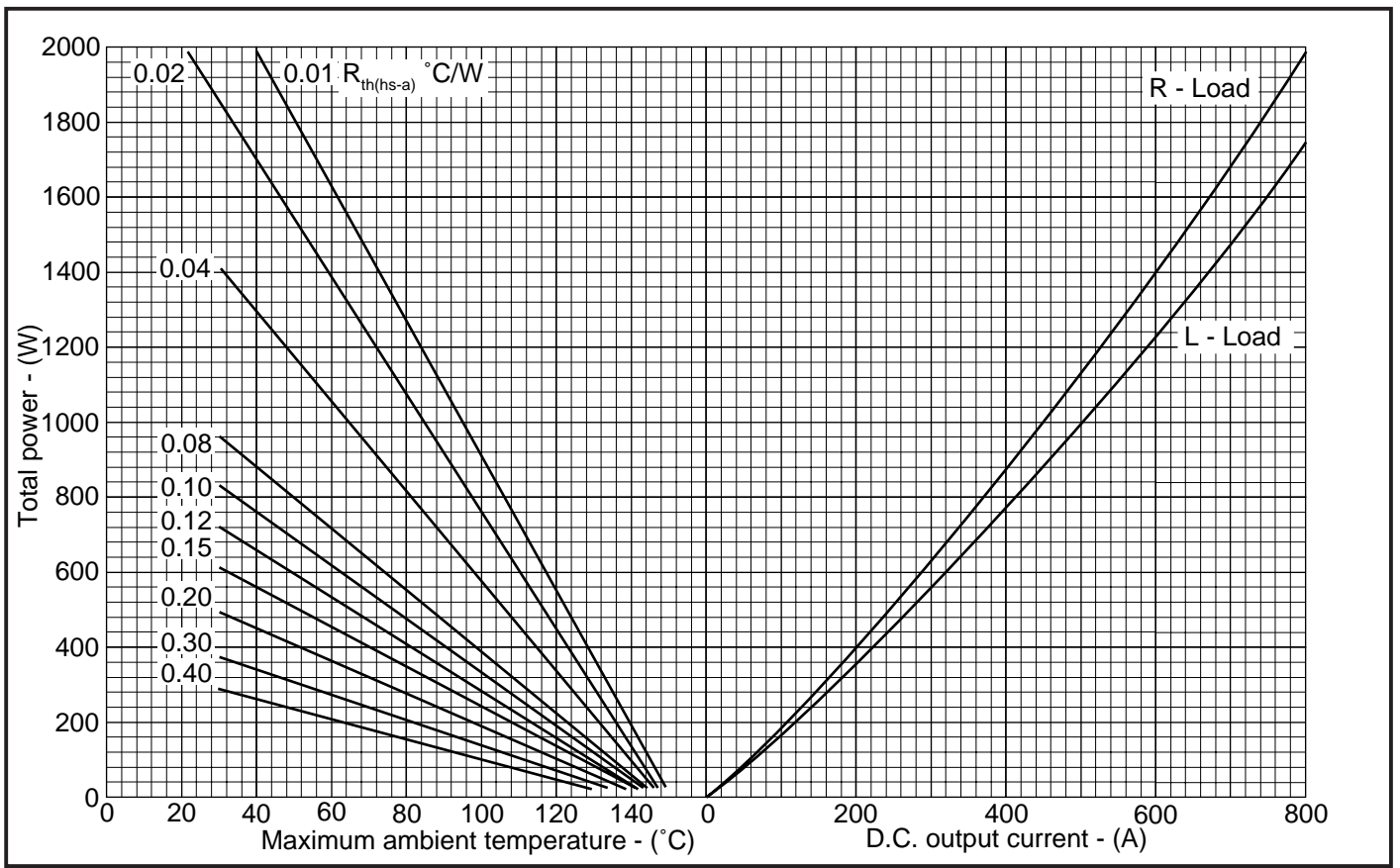


Fig. 6 50/60Hz single phase bridge dc output current vs power loss and maximum permissible ambient temperature for various values of heatsink thermal resistance.

(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).

MP03 XX 440 Series

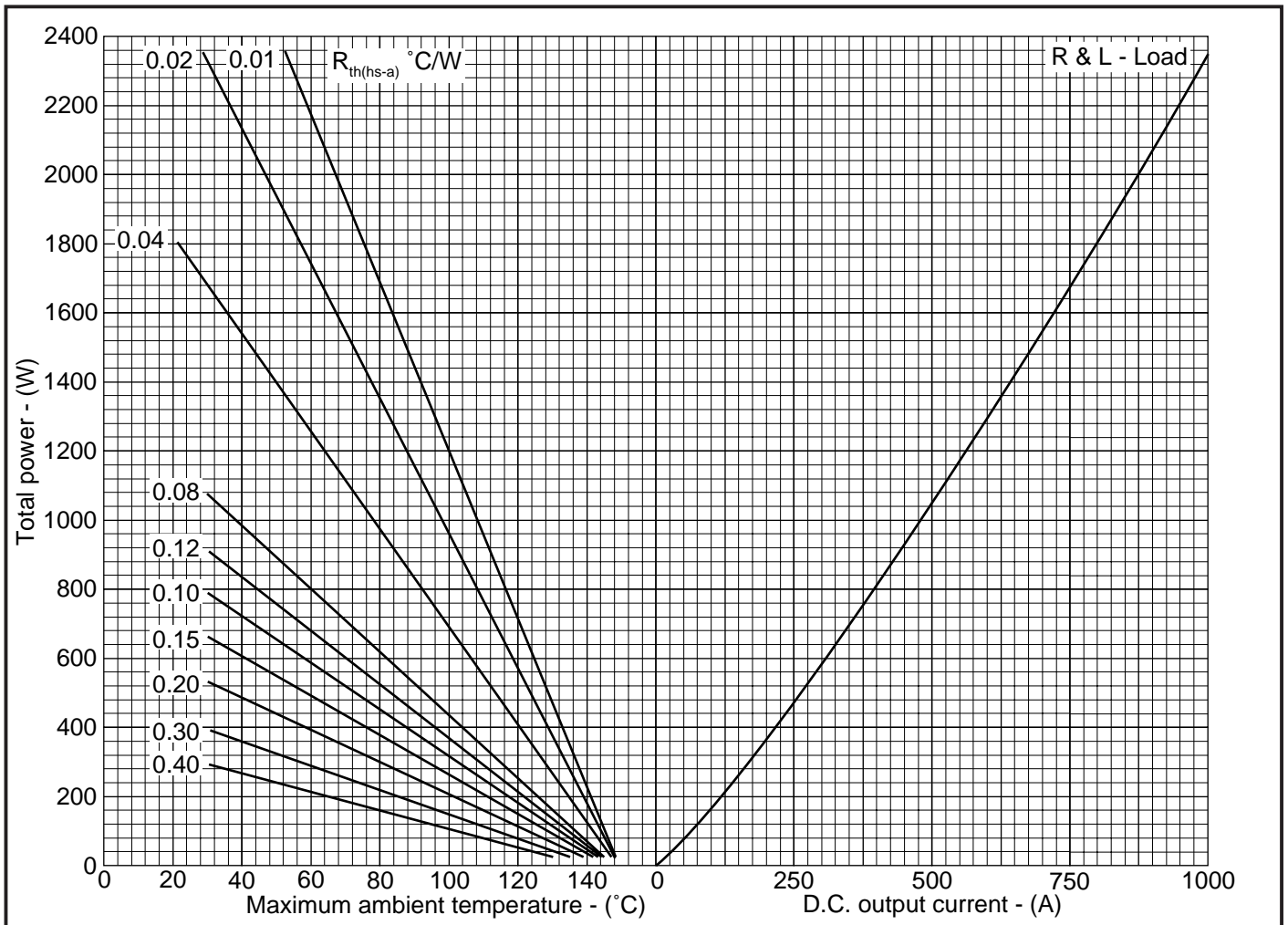
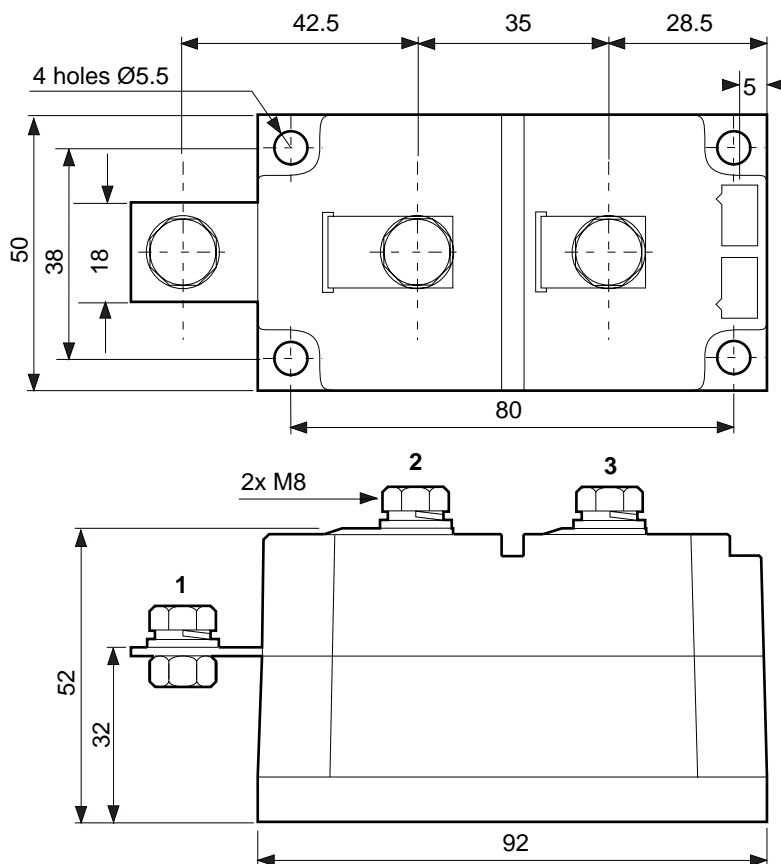


Fig. 7 50/60Hz 3- phase bridge dc output current vs power loss and maximum permissible ambient temperature for various values of heatsink thermal resistance.

(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).

PACKAGE DETAILS

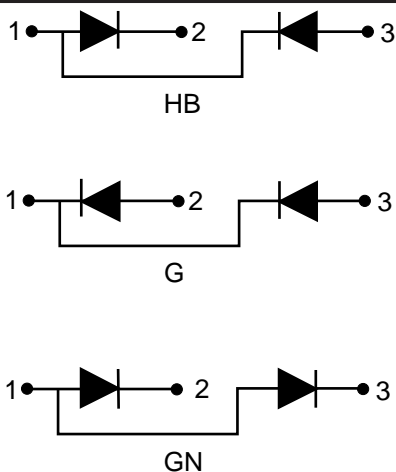
For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



Recommended fixings for mounting:	M5 socket head cap screws.
Recommended mounting torque:	5Nm (44lb.ins)
Recommended torque for electrical connections:	8Nm (70lb.ins)
Maximum torque for electrical connections:	9Nm (80lb.ins)
Nominal weight:	950g

Module outline type code: MP03

CIRCUIT CONFIGURATIONS



MP03 XX 440 Series



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