# MP02 XX 260 Series

## Dual Diode Modules

Replaces December 1998 version, DS5102-3.0

DS5102-4.0 January 2000

### FEATURES

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



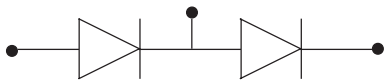
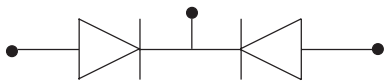
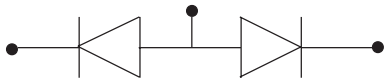
### APPLICATIONS

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

### KEY PARAMETERS

| | |
|---|---|
| $V_{RRM}$ | 1600V |
| $I_{FSM}$ | 8100A |
| $I_{F(AV)}$ (per arm) | 267A |
| $V_{isol}$ | 2500V |

### CIRCUIT OPTIONS

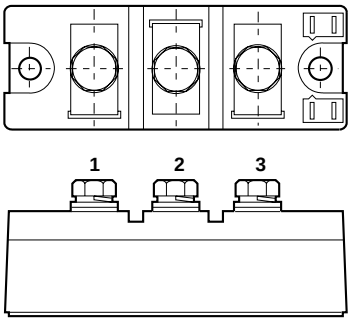
| Code | Circuit |
|---|---|
| HB |  |
| G |  |
| GN |  |

### VOLTAGE RATINGS

| Type Number | Repetitive Peak Voltages $V_{RRM}$ | Conditions |
|---|---|---|
| MP02/260-16 | 1600 | $T_{vj}$ = 150°C<br>$I_{RM}$ = 30mA<br>$V_{RSM}$ = $V_{RRM}$ + 100V |
| MP02/260-14 | 1400 | |
| MP02/260-12 | 1200 | |
| MP02/260-10 | 1000 | |

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

### PACKAGE OUTLINE




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

### CURRENT RATINGS - PER ARM

| Symbol | Parameter | Conditions | | Max. | Units |
|---|---|---|---|---|---|
| $I_{F(AV)}$ | Mean forward current | Halfwave, resistive load | $T_{case}$ = 75°C | 267 | A |
| | | | $T_{case}$ = 85°C | 240 | A |
| | | | $T_{heatsink}$ = 75°C | 216 | A |
| | | | $T_{heatsink}$ = 85°C | 192 | A |
| $I_{F(RMS)}$ | RMS value | $T_{case}$ = 75°C | | 420 | A |

## SURGE RATINGS - PER ARM

| Symbol | Parameter | Conditions | | Max. | Units |
|---|---|---|---|---|---|
| $I_{FSM}$ | Surge (non-repetitive) forward current | 10ms half sine; $T_j$ = 150˚C | $V_R$ = 0 | 8100 | A |
| | | | $V_R$ = 50% $V_{RRM}$ | 6500 | A |
| $I^2t$ | $I^2t$ for fusing | 10ms half sine; $T_j$ = 150˚C | $V_R$ = 0 | 328000 | $A^2s$ |
| | | | $V_R$ = 50% $V_{RRM}$ | 211000 | $A^2s$ |



## THERMAL & MECHANICAL RATINGS

| Symbol | Parameter | Conditions | Max. | Units |
|---|---|---|---|---|
| $R_{th(j-c)}$ | Thermal resistance - junction to case per Diode | dc | 0.21 | °C/W |
| | | halfwave | 0.22 | °C/W |
| | | 3 phase | 0.23 | °C/W |
| $R_{th(c-hs)}$ | Thermal resistance - case to heatsink per Diode | Mounting torque = 6Nm with mounting compound | 0.07 | °C/W |
| $T_{vj}$ | Virtual junction temperature | | 150 | °C |
| $T_{sto}$ | Storage temperature range | | -40 to 150 | °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 600A, $T_{case}$ = 25°C | 1.3 | V |
| $I_{RM}$ | Peak reverse current | At $V_{RRM}$, $T_j$ = 150°C | 30 | mA |
| $V_{TO}$ | Threshold voltage | At $T_{vj}$ = 150°C | 0.84 | V |
| $r_T$ | On-state slope resistance | At $T_{vj}$ = 150°C | 0.667 | mΩ |

## ORDERING INSTRUCTIONS

Part number is made up as follows:

MP02 HB 260 - 12

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



Examples:

MP02 HB260-12
MP02 G260-16
MP02 GN260-10

Note: Prefered type is HB configuration. G & 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 6Nm (55lb.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

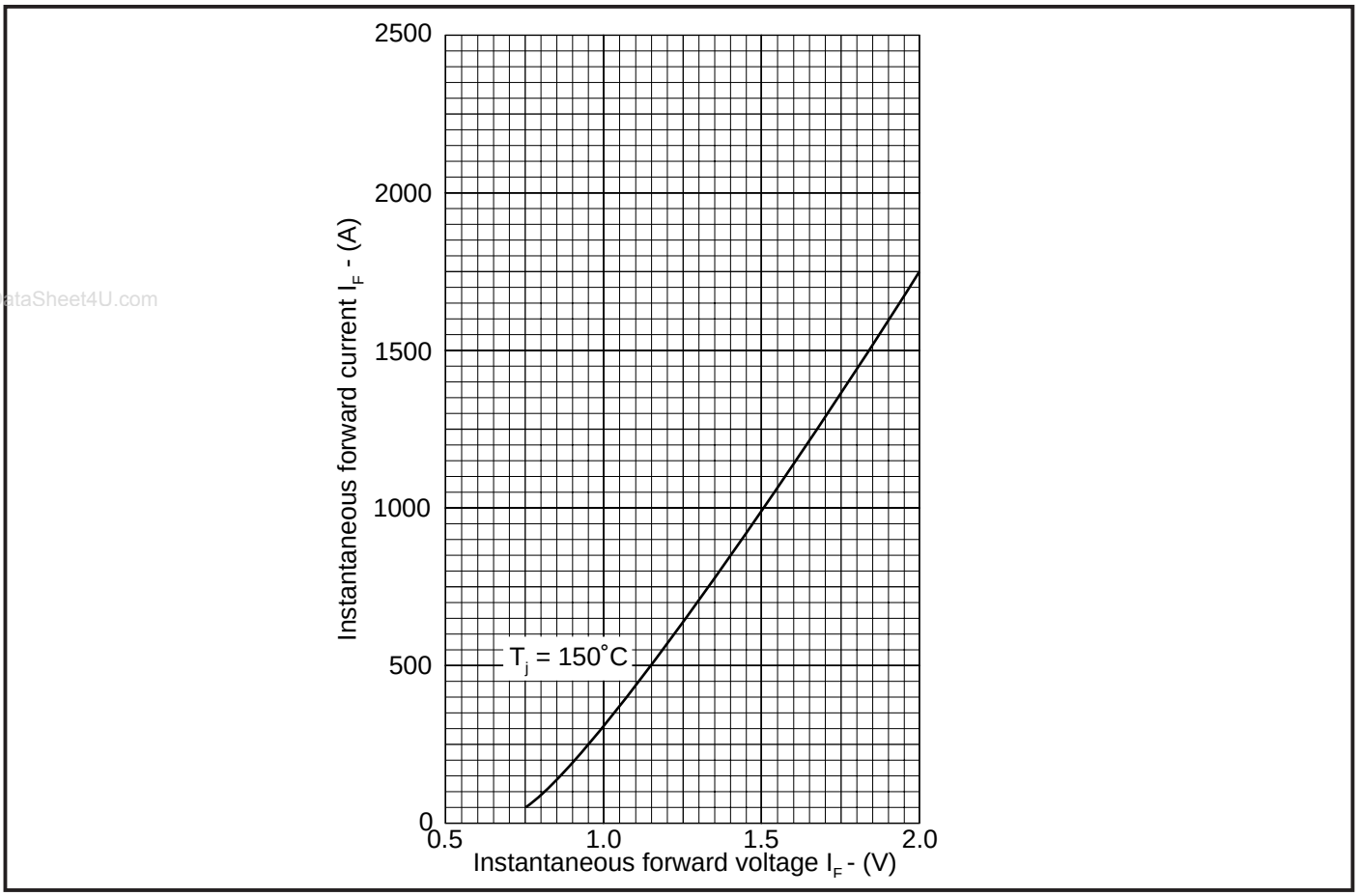



**Fig. 1 Maximum (limit) forward characteristics (Per diode)**

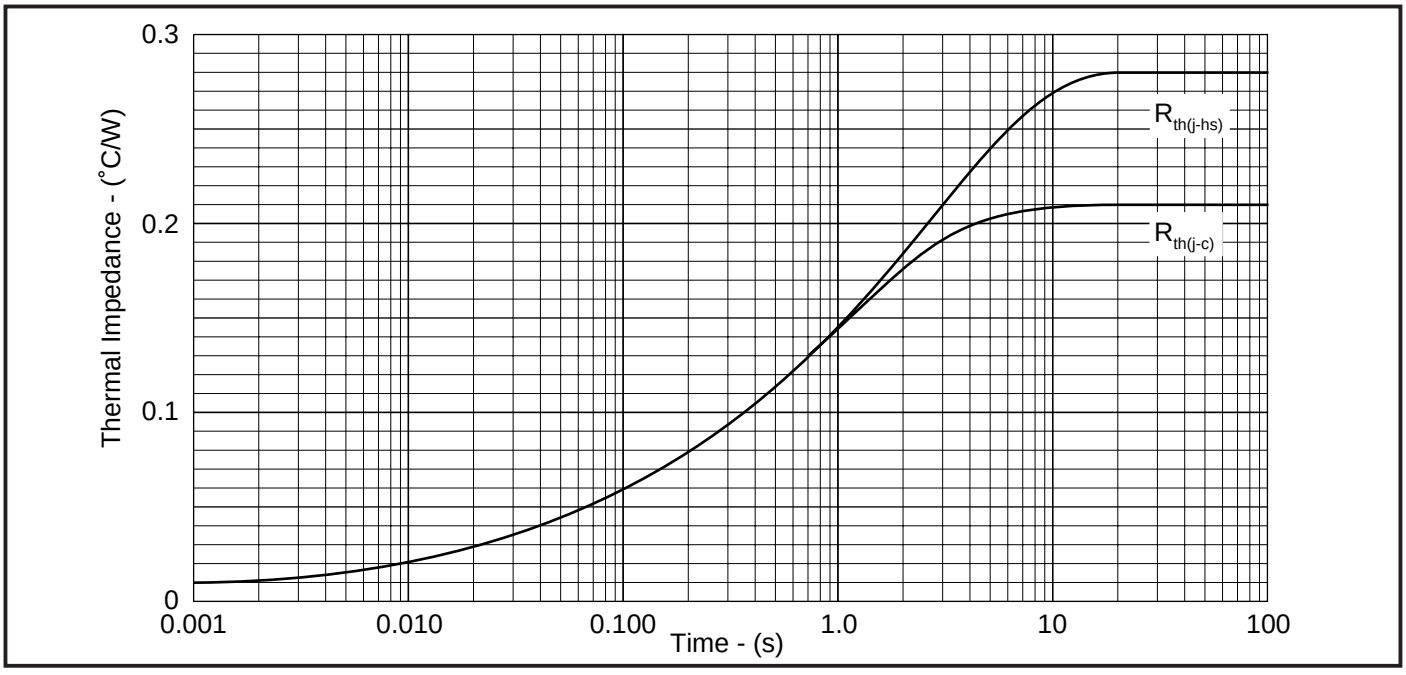



**Fig. 2 Transient thermal impedance (DC) - (Per diode)**

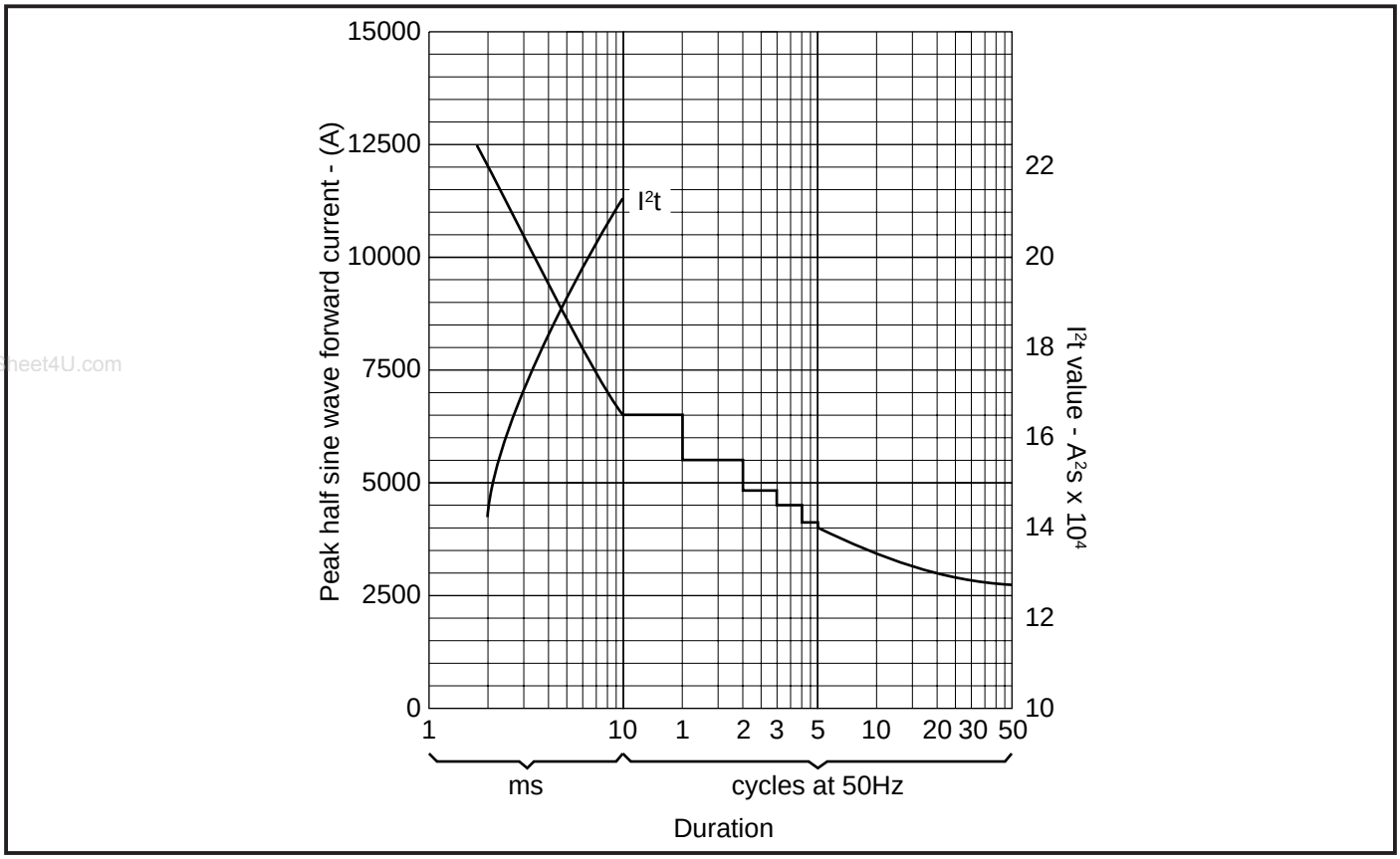



**Fig. 3 Surge (non-repetitive) forward current vs time (with 0% $V_{RRM}$, $T_{case}$ = 150°C)**

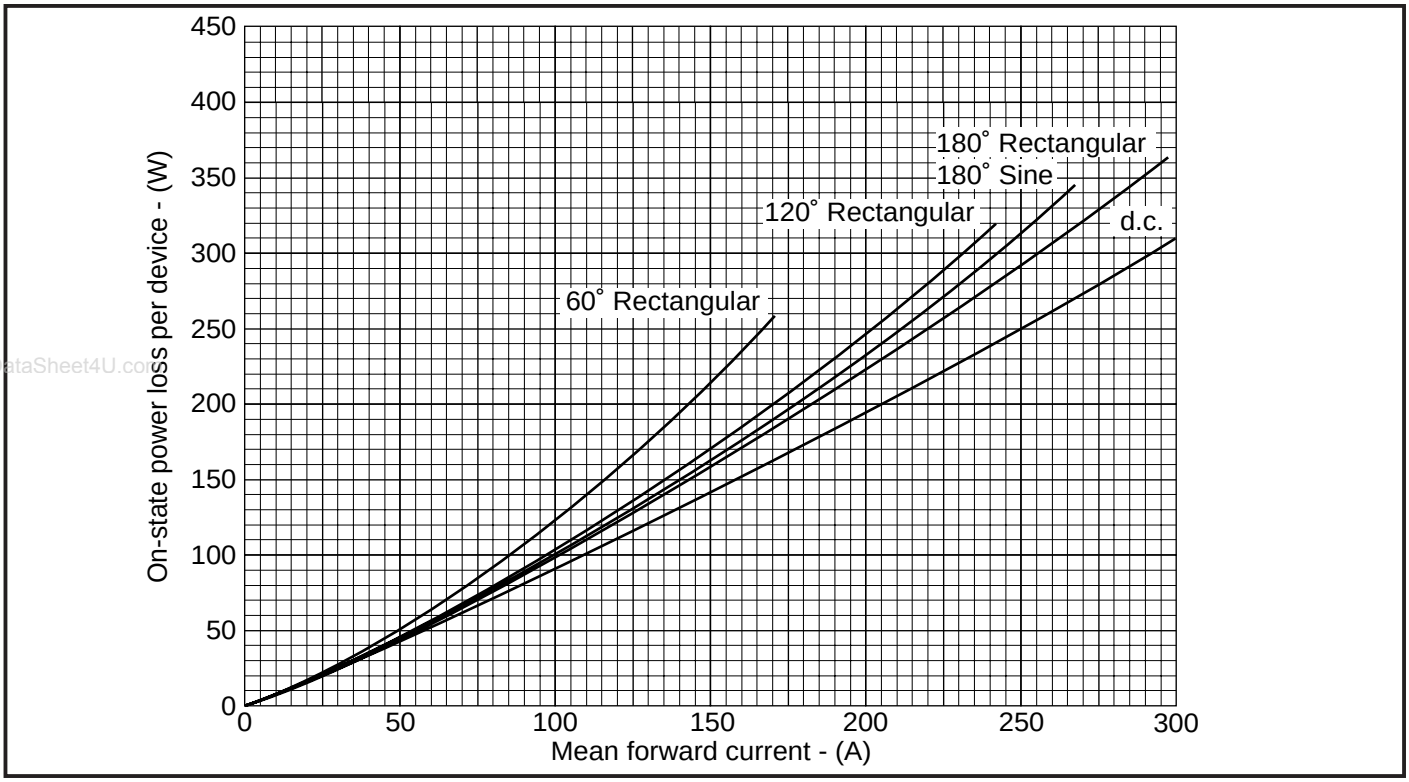





**Fig. 4 On-state power loss per arm vs forward current at various conduction angles, 50/60Hz**

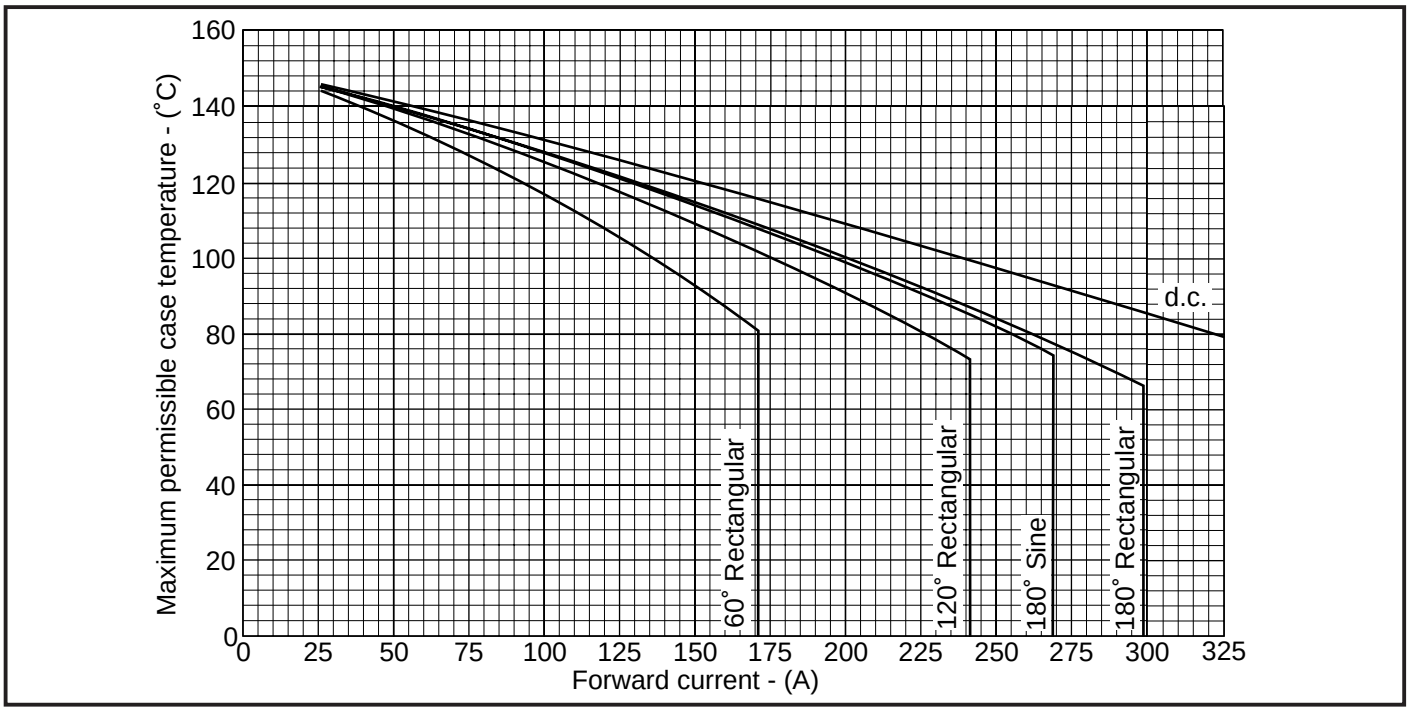



**Fig. 5 Maximum permissible case temperature vs forward current per arm at various conduction angles, 50/60Hz**

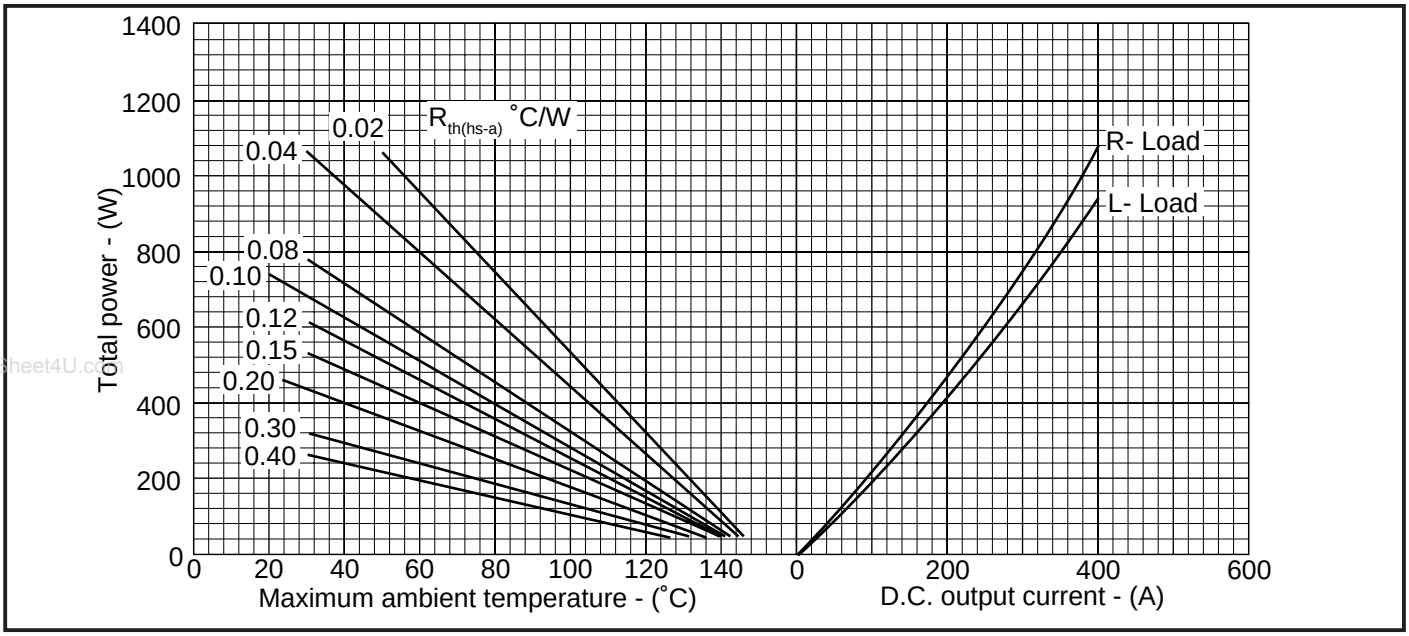



**Fig. 6 50/60Hz single phase bridge dc output current vs power loss and maximum permissible ambient temperature for various values of heatsink thermal resistance.**

(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).

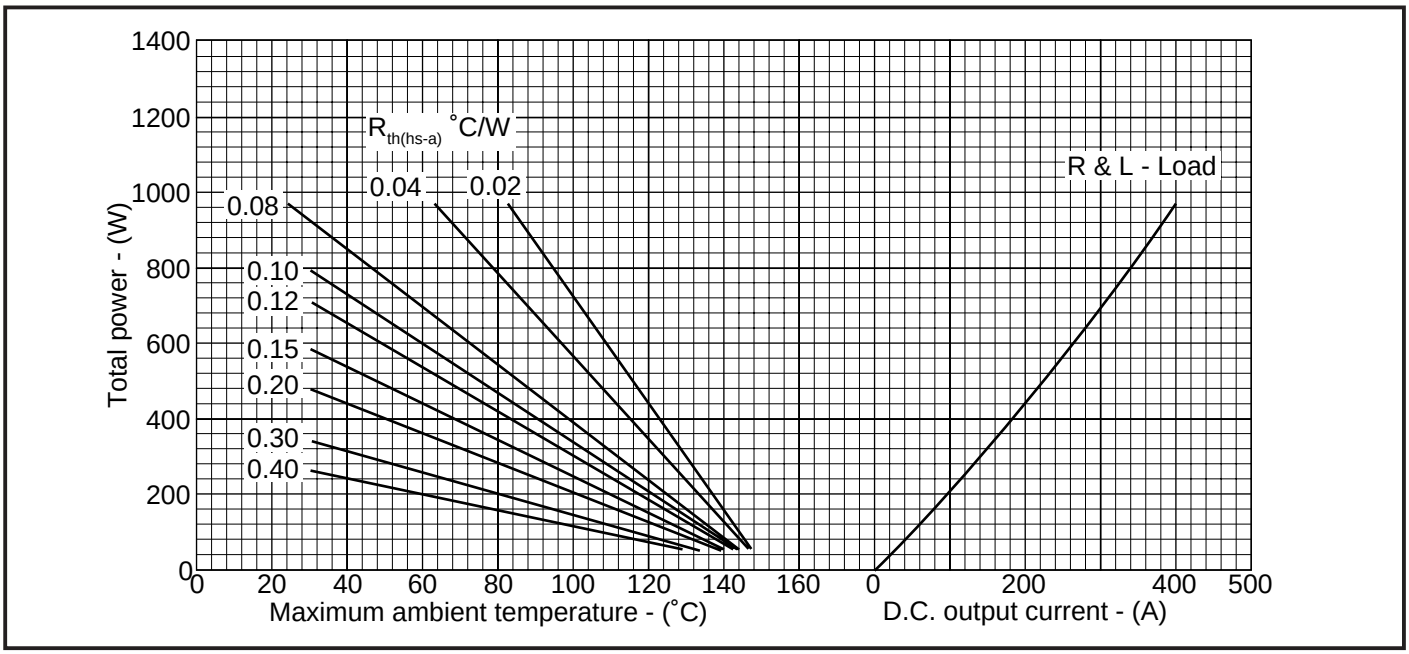



**Fig. 7 50/60Hz 3- phase bridge dc output current vs power loss and maximum permissible ambient temperature for various values of heatsink thermal resistance.**

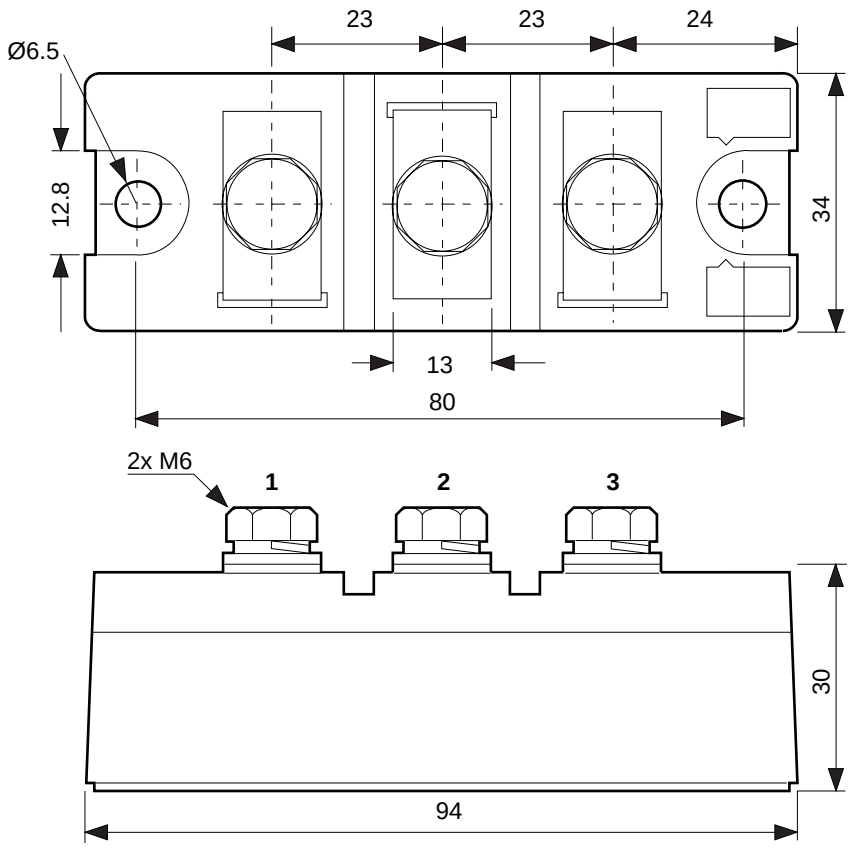
(Note: $R_{th(hs-a)}$ values given above are true heatsink thermal resistances to ambient and already account for $R_{th(c-hs)}$ module contact thermal).

## MP02 XX 260 Series

### PACKAGE DETAILS

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

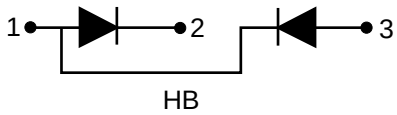




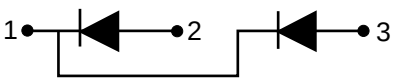

Nominal weight: 350g
Recommended fixings for mounting: M6 socket head cap screws
Recommended mounting torque: 6Nm (55lb.ins)
Recommended torque for electrical connections: 5Nm (44lb.ins)
Maximum torque for electrical connections: 8Nm (70lb.ins)

**Module outline type code: MP02**

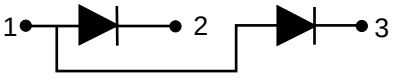
## CIRCUIT CONFIGURATIONS




HB




G




GN

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