

### FEATURES

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

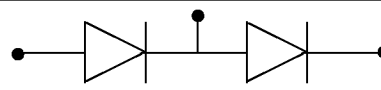
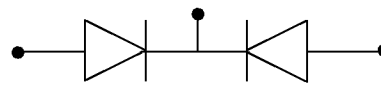
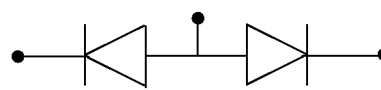
### APPLICATIONS

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

### KEY PARAMETERS

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

### CIRCUIT OPTIONS

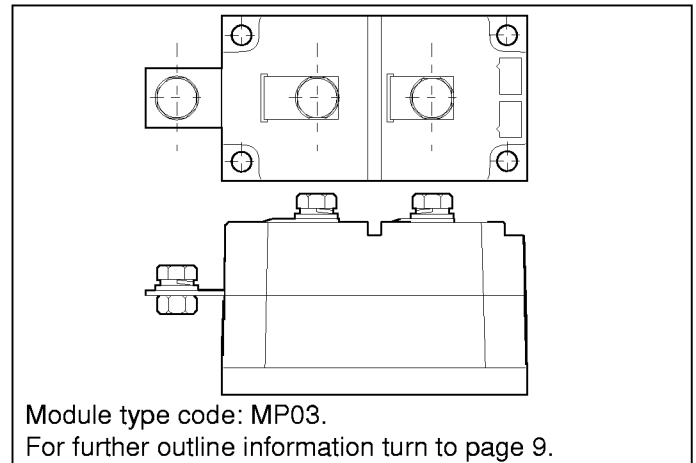
Code	Circuit
HB	
G	
GN	

### 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.

### PACKAGE OUTLINE



### CURRENT RATINGS - PER ARM

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

## 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	$\text{A}^2\text{s}$
			$V_R = 50\% V_{RRM}$	405000	$\text{A}^2\text{s}$

### 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  $75^{\circ}C$  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 ( $32\mu in$ ) 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  $5Nm$  ( $44lb.ins$ ) 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

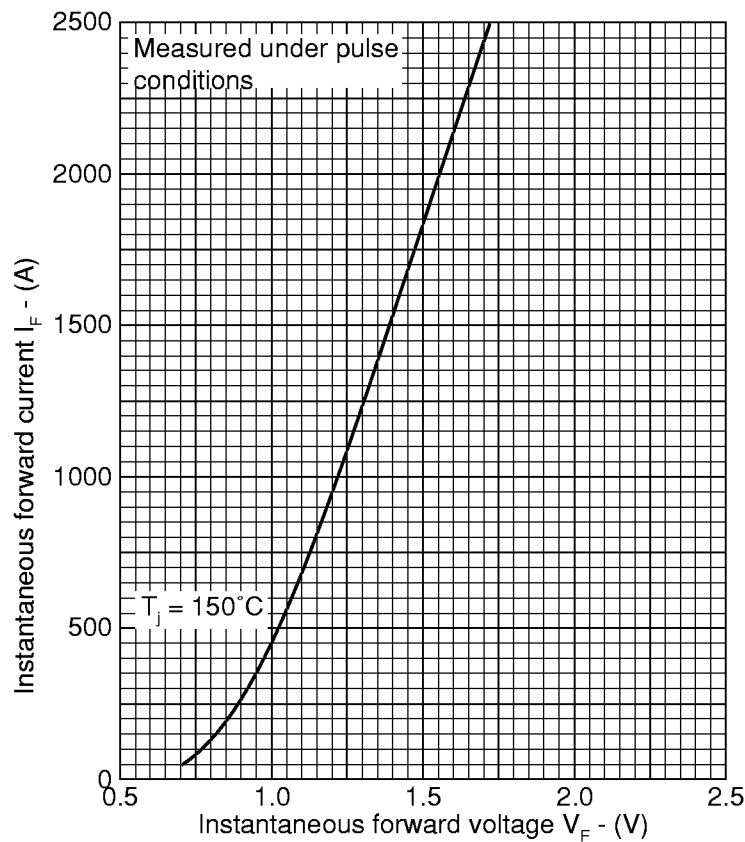


FIG. 1 MAXIMUM (LIMIT) FORWARD CHARACTERISTICS

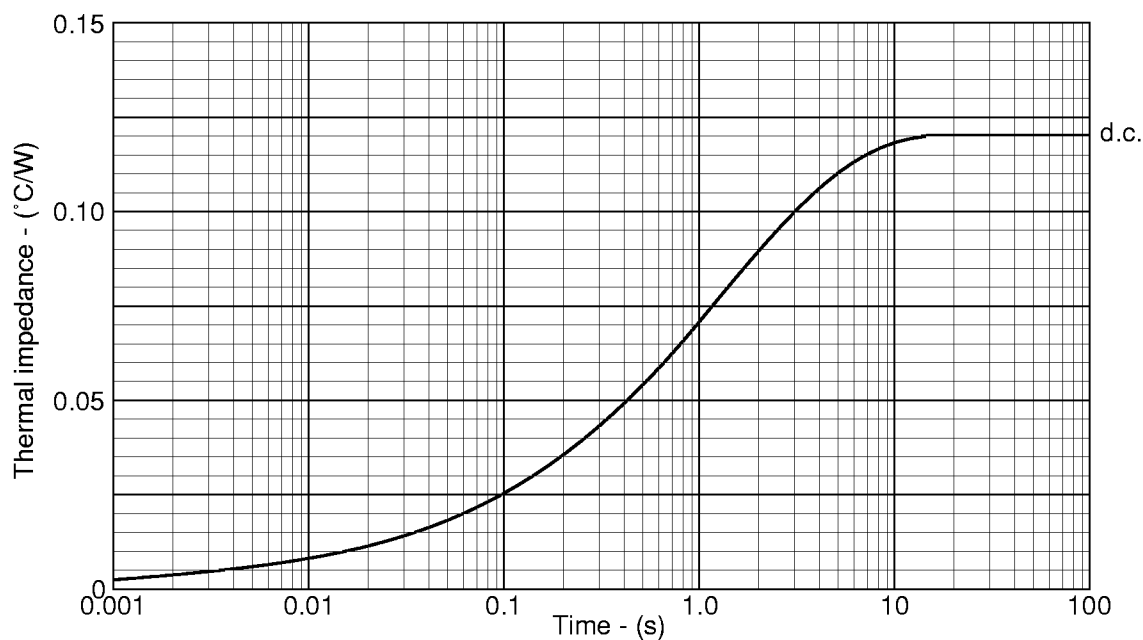
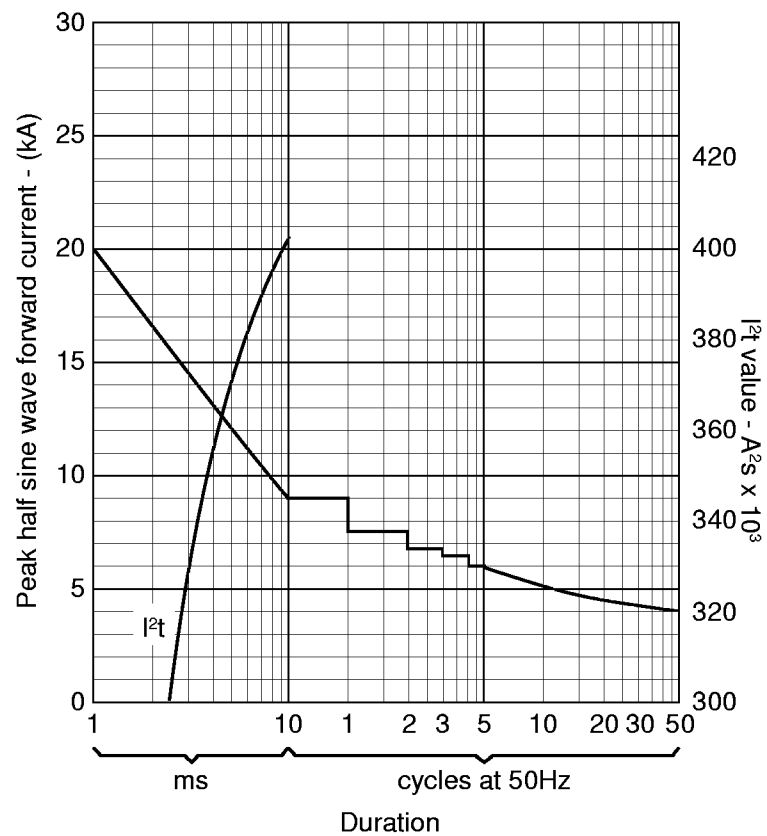
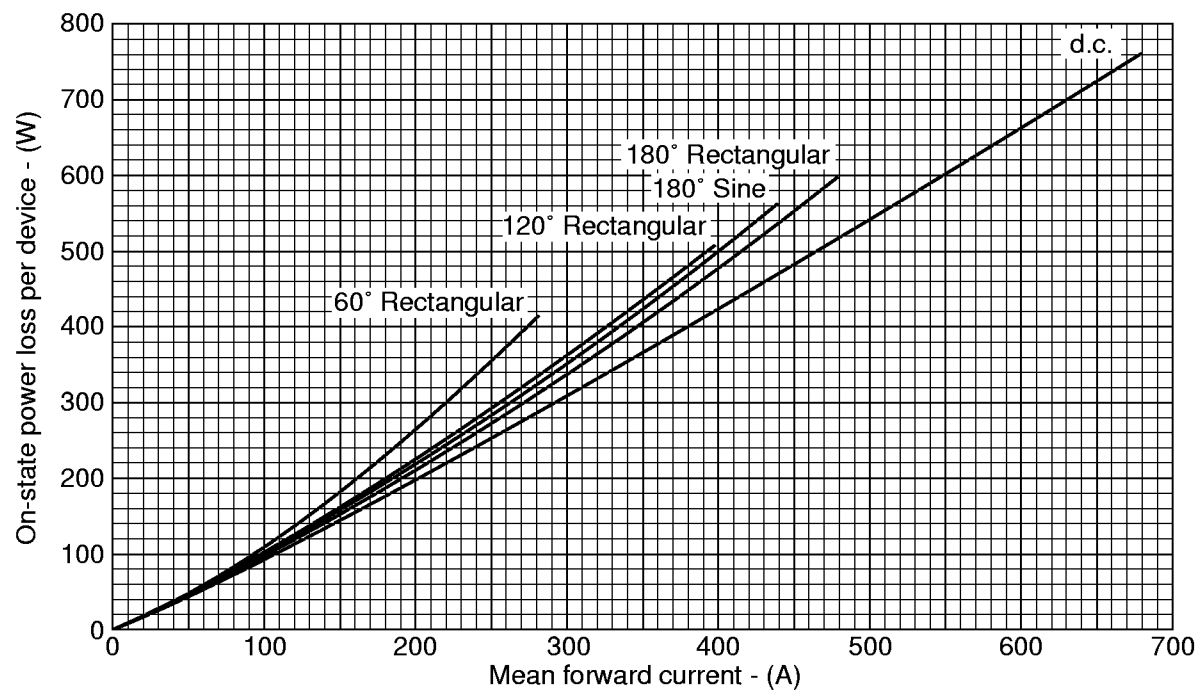


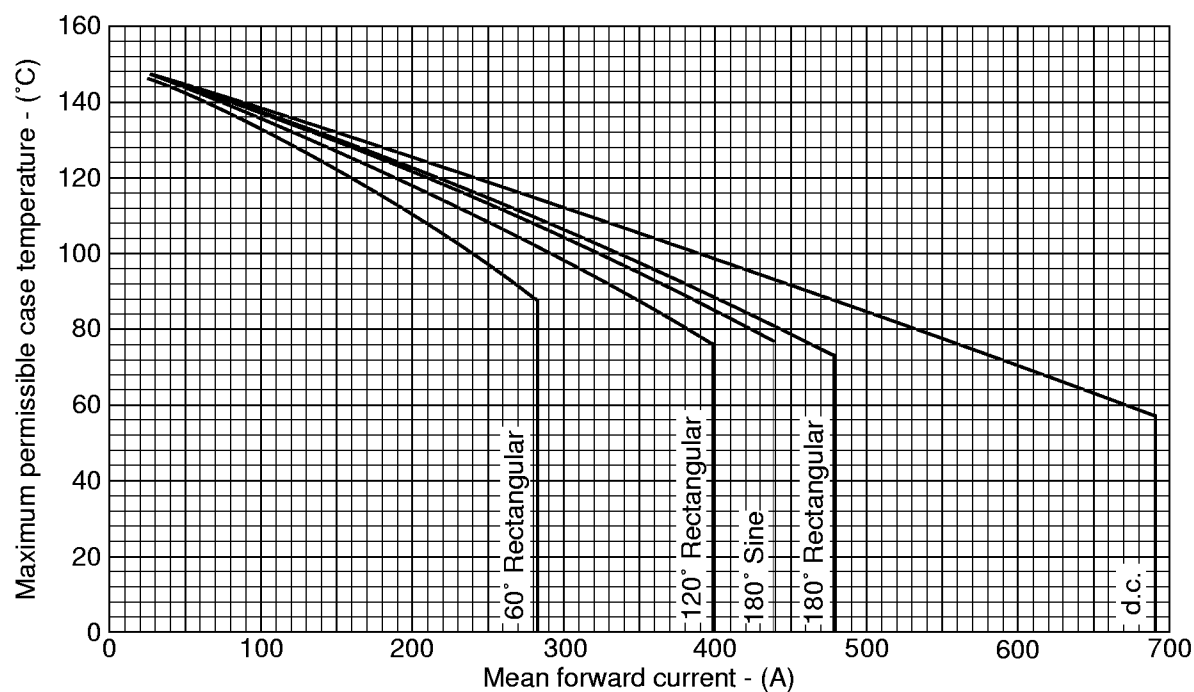
FIG. 2 TRANSIENT THERMAL IMPEDANCE (DC) PER DIODE - (DC)



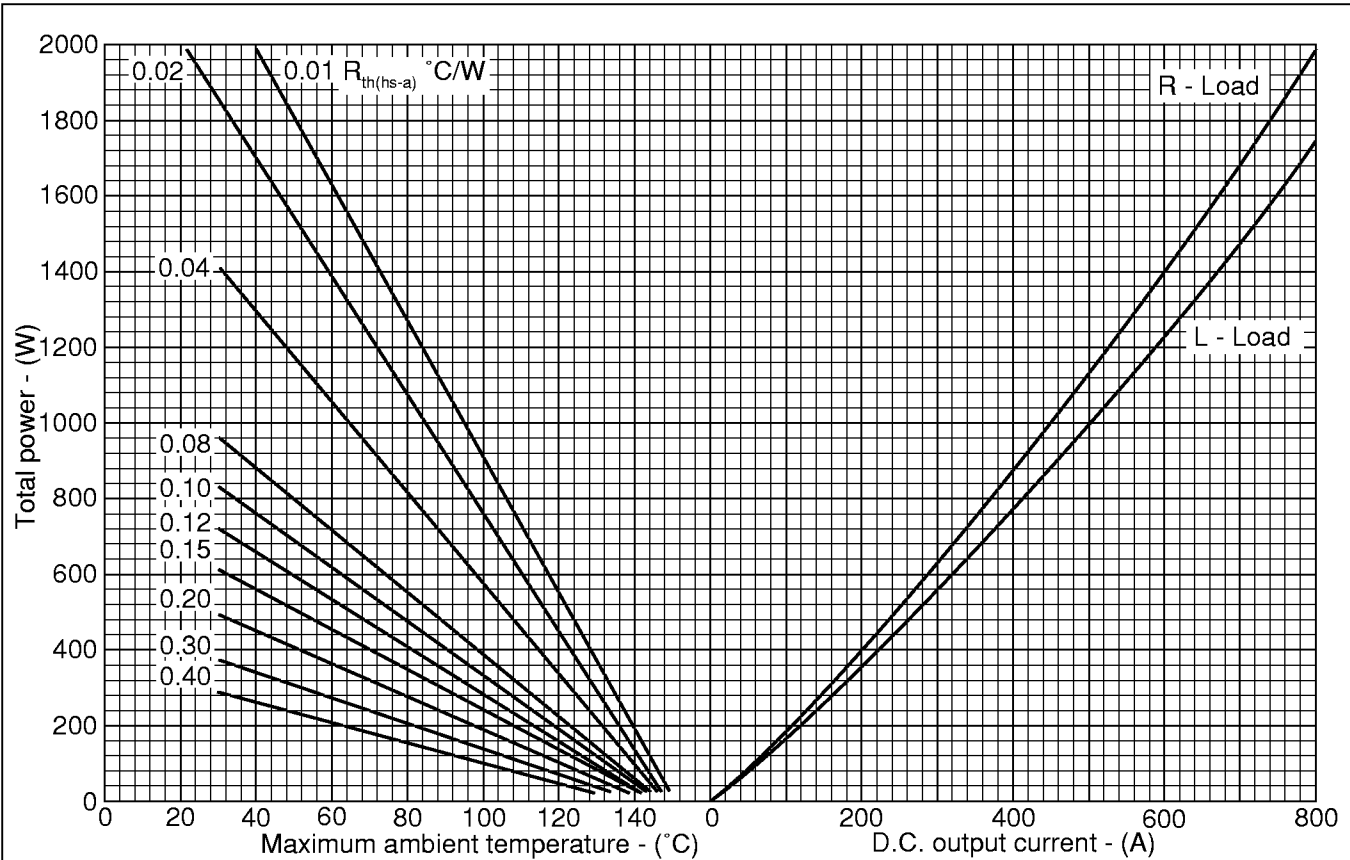
**FIG. 3 SURGE (NON-REPETITIVE) FORWARD CURRENT  
vs TIME (WITH 50%  $V_{RRM}$   $T_{case} = 150^\circ C$ )**



**FIG. 4 ON-STATE POWER LOSS PER ARM vs FORWARD CURRENT AT VARIOUS CONDUCTION ANGLES, 50/60Hz.**

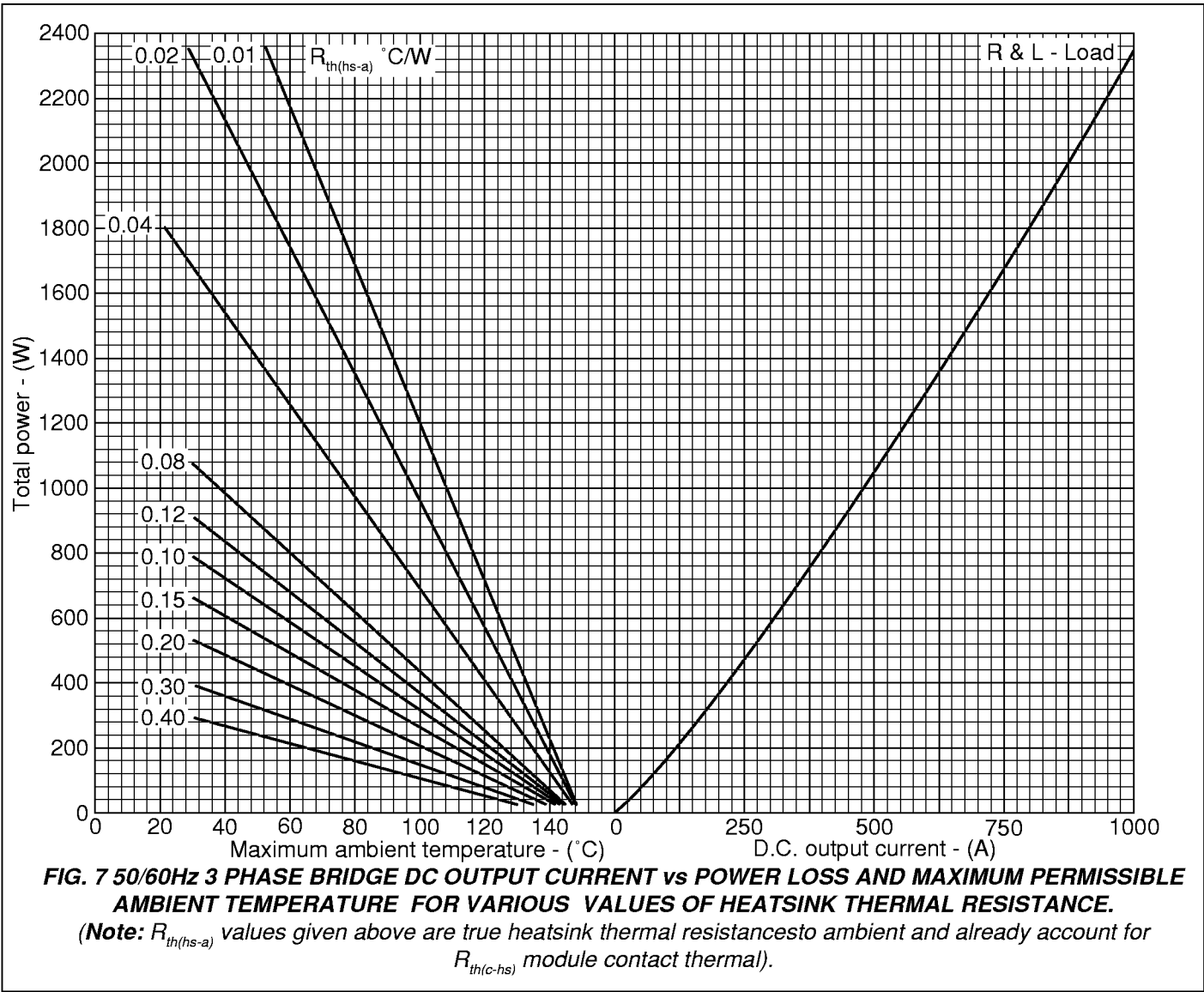


**FIG. 5 MAXIMUM PERMISSIBLE CASE TEMPERATURE vs FORWARD CURRENT PER ARM AT VARIOUS CONDUCTION ANGLES, 50/60Hz.**



**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.**

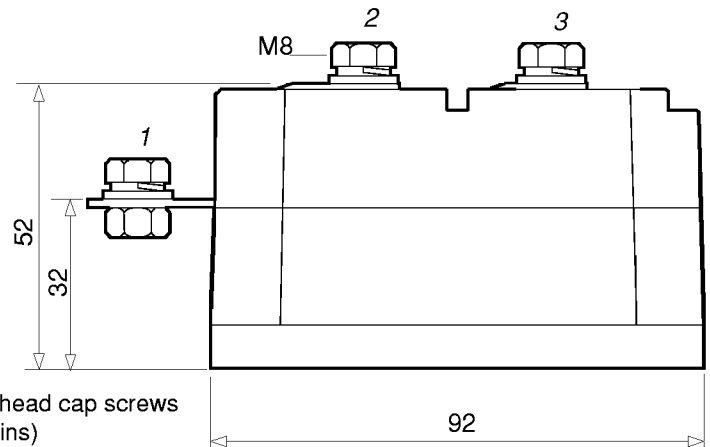
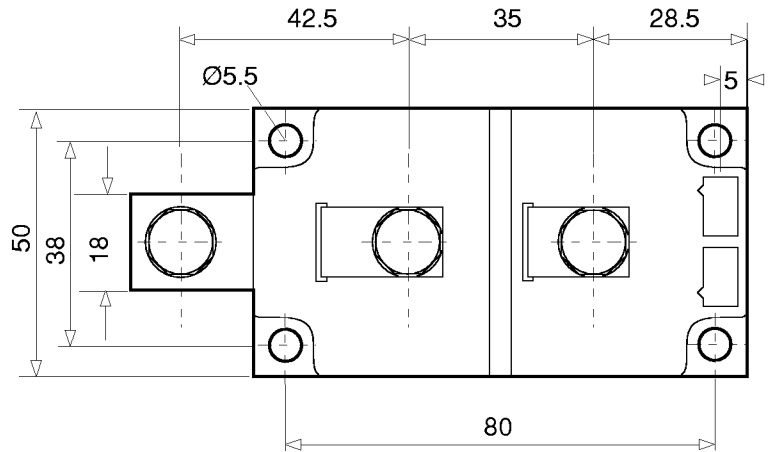
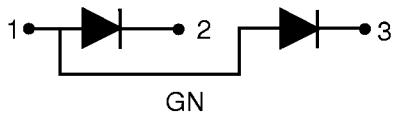
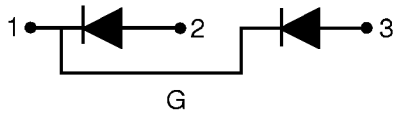
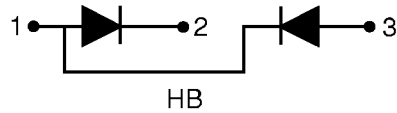
**(Note:  $R_{th(hs-a)}$  values given above are true heatsink thermal resistances to ambient and already account or  $R_{th(c-hs)}$  module contact thermal).**





## OUTLINE - MP03

All Dimensions in mm (Unless stated otherwise)



Recommended fixings for mounting:  
Recommended mounting torque:  
Recommended torque, electrical connections:  
Maximum torque, electrical connections:  
Nominal weight:

M5 socket head cap screws  
5Nm (44lb.ins)  
8Nm (70lb.ins)  
9Nm (80lb.ins)  
950g



## HEADQUARTERS POWER OPERATIONS

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