MP04DD810

Dual Rectifier Diode Water Cooled Module

Preliminary Information

DS5286-2.1 June 2001

FEATURES

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

APPLICATIONS

- Power Supplies
- Large IGBT Circuit 'Front Ends'
- Rectifiers
- Battery Chargers

KEY PARAMETERS

V_{RRM}	3000V
$I_{F(AV)}$	812A
$I_{FSM\ (per\ arm)}$	20000A
$I_{F(RMS)}$	1276A
V_{isol}	3000V

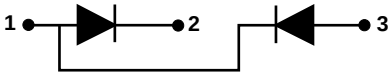


Fig.1 DD circuit configuration

VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages V_{DRM} V_{RRM} V	Conditions
MP04DD810-30	3000	T_{vj} = –40˚ to 150˚C, V_{RSM} = V_{RRM} + 100V
MP04DD810-28	2800	
MP04DD810-26	2600	
MP04DD810-24	2400	

Lower voltage grades available

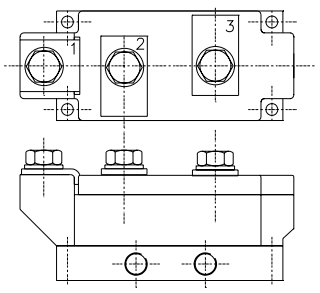
ORDERING INFORMATION

Order As:

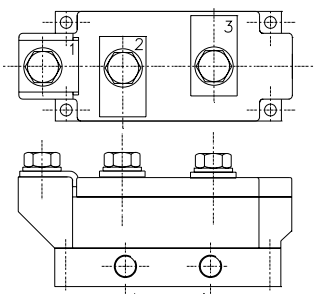
MP04DD810-XX-W2	1/4 - 18 NPT connection
MP04DD810-XX-W3	1/4 - 18 NPT connection
MP04DD810-XX-W3A	1/4 - 18 NPT water connection thread

XX shown in the part number about represents V_{DRM}/100 selection required, eg. MP04DD810-28-W2

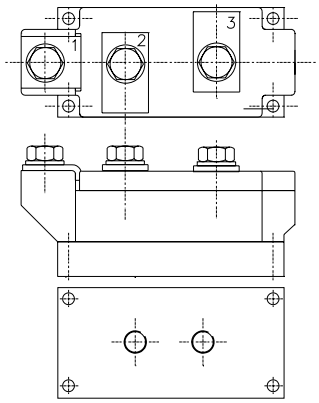
Note: When ordering, please use the complete part number. Please quote full part number in all correspondance.



Module outline type code: MP04-W3



Module outline type code: MP04-W3A



Module outline type code: MP04-W2

(See Package Details for further information)

Fig. 2 Module package variants - (not to scale)

ABSOLUTE MAXIMUM RATINGS - PER ARM

Stresses above those listed under 'Absolute Maximum Ratings' may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to Absolute Maximum Ratings for extended periods may affect device reliability.

Symbol	Parameter	Conditions		Max.	Units
$I_{F(AV)}$	Mean forward current	Half wave resistive load	$T_{water\ (in)}$ = 25°C	885	A
		4.5 Ltr/min	$T_{water\ (in)}$ = 40°C	812	A
$I_{F(RMS)}$	RMS value	$T_{water\ (in)}$ = 25°C, 4.5 Ltr/min		1392	A
		$T_{water\ (in)}$ = 40°C, 4.5 Ltr/min		1276	A
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; T_j = 150°C		20	kA
I^2t	I^2t for fusing	V_R = 0		2.0×10^6	A^2s
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; T_j = 150°C		16	kA
I^2t	I^2t for fusing	V_R = 50% V_{RRM}		1.28×10^6	A^2s
V_{isol}	Isolation voltage	Commoned terminals to base plate AC RMS, 1 min, 50Hz		3000	V

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units
$R_{th(j-w)}$	Thermal resistance - junction to water (per diode)	dc, 4.5 Ltr/min	-	0.102	°C/W
		Halfwave, 4.5 Ltr/min	-	0.106	°C/W
		3 Phase, 4.5 Ltr/min	-	0.112	°C/W
T_{vj}	Virtual junction temperature	Reverse (blocking)	-	150	°C
T_{stg}	Storage temperature range	-	–40	150	°C
-	Screw torque	Mounting - M6	6 (53)	-	Nm (lb.ins)
		Electrical connections - M10	-	12 (106)	Nm (lb.ins)
-	Weight (nominal)	-	-	Refer to Drawing	g

CHARACTERISTICS

Symbol	Parameter	Conditions	Min.	Max.	Units
I_{RRM}	Peak reverse current	At V_{RRM}, T_{case} = 150°C	-	50	mA
Q_S	Total stored charge	I_F = 1000A, dI_{RR}/dt = 3A/µs T_{case} = 150°C, V_R = 100V	-	1600	µC
I_{RR}	Peak recovery current		-	85	A
V_{TO}	Threshold voltage. See Note 1.	At T_{vj} = 150°C	-	0.7	V
r_T	Slope resistance. See Note 1.	At T_{vj} = 150°C	-	0.29	mΩ

Note 1: The data given in this datasheet with regard to forward voltage drop is the for the calculation of the power dissipation in the semiconductor elements only. Forward voltage drops measured at the power terminals will be in excess of these figures due to the impedance of the busbars from the terminals to the semiconductor.

CURVES

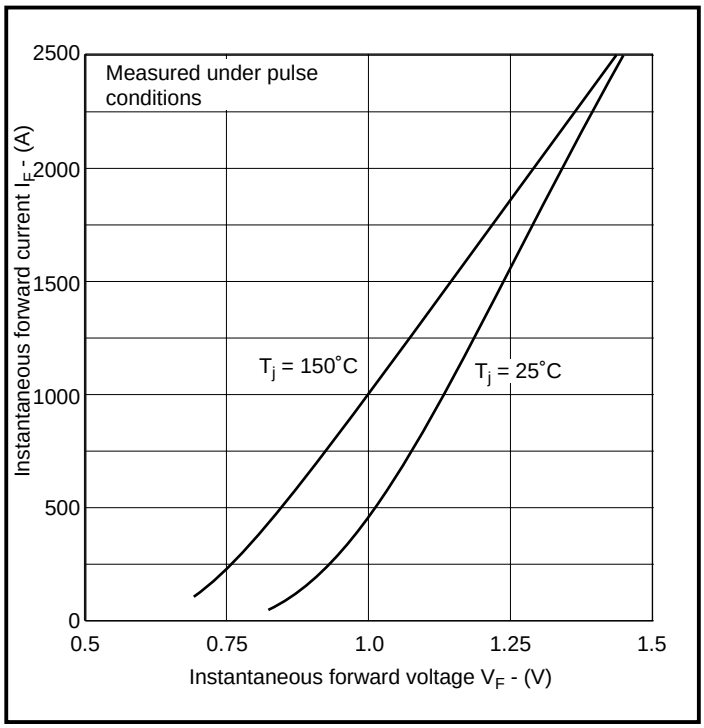


Fig.3 Maximum (limit) forward characteristics

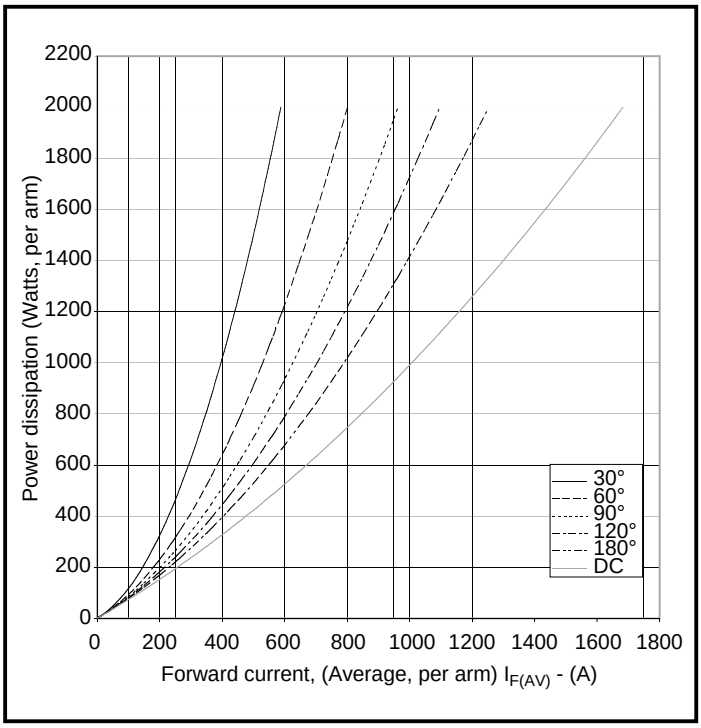


Fig.4 Power dissipation curves

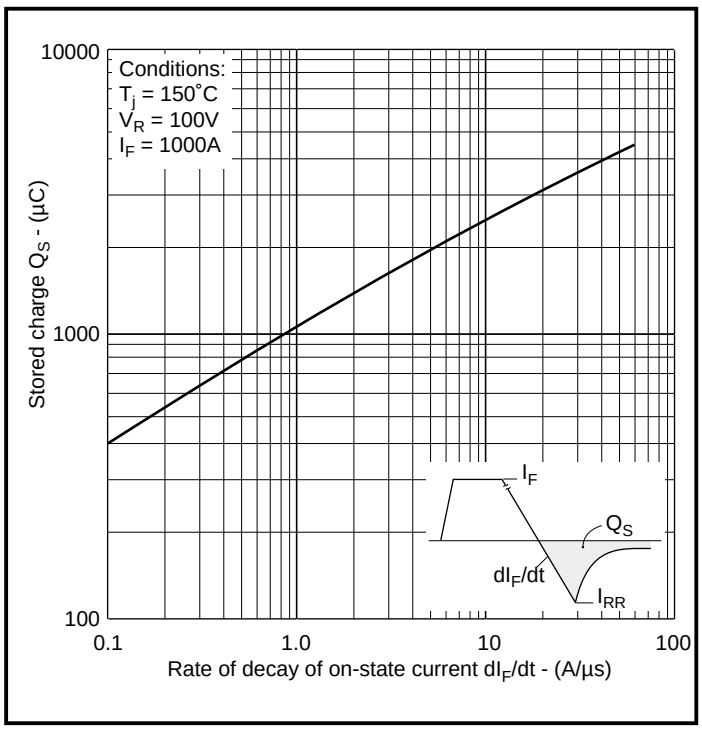


Fig.5 Maximum stored charge

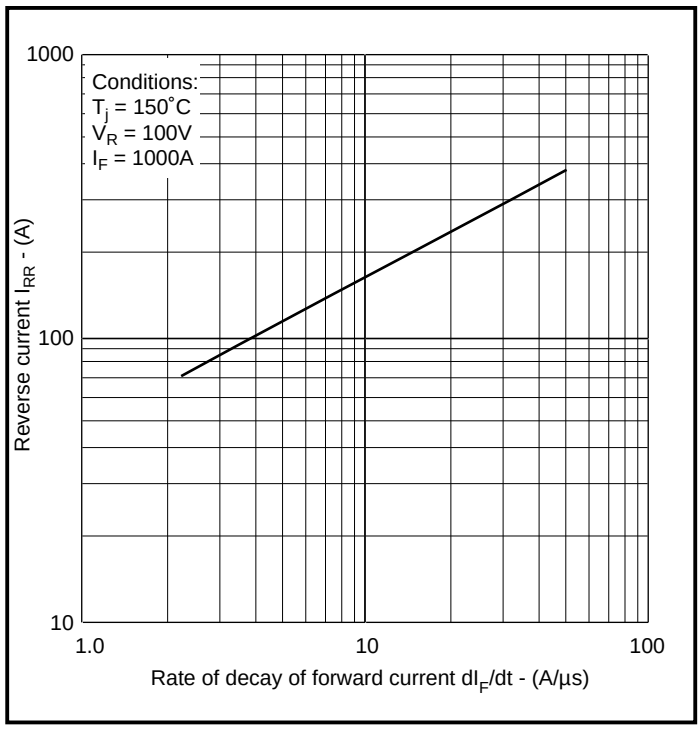


Fig.6 Maximum reverse recovery current

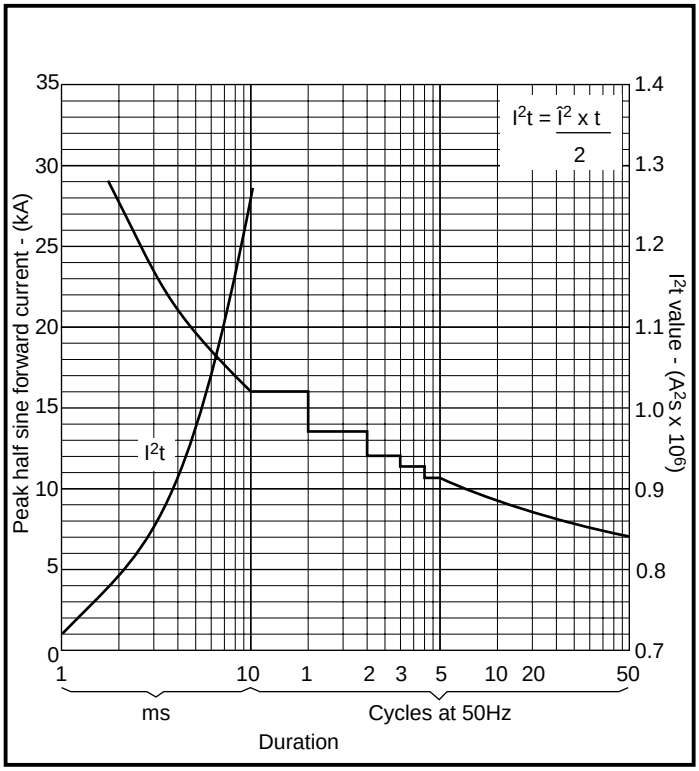


Fig.7 Surge (non-repetitive) forward current vs time (with 50% V_{RRM} @ T_c - 150˚C)

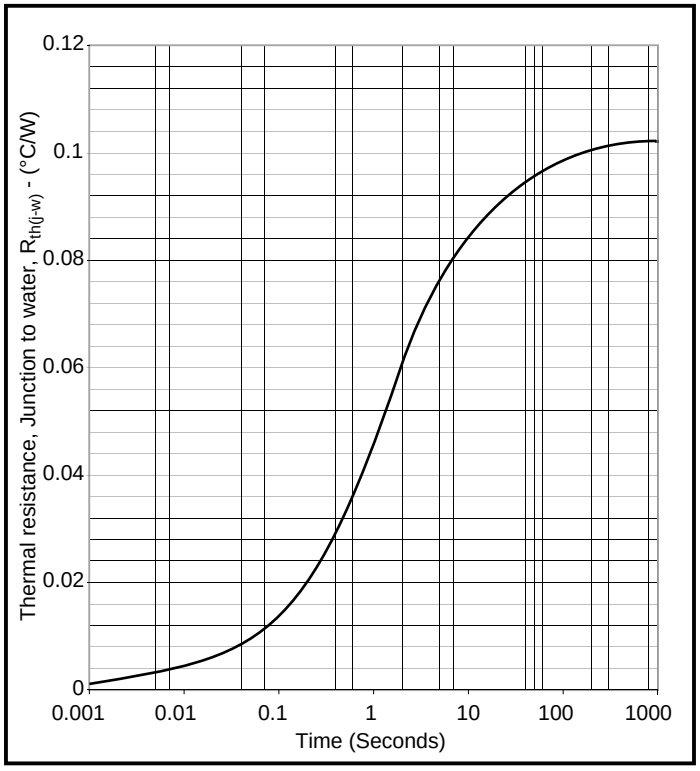


Fig.8 Transient thermal impedance - dc

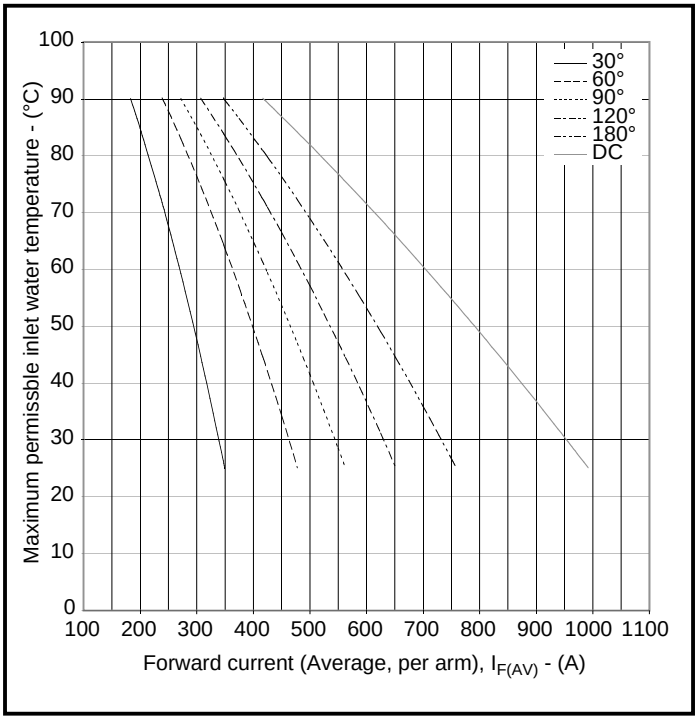
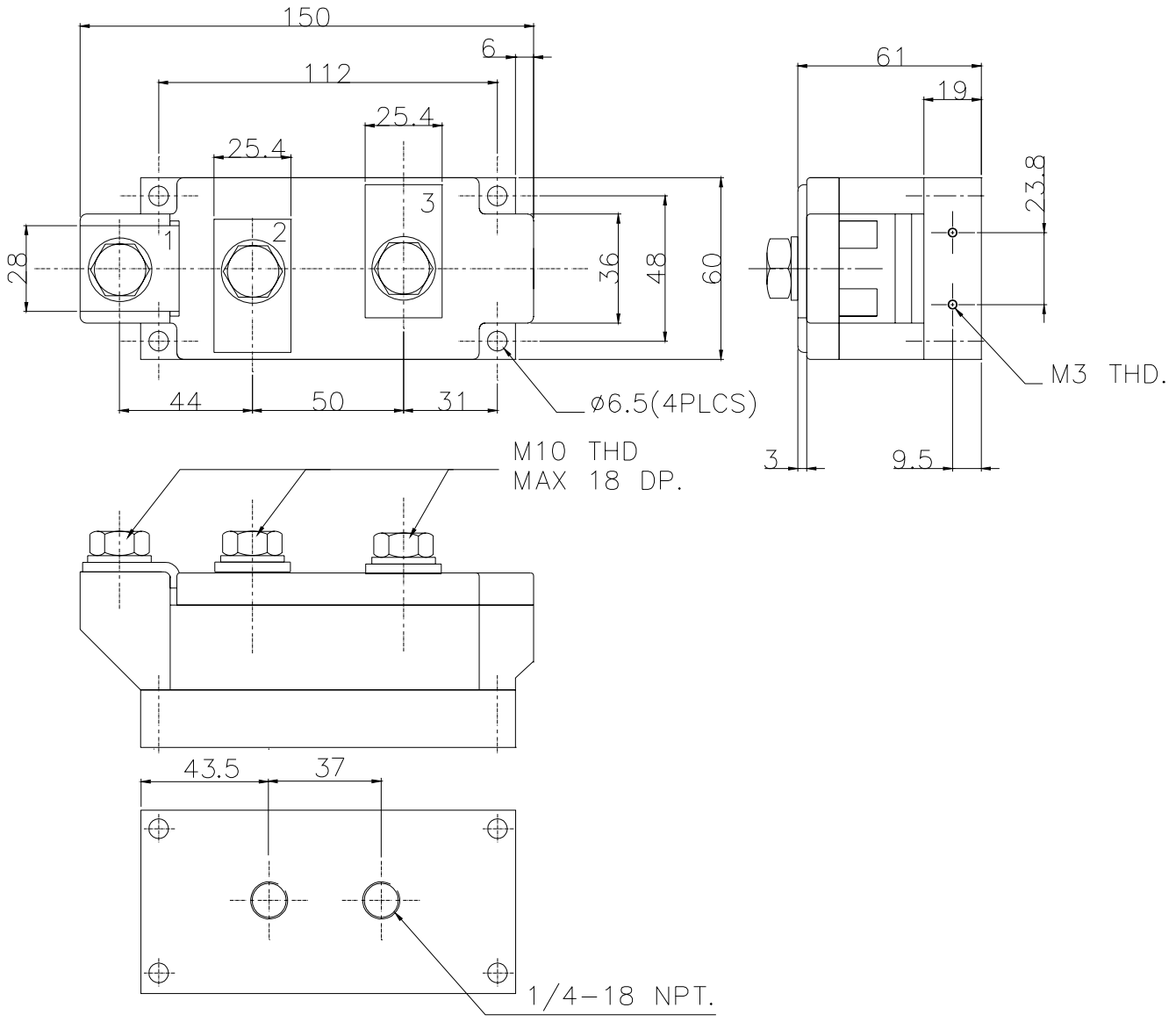


Fig. 9 Maximum permissible water inlet temperature vs on-state current at specified conduction angles, sine wave 50/60Hz

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: M6 socket head cap screws
Nominal weight: 2060g
Auxiliary gate/cathode leads not supplied as standard, but maybe purchased separately.

Module outline type code: MP04-W2

PACKAGE DETAILS

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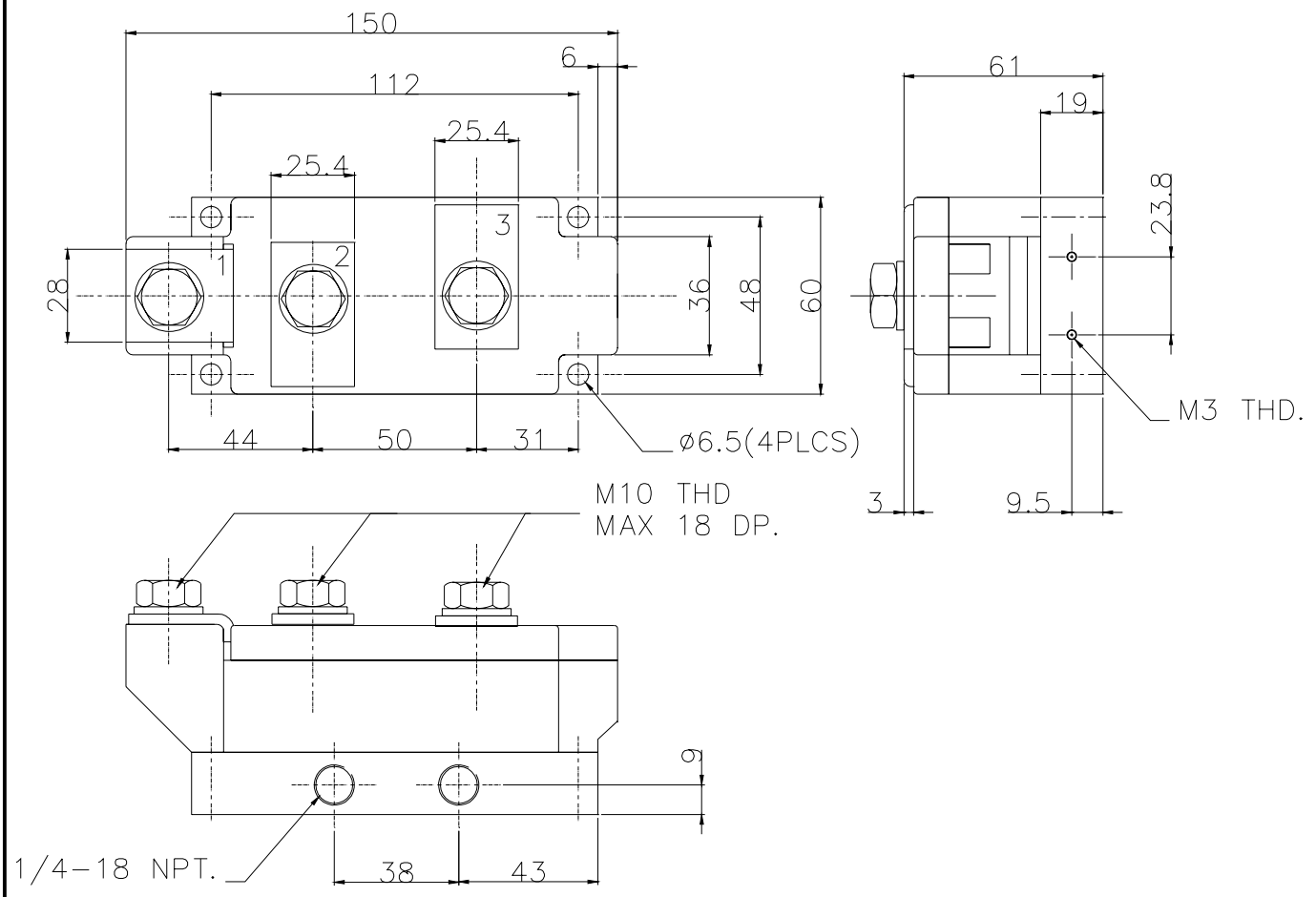

Recommended fixings for mounting: M6 socket head cap screws
Nominal weight: 2060g
Auxiliary gate/cathode leads not supplied as standard, but maybe purchased separately.

Module outline type code: MP04-W3

PACKAGE DETAILS

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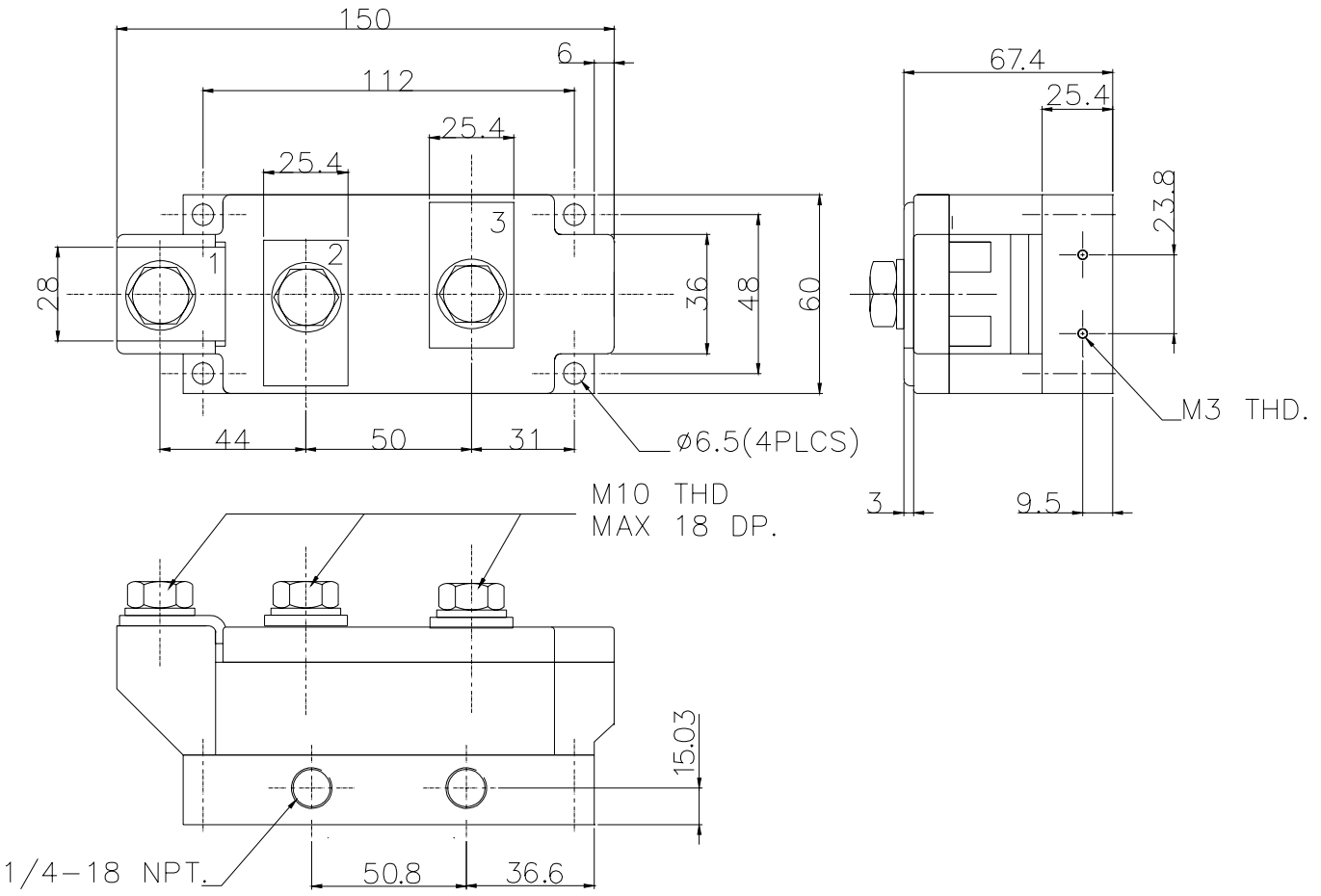

Recommended fixings for mounting: M6 socket head cap screws
Nominal weight: 2530g
Auxiliary gate/cathode leads not supplied as standard, but maybe purchased separately.

Module outline type code: MP04-W3A

POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink and clamping systems in line with advances in device voltages and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group continues to offer high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the latest CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete Solution (PACs).

HEATSINKS

The Power Assembly group has its own proprietary range of extruded aluminium heatsinks. They have been designed to optimise the performance of Dynex semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest sales representative or customer service office.

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Target Information: This is the most tentative form of information and represents a very preliminary specification. No actual design work on the product has been started.

Preliminary Information: The product is in design and development. The datasheet represents the product as it is understood but details may change.

Advance Information: The product design is complete and final characterisation for volume production is well in hand.

No Annotation: The product parameters are fixed and the product is available to datasheet specification.