

#### 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

#### VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages $V_{DRM}$ $V_{RRM}$ $V$	Conditions
MP04HB910-30	3000	$T_{vj} = -40^{\circ}$ to $150^{\circ}\text{C}$ , $V_{RSM} = V_{RRM} + 100\text{V}$
MP04HB910-28	2800	
MP04HB910-26	2600	
MP04HB910-24	2400	

Lower voltage grades available

#### ORDERING INFORMATION

Order As:

#### MP04HB910-XX

XX shown in the part number about represents  $V_{RRM}/100$  selection required.

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

#### KEY PARAMETERS

$V_{RRM}$	<b>3000V</b>
$I_{F(AV)}$	<b>915A</b>
$I_{FSM}$ (per arm)	<b>20000A</b>
$I_{F(RMS)}$	<b>1440A</b>
$V_{isol}$	<b>3000V</b>

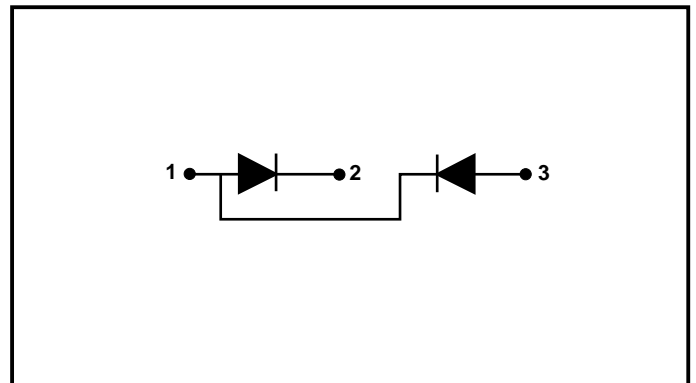
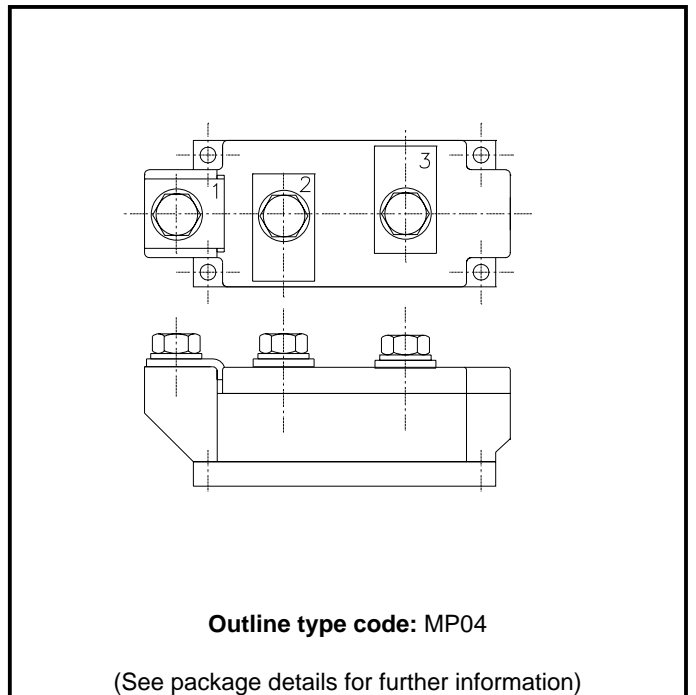


Fig.1 HB circuit configuration



Outline type code: MP04

(See package details for further information)

Fig. 2 Electrical connections - (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	$T_{case} = 75^{\circ}C$	915	A
			$T_{case} = 85^{\circ}C$	830	A
			$T_{case} = 100^{\circ}C$	695	A
$I_{F(RMS)}$	RMS value	$T_{case} = 75^{\circ}C$	1440	A	
		$T_{case} = 85^{\circ}C$	1305	A	
		$T_{case} = 100^{\circ}C$	1090	A	
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_j = 150^{\circ}C$	20	kA	
$I^2t$	$I^2t$ for fusing	$V_R = 0$	$2.0 \times 10^6$	A <sup>2</sup> s	
$I_{FSM}$	Surge (non-repetitive) forward current	10ms half sine; $T_j = 150^{\circ}C$	16	kA	
			$V_R = 50\% V_{RRM}$	$1.28 \times 10^6$	A <sup>2</sup> s
$V_{isol}$	Isolation voltage	Commoned terminals to base plate AC RMS, 1 min, 50Hz	3000	V	

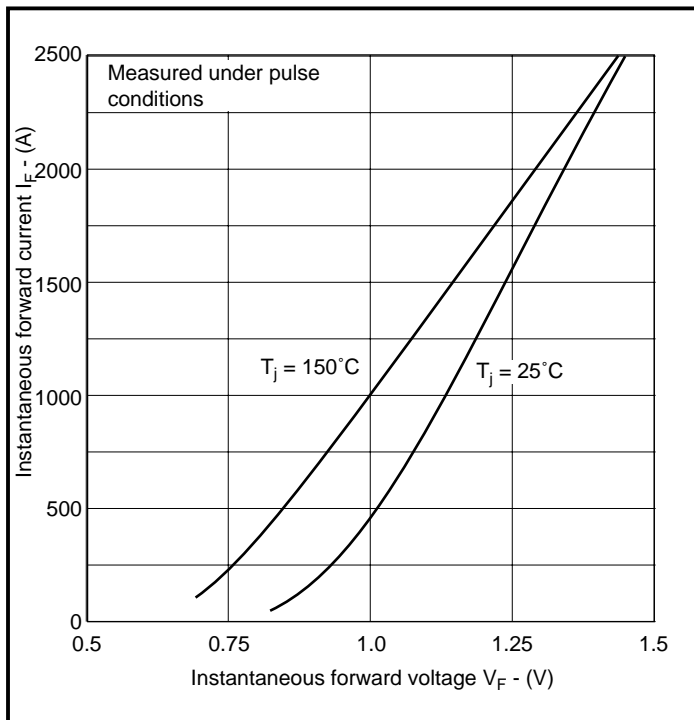
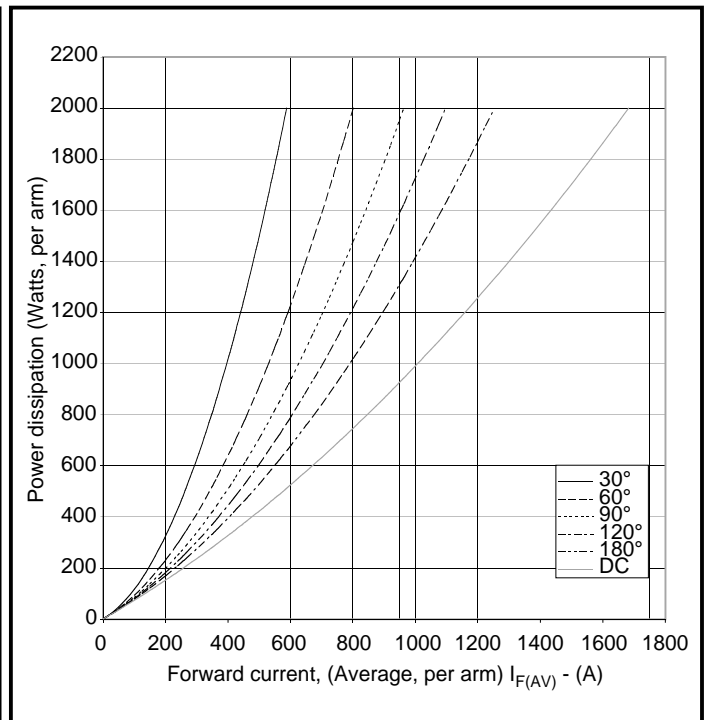
## THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case (per diode)	dc	-	0.056	$^{\circ}C/W$
		Halfwave	-	0.060	$^{\circ}C/W$
		3 Phase	-	0.066	$^{\circ}C/W$
$T_{vj}$	Virtual junction temperature	Reverse (blocking)	-	150	$^{\circ}C$
$T_{stg}$	Storage temperature range	-	-40	150	$^{\circ}C$
-	Screw torque	Mounting	6 (53)	-	Nm (lb.ins)
		Electrical connections	-	12 (106)	Nm (lb.ins)
-	Weight (nominal)	-	-	1580	g

**CHARACTERISTICS**

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

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**

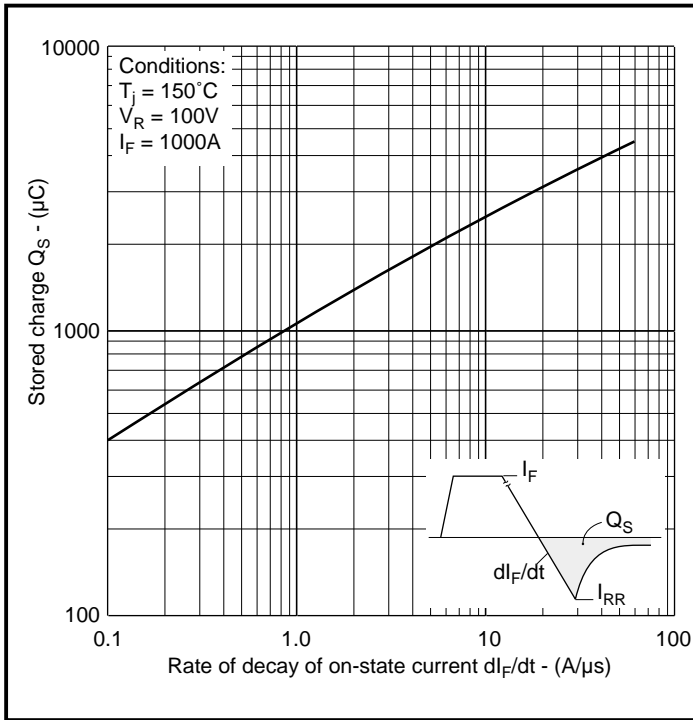


Fig.5 Maximum stored charge

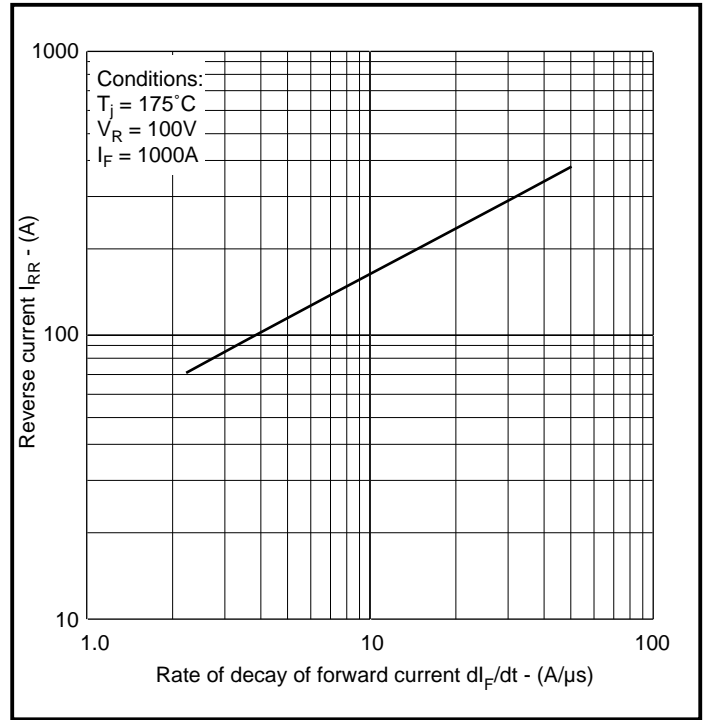


Fig.6 Maximum reverse recovery current

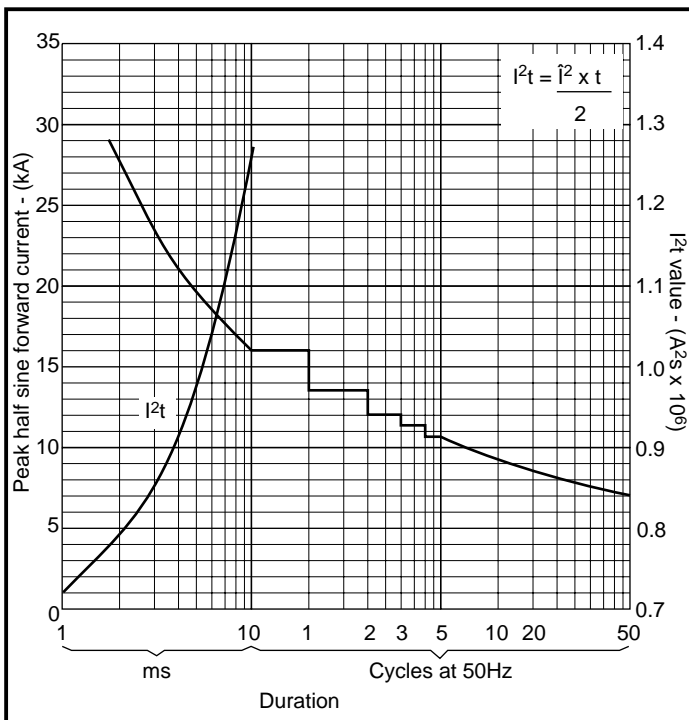


Fig.7 Surge (non-repetitive) forward current vs time (with 50%  $V_{RRM}$  @  $T_c - 150^\circ\text{C}$ )

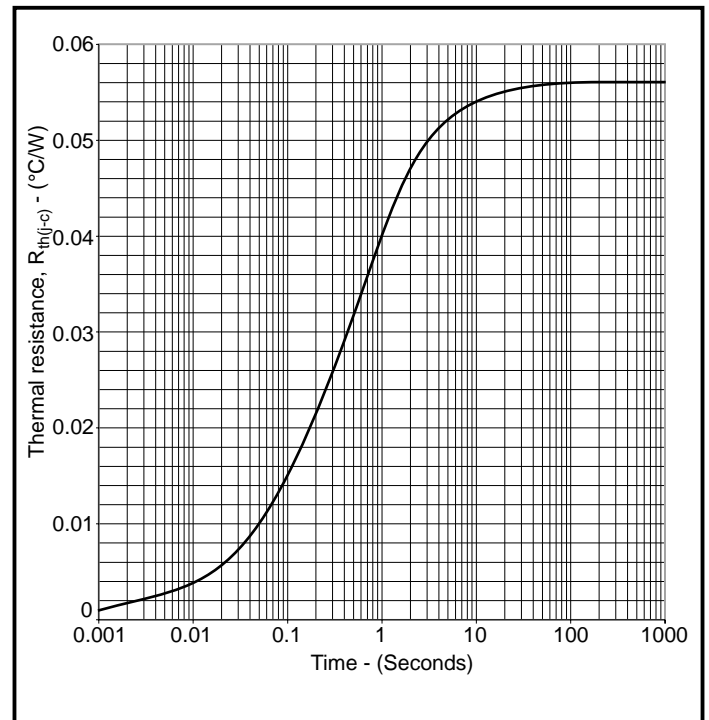
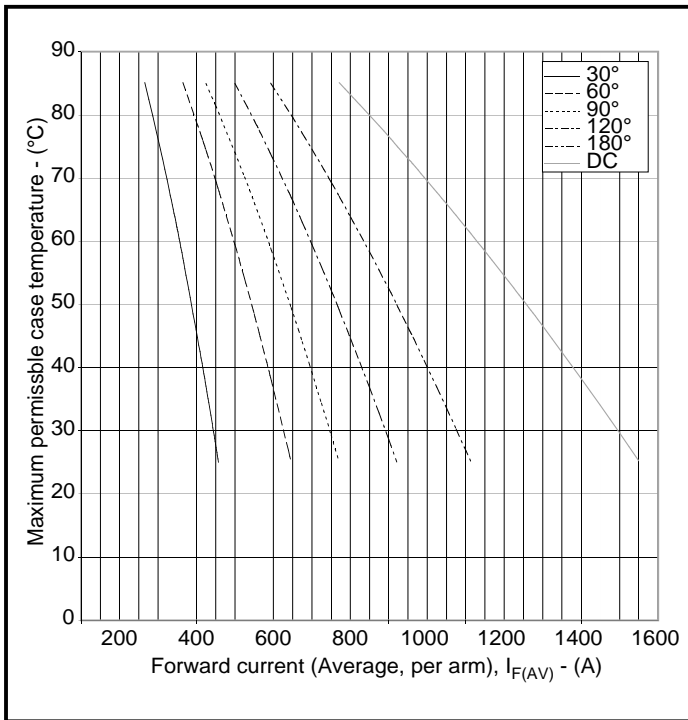


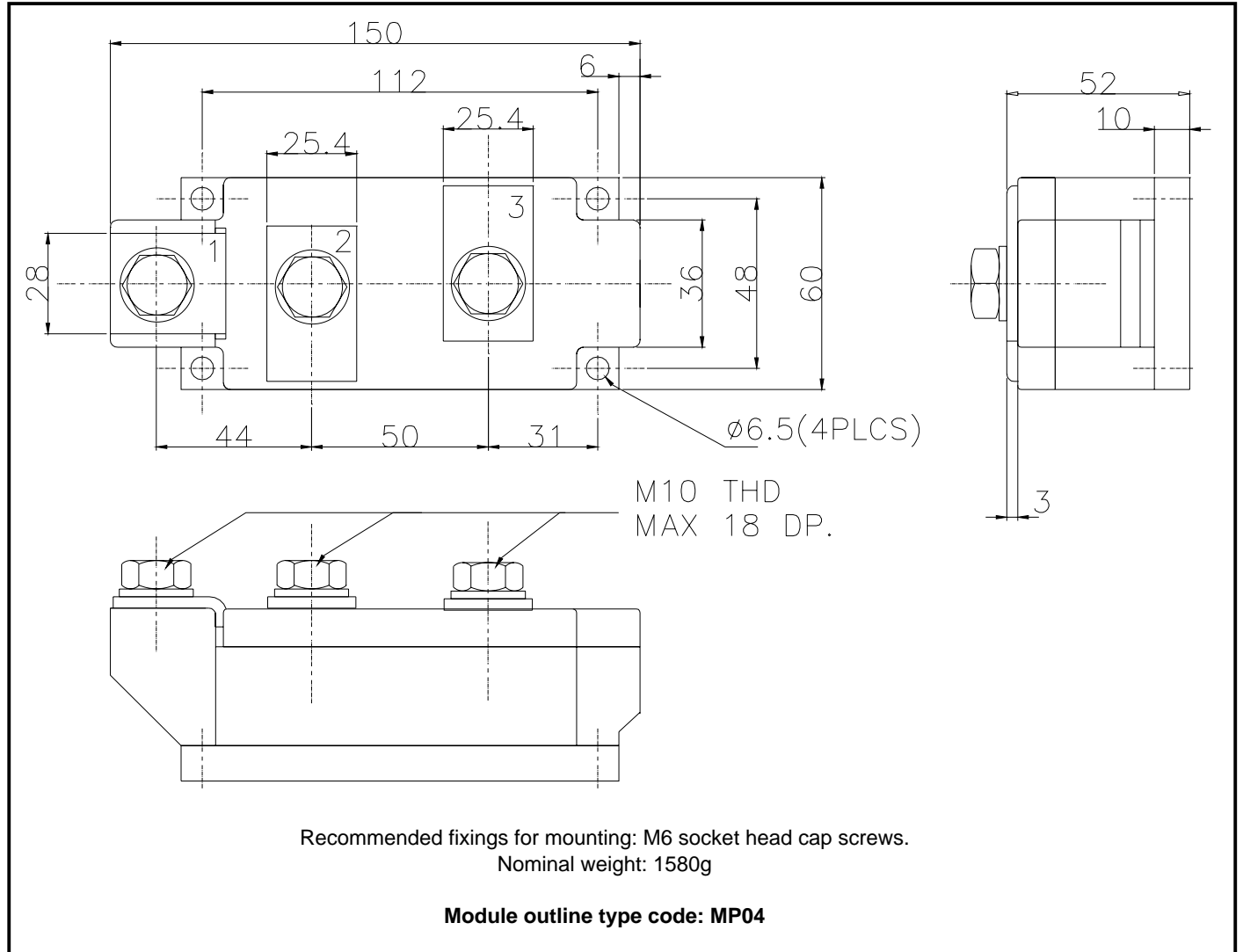
Fig.8 Transient thermal impedance - dc



**Fig.9 Maximum permissible case temperature vs forward current per arm at various conduction angles, 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.



## 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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**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.

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