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With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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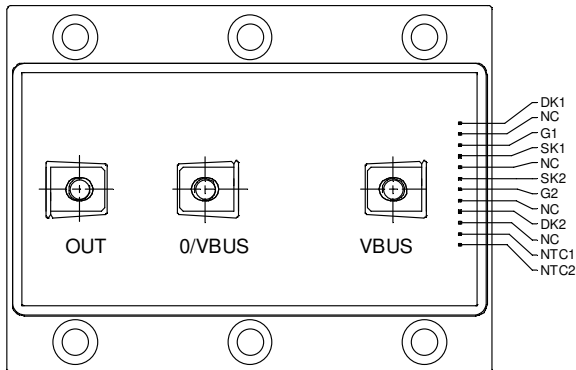
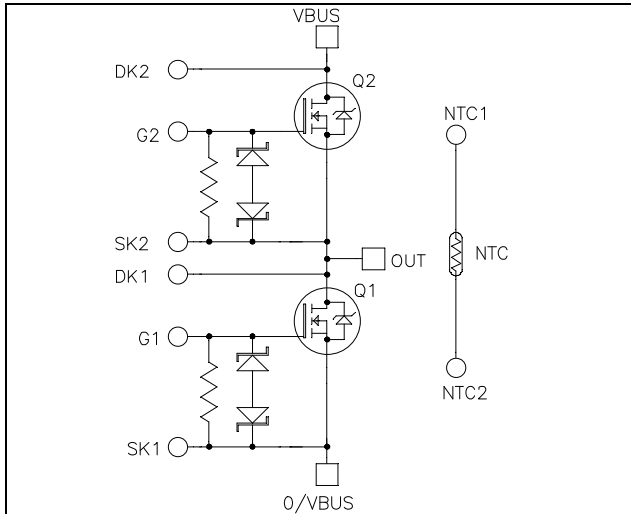
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## Phase leg MOSFET Power Module



$$V_{DSS} = 500V$$

$$R_{DSon} = 25m\Omega \text{ max @ } T_j = 25^\circ C$$

$$I_D = 149A \text{ @ } T_c = 25^\circ C$$

### Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

### Features

- Power MOS V<sup>®</sup> FREDFETs
  - Low  $R_{DSon}$
  - Low input and Miller capacitance
  - Low gate charge
  - Fast intrinsic diode
  - Avalanche energy rated
  - Very rugged
- Kelvin source for easy drive
- Kelvin Drain for VDS monitoring
- Very low stray inductance
  - Symmetrical design
  - M5 power connectors
- Internal thermistor for temperature monitoring
- High level of integration

### Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals for signal and M5 for power for easy PCB mounting
- RoHS Compliant

### Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
$V_{DSS}$	Drain - Source Breakdown Voltage	500	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	149
		$T_c = 80^\circ C$	111
$I_{DM}$	Pulsed Drain current	450	A
$V_{GS}$	Gate - Source Voltage	$\pm 15^*$	V
$R_{DSon}$	Drain - Source ON Resistance	25	m $\Omega$
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	1250
$I_{AR}$	Avalanche current (repetitive and non repetitive)	149	A
$E_{AR}$	Repetitive Avalanche Energy	30	mJ
$E_{AS}$	Single Pulse Avalanche Energy	1300	

\* Limited by internal zener protection.

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.  
See application note APT0502 on [www.microsemi.com](http://www.microsemi.com)

All ratings @  $T_j = 25^\circ\text{C}$  unless otherwise specified

**Electrical Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 500V$			1000	$\mu\text{A}$
		$V_{GS} = 0V, V_{DS} = 400V$			2500	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 74.5A$			25	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 8\text{mA}$	2		4	V
$I_{GSS}$	Gate – Source Leakage Current	$V_{GS} = \pm 15V, V_{DS} = 0V$			$\pm 250$	$\text{nA}$
R	Gate Source input impedance			10		$\text{k}\Omega$

**Dynamic Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$		29.6		$\text{nF}$
$C_{oss}$	Output Capacitance	$V_{DS} = 25V$		4.1		
$C_{rss}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$		1.6		
$Q_g$	Total gate Charge	$V_{GS} = 10V$		1200		$\text{nC}$
$Q_{gs}$	Gate – Source Charge	$V_{Bus} = 250V$		200		
$Q_{gd}$	Gate – Drain Charge	$I_D = 149A$		560		
$T_{d(on)}$	Turn-on Delay Time	<b>Resistive Switching</b> $V_{GS} = 15V$ $V_{Bus} = 250V$ $I_D = 149A$ $R_G = 0.22 \Omega$		15		$\text{ns}$
$T_r$	Rise Time			20		
$T_{d(off)}$	Turn-off Delay Time			50		
$T_f$	Fall Time			10		

**Source - Drain diode ratings and characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_S$	Continuous Source current (Body diode)	$T_c = 25^\circ\text{C}$			149	A
		$T_c = 80^\circ\text{C}$			111	
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0V, I_S = -149A$			1.3	V
dv/dt	Peak Diode Recovery ①				5	V/ns
$t_{rr}$	Reverse Recovery Time	$I_S = -149A$ $V_R = 250V$ $di_s/dt = 800A/\mu\text{s}$	$T_j = 25^\circ\text{C}$		250	$\text{ns}$
			$T_j = 125^\circ\text{C}$		500	
$Q_{rr}$	Reverse Recovery Charge	$I_S = -149A$ $V_R = 250V$ $di_s/dt = 800A/\mu\text{s}$	$T_j = 25^\circ\text{C}$	10.4		$\mu\text{C}$
			$T_j = 125^\circ\text{C}$	36		

① dv/dt numbers reflect the limitations of the circuit rather than the device itself.

$$I_S \leq -149A \quad di/dt \leq 700A/\mu\text{s} \quad V_R \leq V_{DSS} \quad T_j \leq 150^\circ\text{C}$$

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
R <sub>thJC</sub>	Junction to Case Thermal Resisatnce			0.1	°C/W	
V <sub>ISOL</sub>	RMS Isolation Voltage, any terminal to case t =1 min, I isol <1mA, 50/60Hz	2500			V	
T <sub>J</sub>	Operating junction temperature range	-40		150	°C	
T <sub>STG</sub>	Storage Temperature Range	-40		125		
T <sub>C</sub>	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M5	2	3.5	N.m
		For terminals	M5	2	3.5	
Wt	Package Weight			550	g	

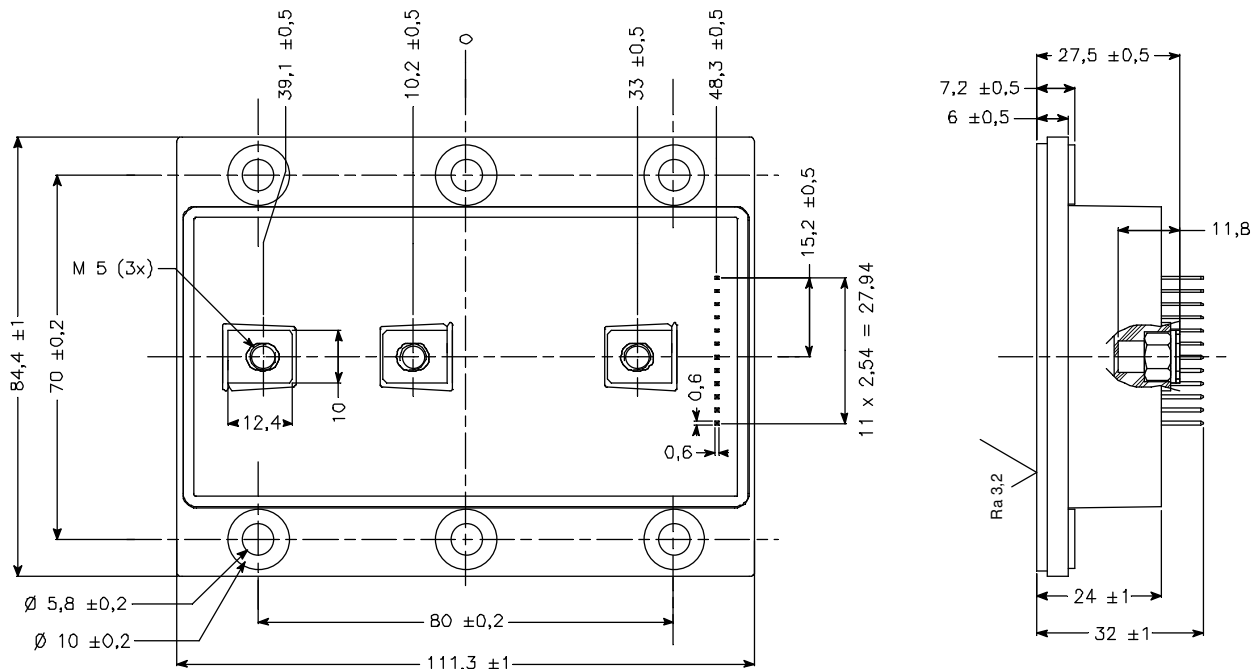
## Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

Symbol	Characteristic	Min	Typ	Max	Unit
R <sub>25</sub>	Resistance @ 25°C		50		kΩ
ΔR <sub>25</sub> /R <sub>25</sub>			5		%
B <sub>25/85</sub>	T <sub>25</sub> = 298.15 K		3952		K
ΔB/B	T <sub>C</sub> = 100°C		4		%

$$R_T = \frac{R_{25}}{\exp \left[ B_{25/85} \left( \frac{1}{T_{25}} - \frac{1}{T} \right) \right]}$$

T: Thermistor temperature  
 R<sub>T</sub>: Thermistor value at T

## Package outline (dimensions in mm)



Microsemi reserves the right to change, without notice, the specifications and information contained herein

Microsemi's products are covered by one or more of U.S. patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 6,939,743 7,352,045 5,283,201 5,801,417 5,648,283 7,196,634 6,664,594 7,157,886 6,939,743 7,342,262 and foreign patents. U.S. and Foreign patents pending. All Rights Reserved.