

## Dual common source 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

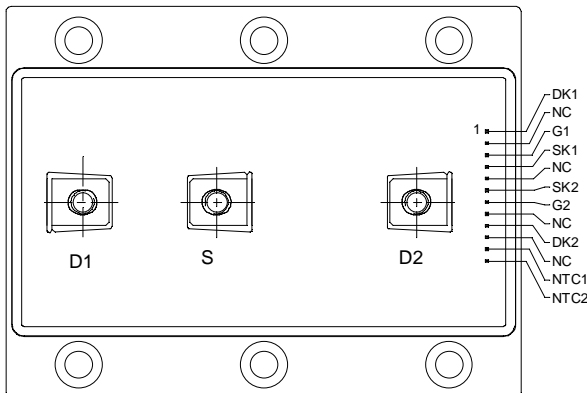
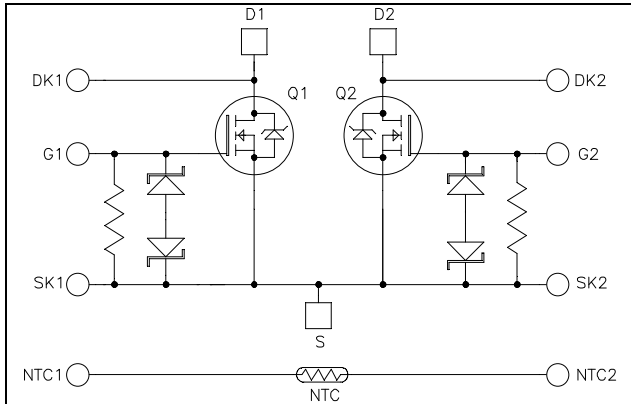
- AC Switches
- Switched Mode Power Supplies
- Uninterruptible Power Supplies

### Features

- Power MOS V<sup>®</sup> MOSFETs
  - Low  $R_{DSon}$
  - Low input and Miller capacitance
  - Low gate charge
  - 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	300	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	$V_{GS} = 0V, V_{DS} = 500V$			300	$\mu\text{A}$
		$T_j = 25^\circ\text{C}$				
		$V_{GS} = 0V, V_{DS} = 400V$			2000	
$R_{DS(on)}$	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		
$C_{rss}$	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>		12		$\text{ns}$
$T_r$	Rise Time	$V_{GS} = 15V$		10		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 250V$		50		
$T_f$	Fall Time	$I_D = 149A$ $R_G = 0.22\ \Omega$		8		

**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
$t_{rr}$	Reverse Recovery Time	$I_S = -149A, V_R = 250V$		510		ns
$Q_{rr}$	Reverse Recovery Charge	$di_s/dt = 800A/\mu\text{s}$		80		$\mu\text{C}$

**Thermal and package characteristics**

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case Thermal Resistance			0.1	$^\circ\text{C}/\text{W}$	
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case $t = 1\text{ min}, I_{isol} < 1\text{mA}, 50/60\text{Hz}$	2500			V	
$T_j$	Operating junction temperature range	-40		150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-40		125		
$T_C$	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	

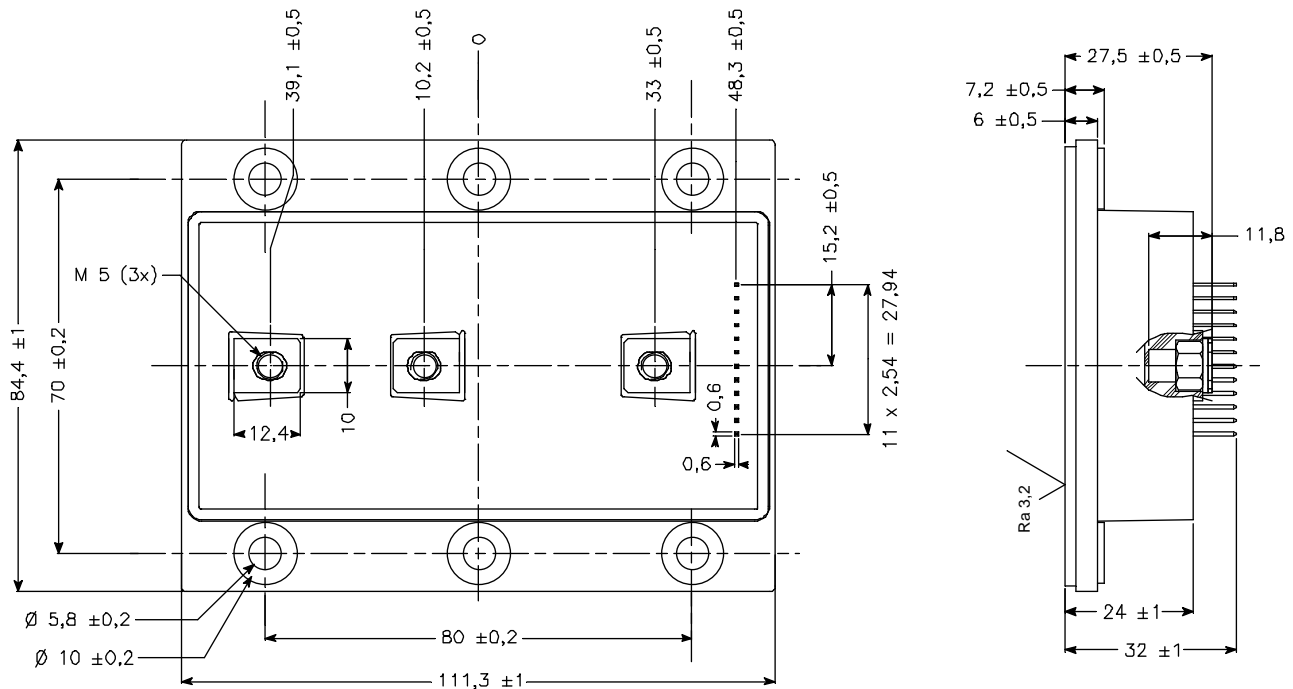
**Temperature sensor NTC** (see application note APT0406 on [www.microsemi.com](http://www.microsemi.com) for more information).

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)



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