

Dual common source MOSFET Power Module

$V_{DSS} = 200V$
 $R_{DSon} = 5m\Omega \text{ max @ } T_j = 25^\circ C$
 $I_D = 333A \text{ @ } T_c = 25^\circ C$

Application

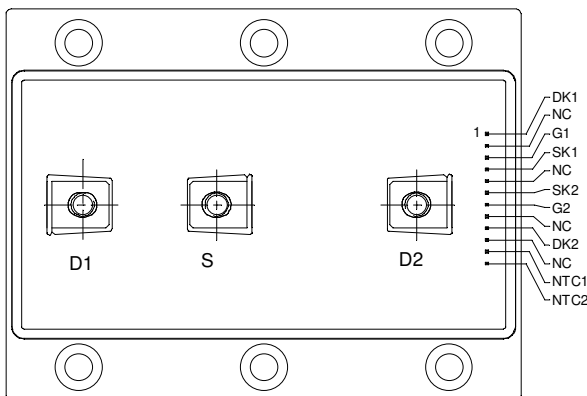
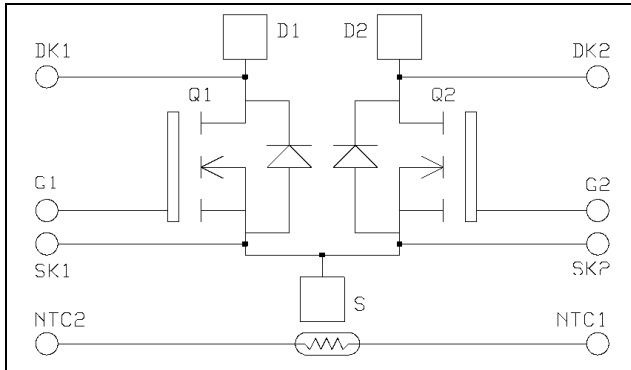
- AC Switches
- Switched Mode Power Supplies
- Uninterruptible Power Supplies

Features

- Power MOS V[®] 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	200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	333
		$T_c = 80^\circ C$	249
I_{DM}	Pulsed Drain current	700	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	5	m Ω
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	1250
I_{AR}	Avalanche current (repetitive and non repetitive)	333	A
E_{AR}	Repetitive Avalanche Energy	30	mJ
E_{AS}	Single Pulse Avalanche Energy	1300	


CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on 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	$V_{GS} = 0V, V_{DS} = 200V$			300	μA
		$T_j = 25^\circ\text{C}$				
		$V_{GS} = 0V, V_{DS} = 160V$			2000	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 166.5A$			5	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 8\text{mA}$	2		4	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 250	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{MHz}$		40.8		nF
C_{oss}	Output Capacitance			9.1		
C_{rss}	Reverse Transfer Capacitance			3.1		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 100V$ $I_D = 333A$		1184		nC
Q_{gs}	Gate – Source Charge			376		
Q_{gd}	Gate – Drain Charge			600		
$T_{d(on)}$	Turn-on Delay Time	Resistive Switching $V_{GS} = 15V$ $V_{Bus} = 100V$ $I_D = 333A$ $R_G = 0.22\ \Omega$		15		ns
T_r	Rise Time			25		
$T_{d(off)}$	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)		$T_c = 25^\circ\text{C}$			333	A
			$T_c = 80^\circ\text{C}$			249	
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = -333A$			1.3	V	
t_{rr}	Reverse Recovery Time	$I_S = -333A, V_R = 100V$ $di_S/dt = 800A/\mu\text{s}$		160		ns	
Q_{rr}	Reverse Recovery Charge	$I_S = -333A, V_R = 100V$ $di_S/dt = 800A/\mu\text{s}$		10.4		μC	

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	

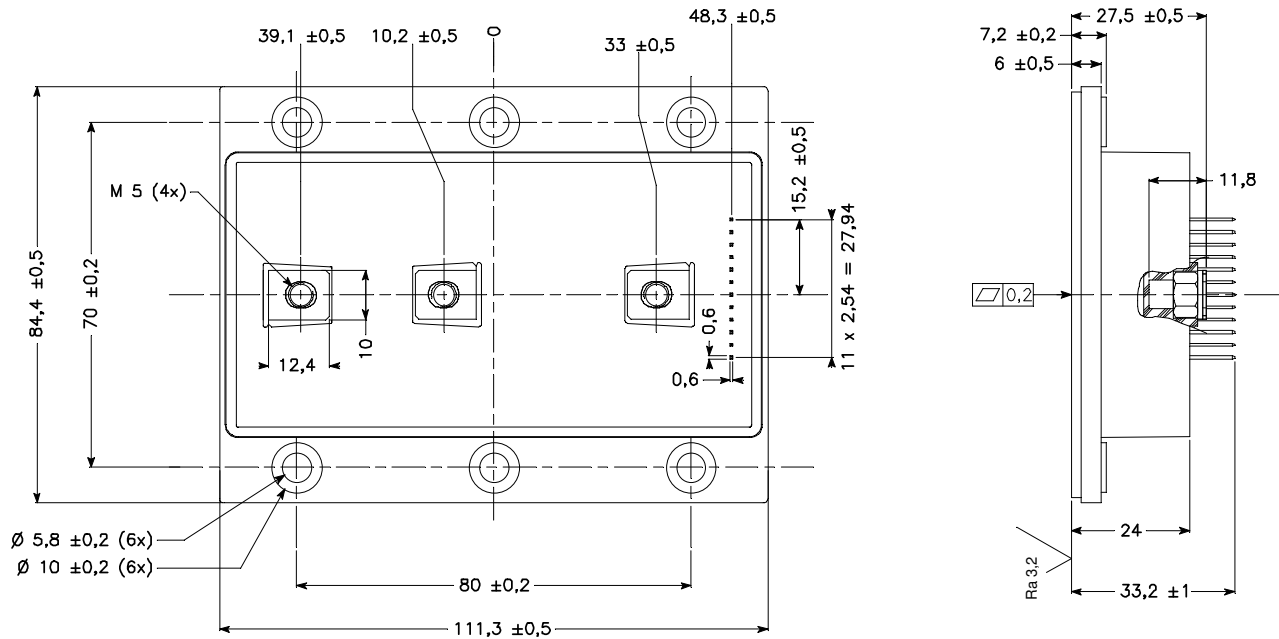
Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

Symbol	Characteristic	Min	Typ	Max	Unit
R ₂₅	Resistance @ 25°C		50		kΩ
B _{25/85}	T ₂₅ = 298.15 K		3952		K

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

T: Thermistor temperature
 R_T: Thermistor value at T

Package outline (dimensions in mm)



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