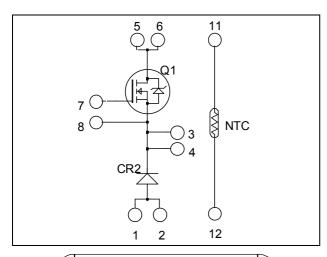
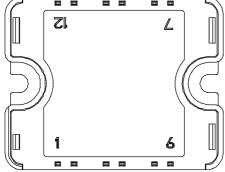


Buck chopper MOSFET Power Module

$$\begin{split} V_{DSS} &= 1200V \\ R_{DSon} &= 560 \text{m}\Omega \text{ typ @ Tj} = 25^{\circ}\text{C} \\ I_D &= 18\text{A @ Tc} = 25^{\circ}\text{C} \end{split}$$





Pins 1/2; 3/4; 5/6 must be shorted together

Application

- AC and DC motor control
- Switched Mode Power Supplies

Features

- Power MOS 8TM MOSFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Avalanche energy rated
 - Very rugged
- Very low stray inductance
- 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 both for power and signal for easy PCB mounting
- Low profile
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter		Max ratings	Unit
$V_{ m DSS}$	Drain - Source Breakdown Voltage		1200	V
T	Continuous Drain Current	$T_c = 25^{\circ}C$	18	
I_D	Continuous Drain Current	$T_c = 80$ °C	13	A
I_{DM}	Pulsed Drain current		104	
V_{GS}	Gate - Source Voltage		±30	V
R_{DSon}	Drain - Source ON Resistance		672	mΩ
P_{D}	Maximum Power Dissipation	$T_c = 25^{\circ}C$	390	W
I_{AR}	Avalanche current (repetitive and non repetitive)		14	A

These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com



All ratings @ $T_j = 25$ °C unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
T	Zero Gate Voltage Drain Current	$V_{\rm DS} = 1200 \rm V$	$T_j = 25$ °C			100	^
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V$	$T_j = 125$ °C			500	μΑ
R _{DS(on)}	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 14A$			560	672	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 2.5 \text{mA}$		3	4	5	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30 \text{ V}$				±100	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		7736		
C_{oss}	Output Capacitance	$V_{\rm DS} = 25V$		715		pF
C_{rss}	Reverse Transfer Capacitance	f = 1MHz		92		
Q_{g}	Total gate Charge	$V_{GS} = 10V$		300		
Q_{gs}	Gate – Source Charge	$V_{Bus} = 600V$		50		nC
Q_{gd}	Gate – Drain Charge	$I_{D} = 14A$		140		
$T_{d(on)}$	Turn-on Delay Time	Resistive switching @ 25°C		50		
$T_{\rm r}$	Rise Time	$\begin{aligned} V_{GS} &= 15V \\ V_{Bus} &= 800V \\ I_D &= 14A \end{aligned}$		31		
$T_{d(off)}$	Turn-off Delay Time			170		ns
T_{f}	Fall Time	$R_G = 2.2\Omega$		48		

Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage			1200			V
I_{RM}	Maximum Reverse Leakage Current	V _R =1200V	$T_i = 25^{\circ}C$ $T_i = 125^{\circ}C$			100 500	μΑ
I_F	DC Forward Current		$Tc = 80^{\circ}C$		30		A
	Diode Forward Voltage	$I_F = 30A$			2.6	3.1	
V_{F}		$I_F = 60A$			3.2		V
		$I_F = 30A$	$T_{i} = 125^{\circ}C$		1.8		
+	Reverse Recovery Time		$T_j = 25^{\circ}C$		300		ns
t_{rr}	$\begin{array}{c c} \text{Reverse Recovery Time} & I_F = 30\text{A} \\ V_R = 800\text{V} & \end{array}$	$I_F = 30A$	$T_j = 125$ °C		380		115
0	Reverse Recovery Charge	$di/dt = 200 \text{ A/}\mu\text{s}$	$T_j = 25$ °C		360		nC
Q_{rr}		·	$T_{j} = 125^{\circ}C$		1700		пС

Thermal and package characteristics

Symbol	Characteristic			Min	Тур	Max	Unit
R_{thJC}	Junction to Case Thermal Resistance		Transistor			0.32	°C/W
1\(\text{thJC}\)		I	Diode			1.2	C/ W
V_{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, 50/60Hz			4000			V
T_{J}	Operating junction temperature range			-40		150	
T_{STG}	Storage Temperature Range			-40		125	°C
$T_{\rm C}$	Operating Case Temperature			-40		100	
Torque	Mounting torque	To heatsin	k M ²	1 2		3	N.m
Wt	Package Weight					80	g



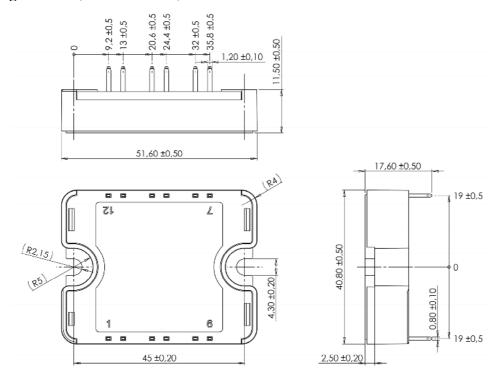
Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

Symbol	Characteristic	Min	Тур	Max	Unit
R ₂₅	Resistance @ 25°C		50		kΩ
B 25/85	$T_{25} = 298.15 \text{ K}$		3952		K

$$R_{T} = \frac{R_{25}}{\exp \left[B_{25/85} \left(\frac{1}{T_{25}} - \frac{1}{T} \right) \right]} \quad \text{T: Thermistor temperature}$$

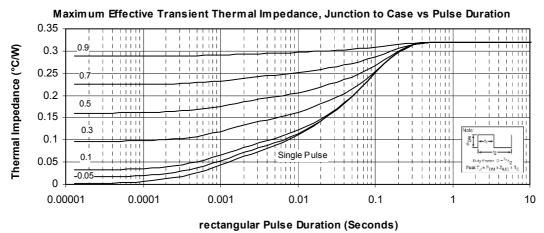
$$R_{T}: \text{ Thermistor value at T}$$

SP1 Package outline (dimensions in mm)

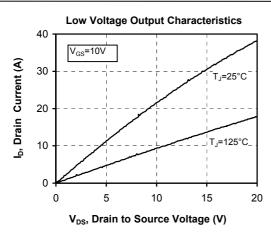


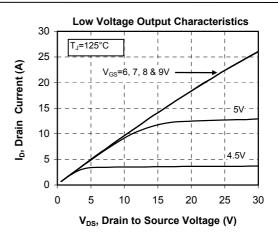
See application note 1904 - Mounting Instructions for SP1 Power Modules on www.microsemi.com

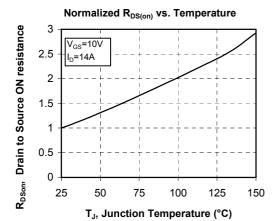
Typical Mosfet Performance Curve

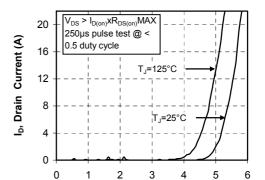






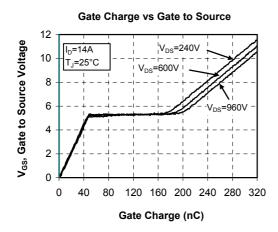


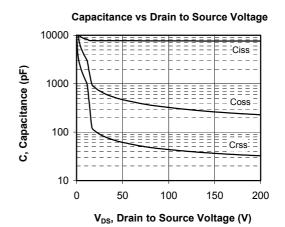




V_{GS}, Gate to Source Voltage (V)

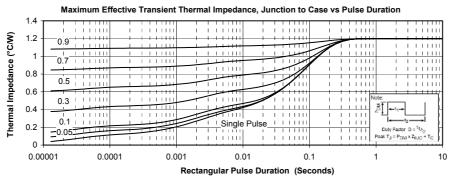
Transfert Characteristics

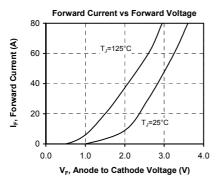


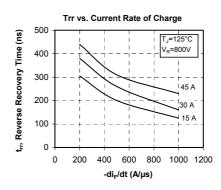


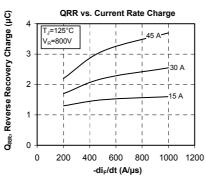


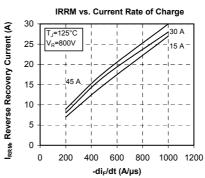
Typical Diode Performance Curve

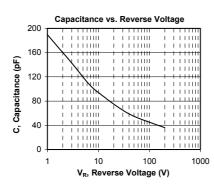


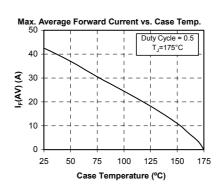












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