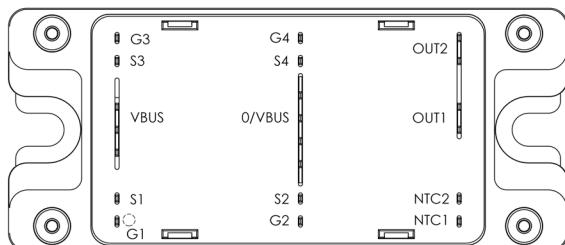
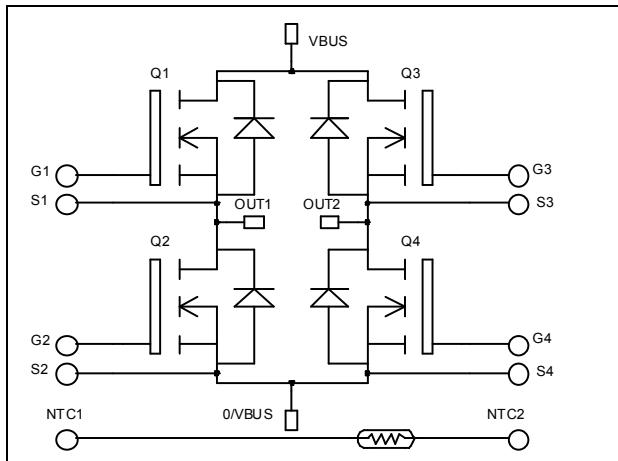


**Full - Bridge
MOSFET Power Module**
 $V_{DSS} = 500V$
 $R_{DSon} = 65m\Omega$ typ @ $T_j = 25^\circ C$
 $I_D = 51A$ @ $T_c = 25^\circ C$

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	500	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	51
		$T_c = 80^\circ C$	38
I_{DM}	Pulsed Drain current	204	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	78	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	390
I_{AR}	Avalanche current (repetitive and non repetitive)	51	A
E_{AR}	Repetitive Avalanche Energy	50	
E_{AS}	Single Pulse Avalanche Energy	3000	mJ

 **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	$V_{GS} = 0\text{V}, V_{DS} = 500\text{V}$	$T_j = 25^\circ\text{C}$			100
		$V_{GS} = 0\text{V}, V_{DS} = 400\text{V}$	$T_j = 125^\circ\text{C}$			500
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10\text{V}, I_D = 25.5\text{A}$		65	78	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 2.5\text{mA}$	3		5	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{V}$			± 100	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$ $V_{DS} = 25\text{V}$ $f = 1\text{MHz}$		7000		pF
C_{oss}	Output Capacitance			1400		
C_{rss}	Reverse Transfer Capacitance			90		
Q_g	Total gate Charge	$V_{GS} = 10\text{V}$ $V_{Bus} = 250\text{V}$ $I_D = 51\text{A}$		140		nC
Q_{gs}	Gate – Source Charge			40		
Q_{gd}	Gate – Drain Charge			70		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15\text{V}$ $V_{Bus} = 333\text{V}$ $I_D = 51\text{A}$		21		ns
T_r	Rise Time			38		
$T_{d(off)}$	Turn-off Delay Time			75		
T_f	Fall Time			93		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{GS} = 15\text{V}, V_{Bus} = 333\text{V}$ $I_D = 51\text{A}, R_G = 3\Omega$		1035		μJ
E_{off}	Turn-off Switching Energy			845		
E_{on}	Turn-on Switching Energy			1556		
E_{off}	Turn-off Switching Energy	Inductive switching @ 125°C $V_{GS} = 15\text{V}, V_{Bus} = 333\text{V}$ $I_D = 51\text{A}, R_G = 3\Omega$		1013		μJ

Source - Drain diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_S	Continuous Source current (Body diode)		$T_c = 25^\circ\text{C}$		51	A
			$T_c = 80^\circ\text{C}$		38	
V_{SD}	Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = - 51\text{A}$			1.3	V
dv/dt	Peak Diode Recovery ①				15	V/ns
t_{rr}	Reverse Recovery Time	$I_S = - 51\text{A}$ $V_R = 333\text{V}$ $di_S/dt = 100\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		270	ns
			$T_j = 125^\circ\text{C}$		540	
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$	2.6		μC
			$T_j = 125^\circ\text{C}$	9.6		

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

 $I_S \leq - 51\text{A}$ $di/dt \leq 700\text{A}/\mu\text{s}$ $V_R \leq V_{DSS}$ $T_j \leq 150^\circ\text{C}$

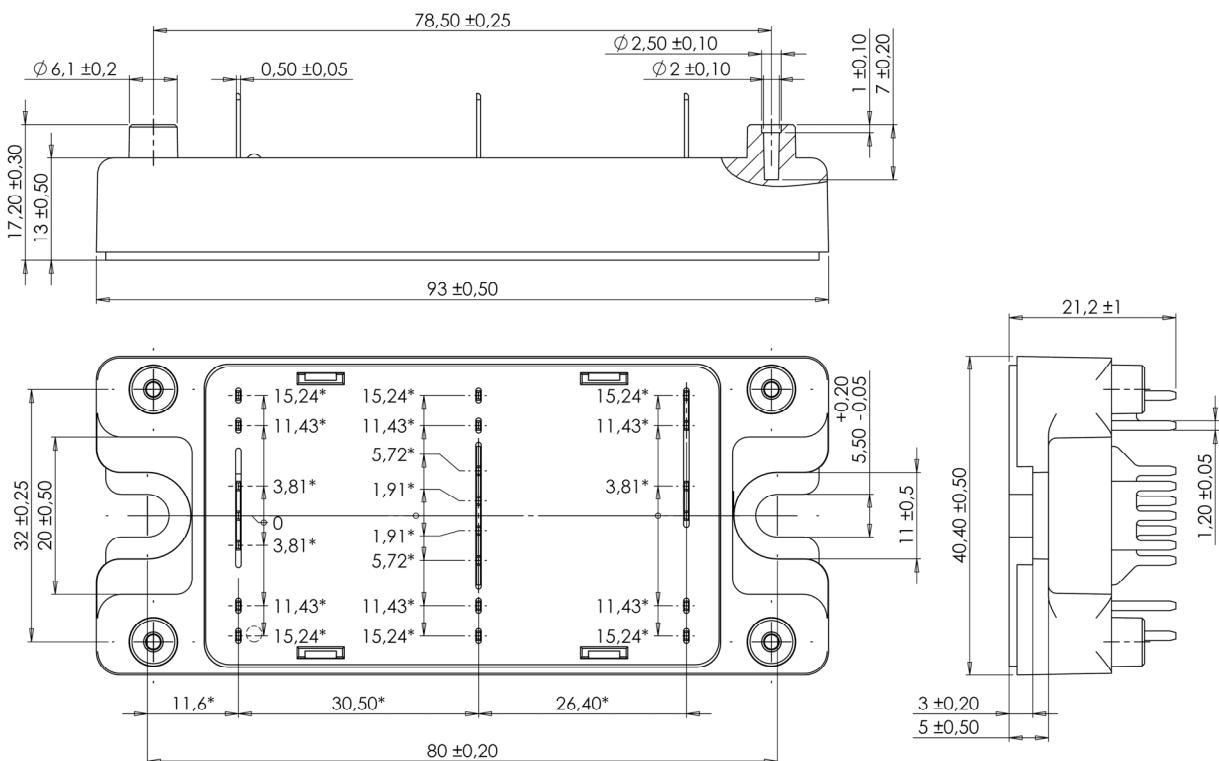
Thermal and package characteristics

Symbol	Characteristic		Min	Typ	Max	Unit
R_{thJC}	Junction to Case Thermal Resistance			0.32		°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_C	Operating Case Temperature		-40		100	
Torque	Mounting torque	To Heatsink	M5	2.5	4.7	N.m
Wt	Package Weight				160	g

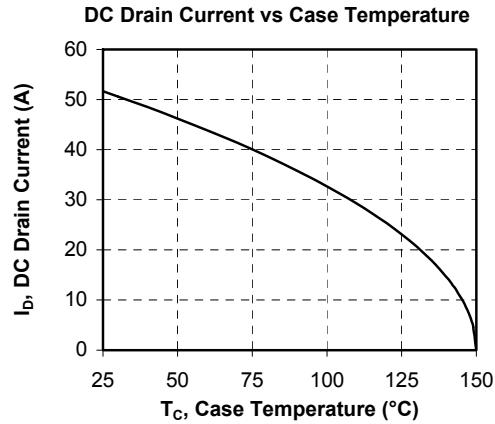
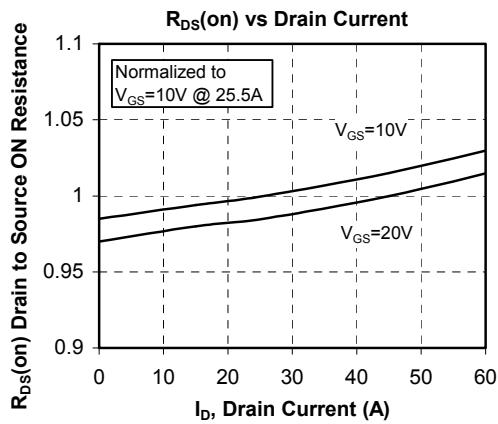
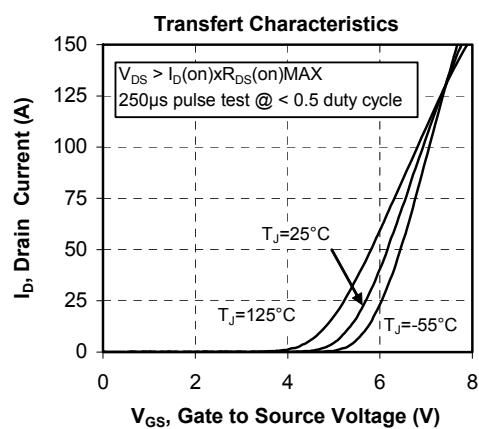
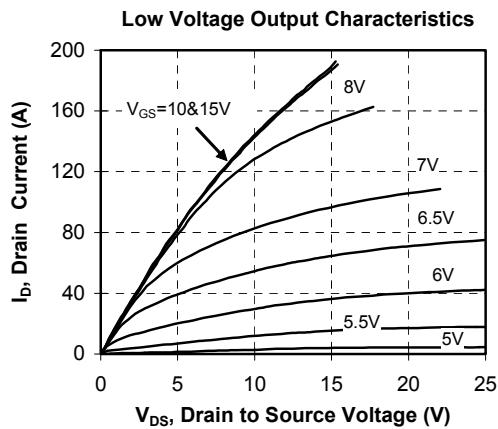
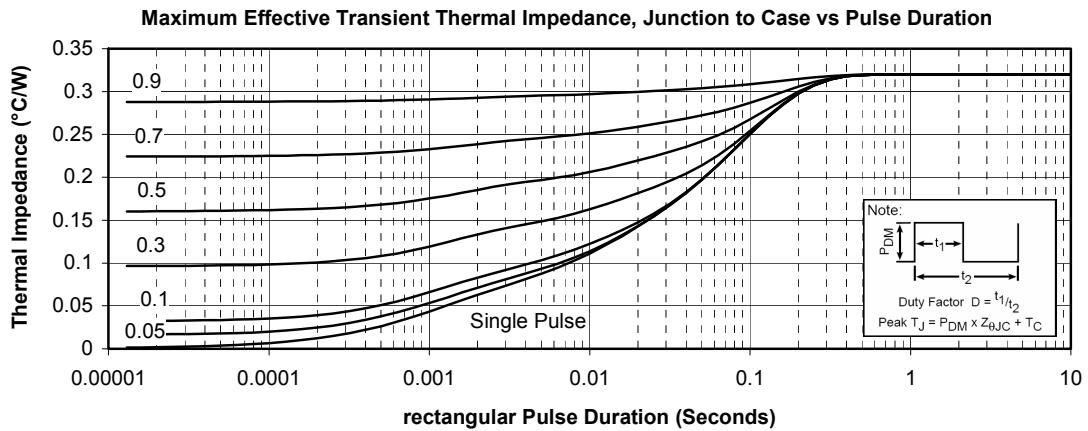
Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

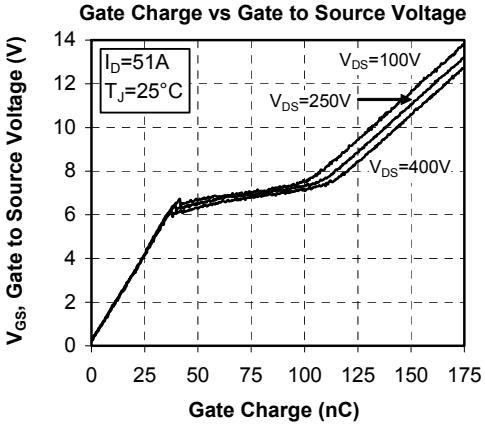
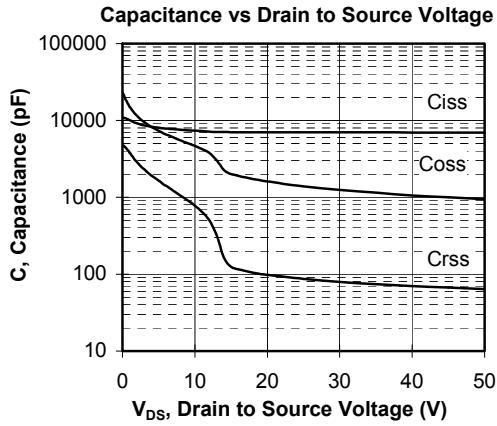
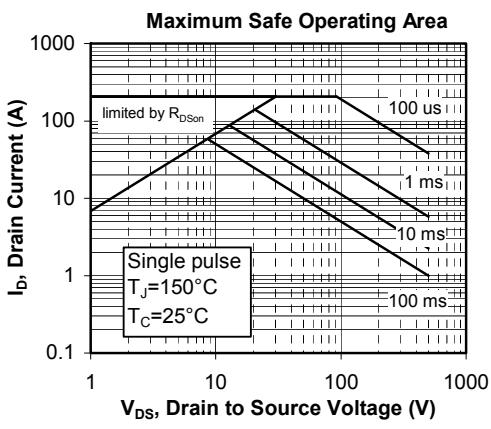
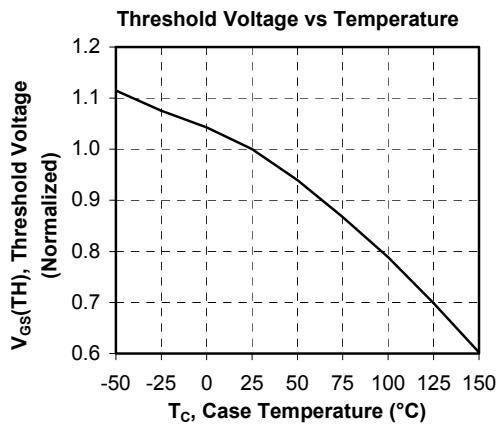
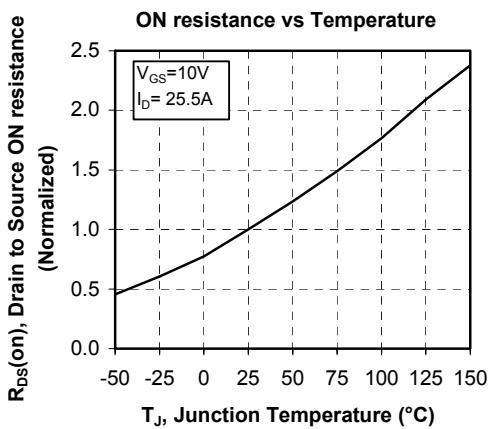
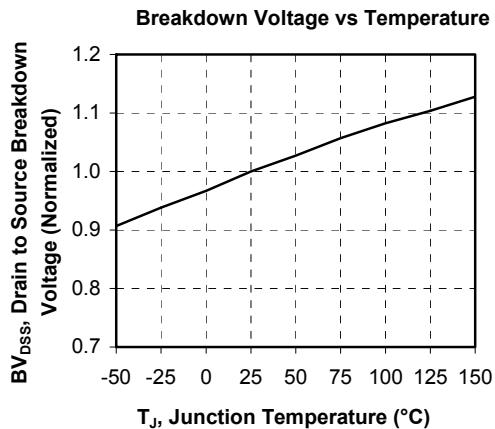
Symbol	Characteristic		Min	Typ	Max	Unit
R_{25}	Resistance @ 25°C			50		kΩ
$B_{25/85}$	$T_{25} = 298.15 \text{ K}$			3952		K

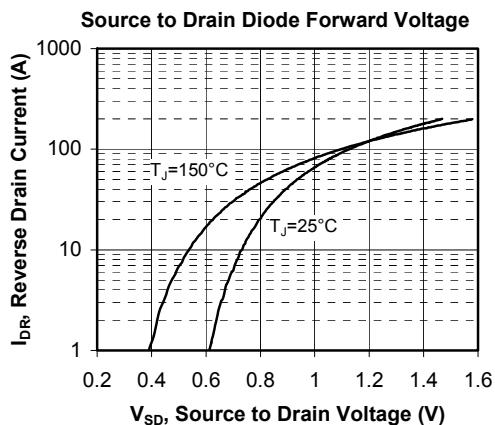
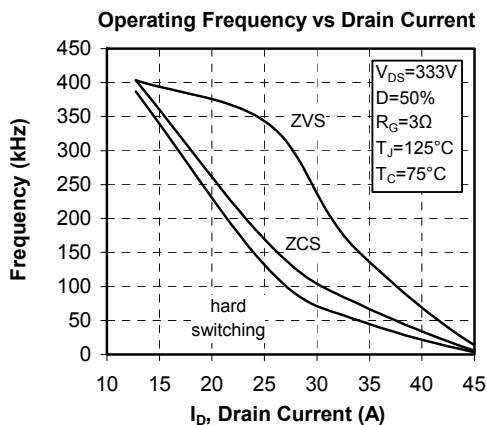
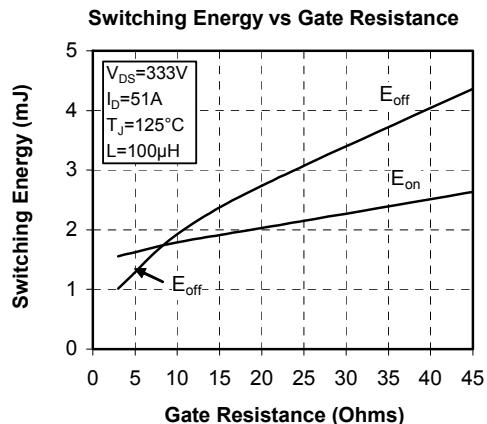
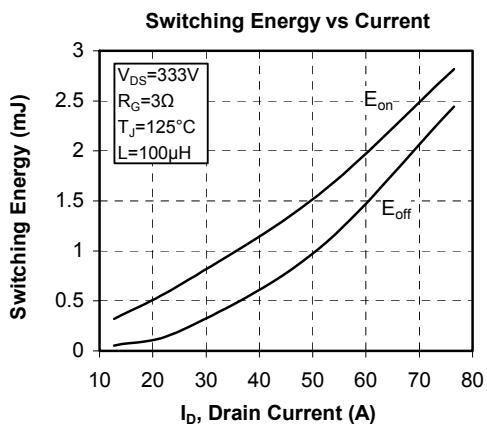
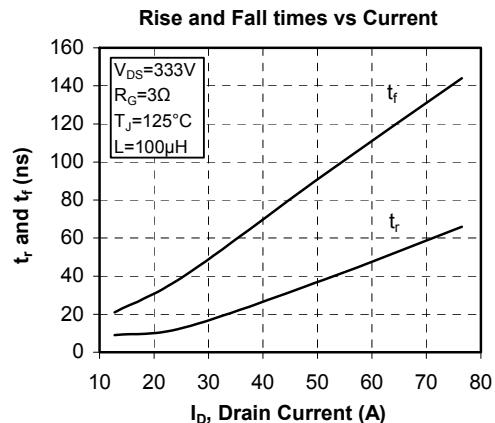
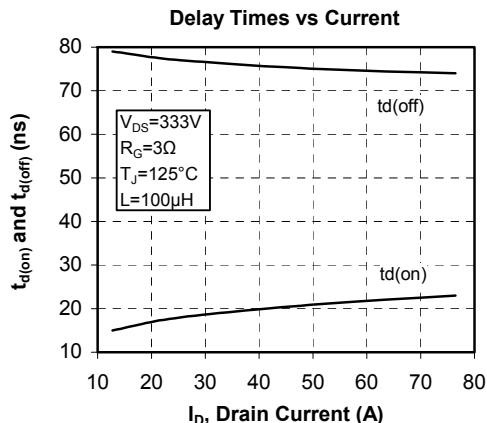
$$R_T = \frac{R_{25}}{\exp\left[B_{25/85}\left(\frac{1}{T_{25}} - \frac{1}{T}\right)\right]} \quad \begin{array}{l} T: \text{Thermistor temperature} \\ R_T: \text{Thermistor value at } T \end{array}$$

SP4 Package outline (dimensions in mm)

 ALL DIMENSIONS MARKED "/*" ARE TOLERANCED AS : ± 0.1

 See application note APT0501 - Mounting Instructions for SP4 Power Modules on www.microsemi.com

Typical Performance Curve






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