All ratings @ T_j = 25°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} = 100V	T_j = 25°C			500	µA
		V_{GS} = 0V, V_{DS} = 80V	T_j = 125°C			2000	
$R_{DS(on)}$	Drain – Source on Resistance	V_{GS} = 10V, I_D = 275A			1.5	1.6	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 12mA		2		4	V
I_{GSS}	Gate – Source Leakage Current	V_{GS} = ±30 V, V_{DS} = 0V				±450	nA

Dynamic Characteristics

Symbol	*Characteristic*	*Test Conditions*	*Min*	*Typ*	*Max*	*Unit*
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1MHz		60		nF
C_{oss}	Output Capacitance			23		
C_{rss}	Reverse Transfer Capacitance			8.8		
Q_g	Total gate Charge	V_{GS} = 10V V_{Bus} = 50V I_D =550A		2100		nC
Q_{gs}	Gate – Source Charge			360		
Q_{gd}	Gate – Drain Charge			1080		
$T_{d(on)}$	Turn-on Delay Time	**Inductive switching** V_{GS} = 15V V_{Bus} = 66V I_D = 550A R_G = 1Ω		185		ns
T_r	Rise Time			270		
$T_{d(off)}$	Turn-off Delay Time			600		
T_f	Fall Time			175		
E_{on}	Turn-on Switching Energy	**Inductive switching @ 25°C** V_{GS} = 15V, V_{Bus} = 66V I_D = 550A, R_G =1Ω		3.3		mJ
E_{off}	Turn-off Switching Energy			3.6		
E_{on}	Turn-on Switching Energy	**Inductive switching @ 125°C** V_{GS} = 15V, V_{Bus} = 66V I_D = 550A, R_G = 1Ω		3.65		mJ
E_{off}	Turn-off Switching Energy			3.85		

Source - Drain diode ratings and characteristics

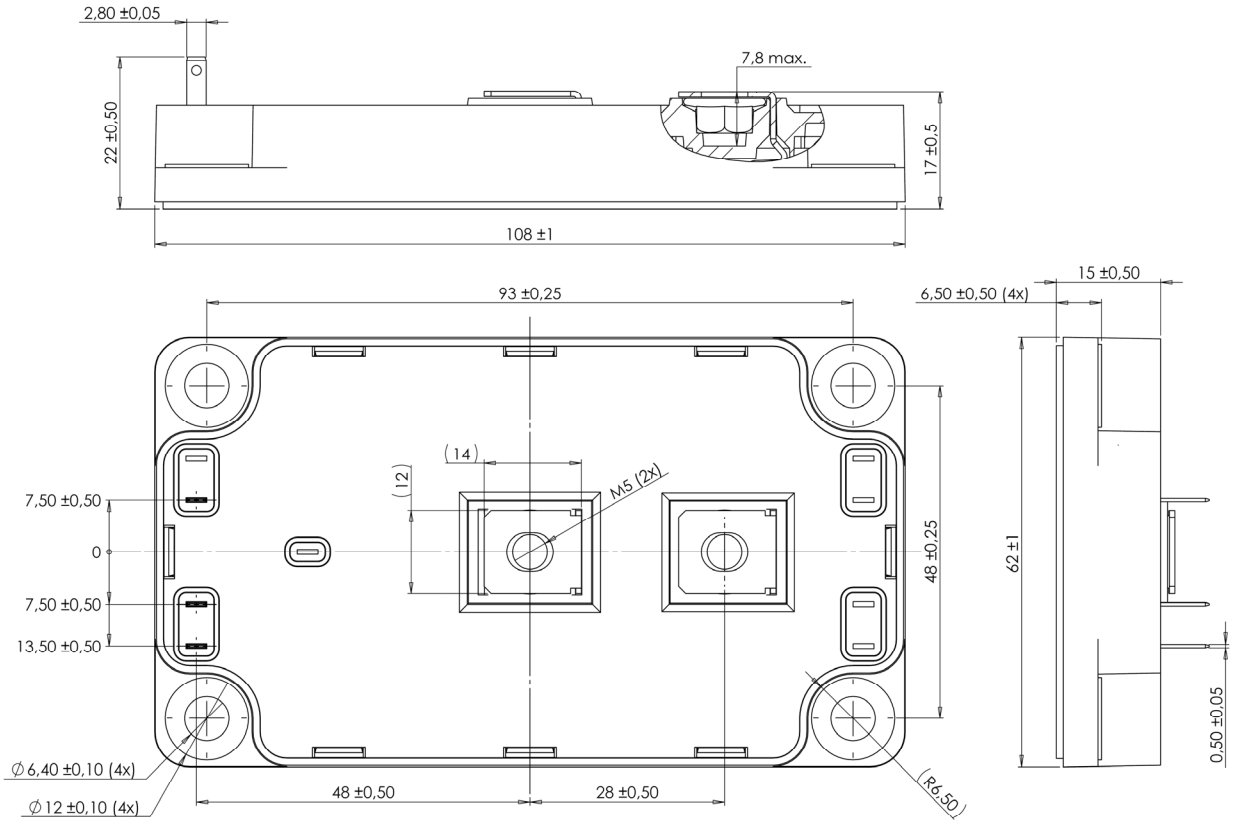
Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
I_S	Continuous Source current (Body diode)		Tc = 25°C			860*	A
			Tc = 80°C			640*	
V_{SD}	Diode Forward Voltage	V_{GS} = 0V, I_S = - 550A				1.3	V
dv/dt	Peak Diode Recovery ❶					5	V/ns
t_{rr}	Reverse Recovery Time	I_S = - 550A V_R = 66V di_S/dt = 600A/µs	T_j = 25°C			190	ns
			T_j = 125°C			370	
Q_{rr}	Reverse Recovery Charge		T_j = 25°C		2.4		µC
			T_j = 125°C		10.2		

❶ dv/dt numbers reflect the limitations of the circuit rather than the device itself.
$I_S \le$ - 860A di/dt ≤ 600A/µs $V_R \le V_{DSS}$ $T_j \le$ 150°C

Thermal and package characteristics

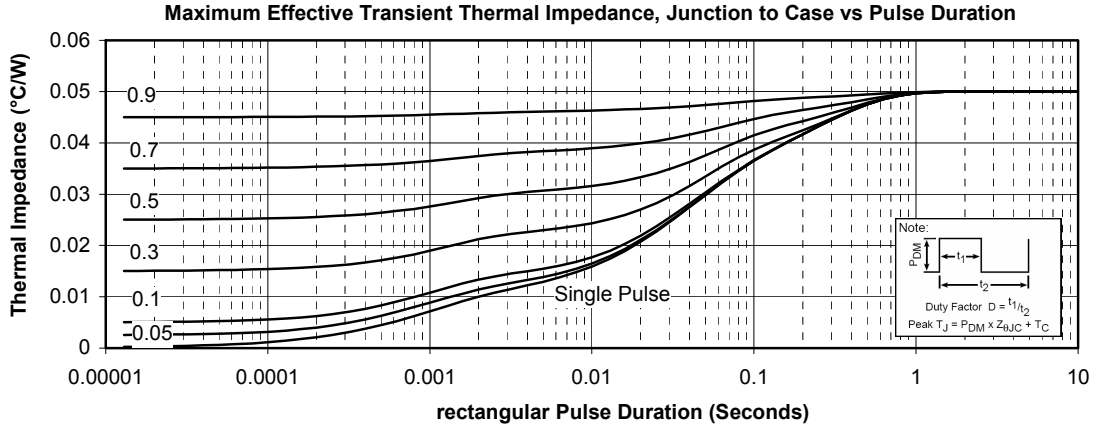
Symbol	*Characteristic*			*Min*	*Typ*	*Max*	*Unit*
R_{thJC}	Junction to Case Thermal Resistance					0.05	°C/W
V_{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, 50/60Hz			4000			V
T_J	Operating junction temperature range			-40		150	°C
T_{STG}	Storage Temperature Range			-40		125	
T_C	Operating Case Temperature			-40		100	
Torque	Mounting torque	To heatsink	M6	3		5	N.m
		For terminals	M5	2		3.5	
Wt	Package Weight					300	g

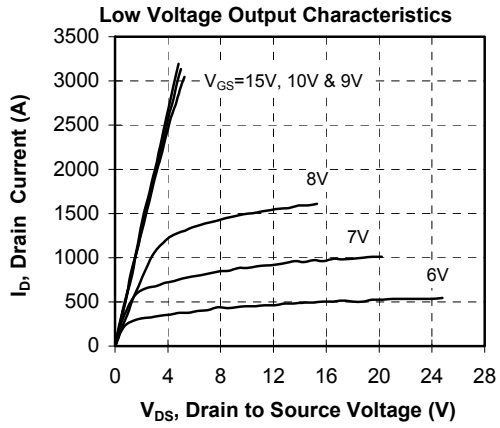
SP6 Package outline (dimensions in mm)

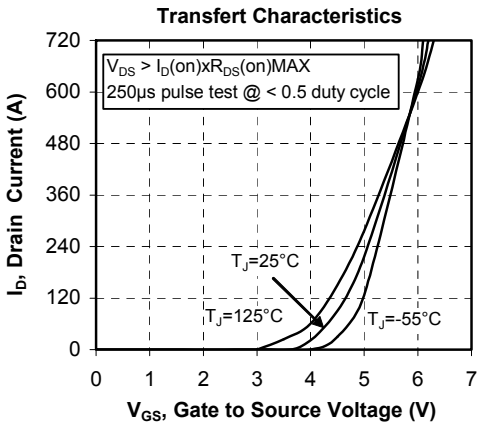


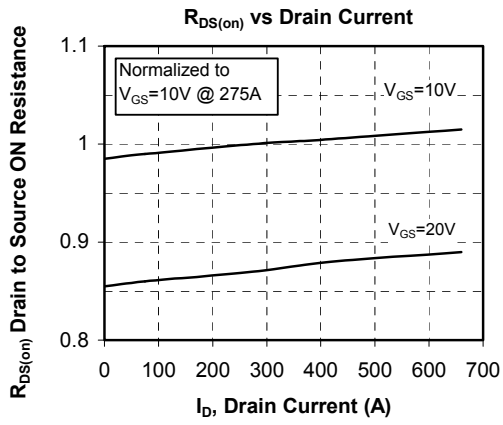
See application note APT0601 - Mounting Instructions for SP6 Power Modules on www.microsemi.com

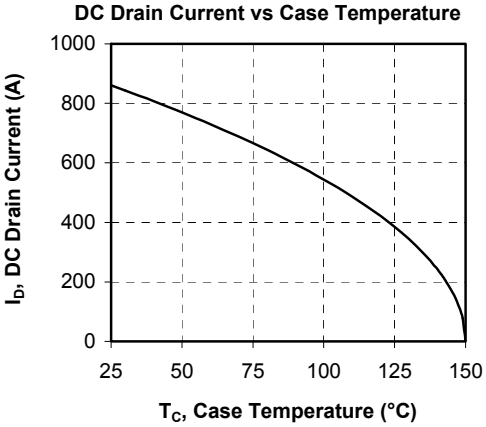
Typical Performance Curve



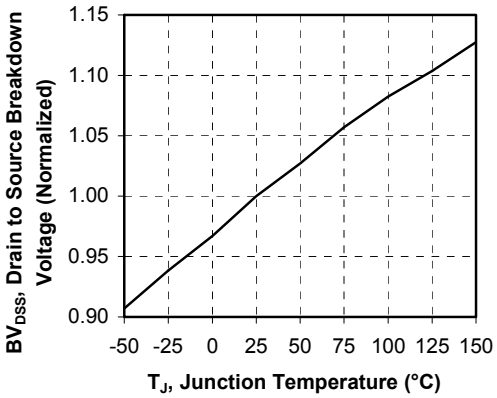




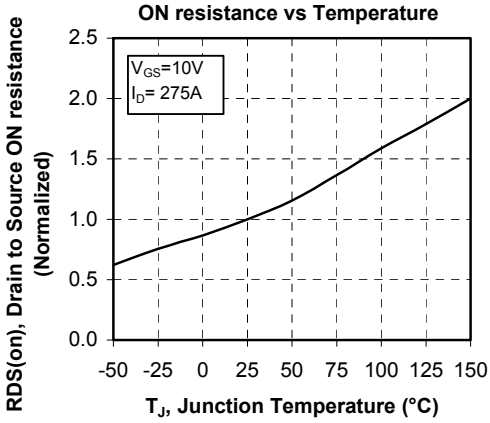




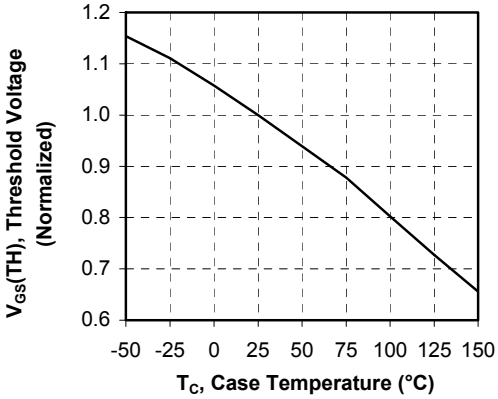
Breakdown Voltage vs Temperature



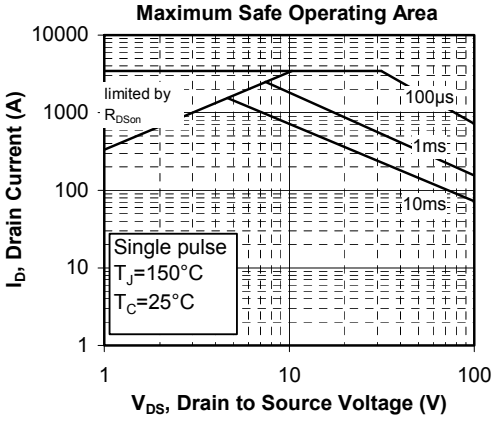
ON resistance vs Temperature



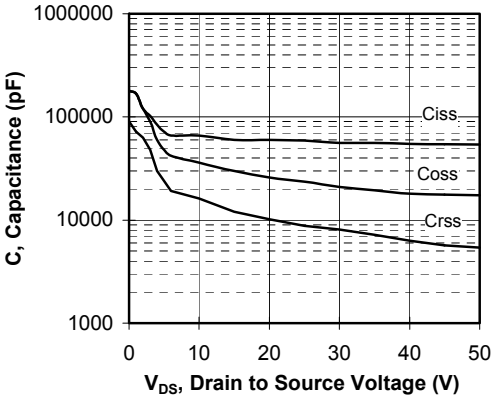
Threshold Voltage vs Temperature



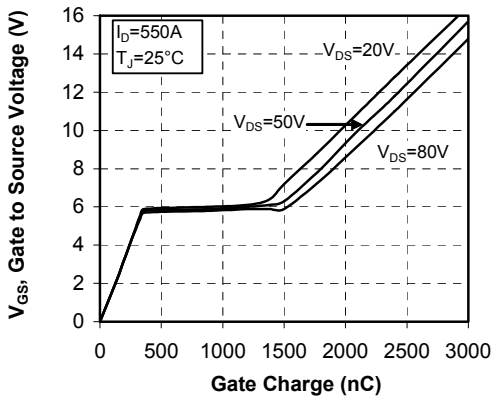
Maximum Safe Operating Area



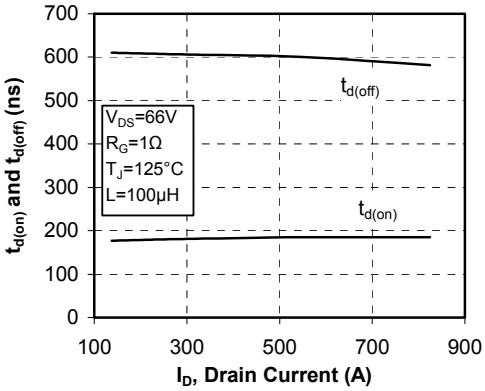
Capacitance vs Drain to Source Voltage



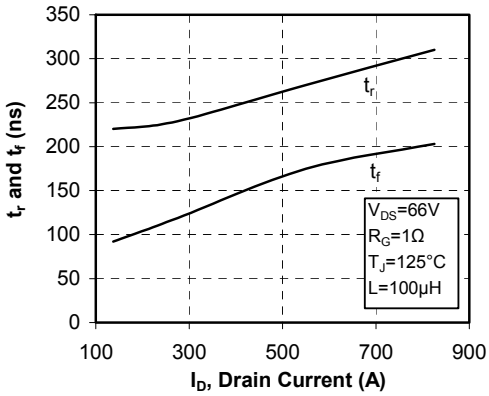
Gate Charge vs Gate to Source Voltage



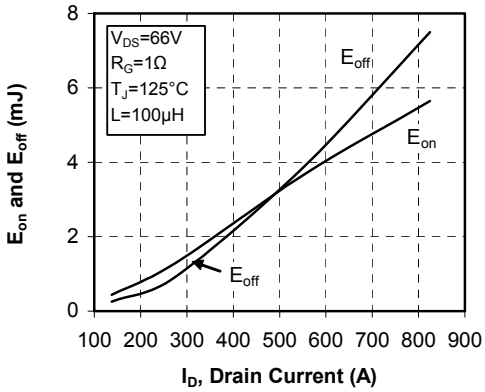
Delay Times vs Current



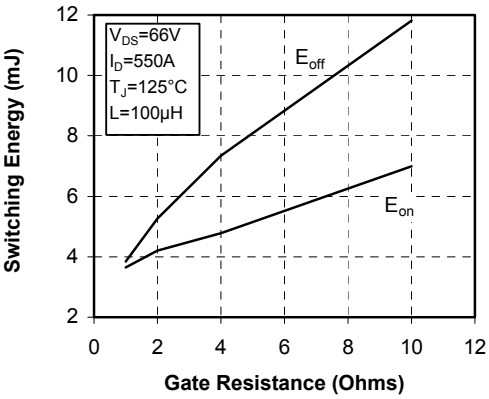
Rise and Fall times vs Current



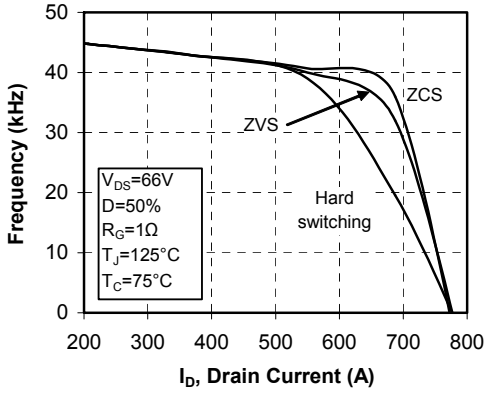
Switching Energy vs Current



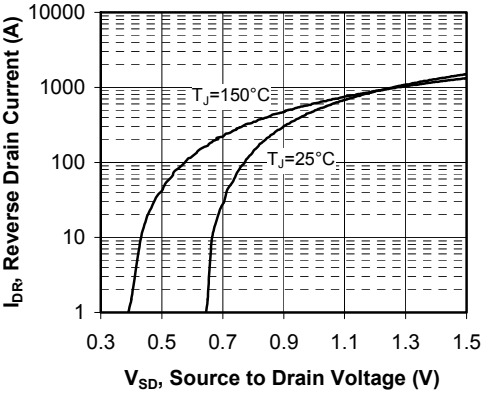
Switching Energy vs Gate Resistance



Operating Frequency vs Drain Current



Source to Drain Diode Forward Voltage



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