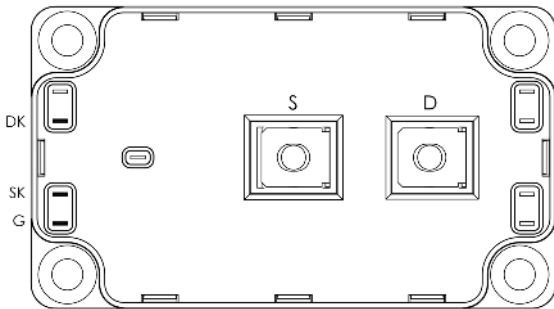
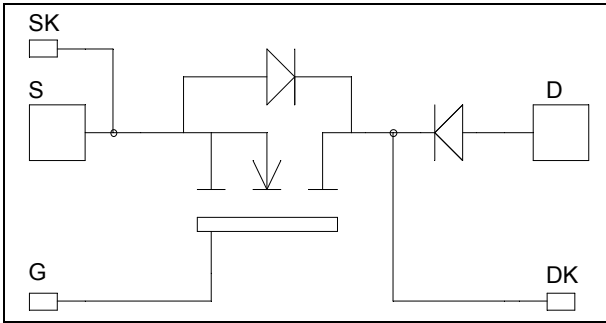


Single switch
with Series diode
MOSFET Power Module

$V_{DSS} = 1000V$
 $R_{DSon} = 45m\Omega \text{ typ @ } T_j = 25^\circ C$
 $I_D = 215A \text{ @ } T_c = 25^\circ C$



Application

- Zero Current Switching resonant mode

Features

- Power MOS 7[®] MOSFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Avalanche energy rated
 - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
 - Symmetrical design
 - M5 power connectors
- High level of integration
- AlN substrate for improved thermal performance

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Low profile
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	1000	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	215
		$T_c = 80^\circ C$	160
I_{DM}	Pulsed Drain current	860	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	52	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	5000
I_{AR}	Avalanche current (repetitive and non repetitive)	30	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	3200	

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} = 1000V			600	μA
		V _{GS} = 0V, V _{DS} = 800V			3	mA
R _{DS(on)}	Drain – Source on Resistance	V _{GS} = 10V, I _D = 107.5A		45	52	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 30mA	3		5	V
I _{GSS}	Gate – Source Leakage Current	V _{GS} = ±30 V, V _{DS} = 0V			±600	nA

Dynamic Characteristics

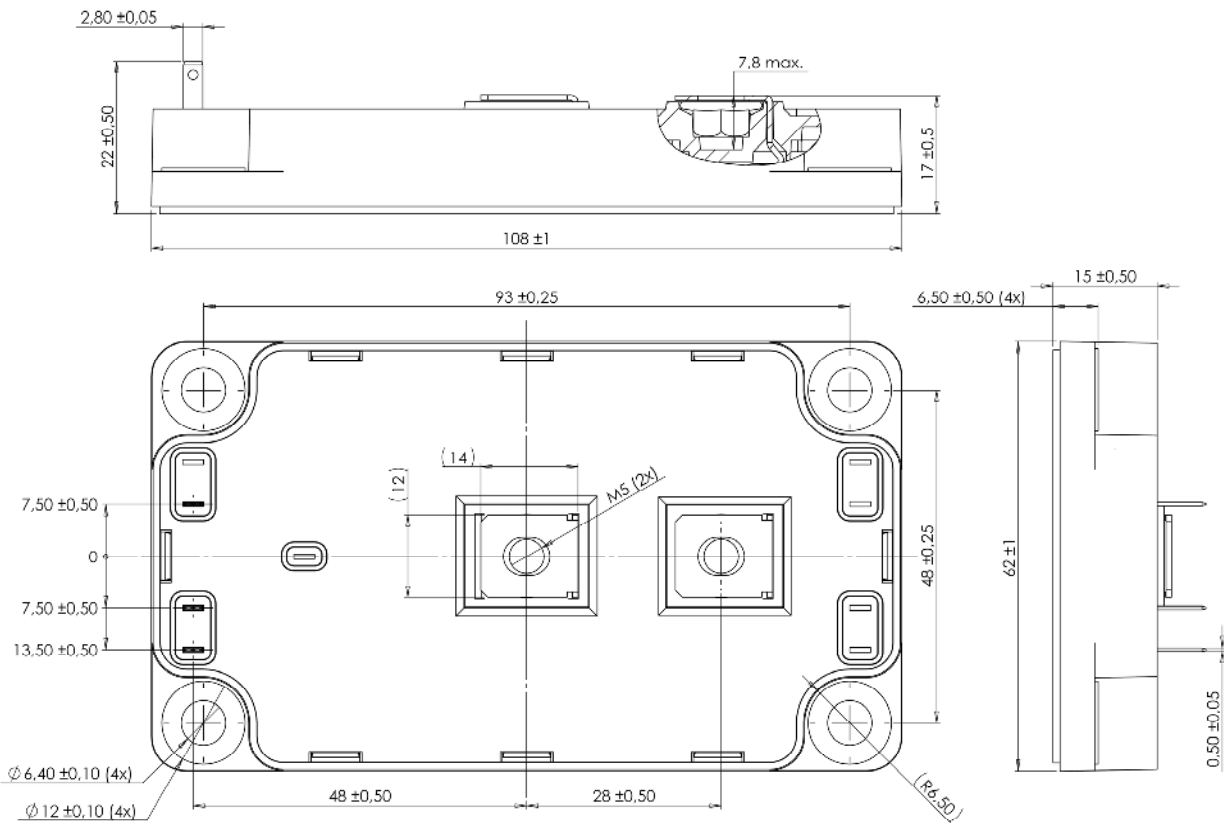
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C _{iss}	Input Capacitance	V _{GS} = 0V		42.7		nF
C _{oss}	Output Capacitance	V _{DS} = 25V		7.6		
C _{rss}	Reverse Transfer Capacitance	f = 1MHz		1.3		
Q _g	Total gate Charge	V _{GS} = 10V V _{Bus} = 500V I _D = 215A		1602		nC
Q _{gs}	Gate – Source Charge			204		
Q _{gd}	Gate – Drain Charge			1038		
T _{d(on)}	Turn-on Delay Time	Inductive switching @ 125°C V _{GS} = 15V V _{Bus} = 670V I _D = 215A R _G = 0.5Ω		18		ns
T _r	Rise Time			14		
T _{d(off)}	Turn-off Delay Time			140		
T _f	Fall Time			55		
E _{on}	Turn-on Switching Energy	Inductive switching @ 25°C V _{GS} = 15V, V _{Bus} = 670V I _D = 215A, R _G = 0.5Ω		7.2		mJ
E _{off}	Turn-off Switching Energy			4.3		
E _{on}	Turn-on Switching Energy	Inductive switching @ 125°C V _{GS} = 15V, V _{Bus} = 670V I _D = 215A, R _G = 0.5Ω		12		mJ
E _{off}	Turn-off Switching Energy			5.8		

Series diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V _{RRM}	Maximum Repetitive Reverse Voltage		1200			V
I _{RM}	Maximum Reverse Leakage Current	V _R = 1200V	T _j = 25°C		600	μA
			T _j = 125°C		2000	
I _F	DC Forward Current	T _j = 80°C		360		A
V _F	Diode Forward Voltage	I _F = 360A		2.5	3	V
		I _F = 720A		3		
		I _F = 360A	T _j = 125°C		1.8	
t _{rr}	Reverse Recovery Time	I _F = 360A V _R = 800V di/dt = 1200A/μs	T _j = 25°C		265	ns
			T _j = 125°C		350	
Q _{rr}	Reverse Recovery Charge	di/dt = 1200A/μs	T _j = 25°C		3.3	μC
			T _j = 125°C		17.3	

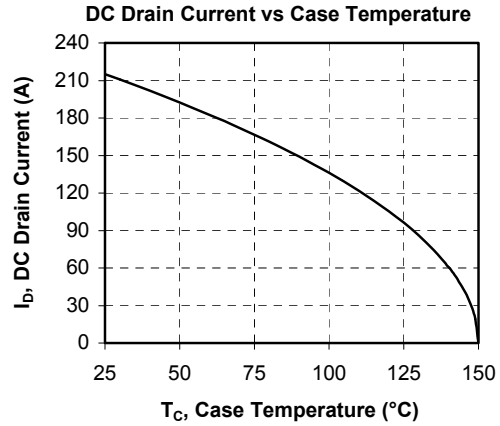
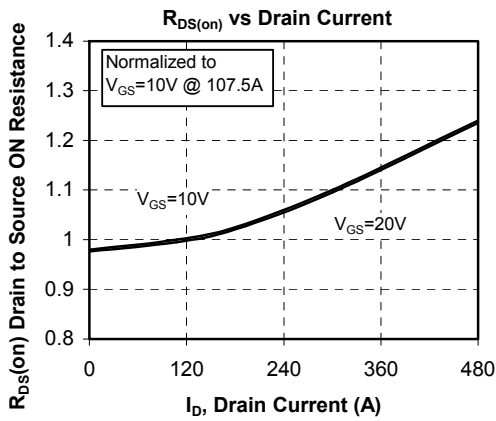
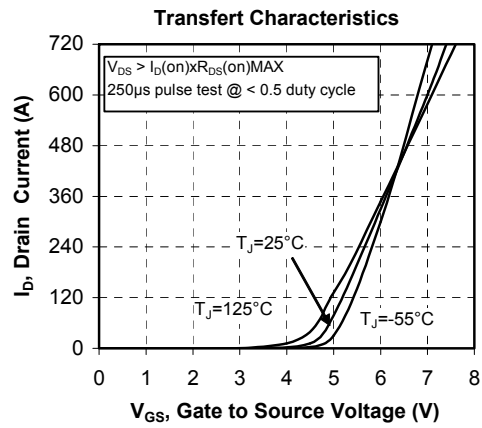
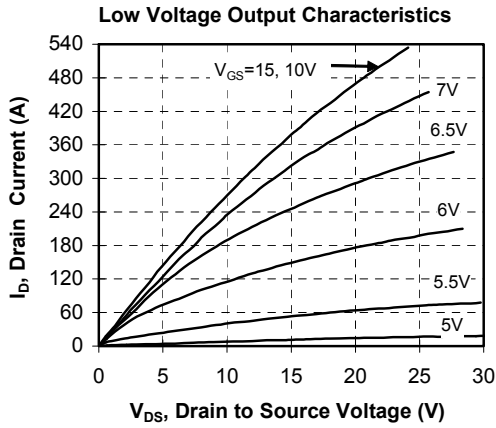
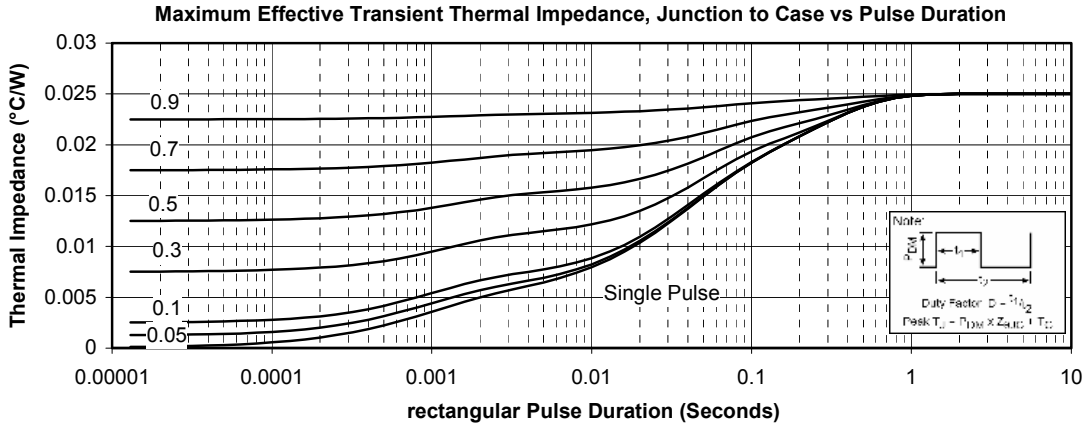
Thermal and package characteristics

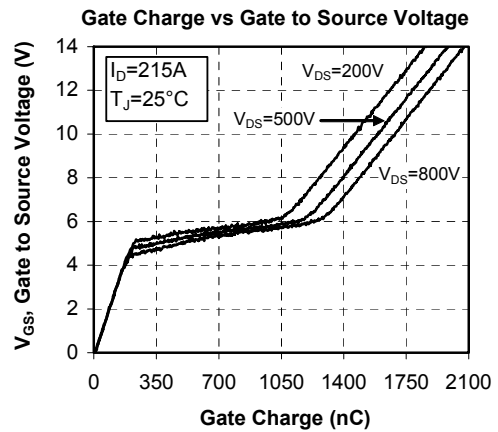
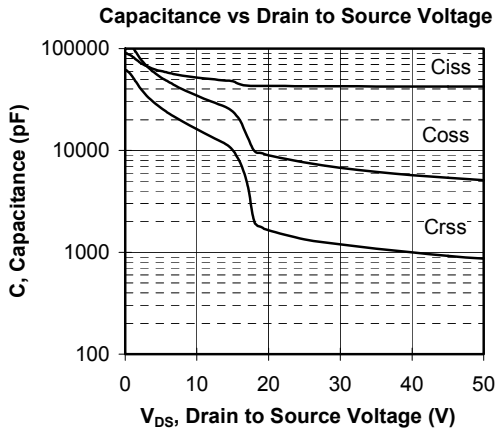
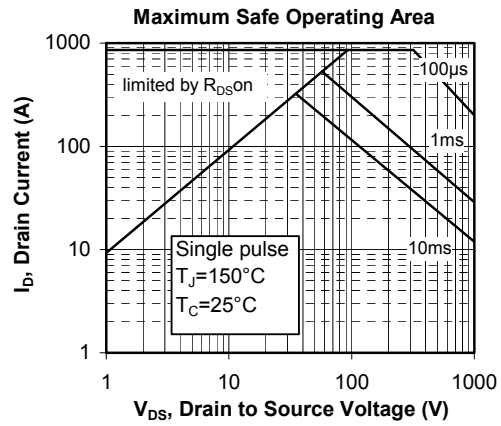
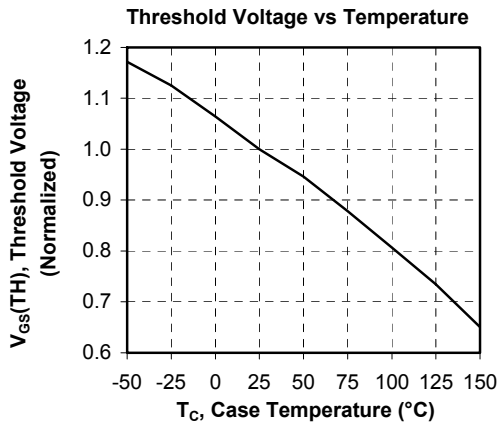
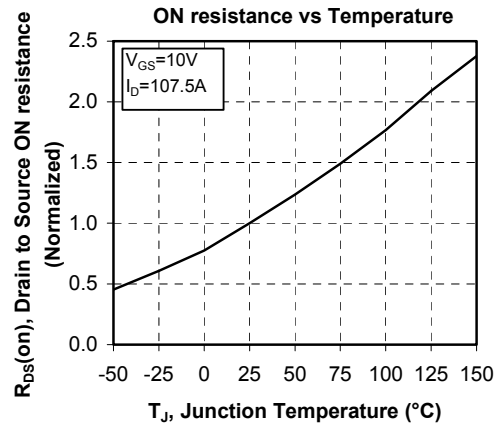
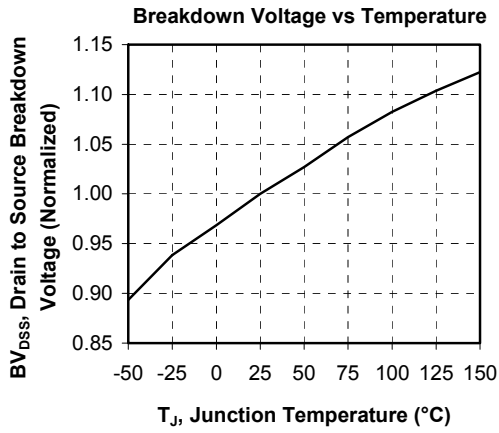
Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case Thermal Resistance	Transistor		0.025	°C/W	
		Series diode		0.16		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-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	

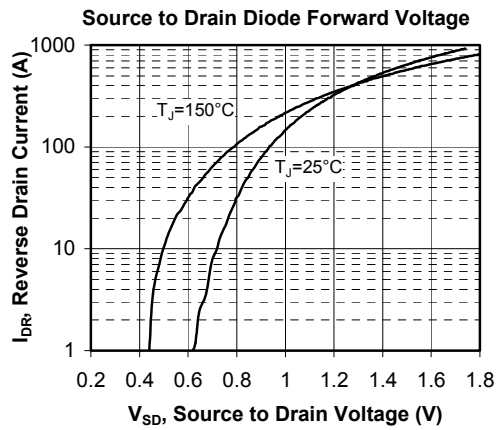
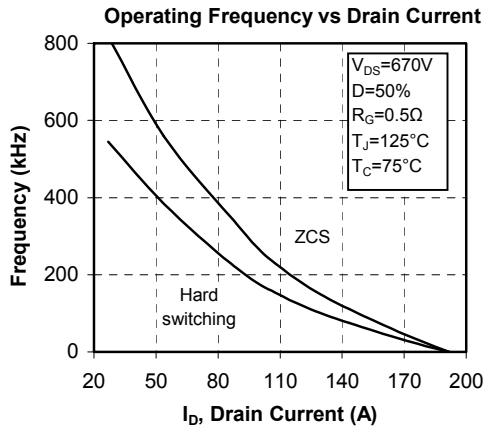
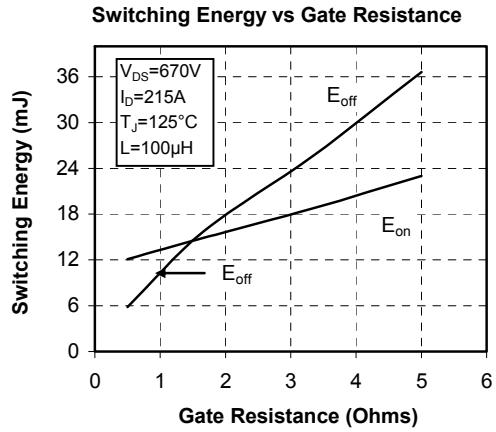
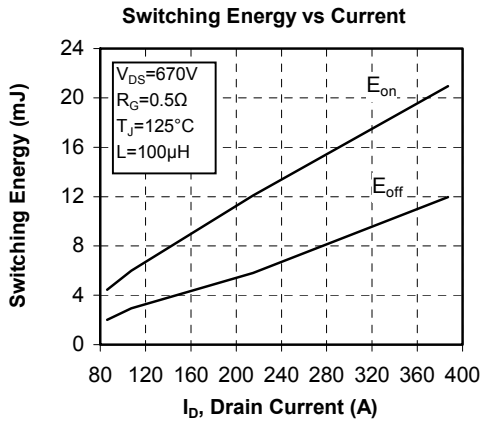
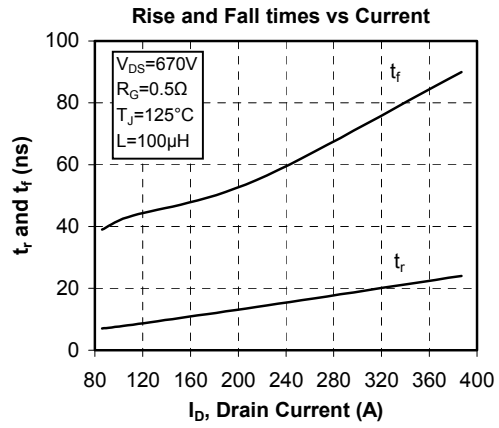
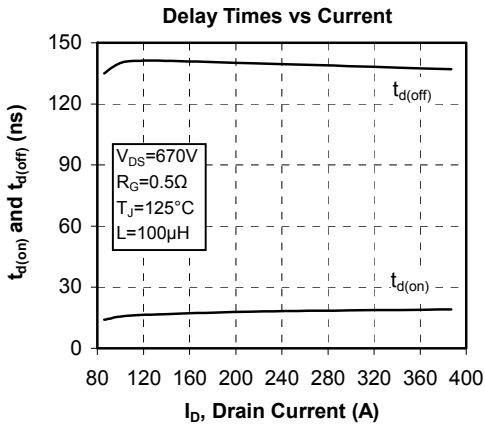
SP6 Package outline (dimensions in mm)


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

Typical Performance Curve







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