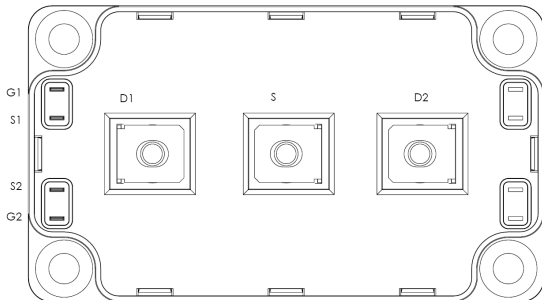
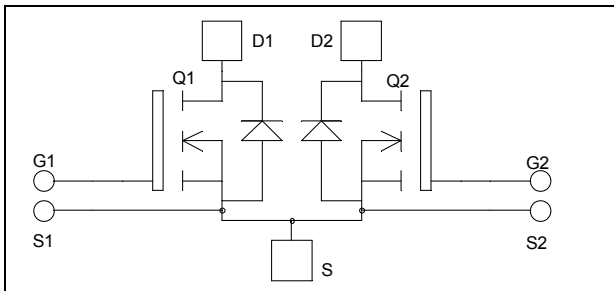


**Dual common source
MOSFET Power Module**

$V_{DSS} = 200V$
 $R_{DSon} = 4m\Omega \text{ typ @ } T_j = 25^\circ C$
 $I_D = 372A \text{ @ } T_c = 25^\circ C$


Application

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

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

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

<i>Symbol</i>	<i>Parameter</i>	<i>Max ratings</i>	<i>Unit</i>
V_{DSS}	Drain - Source Breakdown Voltage	200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	372
		$T_c = 80^\circ C$	278
I_{DM}	Pulsed Drain current	1488	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	5	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	1250
I_{AR}	Avalanche current (repetitive and non repetitive)	100	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	3000	

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 T _j = 25°C			500	μA
		V _{GS} = 0V, V _{DS} = 160V T _j = 125°C			2000	
R _{DS(on)}	Drain – Source on Resistance	V _{GS} = 10V, I _D = 186A		4	5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 10mA	3		5	V
I _{GSS}	Gate – Source Leakage Current	V _{GS} = ±30 V, V _{DS} = 0V			±200	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1MHz		28.9		nF
C _{oss}	Output Capacitance			9.32		
C _{rss}	Reverse Transfer Capacitance			0.58		
Q _g	Total gate Charge	V _{GS} = 10V V _{Bus} = 100V I _D = 372A		560		nC
Q _{gs}	Gate – Source Charge			212		
Q _{gd}	Gate – Drain Charge			268		
T _{d(on)}	Turn-on Delay Time	Inductive switching @ 125°C V _{GS} = 15V V _{Bus} = 133V I _D = 372A R _G = 1.2Ω		32		ns
T _r	Rise Time			64		
T _{d(off)}	Turn-off Delay Time			88		
T _f	Fall Time			116		
E _{on}	Turn-on Switching Energy	Inductive switching @ 25°C V _{GS} = 15V, V _{Bus} = 133V I _D = 372A, R _G = 1.2Ω		3396		μJ
E _{off}	Turn-off Switching Energy			3716		
E _{on}	Turn-on Switching Energy	Inductive switching @ 125°C V _{GS} = 15V, V _{Bus} = 133V I _D = 372A, R _G = 1.2Ω		3744		μJ
E _{off}	Turn-off Switching Energy			3944		

Source - Drain diode ratings and characteristics

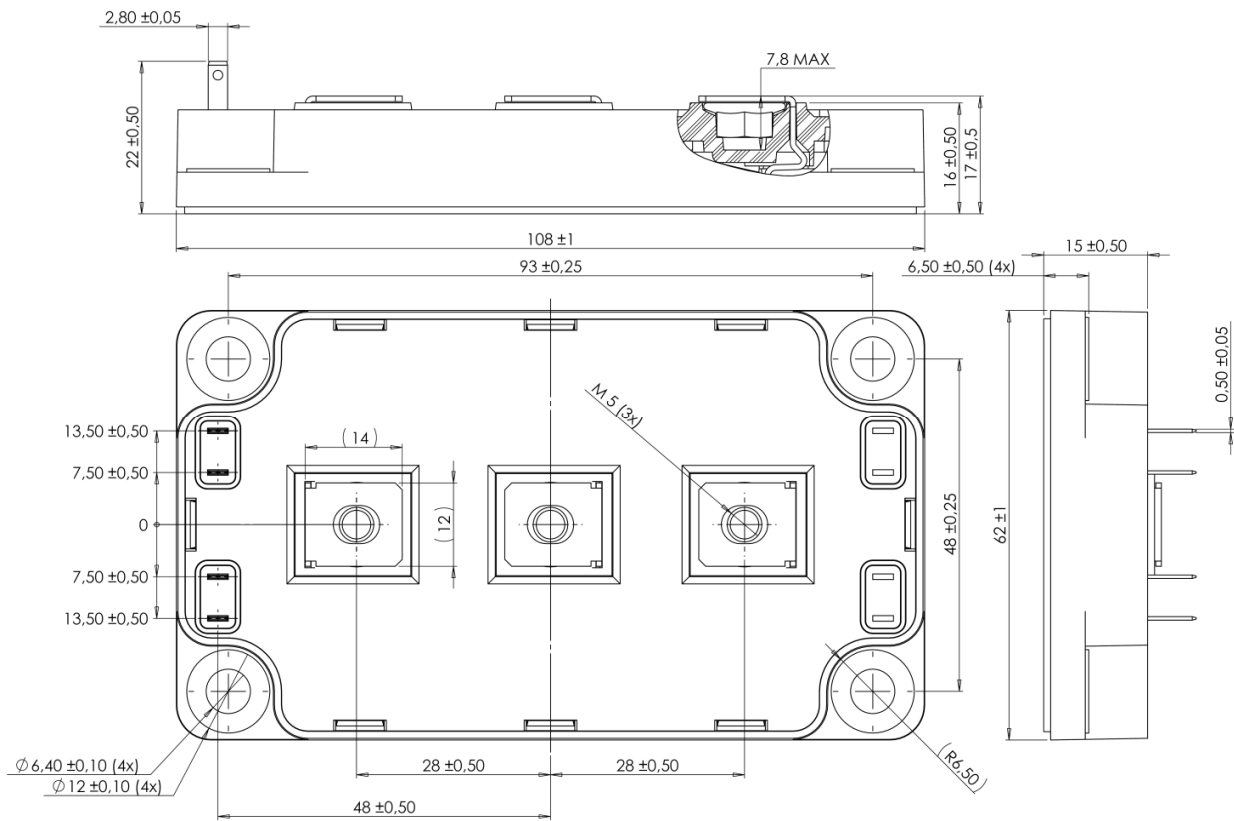
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I _S	Continuous Source current (Body diode)		T _c = 25°C		372	A
			T _c = 80°C		278	
V _{SD}	Diode Forward Voltage	V _{GS} = 0V, I _S = -372A			1.3	V
dv/dt	Peak Diode Recovery ❶				5	V/ns
t _{rr}	Reverse Recovery Time	I _S = -372A, V _R = 133V di _S /dt = 400A/μs		360		ns
Q _{rr}	Reverse Recovery Charge			26.8		μC

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

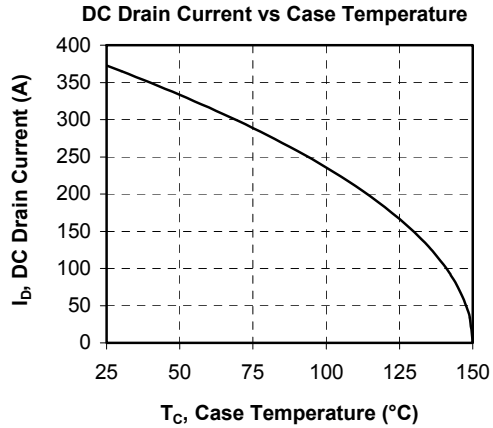
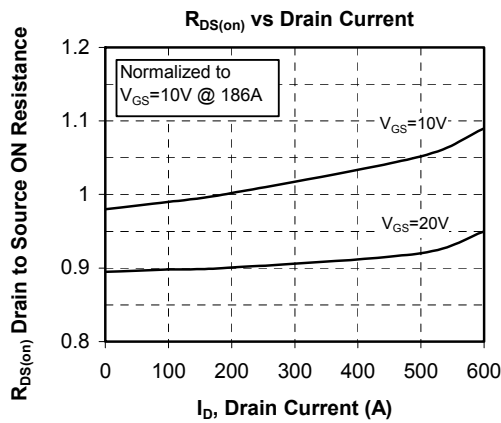
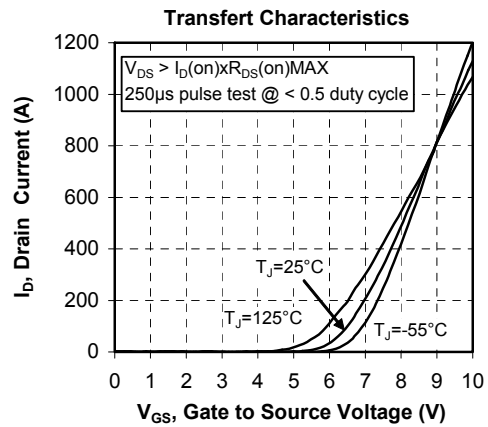
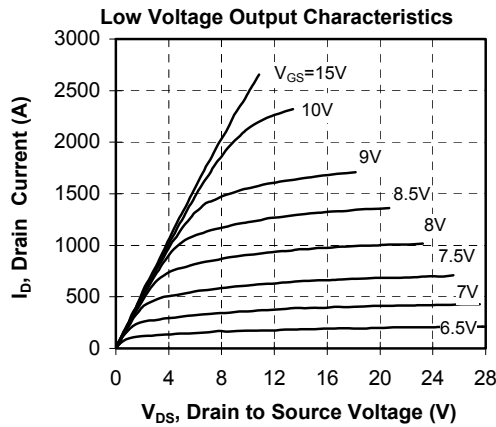
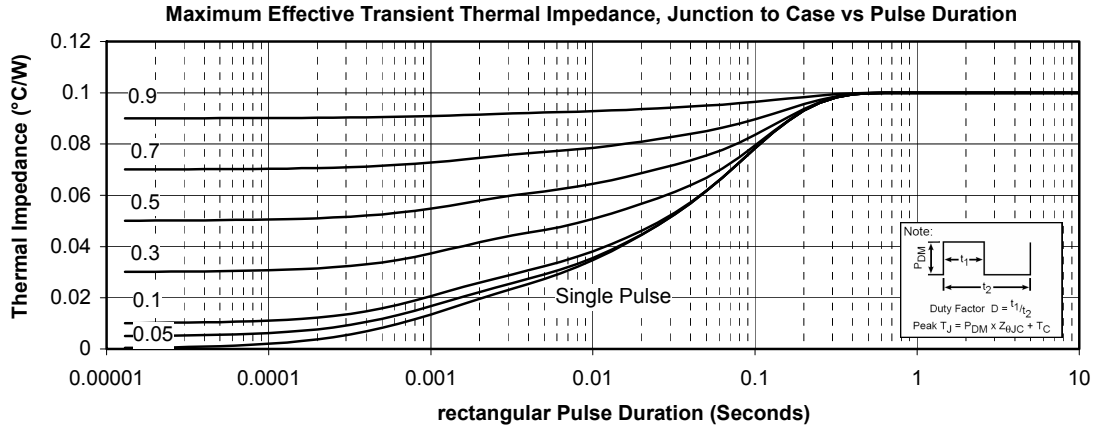
$$I_S \leq -372A \quad di/dt \leq 700A/\mu s \quad V_R \leq V_{DSS} \quad T_j \leq 150^\circ\text{C}$$

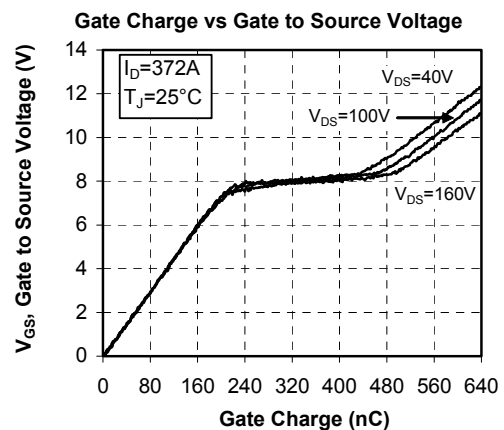
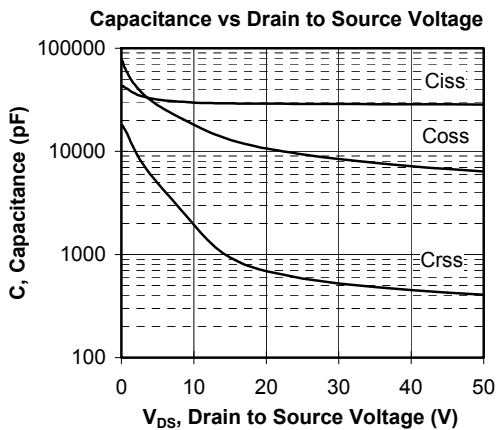
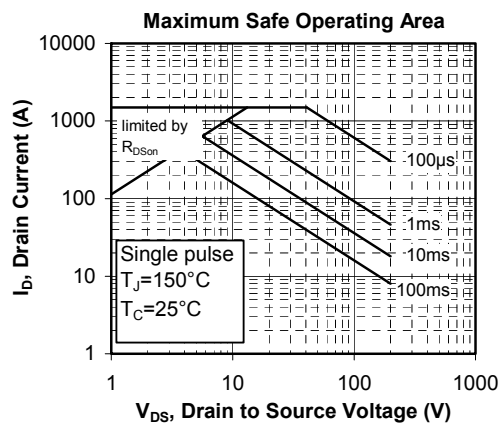
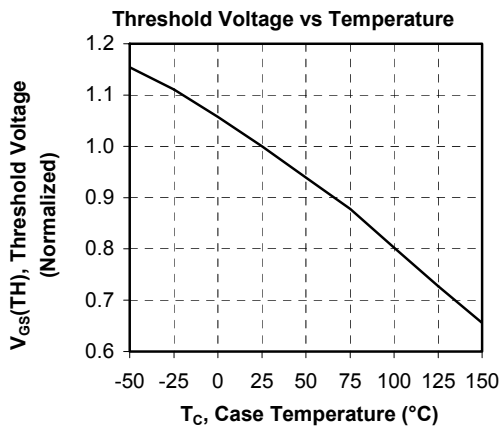
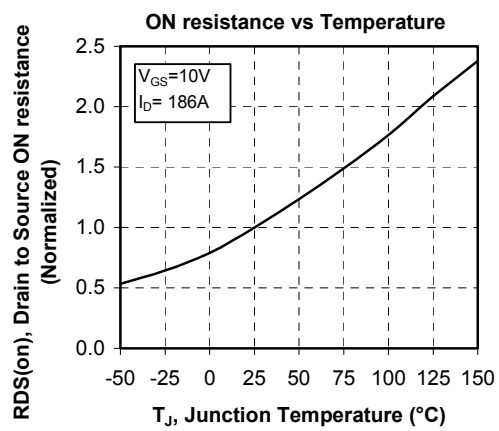
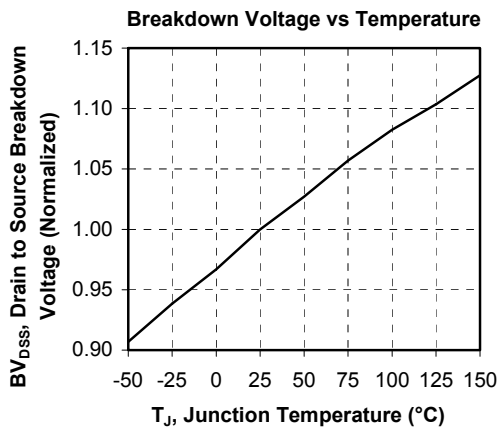
Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case Thermal Resistance			0.1	°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	

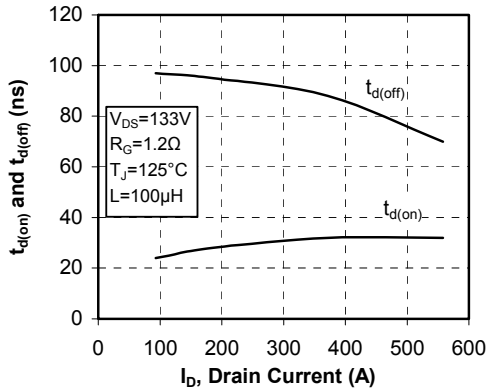
SP6 Package outline (dimensions in mm)


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

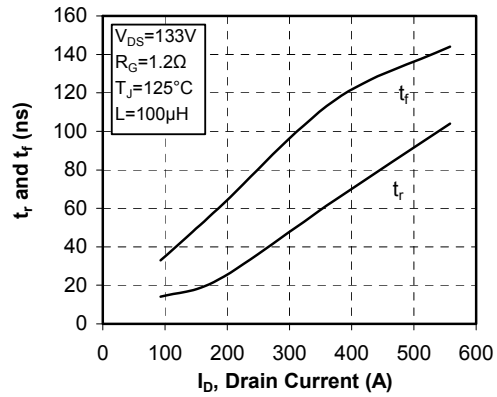
Typical Performance Curve




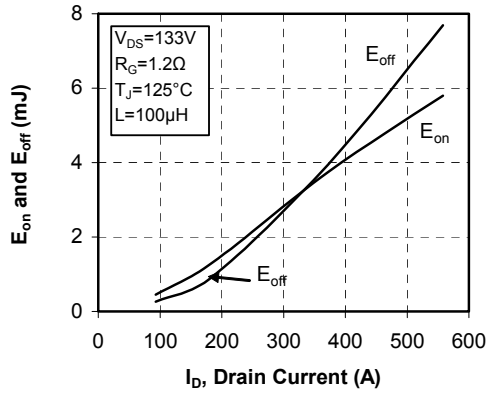
Delay Times vs Current



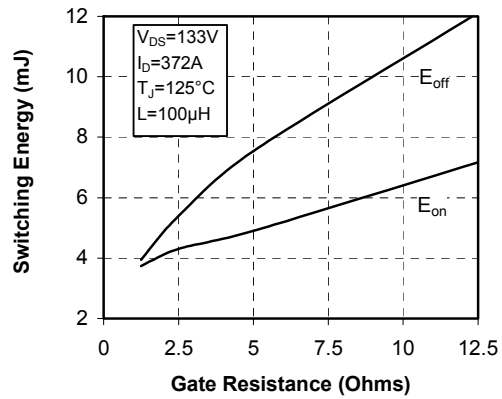
Rise and Fall times vs Current



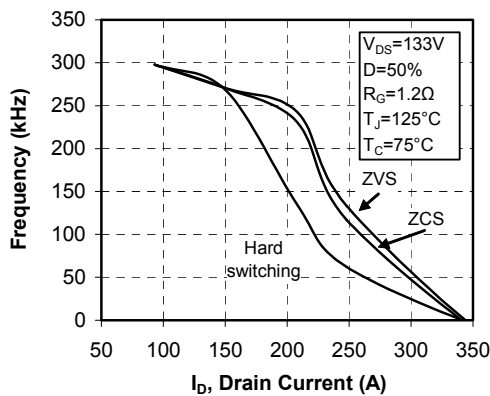
Switching Energy vs Current



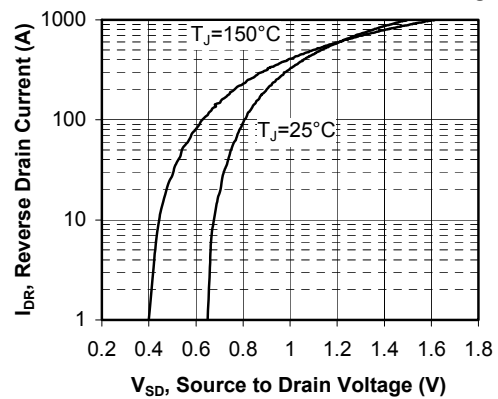
Switching Energy vs Gate Resistance



Operating Frequency vs Drain Current



Source to Drain Diode Forward Voltage



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