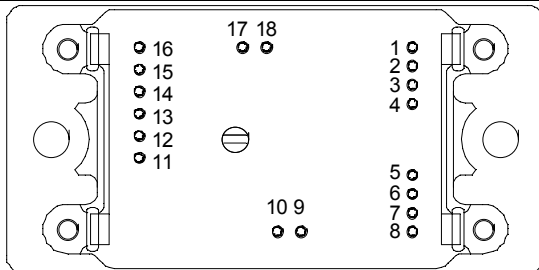
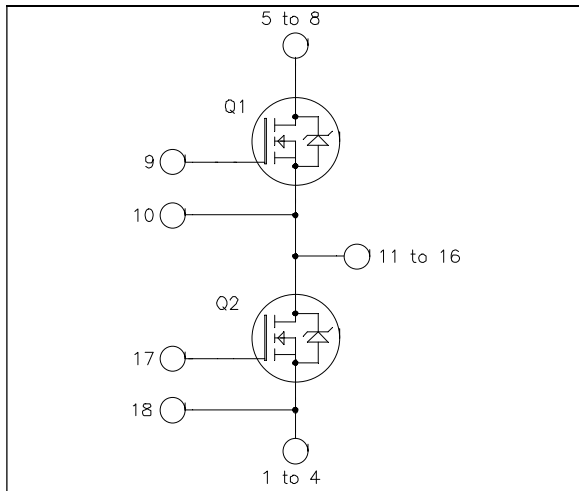


**Phase leg  
Super Junction MOSFET  
Power Module**

**$V_{DSS} = 600V$**   
 **$R_{DSon} = 42m\Omega \text{ max @ } T_j = 25^\circ C$**   
 **$I_D = 66A \text{ @ } T_c = 25^\circ C$**



Pins 1/2/3/4 ; 5/6/7/8 ; 11/12/13/14/15/16 must be shorted together

### Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

### Features

- CoolMOS™
  - Ultra low  $R_{DSon}$
  - Low Miller capacitance
  - Ultra low gate charge
  - Avalanche energy rated
  - Very rugged
  - Fast intrinsic diode
- Very low stray inductance
- Kelvin source for easy drive
- 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

**All ratings @  $T_j = 25^\circ C$  unless otherwise specified**

### Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
$V_{DSS}$	Drain - Source Breakdown Voltage	600	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	66
		$T_c = 80^\circ C$	49
$I_{DM}$	Pulsed Drain current	200	
$V_{GS}$	Gate - Source Voltage	$\pm 20$	V
$R_{DSon}$	Drain - Source ON Resistance	42	$m\Omega$
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	416
$I_{AR}$	Avalanche current (repetitive and non repetitive)	20	A
$E_{AR}$	Repetitive Avalanche Energy	1	mJ
$E_{AS}$	Single Pulse Avalanche Energy	1800	

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on [www.microsemi.com](http://www.microsemi.com)

**Electrical Characteristics**

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 600V			100	μA
R <sub>DS(on)</sub>	Drain – Source on Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> = 33A			42	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 6mA	3	4	5	V
I <sub>GSS</sub>	Gate – Source Leakage Current	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0V			±200	nA

**Dynamic Characteristics**

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V		14.6		nF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> = 25V		3.47		
C <sub>rss</sub>	Reverse Transfer Capacitance	f = 1MHz		0.082		
Q <sub>g</sub>	Total gate Charge	V <sub>GS</sub> = 10V V <sub>Bus</sub> = 300V I <sub>D</sub> = 66A		510		nC
Q <sub>gs</sub>	Gate – Source Charge			86		
Q <sub>gd</sub>	Gate – Drain Charge			270		
T <sub>d(on)</sub>	Turn-on Delay Time	<b>Inductive Switching @ 125°C</b> V <sub>GS</sub> = 15V V <sub>Bus</sub> = 400V I <sub>D</sub> = 66A R <sub>G</sub> = 2.5Ω		21		ns
T <sub>r</sub>	Rise Time			30		
T <sub>d(off)</sub>	Turn-off Delay Time			240		
T <sub>f</sub>	Fall Time			52		
E <sub>off</sub>	Turn-off Switching Energy	<b>Inductive switching</b> V <sub>GS</sub> = 15V ; I <sub>D</sub> = 66A V <sub>Bus</sub> = 400V ; R <sub>G</sub> = 2.5Ω	T <sub>j</sub> = 25°C	1.18		mJ
			T <sub>j</sub> = 125°C	1.45		
R <sub>thJC</sub>	Junction to Case Thermal Resistance				0.3	°C/W

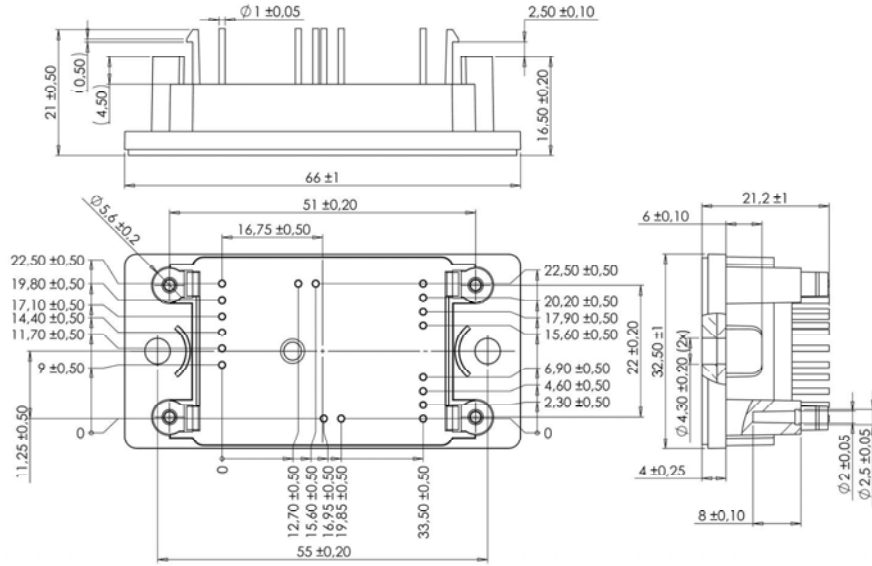
**Source - Drain diode ratings and characteristics**

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
I <sub>S</sub>	Continuous Source current (Body diode)		T <sub>c</sub> = 25°C	66		A
			T <sub>c</sub> = 80°C	49		
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = - 66A			1.2	V
dv/dt	Peak Diode Recovery				40	V/ns
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> = - 66A V <sub>R</sub> = 400V di <sub>S</sub> /dt = 200A/μs	T <sub>j</sub> = 125°C	350		ns
Q <sub>rr</sub>	Reverse Recovery Charge		T <sub>j</sub> = 125°C	5.4		μC

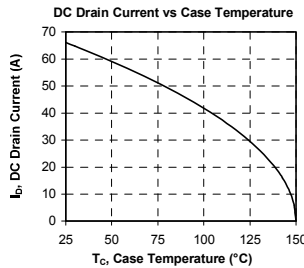
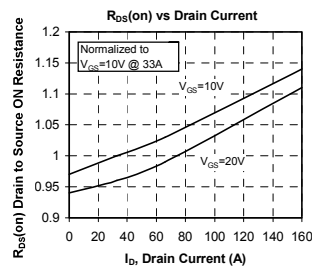
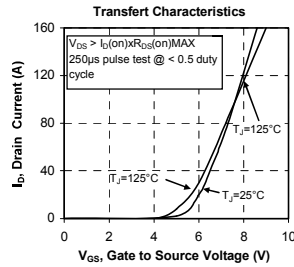
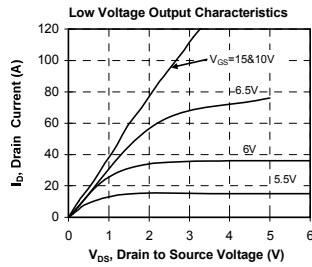
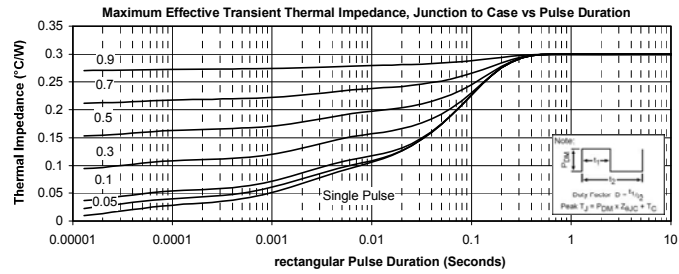
**Thermal and package characteristics**

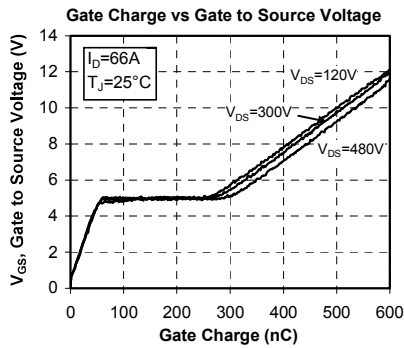
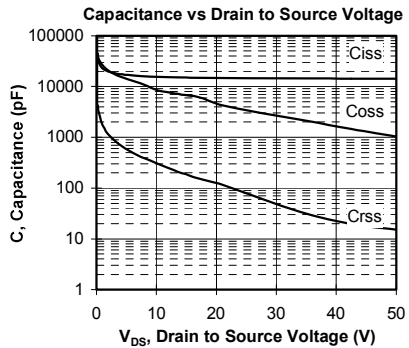
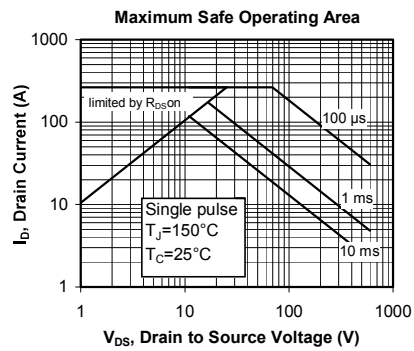
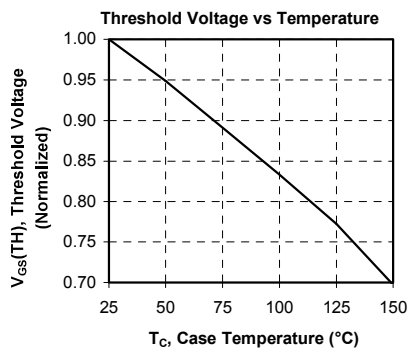
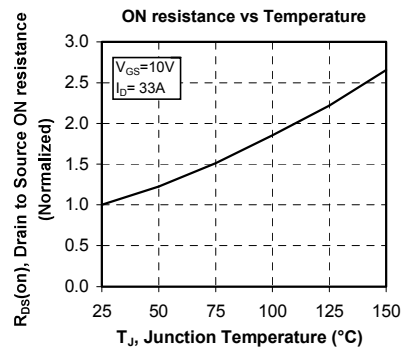
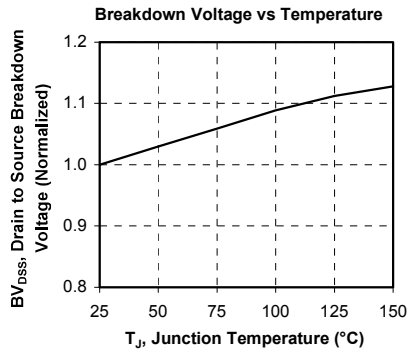
<i>Symbol</i>	<i>Characteristic</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>	
V <sub>ISOL</sub>	RMS Isolation Voltage, any terminal to case t = 1 min, 50/60Hz	4000			V	
T <sub>J</sub>	Operating junction temperature range	-40		150	°C	
T <sub>STG</sub>	Storage Temperature Range	-40		125		
T <sub>C</sub>	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4	2	3	N.m
Wt	Package Weight				75	g

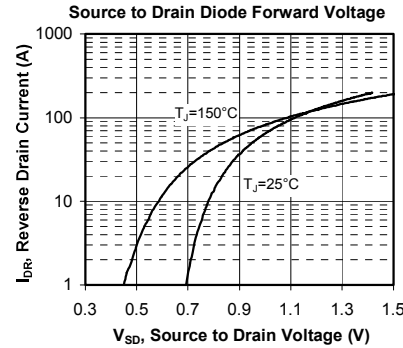
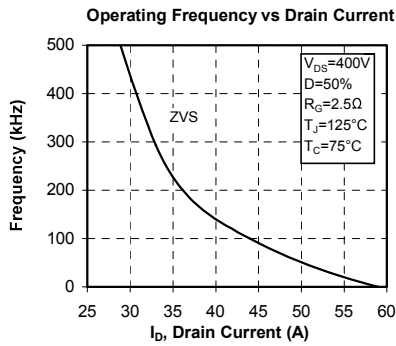
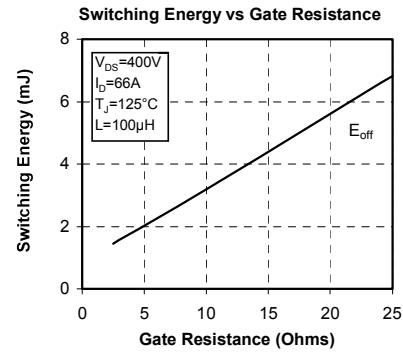
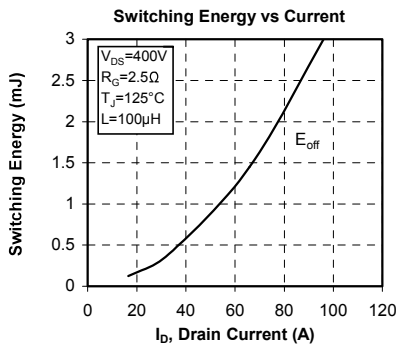
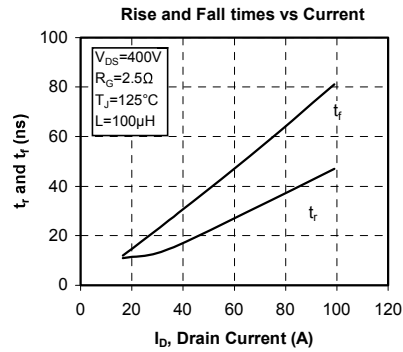
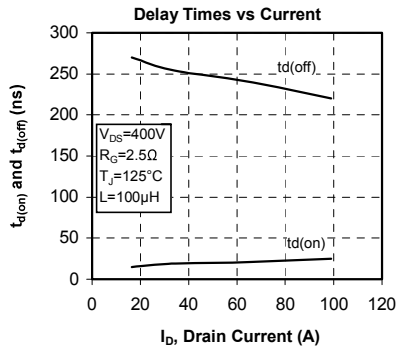
## SP2 Package outline (dimensions in mm)



## Typical Performance Curve







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