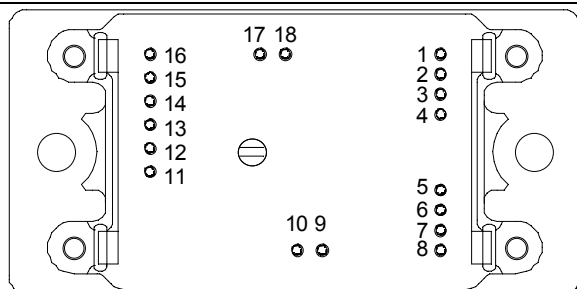
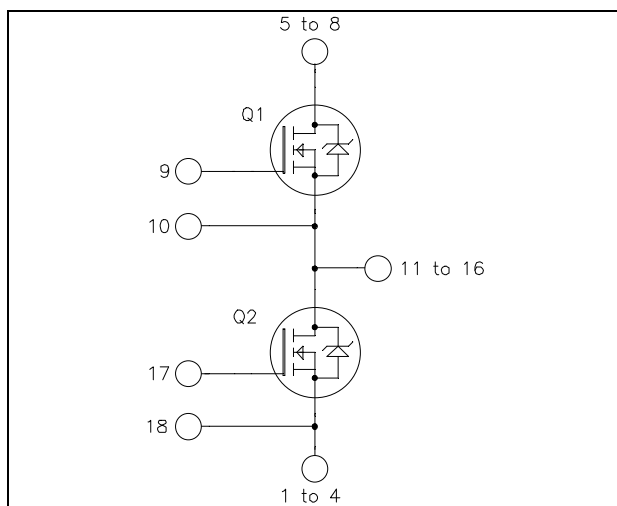


Phase leg Super Junction MOSFET Power Module

$$V_{DSS} = 600V$$

$$R_{DSon} = 24m\Omega \text{ max @ } T_j = 25^\circ C$$

$$I_D = 95A \text{ @ } T_c = 25^\circ C$$



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

- CoolMOST™
 - Ultra low R_{DSon}
 - Low Miller capacitance
 - Ultra low gate charge
 - Avalanche energy rated
 - Very rugged
- 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	$T_c = 25^\circ C$	95
		$T_c = 80^\circ C$	70
I_{DM}	Pulsed Drain current	260	A
V_{GS}	Gate - Source Voltage	± 20	V
R_{DSon}	Drain - Source ON Resistance	24	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	462
I_{AR}	Avalanche current (repetitive and non repetitive)	15	A
E_{AR}	Repetitive Avalanche Energy	3	mJ
E_{AS}	Single Pulse Avalanche Energy	1900	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 600V$			350	μA
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 47.5A$			24	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5mA$	2.1	3	3.9	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$			200	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V; V_{DS} = 25V$		14.4		nF
C_{oss}	Output Capacitance	$f = 1MHz$		17		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 300V$ $I_D = 95A$		300		nC
Q_{gs}	Gate – Source Charge			68		
Q_{gd}	Gate – Drain Charge			102		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GS} = 10V$ $V_{Bus} = 400V$ $I_D = 95A$ $R_G = 2.5\Omega$		21		ns
T_r	Rise Time			30		
$T_{d(off)}$	Turn-off Delay Time			100		
T_f	Fall Time			45		
E_{off}	Turn-off Switching Energy	Inductive switching $V_{GS} = 10V; V_{Bus} = 400V$ $I_D = 95A; R_G = 2.5\Omega$	$T_j = 25^\circ C$	1040		μJ
			$T_j = 125^\circ C$	1270		
R_{thJC}	Junction to Case Thermal Resistance				0.27	$^\circ C/W$

Source - Drain diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_S	Continuous Source current (Body diode)	$T_c = 25^\circ C$		95		A
		$T_c = 80^\circ C$		70		
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = -95A$			1.2	V
dv/dt	Peak Diode Recovery ❶				4	V/ns
t_{rr}	Reverse Recovery Time	$I_S = -95A$ $V_R = 350V$	$T_j = 25^\circ C$	600		ns
Q_{rr}	Reverse Recovery Charge	$di_S/dt = 200A/\mu s$	$T_j = 25^\circ C$	34		μC

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

$$I_S \leq -95A \quad di/dt \leq 200A/\mu s \quad V_R \leq V_{DSS} \quad T_j \leq 150^\circ C$$

Thermal and package characteristics

Symbol	Characteristic			Min	Typ	Max	Unit
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	M4	2		3	N.m
Wt	Package Weight					75	g

[illegible]

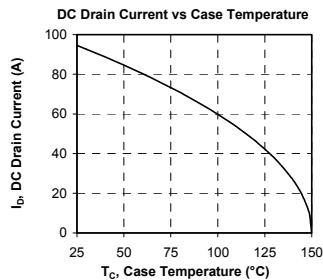
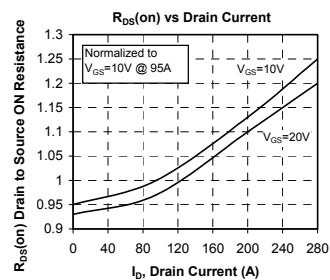
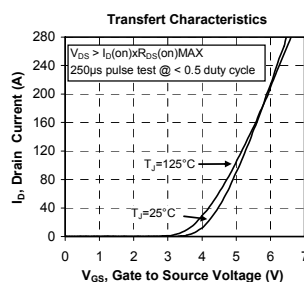
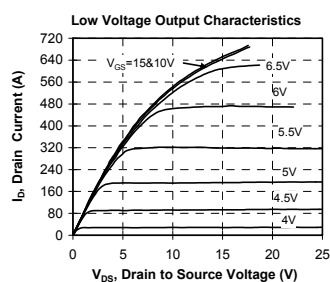
Maximum Effective Transient Thermal Impedance, Junction to Case vs Pulse Duration

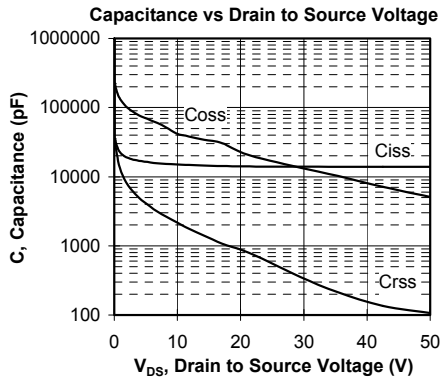
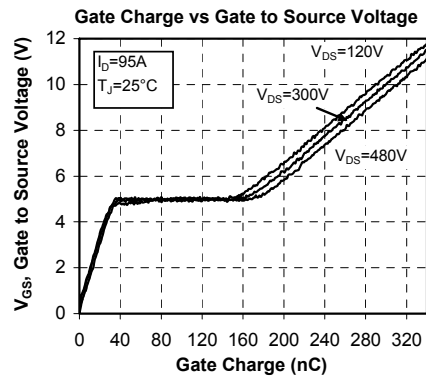
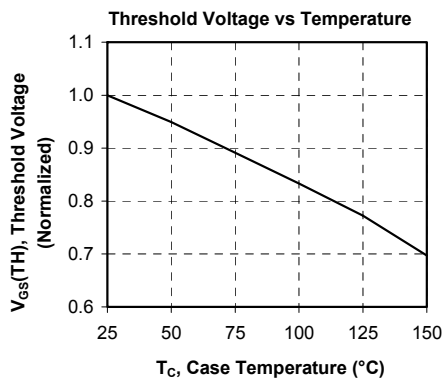
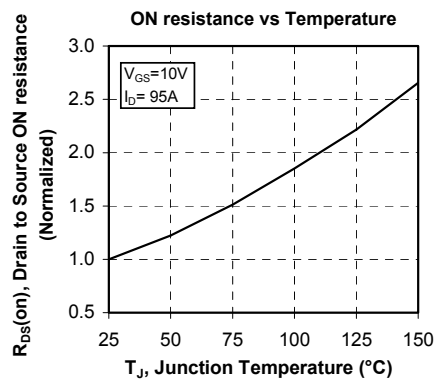
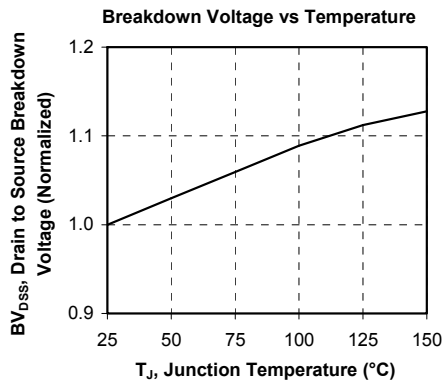
Thermal Impedance ($^{\circ}\text{C}/\text{W}$)

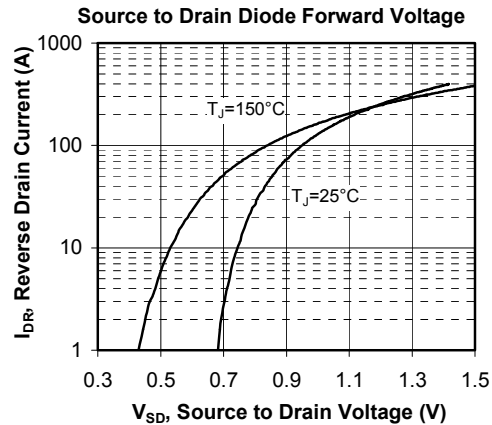
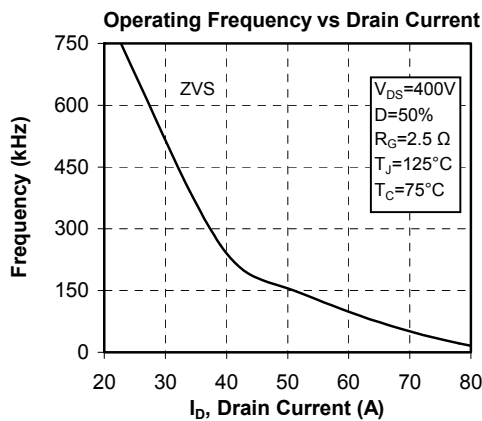
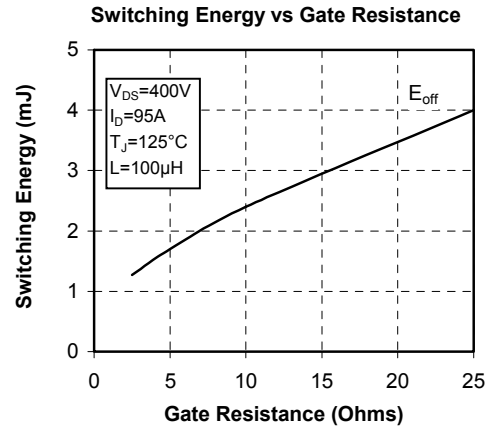
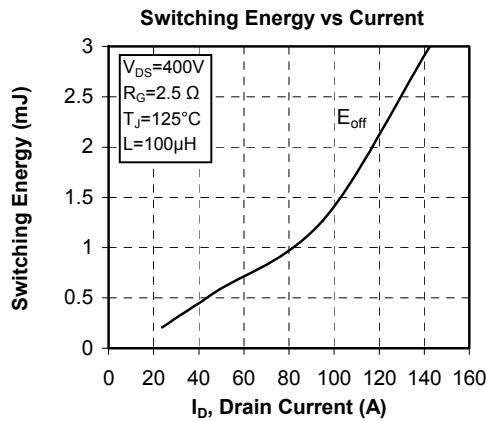
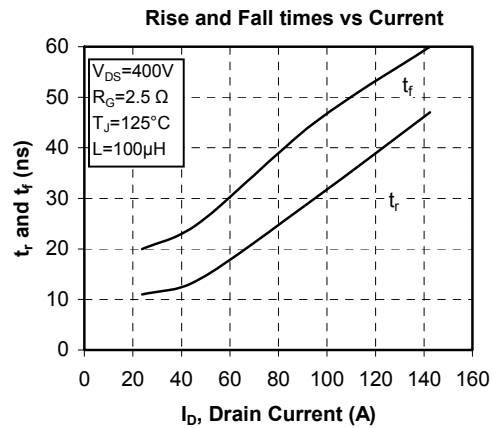
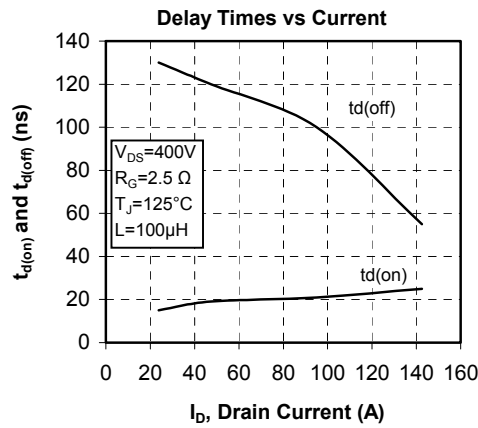
rectangular Pulse Duration (Seconds)

Single Pulse

Note:
 P_{DM}
 t_1
 t_2
 Duty Factor $D = t_1/t_2$
 Peak $T_J = T_{DM} + Z_{thJC} \cdot T_C$







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