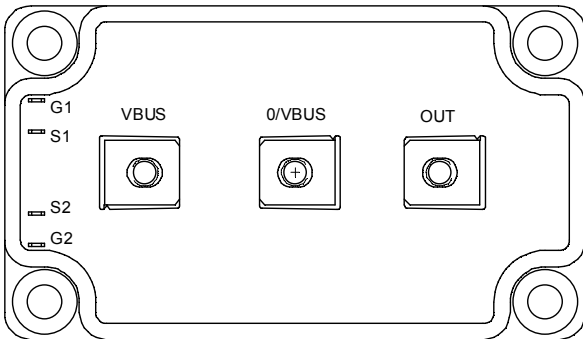
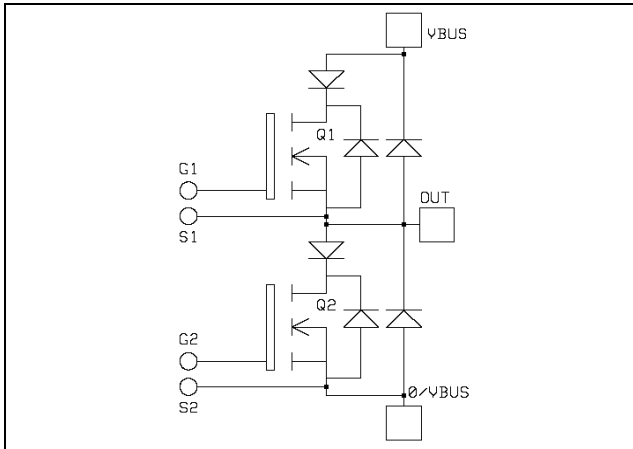


*Phase leg
Series & parallel diodes
MOSFET Power Module*

$V_{DSS} = 1000V$
 $R_{DSon} = 130m\Omega \text{ max @ } T_j = 25^\circ C$
 $I_D = 65A \text{ @ } T_c = 25^\circ C$



Application

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

Features

- Power MOS 7[®] MOSFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Fast intrinsic reverse diode
 - 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

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	1000	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	65
		$T_c = 80^\circ C$	49
I_{DM}	Pulsed Drain current	240	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	130	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	1250
I_{AR}	Avalanche current (repetitive and non repetitive)	24	A
E_{AR}	Repetitive Avalanche Energy	30	mJ
E_{AS}	Single Pulse Avalanche Energy	1300	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain - Source Breakdown Voltage	$V_{GS} = 0V, I_D = 1.5mA$	1000			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 1000V$ $T_j = 25^\circ\text{C}$			600	μA
		$V_{GS} = 0V, V_{DS} = 800V$ $T_j = 125^\circ\text{C}$			2	mA
$R_{DS(on)}$	Drain - Source on Resistance	$V_{GS} = 10V, I_D = 32.5A$			130	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 6mA$	3		5	V
I_{GSS}	Gate - Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 450	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$		15.2		nF
C_{oss}	Output Capacitance			2.6		
C_{rss}	Reverse Transfer Capacitance			0.42		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 500V$ $I_D = 65A$		562		nC
Q_{gs}	Gate - Source Charge			75		
Q_{gd}	Gate - Drain Charge			363		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 667V$ $I_D = 65A$ $R_G = 0.5\Omega$		9		ns
T_r	Rise Time			9		
$T_{d(off)}$	Turn-off Delay Time			50		
T_f	Fall Time			24		
E_{on}	Turn-on Switching Energy ①	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 667V$ $I_D = 65A, R_G = 0.5\Omega$		2.13		mJ
E_{off}	Turn-off Switching Energy ②			0.46		
E_{on}	Turn-on Switching Energy ①	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 667V$ $I_D = 65A, R_G = 0.5\Omega$		4.4		mJ
E_{off}	Turn-off Switching Energy ②			0.57		

Series diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle $T_c = 85^\circ\text{C}$		60		A
V_F	Diode Forward Voltage	$I_F = 60A$		1.1	1.15	V
		$I_F = 120A$		1.4		
		$I_F = 60A$ $T_j = 125^\circ\text{C}$		0.9		
t_{rr}	Reverse Recovery Time	$I_F = 60A$ $V_R = 133V$ $di/dt = 400A/\mu s$ $T_j = 25^\circ\text{C}$		24		ns
		$T_j = 125^\circ\text{C}$		48		
Q_{rr}	Reverse Recovery Charge	$I_F = 60A$ $V_R = 133V$ $di/dt = 400A/\mu s$ $T_j = 25^\circ\text{C}$		66		nC
		$T_j = 125^\circ\text{C}$		300		

① E_{on} includes diode reverse recovery.

② In accordance with JEDEC standard JESD24-1.

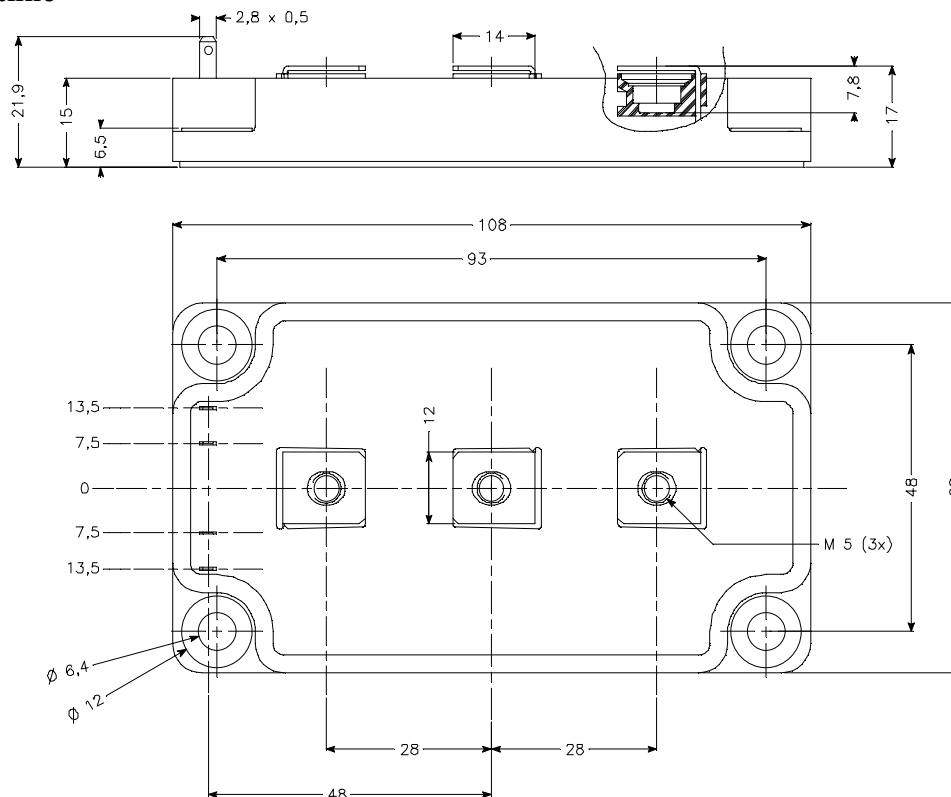
Parallel diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle	$T_c = 100^\circ\text{C}$		120		A
V_F	Diode Forward Voltage	$I_F = 120\text{A}$			1.9	2.5	V
		$I_F = 240\text{A}$			2.2		
		$I_F = 120\text{A}$	$T_j = 125^\circ\text{C}$		1.7		
t_{rr}	Reverse Recovery Time	$I_F = 120\text{A}$ $V_R = 667\text{V}$ $di/dt = 400\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		280		ns
			$T_j = 125^\circ\text{C}$		350		
Q_{rr}	Reverse Recovery Charge	$I_F = 120\text{A}$ $V_R = 667\text{V}$ $di/dt = 400\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		1520		nC
			$T_j = 125^\circ\text{C}$		7200		

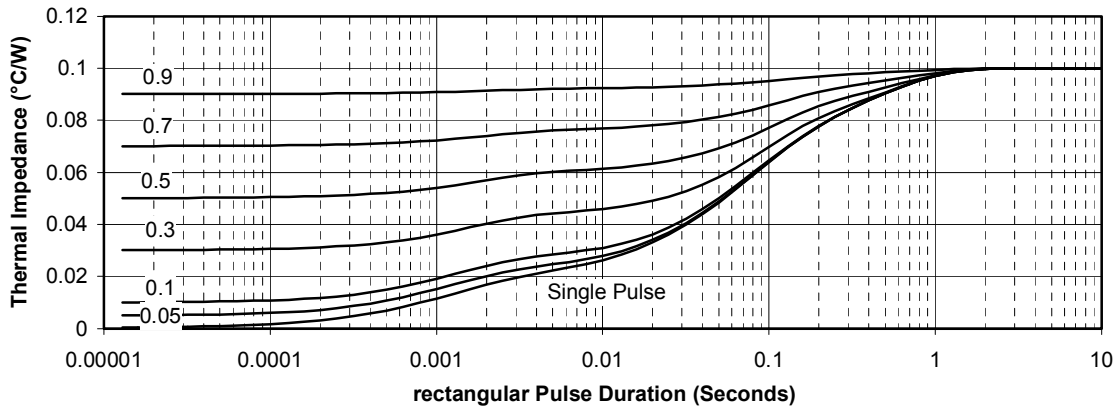
Thermal and package characteristics

Symbol	Characteristic		Min	Typ	Max	Unit
R_{thJC}	Junction to Case	Transistor			0.10	$^\circ\text{C}/\text{W}$
		Diode serie			0.65	
		Diode parallel			0.46	
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1\text{ min}$, $I_{isol} < 1\text{mA}$, 50/60Hz		2500			V
T_J	Operating junction temperature range		-40		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-40		125	
T_C	Operating Case Temperature		-40		100	
Torque	Mounting torque	To heatsink M6	3		5	
		For terminals M5	2		3.5	
Wt	Package Weight				280	g

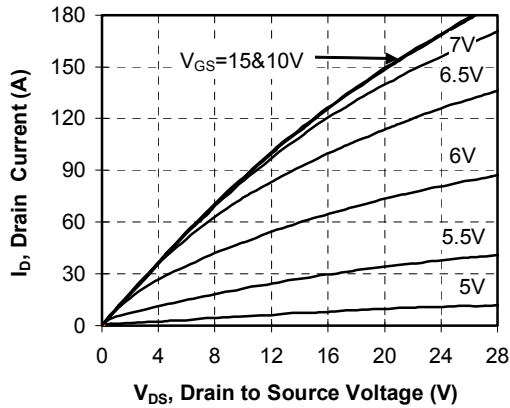
Package outline



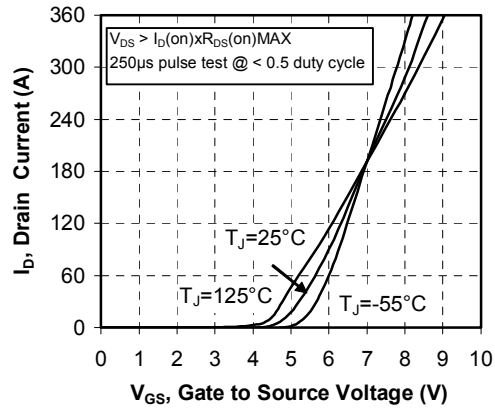
Maximum Effective Transient Thermal Impedance, Junction to Case vs Pulse Duration



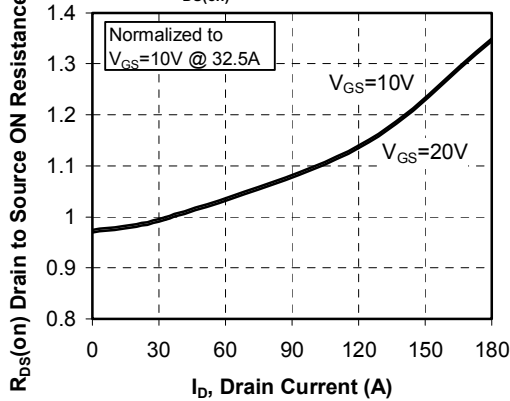
Low Voltage Output Characteristics



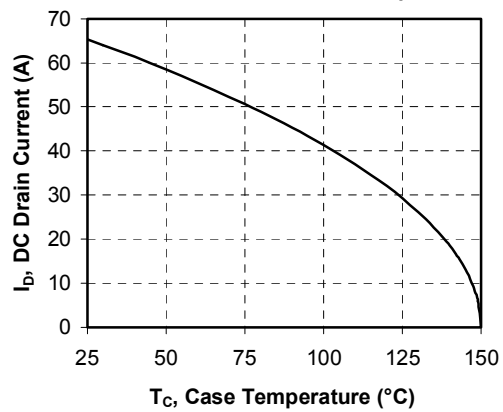
Transfer Characteristics

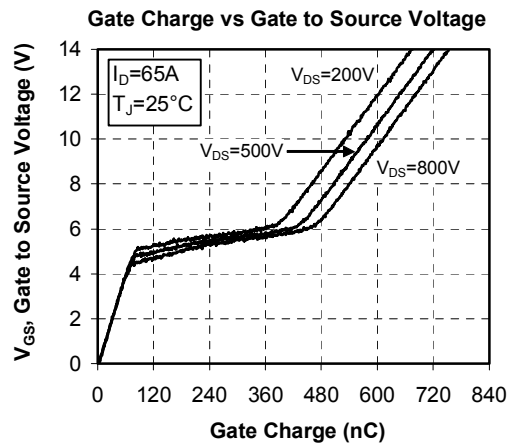
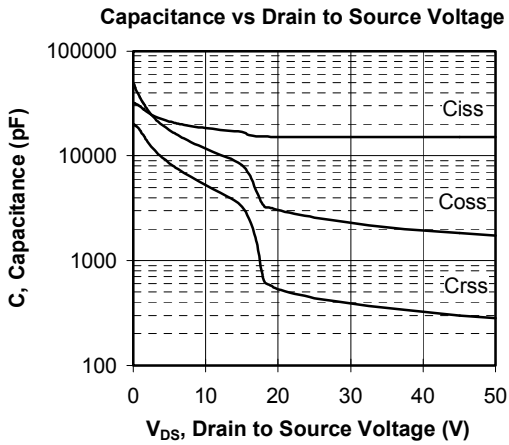
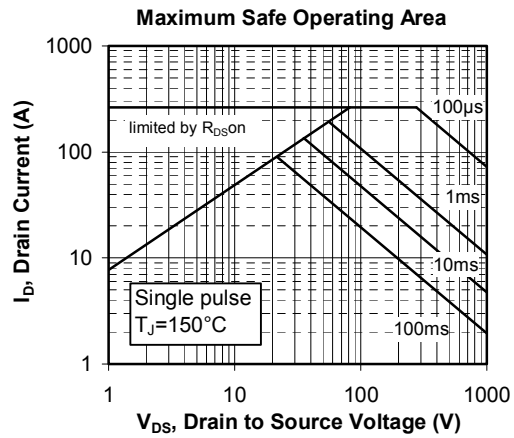
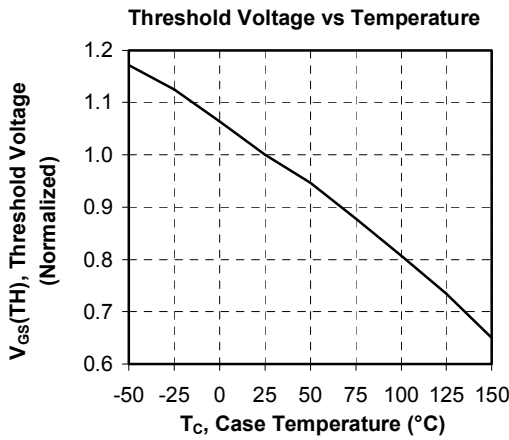
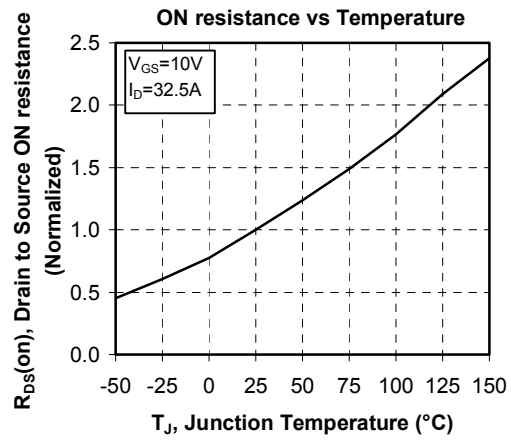
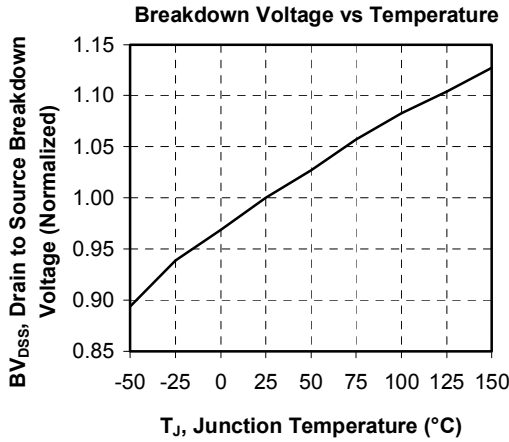


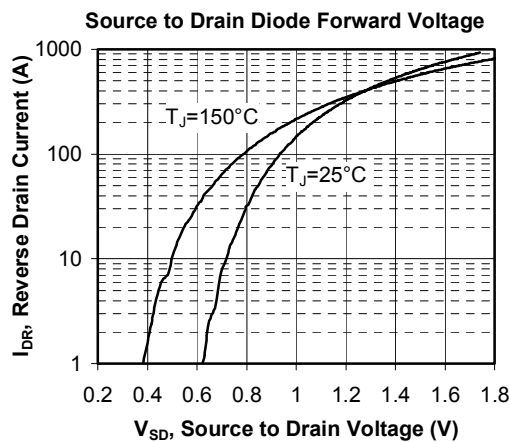
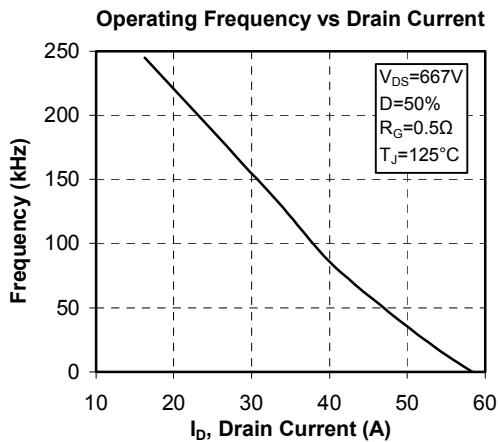
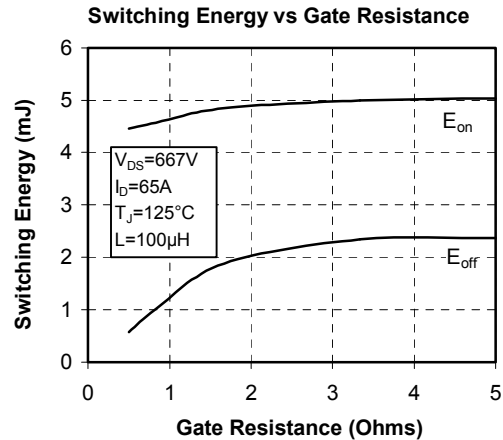
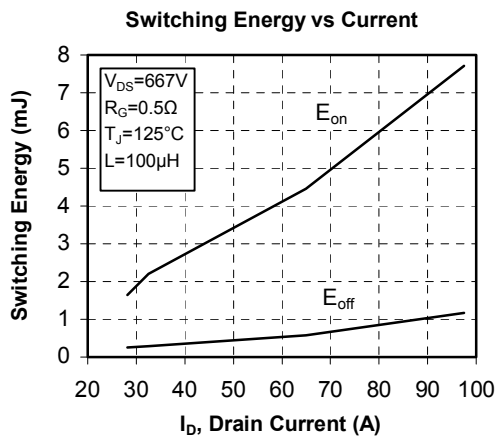
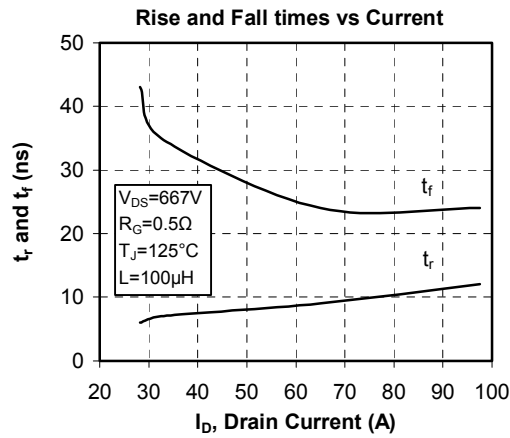
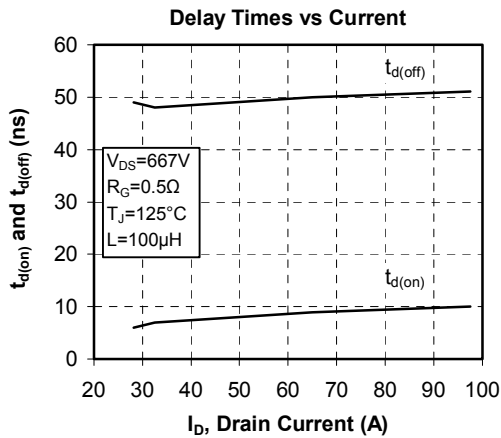
R_DS(on) vs Drain Current



DC Drain Current vs Case Temperature







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