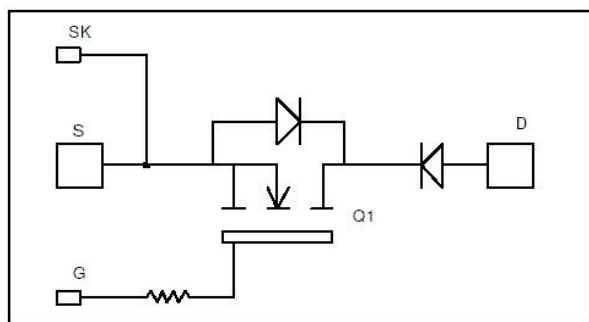


Single switch with Series diode MOSFET Power Module

$$V_{DSS} = 1000V$$

$$R_{DSon} = 65m\Omega \text{ max @ } T_j = 25^{\circ}C$$

$$I_D = 145A \text{ @ } T_c = 25^{\circ}C$$



Application

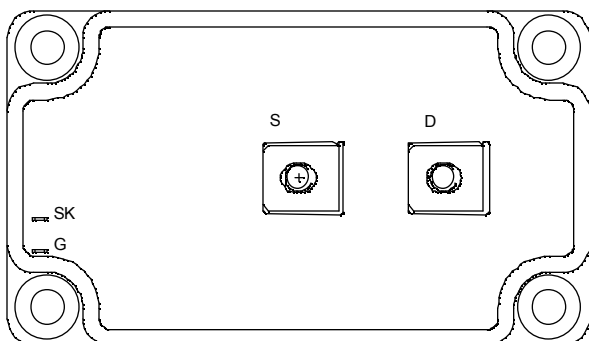
- Zero Current Switching resonant mode

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
- AIN 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



Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	1000	V
I_D	Continuous Drain Current	$T_c = 25^{\circ}C$ 145	A
		$T_c = 80^{\circ}C$ 110	
I_{DM}	Pulsed Drain current	580	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	65	m Ω
P_D	Maximum Power Dissipation	$T_c = 25^{\circ}C$ 3250	W
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.

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

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
BV_{DS}	Drain - Source Breakdown Voltage	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$	1000			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0\text{V}, V_{DS} = 1000\text{V}, T_j = 25^\circ\text{C}$			400	μA
		$V_{GS} = 0\text{V}, V_{DS} = 800\text{V}, T_j = 125^\circ\text{C}$			2	mA
$R_{DS(on)}$	Drain - Source on Resistance	$V_{GS} = 10\text{V}, I_D = 75\text{A}$			65	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 20\text{mA}$	3		5	V
I_{GSS}	Gate - Source Leakage Current	$V_{GS} = \pm 30\text{V}, V_{DS} = 0\text{V}$			± 400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$		28.5		nF
C_{oss}	Output Capacitance	$V_{DS} = 25\text{V}$		5.08		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.9		
Q_g	Total gate Charge	$V_{GS} = 10\text{V}$ $V_{Bus} = 500\text{V}$ $I_D = 145\text{A}$		1068		nC
Q_{gs}	Gate - Source Charge			136		
Q_{gd}	Gate - Drain Charge			692		
$T_{d(on)}$	Turn-on Delay Time	$V_{GS} = 15\text{V}$ $V_{Bus} = 500\text{V}$ $I_D = 145\text{A}$ $R_G = 0.75\Omega$		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 ①	Inductive switching @ 25°C $V_{GS} = 15\text{V}, V_{Bus} = 670\text{V}$ $I_D = 145\text{A}, R_G = 0.75\Omega$		4.8		mJ
E_{off}	Turn-off Switching Energy ②			2.9		
E_{on}	Turn-on Switching Energy ①	Inductive switching @ 125°C $V_{GS} = 15\text{V}, V_{Bus} = 670\text{V}$ $I_D = 145\text{A}, R_G = 0.75\Omega$		8		mJ
E_{off}	Turn-off Switching Energy ②			3.9		

① E_{on} includes diode reverse recovery.

② In accordance with JEDEC standard JESD24-1.

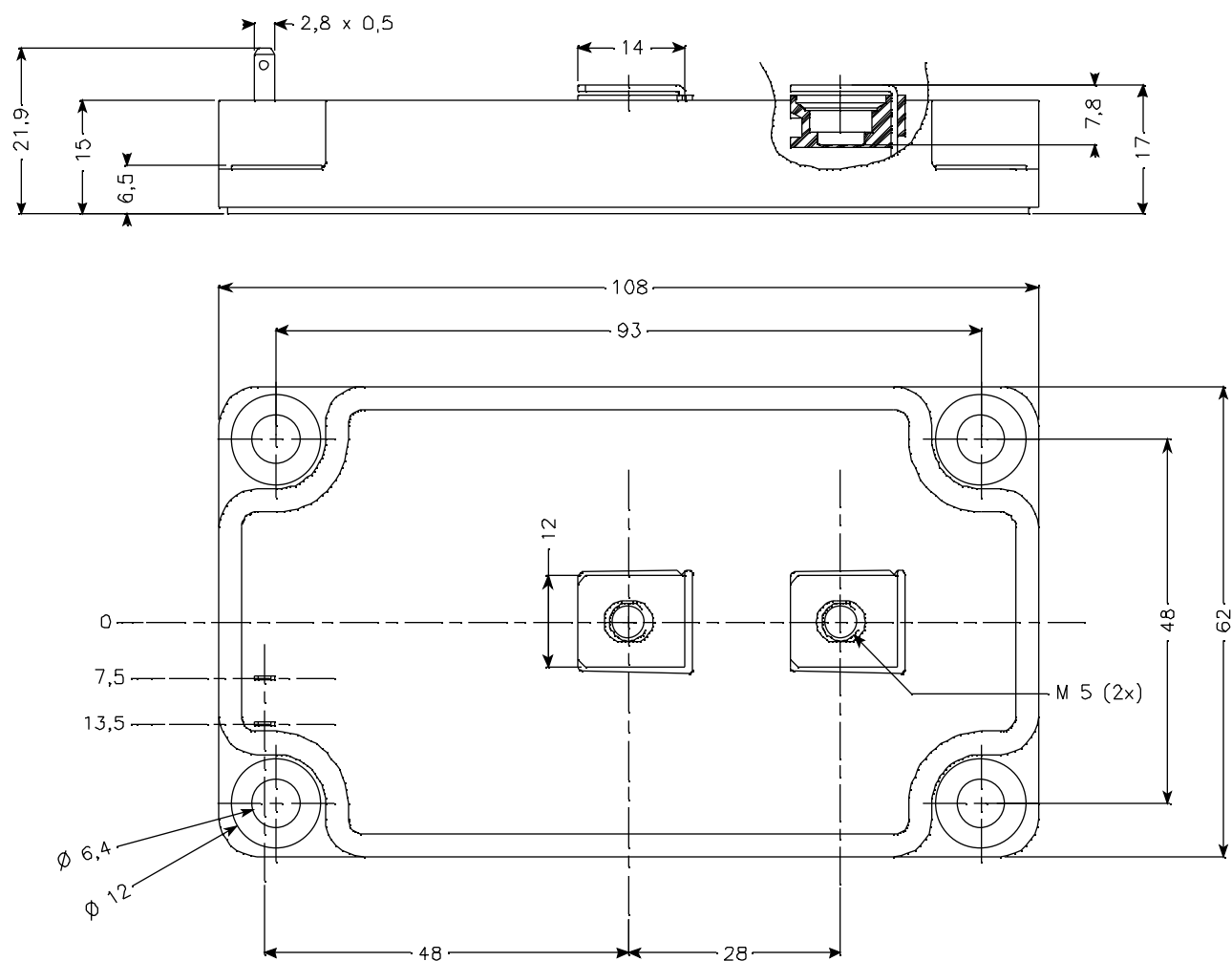
Series diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Repetitive Reverse Voltage		1000			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1000\text{V}, T_j = 125^\circ\text{C}$			2	mA
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle, $T_c = 100^\circ\text{C}$		240		A
V_F	Diode Forward Voltage	$I_F = 240\text{A}$		1.9	2.5	V
		$I_F = 480\text{A}$		2.2		
		$I_F = 240\text{A}, T_j = 125^\circ\text{C}$		1.7		
t_{rr}	Reverse Recovery Time	$I_F = 240\text{A}$ $V_R = 667\text{V}$ $di/dt = 800\text{A}/\mu\text{s}$ $T_j = 25^\circ\text{C}$		280		ns
		$T_j = 125^\circ\text{C}$		350		
Q_{rr}	Reverse Recovery Charge	$I_F = 240\text{A}$ $V_R = 667\text{V}$ $di/dt = 800\text{A}/\mu\text{s}$ $T_j = 25^\circ\text{C}$		3		μC
		$T_j = 125^\circ\text{C}$		14.4		

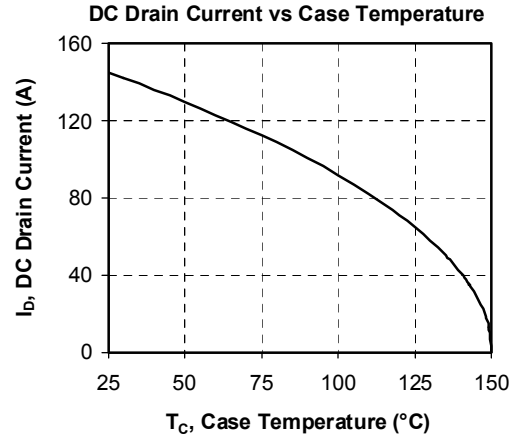
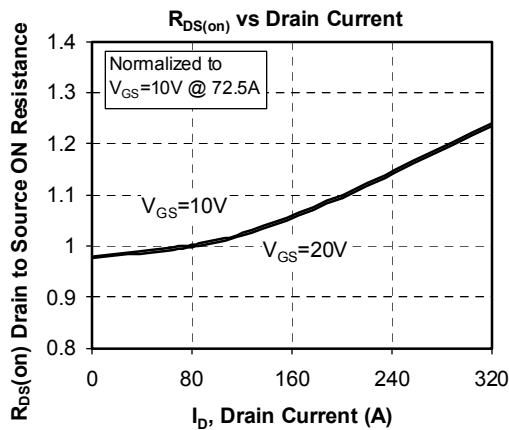
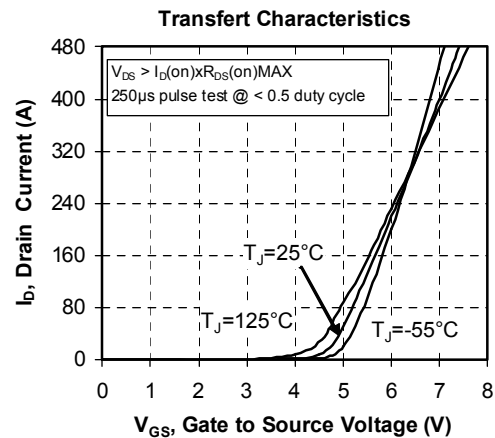
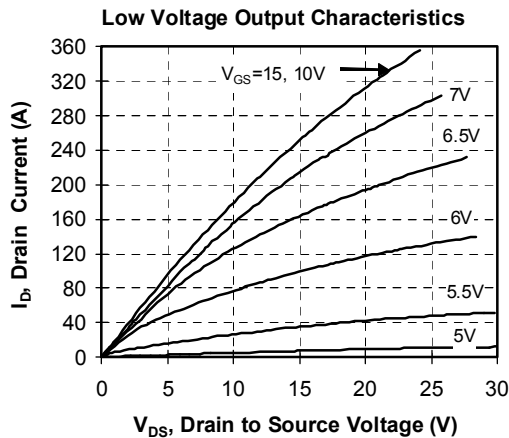
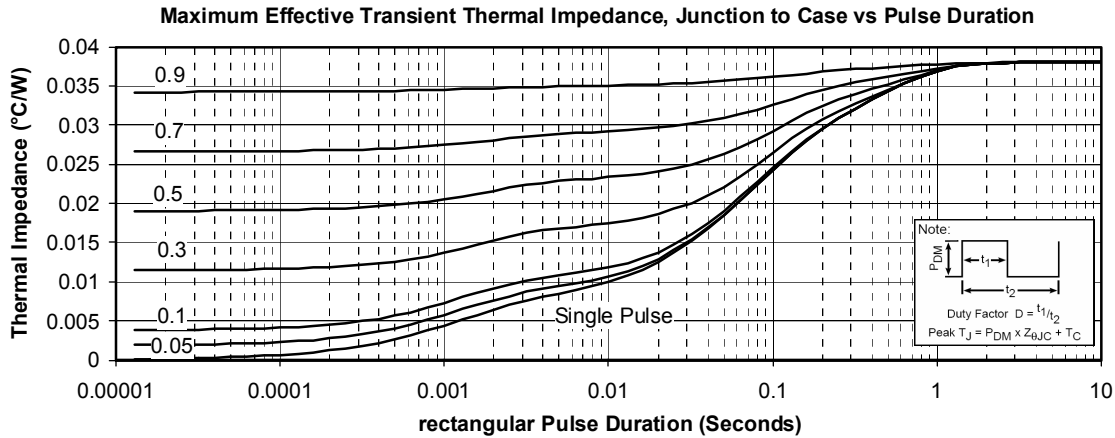
Thermal and package characteristics

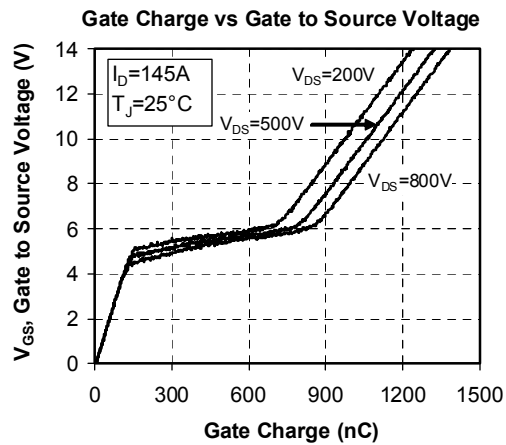
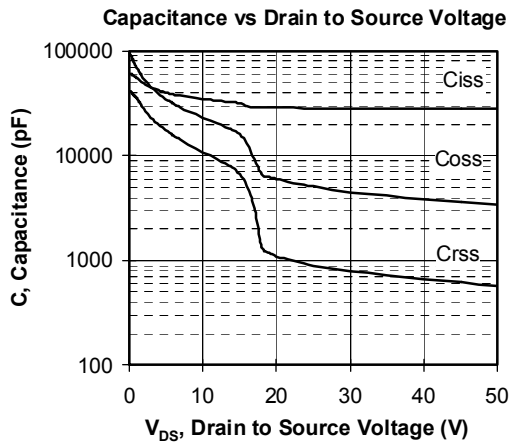
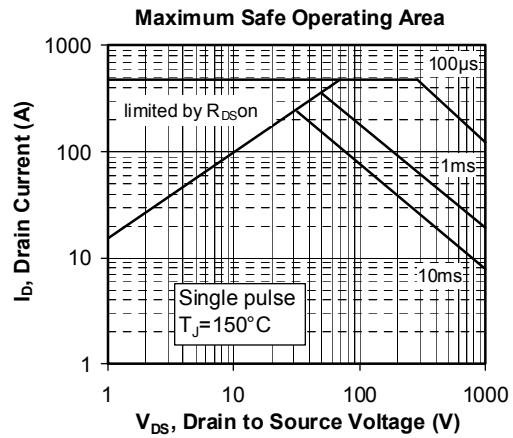
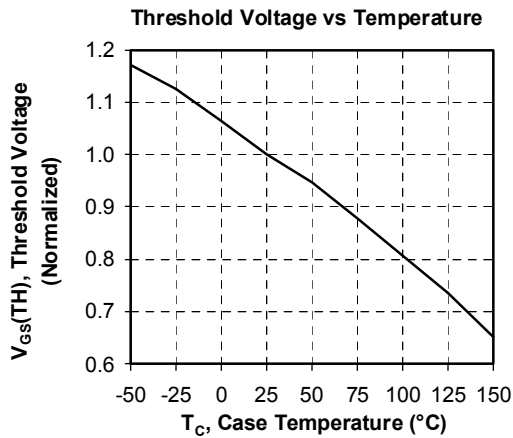
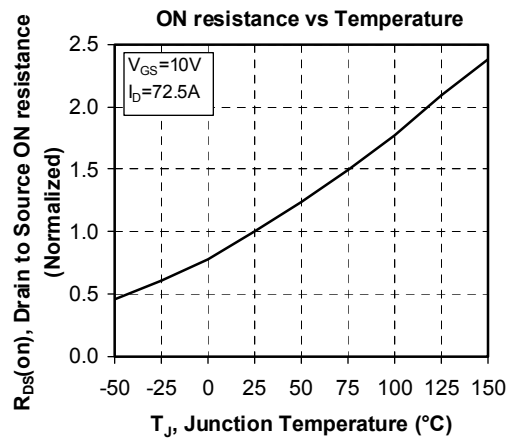
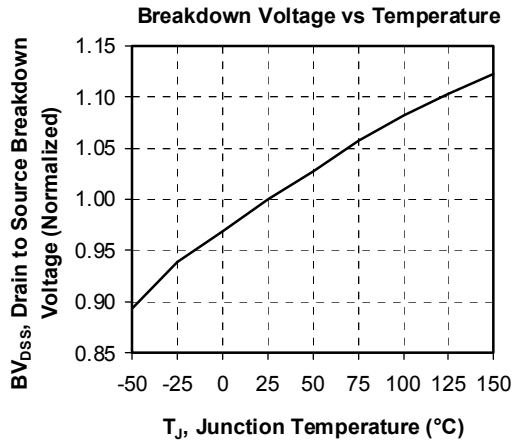
Symbol	Characteristic		Min	Typ	Max	Unit
R _{thJC}	Junction to Case	Transistor			0.038	°C/W
		Series diode			0.23	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, I _{isol} <1mA, 50/60Hz		2500			V
T _J	Operating junction temperature range		-40		150	°C
T _{STG}	Storage Temperature Range		-40		125	
T _C	Operating Case Temperature		-40		100	
Torque	Mounting torque	To Heatsink	M6	3	5	N.m
		For teminals	M5	2	3.5	
Wt	Package Weight				280	g

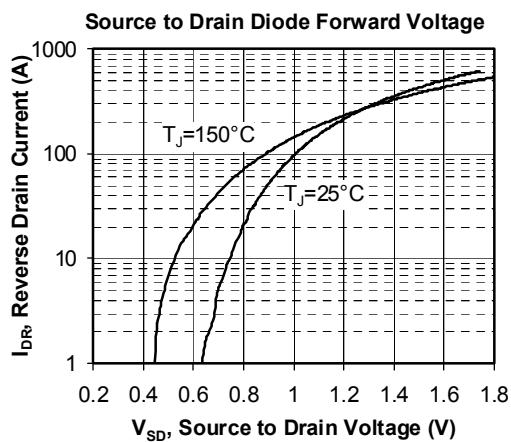
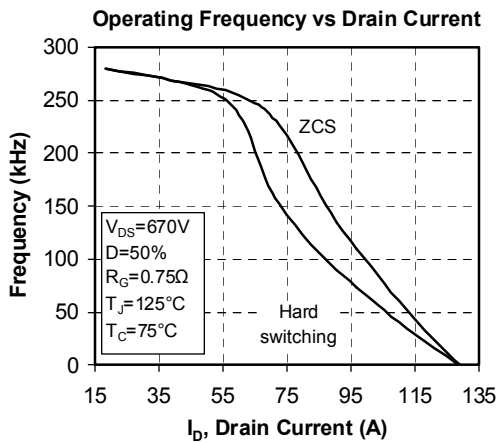
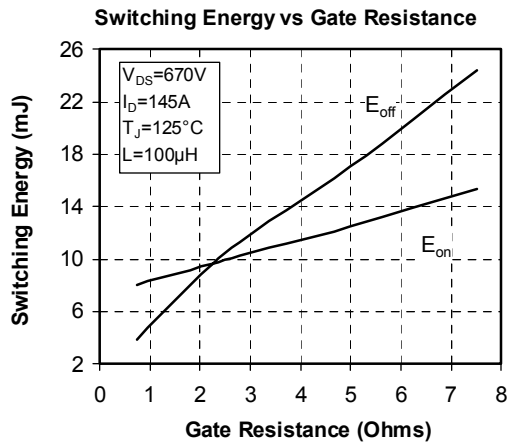
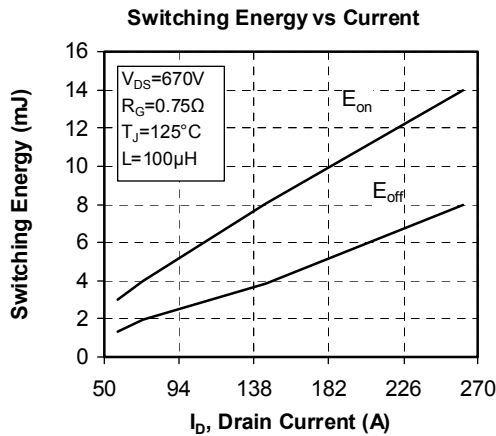
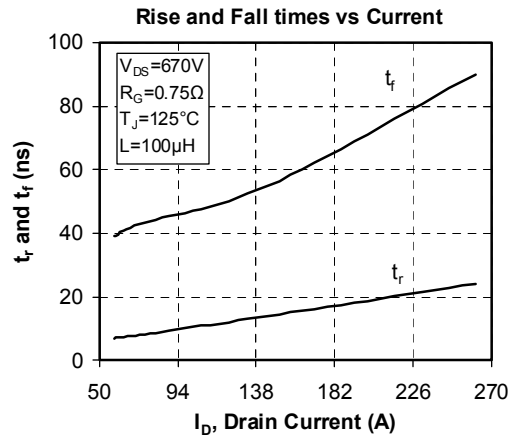
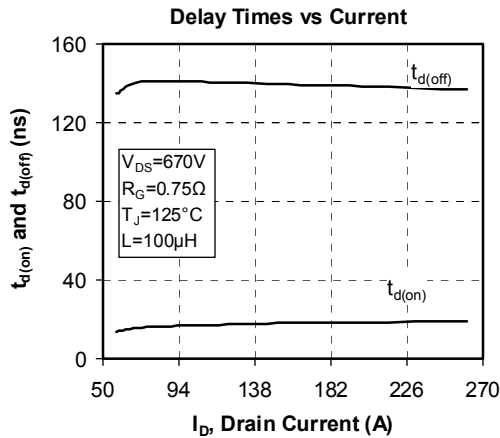
Package outline



Typical Performance Curve







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