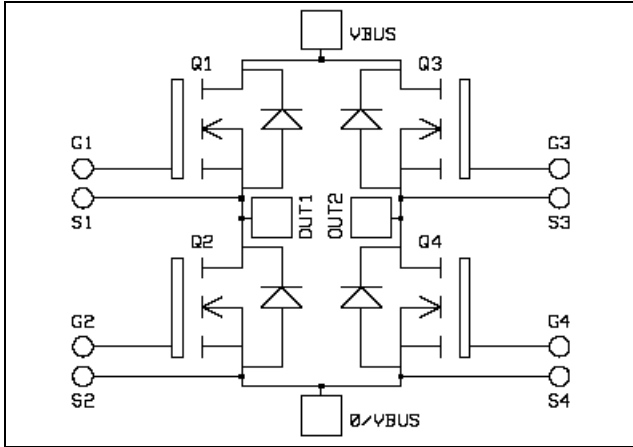


**Full - Bridge  
MOSFET Power Module**

**$V_{DSS} = 500V$   
 $R_{DSon} = 38m\Omega \text{ max @ } T_j = 25^\circ C$   
 $I_D = 90A \text{ @ } T_c = 25^\circ C$**

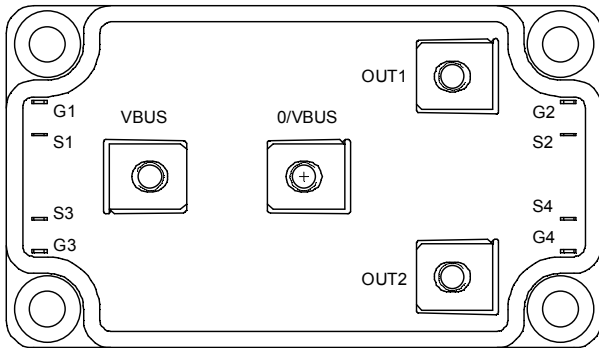


**Application**

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

**Features**

- Power MOS 7® FREDFETs
  - 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	500	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	90
		$T_c = 80^\circ C$	67
$I_{DM}$	Pulsed Drain current	360	
$V_{GS}$	Gate - Source Voltage	$\pm 30$	V
$R_{DSon}$	Drain - Source ON Resistance	38	$m\Omega$
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	694
$I_{AR}$	Avalanche current (repetitive and non repetitive)	46	A
$E_{AR}$	Repetitive Avalanche Energy	50	mJ
$E_{AS}$	Single Pulse Avalanche Energy	2500	

**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	$V_{GS} = 0V, I_D = 375\mu A$	500			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 500V$			375	$\mu A$
		$V_{GS} = 0V, V_{DS} = 400V$			1500	
$R_{DS(on)}$	Drain - Source on Resistance	$V_{GS} = 10V, I_D = 45A$			38	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5mA$	3		5	V
$I_{GSS}$	Gate - Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			$\pm 150$	nA

**Dynamic Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$		11200		$pF$
$C_{oss}$	Output Capacitance			2400		
$C_{rss}$	Reverse Transfer Capacitance			180		
$Q_g$	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 250V$ $I_D = 90A$		246		nC
$Q_{gs}$	Gate - Source Charge			66		
$Q_{gd}$	Gate - Drain Charge			130		
$T_{d(on)}$	Turn-on Delay Time	<b>Inductive switching @ <math>125^\circ\text{C}</math></b> $V_{GS} = 15V$ $V_{Bus} = 333V$ $I_D = 90A$ $R_G = 2\Omega$		18		ns
$T_r$	Rise Time			35		
$T_{d(off)}$	Turn-off Delay Time			87		
$T_f$	Fall Time			77		
$E_{on}$	Turn-on Switching Energy ❶	<b>Inductive switching @ <math>25^\circ\text{C}</math></b> $V_{GS} = 15V, V_{Bus} = 330V$ $I_D = 90A, R_G = 2\Omega$		1510		$\mu J$
$E_{off}$	Turn-off Switching Energy ❷			1452		
$E_{on}$	Turn-on Switching Energy ❶	<b>Inductive switching @ <math>125^\circ\text{C}</math></b> $V_{GS} = 15V, V_{Bus} = 330V$ $I_D = 90A, R_G = 2\Omega$		2482		$\mu J$
$E_{off}$	Turn-off Switching Energy ❷			1692		

**Source - Drain diode ratings and characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_S$	Continuous Source current (Body diode)		$T_c = 25^\circ\text{C}$		90	A
			$T_c = 80^\circ\text{C}$		67	
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0V, I_S = -90A$			1.3	V
dv/dt	Peak Diode Recovery ❸				15	V/ns
$t_{rr}$	Reverse Recovery Time	$I_S = -90A$ $V_R = 250V$ $di_S/dt = 200A/\mu s$	$T_j = 25^\circ\text{C}$		233	ns
			$T_j = 125^\circ\text{C}$		499	
$Q_{rr}$	Reverse Recovery Charge	$I_S = -90A$ $V_R = 250V$ $di_S/dt = 200A/\mu s$	$T_j = 25^\circ\text{C}$		3.8	$\mu C$
			$T_j = 125^\circ\text{C}$		11.4	

❶  $E_{on}$  includes diode reverse recovery.

❷ In accordance with JEDEC standard JESD24-1.

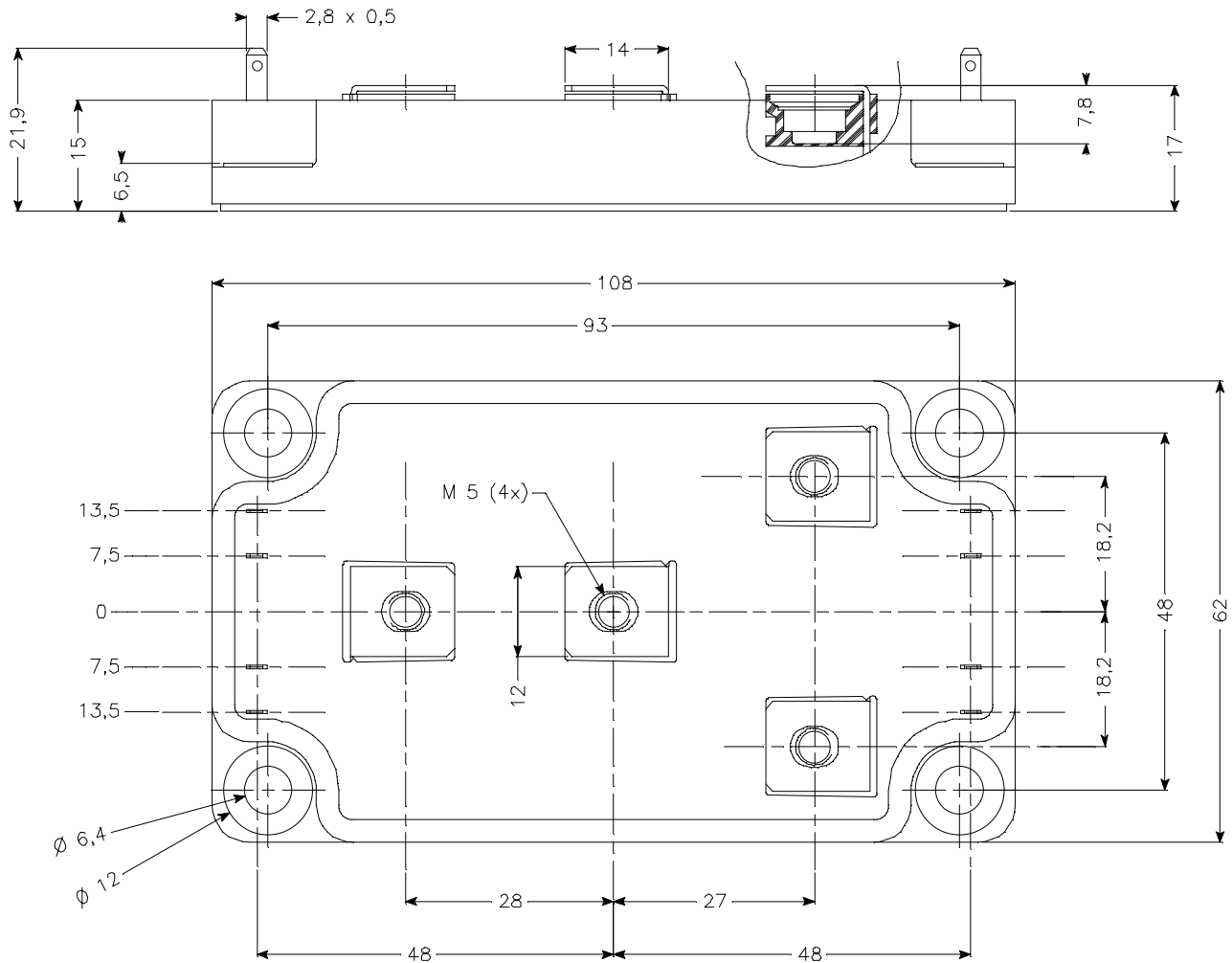
❸ dv/dt numbers reflect the limitations of the circuit rather than the device itself.

$$I_S \leq -90A \quad di/dt \leq 700A/\mu s \quad V_R \leq V_{DSS} \quad T_j \leq 150^\circ\text{C}$$

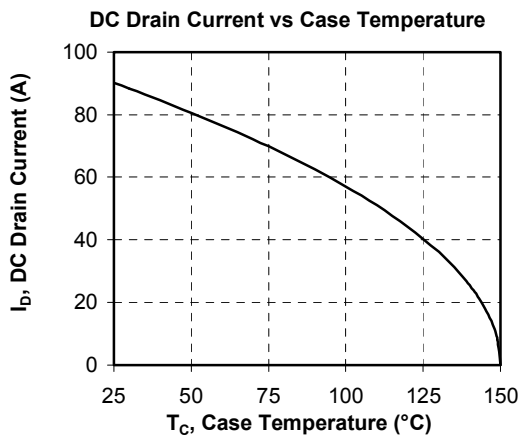
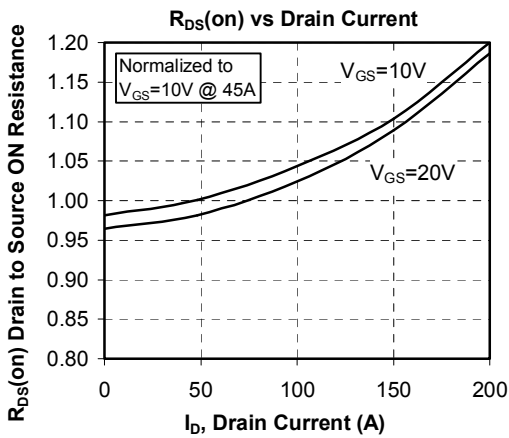
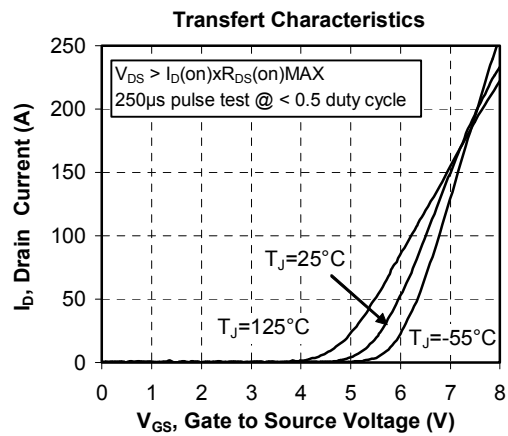
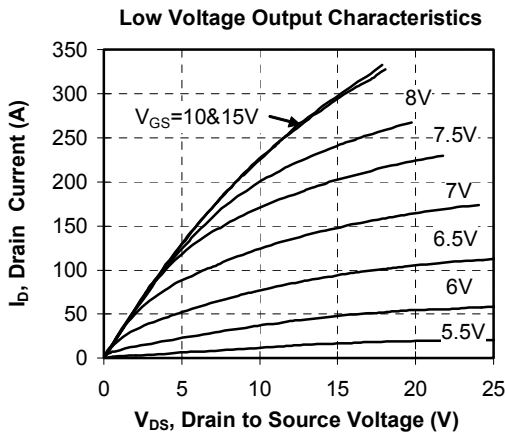
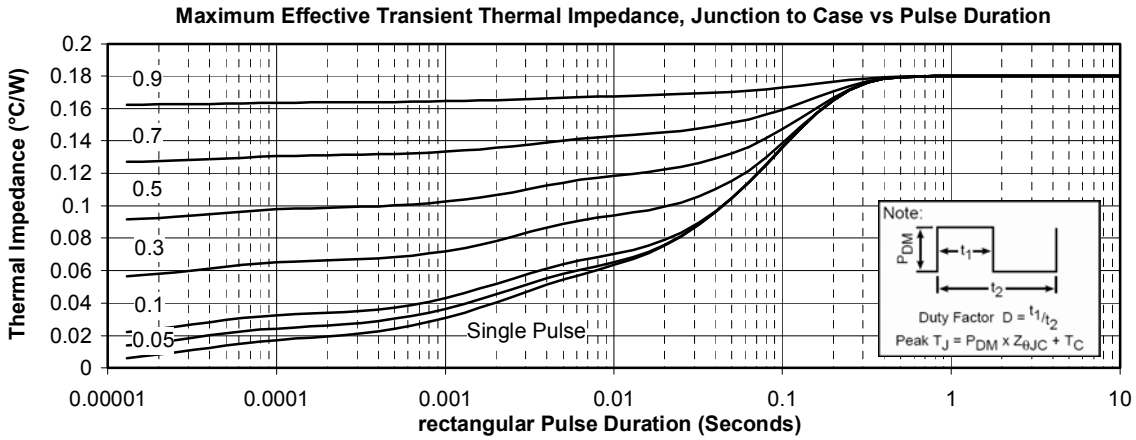
**Thermal and package characteristics**

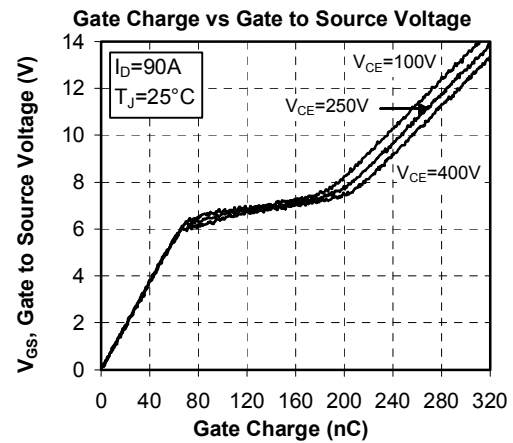
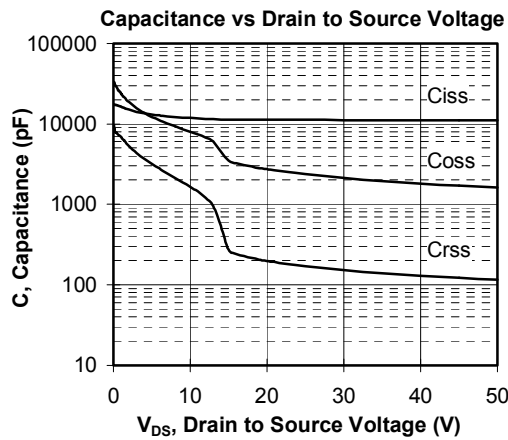
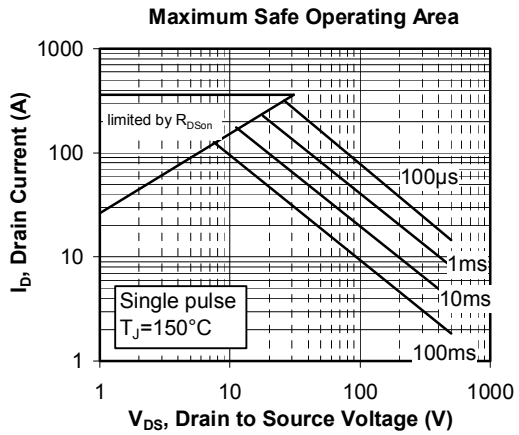
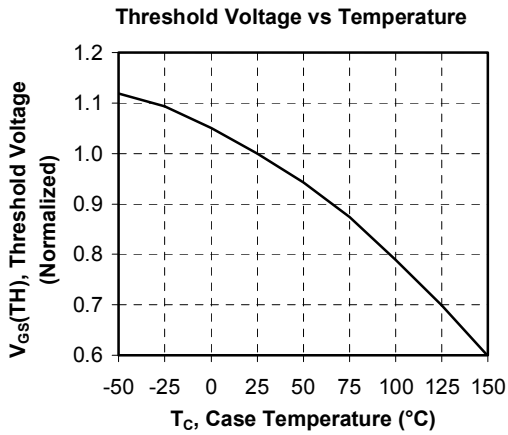
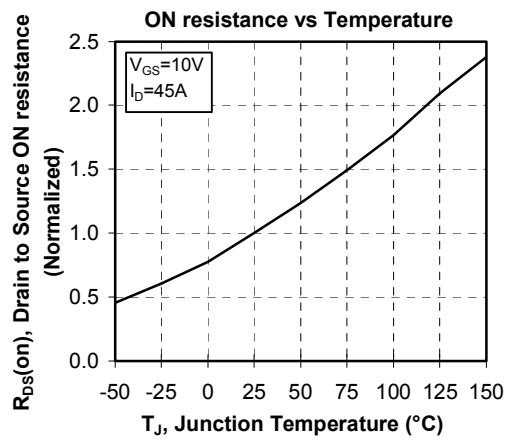
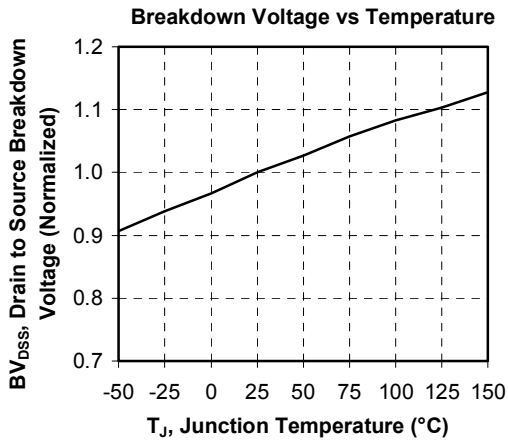
Symbol	Characteristic	Min	Typ	Max	Unit	
R <sub>thJC</sub>	Junction to Case			0.18	°C/W	
V <sub>ISOL</sub>	RMS Isolation Voltage, any terminal to case t=1 min, I <sub>isol</sub> <1mA, 50/60Hz	2500			V	
T <sub>J</sub>	Operating junction temperature range	-40		150	°C	
T <sub>STG</sub>	Storage Temperature Range	-40		125		
T <sub>C</sub>	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M6	3	5	N.m
		For terminals	M5	2	3.5	
Wt	Package Weight			280	g	

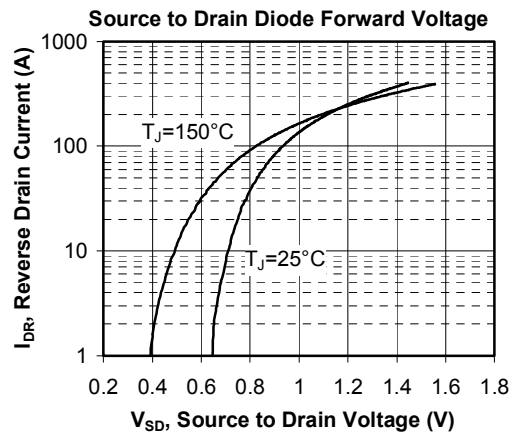
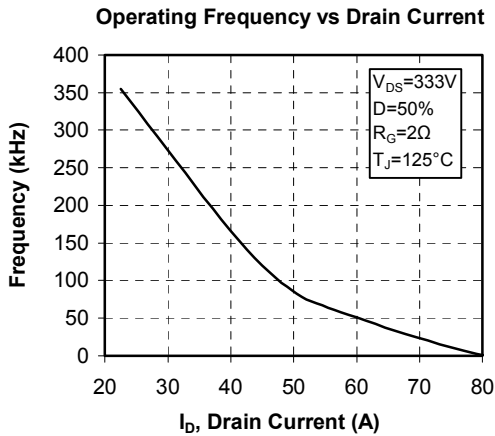
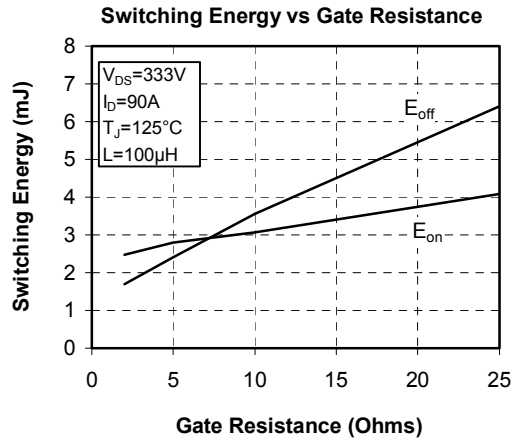
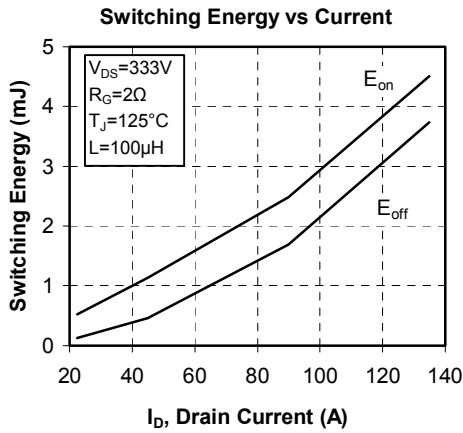
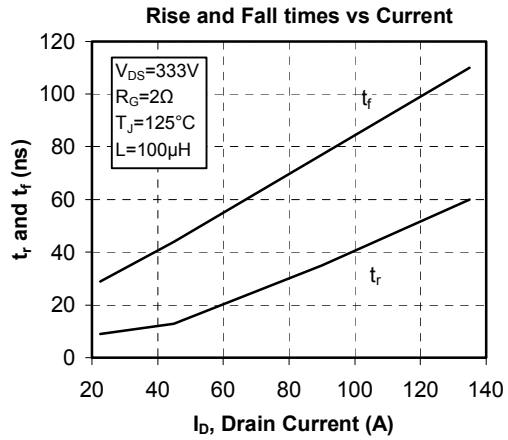
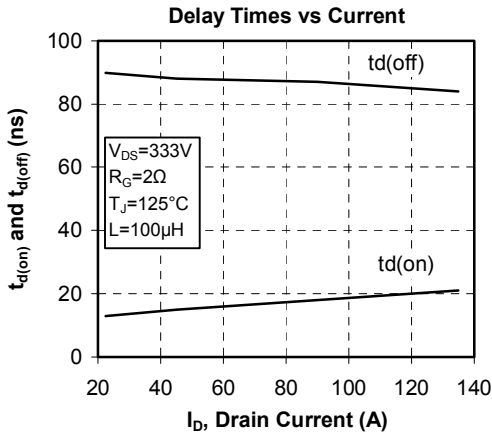
**Package outline**



**Typical Performance Curve**







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