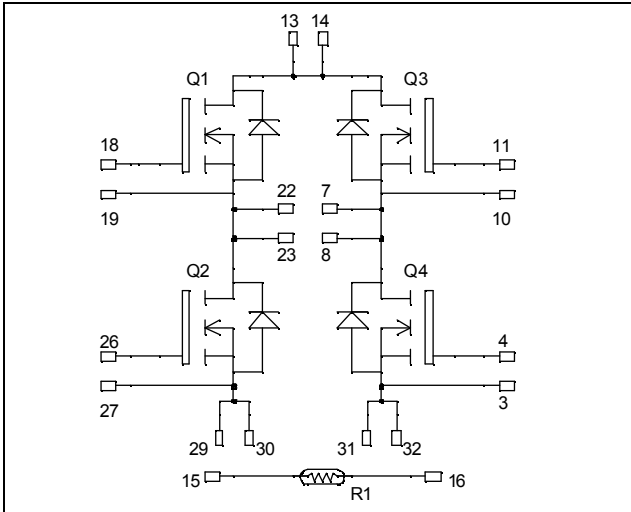


**Full - Bridge  
Super Junction MOSFET  
Power Module**

**$V_{DSS} = 600V$**   
 **$R_{DSon} = 35m\Omega \text{ max @ } T_j = 25^\circ C$**   
 **$I_D = 72A \text{ @ } T_c = 25^\circ C$**

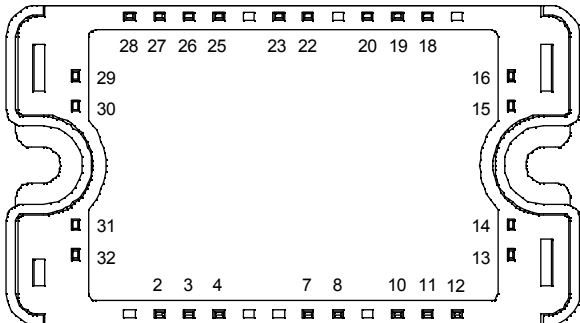


**Application**

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

**Features**

- **COOLMOS** Power Semiconductors
  - Ultra low  $R_{DSon}$
  - Low Miller capacitance
  - Ultra low gate charge
  - Avalanche energy rated
  - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
  - Symmetrical design
- Internal thermistor for temperature monitoring
- High level of integration



**Benefits**

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Low profile
- Each leg can be easily paralleled to achieve a phase leg of twice the current capability

All multiple inputs and outputs must be shorted together  
 Example: 13/14 ; 29/30 ; 22/23 ...

**Absolute maximum ratings**

Symbol	Parameter	Max ratings	Unit
$V_{DSS}$	Drain - Source Breakdown Voltage	600	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	72
		$T_c = 80^\circ C$	54
$I_{DM}$	Pulsed Drain current	200	A
$V_{GS}$	Gate - Source Voltage	$\pm 20$	V
$R_{DSon}$	Drain - Source ON Resistance	35	$m\Omega$
$P_D$	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.

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	$V_{GS} = 0V, I_D = 375\mu A$	600			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 600V$		1	40	$\mu A$
		$V_{GS} = 0V, V_{DS} = 600V$			375	
$R_{DS(on)}$	Drain - Source on Resistance	$V_{GS} = 10V, I_D = 72A$			35	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5.4mA$	2.1	3	3.9	V
$I_{GSS}$	Gate - Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 150$	nA

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$		14		nF
$C_{oss}$	Output Capacitance			5.13		
$C_{rss}$	Reverse Transfer Capacitance			0.42		
$Q_g$	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 300V$ $I_D = 72A$		518		nC
$Q_{gs}$	Gate - Source Charge			58		
$Q_{gd}$	Gate - Drain Charge			222		
$T_{d(on)}$	Turn-on Delay Time	<b>Inductive Switching @ <math>125^\circ\text{C}</math></b> $V_{GS} = 15V$ $V_{Bus} = 400V$ $I_D = 72A$ $R_G = 2.5\Omega$		21		ns
$T_r$	Rise Time			30		
$T_{d(off)}$	Turn-off Delay Time			283		
$T_f$	Fall Time			84		
$E_{on}$	Turn-on Switching Energy ❶	<b>Inductive switching @ <math>25^\circ\text{C}</math></b> $V_{GS} = 15V, V_{Bus} = 400V$ $I_D = 72A, R_G = 2.5\Omega$		1340		$\mu J$
$E_{off}$	Turn-off Switching Energy ❷			1960		
$E_{on}$	Turn-on Switching Energy ❶	<b>Inductive switching @ <math>125^\circ\text{C}</math></b> $V_{GS} = 15V, V_{Bus} = 400V$ $I_D = 72A, R_G = 2.5\Omega$		2192		$\mu J$
$E_{off}$	Turn-off Switching Energy ❷			2412		

## Source - Drain diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_S$	Continuous Source current (Body diode)	$T_c = 25^\circ\text{C}$		72		A
		$T_c = 80^\circ\text{C}$		54		
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0V, I_S = -72A$			1.2	V
$dv/dt$	Peak Diode Recovery ❸				6	V/ns
$t_{rr}$	Reverse Recovery Time	$I_S = -72A$ $V_R = 350V$ $di_S/dt = 200A/\mu s$		580		ns
$Q_{rr}$	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$		46	

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.

$I_S \leq -72A$     $di/dt \leq 200A/\mu s$     $V_R \leq V_{DSS}$     $T_j \leq 150^\circ\text{C}$

**Thermal and package characteristics**

Symbol	Characteristic	Min	Typ	Max	Unit
R <sub>thJC</sub>	Junction to Case			0.30	°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	M4		4.7 N.m
Wt	Package Weight			110	g

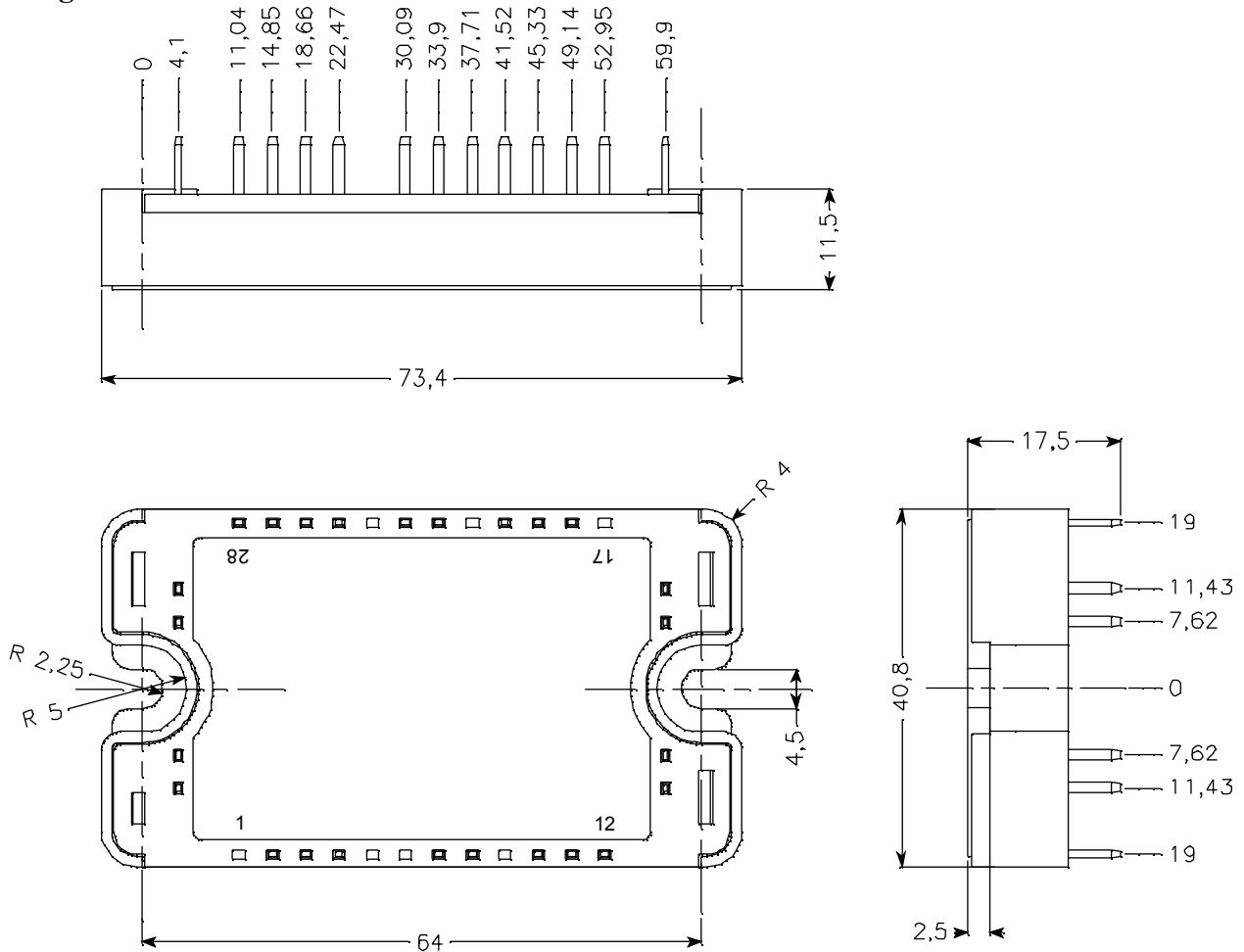
**Temperature sensor NTC**

Symbol	Characteristic	Min	Typ	Max	Unit
R <sub>25</sub>	Resistance @ 25°C		68		kΩ
B <sub>25/85</sub>	T <sub>25</sub> = 298.16 K		4080		K

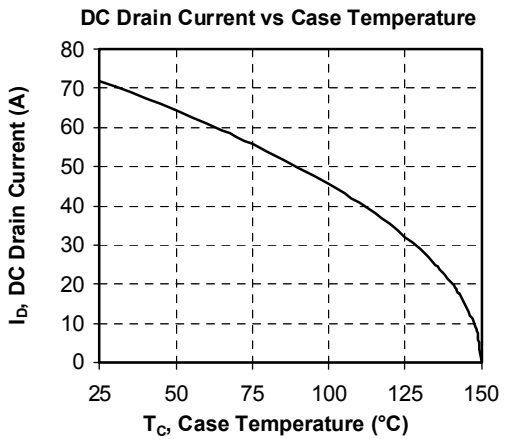
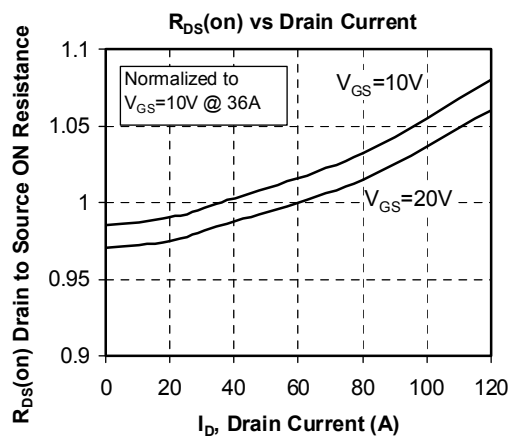
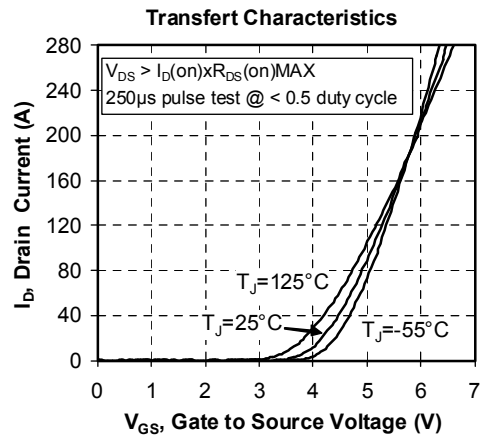
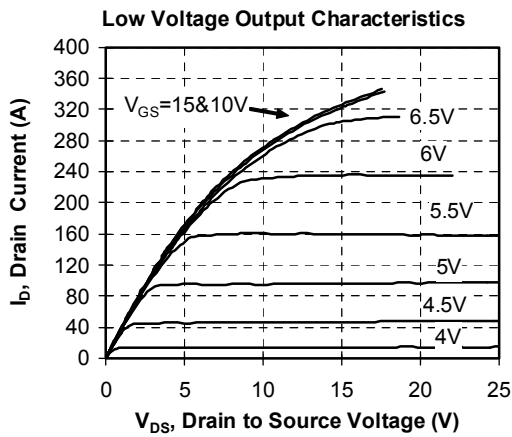
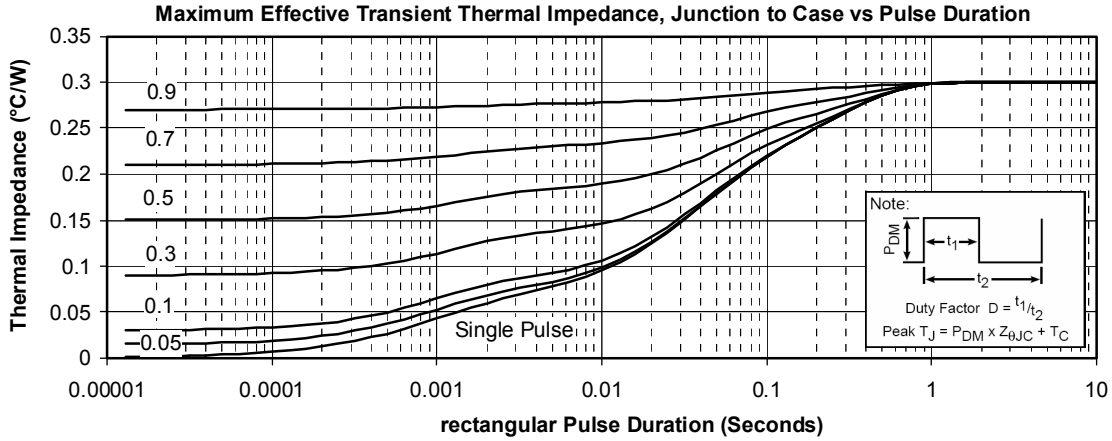
$$R_T = \frac{R_{25}}{\exp \left[ B_{25/85} \left( \frac{1}{T_{25}} - \frac{1}{T} \right) \right]}$$

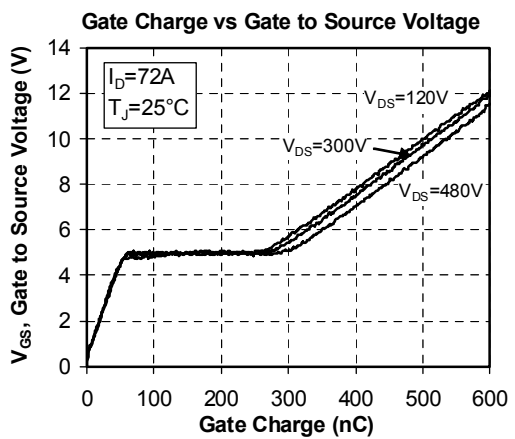
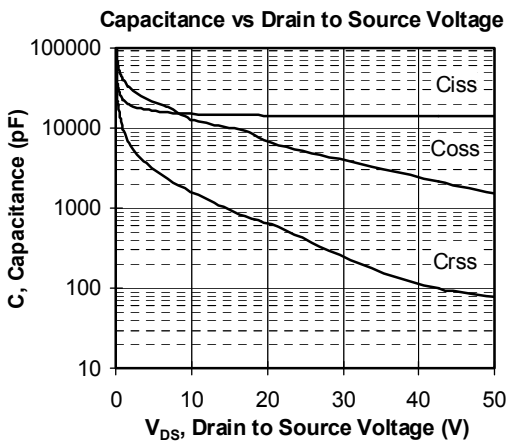
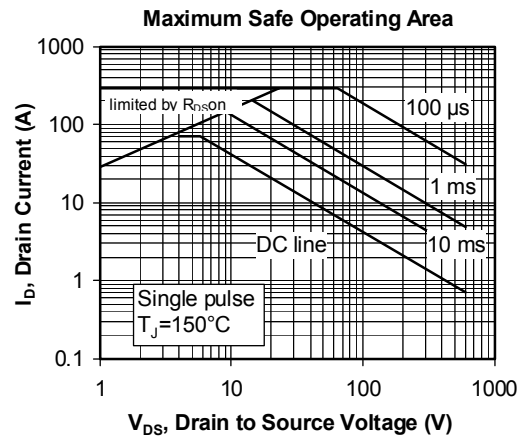
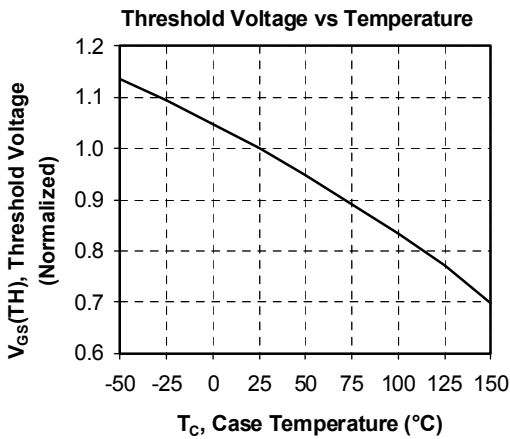
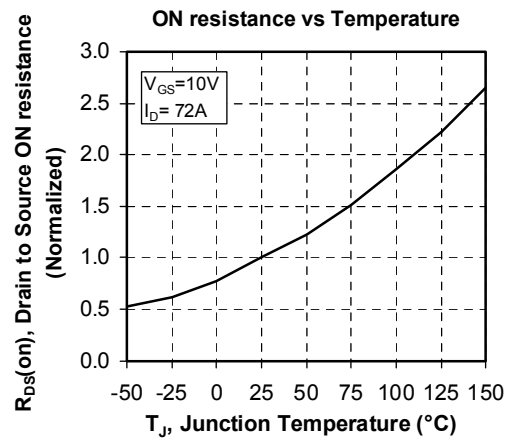
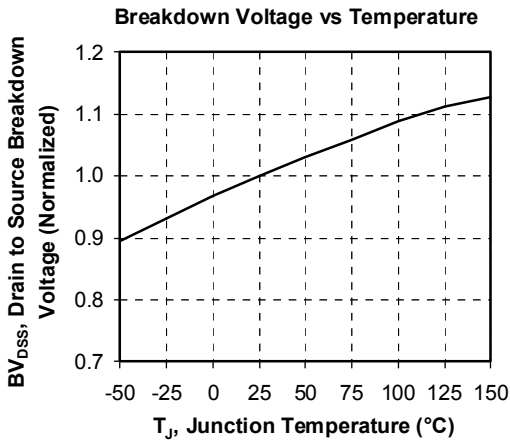
T: Thermistor temperature  
R<sub>T</sub>: Thermistor value at T

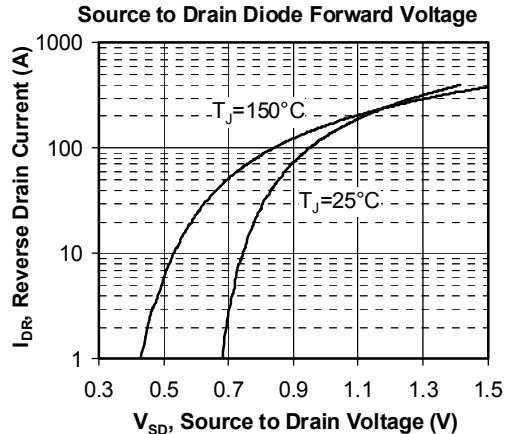
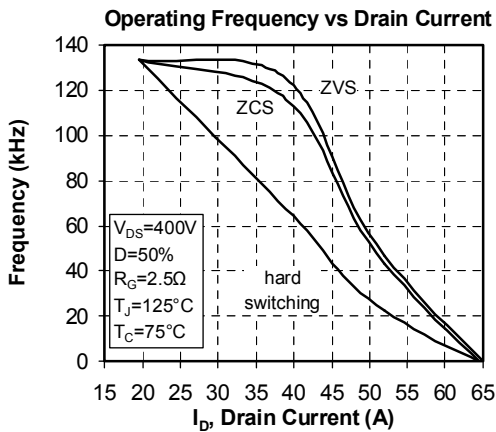
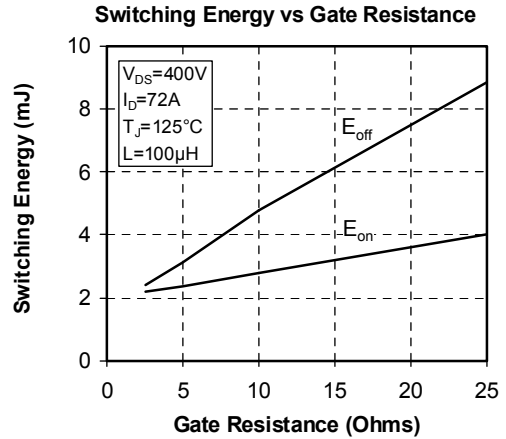
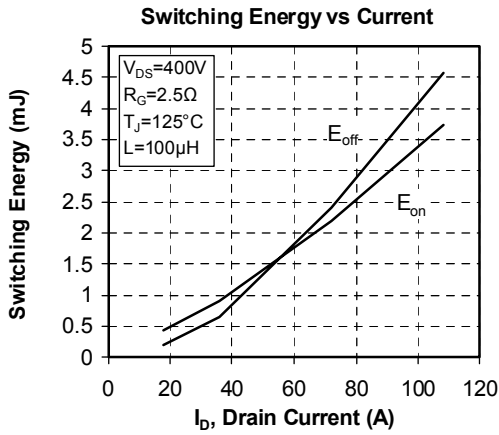
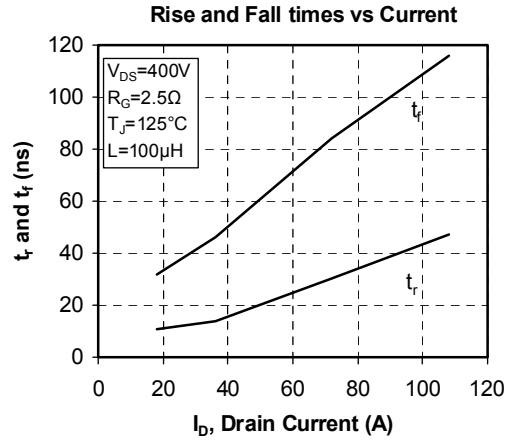
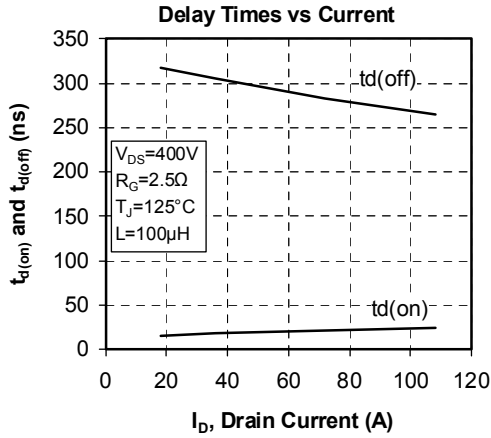
**Package outline**



**Typical Performance Curve**







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