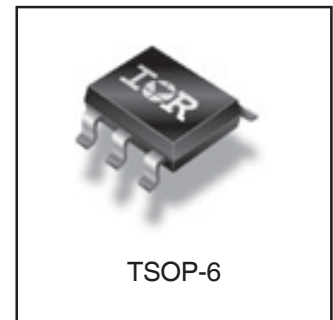
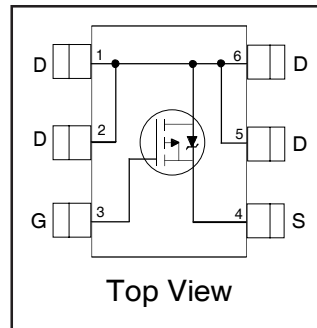


# IRLTS2242PbF

HEXFET® Power MOSFET

$V_{DS}$	<b>-20</b>	<b>V</b>
$V_{GS\ max}$	<b>±12</b>	<b>V</b>
$R_{DS(on)\ max}$ (@ $V_{GS} = -4.5V$ )	<b>32</b>	<b>mΩ</b>
$R_{DS(on)\ max}$ (@ $V_{GS} = -2.5V$ )	<b>55</b>	<b>mΩ</b>
$Q_g\ typ$	<b>12</b>	<b>nC</b>
$I_D$ (@ $T_A = 25^\circ C$ )	<b>-6.9</b>	<b>A</b>



## Applications

- Battery operated DC motor inverter MOSFET
- System/Load Switch

## Features and Benefits

### Features

Industry-Standard TSOP-6 Package
RoHS Compliant Containing no Lead, no Bromide and no Halogen
MSL1, Consumer Qualification

results in

⇒

### Benefits

Multi-Vendor Compatibility
Environmentally Friendlier
Increased Reliability

Orderable part number	Package Type	Standard Pack		Note
		Form	Quantity	
IRLTS2242TRPbF	TSOP-6	Tape and Reel	3000	

## Absolute Maximum Ratings

	Parameter	Max.	Units
$V_{DS}$	Drain-to-Source Voltage	-20	V
$V_{GS}$	Gate-to-Source Voltage	±12	
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	-6.9	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	-5.5	
$I_{DM}$	Pulsed Drain Current ①	-55	
$P_D @ T_A = 25^\circ C$	Power Dissipation	2.0	W
$P_D @ T_A = 70^\circ C$	Power Dissipation	1.3	
	Linear Derating Factor	0.02	W/°C
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Notes ① through ④ are on page 2

## Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$BV_{DSS}$	Drain-to-Source Breakdown Voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	9.4	—	mV/°C	Reference to $25^\circ\text{C}, I_D = -1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	26	32	mΩ	$V_{GS} = -4.5V, I_D = -6.9A$ ②
		—	45	55		$V_{GS} = -2.5V, I_D = -5.5A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	-0.4	—	-1.1	V	$V_{DS} = V_{GS}, I_D = -10\mu A$
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-3.8	—	mV/°C	
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	-1.0	μA	$V_{DS} = -16V, V_{GS} = 0V$
		—	—	-150		$V_{DS} = -16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -12V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 12V$
$g_{fs}$	Forward Transconductance	8.5	—	—	S	$V_{DS} = -10V, I_D = -5.5A$
$Q_g$	Total Gate Charge	—	12	—	nC	$V_{DS} = -10V$
$Q_{gs}$	Gate-to-Source Charge	—	1.5	—		$V_{GS} = -4.5V$
$Q_{gd}$	Gate-to-Drain Charge	—	4.3	—		$I_D = -5.5A$
$R_G$	Gate Resistance	—	17	—	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	5.8	—	ns	$V_{DD} = -10V, V_{GS} = -4.5V$
$t_r$	Rise Time	—	18	—		$I_D = -5.5A$
$t_{d(off)}$	Turn-Off Delay Time	—	81	—		$R_G = 6.8\Omega$
$t_f$	Fall Time	—	68	—		
$C_{iss}$	Input Capacitance	—	905	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	280	—		$V_{DS} = -10V$
$C_{rss}$	Reverse Transfer Capacitance	—	200	—		$f = 1.0\text{KHz}$

## Diode Characteristics

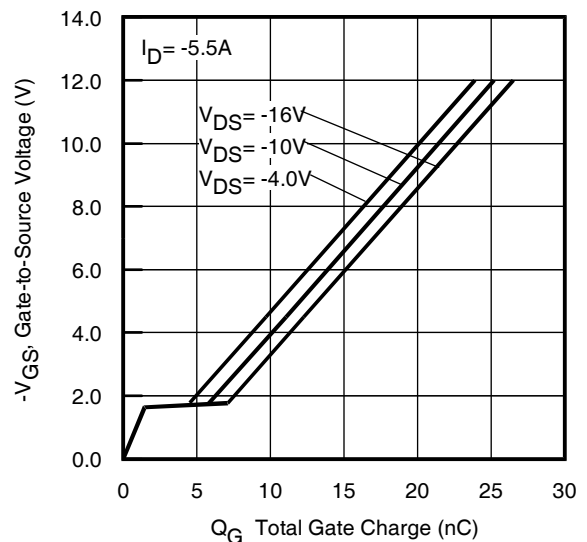
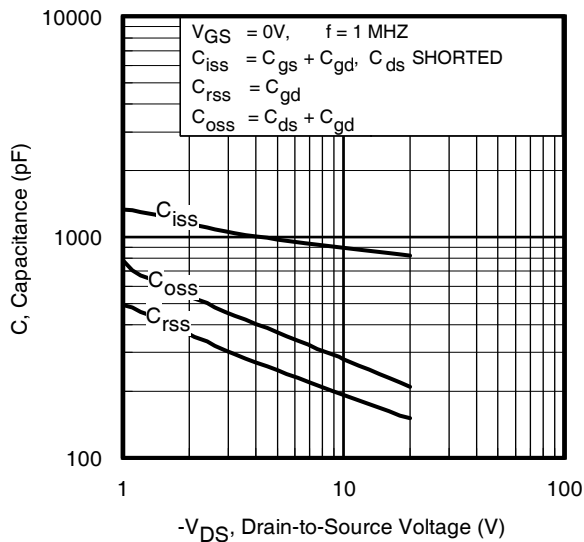
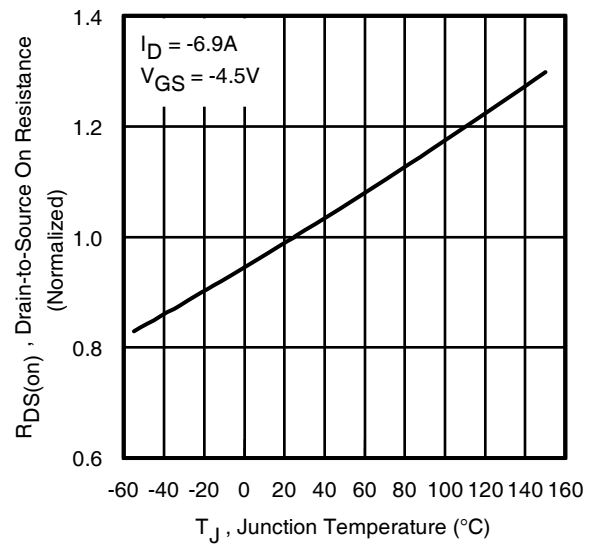
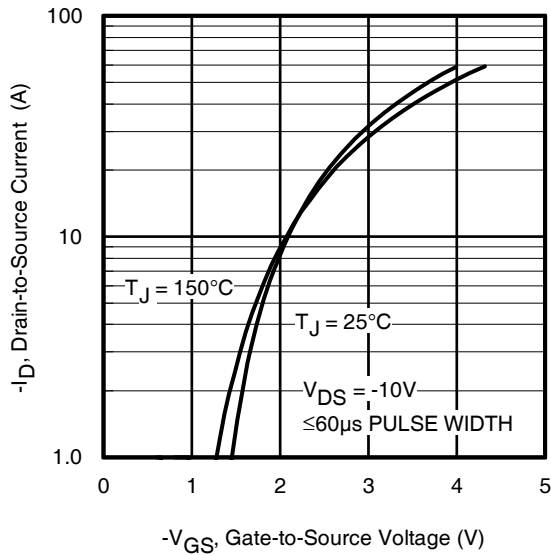
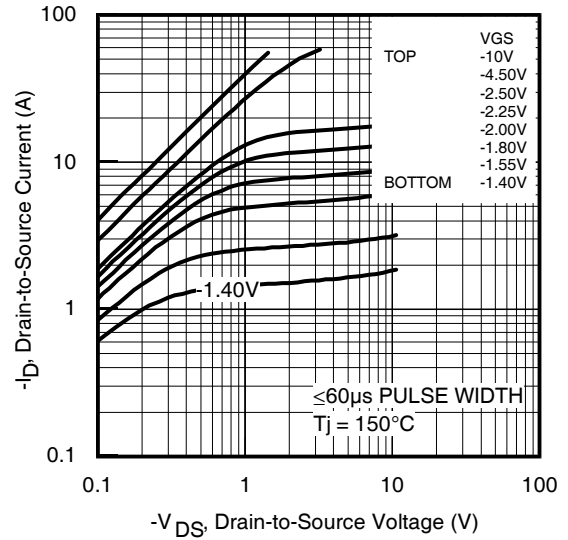
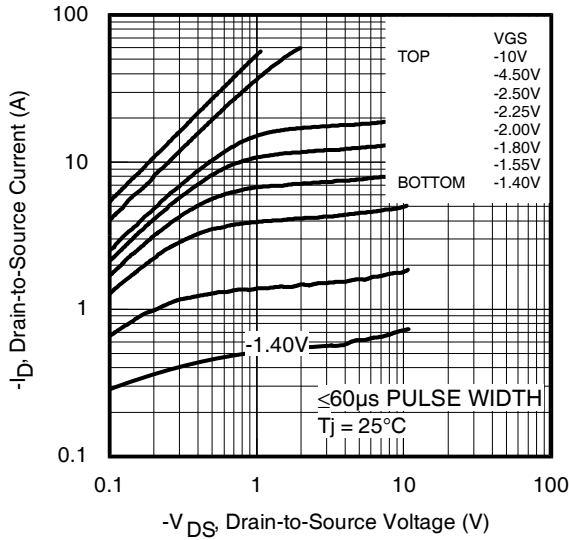
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	-2.0	A	MOSFET symbol showing the integral reverse p-n junction diode.
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	-55		
$V_{SD}$	Diode Forward Voltage	—	—	-1.2	V	$T_J = 25^\circ\text{C}, I_S = -5.5A, V_{GS} = 0V$ ②
$t_{rr}$	Reverse Recovery Time	—	41	62	ns	$T_J = 25^\circ\text{C}, I_F = -5.5A, V_{DD} = -16V$
$Q_{rr}$	Reverse Recovery Charge	—	16	24	nC	$di/dt = 100A/\mu s$ ②
$t_{on}$	Forward Turn-On Time	Time is dominated by parasitic Inductance				

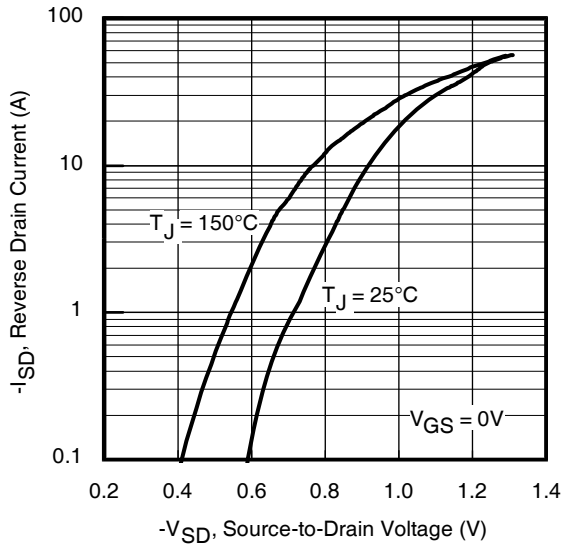
## Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ③	—	62.5	°C/W

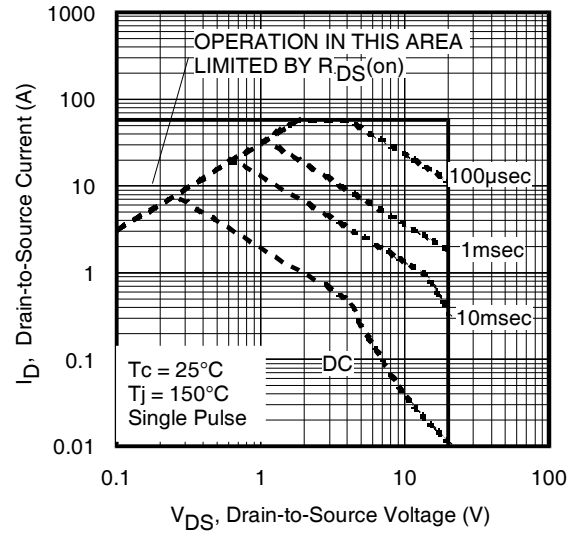
### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width  $\leq 400\mu s$ ; duty cycle  $\leq 2\%$ .
- ③ When mounted on 1 inch square copper board.

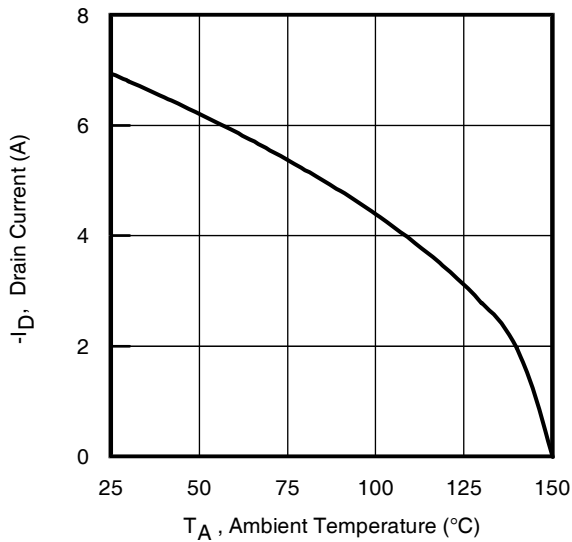




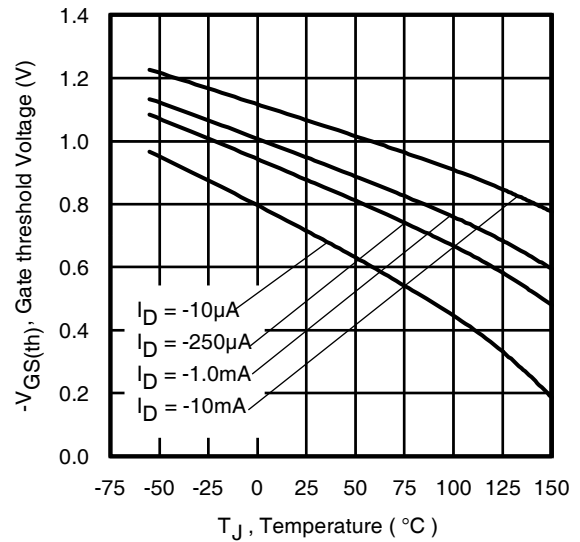
**Fig 7.** Typical Source-Drain Diode Forward Voltage



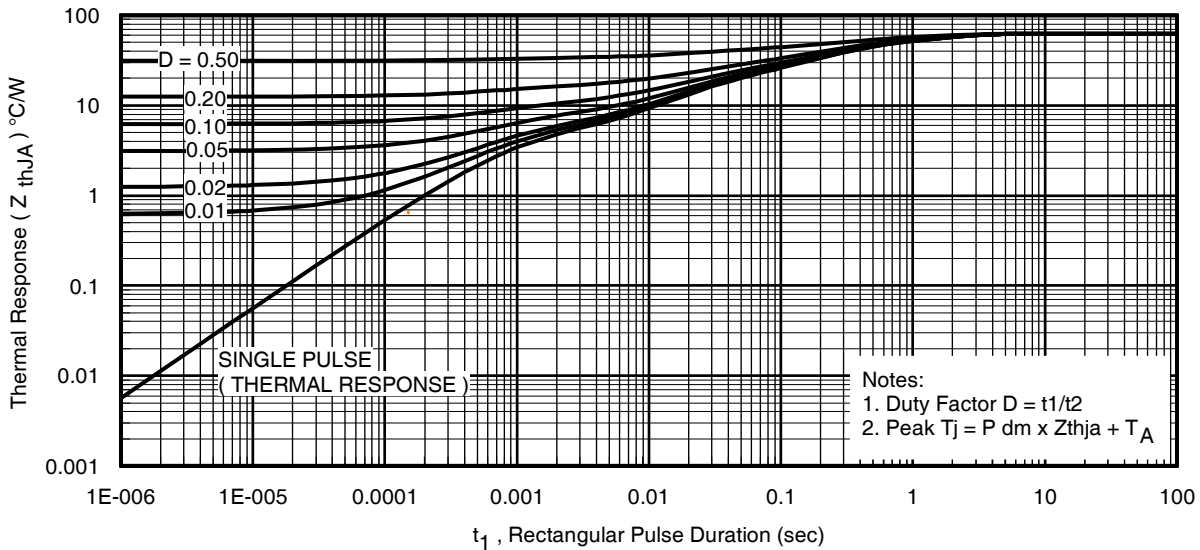
**Fig 8.** Maximum Safe Operating Area



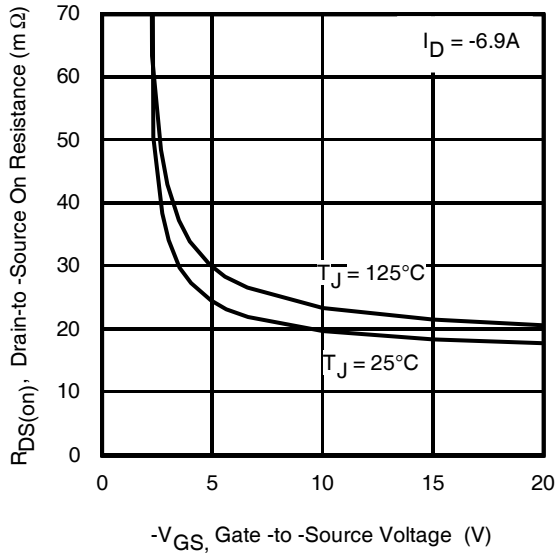
**Fig 9.** Maximum Drain Current vs. Case Temperature



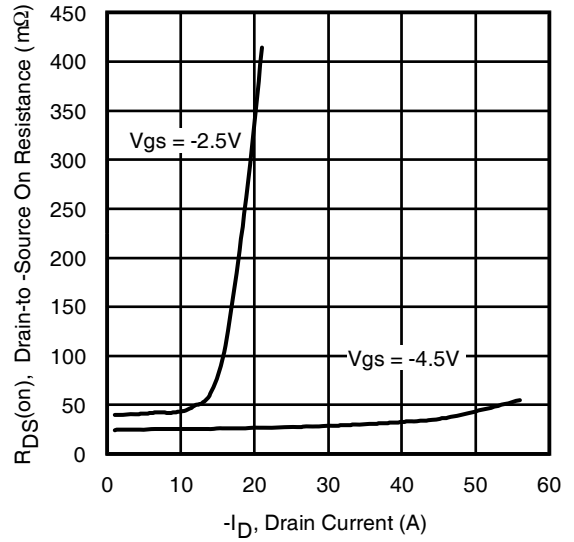
**Fig 10.** Threshold Voltage vs. Temperature



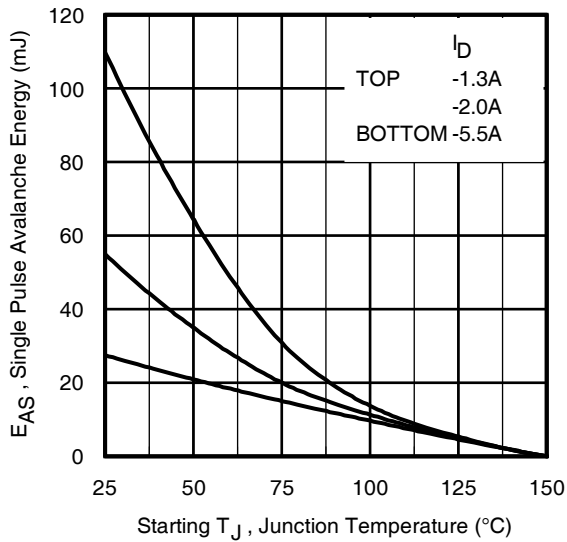
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Case



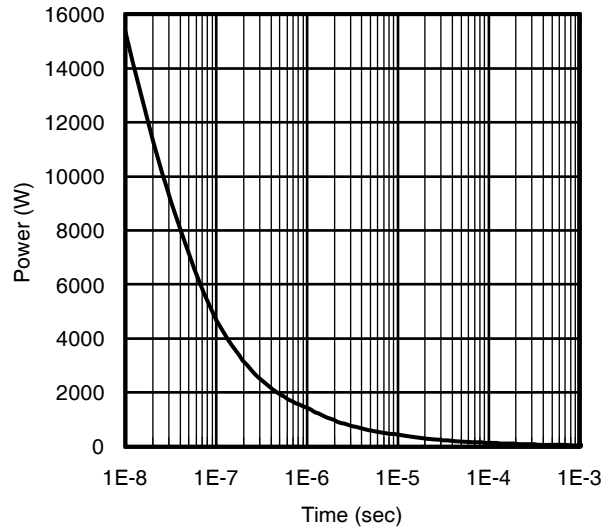
**Fig 12.** On-Resistance vs. Gate Voltage



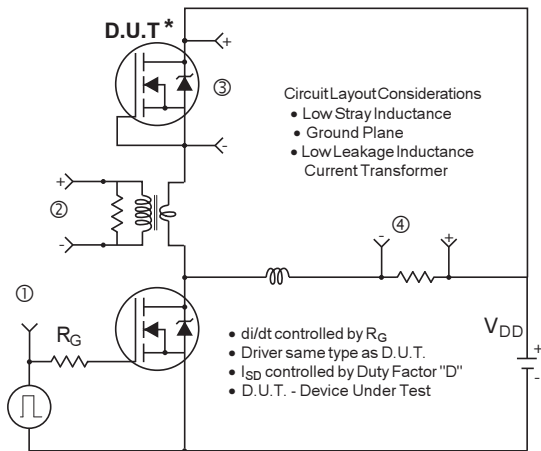
**Fig 13.** Typical On-Resistance vs. Drain Current



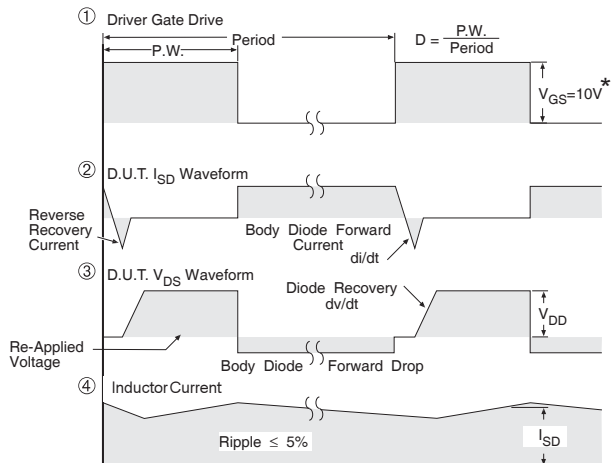
**Fig 14.** Maximum Avalanche Energy vs. Drain Current



**Fig 15.** Typical Power vs. Time

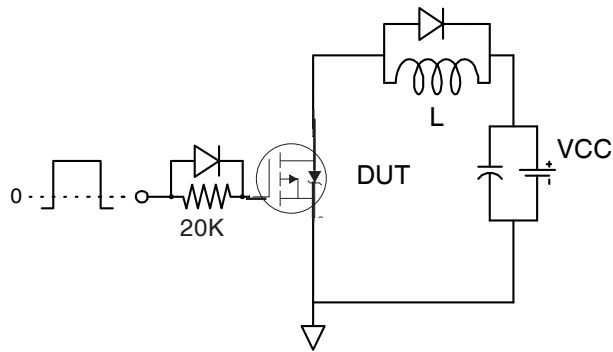


\* Reverse Polarity of D.U.T for P-Channel

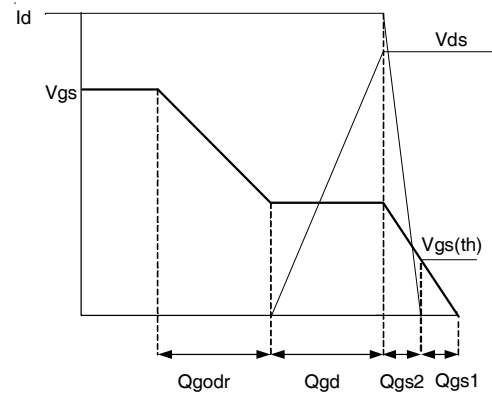


\*  $V_{GS} = 5V$  for Logic Level Devices

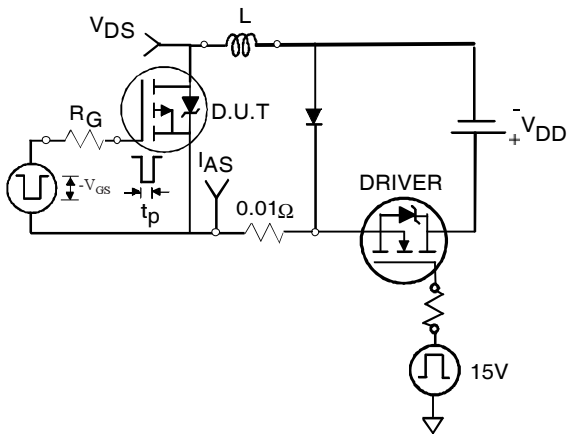
**Fig 16.** Diode Reverse Recovery Test Circuit for P-Channel HEXFET® Power MOSFETs



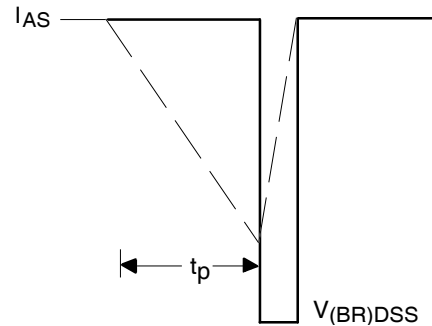
**Fig 17a.** Gate Charge Test Circuit



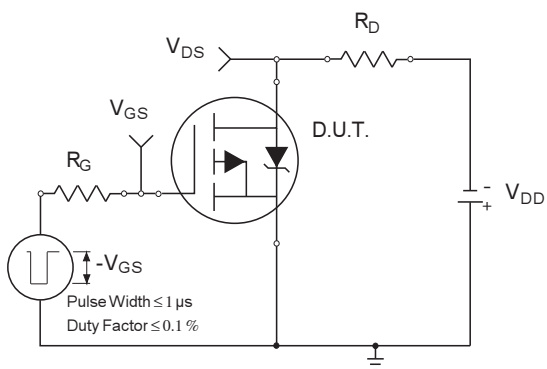
**Fig 17b.** Gate Charge Waveform



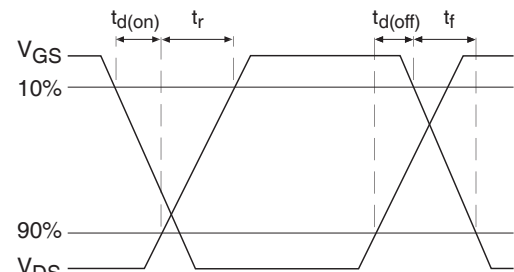
**Fig 18a.** Unclamped Inductive Test Circuit



**Fig 18b.** Unclamped Inductive Waveforms



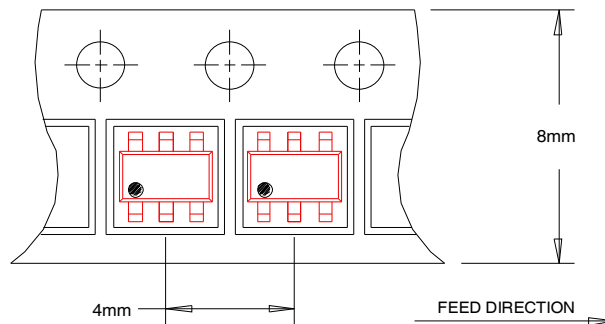
**Fig 19a.** Switching Time Test Circuit



**Fig 19b.** Switching Time Waveforms

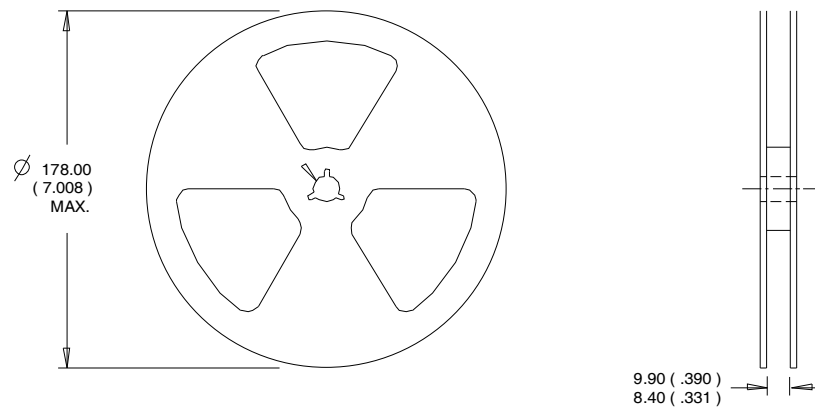


## TSOP-6 Tape and Reel Information



**NOTES :**

1. OUTLINE CONFORMS TO EIA-481 & EIA-541.



**NOTES:**

1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

### Qualification information<sup>†</sup>

Qualification level	Consumer <sup>††</sup> (per JEDEC JESD47F <sup>†††</sup> guidelines )	
Moisture Sensitivity Level	TSOP-6	MSL1 (per IPC/JEDEC J-STD-020D <sup>†††</sup> )
RoHS compliant	Yes	

† Qualification standards can be found at International Rectifier's web site

<http://www.irf.com/product-info/reliability>

†† Higher qualification ratings may be available should the user have such requirements.

Please contact your International Rectifier sales representative for further information:

<http://www.irf.com/whoto-call/salesrep/>

††† Applicable version of JEDEC standard at the time of product release.

Data and specifications subject to change without notice.

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