

# IRF8734PbF

HEXFET® Power MOSFET

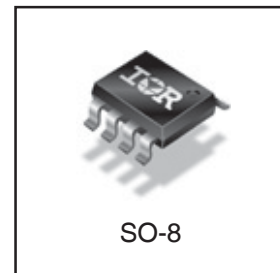
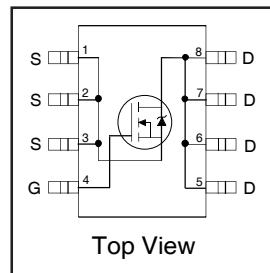
## Applications

- Synchronous MOSFET for Notebook Processor Power
- Synchronous Rectifier MOSFET for Isolated DC-DC Converters in Networking Systems

## Benefits

- Very Low  $R_{DS(on)}$  at 4.5V  $V_{GS}$
- Low Gate Charge
- Fully Characterized Avalanche Voltage and Current
- 100% Tested for  $R_G$
- Lead-Free

$V_{DSS}$	$R_{DS(on)}$ max	Qg (typ.)
30V	3.5mΩ @ $V_{GS} = 10V$	20nC



## Absolute Maximum Ratings

	Parameter	Max.	Units
$V_{DS}$	Drain-to-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	± 20	
$I_D$ @ $T_A = 25^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V	21	A
$I_D$ @ $T_A = 70^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V	17	
$I_{DM}$	Pulsed Drain Current ①	168	
$P_D$ @ $T_A = 25^\circ C$	Power Dissipation ④	2.5	W
$P_D$ @ $T_A = 70^\circ C$	Power Dissipation ④	1.6	
	Linear Derating Factor	0.02	W/°C
$T_J$	Operating Junction and	-55 to + 150	°C
$T_{STG}$	Storage Temperature Range		

## Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead ⑤	—	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④	—	50	

Notes ① through ⑤ are on page 10

## ORDERING INFORMATION:

See detailed ordering and shipping information on the last page of this data sheet.

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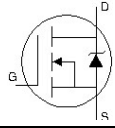
## Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

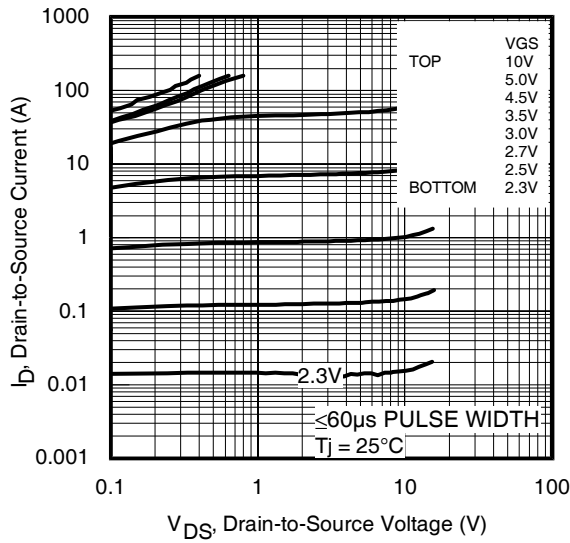
	Parameter	Min.	Typ.	Max.	Units	Conditions
$BV_{DSS}$	Drain-to-Source Breakdown Voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.023	—	V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	2.9	3.5	m $\Omega$	$V_{GS} = 10V, I_D = 21A$ ③
		—	4.2	5.1		$V_{GS} = 4.5V, I_D = 17A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	1.80	2.35	V	$V_{DS} = V_{GS}, I_D = 50\mu A$
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-6.5	—	mV/ $^\circ\text{C}$	
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	1.0	$\mu A$	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20V$
gfs	Forward Transconductance	85	—	—	S	$V_{DS} = 15V, I_D = 17A$
$Q_g$	Total Gate Charge	—	20	30	nC	$V_{DS} = 15V$ $V_{GS} = 4.5V$ $I_D = 17A$ See Figs. 16a & 16b
$Q_{gs1}$	Pre-Vth Gate-to-Source Charge	—	5.2	—		
$Q_{gs2}$	Post-Vth Gate-to-Source Charge	—	2.3	—		
$Q_{gd}$	Gate-to-Drain Charge	—	6.9	—		
$Q_{godr}$	Gate Charge Overdrive	—	5.4	—		
$Q_{sw}$	Switch Charge ( $Q_{gs2} + Q_{gd}$ )	—	9.2	—		
$Q_{oss}$	Output Charge	—	15	—	nC	$V_{DS} = 16V, V_{GS} = 0V$
$R_G$	Gate Resistance	—	1.7	3.1	$\Omega$	
$t_{d(on)}$	Turn-On Delay Time	—	13	—	ns	$V_{DD} = 15V, V_{GS} = 4.5V$ ③ $I_D = 17A$ $R_G = 1.8\Omega$ See Figs. 15a & 15b
$t_r$	Rise Time	—	16	—		
$t_{d(off)}$	Turn-Off Delay Time	—	15	—		
$t_f$	Fall Time	—	8.0	—		
$C_{iss}$	Input Capacitance	—	3175	—	pF	$V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1.0MHz$
$C_{oss}$	Output Capacitance	—	627	—		
$C_{rss}$	Reverse Transfer Capacitance	—	241	—		

## Avalanche Characteristics

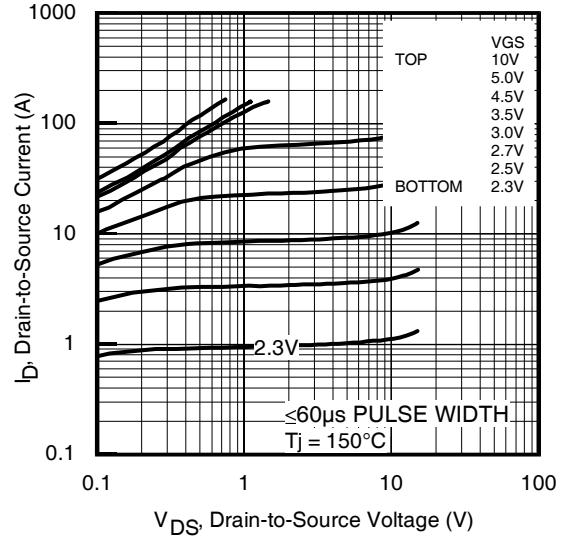
	Parameter	Typ.	Max.	Units
$E_{AS}$	Single Pulse Avalanche Energy ②	—	216	mJ
$I_{AR}$	Avalanche Current ①	—	17	A

## Diode Characteristics

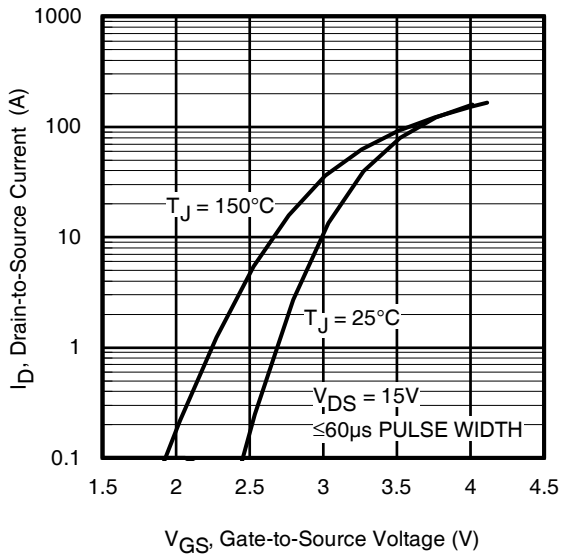
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	3.1	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	168		
$V_{SD}$	Diode Forward Voltage	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 17A, V_{GS} = 0V$ ③
$t_{rr}$	Reverse Recovery Time	—	20	30	ns	$T_J = 25^\circ\text{C}, I_F = 17A, V_{DD} = 15V$
$Q_{rr}$	Reverse Recovery Charge	—	25	38	nC	$di/dt = 345A/\mu s$ ③



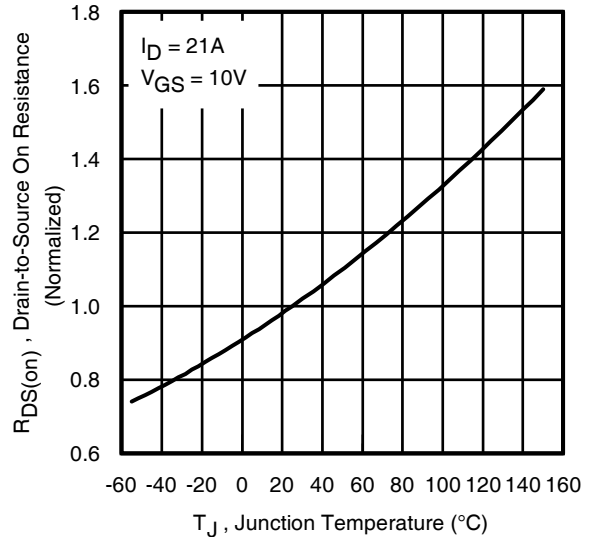
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics



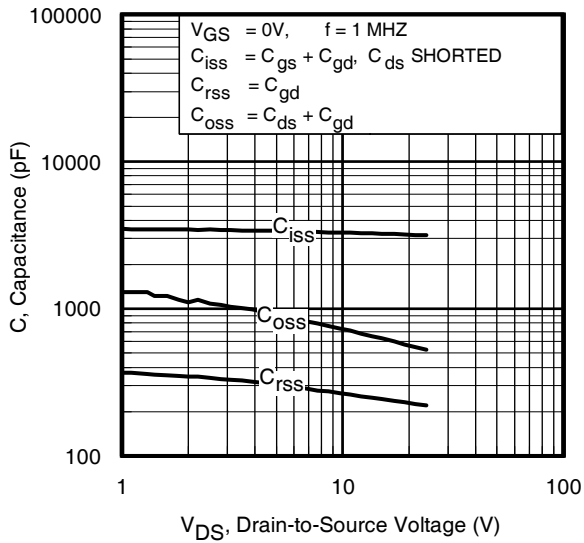
**Fig 3.** Typical Transfer Characteristics



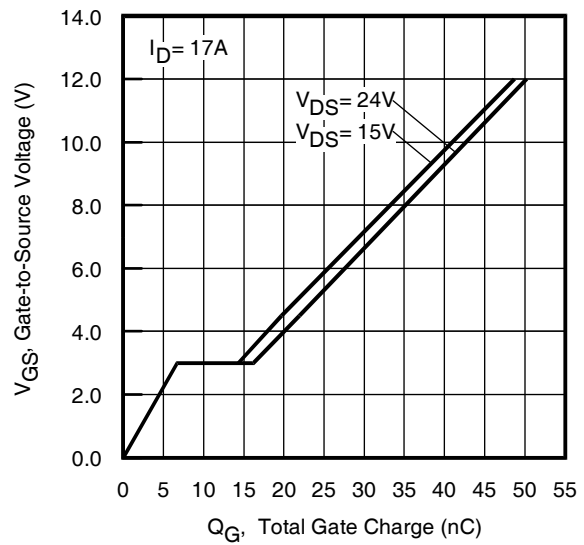
**Fig 4.** Normalized On-Resistance Vs. Temperature

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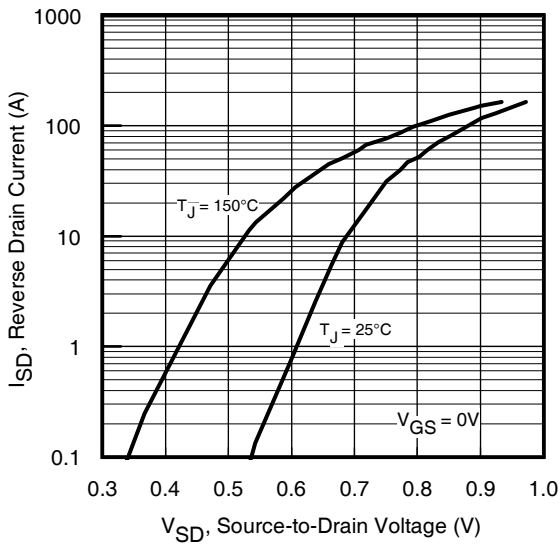
International  
**IR** Rectifier



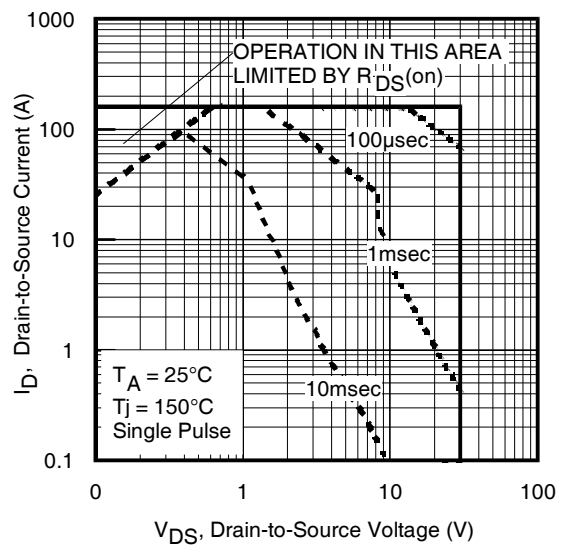
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



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



**Fig 8.** Maximum Safe Operating Area

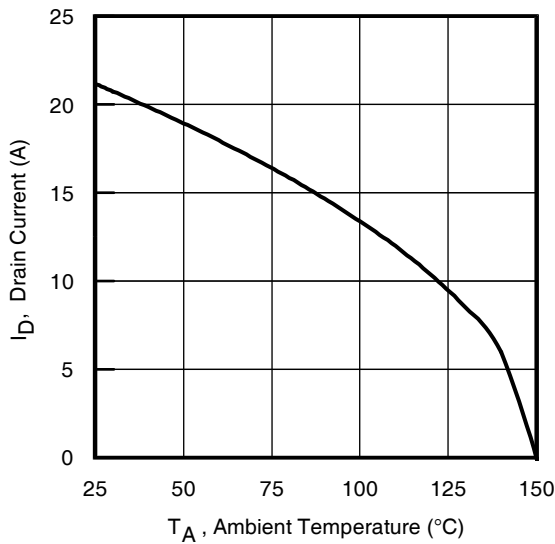


Fig 9. Maximum Drain Current Vs. Ambient Temperature

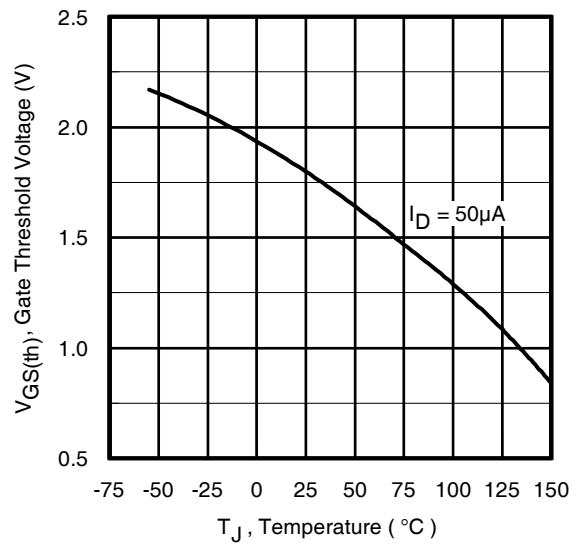


Fig 10. Threshold Voltage Vs. Temperature

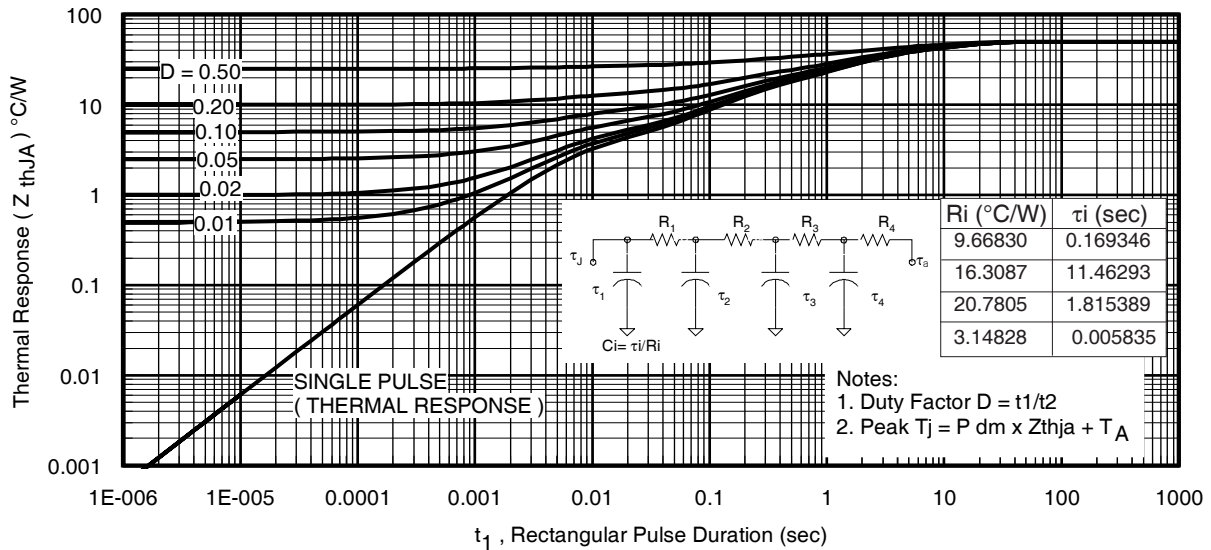
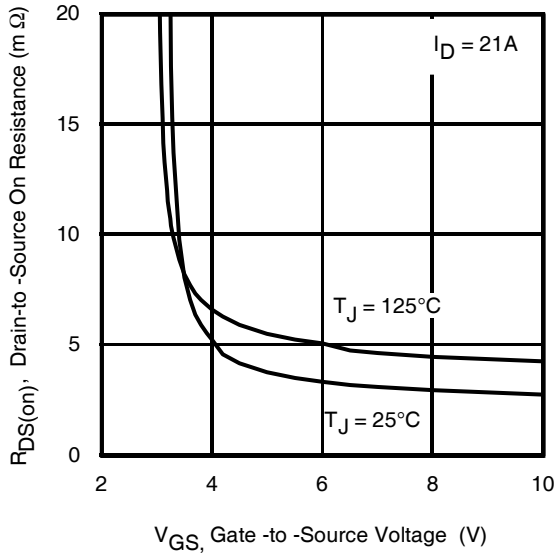


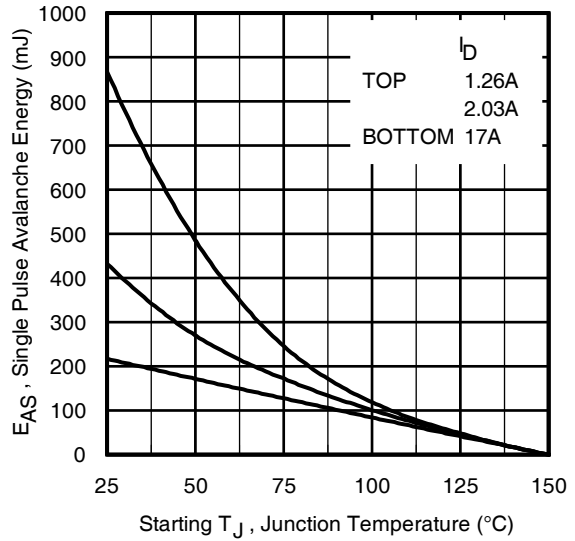
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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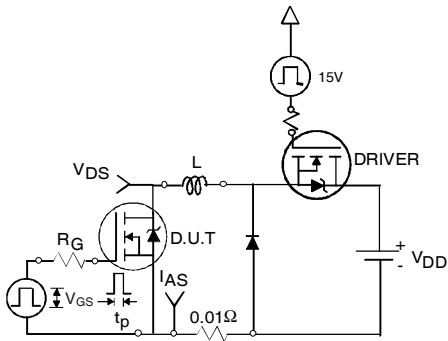
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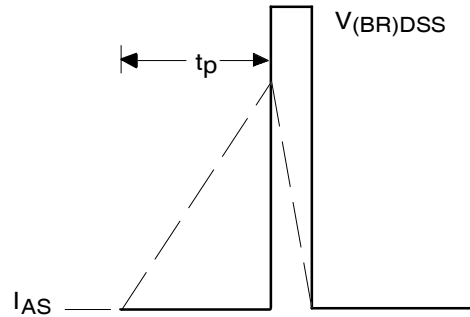
**Fig 12.** On-Resistance Vs. Gate Voltage



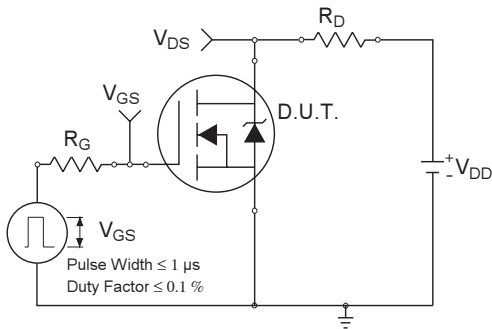
**Fig 13c.** Maximum Avalanche Energy Vs. Drain Current



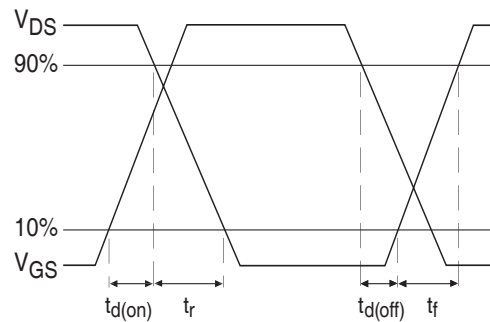
**Fig 14a.** Unclamped Inductive Test Circuit



**Fig 14b.** Unclamped Inductive Waveforms

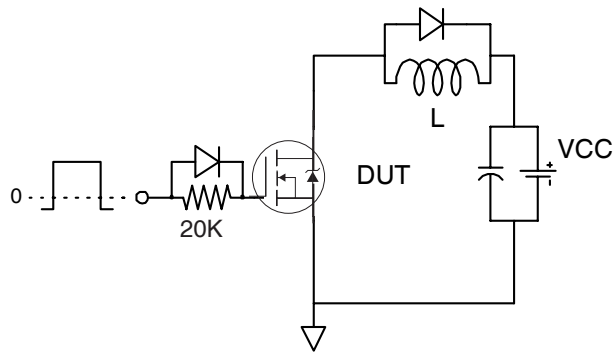


**Fig 15a.** Switching Time Test Circuit

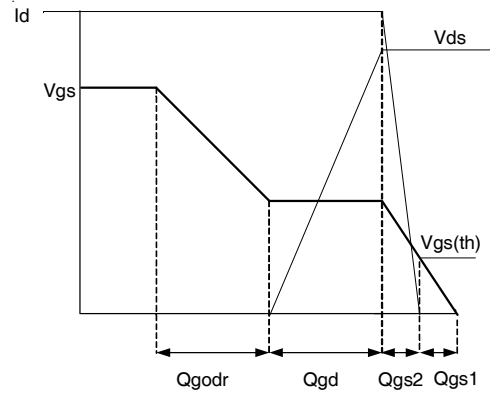


**Fig 15b.** Switching Time Waveforms

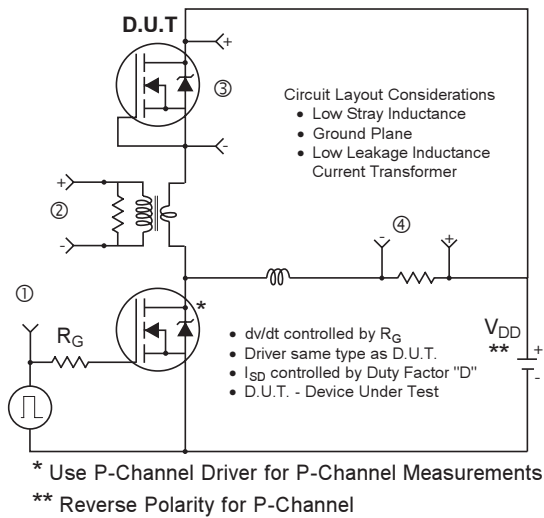
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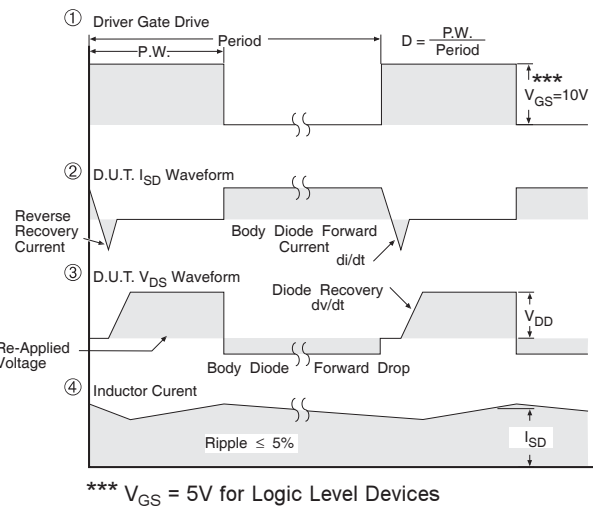
**Fig 16a.** Gate Charge Test Circuit



**Fig 16b.** Gate Charge Waveform



**Fig 17.** Diode Reverse Recovery Test Circuit for HEXFET® Power MOSFETs

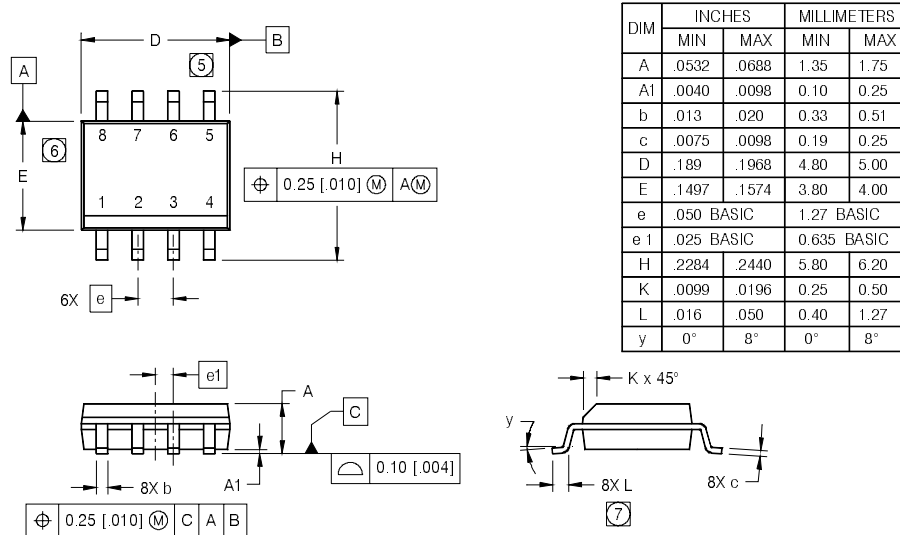


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## SO-8 Package Outline (Mofset & Fetky)

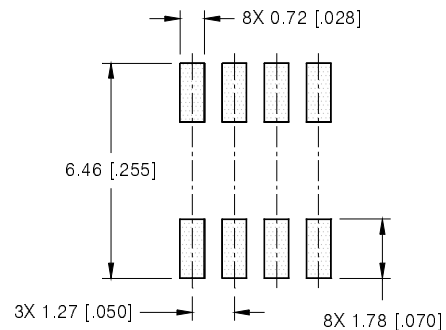
Dimensions are shown in millimeters (inches)



**NOTES:**

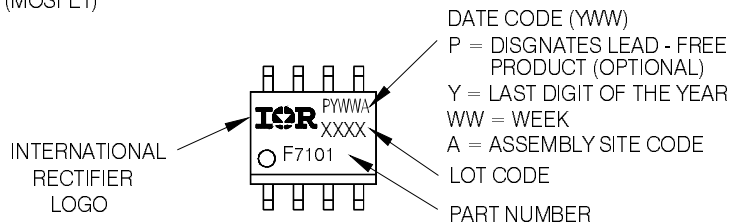
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
- ⑥ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.010].
- ⑦ DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

**FOOTPRINT**



## SO-8 Part Marking Information

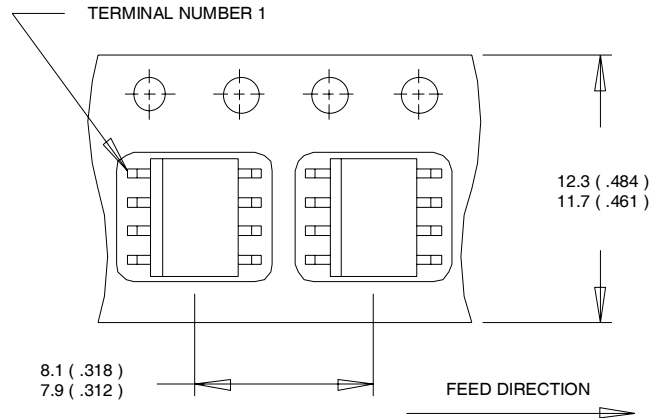
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



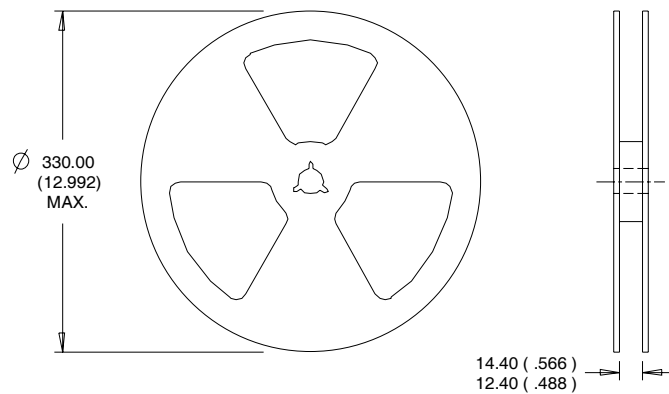
Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>



## SO-8 Tape and Reel (Dimensions are shown in millimeters (inches))



- NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
  2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
  3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



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

Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

# IRF8734PbF

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Orderable part number	Package Type	Standard Pack		Note
		Form	Quantity	
IRF8734PbF	SO-8	Tube/Bulk	95	
IRF8734TRPbF	SO-8	Tape and Reel	4000	

## Qualification Information<sup>†</sup>

Qualification level	Consumer <sup>††</sup>	
	(per JEDEC JESD47F <sup>†††</sup> guidelines)	
Moisture Sensitivity Level	SO-8	MSL1 (per 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.

**Note:** For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting  $T_J = 25^\circ\text{C}$ ,  $L = 1.69\text{mH}$   
 $R_G = 25\Omega$ ,  $I_{AS} = 16\text{A}$ .
- ③ Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ④ When mounted on 1 inch square copper board
- ⑤  $R_\theta$  is measured at  $T_J$  of approximately  $90^\circ\text{C}$ .

Data and specifications subject to change without notice

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**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
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