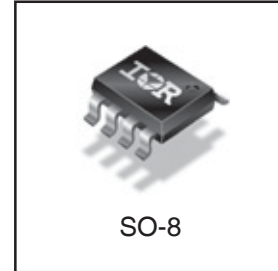
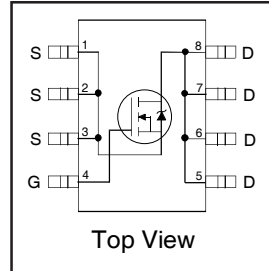


HEXFET® Power MOSFET

V_{DS}	30	V
$R_{DS(on) \max}$ (@ $V_{GS} = 10V$)	8.5	mΩ
Q_g (typical)	8.3	nC
I_D (@ $T_A = 25^\circ C$)	14	A



Applications

- Control MOSFET of Sync-Buck Converters used for Notebook Processor Power
- Control MOSFET for Isolated DC-DC Converters in Networking Systems

Features

Industry-standard pinout SO-8 Package
Compatible with Existing Surface Mount Techniques
RoHS Compliant, Halogen-Free
MSL1, Industrial qualification

⇒

Benefits

Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF8721PbF-1	SO-8	Tube/Bulk	95	IRF8721PbF-1
		Tape and Reel	4000	IRF8721TRPbF-1

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, $V_{GS} @ 10V$	14	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	11	
I_{DM}	Pulsed Drain Current ①	110	
$P_D @ T_A = 25^\circ C$	Power Dissipation	2.5	W
$P_D @ T_A = 70^\circ C$	Power Dissipation	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 ③	—	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④ ⑤	—	50	

Notes ① through ⑤ are on page 9

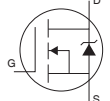
Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV _{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.021	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	6.9	8.5	mΩ	V _{GS} = 10V, I _D = 14A ③
		—	10.6	12.5		V _{GS} = 4.5V, I _D = 11A ③
V _{GS(th)}	Gate Threshold Voltage	1.35	—	2.35	V	V _{DS} = V _{GS} , I _D = 25μA
ΔV _{GS(th)}	Gate Threshold Voltage Coefficient	—	-6.2	—	mV/°C	
I _{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	V _{DS} = 24V, V _{GS} = 0V
		—	—	150		V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V _{GS} = -20V
g _{fs}	Forward Transconductance	27	—	—	S	V _{DS} = 15V, I _D = 11A
Q _g	Total Gate Charge	—	8.3	12	nC	V _{DS} = 15V V _{GS} = 4.5V I _D = 11A See Fig. 16a and 16b
Q _{gs1}	Pre-V _{th} Gate-to-Source Charge	—	2.0	—		
Q _{gs2}	Post-V _{th} Gate-to-Source Charge	—	1.0	—		
Q _{gd}	Gate-to-Drain Charge	—	3.2	—		
Q _{godr}	Gate Charge Overdrive	—	2.0	—		
Q _{sw}	Switch Charge (Q _{gs2} + Q _{gd})	—	4.2	—	nC	V _{DS} = 16V, V _{GS} = 0V
Q _{oss}	Output Charge	—	5.0	—		
R _G	Gate Resistance	—	1.8	3.0	Ω	
t _{d(on)}	Turn-On Delay Time	—	8.2	—	ns	V _{DD} = 15V, V _{GS} = 4.5V I _D = 11A R _G = 1.8Ω See Fig. 15a
t _r	Rise Time	—	11	—		
t _{d(off)}	Turn-Off Delay Time	—	8.1	—		
t _f	Fall Time	—	7.0	—		
C _{iss}	Input Capacitance	—	1040	—	pF	V _{GS} = 0V V _{DS} = 15V f = 1.0MHz
C _{oss}	Output Capacitance	—	229	—		
C _{rss}	Reverse Transfer Capacitance	—	114	—		

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy ②	—	68	mJ
I _{AR}	Avalanche Current ①	—	11	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	—	—	112		
V _{SD}	Diode Forward Voltage	—	—	1.0	V	T _J = 25°C, I _S = 11A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	—	14	21	ns	T _J = 25°C, I _F = 11A, V _{DD} = 15V
Q _{rr}	Reverse Recovery Charge	—	15	23	nC	di/dt = 300A/μs ③
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

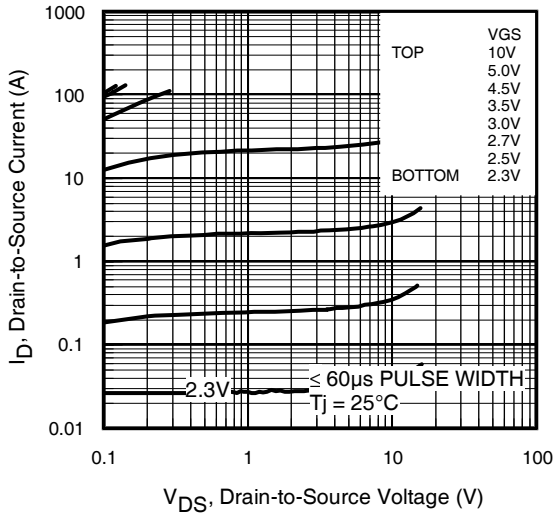


Fig 1. Typical Output Characteristics

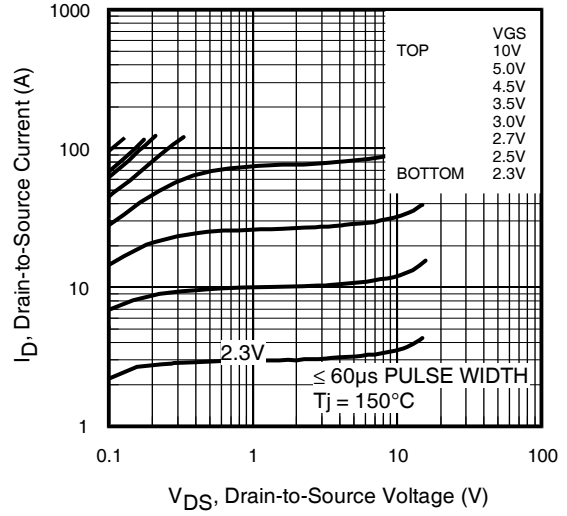


Fig 2. Typical Output Characteristics

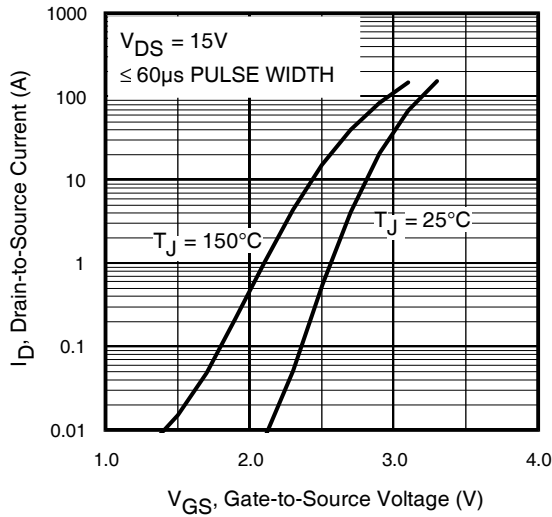


Fig 3. Typical Transfer Characteristics

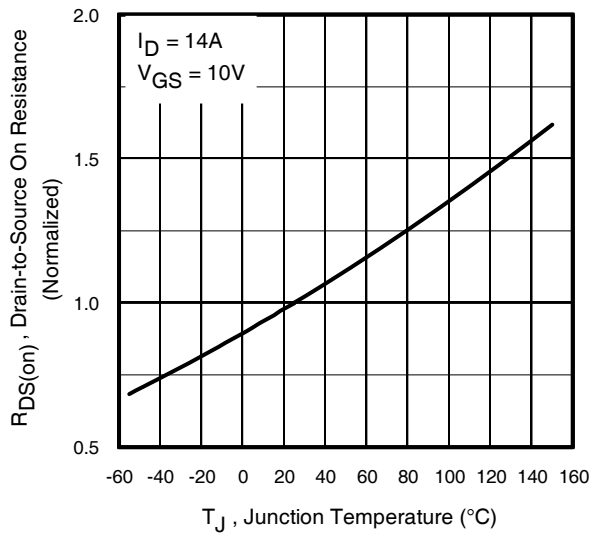
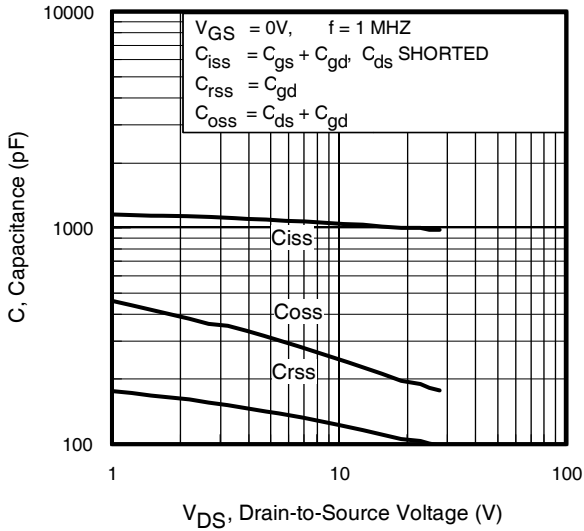
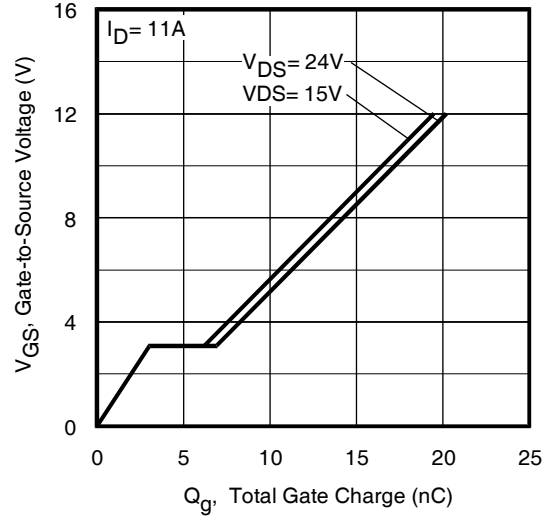
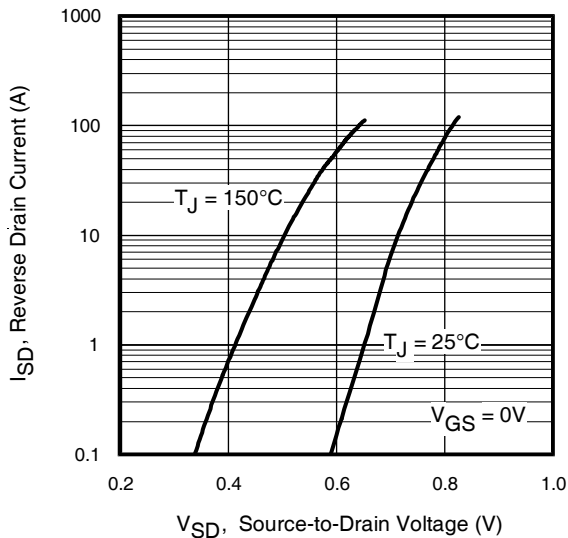
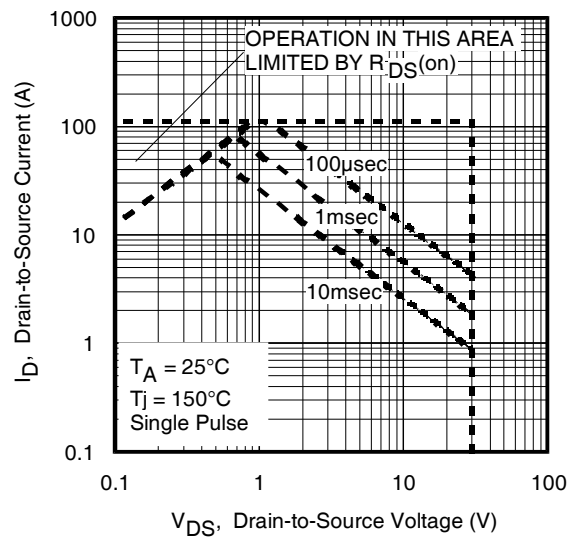


Fig 4. Normalized On-Resistance Vs. Temperature


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

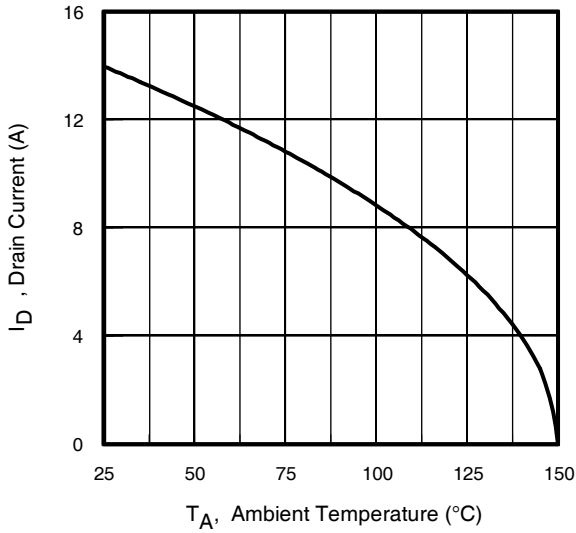


Fig 9. Maximum Drain Current Vs. Case Temperature

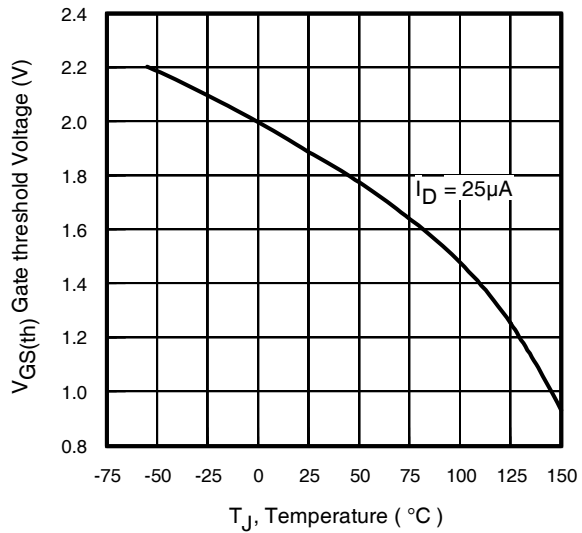


Fig 10. Threshold Voltage Vs. Temperature

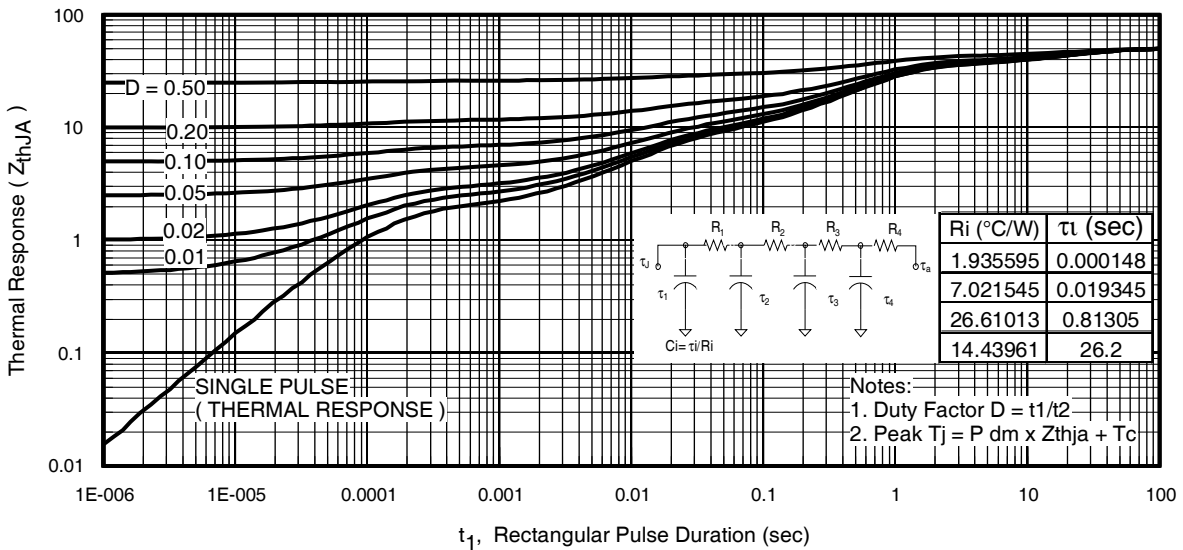
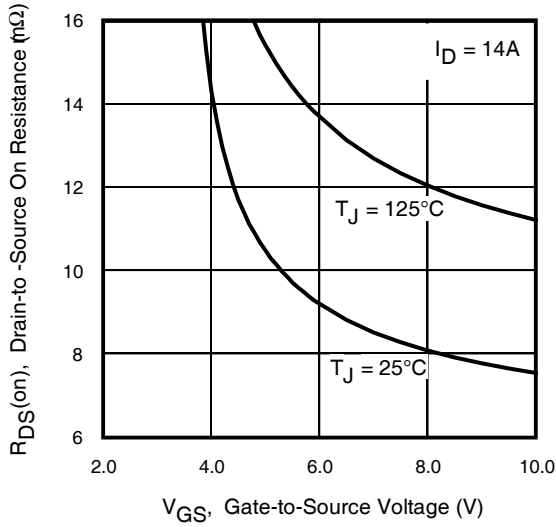
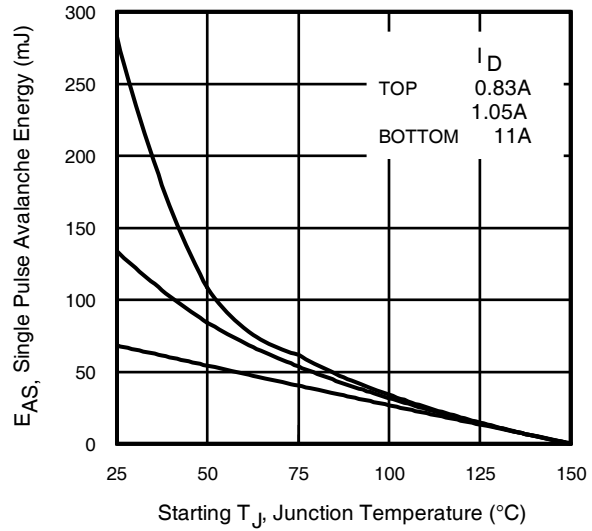
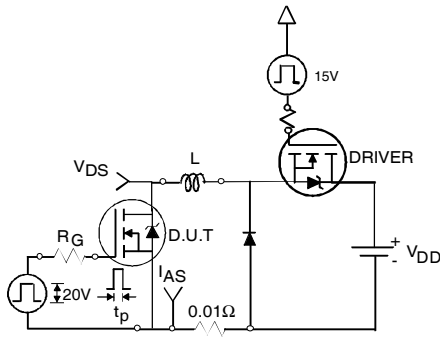
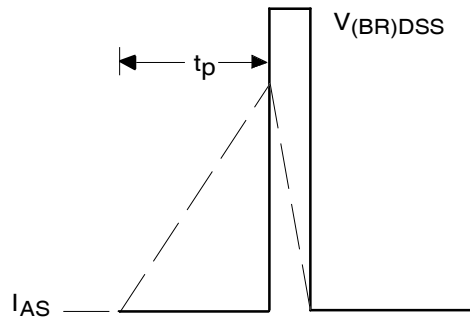
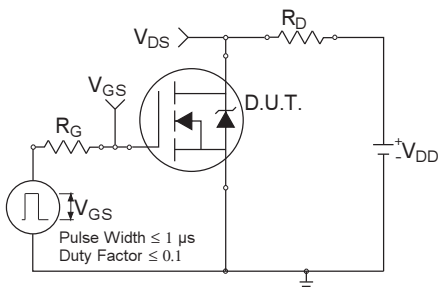
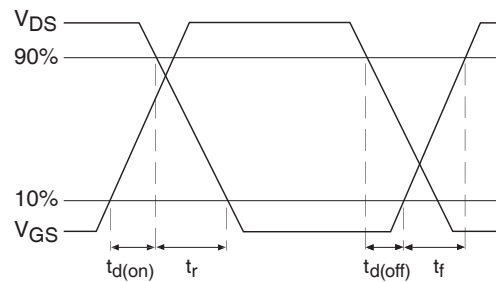
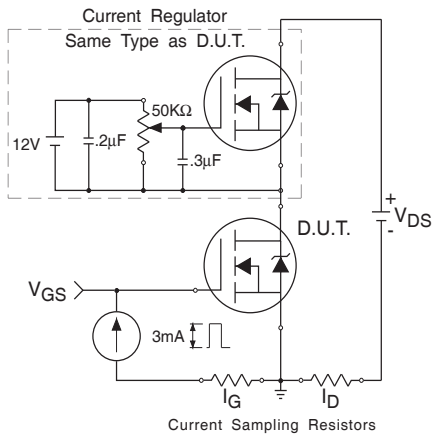
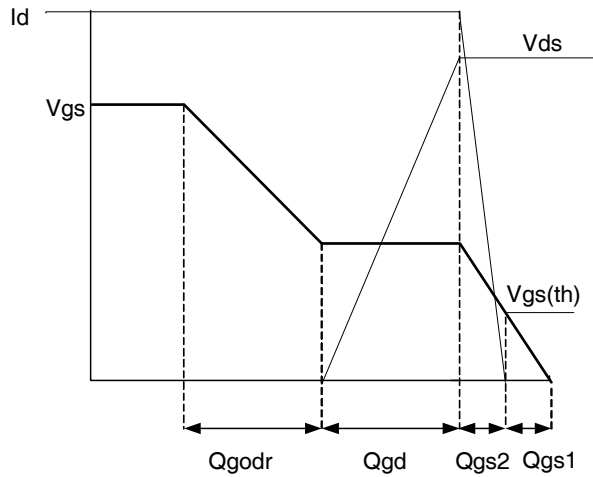
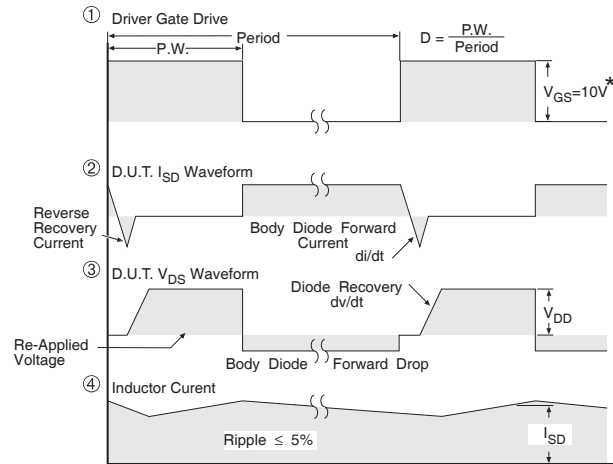
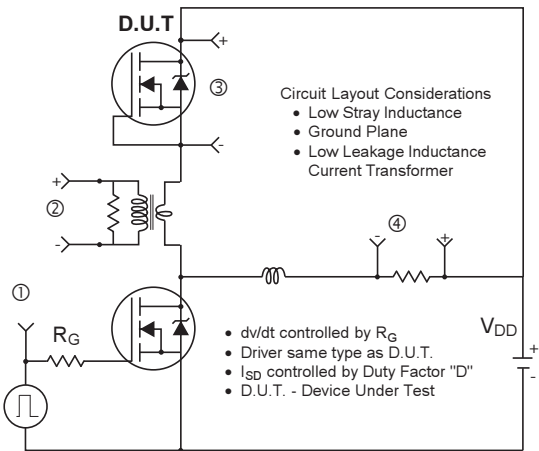


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


Fig 12. On-Resistance vs. Gate Voltage

Fig 13. 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

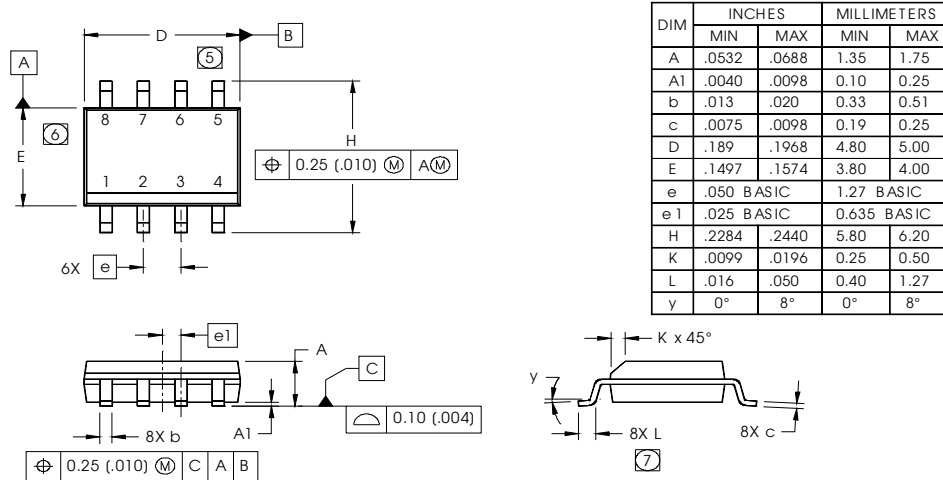

Fig 16a. Gate Charge Test Circuit

Fig 16b. Gate Charge Waveform


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

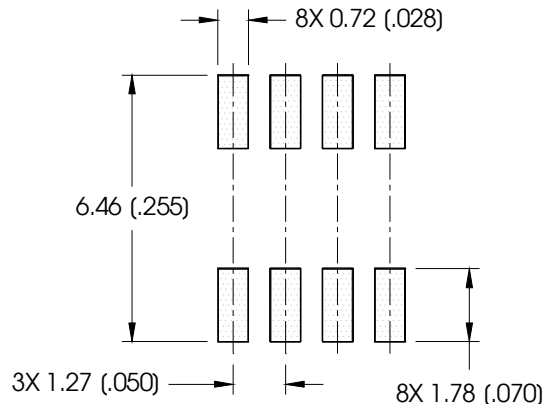
Fig 17. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET[®] Power MOSFETs

SO-8 Package Outline

Dimensions are shown in millimeters (inches)



FOOTPRINT

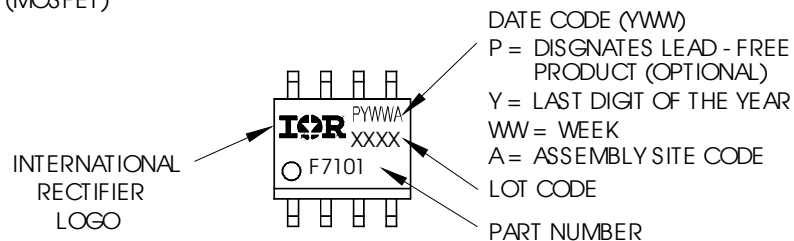


NOTES:

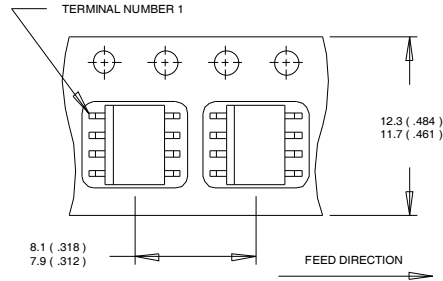
- DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
- CONTROLLING DIMENSION: MILLIMETER
- DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
- OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- 5 DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- 6 DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.010).
- 7 DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

SO-8 Part Marking Information

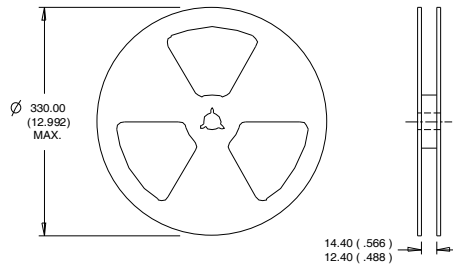
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



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/>

Qualification information[†]

Qualification level	Industriid (per JEDEC JESD47F ^{††} guidelines)	
Moisture Sensitivity Level	SO-8	MSL1 (per JEDEC J-STD-020D ^{††})
RoHS compliant	Yes	

[†] Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability>

^{††} Applicable version of JEDEC standard at the time of product release

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 1.09\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 11\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board.
- ⑤ R_θ is measured at T_J of approximately 90°C .

International
 Rectifier

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 To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>