

IRF7910TRPBF Datasheet



DiGi Electronics Part Number	IRF7910TRPBF-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	IRF7910TRPBF
Description	MOSFET 2N-CH 12V 10A 8SO
Detailed Description	Mosfet Array 12V 10A 2W Surface Mount 8-SO

<https://www.DiGi-Electronics.com>



Tel: +00 852-30501935

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Purchase and inquiry

Manufacturer Product Number:

IRF7910TRPBF

Series:

HEXFET®

Technology:

MOSFET (Metal Oxide)

FET Feature:

Logic Level Gate

Current - Continuous Drain (Id) @ 25°C:

10A

Vgs(th) (Max) @ Id:

2V @ 250µA

Input Capacitance (Ciss) (Max) @ Vds:

1730pF @ 6V

Operating Temperature:

-55°C ~ 150°C (Tj)

Package / Case:

8-SOIC (0.154", 3.90mm Width)

Base Product Number:

IRF7910

Manufacturer:

Infineon Technologies

Product Status:

Obsolete

Configuration:

2 N-Channel (Dual)

Drain to Source Voltage (Vdss):

12V

Rds On (Max) @ Id, Vgs:

15mOhm @ 8A, 4.5V

Gate Charge (Qg) (Max) @ Vgs:

26nC @ 4.5V

Power - Max:

2W

Mounting Type:

Surface Mount

Supplier Device Package:

8-SO

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

IRF7910PbF

HEXFET® Power MOSFET

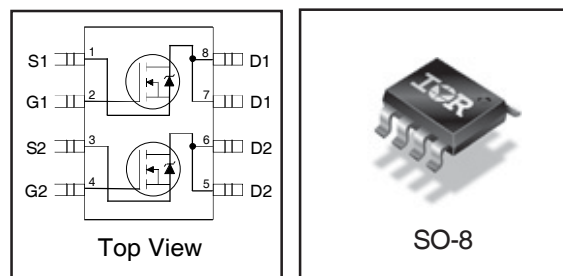
Applications

- High Frequency 3.3V and 5V input Point-of-Load Synchronous Buck Converters for Netcom and Computing Applications
- Power Management for Netcom, Computing and Portable Applications
- Lead-Free

Benefits

- Ultra-Low Gate Impedance
- Very Low $R_{DS(on)}$
- Fully Characterized Avalanche Voltage and Current

V_{DSS}	$R_{DS(on)}$ max	I_D
12V	15m Ω @ $V_{GS} = 4.5V$	10A

**Absolute Maximum Ratings**

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	12	V
V_{GS}	Gate-to-Source Voltage	± 12	V
I_D @ $T_A = 25^\circ C$	Continuous Drain Current, V_{GS} @ 4.5V	10	A
I_D @ $T_A = 70^\circ C$	Continuous Drain Current, V_{GS} @ 4.5V	7.9	
I_{DM}	Pulsed Drain Current ^①	79	
P_D @ $T_A = 25^\circ C$	Maximum Power Dissipation ^④	2.0	W
P_D @ $T_A = 70^\circ C$	Maximum Power Dissipation ^④	1.3	W
	Linear Derating Factor	16	mW/ $^\circ C$
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	$^\circ C$

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead	—	42	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient ^④	—	62.5	

Notes ^① through ^④ are on page 8
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Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	12	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.01	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	11.5	15	mΩ	$V_{GS} = 4.5V, I_D = 8.0A$ ③
		—	20	50		$V_{GS} = 2.8V, I_D = 5.0A$
$V_{GS(th)}$	Gate Threshold Voltage	0.6	—	2.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	100	μA	$V_{DS} = 9.6V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 9.6V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	200	nA	$V_{GS} = 12V$
	Gate-to-Source Reverse Leakage	—	—	-200		$V_{GS} = -12V$

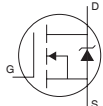
Dynamic @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	18	—	—	S	$V_{DS} = 6.0V, I_D = 8.0A$
Q_g	Total Gate Charge	—	17	26	nC	$I_D = 8.0A$
Q_{gs}	Gate-to-Source Charge	—	4.4	—		$V_{DS} = 6.0V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	5.2	—		$V_{GS} = 4.5V$
Q_{oss}	Output Gate Charge	—	16	—		$V_{GS} = 0V, V_{DS} = 10V$
$t_{d(on)}$	Turn-On Delay Time	—	9.4	—	ns	$V_{DD} = 6.0V$
t_r	Rise Time	—	22	—		$I_D = 8.0A$
$t_{d(off)}$	Turn-Off Delay Time	—	16	—		$R_G = 1.8\Omega$
t_f	Fall Time	—	6.3	—		$V_{GS} = 4.5V$ ③
C_{iss}	Input Capacitance	—	1730	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	1340	—		$V_{DS} = 6.0V$
C_{rss}	Reverse Transfer Capacitance	—	330	—		$f = 1.0\text{MHz}$

Avalanche Characteristics

Symbol	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	—	100	mJ
I_{AR}	Avalanche Current①	—	8.0	A

Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	1.8	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	79		
V_{SD}	Diode Forward Voltage	—	0.85	1.3	V	$T_J = 25^\circ\text{C}, I_S = 8.0A, V_{GS} = 0V$ ③
		—	0.70	—		$T_J = 125^\circ\text{C}, I_S = 8.0A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	50	75	ns	$T_J = 25^\circ\text{C}, I_F = 8.0A, V_R = 12V$
Q_{rr}	Reverse Recovery Charge	—	60	90	nC	$di/dt = 100A/\mu s$ ③
t_{rr}	Reverse Recovery Time	—	51	77	ns	$T_J = 125^\circ\text{C}, I_F = 8.0A, V_R = 12V$
Q_{rr}	Reverse Recovery Charge	—	60	90	nC	$di/dt = 100A/\mu s$ ③

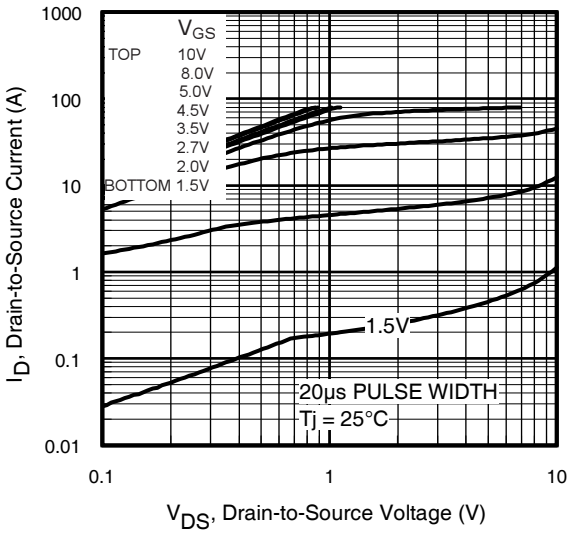


Fig 1. Typical Output Characteristics

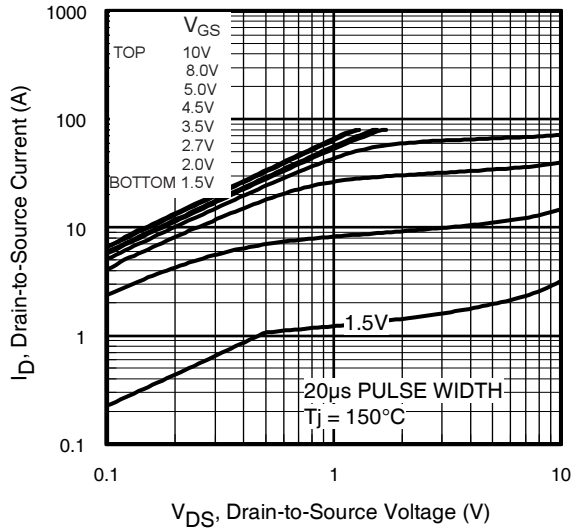


Fig 2. Typical Output Characteristics

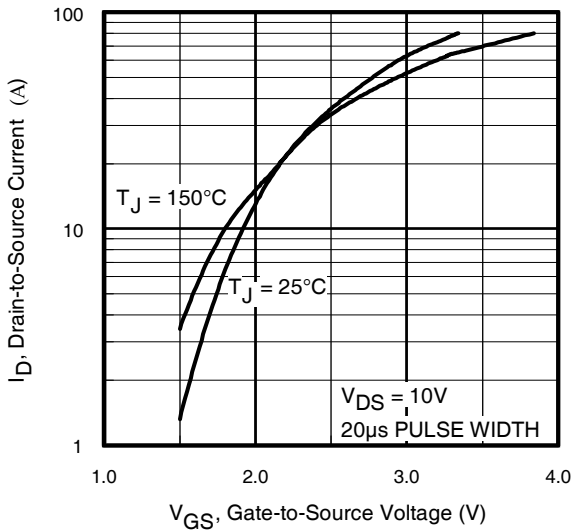


Fig 3. Typical Transfer Characteristics

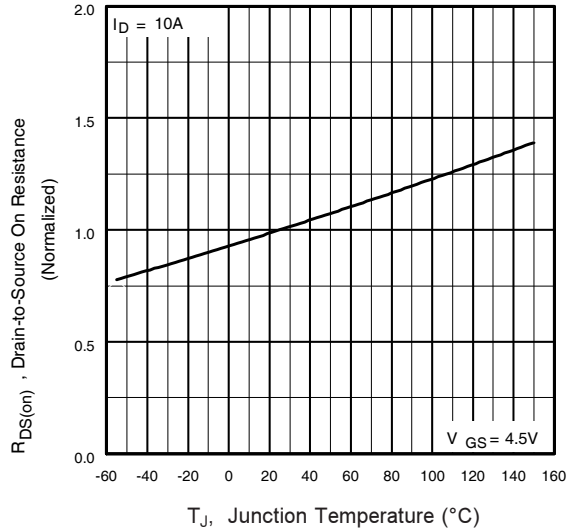


Fig 4. Normalized On-Resistance Vs. Temperature

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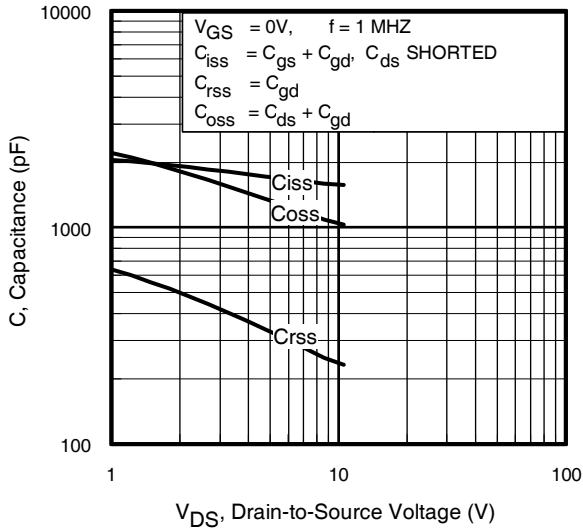


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

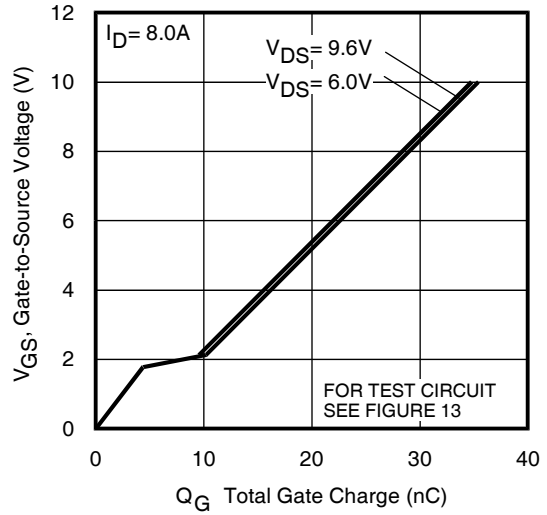


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

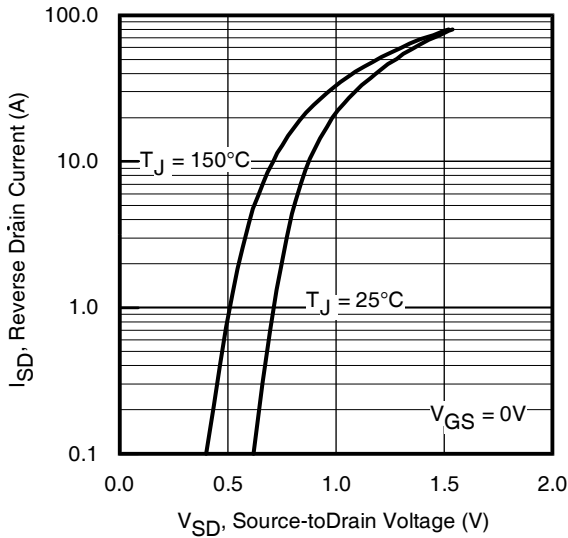


Fig 7. Typical Source-Drain Diode Forward Voltage

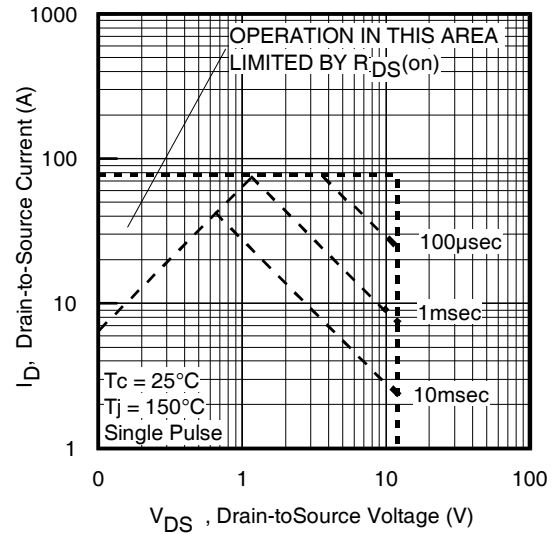


Fig 8. Maximum Safe Operating Area

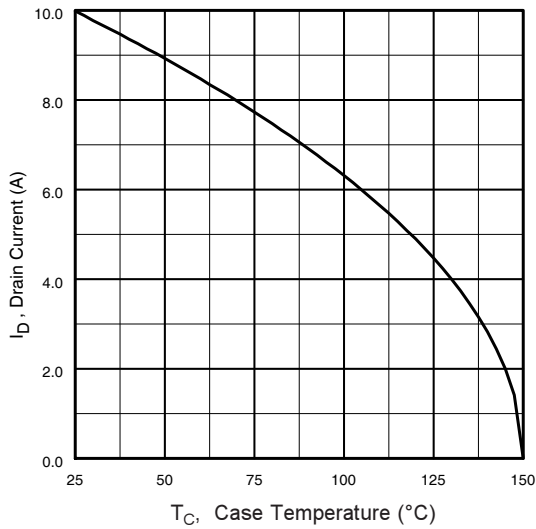


Fig 9. Maximum Drain Current Vs. Ambient Temperature

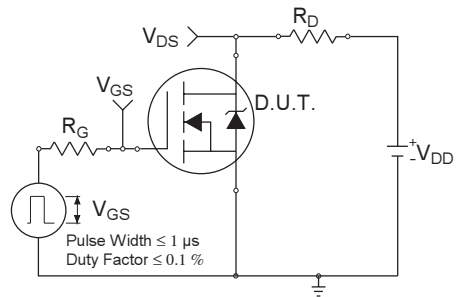


Fig 10a. Switching Time Test Circuit

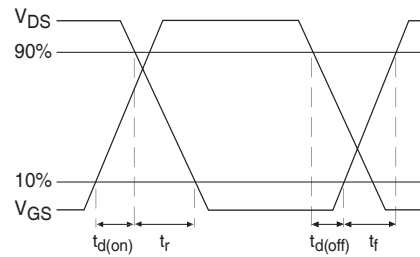


Fig 10b. Switching Time Waveforms

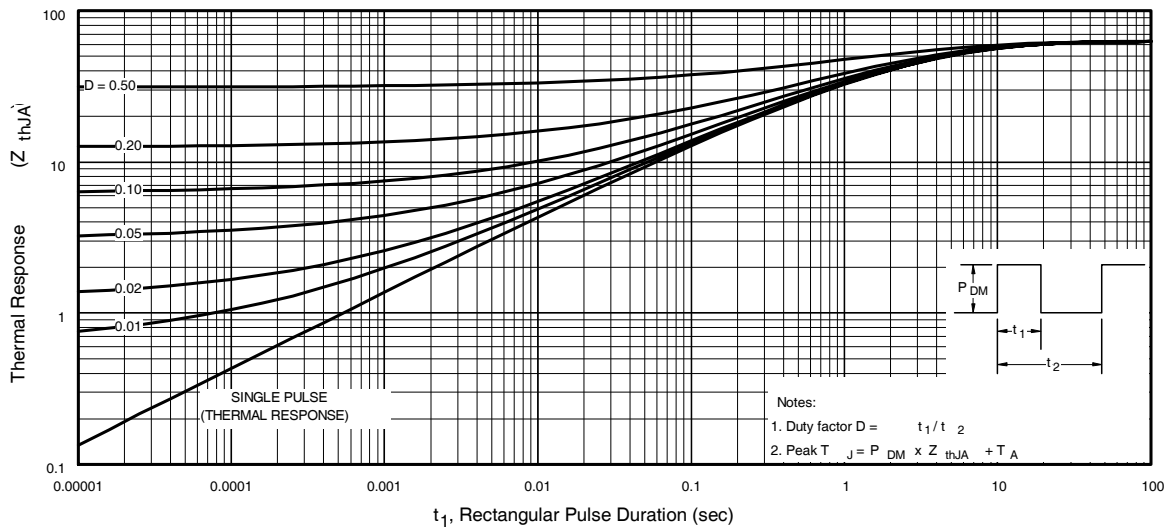


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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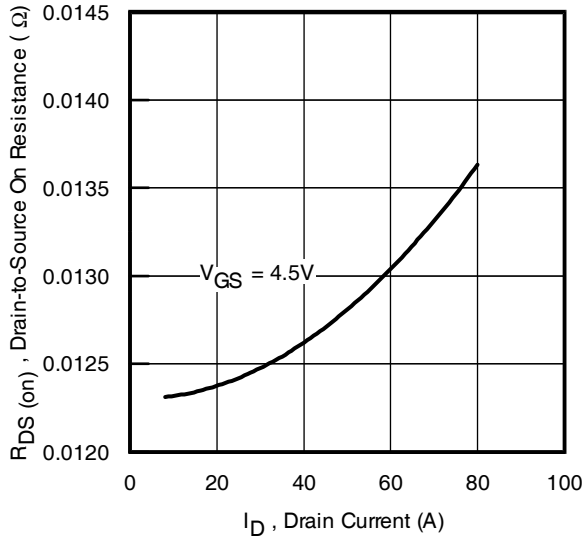


Fig 12. On-Resistance Vs. Drain Current

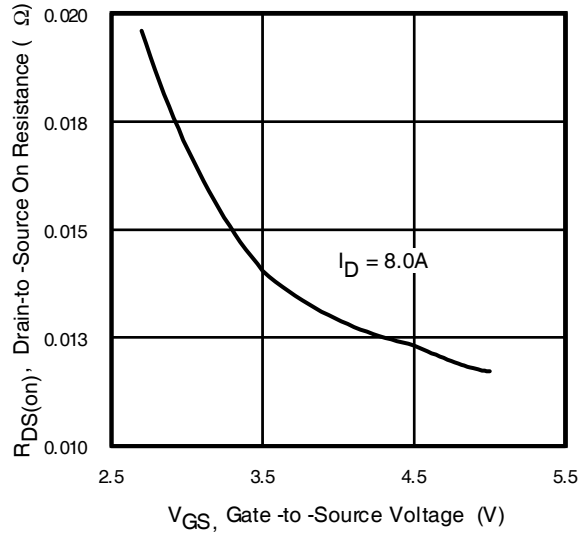


Fig 13. On-Resistance Vs. Gate Voltage

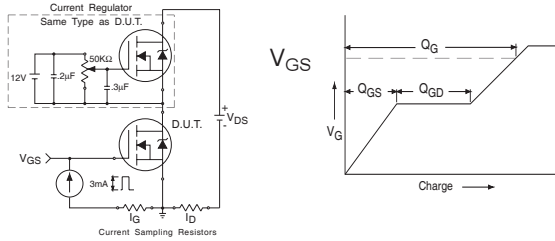


Fig 14a&b. Basic Gate Charge Test Circuit and Waveform

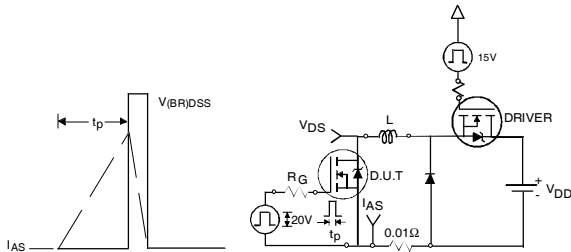


Fig 15a&b. Unclamped Inductive Test circuit and Waveforms

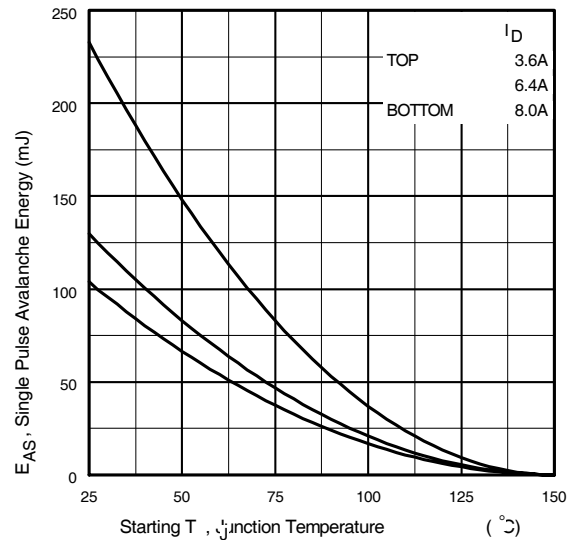
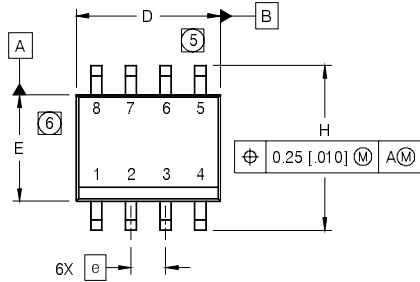


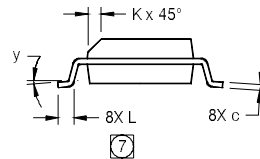
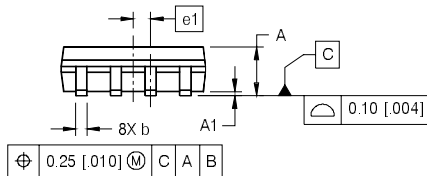
Fig 15c. Maximum Avalanche Energy Vs. Drain Current

SO-8 Package Outline (Mosfet & Fetky)

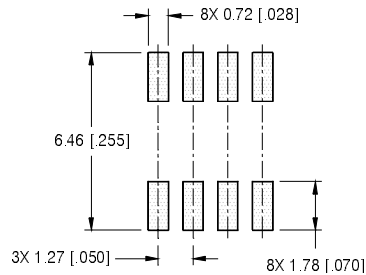
Dimensions are shown in millimeters (inches)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°



FOOTPRINT

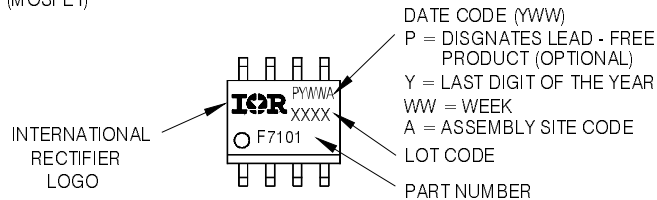


NOTES:

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.

SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)



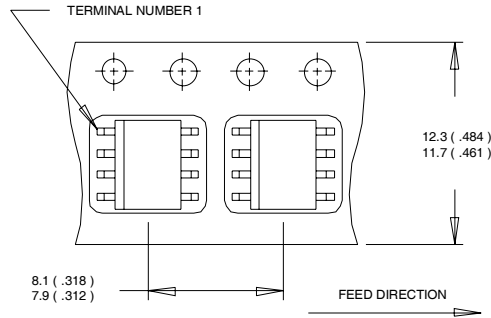
Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>
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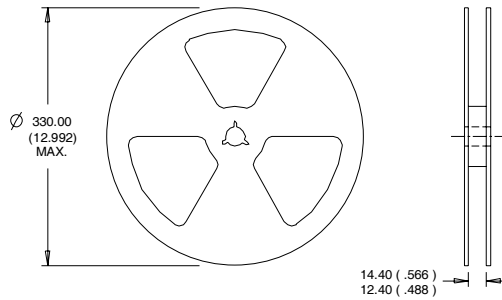
SO-8 Tape and Reel

Dimensions are shown in millimeters (inches)

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- 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/>

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 3.2\text{mH}$
 $R_G = 25\Omega$, $I_{AS} = 8.0\text{A}$.
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board, $t < 10$ sec

Data and specifications subject to change without notice.
This product has been designed and qualified for the Consumer market.
Qualifications Standards can be found on IR's Web site.

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