

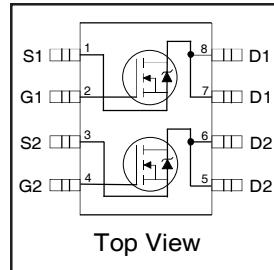
International **IR** Rectifier

PD -95037B

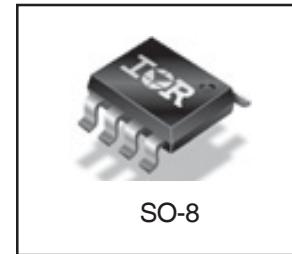
IRF7103PbF

HEXFET® Power MOSFET

- Advanced Process Technology
- Ultra Low On-Resistance
- Dual N-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Dynamic dv/dt Rating
- Fast Switching
- Lead-Free



$V_{DSS} = 50V$
 $R_{DS(on)} = 0.130\Omega$
 $I_D = 3.0A$



Description

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics and dual-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.

Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	3.0	
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	2.3	A
I_{DM}	Pulsed Drain Current ①	10	
$P_D @ T_A = 25^\circ C$	Power Dissipation	2.0	W
	Linear Derating Factor	0.016	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt ②	4.5	V/nS
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

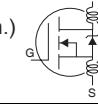
Thermal Resistance Ratings

	Parameter	Min.	Typ.	Max.	Units
$R_{θJA}$	Maximum Junction-to-Ambient ④	—	—	62.5	°C/W

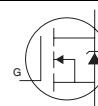
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Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(\text{BR})\text{DSS}}$	Drain-to-Source Breakdown Voltage	50	—	—	V	$V_{\text{GS}} = 0\text{V}$, $I_D = 250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}/\Delta T_J}$	Breakdown Voltage Temp. Coefficient	—	0.049	—	$\text{V}/^\circ\text{C}$	Reference to 25°C , $I_D = 1\text{mA}$
$R_{\text{DS}(\text{ON})}$	Static Drain-to-Source On-Resistance	—	0.11	0.13	Ω	$V_{\text{GS}} = 10\text{V}$, $I_D = 3.0\text{A}$ ③
		—	0.16	0.20		$V_{\text{GS}} = 4.5\text{V}$, $I_D = 1.5\text{A}$ ③
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	1.0	—	3.0	V	$V_{\text{DS}} = V_{\text{GS}}$, $I_D = 250\mu\text{A}$
g_{fs}	Forward Transconductance	—	3.8	—	S	$V_{\text{DS}} = 15\text{V}$, $I_D = 3.0\text{A}$ ③
I_{DSS}	Drain-to-Source Leakage Current	—	—	2.0	μA	$V_{\text{DS}} = 40\text{V}$, $V_{\text{GS}} = 0\text{V}$
		—	—	25		$V_{\text{DS}} = 40\text{V}$, $V_{\text{GS}} = 0\text{V}$, $T_J = 55^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{\text{GS}} = 20\text{V}$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{\text{GS}} = -20\text{V}$
Q_g	Total Gate Charge	—	12	30	nC	$I_D = 2.0\text{A}$
Q_{gs}	Gate-to-Source Charge	—	1.2	—		$V_{\text{DS}} = 25\text{V}$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	3.5	—		$V_{\text{GS}} = 10\text{V}$ ③
$t_{\text{d}(\text{on})}$	Turn-On Delay Time	—	9.0	20	ns	$V_{\text{DD}} = 25\text{V}$
t_r	Rise Time	—	8.0	20		$I_D = 1.0\text{A}$
$t_{\text{d}(\text{off})}$	Turn-Off Delay Time	—	45	70		$R_G = 6.0\Omega$
t_f	Fall Time	—	25	50		$R_D = 25\Omega$ ③
L_D	Internal Drain Inductance	—	4.0	—	nH	Between lead, 6mm(0.25in.) from package and center of die contact
L_S	Internal Source Inductance	—	6.0	—		
C_{iss}	Input Capacitance	—	290	—	pF	$V_{\text{GS}} = 0\text{V}$
C_{oss}	Output Capacitance	—	140	—		$V_{\text{DS}} = 25\text{V}$
C_{rss}	Reverse Transfer Capacitance	—	37	—		$f = 1.0\text{MHz}$

Source-Drain Ratings and 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	—	—	12		
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$T_J = 25^\circ\text{C}$, $I_S = 1.5\text{A}$, $V_{\text{GS}} = 0\text{V}$ ③
t_{rr}	Reverse Recovery Time	—	70	100	ns	$T_J = 25^\circ\text{C}$, $I_F = 1.5\text{A}$
Q_{rr}	Reverse Recovery Charge	—	110	170	nC	$di/dt = 100\text{A}/\mu\text{s}$ ③
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

② $I_{\text{SD}} \leq 1.8\text{A}$, $di/dt \leq 90\text{A}/\mu\text{s}$, $V_{\text{DD}} \leq V_{(\text{BR})\text{DSS}}$, $T_J \leq 150^\circ\text{C}$

④ Surface mounted on FR-4 board, $t \leq 10\text{sec}$.

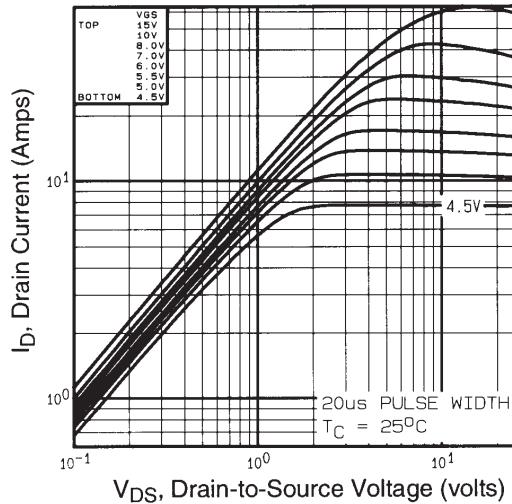


Fig 1. Typical Output Characteristics,

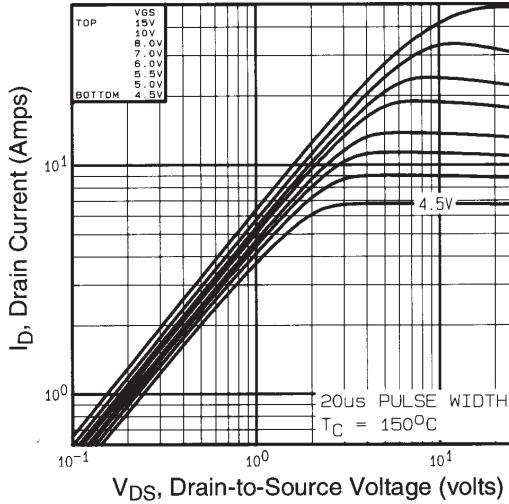


Fig 2. Typical Output Characteristics,

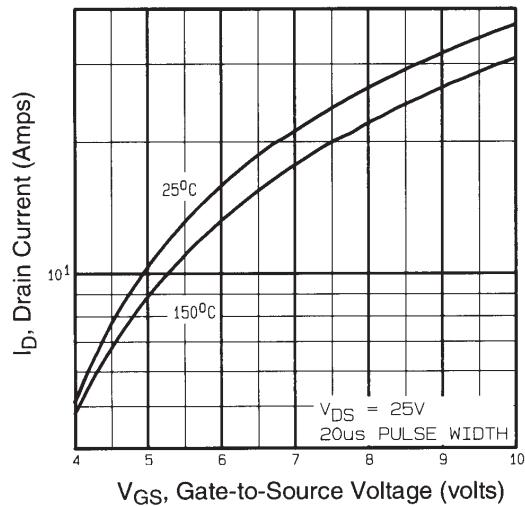


Fig 3. Typical Transfer Characteristics

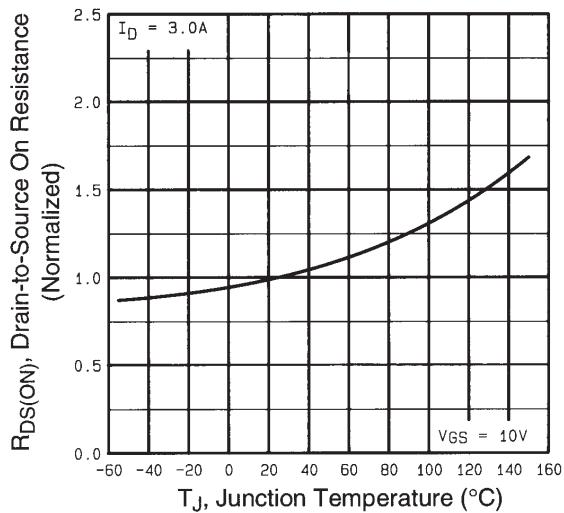


Fig 4. Normalized On-Resistance
 Vs. Temperature

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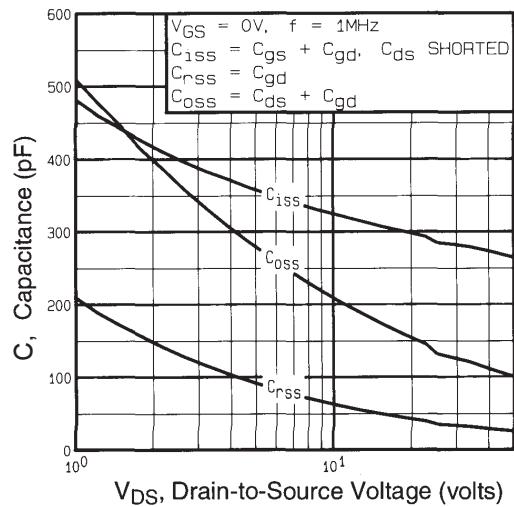


Fig 5. Typical Capacitance Vs.
Drain-to-Source Voltage

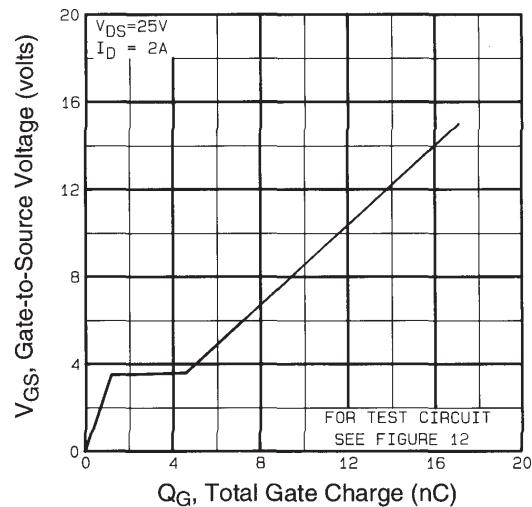


Fig 6. Typical Gate Charge Vs.
Gate-to-Source Voltage

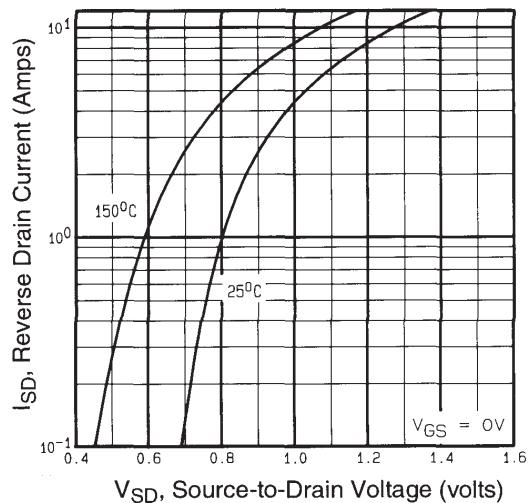


Fig 7. Typical Source-Drain Diode
Forward Voltage

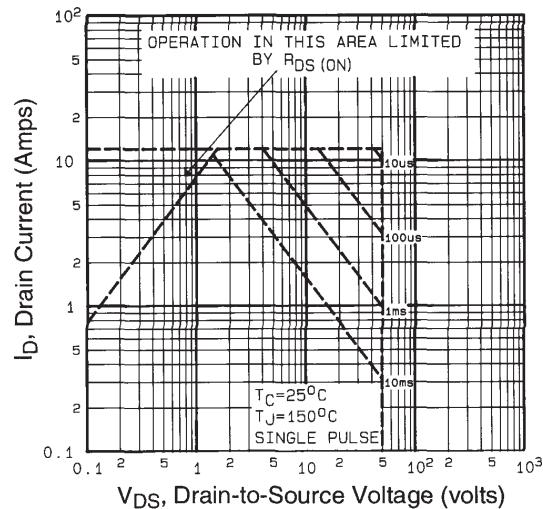


Fig 8. Maximum Safe Operating Area

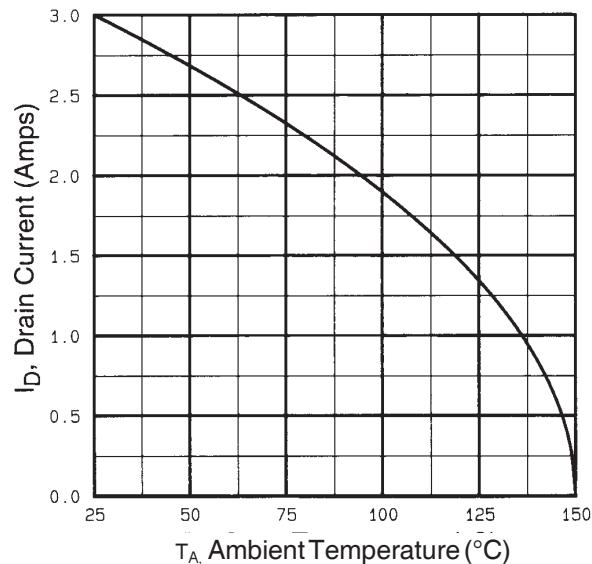


Fig 9. Maximum Drain Current Vs.
 Ambient Temperature

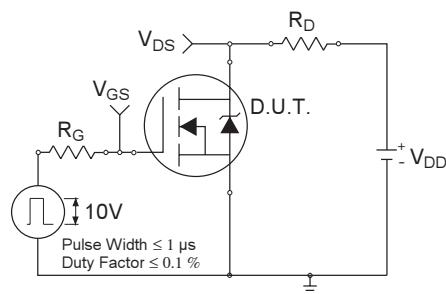


Fig 10a. Switching Time Test Circuit

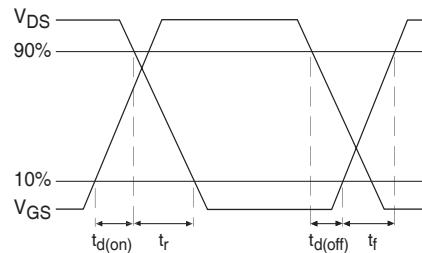


Fig 10b. Switching Time Waveforms

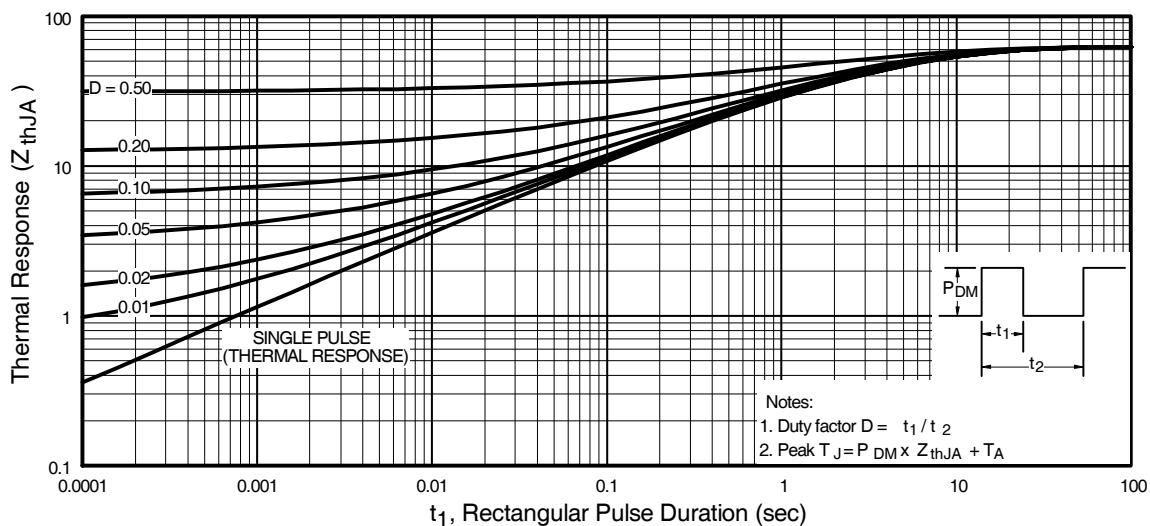


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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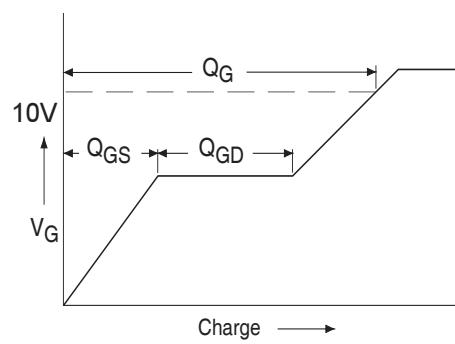


Fig 12a. Basic Gate Charge Waveform

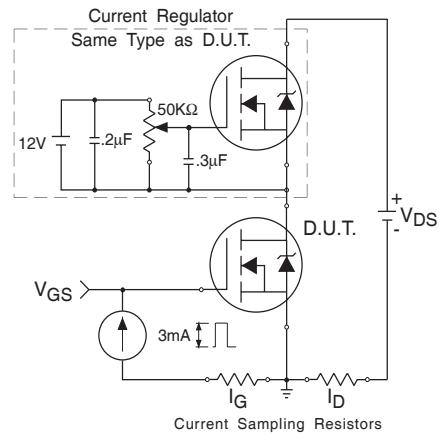


Fig 12b. Gate Charge Test Circuit

Peak Diode Recovery dv/dt Test Circuit

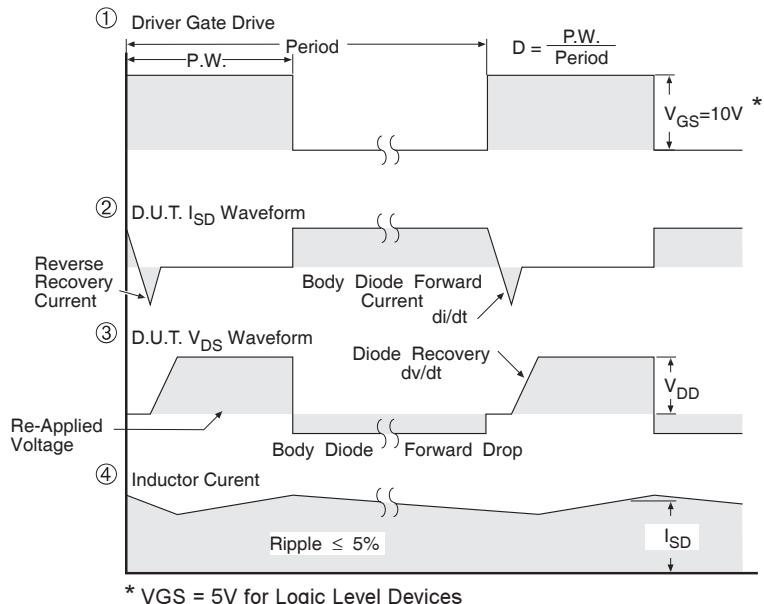
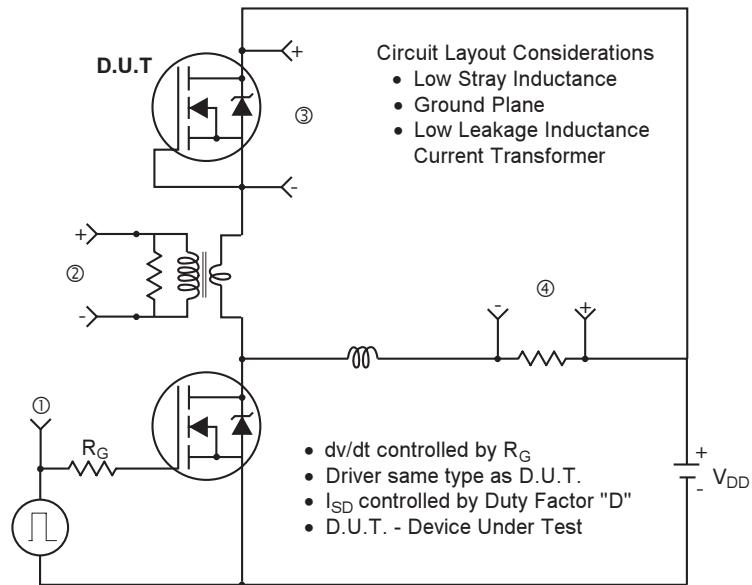


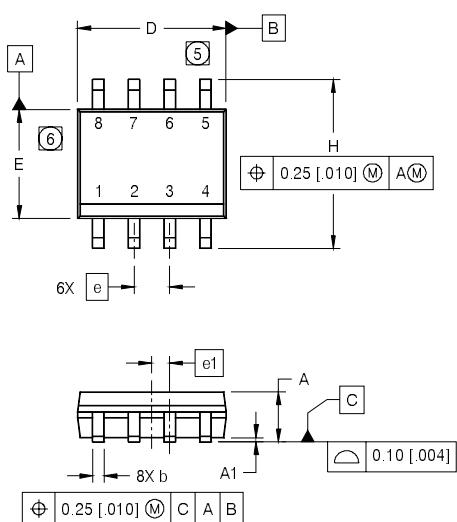
Fig 13. For N-Channel HEXFETs

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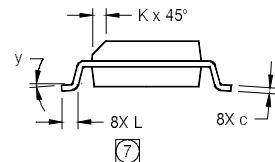
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SO-8 Package Outline (Mosfet & Fetky)

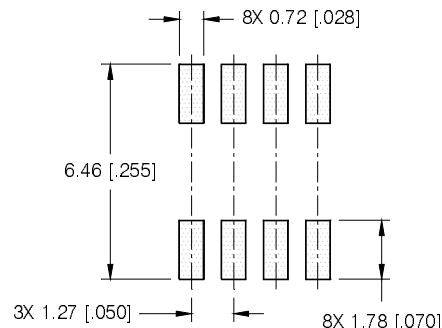
Dimensions are shown in millimeters (inches)



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°

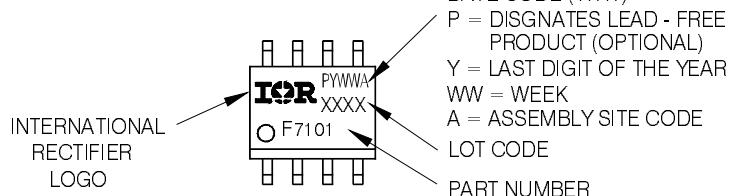


FOOTPRINT



SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

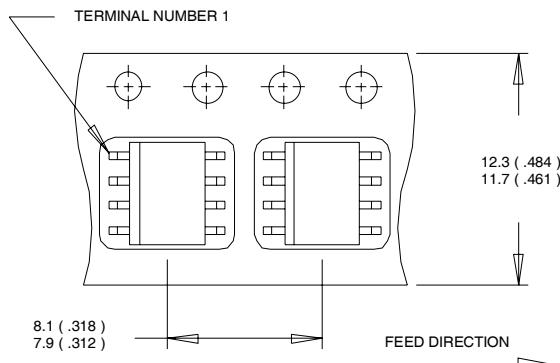


Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

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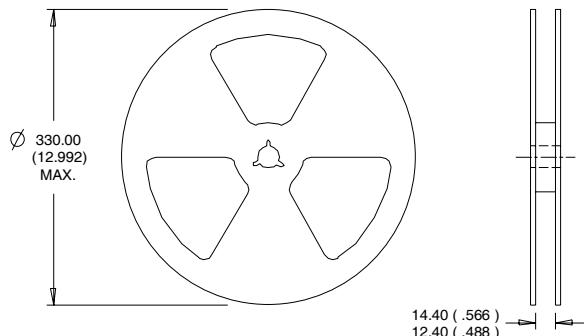
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SO-8 Tape and Reel (Dimensions are shown in millimeters (inches))



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.

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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