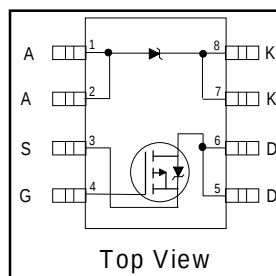


PRELIMINARY

IRF7324D1

FETKY™ MOSFET / Schottky Diode

- Co-packaged HEXFET® Power MOSFET and Schottky Diode
- Ideal for Mobile Phone Applications
- Generation V Technology
- SO-8 Footprint



$$V_{DSS} = -20V$$

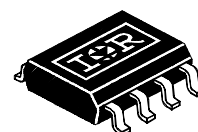
$$R_{DS(on)} = 0.18\Omega$$

$$\text{Schottky } V_f = 0.39V$$

Description

The FETKY™ family of co-packaged HEXFETs and Schottky diodes offer the designer an innovative board space saving solution for switching regulator applications. Generation 5 HEXFETs utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. Combining this technology with International Rectifier's low forward drop Schottky rectifiers results in an extremely efficient device suitable for use in a wide variety of portable electronics applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics. The SO-8 package is designed for vapor phase, infrared or wave soldering techniques.



SO-8

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Maximum	Units
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS}@4.5V^{(4)}$	-2.9	A
$I_D @ T_A = 70^\circ\text{C}$		-2.3	
I_{DM}		-23	
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation ⁽⁴⁾	2.0	W
$P_D @ T_A = 70^\circ\text{C}$		1.3	
	Linear Derating Factor	16	mW/°C
V_{GS}	Gate-to-Source Voltage	± 12	V
dv/dt	Peak Diode Recovery dv/dt ⁽²⁾	-5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C

Thermal Resistance Ratings

Parameter		Maximum	Units
$R_{\theta JA}$	Junction-to-Ambient ⁽⁴⁾	62.5	°C/W

Notes:

- ① Repetitive rating; pulse width limited by maximum junction temperature (see figure 11)
- ② $I_{SD} \leq -2.2A$, $di/dt \leq -50A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$
- ③ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$
- ④ Surface mounted on FR-4 board, $t \leq 10\text{sec}$.

MOSFET Electrical Characteristics @ T_j = 25°C (unless otherwise specified)

Parameter		Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	0.070	0.180	Ω	V _{GS} = -4.5V, I _D = -2.9A ③
		—	0.115	0.375		V _{GS} = -2.7V, I _D = -2.5A ③
V _{GS(th)}	Gate Threshold Voltage	-0.70	—	—	V	V _{DS} = V _{GS} , I _D = -250μA
g _{fs}	Forward Transconductance	4.0	—	—	S	V _{DS} = -16V, I _D = -2.2A
I _{DSS}	Drain-to-Source Leakage Current	—	—	-1.0	μA	V _{DS} = -16V, V _{GS} = 0V
		—	—	-25		V _{DS} = -16V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	V _{GS} = -12V
	Gate-to-Source Reverse Leakage	—	—	100		V _{GS} = 12V
Q _g	Total Gate Charge	—	15	22	nC	I _D = -2.2A
Q _{gs}	Gate-to-Source Charge	—	2.2	3.3		V _{DS} = -16V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	6.0	9.0		V _{GS} = -4.5V (see figure 10) ③
t _{d(on)}	Turn-On Delay Time	—	8.4	—	ns	V _{DD} = -10V
t _r	Rise Time	—	26	—		I _D = -2.2A
t _{d(off)}	Turn-Off Delay Time	—	51	—		R _G = 6.0Ω
t _f	Fall Time	—	33	—		R _D = 4.5Ω ③
C _{iss}	Input Capacitance	—	610	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	310	—		V _{DS} = -15V
C _{rss}	Reverse Transfer Capacitance	—	170	—		f = 1.0MHz (see figure 9)

MOSFET Source-Drain Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	-2.0	A	
I _{SM}	Pulsed Source Current (Body Diode)	—	—	-23		
V _{SD}	Body Diode Forward Voltage	—	—	-1.2	V	T _J = 25°C, I _S = -2.0A, V _{GS} = 0V
t _{rr}	Reverse Recovery Time (Body Diode)	—	43	65	ns	T _J = 25°C, I _F = -2.3A
Q _{rr}	Reverse Recovery Charge	—	44	66	nC	di/dt = 100A/μs ③

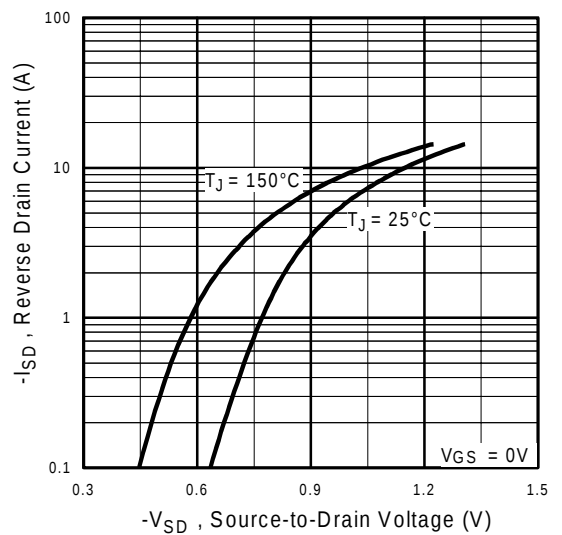
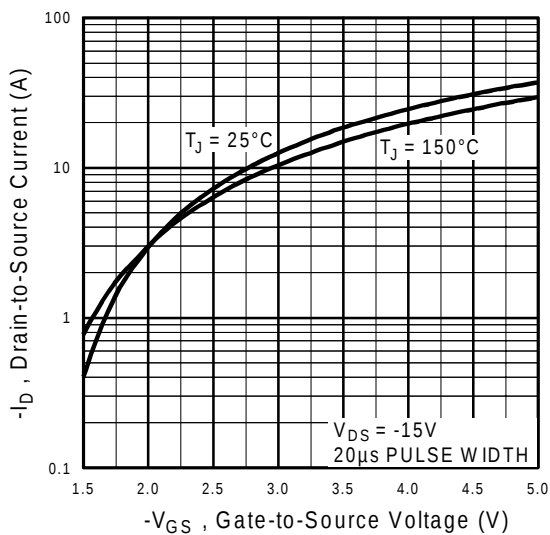
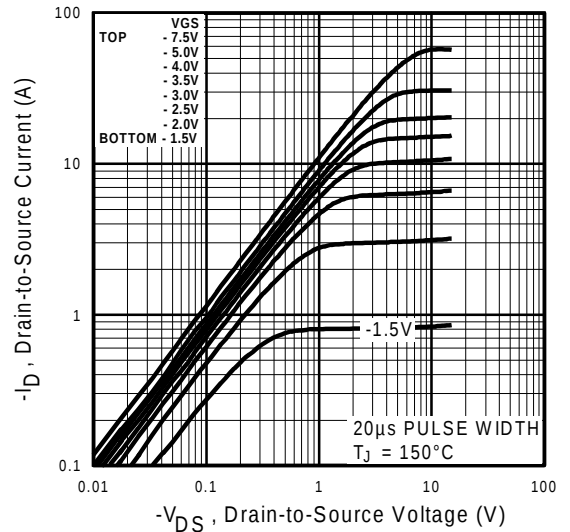
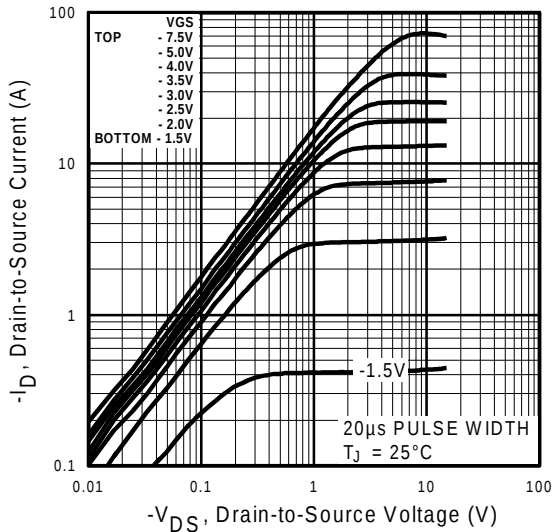
Schottky Diode Maximum Ratings

	Parameter	Max.	Units	Conditions	
I _{F(av)}	Max. Average Forward Current	1.7	A	50% Duty Cycle. Rectangular Wave, T _A = 25°C	
		1.2		T _A = 70°C	
I _{SM}	Max. peak one cycle Non-repetitive Surge current	120	A	5μs sine or 3μs Rect. pulse	Following any rated load condition & with V _{RRM} applied
		11		10ms sine or 6ms Rect. pulse	

Schottky Diode Electrical Specifications

	Parameter	Max.	Units	Conditions	
V _{FM}	Max. Forward voltage drop	0.50	V	I _F = 1.0A, T _J = 25°C	
		0.62		I _F = 2.0A, T _J = 25°C	
		0.39		I _F = 1.0A, T _J = 125°C	
		0.57		I _F = 2.0A, T _J = 125°C	
I _{RM}	Max. Reverse Leakage current	0.05	mA	V _R = 20V	T _J = 25°C
		10			T _J = 125°C
C _t	Max. Junction Capacitance	92	pF	V _R = 5Vdc (100kHz to 1 MHz) 25°C	
dv/dt	Max. Voltage Rate of Charge	3600	V/ μs	Rated V _R	

Power Mosfet Characteristics



Power Mosfet Characteristics

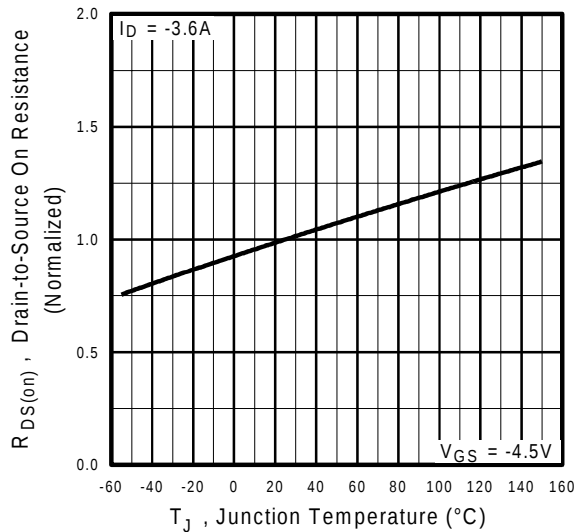


Fig 5. Normalized On-Resistance Vs. Temperature

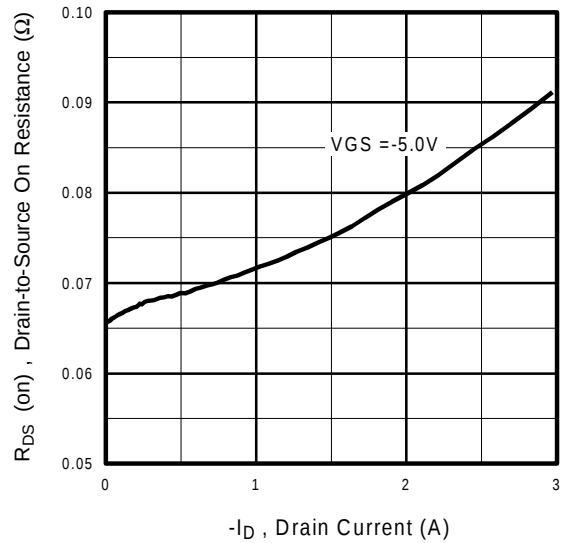


Fig 6. Typical On-Resistance Vs. Drain Current

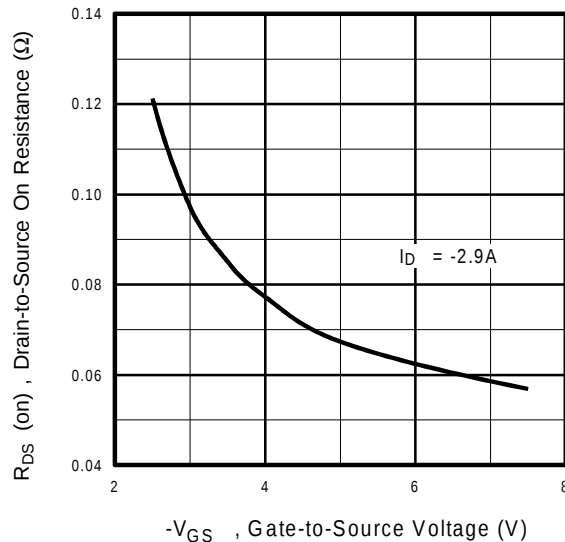


Fig 7. Typical On-Resistance Vs. Gate Voltage

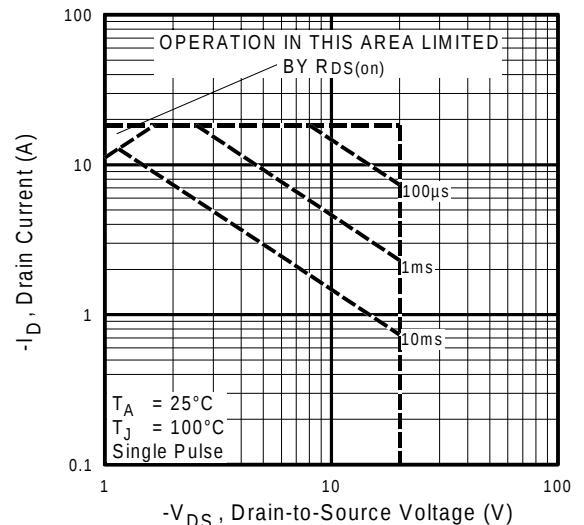


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

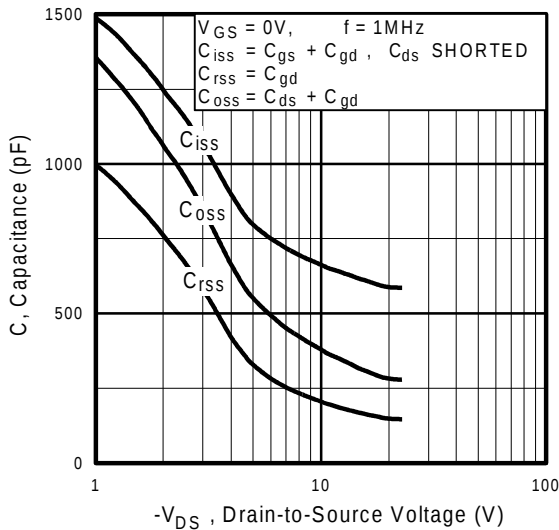


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

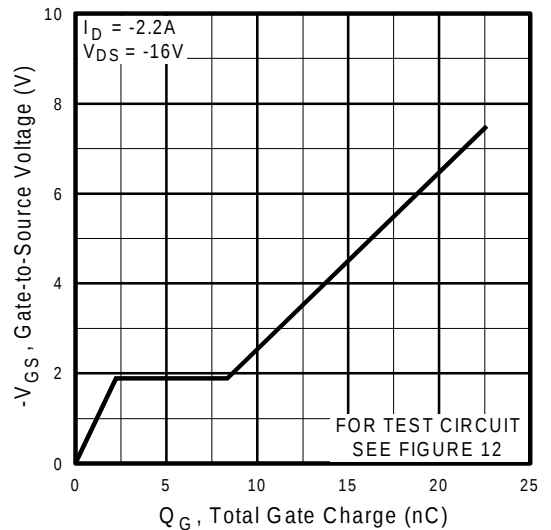


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

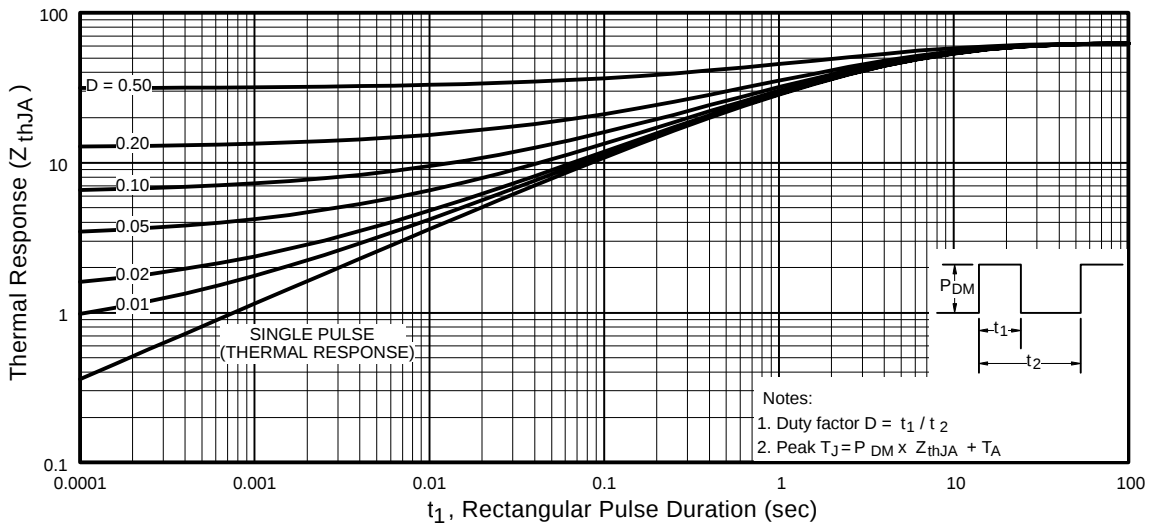


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Schottky Diode Characteristics

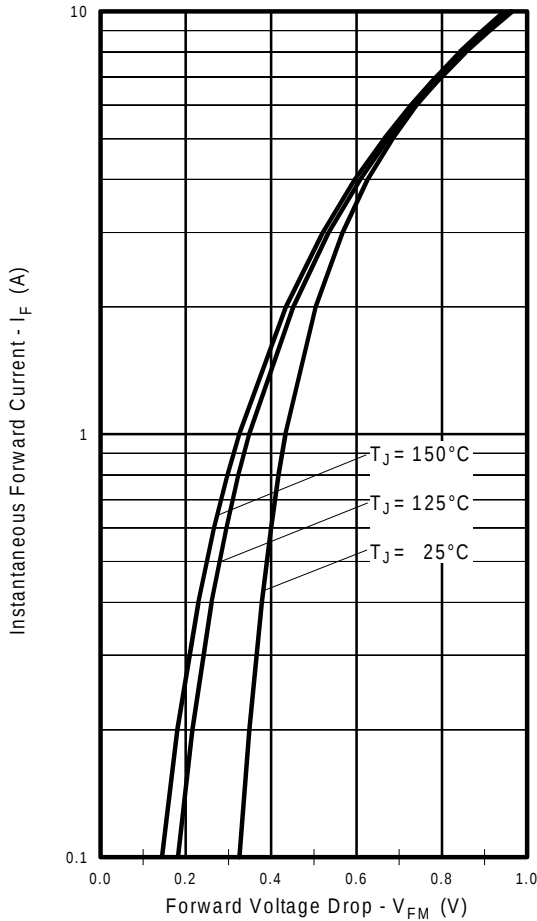


Fig. 12 -Typical Forward Voltage Drop Characteristics

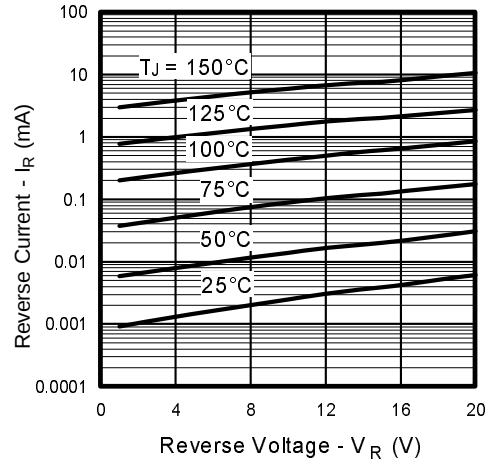


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

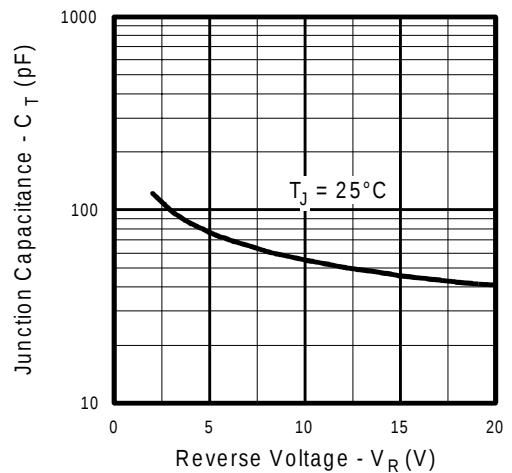
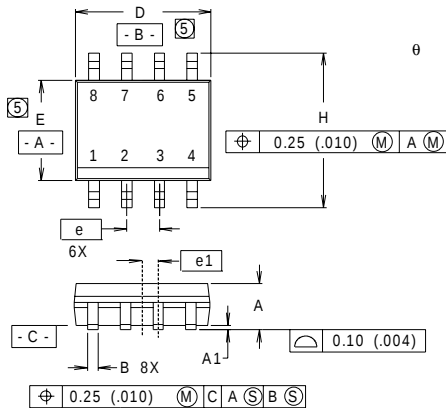


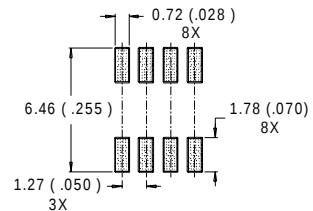
Fig.14 - Typical Junction Capacitance Vs. Reverse Voltage

SO-8 Package Details



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	0.16	.050	0.41	1.27
θ	0°	8°	0°	8°

RECOMMENDED FOOTPRINT

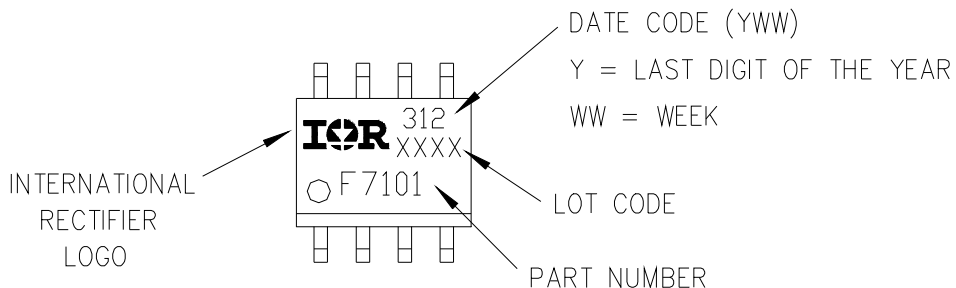


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : INCH.
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 0.25 (.006).
6. DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

Part Marking (IRF7101 example)

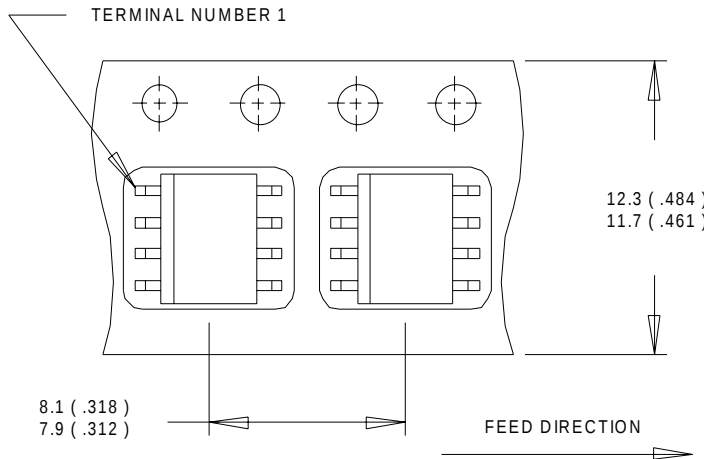
EXAMPLE: THIS IS AN IRF7101



IRF7324D1

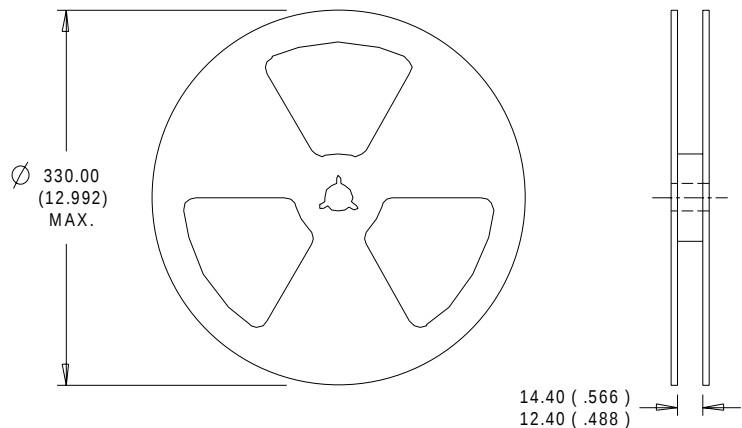
International
IOR Rectifier

Tape and Reel



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.

International
IOR Rectifier

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IR CANADA: 15 Lincoln Court, Brampton, Ontario L6T3Z2, Tel: (905) 453 2200

IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590

IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111

IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo Japan 171 Tel: 81 3 3983 0086

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