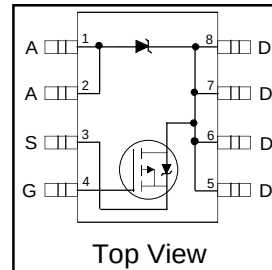


IRF7422D2

FETKY™ MOSFET & Schottky Diode

- Co-packaged HEXFET® Power MOSFET and Schottky Diode
- Ideal For Buck Regulator Applications
- P-Channel HEXFET
- Low V_F Schottky Rectifier
- Generation 5 Technology
- SO-8 Footprint

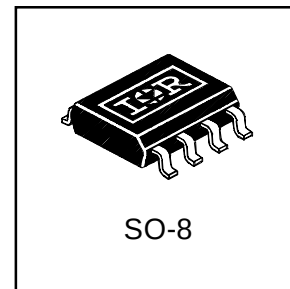


$V_{DSS} = -20V$
$R_{DS(on)} = 0.09\Omega$
Schottky $V_f = 0.52V$

Description

The **FETKY™** family of Co-packaged HEXFETs and Schottky diodes offer the designer an innovative board space saving solution for switching regulator and power management 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.



Absolute Maximum Ratings

Parameter	Maximum	Units
I_D @ $T_A = 25^\circ C$	-4.3	A
I_D @ $T_A = 70^\circ C$	-3.4	
I_{DM}	-33	
P_D @ $T_A = 25^\circ C$	2.0	W
P_D @ $T_A = 70^\circ C$	1.3	
Linear Derating Factor	16	mW/°C
V_{GS}	± 12	V
dv/dt	-5.0	V/ns
T_J, T_{STG}	-55 to +150	°C

Thermal Resistance Ratings

Parameter	Maximum	Units
$R_{\theta JA}$	62.5	°C/W

Notes:

① Repetitive rating – pulse width limited by max. junction temperature (see fig. 11)

② $I_{SD} \leq -2.2A$, $di/dt \leq -50A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ C$

③ Pulse width $\leq 300\mu s$ – duty cycle $\leq 2\%$

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

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.07	0.09	Ω	$V_{GS} = -4.5V, I_D = -2.2A$ ③
		—	0.115	0.14		$V_{GS} = -2.7V, I_D = -1.8A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	-0.70	—	—	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
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		$V_{DS} = -16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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 Fig. 6 and 9 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	—		$R_G = 6.0\Omega$
t_f	Fall Time	—	33	—		$R_D = 4.5\Omega$, See Fig. 10 ③
C_{iss}	Input Capacitance	—	610	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	310	—		$V_{DS} = -15V$
C_{rss}	Reverse Transfer Capacitance	—	170	—		$f = 1.0\text{MHz}$, See Fig. 5

MOSFET Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-2.5	A	
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-17		
V_{SD}	Body Diode Forward Voltage	—	—	-1.0	V	$T_J = 25^\circ\text{C}, I_S = -1.8A, V_{GS} = 0V$
t_{rr}	Reverse Recovery Time (Body Diode)	—	56	84	ns	$T_J = 25^\circ\text{C}, I_F = -2.2A$
Q_{rr}	Reverse Recovery Charge	—	71	110	nC	$di/dt = -100A/\mu s$ ③

Schottky Diode Maximum Ratings

	Parameter	Max.	Units	Conditions
I_f (av)	Max. Average Forward Current	2.8	A	50% Duty Cycle. Rectangular Wave, $T_c = 25^\circ\text{C}$
		1.8		50% Duty Cycle. Rectangular Wave, $T_c = 70^\circ\text{C}$
I_{SM}	Max. peak one cycle Non-repetitive Surge current	200	A	5 μs sine or 3 μs Rect. pulse
		20		10ms sine or 6ms Rect. pulse

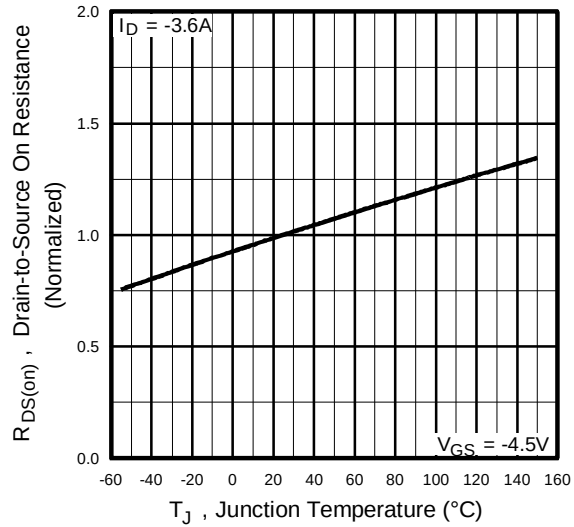
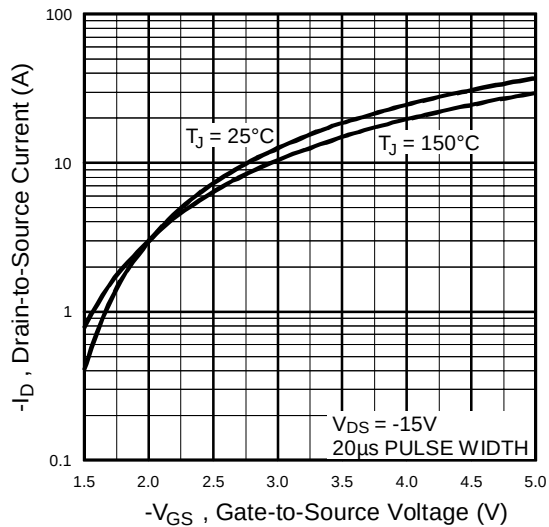
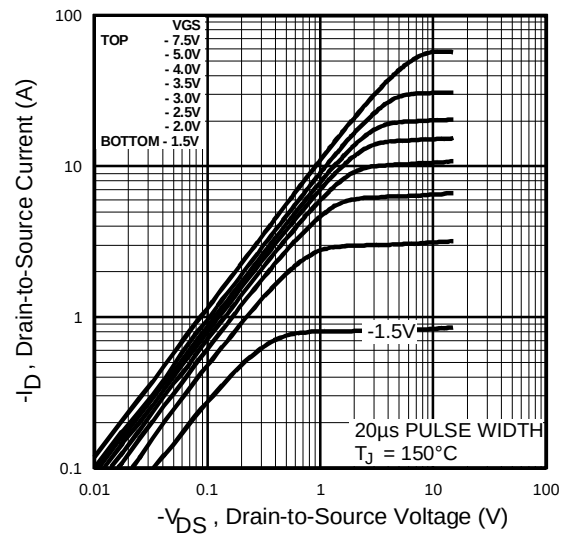
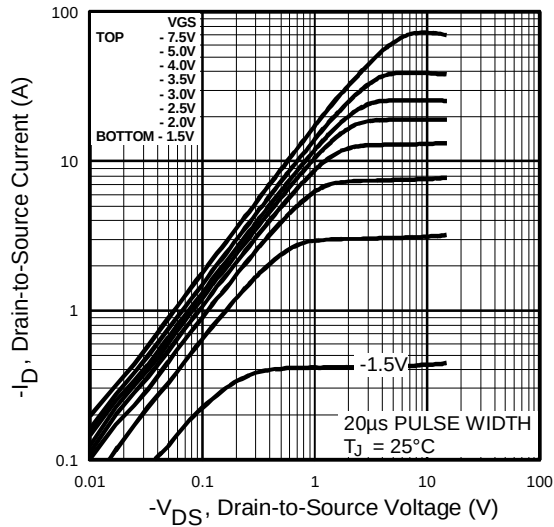
Following any rated load condition & with V_{rrm} applied

Schottky Diode Electrical Specifications

	Parameter	Max.	Units	Conditions
V_{fm}	Max. Forward voltage drop	0.57	V	$I_f = 3.0, T_J = 25^\circ\text{C}$
		0.77		$I_f = 6.0, T_J = 25^\circ\text{C}$
		0.52		$I_f = 3.0, T_J = 125^\circ\text{C}$
		0.79		$I_f = 6.0, T_J = 125^\circ\text{C}$
I_{rm}	Max. Reverse Leakage current	0.13	mA	$V_r = 20V, T_J = 25^\circ\text{C}$
		18		$T_J = 125^\circ\text{C}$
C_t	Max. Junction Capacitance	310	pF	$V_r = 5V_{dc}$ (100kHz to 1 MHz) 25°C
dv/dt	Max. Voltage Rate of Charge	4900	V/ μs	Rated V_r

(HEXFET is the reg. TM for International Rectifier Power MOSFET's)

Power Mosfet Characteristics



Power Mosfet Characteristics

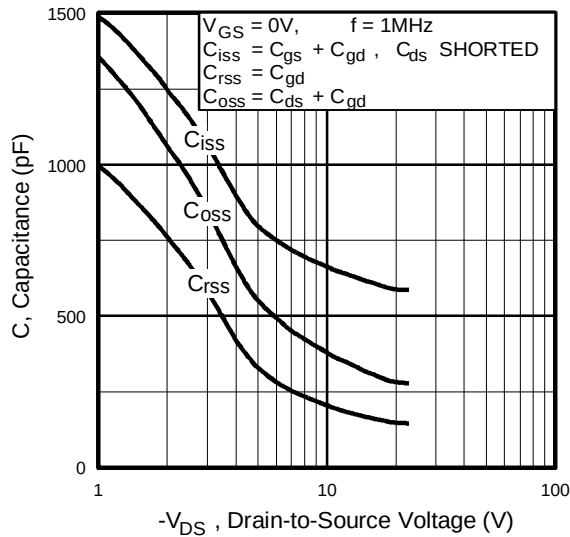


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

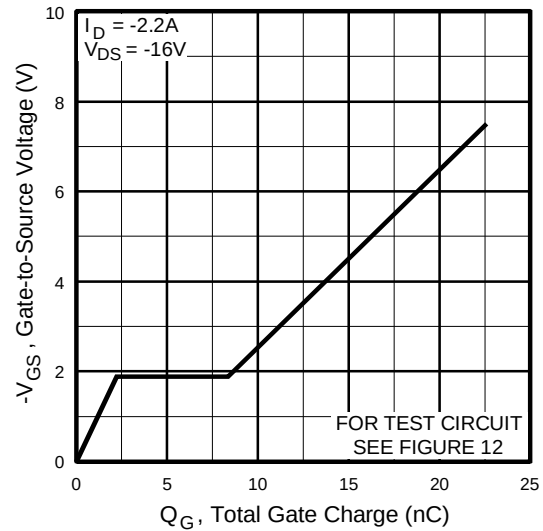


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

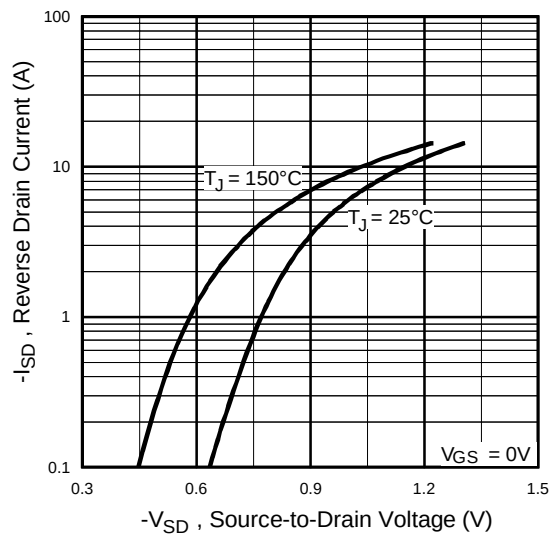


Fig 7. Typical Source-Drain Diode Forward Voltage

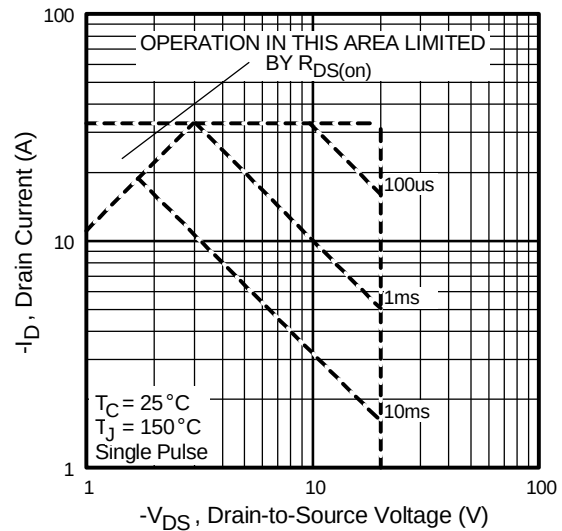


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

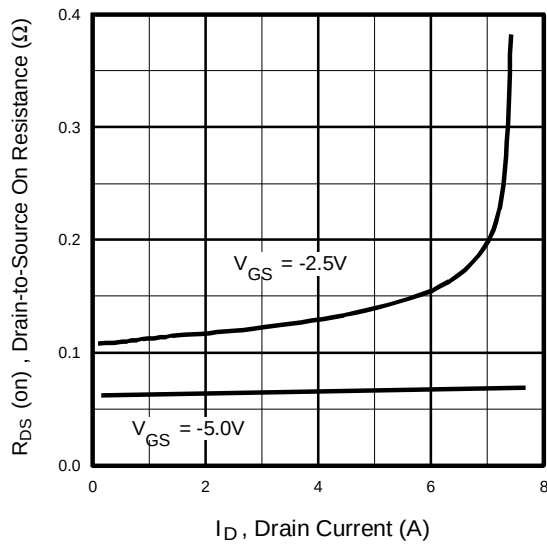
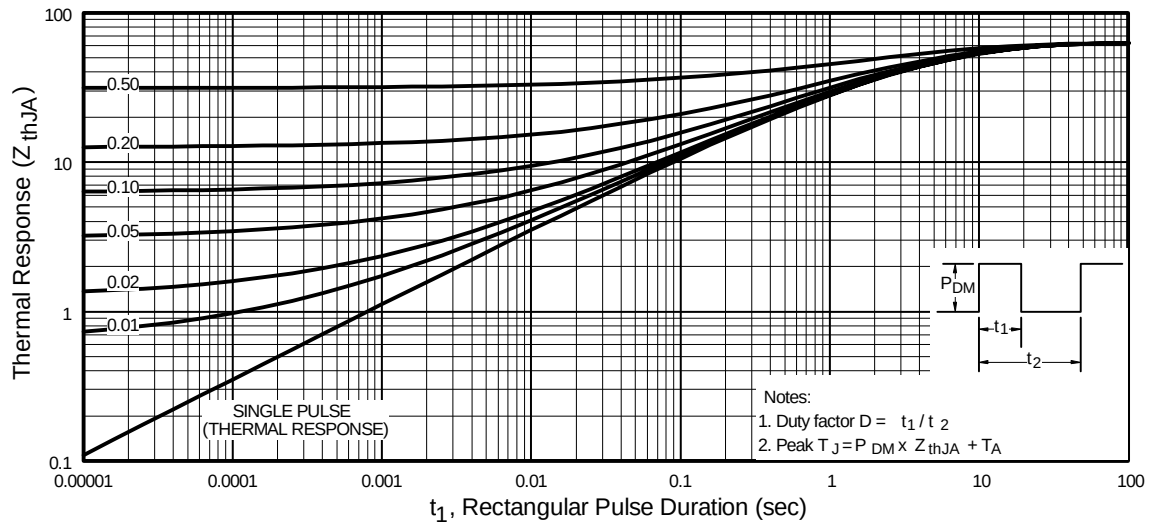


Fig 10. Typical On-Resistance Vs. Drain Current

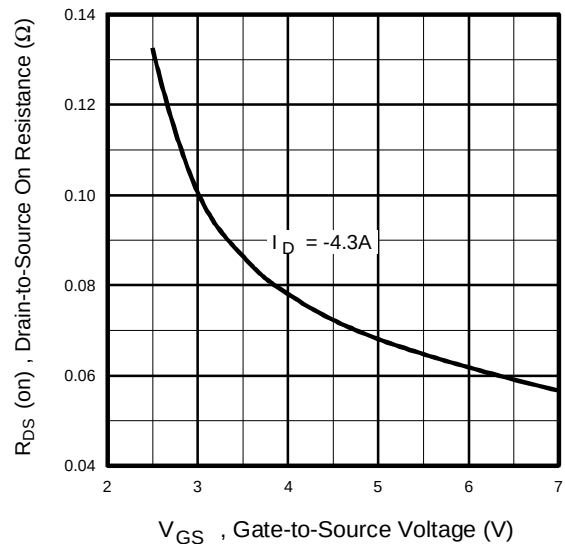


Fig 11. Typical On-Resistance Vs. Gate Voltage

Schottky Diode Characteristics

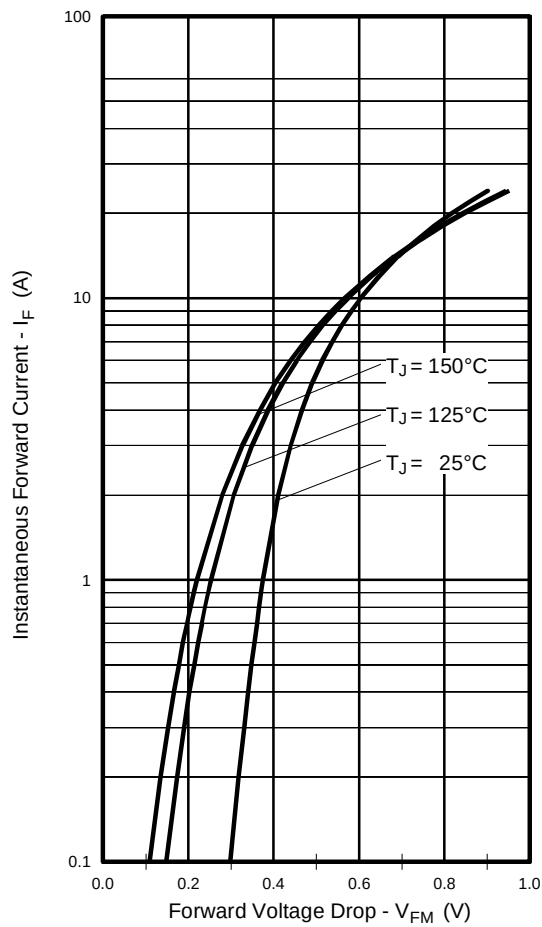


Fig. 12 - Typical Forward Voltage Drop Characteristics

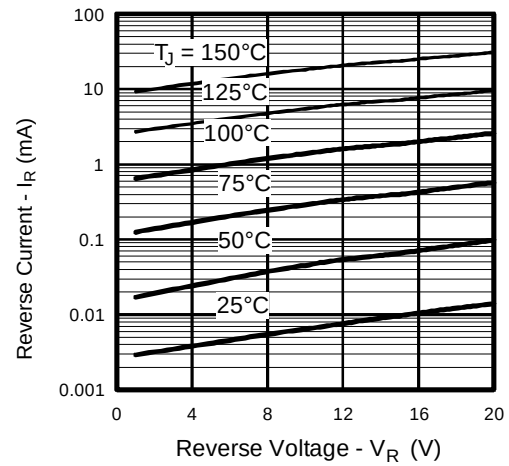


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

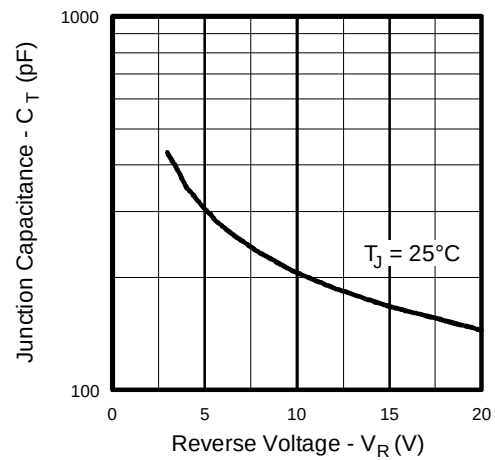
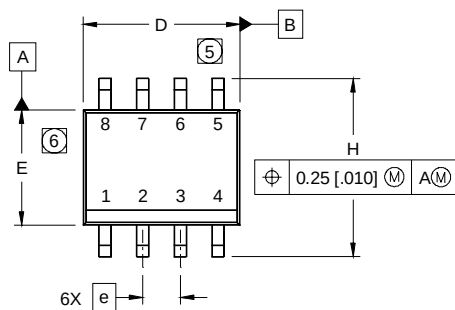
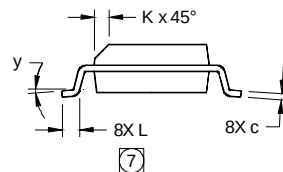
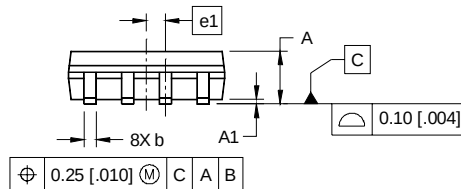


Fig. 14 - Typical Junction Capacitance Vs. Reverse Voltage

SO-8 Package Details



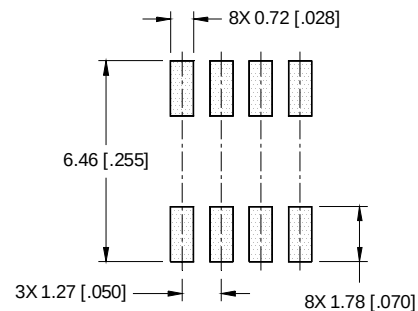
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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



NOTES:

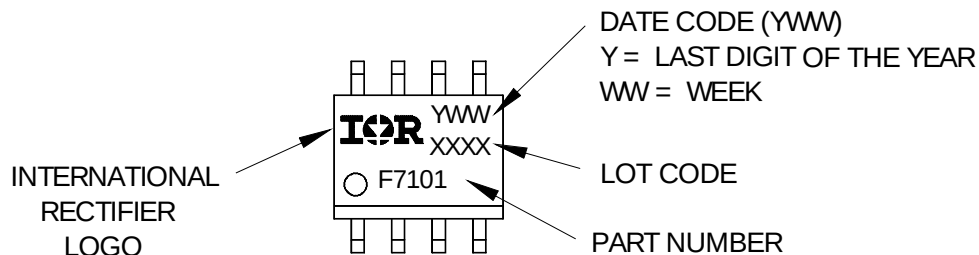
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
6. DIMENSION DOES NOT INCLUDE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

FOOTPRINT



SO-8 Part Marking

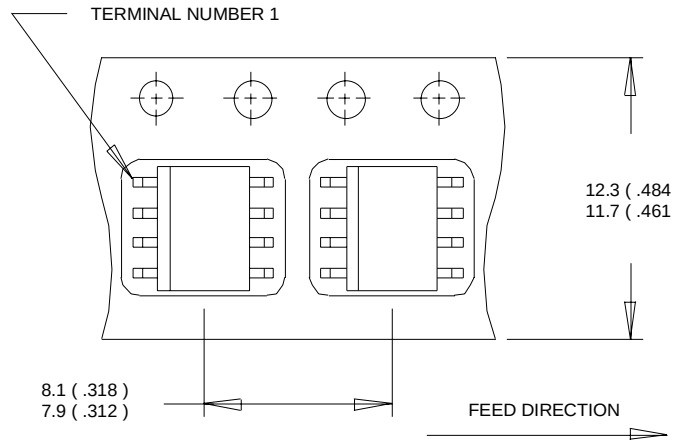
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



IRF7422D2

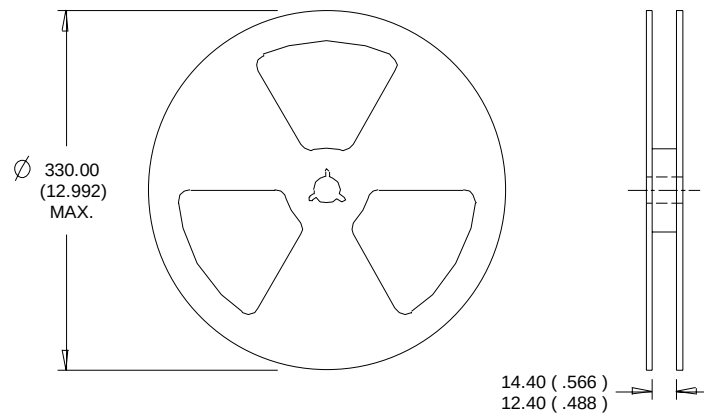
International
IR Rectifier

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.

Data and specifications subject to change without notice.
Qualification Standards can be found on IR's Web site.

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