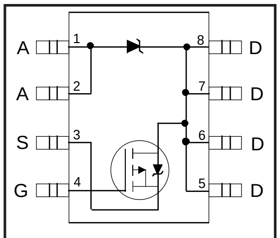
International Rectifier

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

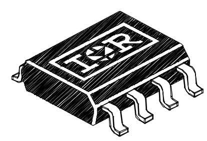


Top View

V_{DSS} = -20V

$R_{DS(on)}$ = 0.09Ω

Schottky Vf = 0.52V


SO-8

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. Combinining 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°C	Continuous Drain Current, V_{GS} @ -4.5V	-4.3	A
I_D @ T_A = 70°C		-3.4	
I_{DM}	Pulsed Drain Current ①	-33	
P_D @T_A = 25°C	Power Dissipation	2.0	W
P_D @T_A = 70°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 max. junction temperature (see fig. 11)

② $I_{SD} \le$ -2.2A, di/dt ≤ -50A/µs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le$ 150°C

③ Pulse width ≤ 300µs – duty cycle ≤ 2%

④ Surface mounted on FR-4 board, t ≤ 10sec.

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	——	0.07	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 = -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 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 = 6.0Ω
t_f	Fall Time	——	33	——		R_D = 4.5Ω, 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	——		ƒ = 1.0MHz, 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°C, I_S = -1.8A, V_{GS} = 0V
t_{rr}	Reverse Recovery Time (Body Diode)	——	56	84	ns	T_J = 25°C, I_F = -2.2A
Q_{rr}	Reverse RecoveryCharge	——	71	110	nC	di/dt = -100A/µs ③

Schottky Diode Maximum Ratings

	Parameter	Max.	Units	Conditions	
If (av)	Max. Average Forward Current	2.8	A	50% Duty Cycle. Rectangular Wave, Tc = 25°C	
		1.8		50% Duty Cycle. Rectangular Wave, Tc = 70°C	
I_{SM}	Max. peak one cycle Non-repetitive Surge current	200	A	5µs sine or 3µs Rect. pulse	Following any rated load condition & with Vrrm applied
		20		10ms sine or 6ms Rect. pulse	

Schottky Diode Electrical Specifications

	Parameter	Max.	Units	Conditions	
Vfm	Max. Forward voltage drop	0.57	V	If = 3.0, Tj = 25°C	
		0.77		If = 6.0, Tj = 25°C	
		0.52		If = 3.0, Tj = 125°C	
		0.79		If = 6.0, Tj = 125°C .	
Irm	Max. Reverse Leakage current	0.13	mA	Vr = 20V	Tj = 25°C
		18			Tj = 125°C
Ct	Max. Junction Capacitance	310	pF	Vr = 5Vdc (100kHz to 1 MHz) 25°C	
dv/dt	Max. Voltage Rate of Charge	4900	V/µs	Rated Vr	

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

Power Mosfet Characteristics

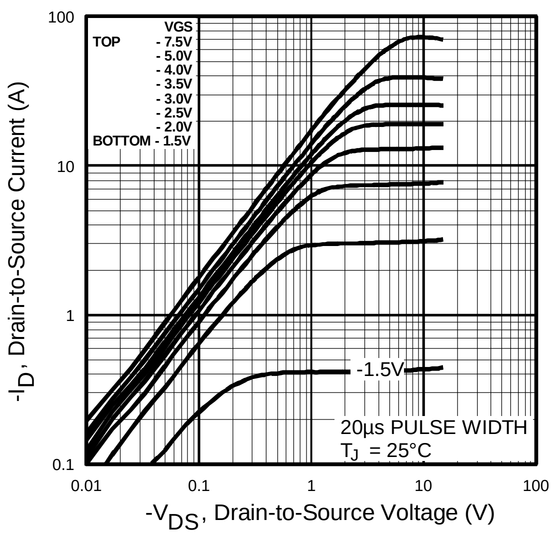


Fig 1. Typical Output Characteristics

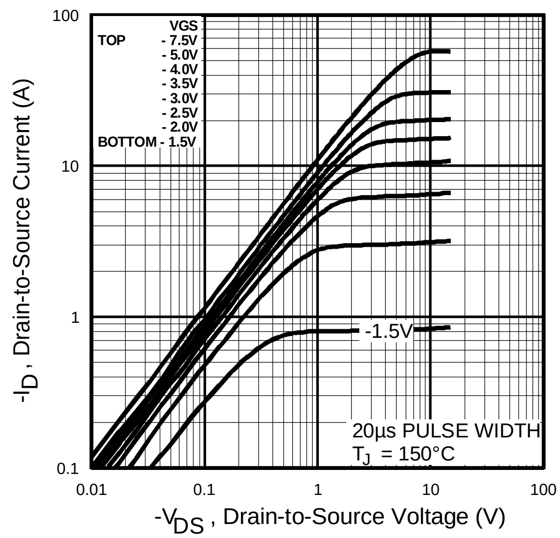


Fig 2. Typical Output Characteristics

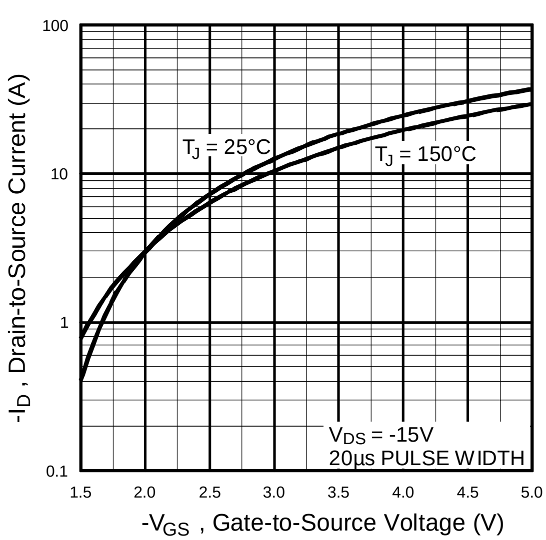


Fig 3. Typical Transfer Characteristics

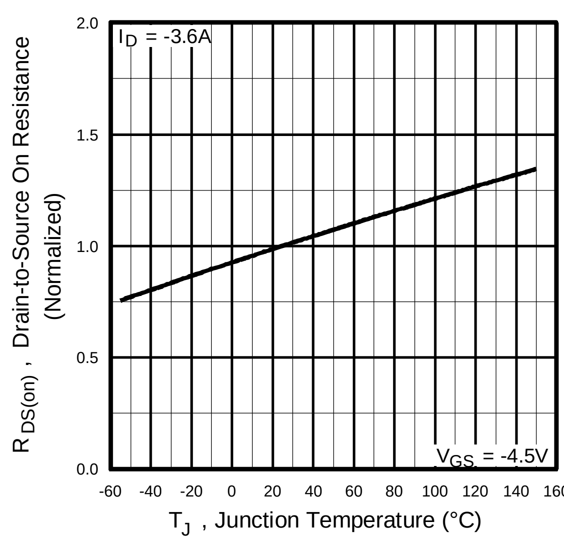


Fig 4. Normalized On-Resistance Vs. Temperature

Power Mosfet Characteristics

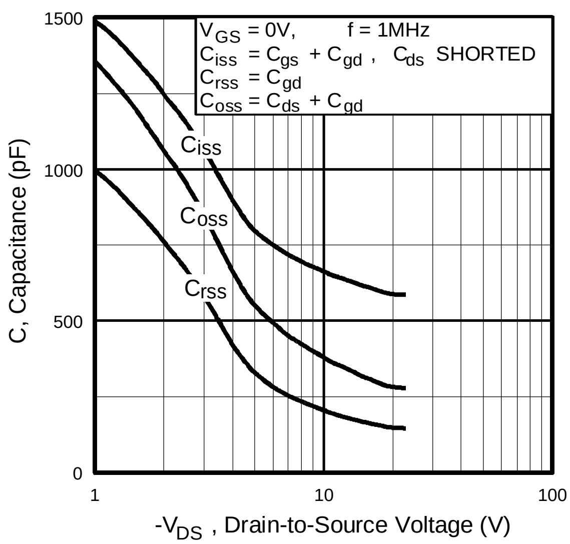


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

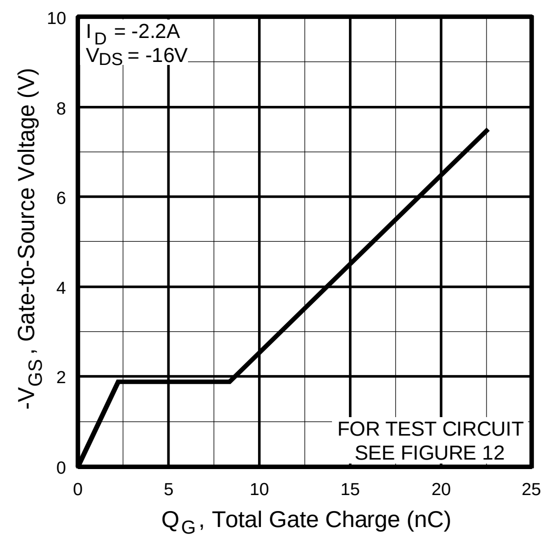


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

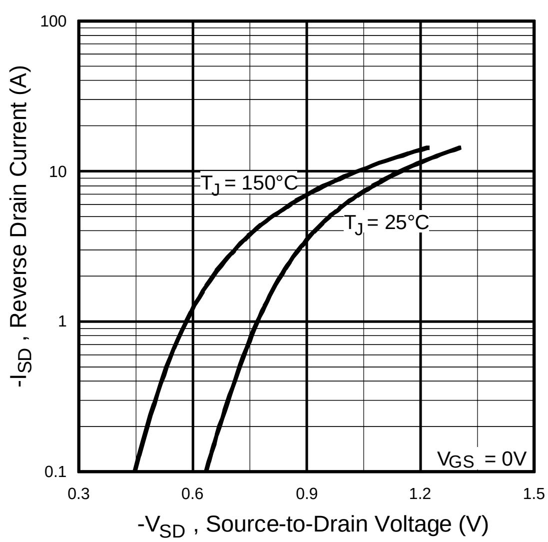


Fig 7. Typical Source-Drain Diode Forward Voltage

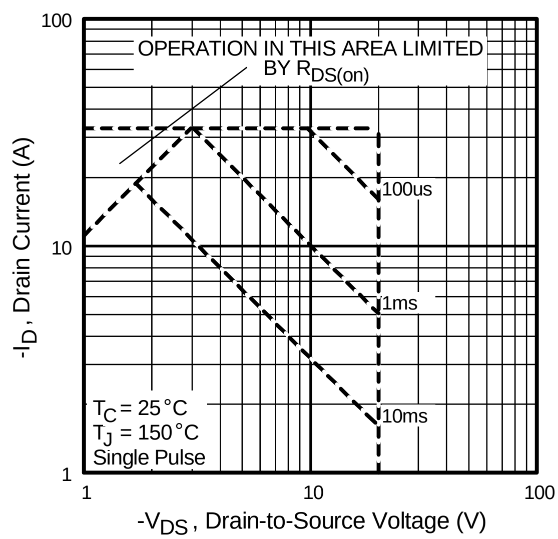
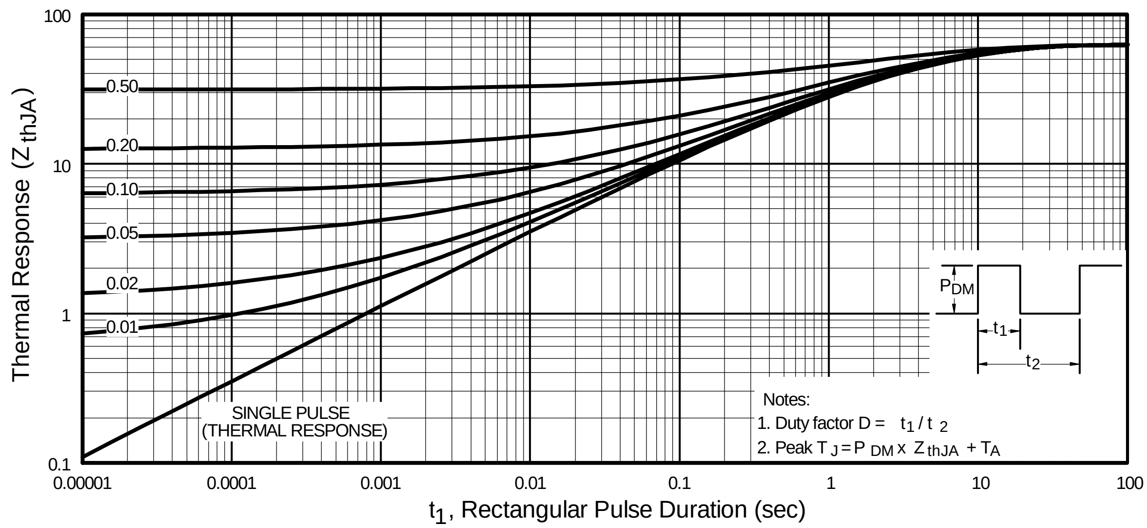


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics



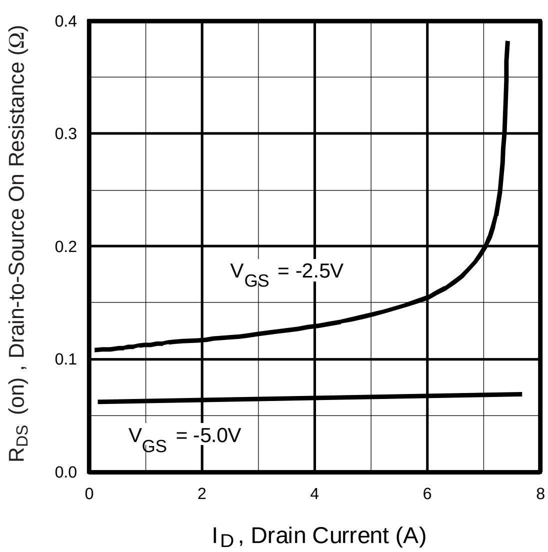


Fig 10. Typical On-Resistance Vs. Drain Current

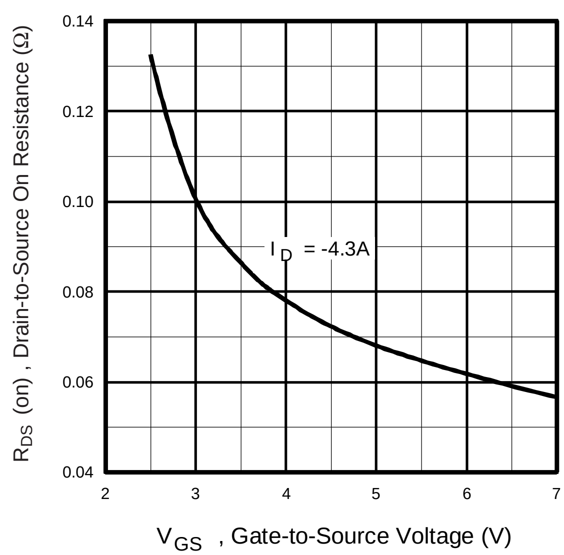


Fig 11. Typical On-Resistance Vs. Gate Voltage

Schottky Diode Characteristics

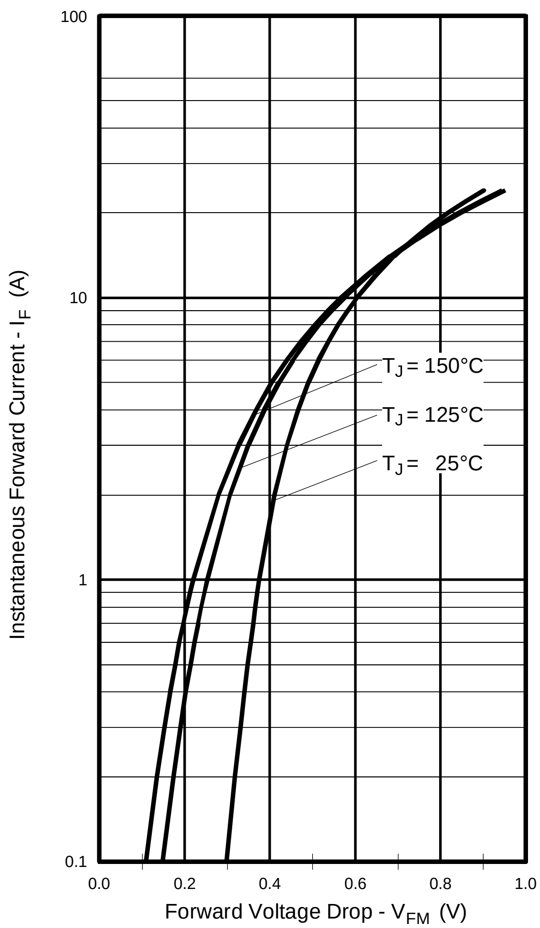


Fig. 12 - Typical Forward Voltage Drop Characteristics

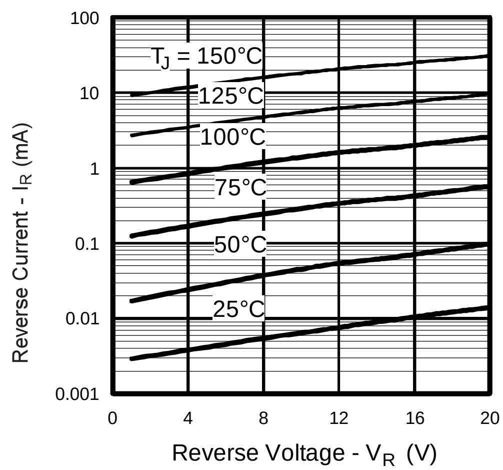


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

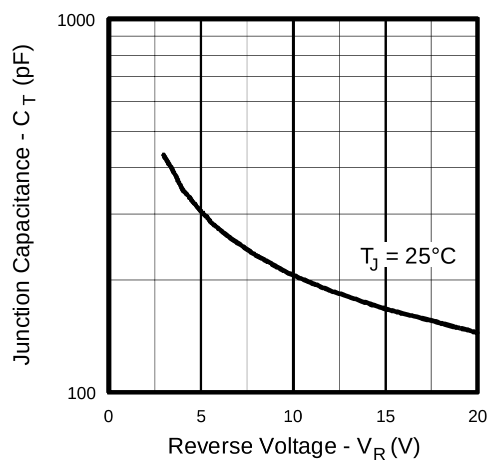
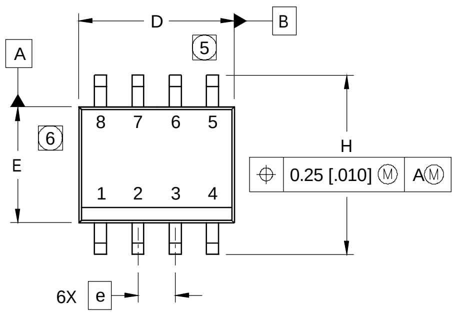


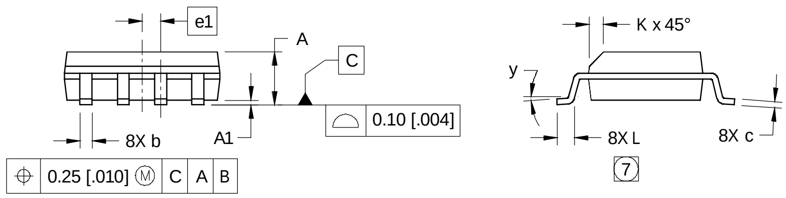
Fig.14 - Typical Junction Capacitance Vs. Reverse Voltage

SO-8 (Fetky) Package Outline

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	
e 1	.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°



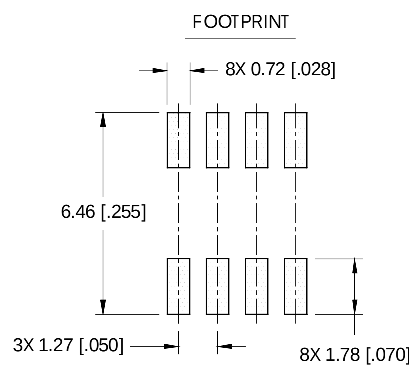
NOTES:

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].

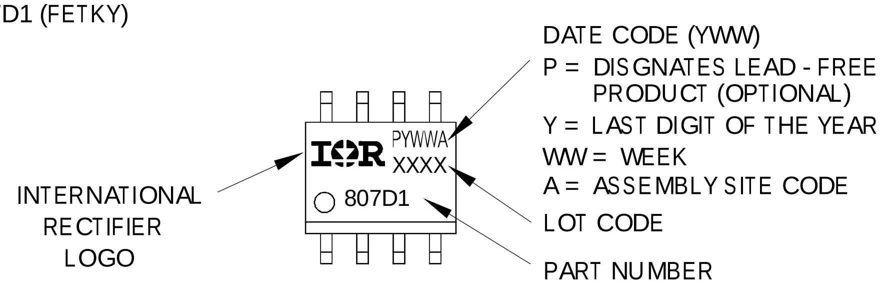
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].

7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



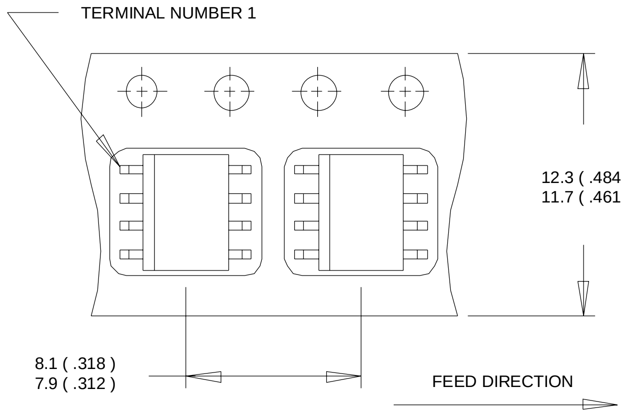
SO-8 (Fetky) Part Marking Information

EXAMPLE: THIS IS AN IRF7807D1 (FETKY)

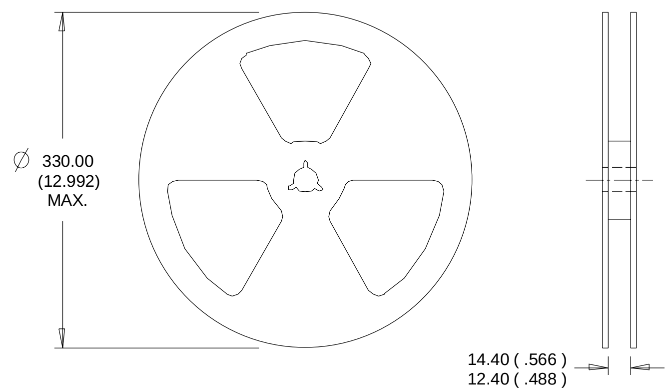


SO-8 (Fetky) Tape and Reel

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.
Qualification Standards can be found on IR's Web site.

International IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903
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