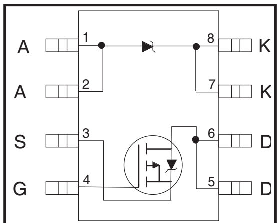
International
IOR Rectifier

IRF7321D2PbF

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
- Lead-Free

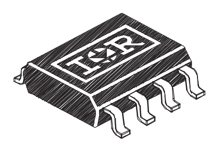


Top View

V_{DSS} = -30V

$R_{DS(on)}$ = 0.062Ω

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 (T_A = 25°C Unless Otherwise Noted)

	Parameter	Maximum	Units
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ -10V	-4.7	A
I_D @ T_A = 70°C		-3.8	
I_{DM}	Pulsed Drain Current ①	-38	
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	± 20	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 $I_{SD} \leq$ -2.9A, di/dt ≤ -77A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq$ 150°C
③ Pulse width ≤ 300µs – duty cycle ≤ 2%
④ Surface mounted on FR-4 board, t ≤ 10sec.

10/12/04

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-30	——	——	V	V_{GS} = 0V, I_D = -250µA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	0.042	0.062	Ω	V_{GS} = -10V, I_D = -4.9A ③
		——	0.076	0.098		V_{GS} = -4.5V, I_D = -3.6A ③
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	——	——	V	V_{DS} = V_{GS}, I_D = -250µA
g_{fs}	Forward Transconductance	——	7.7	——	S	V_{DS} = -15V, I_D = -4.9A
I_{DSS}	Drain-to-Source Leakage Current	——	——	-1.0	µA	V_{DS} = -24V, V_{GS} = 0V
		——	——	-25		V_{DS} = -24V, V_{GS} = 0V, T_J = 55°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	100	nA	V_{GS} = -20V
	Gate-to-Source Reverse Leakage	——	——	-100		V_{GS} = 20V
Q_g	Total Gate Charge	——	23	34	nC	I_D = -4.9A
Q_{gs}	Gate-to-Source Charge	——	3.8	5.7		V_{DS} = -15V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	5.9	8.9		V_{GS} = -10V, See Fig. 6 ③
$t_{d(on)}$	Turn-On Delay Time	——	13	19	ns	V_{DD} = -15V
t_r	Rise Time	——	13	20		I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time	——	34	51		R_G = 6.0Ω
t_f	Fall Time	——	32	48		R_D = 15Ω, ③
C_{iss}	Input Capacitance	——	710	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	380	——		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	——	180	——		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)	——	——	-30		
V_{SD}	Body Diode Forward Voltage	——	-0.78	-1.0	V	T_J = 25°C, I_S = -1.7A, V_{GS} = 0V
t_{rr}	Reverse Recovery Time (Body Diode)	——	44	66	ns	T_J = 25°C, I_F = -1.7A
Q_{rr}	Reverse Recovery Charge	——	42	63	nC	di/dt = 100A/µs ③

Schottky Diode Maximum Ratings

	Parameter	Max.	Units	Conditions	
If (av)	Max. Average Forward Current	3.2	A	50% Duty Cycle. Rectangular Wave, See Fig.14	Tc = 25°C
		2.0			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	0.30	mA	Vr = 30V	Tj = 25°C
		37			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	

Power Mosfet Characteristics

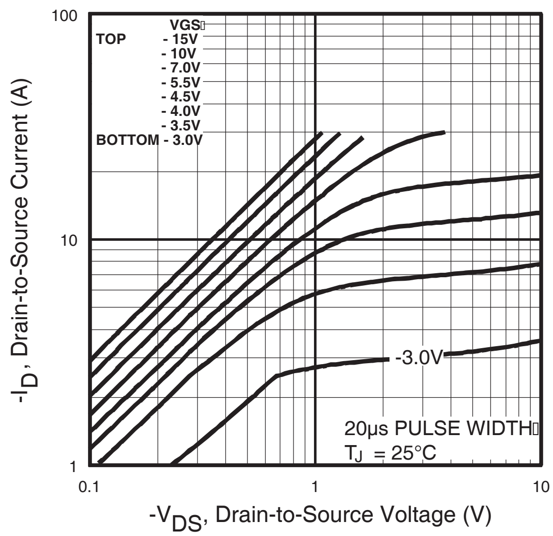


Fig 1. Typical Output Characteristics

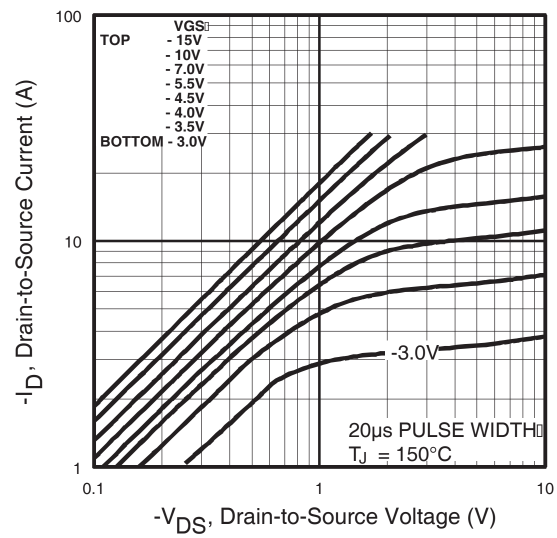


Fig 2. Typical Output Characteristics

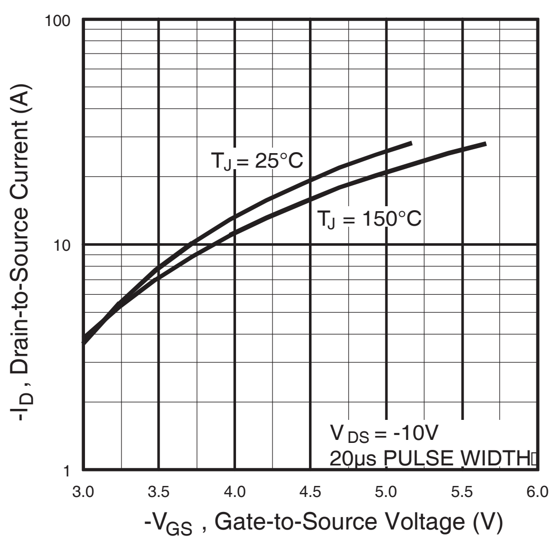


Fig 3. Typical Transfer Characteristics

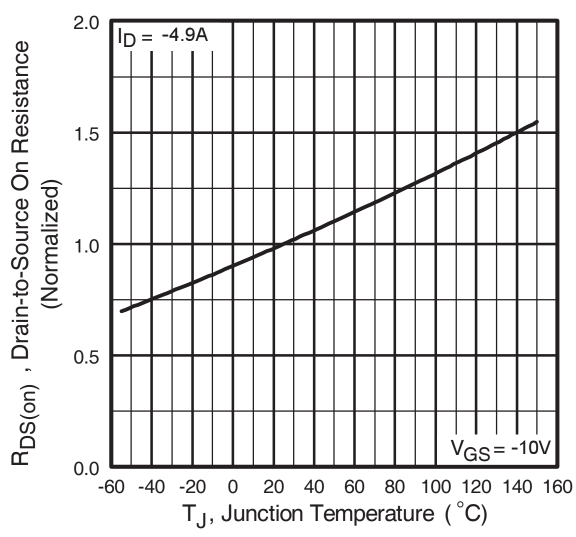


Fig 4. Normalized On-Resistance Vs. Temperature

Power Mosfet Characteristics

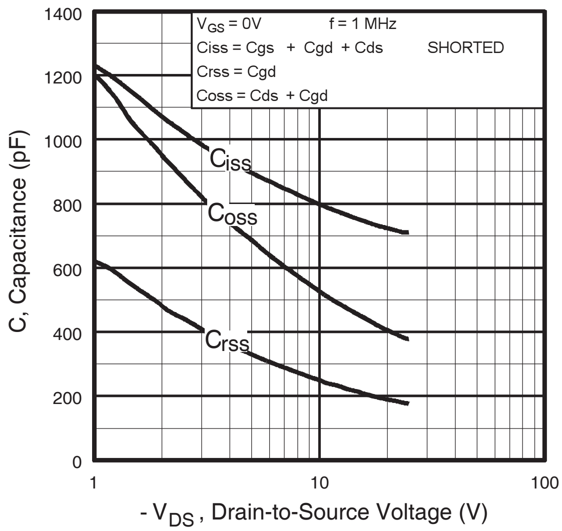


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

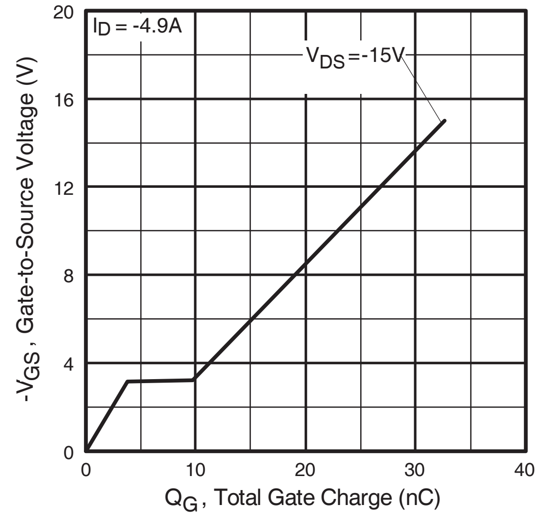


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

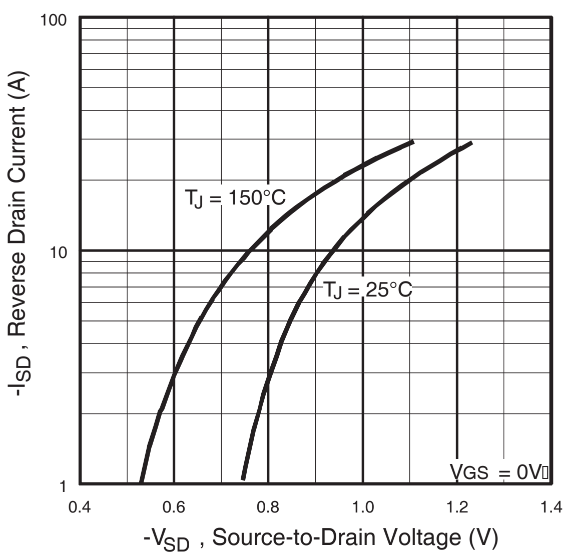


Fig 7. Typical Source-Drain Diode Forward Voltage

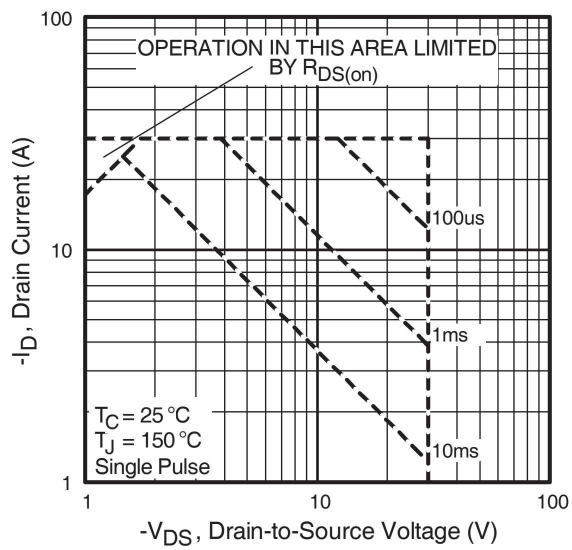


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

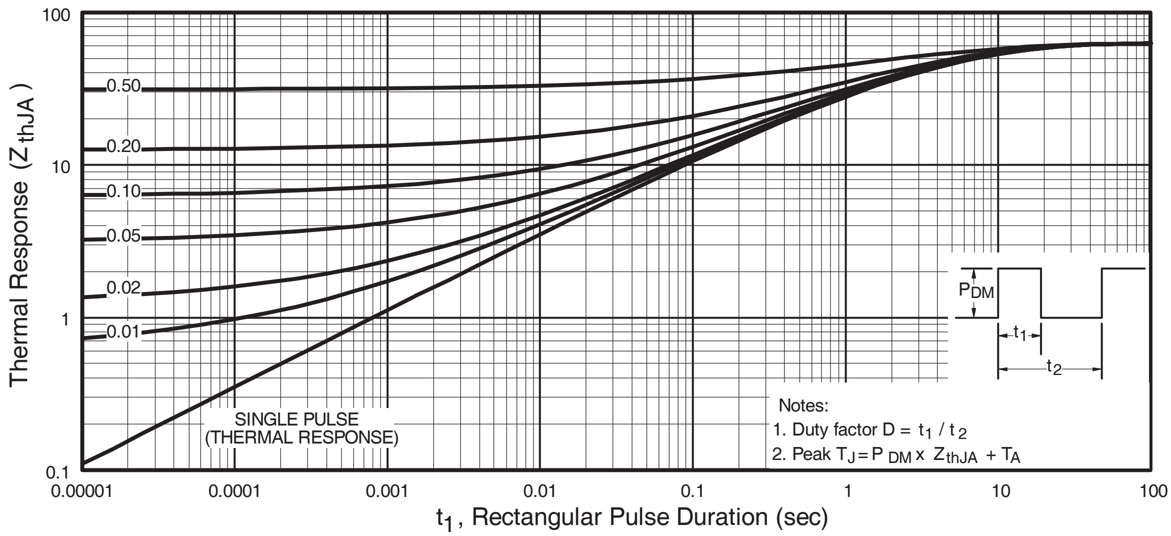


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

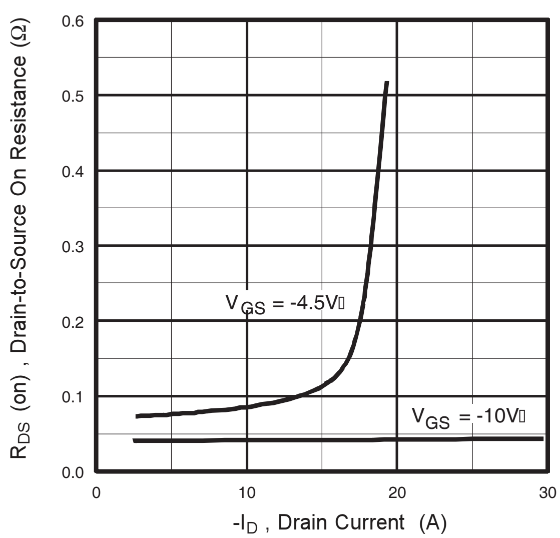


Fig 10. Typical On-Resistance Vs. Drain Current

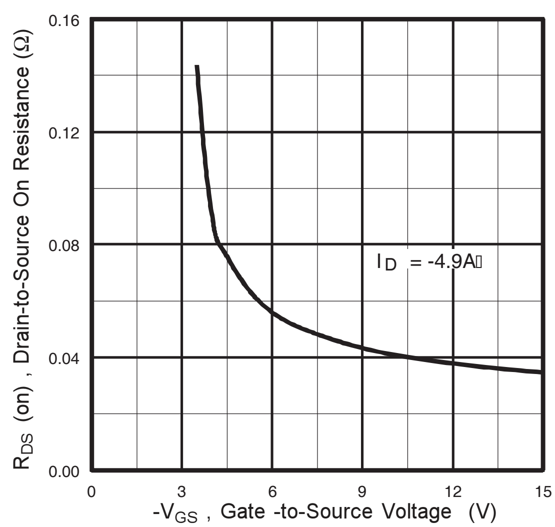


Fig 11. Typical On-Resistance Vs. Gate Voltage

Schottky Diode Characteristics

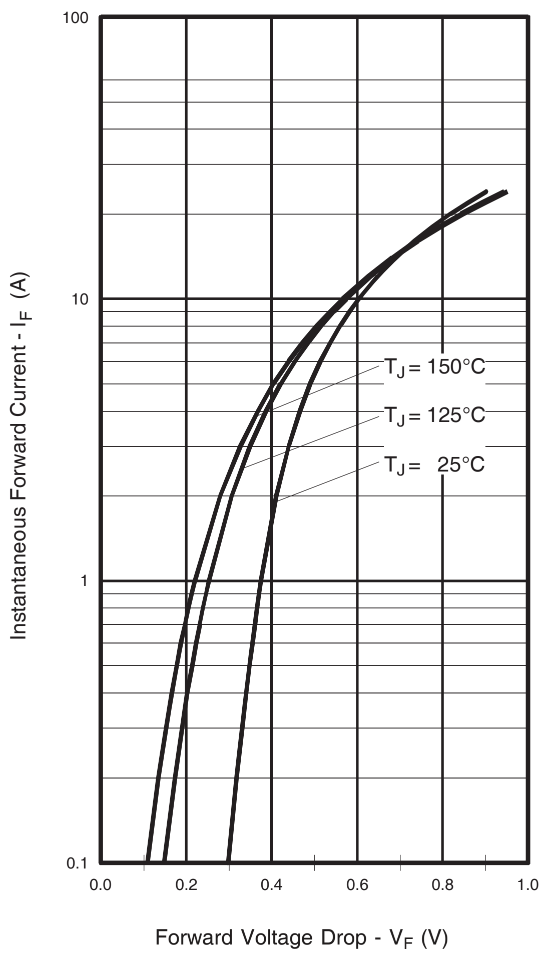


Fig. 12 - Typical Forward Voltage Drop Characteristics

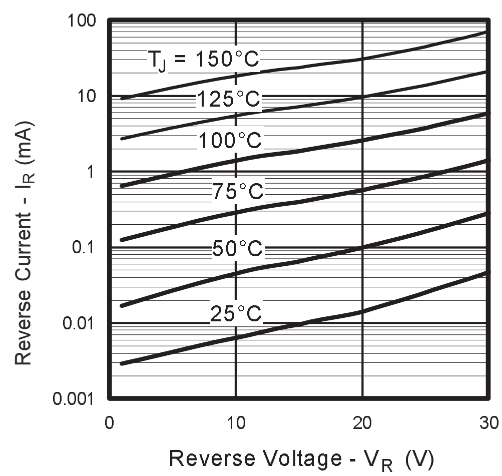


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

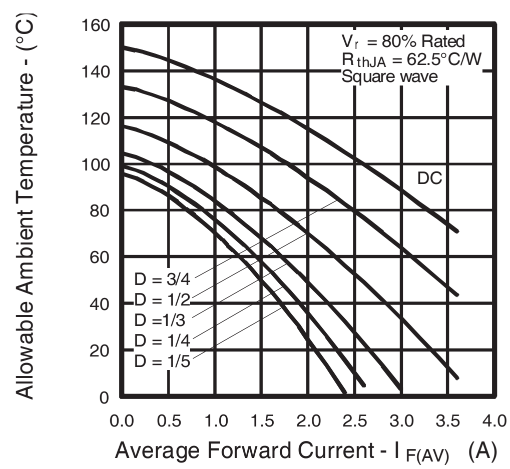
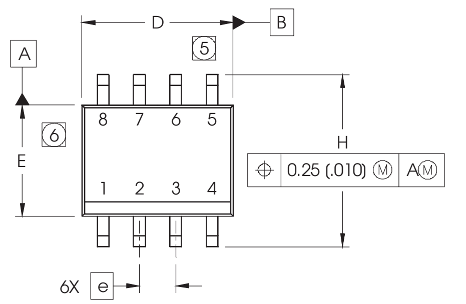
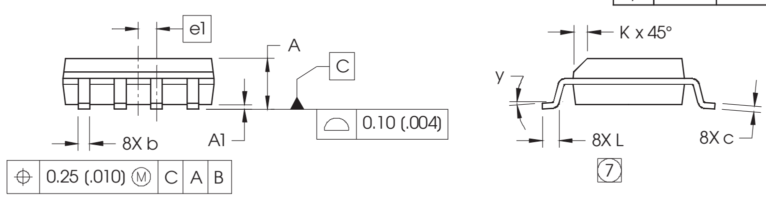


Fig.14 - Maximum Allowable Ambient Temp. Vs. Forward Current

SO-8 (Fetky) Package Outline



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°



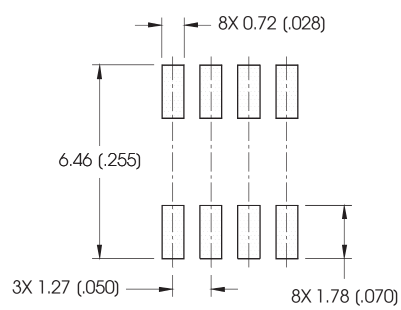
NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.

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).

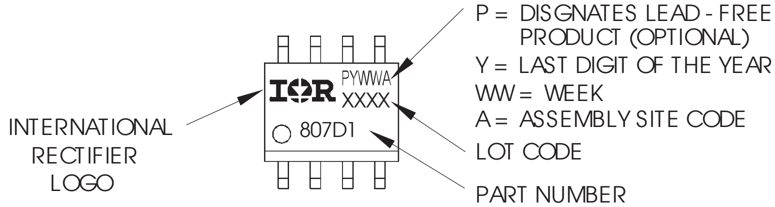
7 DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

FOOTPRINT



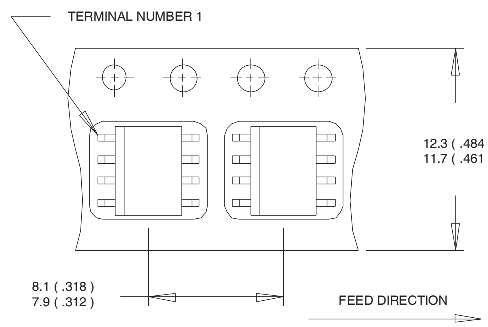
SO-8 (Fetky) Part Marking Information

EXAMPLE: THIS IS AN IRF7807D1 (FETKY)

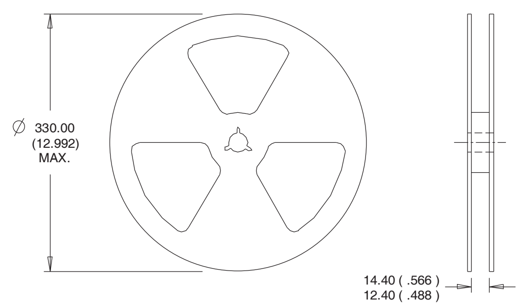


SO-8 Tape and Reel

Dimensions are shown in milimeters (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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