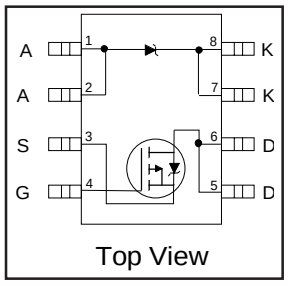
International
IOR Rectifier

PD- 91789B

IRF7324D1

FETKY™ MOSFET / Schottky Diode

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



Top View

V_{DSS} = -20V

$R_{DS(on)}$ = 0.27Ω

Schottky Vf = 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

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	-20	V
V_{GS}	Gate-to-Source Voltage	± 12	
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	-2.2	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	-1.8	
I_{DM}	Pulsed Drain Current ①	-22	
P_D @T_A = 25°C	Power Dissipation ④	2.0	W
P_D @T_A = 70°C	Power Dissipation ④	1.3	
dV/dt	Peak Diode Recovery ②	-0.74	V/ns
	Linear Derating Factor	16	mW/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead ⑤	——	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④⑤	——	62.5	

Notes ① through ⑤ are on page 8

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	-20	—	—	V	V_{GS} = 0V, I_D = -250µA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.155	0.270	Ω	V_{GS} = -4.5V, I_D = -1.2A ③
		—	0.260	0.400		V_{GS} = -2.7V, I_D = -0.6A ③
$V_{GS(th)}$	Gate Threshold Voltage	-0.70	—	—	V	V_{DS} = V_{GS}, I_D = -250µA
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
gfs	Forward Transconductance	2.4	—	—	S	V_{DS} = -16V, I_D = -2.2A
Q_g	Total Gate Charge	—	5.2	7.8		I_D = -2.2A
Q_{gs}	Gate-to-Source Charge	—	0.88	—	nC	V_{GS} = -4.5V
Q_{gd}	Gate-to-Drain Charge	—	2.5	—		V_{DD} = -16V
$t_{d(on)}$	Turn-On Delay Time	—	10	—		V_{DD} = -10V, V_{GS} = -4.5V ③
t_r	Rise Time	—	12	—		I_D = -2.2A
$t_{d(off)}$	Turn-Off Delay Time	—	11	—	ns	R_G = 6.0Ω
t_f	Fall Time	—	7.6	—		R_D = 4.5Ω
C_{iss}	Input Capacitance	—	260	—		V_{GS} = 0V
C_{oss}	Output Capacitance	—	140	—	pF	V_{DS} = -15V
C_{rss}	Reverse Transfer Capacitance	—	70	—		f = 1.0MHz

MOSFET Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current	—	—	-2.2		
I_{SM}	Pulsed Source Current	—	—	-22		
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	T_J = 25°C, I_S = -2.2A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	26	39	ns	T_J = 25°C, I_F = -2.2A, V_{DD} = -10V
Q_{rr}	Reverse Recovery Charge	—	24	36	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		5µs sine or 3µs Rect. Pulse	Following any rated load condition & with VRRM 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
Ct	Max. Junction Capacitance	92	pF	V_R = 5Vdc (100kHz to 1MHz) 25°C	
dV/dt	Max. Voltage Rate of Charge	3600	V/µs	Rated V_R	

Power Mosfet Characteristics

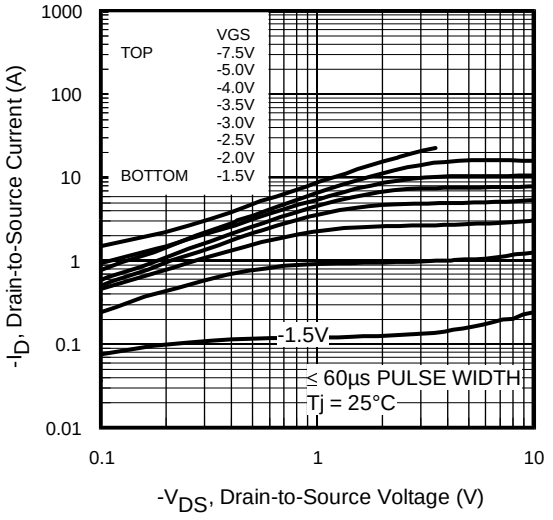


Fig 1. Typical Output Characteristics

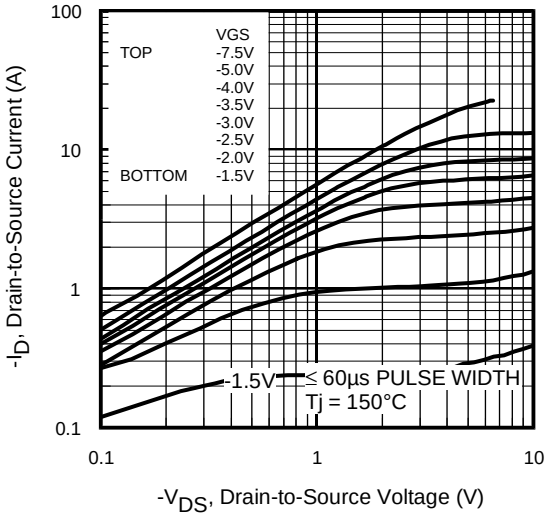


Fig 2. Typical Output Characteristics

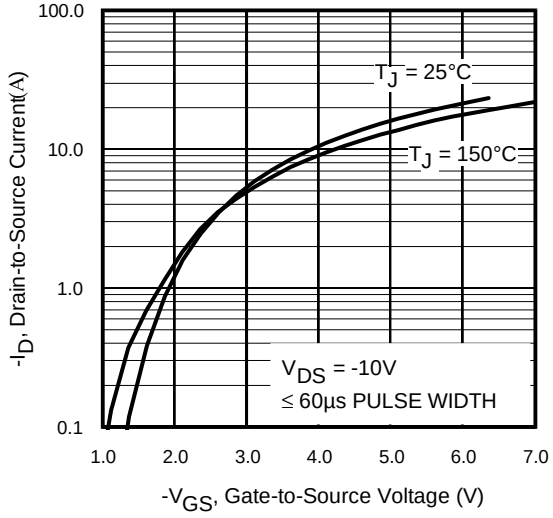


Fig 3. Typical Transfer Characteristics

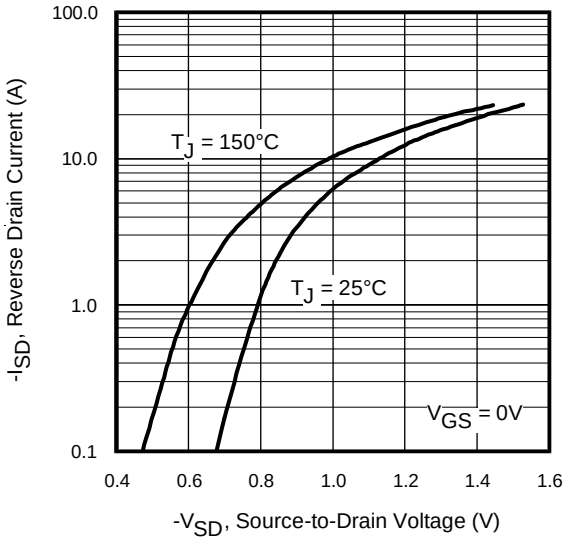


Fig 4. Typical Source-Drain Diode Forward Voltage

Power Mosfet Characteristics

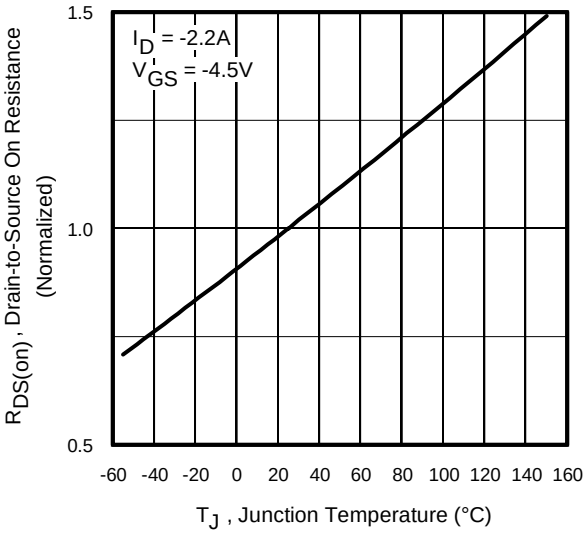


Fig 5. Normalized On-Resistance Vs. Temperature

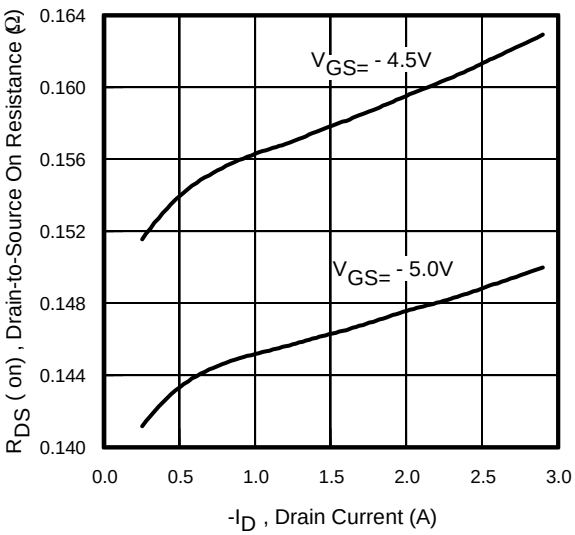


Fig 6. Typical On-Resistance Vs. Drain Current

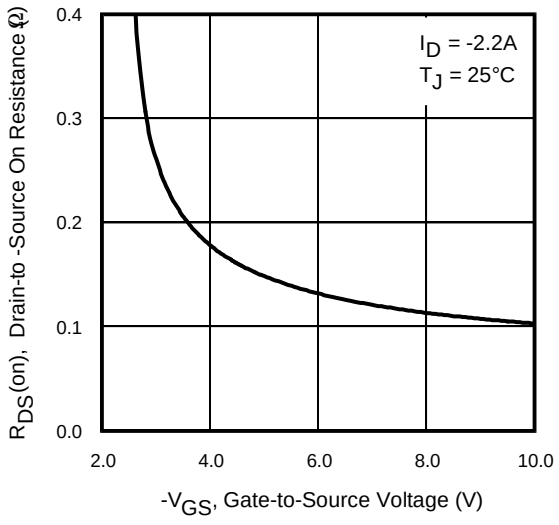


Fig 7. Typical On-Resistance Vs. Gate Voltage

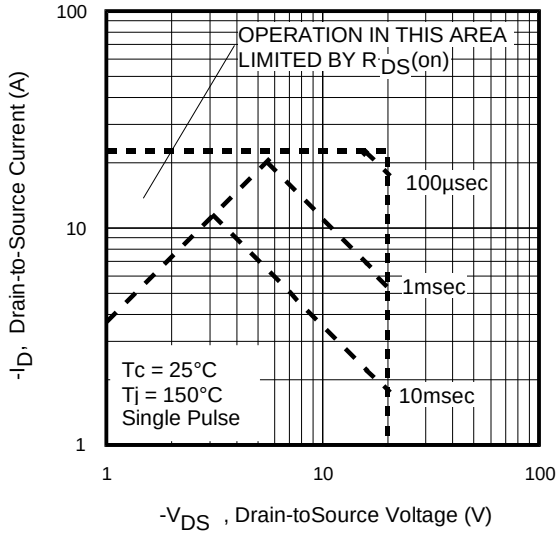


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

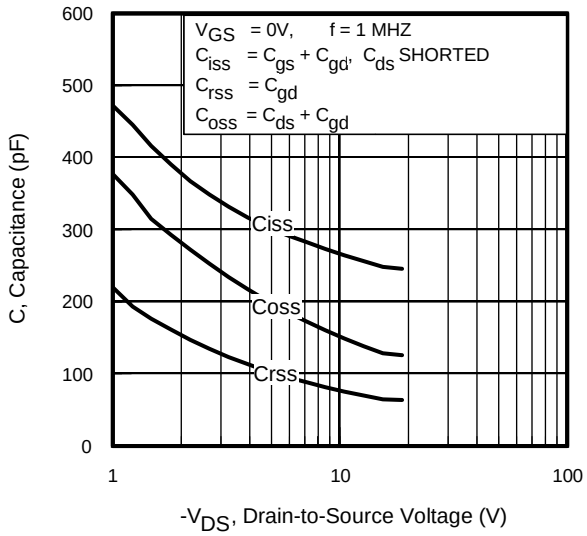


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

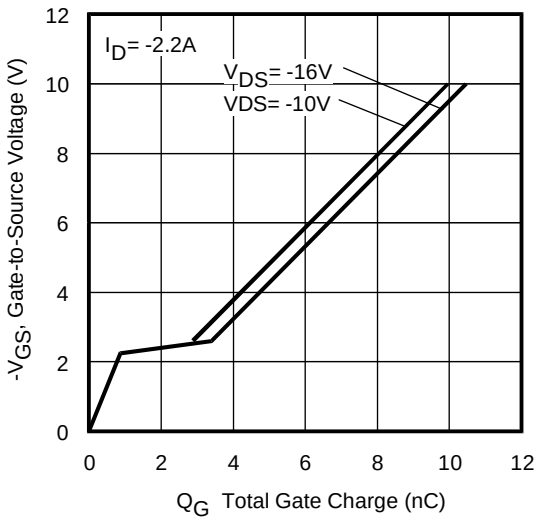


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

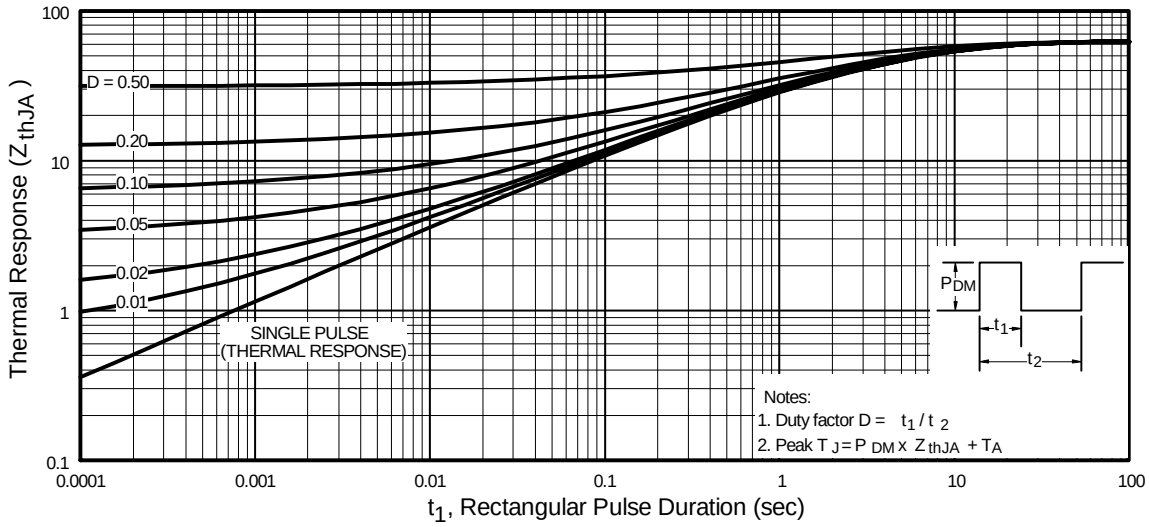


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Schottky Diode Characteristics

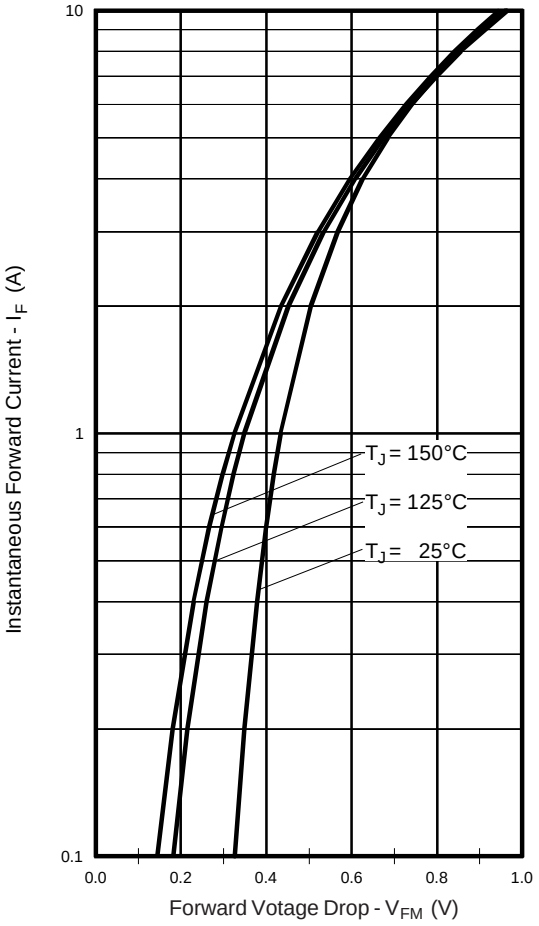


Fig. 12 -Typical Forward Voltage Drop Characteristics

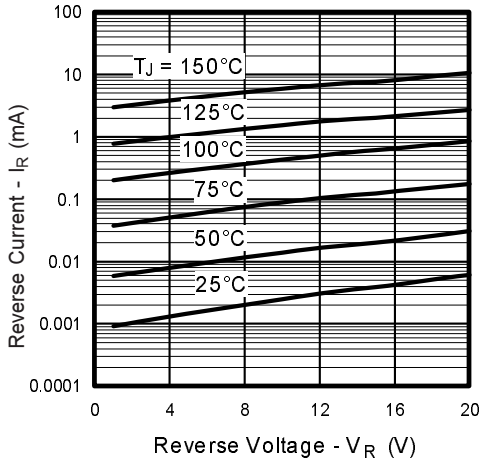


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

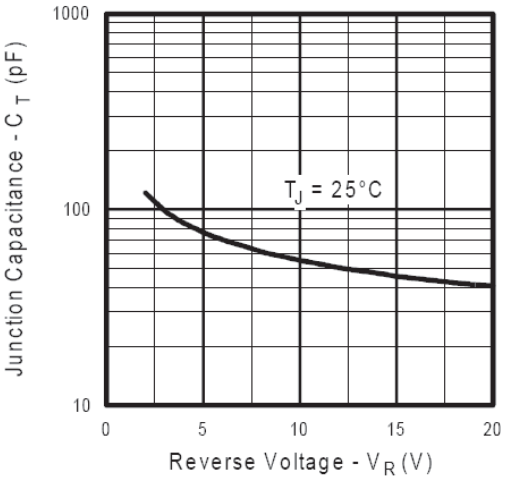
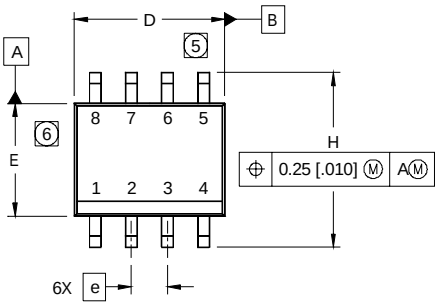


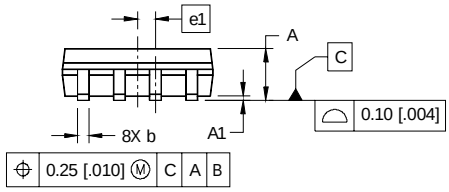
Fig.14 - Typical Junction capacitance Vs.Reverse Voltage

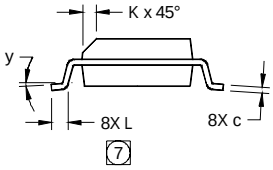
SO-8 (Fetky) Package Outline

Dimensions are shown in millimeters (inches)



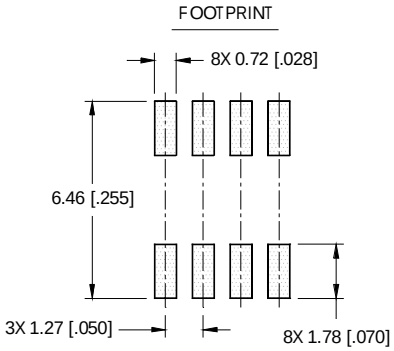
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°





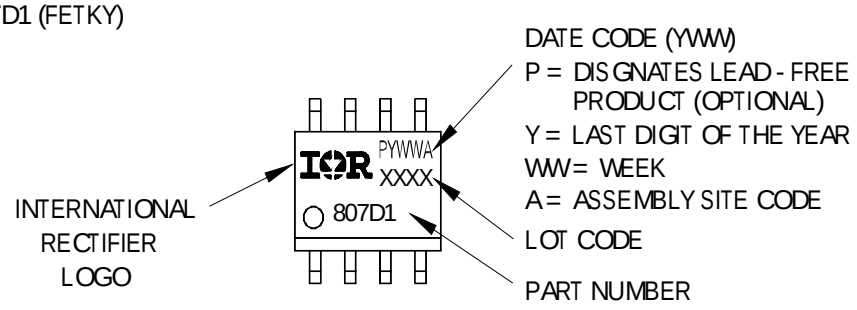
NOTES:

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.



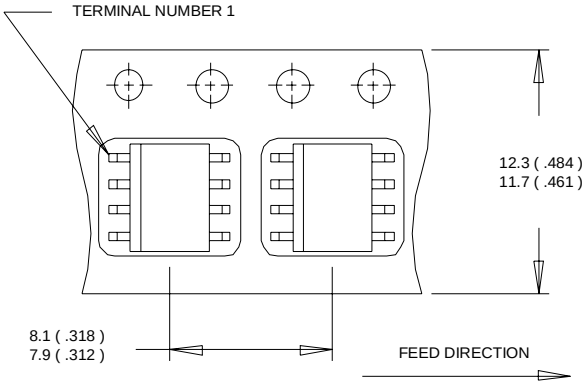
SO-8 (Fetky) Part Marking Information

EXAMPLE: THIS IS AN IRF7807D1 (FETKY)

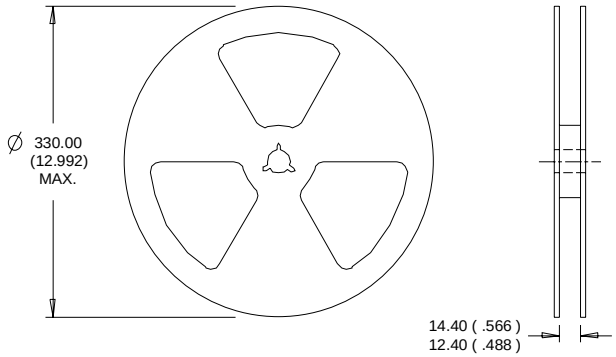


SO-8 (Fetky) Tape and Reel

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.

Notes:

① Repetitive rating; pulse width limited by maximum junction temperature (see figure 11)

② $I_{SD} \leq$ -2.2A, di/dt ≤ -96A/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, steady-state

⑤ R_θ is measured at T_J of approximately 90°C.

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