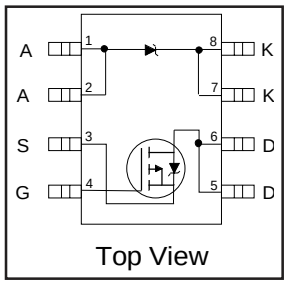
International
IOR Rectifier

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

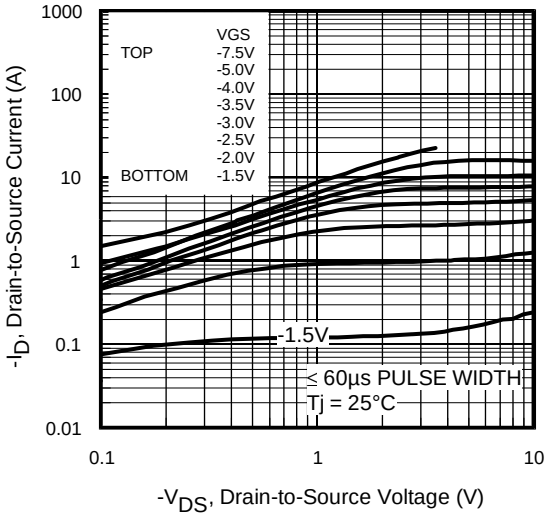


Fig 1. Typical Output Characteristics

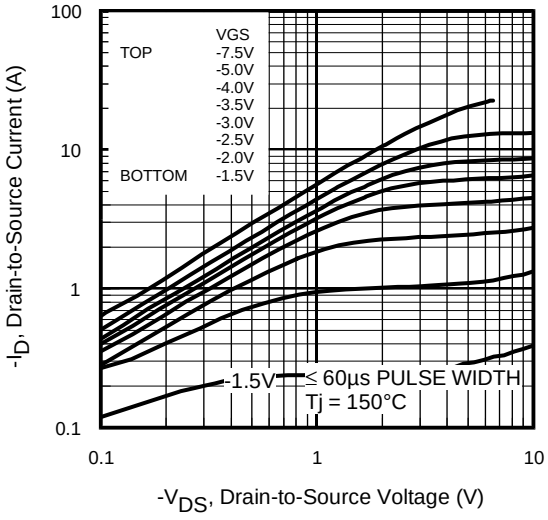


Fig 2. Typical Output Characteristics

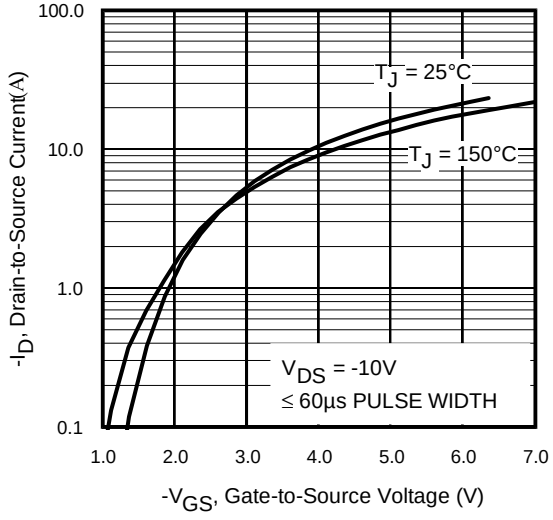


Fig 3. Typical Transfer Characteristics

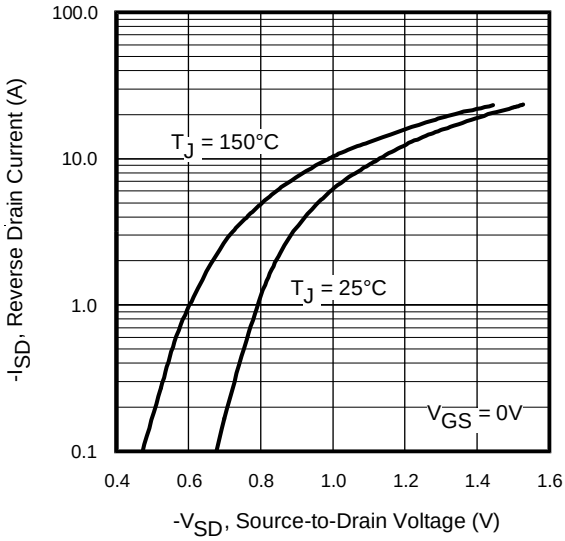


Fig 4. Typical Source-Drain Diode Forward Voltage

Power Mosfet Characteristics

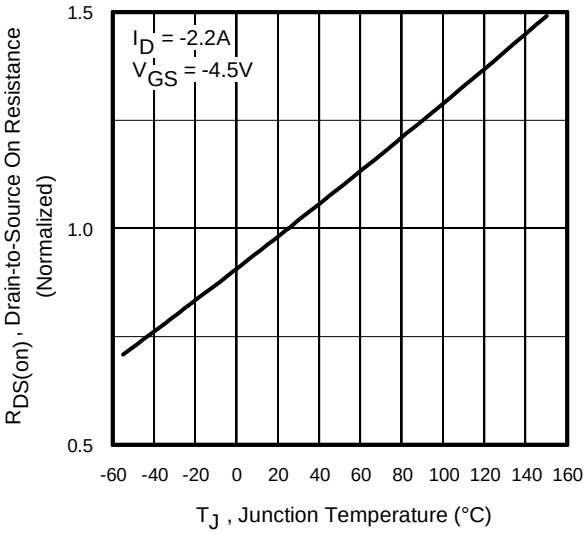


Fig 5. Normalized On-Resistance Vs. Temperature

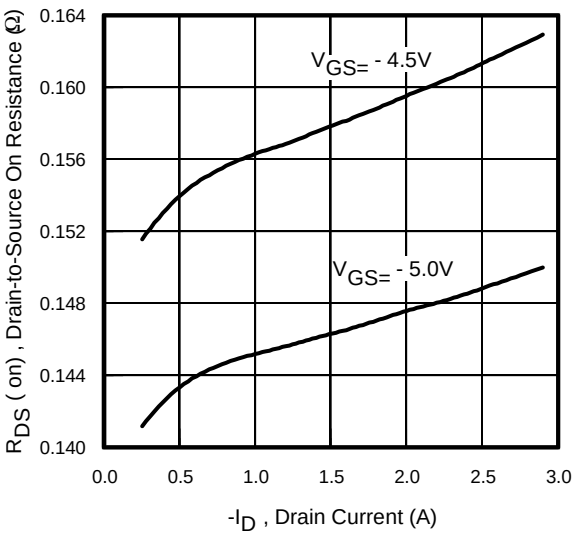


Fig 6. Typical On-Resistance Vs. Drain Current

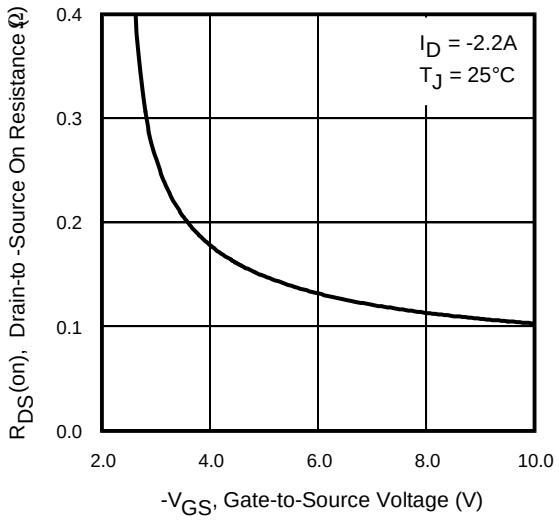


Fig 7. Typical On-Resistance Vs. Gate Voltage

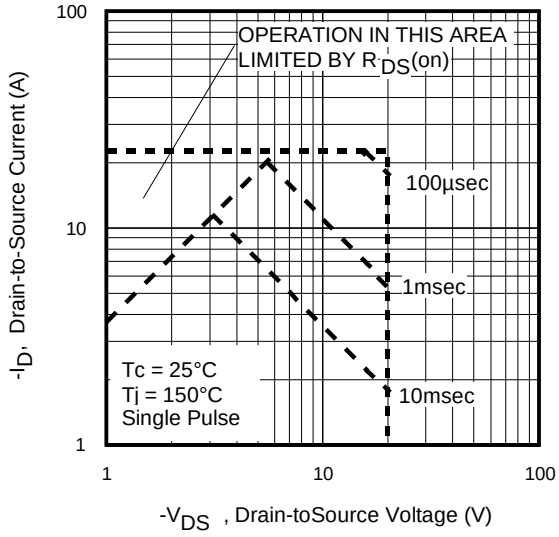


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

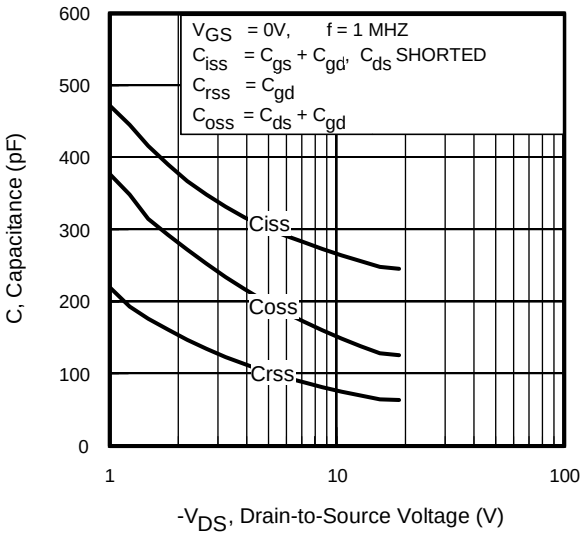


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

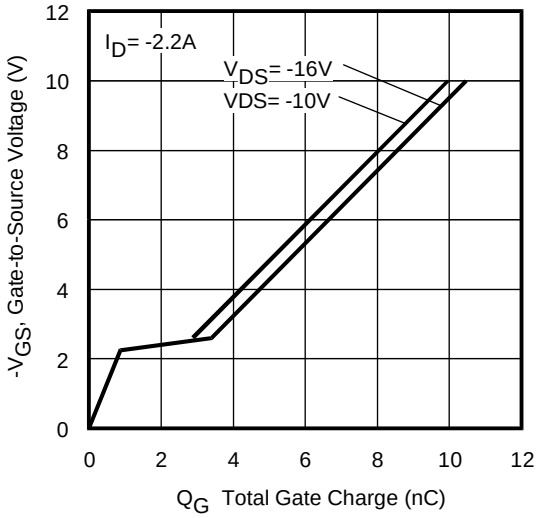


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

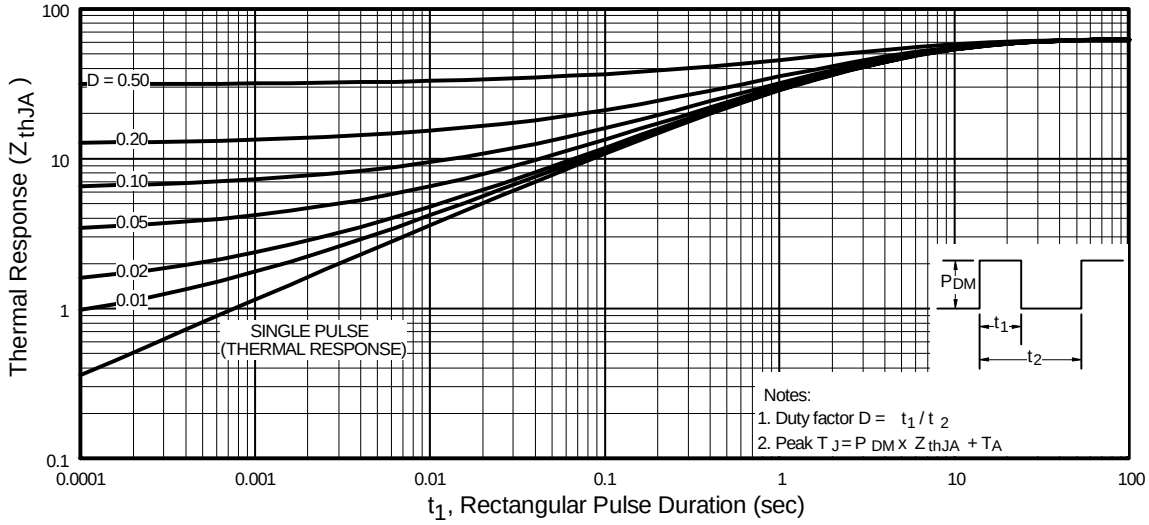


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Schottky Diode Characteristics

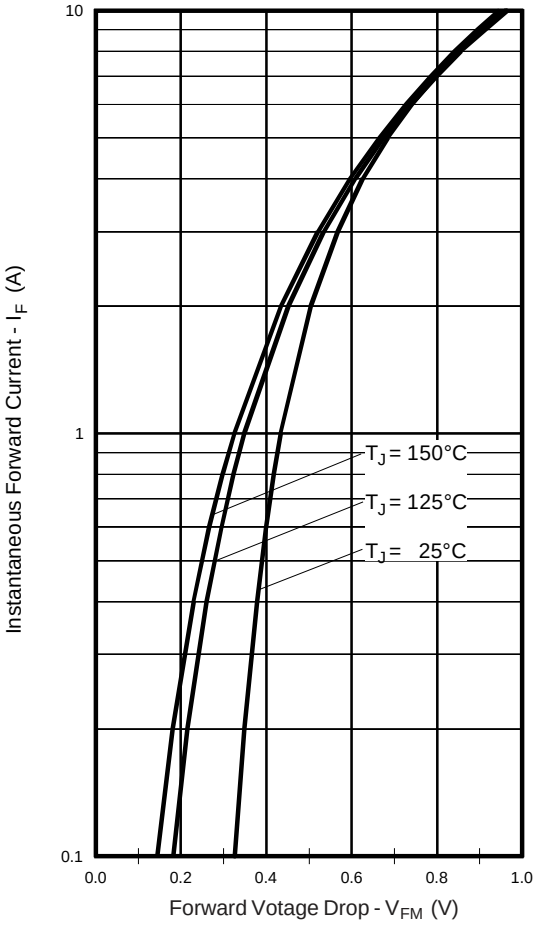


Fig. 12 -Typical Forward Voltage Drop Characteristics

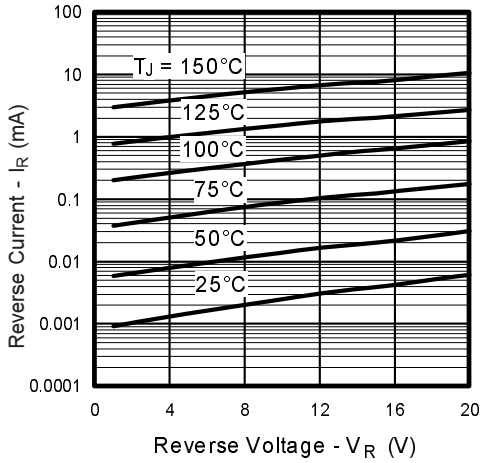


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

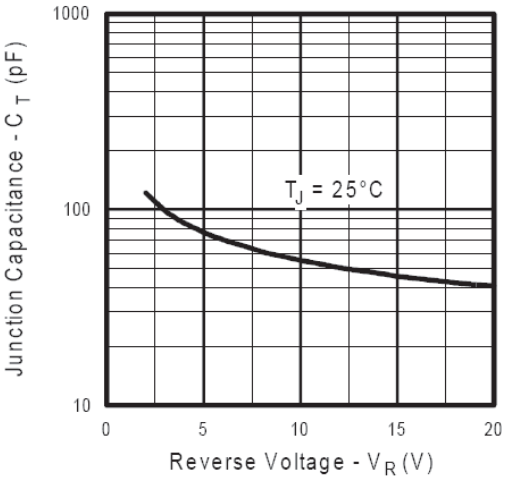
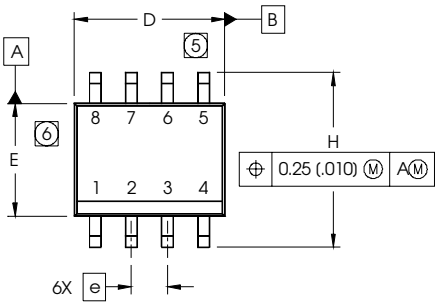


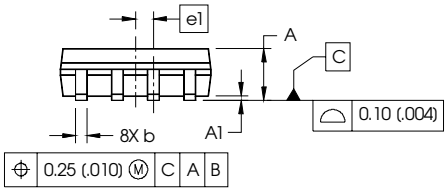
Fig.14 - Typical Junction capacitance Vs.Reverse Voltage

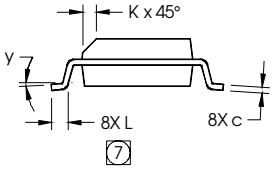
SO-8 (Fetky) Package Outline

Dimensions are shown in millimeters (inches)



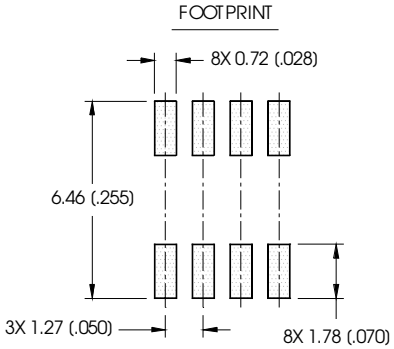
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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





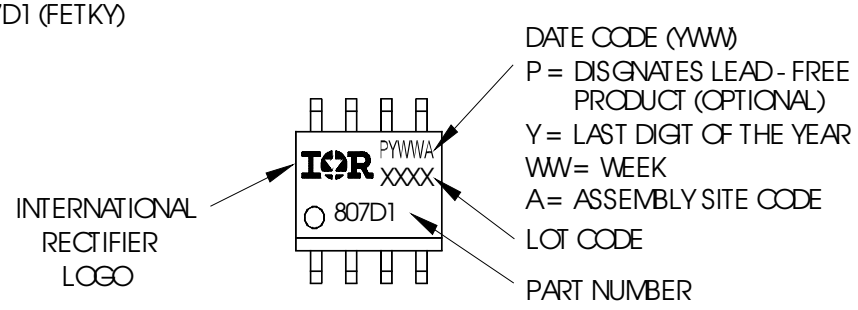
NOTES:

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.



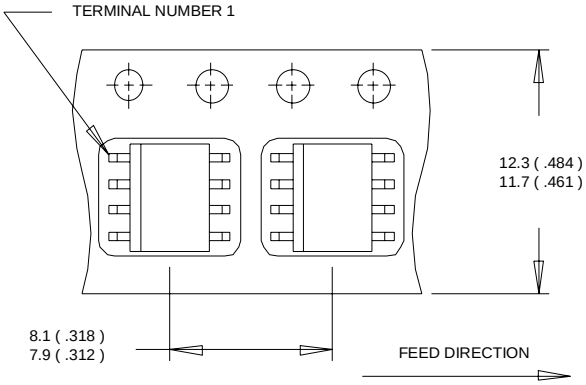
SO-8 (Fetky) Part Marking Information

EXAMPLE: THIS IS AN IRF7807D1 (FETKY)

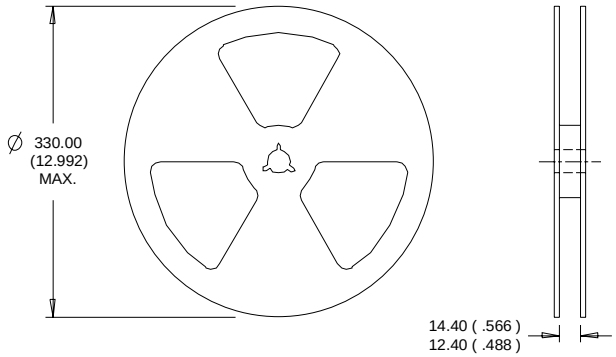


SO-8 (Fetky) Tape and Reel

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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