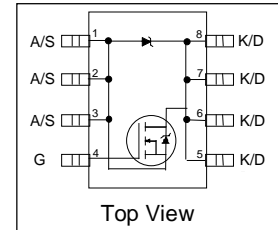
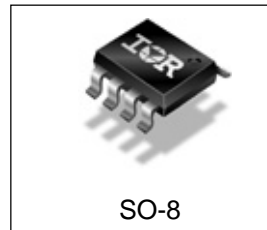


# IRF7807D1

## FETKY™ MOSFET / SCHOTTKY DIODE

- Co-Pack N-channel HEXFET® Power MOSFET and Schottky Diode
- Ideal for Synchronous Rectifiers in DC-DC Converters Up to 5A Output
- Low Conduction Losses
- Low Switching Losses
- Low Vf Schottky Rectifier



### Description

The FETKY™ family of Co-Pack HEXFET® MOSFETs and Schottky diodes offers the designer an innovative, board space saving solution for switching regulator and power management applications. HEXFET power MOSFETs 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.

### Device Features (Max Values)

	IRF7807D1
$V_{DS}$	30V
$R_{DS(on)}$	25mΩ
$Q_g$	14nC
$Q_{sw}$	5.2nC
$Q_{oss}$	18.4nC

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	Symbol	Max.	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	±12	
Continuous Drain or Source Current ( $V_{GS} \geq 4.5V$ )	$I_D$	25°C	A
		70°C	
Pulsed Drain Current①	$I_{DM}$	66	
Power Dissipation	$P_D$	25°C	W
		70°C	
Schottky and Body Diode Average Forward Current④	$I_F (AV)$	25°C	A
		70°C	
Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C

### Thermal Resistance

Parameter	Symbol	Max.	Units
Maximum Junction-to-Ambient③	$R_{\theta JA}$	50	°C/W

## Electrical Characteristics

Parameter		Min	Typ	Max	Units	Conditions
Drain-to-Source Breakdown Voltage*	$V_{(BR)DSS}$	30			V	$V_{GS} = 0V, I_D = 250\mu A$
Static Drain-Source on Resistance*	$R_{DS(on)}$		17	25	m $\Omega$	$V_{GS} = 4.5V, I_D = 7A$ ②
Gate Threshold Voltage*	$V_{GS(th)}$	1.0			V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Drain-Source Leakage Current*	$I_{DSS}$			90	$\mu A$	$V_{DS} = 24V, V_{GS} = 0V$
				7.2	mA	$V_{DS} = 24V, V_{GS} = 0V, T_j = 125^\circ C$
Gate-Source Leakage Current*	$I_{GSS}$			+/- 100	nA	$V_{GS} = +/-12V$
Total Gate Charge Synch FET*	$Q_{gsync}$		10.5	14	nC	$V_{DS} < 100mV, V_{GS} = 5V, I_D = 7A$
Total Gate Charge Control FET*	$Q_{gcont}$		12	17		$V_{DS} = 16V, V_{GS} = 5V, I_D = 7A$
Pre-Vth Gate-Source Charge	$Q_{gs1}$		2.1			$V_{DS} = 16V, I_D = 7A$
Post-Vth Gate-Source Charge	$Q_{gs2}$		0.76			
Gate to Drain Charge	$Q_{gd}$		2.9			
Switch Charge* ( $Q_{gs2} + Q_{gd}$ )	$Q_{SW}$		3.66	5.2		
Output Charge*	$Q_{oss}$		15.3	18.4		$V_{DS} = 16V, V_{GS} = 0$
Gate Resistance	$R_g$		1.2		$\Omega$	

## Schottky Diode & Body Diode Ratings and Characteristics

Parameter		Min	Typ	Max	Units	Conditions
Diode Forward Voltage	$V_{SD}$			0.5	V	$T_j = 25^\circ C, I_s = 1A, V_{GS} = 0V$ ②
				0.39		$T_j = 125^\circ C, I_s = 1A, V_{GS} = 0V$ ②
Reverse Recovery Time	trr		51		ns	$T_j = 25^\circ C, I_s = 7.0A, V_{DS} = 16V$
Reverse Recovery Charge	Qrr		48		nC	di/dt = 100A/ $\mu s$
Forward Turn-On Time	$t_{on}$	Intrinsic turn-on time is negligible (turn-on is dominated by $L_s + L_D$ )				

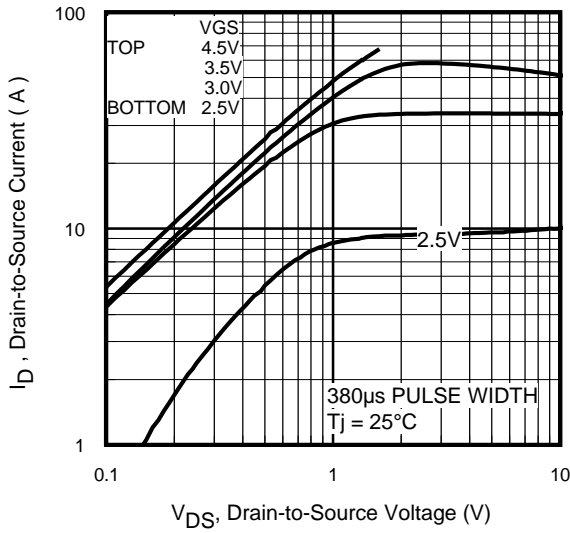
① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width  $\leq 300 \mu s$ ; duty cycle  $\leq 2\%$ .

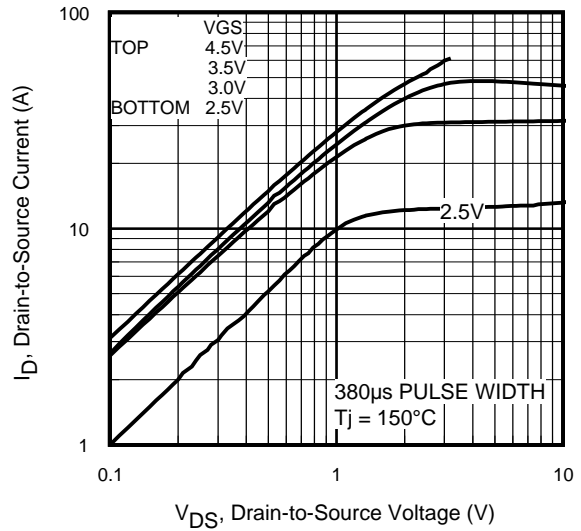
③ When mounted on 1 inch square copper board,  $t < 10$  sec.

④ 50% Duty Cycle, Rectangular

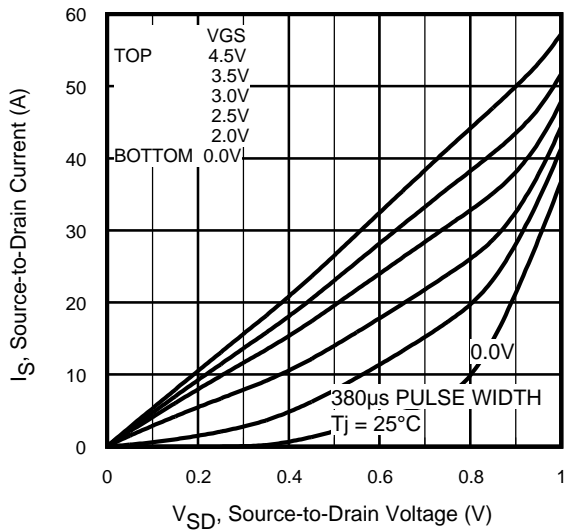
\* Devices are 100% tested to these parameters.



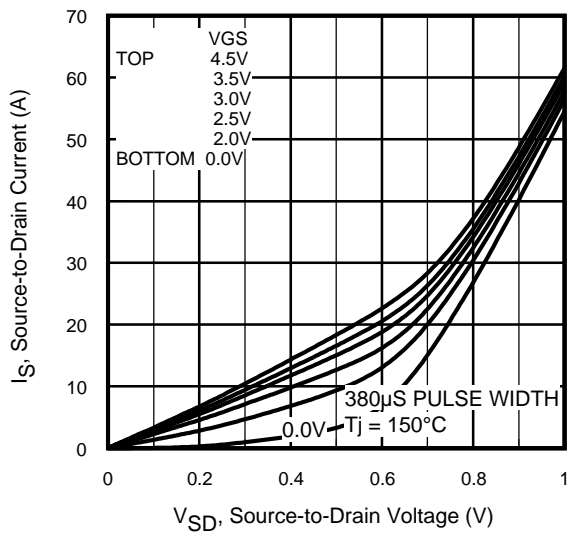
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics

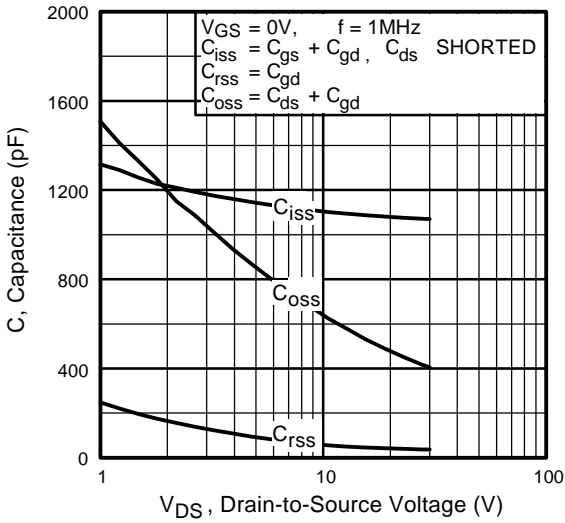


**Fig 3.** Typical Reverse Output Characteristics

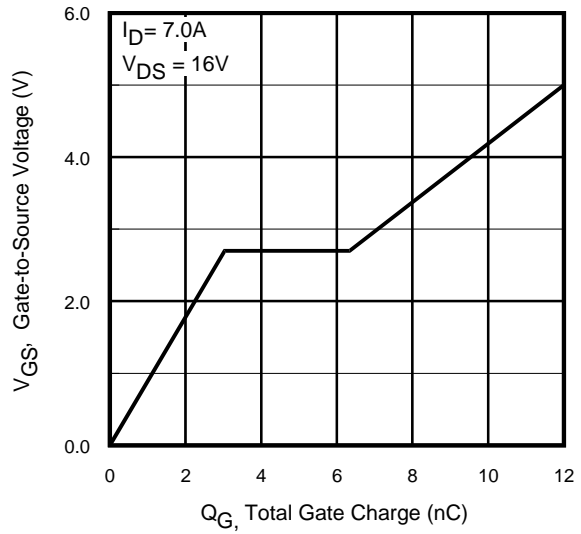


**Fig 4.** Typical Reverse Output Characteristics

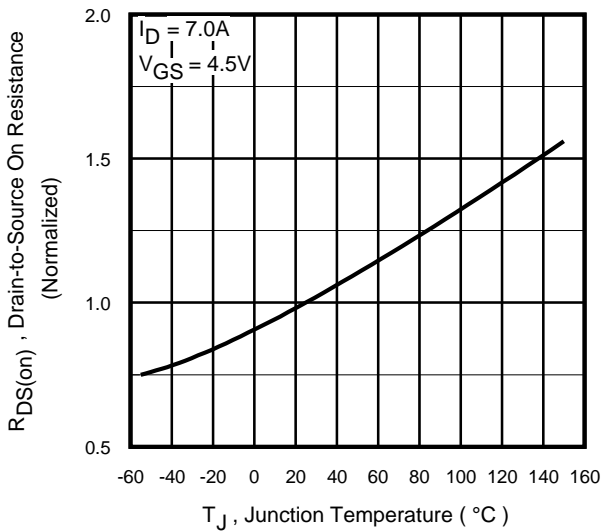
# IRF7807D1



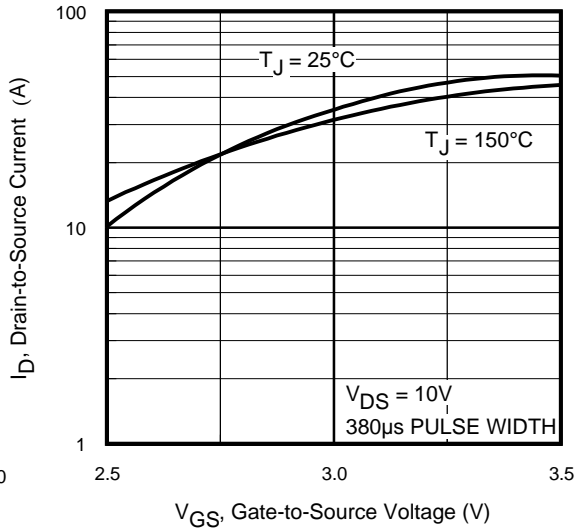
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



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



**Fig 7.** Normalized On-Resistance Vs. Temperature



**Fig 8.** Typical Transfer Characteristics

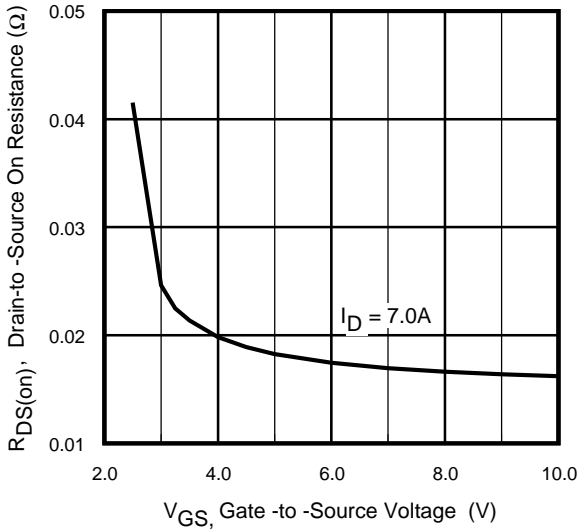


Fig 9. On-Resistance Vs. Gate Voltage

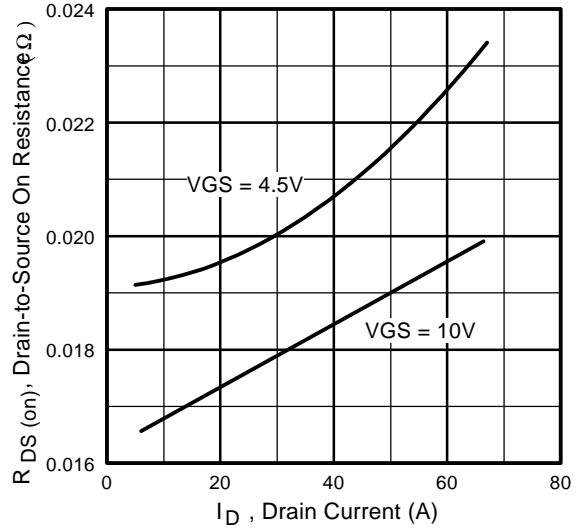


Fig 10. On-Resistance Vs. Drain Current

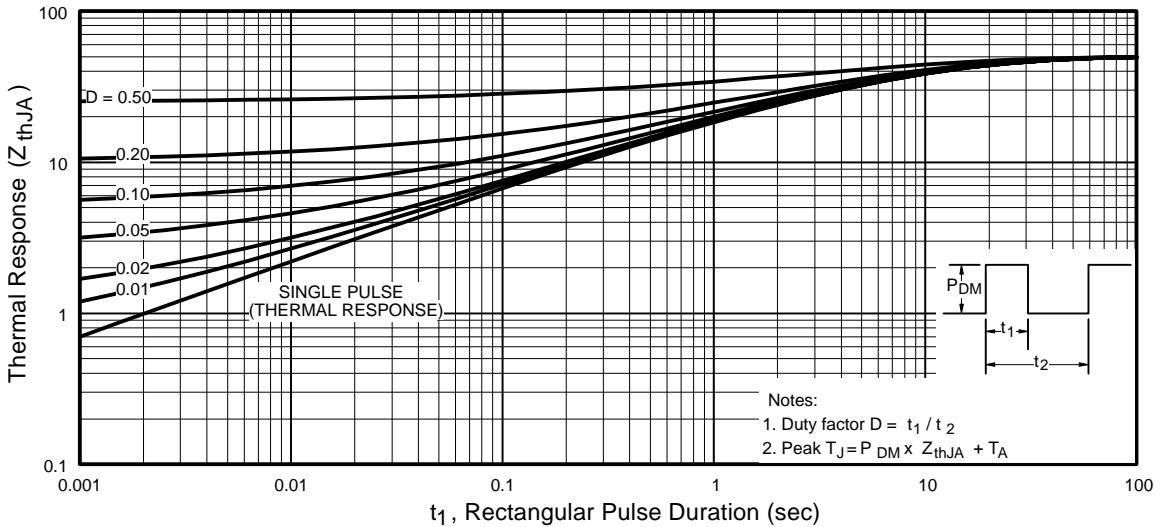
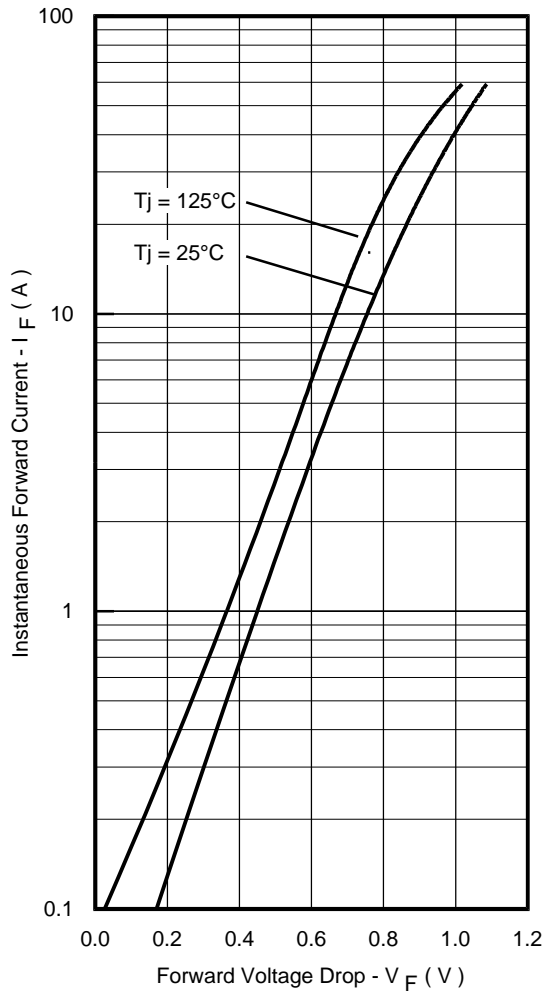
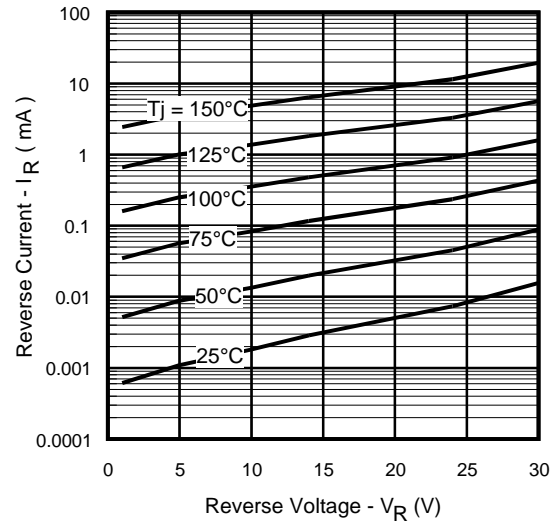


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (HEXFET<sup>®</sup> MOSFET)

## MOSFET , Body Diode & Schottky Diode Characteristics

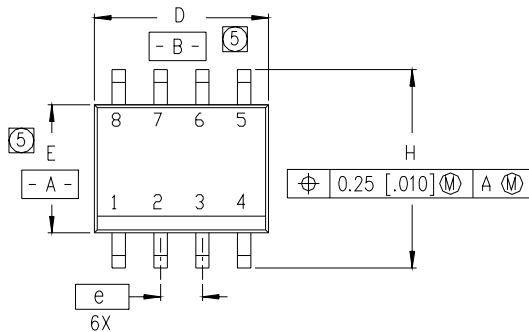


**Fig. 12** - Typical Forward Voltage Drop Characteristics

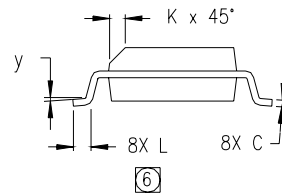
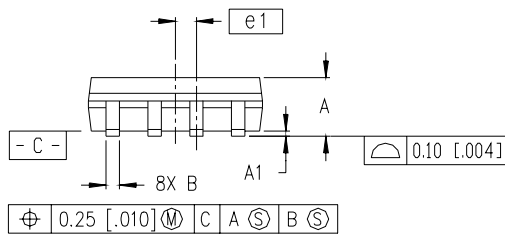


**Fig. 13** - Typical Values of Reverse Current Vs. Reverse Voltage

## SO-8 Package Details



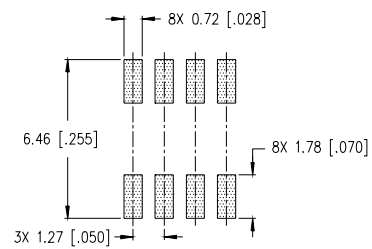
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050	BASIC	1.27	BASIC
e1	.025	BASIC	0.635	BASIC
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	.016	.050	0.41	1.27
y	0°	8°	0°	8°



**NOTES:**

1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1982.
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 0.25 [.006].
- ⑥ DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

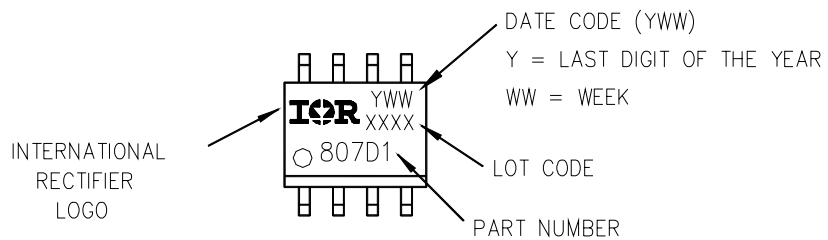
**RECOMMENDED FOOTPRINT**



## SO-8 Part Marking

SO-8 ( MS-012AA )

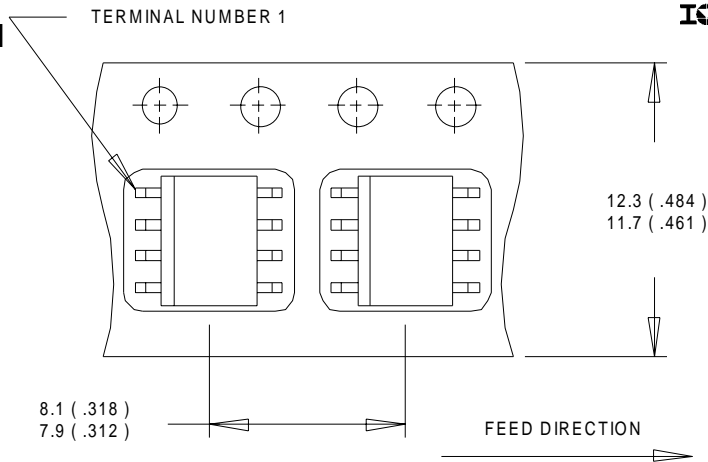
EXAMPLE: THIS IS AN IRF7807D1 (FETKY)



# IRF7807D1

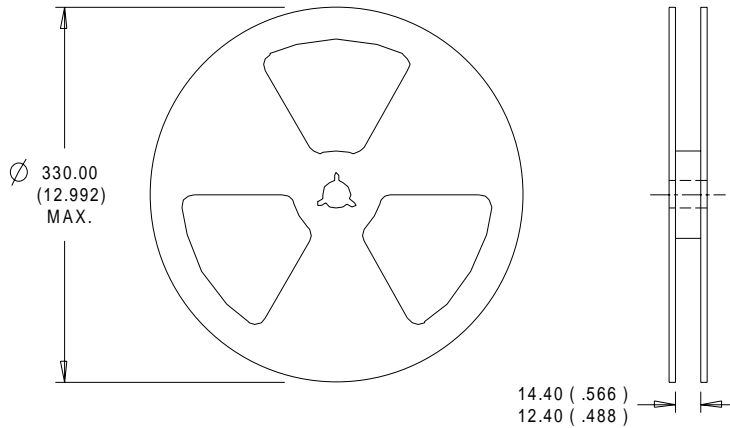
SO-8 Tape and Reel

International  
**IR** Rectifier



**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.

International  
**IR** Rectifier

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**IR GREAT BRITAIN:** Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: ++ 44 1883 732020

**IR CANADA:** 15 Lincoln Court, Brampton, Ontario L6T3Z2, Tel: (905) 453 2200

**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590

**IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111

**IR JAPAN:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo Japan 171 Tel: 81 3 3983 0086

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*Data and specifications subject to change without notice. 11/99*