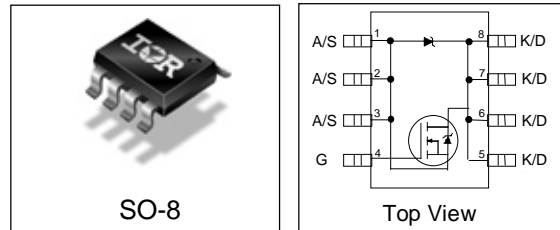


IRF7807D1

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 Ω	$V_{GS} = 4.5V, I_D = 7A$ 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	μA	$V_{DS} = 24V, V_{GS} = 0V$
				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		Ω	

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/ μs
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.

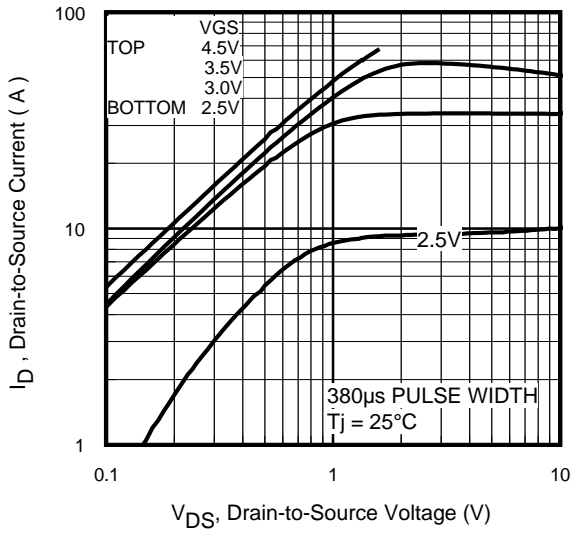


Fig 1. Typical Output Characteristics

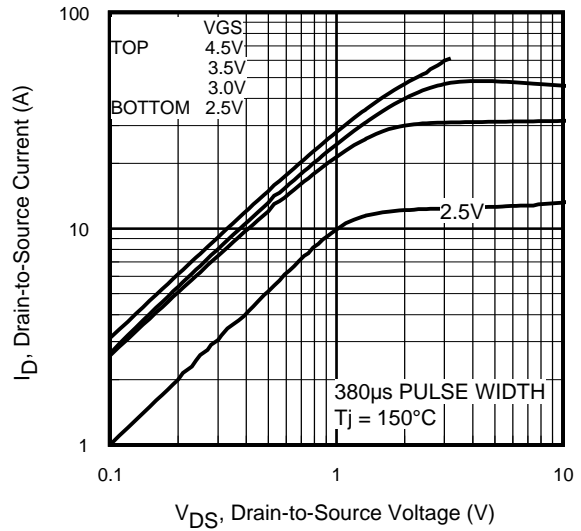


Fig 2. Typical Output Characteristics

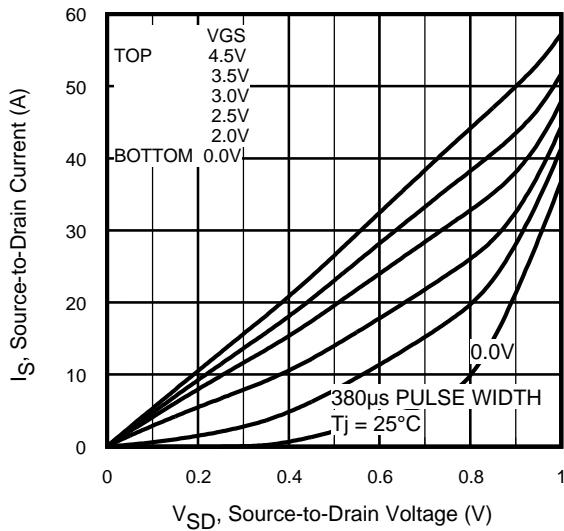


Fig 3. Typical Reverse Output Characteristics

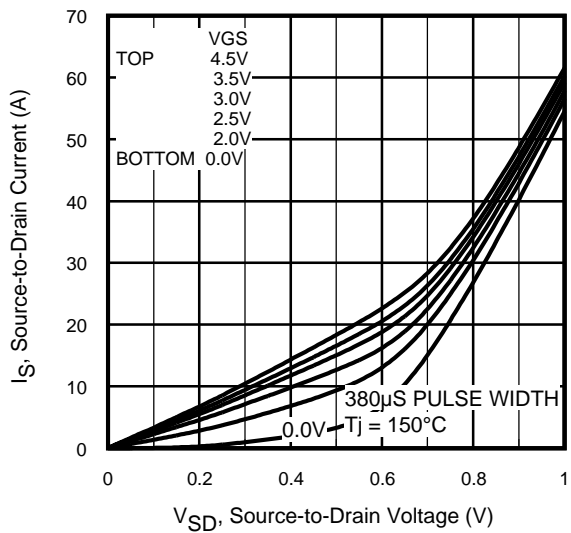


Fig 4. Typical Reverse Output Characteristics

IRF7807D1

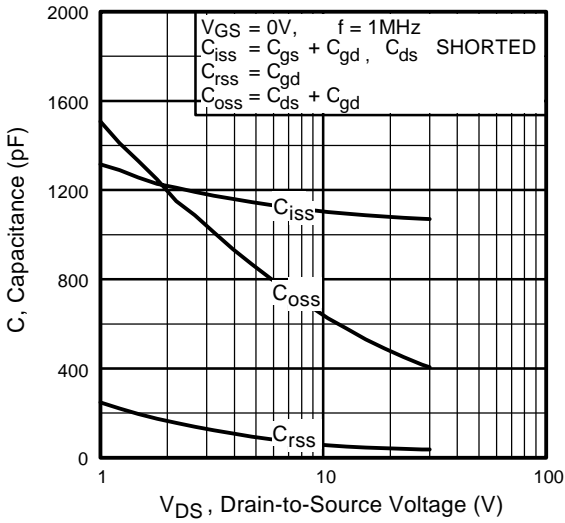


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

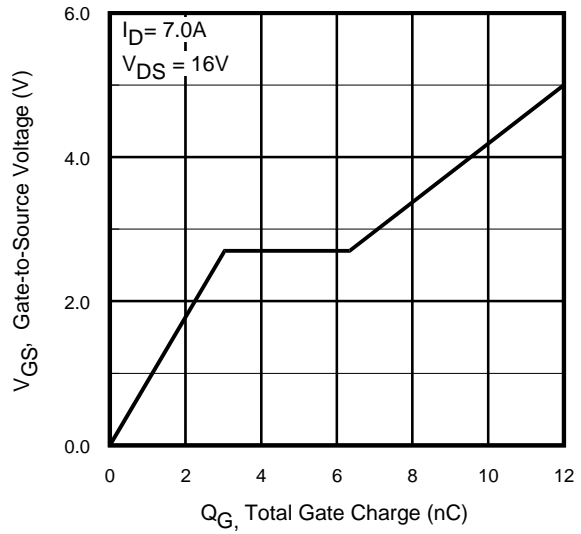


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

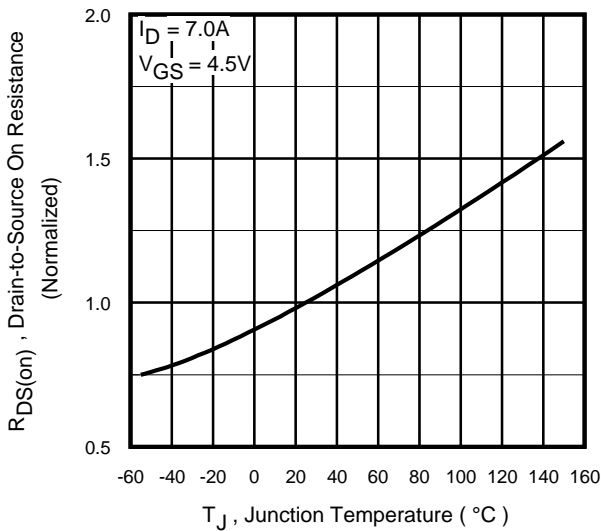


Fig 7. Normalized On-Resistance Vs. Temperature

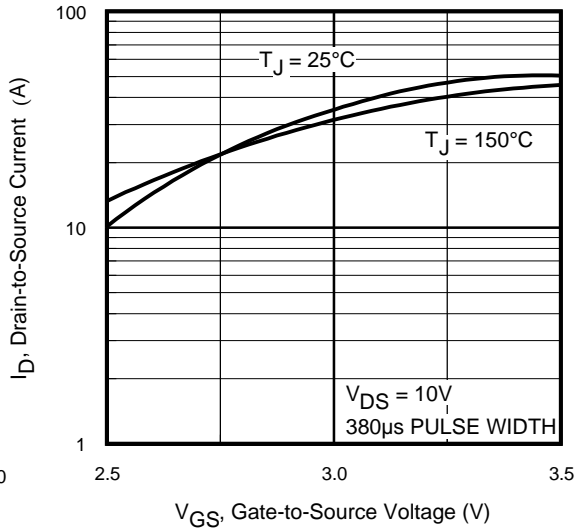


Fig 8. Typical Transfer Characteristics

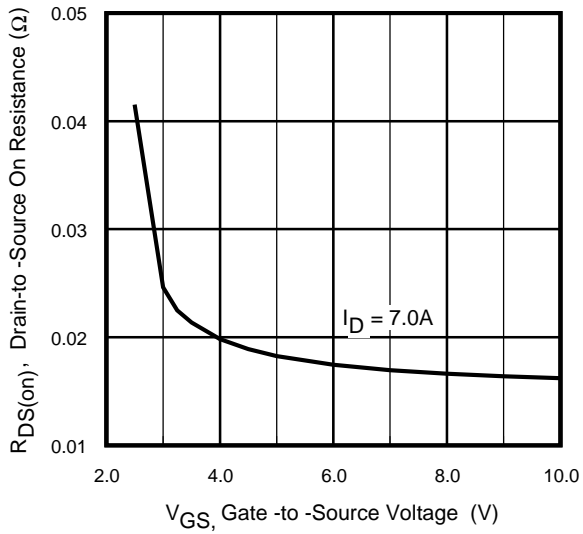


Fig 9. On-Resistance Vs. Gate Voltage

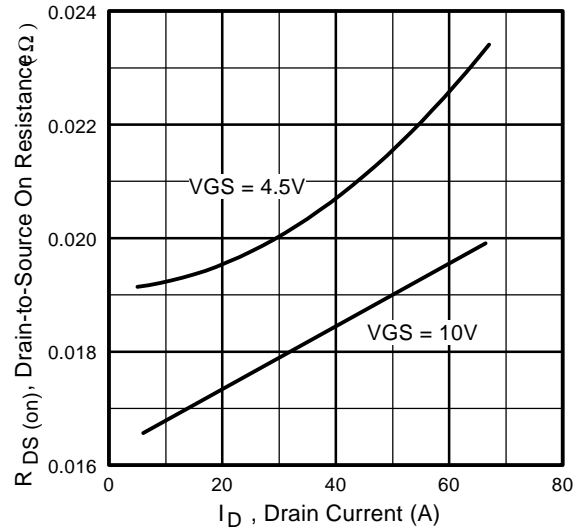


Fig 10. On-Resistance Vs. Drain Current

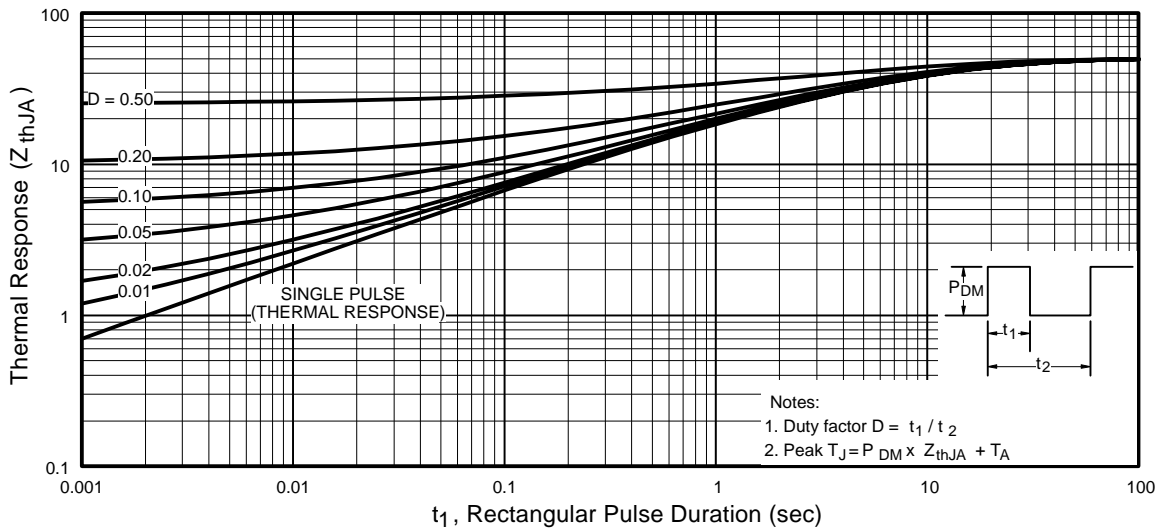


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (HEXFET[®] MOSFET)

MOSFET , Body Diode & Schottky Diode Characteristics

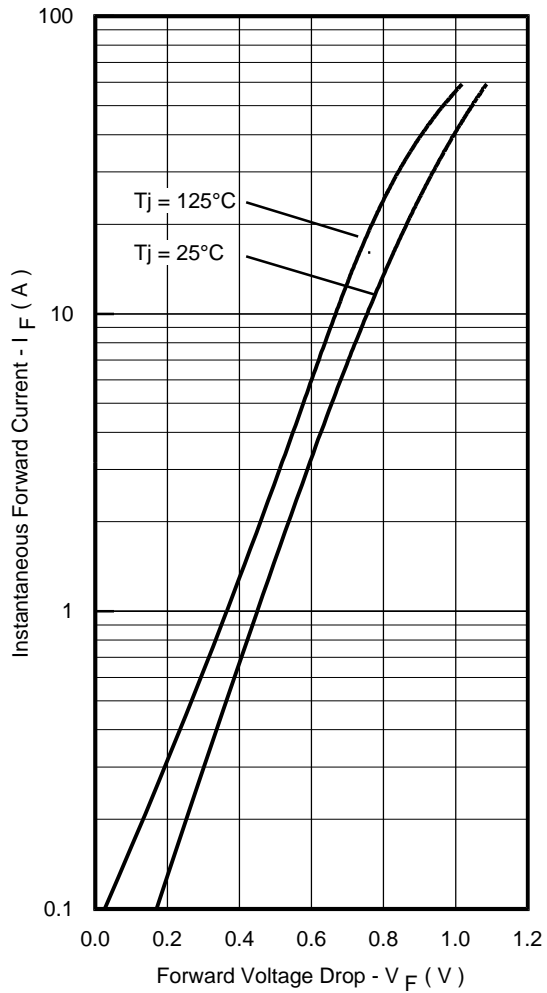


Fig. 12 - Typical Forward Voltage Drop Characteristics

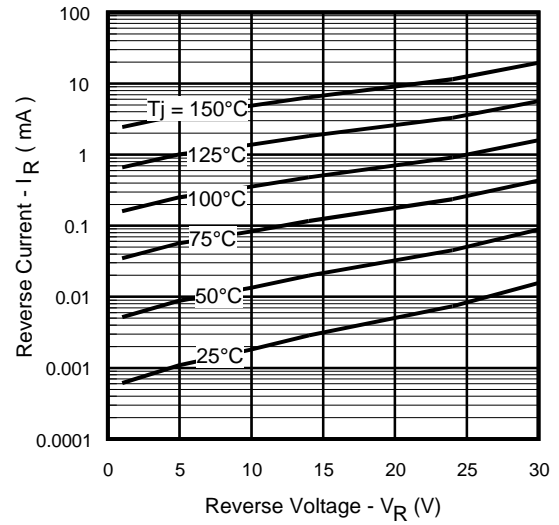
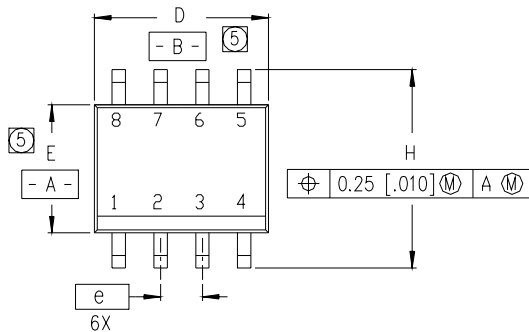
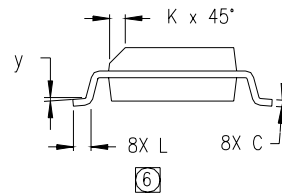
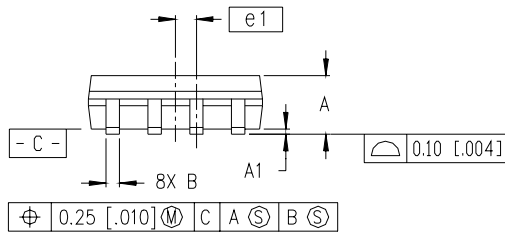


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

SO-8 Package Details



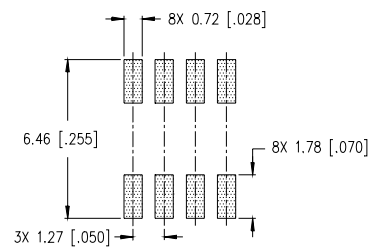
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050	BASIC	1.27	BASIC
e1	.025	BASIC	0.635	BASIC
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	.016	.050	0.41	1.27
y	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 [0.006].
- ⑥ DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

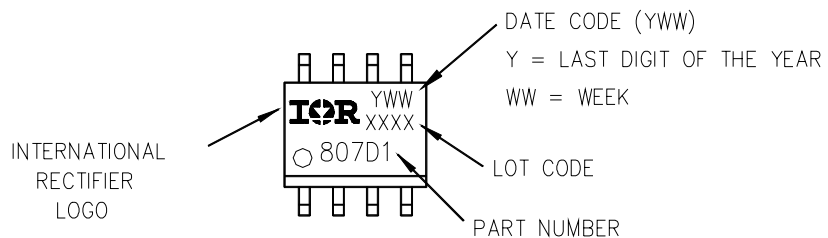
RECOMMENDED FOOTPRINT



SO-8 Part Marking

SO-8 (MS-012AA)

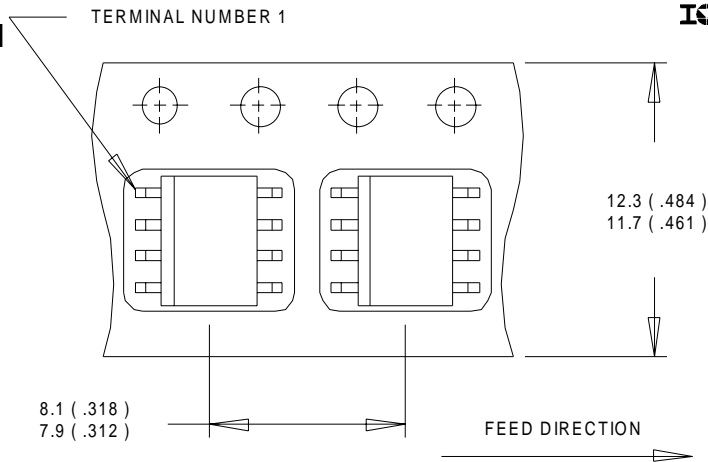
EXAMPLE: THIS IS AN IRF7807D1 (FETKY)



IRF7807D1

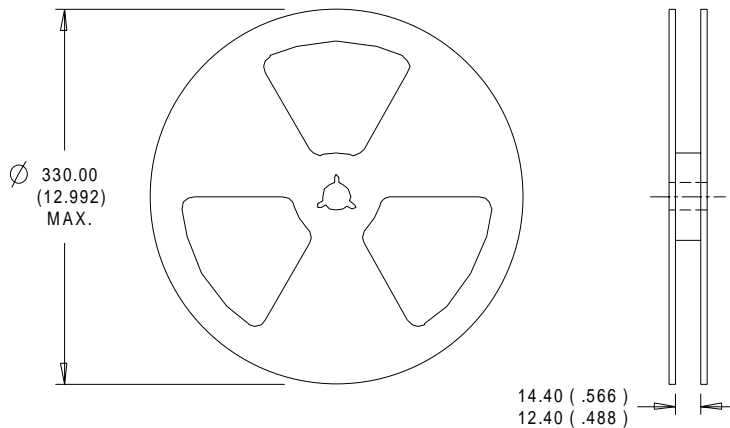
SO-8 Tape and Reel

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 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