WINSOURCE ELECTRONICS

THE DATASHEET OF

IRF7807D1

International
IOR Rectifier

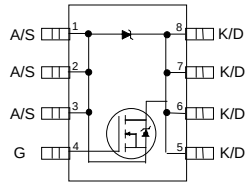
PD- 93761

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

SO-8



Top View

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.

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.

Device Features (Max Values)

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

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 ($V_{GS} \geq 4.5V$)	25°C	I_D	8.3	A
	70°C		6.6	
Pulsed Drain Current①		I_{DM}	66	
Power Dissipation	25°C	P_D	2.5	W
	70°C		1.6	
Schottky and Body Diode Average ForwardCurrent④	25°C	I_F (AV)	3.5	A
	70°C		2.2	
Junction & Storage Temperature Range		T_J, T_{STG}	–55 to 150	°C

Thermal Resistance

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

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Electrical Characteristics

Parameter		Min	Typ	Max	Units	Conditions
Drain-to-Source Breakdown Voltage*	$V_{(BR)DSS}$	30			V	V_{GS} = 0V, I_D = 250µA
Static Drain-Source on Resistance*	R_{DS}(on)		17	25	mΩ	V_{GS} = 4.5V, I_D = 7A②
Gate Threshold Voltage*	V_{GS}(th)	1.0			V	V_{DS} = V_{GS}, I_D = 250µA
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°C
Gate-Source Leakage Current*	I_{GSS}			+/- 100	nA	V_{GS} = +/-12V
Total Gate Charge Synch FET*	Q_{gsync}		10.5	14		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		nC	
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°C, I_s = 1A, V_{GS} =0V②
				0.39		T_j = 125°C, I_s = 1A, V_{GS} =0V②
Reverse Recovery Time	trr		51		ns	T_j = 25°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 ≤ 300 µs; duty cycle ≤ 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.

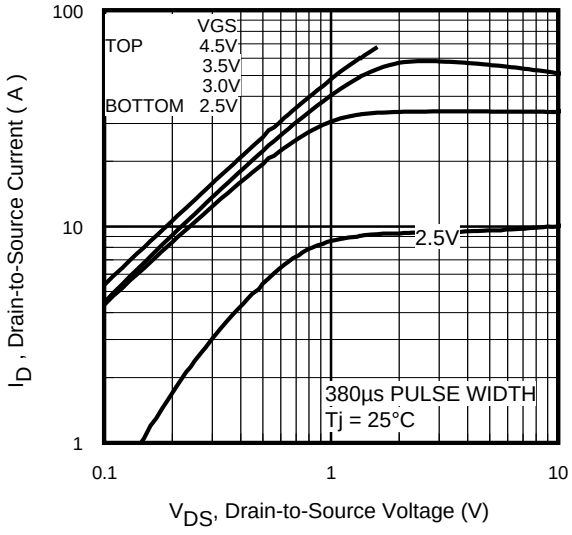


Fig 1. Typical Output Characteristics

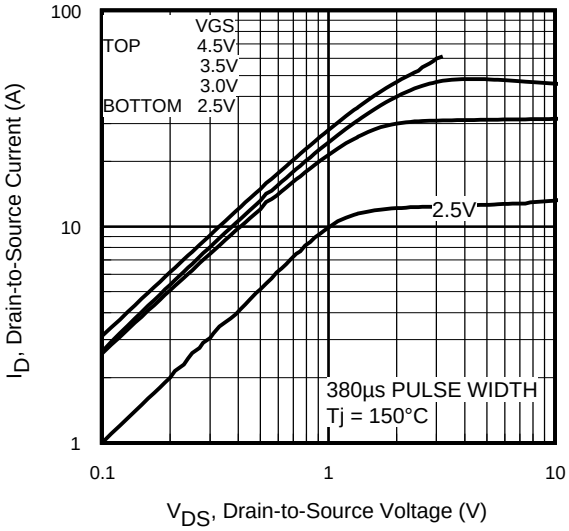


Fig 2. Typical Output Characteristics

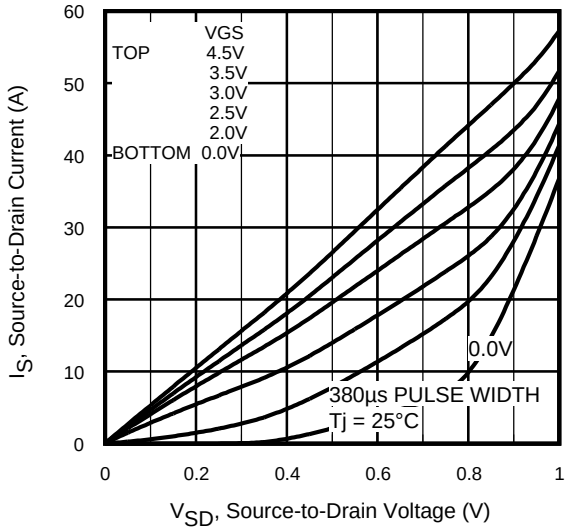


Fig 3. Typical Reverse Output Characteristics

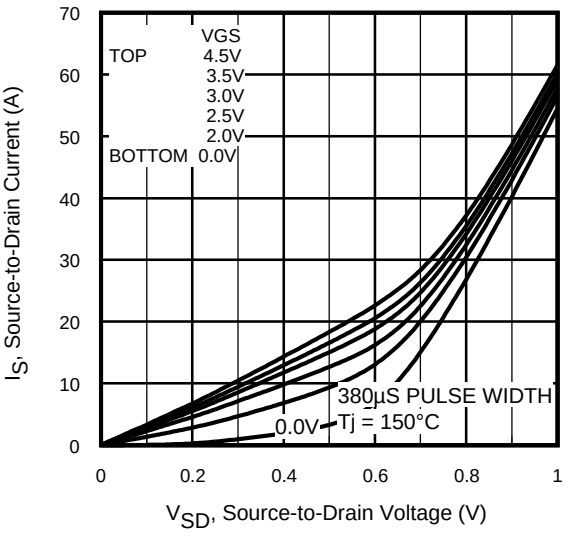


Fig 4. Typical Reverse Output Characteristics

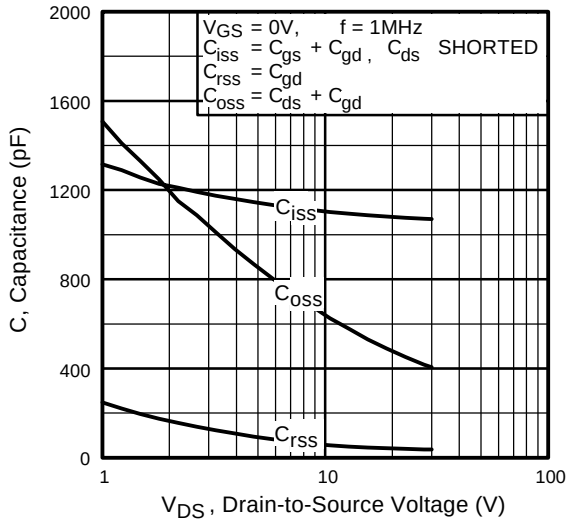


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

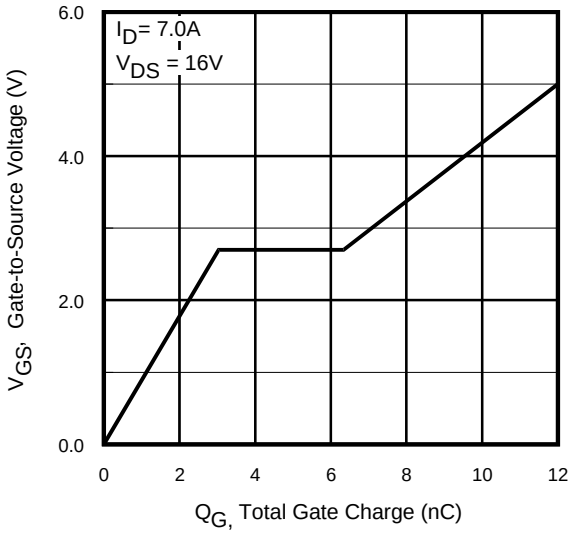


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

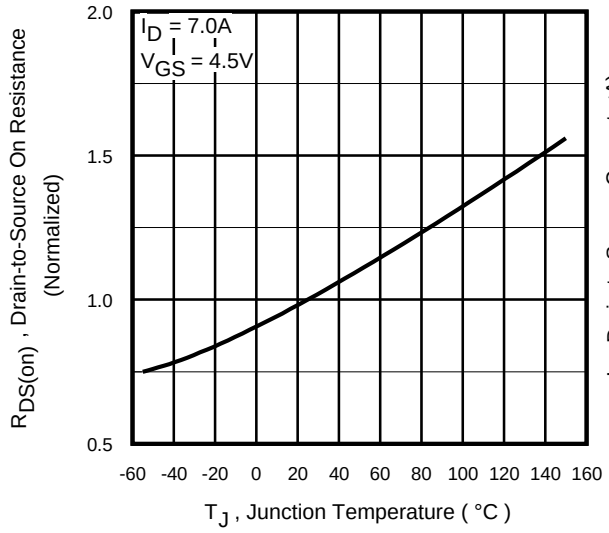


Fig 7. Normalized On-Resistance Vs. Temperature

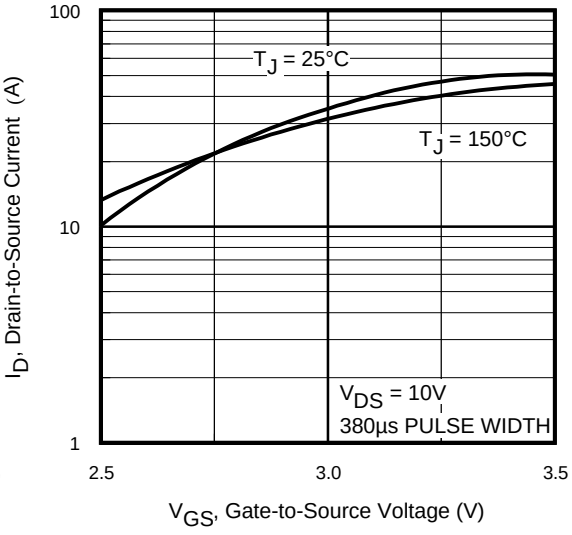


Fig 8. Typical Transfer Characteristics

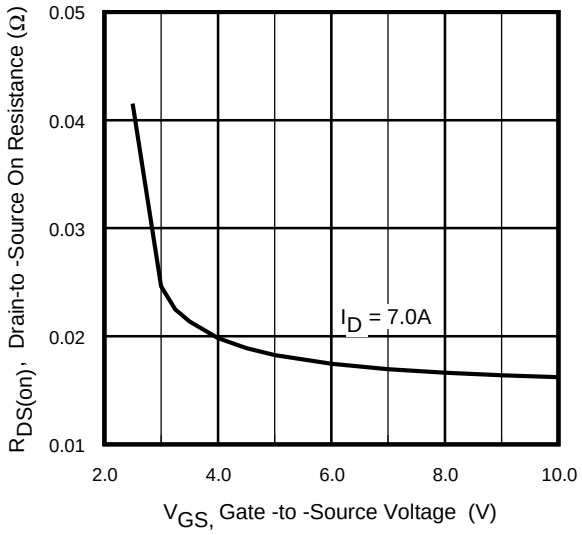


Fig 9. On-Resistance Vs. Gate Voltage

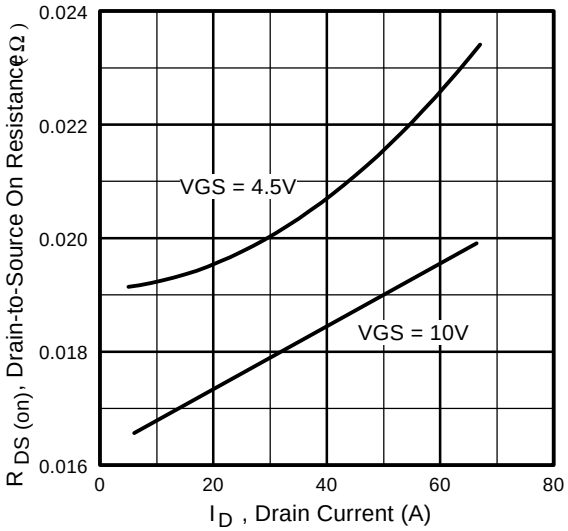


Fig 10. On-Resistance Vs. Drain Current

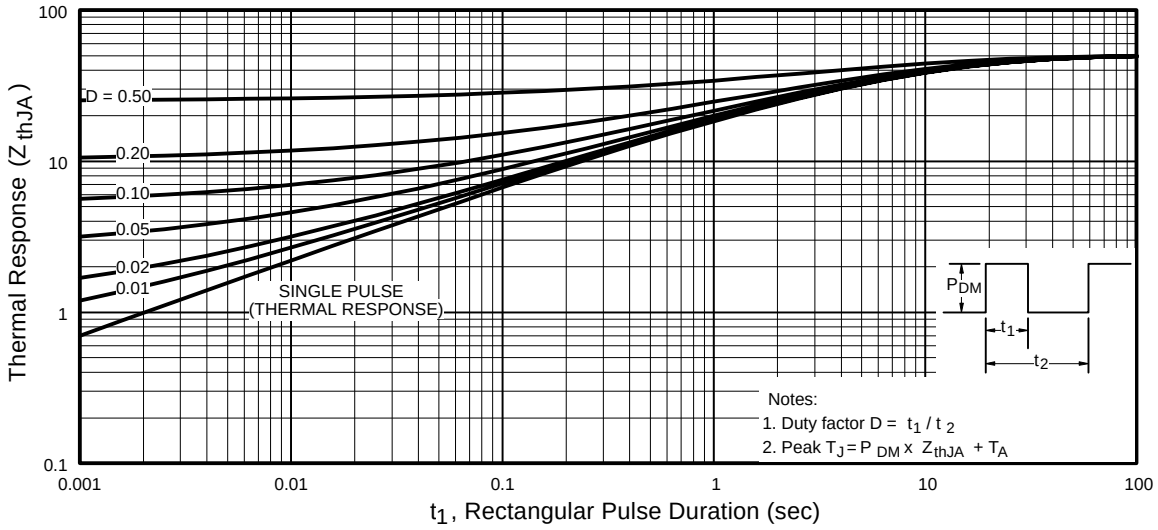


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (HEXFET® MOSFET)

MOSFET , Body Diode & Schottky Diode Characteristics

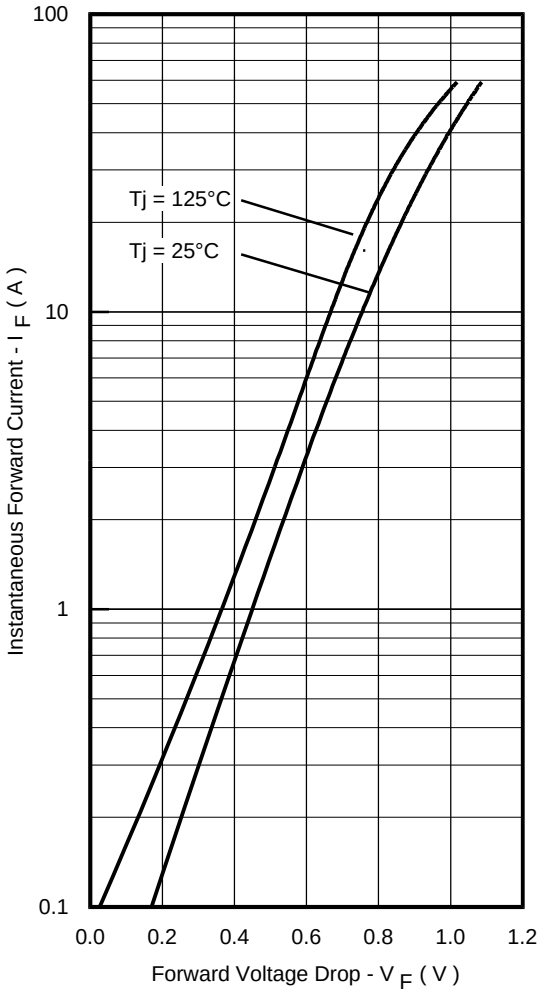


Fig. 12 - Typical Forward Voltage Drop Characteristics

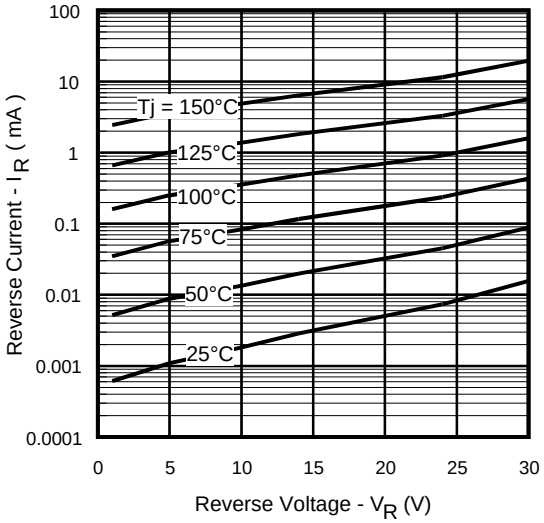
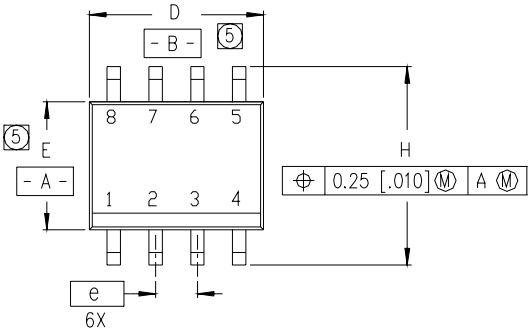
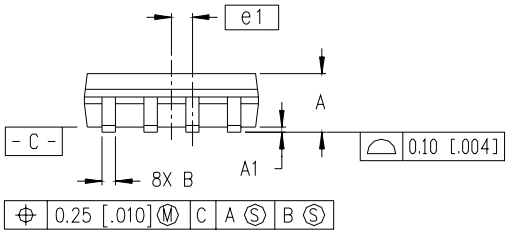


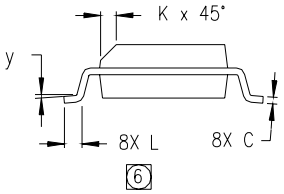
Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

SO-8 Package Details

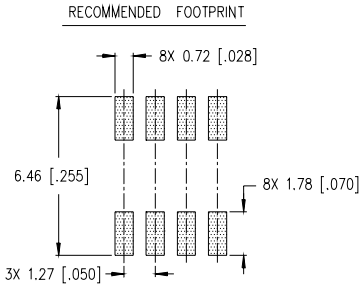


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	.016	.050	0.41	1.27
y	0°	8°	0°	8°

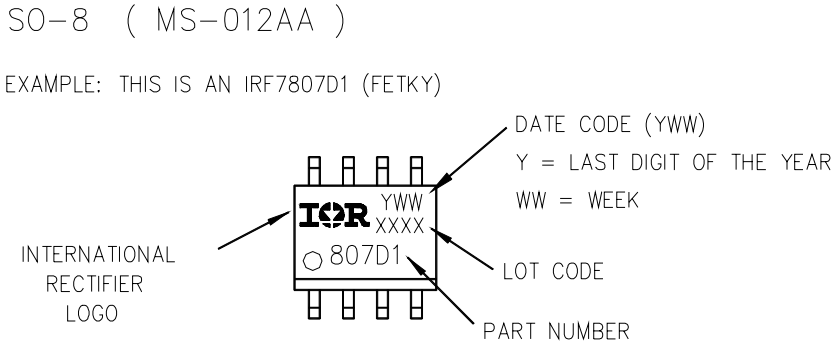




NOTES:
1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.006].
6. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



SO-8 Part Marking



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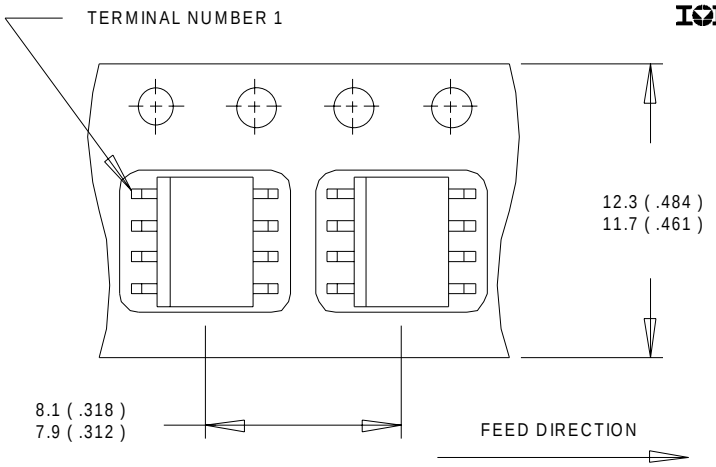
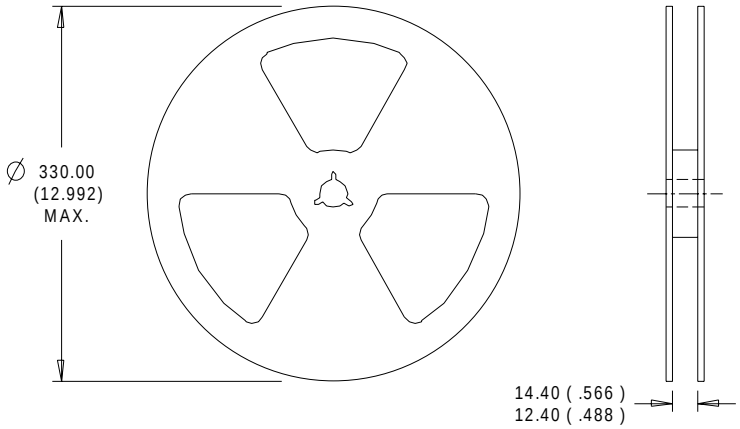
SO-8 Tape and Reel



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
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