



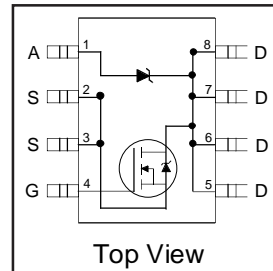
THE DATASHEET OF IRF7421D1



IRF7421D1

FETKY™ MOSFET / Schottky Diode

- Co-packaged HEXFET® Power MOSFET and Schottky Diode
- Ideal For Synchronous Regulator Applications
- Generation V Technology
- SO-8 Footprint

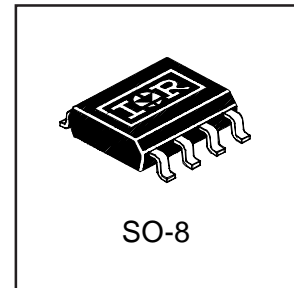


$V_{DSS} = 30V$
$R_{DS(on)} = 0.035\Omega$
Schottky Vf = 0.39V

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.



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Maximum	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{(4)}$	5.8	A
$I_D @ T_A = 70^\circ C$		4.6	
I_{DM}	Pulsed Drain Current ⁽¹⁾	46	
$P_D @ T_A = 25^\circ C$	Power Dissipation ⁽⁴⁾	2.0	W
$P_D @ T_A = 70^\circ C$		1.3	
	Linear Derating Factor	16	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt ⁽²⁾	-5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	°C

Thermal Resistance Ratings

Parameter		Maximum	Units
$R_{\theta JA}$	Junction-to-Ambient ⁽⁴⁾	62.5	°C/W

Notes:

- ⁽¹⁾ Repetitive rating; pulse width limited by maximum junction temperature (see figure 11)
- ⁽²⁾ $I_{SD} \leq 4.1A$, $di/dt \leq 110A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ C$
- ⁽³⁾ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$
- ⁽⁴⁾ Surface mounted on FR-4 board, $t \leq 10sec$.

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

Parameter		Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V _{GS} = 0V, I _D = 250μA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	0.026	0.035	Ω	V _{GS} = 10V, I _D = 4.1A ③
		—	0.040	0.060		V _{GS} = 4.5V, I _D = 2.1A ③
V _{GS(th)}	Gate Threshold Voltage	1.0	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
g _{fs}	Forward Transconductance	4.6	—	—	S	V _{DS} = 15V, I _D = 2.1A
I _{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	V _{DS} = 24V, V _{GS} = 0V
		—	—	25		V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	V _{GS} = -20V
	Gate-to-Source Reverse Leakage	—	—	100		V _{GS} = 20V
Q _g	Total Gate Charge	—	18	27	nC	I _D = 4.1A
Q _{gs}	Gate-to-Source Charge	—	2.2	3.3		V _{DS} = 24V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	5.9	8.9		V _{GS} = 10V (see figure 10) ③
t _{d(on)}	Turn-On Delay Time	—	6.7	—		V _{DD} = 15V
t _r	Rise Time	—	27	—	ns	I _D = 4.1A
t _{d(off)}	Turn-Off Delay Time	—	20	—		R _G = 6.2Ω
t _f	Fall Time	—	16	—		R _D = 3.7Ω ③
C _{iss}	Input Capacitance	—	510	—		V _{GS} = 0V
C _{oss}	Output Capacitance	—	200	—	pF	V _{DS} = 25V
C _{riss}	Reverse Transfer Capacitance	—	84	—		f = 1.0MHz (see figure 9)

MOSFET Source-Drain Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	3.1	A	
I _{SM}	Pulsed Source Current (Body Diode)	—	—	33		
V _{SD}	Body Diode Forward Voltage	—	—	1.0	V	T _J = 25°C, I _S = 4.1A, V _{GS} = 0V
t _{rr}	Reverse Recovery Time (Body Diode)	—	57	86	ns	T _J = 25°C, I _F = 4.1A
Q _{rr}	Reverse Recovery Charge	—	93	140	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 T _A = 70°C
		1.2		
I _{SM}	Max. peak one cycle Non-repetitive Surge current	120	A	Following any rated load condition & with V _{RRM} applied
		11		

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	0.06	mA	V _R = 30V, T _J = 25°C
		16		T _J = 125°C
C _t	Max. Junction Capacitance	110	pF	V _R = 5Vdc (100kHz to 1 MHz) 25°C
dv/dt	Max. Voltage Rate of Charge	3600	V/ μs	Rated V _R

Power Mosfet Characteristics

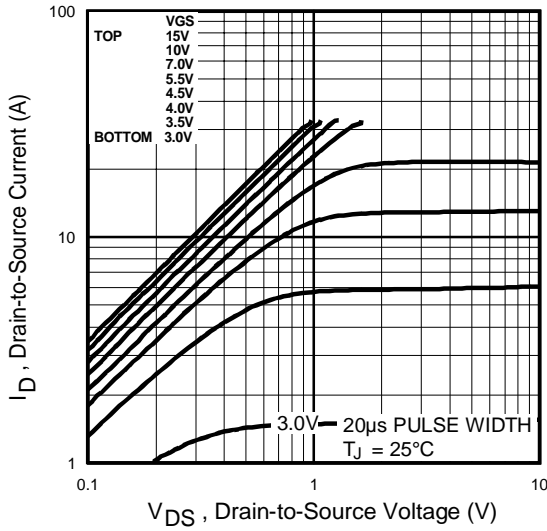


Fig 1. Typical Output Characteristics

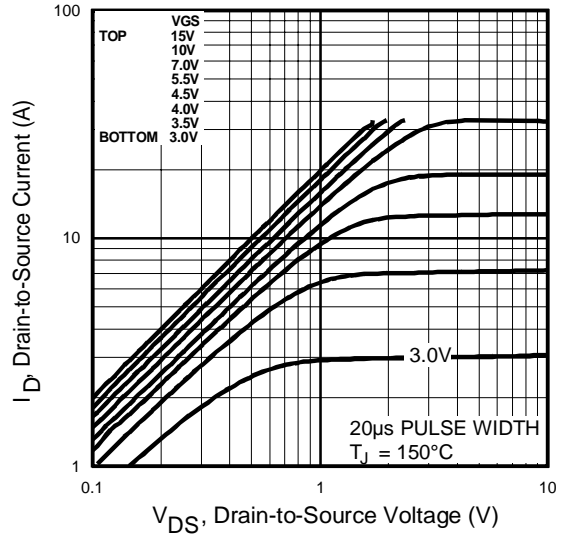


Fig 2. Typical Output Characteristics

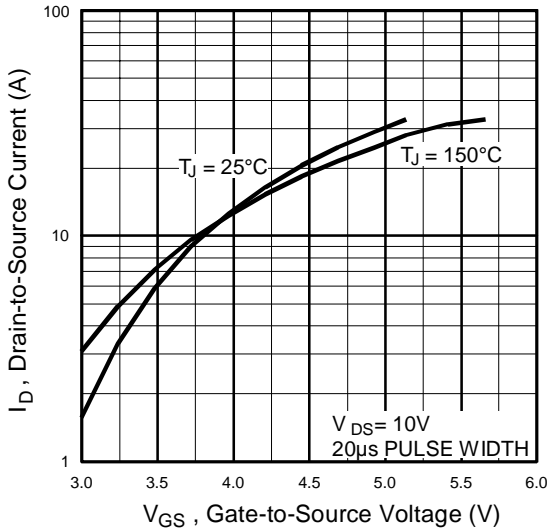


Fig 3. Typical Transfer Characteristics

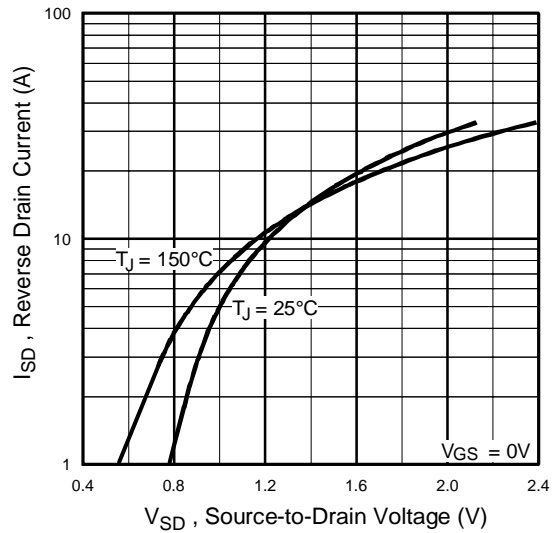


Fig 4. Typical Source-Drain Diode Forward Voltage

Power Mosfet Characteristics

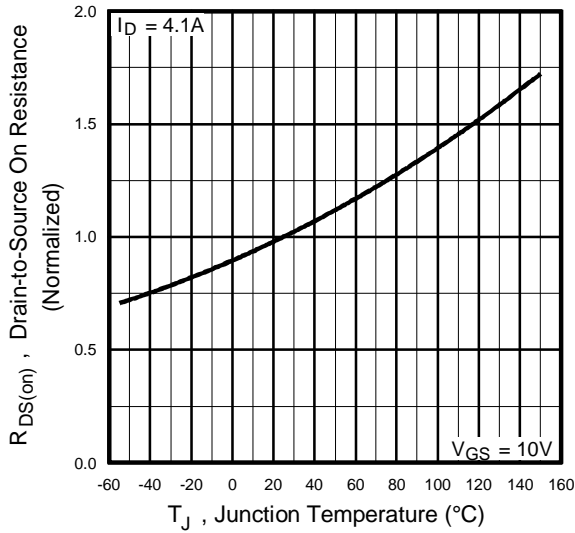


Fig 5. Normalized On-Resistance Vs. Temperature

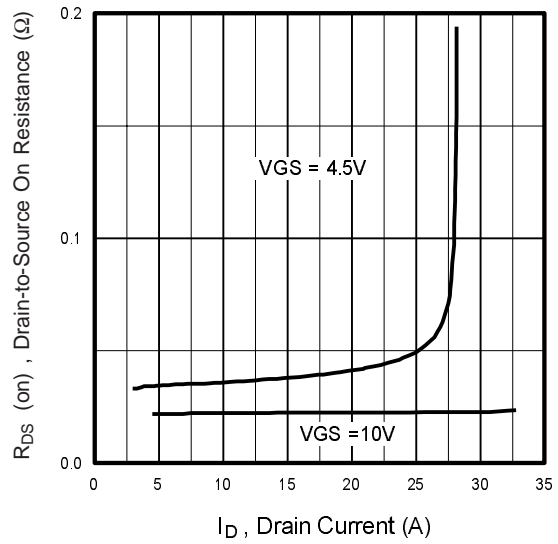


Fig 6. Typical On-Resistance Vs. Drain Current

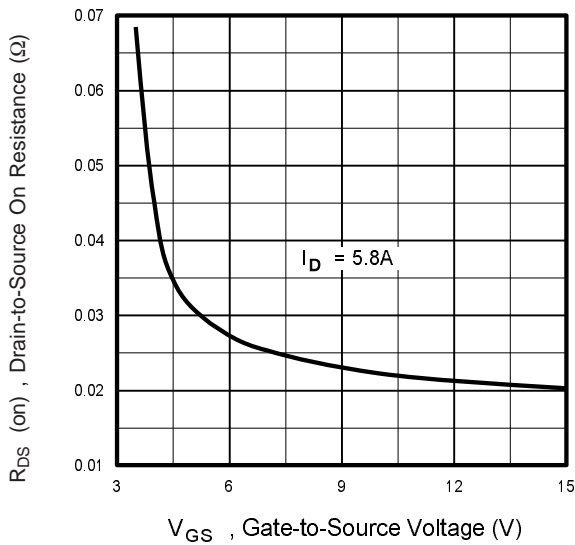


Fig 7. Typical On-Resistance Vs. Gate Voltage

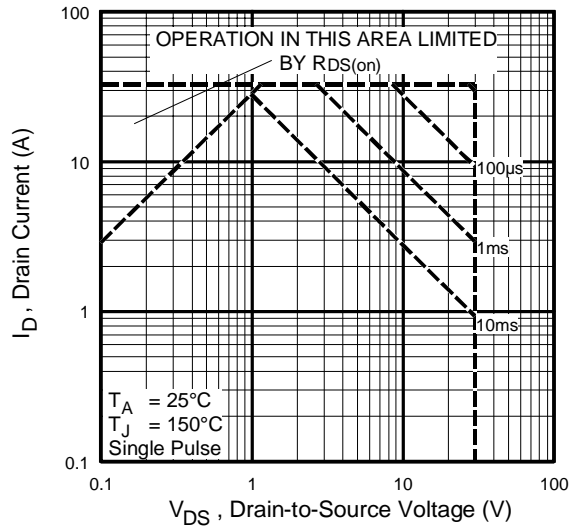


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

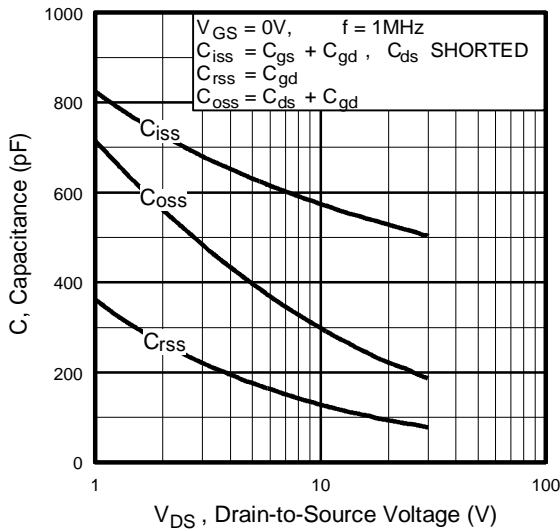


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

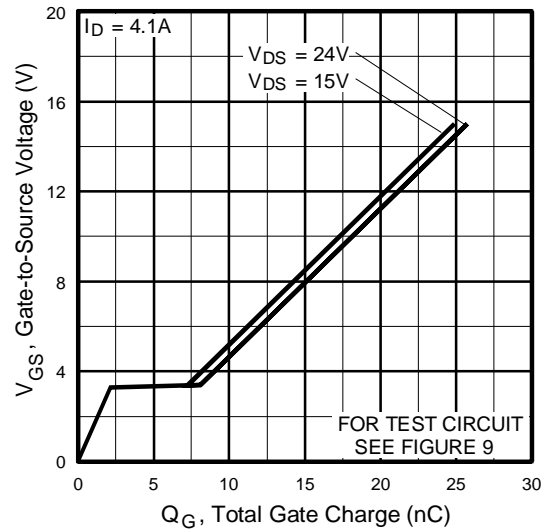


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

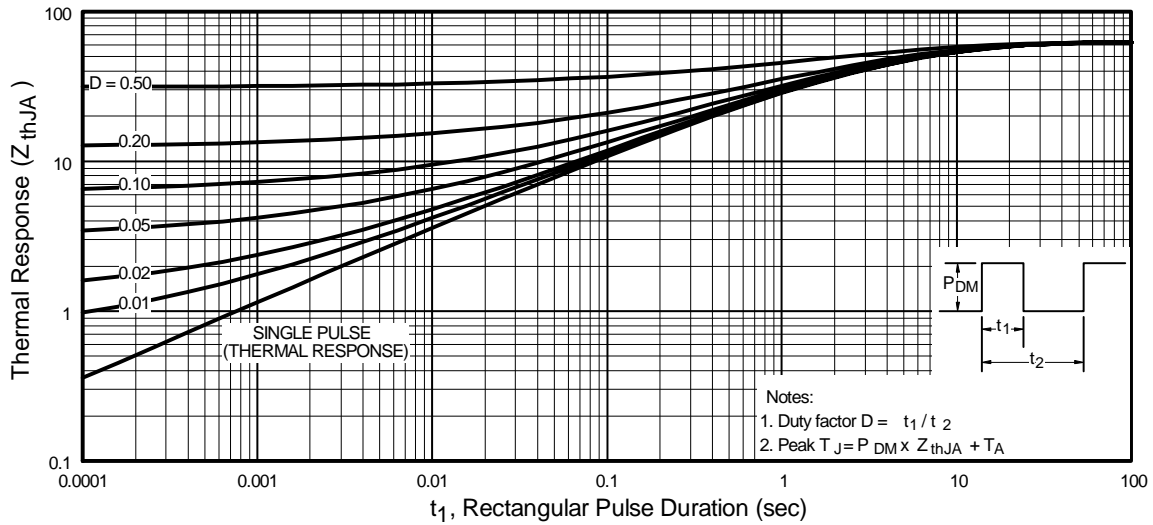


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Schottky Diode Characteristics

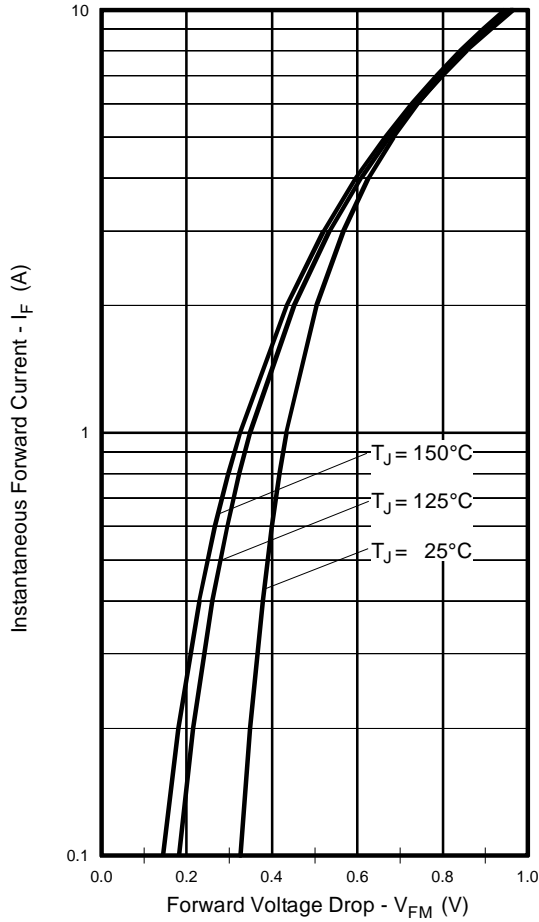


Fig. 12 -Typical Forward Voltage Drop Characteristics

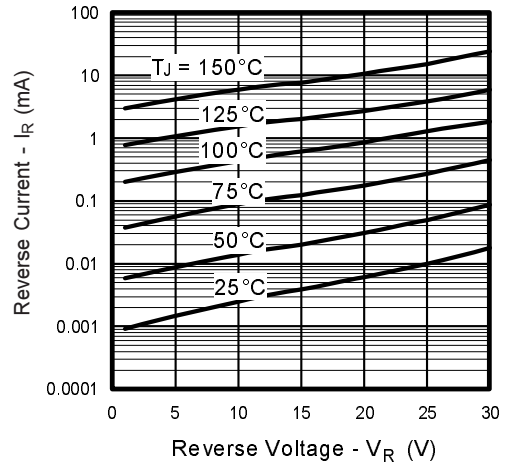


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

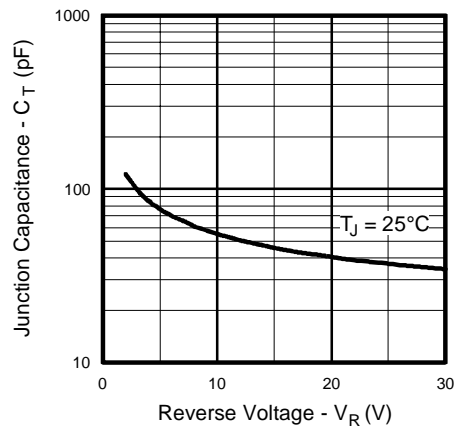
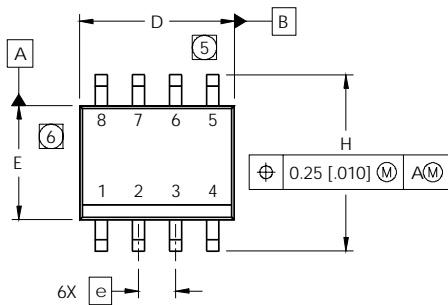
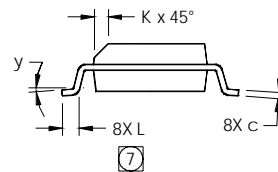
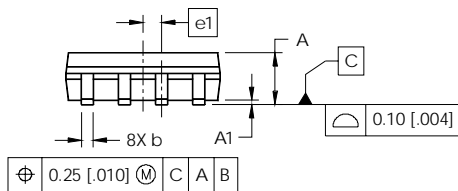


Fig.14 - Typical Junction Capacitance Vs. Reverse Voltage

SO-8 (Fetky) Package Outline
 Dimensions are shown in millimeters (inches)

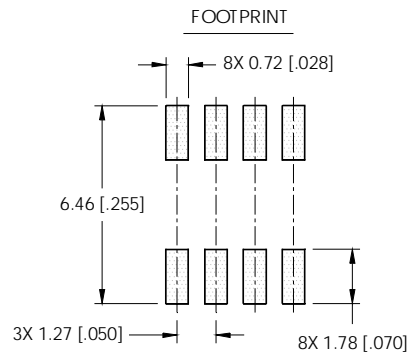


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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



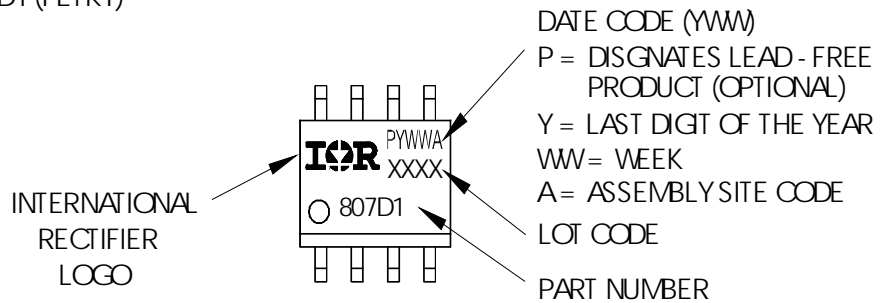
NOTES:

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 [0.006].
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.010].
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



SO-8 (Fetky) Part Marking Information

EXAMPLE: THIS IS AN IRF7807D1 (FETKY)

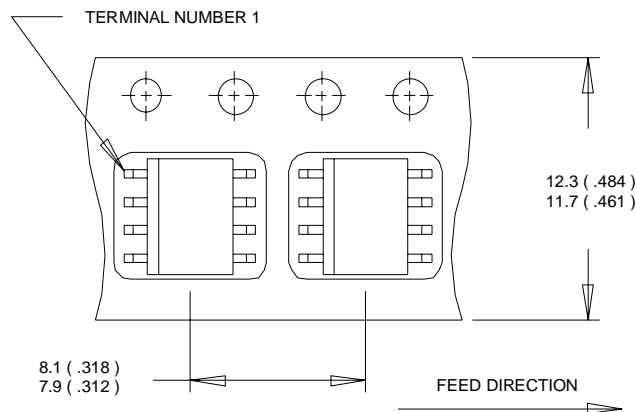


IRF7421D1

International
IR Rectifier

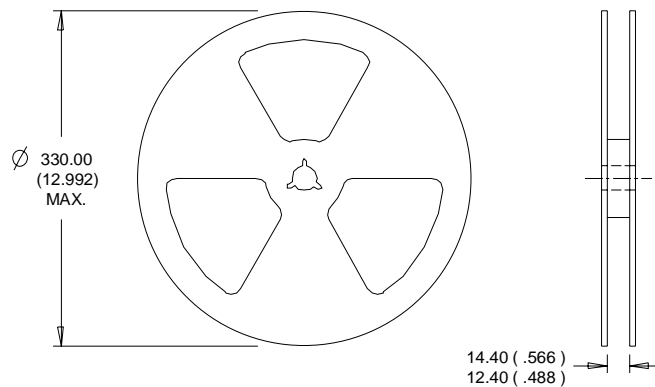
SO-8 (Fetky) Tape and Reel

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.

Data and specifications subject to change without notice.

International
IR Rectifier

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