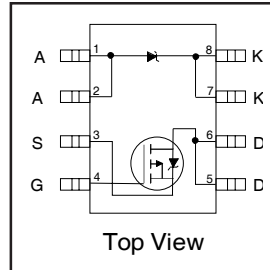


# IRF7322D1PbF

FETKY™ MOSFET / Schottky Diode

- Co-packaged HEXFET® Power MOSFET and Schottky Diode
- Ideal For Buck Regulator Applications
- P-Channel HEXFET
- Low  $V_F$  Schottky Rectifier
- Generation 5 Technology
- SO-8 Footprint
- Lead-Free

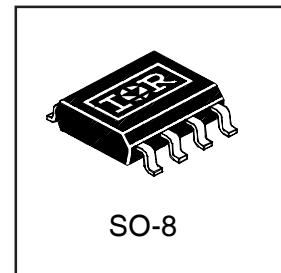


$V_{DSS} = -20V$
$R_{DS(on)} = 0.058\Omega$
Schottky $V_f = 0.39V$

## Description

The FETKY family of co-packaged MOSFETs and Schottky diodes offers the designer an innovative, board space saving solution for switching regulator and power management applications. Generation 5 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.



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

Parameter		Maximum	Units
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5V$	-5.3	A
$I_D @ T_A = 70^\circ\text{C}$		-4.3	
$I_{DM}$		Pulsed Drain Current ①	
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation	2.0	W
$P_D @ T_A = 70^\circ\text{C}$		1.3	
	Linear Derating Factor	16	mW/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 12$	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 9)
- ②  $I_{SD} \leq -2.9A$ ,  $di/dt \leq -77A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 150^\circ\text{C}$
- ③ Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$
- ④ Surface mounted on FR-4 board,  $t \leq 10\text{sec}$ .

## MOSFET Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.049	0.062	$\Omega$	$V_{GS} = -4.5V, I_D = -2.9A$ ③
		—	0.082	0.098		$V_{GS} = -2.7V, I_D = -1.5A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	-0.70	—	—	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
$g_{fs}$	Forward Transconductance	—	5.9	—	S	$V_{DS} = -10V, I_D = -1.5A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	-1.0	$\mu A$	$V_{DS} = -16V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -16V, V_{GS} = 0V, T_J = 55^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = -12.0V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = 12.0V$
$Q_g$	Total Gate Charge	—	19	29	nC	$I_D = -2.9A$
$Q_{gs}$	Gate-to-Source Charge	—	4.0	6.1		$V_{DS} = -16V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	7.7	12		$V_{GS} = -4.5V$ (see figure 6) ③
$t_{d(on)}$	Turn-On Delay Time	—	15	22	ns	$V_{DD} = -10V$
$t_r$	Rise Time	—	40	60		$I_D = -2.9A$
$t_{d(off)}$	Turn-Off Delay Time	—	42	63		$R_G = 6.0\Omega$
$t_f$	Fall Time	—	49	73		$R_D = 3.4\Omega$ ③
$C_{iss}$	Input Capacitance	—	780	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	470	—		$V_{DS} = -15V$
$C_{rss}$	Reverse Transfer Capacitance	—	240	—		$f = 1.0\text{MHz}$ (see figure 5)

## MOSFET Source-Drain Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	-2.5	A	
$I_{SM}$	Pulsed Source Current (Body Diode)	—	—	-21	A	
$V_{SD}$	Body Diode Forward Voltage	—	—	-1.2	V	$T_J = 25^\circ\text{C}, I_S = -2.9A, V_{GS} = 0V$
$t_{rr}$	Reverse Recovery Time (Body Diode)	—	47	71	ns	$T_J = 25^\circ\text{C}, I_F = -2.9A$
$Q_{rr}$	Reverse Recovery Charge	—	49	73	nC	$di/dt = 100A/\mu s$ ③

## Schottky Diode Maximum Ratings

	Parameter	Max.	Units	Conditions
$I_{F(av)}$	Max. Average Forward Current	2.7	A	50% Duty Cycle. Rectangular Wave, $T_A = 25^\circ\text{C}$ See Fig. 14 $T_A = 70^\circ\text{C}$
		2		
$I_{SM}$	Max. peak one cycle Non-repetitive Surge current	120	A	Following any rated load condition & with $V_{RSM}$ applied
		11		

## Schottky Diode Electrical Specifications

	Parameter	Max.	Units	Conditions
$V_{FM}$	Max. Forward voltage drop	0.50	V	$I_F = 1.0A, T_J = 25^\circ\text{C}$
		0.62		$I_F = 2.0A, T_J = 25^\circ\text{C}$
		0.39		$I_F = 1.0A, T_J = 125^\circ\text{C}$
		0.57		$I_F = 2.0A, T_J = 125^\circ\text{C}$
$I_{RM}$	Max. Reverse Leakage current	0.02	mA	$V_R = 20V, T_J = 25^\circ\text{C}$
		8		$T_J = 125^\circ\text{C}$
$C_t$	Max. Junction Capacitance	92	pF	$V_R = 5Vdc$ ( 100kHz to 1 MHz) $25^\circ\text{C}$
$dv/dt$	Max. Voltage Rate of Charge	3600	V/ $\mu s$	Rated $V_R$

Power Mosfet Characteristics

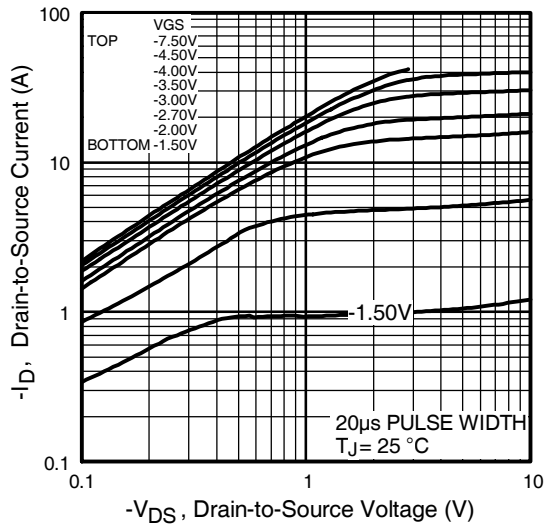


Fig 1. Typical Output Characteristics

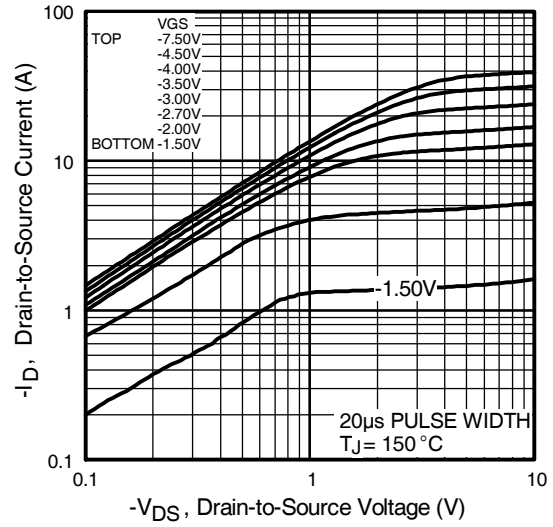


Fig 2. Typical Output Characteristics

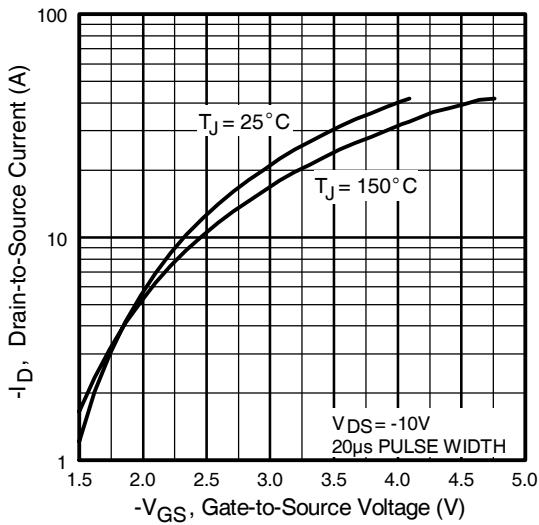


Fig 3. Typical Transfer Characteristics

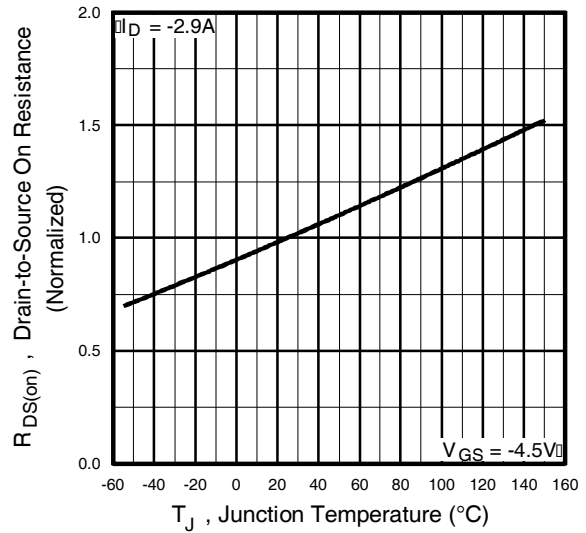
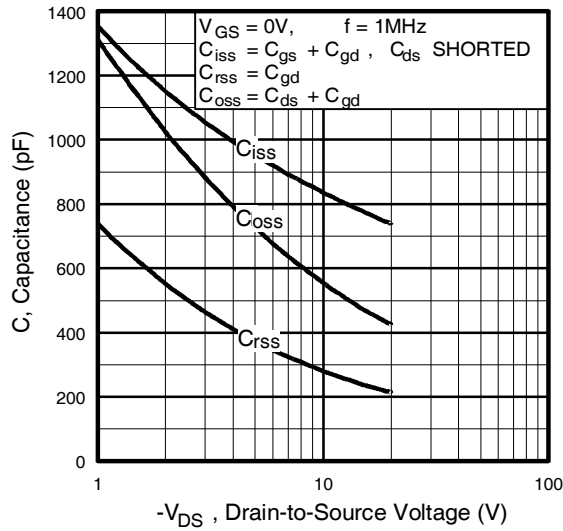
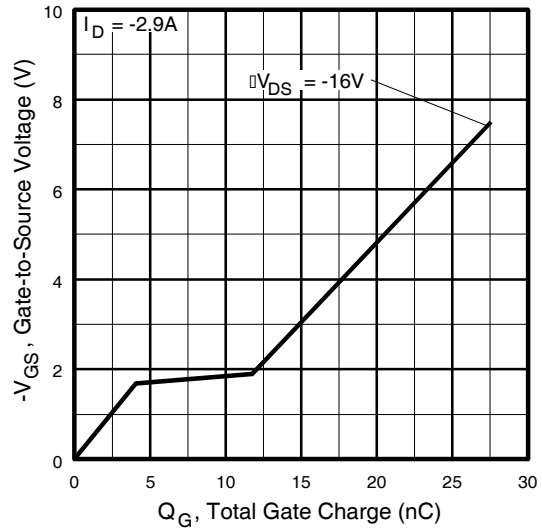


Fig 4. Normalized On-Resistance Vs. Temperature

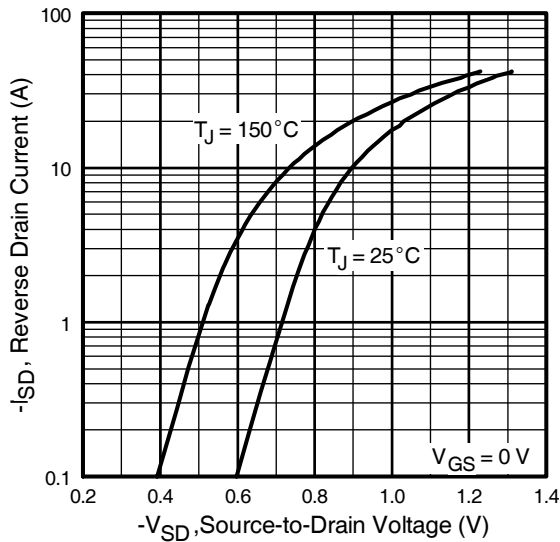
## Power Mosfet Characteristics



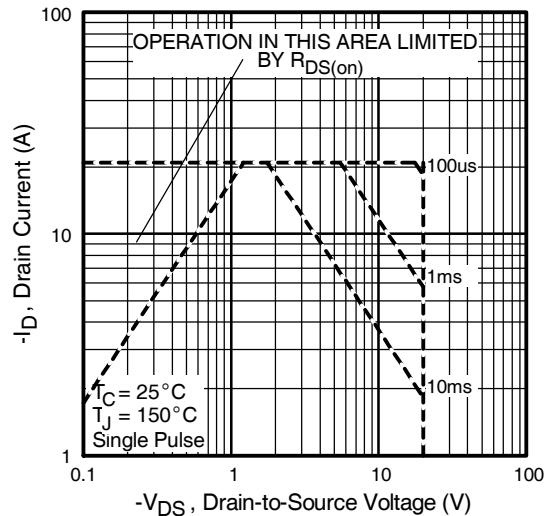
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



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



**Fig 7.** Typical Source-Drain Diode Forward Voltage



**Fig 8.** Maximum Safe Operating Area

Power Mosfet Characteristics

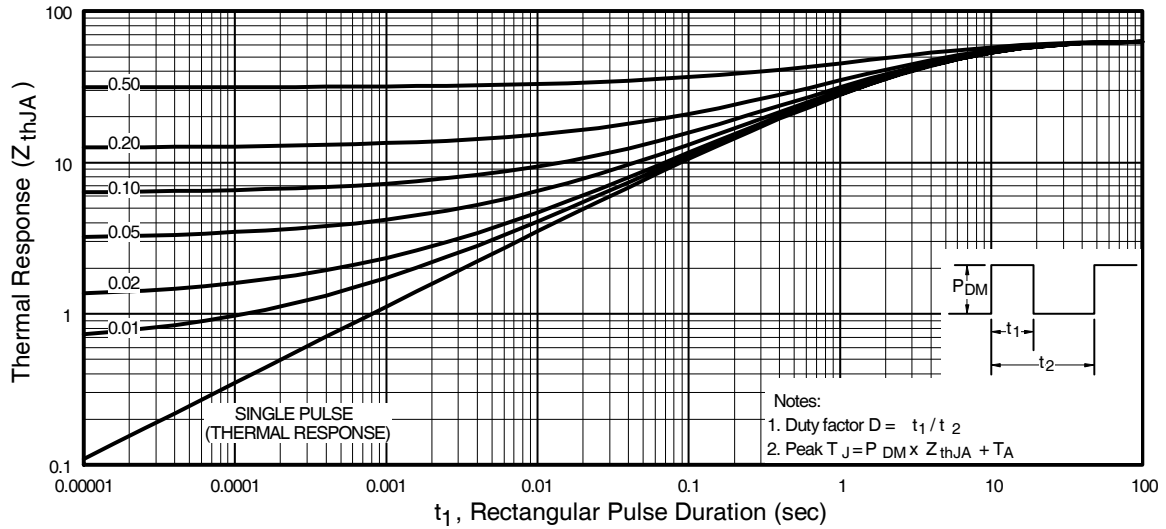


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

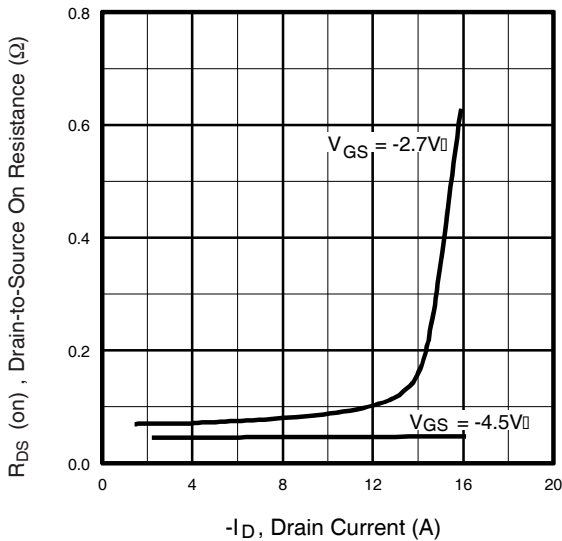


Fig 10. Typical On-Resistance Vs. Drain Current

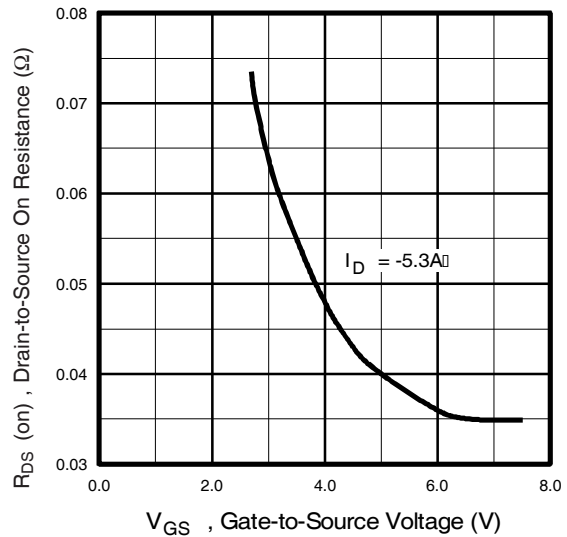


Fig 11. Typical On-Resistance Vs. Gate Voltage

Schottky Diode Characteristics

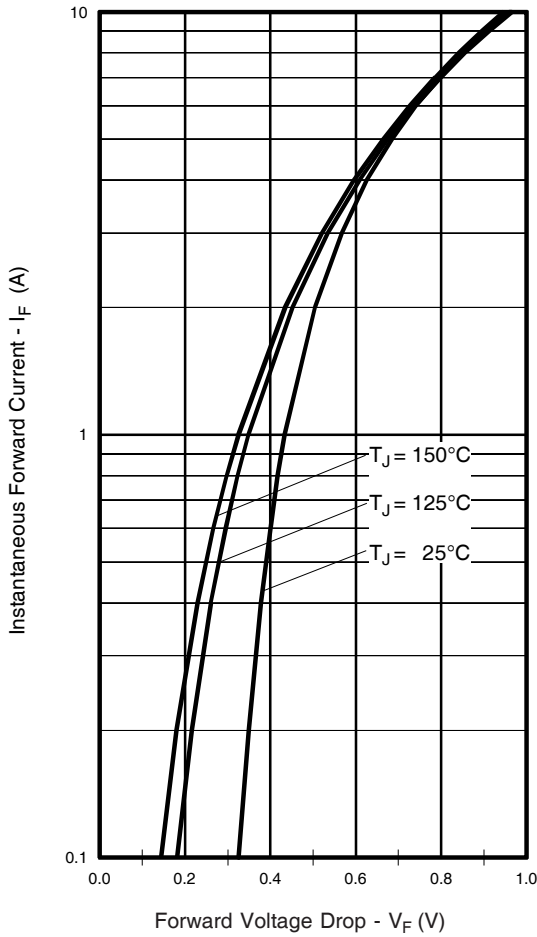


Fig. 12 - Typical Forward Voltage Drop Characteristics

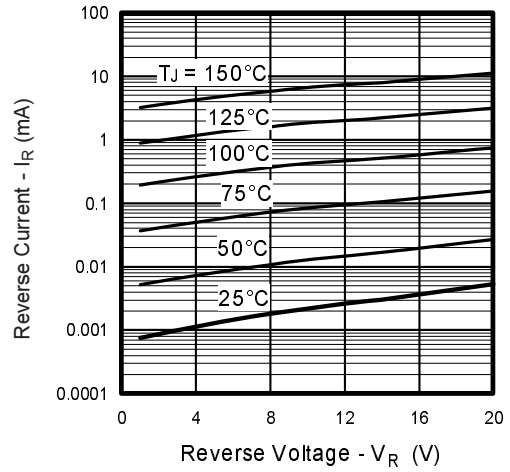


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

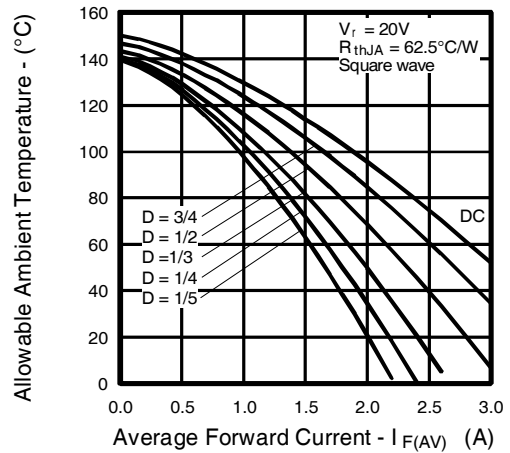
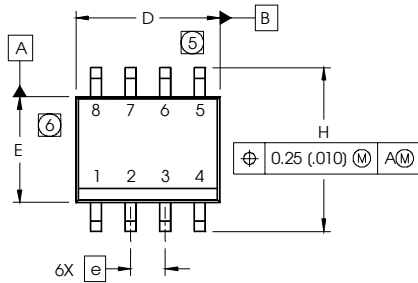
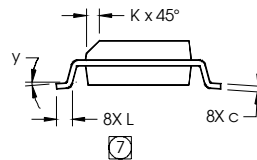
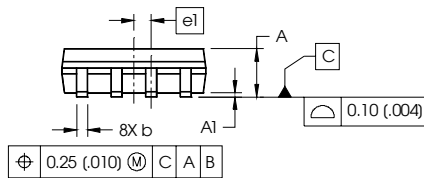


Fig.14 - Maximum Allowable Ambient Temp. Vs. Forward Current

## SO-8 (Fetky) Package Outline

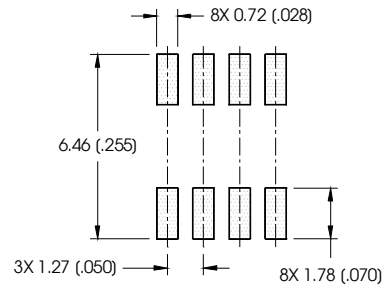


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
AI	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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



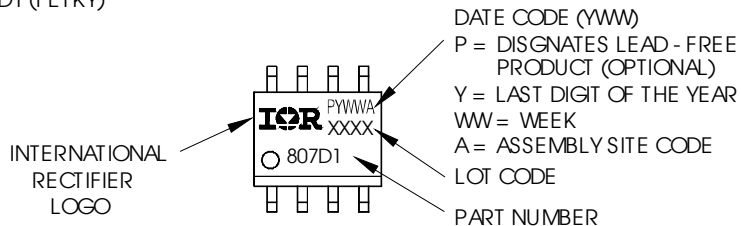
- NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
  2. CONTROLLING DIMENSION: MILLIMETER
  3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
  4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
  - ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
  - ⑥ 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.

### FOOTPRINT



## SO-8 (Fetky) Part Marking Information

EXAMPLE: THIS IS AN IRF7807D1 (FETKY)

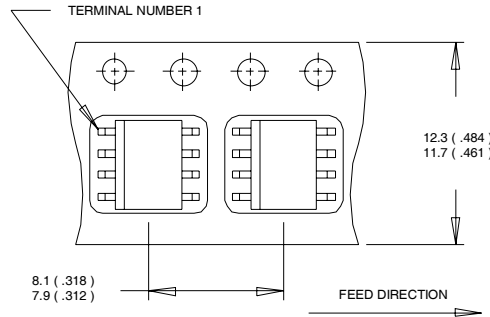


# IRF7322D1PbF

International  
**IR** Rectifier

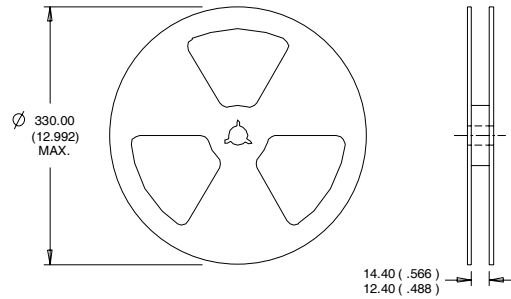
## SO-8 Tape and Reel

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.  
This product has been designed and qualified for the Consumer market.  
Qualifications Standards can be found on IR's Web site.

International  
**IR** Rectifier

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