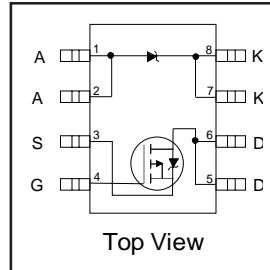


IRF7322D1

FETKY™ MOSFET / Schottky Diode

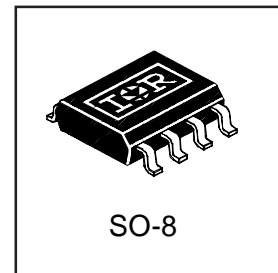
- Co-packaged HEXFET® Power MOSFET and Schottky Diode
- Ideal For Buck Regulator Applications
- P-Channel HEXFET
- Low V_F Schottky Rectifier
- Generation 5 Technology
- SO-8 Footprint



| |
|----------------------------|
| $V_{DSS} = -20V$ |
| $R_{DS(on)} = 0.058\Omega$ |
| 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 ($T_A = 25^\circ C$ unless otherwise noted)

| Parameter | | Maximum | Units |
|--------------------------|--------------------------------------------|------------------------|-------|
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V$ | -5.3 | A |
| $I_D @ T_A = 70^\circ C$ | | -4.3 | |
| I_{DM} | | Pulsed Drain Current ① | |
| $P_D @ T_A = 25^\circ C$ | Power Dissipation | 2.0 | W |
| $P_D @ T_A = 70^\circ C$ | | 1.3 | |
| | Linear Derating Factor | 16 | mW/°C |
| V_{GS} | Gate-to-Source Voltage | ± 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 $I_{SD} \leq -2.9A$, $di/dt \leq -77A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ C$
- 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 | -20 | — | — | V | V _{GS} = 0V, I _D = -250μA |
| R _{DS(on)} | Static Drain-to-Source On-Resistance | — | 0.049 | 0.062 | Ω | 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 = -250μA |
| g _{fs} | Forward Transconductance | — | 5.9 | — | S | V _{DS} = -10V, I _D = -1.5A |
| I _{DSS} | Drain-to-Source Leakage Current | — | — | -1.0 | μA | V _{DS} = -16V, V _{GS} = 0V |
| | | — | — | -25 | | V _{DS} = -16V, V _{GS} = 0V, T _J = 55°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 = 6.0Ω |
| t _f | Fall Time | — | 49 | 73 | | R _D = 3.4Ω 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 = 1.0MHz (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°C, I _S = -2.9A, V _{GS} = 0V |
| t _{rr} | Reverse Recovery Time (Body Diode) | — | 47 | 71 | ns | T _J = 25°C, I _F = -2.9A |
| Q _{rr} | Reverse Recovery Charge | — | 49 | 73 | nC | di/dt = 100A/μs 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°C See Fig. 14 T _A = 70°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°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 | 0.02 | mA | V _R = 20V T _J = 25°C |
| | | 8 | | T _J = 125°C |
| C _t | Max. Junction Capacitance | 92 | 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

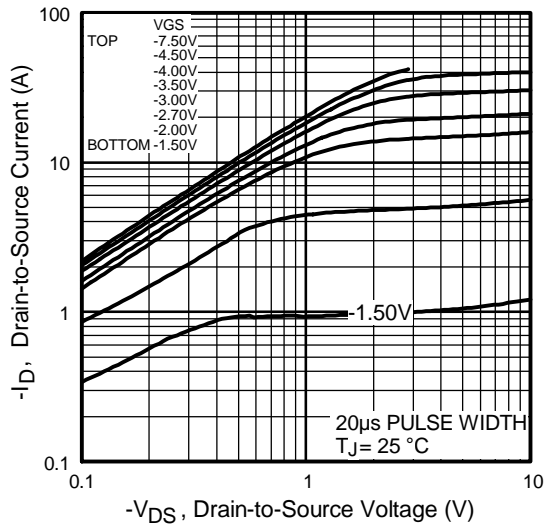


Fig 1. Typical Output Characteristics

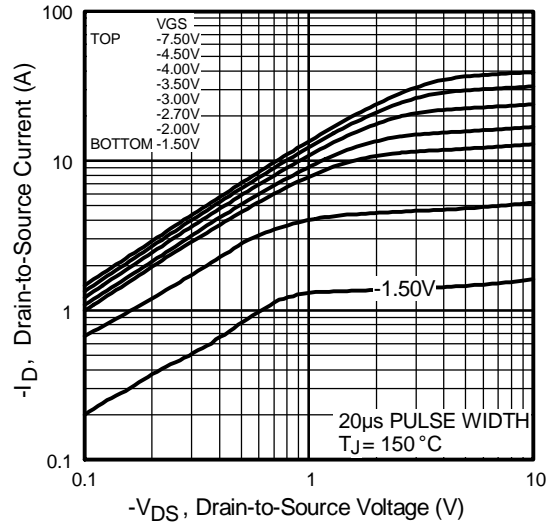


Fig 2. Typical Output Characteristics

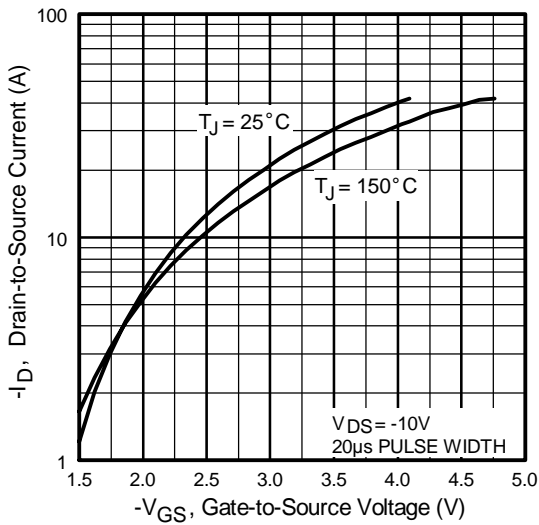


Fig 3. Typical Transfer Characteristics

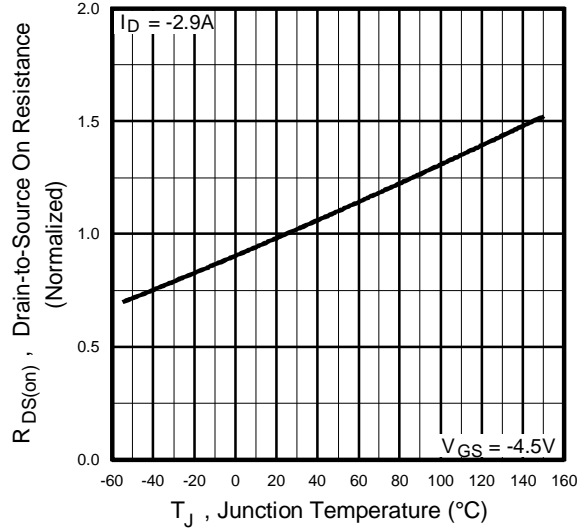


Fig 4. Normalized On-Resistance Vs. Temperature

Power Mosfet Characteristics

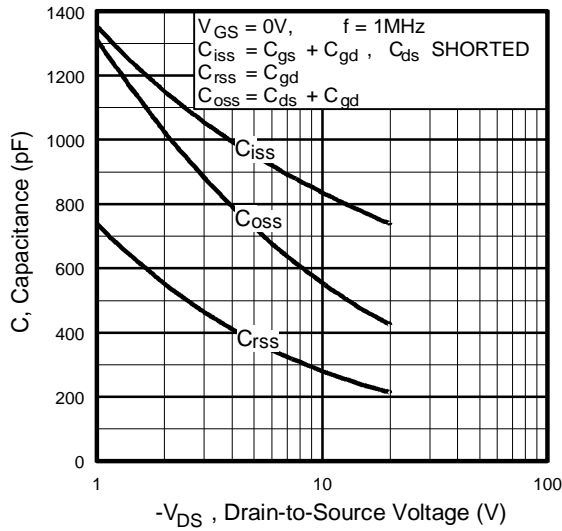


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

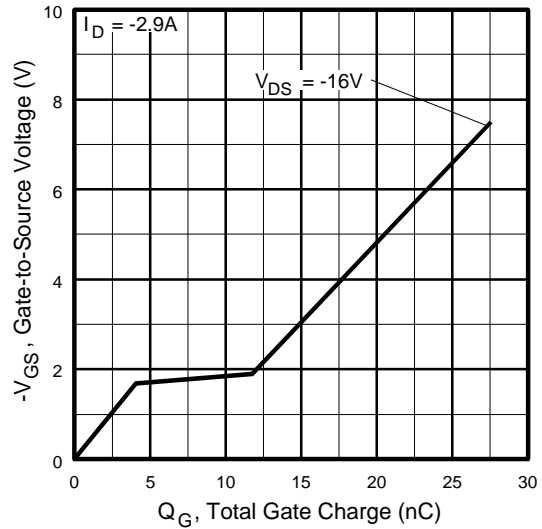


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

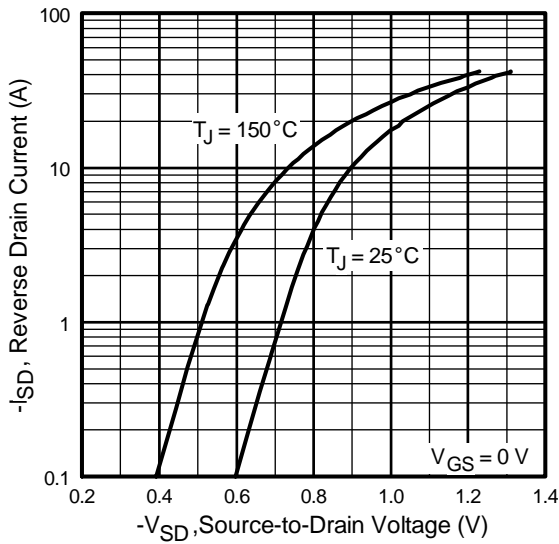


Fig 7. Typical Source-Drain Diode Forward Voltage

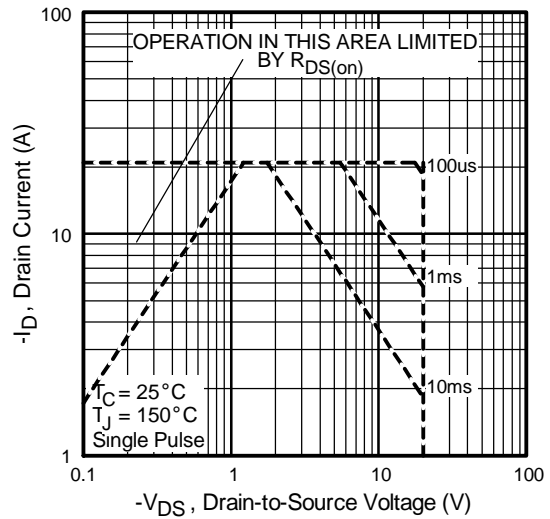


Fig 8. Maximum Safe Operating Area

Power Mosfet Characteristics

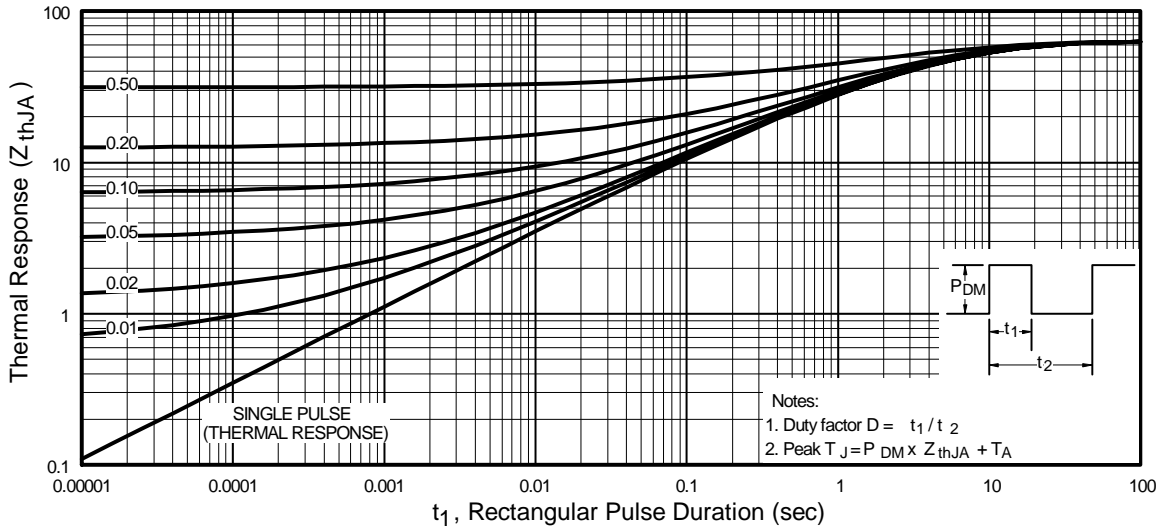


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

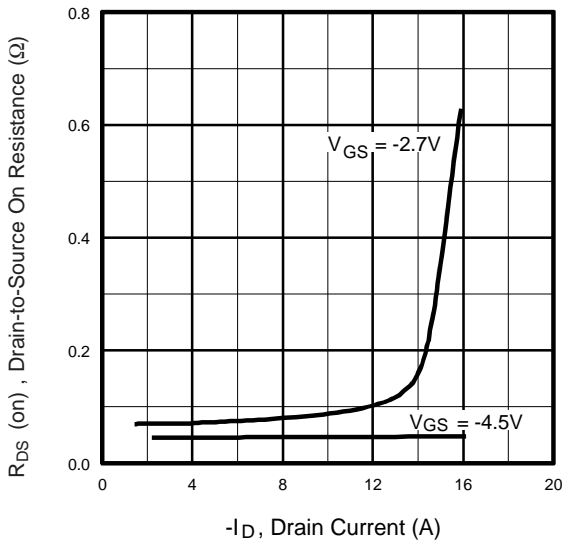


Fig 10. Typical On-Resistance Vs. Drain Current

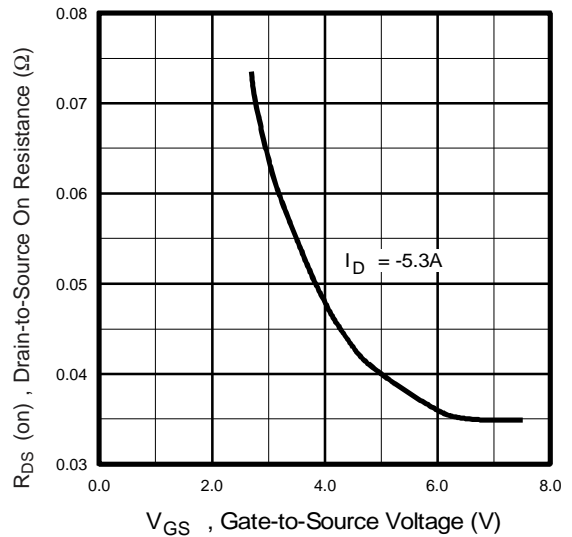


Fig 11. Typical On-Resistance Vs. Gate Voltage

Schottky Diode Characteristics

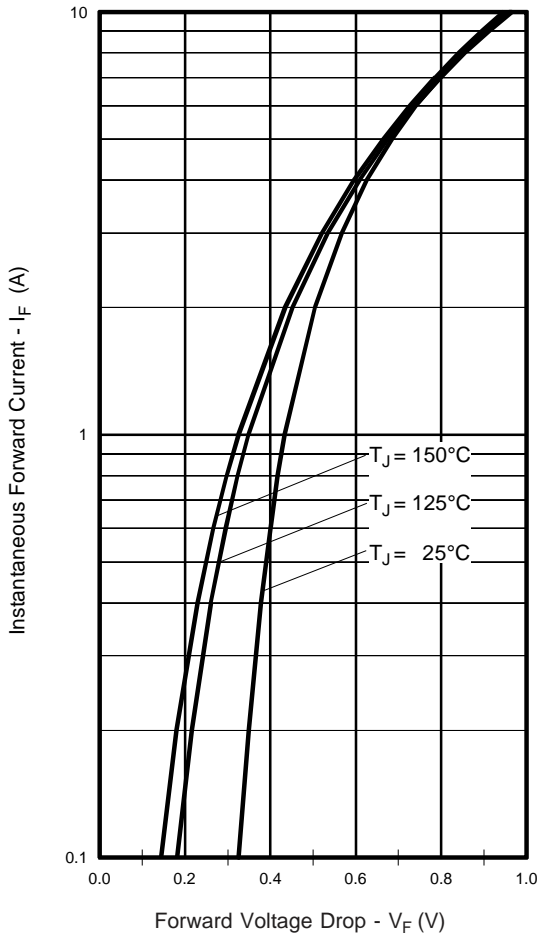


Fig. 12 - Typical Forward Voltage Drop Characteristics

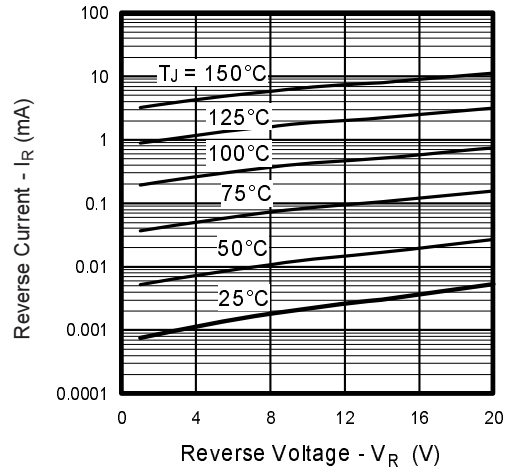


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

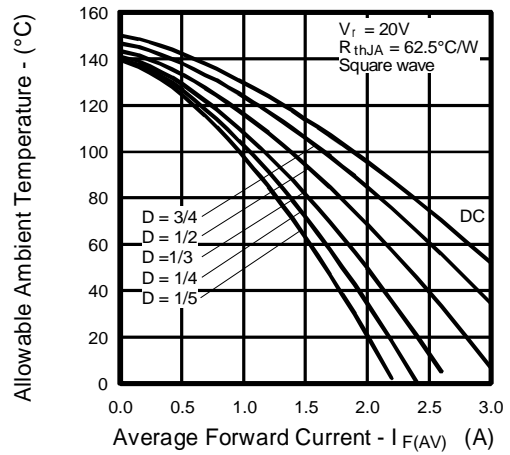
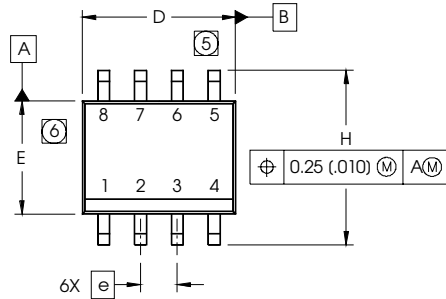


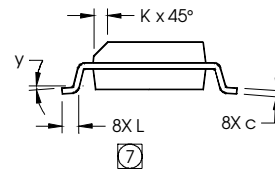
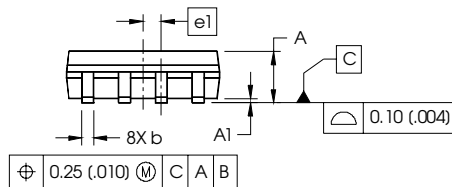
Fig.14 - Maximum Allowable Ambient Temp. Vs. Forward Current

SO-8 (Fetky) Package Outline

Dimensions are shown in millimeters (inches)



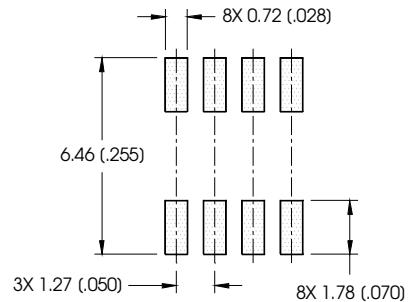
| DIM | INCHES | | MILLIMETERS | |
|-----|------------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | .0532 | .0688 | 1.35 | 1.75 |
| A1 | .0040 | .0098 | 0.10 | 0.25 |
| b | .013 | .020 | 0.33 | 0.51 |
| c | .0075 | .0098 | 0.19 | 0.25 |
| D | .189 | .1968 | 4.80 | 5.00 |
| E | .1497 | .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:

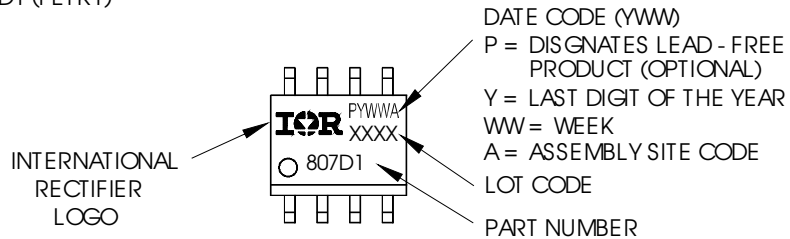
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- ⑥ DIMENSION DOES NOT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

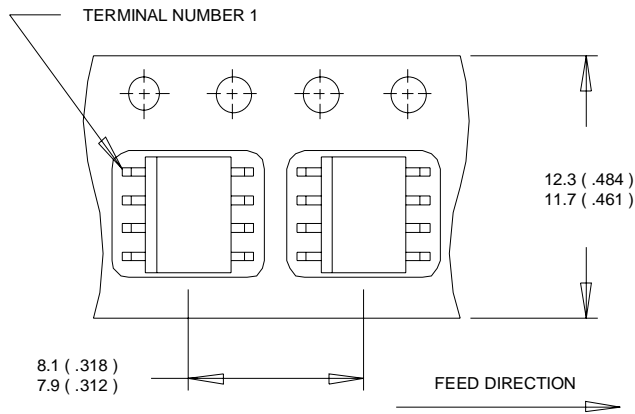


IRF7322D1

International
IR Rectifier

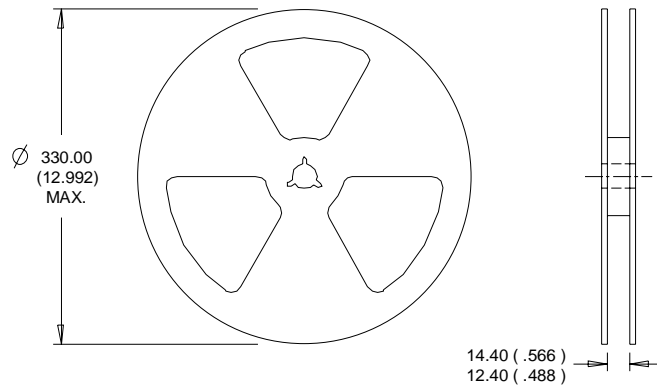
SO-8 (Fetky) Tape and Reel

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

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903

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