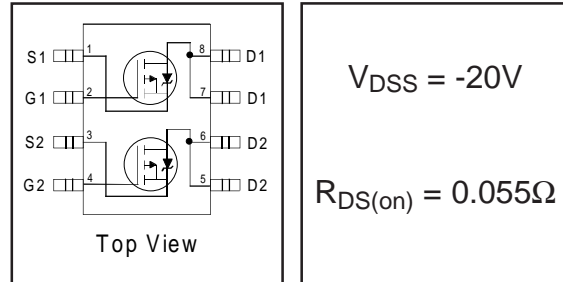


IRF7555

HEXFET[®] Power MOSFET

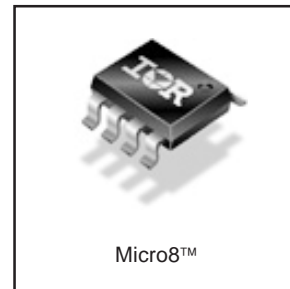
- Trench Technology
- Ultra Low On-Resistance
- Dual P-Channel MOSFET
- Very Small SOIC Package
- Low Profile (<1.1mm)
- Available in Tape & Reel



Description

New trench HEXFET[®] power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The new Micro8[™] package has half the footprint area of the standard SO-8. This makes the Micro8 an ideal package for applications where printed circuit board space is at a premium. The low profile (<1.1 mm) of the Micro8 will allow it to fit easily into extremely thin application environments such as portable electronics and PCMCIA cards.



Absolute Maximum Ratings

| | Parameter | Max. | Units |
|--------------------------|--|-----------------------|-------|
| V_{DS} | Drain-Source Voltage | -20 | V |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V$ | -4.3 | A |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V$ | -3.4 | |
| I_{DM} | Pulsed Drain Current ^① | -34 | |
| $P_D @ T_A = 25^\circ C$ | Maximum Power Dissipation ^④ | 1.25 | W |
| $P_D @ T_A = 70^\circ C$ | Maximum Power Dissipation ^④ | 0.8 | W |
| | Linear Derating Factor | 10 | mW/°C |
| V_{GS} | Gate-to-Source Voltage | ± 12 | V |
| E_{AS} | Single Pulse Avalanche Energy ^④ | 36 | mJ |
| dv/dt | Peak Diode Recovery dv/dt ^② | 1.1 | V/ns |
| T_J, T_{STG} | Junction and Storage Temperature Range | -55 to + 150 | °C |
| | Soldering Temperature, for 10 seconds | 240 (1.6mm from case) | |

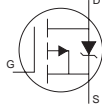
Thermal Resistance

| | Parameter | Max. | Units |
|-----------------|--|------|-------|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient ^④ | 100 | °C/W |

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 | $V_{GS} = 0V, I_D = -250\mu A$ |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | -0.005 | — | V/ $^\circ\text{C}$ | Reference to $25^\circ\text{C}, I_D = -1\text{mA}$ |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | — | 0.055 | Ω | $V_{GS} = -4.5V, I_D = -4.3A$ ③ |
| | | — | — | 0.105 | | $V_{GS} = -2.5V, I_D = -3.4A$ ③ |
| $V_{GS(th)}$ | Gate Threshold Voltage | -0.60 | — | -1.2 | V | $V_{DS} = V_{GS}, I_D = -250\mu A$ |
| g_{fs} | Forward Transconductance | 2.5 | — | — | S | $V_{DS} = -10V, I_D = -0.8A$ |
| I_{DSS} | Drain-to-Source Leakage Current | — | — | -1.0 | μA | $V_{DS} = -16V, V_{GS} = 0V$ |
| | | — | — | -25 | | $V_{DS} = -16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$ |
| I_{GSS} | Gate-to-Source Forward Leakage | — | — | -100 | nA | $V_{GS} = -12V$ |
| | Gate-to-Source Reverse Leakage | — | — | 100 | | $V_{GS} = 12V$ |
| Q_g | Total Gate Charge | — | 10 | 15 | nC | $I_D = -3.0A$ |
| Q_{gs} | Gate-to-Source Charge | — | 2.1 | 3.1 | | $V_{DS} = -10V$ |
| Q_{gd} | Gate-to-Drain ("Miller") Charge | — | 2.5 | 3.7 | | $V_{GS} = -5.0V$ |
| $t_{d(on)}$ | Turn-On Delay Time | — | 10 | — | ns | $V_{DD} = -10V$ |
| t_r | Rise Time | — | 46 | — | | $I_D = -2.0A$ |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 60 | — | | $R_G = 6.0\Omega$ |
| t_f | Fall Time | — | 64 | — | | $R_D = 5.0\Omega$ ③ |
| C_{iss} | Input Capacitance | — | 1066 | — | pF | $V_{GS} = 0V$ |
| C_{oss} | Output Capacitance | — | 402 | — | | $V_{DS} = -10V$ |
| C_{rss} | Reverse Transfer Capacitance | — | 126 | — | | $f = 1.0\text{MHz}$ |

Source-Drain Ratings and Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------|--|------|------|------|-------|--|
| I_S | Continuous Source Current (Body Diode) | — | — | -1.3 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I_{SM} | Pulsed Source Current (Body Diode) ① | — | — | -34 | | |
| V_{SD} | Diode Forward Voltage | — | — | -1.2 | V | $T_J = 25^\circ\text{C}, I_S = -1.6A, V_{GS} = 0V$ ③ |
| t_{rr} | Reverse Recovery Time | — | 54 | 82 | ns | $T_J = 25^\circ\text{C}, I_F = -2.5A$ |
| Q_{rr} | Reverse Recovery Charge | — | 41 | 61 | nC | $di/dt = -100A/\mu s$ ③ |

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② $I_{SD} \leq -2.0A, di/dt \leq -140A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ③ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- ④ Surface mounted on FR-4 board, $t \leq 10\text{sec}$.
- ⑤ Starting $T_J = 25^\circ\text{C}, L = 8.0\text{mH}, R_G = 25\Omega, I_{AS} = -3.0A$.

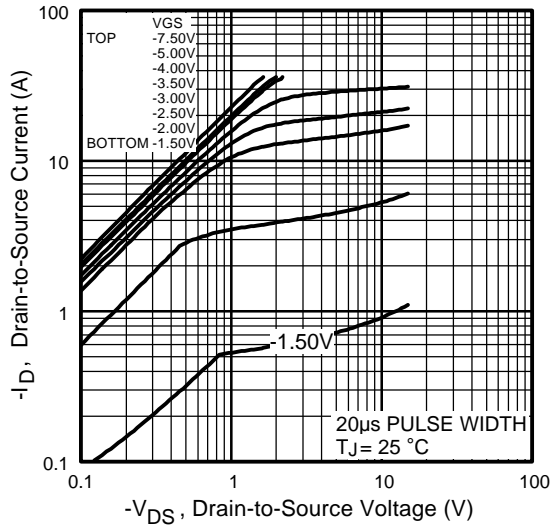


Fig 1. Typical Output Characteristics

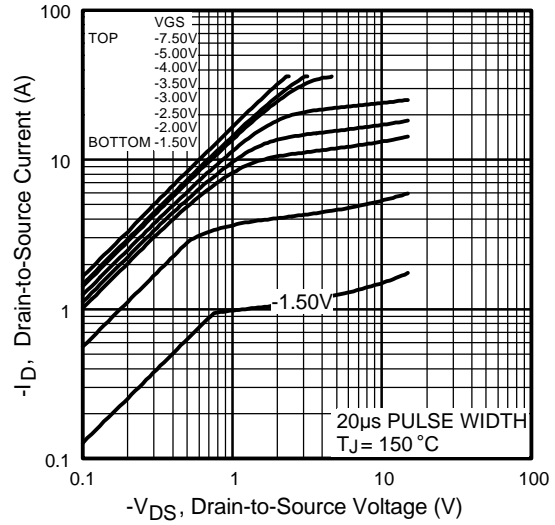


Fig 2. Typical Output Characteristics

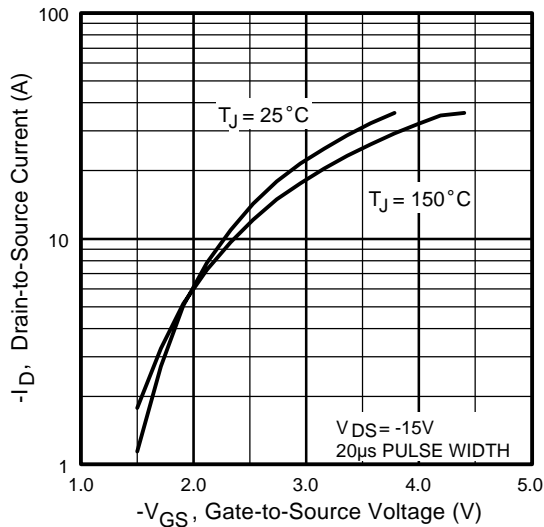


Fig 3. Typical Transfer Characteristics

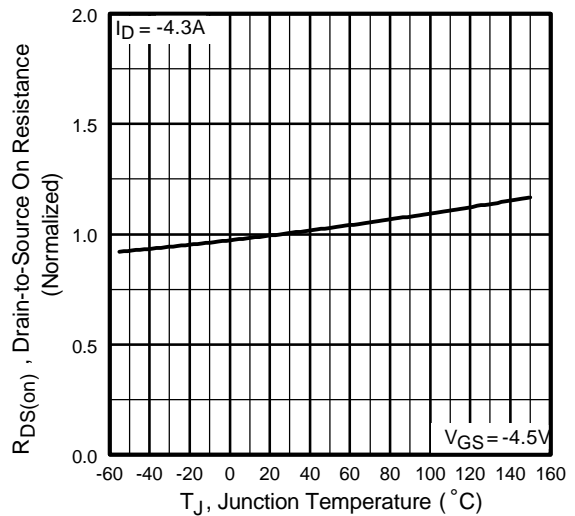


Fig 4. Normalized On-Resistance Vs. Temperature

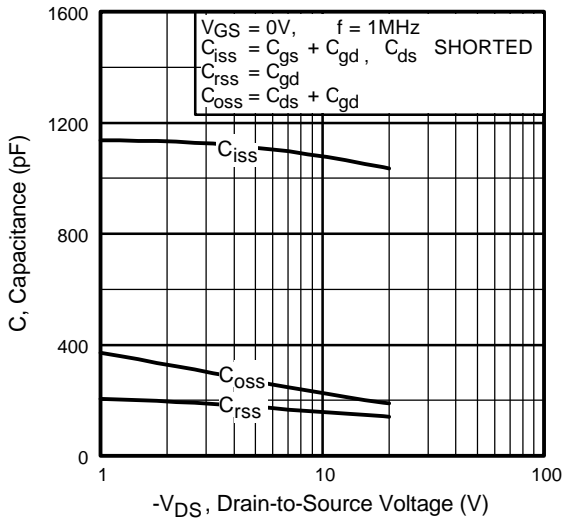


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

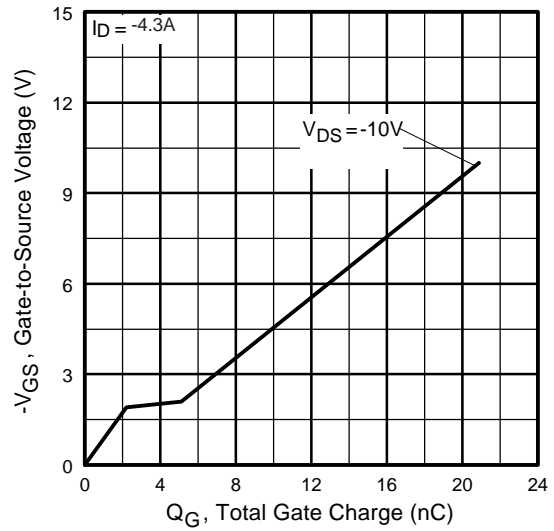


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

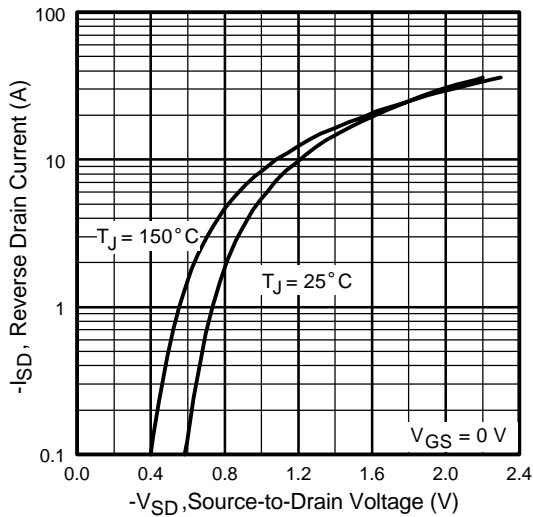


Fig 7. Typical Source-Drain Diode Forward Voltage

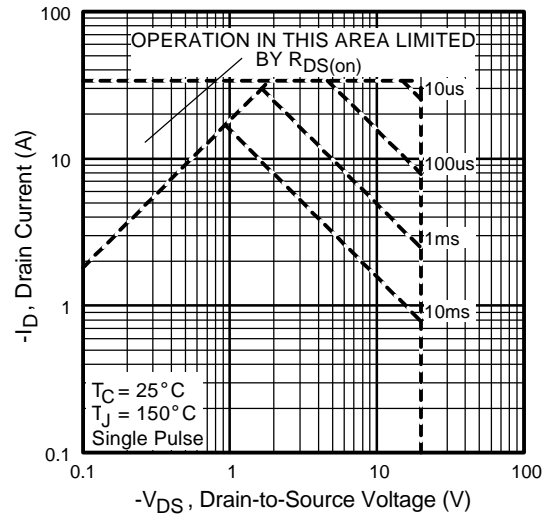


Fig 8. Maximum Safe Operating Area

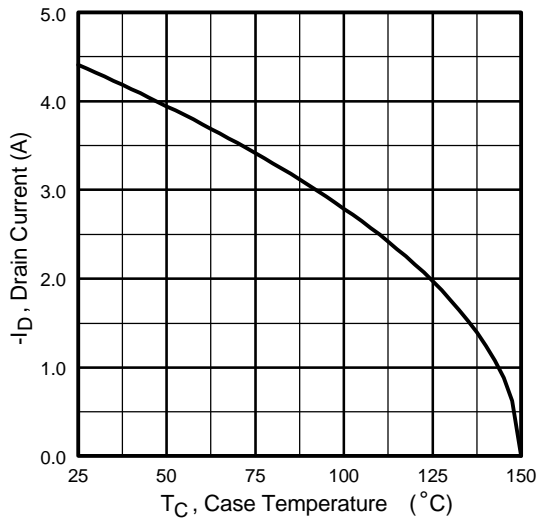


Fig 9. Maximum Drain Current Vs. Case Temperature

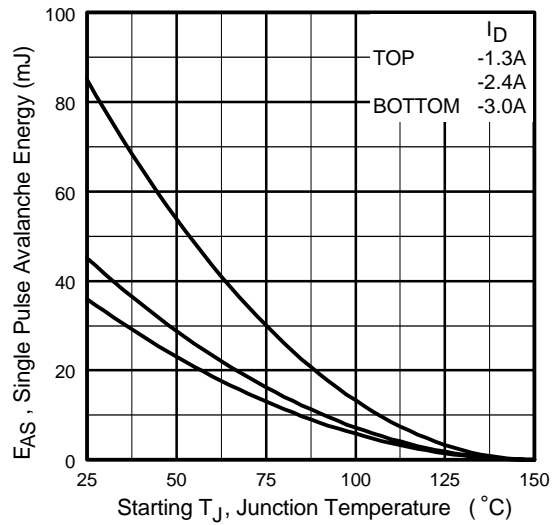


Fig 10. Maximum Avalanche Energy Vs. Drain Current

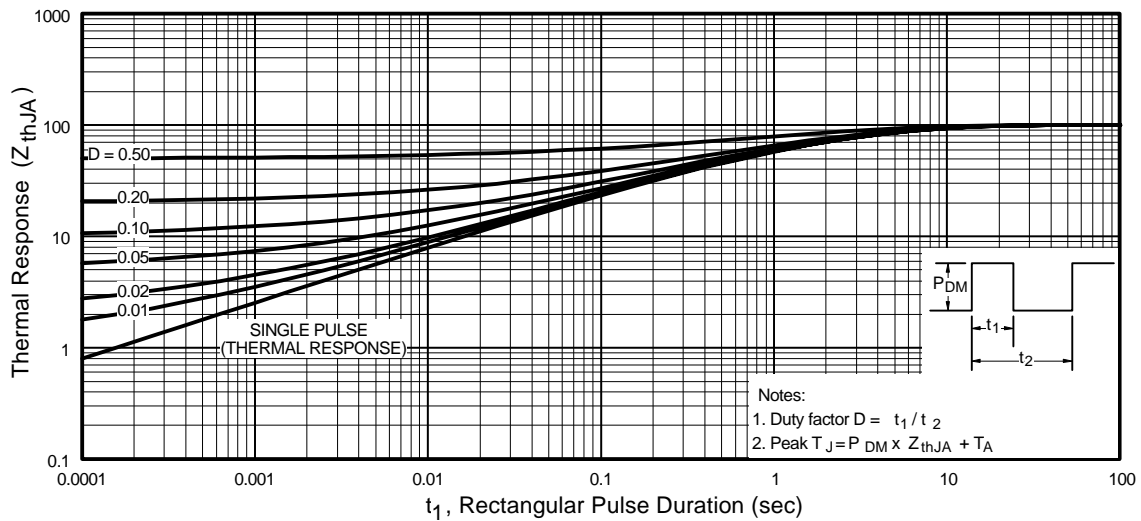


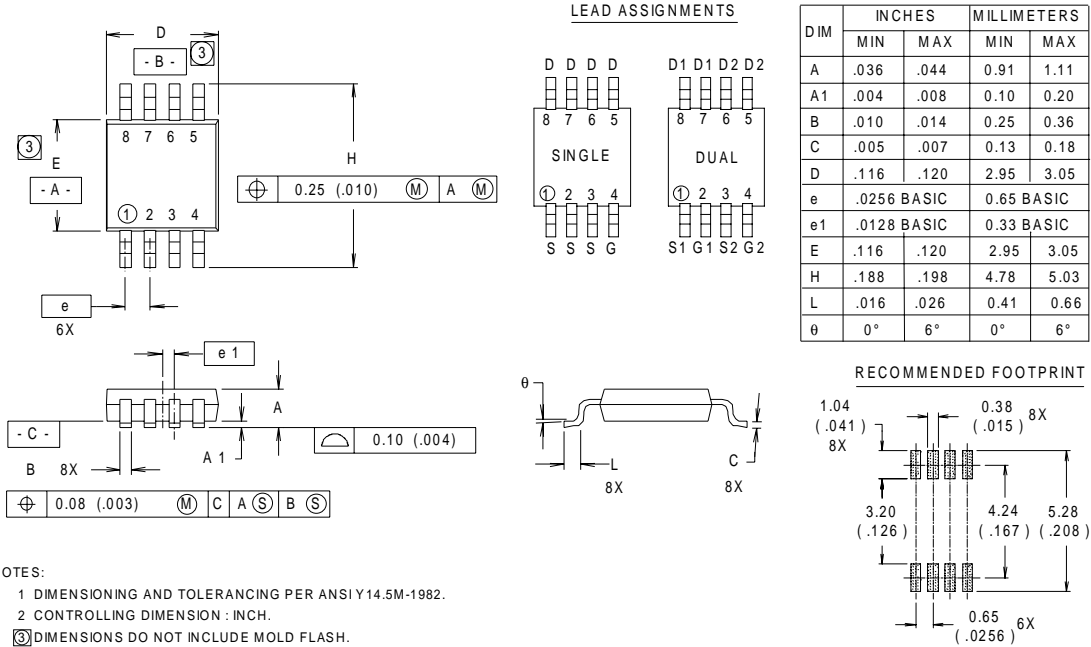
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

IRF7555

Package Outline

Micro8™ Outline

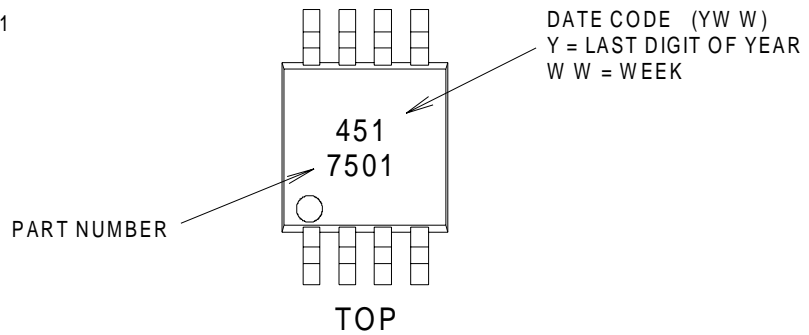
Dimensions are shown in millimeters (inches)



Part Marking Information

Micro8™

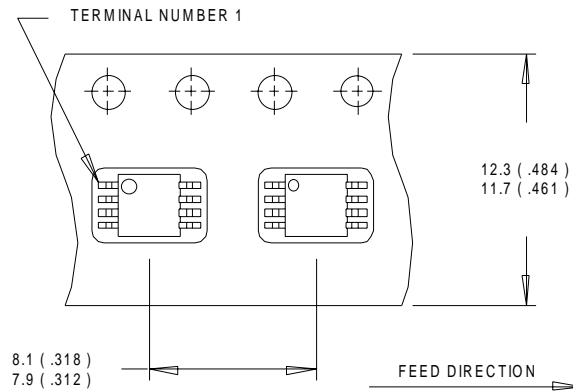
EXAMPLE : THIS IS AN IRF7501



Tape & Reel Information

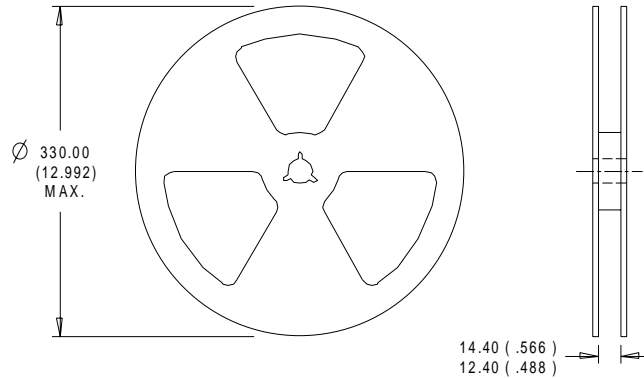
Micro8™

Dimensions are shown in millimeters (inches)



NOTES:

1. OUTLINE CONFORMS TO EIA-481 & EIA-541.
2. CONTROLLING DIMENSION : MILLIMETER.



NOTES:

1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

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Data and specifications subject to change without notice. 2/2000