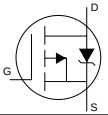
## Electrical Characteristics @ $T_J$ = 25°C (unless otherwise specified)

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-to-Source Breakdown Voltage | -30 | — | — | V | $V_{GS}$ = 0V, $I_D$ = -250µA |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | -0.039 | — | V/°C | Reference to 25°C, $I_D$ = -1mA |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | — | 0.27 | Ω | $V_{GS}$ = -10V, $I_D$ = -1.2A ③ |
| | | — | — | 0.45 | | $V_{GS}$ = -4.5V, $I_D$ = -0.60A ③ |
| $V_{GS(th)}$ | Gate Threshold Voltage | -1.0 | — | — | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -250µA |
| $g_{fs}$ | Forward Transconductance | 0.92 | — | — | S | $V_{DS}$ = -10V, $I_D$ = -0.60A |
| $I_{DSS}$ | 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 | — | 7.5 | 11 | nC | $I_D$ = -1.2A |
| $Q_{gs}$ | Gate-to-Source Charge | — | 1.3 | 1.9 | | $V_{DS}$ = -24V |
| $Q_{gd}$ | Gate-to-Drain ("Miller") Charge | — | 2.5 | 3.7 | | $V_{GS}$ = -10V, See Fig. 6 and 9 ③ |
| $t_{d(on)}$ | Turn-On Delay Time | — | 9.7 | — | ns | $V_{DD}$ = -15V |
| $t_r$ | Rise Time | — | 12 | — | | $I_D$ = -1.2A |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 19 | — | | $R_G$ = 6.2Ω |
| $t_f$ | Fall Time | — | 9.3 | — | | $R_D$ = 12Ω, See Fig. 10 ③ |
| $C_{iss}$ | Input Capacitance | — | 180 | — | pF | $V_{GS}$ = 0V |
| $C_{oss}$ | Output Capacitance | — | 87 | — | | $V_{DS}$ = -25V |
| $C_{rss}$ | Reverse Transfer Capacitance | — | 42 | — | | $f$ = 1.0MHz, See Fig. 5 |

## Source-Drain Ratings and Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | — | — | -1.25 | A | MOSFET symbol showing the integral reverse p-n junction diode.   |
| $I_{SM}$ | Pulsed Source Current (Body Diode) ① | — | — | -9.6 | | |
| $V_{SD}$ | Diode Forward Voltage | — | — | -1.2 | V | $T_J$ = 25°C, $I_S$ = -1.2A, $V_{GS}$ = 0V ③ |
| $t_{rr}$ | Reverse Recovery Time | — | 30 | 45 | ns | $T_J$ = 25°C, $I_F$ = -1.2A |
| $Q_{rr}$ | Reverse RecoveryCharge | — | 37 | 55 | nC | di/dt = -100A/µs ③ |

**Notes:**

① Repetitive rating – pulse width limited by max. junction temperature (see fig. 11)

② $I_{SD}$ ≤ -1.2A, di/dt ≤ -140A/µs, $V_{DD}$ ≤ $V_{(BR)DSS}$, $T_J$ ≤ 150°C

③ Pulse width ≤ 300µs – duty cycle ≤ 2%

④ Surface mounted on FR-4 board, t ≤ 10sec.

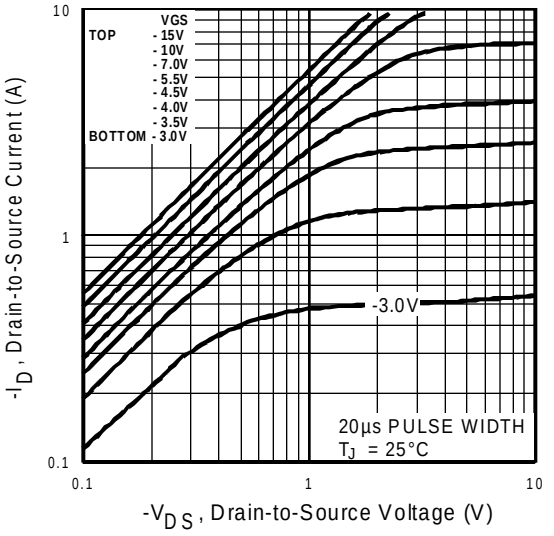



**Fig 1.** Typical Output Characteristics

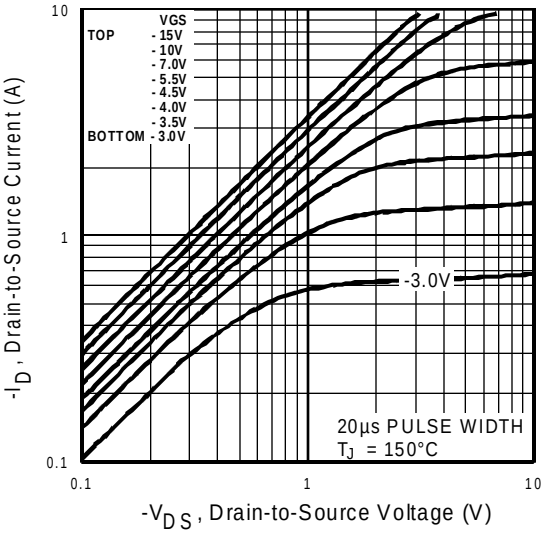



**Fig 2.** Typical Output Characteristics

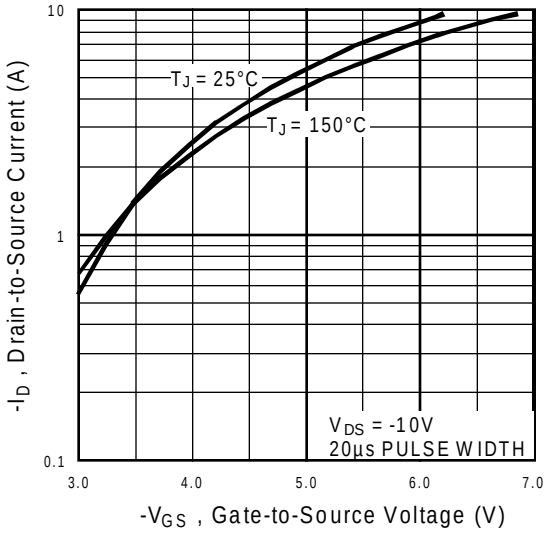



**Fig 3.** Typical Transfer Characteristics

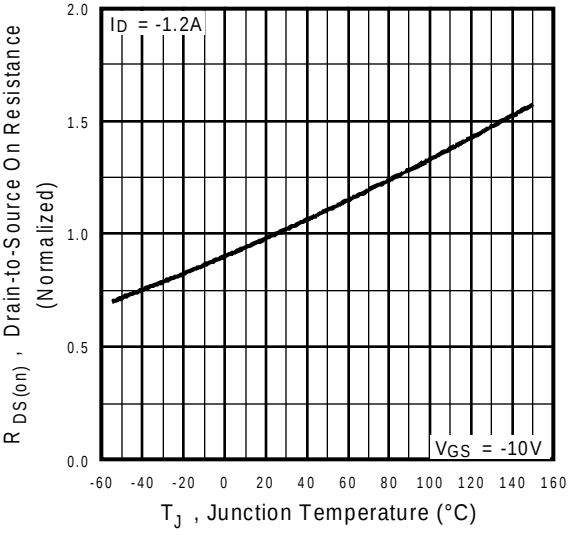



**Fig 4.** Normalized On-Resistance Vs. Temperature

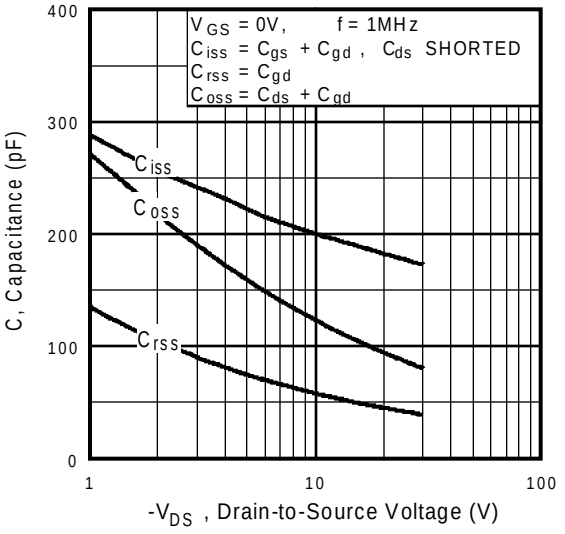



**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage

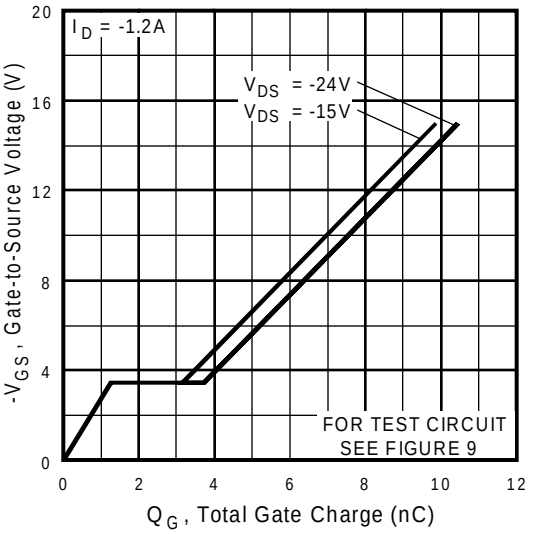



**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage

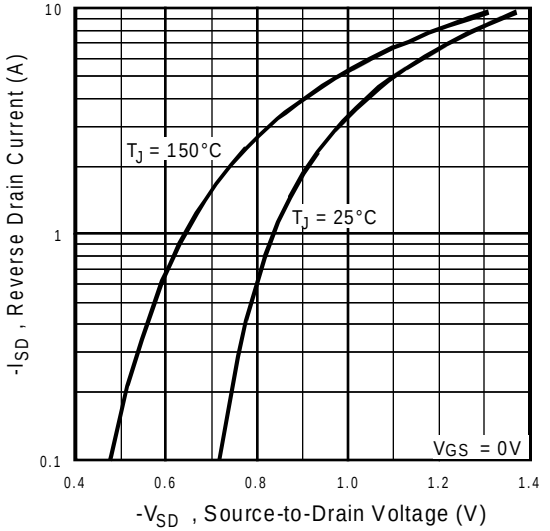



**Fig 7.** Typical Source-Drain Diode Forward Voltage

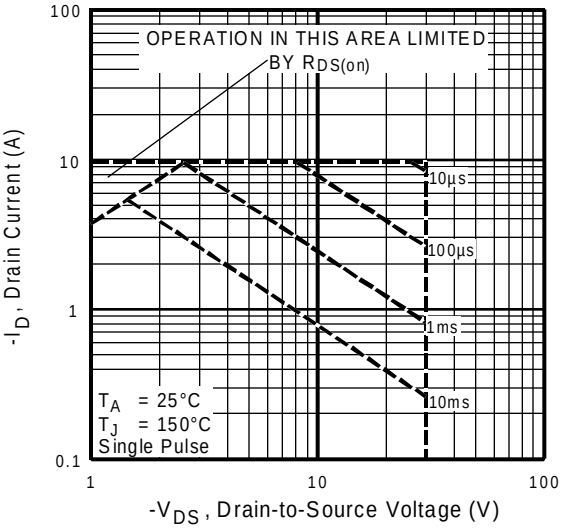



**Fig 8.** Maximum Safe Operating Area

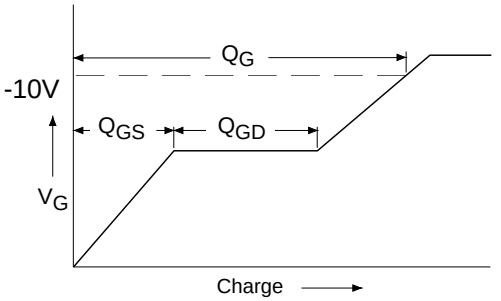



**Fig 9a.** Basic Gate Charge Waveform

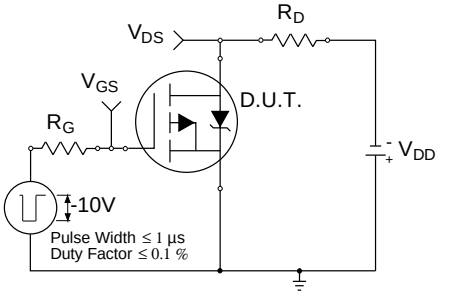



**Fig 10a.** Switching Time Test Circuit

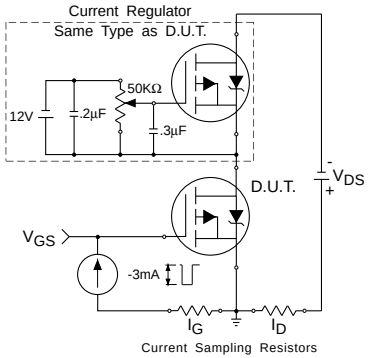



**Fig 9b.** Gate Charge Test Circuit

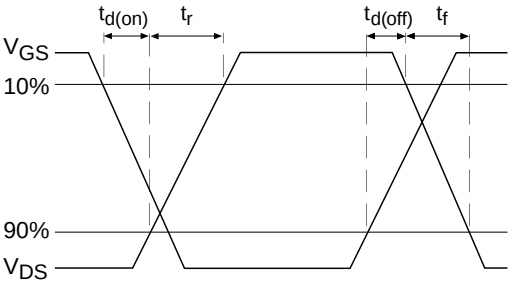



**Fig 10b.** Switching Time Waveforms

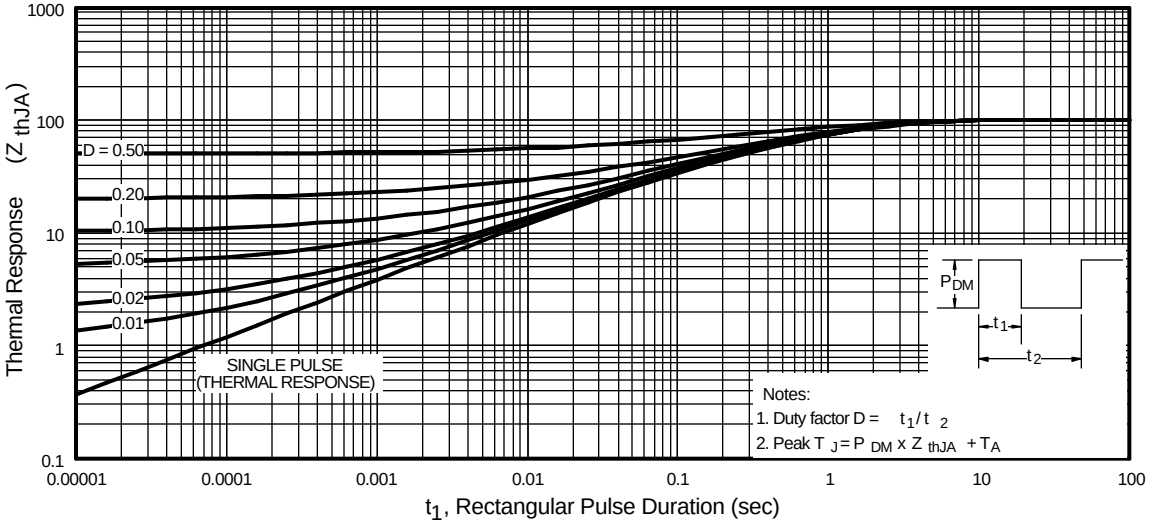
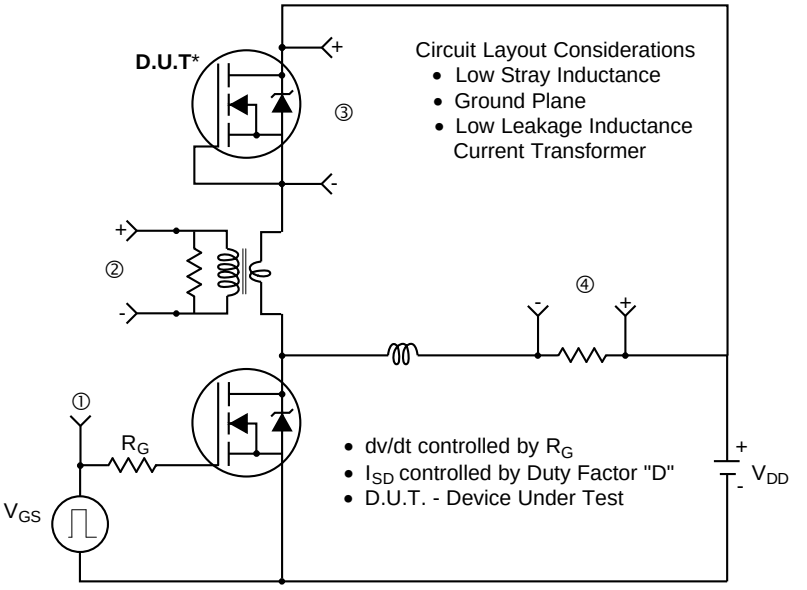
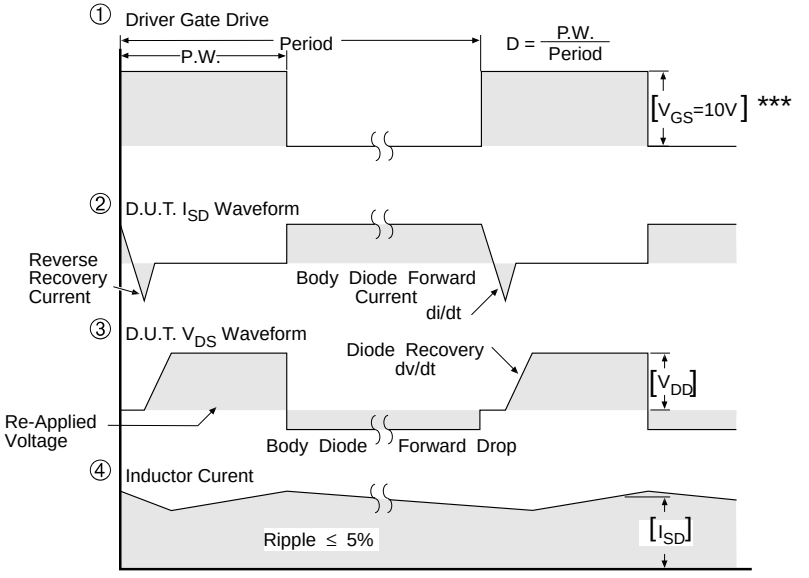



**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

## Peak Diode Recovery dv/dt Test Circuit




* Reverse Polarity of D.U.T for P-Channel



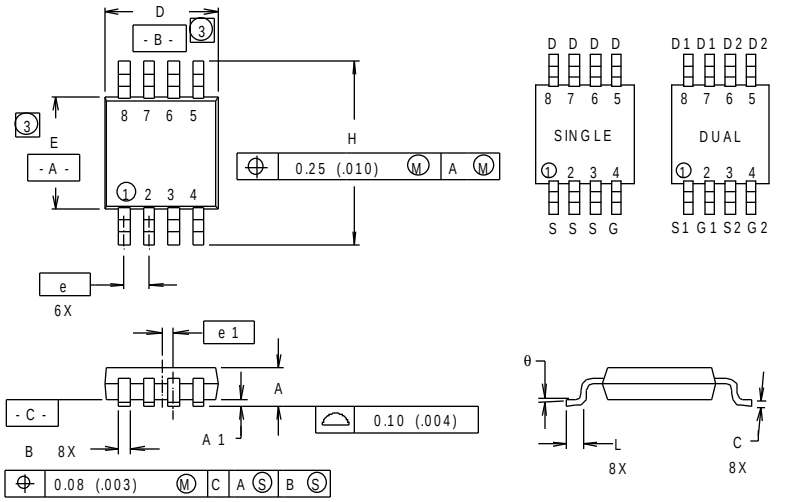

*** $V_{GS}$ = 5.0V for Logic Level and 3V Drive Devices

**Fig 12.** For P-Channel HEXFETS

# Package Outline

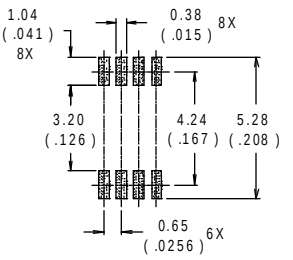
**Micro8 Outline**

Dimensions are shown in millimeters (inches)




| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | .036 | .044 | 0.91 | 1.11 |
| A1 | .004 | .008 | 0.10 | 0.20 |
| B | .010 | .014 | 0.25 | 0.36 |
| C | .005 | .007 | 0.13 | 0.18 |
| D | .116 | .120 | 2.95 | 3.05 |
| e | .0256 BASIC | | 0.65 BASIC | |
| e1 | .0128 BASIC | | 0.33 BASIC | |
| E | .116 | .120 | 2.95 | 3.05 |
| H | .188 | .198 | 4.78 | 5.03 |
| L | .016 | .026 | 0.41 | 0.66 |
| θ | 0° | 6° | 0° | 6° |

RECOMMENDED FOOTPRINT




NOTES:

1 DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.

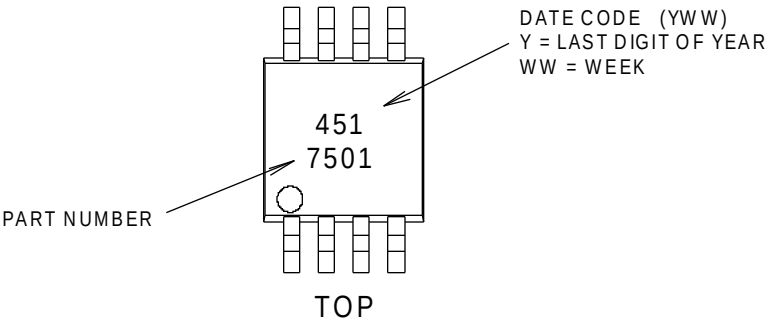
2 CONTROLLING DIMENSION : INCH.

3 DIMENSIONS DO NOT INCLUDE MOLD FLASH.

# Part Marking Information

**Micro8**

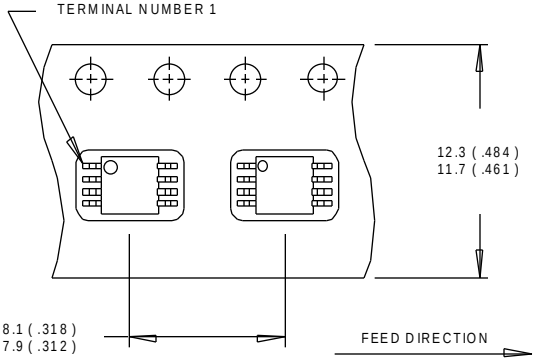
EXAMPLE : THIS IS AN IRF7501



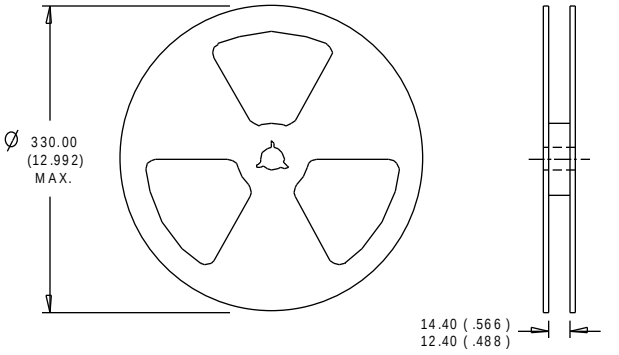
# Tape & Reel Information

**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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IOR Rectifier

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