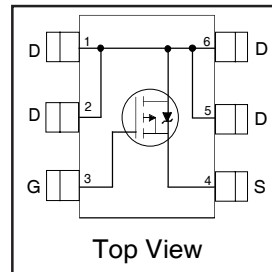


# IRLMS6802PbF

HEXFET® Power MOSFET

- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Lead-Free



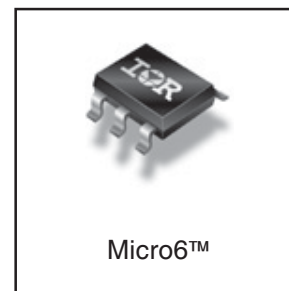
$$V_{DSS} = -20V$$

$$R_{DS(on)} = 0.050\Omega$$

## Description

These P-Channel MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit provides the designer with an extremely efficient device for use in battery and load management applications.

The Micro6™ package with its customized leadframe produces a HEXFET® power MOSFET with  $R_{DS(on)}$  60% less than a similar size SOT-23. This package is ideal for applications where printed circuit board space is at a premium. The unique thermal design and  $R_{DS(on)}$  reduction enables a current-handling increase of nearly 300% compared to the SOT-23.



## Absolute Maximum Ratings

|                          | Parameter                                  | Max.         | Units |
|--------------------------|--------------------------------------------|--------------|-------|
| $V_{DS}$                 | Drain- Source Voltage                      | -20          | V     |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V$ | -5.6         | A     |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V$ | -4.5         |       |
| $I_{DM}$                 | Pulsed Drain Current ①                     | -45          |       |
| $P_D @ T_A = 25^\circ C$ | Power Dissipation                          | 2.0          | W     |
| $P_D @ T_A = 70^\circ C$ | Power Dissipation                          | 1.3          |       |
|                          | Linear Derating Factor                     | 0.016        | W/°C  |
| $E_{AS}$                 | Single Pulse Avalanche Energy②             | 31           | mJ    |
| $V_{GS}$                 | Gate-to-Source Voltage                     | $\pm 12$     | V     |
| $T_J, T_{STG}$           | Junction and Storage Temperature Range     | -55 to + 150 | °C    |

## Thermal Resistance

|                 | Parameter                    | Max. | Units |
|-----------------|------------------------------|------|-------|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient③ | 62.5 | °C/W  |

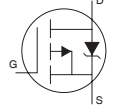
# IRLMS6802PbF

International  
**IR** Rectifier

## 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 | —     | —      | 0.050 | $\Omega$            | $V_{GS} = -4.5V$ , $I_D = -5.1A$ ②                          |
|                                 |                                      | —     | —      | 0.100 |                     | $V_{GS} = -2.5V$ , $I_D = -3.4A$ ②                          |
| $V_{GS(th)}$                    | Gate Threshold Voltage               | -0.60 | —      | -1.2  | V                   | $V_{DS} = V_{GS}$ , $I_D = -250\mu A$                       |
| $g_{fs}$                        | Forward Transconductance             | 1.5   | —      | —     | S                   | $V_{DS} = -10V$ , $I_D = -0.80A$                            |
| $I_{DSS}$                       | Drain-to-Source Leakage Current      | —     | —      | -1.0  | $\mu A$             | $V_{DS} = -16V$ , $V_{GS} = 0V$                             |
|                                 |                                      | —     | —      | -25   |                     | $V_{DS} = -16V$ , $V_{GS} = 0V$ , $T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                       | Gate-to-Source Forward Leakage       | —     | —      | -100  | nA                  | $V_{GS} = -12V$                                             |
|                                 | Gate-to-Source Reverse Leakage       | —     | —      | 100   |                     | $V_{GS} = 12V$                                              |
| $Q_g$                           | Total Gate Charge                    | —     | 11     | 16    | nC                  | $I_D = -4.5A$                                               |
| $Q_{gs}$                        | Gate-to-Source Charge                | —     | 2.2    | 3.3   |                     | $V_{DS} = -10V$                                             |
| $Q_{gd}$                        | Gate-to-Drain ("Miller") Charge      | —     | 2.9    | 4.3   |                     | $V_{GS} = -5.0V$ ②                                          |
| $t_{d(on)}$                     | Turn-On Delay Time                   | —     | 12     | —     | ns                  | $V_{DD} = -10V$                                             |
| $t_r$                           | Rise Time                            | —     | 33     | —     |                     | $I_D = -1.0A$                                               |
| $t_{d(off)}$                    | Turn-Off Delay Time                  | —     | 70     | —     |                     | $R_G = 6.0\Omega$                                           |
| $t_f$                           | Fall Time                            | —     | 72     | —     |                     | $R_D = 10\Omega$ ②                                          |
| $C_{iss}$                       | Input Capacitance                    | —     | 1079   | —     | pF                  | $V_{GS} = 0V$                                               |
| $C_{oss}$                       | Output Capacitance                   | —     | 220    | —     |                     | $V_{DS} = -10V$                                             |
| $C_{rss}$                       | Reverse Transfer Capacitance         | —     | 152    | —     |                     | $f = 1.0\text{MHz}$                                         |

## Source-Drain Ratings and Characteristics

|          | Parameter                              | Min. | Typ. | Max. | Units | Conditions                                                                                                                                           |
|----------|----------------------------------------|------|------|------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_S$    | Continuous Source Current (Body Diode) | —    | —    | -2.0 | A     | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current (Body Diode) ①   | —    | —    | -45  |       |                                                                                                                                                      |
| $V_{SD}$ | 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                  | —    | 74   | 110  | ns    | $T_J = 25^\circ\text{C}$ , $I_F = -3.0A$                                                                                                             |
| $Q_{rr}$ | Reverse Recovery Charge                | —    | 45   | 67   | nC    | $di/dt = -100A/\mu s$ ②                                                                                                                              |

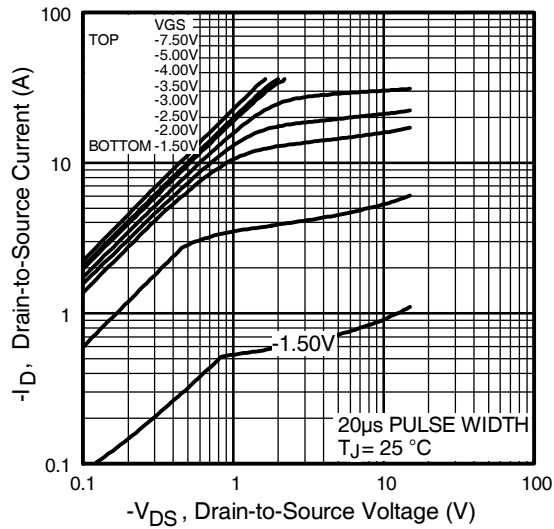
### Notes:

① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )

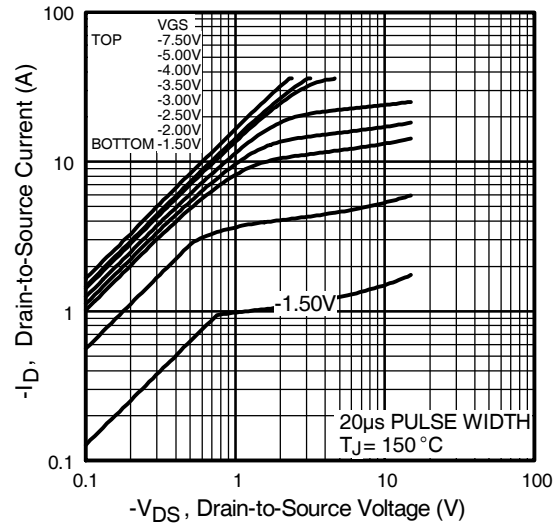
② Pulse width  $\leq 400\mu s$ ; duty cycle  $\leq 2\%$ .

③ Surface mounted on FR-4 board,  $t \leq 5\text{sec}$ .

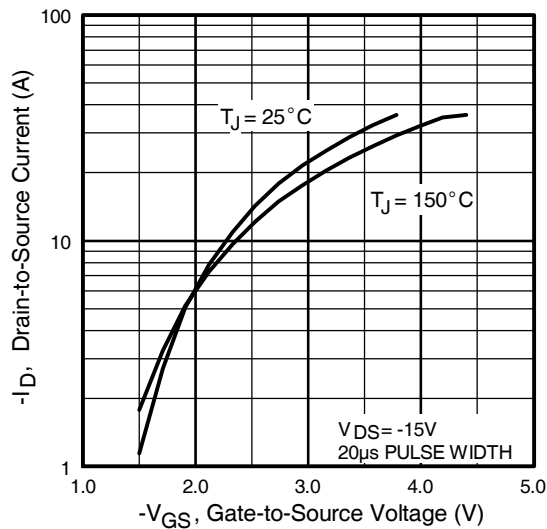
④ Starting  $T_J = 25^\circ\text{C}$ ,  $L = 6.8\text{mH}$   
 $R_G = 25\Omega$ ,  $I_{AS} = -3.0A$ . (See Figure 12)



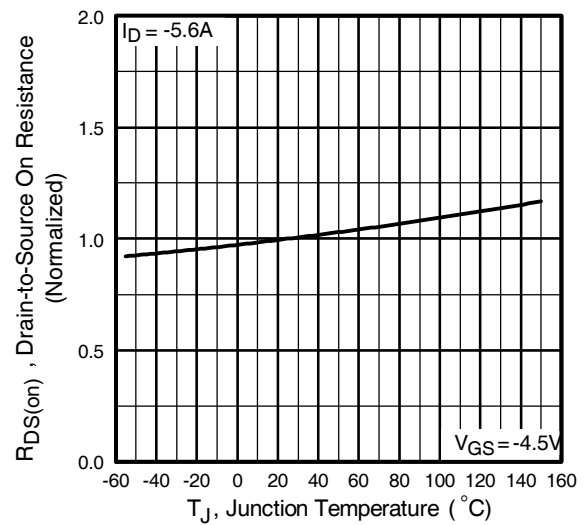
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics



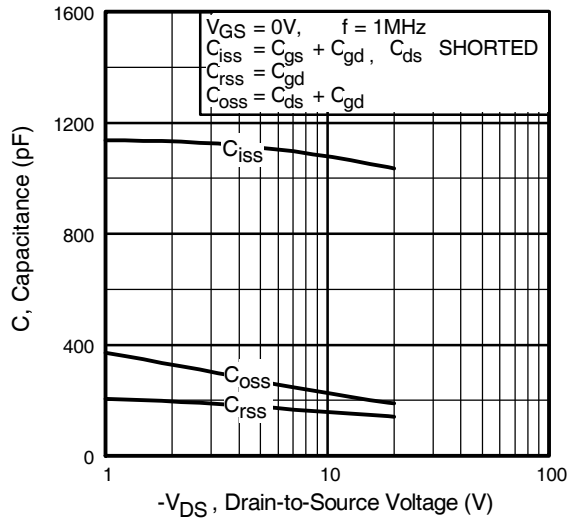
**Fig 3.** Typical Transfer Characteristics



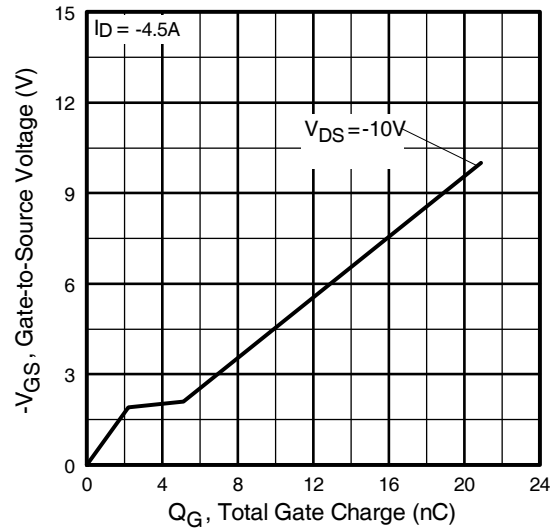
**Fig 4.** Normalized On-Resistance  
Vs. Temperature

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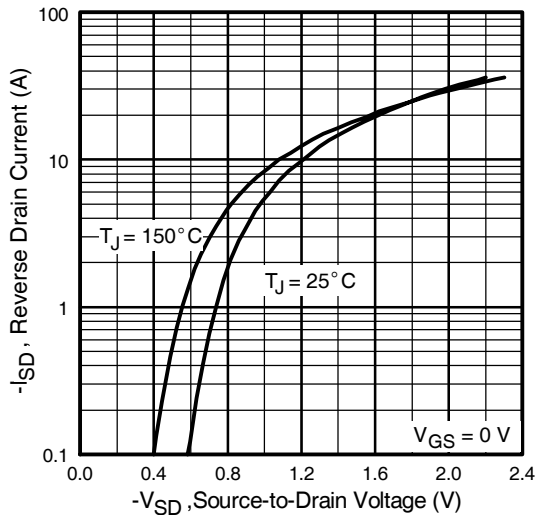
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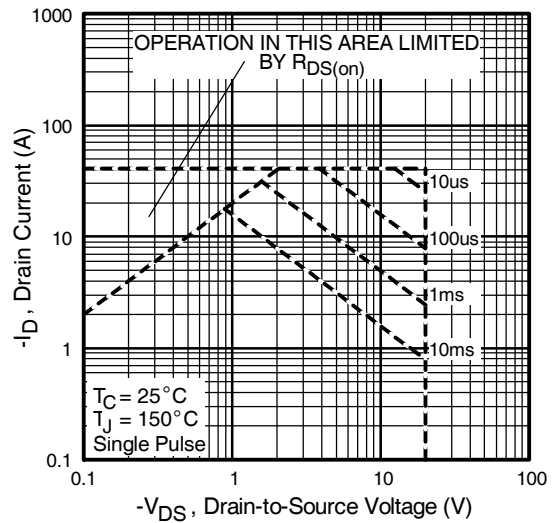
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



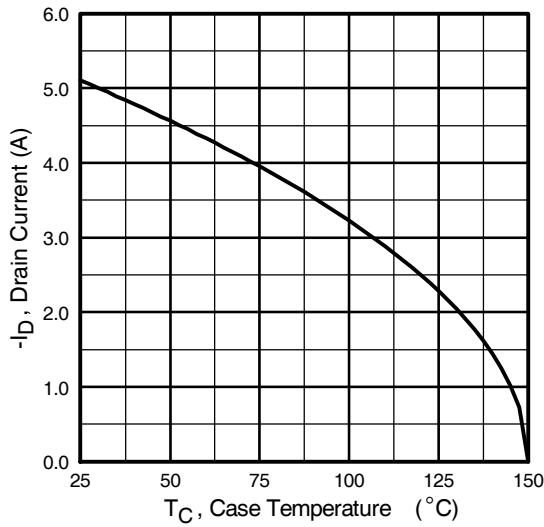
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



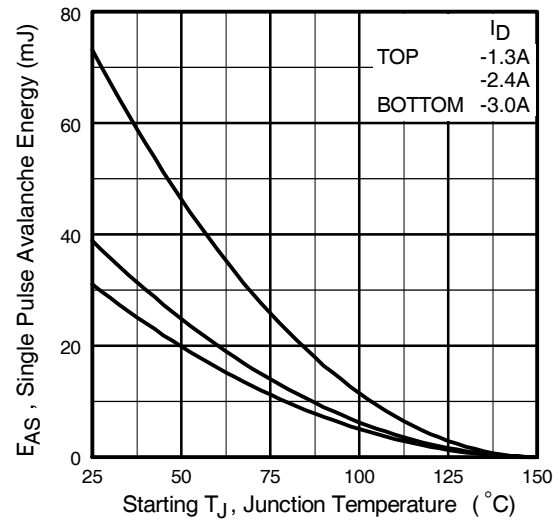
**Fig 7.** Typical Source-Drain Diode Forward Voltage



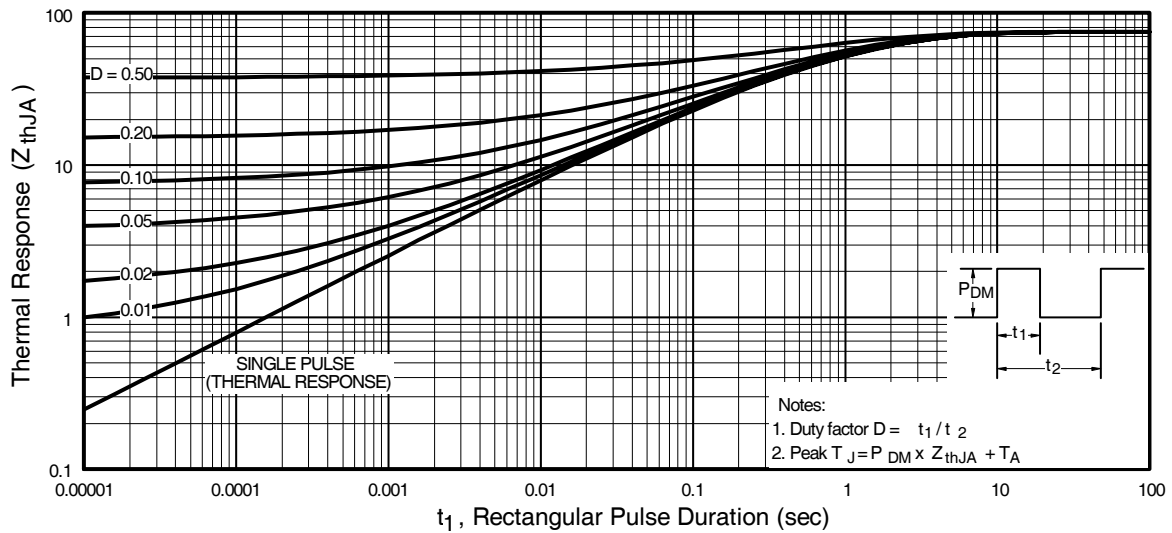
**Fig 8.** Maximum Safe Operating Area



**Fig 9.** Maximum Drain Current Vs. Case Temperature



**Fig 10.** Maximum Avalanche Energy Vs. Drain Current



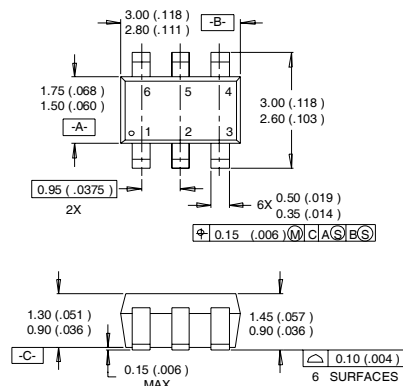
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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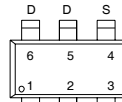
International  
**IR** Rectifier

## Micro6 (SOT23 6L) Package Outline

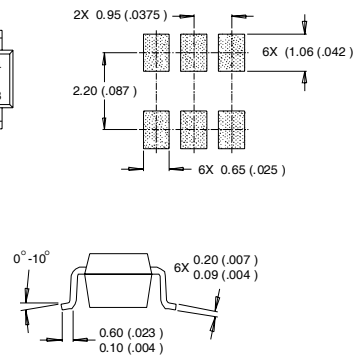
Dimensions are shown in millimeters (inches)



### LEAD ASSIGNMENTS



### RECOMMENDED FOOTPRINT

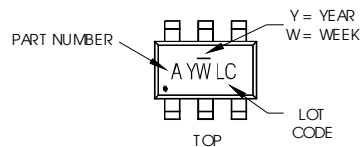


### NOTES :

1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : MILLIMETER.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).

## Micro6 (SOT23 6L) Part Marking Information

W = (1-26) IF PRECEDED BY LAST DIGIT OF CALENDAR YEAR



### PART NUMBER CODE REFERENCE:

A = IRLMS1902  
B = IRLMS1503  
C = IRLMS6702  
D = IRLMS5703  
E = IRLMS6802  
F = IRLMS4502  
G = IRLMS2002  
H = IRLMS6803

Note: A line above the work week (as shown here) indicates Lead-Free.

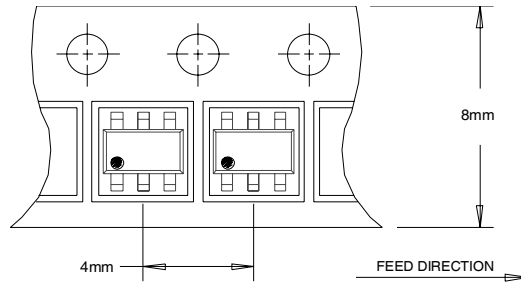
| YEAR | Y | WORK WEEK | W |
|------|---|-----------|---|
| 2001 | 1 | 01        | A |
| 2002 | 2 | 02        | B |
| 2003 | 3 | 03        | C |
| 2004 | 4 | 04        | D |
| 2005 | 5 |           |   |
| 2006 | 6 |           |   |
| 2007 | 7 |           |   |
| 2008 | 8 |           |   |
| 2009 | 9 |           |   |
| 2010 | 0 | 24        | X |
|      |   | 25        | Y |
|      |   | 26        | Z |

W = (27-52) IF PRECEDED BY A LETTER

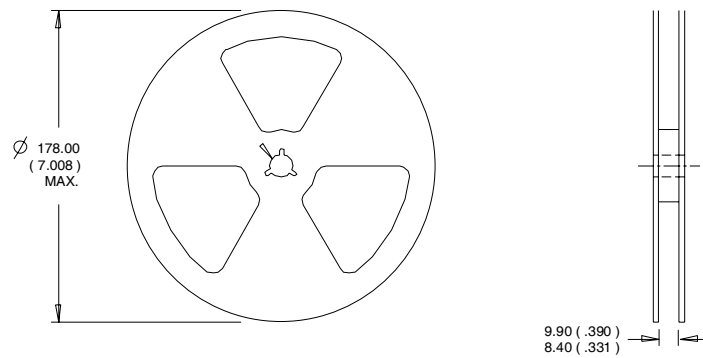
| YEAR | Y | WORK WEEK | W |
|------|---|-----------|---|
| 2001 | A | 27        | A |
| 2002 | B | 28        | B |
| 2003 | C | 29        | C |
| 2004 | D | 30        | D |
| 2005 | E |           |   |
| 2006 | F |           |   |
| 2007 | G |           |   |
| 2008 | H |           |   |
| 2009 | J |           |   |
| 2010 | K | 50        | X |
|      |   | 51        | Y |
|      |   | 52        | Z |

## Micro6 Tape & Reel Information

Dimensions are shown in millimeters (inches)



NOTES:  
1. OUTLINE CONFORMS TO EIA-481 & EIA-541.



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

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

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

Visit us at [www.irf.com](http://www.irf.com) for sales contact information.01/05

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