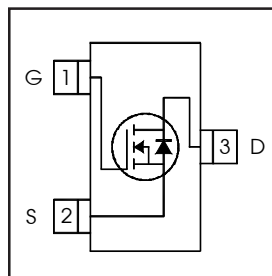


# IRLML6344TRPbF

HEXFET® Power MOSFET

|                                                             |             |           |
|-------------------------------------------------------------|-------------|-----------|
| <b>V<sub>DS</sub></b>                                       | <b>30</b>   | <b>V</b>  |
| <b>V<sub>GS</sub> Max</b>                                   | <b>± 12</b> | <b>V</b>  |
| <b>R<sub>DS(on)</sub> max</b><br>(@ V <sub>GS</sub> = 4.5V) | <b>29</b>   | <b>mΩ</b> |
| <b>R<sub>DS(on)</sub> max</b><br>(@ V <sub>GS</sub> = 2.5V) | <b>37</b>   | <b>mΩ</b> |



## Application(s)

- Load/ System Switch

## Features and Benefits

|                                                              |
|--------------------------------------------------------------|
| Low R <sub>DS(on)</sub> (<29mΩ)                              |
| Industry-standard SOT-23 Package                             |
| RoHS compliant containing no lead, no bromide and no halogen |
| MSL1, Consumer Qualification                                 |

results in

## Benefits

|                            |
|----------------------------|
| Lower Conduction Losses    |
| Multi-vendor compatibility |
| Environmentally friendly   |
| Increased Reliability      |

## Absolute Maximum Ratings

| Symbol                                 | Parameter                                       | Max.         | Units |
|----------------------------------------|-------------------------------------------------|--------------|-------|
| V <sub>DS</sub>                        | Drain-Source Voltage                            | 30           | V     |
| I <sub>D</sub> @ T <sub>A</sub> = 25°C | Continuous Drain Current, V <sub>GS</sub> @ 10V | 5.0          | A     |
| I <sub>D</sub> @ T <sub>A</sub> = 70°C | Continuous Drain Current, V <sub>GS</sub> @ 10V | 4.0          |       |
| I <sub>DM</sub>                        | Pulsed Drain Current                            | 25           |       |
| P <sub>D</sub> @ T <sub>A</sub> = 25°C | Maximum Power Dissipation                       | 1.3          | W     |
| P <sub>D</sub> @ T <sub>A</sub> = 70°C | Maximum Power Dissipation                       | 0.8          |       |
|                                        | Linear Derating Factor                          | 0.01         |       |
| V <sub>GS</sub>                        | Gate-to-Source Voltage                          | ± 12         | V     |
| T <sub>J</sub> , T <sub>STG</sub>      | Junction and Storage Temperature Range          | -55 to + 150 | °C    |

## Thermal Resistance

| Symbol           | Parameter                     | Typ. | Max. | Units |
|------------------|-------------------------------|------|------|-------|
| R <sub>θJA</sub> | Junction-to-Ambient ③         | —    | 100  | °C/W  |
| R <sub>θJA</sub> | Junction-to-Ambient (t<10s) ④ | —    | 99   |       |

## ORDERING INFORMATION:

See detailed ordering and shipping information on the last page of this data sheet.

Notes ① through ④ are on page 10

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# IRLML6344TRPbF

International  
**IR** Rectifier

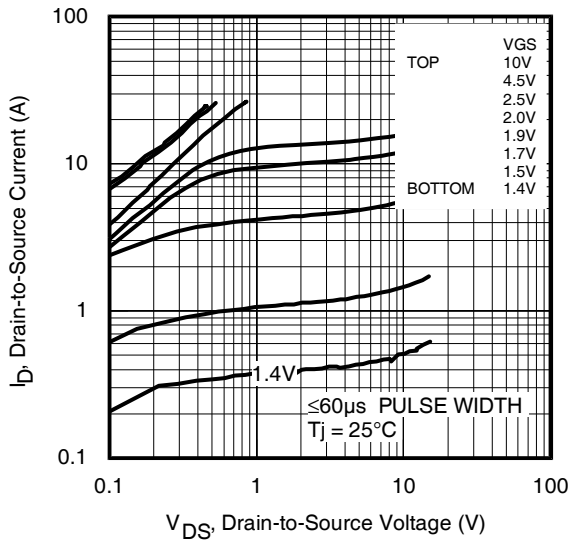
## Electric Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

| Symbol                          | Parameter                            | Min. | Typ. | Max. | Units     | Conditions                                           |
|---------------------------------|--------------------------------------|------|------|------|-----------|------------------------------------------------------|
| $V_{(BR)DSS}$                   | Drain-to-Source Breakdown Voltage    | 30   | —    | —    | V         | $V_{GS} = 0V, I_D = 250\mu A$                        |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient  | —    | 0.02 | —    | V/°C      | Reference to $25^\circ\text{C}$ , $I_D = 1mA$        |
| $R_{DS(on)}$                    | Static Drain-to-Source On-Resistance | —    | 22   | 29   | $m\Omega$ | $V_{GS} = 4.5V, I_D = 5.0A$ ②                        |
|                                 |                                      | —    | 27   | 37   |           | $V_{GS} = 2.5V, I_D = 4.0A$ ②                        |
| $V_{GS(th)}$                    | Gate Threshold Voltage               | 0.5  | 0.8  | 1.1  | V         | $V_{DS} = V_{GS}, I_D = 10\mu A$                     |
| $I_{DSS}$                       | Drain-to-Source Leakage Current      | —    | —    | 1.0  | $\mu A$   | $V_{DS} = 24V, V_{GS} = 0V$                          |
|                                 |                                      | —    | —    | 150  |           | $V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                       | Gate-to-Source Forward Leakage       | —    | —    | 100  | nA        | $V_{GS} = 12V$                                       |
|                                 | Gate-to-Source Reverse Leakage       | —    | —    | -100 |           | $V_{GS} = -12V$                                      |
| $R_G$                           | Internal Gate Resistance             | —    | 1.7  | —    | $\Omega$  |                                                      |
| $g_{fs}$                        | Forward Transconductance             | 19   | —    | —    | S         | $V_{DS} = 10V, I_D = 5.0A$                           |
| $Q_g$                           | Total Gate Charge                    | —    | 6.8  | —    | nC        | $I_D = 5.0A$                                         |
| $Q_{gs}$                        | Gate-to-Source Charge                | —    | 0.3  | —    |           | $V_{DS} = 15V$                                       |
| $Q_{gd}$                        | Gate-to-Drain ("Miller") Charge      | —    | 2.4  | —    |           | $V_{GS} = 4.5V$ ②                                    |
| $t_{d(on)}$                     | Turn-On Delay Time                   | —    | 4.2  | —    | ns        | $V_{DD} = 15V$ ②                                     |
| $t_r$                           | Rise Time                            | —    | 5.6  | —    |           | $I_D = 1.0A$                                         |
| $t_{d(off)}$                    | Turn-Off Delay Time                  | —    | 22   | —    |           | $R_G = 6.8\Omega$                                    |
| $t_f$                           | Fall Time                            | —    | 9.1  | —    |           | $V_{GS} = 4.5V$                                      |
| $C_{iss}$                       | Input Capacitance                    | —    | 650  | —    | pF        | $V_{GS} = 0V$                                        |
| $C_{oss}$                       | Output Capacitance                   | —    | 65   | —    |           | $V_{DS} = 25V$                                       |
| $C_{rss}$                       | Reverse Transfer Capacitance         | —    | 46   | —    |           | $f = 1.0MHz$                                         |

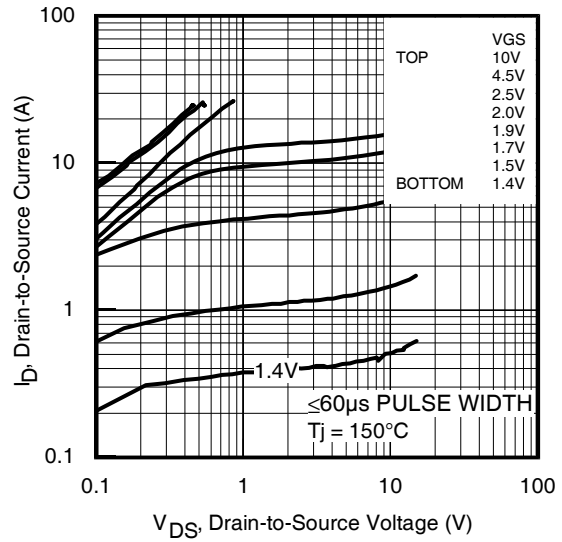
## Source - Drain Ratings and Characteristics

| Symbol   | Parameter                                 | Min. | Typ. | Max. | Units | Conditions                                                              |
|----------|-------------------------------------------|------|------|------|-------|-------------------------------------------------------------------------|
| $I_S$    | Continuous Source Current<br>(Body Diode) | —    | —    | 1.3  | A     | MOSFET symbol<br>showing the<br>integral reverse<br>p-n junction diode. |
| $I_{SM}$ | Pulsed Source Current<br>(Body Diode) ①   | —    | —    | 25   |       |                                                                         |
| $V_{SD}$ | Diode Forward Voltage                     | —    | —    | 1.2  | V     | $T_J = 25^\circ\text{C}, I_S = 5.0A, V_{GS} = 0V$ ②                     |
| $t_{rr}$ | Reverse Recovery Time                     | —    | 10   | 15   | ns    | $T_J = 25^\circ\text{C}, V_R = 15V, I_F = 1.3A$                         |
| $Q_{rr}$ | Reverse Recovery Charge                   | —    | 3.8  | 5.7  | nC    | $di/dt = 100A/\mu s$ ②                                                  |

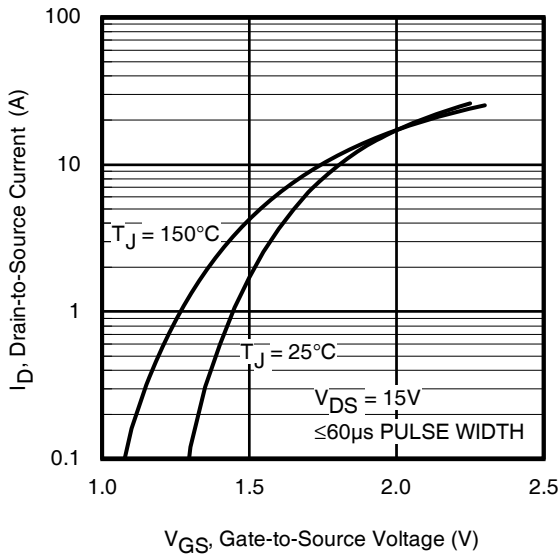




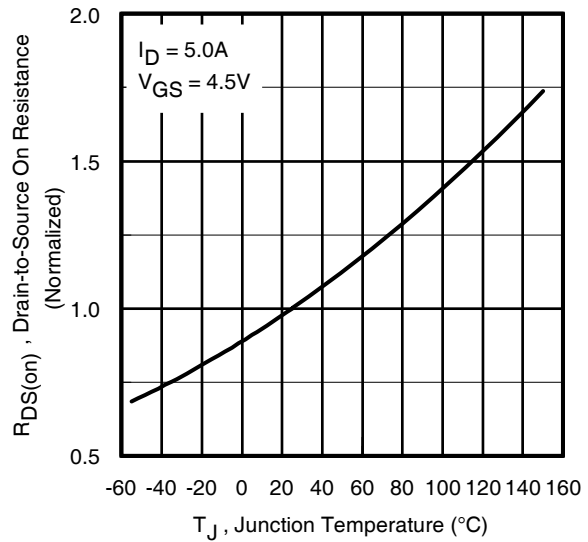
**Fig 1.** Typical Output Characteristics



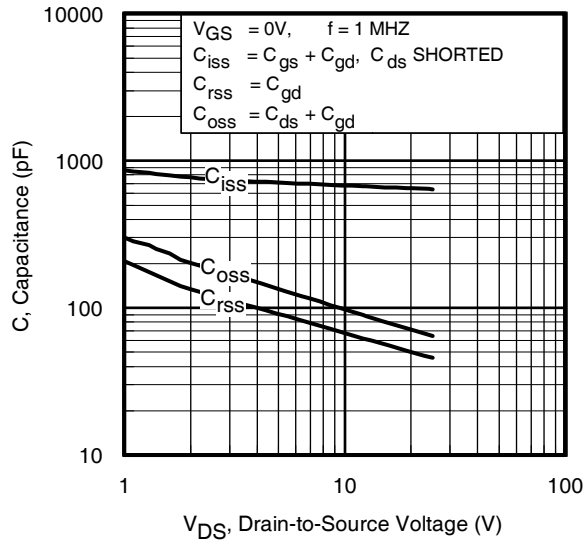
**Fig 2.** Typical Output Characteristics



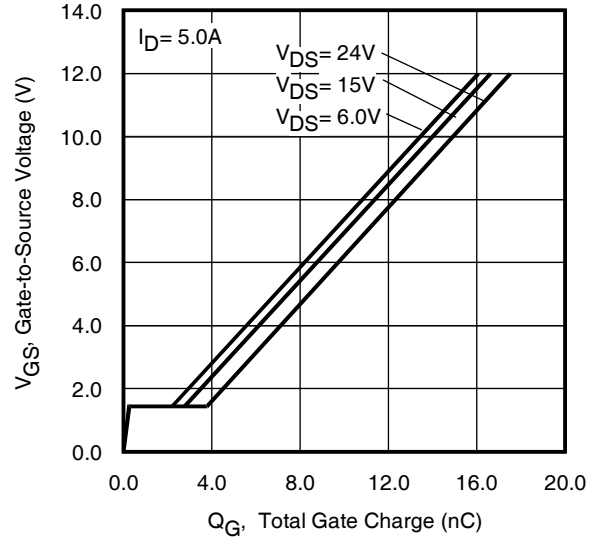
**Fig 3.** Typical Transfer Characteristics



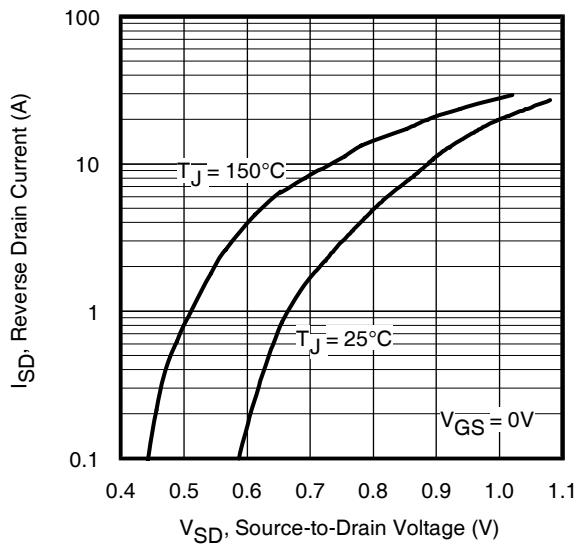
**Fig 4.** Normalized On-Resistance  
Vs. Temperature



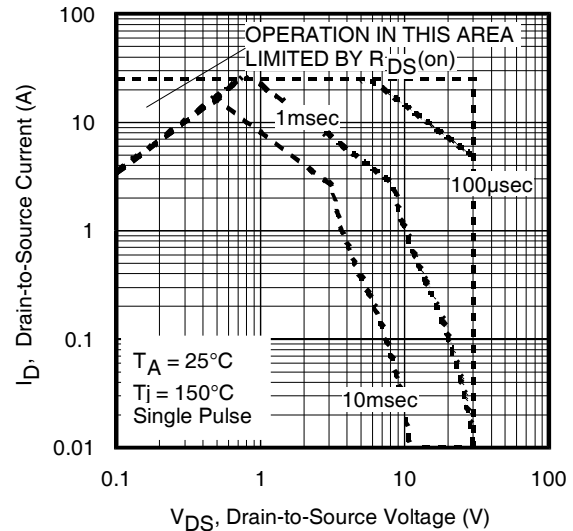
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



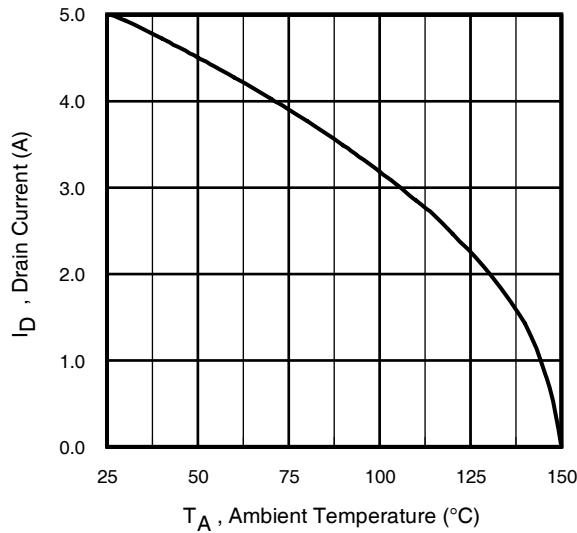
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



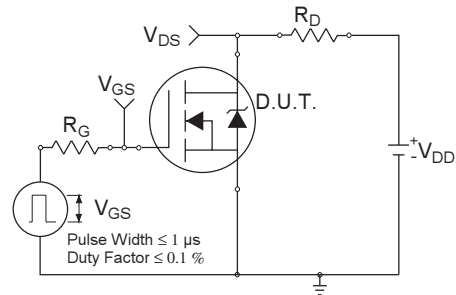
**Fig 7.** Typical Source-Drain Diode Forward Voltage



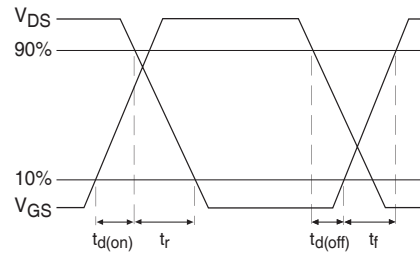
**Fig 8.** Maximum Safe Operating Area



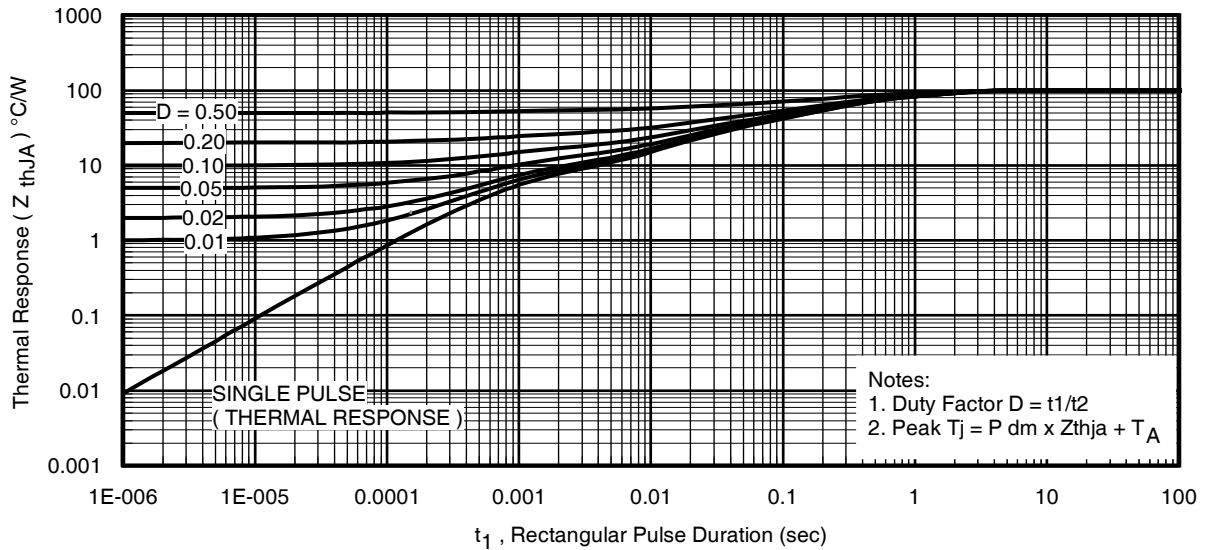
**Fig 9.** Maximum Drain Current Vs. Ambient Temperature



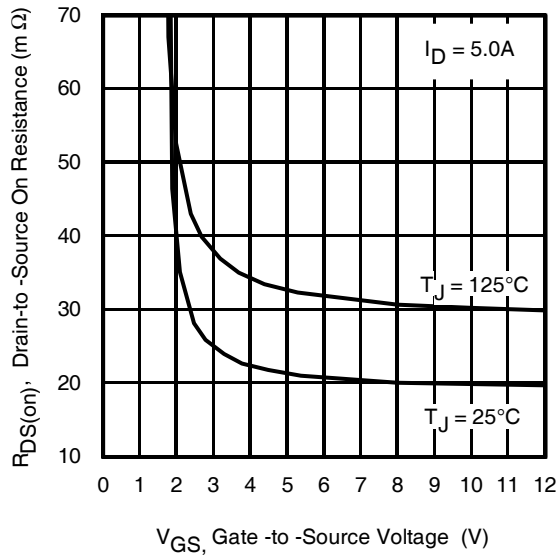
**Fig 10a.** Switching Time Test Circuit



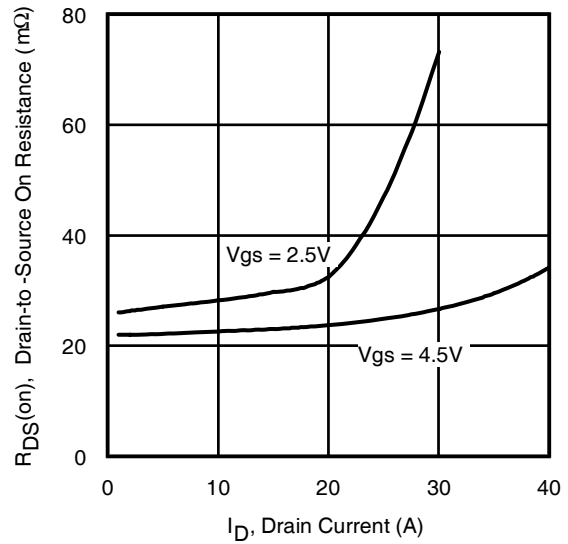
**Fig 10b.** Switching Time Waveforms



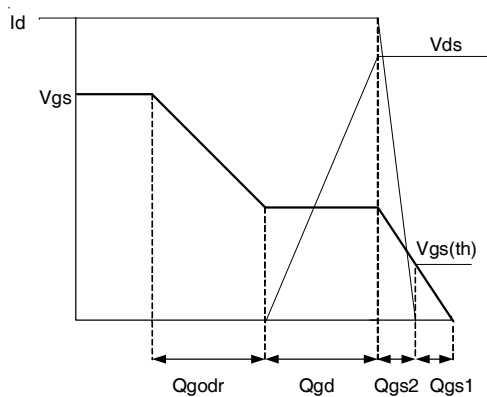
**Fig 11.** Typical Effective Transient Thermal Impedance, Junction-to-Ambient



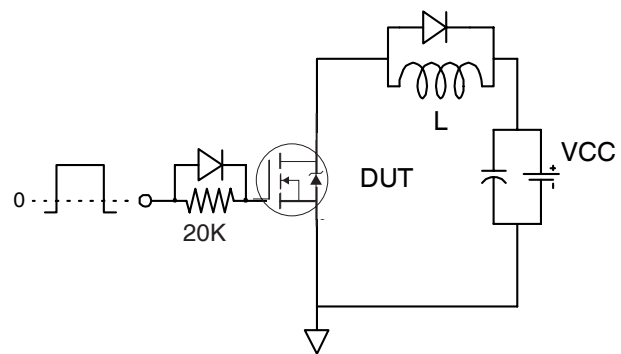
**Fig 12.** Typical On-Resistance Vs. Gate Voltage



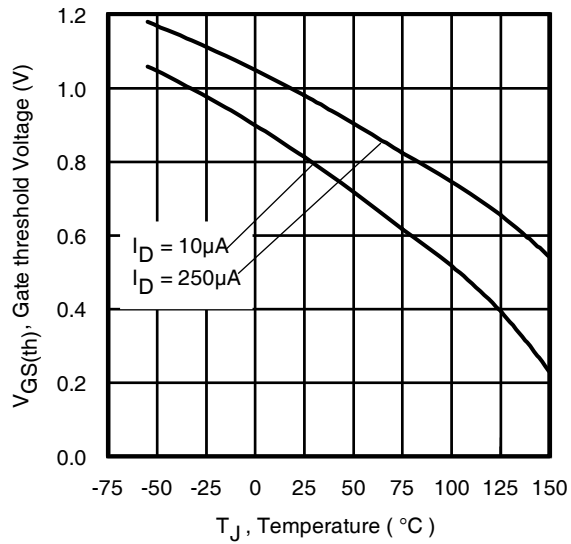
**Fig 13.** Typical On-Resistance Vs. Drain Current



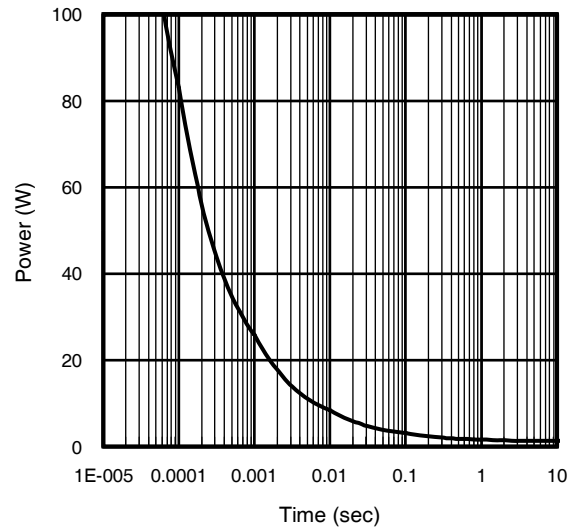
**Fig 14a.** Basic Gate Charge Waveform



**Fig 14b.** Gate Charge Test Circuit



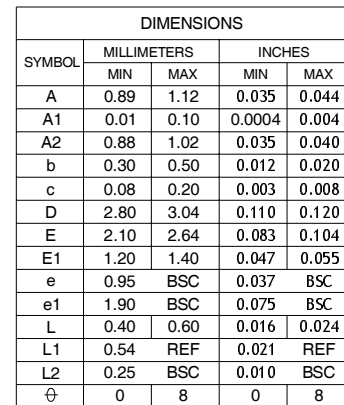
**Fig 15.** Typical Threshold Voltage Vs. Junction Temperature



**Fig 16.** Typical Power Vs. Time

International  
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Dimensions are shown in millimeters (inches)



## Micro3™(SOT-23) Part Marking Information



X = PART NUMBER CODE REFERENCE:

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

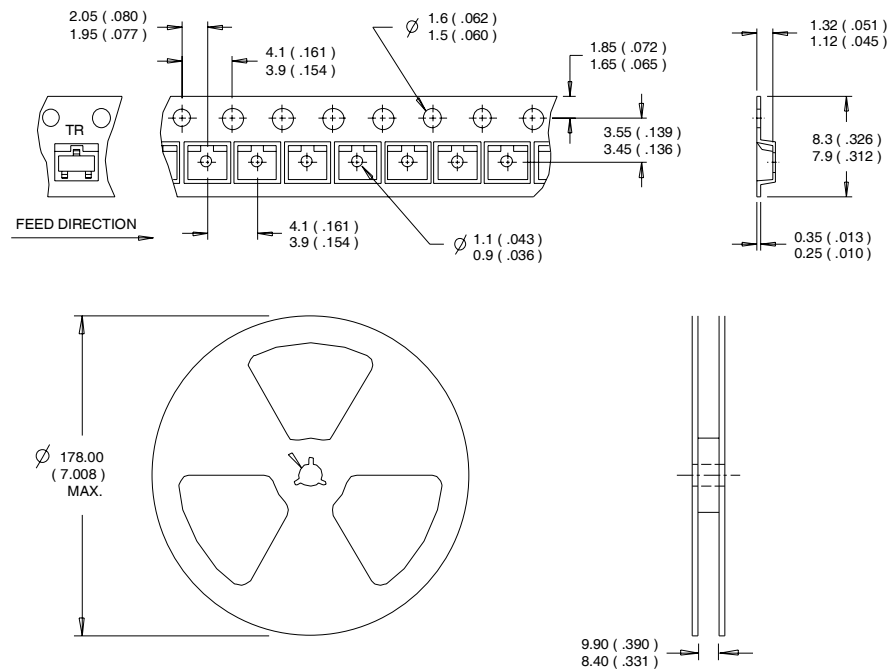
Note: A line above the work week (as shown here) indicates Lead - Free.

Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>



## Micro3™(SOT-23) Tape & Reel Information

Dimensions are shown in millimeters (inches)



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

Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

# IRLML6344TRPbF

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| Orderable part number | Package Type    | Standard Pack |          | Note |
|-----------------------|-----------------|---------------|----------|------|
|                       |                 | Form          | Quantity |      |
| IRLML6344TRPbF        | Micro3™(SOT-23) | Tape and Reel | 3000     |      |

## Qualification information<sup>†</sup>

|                            |                                                                         |                                                    |
|----------------------------|-------------------------------------------------------------------------|----------------------------------------------------|
| Qualification level        | Consumer <sup>††</sup><br>(per JEDEC JESD47F <sup>†††</sup> guidelines) |                                                    |
| Moisture Sensitivity Level | Micro3™(SOT-23)                                                         | MSL1<br>(per IPC/JEDEC J-STD-020D <sup>†††</sup> ) |
| RoHS compliant             | Yes                                                                     |                                                    |

- † Qualification standards can be found at International Rectifier's web site  
<http://www.irf.com/product-info/reliability>
- †† Higher qualification ratings may be available should the user have such requirements.  
Please contact your International Rectifier sales representative for further information:  
<http://www.irf.com/whoto-call/salesrep/>
- ††† Applicable version of JEDEC standard at the time of product release.

## Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width ≤ 400μs; duty cycle ≤ 2%.
- ③ Surface mounted on 1 in square Cu board
- ④ Refer to [application note #AN-994](#).

Data and specifications subject to change without notice.

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**IR** Rectifier

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