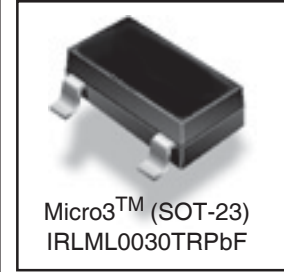
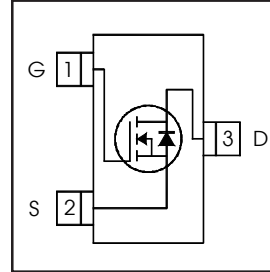


# IRLML0030TRPbF

HEXFET® Power MOSFET

|  |             |           |
|--|-------------|-----------|
| <b>V<sub>DS</sub></b>                                      | <b>30</b>   | <b>V</b>  |
| <b>V<sub>GS Max</sub></b>                                  | <b>± 20</b> | <b>V</b>  |
| <b>R<sub>DS(on) max</sub></b><br>(@V <sub>GS</sub> = 10V)  | <b>27</b>   | <b>mΩ</b> |
| <b>R<sub>DS(on) max</sub></b><br>(@V <sub>GS</sub> = 4.5V) | <b>40</b>   | <b>mΩ</b> |



## Application(s)

- Load/ System Switch

## Features and Benefits

### Features

|  |
|--|
| Low R <sub>DS(on)</sub> ( ≤ 27mΩ)                            |
| Industry-standard pinout                                     |
| Compatible with existing Surface Mount Techniques            |
| RoHS compliant containing no lead, no bromide and no halogen |
| MSL1, Industrial qualification                               |

results in  
⇒

### Benefits

|                            |
|----------------------------|
| Lower switching losses     |
| Multi-vendor compatibility |
| Easier manufacturing       |
| 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 | 5.3          | A     |
| I <sub>D</sub> @ T <sub>A</sub> = 70°C | Continuous Drain Current, V <sub>GS</sub> @ 10V | 4.3          |       |
| I <sub>DM</sub>                        | Pulsed Drain Current                            | 21           |       |
| 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                          | ± 20         | 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   |       |

# IRLML0030TRPbF

## 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     | $V_{GS} = 0V, I_D = 250\mu\text{A}$                  |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient  | —    | 0.02 | —    | V/°C  | Reference to $25^\circ\text{C}, I_D = 1\text{mA}$    |
| $R_{DS(on)}$                    | Static Drain-to-Source On-Resistance | —    | 33   | 40   | mΩ    | $V_{GS} = 4.5V, I_D = 4.2A$ ②                        |
|                                 |                                      | —    | 22   | 27   |       | $V_{GS} = 10V, I_D = 5.2A$ ②                         |
| $V_{GS(th)}$                    | Gate Threshold Voltage               | 1.3  | 1.7  | 2.3  | V     | $V_{DS} = V_{GS}, I_D = 25\mu\text{A}$               |
| $I_{DSS}$                       | Drain-to-Source Leakage Current      | —    | —    | 1    | μA    | $V_{DS} = 24V, V_{GS} = 0V$                          |
|                                 |                                      | —    | —    | 150  |       | $V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$ |
| $I_{GSS}$                       | Gate-to-Source Forward Leakage       | —    | —    | 100  | nA    | $V_{GS} = 20V$                                       |
|                                 | Gate-to-Source Reverse Leakage       | —    | —    | -100 |       | $V_{GS} = -20V$                                      |
| $R_G$                           | Internal Gate Resistance             | —    | 2.3  | —    | Ω     |  |
| $g_{fs}$                        | Forward Transconductance             | 9.5  | —    | —    | S     | $V_{DS} = 10V, I_D = 5.2A$                           |
| $Q_g$                           | Total Gate Charge                    | —    | 2.6  | —    | nC    | $I_D = 5.2A$   |
| $Q_{gs}$                        | Gate-to-Source Charge                | —    | 0.8  | —    |       | $V_{DS} = 15V$                                       |
| $Q_{gd}$                        | Gate-to-Drain ("Miller") Charge      | —    | 1.1  | —    |       | $V_{GS} = 4.5V$ ②                                    |
| $t_{d(on)}$                     | Turn-On Delay Time                   | —    | 5.2  | —    | ns    | $V_{DD} = 15V$ ②                                     |
| $t_r$                           | Rise Time                            | —    | 4.4  | —    |       | $I_D = 1.0A$   |
| $t_{d(off)}$                    | Turn-Off Delay Time                  | —    | 7.4  | —    |       | $R_G = 6.8\Omega$                                    |
| $t_f$                           | Fall Time                            | —    | 4.4  | —    |       | $V_{GS} = 4.5V$                                      |
| $C_{iss}$                       | Input Capacitance                    | —    | 382  | —    | pF    | $V_{GS} = 0V$  |
| $C_{oss}$                       | Output Capacitance                   | —    | 84   | —    |       | $V_{DS} = 15V$                                       |
| $C_{rss}$                       | Reverse Transfer Capacitance         | —    | 39   | —    |       | $f = 1.0\text{MHz}$                                  |

## Source - Drain Ratings and Characteristics

| Symbol   | Parameter                                 | Min. | Typ. | Max. | Units | Conditions   |
|----------|---|------|------|------|-------|--|
| $I_S$    | Continuous Source Current<br>(Body Diode) | —    | —    | 1.6  | A     | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current<br>(Body Diode) ①   | —    | —    | 21   |       |  |
| $V_{SD}$ | Diode Forward Voltage                     | —    | —    | 1.0  | V     | $T_J = 25^\circ\text{C}, I_S = 1.6A, V_{GS} = 0V$ ②  |
| $t_{rr}$ | Reverse Recovery Time                     | —    | 11   | 17   | ns    | $T_J = 25^\circ\text{C}, V_R = 15V, I_F = 1.6A$  |
| $Q_{rr}$ | Reverse Recovery Charge                   | —    | 4.0  | 6.0  | nC    | $di/dt = 100A/\mu\text{s}$ ②   |