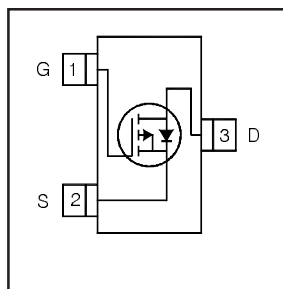


IRLML6302PbF

HEXFET® Power MOSFET

- Generation V Technology
- Ultra Low On-Resistance
- P-Channel MOSFET
- SOT-23 Footprint
- Low Profile (<1.1mm)
- Available in Tape and Reel
- Fast Switching
- Lead-Free

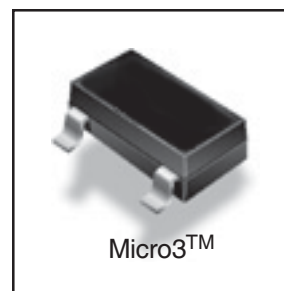


| |
|---------------------------|
| $V_{DSS} = -20V$ |
| $R_{DS(on)} = 0.60\Omega$ |

Description

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and 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.

A customized leadframe has been incorporated into the standard SOT-23 package to produce a HEXFET Power MOSFET with the industry's smallest footprint. This package, dubbed the Micro3, is ideal for applications where printed circuit board space is at a premium. The low profile (<1.1mm) of the Micro3 allows it to fit easily into extremely thin application environments such as portable electronics and PCMCIA cards.



Absolute Maximum Ratings

| | Parameter | Max. | Units |
|--------------------------|--|--------------|-------|
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V$ | -0.78 | A |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ -4.5V$ | -0.62 | |
| I_{DM} | Pulsed Drain Current ① | -4.9 | |
| $P_D @ T_A = 25^\circ C$ | Power Dissipation | 540 | mW |
| | Linear Derating Factor | 4.3 | mW/°C |
| V_{GS} | Gate-to-Source Voltage | ± 12 | V |
| dv/dt | Peak Diode Recovery dv/dt ② | -5.0 | V/ns |
| T_J, T_{STG} | Junction and Storage Temperature Range | -55 to + 150 | °C |

Thermal Resistance

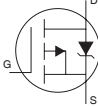
| | Parameter | Typ. | Max. | Units |
|-----------------|-------------------------------|------|------|-------|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient ④ | — | 230 | °C/W |

IRLML6302PbF

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 | — | -4.9 | — | mV/°C | Reference to $25^\circ\text{C}, I_D = -1\text{mA}$ |
| $R_{DS(ON)}$ | Static Drain-to-Source On-Resistance | — | — | 0.60 | Ω | $V_{GS} = -4.5V, I_D = -0.61A$ ③ |
| | | — | — | 0.90 | | $V_{GS} = -2.7V, I_D = -0.31A$ ③ |
| $V_{GS(th)}$ | Gate Threshold Voltage | -0.70 | — | -1.5 | V | $V_{DS} = V_{GS}, I_D = -250\mu A$ |
| g_{fs} | Forward Transconductance | 0.56 | — | — | S | $V_{DS} = -10V, I_D = -0.31A$ |
| 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 | — | 2.4 | 3.6 | nC | $I_D = -0.61A$ |
| Q_{gs} | Gate-to-Source Charge | — | 0.56 | 0.84 | | $V_{DS} = -16V$ |
| Q_{gd} | Gate-to-Drain ("Miller") Charge | — | 1.0 | 1.5 | | $V_{GS} = -4.5V$, See Fig. 6 and 9 ③ |
| $t_{d(on)}$ | Turn-On Delay Time | — | 13 | — | | $V_{DD} = -10V$ |
| t_r | Rise Time | — | 18 | — | ns | $I_D = -0.61A$ |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 22 | — | | $R_G = 6.2\Omega$ |
| t_f | Fall Time | — | 22 | — | | $R_D = 16\Omega$, See Fig. 10 ③ |
| C_{iss} | Input Capacitance | — | 97 | — | pF | $V_{GS} = 0V$ |
| C_{oss} | Output Capacitance | — | 53 | — | | $V_{DS} = -15V$ |
| C_{rss} | Reverse Transfer Capacitance | — | 28 | — | | $f = 1.0\text{MHz}$, See Fig. 5 |

Source-Drain Ratings and Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------|--|------|------|-------|-------|--|
| I_S | Continuous Source Current (Body Diode) | — | — | -0.54 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I_{SM} | Pulsed Source Current (Body Diode) ① | — | — | -4.9 | | |
| V_{SD} | Diode Forward Voltage | — | — | -1.2 | V | $T_J = 25^\circ\text{C}, I_S = -0.61A, V_{GS} = 0V$ ④ |
| t_{rr} | Reverse Recovery Time | — | 35 | 53 | ns | $T_J = 25^\circ\text{C}, I_F = -0.61A$ |
| Q_{rr} | Reverse Recovery Charge | — | 26 | 39 | nC | $di/dt = -100A/\mu s$ ④ |

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② $I_{SD} \leq -0.61A, di/dt \leq 76A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ③ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- ④ Surface mounted on FR-4 board, $t \leq 5\text{sec}$.