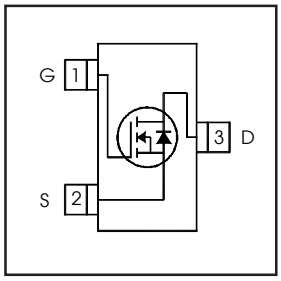
TY Semicondutor®

Product specification

IRLML2502PbF

HEXFET® Power MOSFET

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



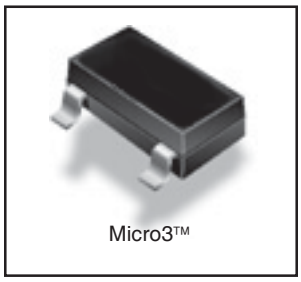
V_{DSS} = 20V

$R_{DS(on)}$ = 0.045Ω

Description

These N-Channel MOSFETs 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 battery and load management.

A thermally enhanced large pad 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. The thermal resistance and power dissipation are the best available.



Micro3™

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	20	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 4.5V	4.2	A
I_D @ T_A= 70°C	Continuous Drain Current, V_{GS} @ 4.5V	3.4	
I_{DM}	Pulsed Drain Current ①	33	
P_D @T_A = 25°C	Power Dissipation	1.25	W
P_D @T_A = 70°C	Power Dissipation	0.8	
	Linear Derating Factor	0.01	W/°C
V_{GS}	Gate-to-Source Voltage	± 12	V
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-Ambient③	75	100	°C/W

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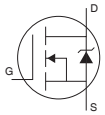
Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	20	—	—	V	V_{GS} = 0V, I_D = 250uA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.01	—	V/°C	Reference to 25°C, I_D = 1.0mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.035	0.045	Ω	V_{GS} = 4.5V, I_D = 4.2A ②
		—	0.050	0.080		V_{GS} = 2.5V, I_D = 3.6A ②
$V_{GS(th)}$	Gate Threshold Voltage	0.60	—	1.2	V	V_{DS} = V_{GS}, I_D = 250μA
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	-3.2	—	mV/°C	
gfs	Forward Transconductance	5.8	—	—	S	V_{DS} = 10V, I_D = 4.0A
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 = 70°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	—	8.0	12	nC	I_D = 4.0A
Q_{gs}	Gate-to-Source Charge	—	1.8	2.7		V_{DS} = 10V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	1.7	2.6		V_{GS} = 5.0V ②
$t_{d(on)}$	Turn-On Delay Time	—	7.5	—	ns	V_{DD} = 10V
t_r	Rise Time	—	10	—		I_D = 1.0A
$t_{d(off)}$	Turn-Off Delay Time	—	54	—		R_G = 6Ω
t_f	Fall Time	—	26	—		R_D = 10Ω ②
C_{iss}	Input Capacitance	—	740	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	90	—		V_{DS} = 15V
C_{rss}	Reverse Transfer Capacitance	—	66	—		f = 1.0MHz

Source-Drain Rating and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	1.3	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	33		
V_{SD}	Diode Forward Voltage	—	—	1.2	V	T_J = 25°C, I_S = 1.3A, V_{GS} = 0V ②
t_{rr}	Reverse Recovery Time	—	16	24	ns	T_J = 25°C, I_F = 1.3A
Q_{rr}	Reverse Recovery Charge	—	8.6	13	nC	di/dt = 100A/μs ②



Notes:

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

② Pulse width ≤ 300μs; duty cycle ≤ 2%.

③ Surface mounted on FR-4 board, t ≤ 5sec.