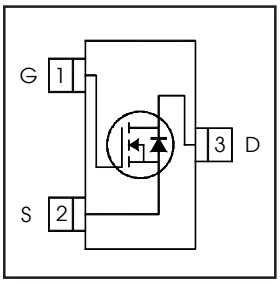
IRLML0040TRPbF

HEXFET® Power MOSFET

V_{DSS}	40	V
$V_{GS\ Max}$	± 16	V
$R_{DS(on)\ max}$ (@V_{GS} = 10V)	56	mΩ
$R_{DS(on)\ max}$ (@V_{GS} = 4.5V)	78	mΩ



Micro3™ (SOT-23)
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Application(s)

- Load/ System Switch
- DC Motor Drive

Features and Benefits

Features		Benefits
Low $R_{DS(on)}$ (≤ 56mΩ)		Lower switching losses
Industry-standard pinout		Multi-vendor compatibility
Compatible with existing Surface Mount Techniques	results in	Easier manufacturing
RoHS compliant containing no lead, no bromide and no halogen	⇒	Environmentally friendly
MSL1, Consumer qualification		Increased reliability

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	40	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	3.6	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	2.9	
I_{DM}	Pulsed Drain Current	15	
P_D @T_A = 25°C	Maximum Power Dissipation	1.3	W
P_D @T_A = 70°C	Maximum Power Dissipation	0.8	
	Linear Derating Factor	0.01	W/°C
V_{GS}	Gate-to-Source Voltage	± 16	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ③	—	100	°C/W
$R_{\theta JA}$	Junction-to-Ambient (t<10s) ④	—	99	

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	40	——	——	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.04	——	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	44	56	mΩ	V_{GS} = 10V, I_D = 3.6A ②
		——	62	78		V_{GS} = 4.5V, I_D = 2.9A ②
$V_{GS(th)}$	Gate Threshold Voltage	1.0	1.8	2.5	V	V_{DS} = V_{GS}, I_D = 25µA
I_{DSS}	Drain-to-Source Leakage Current	——	——	20	µA	V_{DS} = 40V, V_{GS} = 0V
		——	——	250		V_{DS} = 40V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	100	nA	V_{GS} = 16V
	Gate-to-Source Reverse Leakage	——	——	-100		V_{GS} = -16V
R_G	Internal Gate Resistance	——	1.1	——	Ω	
gfs	Forward Transconductance	6.2	——	——	S	V_{DS} = 10V, I_D = 3.6A
Q_g	Total Gate Charge	——	2.6	3.9	nC	I_D = 3.6A
Q_{gs}	Gate-to-Source Charge	——	0.7	——		V_{DS} = 20V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	1.4	——		V_{GS} = 4.5V ②
$t_{d(on)}$	Turn-On Delay Time	——	5.1	——	ns	V_{DD} = 20V
t_r	Rise Time	——	5.4	——		I_D = 1.0A
$t_{d(off)}$	Turn-Off Delay Time	——	6.4	——		R_G = 6.8 Ω
t_f	Fall Time	——	4.3	——		V_{GS} = 4.5V
C_{iss}	Input Capacitance	——	266	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	49	——		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	——	29	——		f = 1.0MHz

Source - Drain Ratings and Characteristics

Symbol	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	——	——	15		
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	——	10	——	ns	T_J = 25°C, V_R = 32V, I_F = 1.3 A
Q_{rr}	Reverse Recovery Charge	——	9.3	——	nC	di/dt = 100A/µs ②