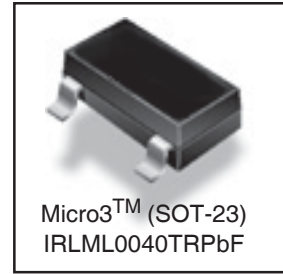
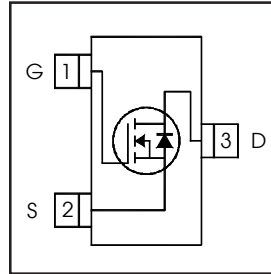


# IRLML0040TRPbF

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



## Application(s)

- Load/ System Switch
- DC Motor Drive

## Features and Benefits

### Features

Low $R_{DS(on)}$ ( $\leq 56m\Omega$ )
Industry-standard pinout
Compatible with existing Surface Mount Techniques
RoHS compliant containing no lead, no bromide and no halogen
MSL1, Consumer qualification

results in  
⇒

### Benefits

Lower switching losses
Multi-vendor compatibility
Easier manufacturing
Environmentally friendly
Increased reliability

## Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
$V_{DS}$	Drain-Source Voltage	40	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	3.6	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	2.9	
$I_{DM}$	Pulsed Drain Current	15	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation	1.3	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation	0.8	
	Linear Derating Factor	0.01	
$V_{GS}$	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	



# IRLML0040TRPbF

## 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	40	—	—	V	$V_{GS} = 0V, I_D = 250\mu\text{A}$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.04	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	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	$V_{DS} = V_{GS}, I_D = 25\mu\text{A}$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	20	μA	$V_{DS} = 40V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 40V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	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	
$g_{fs}$	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	—		$R_G = 6.8\Omega$
$t_f$	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	—		$f = 1.0\text{MHz}$

## 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	$T_J = 25^\circ\text{C}, I_S = 1.3A, V_{GS} = 0V$ ②
$t_{rr}$	Reverse Recovery Time	—	10	—	ns	$T_J = 25^\circ\text{C}, V_R = 32V, I_F = 1.3\text{A}$
$Q_{rr}$	Reverse Recovery Charge	—	9.3	—	nC	$di/dt = 100A/\mu\text{s}$ ②

