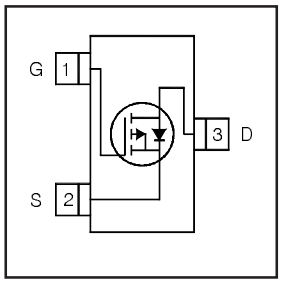
IRLML5203

Power MOSFET

- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Low Gate Charge
- Lead-Free
- Halogen-Free
- Marking: H0

V_{DSS}	$R_{DS(on)}$ max (mΩ)	I_D
-30V	98@V_{GS} = -10V	-3.0A
	165@V_{GS} = -4.5V	-2.6A



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	-30	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ -10V	-3.0	A
I_D @ T_A= 70°C	Continuous Drain Current, V_{GS} @ -10V	-2.4	
I_{DM}	Pulsed Drain Current ①	-24	
P_D @T_A = 25°C	Power Dissipation	1.25	W
P_D @T_A = 70°C	Power Dissipation	0.80	
	Linear Derating Factor	10	mW/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient③	100	°C/W

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-30	——	——	V	V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.019	——	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	——	98	mΩ	V_{GS} = -10V, I_D = -3.0A ②
		——	——	165		V_{GS} = -4.5V, I_D = -2.6A ②
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	——	-2.5	V	V_{DS} = V_{GS}, I_D = -250μA
g_{fs}	Forward Transconductance	3.1	——	——	S	V_{DS} = -10V, I_D = -3.0A
I_{DSS}	Drain-to-Source Leakage Current	——	——	-1.0	μA	V_{DS} = -24V, V_{GS} = 0V
		——	——	-5.0		V_{DS} = -24V, V_{GS} = 0V, T_J = 70°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	-100	nA	V_{GS} = -20V
	Gate-to-Source Reverse Leakage	——	——	100		V_{GS} = 20V
Q_g	Total Gate Charge	——	9.5	14	nC	I_D = -3.0A
Q_{gs}	Gate-to-Source Charge	——	2.3	3.5		V_{DS} = -24V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	1.6	2.4		V_{GS} = -10V ②
$t_{d(on)}$	Turn-On Delay Time	——	12	——	ns	V_{DD} = -15V ②
t_r	Rise Time	——	18	——		I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time	——	88	——		R_G = 6.0Ω
t_f	Fall Time	——	52	——		V_{GS} = -10V
C_{iss}	Input Capacitance	——	510	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	71	——		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	——	43	——		f = 1.0MHz

IRLML5203

Source-Drain Ratings and Characteristics

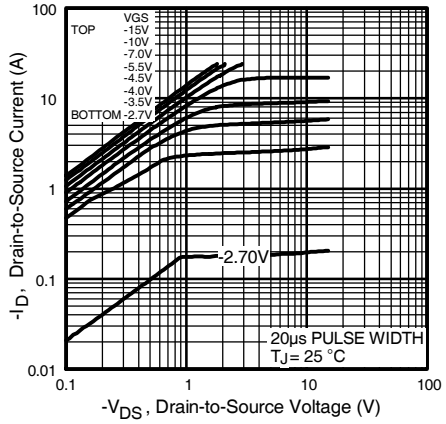
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	---	---	-1.3	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	---	---	-24		
V_{SD}	Diode Forward Voltage	---	---	-1.2	V	T_J = 25°C, I_S = -1.3A, V_{GS} = 0V ②
t_{rr}	Reverse Recovery Time	---	17	26	ns	T_J = 25°C, I_F = -1.3A
Q_{rr}	Reverse Recovery Charge	---	12	18	nC	di/dt = -100A/μs ②

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width ≤ 400μs; duty cycle ≤ 2%.

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



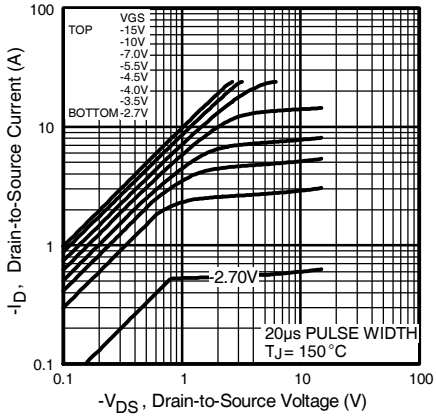


Fig 2. Typical Output Characteristics

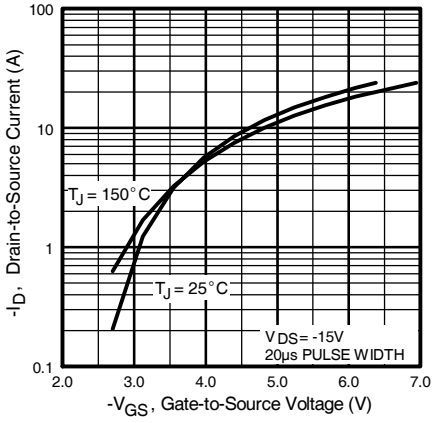


Fig 3. Typical Transfer Characteristics

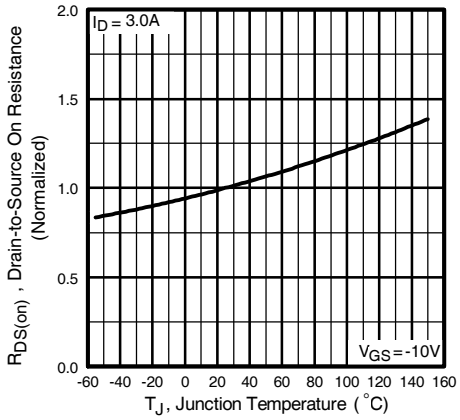


Fig 4. Normalized On-Resistance Vs. Temperature

IRLML5203

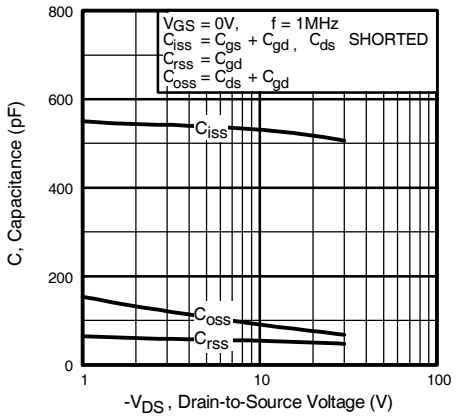


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

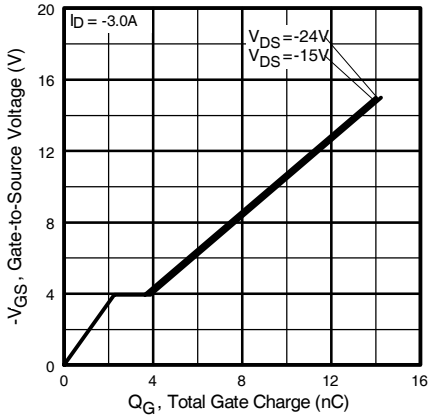


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

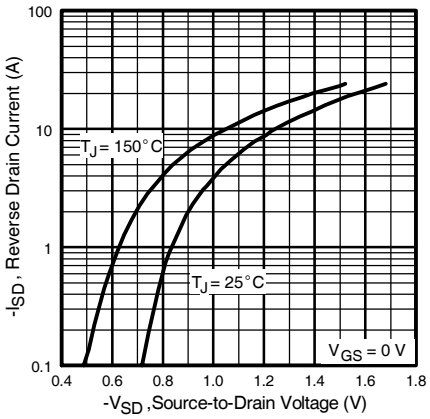


Fig 7. Typical Source-Drain Diode Forward Voltage

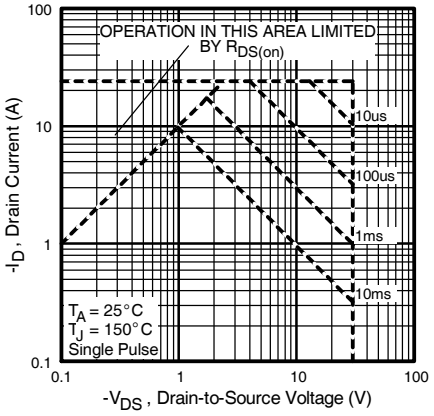


Fig 8. Maximum Safe Operating Area

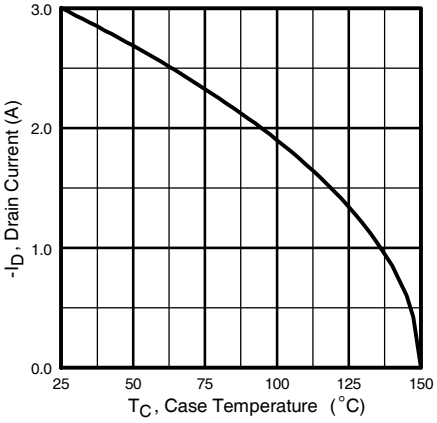


Fig 9. Maximum Drain Current Vs. Case Temperature

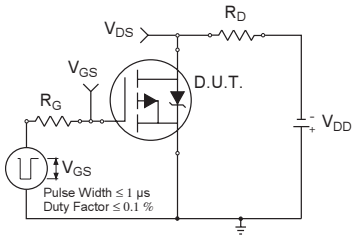


Fig 10a. Switching Time Test Circuit

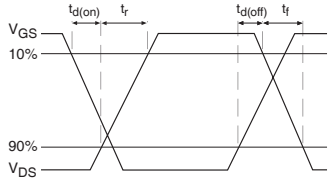


Fig 10b. Switching Time Waveforms

IRLML5203

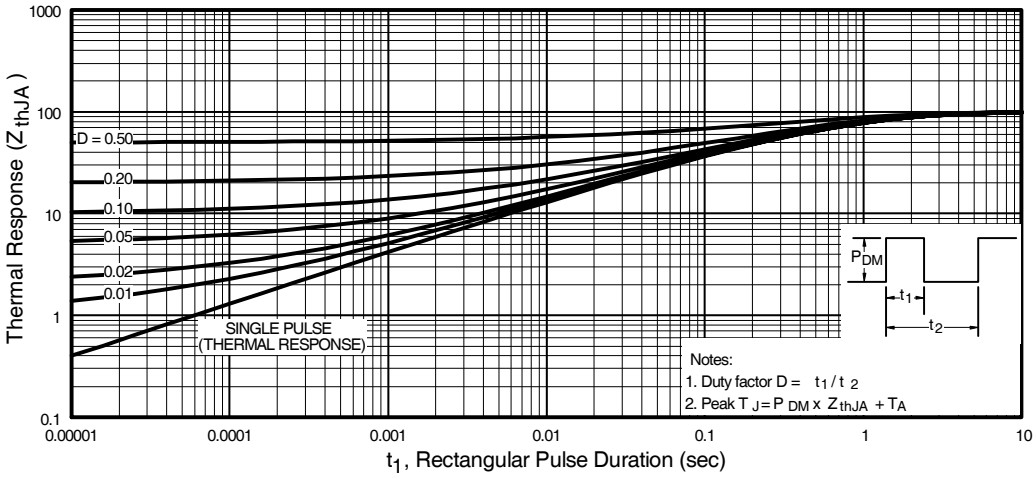


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

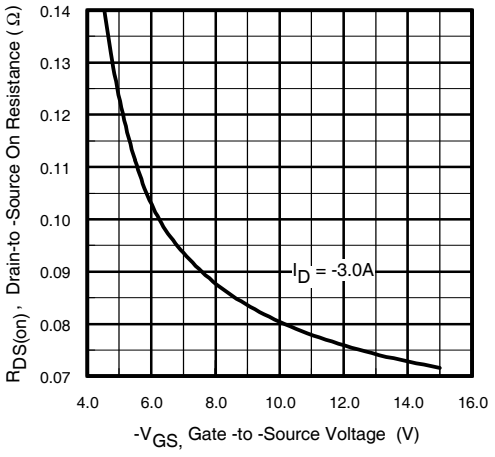


Fig 11. Typical On-Resistance Vs. Gate Voltage

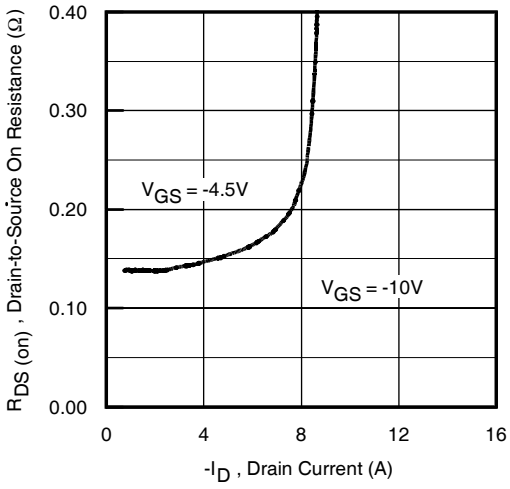


Fig 12. Typical On-Resistance Vs. Drain Current

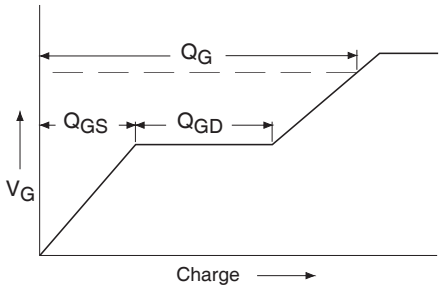


Fig 13a. Basic Gate Charge Waveform

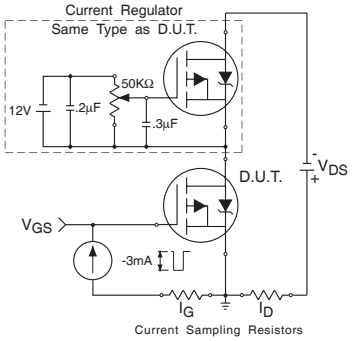


Fig 13b. Gate Charge Test Circuit

IRLML5203

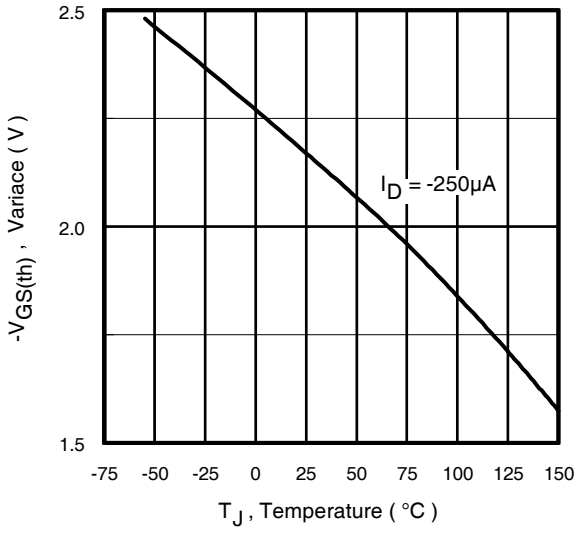


Fig 14. Threshold Voltage Vs. Temperature

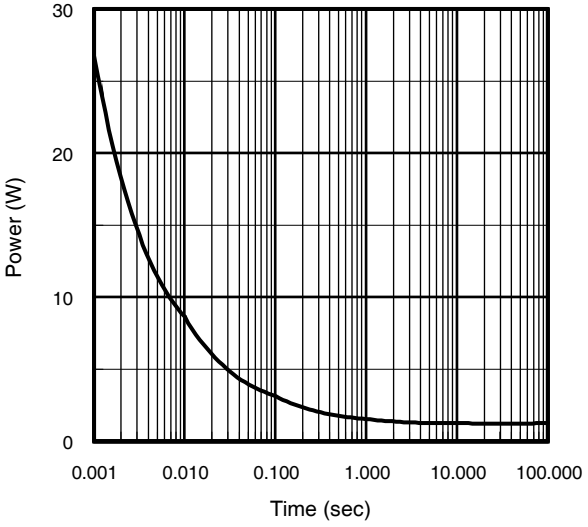


Fig 15. Typical Power Vs. Time