IRLML5203

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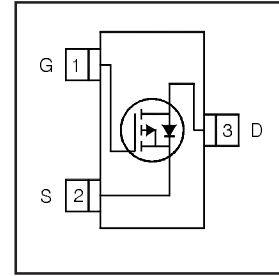
- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Low Gate Charge
- Lead-Free
- Halogen-Free
- Marking: H0

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	
I_D @ T_A= 70°C	Continuous Drain Current, V_{GS} @ -10V	-2.4	A
I_{DM}	Pulsed Drain Current ①	-24	
P_D @T_A = 25°C	Power Dissipation	1.25	
P_D @T_A = 70°C	Power Dissipation	0.80	W
	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

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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.
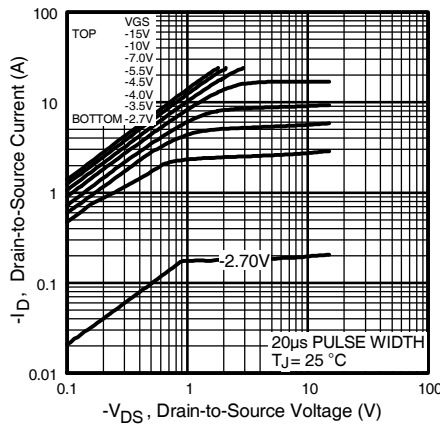
Fig 1. Typical Output Characteristics
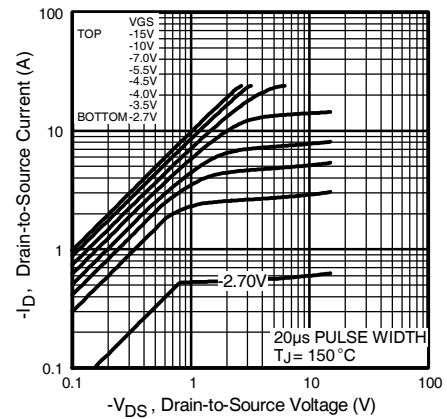
Fig 2. Typical Output Characteristics
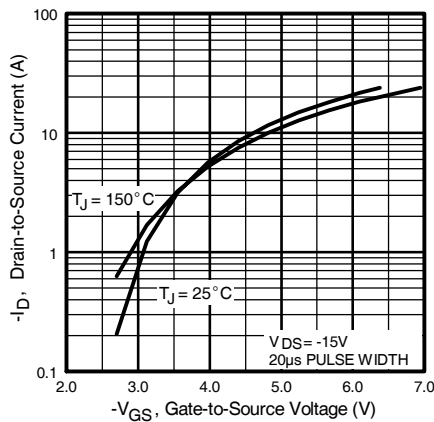
Fig 3. Typical Transfer Characteristics
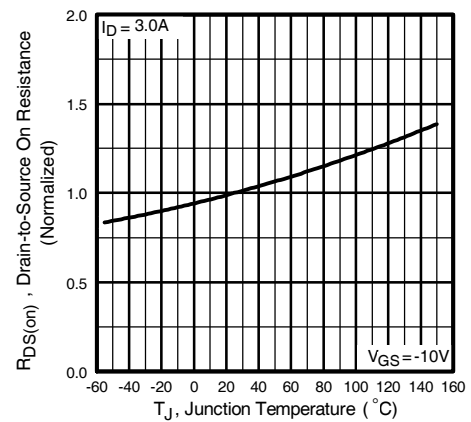
Fig 4. Normalized On-Resistance Vs. Temperature

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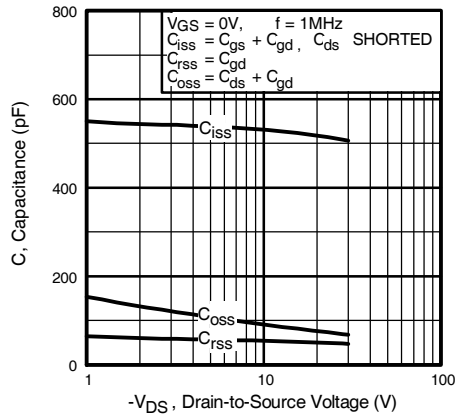
Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage
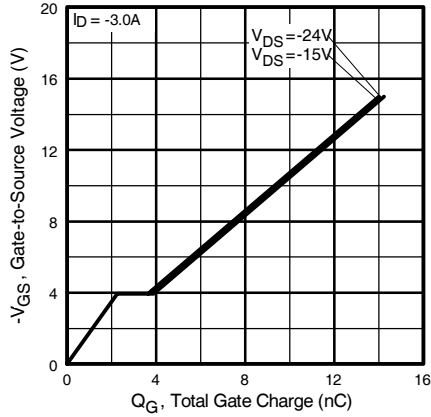
Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage
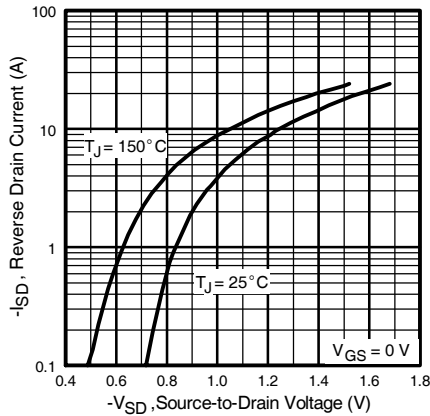

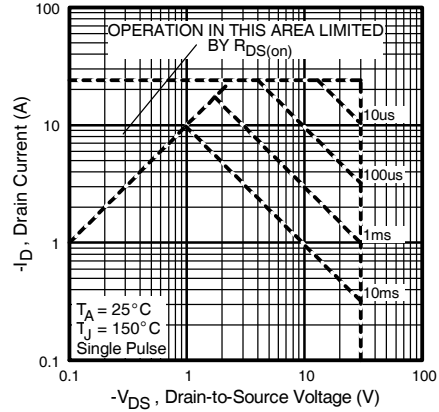**Fig 7.** Typical Source-Drain Diode Forward Voltage
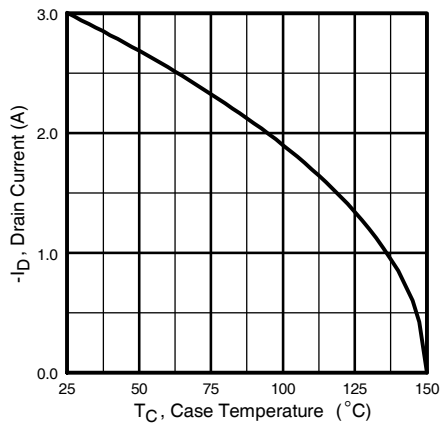

Fig 8. Maximum Safe Operating Area
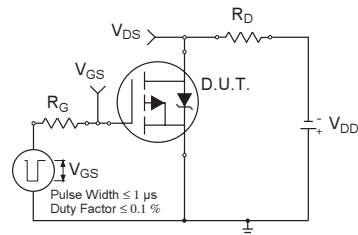

Fig 9. Maximum Drain Current Vs. Case Temperature
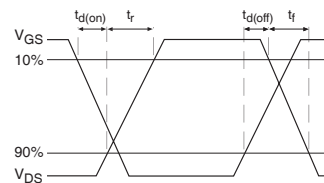

Fig 10a. Switching Time Test Circuit
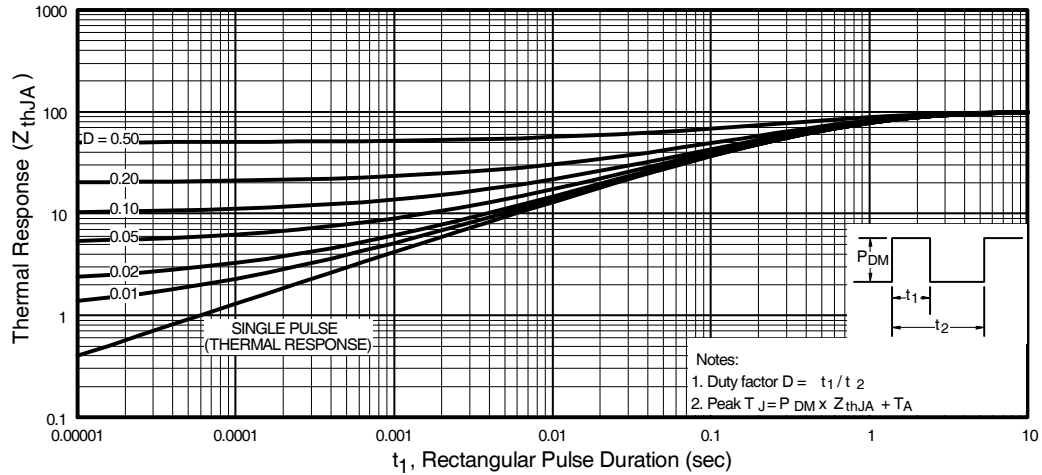

Fig 10b. Switching Time Waveforms

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Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient
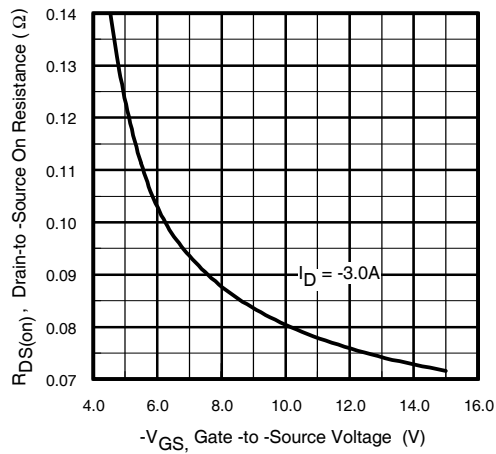
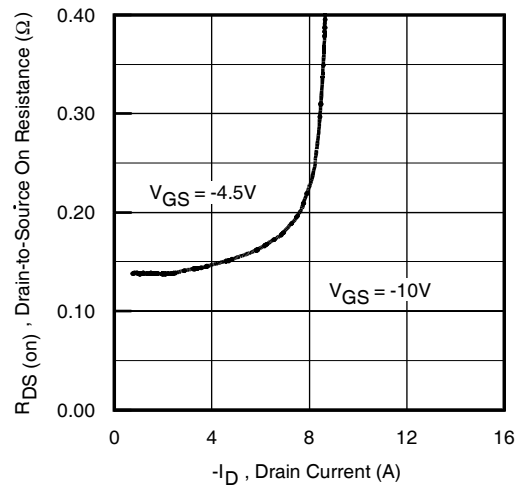**Fig 11.** Typical On-Resistance Vs. Gate Voltage
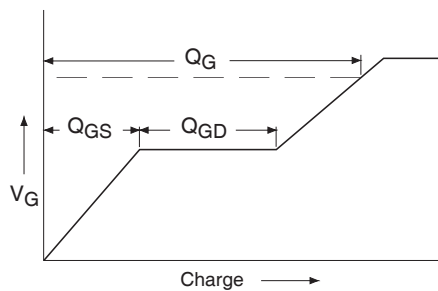
Fig 12. Typical On-Resistance Vs. Drain Current
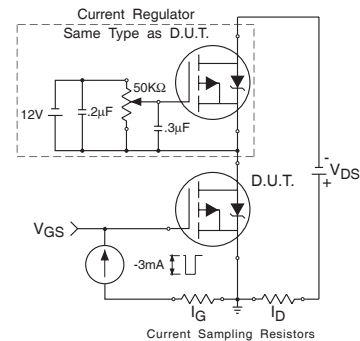
Fig 13a. Basic Gate Charge Waveform

Fig 13b. Gate Charge Test Circuit

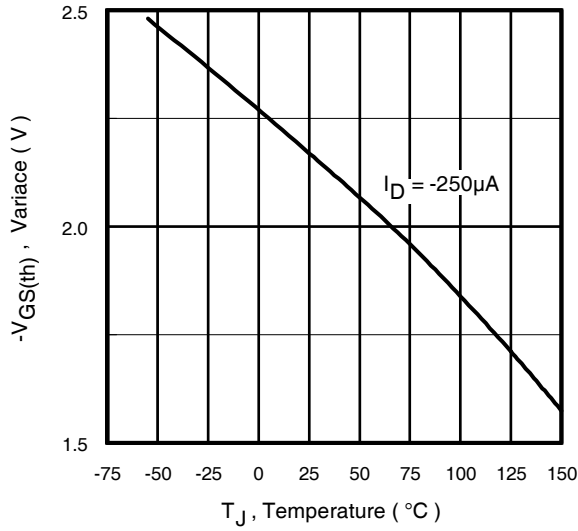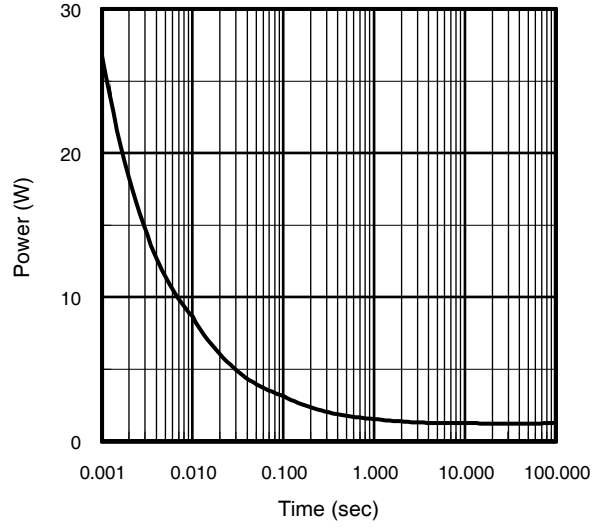GUANGDONG HOTTECH INDUSTRIAL CO., LTD.

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Fig 14. Threshold Voltage Vs. Temperature

Fig 15. Typical Power Vs. Time