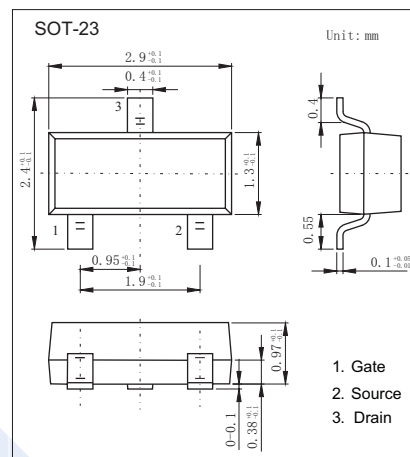
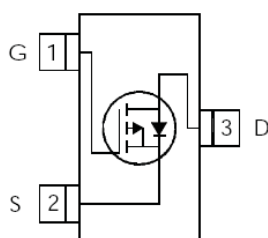


## P-Channel MOSFET

### IRLML5203 (KRLML5203)

#### ■ Features

- $V_{DS} (V) = -30V$
- $R_{DS(ON)} \leq 98m\Omega @ V_{GS} = -10V, I_D = -3.0A$
- $R_{DS(ON)} \leq 165m\Omega @ V_{GS} = -4.5V, I_D = -2.6A$
- Ultra Low On-Resistance
- Low Gate Charge



#### ■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	-30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current, $V_{GS} @ -10V$	$I_D$	$T_A=25^\circ C$	-3.0	A
		$T_A=70^\circ C$	-2.4	
Pulsed Drain Current (Note 1)	$I_{DM}$	-24		
Power Dissipation	$P_D$	$T_A=25^\circ C$	1.25	W
		$T_A=70^\circ C$	0.8	
Linear Derating Factor	DL	10	mW/ $^\circ C$	
Thermal Resistance, Junction- to-Ambient (Note 2)	$R_{thJA}$	100	$^\circ C/W$	
Junction Temperature	$T_J$	150	$^\circ C$	
Junction Storage Temperature Range	$T_{stg}$	-55 to 150		

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

2. Surface mounted on FR-4 board,  $t \leq 5sec.$

## P-Channel MOSFET

### IRLML5203 (KRLML5203)

#### ■ Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{DS}$	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$	-30			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D = -1\text{mA}$		0.019		V/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24\text{V}$ , $V_{GS} = 0\text{V}$			-1.0	$\mu\text{A}$
		$V_{DS} = -24\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 70^\circ\text{C}$			-5.0	
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}$ , $V_{GS} = \pm 20\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250\mu\text{A}$	-1.0		-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10\text{V}$ , $I_D = -3.0\text{A}$ (Note 3)			98	m $\Omega$
		$V_{GS} = -4.5\text{V}$ , $I_D = -2.6\text{A}$ (Note 3)			165	
Forward Transconductance	$g_{FS}$	$V_{DS} = -10\text{V}$ , $I_D = -3.0\text{A}$	3.1			S
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}$ , $V_{DS} = -25\text{V}$ , $f = 1\text{MHz}$ (Note 3)		510		pF
Output Capacitance	$C_{oss}$			71		
Reverse Transfer Capacitance	$C_{rss}$			43		
Total Gate Charge	$Q_g$	$V_{GS} = -10\text{V}$ , $V_{DS} = -24\text{V}$ , $I_D = -3.0\text{A}$		9.5	14	nC
Gate Source Charge	$Q_{gs}$			2.3	3.5	
Gate Drain Charge	$Q_{gd}$			1.6	2.4	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = -10\text{V}$ , $V_{DD} = -15\text{V}$ , $I_D = -1.0\text{A}$ , $R_G = 6.0\Omega$ (Note 3)		12		ns
Turn-On Rise Time	$t_r$			18		
Turn-Off Delay Time	$t_{d(off)}$			88		
Turn-Off Fall Time	$t_f$			52		
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = -1.3\text{A}$ , $dI/dt = 100\text{A}/\mu\text{s}$ (Note 3)		17	26	nC
Body Diode Reverse Recovery Charge	$Q_{rr}$			12	18	
Maximum Body-Diode Continuous Current	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.			-1.3	A
Body-Diode Pulsed Source Current (Note 1)	$I_{SM}$				-24	
Diode Forward Voltage	$V_{SD}$	$I_S = -1.3\text{A}$ , $V_{GS} = 0\text{V}$			-1.2	V

Note 3: Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

#### ■ Marking

Marking	1H** or HJA03
---------	---------------

## P-Channel MOSFET

### IRLML5203 (KRLML5203)

■ Typical Characteristics

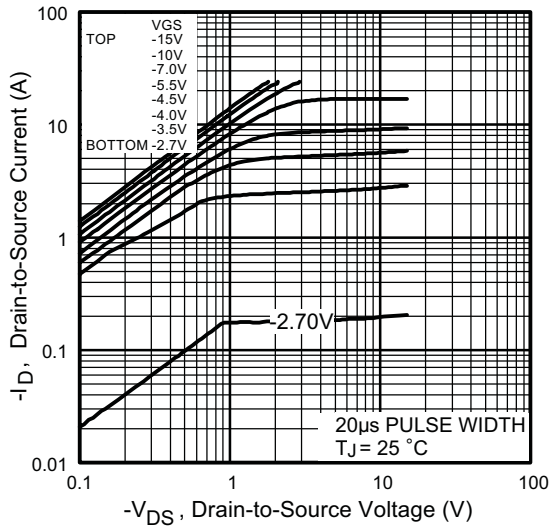


Fig 1. Typical Output Characteristics

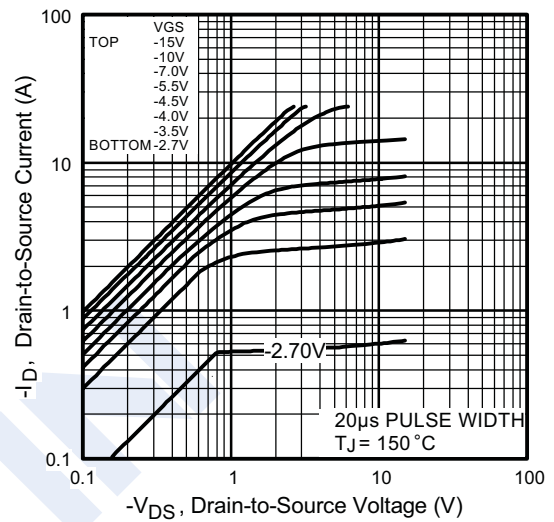


Fig 2. Typical Output Characteristics

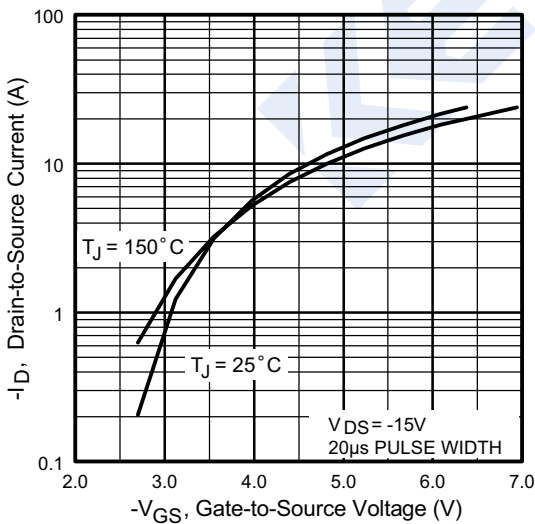


Fig 3. Typical Transfer Characteristics

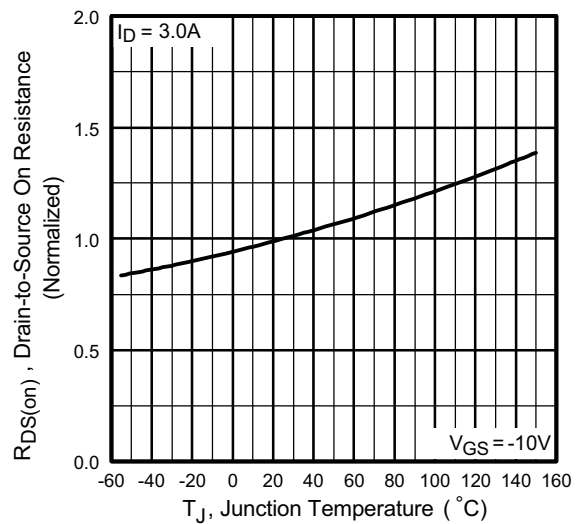
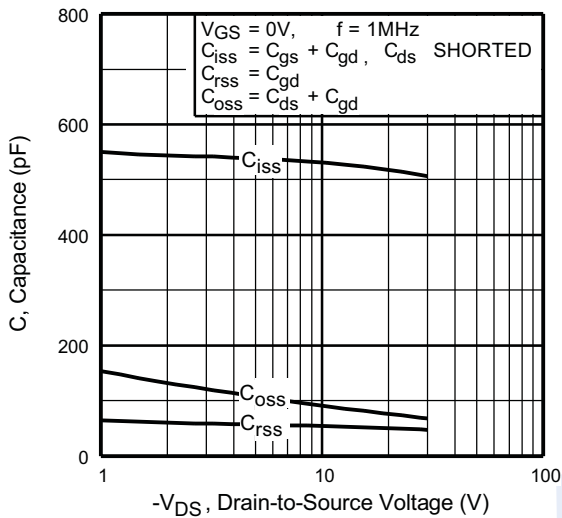


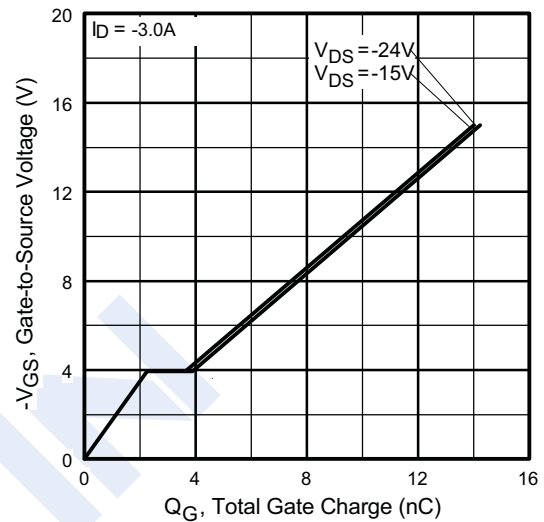
Fig 4. Normalized On-Resistance Vs. Temperature

## P-Channel MOSFET

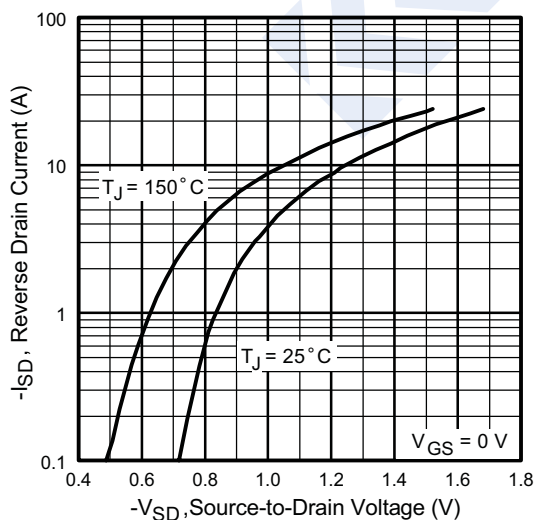
### IRLML5203 (KRLML5203)



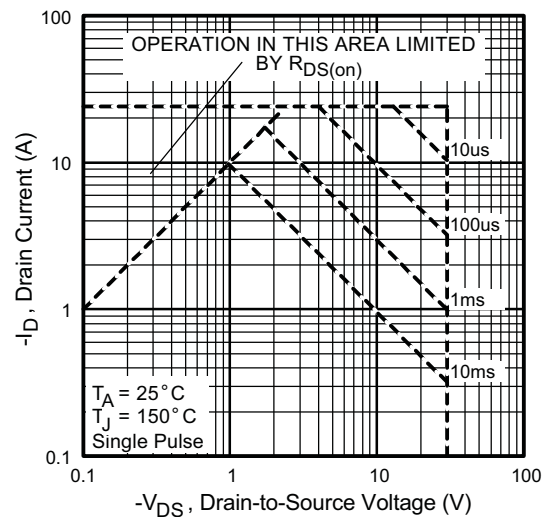
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



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



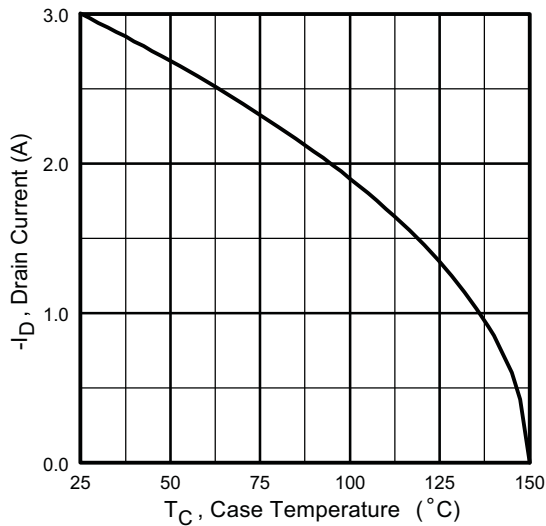
**Fig 7.** Typical Source-Drain Diode Forward Voltage



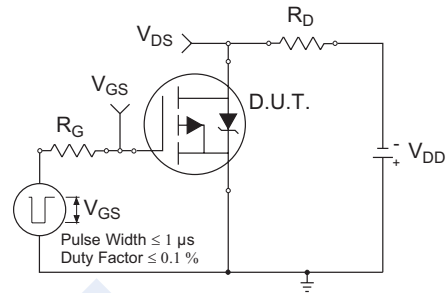
**Fig 8.** Maximum Safe Operating Area

## P-Channel MOSFET

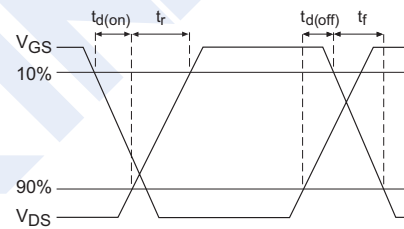
### IRLML5203 (KRLML5203)



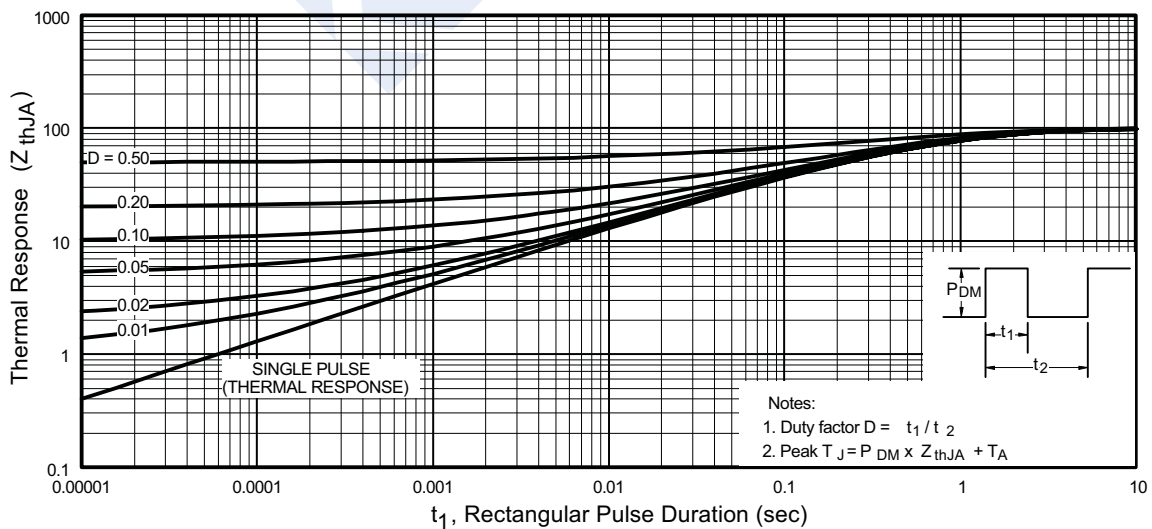
**Fig 9.** Maximum Drain Current Vs. Case Temperature



**Fig 10a.** Switching Time Test Circuit



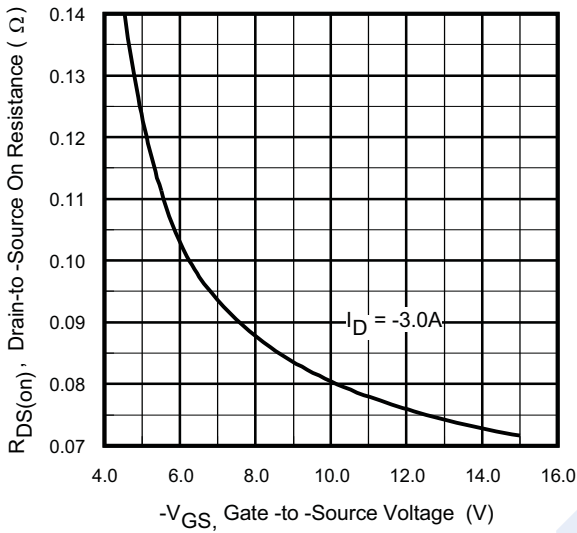
**Fig 10b.** Switching Time Waveforms



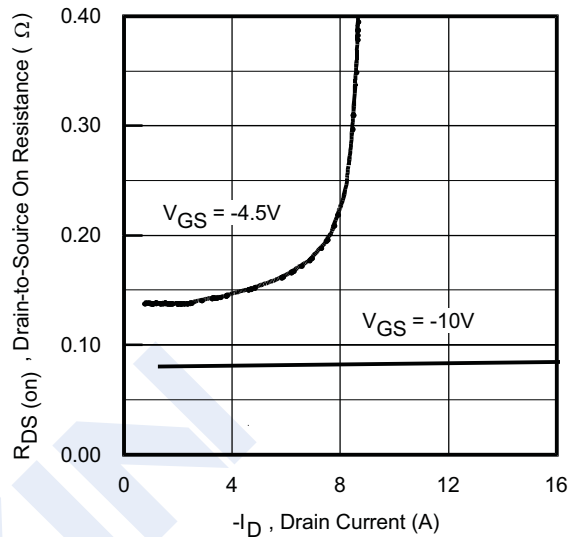
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

## P-Channel MOSFET

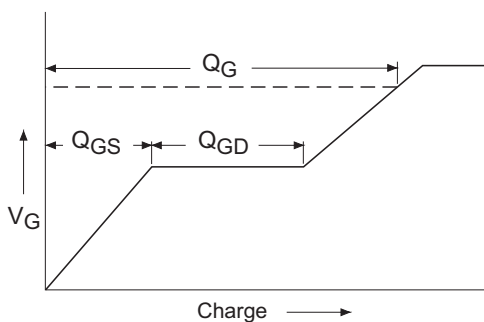
### IRLML5203 (KRLML5203)



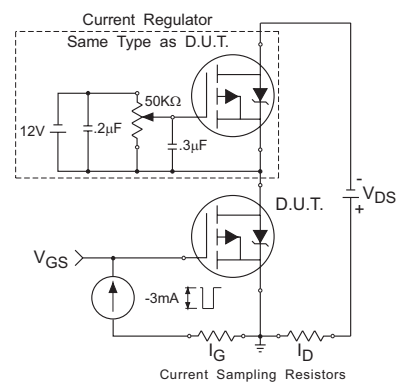
**Fig 11.** Typical On-Resistance Vs. Gate Voltage



**Fig 12.** Typical On-Resistance Vs. Drain Current

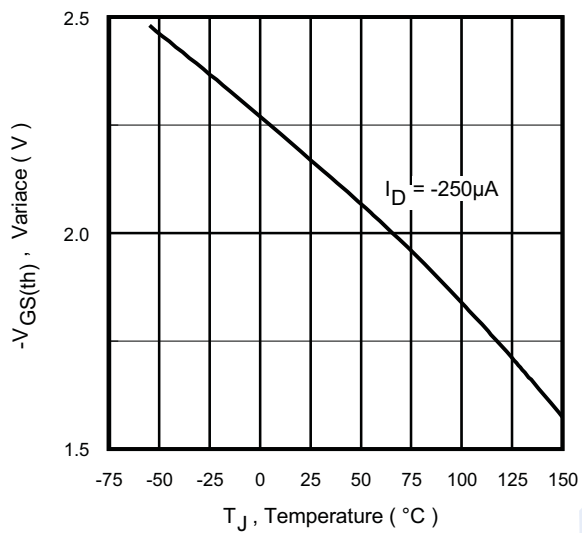


**Fig 13a.** Basic Gate Charge Waveform

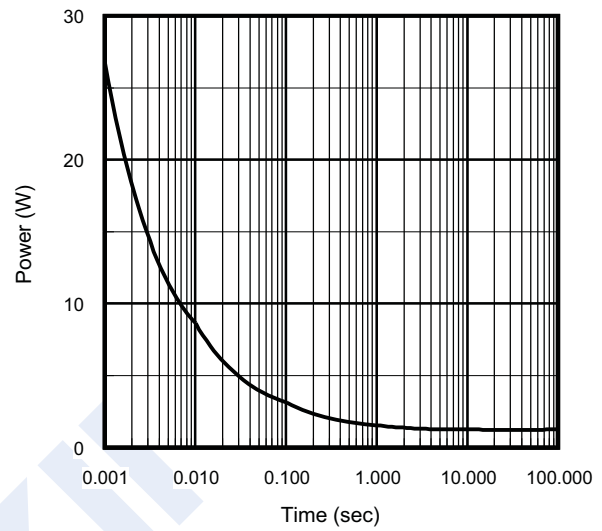


**Fig 13b.** Gate Charge Test Circuit

**P-Channel MOSFET**  
**IRLML5203 (KRLML5203)**



**Fig 14.** Threshold Voltage Vs. Temperature



**Fig 15.** Typical Power Vs. Time