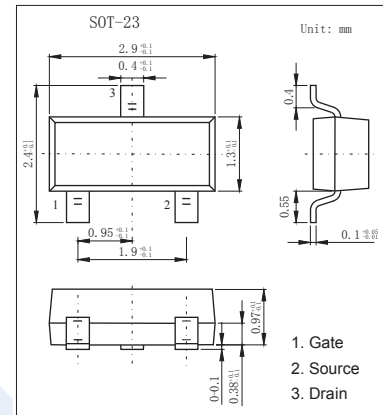
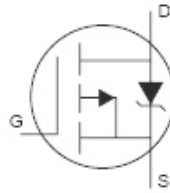


## P-Channel Enhancement MOSFET

## IRLML6401 (KRLML6401)

## ■ Features

- Ultra low on-resistance.
- P-Channel MOSFET.
- Fast switching.

■ Absolute Maximum Ratings  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-12	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current $V_{GS}=4.5\text{V}$ @ $T_A=25^\circ\text{C}$	$I_D$	-4.3	A
Continuous Drain Current $V_{GS}=4.5\text{V}$ @ $T_A=70^\circ\text{C}$		-3.4	
Pulsed Drain Current a		$I_{DM}$	
Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	1.3	W
Power Dissipation @ $T_A=70^\circ\text{C}$		0.8	
Single Pulse Avalanche Energy b	$E_{AS}$	33	mJ
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	100	$^\circ\text{C}/\text{W}$
Linera Derating Factor		0.01	$\text{W}/^\circ\text{C}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Junction and Storage Temperature Range	$T_{stg}$	-55 to 150	

## Notes:

- a.Repetitive Rating :Pulse width limited by maximum junction temperature  
 b.Starting  $T_J=25^\circ\text{C}$ ,  $L=3.5\text{mH}$ ,  $R_G=25\Omega$ ,  $I_{AS}=-4.3\text{A}$

## IRLML6401 (KRLML6401)

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =-250 μA, V <sub>GS</sub> =0V	-12			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V			-1	μA
		V <sub>DS</sub> =-9.6V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			-25	
Gate-Body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μA	-0.4	-0.55	-0.95	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.3A			50	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.5A			85	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2A			125	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-4.3A	8.6			S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-10V, f=1MHz		830		pF
Output Capacitance	C <sub>oss</sub>			180		
Reverse Transfer Capacitance	C <sub>rss</sub>			125		
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-5.0V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-4.3A		10	15	nC
Gate Source Charge	Q <sub>gs</sub>			1.4	2.1	
Gate Drain Charge	Q <sub>gd</sub>			2.6	3.9	
Turn-On DelayTime	t <sub>d(on)</sub>			11		
Turn-On Rise Time	t <sub>r</sub>	I <sub>D</sub> =-1.0A, V <sub>DS</sub> =-6.0V, R <sub>L</sub> =6 Ω, R <sub>GEN</sub> =89 Ω		32		ns
Turn-Off DelayTime	t <sub>d(off)</sub>			250		
Turn-Off Fall Time	t <sub>f</sub>			210		
Body Diode Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> =-1.3A, di/dt=-100A/μs		22	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =-1.3A, di/dt=-100A/μs		8	12	Nc
Maximum Body-Diode Continuous Current	I <sub>S</sub>				1.3	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1.3A, V <sub>GS</sub> =0V			-1.2	V

## ■ Marking

Marking	1F *
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### IRLML6401 (KRLML6401)

■ Typical Characteristics

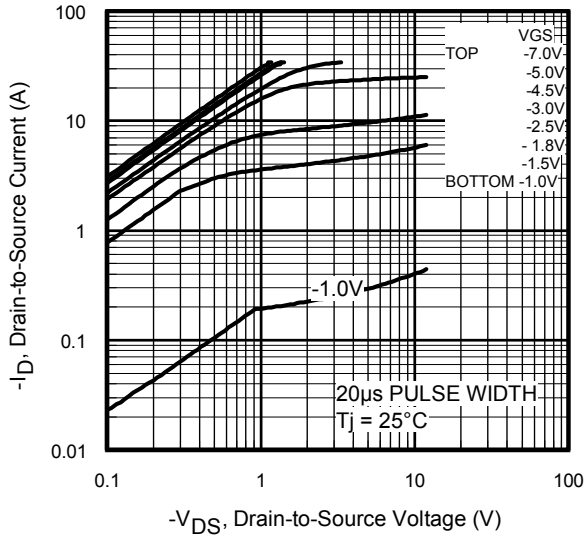


Fig 1. Typical Output Characteristics

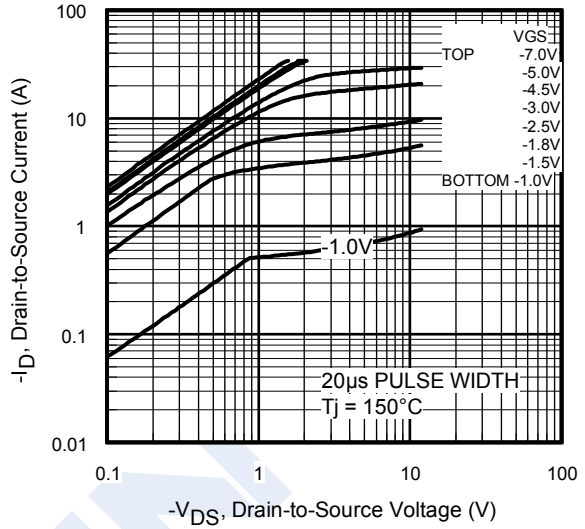


Fig 2. Typical Output Characteristics

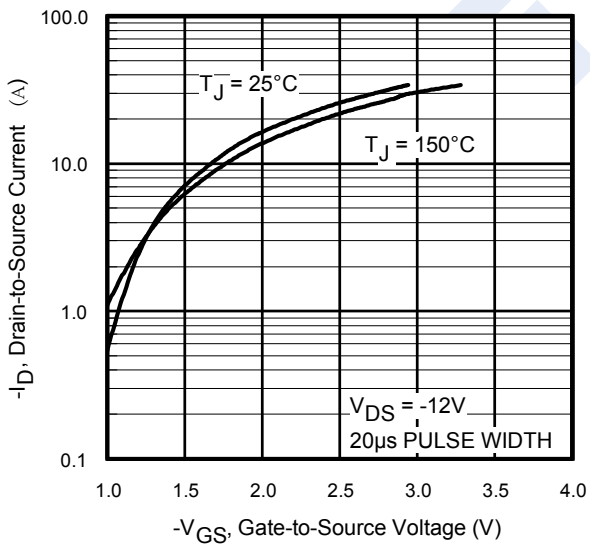


Fig 3. Typical Transfer Characteristics

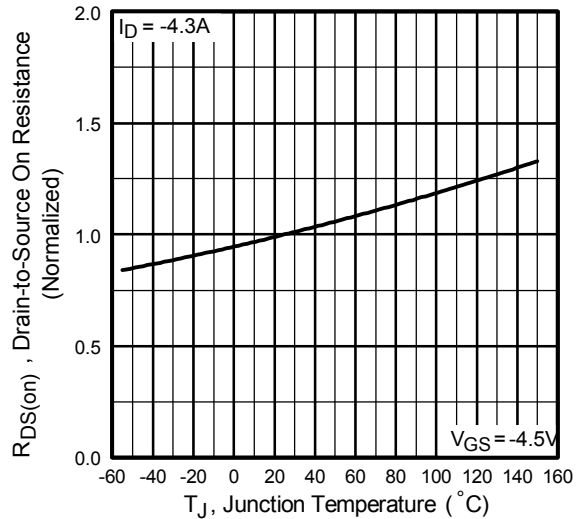


Fig 4. Normalized On-Resistance Vs. Temperature

IRLML6401 (KRLML6401)

■ Typical Characteristics

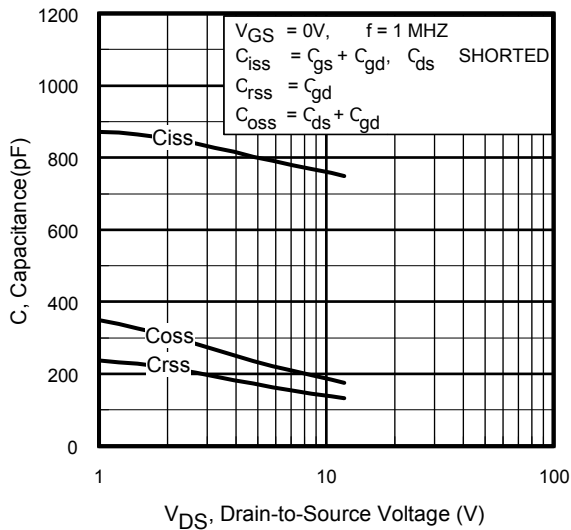


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

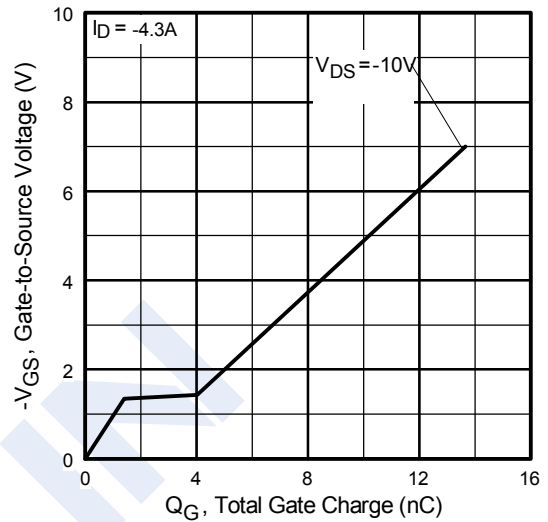


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

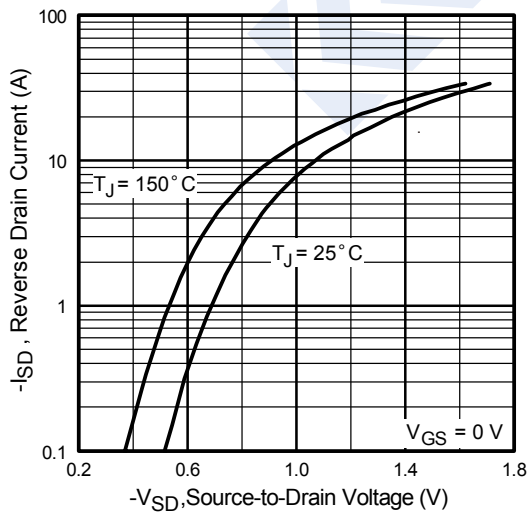


Fig 7. Typical Source-Drain Diode Forward Voltage

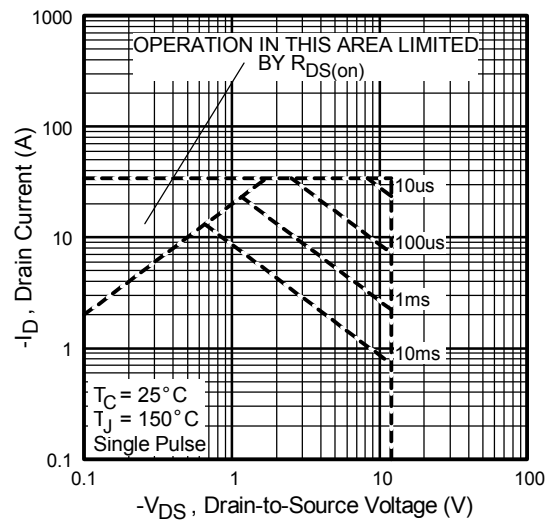
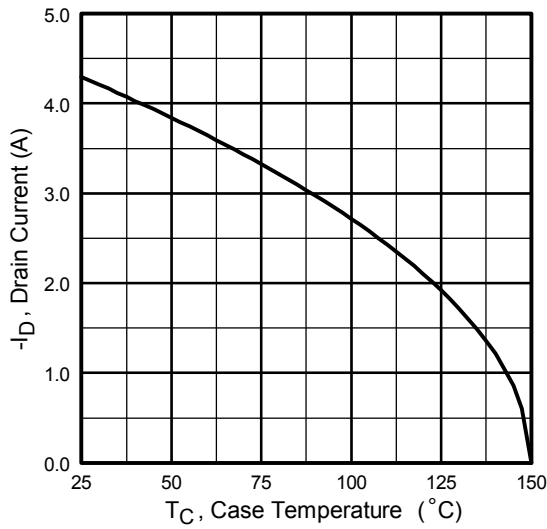


Fig 8. Maximum Safe Operating Area

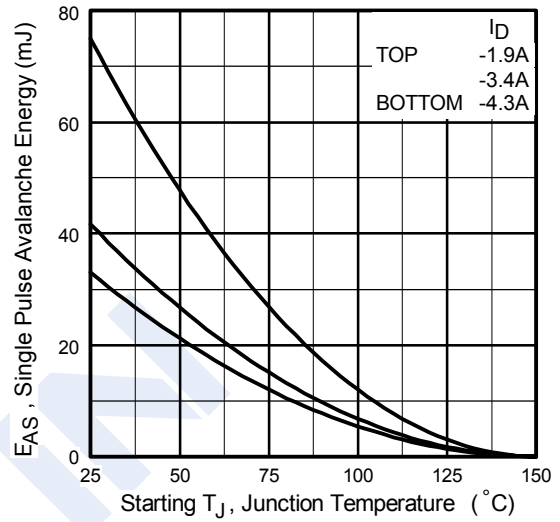
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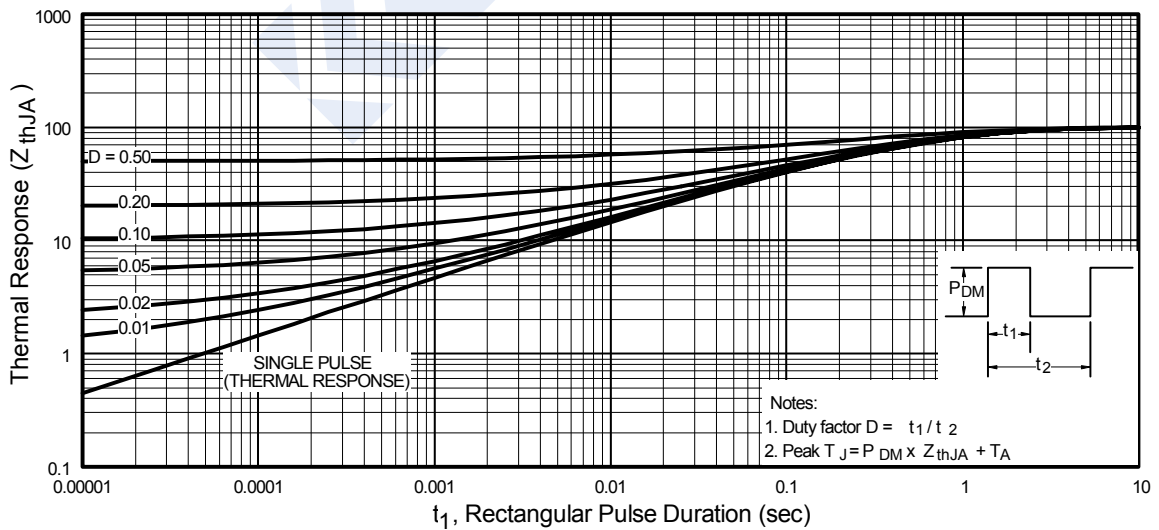
■ Typical Characteristics



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



**Fig 10.** Maximum Avalanche Energy Vs. Drain Current

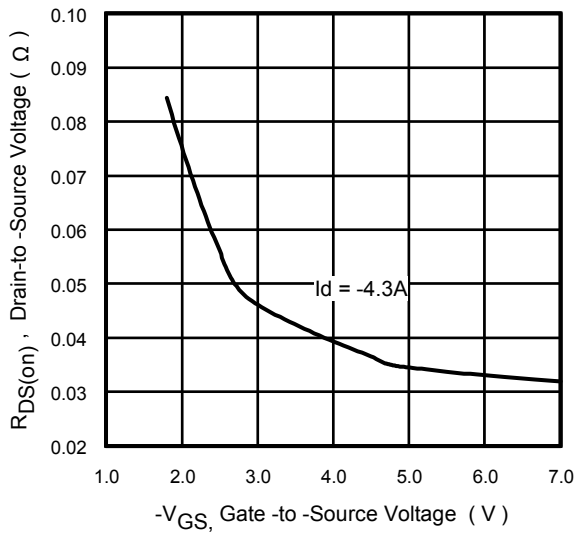


**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

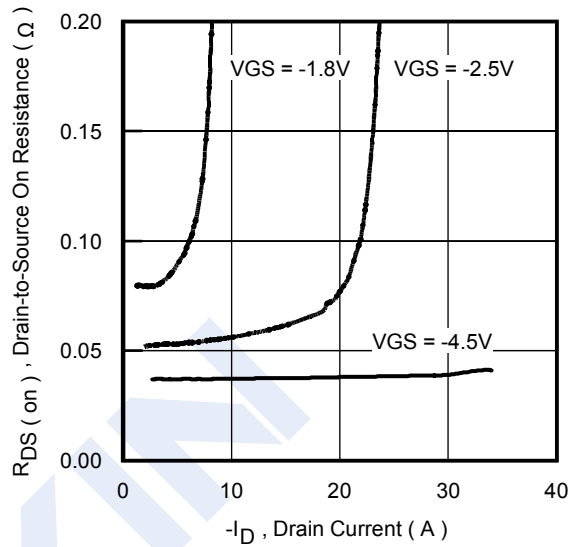
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**IRLML6401 (KRLML6401)**

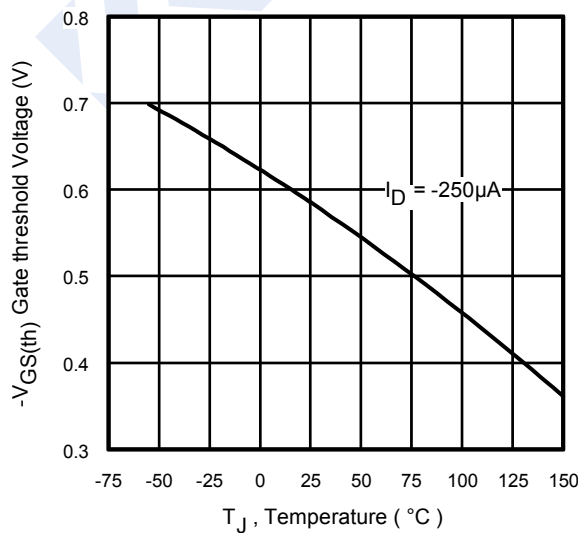
■ Typical Characteristics



**Fig 12.** Typical On-Resistance Vs. Gate Voltage



**Fig 13.** Typical On-Resistance Vs. Drain Current



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