P-Channel Enhancement MOSFET
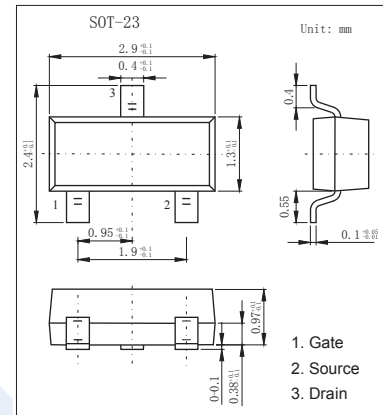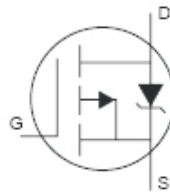
IRLML6401 (KRLML6401)

■ Features

● Ultra low on-resistance.

● P-Channel MOSFET.

● Fast switching.

SOT-23   Unit: mm

1. Gate
2. Source
3. Drain

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-12	V
Gate-Source Voltage	V_{GS}	±8	
Continuous Drain Current V_{GS}=4.5V @ T_A=25℃	I_D	-4.3	A
Continuous Drain Current V_{GS}=4.5V@ T_A=70℃		-3.4	
Pulsed Drain Current a	I_{DM}	-34	
Power Dissipation @ T_A=25℃	P_D	1.3	W
Power Dissipation @ T_A=70℃		0.8	
Single Pulse Avalanche Energy b	E_{AS}	33	mJ
Thermal Resistance.Junction- to-Ambient	R_{thJA}	100	℃/W
Linera Derating Factor		0.01	W/℃
Junction Temperature	T_J	150	℃
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℃, L=3.5mH, R_G=25Ω, I_{AS}=-4.3A

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VDSS	ID=-250μA, VGS=0V	-12			V
Zero Gate Voltage Drain Current	IDSS	VDS=-12V, VGS=0V			-1	μA
		VDS=-9.6V, VGS=0V, TJ= 55℃			-25	
Gate-Body leakage current	IGSS	VDS=0V, VGS=±8V			±100	nA
Gate Threshold Voltage	VGS(th)	VDS=VGS ID=-250μA	-0.4	-0.55	-0.95	V
Static Drain-Source On-Resistance	RDS(on)	VGS=-4.5V, ID=-4.3A			50	mΩ
		VGS=-2.5V, ID=-2.5A			85	
		VGS=-1.8V, ID=-2A			125	
Forward Transconductance	gFS	VDS=-10V, ID=-4.3A	8.6			S
Input Capacitance	Ciss	VGS=0V, VDS=-10V, f=1MHz		830		pF
Output Capacitance	Coss			180		
Reverse Transfer Capacitance	Crss			125		
Total Gate Charge	Qg	VGS=-5.0V, VDS=-10V, ID=-4.3A		10	15	nC
Gate Source Charge	Qgs			1.4	2.1	
Gate Drain Charge	Qgd			2.6	3.9	
Turn-On DelayTime	td(on)	ID=-1.0A, VDS=-6.0V, RL=6Ω, RGEN=89Ω		11		ns
Turn-On Rise Time	tr			32		
Turn-Off DelayTime	td(off)			250		
Turn-Off Fall Time	tf			210		
Body Diode Reverse Recovery Time	trr	IF=-1.3A, dI/dt=-100A/μs		22	33	
Body Diode Reverse Recovery Charge	Qrr	IF=-1.3A, dI/dt=-100A/μs		8	12	Nc
Maximum Body-Diode Continuous Current	Is				1.3	A
Diode Forward Voltage	VSD	Is=-1.3A,VGS=0V			-1.2	V

■ Marking

Marking	1F *

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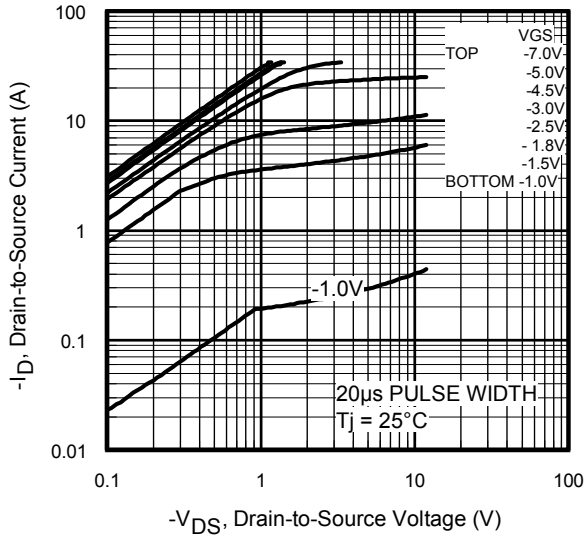■ Typical Characterisitics

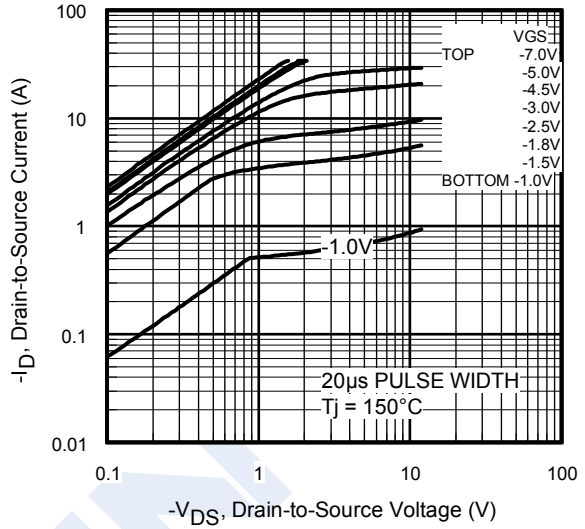**Fig 1.** Typical Output Characteristics

Fig 2. Typical Output Characteristics
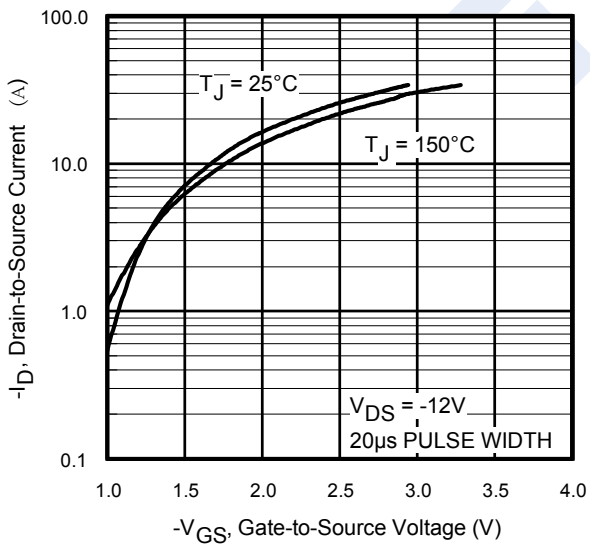

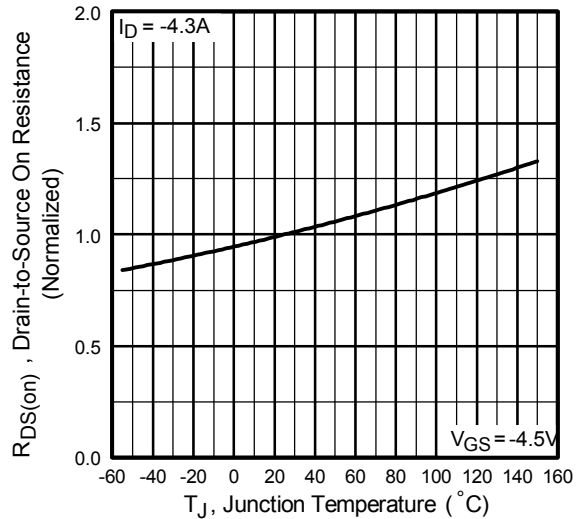**Fig 3.** Typical Transfer Characteristics

Fig 4. Normalized On-Resistance Vs. Temperature

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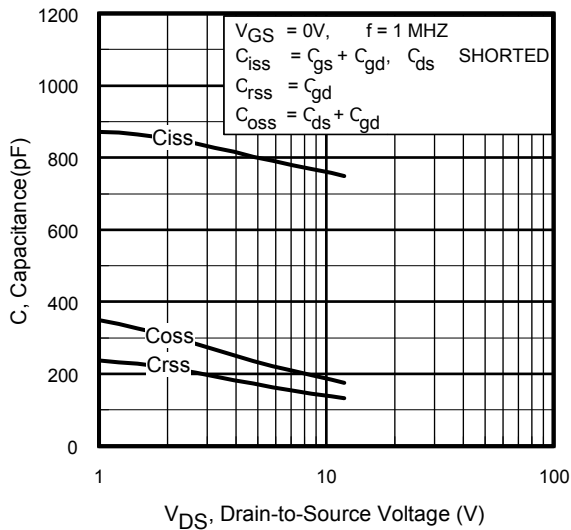
■ Typical Characterisitics

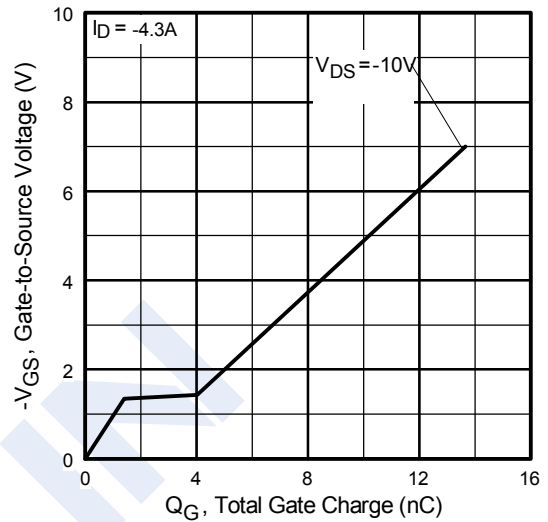**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage

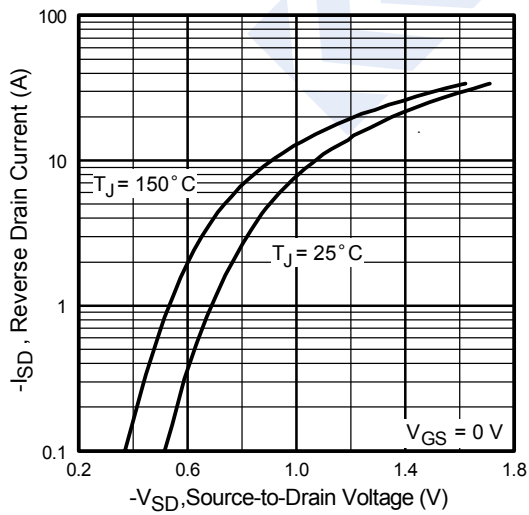**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage
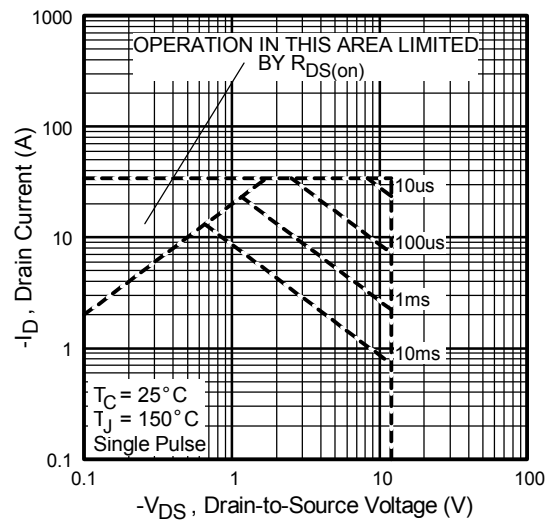

Fig 7. Typical Source-Drain Diode Forward Voltage

Fig 8. Maximum Safe Operating Area

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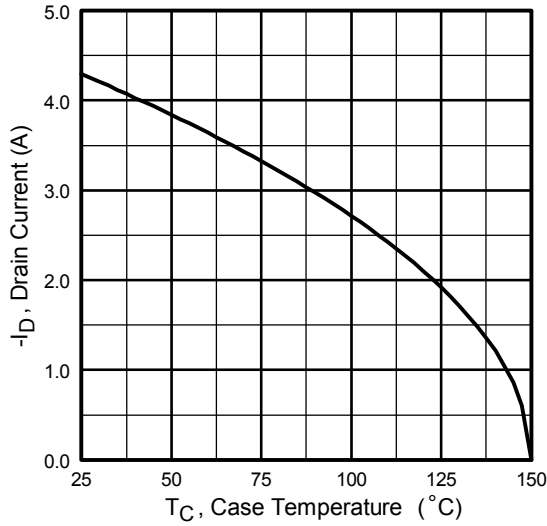
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■ Typical Charactersitics

Fig 9. Maximum Drain Current Vs. Case Temperature
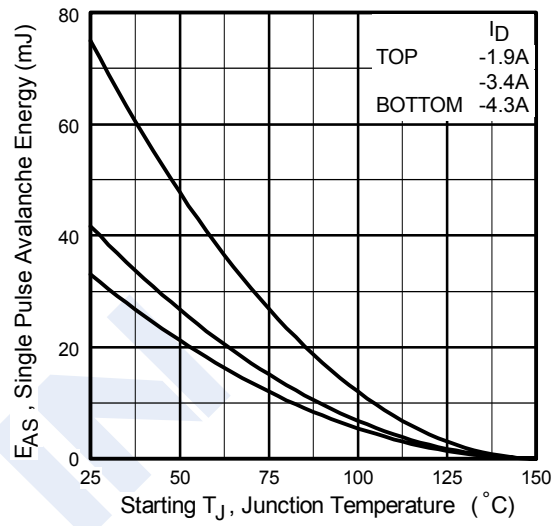

Fig 10. Maximum Avalanche Energy Vs. Drain Current
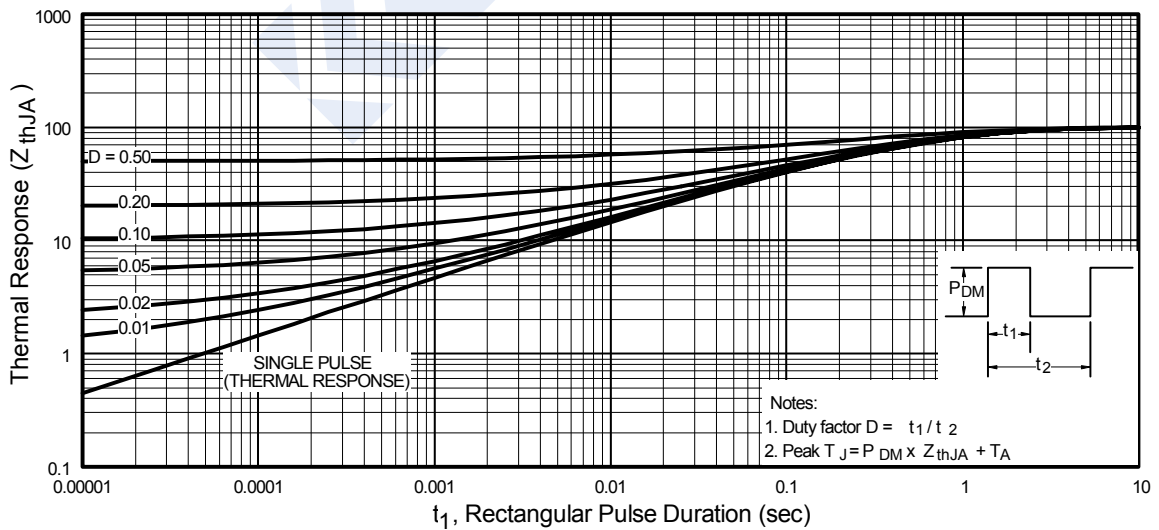

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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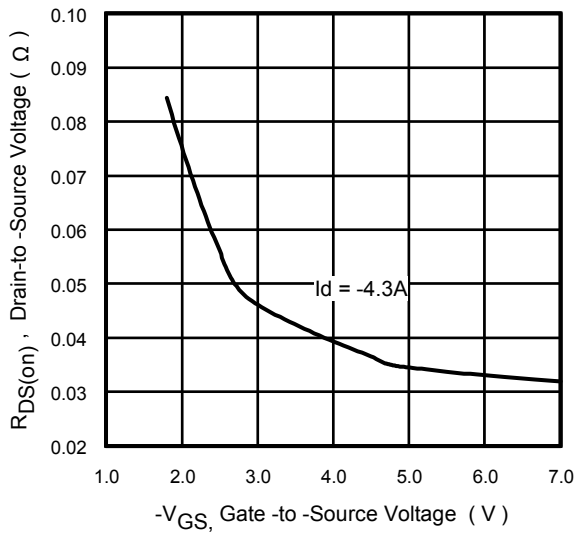
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■ Typical Characterisitics

Fig 12. Typical On-Resistance Vs. Gate Voltage

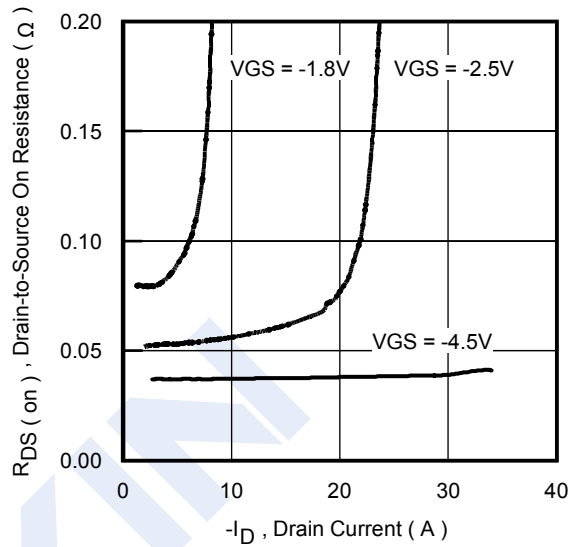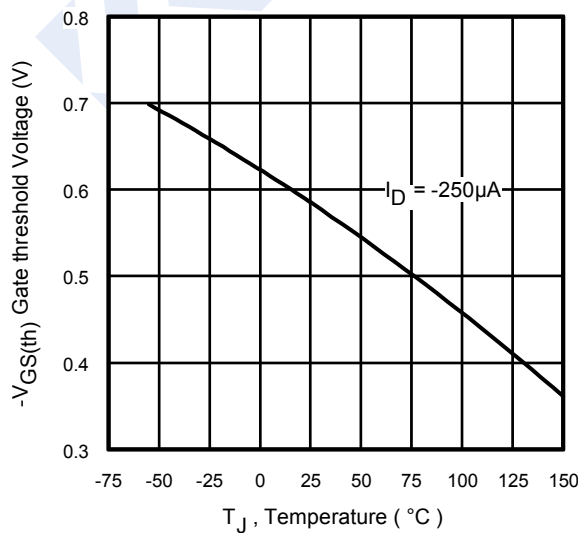**Fig 13.** Typical On-Resistance Vs. Drain Current

Fig 14. Typical Threshold Voltage Vs. Junction Temperature