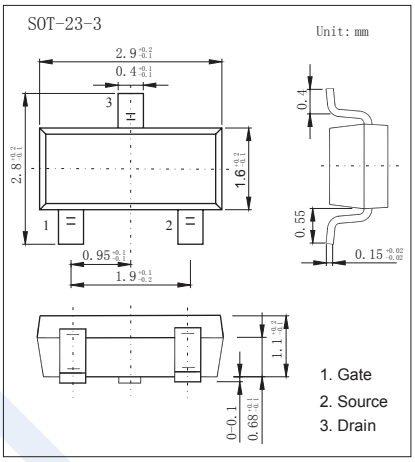
P-Channel Enhancement MOSFET

IRLML6402 (KRLML6402)



■ Features

- Ultra low on-resistance.
- P-Channel MOSFET.
- SOT-23 Footprint.
- Low profile(＜1.1mm).
- Available in tape and reel.
- Fast switching.

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current V_{GS}=4.5V @ T_A=25℃	I_D	-3.7	A
Continuous Drain Current VGS=4.5V@ T_A=70℃		-2.2	
Pulsed Drain Current a	I_{DM}	-30	
Power Dissipation @ TA=25℃	P_D	1.3	W
Power Dissipation @ TA=70℃		0.8	
Single Pulse Avalanche Energy b	E_{AS}	11	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	Tstg	-55 to 150	

Notes:

a.Repetitive Rating :Pulse width limited by maximum junction temperature

b.Starting T_J=25℃, L=1.65mH, R_G=25Ω, I_{AS}=-3.7A

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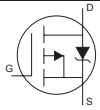
■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source Breakdown voltage	V_{DSS}	I_D= -250 μA, V_{GS} = 0V	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20 V, V_{GS} = 0V			-1.0	μA
		V_{DS} = -20 V, V_{GS} = 0V, T_J=70℃			-25	
Gate-source leadage	I_{GSS}	V_{GS} =±12V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D= -250 μA	-0.40	-0.55	-0.95	V
Static drain-source on- resistance	$R_{DS(on)}$	I_D= -3.7A, V_{GS} = -4.5V		0.050	0.065	Ω
		I_D= -3.1A, V_{GS} = -2.5V		0.080	0.135	
Forward Transconductance	g_{fs}	V_{DS} = -10 V, I_D = -3.7 A	6.0			S
Input capacitance	C_{iss}	V_{DS} = -10 V,		633		pF
Output capacitance	C_{oss}	V_{GS} = 0 V,		145		
Reverse transfer capacitance	C_{rss}	f= 1MHz		110		
Total Gate Charge	Q_g	V_{DS} = -10V ,V_{GS} = -5.0 V , I_D= -3.7 A		8.0	12	nC
Gate-Source Charge	Q_{gs}			1.2	1.8	
Gate-Drain Charge	Q_{gd}			2.8	4.2	
Turn-on delay time	$t_{d(on)}$	I_D= -3.7 A,		350		ns
Rise time	t_r	V_{DD}= -10 V,		48		
Turn-off delay time	$t_{d(off)}$	R_D= 2.7Ω		588		
Fall time	t_f	R_G= 89Ω		381		
Reverse recovery time	t_{rr}	T_J=25℃, I_F = -1.0 A,		29	43	ns
Reverse recovery charge	Q_{rr}	di / dt = -100 A/μs *2		11	17	nC
Continuous source current	I_S	MOSFET symbol showing the integral reverse p-n junction diode 			-1.3	A
Pulsed source current *1	I_{SM}				-22	
Diode forward voltage	V_{SD}	T_J=25℃,V_{GS} = 0 V, I_S = -1.0 A *2			-1.2	V

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

* 2 Pulse width ≤ 400μs, Duty cycle ≤ 2%

■ Marking

Marking	1E **

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■ Typical Characterisitics

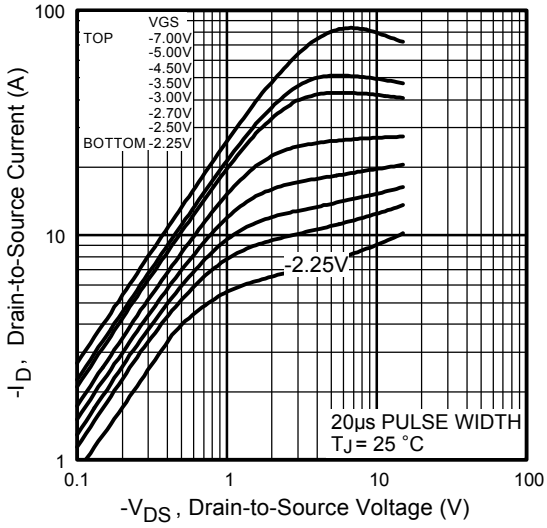

Fig 1. Typical Output Characteristics

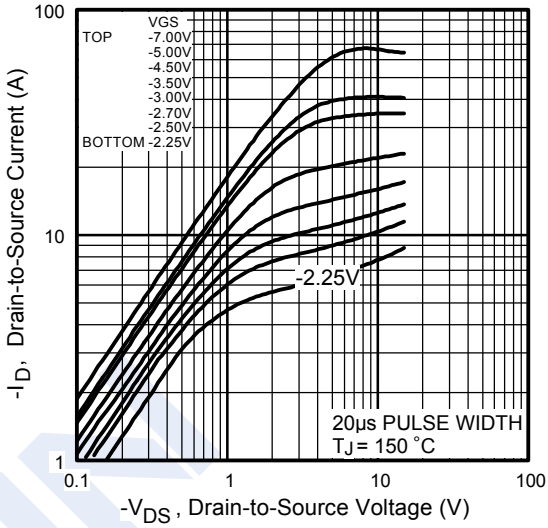

Fig 2. Typical Output Characteristics

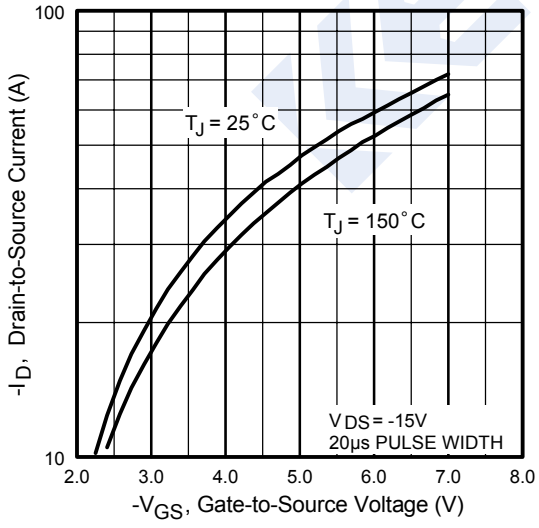

Fig 3. Typical Transfer Characteristics

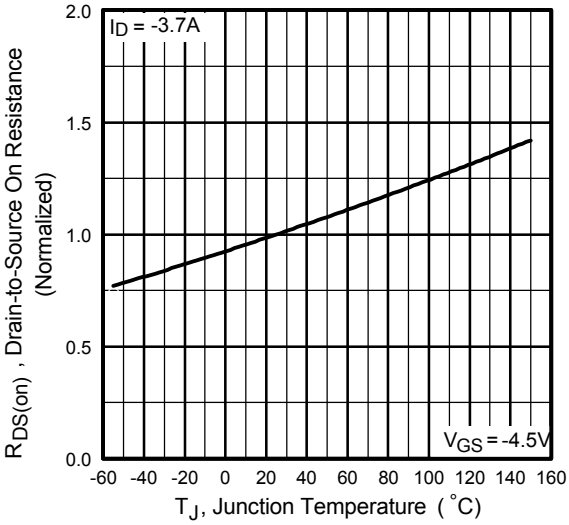

Fig 4. Normalized On-Resistance

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■ Typical Characterisitics

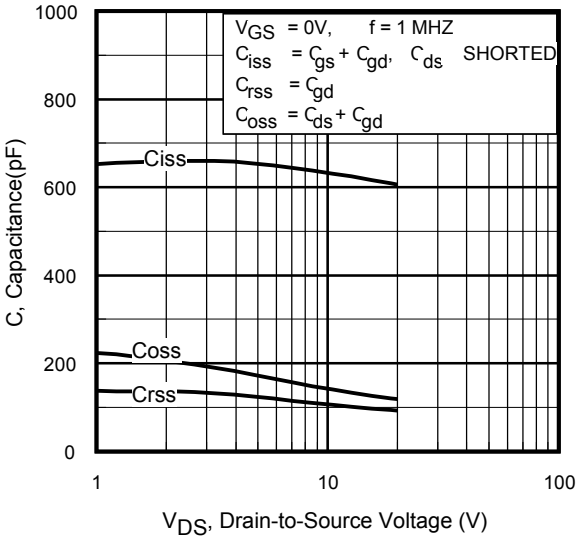

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

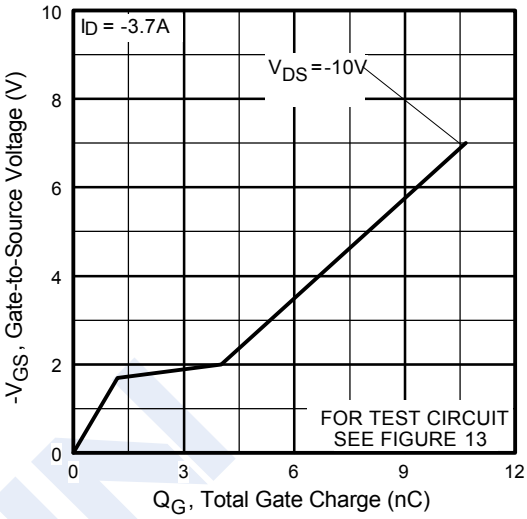

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

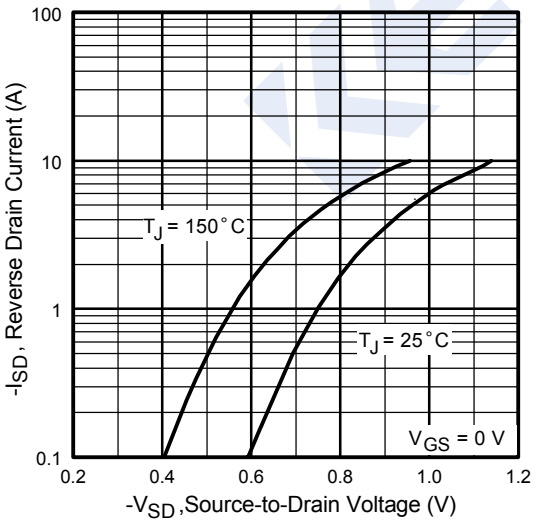

Fig 7. Typical Source-Drain Diode Forward Voltage

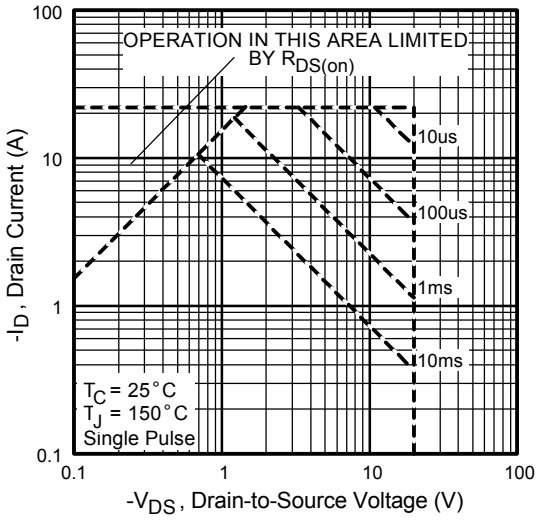

Fig 8. Maximum Safe Operating Area

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■ Typical Characterisitics

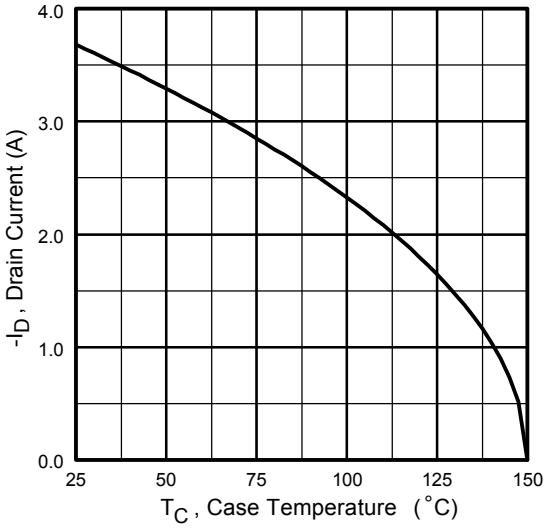

Fig 9. Maximum Drain Current Vs. Case Temperature

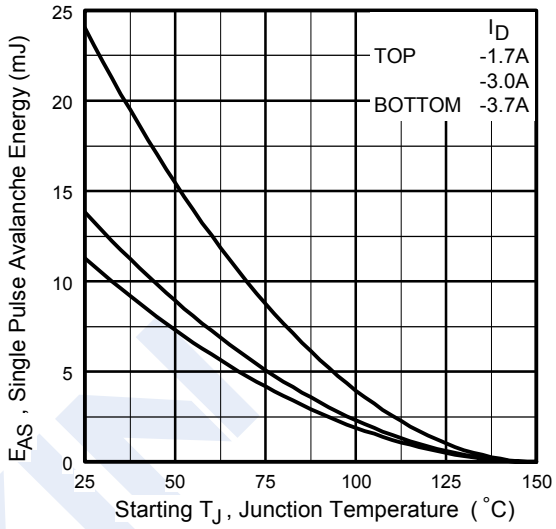

Fig 10. Maximum Avalanche Energy Vs. Drain Current

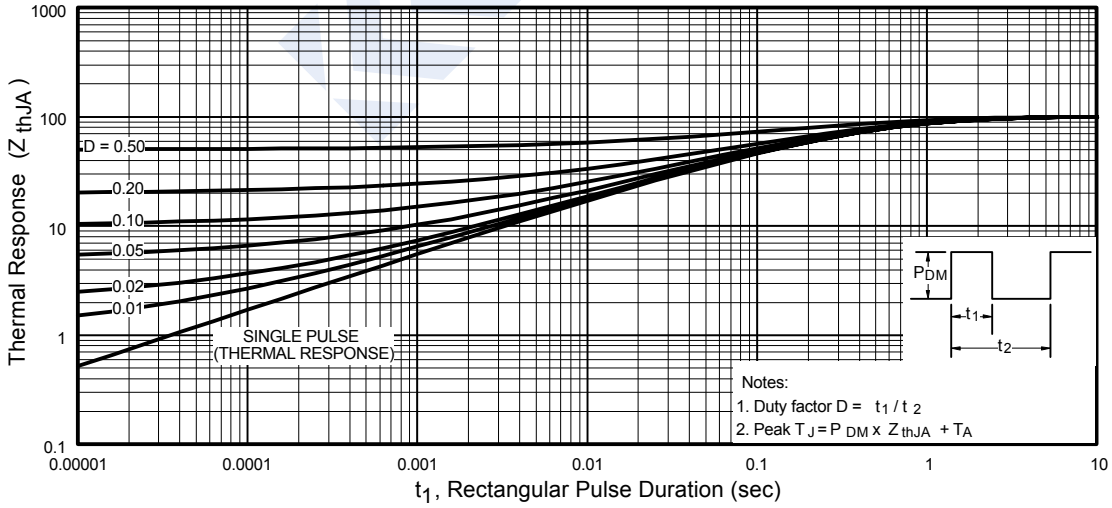

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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■ Typical Characterisitics

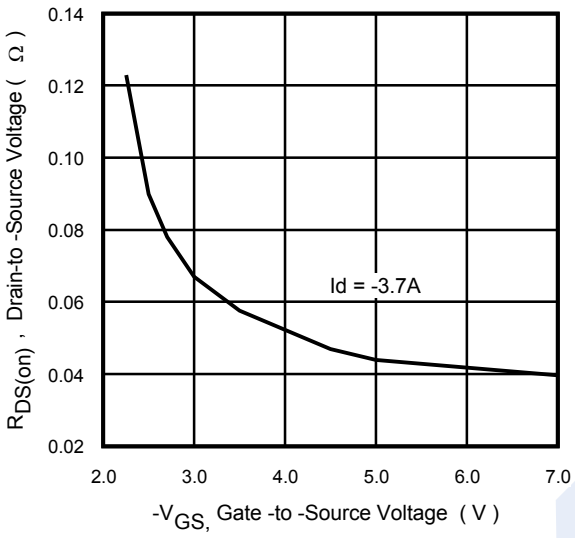

Fig 12. Typical On-Resistance Vs. Gate Voltage

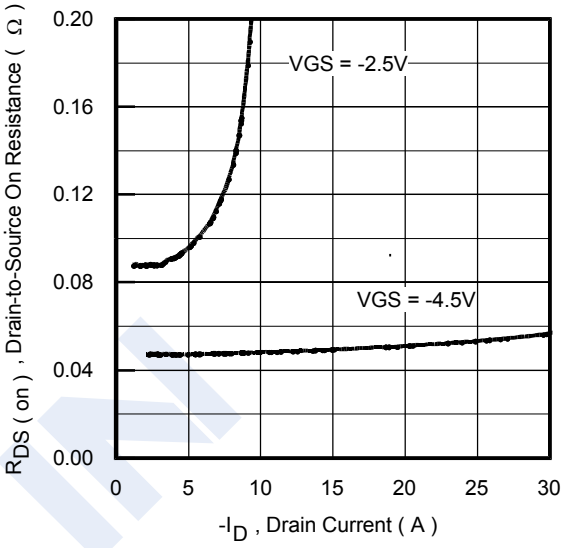

Fig 13. Typical On-Resistance Vs. Drain Current