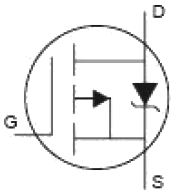
P Channel Enhancement MOSFET

RoHS Compliant



Features

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

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-12	V
Gate-Source Voltage	V_{GS}	±8	
Continuous Drain Current V_{GS}=4.5V @ TA=25°C	I_D	-4.3	A
Continuous Drain Current V_{GS}=4.5V @ TA=70°C		-3.4	
Pulsed Drain Current a	I_{DM}	-34	
Power Dissipation @ TA=25°C	P_D	1.3	W
Power Dissipation @ TA=70°C		0.8	
Single Pulse Avalanche Energy b	E_{AS}	33	mJ
Thermal Resistance. Junction- to-Ambient	R_{thJA}	100	°C/W
Linera Derating Factor		0.01	W/°C
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{stg}	-55 to 150	

Note.
a. Repetitive Rating : Pulse width limited by maximum junction temperature
b. Starting T_J=25°C, L=3.5mH, R_G=25Ω, I_{as}=-4.3A

Electrical Characteristics Ta = 25°C

Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250μA, V_{GS}=0V	-12			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-12V, V_{GS}=0V			-1	uA
		V_{DS}=9.6V, V_{GS}=0V, T_J=55°C			-25	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-0.4	-0.55	-0.95	V
Static Drain-Source On-Resistance	$R_{DS(On)}$	V_{GS}=-4.5V, I_D=-4.3A			50	mΩ
		V_{GS}=-2.5V, I_D=-2.5A			85	
		V_{GS}=-1.8V, I_D=-2A			125	

Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Forward Transconductance	g_{FS}	V_{DS}=-10V, I_D=-4.3A	8.6			S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, f=1MHz		830		pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{RSS}			125		
Total Gate Charge	Q_g	V_{GS}=-5V, V_{DS}=-10V, I_D=-4.3A		10	15	nC
Gate Source Charge	Q_{gs}			1.4	2.1	
Gate Drain Charge	Q_{gd}			2.6	3.9	
Turn-On DelayTime	$t_{d(on)}$	I_D=-1A, V_{DS}=-6V, R_L=6Ω, R_{GEN}=89Ω		11		nS
Turn-On Rise Time	t_r			32		
Turn-Off DelayTime	$t_{d(off)}$			250		
Turn-Off Fall Time	t_f			210		
Body Diode Reverse Recovery Time	t_{rr}	I_F=-1.3A, dI/dt=-100A/μs		22	33	
Body Diode Reverse Recovery Charge	Q_{rr}			8	12	Nc
Maximum Body-Diode Continuous Current	I_S				1.3	A
Diode Forward Voltage	V_{SD}	I_S=-1.3A,V_{GS}=0V			-1.2	V

Typical Characterisitics

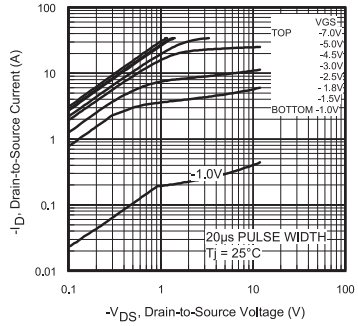


Fig 1. Typical Output Characteristics

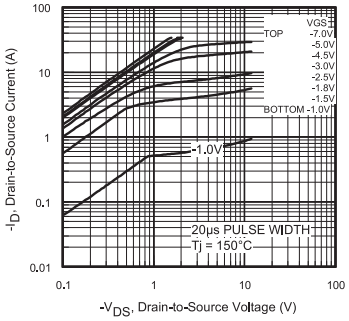


Fig 2. Typical Output Characteristics

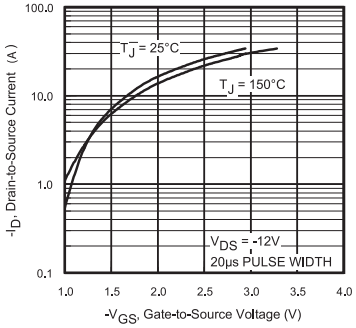


Fig 3. Typical Transfer Characteristics

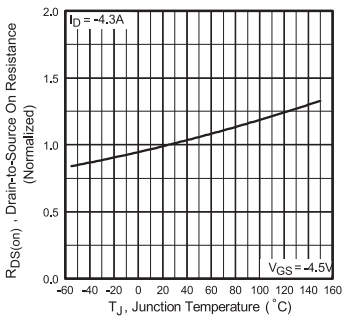


Fig 4. Normalized On-Resistance Vs. Temperature

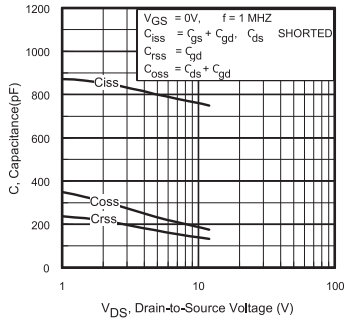


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

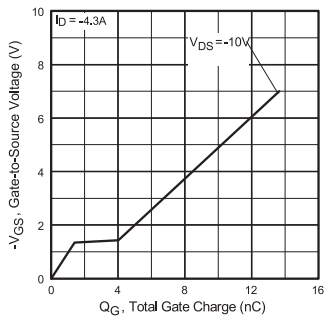


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

Typical Characterisitics

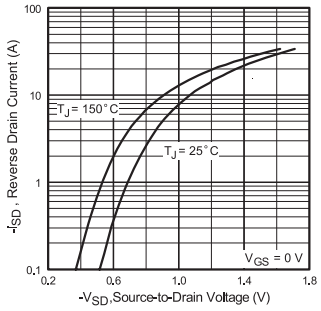


Fig 7. Typical Source-Drain Diode Forward Voltage

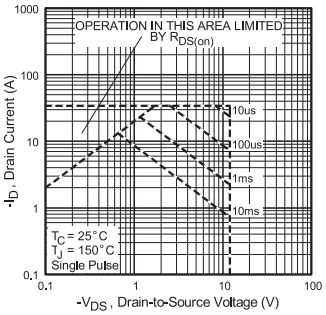


Fig 8. Maximum Safe Operating Area

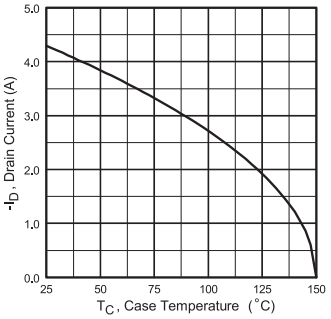


Fig 9. Maximum Drain Current Vs. Case Temperature

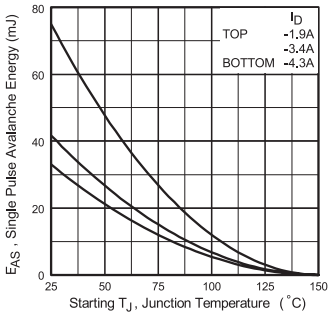


Fig 10. Maximum Avalanche Energy Vs. Drain Current

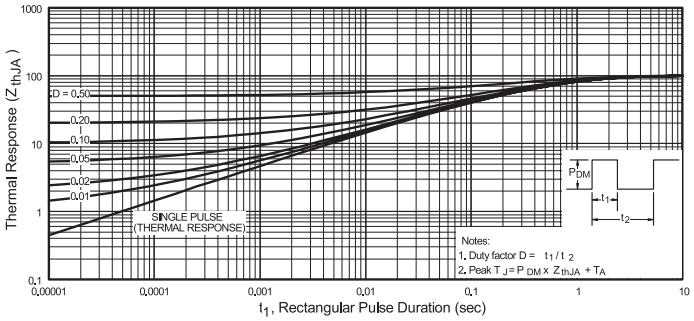


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

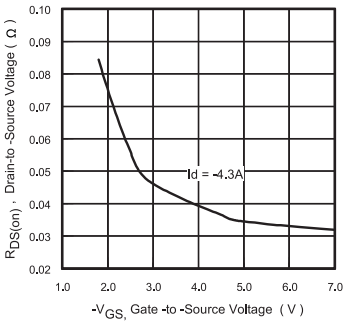


Fig 12. Typical On-Resistance Vs. Gate Voltage

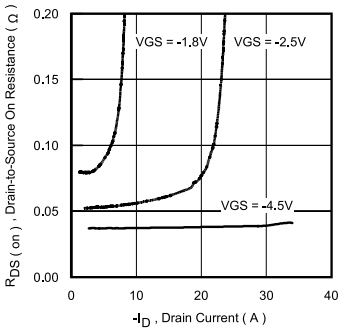


Fig 13. Typical On-Resistance Vs. Drain Current

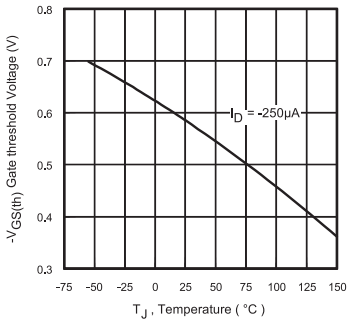
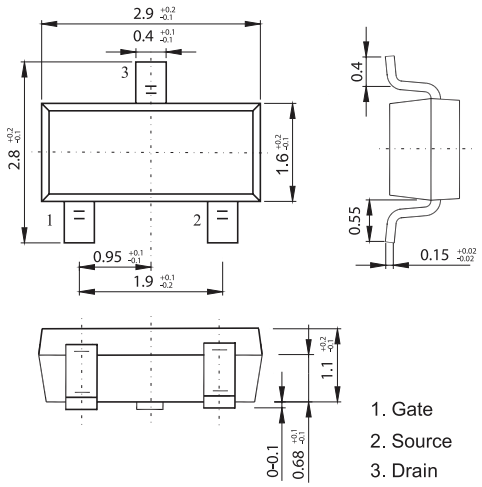


Fig 14. Typical Threshold Voltage Vs. Junction Temperature

Diagram



Part Number Table

Description	Part Number
P Channel Enhancement MOSFET, -4.3A, -12V, SOT 23	IRLML6401-3

Dimensions : Millimetres