

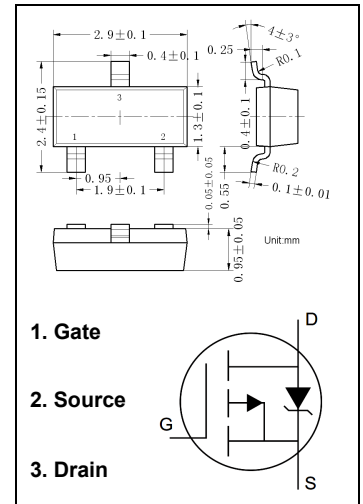
SOT-23 Plastic-Encapsulate Mosfets

IRLML6402TR-ALJ P-Channel Mosfet

Features

- Ultra Low On-Resistance
- P-Channel MOSFET
- Low Profile (<1.1mm)
- Available in Tape and Reel
- Fast Switching

Marking:6402



Maximum Ratings (T_a=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source voltage	-20	V
V _{GS}	Gate-Source voltage	±12	V
I _D @ T _A = 25°C	Continuous Drain Current, V _{GS} @ -4.5V	-3.7	A
I _D @ T _A = 70°C	Continuous Drain Current, V _{GS} @ -4.5V	-2.2	A
P _D @ T _A = 25°C	Power Dissipation	1.3	W
P _D @ T _A = 70°C	Power Dissipation	0.8	W
	Linear Derating Factor	0.01	W/°C
R _{θJA}	Maximum Junction-to-Ambient ⁽³⁾	(Typ:75) 100	°C/W
E _{AS}	Single Pulse Avalanche Energy ⁽⁴⁾	11	mJ
T _J , T _{STG}	Junction and Storage Temperature Range	-55 to +150	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-20			V
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	Reference to 25°C, I _D = -1mA ⁽²⁾		0.009		V/°C
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} = -4.5V, I _D = -3.7A ⁽²⁾		50	65	mΩ
		V _{GS} = -2.5V, I _D = -3.1A ⁽²⁾		80	135	
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-0.55	-0.95	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0 V			-1.0	μA
		V _{DS} = -20V, V _{GS} = 0 V, T _J = 70°C			-25	μA
I _{GSS}	Gate-body Leakage current	V _{DS} = 0 V, V _{GS} = ±12V			±100	nA
Q _g	Total Gate Charge	I _D = -3.7A		8.0	12	nC
Q _{gs}	Gate-to-Source Charge	V _{DS} = -10V		1.2	1.8	
Q _{gd}	Gate-to-Drain ("Miller") Charge	V _{GS} = -5.0V ⁽²⁾		2.8	4.2	
C _{iss}	Input Capacitance	V _{GS} = 0V		633		pF
C _{oss}	Output Capacitance	V _{DS} = -10V		145		
C _{rss}	Reverse Transfer Capacitance	f = 1.0MHz		110		

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = -10V$ $I_D = -3.7A$ $R_G = 89\Omega$ $R_D = 2.7\Omega$		350		ns
t_r	Rise Time			48		
$t_{d(off)}$	Turn-Off Delay Time			588		
t_f	Fall Time			381		
g_{fs}	Forward Transconductance	$V_{DS} = -10V, I_D = -3.7A$ ²⁾	6.0			S
I_S	Continuous Source Current (Body Diode)	MOSFET symbol showing the integral reverse p-n junction diode.			-1.3	A
I_{SM}	Pulsed Source Current (Body Diode) ¹⁾				-22	
V_{SD}	Diode Forward Voltage	$T_J = 25^\circ C, I_S = -1.0A, V_{GS} = 0V$			-1.2	V
t_{rr}	Reverse Recovery Time	$T_J = 25^\circ C, I_F = -1.0A$		29	43	ns
Q_{rr}	Reverse Recovery Charge	$di/dt = -100A/\mu s$ ²⁾		11	17	nC

Notes:

1. Repetitive rating; pulse width limited by max. Junction temperature.
2. Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.
3. Surface mounted on 1" square single layer 1oz. copper FR4 board, steady state.
4. Starting $T_J = 25^\circ C, L = 1.65mH, R_G = 25\Omega, I_{AS} = -3.7A$.

Typical Characteristics

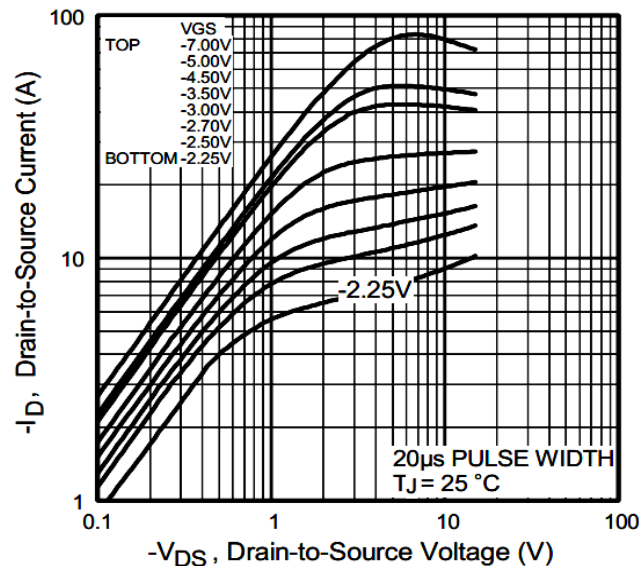


Fig 1. Typical Output Characteristics

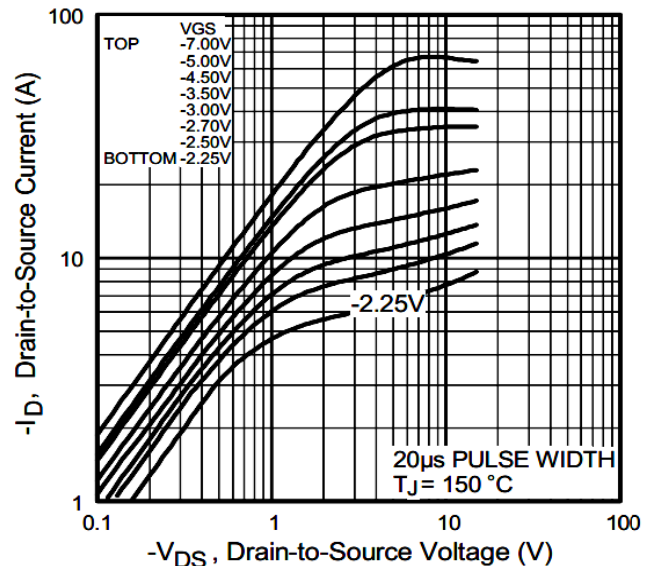


Fig 2. Typical Output Characteristics

Typical Characteristics (Continued)

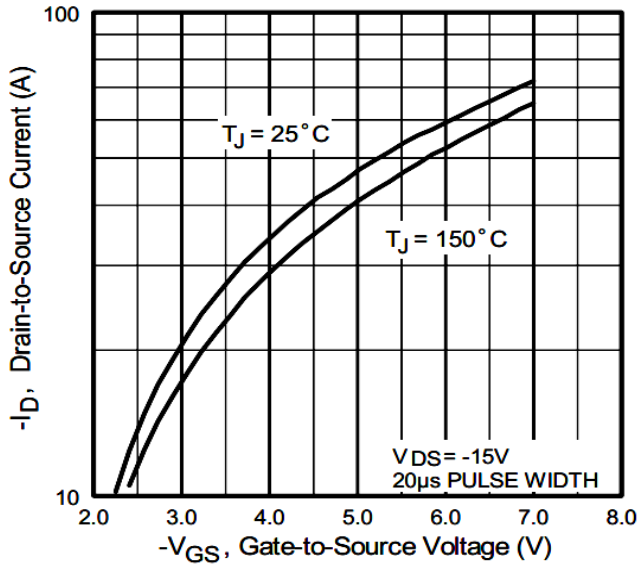


Fig 4. Normalized On-Resistance

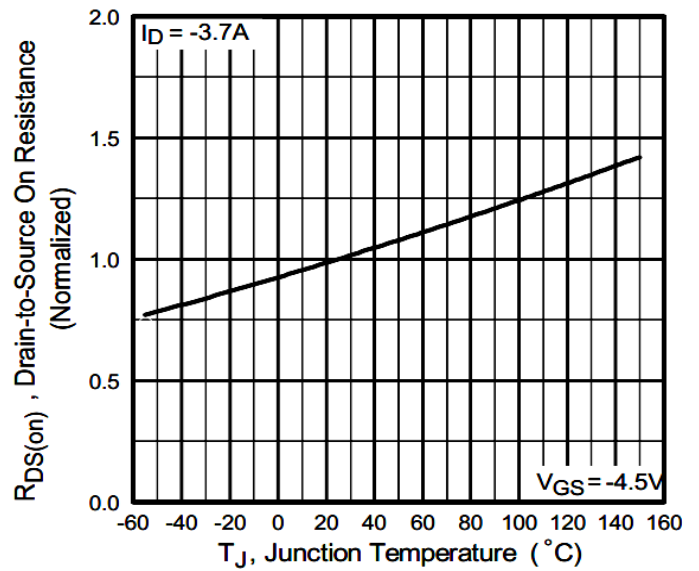


Fig 3. Typical Transfer Characteristics Vs. Temperature

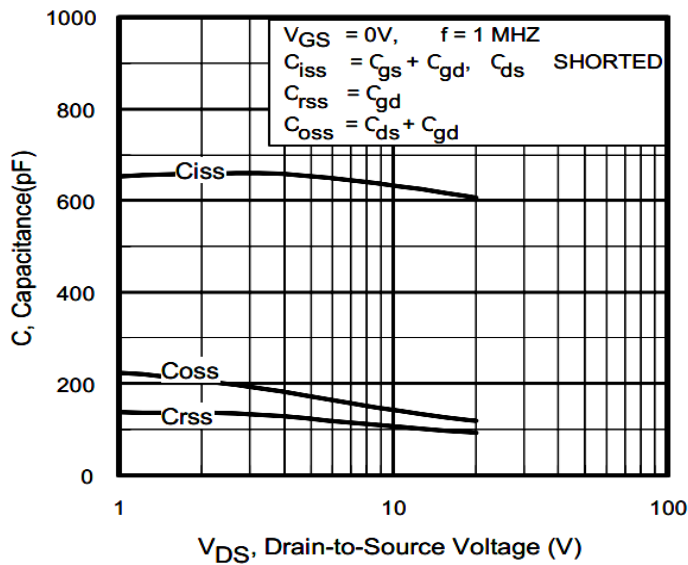


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

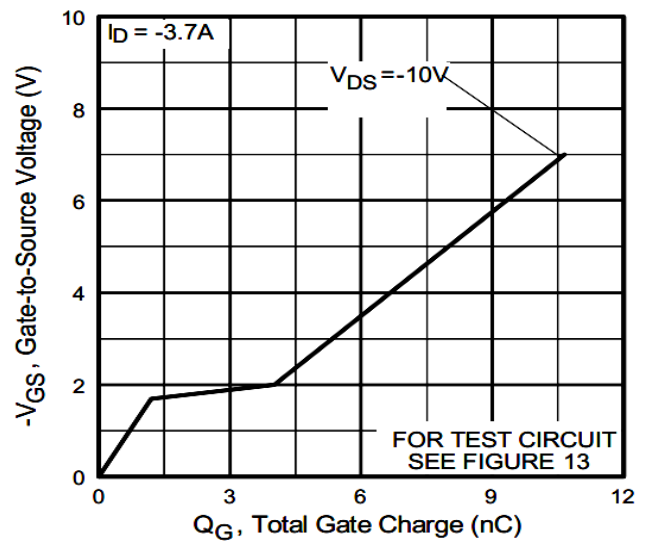


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

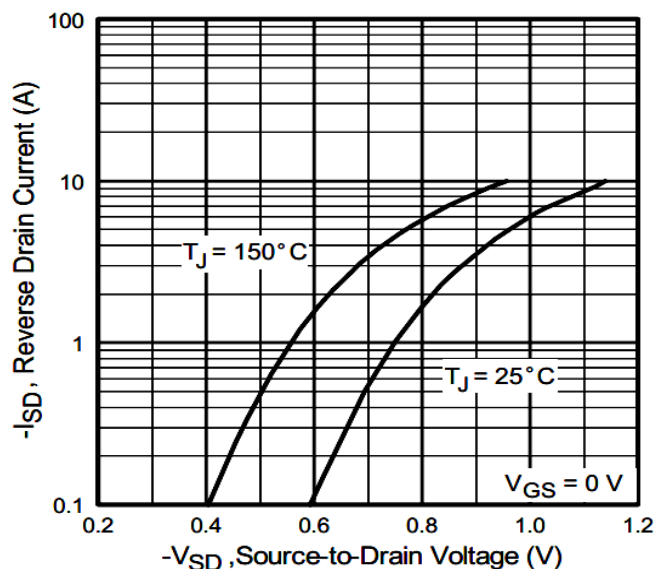


Fig 7. Typical Source-Drain Diode Forward Voltage

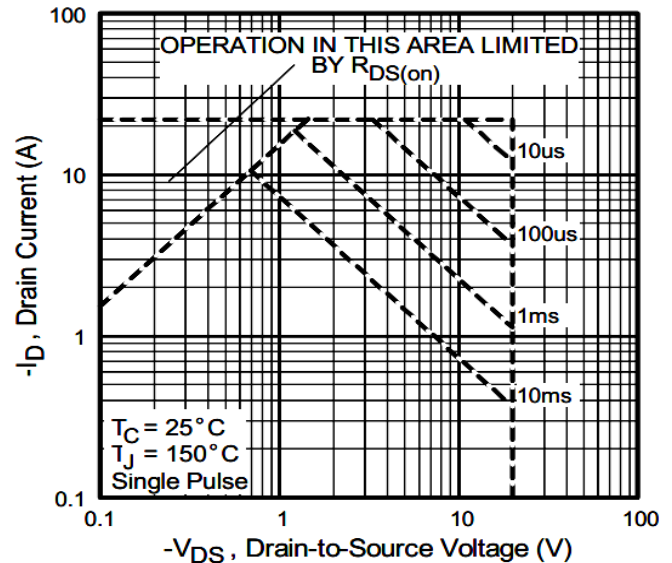


Fig 8. Maximum Safe Operating Area

Typical Characteristics (Continued)

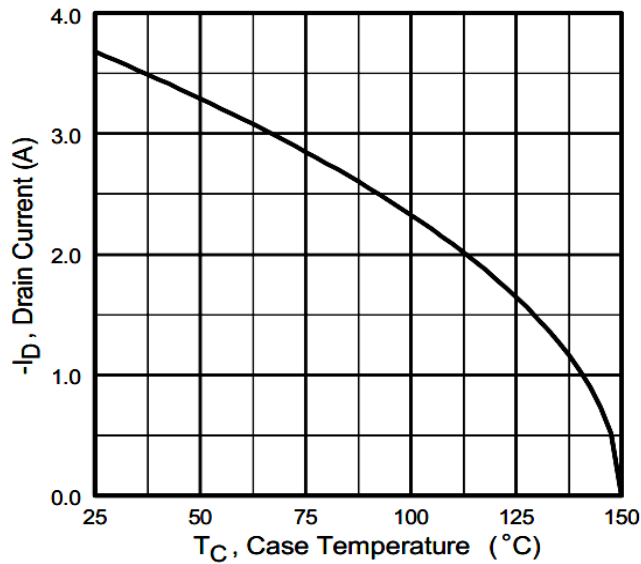


Fig 9. Maximum Drain Current Vs. Case Temperature

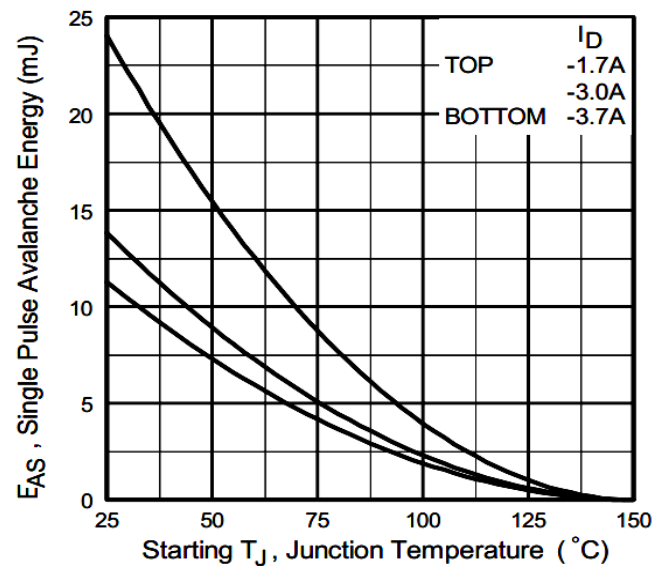


Fig 10. Maximum Avalanche Energy Vs. Drain Current

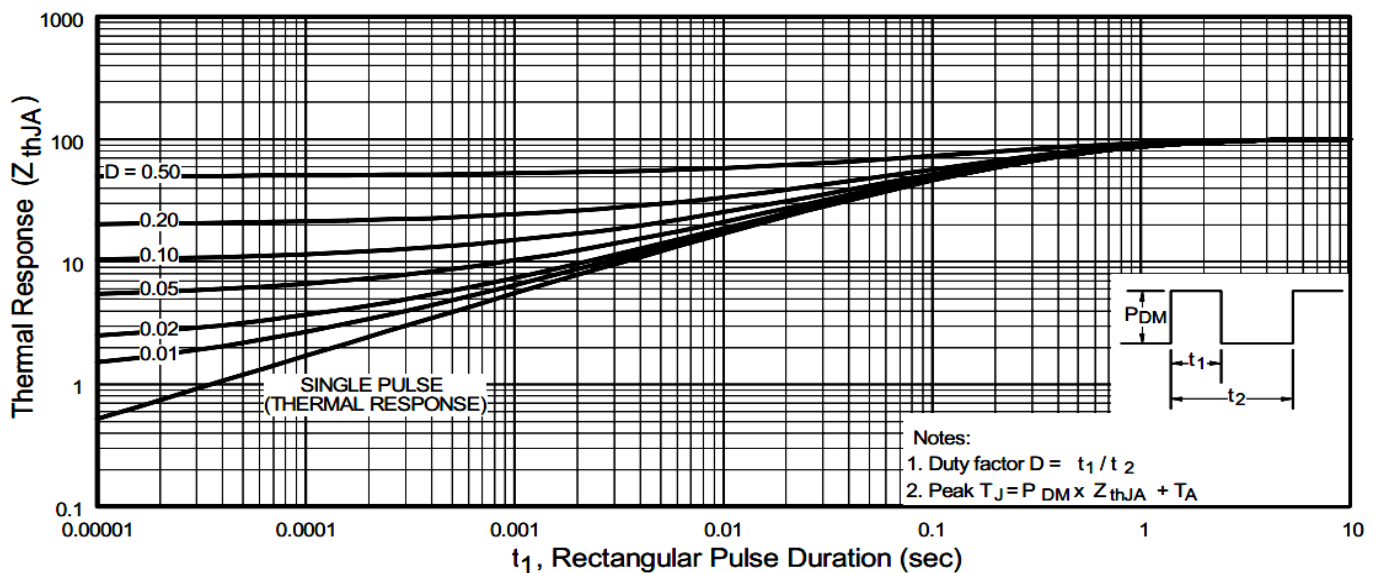


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

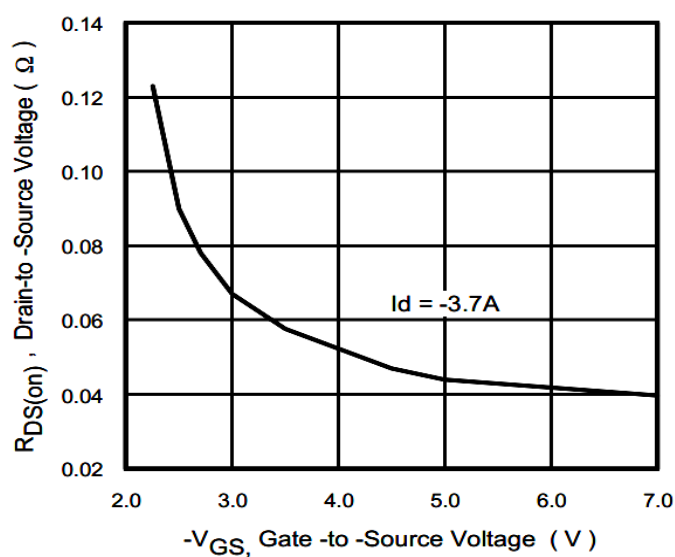


Fig 12. Typical On-Resistance Vs. Gate Voltage

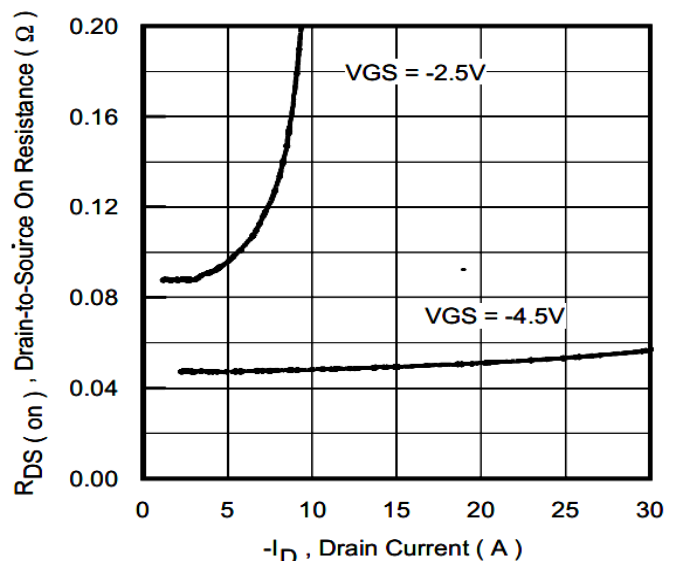


Fig 13. Typical On-Resistance Vs. Drain Current