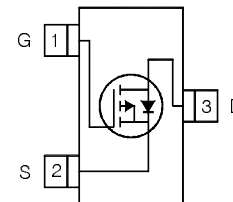
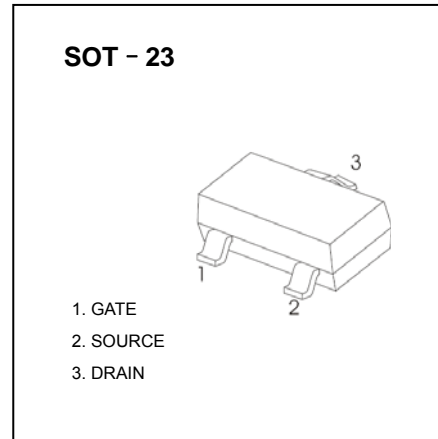


**Features**

- $V_{DS} (V) = -20V$
- $R_{DS(ON)} < 90m\Omega$  ( $V_{GS} = 4.5V$ )
- $R_{DS(ON)} < 110m\Omega$  ( $V_{GS} = -2.7V$ )
- P-Channel MOSFET
- SOT-23 Footprint
- Available in Tape and Reel Fast
- Switching
- Lead-Free



**Absolute Maximum Ratings**

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$	-0.78	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$	-0.62	
$I_{DM}$	Pulsed Drain Current ①	-4.9	
$P_D @ T_A = 25^\circ C$	Power Dissipation	540	mW
	Linear Derating Factor	4.3	mW/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 12$	V
dv/dt	Peak Diode Recovery dv/dt ②	-5.0	V/ns
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to + 150	°C

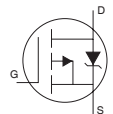
**Thermal Resistance**

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ④		230	°C/W

**Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source Breakdown Voltage	-20			V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coefficient		-4.9		mV/°C	Reference to 25°C, I <sub>D</sub> = -1mA
R <sub>DS(ON)</sub>	Static Drain-to-Source On-Resistance			90	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.61A ③
				110		V <sub>GS</sub> = -2.7V, I <sub>D</sub> = -0.31A ③
V <sub>GS(th)</sub>	Gate Threshold Voltage	-0.70		-1.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
g <sub>fs</sub>	Forward Transconductance	0.56			S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -0.31A
I <sub>DSS</sub>	Drain-to-Source Leakage Current			-1.0	μA	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V
				-25		V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage			-100	nA	V <sub>GS</sub> = -12V
	Gate-to-Source Reverse Leakage			100		V <sub>GS</sub> = 12V
Q <sub>g</sub>	Total Gate Charge		2.4	3.6	nC	I <sub>D</sub> = -0.61A
Q <sub>gs</sub>	Gate-to-Source Charge		0.56	0.84		V <sub>DS</sub> = -16V
Q <sub>gd</sub>	Gate-to-Drain ("Miller") Charge		1.0	1.5		V <sub>GS</sub> = -4.5V, See Fig. 6 and 9 ③
t <sub>d(on)</sub>	Turn-On Delay Time		13		ns	V <sub>DD</sub> = -10V
t <sub>r</sub>	Rise Time		18			I <sub>D</sub> = -0.61A
t <sub>d(off)</sub>	Turn-Off Delay Time		22			R <sub>G</sub> = 6.2Ω
t <sub>f</sub>	Fall Time		22			R <sub>D</sub> = 16Ω, See Fig. 10 ③
C <sub>iss</sub>	Input Capacitance		97		pF	V <sub>GS</sub> = 0V
C <sub>oss</sub>	Output Capacitance		53			V <sub>DS</sub> = -15V
C <sub>rss</sub>	Reverse Transfer Capacitance		28			f = 1.0MHz, See Fig. 5

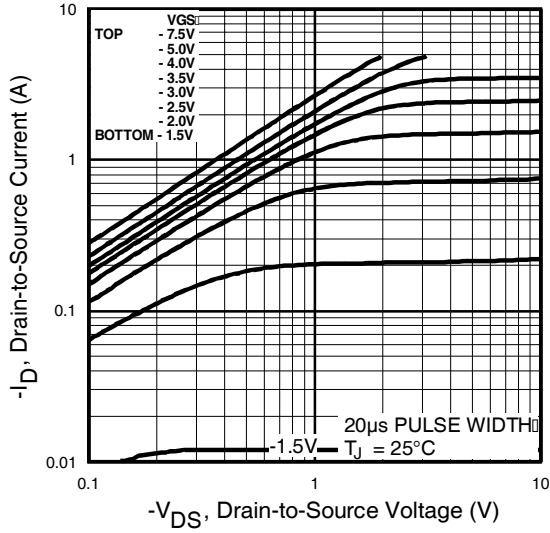
**Source-Drain Ratings and Characteristics**

	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)			-0.54	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①			-4.9		
V <sub>SD</sub>	Diode Forward Voltage			-1.2	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = -0.61A, V <sub>GS</sub> = 0V ④
t <sub>rr</sub>	Reverse Recovery Time		35	53	ns	T <sub>J</sub> = 25°C, I <sub>F</sub> = -0.61A
Q <sub>rr</sub>	Reverse Recovery Charge		26	39	nC	di/dt = -100A/μs ④

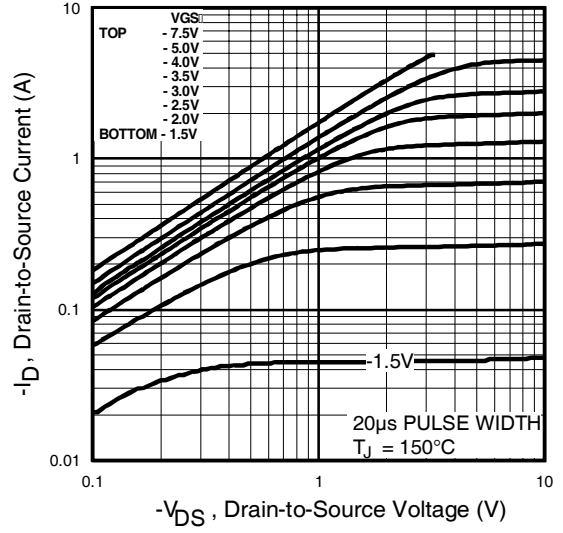
**Notes:**

- ① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )
- ② I<sub>SD</sub> ≤ -0.61A, di/dt ≤ 76A/μs, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>, T<sub>J</sub> ≤ 150°C
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ④ Surface mounted on FR-4 board, t ≤ 5sec.

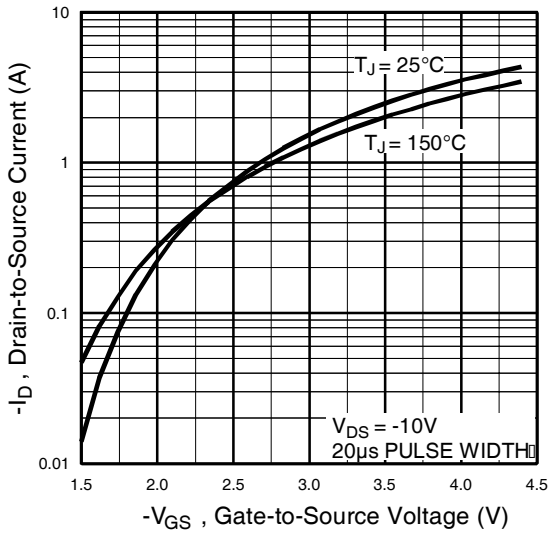
**Typical Electrical Characteristics**



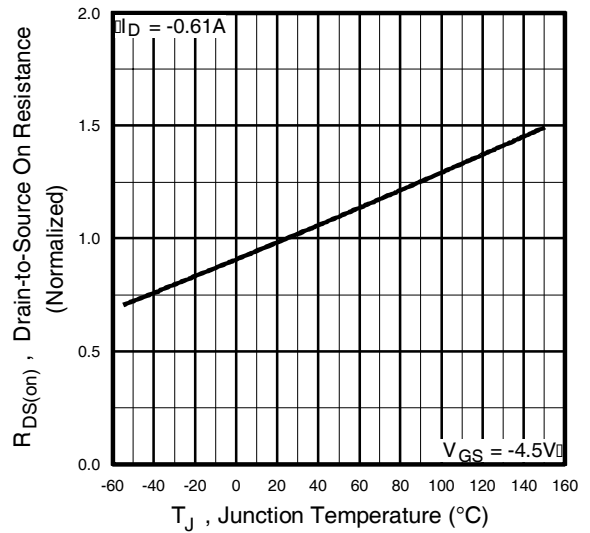
**Fig 1. Typical Output Characteristics**



**Fig 2. Typical Output Characteristics**

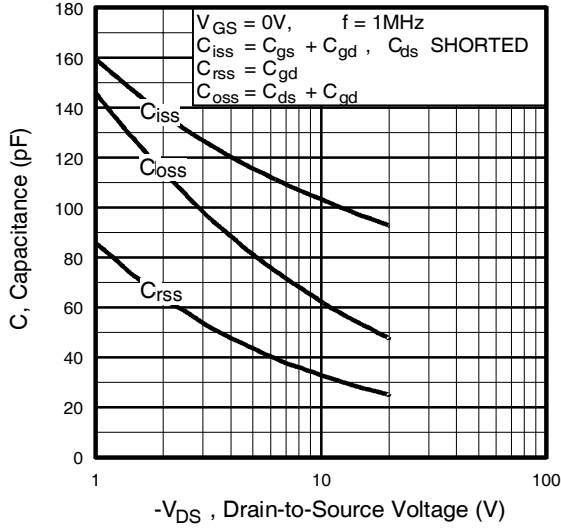


**Fig 3. Typical Transfer Characteristics**

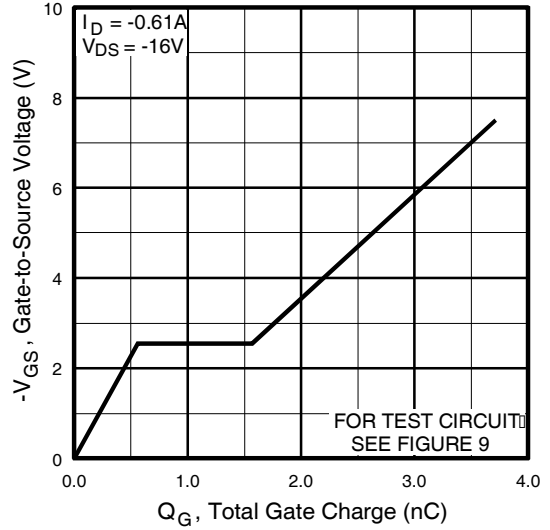


**Fig 4. Normalized On-Resistance Vs. Temperature**

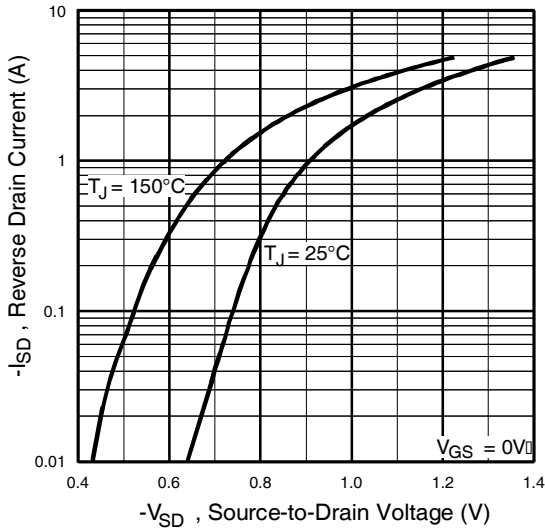
**Typical Electrical Characteristics**



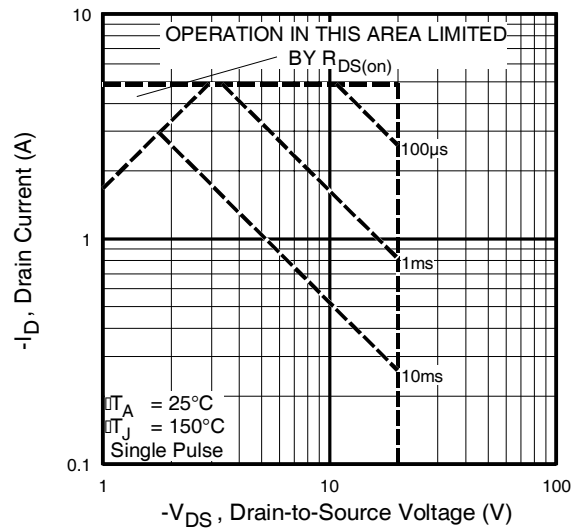
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



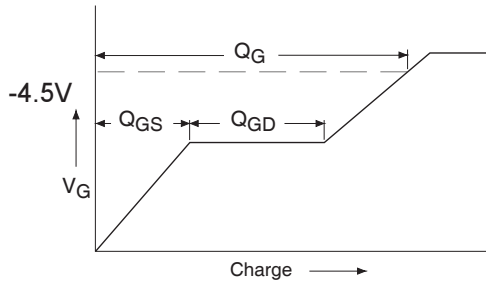
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



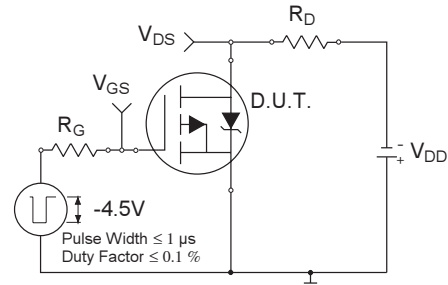
**Fig 7.** Typical Source-Drain Diode Forward Voltage



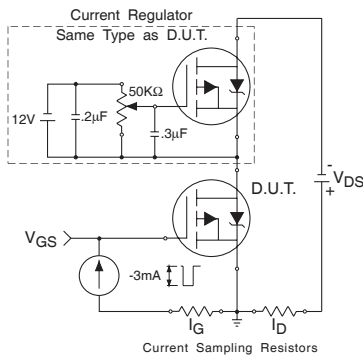
**Fig 8.** Maximum Safe Operating Area



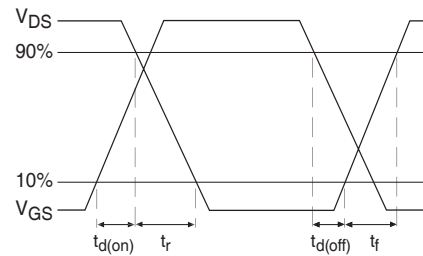
**Fig 9a. Basic Gate Charge Waveform**



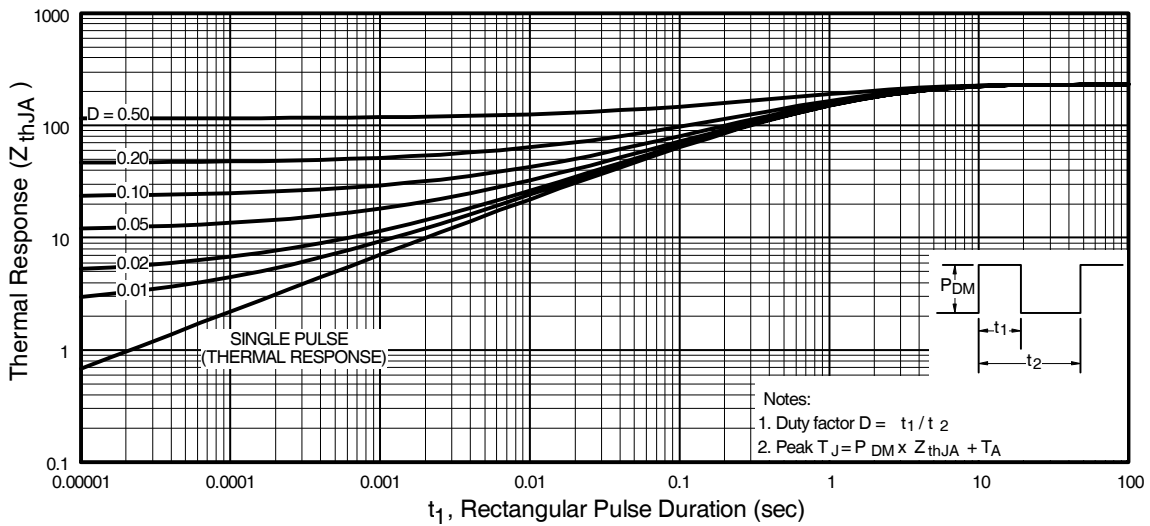
**Fig 10a. Switching Time Test Circuit**



**Fig 9b. Gate Charge Test Circuit**

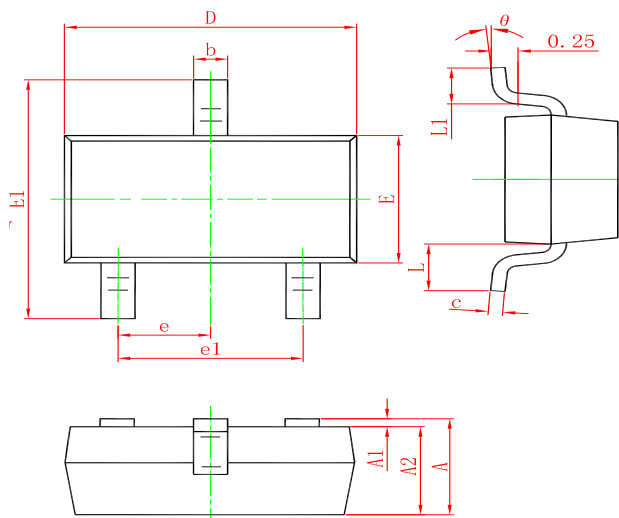


**Fig 10b. Switching Time Waveforms**



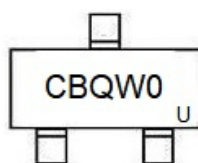
**Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient**

**SOT-23 PACKAGE OUTLINE DIMENSIONS**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°

**Marking**



**Ordering information**

Order code	Package	Baseqty	Deliverymode
IRLML6302	SOT-23	3000	Tape and reel