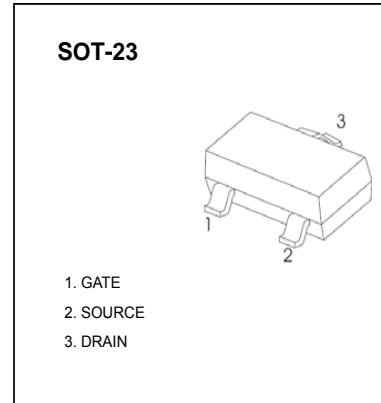


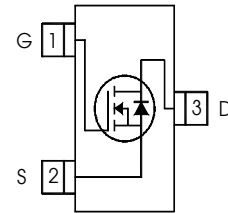
**Product summary**

<b>V<sub>DS</sub></b>	<b>20</b>	<b>V</b>
<b>R<sub>DS(on) max</sub></b> (@ V <sub>GS</sub> = 4.5V)	<b>250</b>	<b>mΩ</b>
<b>Q<sub>g</sub> (typical)</b>	<b>2.6</b>	<b>nC</b>
<b>I<sub>D</sub></b> (@ T <sub>A</sub> = 25°C)	<b>1.2</b>	<b>A</b>



**Features**

- Industry-standard pinout SOT-23 Package
- Compatible with Existing Surface Mount Techniques
- RoHS Compliant, Halogen-Free
- MSL1, Industrial qualification



**Absolute Maximum Ratings**

	Parameter	Max.	Units
I <sub>D</sub> @ T <sub>A</sub> = 25°C	Continuous Drain Current, V <sub>GS</sub> @ 4.5V	1.2	A
I <sub>D</sub> @ T <sub>A</sub> = 70°C	Continuous Drain Current, V <sub>GS</sub> @ 4.5V	0.95	
I <sub>DM</sub>	Pulsed Drain Current ①	7.4	
P <sub>D</sub> @ T <sub>A</sub> = 25°C	Power Dissipation	540	mW
	Linear Derating Factor	4.3	mW/°C
V <sub>GS</sub>	Gate-to-Source Voltage	± 12	V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	V/ns
T <sub>J</sub> , T <sub>STG</sub>	Junction and Storage Temperature Range	-55 to + 150	°C

**Thermal Resistance**

	Parameter	Typ.	Max.	Units
R <sub>θJA</sub>	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/ΔT<sub>J</sub></sub>	Breakdown Voltage Temp. Coefficient	—	0.024	—	V/°C	Reference to 25°C, I <sub>D</sub> = 1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance	—	—	250	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.93A ③
		—	—	350		V <sub>GS</sub> = 2.7V, I <sub>D</sub> = 0.47A ③
V <sub>GS(th)</sub>	Gate Threshold Voltage	0.70	—	—	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
g <sub>fs</sub>	Forward Transconductance	1.3	—	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.47A
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	—	2.6	3.9	nC	I <sub>D</sub> = 0.93A
Q <sub>gs</sub>	Gate-to-Source Charge	—	0.41	0.62		V <sub>DS</sub> = 16V
Q <sub>gd</sub>	Gate-to-Drain ("Miller") Charge	—	1.1	1.7		V <sub>GS</sub> = 4.5V, See Fig. 6 and 9 ③
t <sub>d(on)</sub>	Turn-On Delay Time	—	2.5	—	ns	V <sub>DD</sub> = 10V
t <sub>r</sub>	Rise Time	—	9.5	—		I <sub>D</sub> = 0.93A
t <sub>d(off)</sub>	Turn-Off Delay Time	—	9.7	—		R <sub>G</sub> = 6.2Ω
t <sub>f</sub>	Fall Time	—	4.8	—	pF	R <sub>D</sub> = 11Ω, See Fig. 10 ③
C <sub>iss</sub>	Input Capacitance	—	110	—		V <sub>GS</sub> = 0V
C <sub>oss</sub>	Output Capacitance	—	51	—		V <sub>DS</sub> = 15V
C <sub>rss</sub>	Reverse Transfer Capacitance	—	25	—		f = 1.0MHz, See Fig. 5

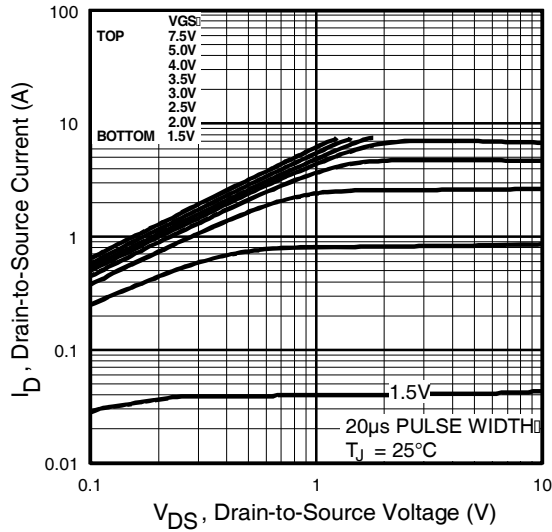
**Source-Drain Ratings and Characteristics**

	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	—	—	7.4		
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.2	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = 0.93A, V <sub>GS</sub> = 0V ③
t <sub>rr</sub>	Reverse Recovery Time	—	25	38	ns	T <sub>J</sub> = 25°C, I <sub>F</sub> = 0.93A
Q <sub>rr</sub>	Reverse Recovery Charge	—	16	24	nC	di/dt = 100A/μs ③

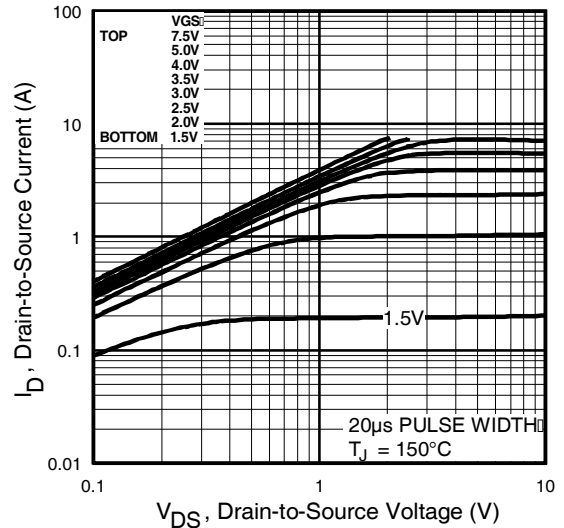
**Notes:**

- ① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )
- ② I<sub>SD</sub> ≤ 0.93A, di/dt ≤ 90A/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.

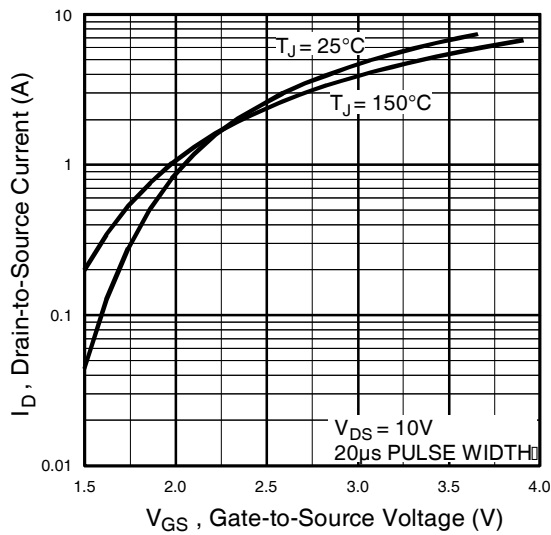
**Typical Characteristics**



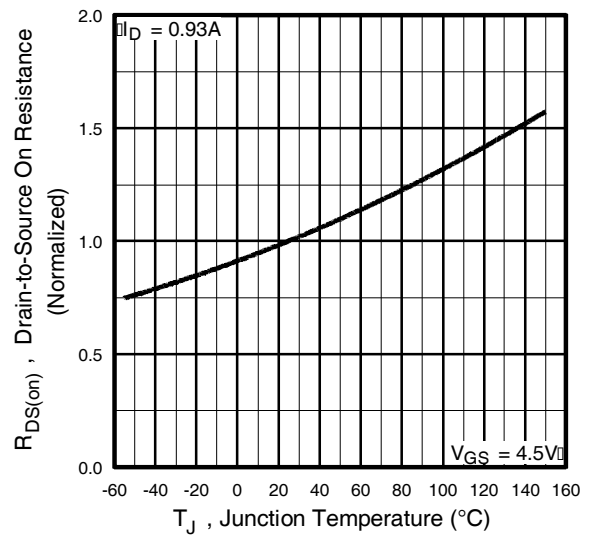
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics

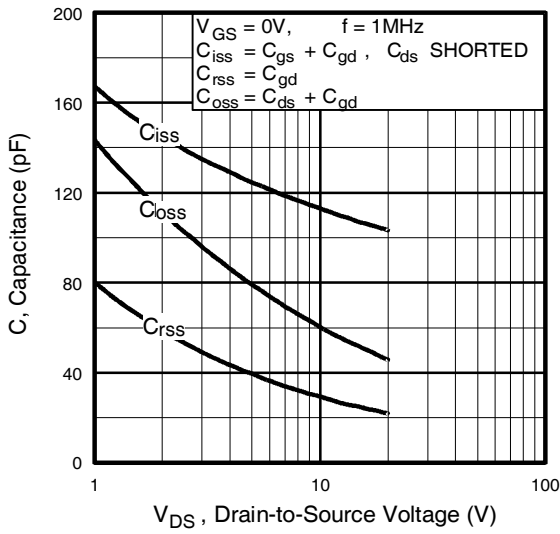


**Fig 3.** Typical Transfer Characteristics

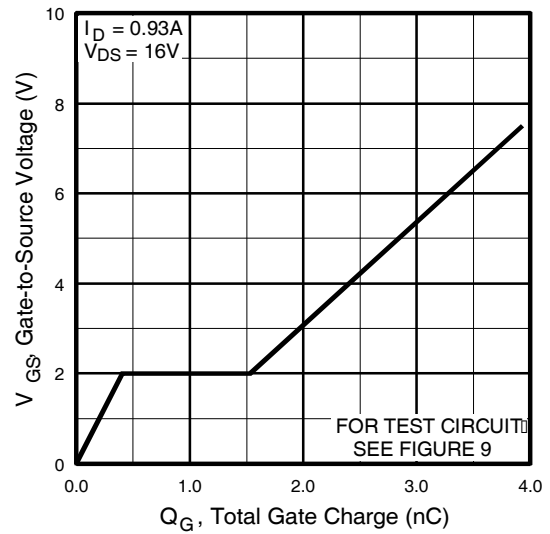


**Fig 4.** Normalized On-Resistance Vs. Temperature

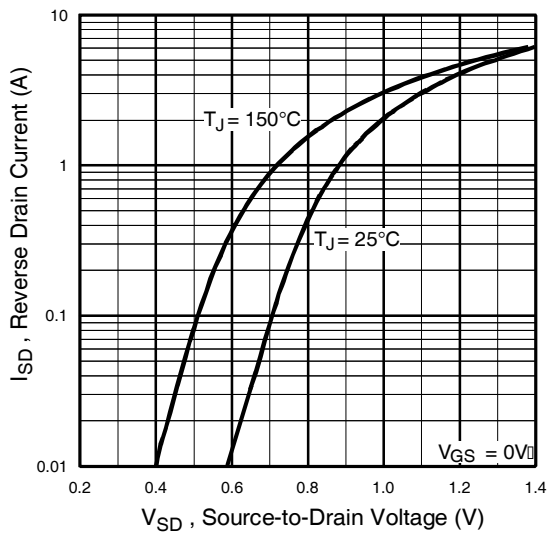
**Typical Characteristics**



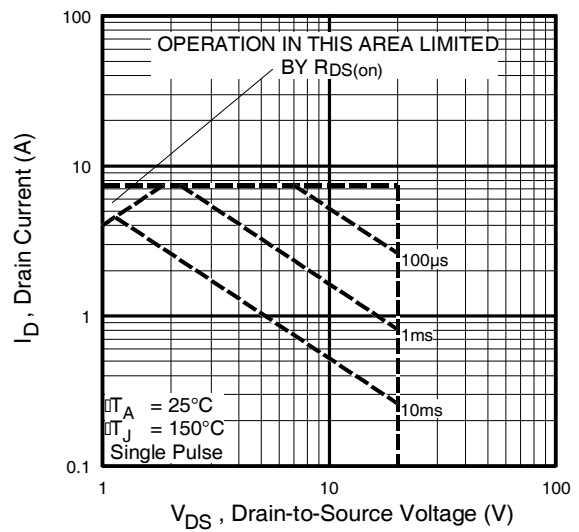
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



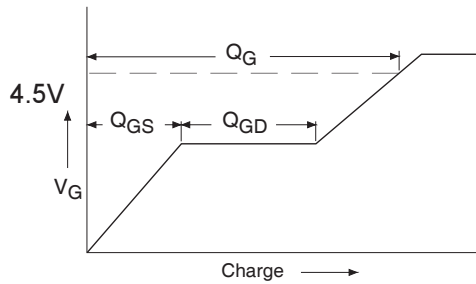
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



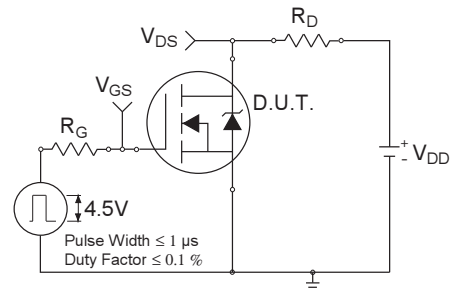
**Fig 7.** Typical Source-Drain Diode Forward Voltage



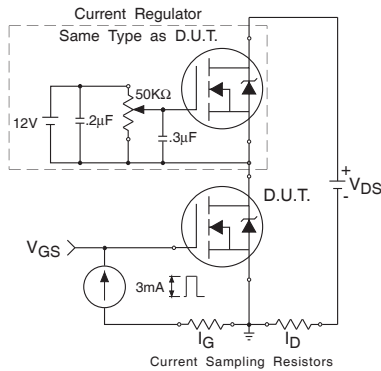
**Fig 8.** Maximum Safe Operating Area



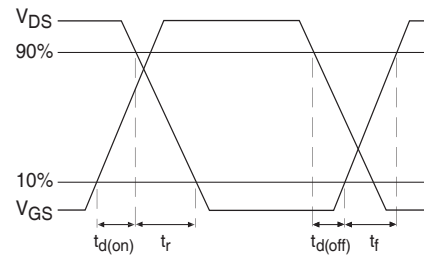
**Fig 9a. Basic Gate Charge Waveform**



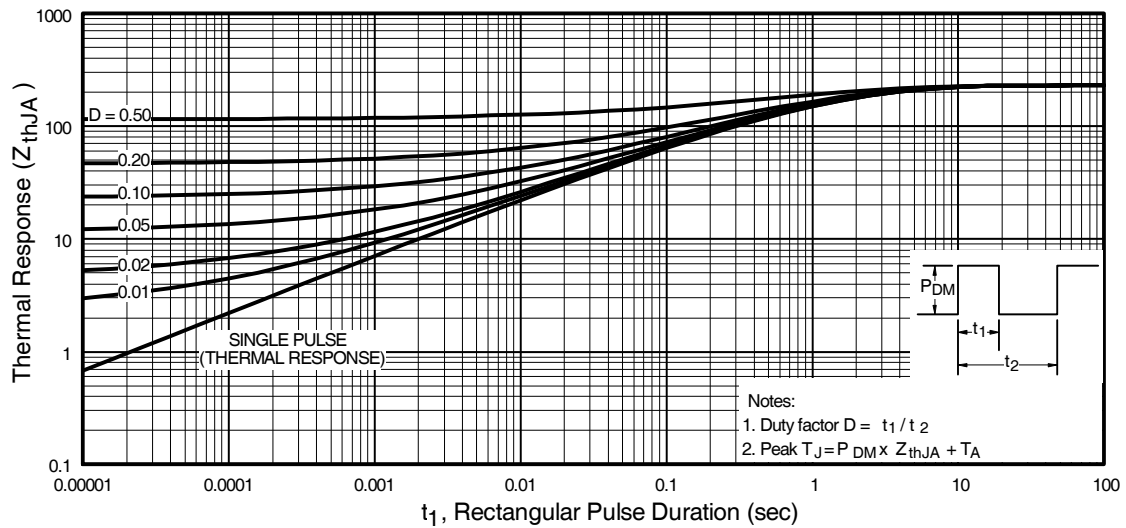
**Fig 10a. Switching Time Test Circuit**



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

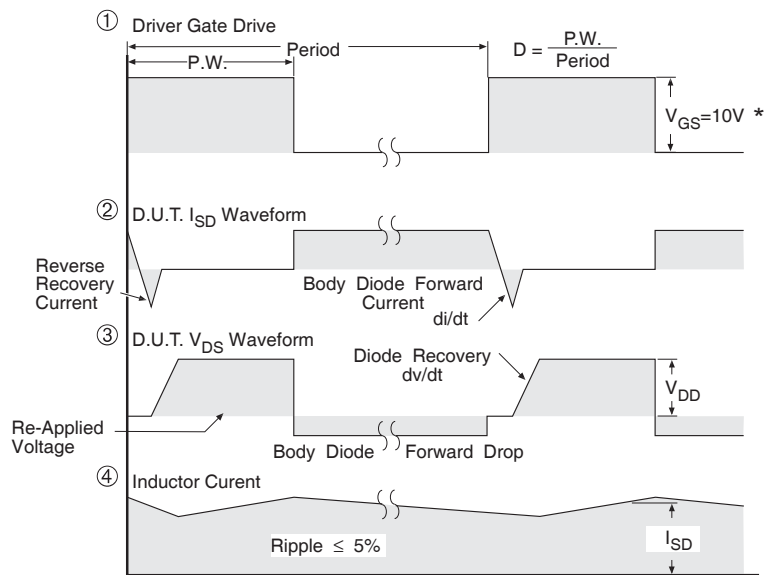
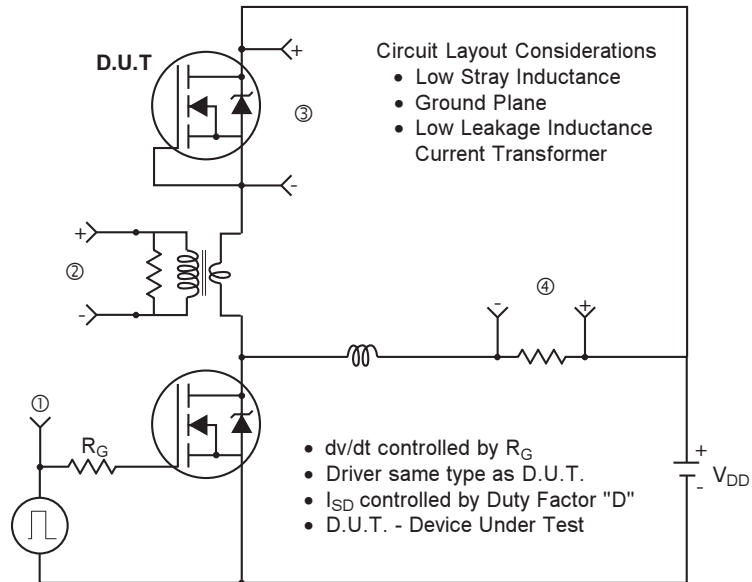


**Fig 10b. Switching Time Waveforms**



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

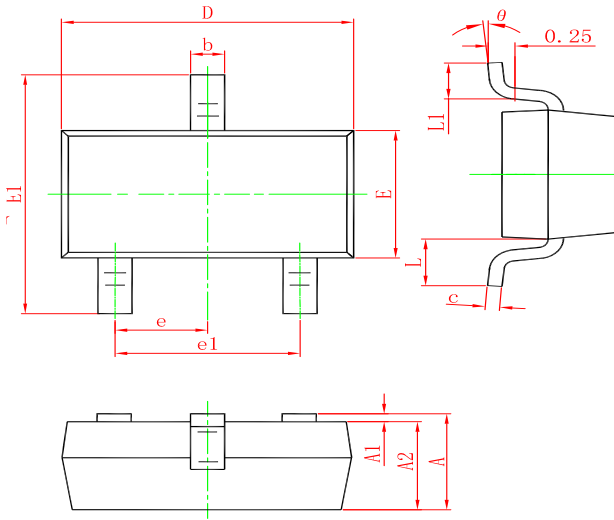
**Peak Diode Recovery dv/dt Test Circuit**



\*  $V_{GS} = 5V$  for Logic Level Devices

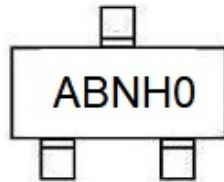
**Fig 12. For N-Channel HEXFETS**

**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
IRLML2402	SOT-23	3000	Tape and reel