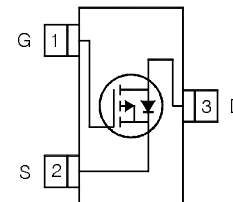
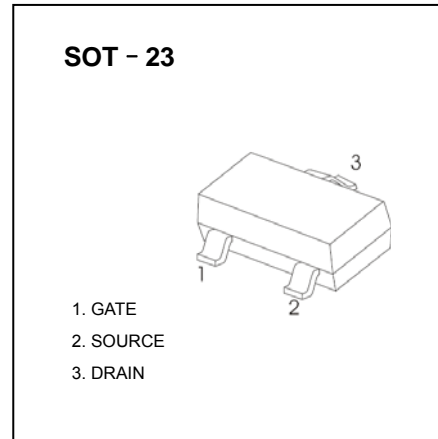


**Features**

- $V_{DS} (V) = -20V$
- $R_{DS(ON)} < 90m\Omega$  ( $V_{GS} = 4.5V$ )
- $R_{DS(ON)} < 110m\Omega$  ( $V_{GS} = -2.7V$ )
- 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

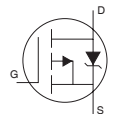
**Thermal Resistance**

	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			90 110	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.61A ③ 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 -25	μA	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V 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	nA	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	nC	V <sub>DS</sub> = -16V
Q <sub>gd</sub>	Gate-to-Drain ("Miller") Charge		1.0	1.5	nC	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		ns	I <sub>D</sub> = -0.61A
t <sub>d(off)</sub>	Turn-Off Delay Time		22		ns	R <sub>G</sub> = 6.2Ω
t <sub>f</sub>	Fall Time		22		ns	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		pF	V <sub>DS</sub> = -15V
C <sub>rss</sub>	Reverse Transfer Capacitance		28		pF	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

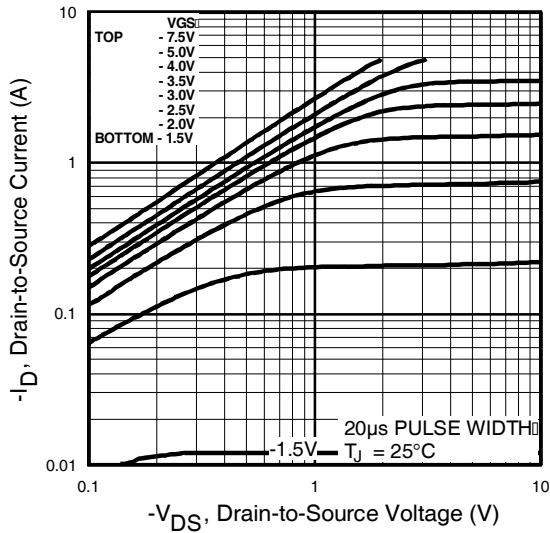


Fig 1. Typical Output Characteristics

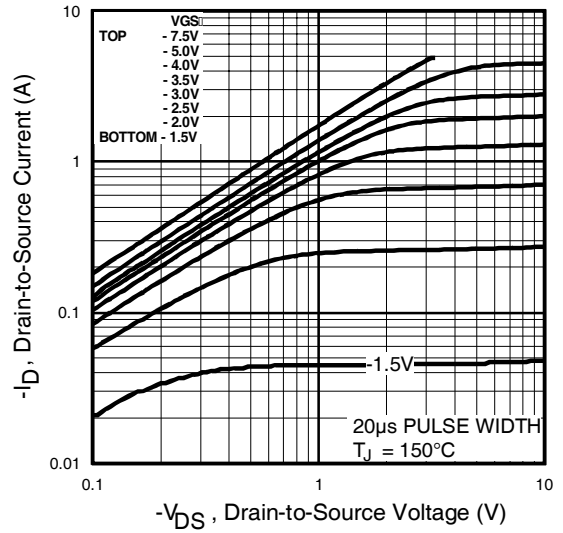


Fig 2. Typical Output Characteristics

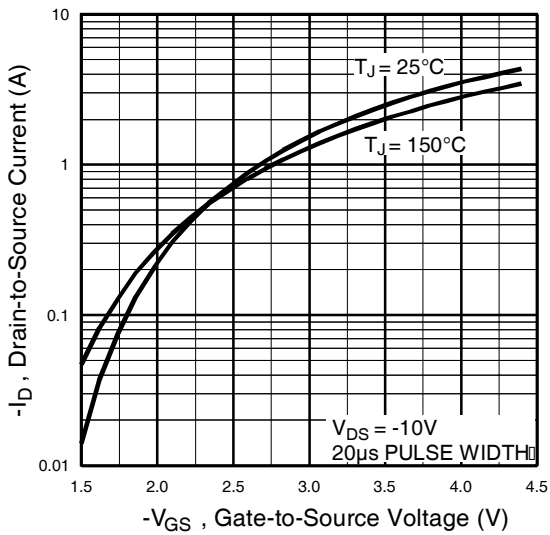


Fig 3. Typical Transfer Characteristics

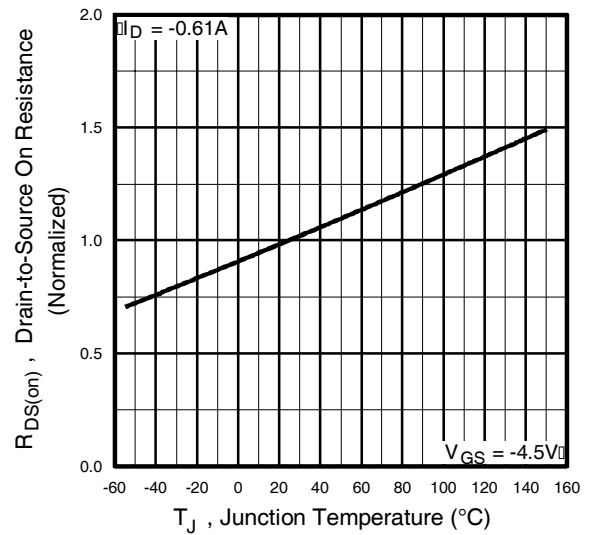


Fig 4. Normalized On-Resistance Vs. Temperature

Typical Electrical Characteristics

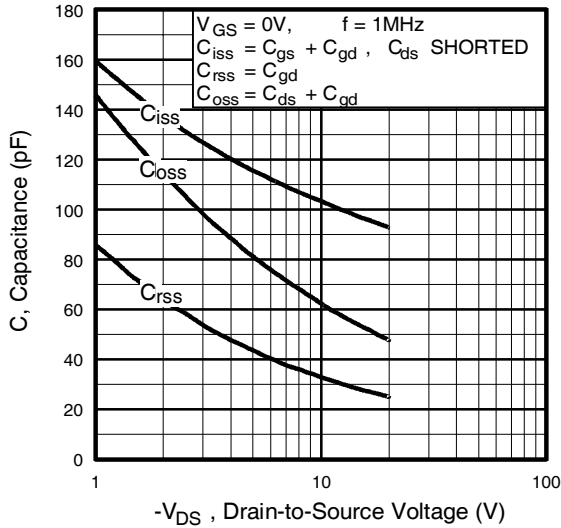


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

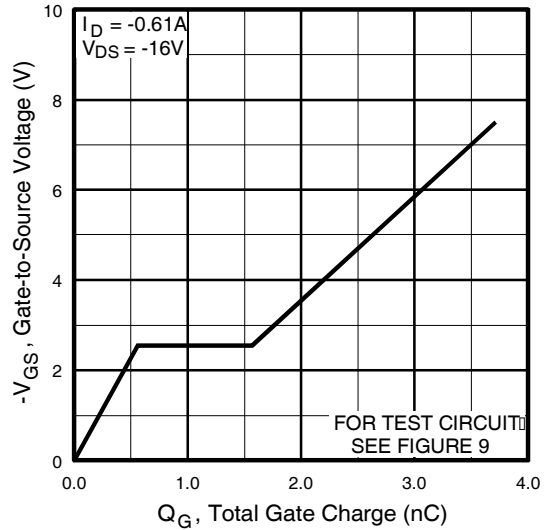


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

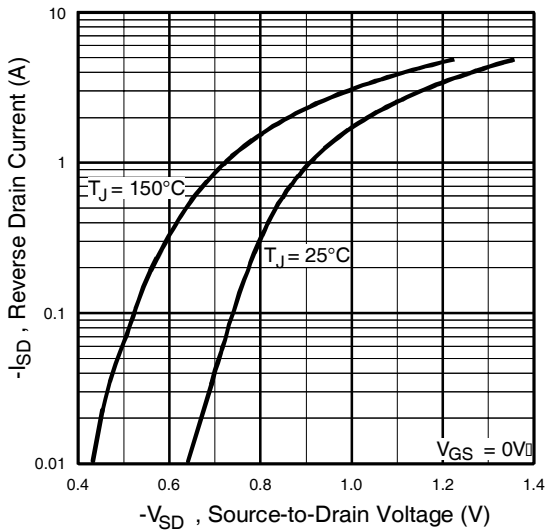


Fig 7. Typical Source-Drain Diode Forward Voltage

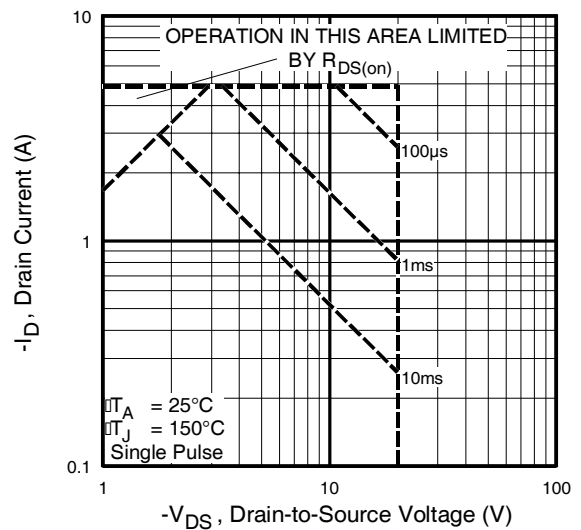


Fig 8. Maximum Safe Operating Area

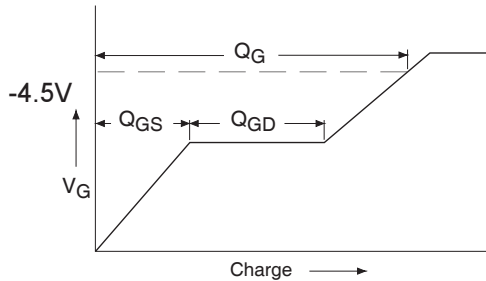


Fig 9a. Basic Gate Charge Waveform

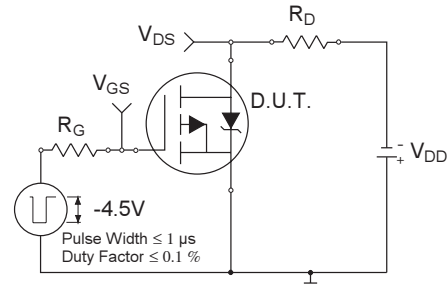


Fig 10a. Switching Time Test Circuit

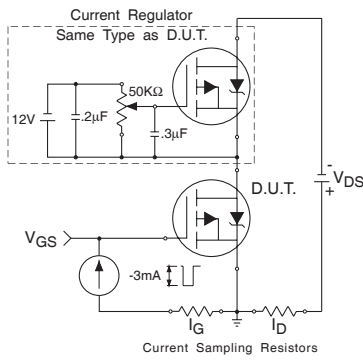


Fig 9b. Gate Charge Test Circuit

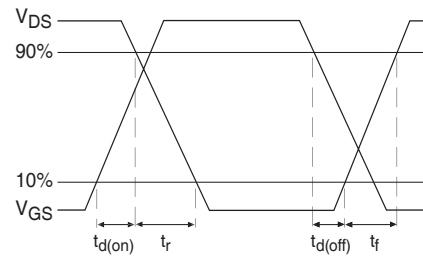


Fig 10b. Switching Time Waveforms

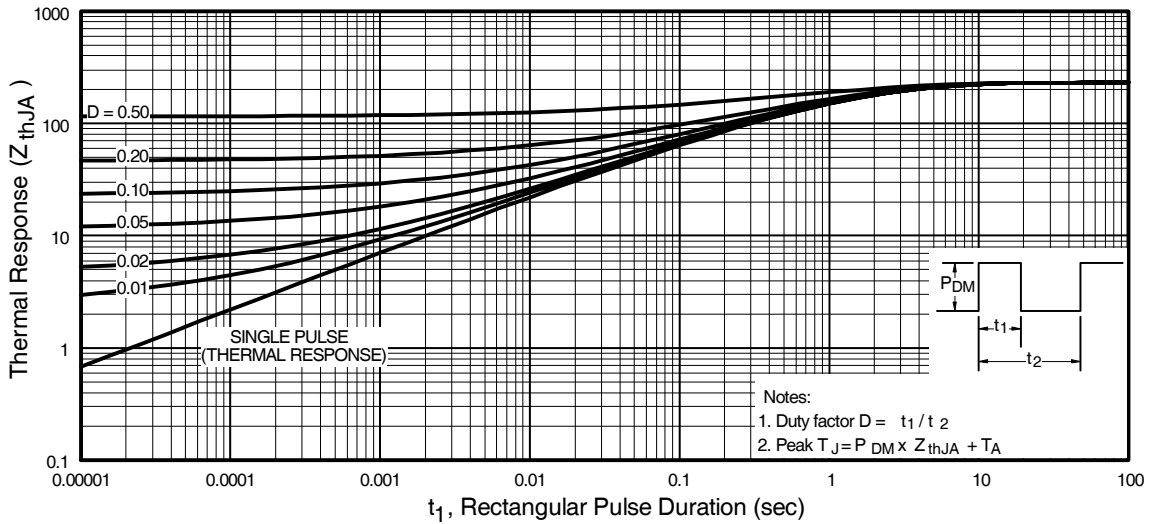
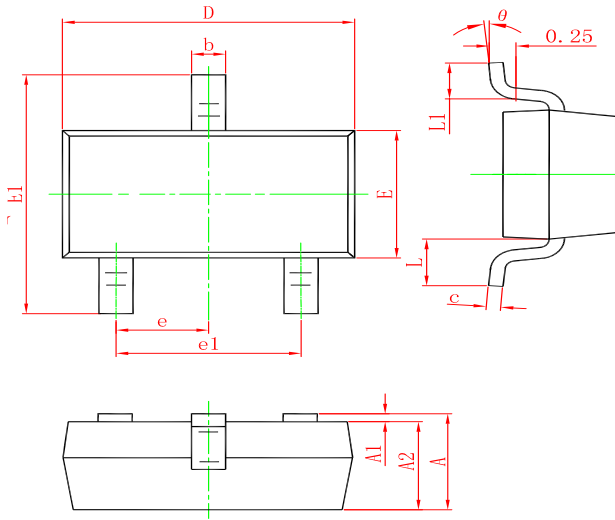


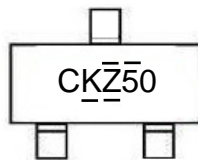
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

**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
θ	0°	8°	0°	8°

**Marking**



**Ordering information**

Order code	Package	Baseqty	Deliverymode
UMW IRLML6302TR	SOT-23	3000	Tape and reel