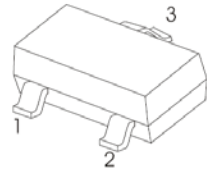


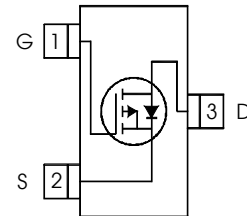
Features

- Generation VTechnology
- UltraLowOn-Resistance
- P-ChannelMOSFET
- SOT-23Footprint
- Low Profile(<1.1mm)
- Available in Tape and Reel
- Fast Switching
- Lead-Free
- RoHS CompliantHalogen-Free

SOT - 23



1. GATE
2. SOURCE
3. DRAIN



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -10\text{V}$	-0.76	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -10\text{V}$	-0.61	
I_{DM}	Pulsed Drain Current ①	-4.8	
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation	540	mW
	Linear Derating Factor	4.3	mW/°C
V_{GS}	Gate-to-Source Voltage	± 20	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 @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	-0.029	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D = -1mA$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	—	—	600	m Ω	$V_{GS} = -10V, I_D = -0.60A$ ③
		—	—	1000		$V_{GS} = -4.5V, I_D = -0.30A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	—	—	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
g_{fs}	Forward Transconductance	0.44	—	—	S	$V_{DS} = -10V, I_D = -0.30A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-1.0	μA	$V_{DS} = -24V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -20V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 20V$
Q_g	Total Gate Charge	—	3.4	5.1	nC	$I_D = -0.60A$
Q_{gs}	Gate-to-Source Charge	—	0.52	0.78		$V_{DS} = -24V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	1.1	1.7		$V_{GS} = -10V$, See Fig. 6 and 9 ③
$t_{d(on)}$	Turn-On Delay Time	—	10	—	ns	$V_{DD} = -15V$
t_r	Rise Time	—	8.2	—		$I_D = -0.60A$
$t_{d(off)}$	Turn-Off Delay Time	—	23	—		$R_G = 6.2\Omega$
t_f	Fall Time	—	16	—		$R_D = 25\Omega$, See Fig. 10 ③
C_{iss}	Input Capacitance	—	75	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	37	—		$V_{DS} = -25V$
C_{rss}	Reverse Transfer Capacitance	—	18	—		$f = 1.0MHz$, See Fig. 5

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-0.54	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-4.8		
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$T_J = 25^\circ\text{C}, I_S = -0.60A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	26	39	ns	$T_J = 25^\circ\text{C}, I_F = -0.60A$
Q_{rr}	Reverse Recovery Charge	—	20	30	nC	$di/dt = 100A/\mu s$ ③

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② $I_{SD} \leq -0.60A$, $di/dt \leq 110A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$
- ③ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- ④ Surface mounted on FR-4 board, $t \leq 5sec$.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

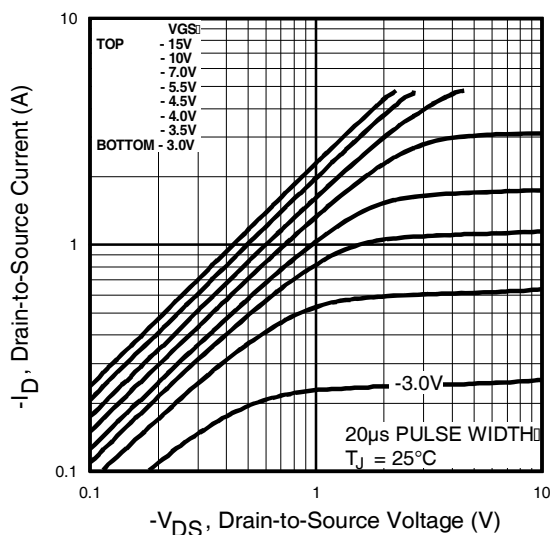


Fig 1. Typical Output Characteristics

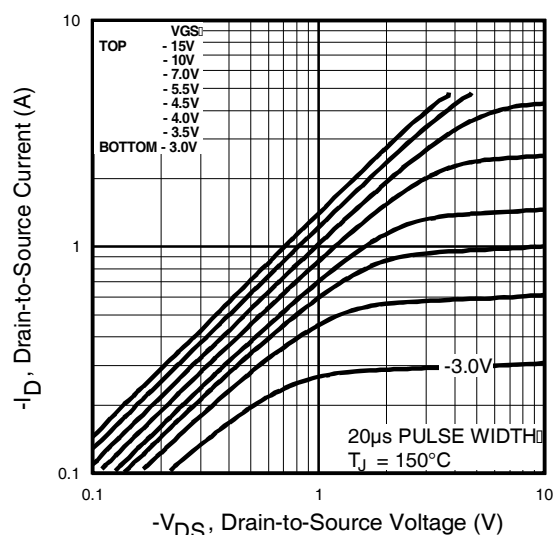


Fig 2. Typical Output Characteristics

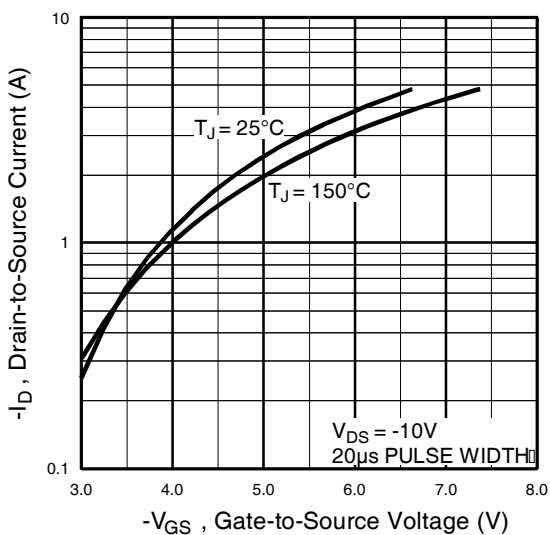


Fig 3. Typical Transfer Characteristics

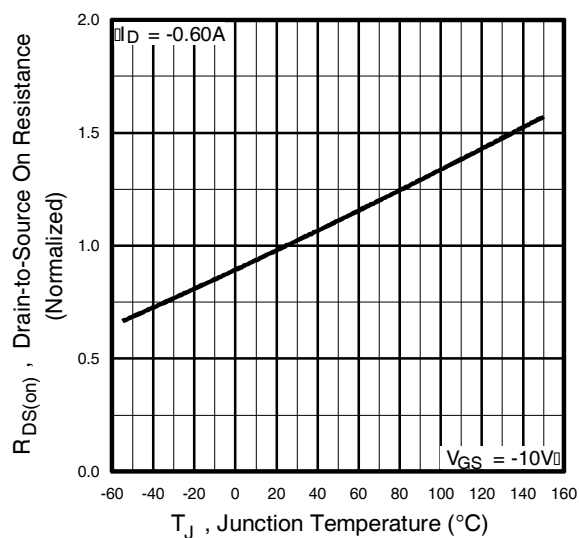


Fig 4. Normalized On-Resistance Vs. Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

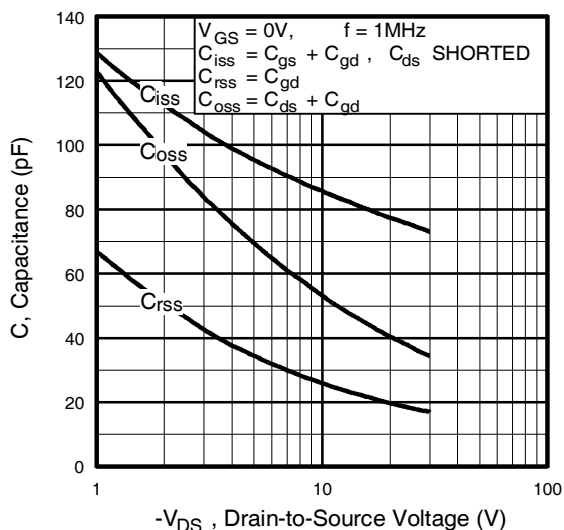


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

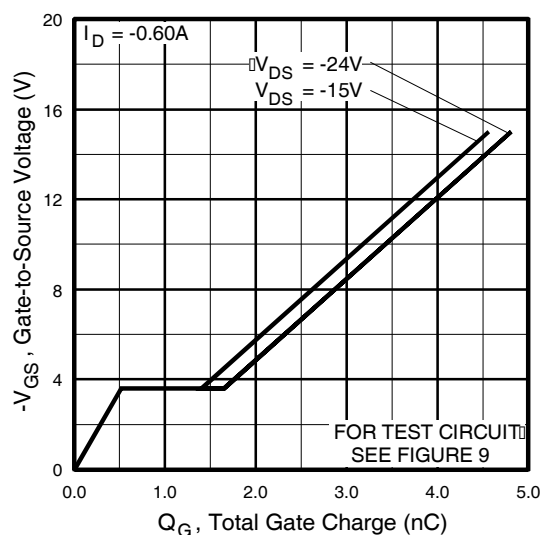


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

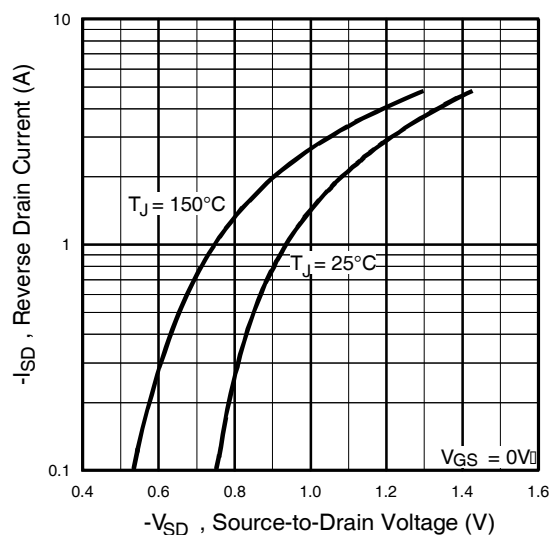


Fig 7. Typical Source-Drain Diode Forward Voltage

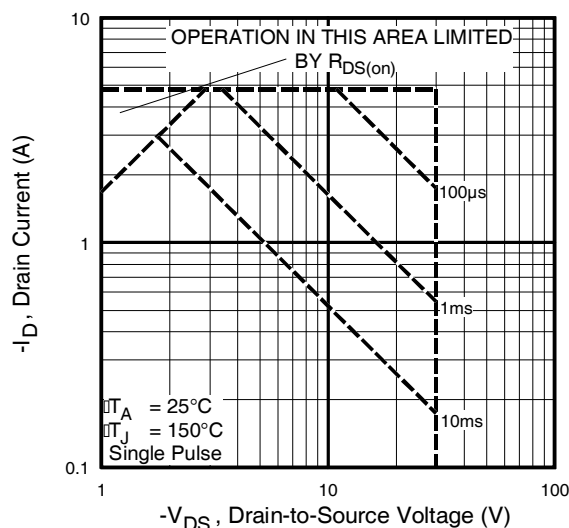
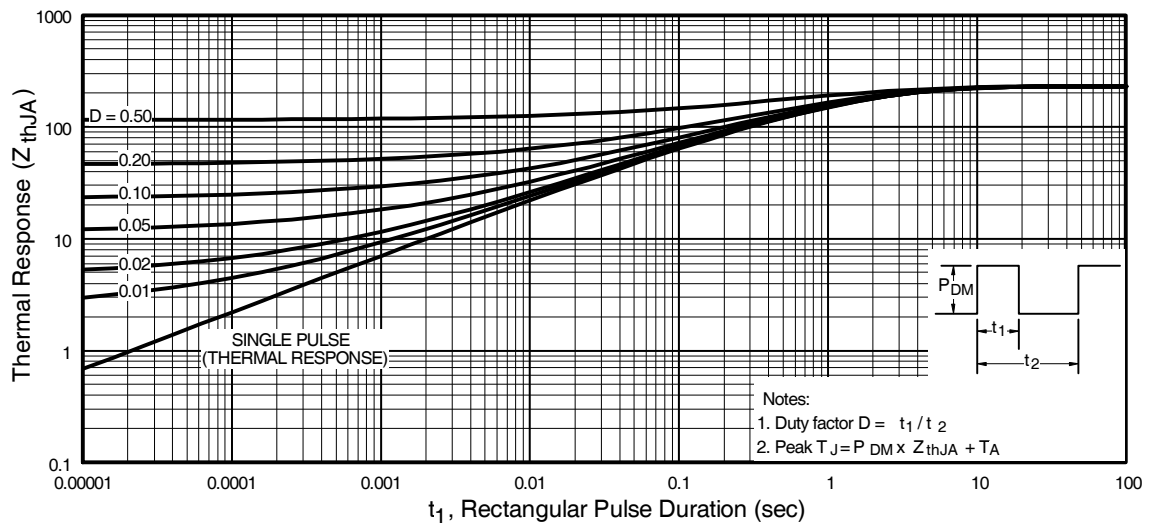
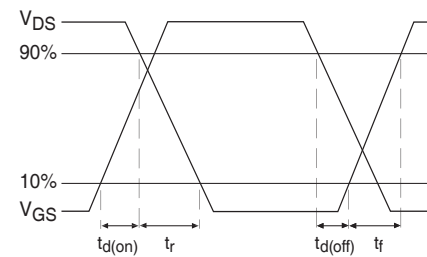
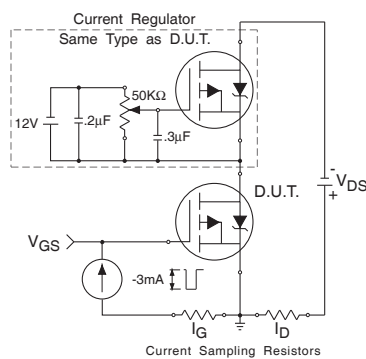
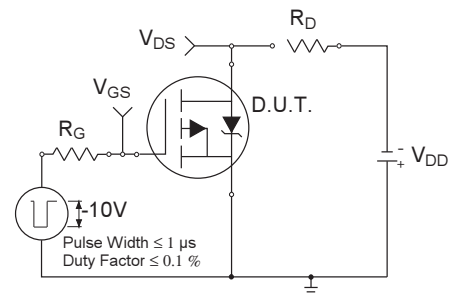
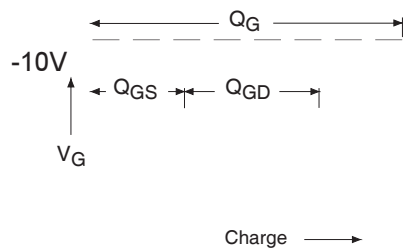
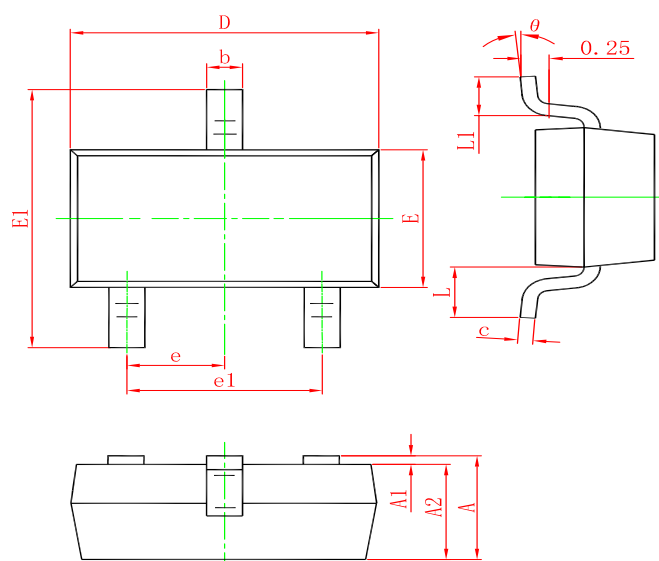


Fig 8. Maximum Safe Operating Area

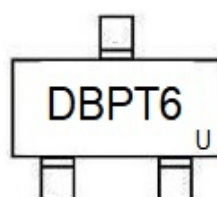


SOT-23 PACKAGE OUTLINE DIMENSIONS



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 IRLML5103TR	SOT-23	3000	Tape and reel