

1.Description

The IRLML2244TR uses advanced trench technology to provide excellent $R_{DS(on)}$ with low gate charge. This device is suitable for use as a load switch or in PWM applications.

3.Benefits

- Multi-vendor compatibility
- Easier manufacturing

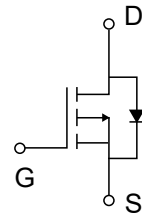
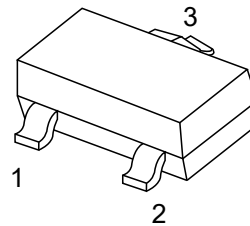
2.Features

- $V_{DS(V)} = -20V$
- $R_{DS(on)} < 54m\Omega (V_{GS} = 4.5V)$
- $R_{DS(on)} < 95m\Omega (V_{GS} = 2.5V)$

4.Pinning information

Pin	Symbol	Description
1	G	GATE
2	S	SOURCE
3	D	DRAIN

SOT-23



5.Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	-20	V
Continuous Drain Current, $V_{GS} @ -4.5V$	$T_A = 25^\circ C$	I_D	-4.3	A
Continuous Drain Current, $V_{GS} @ -4.5V$	$T_A = 70^\circ C$		-3.4	
Pulsed Drain Current		I_{DM}	-18	
Maximum Power Dissipation	$T_A = 25^\circ C$	P_D	1.3	W
Maximum Power Dissipation	$T_A = 70^\circ C$		0.8	
Linear Derating Factor			0.01	W/ $^\circ C$
Gate-to-Source Voltage		V_{GS}	± 12	V
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$



6. Thermal Resistance Rating

Parameter	Symbol	Typ	Max	Units
Junction-to-Ambient ③	$R_{\theta JA}$		100	°C/W
Junction-to-Ambient (t<10s) ④	$R_{\theta JA}$		99	°C/W

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ③ Surface mounted on 1 in square Cu board.



7. Electrical Characteristics $T_J=25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-20			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/\Delta T_J$	$I_D=-1\text{mA}$, Reference to 25°C		0.01		V/ $^\circ\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5\text{V}$, $I_D=-4.3\text{A}$ ②		42	54	m Ω
		$V_{GS}=-2.5\text{V}$, $I_D=-3.4\text{A}$ ②		71	95	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-10\mu\text{A}$	-0.4		-1.1	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=-16\text{V}$, $V_{GS}=0\text{V}$			-1	μA
		$V_{DS}=-16\text{V}$, $V_{GS}=0\text{V}$, $T_J=125^\circ\text{C}$			-150	
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=12\text{V}$			100	nA
Gate-to-Source Reverse Leakage		$V_{GS}=-12\text{V}$			-100	
Internal Gate Resistance	R_G			8.9		Ω
Forward Transconductance	g_{fs}	$V_{DS}=-10\text{V}$, $I_D=-4.3\text{A}$	6.5			S
Total Gate Charge	Q_g	$V_{DS}=-10\text{V}$		6.9		nC
Gate-to-Source Charge	Q_{gs}	$V_{GS}=-4.5\text{V}$ ②		1		
Gate-to-Drain ("Miller") Charge	Q_{gd}	$I_D=-4.3\text{A}$		2.9		
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=-10\text{V}$ ②		7		ns
Rise Time	t_r	$I_D=-1\text{A}$		12		
Turn-Off Delay Time	$t_{D(off)}$	$R_G=6.8\Omega$		34		
Fall Time	t_f	$V_{GS}=-4.5\text{V}$		25		
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$		570		pF
Output Capacitance	C_{oss}	$V_{DS}=-16\text{V}$		160		
Reverse Transfer Capacitance	C_{rss}	$f=1\text{KHz}$		110		



Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-1.3	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-18	
Diode Forward Voltage	V_{SD}		$T_J=25^{\circ}\text{C}, I_S=1.2\text{A}, V_{GS}=0\text{V}$ ②		-1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}\text{C}, V_R=30\text{V}, I_F=1.3\text{A}$		21	32	ns
Reverse Recovery Charge	Q_{rr}	$dI/dt=100\text{A}/\mu\text{s}$ ②		9	14	nC



8.1 Typical Characteristics

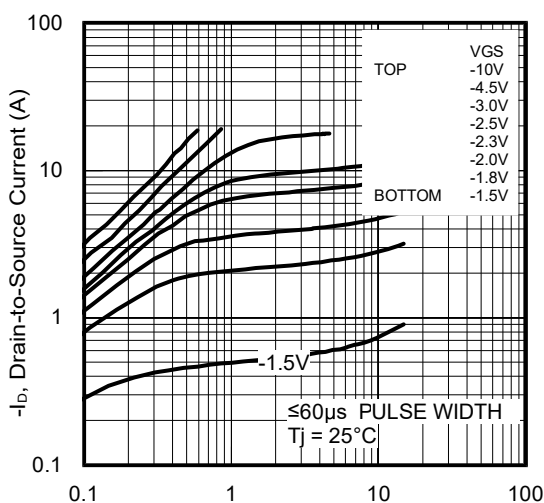


Fig 1. Typical Output Characteristics

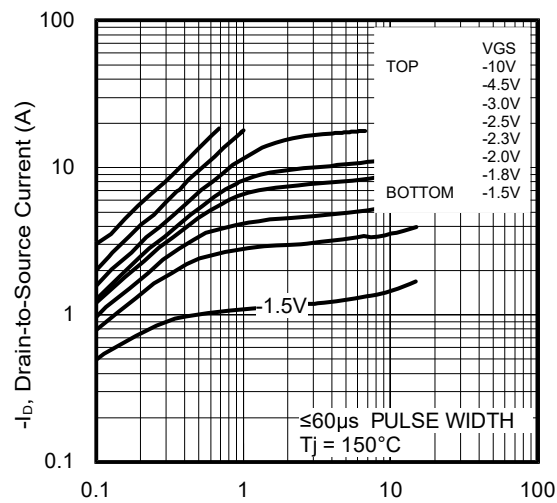


Fig 2. Typical Output Characteristics

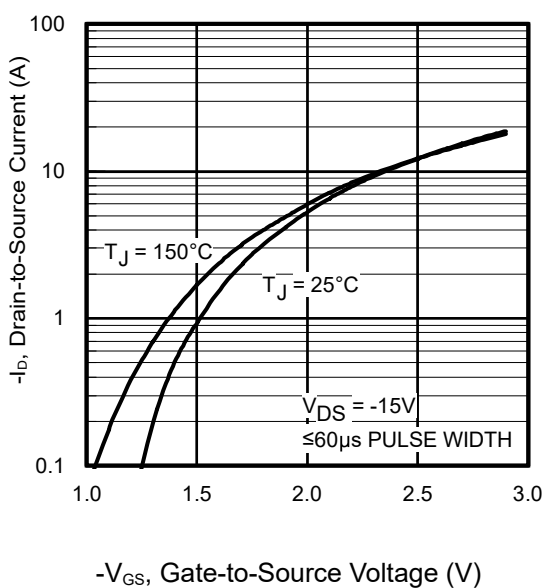


Fig 3. Typical Transfer Characteristics

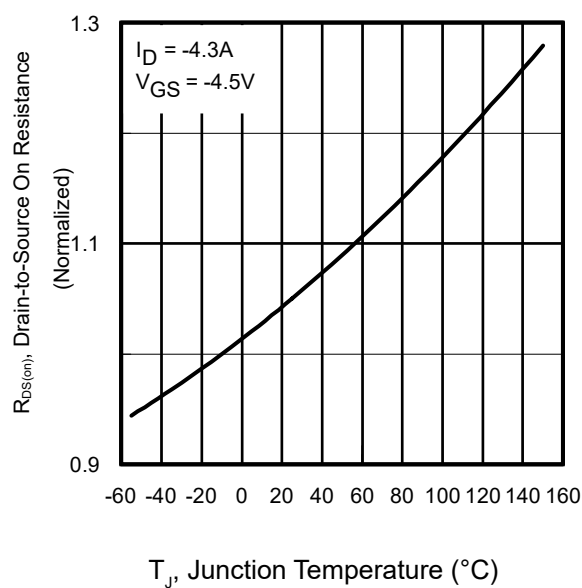
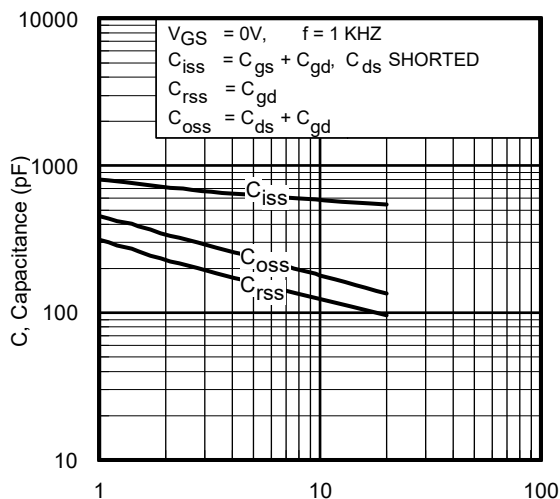


Fig 4. Normalized On-Resistance vs. Temperature

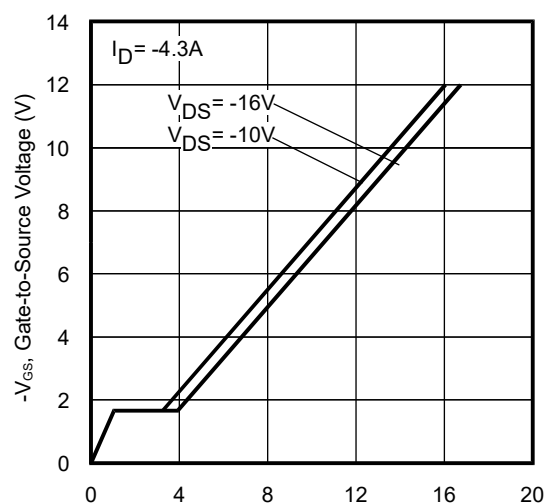


8.2 Typical Characteristics



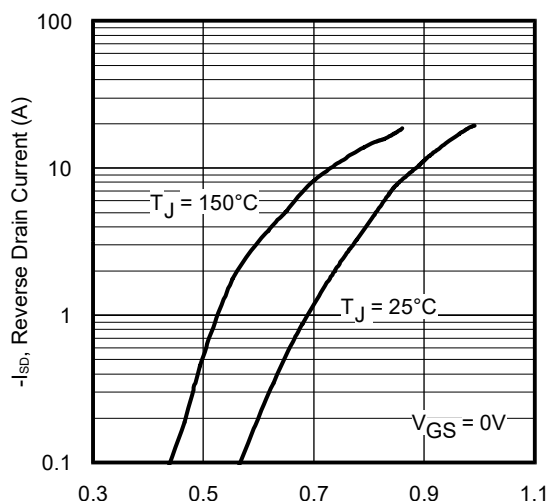
$-V_{DS}$, Drain-to-Source Voltage (V)

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



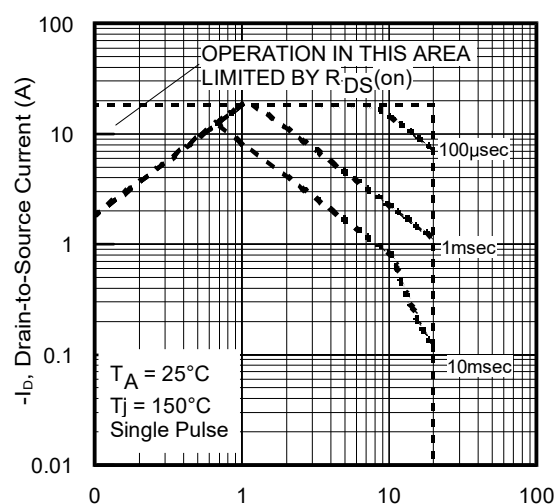
Q_G , Total Gate Charge (nC)

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



$-V_{SD}$, Source-to-Drain Voltage (V)

Fig 7. Typical Source-Drain Diode Forward Voltage

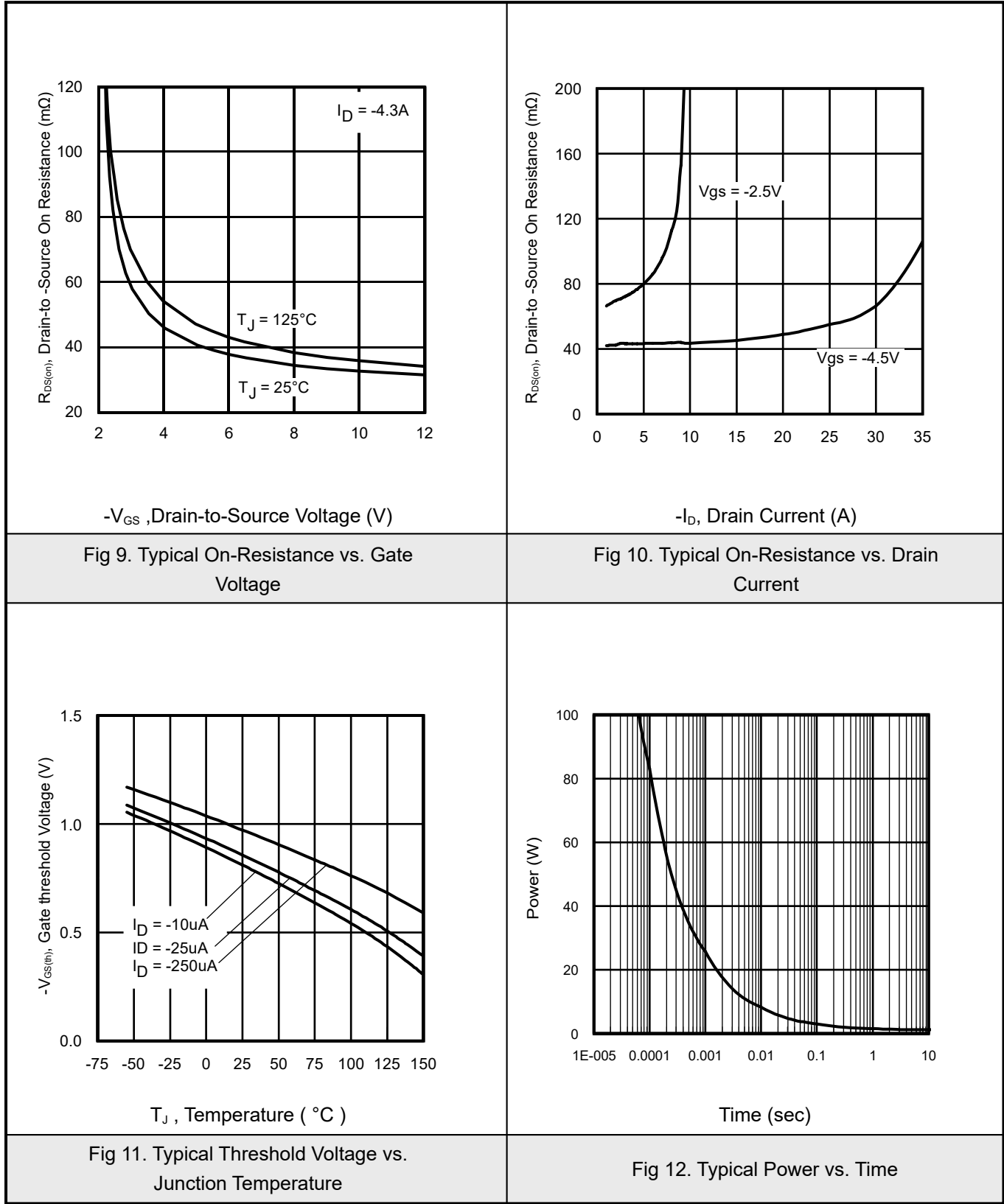


$-V_{DS}$, Drain-to-Source Voltage (V)

Fig 8. Maximum Safe Operating Area



8.3Typical Characterisitics





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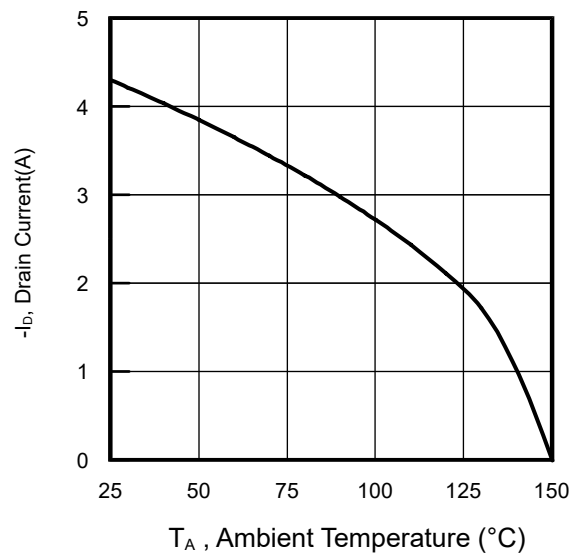


Fig 13. Maximum Drain Current vs. Ambient Temperature

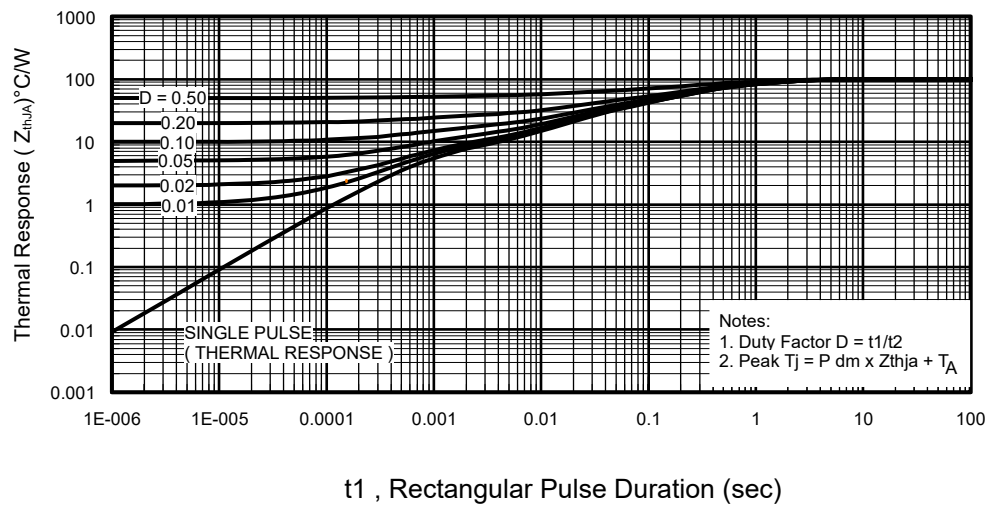


Fig 14. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

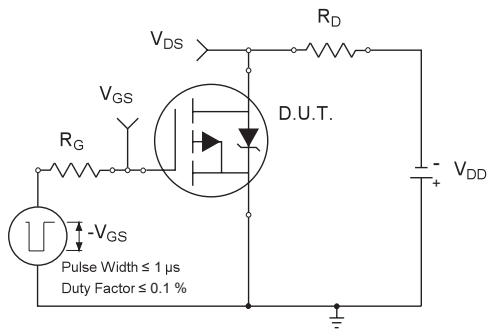


Fig 15a. Switching Time Test Circuit

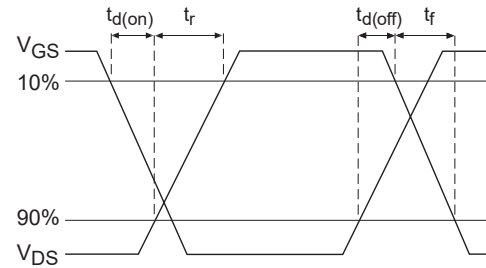


Fig 15b. Switching Time Waveforms

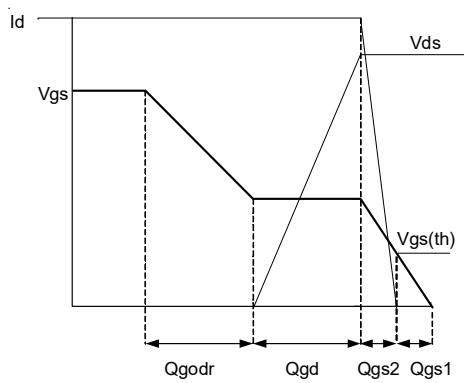


Fig 16a. Basic Gate Charge Waveform

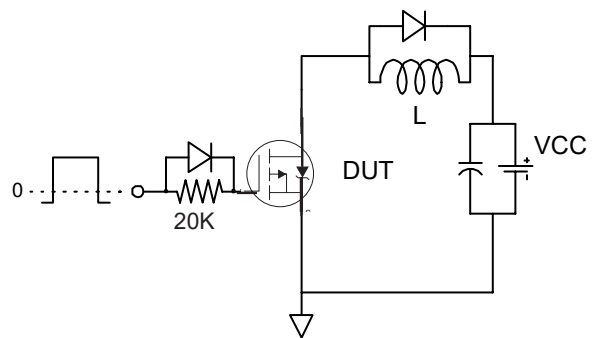
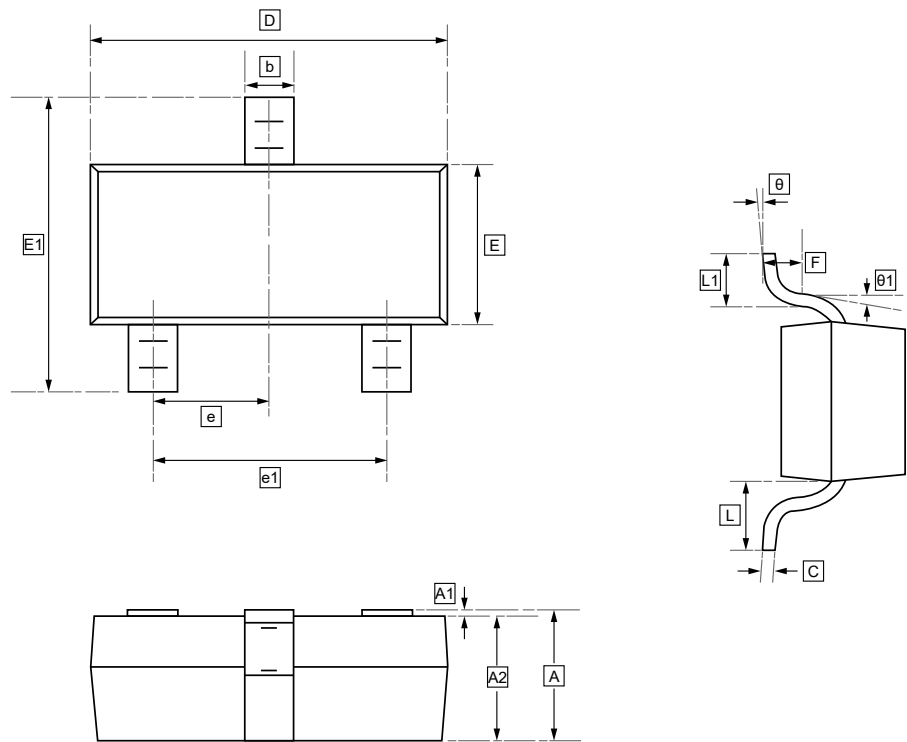


Fig 16b. Gate Charge Test Circuit



9.SOT-23 Package Outline Dimensions



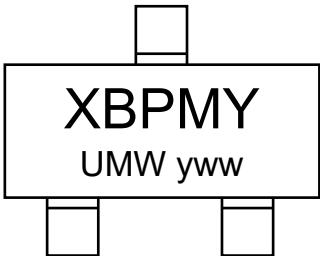
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°



10.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRLML2244TR	SOT-23	3000	Tape and reel



11.Disclaimer

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