

1.Description

The IRLML2502TR 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.

2.Features

- $V_{(BR)DSS}=20V$
- $I_D=4.2A$
- $R_{DS(ON)}<45m\Omega(V_{GS}=4.5V)$
- $R_{DS(ON)}<60m\Omega(V_{GS}=2.5V)$
- TrenchFET Power MOSFET

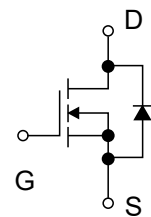
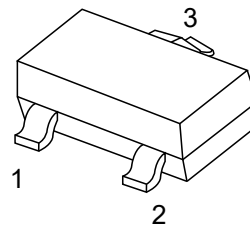
3.Application

- Load Switch for Portable Devices
- DC/DC Converter

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	Rating	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	4.2	A
Power Dissipation	P_D	1.25	W
Thermal Resistance from Junction to Ambient ($t \leq 5s$)	$R_{\theta JA}$	0.01	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~+150	$^{\circ}C$



6. $T_A=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=10\mu A$	20			V
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=50\mu A$	0.65		1.2	V
Gate-body leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 8V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Drain-source on-state resistance ^a	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=4.2A$		0.035	0.045	Ω
		$V_{GS}=2.5V, I_D=3.6A$		0.045	0.06	Ω
Forward transconductance ^a	g_{FS}	$V_{DS}=5V, I_D=3.6A$		8		S
Diode forward voltage	V_{SD}	$I_S=0.94A, V_{GS}=0V$		0.76	1.2	V
Dynamic						
Total gate charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$		4	10	nC
Gate-source charge	Q_{gs}			0.65		
Gate-drain charge	Q_{gd}			1.5		
Input capacitance ^b	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		300		pF
Output capacitance ^b	C_{oss}			120		
Reverse transfer capacitance ^b	C_{rss}			80		
Switching ^b						
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=10V$ $R_L=5.5\Omega, I_D\approx 3.6A$ $V_{GEN}=4.5V, R_G=6\Omega$		7	15	ns
Rise Time	t_r			55	80	ns
Turn-Off Delay Time	$t_{D(off)}$			16	60	ns
Fall time	t_f			10	25	ns

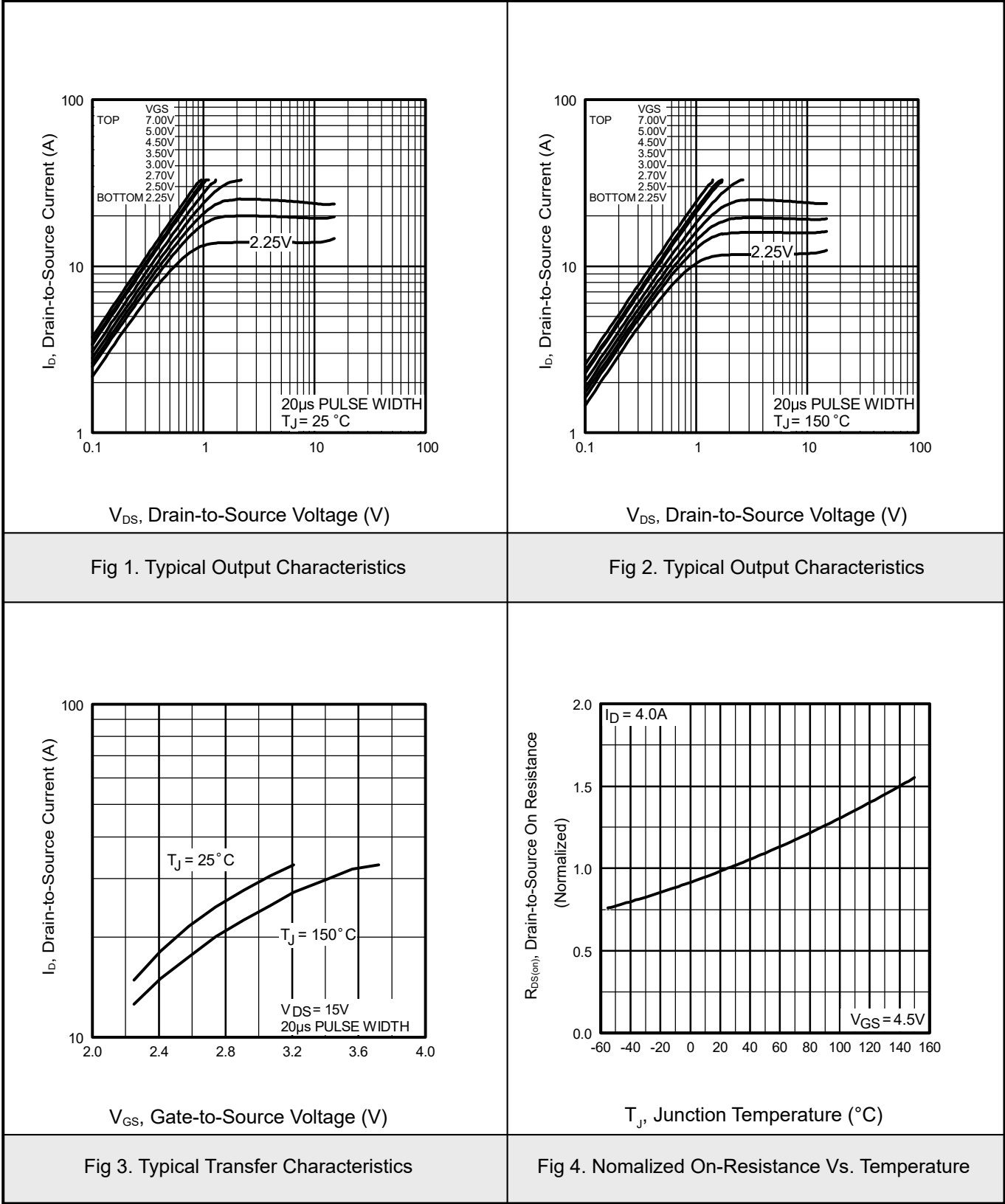
Notes :

a. Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

b. These parameters have no way to verify.

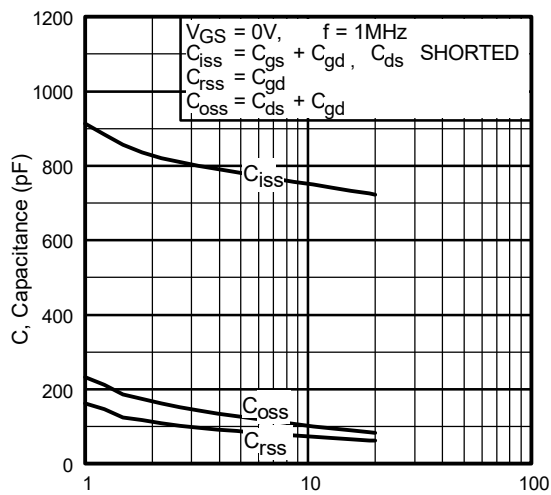


7.1 Typical Characteristics



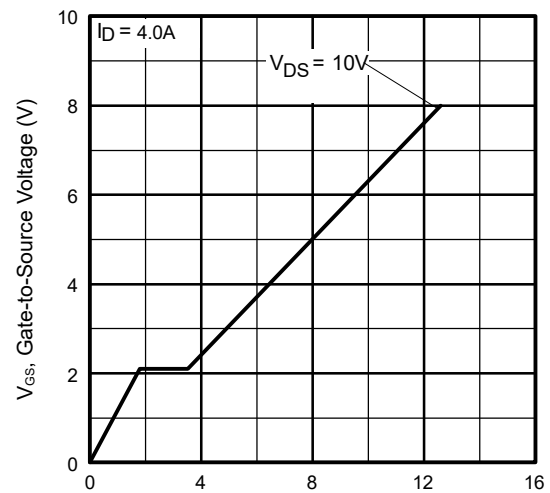


7.2 Typical Characteristics



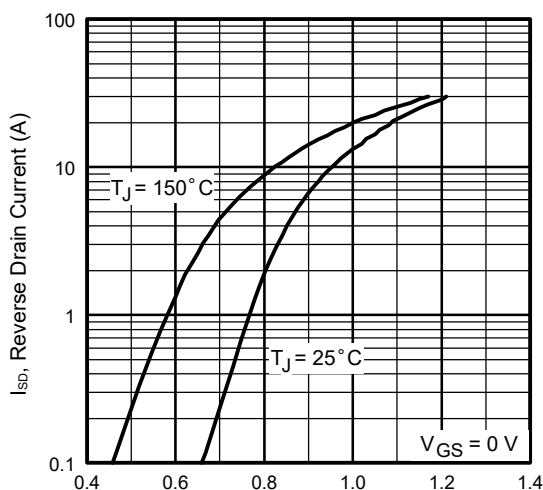
V_{DS} , Drain-to-Source Voltage (V)

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



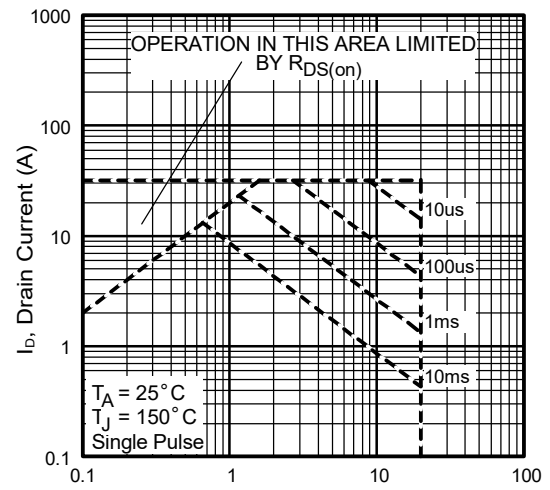
Q_g , Total Gate Charge (nC)

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

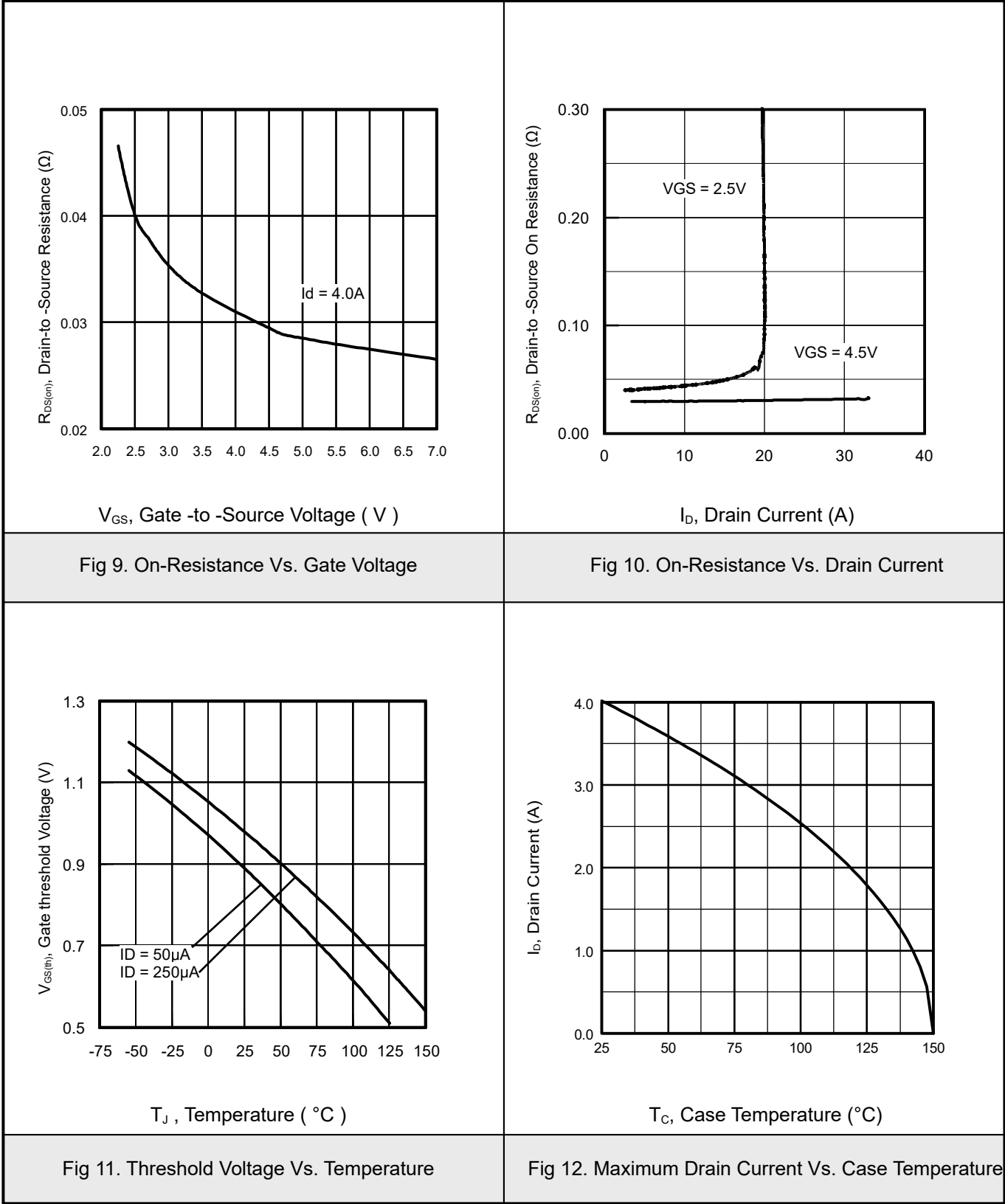


V_{DS} , Drain-to-Source Voltage (V)

Fig 8. Maximum Safe Operating Area

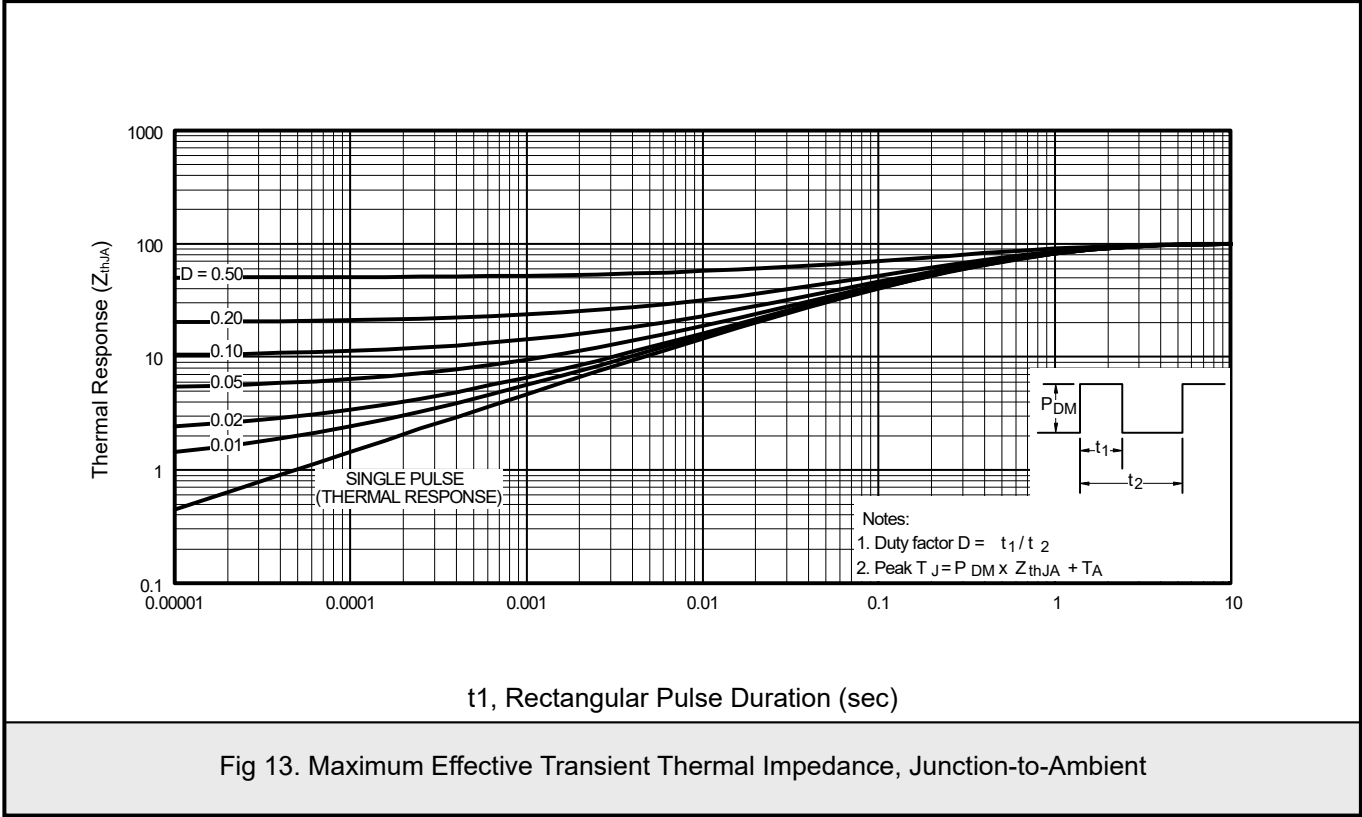


7.3 Typical Characteristics



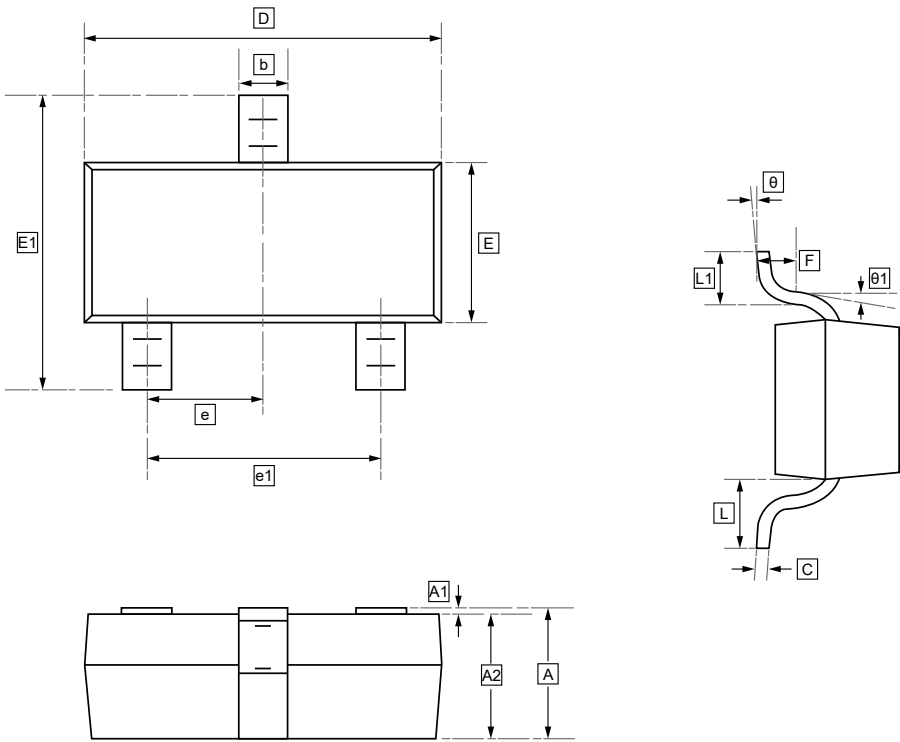


7.4 Typical Characteristics





8.SOT-23 Package Outline Dimensions



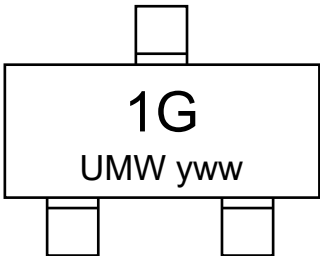
DIMENSIONS (mm are the original dimensions)

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°



9.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRLML2502TR	SOT-23	3000	Tape and reel



10.Disclaimer

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