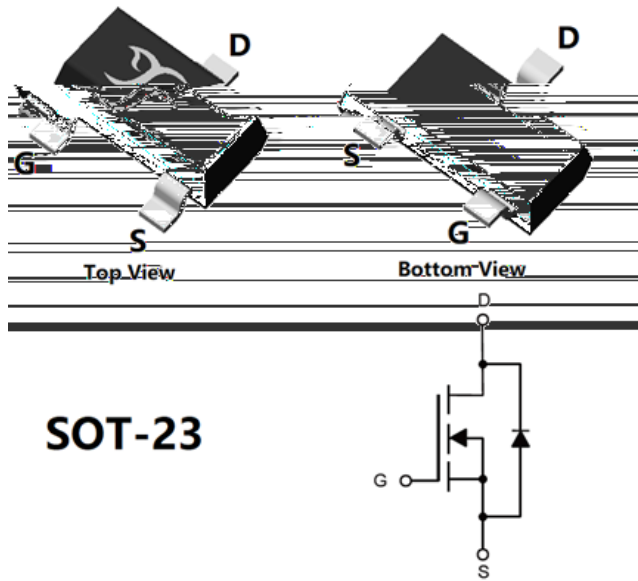




N-Channel Enhancement Mode Field Effect Transistor



SOT-23

Product Summary

V_{DS}	30V
I_D	3.5A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	45m
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	85m

General Description

Trench Power LV MOSFET technology
 High Speed switching
 Halogen Free
 Moisture Sensitivity Level 1
 Epoxy Meets UL 94 V-0 Flammability Rating
 Halogen Free

Applications

Power switching application
 Uninterruptible power supply
 DC-DC convertor

Absolute Maximum Ratings ($T_A=25$ unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-source Voltage	V_{DS}	30	V	
Gate-source Voltage	V_{GS}	± 20	V	
Drain Current	I_D	$T_A=25$	3.5	A
		$T_A=100$	2.2	
Pulsed Drain Current ^A	I_{DM}	20	A	
Total Power Dissipation ^B	P_D	$T_A=25$	1.05	W
		$T_A=100$	0.43	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 +150		

Thermal resistance

Parameter	Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^C	R_{JA}	95	115	$\text{}/W$

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL2304D	F2	2304D.	3000	30000	120000	7" reel



YJL2304D

Electrical Characteristics ($T_J=25$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=30V, V_{GS}=0V, T_J=150$	-	-	100	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.5A$	-	34	45	m
		$V_{GS}=4.5V, I_D=2A$	-	58	85	
Diode Forward Voltage	V_{SD}	$I_S=3.5A, V_{GS}=0V$	-	0.85	1.2	V
Gate resistance	R_G	$f=1MHz$	-	6	-	
Maximum Body-Diode Continuous Current	I_S		-	-	3.5	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	-	155	-	pF
Output Capacitance	C_{oss}		-	35	-	
Reverse Transfer Capacitance	C_{rss}		-	25	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=15V, I_D=3.5A$	-	4.4	-	nC
Gate-Source Charge	Q_{gs}		-	1.1	-	
Gate-Drain Charge	Q_{gd}		-	0.85	-	
Reverse Recovery Charge	Q_{rr}	$I_F=3.5A, di/dt=60A/\mu s$	-	0.7	-	nC
Reverse Recovery Time	t_{rr}		-	9.5	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=15V, I_D=3.5A$ $R_{GEN}=3$	-	1.1	-	ns
Turn-on Rise Time	t_r		-	36	-	
Turn-off Delay Time	$t_{D(off)}$		-	9.5	-	
Turn-off fall Time	t_f		-	7.5	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. P_d is based on max. junction temperature, using junction-case thermal resistance.

C. The value of R_{JA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with $T_A=25$. The maximum allowed junction temperature of 150. The value in any given application depends on the user's specific board design.



Typical Electrical and Thermal Characteristics Diagrams

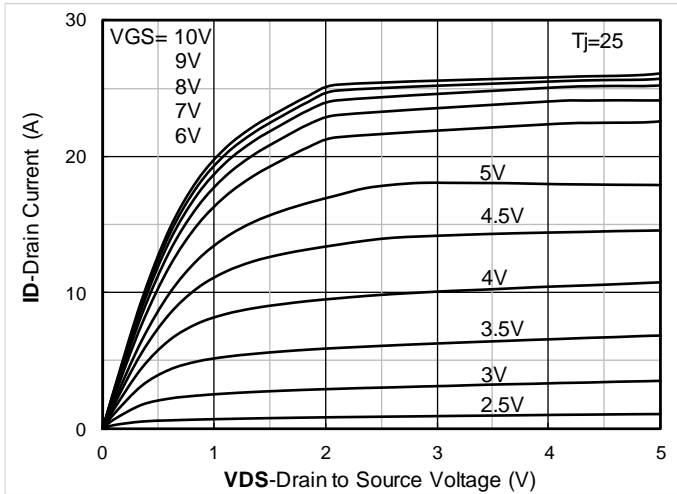


Figure 1. Output Characteristics

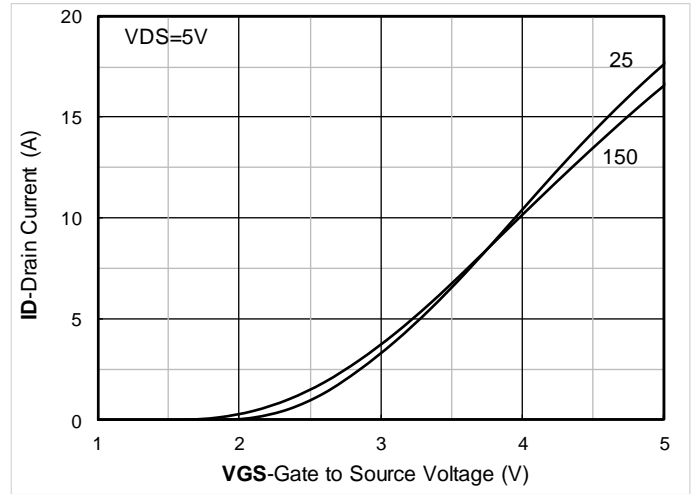


Figure 2. Transfer Characteristics

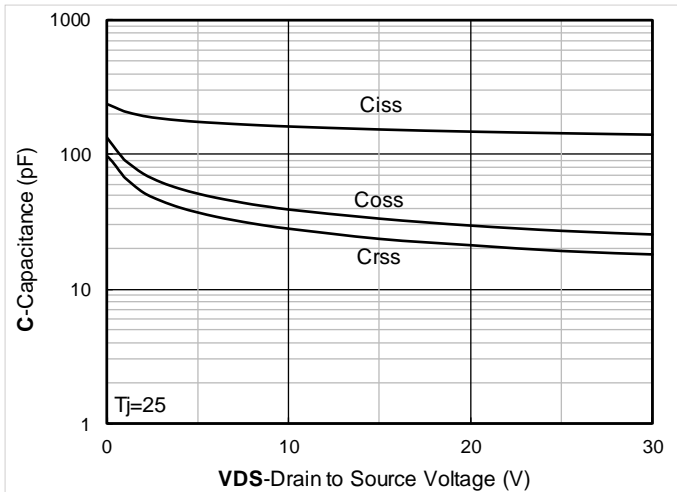


Figure 3. Capacitance Characteristics

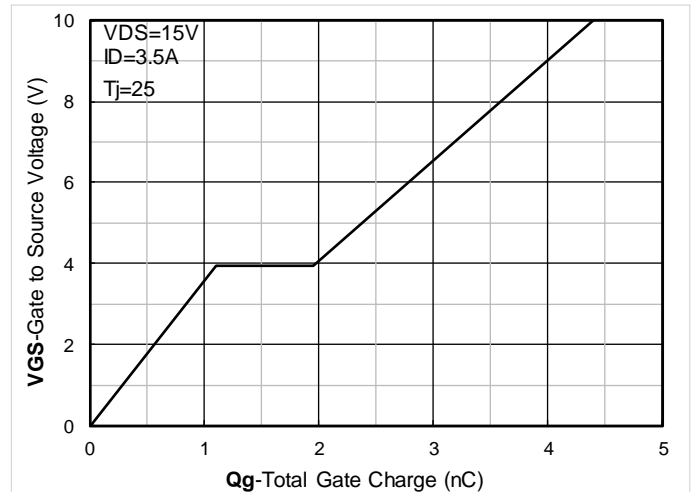


Figure 4. Gate Charge

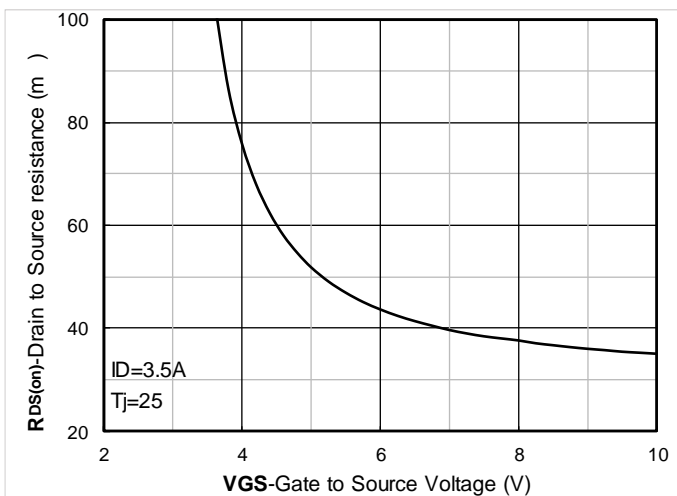


Figure 5. On-Resistance vs Gate to Source Voltage

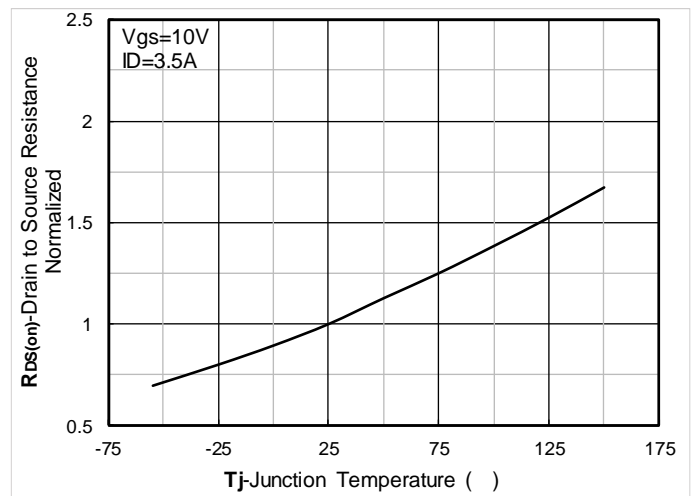


Figure 6. Normalized On-Resistance

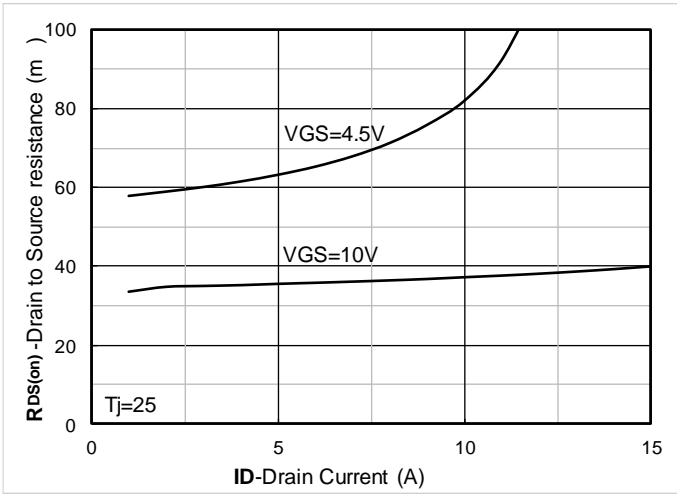


Figure 7. $R_{DS(on)}$ VS Drain Current

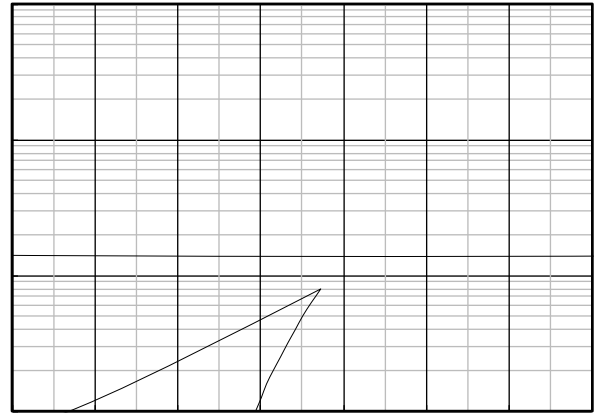


Figure 8. Forward characteristics of reverse diode

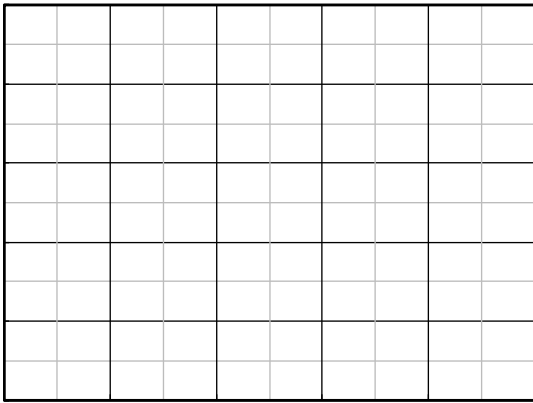


Figure 9. Normalized breakdown voltage

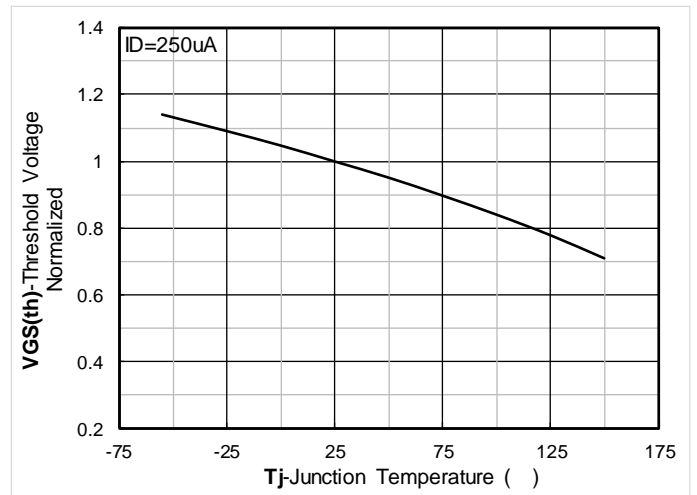


Figure 10. Normalized Threshold voltage

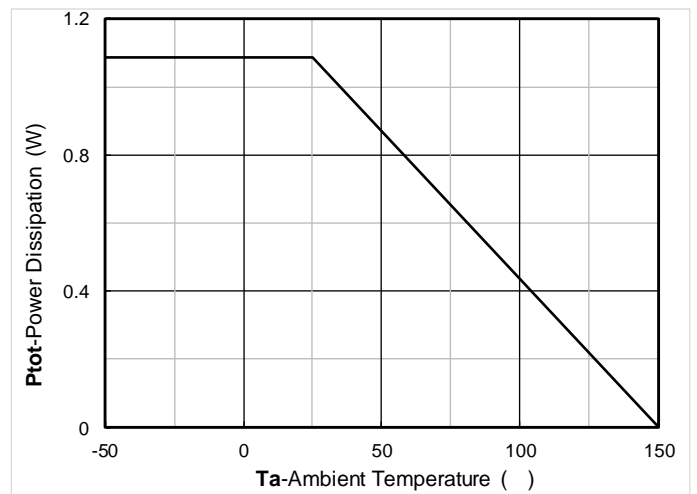


Figure 12. Power dissipation

Figure 11. Current dissipation

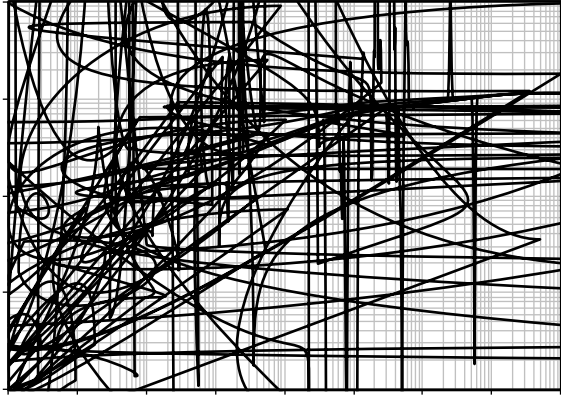


Figure 13. Maximum Transient Thermal Impedance

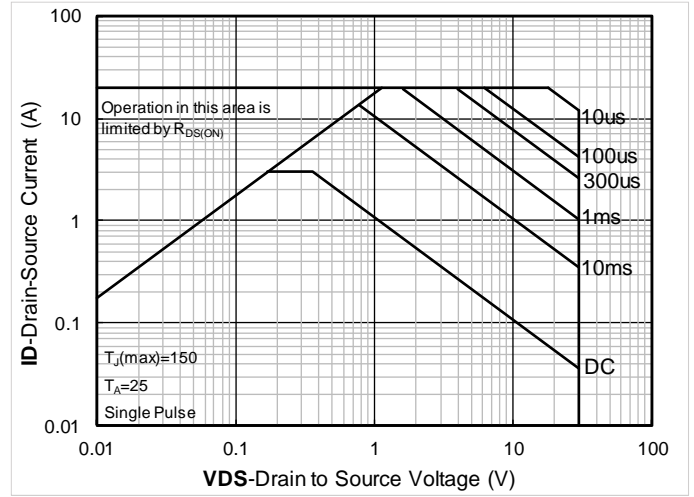


Figure 14. Safe Operation Area

Test Circuits & Waveforms

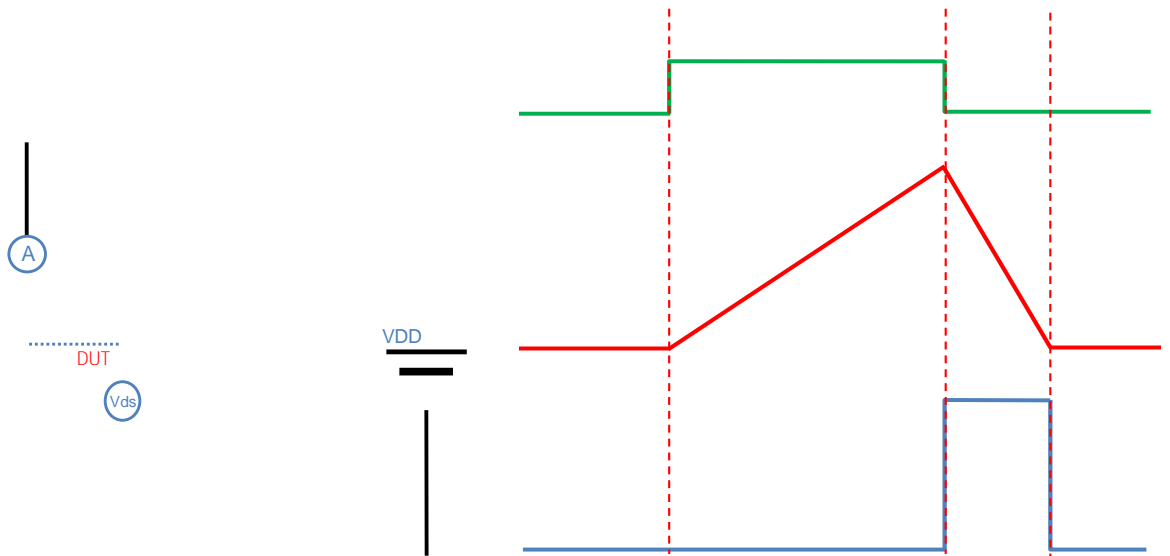


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

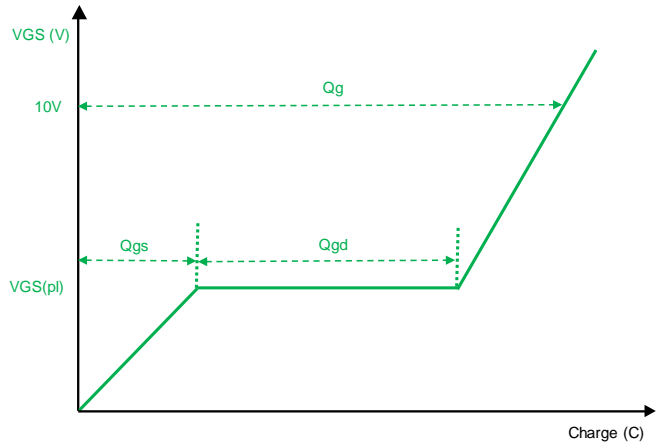
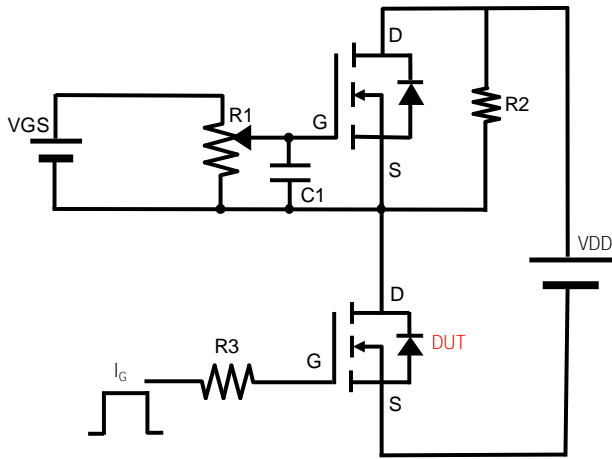


Figure B. Gate Charge Test Circuit & Waveform

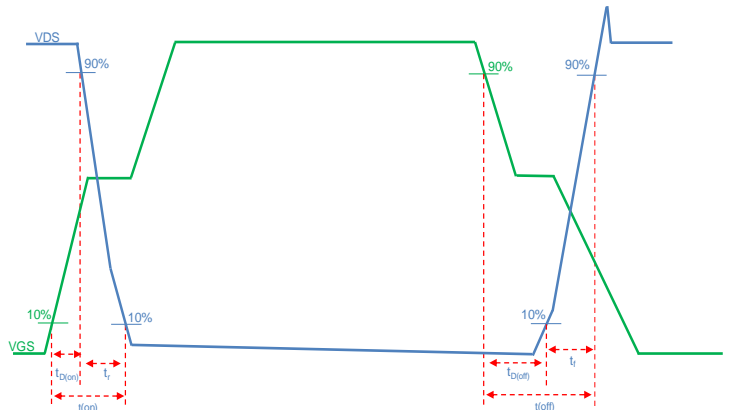
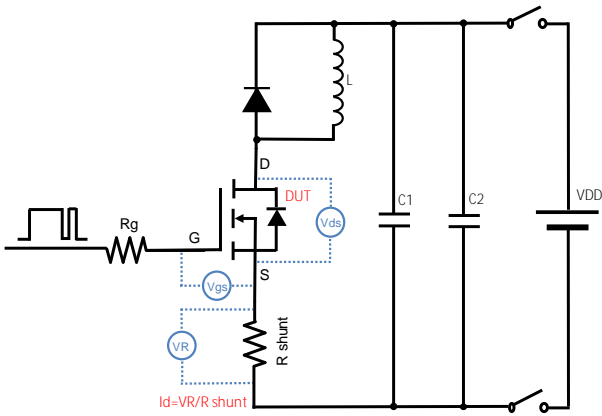


Figure C. Resistive Switching Test Circuit & Waveform

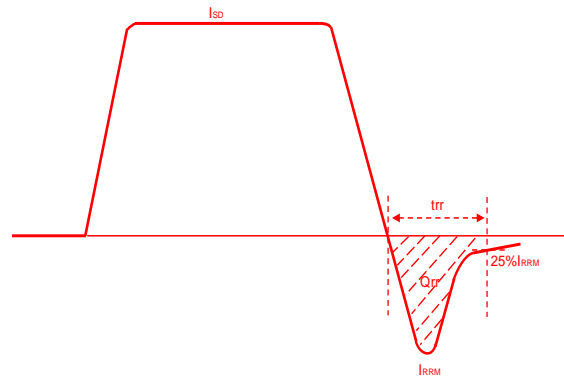
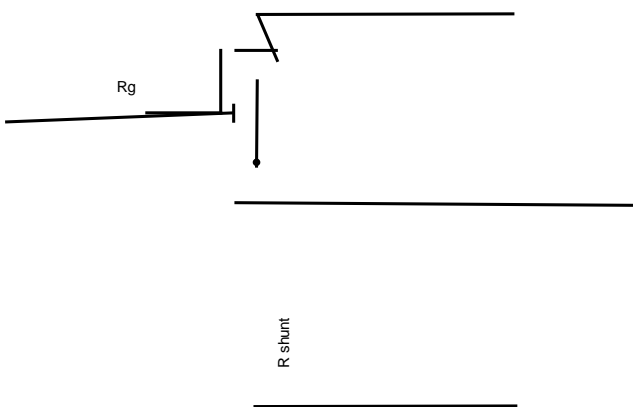
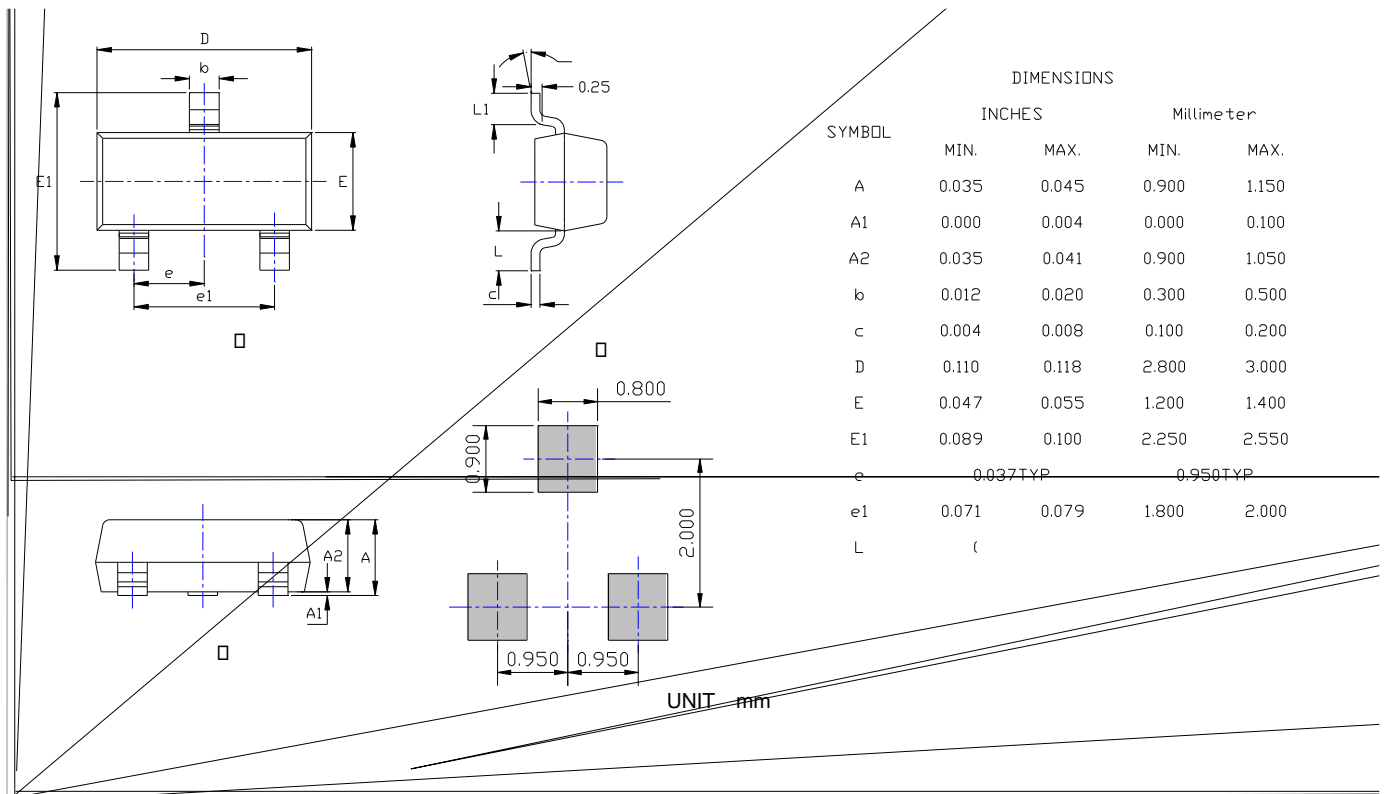


Figure D. Diode Recovery Test Circuit & Waveform



YJL2304D

SOT-23 Package Information





YJL2304D

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The product listed herein is designed to be used with ordinary electronic equipment or devices, and not501.1ces(n)- q0.00d(D93(d)-3()-94