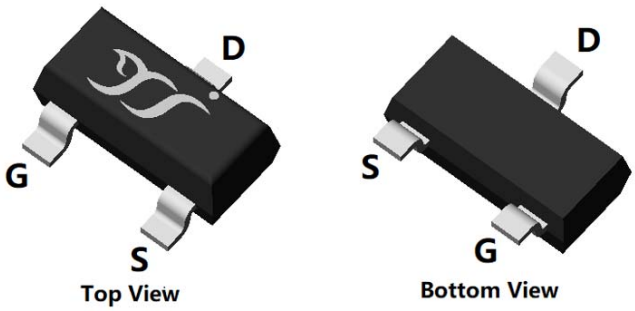
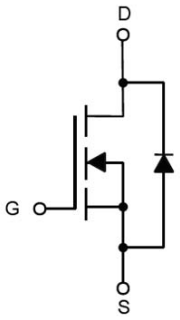
N-Channel Enhancement Mode Field Effect Transistor



SOT-23



Product Summary

- V_{DS} 20V
- I_D 6.8A
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜18mohm
- $R_{DS(ON)}$(at V_{GS}=2.5V) ＜22mohm
- $R_{DS(ON)}$(at V_{GS}=1.8V) ＜39mohm

General Description

- Trench Power LV MOSFET technology
- High Power and current handing capability
- Part no. with suffix “Q” means AEC-Q101 qualified

Applications

- PWM applications
- Load switch

■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	20	V
Gate-source Voltage		V_{GS}	±10	V
Drain Current	T_A=25℃	I_D	6.8	A
	T_A=70℃		5.4	
Pulsed Drain Current [A]		I_{DM}	27	A
Total Power Dissipation	T_A=25℃	P_D	1.25	W
	T_A=70℃		0.8	W
Thermal Resistance Junction-to-Ambient [B]		$R_{\theta JA}$	100	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL2312AQ	F2	S12.	3000	30000	120000	7“ reel

■ 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=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=6.8A		13.5	18	mΩ
		V_{GS}=2.5V, I_D=3A		17	22	
		V_{GS}=1.8V, I_D=2.5A		22	39	
Diode Forward Voltage	V_{SD}	I_S=6.8A,V_{GS}=0V			1.2	V
Gate resistance	R_G	f=1MHz		2		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1MHZ		888		pF
Output Capacitance	C_{oss}			133		
Reverse Transfer Capacitance	C_{rss}			117		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=4.5V,V_{DS}=10V,I_D=6.8A		11.05		nC
Gate-Source Charge	Q_{gs}			1.73		
Gate-Drain Charge	Q_{gd}			3.1		
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=4.5V, V_{DS}=10V, I_D=6.8A R_{GEN}=3Ω		7		ns
Turn-on Rise Time	t_r			46		
Turn-off Delay Time	$t_{D(off)}$			30		
Turn-off fall Time	t_f			52		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. The value of $R_{\theta JA}$ is measured with the device mounted on the minimum recommend pad size, 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 Performance Characteristics

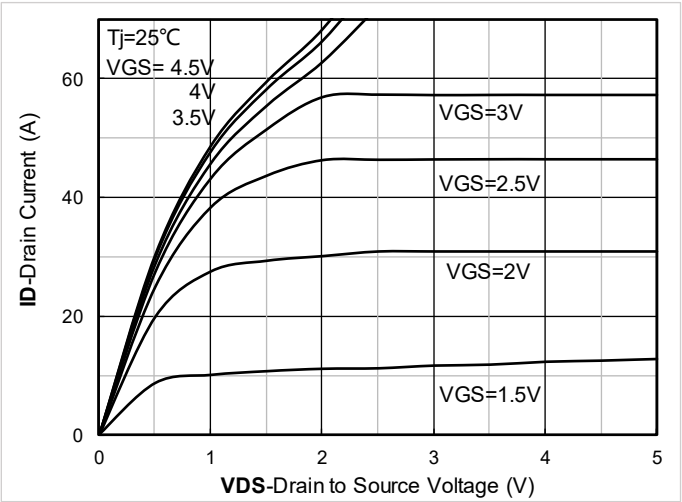


Figure1. Output Characteristics

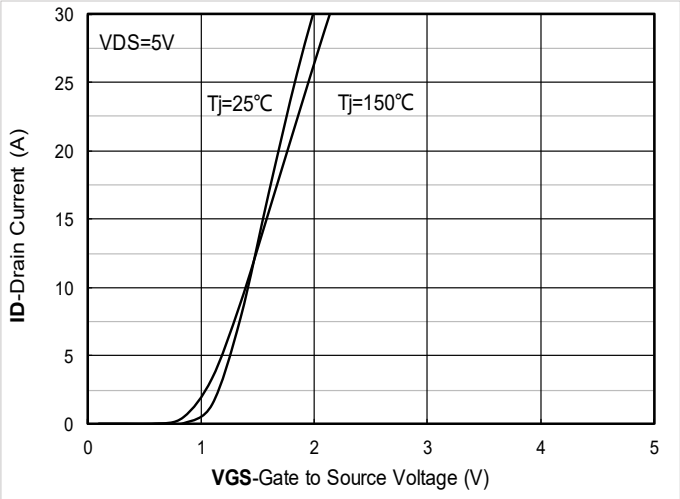


Figure2. Transfer Characteristics

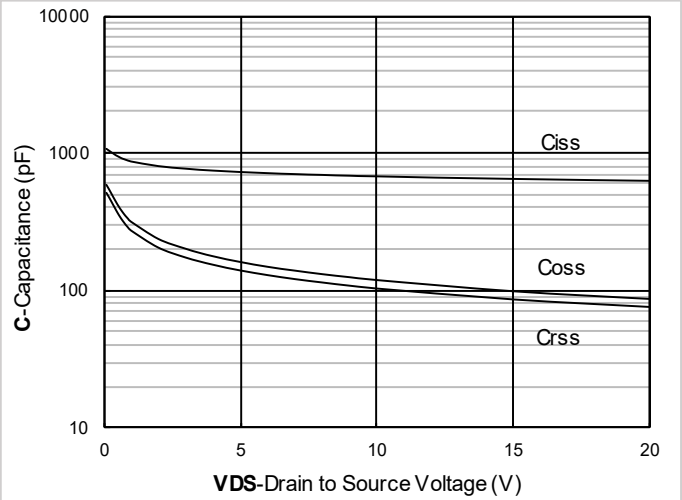


Figure3. Capacitance Characteristics

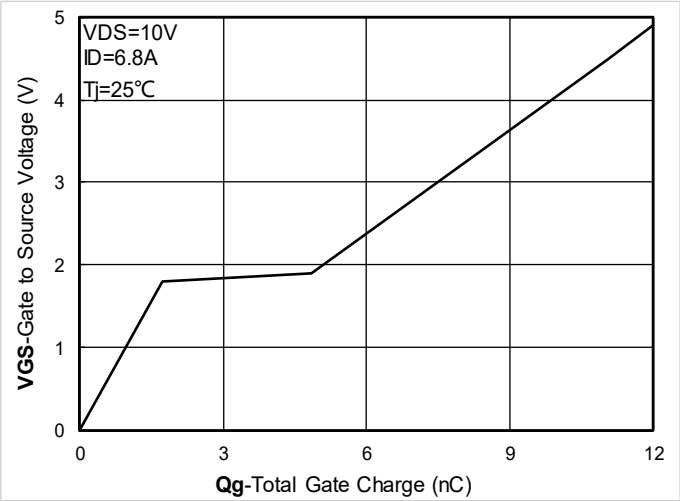


Figure4. Gate Charge

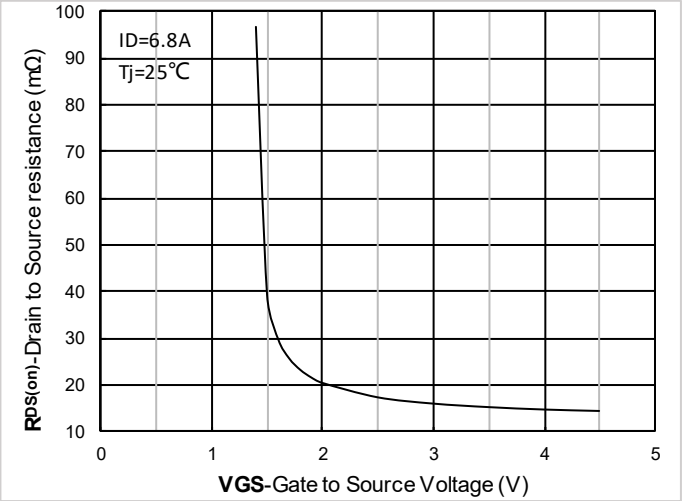


Figure5. On-Resistance vs Gate to Source Voltage

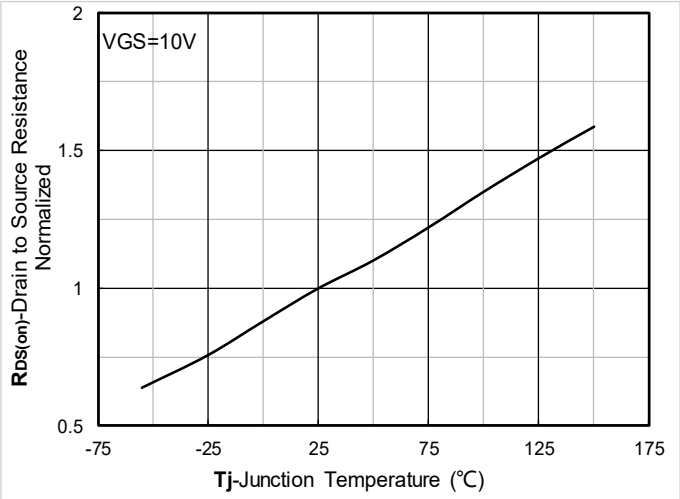


Figure6. Normalized On-Resistance

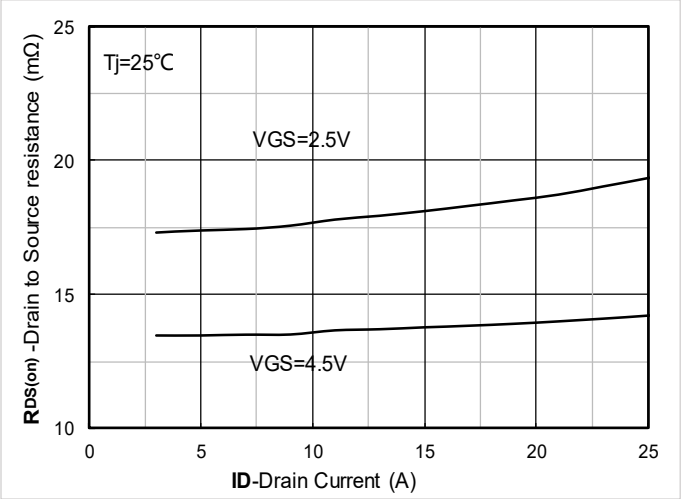


Figure 7. $R_{DS(on)}$ VS Drain Current

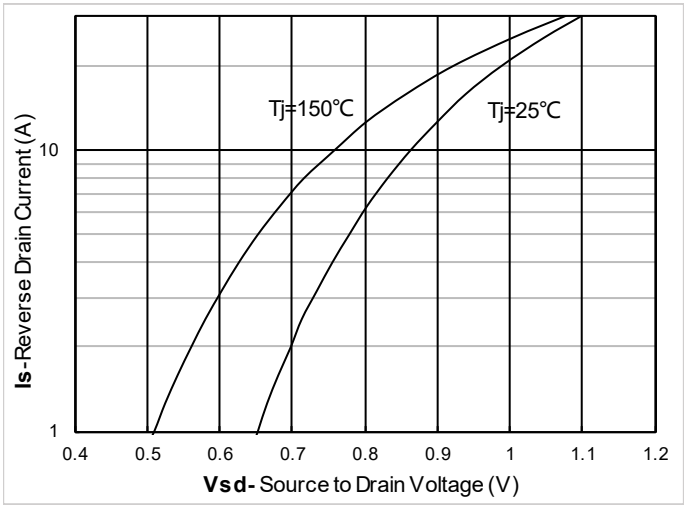


Figure 8. Forward characteristics of reverse diode

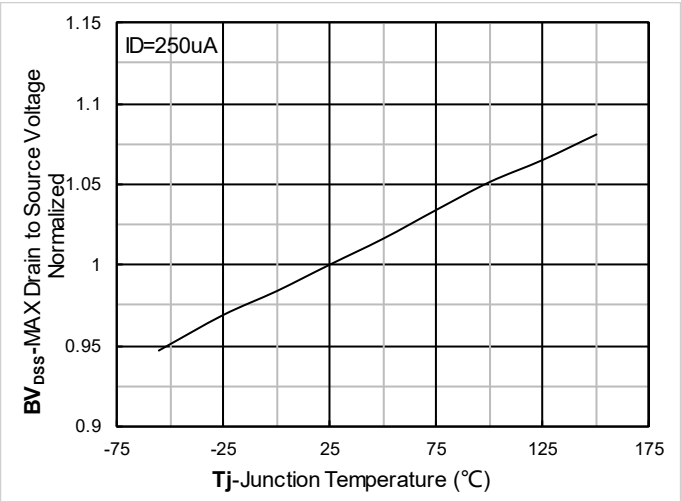


Figure 9. Normalized breakdown voltage

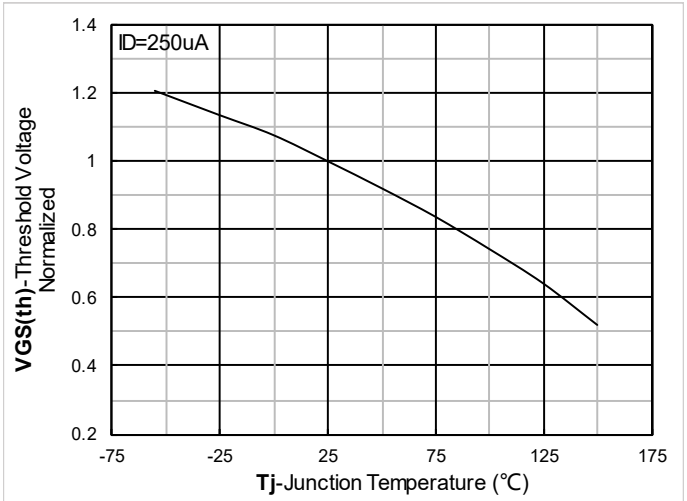


Figure 10. Normalized Threshold voltage

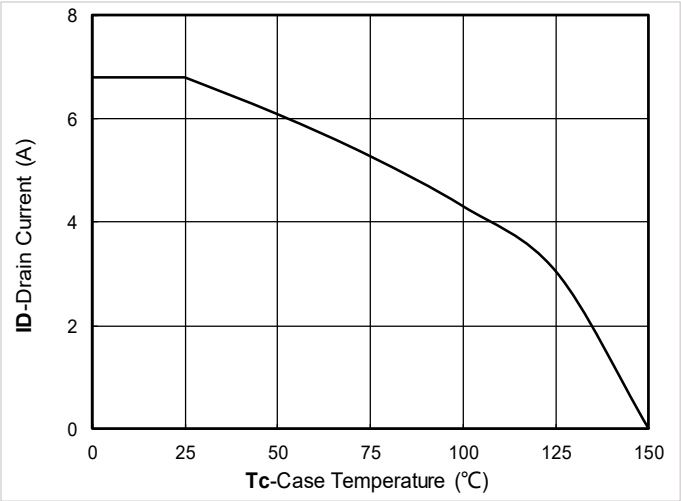


Figure 11. Current dissipation

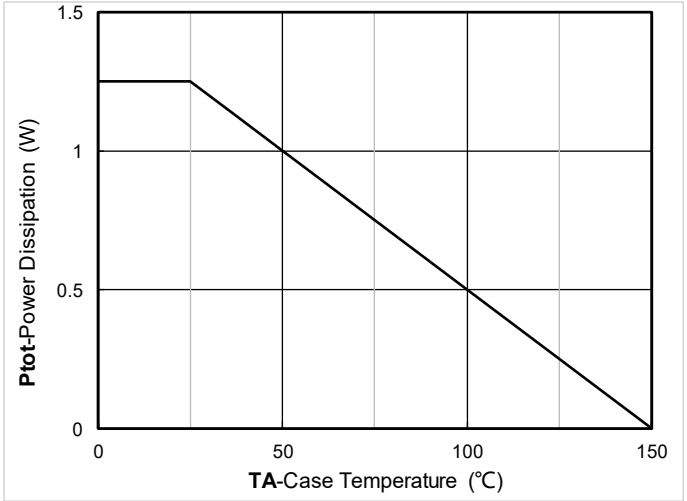


Figure 12. Power dissipation

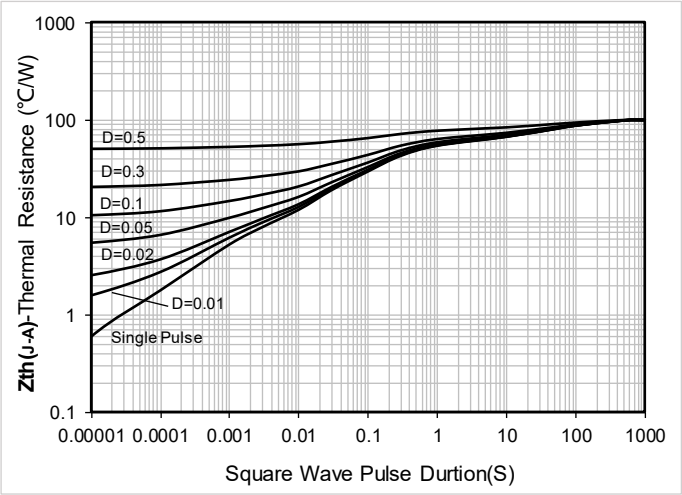


Figure 13. Maximum Transient Thermal Impedance

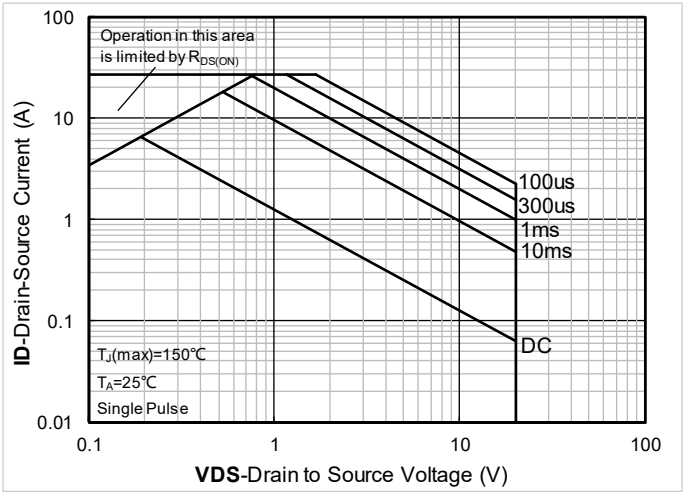


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

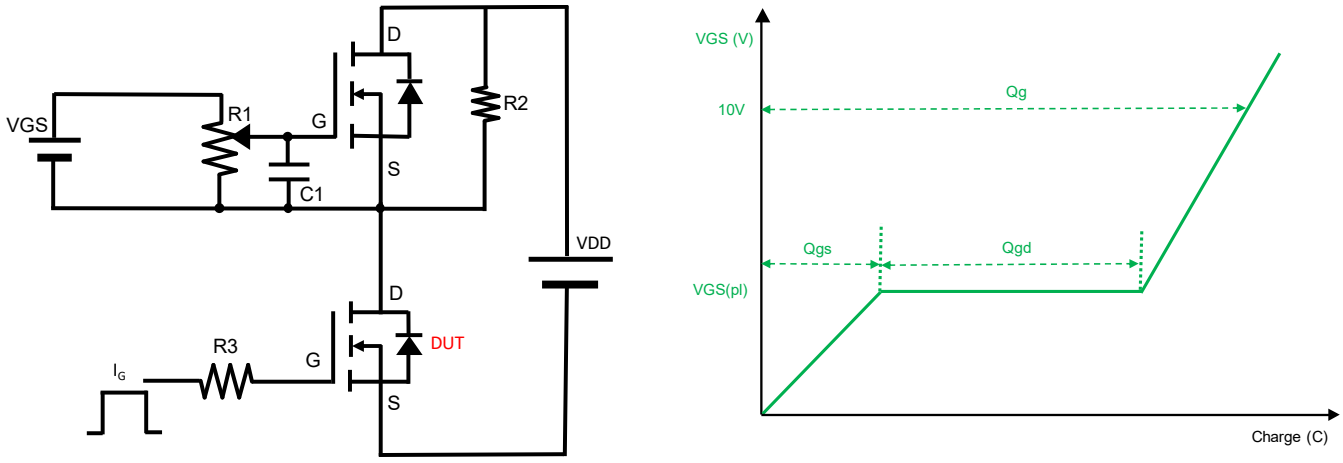


Figure A. Gate Charge Test Circuit & Waveform

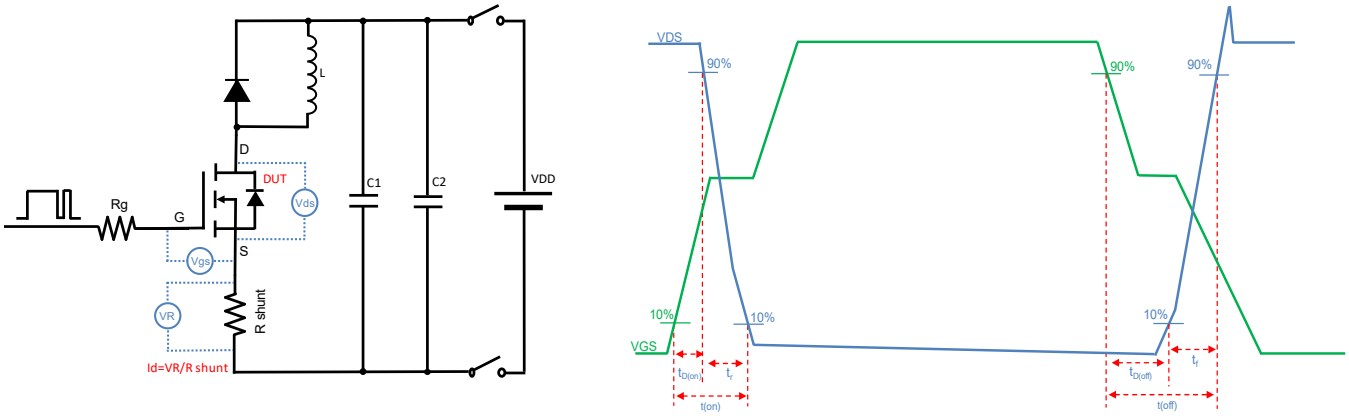


Figure B. Resistive Switching Test Circuit & Waveform

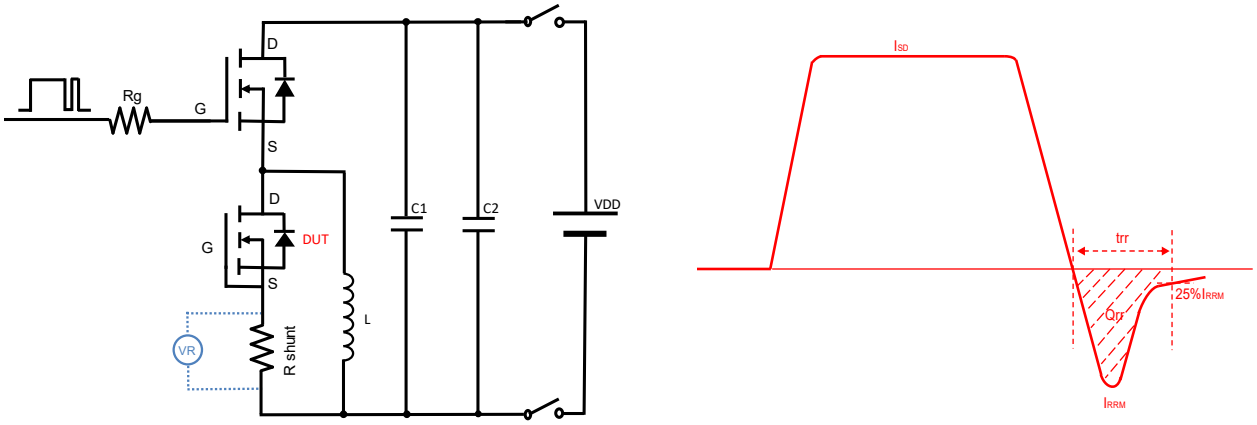
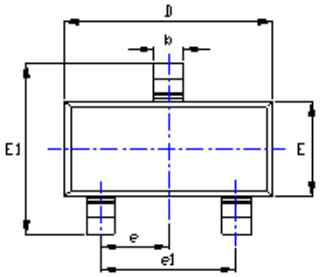
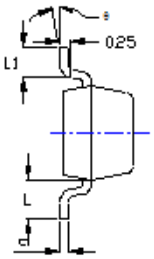


Figure C. Diode Recovery Test Circuit & Waveform

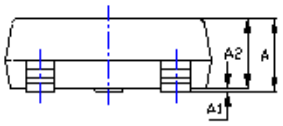
■ SOT-23 Package information



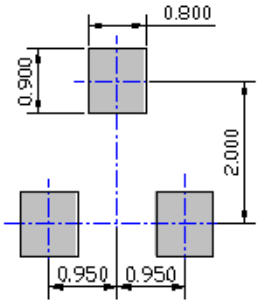
TOP VIEW



SIDE VIEW



SIDE VIEW



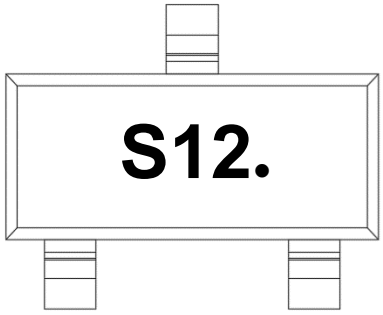
UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.045	0.900	1.150
A1	0.000	0.004	0.000	0.100
A2	0.035	0.041	0.900	1.050
b	0.012	0.020	0.300	0.500
c	0.004	0.008	0.100	0.200
D	0.110	0.118	2.800	3.000
E	0.047	0.055	1.200	1.400
E1	0.089	0.100	2.250	2.550
e	0.037TYP		0.950TYP	
e1	0.071	0.079	1.800	2.000
L	0.022REF		0.550REF	
L1	0.012	0.020	0.300	0.500
θ	0°	8°	0°	8°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

■ Marking Information



Note:
1. All marking is at middle of the product body
2. All marking is in laser marking
3. S12 is Marking Code
4. Body color: Black

Disclaimer

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