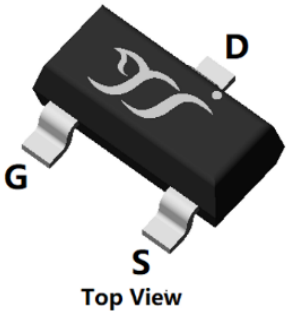
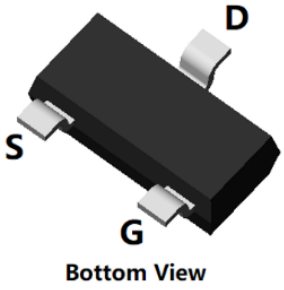
P-Channel Enhancement Mode Field Effect Transistor

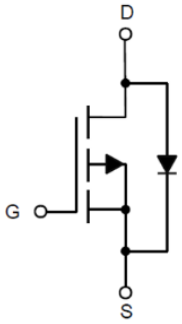


Top View



Bottom View

SOT-23



Product Summary

- V_{DS} -30V
- I_D -4.4A
- $R_{DS(ON)}$(at V_{GS}=-10V) ＜55mohm
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜68mohm
- $R_{DS(ON)}$(at V_{GS}=-2.5V) ＜96mohm

General Description

- Trench Power LV MOSFET technology
- High density cell design for Low RDS(ON)
- High Speed switching
- Part no. with suffix “Q” means AEC-Q101 qualified

Applications

- Battery protection
- Power management
- Load switch
- 12V Automotive systems

■ 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}	±12	V
Drain Current	T_A=25℃	I_D	-4.4	A
	T_A=125℃		-1.9	
Pulsed Drain Current [A]		I_{DM}	-27	A
Total Power Dissipation	T_A=25℃	P_D	1.2	W
	T_A=125℃		0.2	W
Thermal Resistance Junction-to-Ambient [B]		$R_{\theta JA}$	104	℃/ 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
YJL3401AQ	F2	3401.	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	-30			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	-0.6	-0.9	-1.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.4A		45.5	55	mΩ
		V_{GS}=-4.5V, I_D=-4A		52	68	
		V_{GS}=-2.5V, I_D=-2A		64	96	
Diode Forward Voltage	V_{SD}	I_S=-4.4A,V_{GS}=0V			-1.2	V
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-15V,V_{GS}=0V,f=1MHZ		1040		pF
Output Capacitance	C_{oss}			80		
Reverse Transfer Capacitance	C_{rss}			68		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V,I_D=-4.4A		18		nC
Gate-Source Charge	Q_{gs}			2.85		
Gate-Drain Charge	Q_{gd}			1.5		
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V, V_{DS}=-15V, I_D=-4.4A R_{GEN}=3Ω		5.0		ns
Turn-on Rise Time	t_r			30		
Turn-off Delay Time	$t_{D(off)}$			29		
Turn-off fall Time	t_f			48		

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

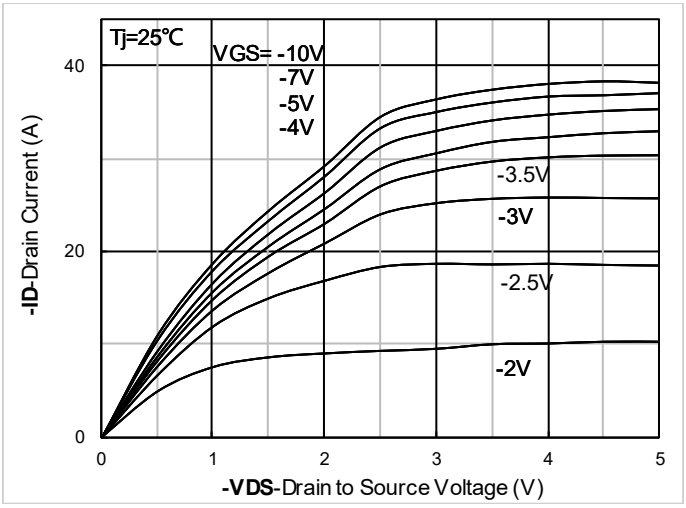


Figure1. Output Characteristics

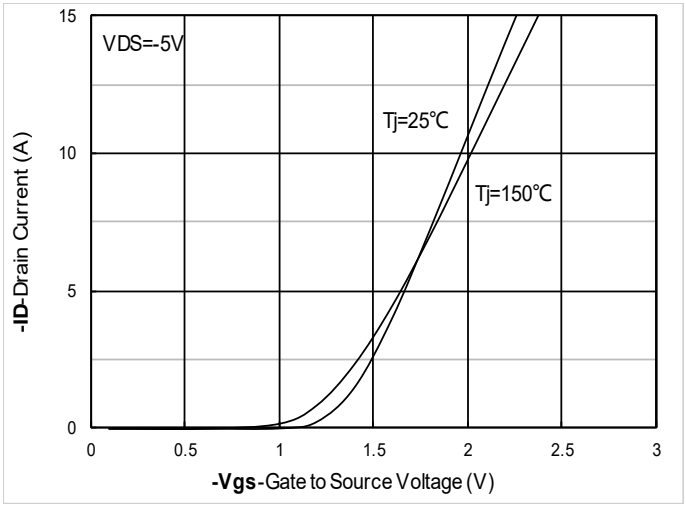


Figure2. Transfer Characteristics

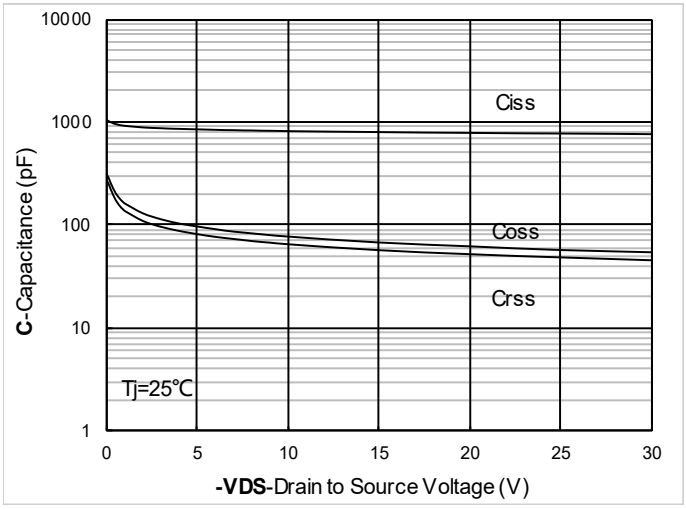


Figure3. Capacitance Characteristics

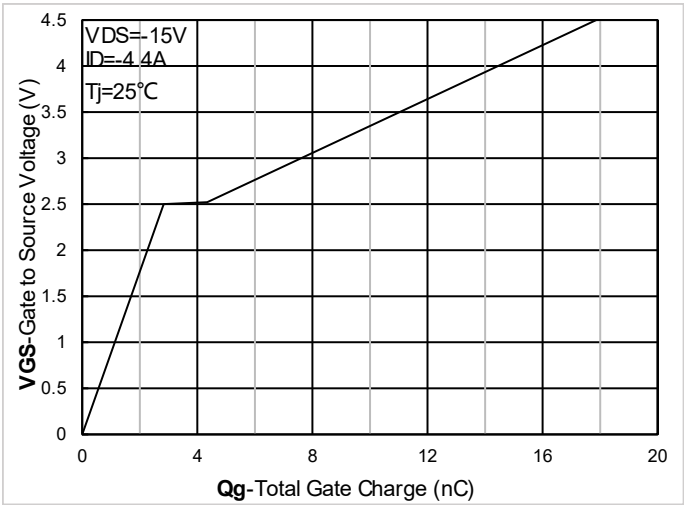


Figure4. Gate Charge

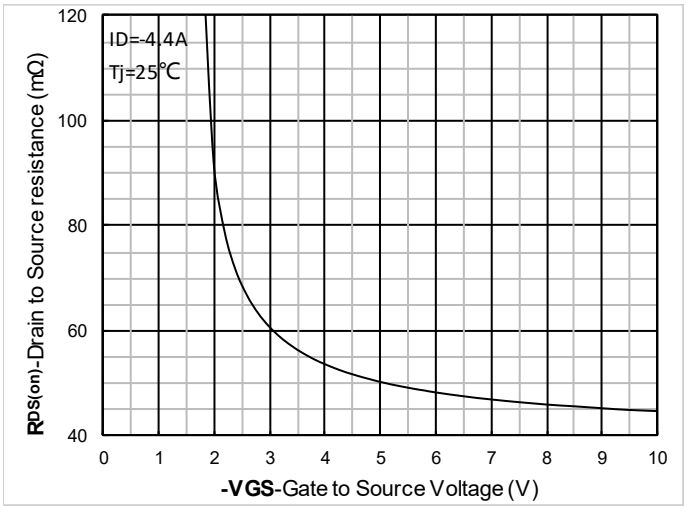


Figure5. On-Resistance vs Gate to Source Voltage

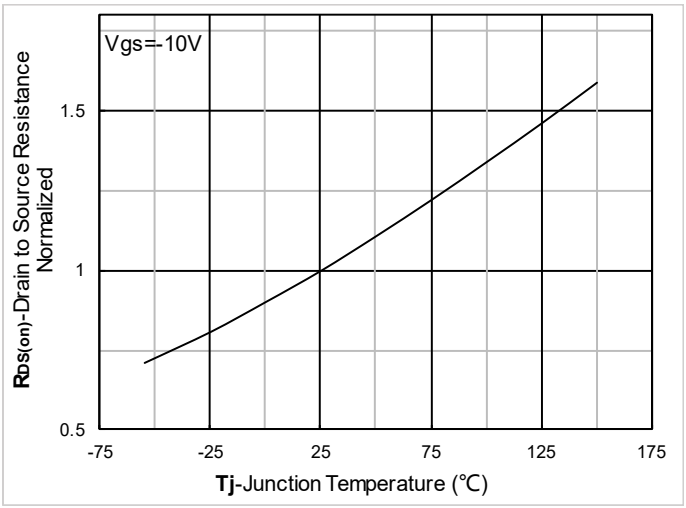


Figure6. Normalized On-Resistance

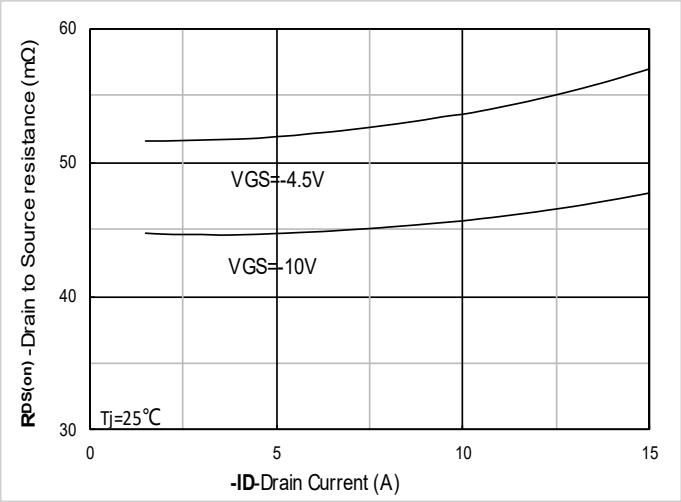


Figure 7. $R_{DS(on)}$ VS Drain Current

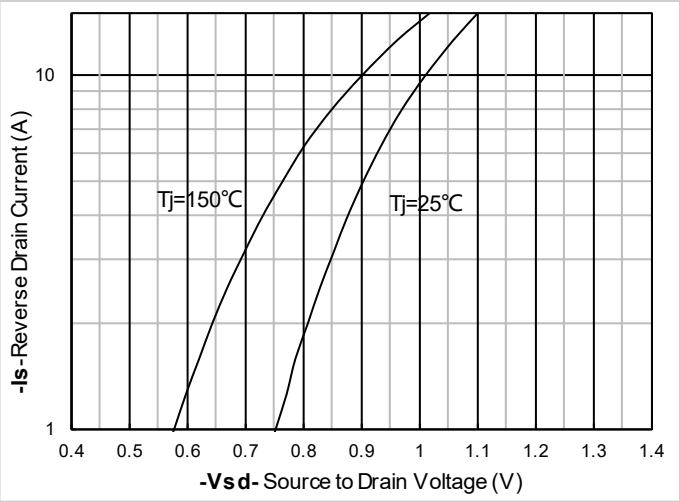


Figure 8. Forward characteristics of reverse diode

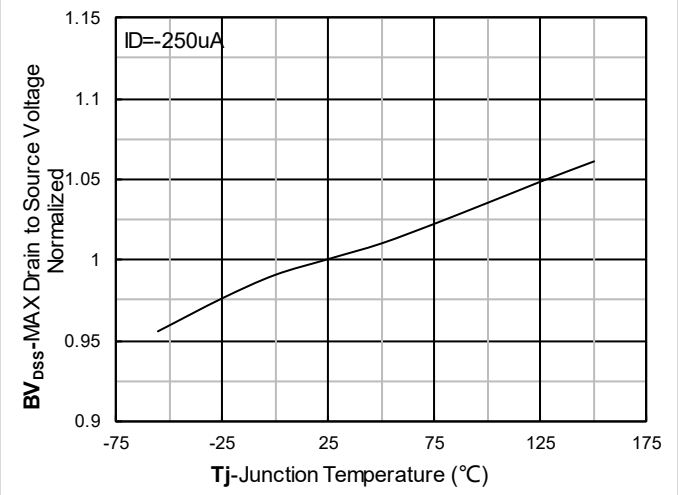


Figure 9. Normalized breakdown voltage

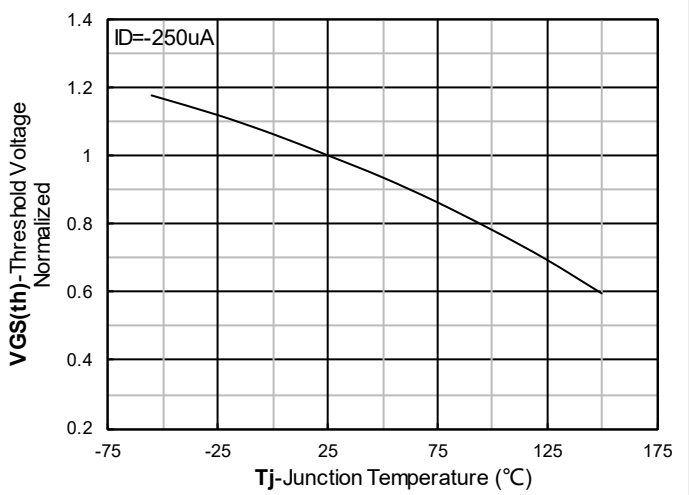


Figure 10. Normalized Threshold voltage

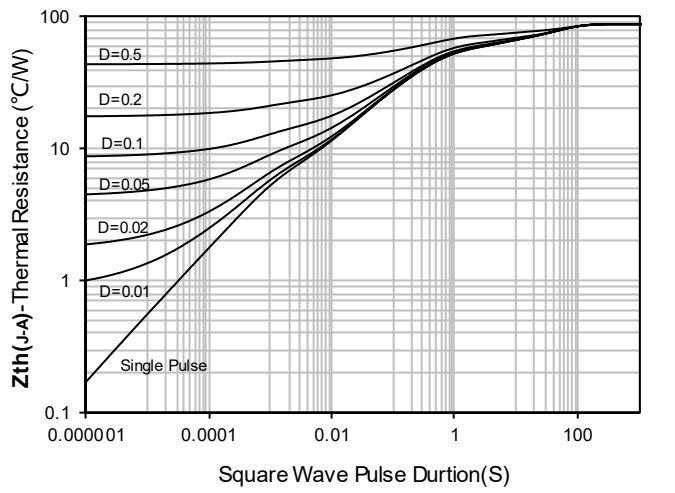


Figure 11. Maximum Transient Thermal Impedance

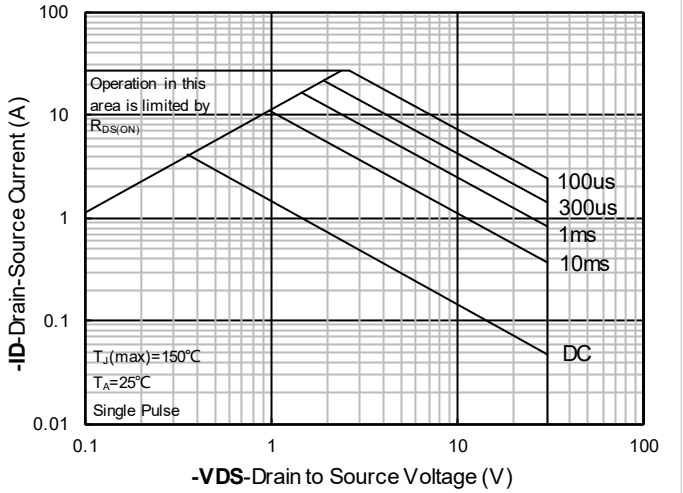


Figure 12. Safe Operation Area

■ Test Circuits & Waveforms

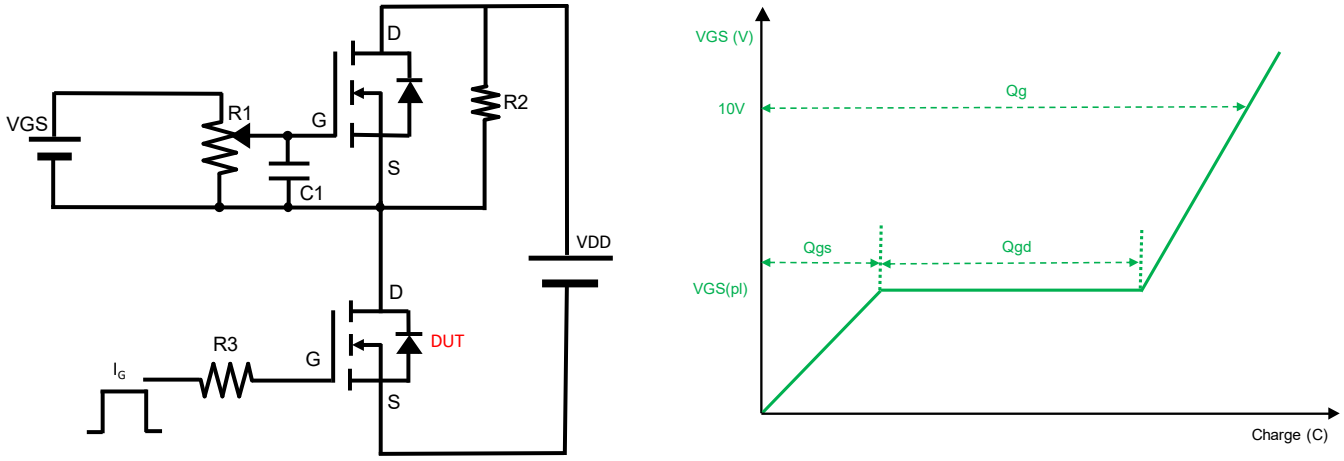


Figure A. Gate Charge Test Circuit & Waveform

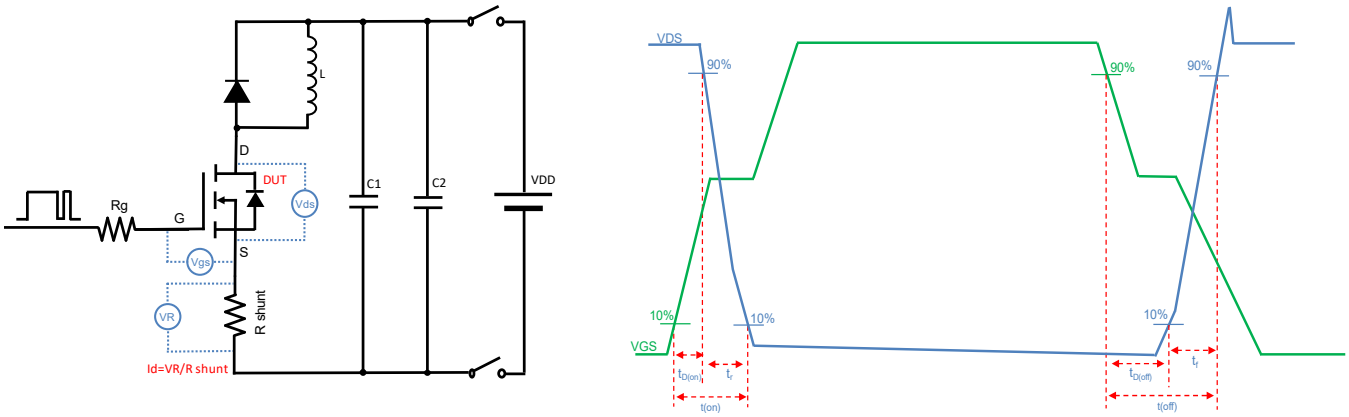


Figure B. Resistive Switching Test Circuit & Waveform

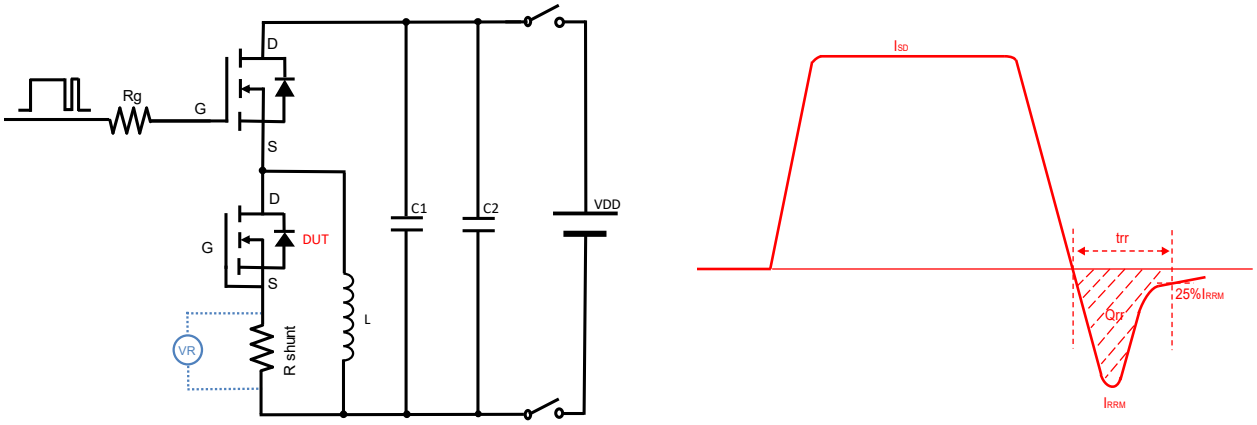
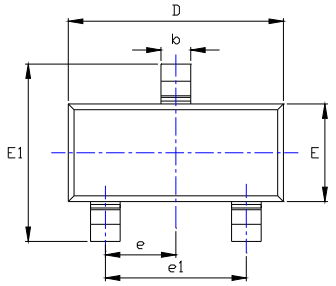
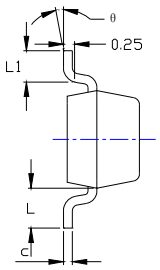


Figure C. Diode Recovery Test Circuit & Waveform

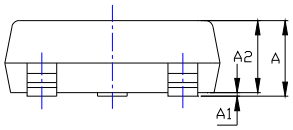
■ SOT-23 Package information



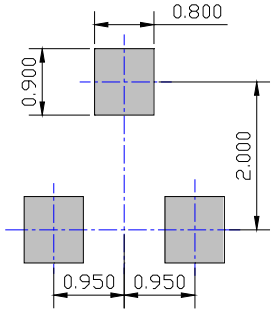
TOP VIEW



SIDE VIEW



SIDE VIEW



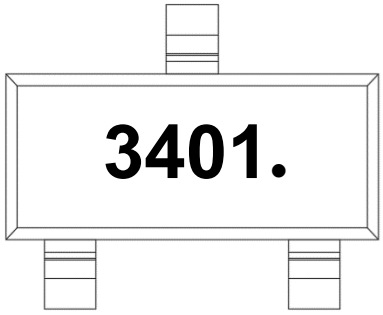
UNIT：mm

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. 3401 is Marking Code
4. Body color: Black

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