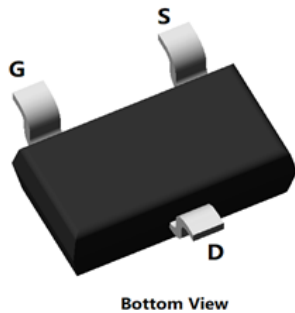
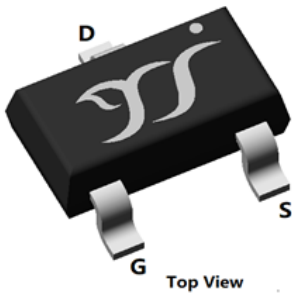
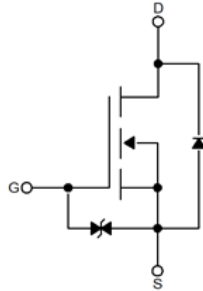


N-Channel Enhancement Mode Field Effect Transistor



SOT-23-3L



Product Summary

- V_{DS} 30V
- I_D 5.3A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<20m\Omega$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) $<32m\Omega$
- ESD Protected Up to 1KV (HBM)

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Limiting Values

Parameter	Conditions	Symbol	Min	Max	Unit	
Drain-source Voltage		V_{DS}	-	30	V	
Gate-source Voltage		V_{GS}	-20	20		
Continuous Drain Current (Note 1,2)	Steady-State	I_D	$T_A=25^\circ C, V_{GS}=10V$	-	5.3	A
			$T_A=100^\circ C, V_{GS}=10V$	-	3.4	
Pulsed Drain Current	$T_A=25^\circ C, t_p \leq 10\mu s$	I_{DM}	-	42		
Maximum Body-Diode Continuous Current	$T_A=25^\circ C$	I_S		1.7		
Total Power Dissipation (Note 1,2)	Steady-State	P_D	$T_A=25^\circ C$	-	0.9	W
			$T_A=100^\circ C$	-	0.36	
Junction and Storage Temperature Range		T_J, T_{STG}	-55	150	$^\circ C$	

Thermal Resistance

Parameter	Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	$R_{\theta JA}$	-	139	$^\circ C/W$

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJL020N03ALJK	F2	020AL.	3000	30000	120000	7" reel



YJL020N03ALJK

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A, T_j=25^\circ C$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V, T_j=25^\circ C$	-	-	1	μA
		$V_{DS}=30V, V_{GS}=0V, T_j=150^\circ C$	-	-	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^\circ C$	-	-	± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A, T_j=25^\circ C$	1.3	1.8	2.3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A, T_j=25^\circ C$	-	16	20	$m\Omega$
		$V_{GS}=4.5V, I_D=2.5A, T_j=25^\circ C$	-	23	32	$m\Omega$
Diode Forward Voltage	V_{SD}	$I_S=5A, V_{GS}=0V, T_j=25^\circ C$	-	0.85	1.2	V
Gate Resistance	R_G	$f=1MHz, T_j=25^\circ C$	-	5.2	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$	-	887	-	pF
Output Capacitance	C_{oss}		-	81	-	
Reverse Transfer Capacitance	C_{rss}		-	73	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=15V, I_D=5A, T_j=25^\circ C$	-	16	-	nC
Gate-Source Charge	Q_{gs}		-	2.9	-	
Gate-Drain Charge	Q_{gd}		-	3	-	
Reverse Recovery Charge	Q_{rr}	$I_F=5A, di/dt=100A/\mu s, V_{GS}=0V, V_R=15V, T_j=25^\circ C$	-	6	-	nC
Reverse Recovery Time	t_{rr}		-	12	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=15V, I_D=5A, R_L=3\Omega, R_{GEN}=3\Omega, T_j=25^\circ C$	-	6.7	-	ns
Turn-on Rise Time	t_r		-	3.0	-	
Turn-off Delay Time	$t_{D(off)}$		-	24	-	
Turn-off Fall Time	t_f		-	5.5	-	

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of $150^\circ C$. The value in any given application depends on the user's specific board design.
- Thermal resistance from junction to soldering point (on the exposed drain pad).



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Typical Electrical and Thermal Characteristics Diagrams

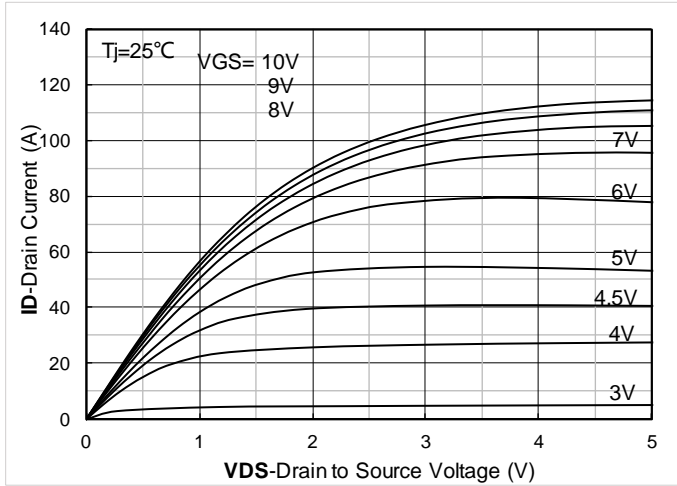


Figure 1. Output Characteristics; typical values

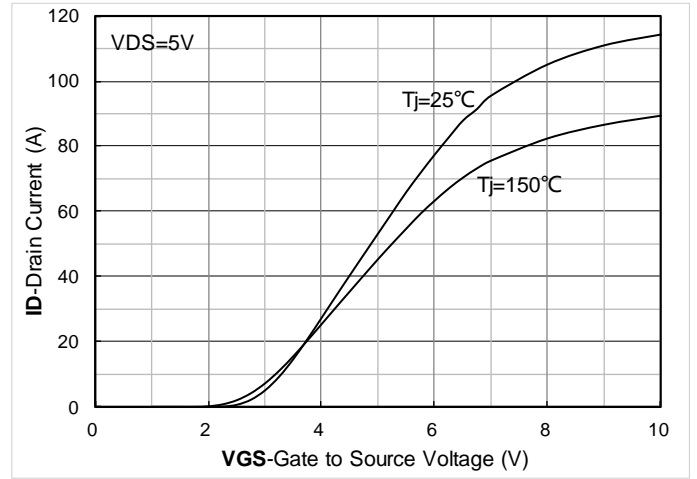


Figure 2. Transfer Characteristics; typical values

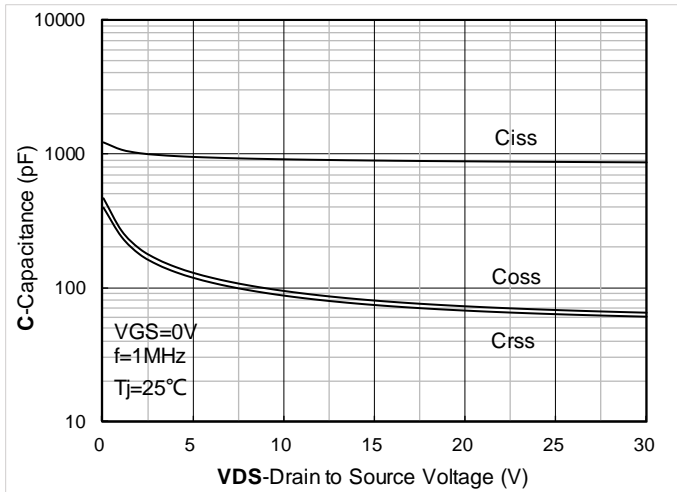


Figure 3. Capacitance Characteristics; typical values

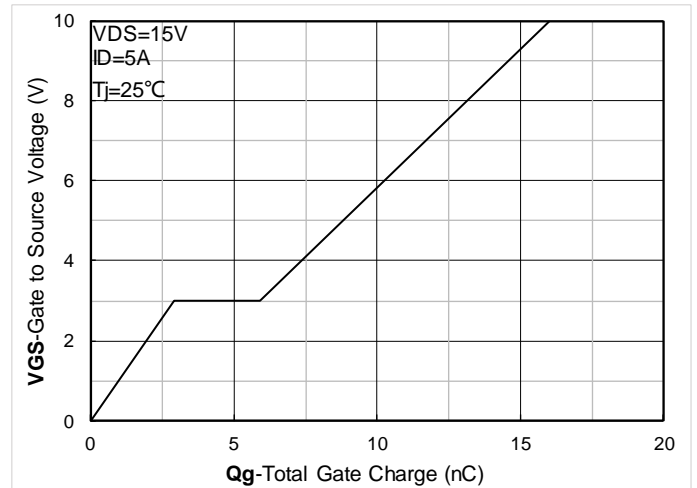


Figure 4. Gate Charge; typical values

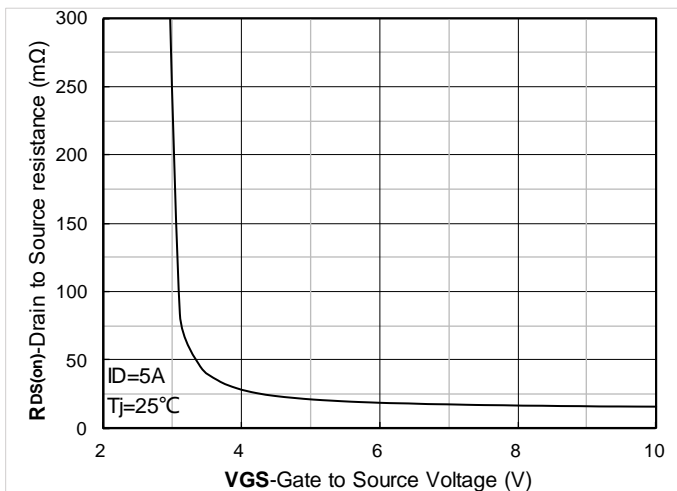


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

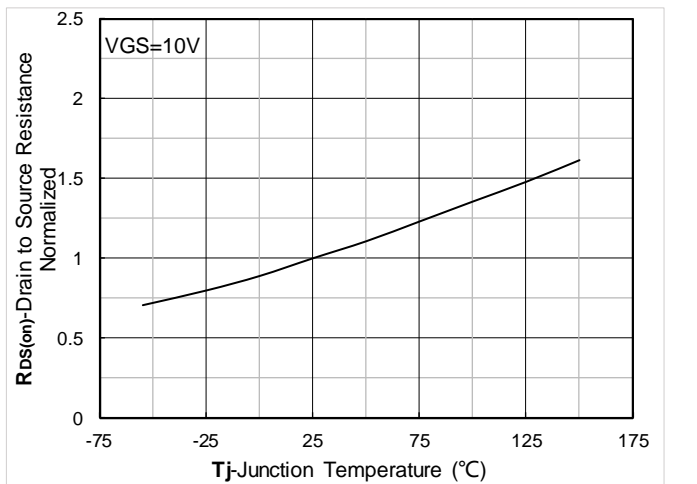


Figure 6. Normalized On-Resistance



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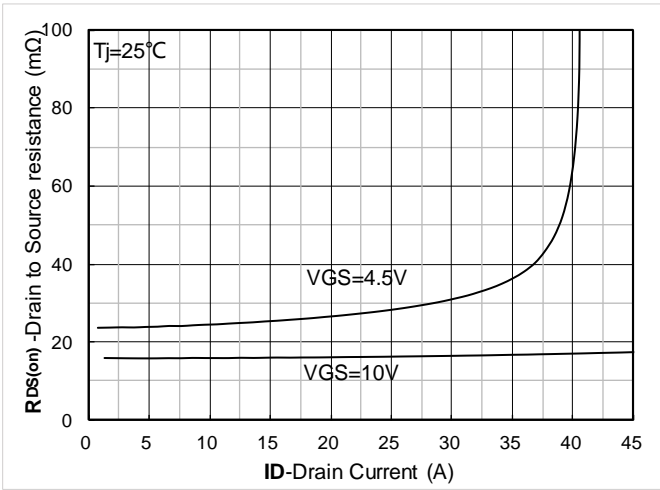


Figure 7. RDS(on) VS Drain Current; typical values

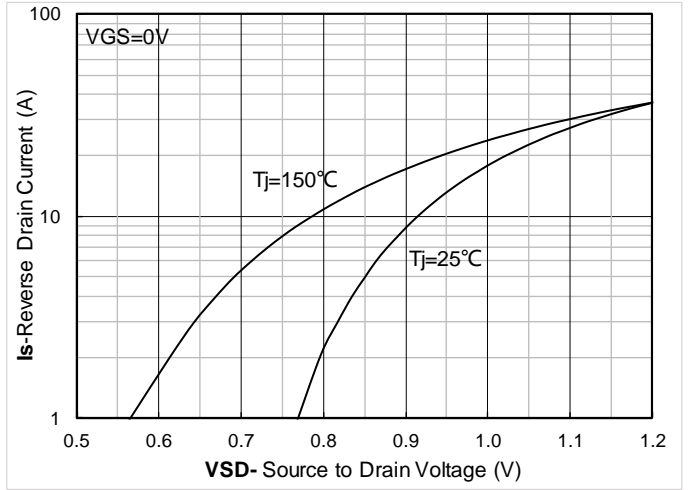


Figure 8. Forward characteristics of reverse diode; typical values

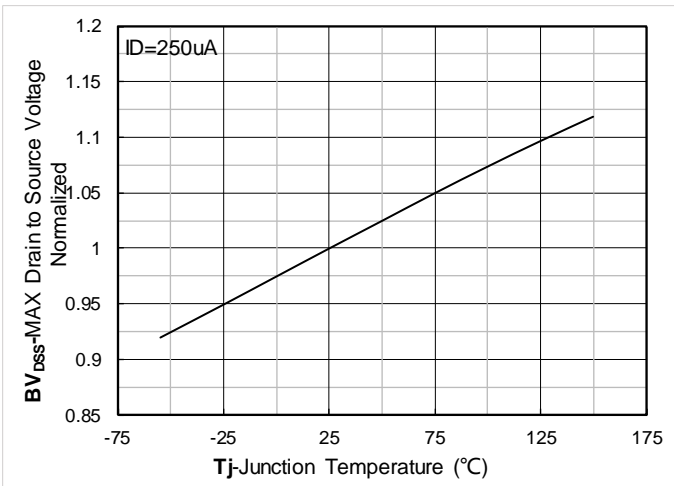


Figure 9. Normalized breakdown voltage

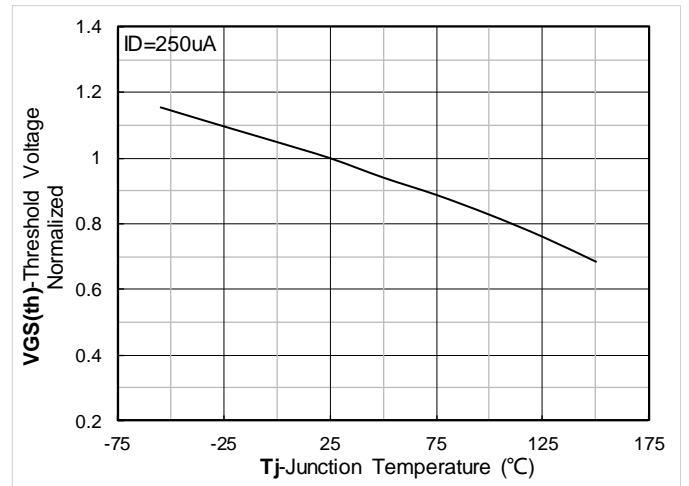


Figure 10. Normalized Threshold voltage

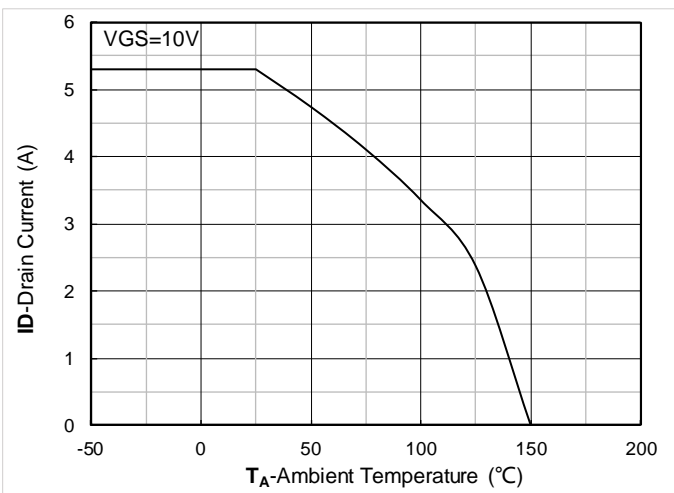


Figure 11. Current dissipation

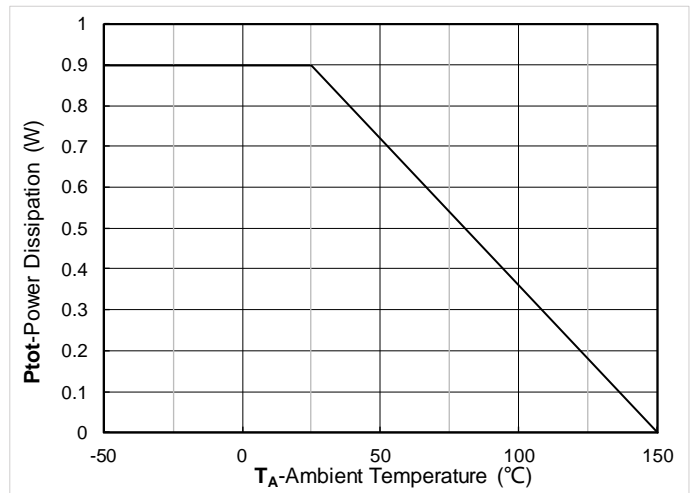


Figure 12. Power dissipation



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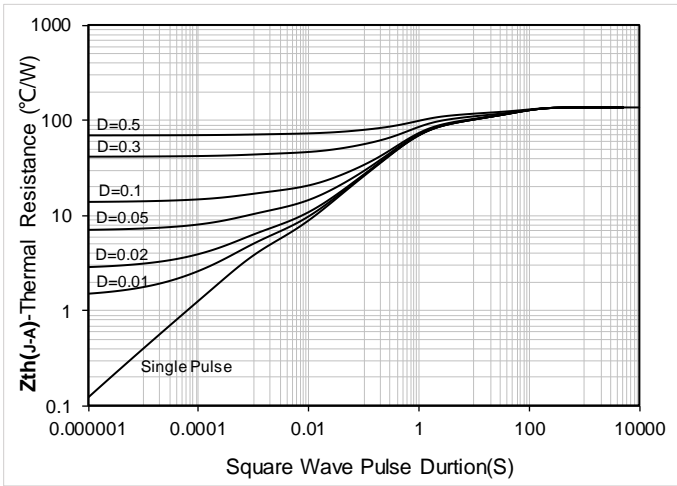


Figure 13. Maximum Transient Thermal Impedance

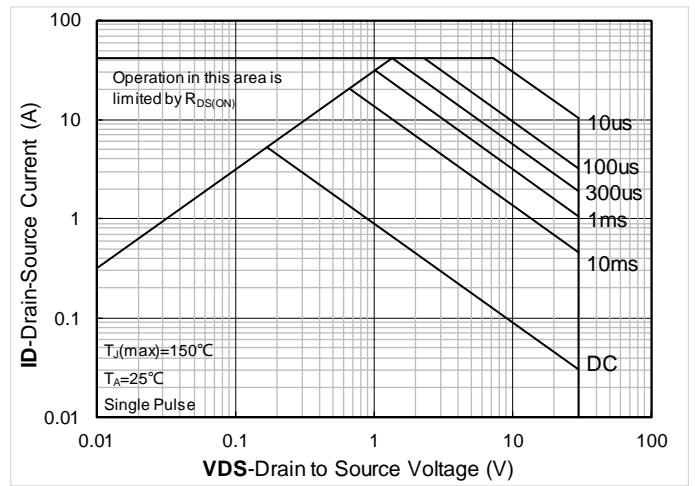


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

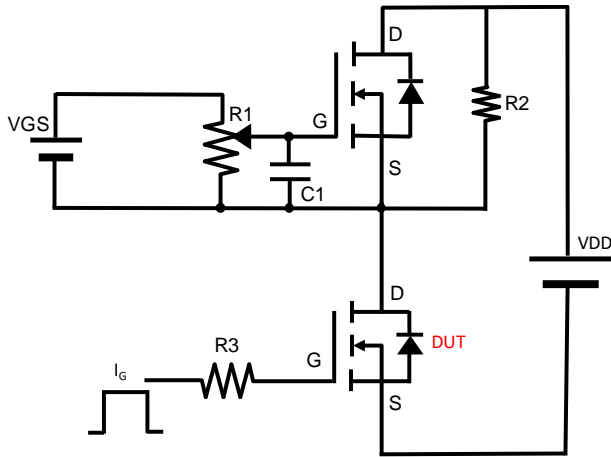


Figure A. Gate Charge Test Circuit & Waveform

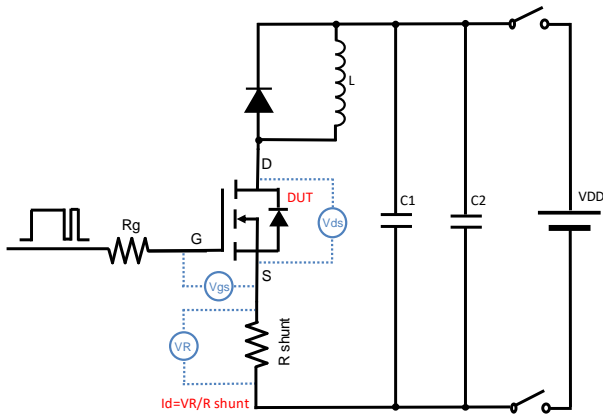


Figure B. Resistive Switching Test Circuit & Waveform

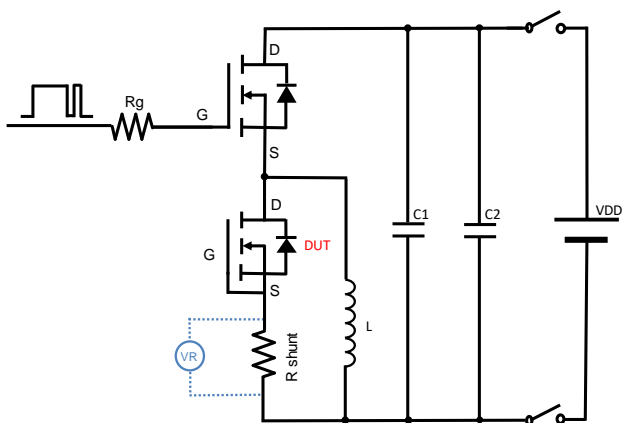
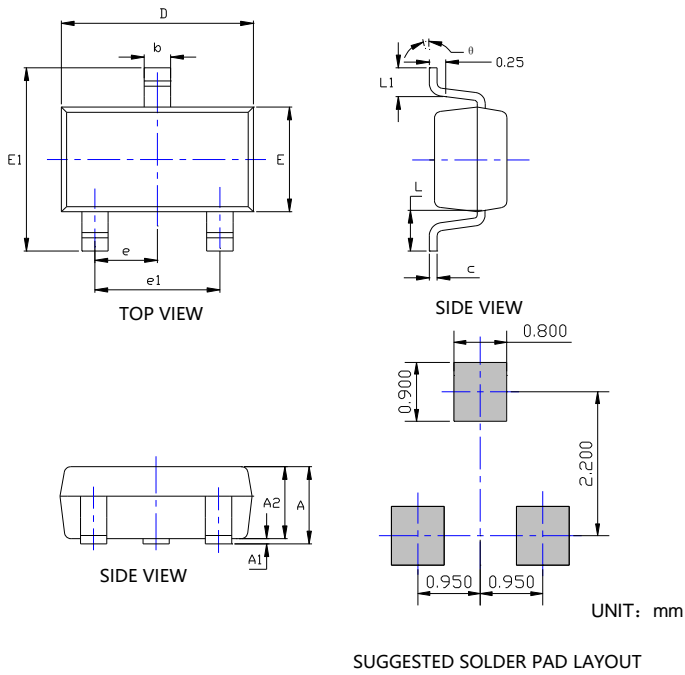


Figure C. Diode Recovery Test Circuit & Waveform

■ SOT-23-3L Package information



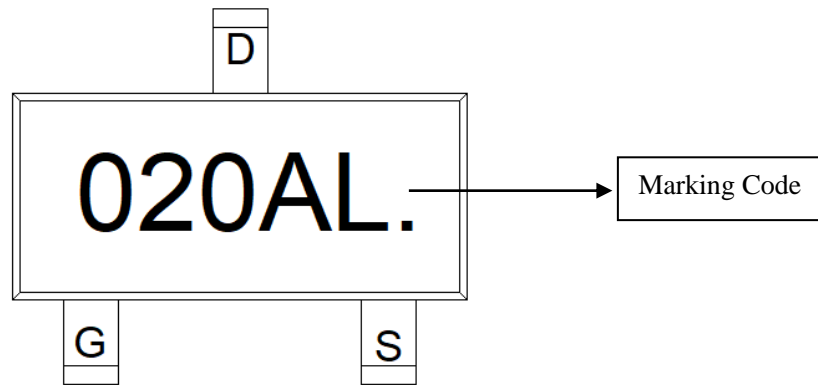
SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.041	---	0.049	1.050	---	1.250
A1	0.000	---	0.008	0.000	---	0.200
A2	0.041	0.043	0.045	1.050	1.100	1.150
b	0.012	0.016	0.020	0.300	0.400	0.500
c	0.004	---	0.008	0.100	---	0.200
D	0.111	0.115	0.119	2.820	2.920	3.020
E	0.059	0.063	0.067	1.500	1.600	1.700
E1	0.104	0.110	0.116	2.650	2.800	2.950
e	0.037TYP			0.950TYP		
e1	0.071	0.075	0.079	1.800	1.900	2.000
L	0.024REF			0.600REF		
L1	0.012	0.018	0.024	0.300	0.450	0.600
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



- Note:
1. All marking is at middle of the product body
 2. All marking is in laser printing
 3. 020AL. is Marking Code
 4. Body color: Black



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The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

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