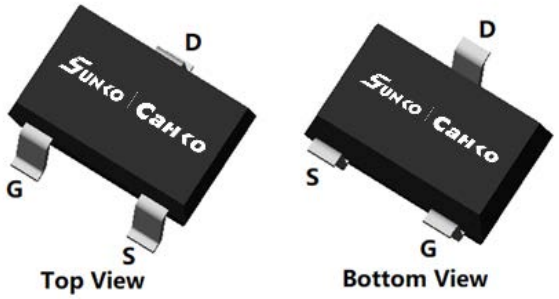
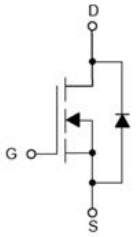
N-Channel Enhancement Mode Field Effect Transistor



SOT-323



Product Summary

- V_{DS} 30 V
- I_D 200mA
- $R_{DS(ON)}$(at V_{GS}=10V) ＜ 2.5Ω
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜ 3Ω
- Gate-Source ESD Rating Up to 2KV (HBM)

General Description

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

Applications

- Power management
- Portable equipment

■ 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	T_A=25℃	I_D	200	mA
	T_A=100℃		125	
Pulsed Drain Current [A]		I_{DM}	800	mA
Total Power Dissipation [B]	T_A=25℃	P_D	250	mW
	T_A=100℃		100	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [C]	Steady-State	$R_{\theta JA}$	400	500	℃/W

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
2SK3018KWJ	F2	KN	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}=30V, V_{GS}=0V	-	-	1	μA
		V_{DS}=30V, V_{GS}=0V, Tj=150℃	-	-	100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±10	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.6	1.0	1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=200mA	-	1.7	2.5	Ω
		V_{GS}=4.5V, I_D=100mA	-	2	3	
Diode Forward Voltage	V_{SD}	I_S=200mA, V_{GS}=0V	-	0.9	1.2	V
Gate resistance	R_G	f=1MHz, Open drain	-	150	-	Ω
Maximum Body-Diode Continuous Current	I_S		-	-	200	mA
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHz	-	11	-	pF
Output Capacitance	C_{oss}		-	5	-	
Reverse Transfer Capacitance	C_{rss}		-	2.5	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=15V, I_D=1A	-	1.22	-	nC
Gate-Source Charge	Q_{gs}		-	0.48	-	
Gate-Drain Charge	Q_{gd}		-	0.2	-	
Reverse Recovery Charge	Q_{rr}	I_F=1A, di/dt=100A/us	-	4.4	-	nC
Reverse Recovery Time	t_{rr}		-	14	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=15V, I_D=1A R_{GEN}=2.3Ω	-	3	-	ns
Turn-on Rise Time	t_r		-	19	-	
Turn-off Delay Time	$t_{D(off)}$		-	7	-	
Turn-off fall Time	t_f		-	20	-	

A. Repetitive rating; pulse width limited by max. junction temperature.
B. P_d is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.
C. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 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

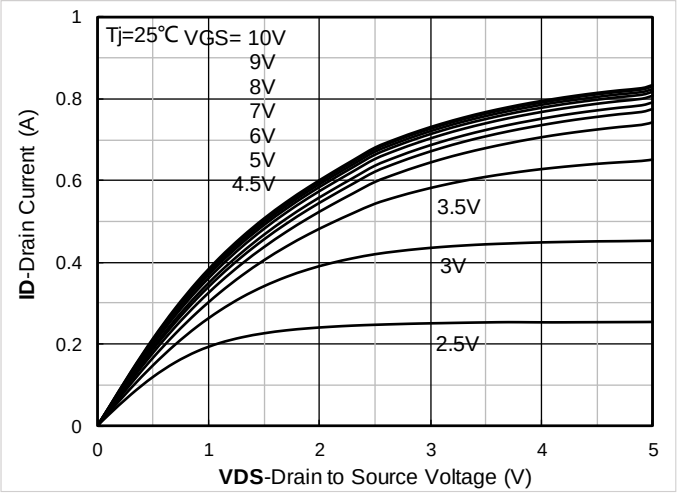


Figure 1. Output Characteristics

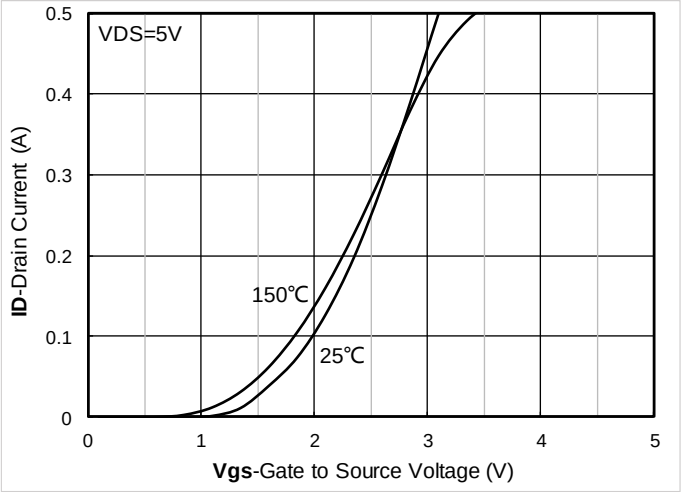


Figure 2. Transfer Characteristics

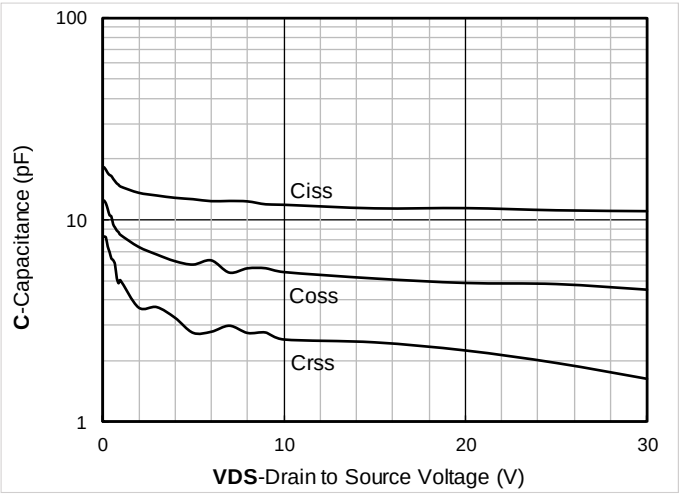


Figure 3. Capacitance Characteristics

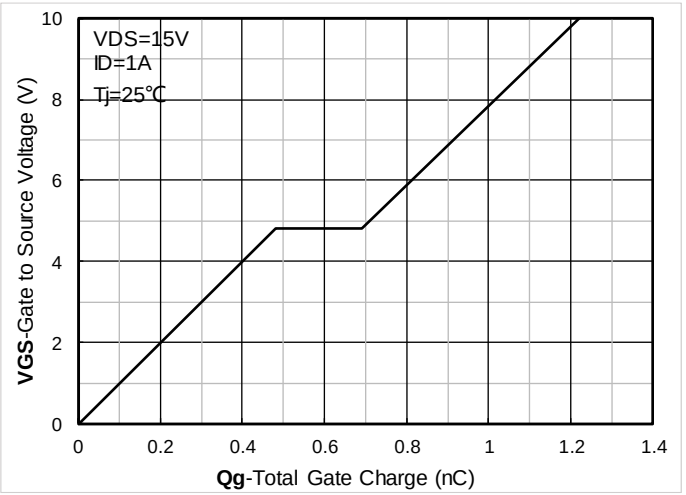


Figure 4. Gate Charge

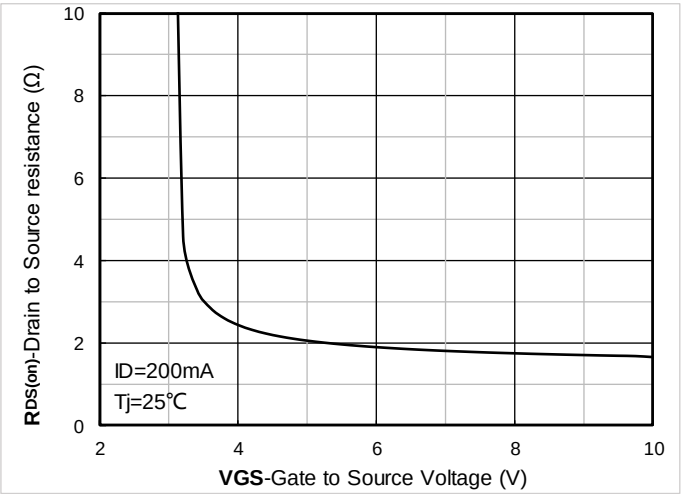


Figure 5. On-Resistance vs Gate to Source Voltage

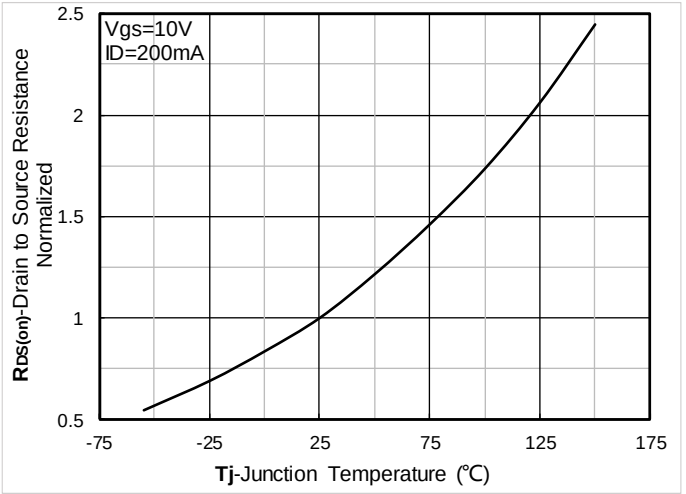


Figure 6. Normalized On-Resistance

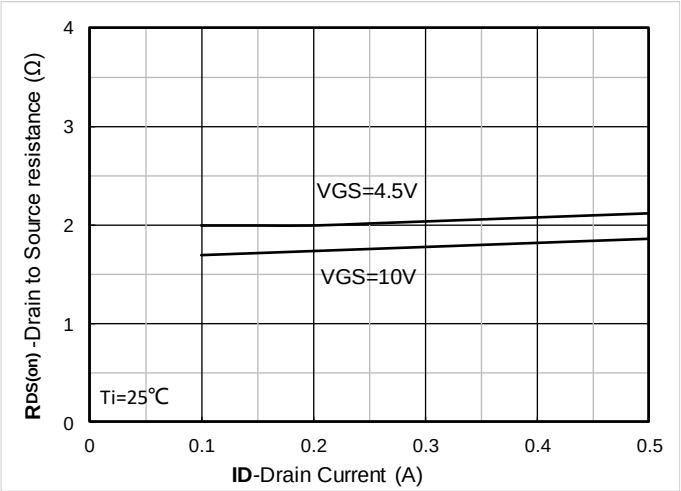


Figure 7. $R_{DS(on)}$ VS Drain Current

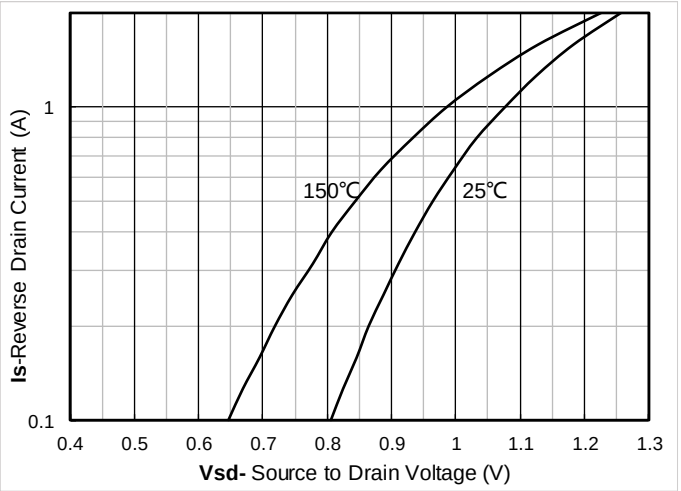


Figure 8. Forward characteristics of reverse diode

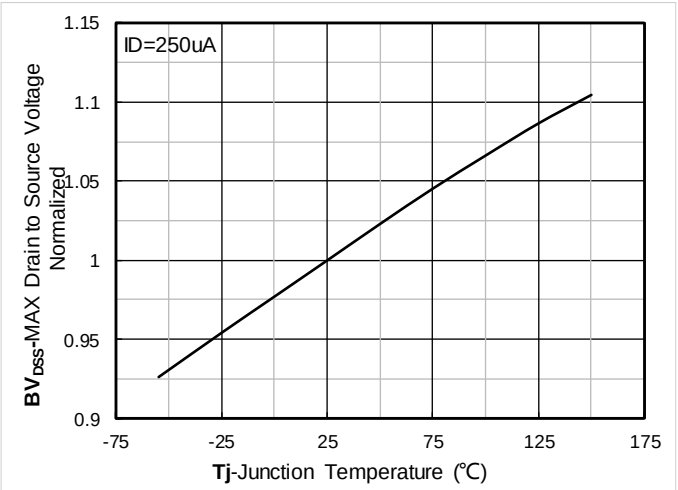


Figure 9. Normalized breakdown voltage

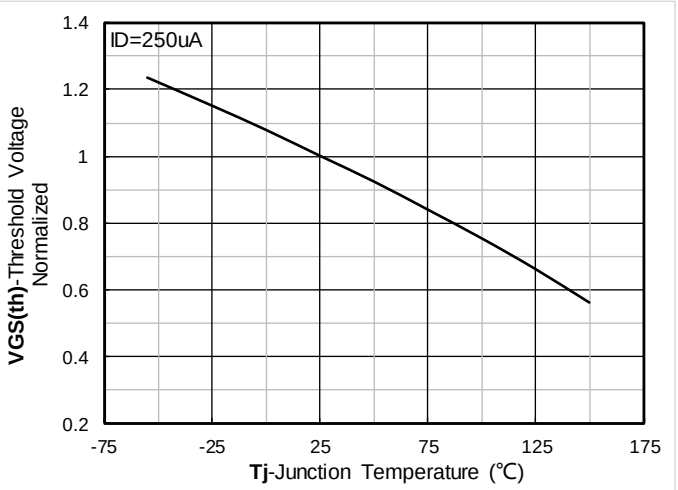


Figure 10. Normalized Threshold voltage

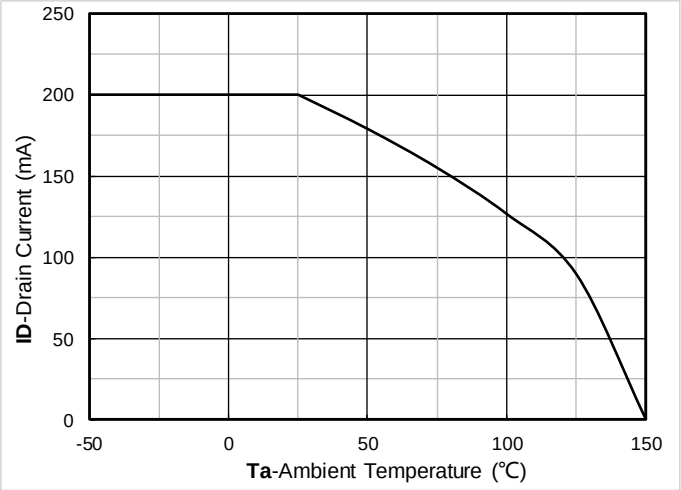


Figure 11. Current dissipation

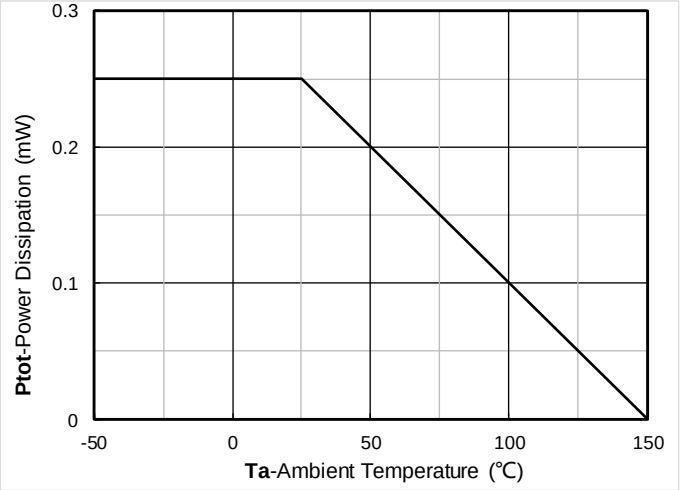


Figure 12. Power dissipation

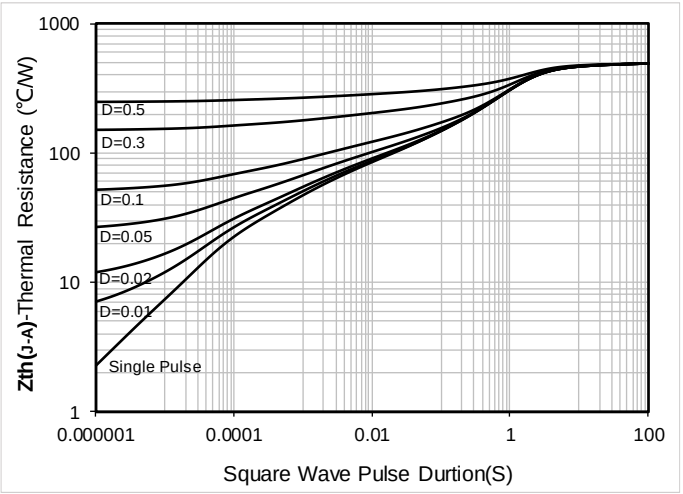


Figure 13. Maximum Transient Thermal Impedance

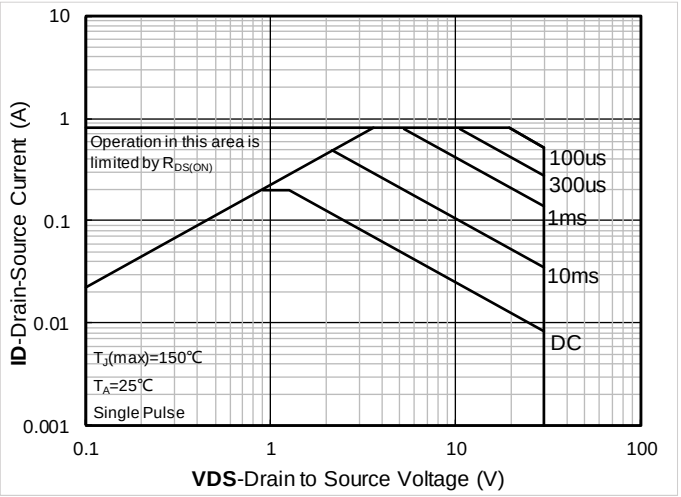


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

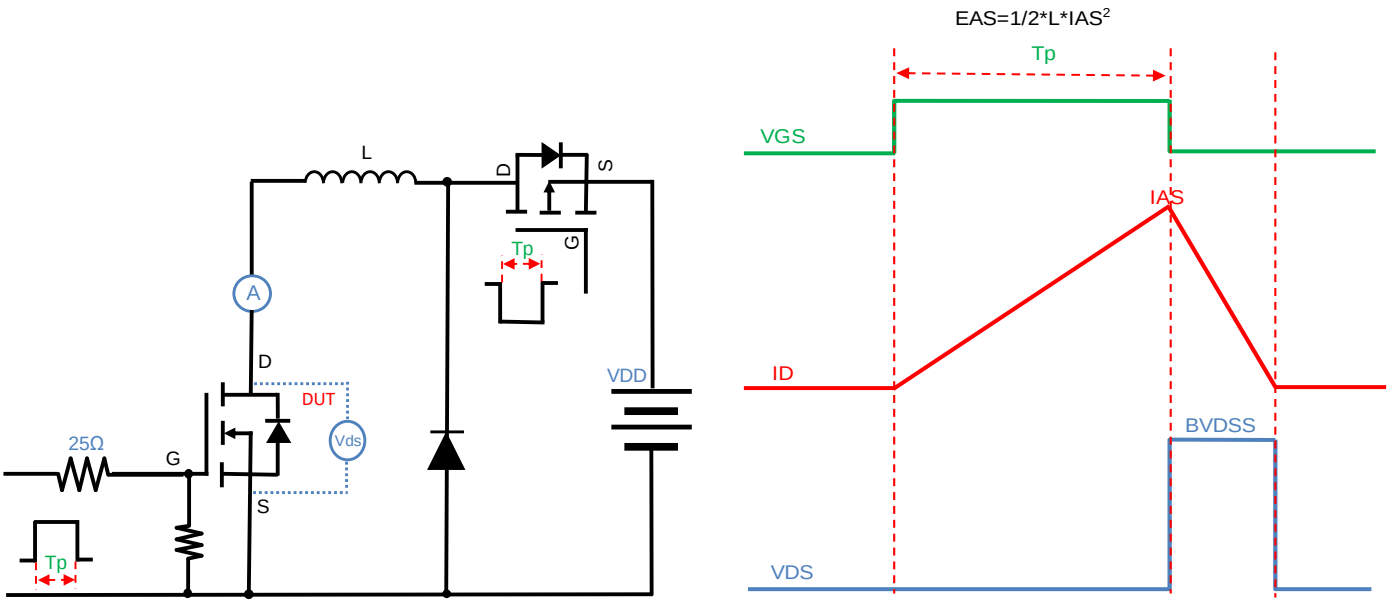


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

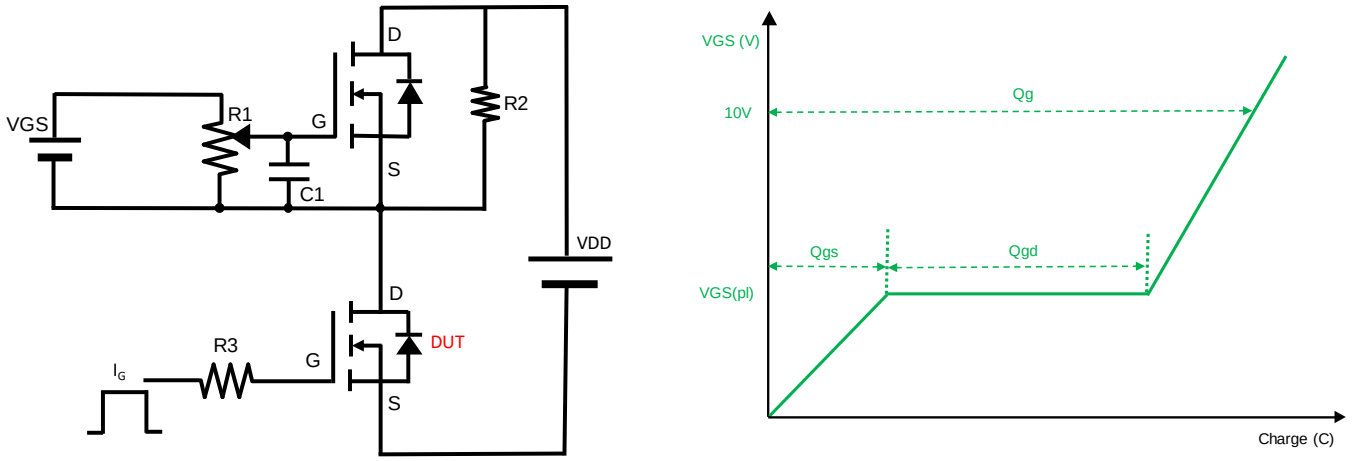


Figure B. Gate Charge Test Circuit & Waveform

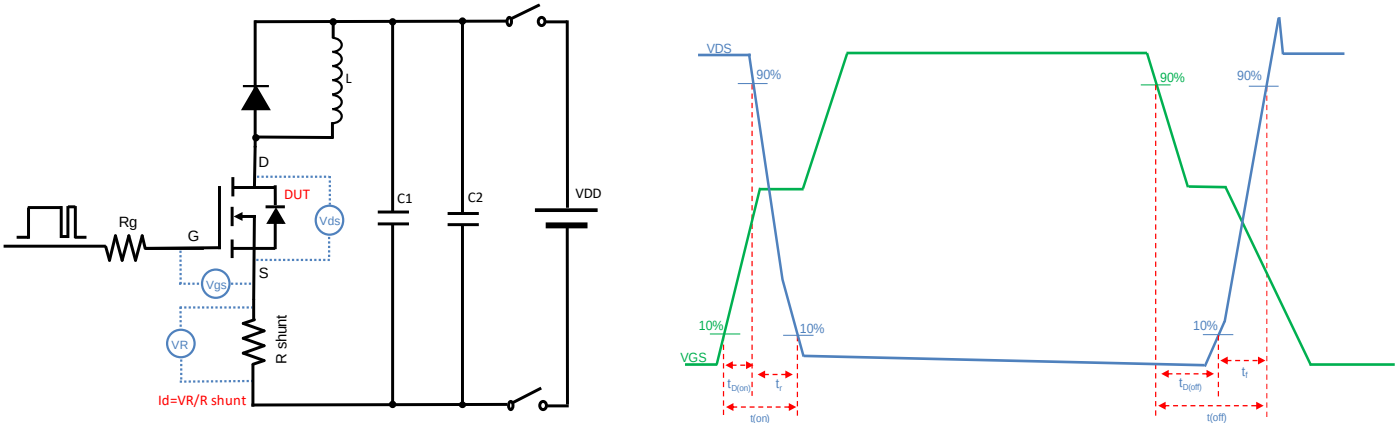


Figure C. Resistive Switching Test Circuit & Waveform

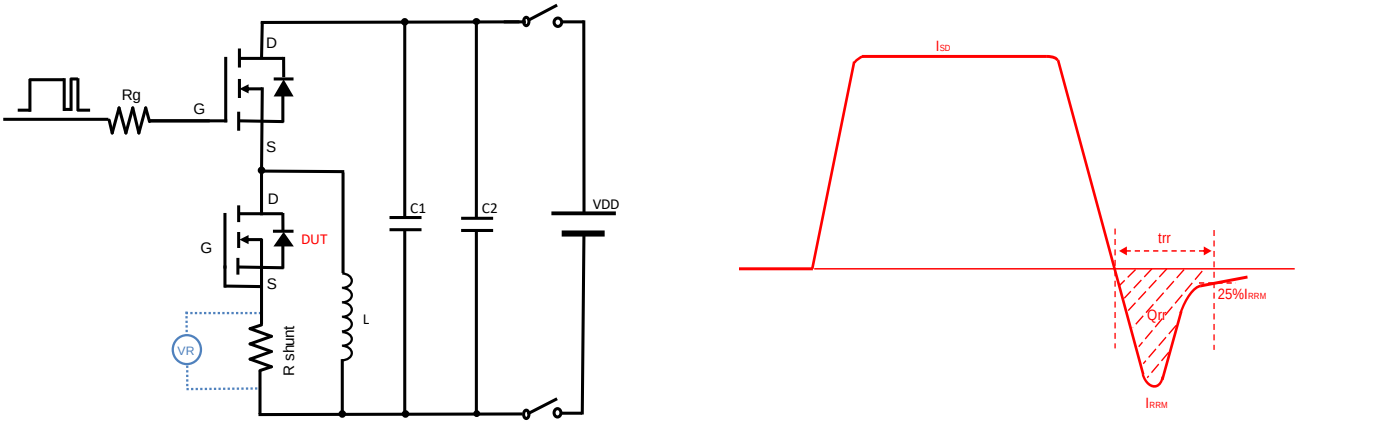
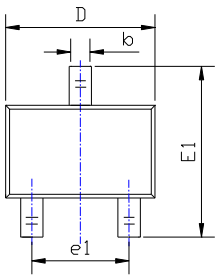
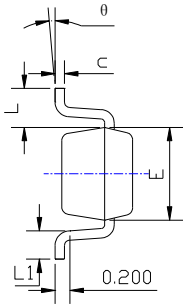


Figure D. Diode Recovery Test Circuit & Waveform

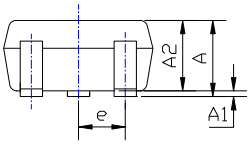
■ SOT-323 Package information



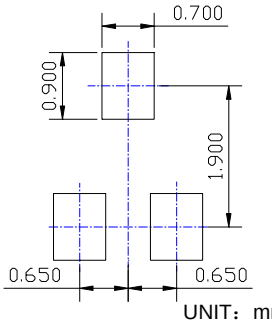
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT：mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.043	0.900	1.100
A1	0.000	0.004	0.000	0.100
A2	0.035	0.039	0.900	1.000
b	0.006	0.016	0.150	0.400
c	0.004	0.010	0.100	0.250
D	0.071	0.087	1.800	2.200
E	0.045	0.053	1.150	1.350
E1	0.085	0.096	2.150	2.450
e	0.026TYP		0.650TYP	
e1	0.047	0.055	1.200	1.400
L	0.021REF		0.525REF	
L1	0.010	0.018	0.260	0.460
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.

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