



YJS05G15A

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

V_{DS}	150V
I_D	5A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	<70m
$R_{DS(ON)}$ (at $V_{GS}=6V$)	<80m
100% EAS Tested	

General Description

Split gate trench MOSFET technology
Low $R_{DS(on)}$ & FOM
Extremely low switching loss
Excellent stability and uniformity
Moisture Sensitivity Level 3
Epoxy Meets UL 94 V-0 Flammability Rating
Halogen Free

Applications

Switching Voltage Regulators
DC-DC convertor

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	150	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D		

$T_A=25^\circ C$



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Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	150	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =150V, V _{GS} =0V	-	-	1	μA
		V _{DS} =150V, V _{GS} =0V, T _J =150°C	-	-	100	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	2	3	4	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =5A	-	50	70	m
		V _{GS} =6V, I _D =3A	-	55	80	
Diode Forward Voltage	V _{SD}	I _S =5A, V _{GS} =0V	-	0.9	1.2	V
Gate resistance	R _G	f=1MHz, Open drain	-	1.2	-	
Maximum Body-Diode Continuous Current	I _S		-	-	5	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V, f=1MHz	-	750	-	pF
Output Capacitance	C _{oss}		-	65	-	
Reverse Transfer Capacitance	C _{rss}		-	5	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =75V, I _D =5A	-	16	-	nC
Gate-Source Charge	Q _{gs}		-	3	-	
Gate-Drain Charge	Q _{gd}		-	4	-	
Reverse Recovery Charge	Q _{rr}	I _F =5A, di/dt=100A/us	-	235	-	nC
Reverse Recovery Time	t _{rr}		-	41	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =75V, I _D =5A R _{GEN} =2.2	-	7	-	ns
Turn-on Rise Time	t _r		-	20	-	
Turn-off Delay Time	t _{D(off)}		-	16	-	
Turn-off fall Time	t _f		-	14	-	

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

B. T_J=25°C, V_{DD}=150V, V_G=10V, R_G=25 , L=0.5mH, I_{AS}=4.2A.

C. P_g is based on max. junction temperature, using junction-case thermal resistance.

D. 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°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



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Typical Electrical and Thermal Characteristics Diagrams

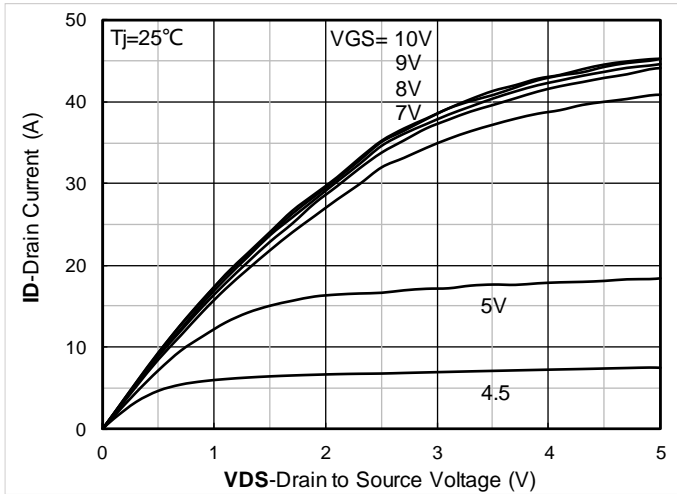


Figure 1. Output Characteristics

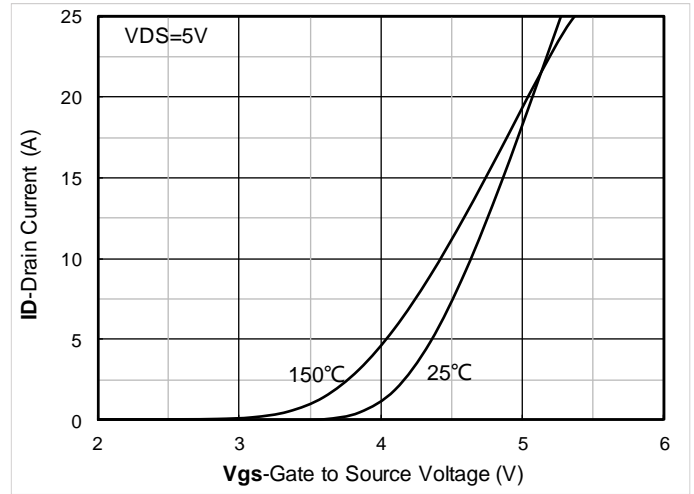


Figure 2. Transfer Characteristics

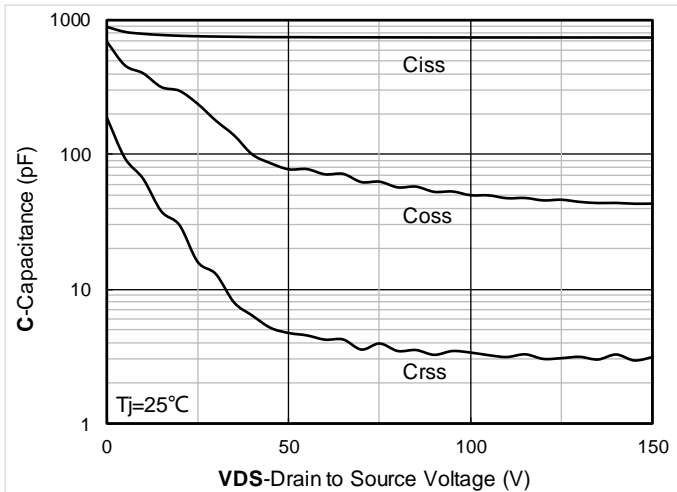
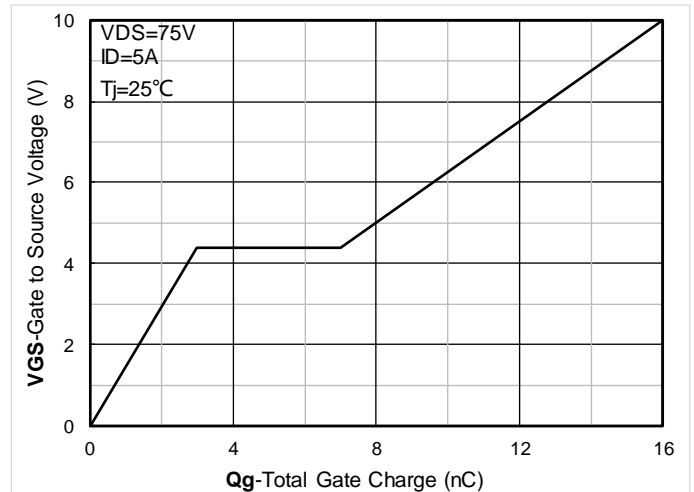


Figure 3.





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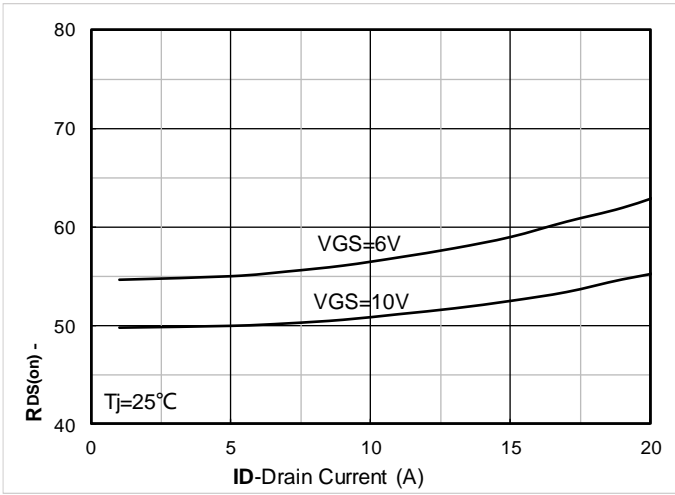


Figure 7. RDS(on) VS Drain Current

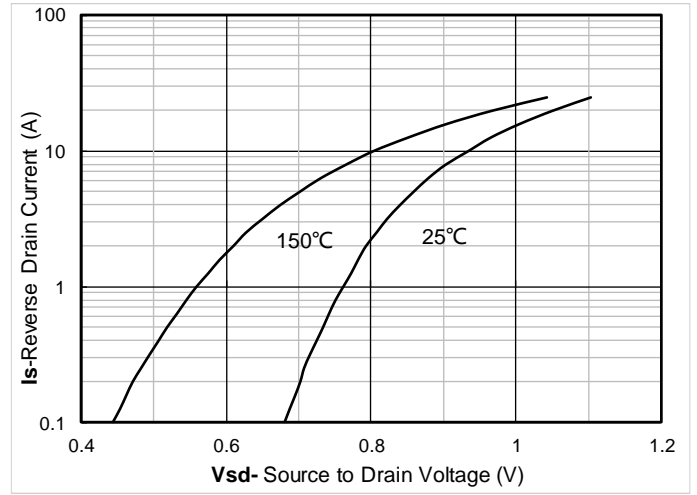


Figure 8. Forward characteristics of reverse diode

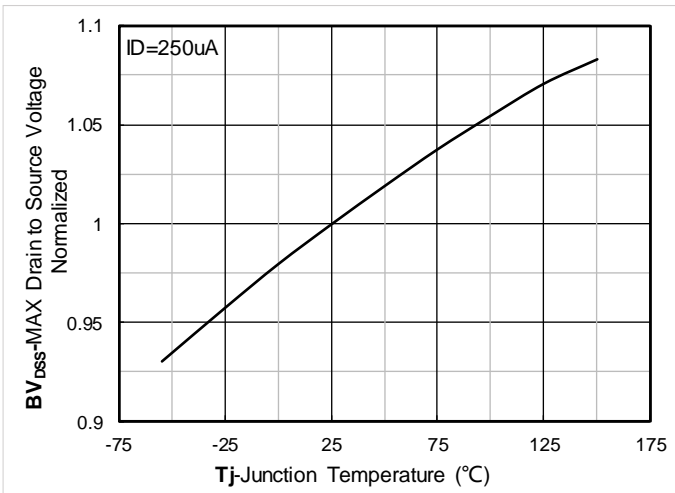


Figure 9. Normalized breakdown voltage

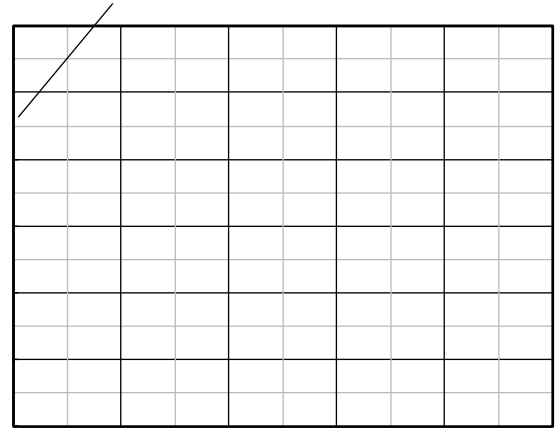


Figure 10. Normalized Threshold voltage

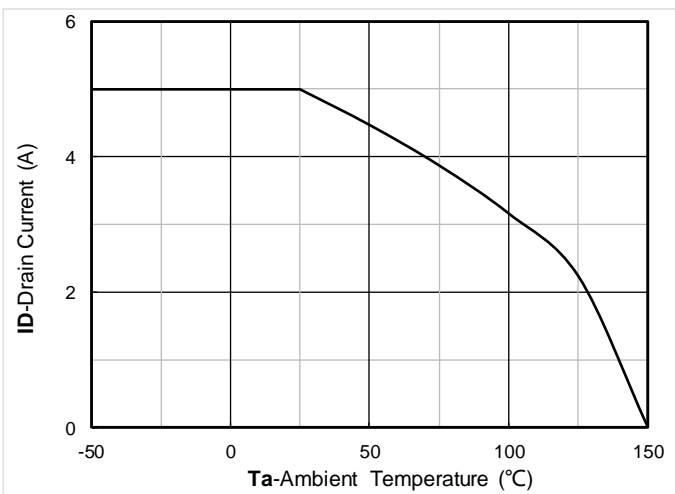


Figure 11. Current dissipation

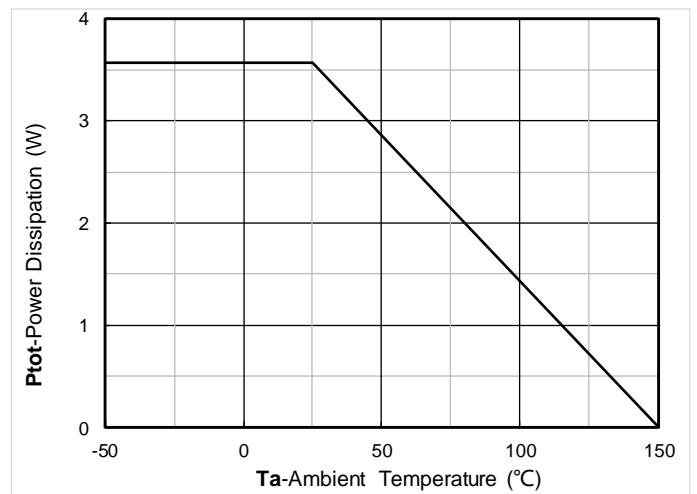


Figure 12. Power dissipation

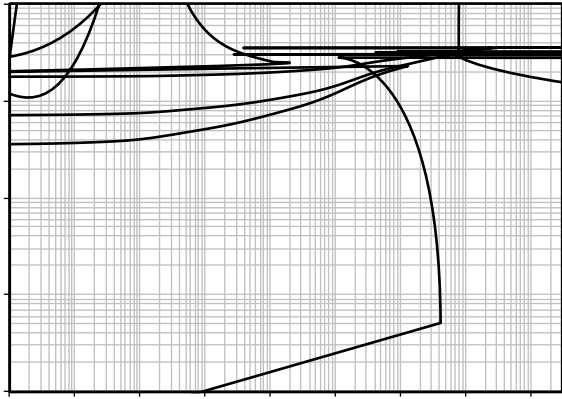


Figure 13. Maximum Transient Thermal Impedance

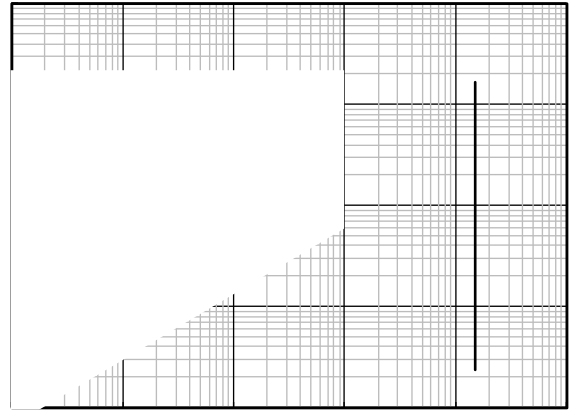


Figure 14. Safe Operation Area

Test Circuits & Waveforms

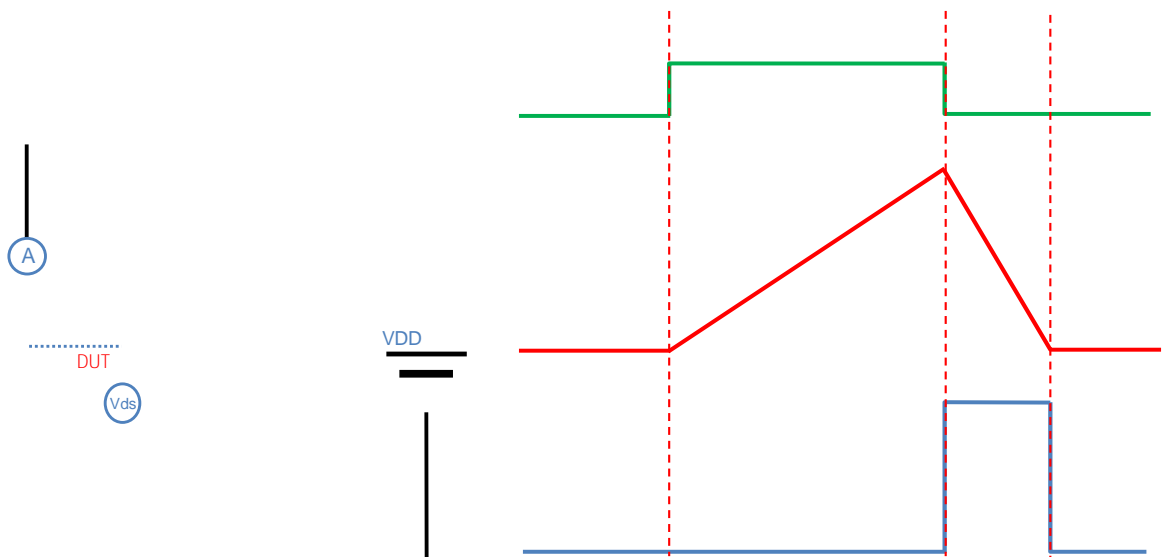


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

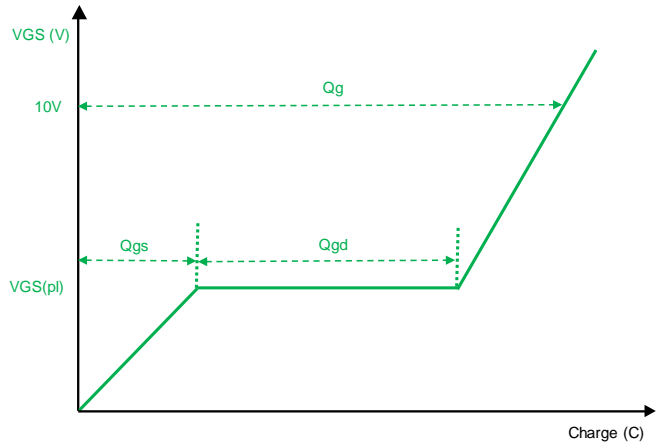
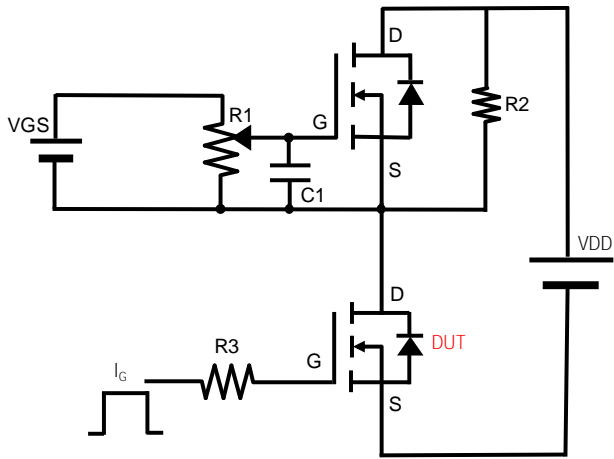


Figure B. Gate Charge Test Circuit & Waveform

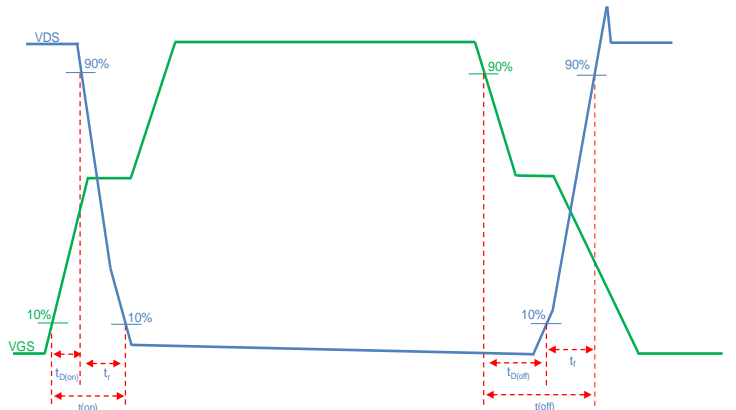
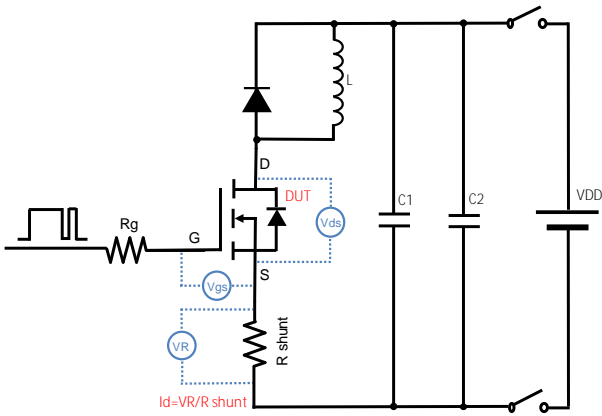


Figure C. Resistive Switching Test Circuit & Waveform

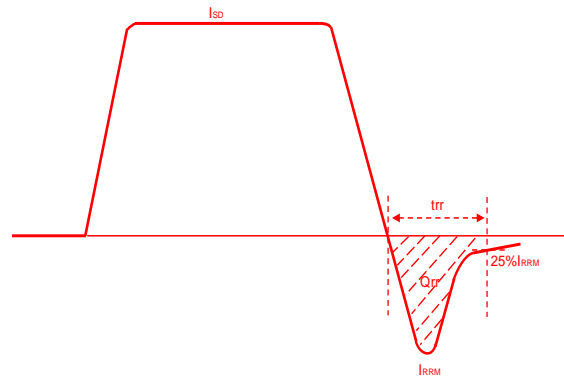
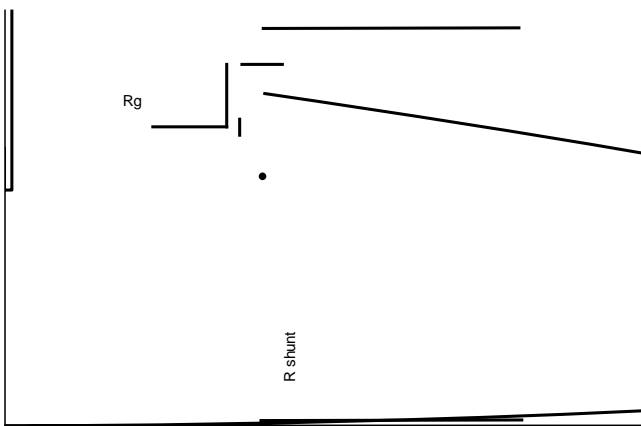
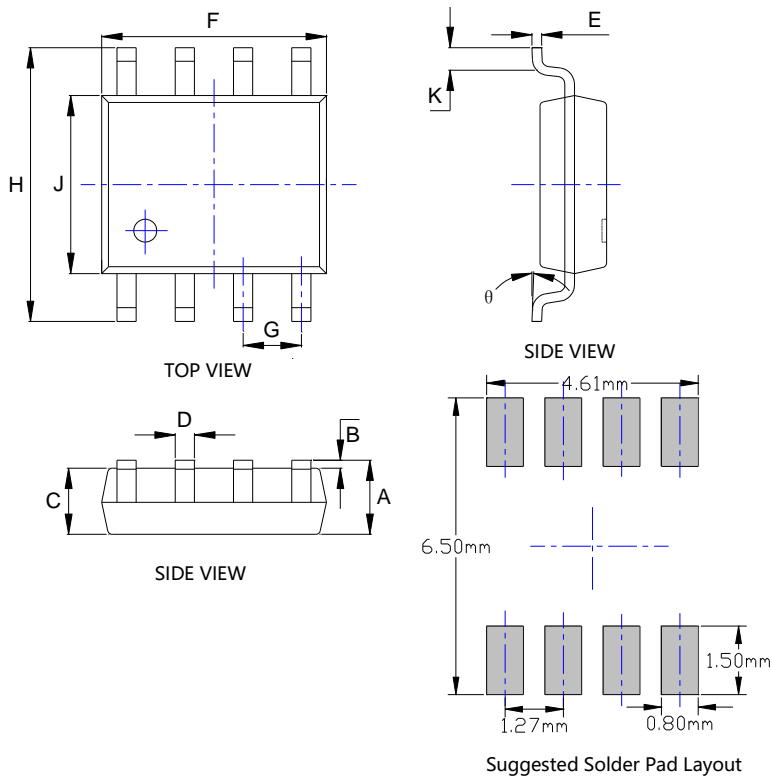


Figure D. Diode Recovery Test Circuit & Waveform



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SOP8 Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.053	0.069	1.350	1.750
B	0.004	0.010	0.100	0.250
C	0.053	0.061	1.350	1.550
D	0.013	0.020	0.330	0.510
E	0.007	0.010	0.170	0.250
F	0.189	0.197	4.800	5.000
G	0.050BSC		1.270BSC	
H	0.228	0.244	5.800	6.200
J	0.150	0.157	3.800	4.000
K	0.016	0.050	0.400	1.270
θ	0°	8°	0°	8°

- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.



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