

Description

- Trench Power MV MOSFET technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications

General Features

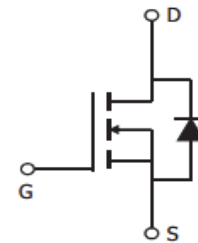
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V_{DS}	$R_{DS(ON)}$ @4.5V(Typ)	$R_{DS(ON)}$ @10V(Typ)	I_D
100V	8.9 mΩ	6.6 mΩ	15A

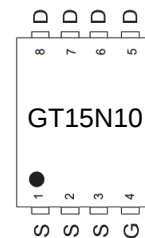
- High power and current handling capability
- RoHS Compliant
- Surface mount package

Applications

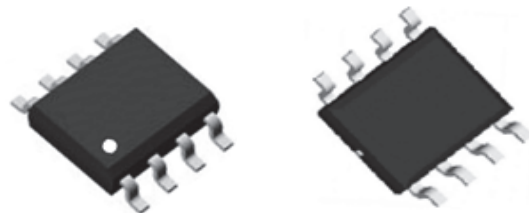
- Synchronous Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications



Schematic diagram



Marking and pin assignment



SOP-8

Ordering Information

Part Number	Marking	Case	Packaging
GT15N10	GT15N10	SOP-8	4000pcs/Reel

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^G	I_D	15	A
		9.5	
Pulsed Drain Current ^C	I_{DM}	55	A
Avalanche energy $L=0.3\text{mH}$ ^C	E_{AS}	150	mJ
Power Dissipation ^A	P_{DSM}	3.1	W
		2.0	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	30	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^{A D}		40	
Maximum Junction-to-Ambient ^{A D}	$R_{\theta JC}$	58	$^\circ\text{C/W}$
Maximum Junction-to-Case		75	
Maximum Junction-to-Case	$R_{\theta JC}$	15	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100\text{V}$, $V_{GS}=0\text{V}$ $T_J=55^{\circ}\text{C}$			1 5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.3	1.9	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=7.5\text{A}$ $T_J=125^{\circ}\text{C}$ $V_{GS}=4.5\text{V}$, $I_D=7.5\text{A}$		6.6 11.6 8.9	7.8 13.7 10.5	$\text{m}\Omega$
g_{FS}	Diode Forward Voltage	$V_{DS}=5\text{V}$, $I_D=7.5\text{A}$	30			S
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}$, $V_{GS}=0\text{V}$		0.7	0.95	V
I_S	Maximum Body-Diode Continuous Current ^G				48	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=15\text{V}$, $f=1\text{MHz}$		2808		pF
C_{oss}	Output Capacitance			961		pF
C_{rss}	Reverse Transfer Capacitance			23		pF
R_g	Gate resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$		2		Ω
SWITCHING PARAMETERS						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $I_D=7.5\text{A}$		50		nC
$Q_g(4.5\text{V})$	Total Gate Charge			33		nC
Q_{gs}	Gate Source Charge			17		nC
Q_{gd}	Gate Drain Charge			11		nC
$t_{D(on)}$	Turn-on Delay Time	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $R_L=2.5\Omega$, $R_{GEN}=3\Omega$		15		ns
t_r	Turn-on Rise Time			12		ns
$t_{D(off)}$	Turn-off Delay Time			25		ns
t_f	Turn-off Fall Time			13		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=15\text{A}$, $di/dt=500\text{A}/\mu\text{s}$		45		ns
Q_{rr}	Body Diode Reverse Recovery charge	$I_F=15\text{A}$, $di/dt=500\text{A}/\mu\text{s}$		140		nC

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} \leq 10\text{s}$ and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.

B. The power dissipation P_D is based on $T_J(\text{MAX})=150^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Single pulse width limited by junction temperature $T_J(\text{MAX})=150^{\circ}\text{C}$.

D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using $<300\mu\text{s}$ pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_J(\text{MAX})=150^{\circ}\text{C}$. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

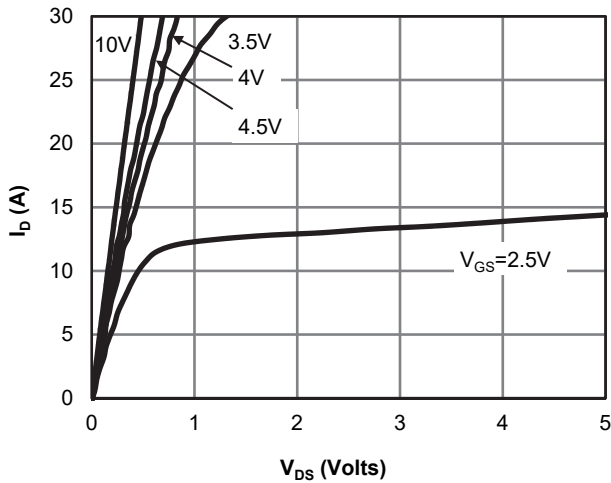


Fig 1: On-Region Characteristics

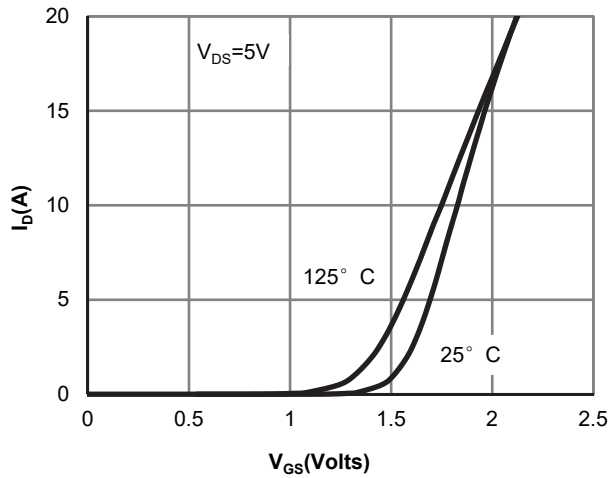


Figure 2: Transfer Characteristics

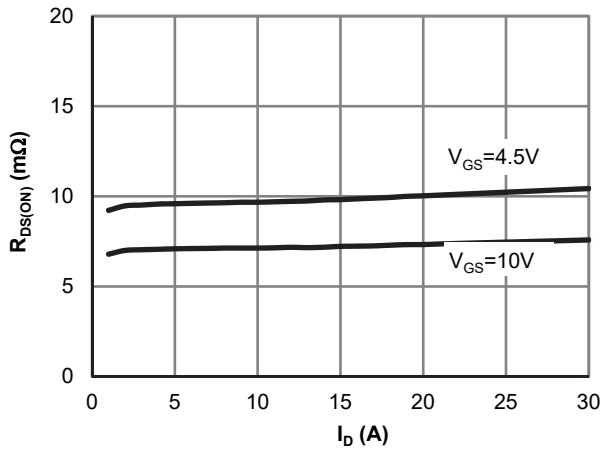


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

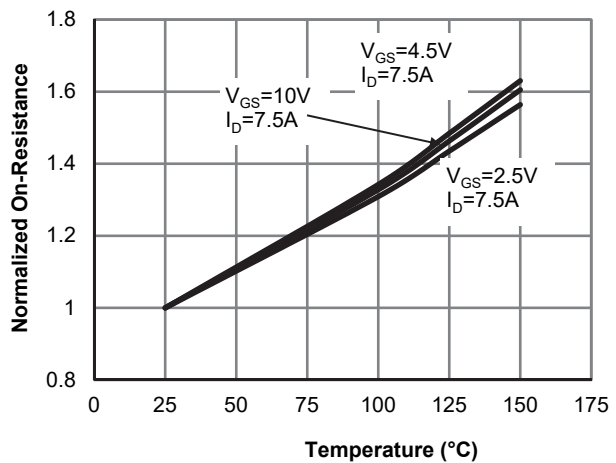


Figure 4: On-Resistance vs. Junction Temperature

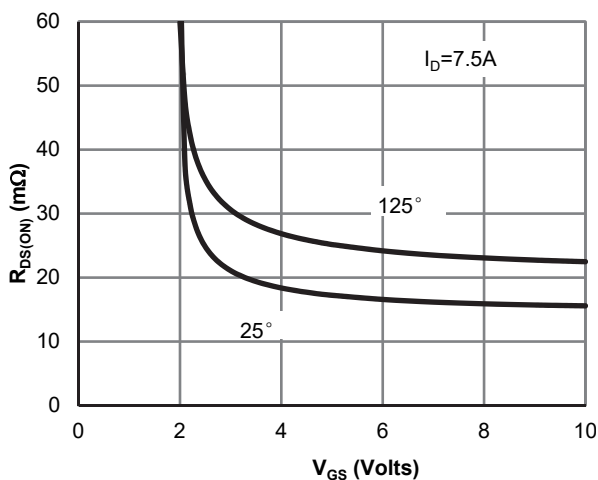


Figure 5: On-Resistance vs. Gate-Source Voltage

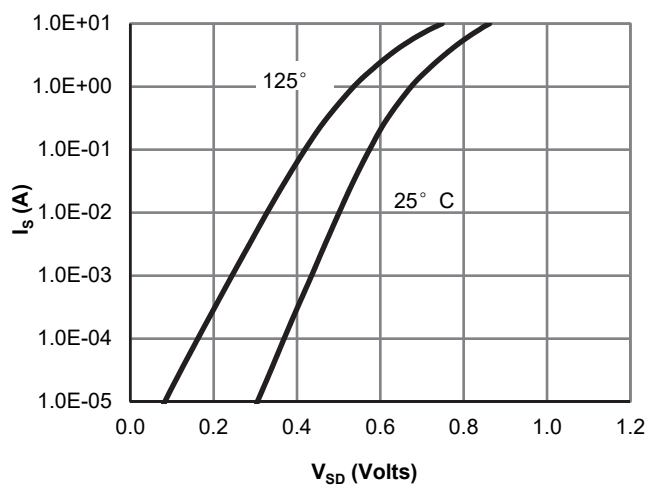


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

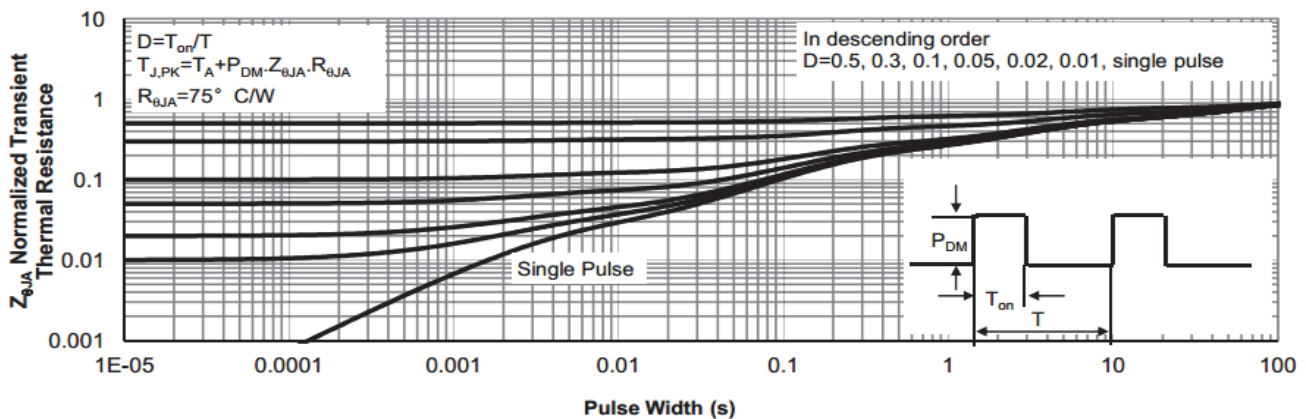
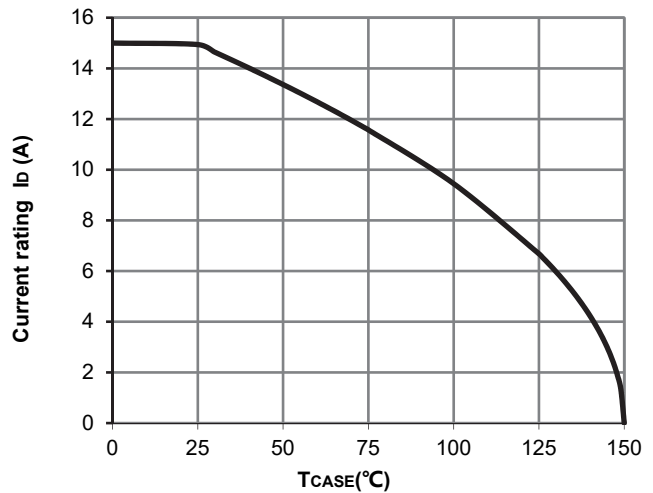
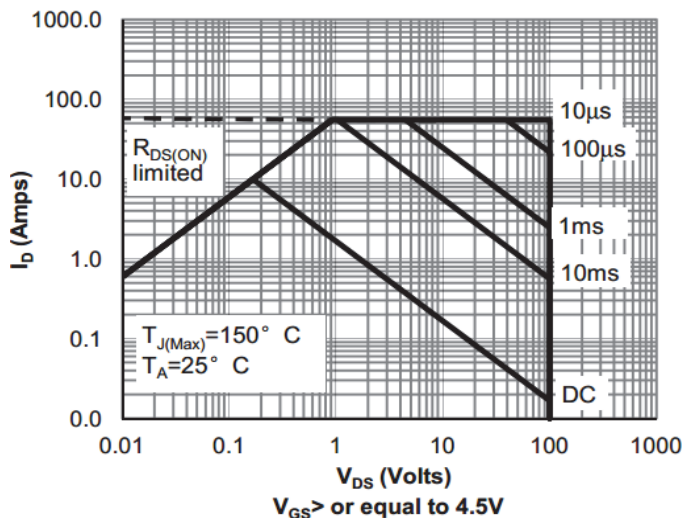
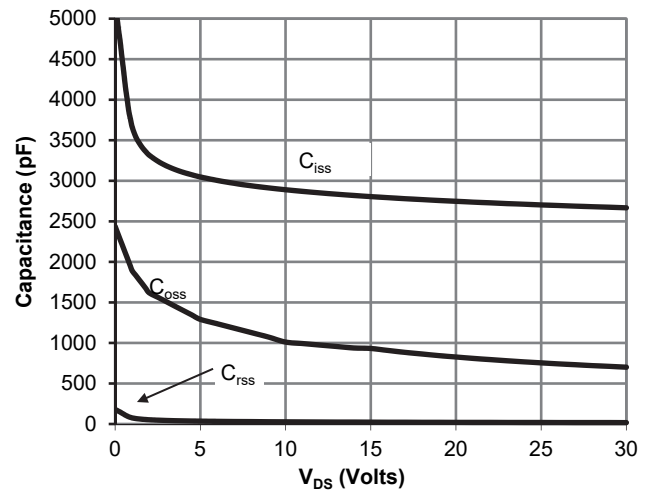
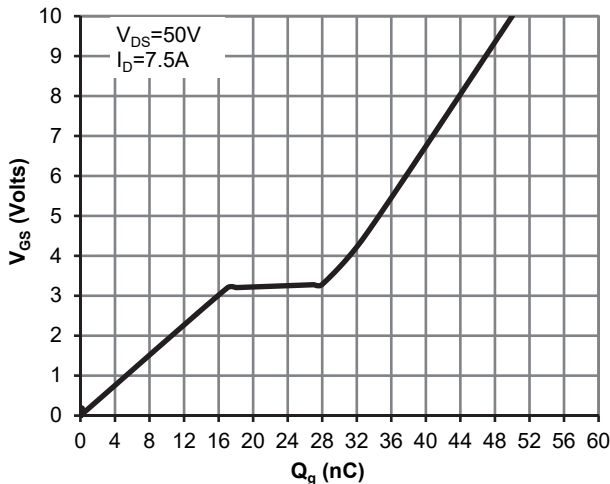


Figure A: Gate Charge Test Circuit & Waveforms

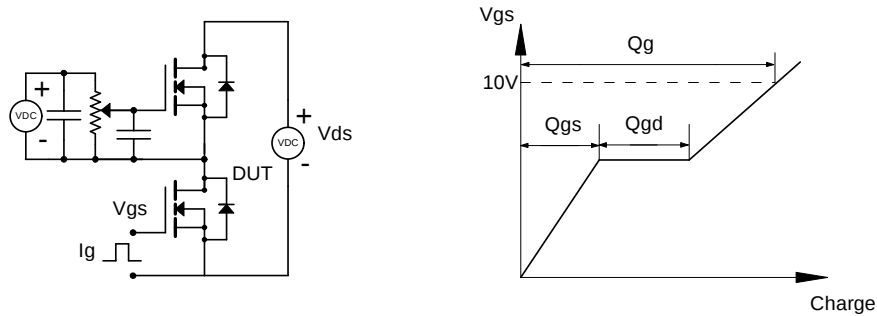


Figure B: Resistive Switching Test Circuit & Waveforms

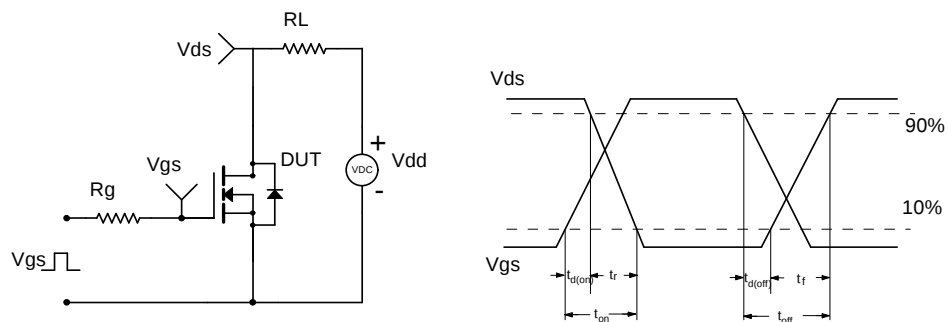


Figure C: Unclamped Inductive Switching (UIS) Test

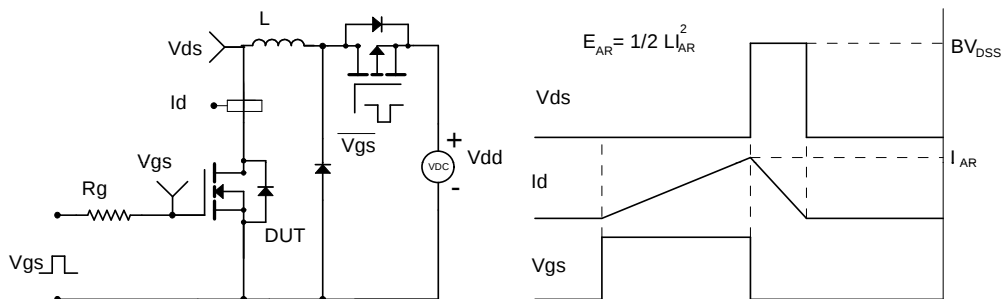
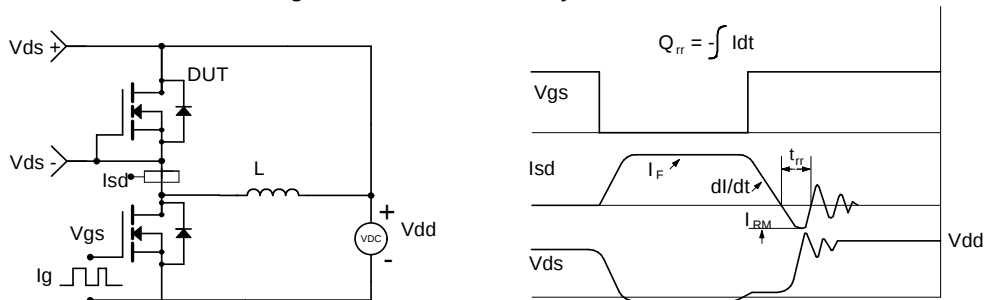
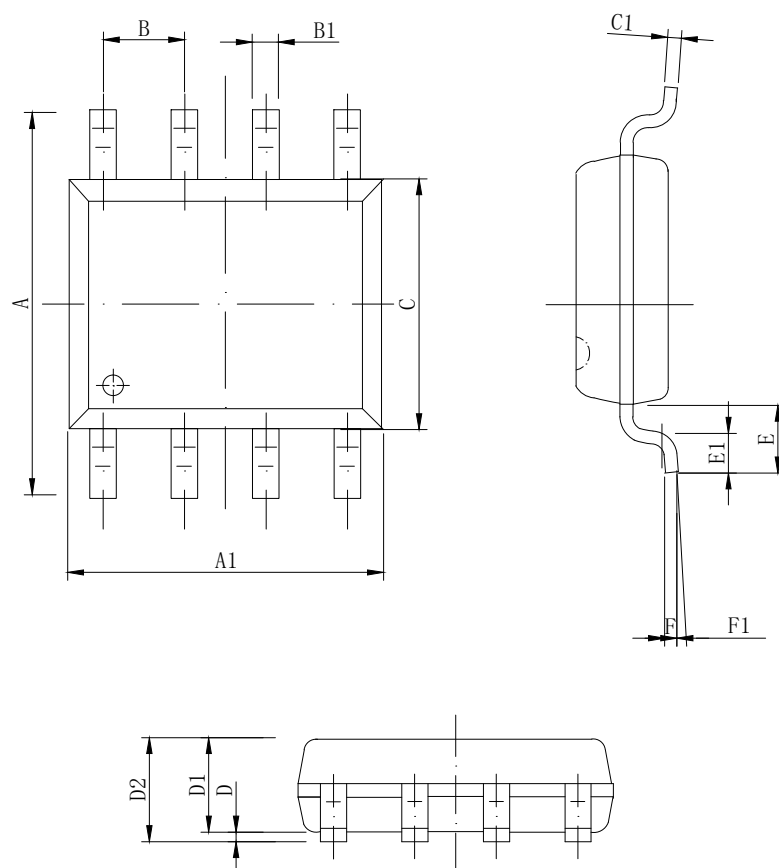


Figure D: Diode Recovery Test Circuit & Waveforms



SOP-8 Package information



DIM	MIN	NOM	MAX
A	5.800	6.000	6.200
A1	4.800	4.900	5.000
B	1.270BSC		
B1	0.35 ^ 8x	0.40 ^ 8x	0.45 ^ 8x
C	3.780	3.880	3.980
C1	—	0.203	0.253
D	0.050	0.150	0.250
D1	1.350	1.450	1.550
D2	1.500	1.600	1.700
E	1.060 REF		
E1	0.400	0.700	0.100
F	0.250BSC		
F1	2°	4°	6°

All Dimensions in mm