

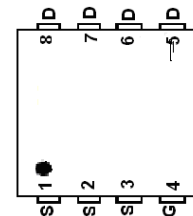
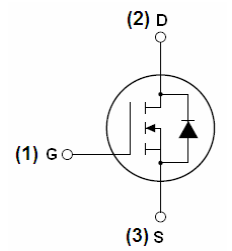
## General Features

VDSS	RDS(ON) @10V (typ)	RDS(ON) @4.5V (typ)	ID
60V	6.8 mΩ	9.5 mΩ	45A

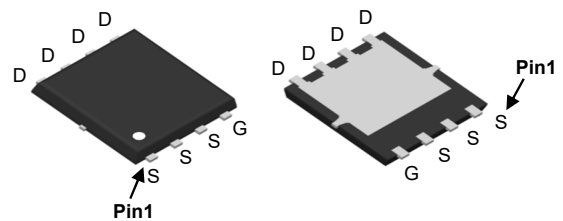
- Split Gate Trench Power MV MOSFET technology
- Low  $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications
- RoHS Compliant

## Applications

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



Top View



DFN 3x3-8L

## Ordering Information

Part Number	Marking	Case	Packaging
GT45N06	GT45N06	DFN3*3-8L	3000pcs/Reel

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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>G</sup>	$I_D$	$T_A=25^\circ\text{C}$	45
		$T_A=100^\circ\text{C}$	25
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	80	A
Avalanche energy $L=0.5\text{mH}$ <sup>C</sup>	$E_{AS}$	180	mJ
Power Dissipation <sup>A</sup>	$P_{DSM}$	$T_A=25^\circ\text{C}$	50
		$T_A=100^\circ\text{C}$	20
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 <sup>A</sup>	$R_{\theta JA}$	$t \leq 10\text{s}$	18
		Steady-State	22
Maximum Junction-to-Ambient <sup>A,D</sup>	$R_{\theta JA}$	55	$^\circ\text{C/W}$
Maximum Junction-to-Case	$R_{\theta JC}$	2.1	$^\circ\text{C/W}$

## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	60	65		V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C			1 5	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.1	1.7	2.5	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		6.8 9.5	8.2 12.0	mΩ
g <sub>FS</sub>	Diode Forward Voltage	V <sub>DS</sub> =5V, I <sub>D</sub> =20A	30			S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =20A, V <sub>GS</sub> =0V		0.85	0.99	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current <sup>G</sup>				53	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, f=1MHz		1988		pF
C <sub>oss</sub>	Output Capacitance			470		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			14		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		1.6		Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub> (10V)	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =20A		31		nC
Q <sub>g</sub> (4.5V)	Total Gate Charge			16		nC
Q <sub>gs</sub>	Gate Source Charge			6		nC
Q <sub>gd</sub>	Gate Drain Charge			5		nC
t <sub>D(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =2.5Ω, R <sub>GEN</sub> =3Ω		10.5		ns
t <sub>r</sub>	Turn-on Rise Time			4.5		ns
t <sub>D(off)</sub>	Turn-off Delay Time			29.5		ns
t <sub>f</sub>	Turn-off Fall Time			8		ns
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =20A, di/dt=500A/μs		17		ns
Q <sub>rr</sub>	Body Diode Reverse Recovery charge	I <sub>F</sub> =20A, di/dt=500A/μs		58		nC

A. The value of R<sub>θJA</sub> is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25° C. The Power dissipation P<sub>D(SM)</sub> is based on R<sub>θJA</sub> ≤ 10s 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<sub>D</sub> is based on T<sub>J(MAX)</sub>=150° 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<sub>J(MAX)</sub>=150° C.

D. The R<sub>θJA</sub> is the sum of the thermal impedance from junction to case R<sub>θJC</sub> and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs 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<sub>J(MAX)</sub>=150° C. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

Typical Performance Characteristics

Fig 1: Output Characteristics

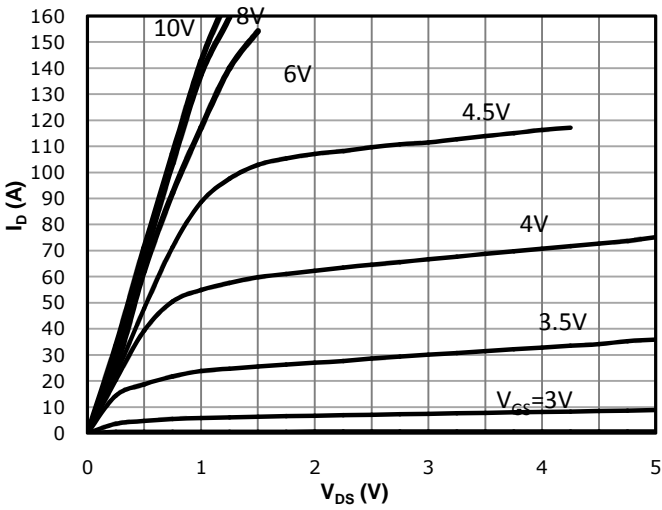


Fig 2: Transfer Characteristics

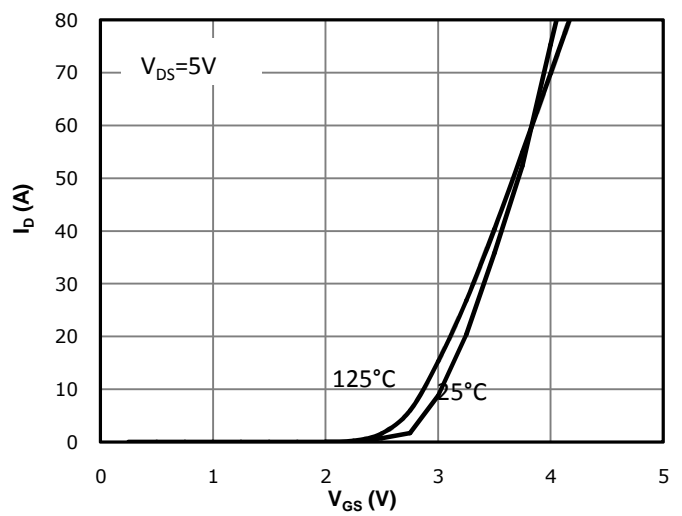


Fig 3: Rds(on) vs Drain Current and Gate Voltage

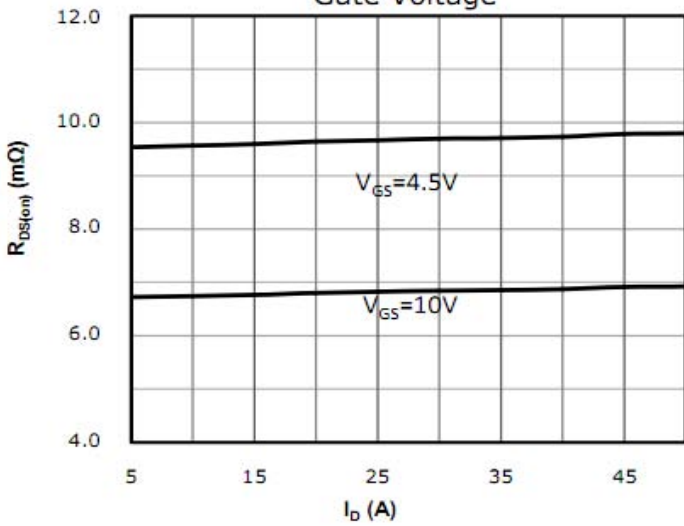


Fig 4: Rds(on) vs Gate Voltage

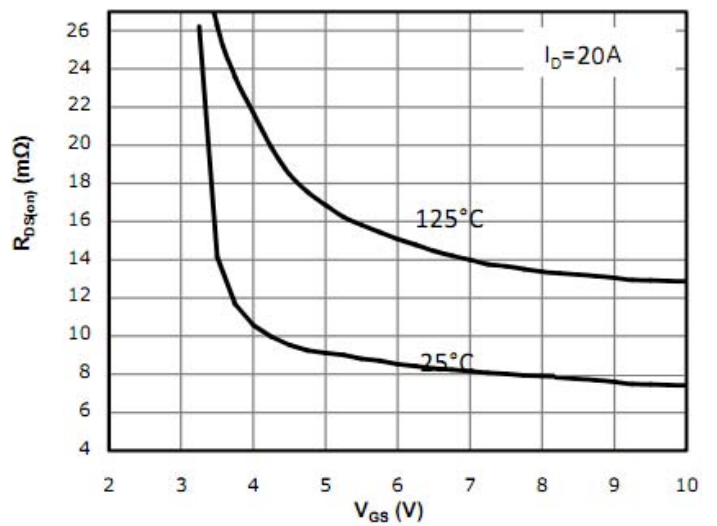


Fig 5: Rds(on) vs. Temperature

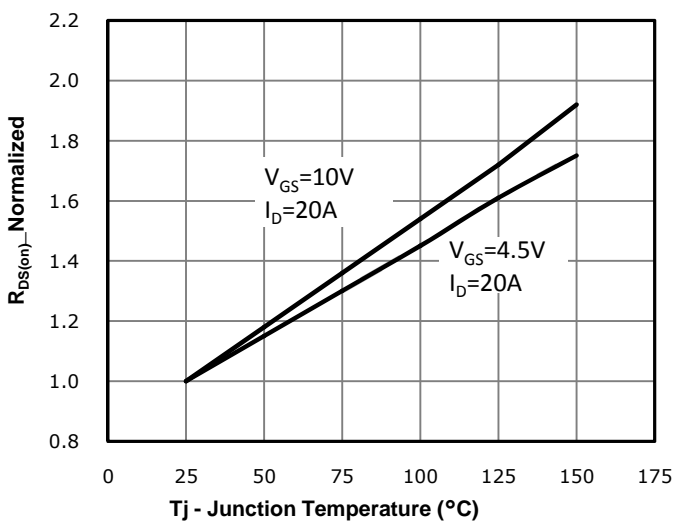


Fig 6: Capacitance Characteristics

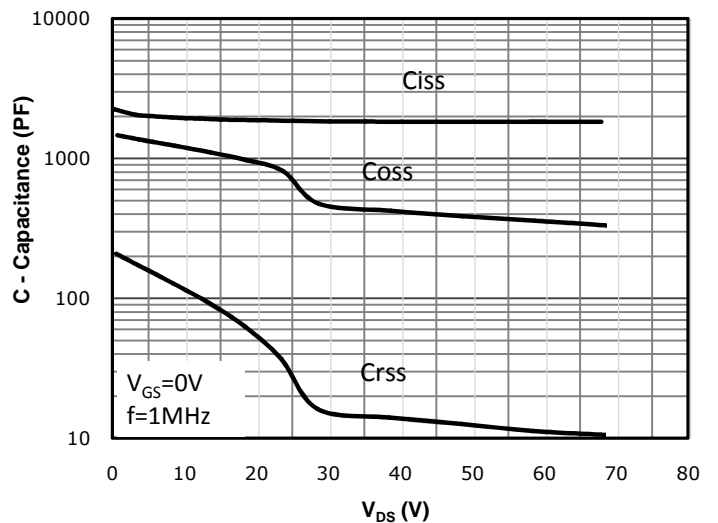


Fig 7: Gate Charge Characteristics

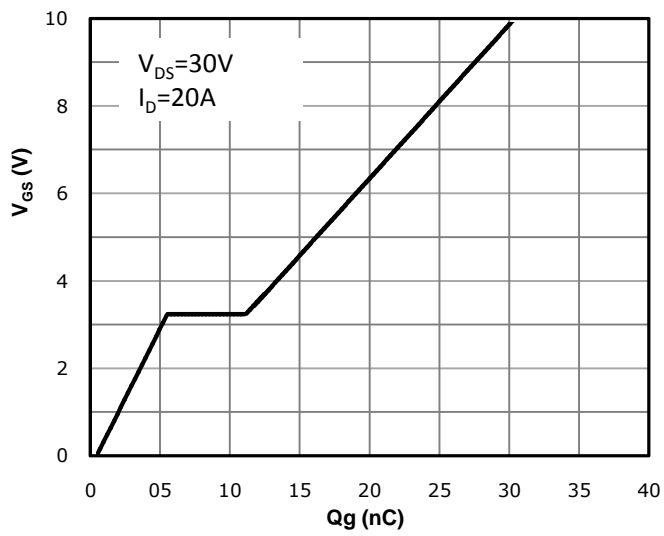


Fig 8: Body-diode Forward Characteristics

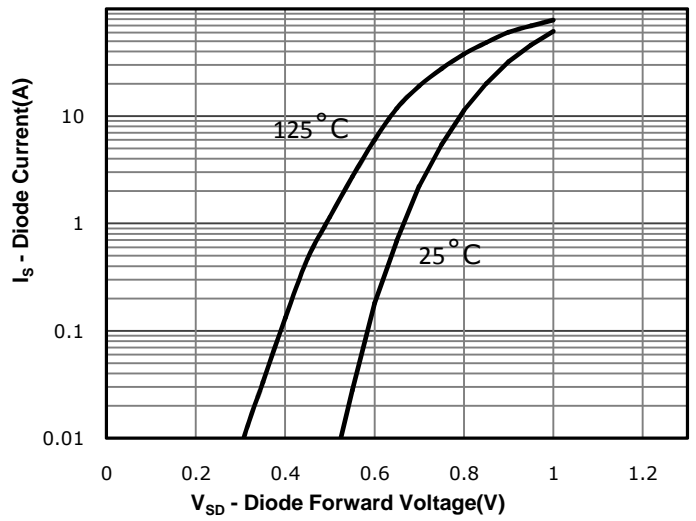


Fig 9: Power Dissipation

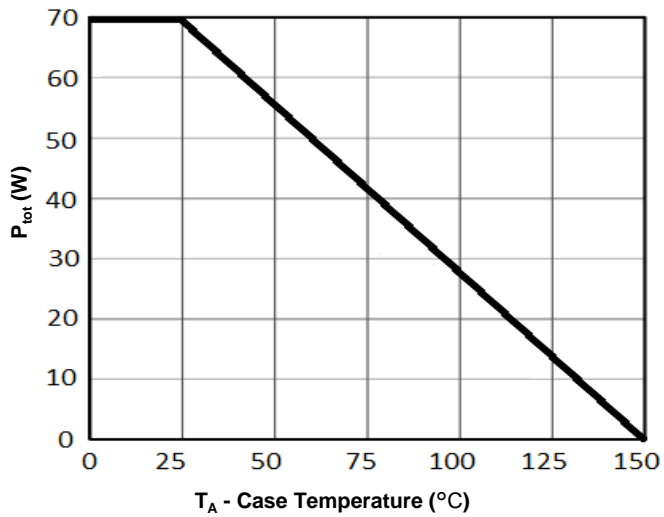


Fig 10: Drain Current Derating

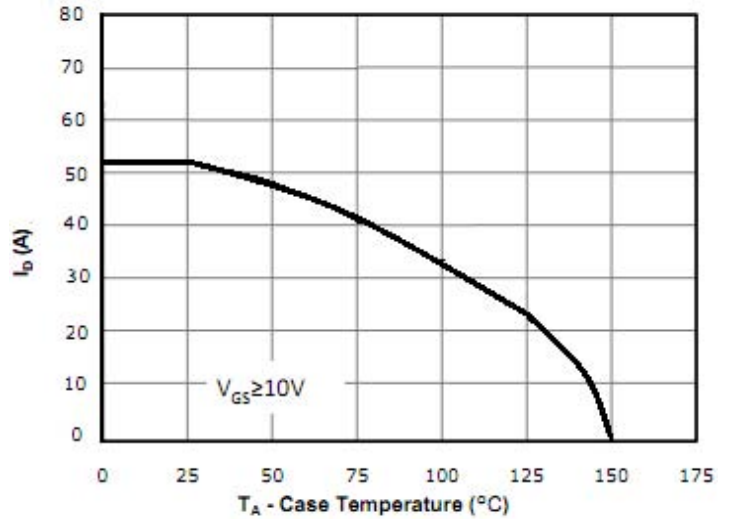


Figure A: Gate Charge Test Circuit & Waveforms

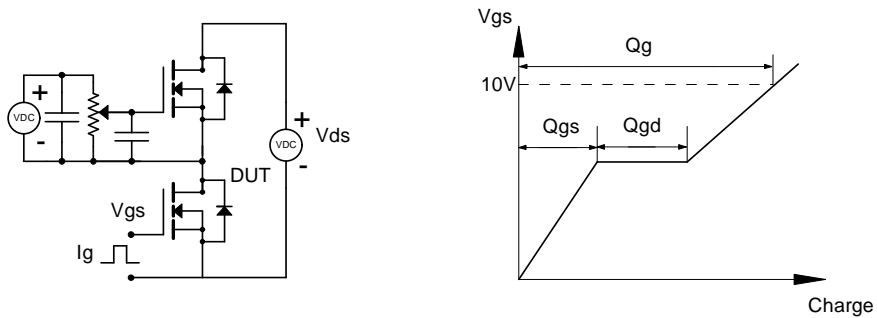


Figure B: Resistive Switching Test Circuit & Waveforms

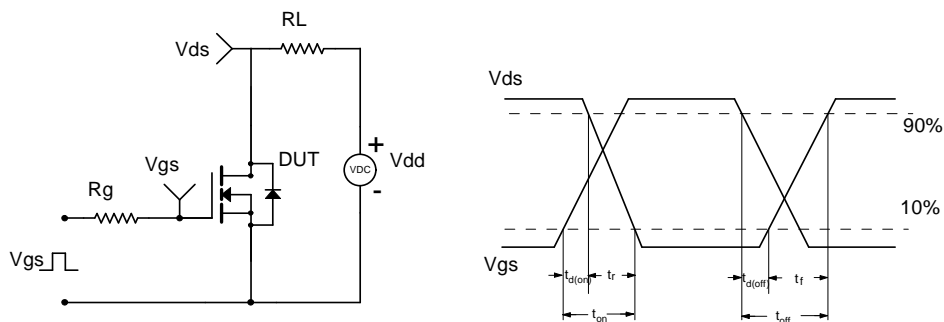


Figure C: Unclamped Inductive Switching (UIS) Test

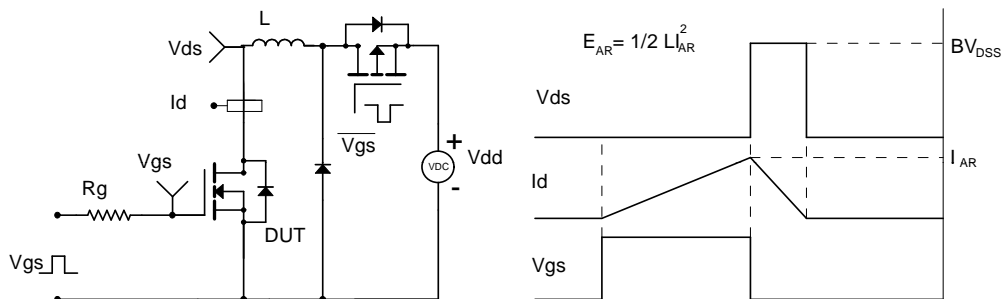
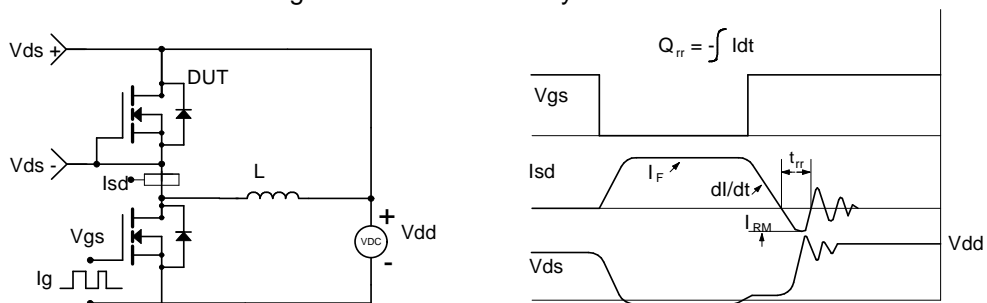
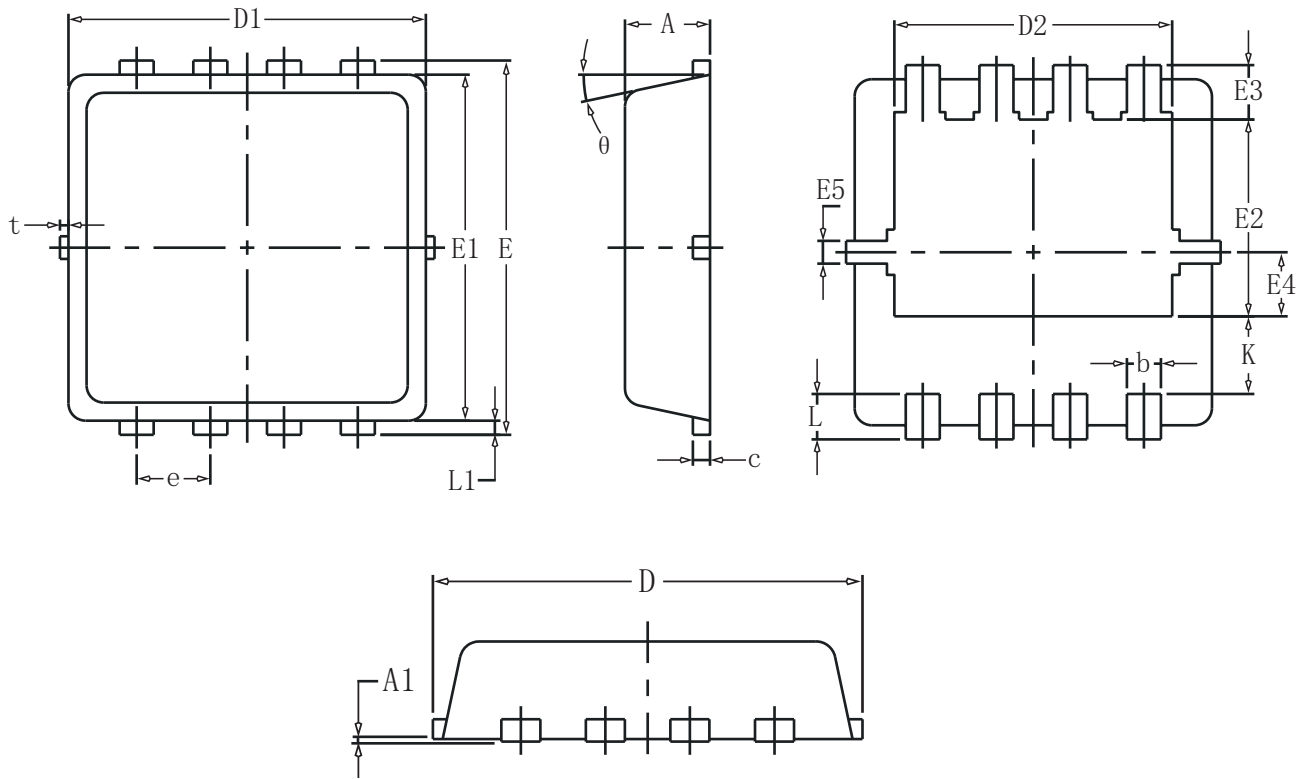


Figure D: Diode Recovery Test Circuit & Waveforms



**DFN3X3-8L Package information**



SYMBOL	COMMON		
	MM		
	MIN	NOM	MAX
A	0.70	0.75	0.85
A1	-	-	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
$\theta$	10°	12°	14°