TXTK080N03L

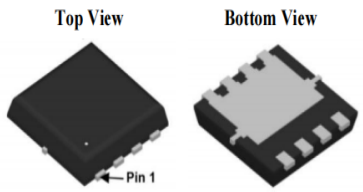
Silicon N-Channel Power MOSFET

V_{DSS}	30	V
I_D	50	A
P_D	25	W
$R_{DS(ON)type}$	5.5	mΩ

General Description :

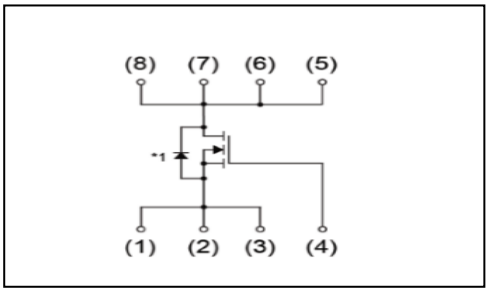
The TXTK080N03L uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is PDFN3.0*3.0, which accords with the RoHS standard.

PDFN3.0*3.0



Features :

- Fast Switching
- Low Gate Charge and R_{dson}
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test



Applications :

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute (Tc= 25℃ unless otherwise specified) :

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	30	V
I_D	Continuous Drain Current	50	A
	Continuous Drain Current T_C = 100 °C	30	A
I_{DM}	Pulsed Drain Current	200	A
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS} [a2]	Single Pulse Avalanche Energy	100	mJ
E_{AR} [a1]	Avalanche Energy ,Repetitive	35	mJ
I_{AR} [a1]	Avalanche Current	25	A
dv/dt [a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	25	W
T_J , T_{stg}	Operating Junction and Storage Temperature Range	150 , −55 to 150	℃
T_L	MaximumTemperature for Soldering	300	℃

Electrical Characteristics (Tc= 25℃ unless otherwise specified) :

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.1	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=60V,V_{GS}=0V,T_a=25℃	--	--	1	μA
		V_{DS}=48V,V_{GS}=0V,T_a=125℃	--	--	250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=20A	--	5.5	8.0	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.75	2.5	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=5V,I_D=20A	18	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=10V f=1.0MHz	--	1279	--	pF
C_{oss}	Output Capacitance		--	192	--	
C_{rss}	Reverse Transfer Capacitance		--	147	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=20A,V_{DD}=10V V_{GS}=10V,R_G=3.0Ω	--	7.9	--	ns
t_r	Rise Time		--	15	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	25.0	--	
t_f	Fall Time		--	5.9	--	
Q_g	Total Gate Charge	I_D=20A,V_{DD}=10V V_{GS}=10V	--	25.2	--	nC
Q_{gs}	Gate to Source Charge		--	4.2	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	6.1	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	50	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	200	A
V_{SD}	Diode Forward Voltage	I_S=50A,V_{GS}=0V	--	--	1.1	V
t_{rr}	Reverse Recovery Time	I_S=20A,T_j = 25°C	--	30	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/us,V_{GS}=0V	--	40	--	nC
Pulse width tp≤380μs,δ≤2%						

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	35	℃/W

[a1] : Repetitive rating; pulse width limited by maximum junction temperature

[a2] : EAS condition : T_j=25℃ ,V_{DD}=10V,V_G=10V,L=0.5mH,Rg=25Ω

[a3] : I_{SD} =20A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25℃

Typical Performance Characteristics

Fig1 Output Characteristics

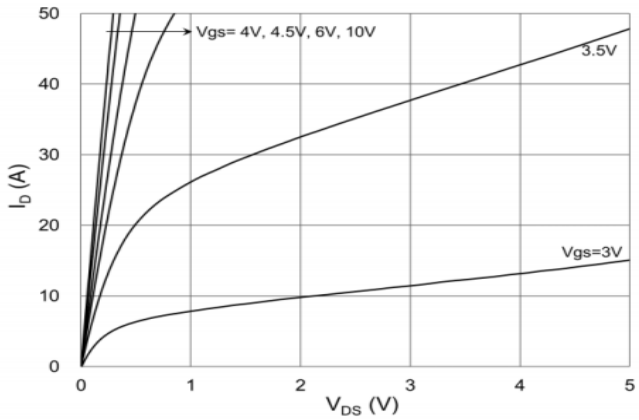


Fig2 Normalized R_{DSON} vs. T_J

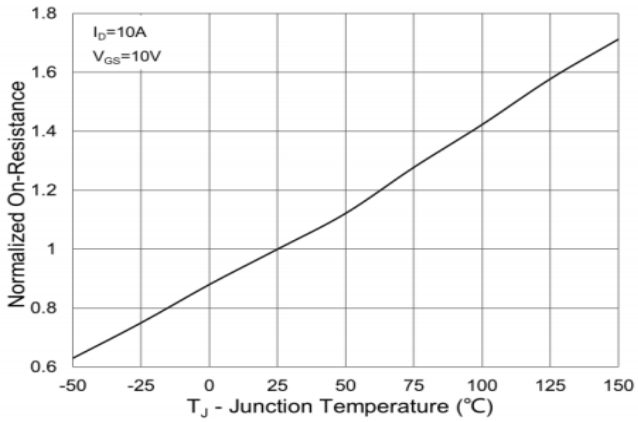


Fig3 Gate Charge Waveform

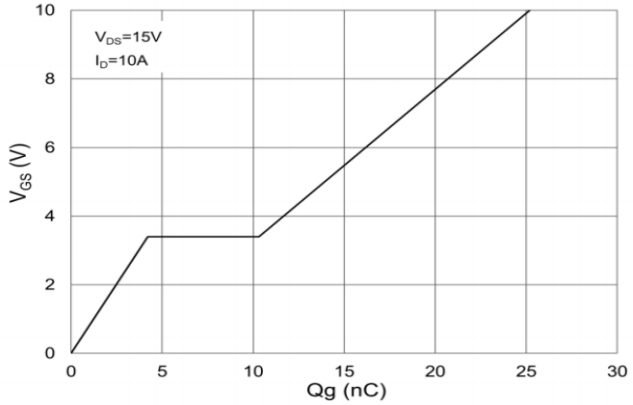


Fig4 Transfer Characteristics

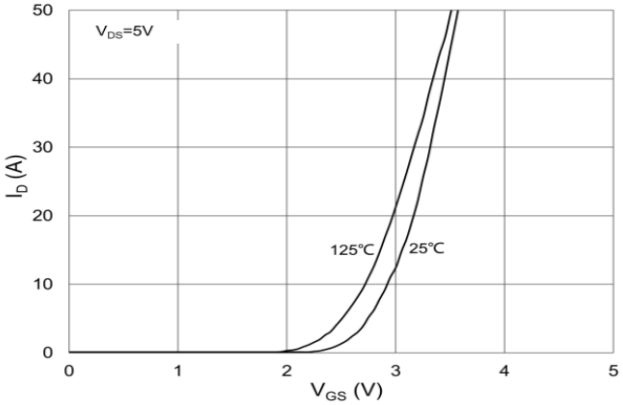


Fig5 Rds(on) vs. Drain Current and Gate Voltage

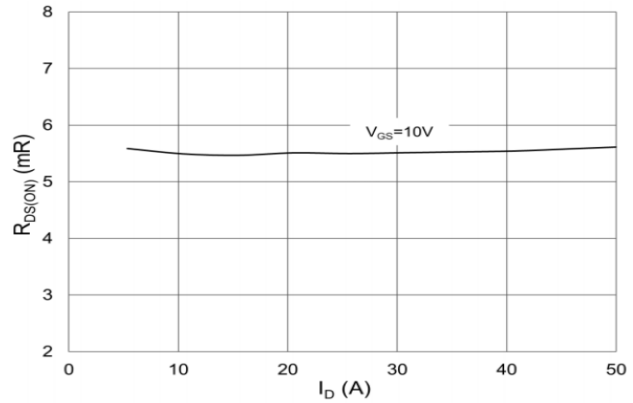


Fig6 Rds(on) vs. Gate Voltage

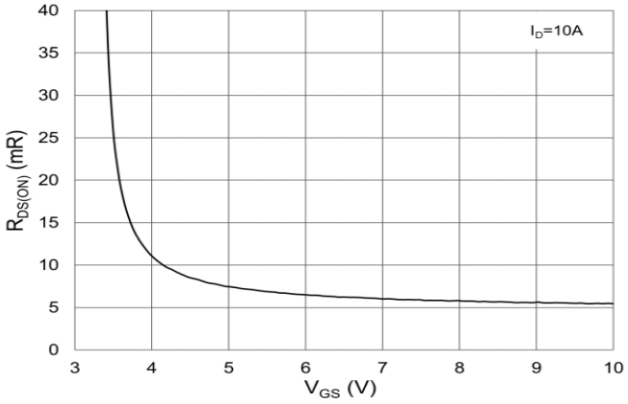


Fig7 Capacitance Characteristics

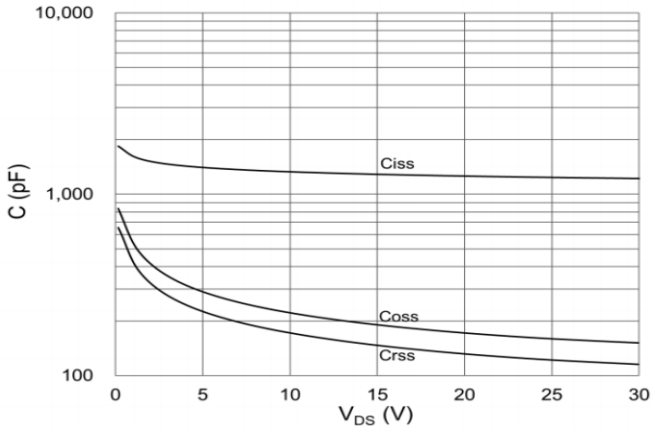


Fig8 Drain Current Derating

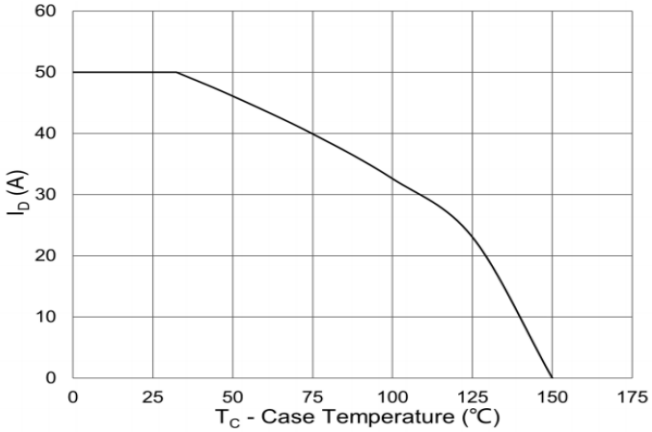


Fig9 Power Dissipation

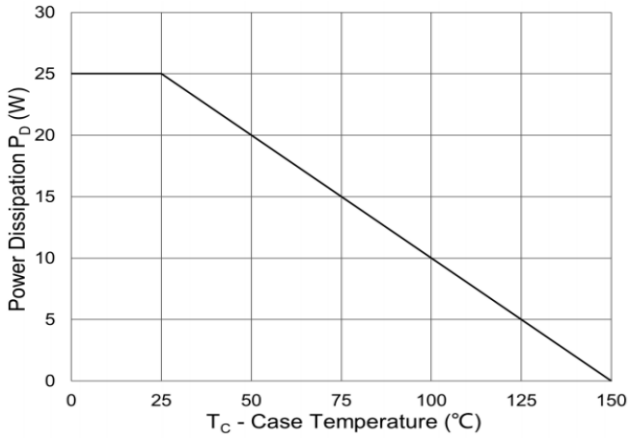


Fig10 Source-Drain Diode Forward Characteristics

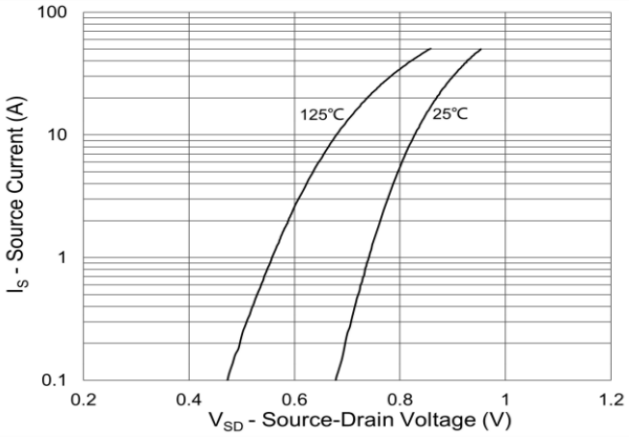


Fig11 Normalized Threshold Voltage vs. T_J

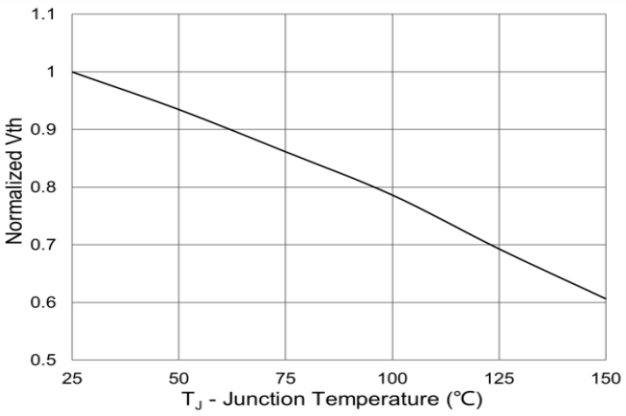


Fig12 Normalized Breakdown Voltage vs. T_J

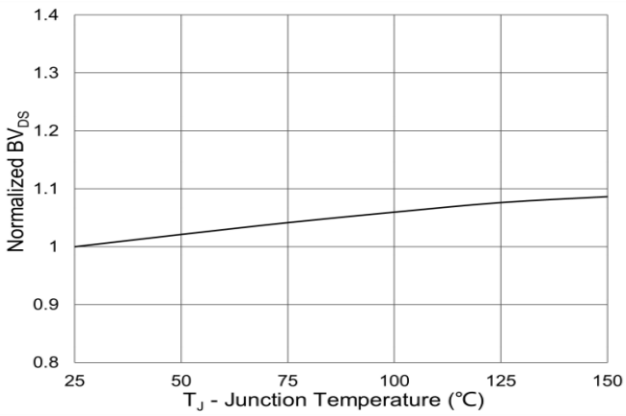


Fig13 Maximum Safe Operation Area

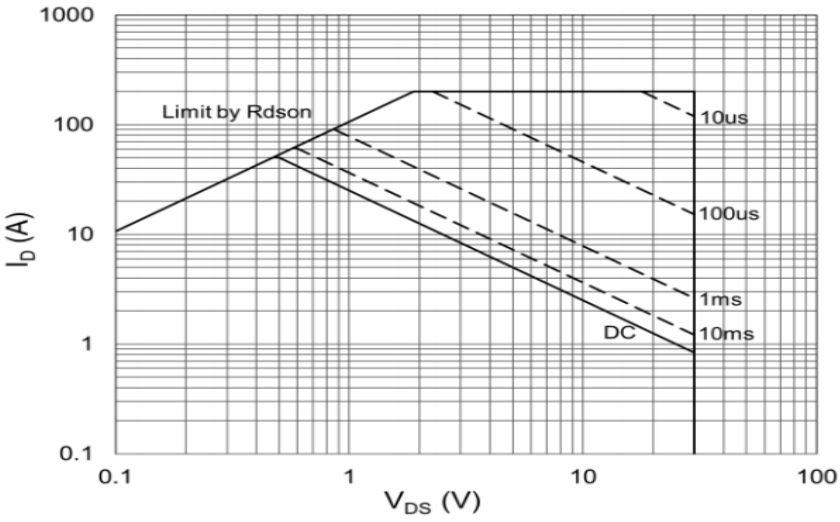
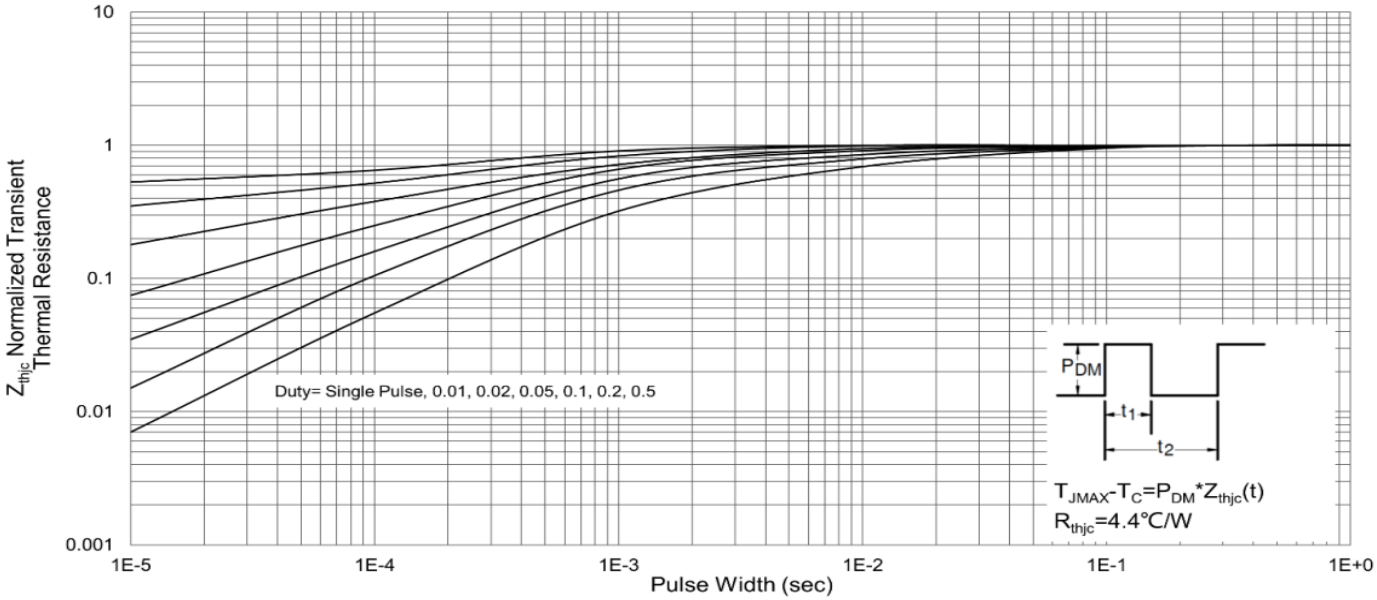
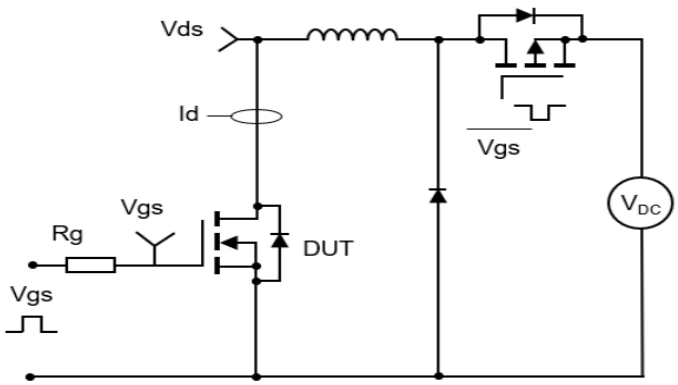


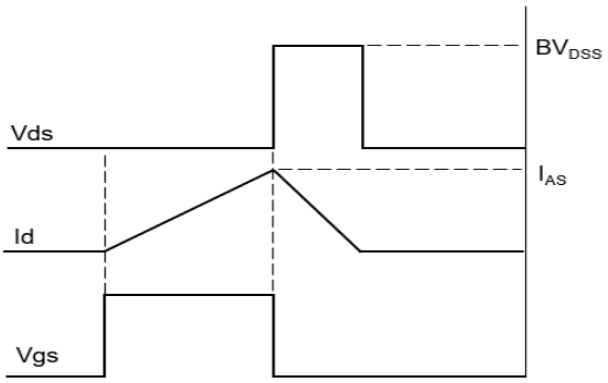
Fig14 Normalized Transient Impedance



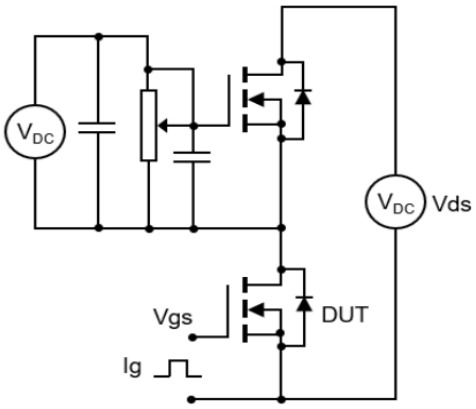
Test Circuit & Waveform

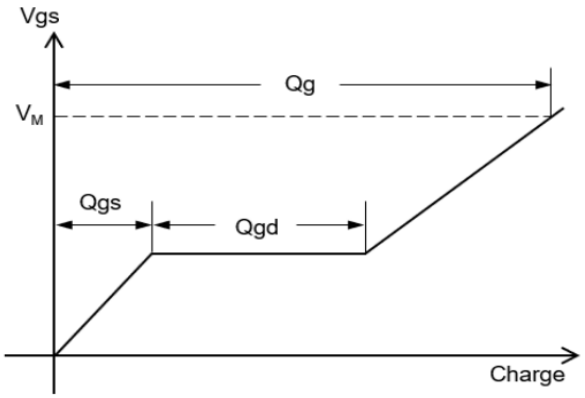
1. Unclamped Inductive Switching Test Circuit & Waveform



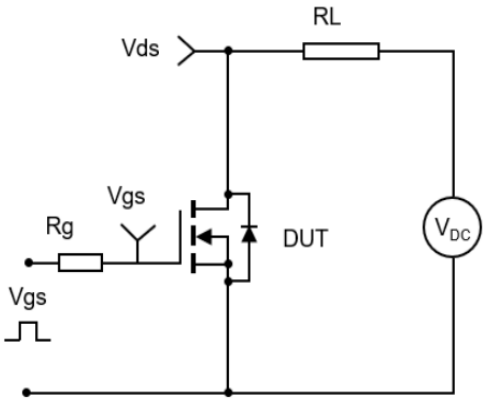


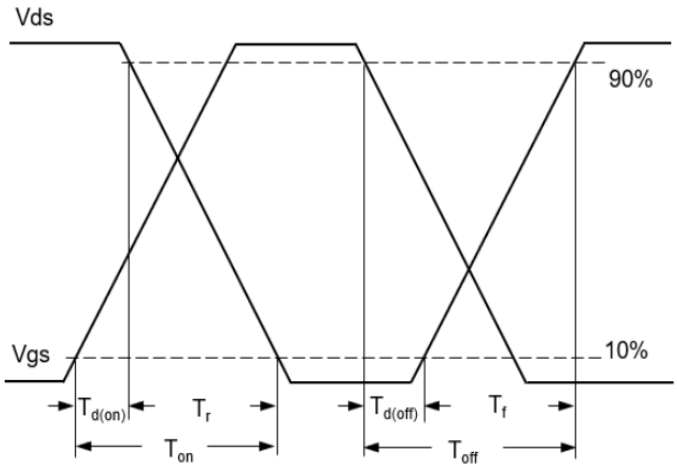
2. Gate Charge Test Circuit & Waveform



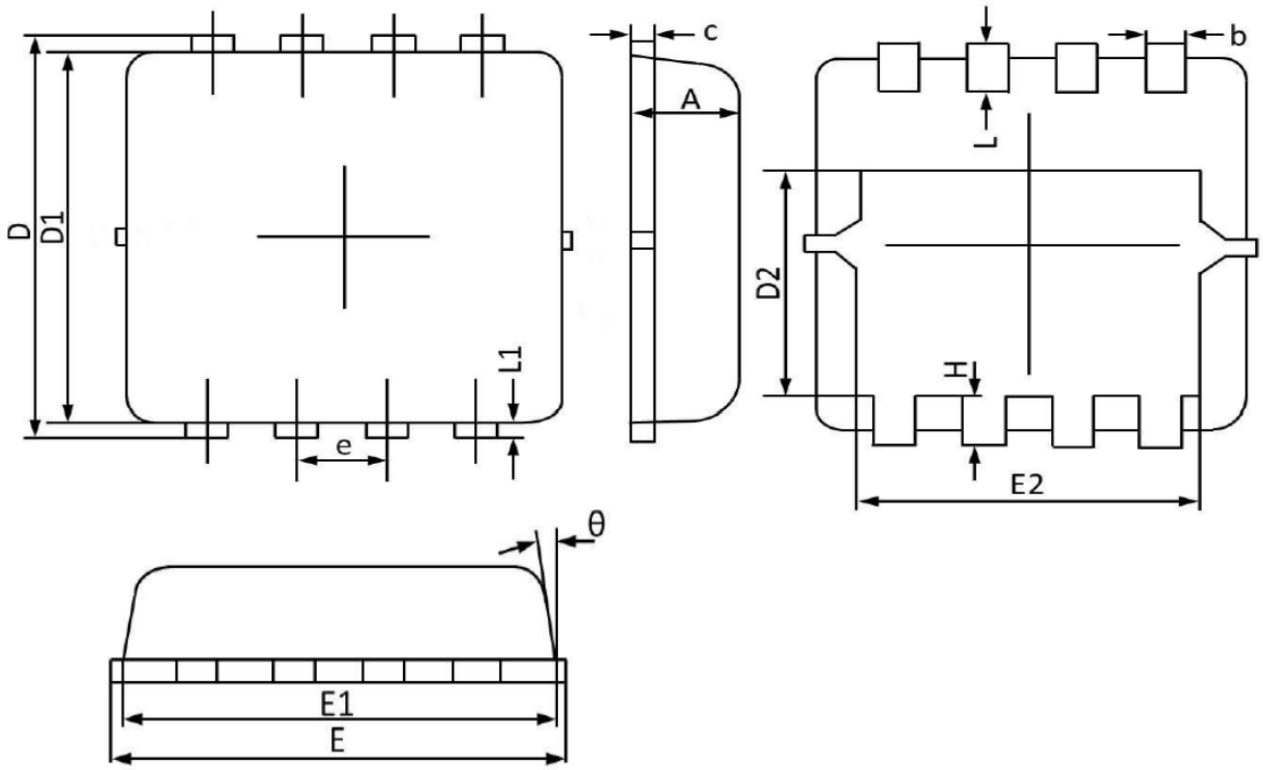


3. Resistive Switching Test Circuit & Waveform





PDFN3.0*3.0 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
b	0.350	0.240	0.014	0.009
c	0.250	0.100	0.010	0.004
D	3.450	3.050	0.136	0.120
D1	3.200	2.900	0.126	0.114
D2	1.850	1.350	0.073	0.053
E	3.400	3.000	0.134	0.118
E1	3.250	2.900	0.128	0.114
E2	2.600	2.350	0.102	0.093
e	0.65BSC		0.026BSC	
H	0.500	0.300	0.020	0.012
L	0.500	0.300	0.020	0.012
L1	0.200	0.070	0.008	0.003
θ	12°	0°	12°	0°