

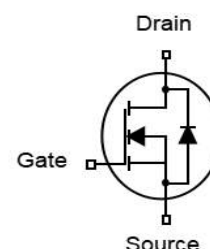
Features

- N-Channel
- Low grid charge
- Low reverse transmission capacitance
- Fast switching speed
- Pb-free lead plating
- 100% EAS Tested

V_{DS}	40	V
$R_{DS(on),TYP}@ V_{GS}=10V$	0.8	m Ω
I_D	270	A

DFN5x6


Part ID	Package Type	Marking	Packing
ZTG009N04GC	DFN5x6	ZTG009N04GC	5000pcs/Reel



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

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_c=25^{\circ}\text{C}$ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage	± 20	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	40	V	
T_J	Maximum Junction Temperature	150	$^{\circ}\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$	
I_{DM}	Drain Current-Continuous@ Current-Pulsed	$T_c=25^{\circ}\text{C}$ 1080	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	$T_c=25^{\circ}\text{C}$	270	A
		$T_c=100^{\circ}\text{C}$	171	A
I_{AS}	Single pulse avalanche Current	49	A	
P_D	Maximum Power Dissipation	119	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.05	$^{\circ}\text{C}/\text{W}$	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient (Note 3)	50	$^{\circ}\text{C}/\text{W}$	
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 5)	600	mJ	

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

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J=25°C (unless otherwise stated)						
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	40	--	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V T _J =25°C	--	--	1	μA
		V _{DS} =40V, V _{GS} =0V T _J =125°C	--	4	--	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.4	--	3.4	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =50A	--	0.8	0.95	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note 4)						
Ciss	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	6390	--	pF
Coss	Output Capacitance		--	1930	--	pF
Crss	Reverse Transfer Capacitance		--	50	--	pF
Rg	Gate Resistance	f=1MHz	--	1.3	--	Ω
Qg	Total Gate Charge	V _{DD} =32V, I _D =50A, V _{GS} =10V	--	96	--	nC
Qgs	Gate-Source Charge		--	32	--	nC
Qgd	Gate-Drain Charge		--	24	--	nC
Switching Characteristics						
Td(on)	Turn-on Delay Time	V _{DD} =32V, I _D =50A, R _G =2.5Ω, V _{GS} =10V	--	27	--	ns
Tr	Turn-on Rise Time		--	37	--	ns
Td(off)	Turn-Off Delay Time		--	64	--	ns
Tf	Turn-Off Fall Time		--	24	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
I _S	Diode Forward Current (Note 2)		--	--	270	A
V _{SD}	Forward on voltage (Note 3)	I _S =50A, V _{GS} =0V	--	--	1.4	V
T _{rr}	Reverse Recovery Time	T _J =25°C, I _S =50A, V _R =40V	--	79	--	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	145	--	nC

1. The rating only refers to the maximum absolute value of 25 °C in the specification. If the shell temperature is higher than 25 °C, it needs to be derated according to the actual environmental conditions.
2. Pulse time 5μs, pulse width is limited by the maximum junction temperature.
3. The dissipated power value will change with the change of temperature, when greater than 25 °C, the dissipated power value will decrease by 1.11 W/°C with the increase of 1 °C of temperature.
4. Pulse test: pulse width ≤ 300μs, Duty Cycle ≤ 2%.
5. EAS condition: T_J=25°C, V_{DD}=32V, V_G =10V, L=0.5mH, R_G=25Ω.

Typical Electrical and Thermal Characteristics

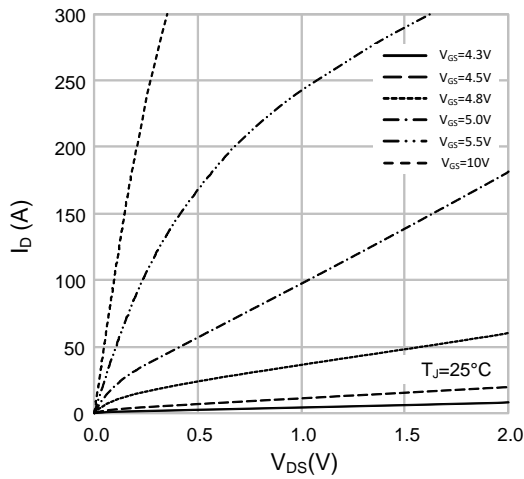


Figure 1 Output Characteristics

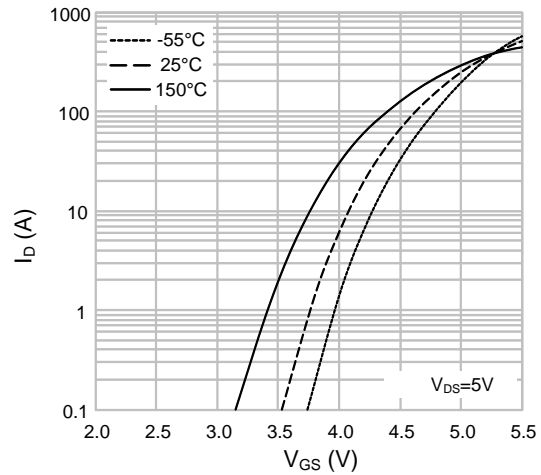


Figure 4 Transfer Characteristics

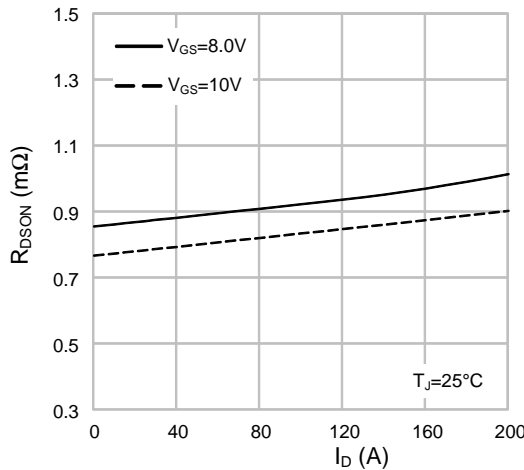


Figure 2 Rdson VS Drain Current

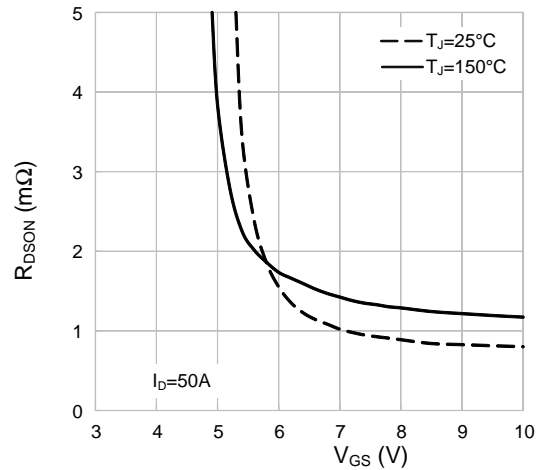


Figure 5 Rdson VS V_GS

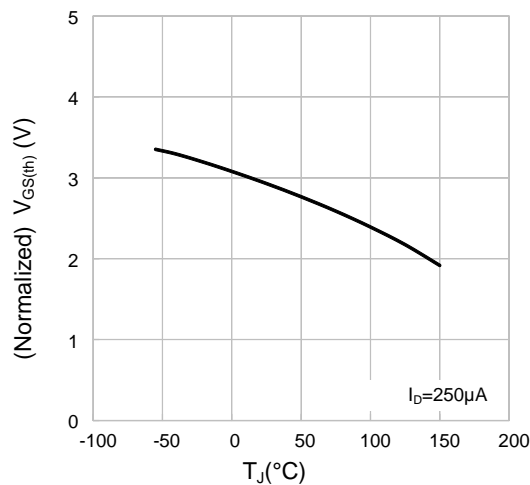


Figure 3 V_GS(th) VS Junction Temperature

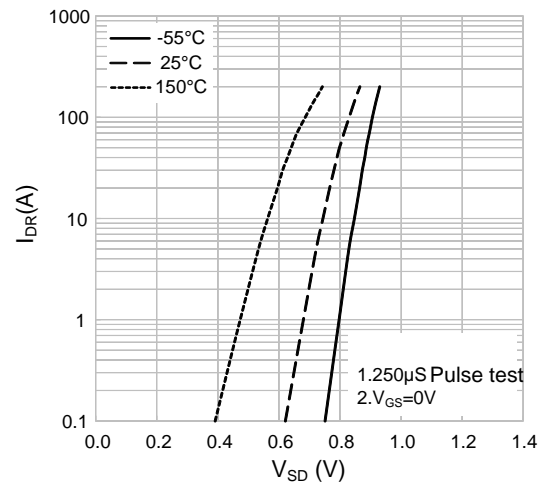


Figure 6 Body Diode Forward Voltage Drop VS Source Current and Temperature

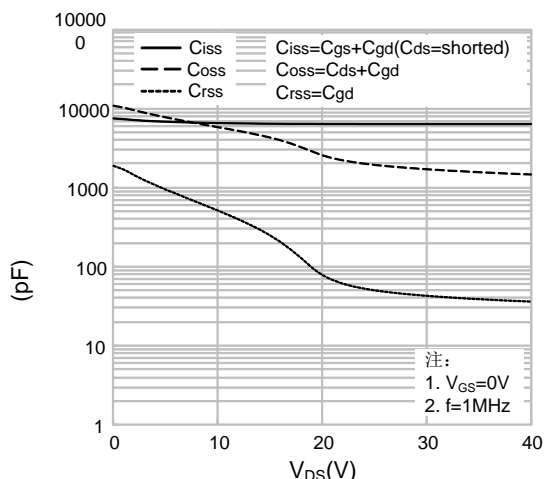


Figure 7 Capacitance Characteristics

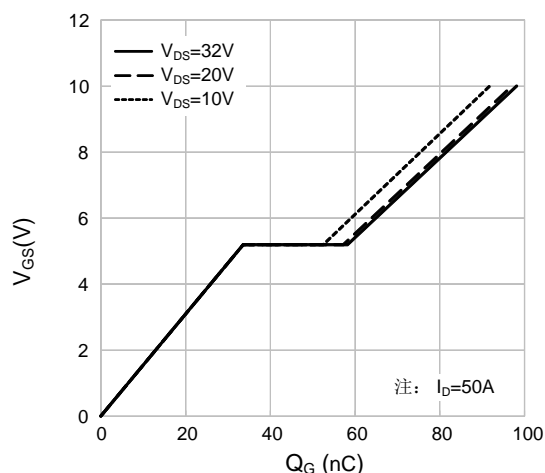


Figure 10 Gate Charge

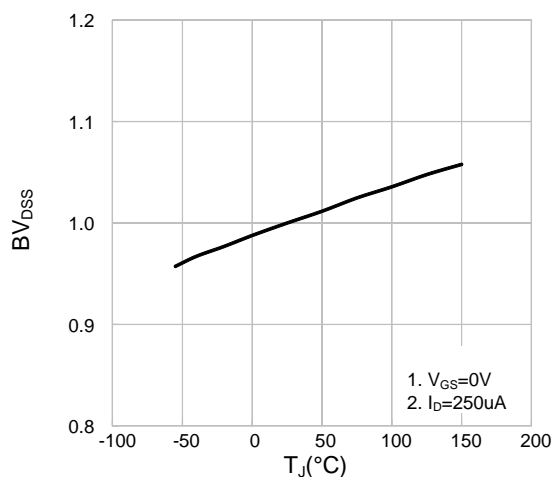


Figure 8 Breakdown Voltage VS Temperature Characteristic

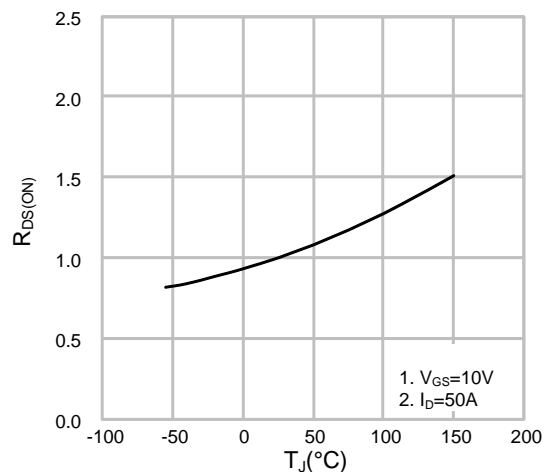


Figure 11 R_{DS(on)} VS Temperature Characteristic

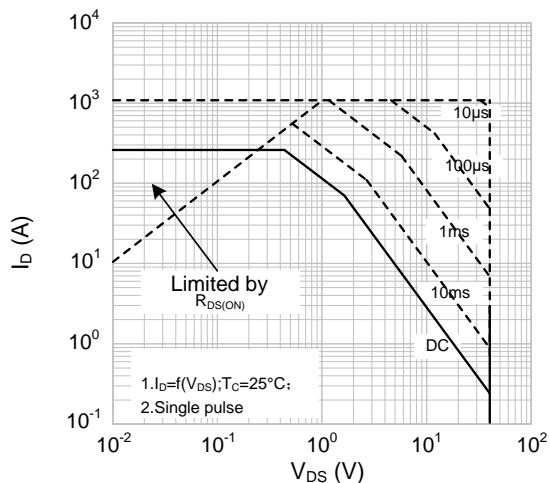


Figure 9 Safe Operation Area

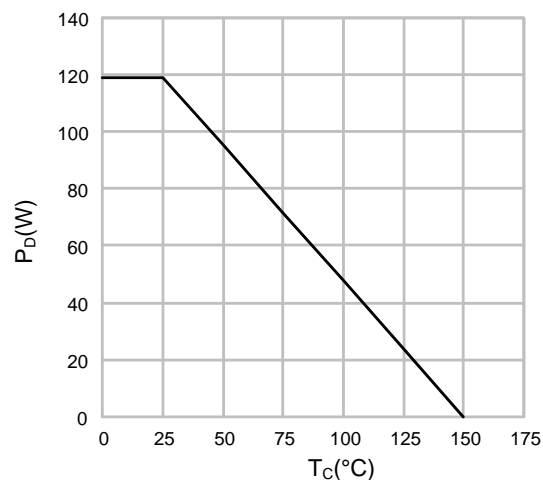


Figure 12 Power Dissipation VS Case Temperature

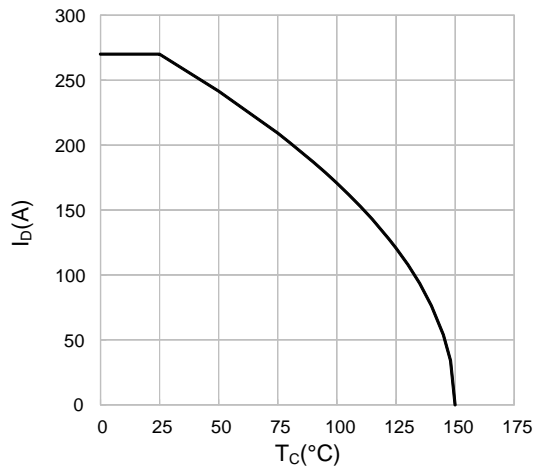


Figure 13 Drain Current VS Case Temperature

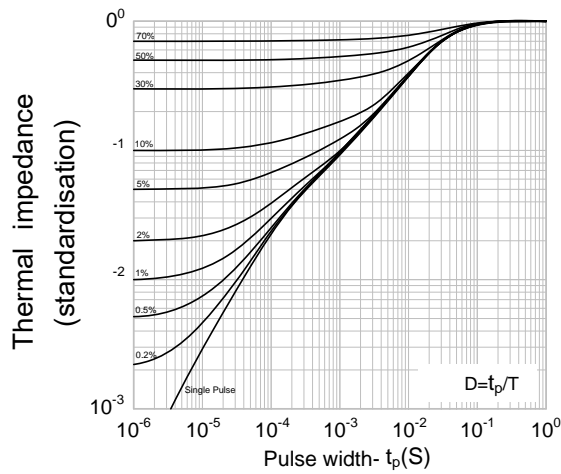
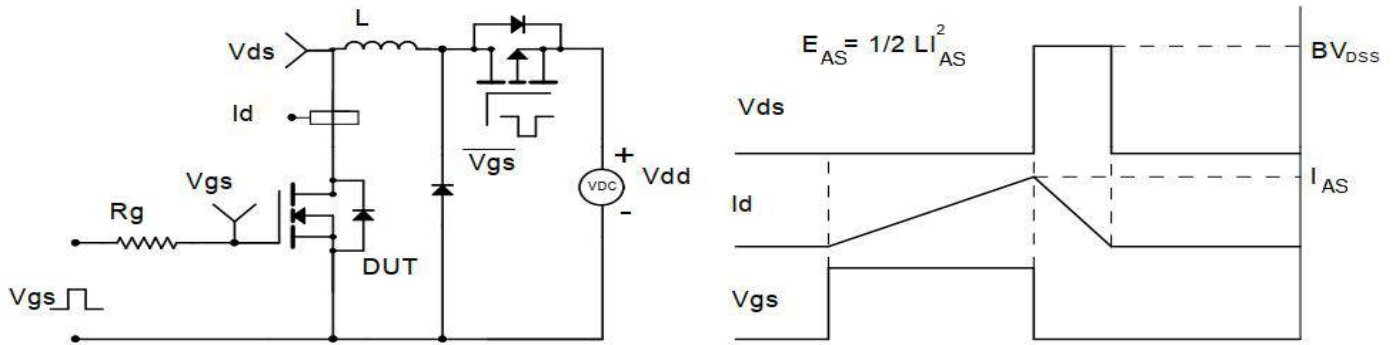


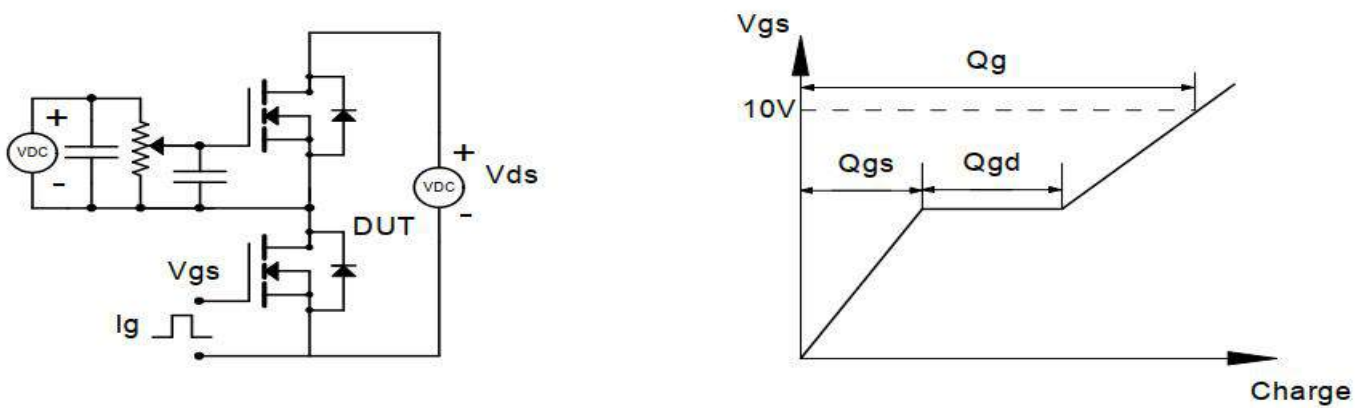
Figure 14 Transient Heat Value Reactance VS Pulse Width

Test circuit&Waveform

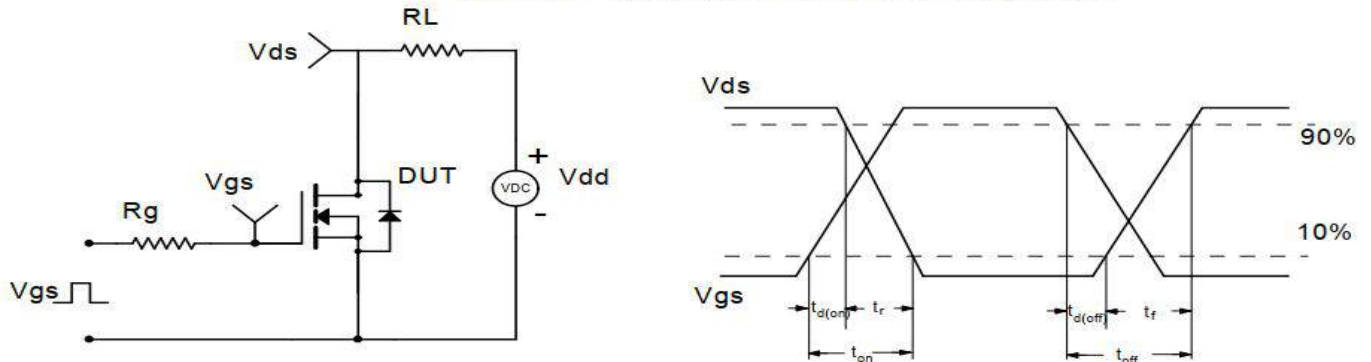
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



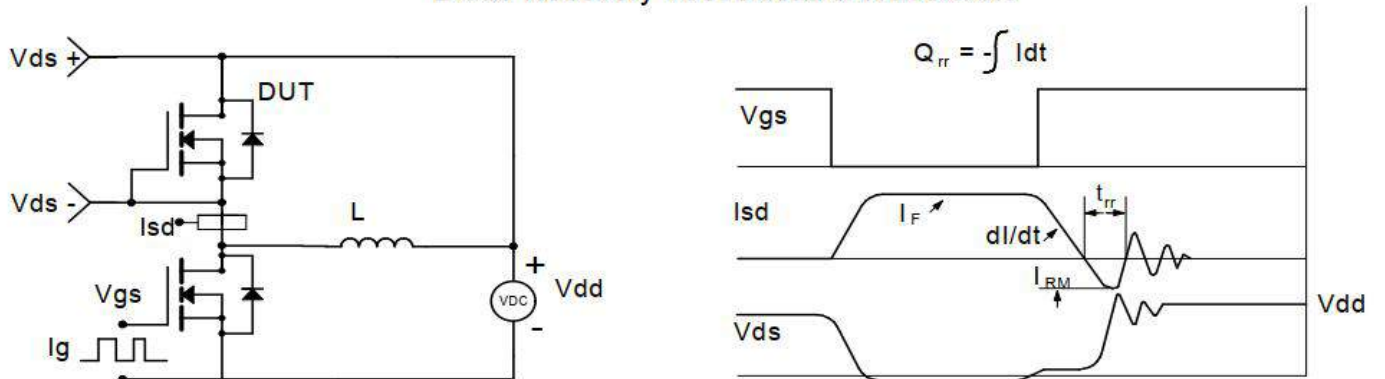
Gate Charge Test Circuit & Waveform



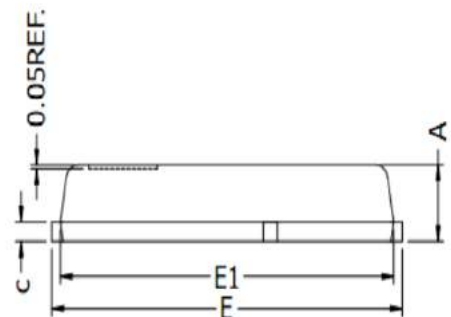
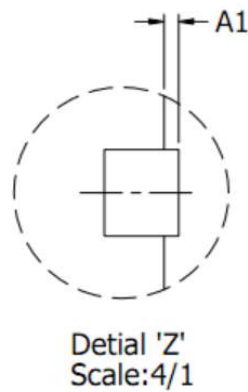
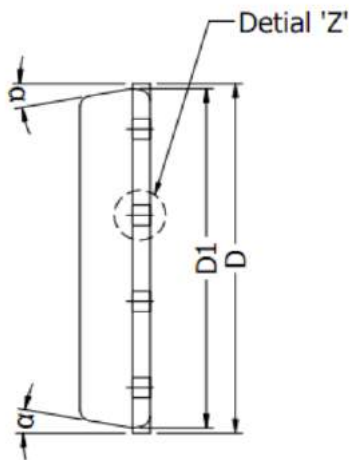
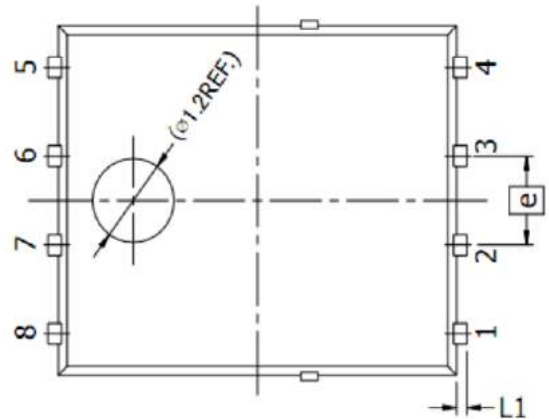
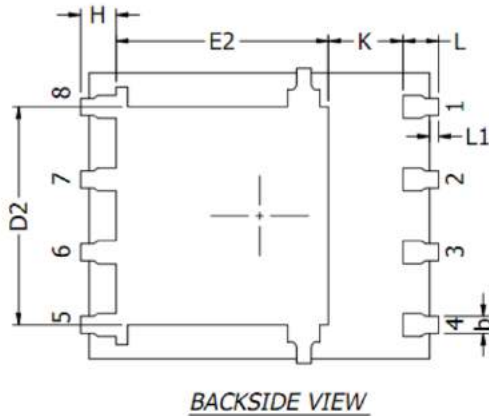
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



DFN5x6-8L Package Information



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.30	0.40	0.50
c	0.20	0.25	0.30
D	5.15 BSC		
D1	5.00 BSC		
D2	3.76	3.81	3.86
E	6.15 BSC		
E1	5.80	5.85	5.90
E2	3.45	3.65	3.85
e	1.27 BSC		
H	0.51	0.61	0.71
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.08	0.15	0.23
α	10°	11°	12°

Customer Service

Sales and Service:
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