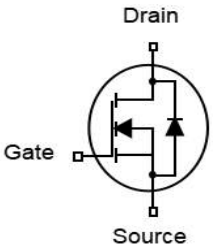
Features

- N-Channel
- Excellent Gate Charge × R_{DSON} (FOM)
- Very low on-resistance
- RoHS compliant (Note 1)
- Halogen-free (Note 1)
- 100% EAS Tested

V_{DS}	40	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	2.1	mΩ
$R_{DS(on),TYP}$@ V_{GS}=4.5 V	3.1	mΩ
I_D	110	A

DFN5x6

Part ID	Package Type	Marking	Packing
ZTG023N04GC	DFN5x6	ZTG023N04GC	5000pcs/Reel



Absolute Maximum Ratings T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°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	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_{DM}	Drain Current-Continuous@ Current-Pulsed (Note 2)	T_C =25°C	468	A
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous (Note 1)	T_C =25°C	110	A
		T_C =100°C	74	A
P_D	Maximum Power Dissipation		62.5	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient (Note 4)		65	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 3)		412	mJ

Electrical Characteristics (T_J=25℃ 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
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.4	1.7	2.4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=20A	--	2.1	2.7	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=20A	--	3.1	4.0	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated) (Note 5)						
Ciss	Input Capacitance	V_{DS}=20V,V_{GS}=0V, f=1MHz	--	2603	--	pF
Coss	Output Capacitance		--	637	--	pF
Crss	ReverseTransferCapacitance		--	45	--	pF
Rg	Gate Resistance	f=1MHz	--	1.5	--	Ω
Qg	Total Gate Charge	V_{DS}=20V,I_D=20A, V_{GS}=10V	--	21.5	--	nC
Qgs	Gate-SourceCharge		--	6.2	--	nC
Qgd	Gate-DrainCharge		--	4.6	--	nC
Switching Characteristics (Note 5)						
Td(on)	Turn-on Delay Time	V_{DD}=20V, I_D =20A, R_G=6.0Ω, V_{GS}=10V	--	6	--	ns
Tr	Turn-on Rise Time		--	27	--	ns
Td(off)	Turn-Off Delay Time		--	39.5	--	ns
Tf	Turn-Off Fall Time		--	16.6	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
I_S	Diode Forward Current (Note 3)		--	--	110	A
V_{SD}	Forward on voltage (Note 6)	I_S =20A,V_{GS}=0V	--	--	1.2	V
Trr	Reverse Recovery Time (Note 4)	T_j=25℃,I_F =20A di/dt=100A/μs	--	36	--	ns
Qrr	Reverse Recovery Charge		--	20	--	nC

Notes:

1. The max drain current rating is limited by T_{JMAX}
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L = 0.5 mH, V_{DD} = 20V, I_{AS} = 24A, R_G = 25 Ω, Starting T_J = 25 °C
4. Mount on minimum PCB layout

Electrical Characteristics Diagrams

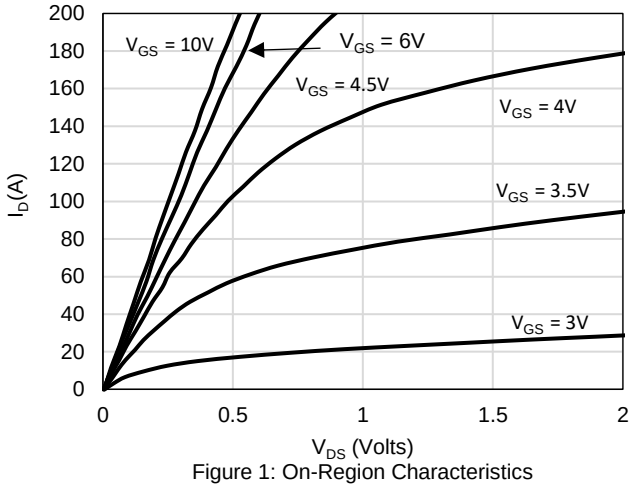


Figure 1: On-Region Characteristics

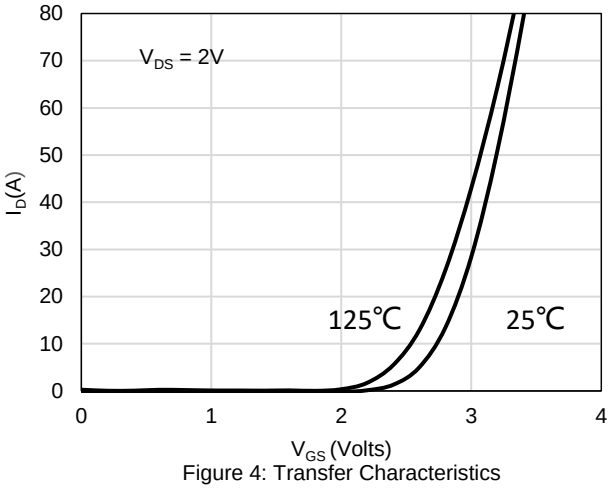


Figure 4: Transfer Characteristics

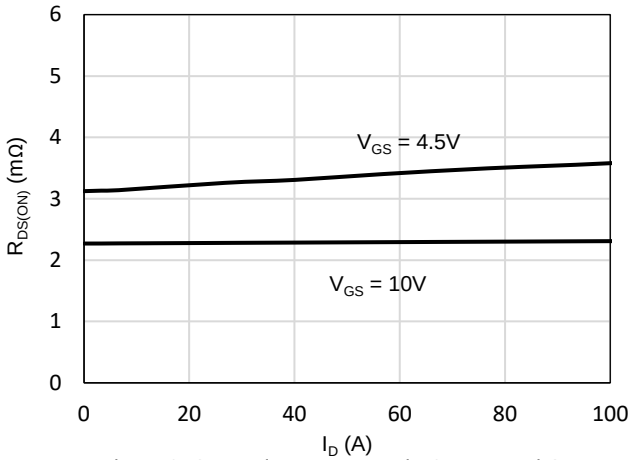


Figure 2: On-Resistance vs. Drain Current and Gate Voltage

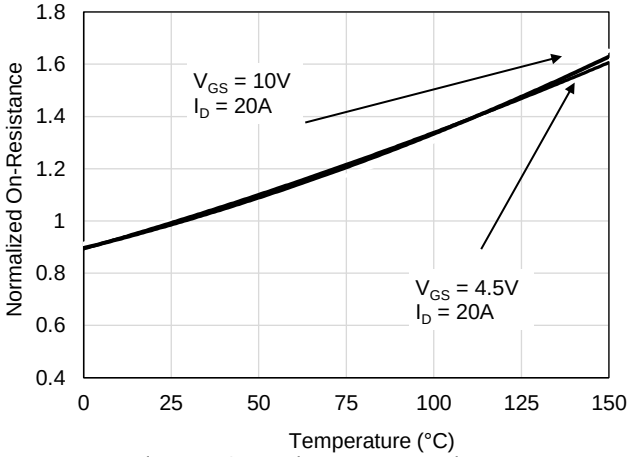


Figure 5: On-Resistance vs. Junction Temperature

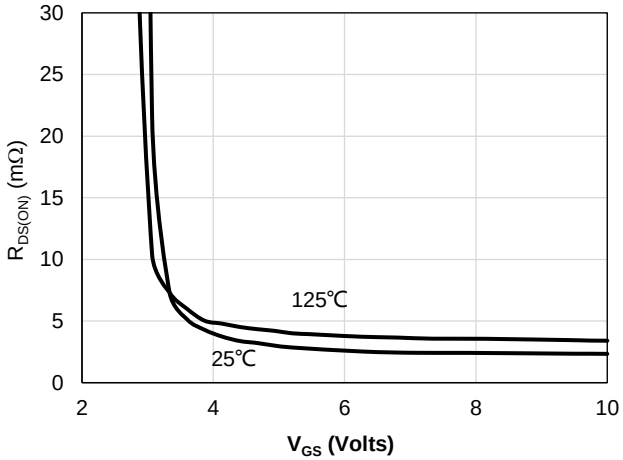


Figure 3: On-Resistance vs. Gate-Source Voltage

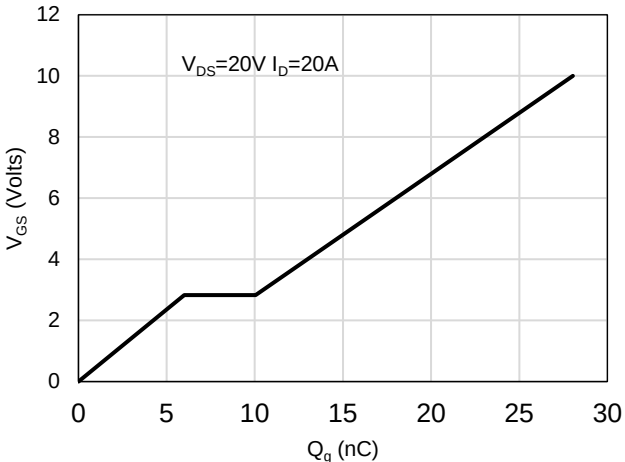


Figure 6: Gate-Charge Characteristics

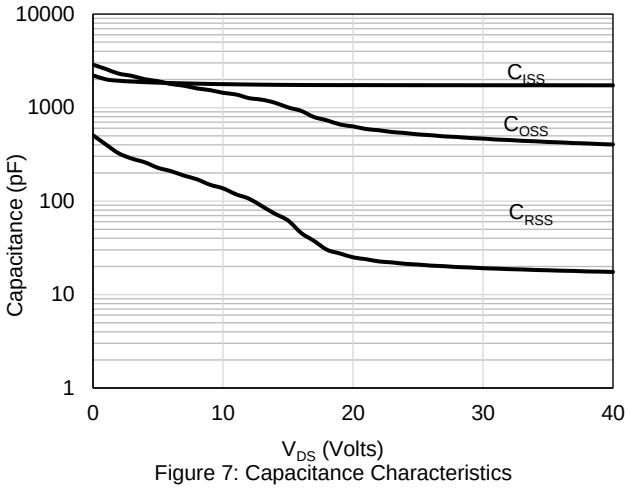


Figure 7: Capacitance Characteristics

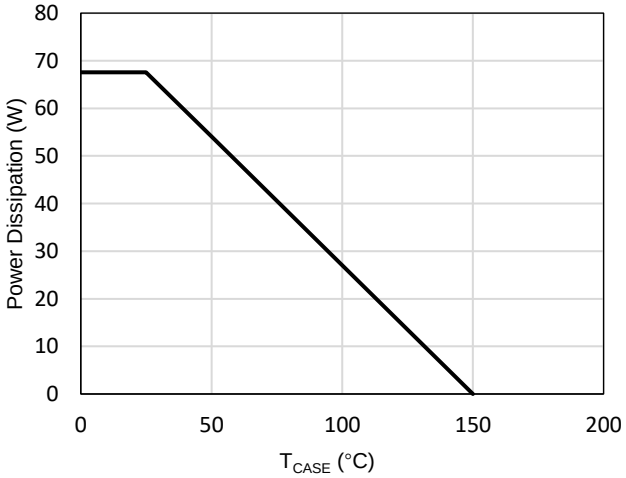


Figure 10: Power De-rating

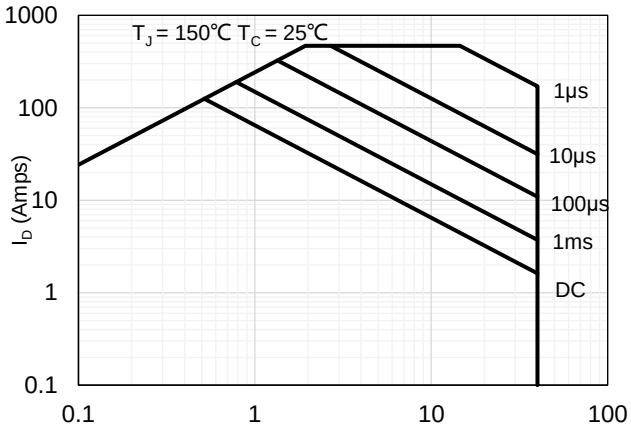


Figure 8: Maximum Forward Biased Safe Operating Area

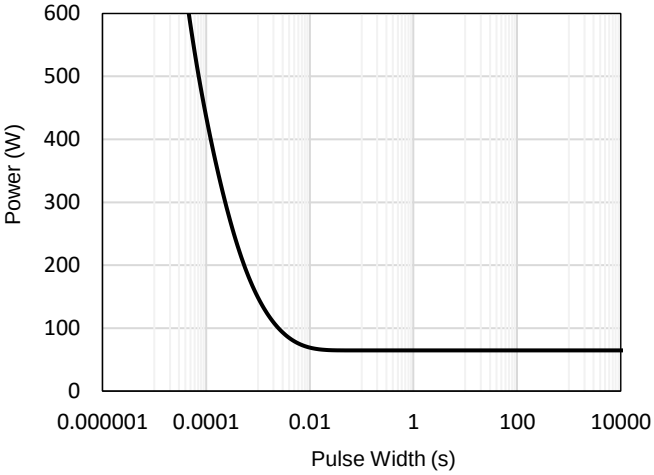


Figure 11: Single Pulse Power Rating Junction-to-Case

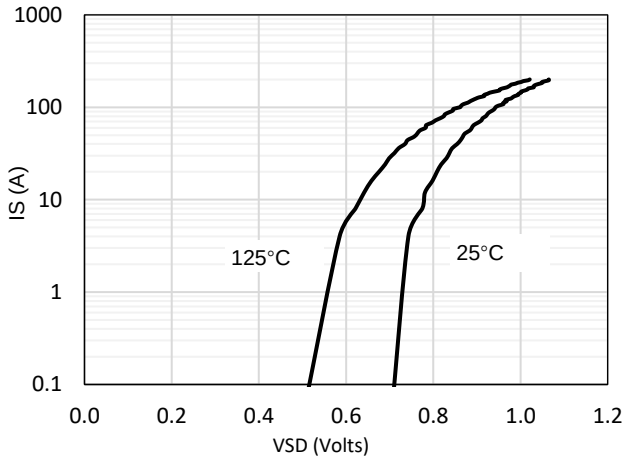


Figure 9: Body -Diode Characteristics

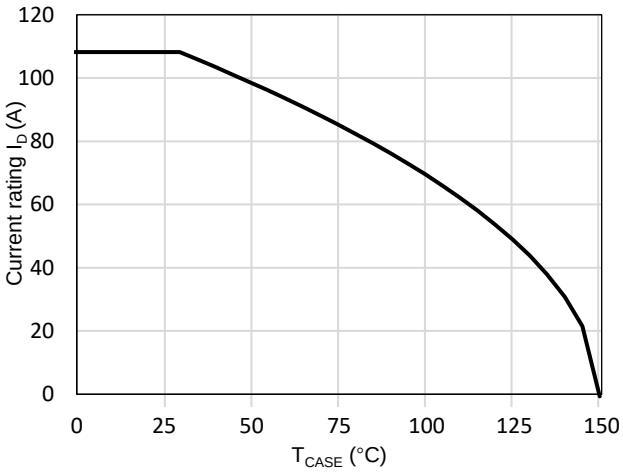


Figure 12: Current De-rating

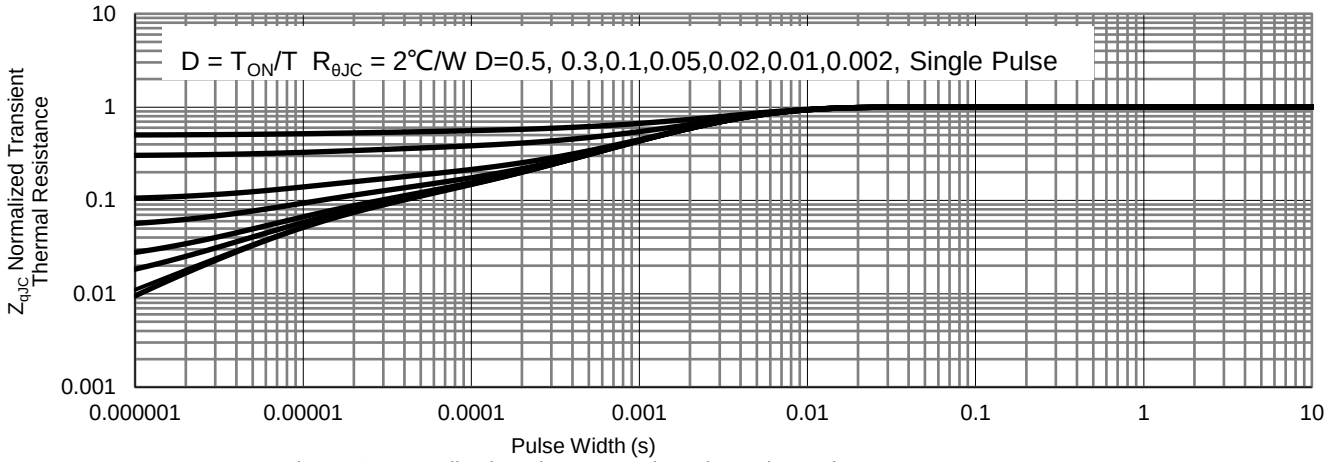
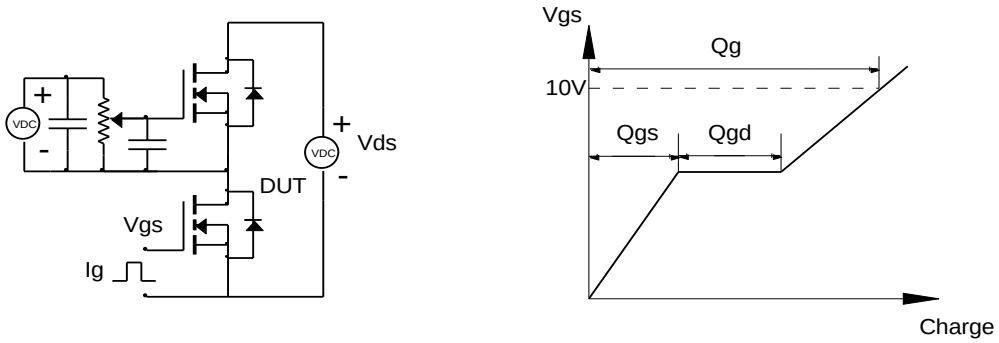


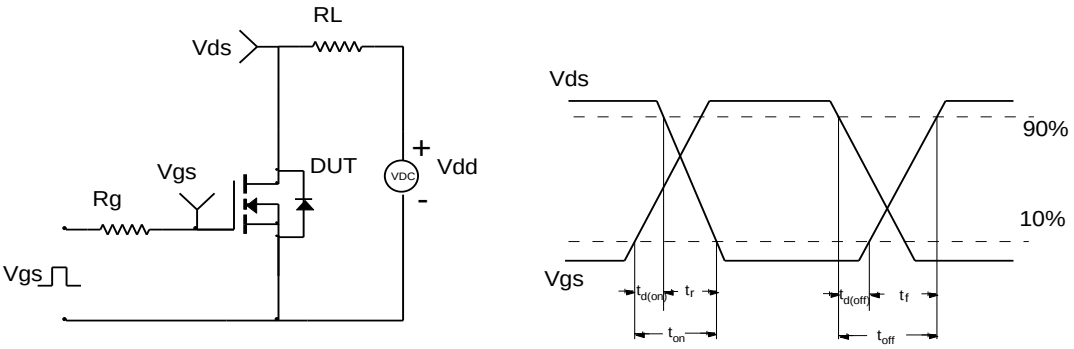
Figure 13: Normalized Maximum Transient Thermal Impedance

Test Circuit and Waveform

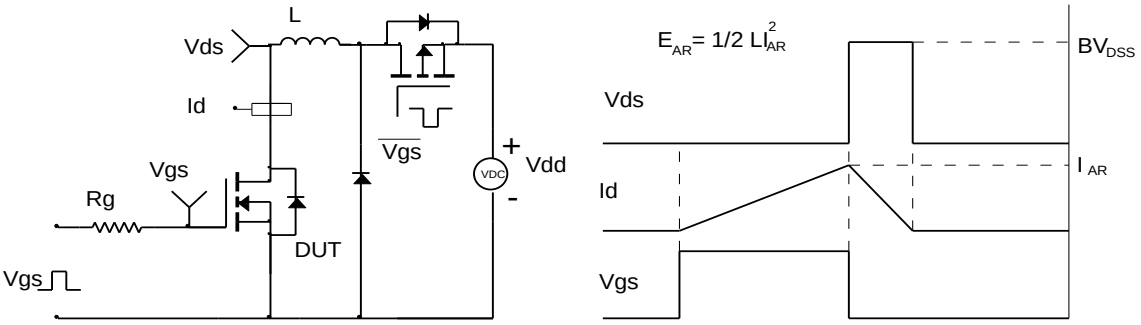
Gate Charge Test Circuit & Waveform



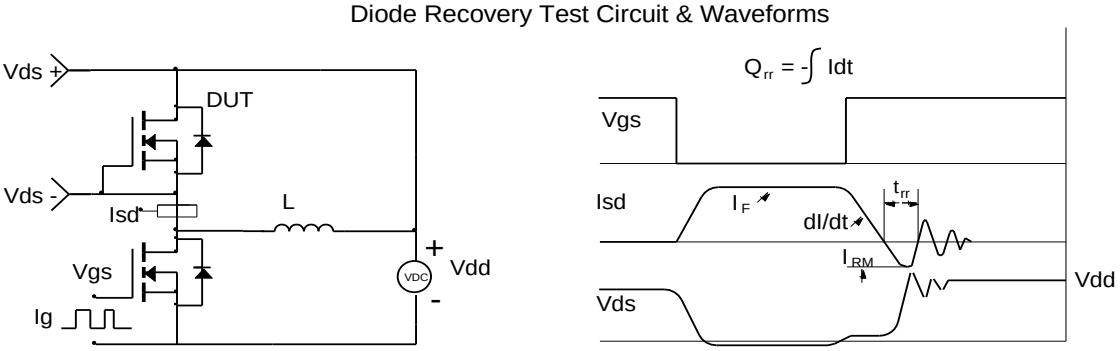
Resistive Switching Test Circuit & Waveforms



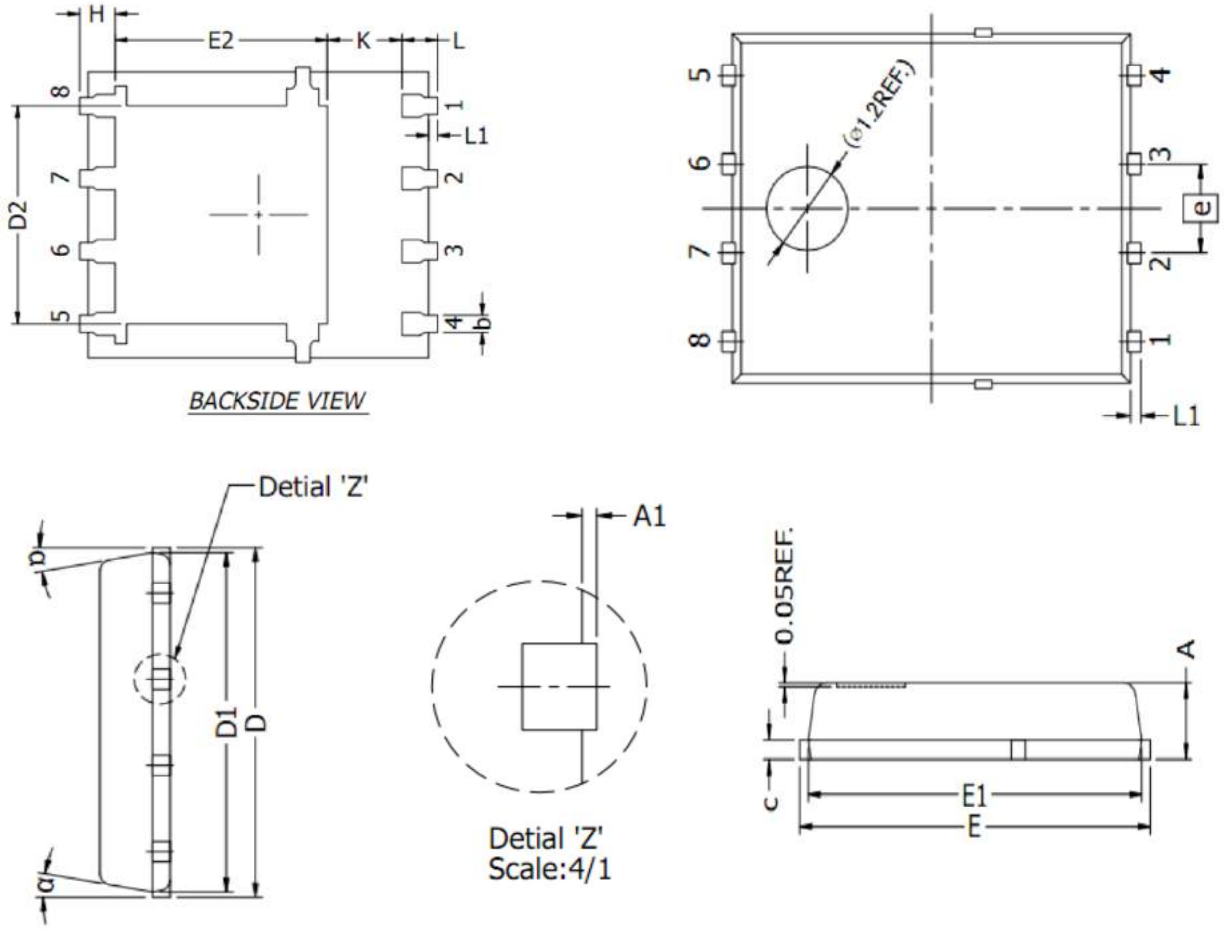
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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:

zj@ztasemi.com