

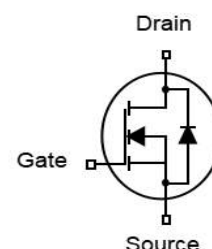
Features

- N-Channel
- Low FOM $R_{DS(ON)}$
- RoHS compliant
- Ultra-low on-resistance
- Halogen Free
- 100% EAS Tested

V_{DS}	30	V
$R_{DS(on),TYP@ V_{GS}=10V}$	1.1	$m\Omega$
$R_{DS(on),TYP@ V_{GS}=4.5V}$	1.9	$m\Omega$
I_D	140	A

DFN3x3


Part ID	Package Type	Marking	Packing
ZTG011N03Q	DFN3x3	ZTG011N03Q	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	30	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 (Note 2)	$T_C = 25^\circ\text{C}$ 560	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous (Note 1)	$T_C = 25^\circ\text{C}$	140	A
		$T_C = 70^\circ\text{C}$	88	A
P_D	Maximum Power Dissipation (Note 4)	$T_C = 25^\circ\text{C}$	42	W
		$T_C = 100^\circ\text{C}$	17	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case (Note 5)	2.3	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 4)	40	$^\circ\text{C/W}$	
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 3)	335	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) (Note 6)						
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, 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	1.2	1.7	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	--	1.1	1.4	mΩ
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =20A	--	1.9	2.6	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note 7)						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	2942	--	pF
C _{oss}	Output Capacitance		--	2013	--	pF
C _{rss}	Reverse Transfer Capacitance		--	214	--	pF
R _g	Gate resistance	f=1MHz		1.8		Ω
Q _g	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	--	50	--	nC
Q _{gs}	Gate-Source Charge		--	10	--	nC
Q _{gd}	Gate-Drain Charge		--	10	--	nC
Switching Characteristics (Note 7)						
T _{d(on)}	Turn-on Delay Time	V _{DS} =15V, I _D =20A, R _G =3Ω, V _{GS} =10V	--	6.5	--	ns
T _r	Turn-on Rise Time		--	29.5	--	ns
T _{d(off)}	Turn-Off Delay Time		--	33.6	--	ns
T _f	Turn-Off Fall Time		--	21.3	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated) (Note 7)						
I _S	Diode Forward Current		--	--	140	A
V _{SD}	Forward on voltage	I _S =20A, V _{GS} =0V	--	--	1.0	V
T _{rr}	Reverse Recovery Time	T _J =25°C, I _F =20A	--	49	--	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	57	--	nC

Notes:

1. This current is chip limited, which is calculated based on R_{thjc}.
2. This current is calculated on single pulse with 10μs Pulse & Duty Cycle = 1%.
3. Defined by design, not subject to production test, E_{AS} condition: T_J=25°C, V_{DD}=15V, V_{GS}=10V, L=1.0mH.
4. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
5. Thermal resistance from junction to soldering point (on the exposed drain pad).
6. Short duration pulse test used to minimize self-heating effect.
7. Defined by design, not subject to production.

Typical Electrical & Thermal Characteristics

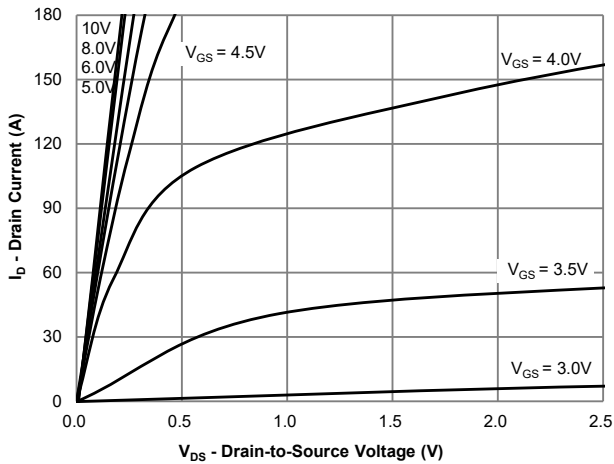


Figure 1: Output Characteristics

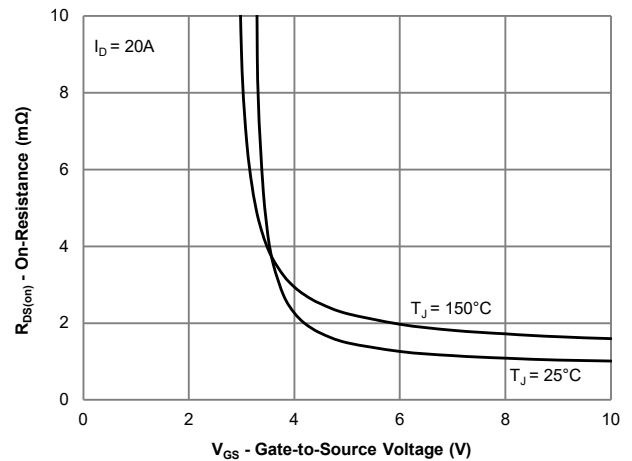


Figure 4: On-Resistance vs. Gate-Source Voltage

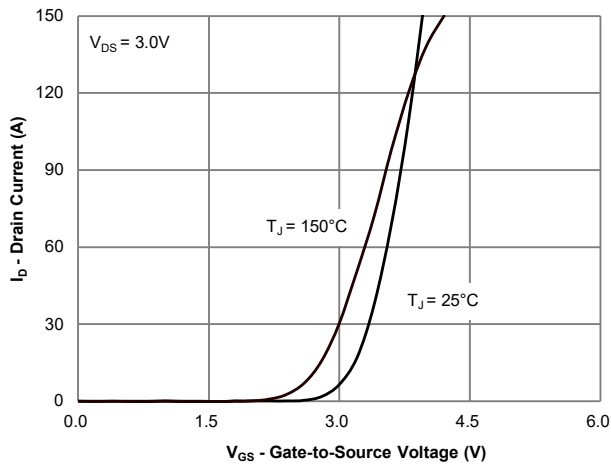


Figure 2: Transfer Characteristics

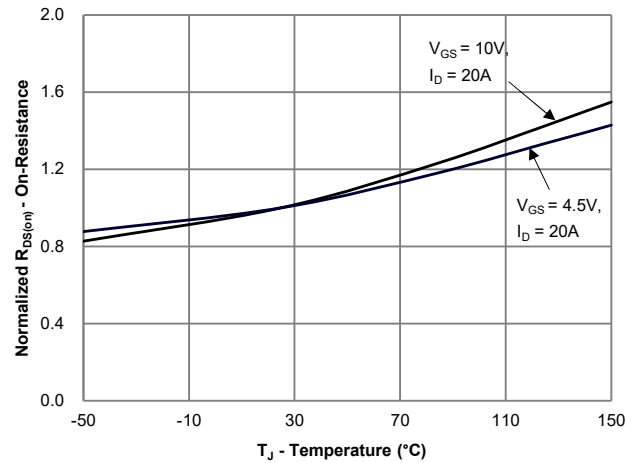


Figure 5: On-Resistance vs. Junction Temperature

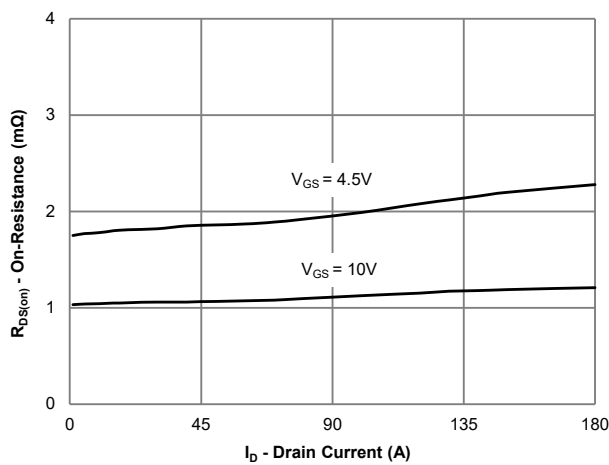


Figure 3: On-Resistance vs. Gate-Source Voltage

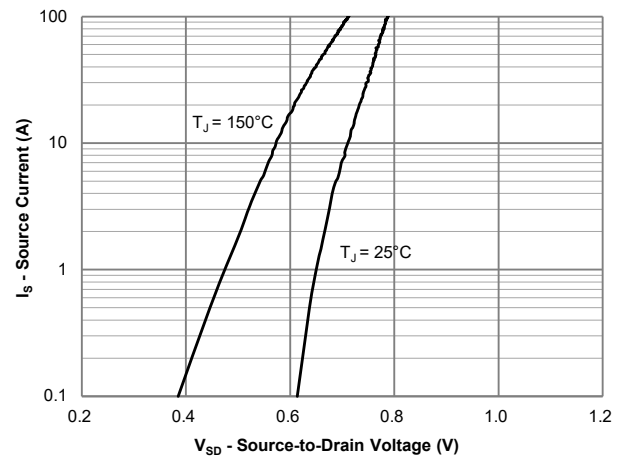


Figure 6: Source-Drain Diode Forward Voltage

Typical Electrical & Thermal Characteristics

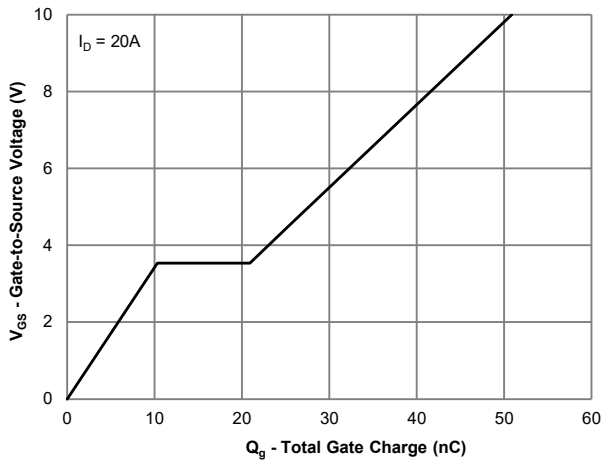


Figure 7: Gate Charge Characteristics

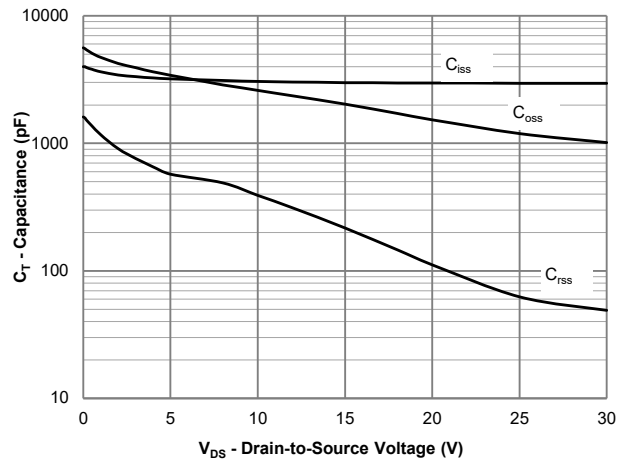


Figure 10: Capacitance Characteristics

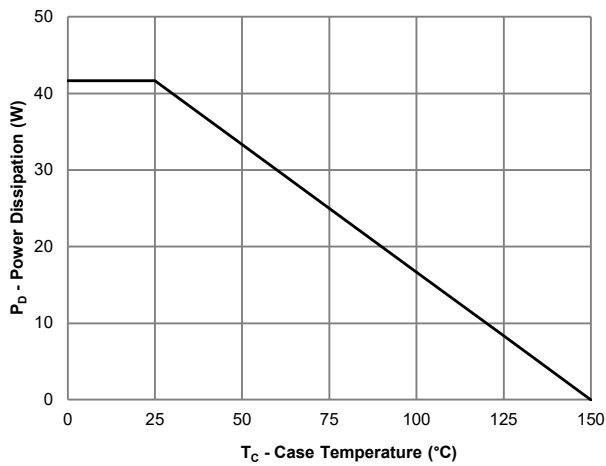


Figure 8: Power Derating

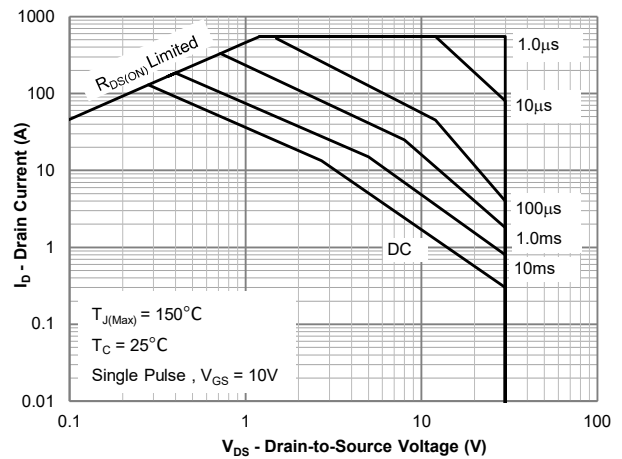


Figure 11: Safe Operating Area

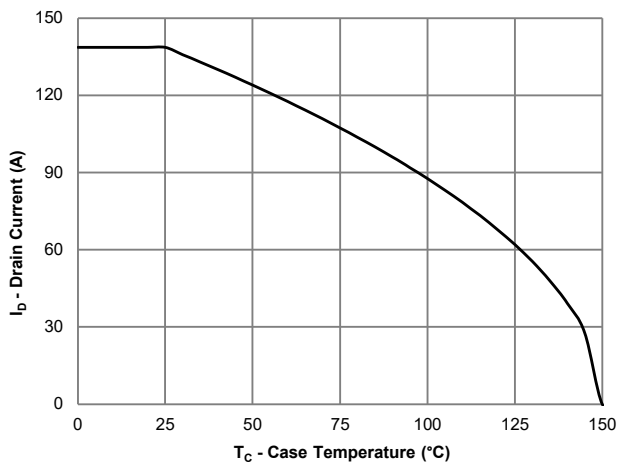


Figure 9: Current Derating

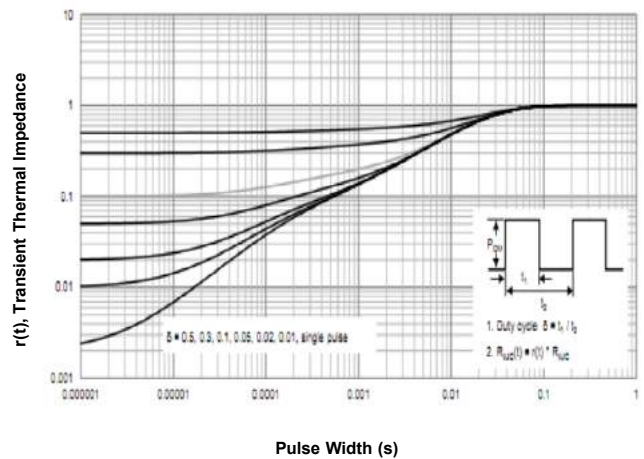
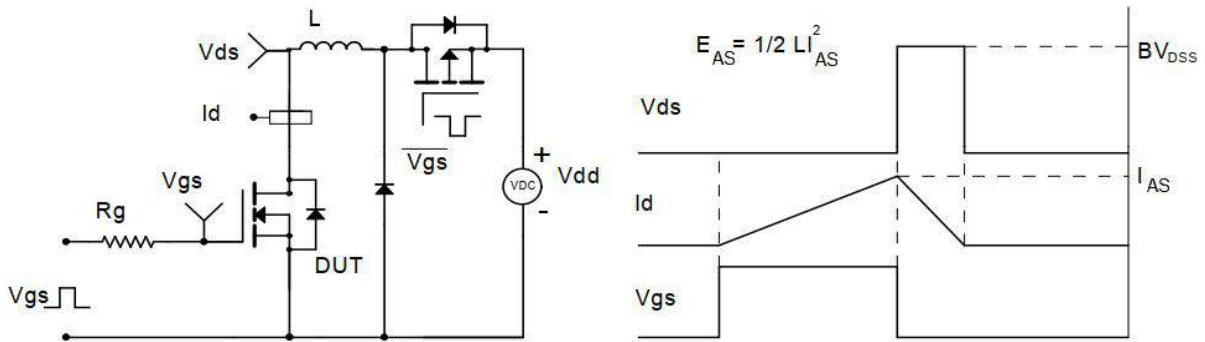


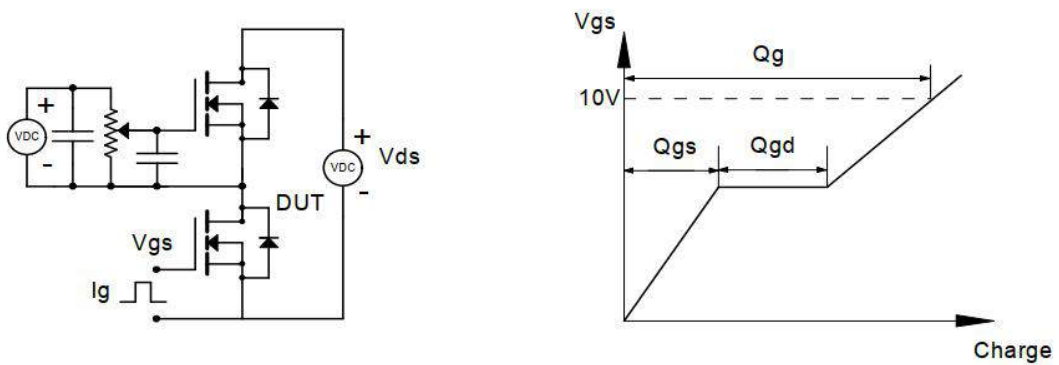
Figure 12: Normalized Maximum Transient Thermal Impedance

Test circuit&Waveform

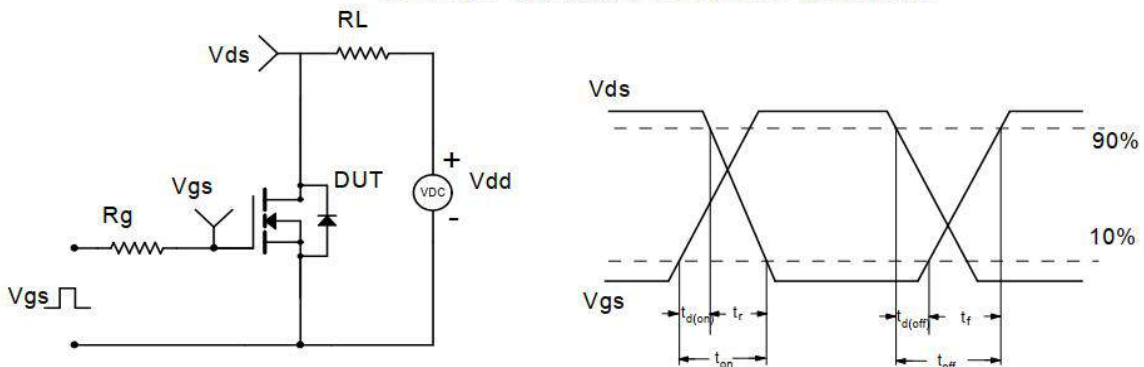
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



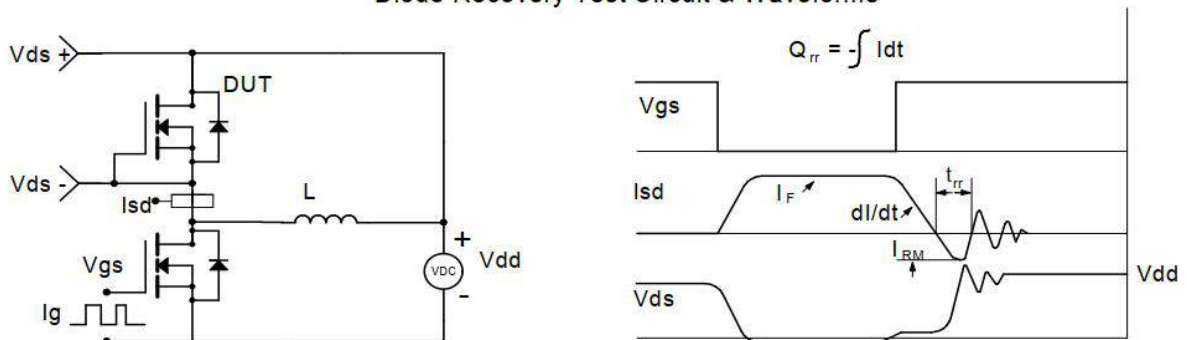
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

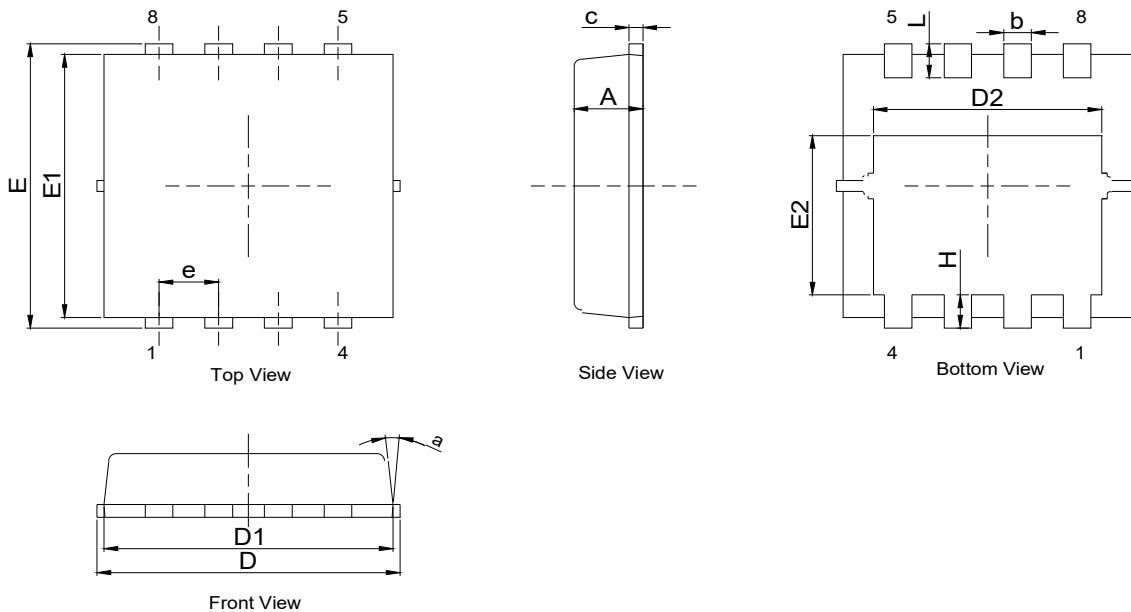


Diode Recovery Test Circuit & Waveforms



DFN3x3-8L Package Information

Package Outline

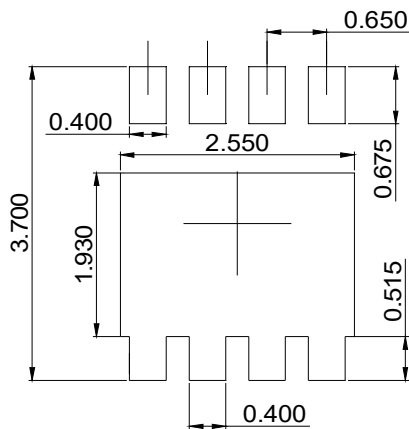


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. ALL DIMENSIONS IN MILLIMETER (ANGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.70	0.80	0.90
b	0.20	0.30	0.40
c	0.10	0.15	0.25
D	3.20	3.30	3.40
D1	3.00	3.15	3.25
D2	2.35	--	2.69
E	3.20	3.35	3.45
E1	2.85	3.10	3.20
E2	1.48	--	1.98
e	0.65 BSC		
H	0.25	--	0.60
L	0.25	0.40	0.50
a	---	---	15°

Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

Customer Service

Sales and Service:

zj@ztasemi.com