Features

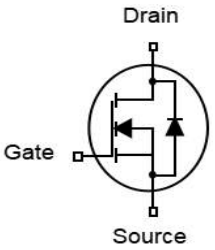
- N-Channel
- Low FOM $R_{DS(ON)}$
- RoHS compliant
- Ultra-low on-resistance
- Halogen Free
- 100% EAS Tested

V_{DS}	30	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	1.2	mΩ
$R_{DS(on),TYP}$@ V_{GS}=4.5 V	2.0	mΩ
I_D	145	A

DFN3x3

RoHS

Part ID	Package Type	Marking	Packing
ZTG012N03Q	DFN3x3	ZTG012N03Q	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		30	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	450	A
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous (Note 1)	T_C =25°C	145	A
		T_C =70°C	91	A
P_D	Maximum Power Dissipation (Note 4)	T_C =25°C	50	W
		T_C =100°C	20	W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 3)		101	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	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	--	1.2	1.4	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=15A	--	2	2.9	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated) (Note 5)						
Ciss	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz	--	2942	--	pF
Coss	Output Capacitance		--	2633	--	pF
Crss	Reverse Transfer Capacitance		--	115	--	pF
Rg	Gate resistance	f=1MHz		1.4		Ω
Qg	Total Gate Charge	V_{DS}=15V,I_D=20A, V_{GS}=10V	--	38	--	nC
Qgs	Gate-SourceCharge		--	8.4	--	nC
Qgd	Gate-DrainCharge		--	4.8	--	nC
Switching Characteristics (Note 5)						
Td(on)	Turn-on Delay Time	V_{DS}=15V, R_L=0.75Ω, R_G=3Ω, V_{GS}=10V	--	6.1	--	ns
Tr	Turn-on Rise Time		--	8.9	--	ns
Td(off)	Turn-Off Delay Time		--	25.6	--	ns
Tf	Turn-Off Fall Time		--	9.9	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
I_S	Diode Forward Current		--	--	145	A
V_{SD}	Forward on voltage	I_S =1A,V_{GS}=0V	--	--	1.0	V
Trr	Reverse Recovery Time	T_j=25℃,I_F =20A di/dt=100A/μs	--	51	--	ns
Qrr	Reverse Recovery Charge		--	57	--	nC

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_Max} = 150°C.
3. This single-pulse measurement was taken under the following condition [L = 100μH, V_{GS} = 10V, V_{DS} = 30V] while its value is limited by T_{J_Max} = 150°C.
4. The power dissipation P_D is based on T_{J_Max} = 150°C.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

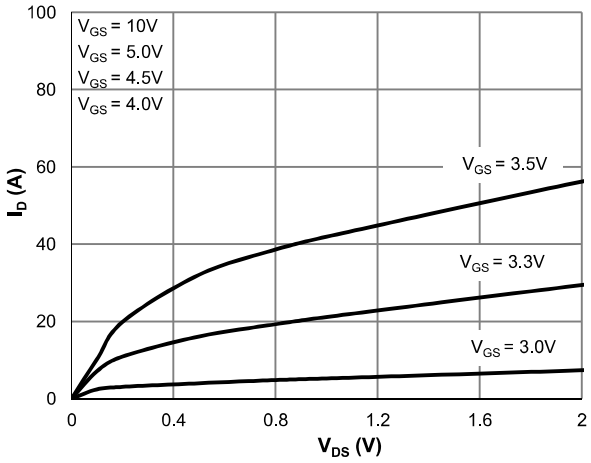


Figure 1: Saturation Characteristics

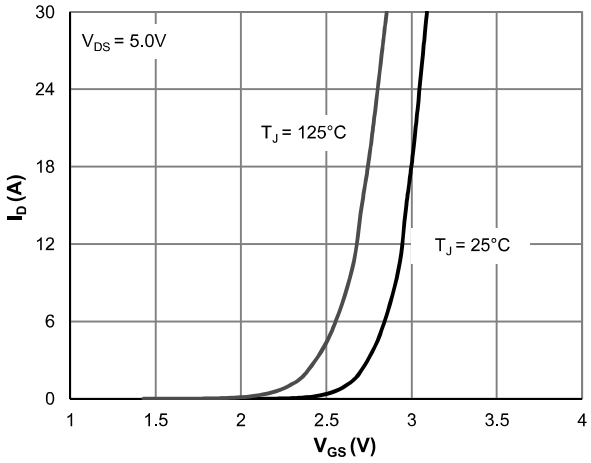


Figure 2: Transfer Characteristics

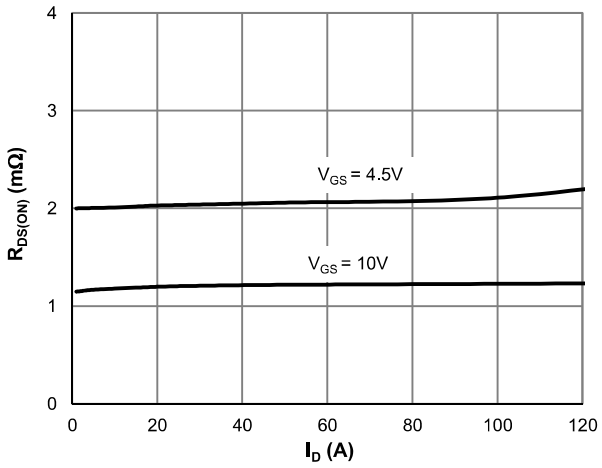


Figure 3: $R_{DS(ON)}$ vs. Drain Current

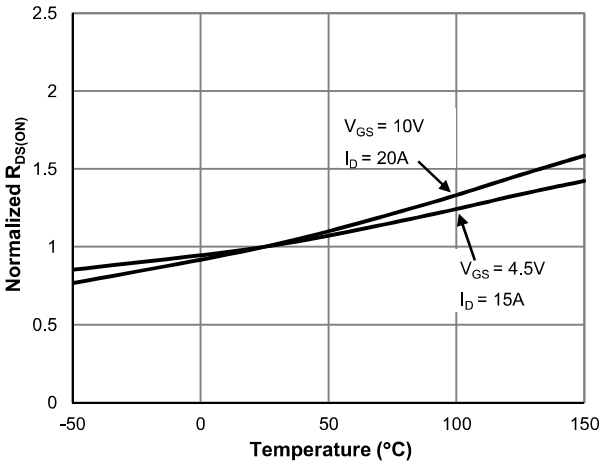


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

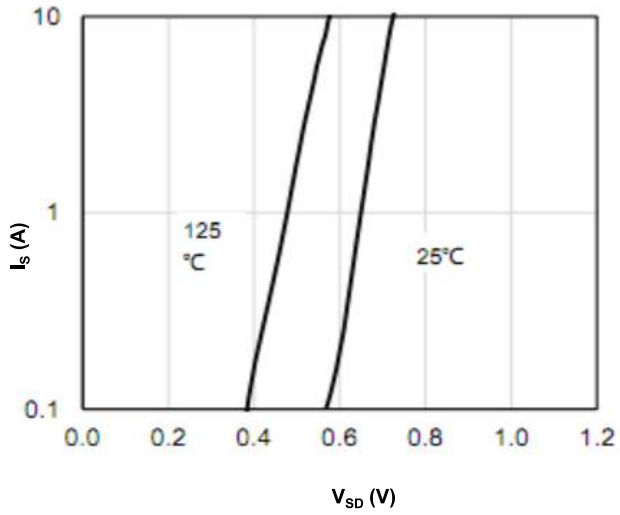


Figure 5: Body-Diode Characteristics

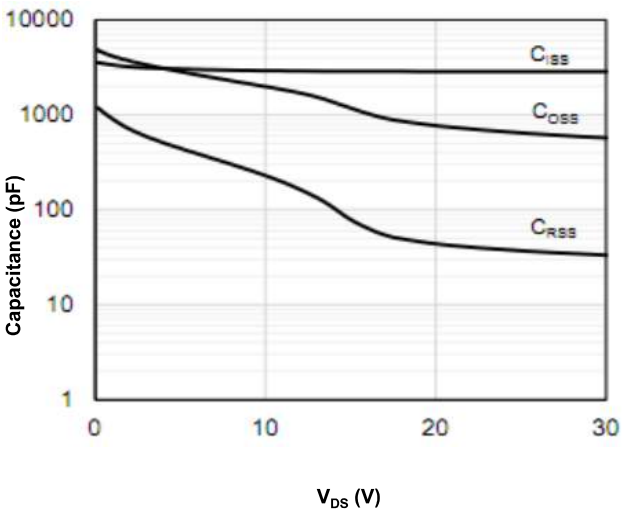


Figure 6: Capacitance Characteristics

Typical Electrical & Thermal Characteristics

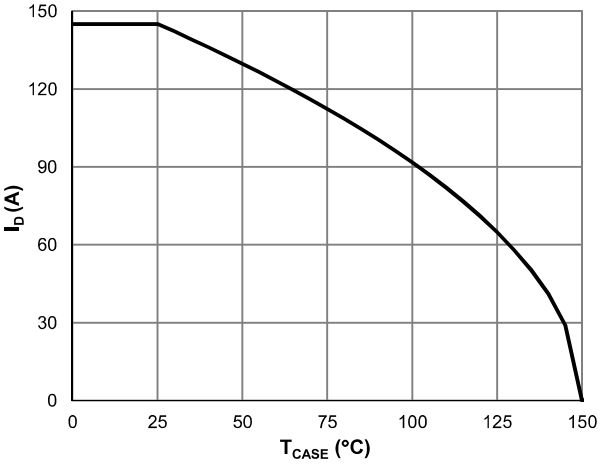


Figure 7: Current De-rating

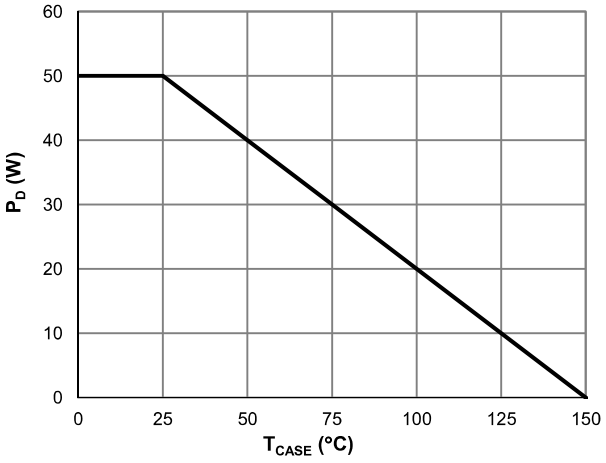


Figure 8: Power De-rating

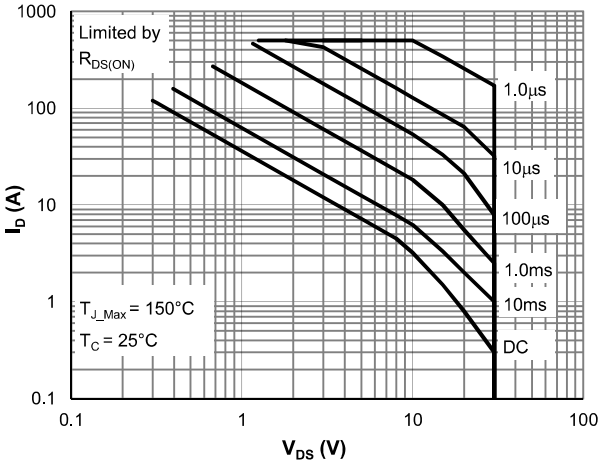


Figure 9: Maximum Safe Operating Area

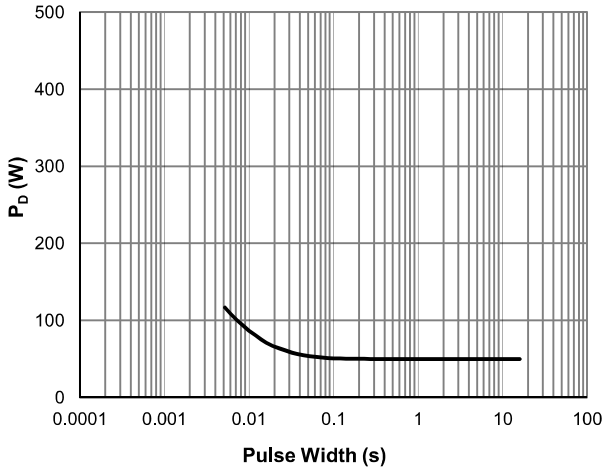


Figure 10: Single Pulse Power Rating, Junction-to-Case

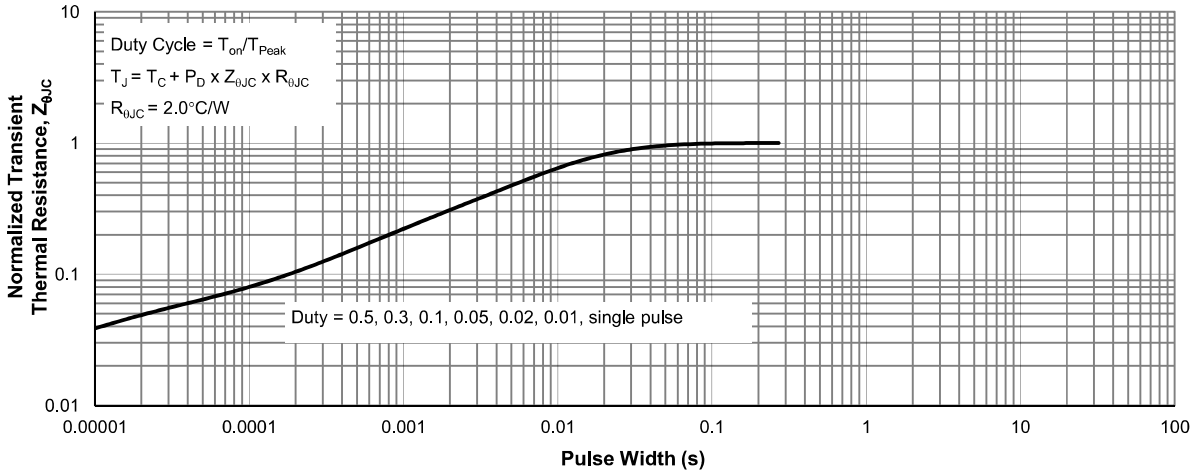
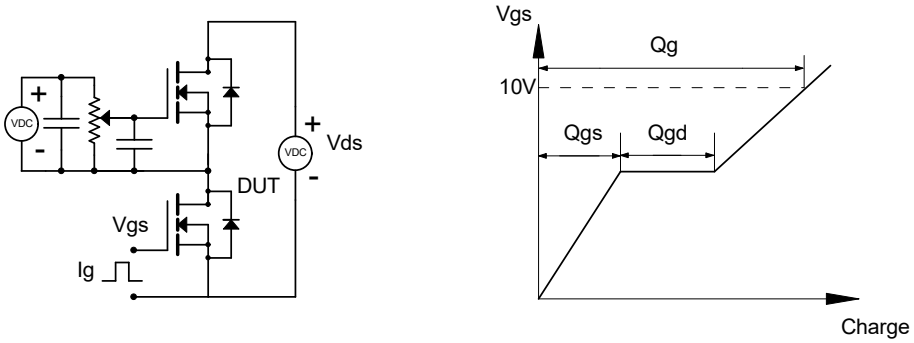


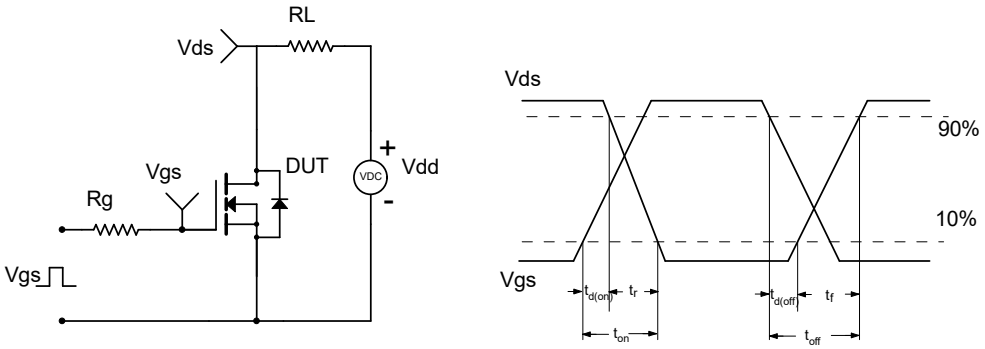
Figure 11: Normalized Maximum Transient Thermal Impedance

Test Circuit and Waveform

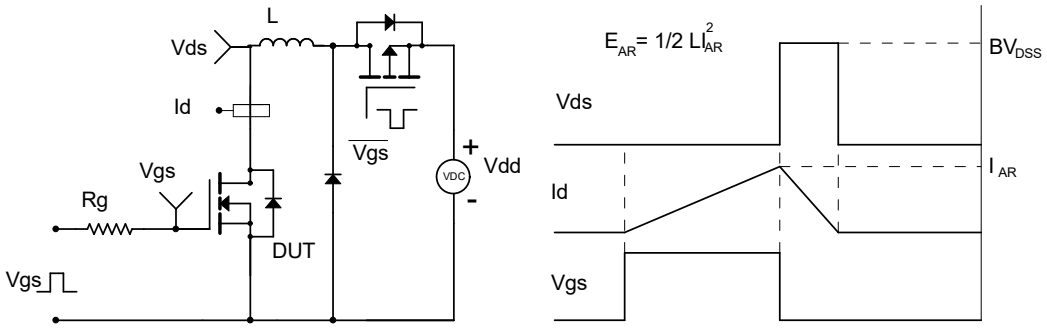
Gate Charge Test Circuit & Waveform



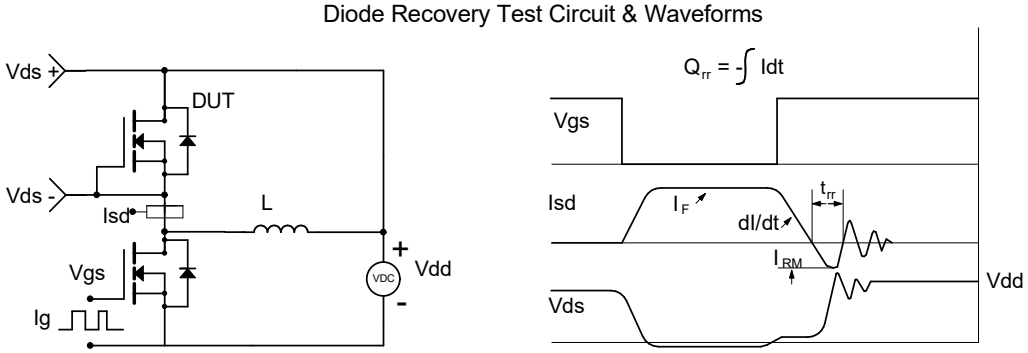
Resistive Switching Test Circuit & Waveforms



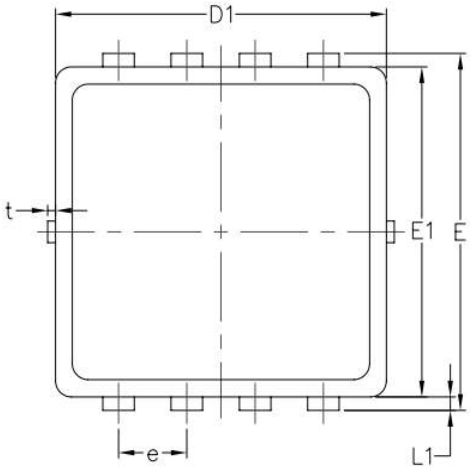
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

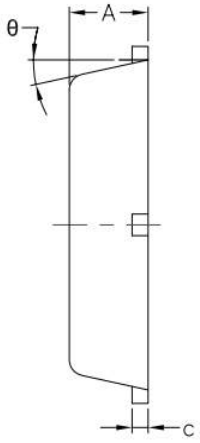


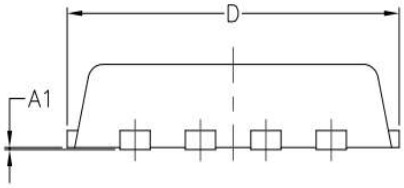
Diode Recovery Test Circuit & Waveforms

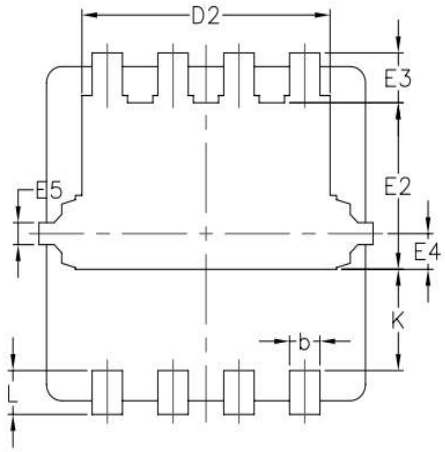


DFN3x3-8L Package Information









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	1.32	1.52	1.72
E3	0.28	0.46	0.65
E4	0.18	0.33	0.48
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.78	0.93	1.13
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
θ	10°	12°	14°

Customer Service

Sales and Service:

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