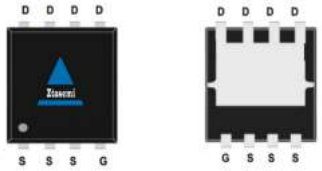
Features

- P-Channel
- Very low on-resistance $R_{DS(ON)}$
- Low Crss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- 100% EAS Tested

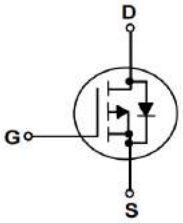
V_{DS}	-30	V
$R_{DS(on),TYP}$@ V_{GS}=-10 V	9	mΩ
$R_{DS(on),TYP}$@ V_{GS}=-4.5 V	14	mΩ
I_D	-50	A

DNF3x3



RoHS HF

Part ID	Package Type	Marking	Packing
ZT090P03Q	DFN3x3	ZT090P03Q	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		±25	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 1)	T_C =25°C	-200	A
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	T_C =25°C	-50	A
		T_C =100°C	-33	A
P_D	Maximum Power Dissipation	T_C =25°C	20	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		6.25	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 2)		225	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	-1.0	-1.5	-2.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V,I_D=-12A	--	9	10.5	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V,I_D=-7A	--	14	17	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
Ciss	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1MHz	--	1770	--	pF
Coss	OutputCapacitance		--	231	--	pF
Crss	ReverseTransferCapacitance		--	216	--	pF
Rg	GateResistancef=1MHz	f=1MHz	--	2.5	--	Ω
Qg	Total Gate Charge	V_{DS}=-15V,I_D=-25A, V_{GS}=-10V	--	32	--	nC
Qgs	Gate-SourceCharge		--	6	--	nC
Qgd	Gate-DrainCharge		--	10	--	nC
Switching Characteristics						
Td(on)	Turn-on Delay Time	V_{DS}=-15V, I_D=-25A, R_G=3Ω, V_{GS}=-10V	--	13	--	ns
Tr	Turn-on Rise Time		--	8.5	--	ns
Td(off)	Turn-Off Delay Time		--	26	--	ns
Tf	Turn-Off Fall Time		--	12	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
I_{SD}	Source-Drain Current (Body Diode)		--	--	-50	A
V_{SD}	Forward on voltage (Note 3)	I_S =-10A,V_{GS}=0V	--	--	-1.2	V
Trr	Reverse Recovery Time	T_j=25℃,I_F =-25A, V_{GS}=0V di/dt=100A/μs	--	32	--	ns
Qrr	Reverse Recovery Charge		--	21	--	nC

Notes :

1.Repetitive Rating: Pulse width limited by maximum junction temperature.
2.E_{AS} condition: T_J=25℃,V_{DD}=-20V,V_G=-10V, Rg=25Ω, L=0.5mH.
3.Repetitive Rating: Pulse width limited by maximum junction temperature.

P- Channel Typical Characteristics

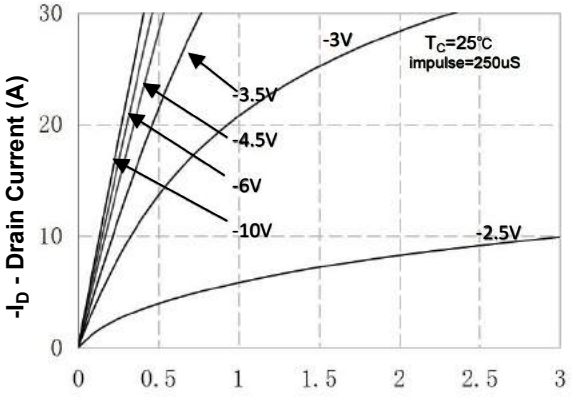


Figure 1. On-Region Characteristics

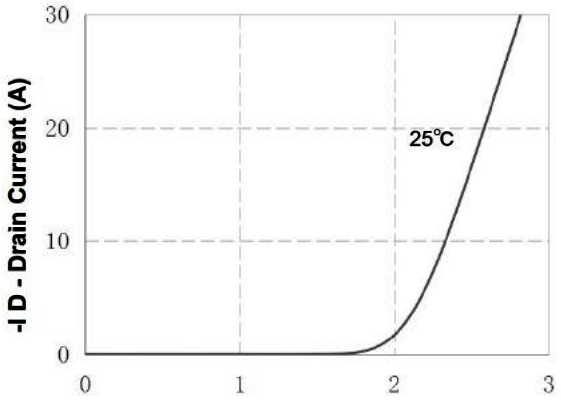


Figure 4. Transfer Characteristics

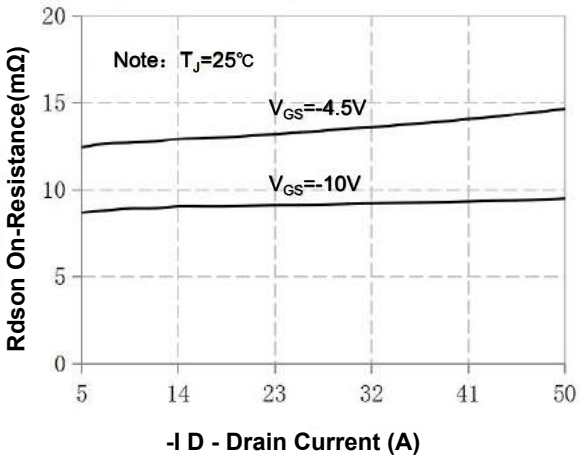


Figure 2. On-Resistance Variation vs Drain Current and Gate Voltage

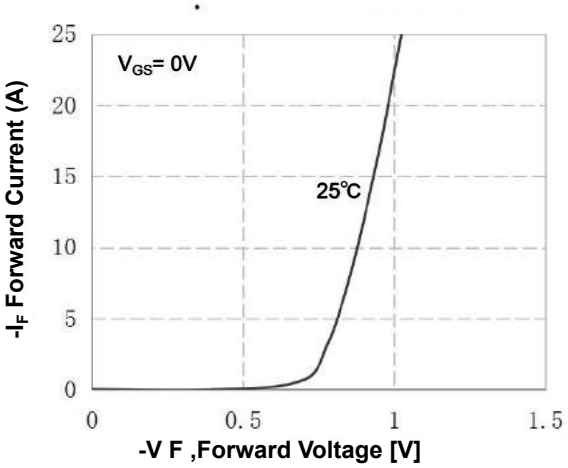


Figure 5. Body Diode Forward Voltage Variation with Source Current and Temperature

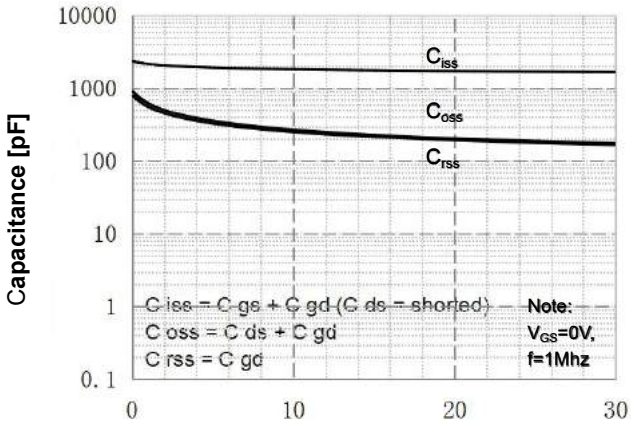


Figure 3. Capacitance Characteristics

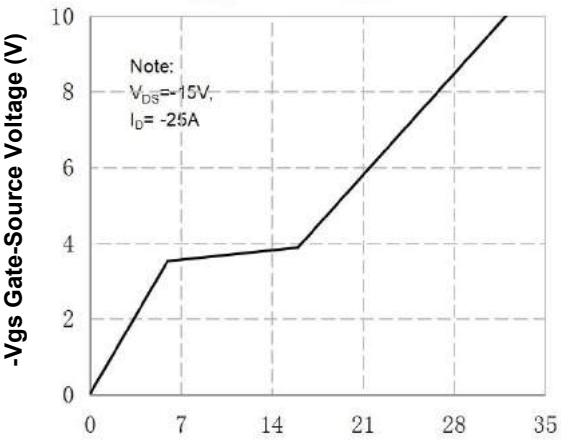


Figure 6. Gate Charge Characteristics

P- Channel Typical Characteristics (Continued)

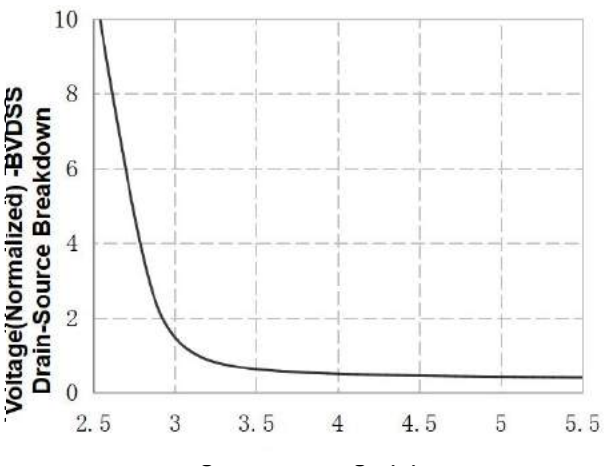


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

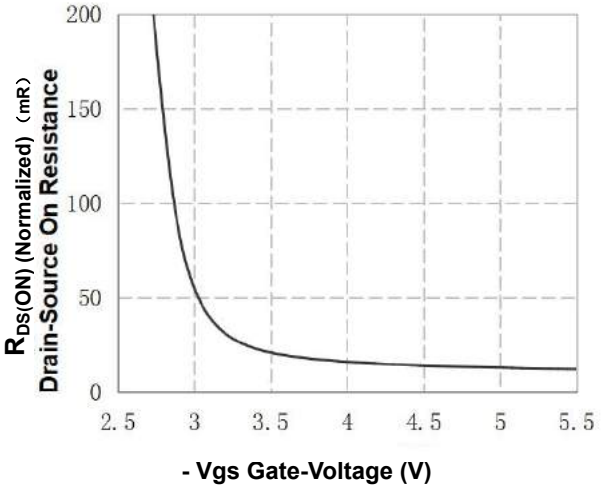


Figure 9. On-Resistance Variation vs Gate Voltage

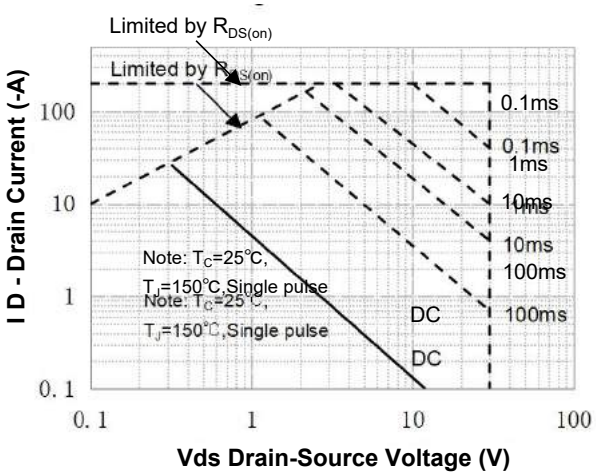


Figure 8. Maximum Safe Operating Area

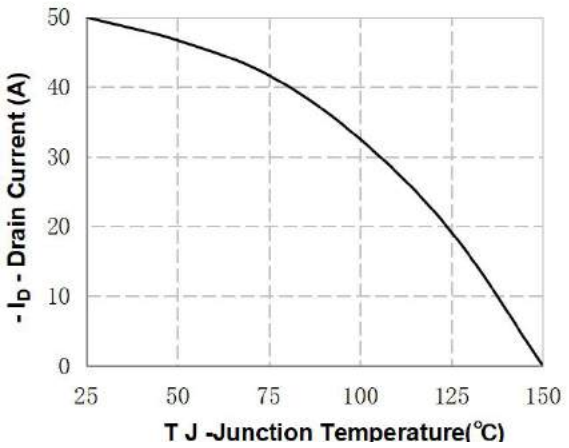


Figure 10. Maximum PContinuous Drain Currentvs Case Temperature

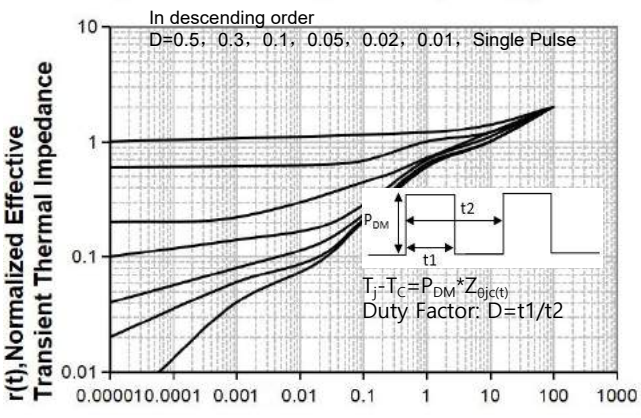
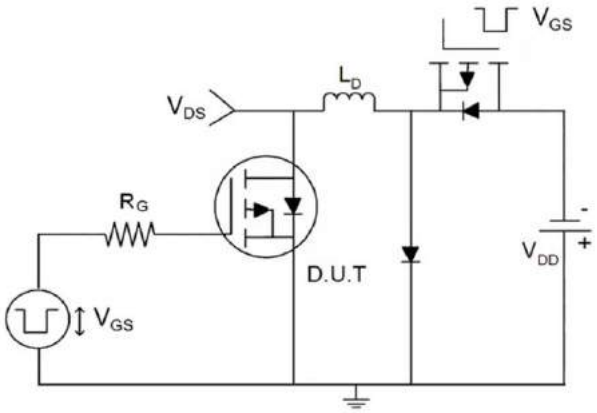
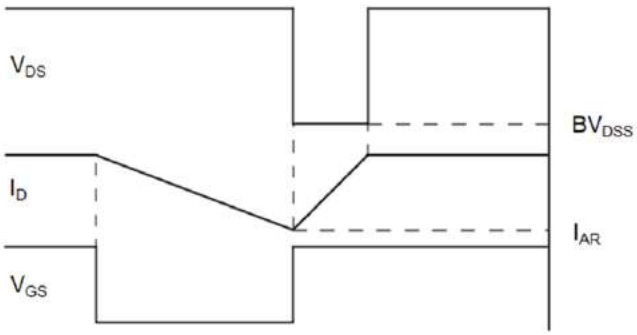


Figure 11 Transient Thermal Response Curve

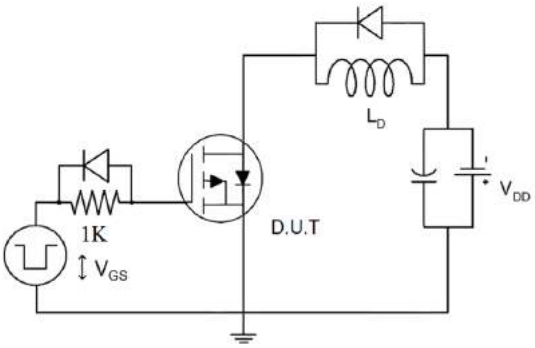
Test Circuit

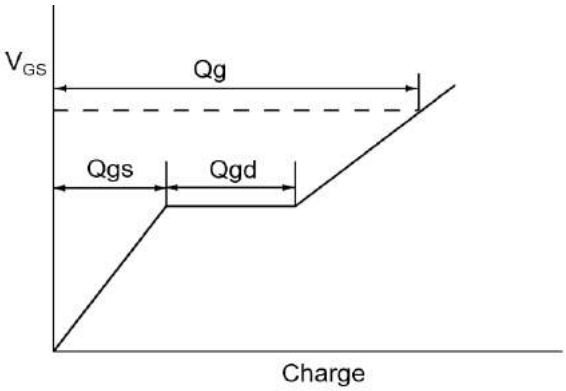
1) E_{AS} Test Circuits



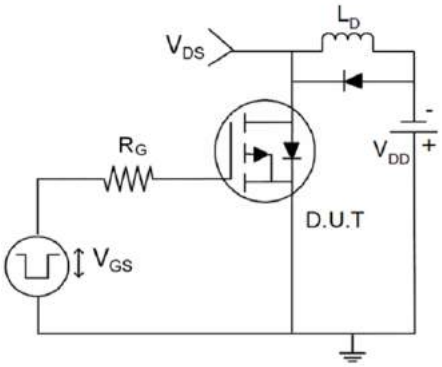


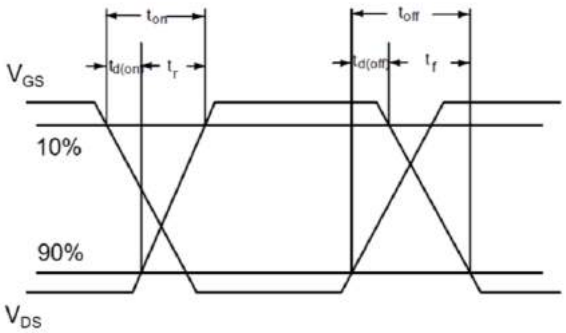
2) Gate Charge Test Circuit



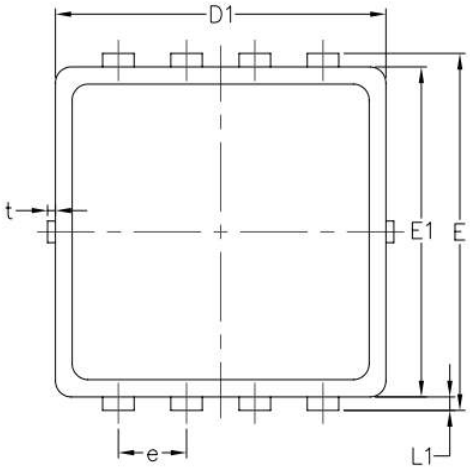


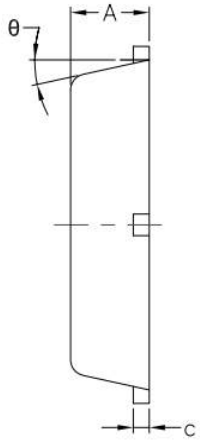
3) Switch Time Test Circuit

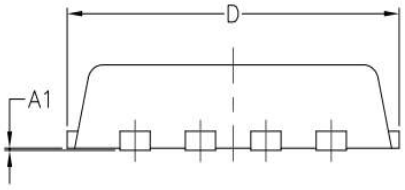


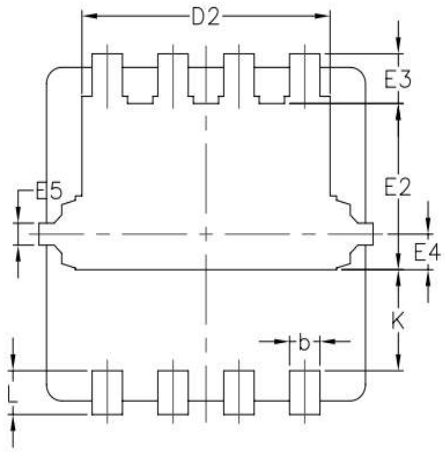


DFN3x3-8L Package Information









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:

zj@ztasemi.com