

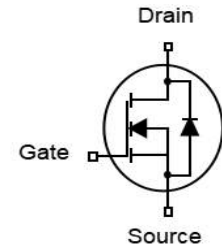
## Features

- N-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
$R_{DS(on),TYP}@ V_{GS}=10V$	6.2	mΩ
$R_{DS(on),TYP}@ V_{GS}=4.5V$	10	mΩ
$I_D$	30	A

**DFN3x3**


Part ID	Package Type	Marking	Packing
ZT060N03Q	DFN3x3	ZT060N03Q	5000pcs/Reel



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

Symbol	Parameter	Rating	Unit	
<b>Common Ratings (<math>T_C = 25^\circ\text{C}</math> Unless Otherwise Noted)</b>				
$V_{GS}$	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 1)	$T_C = 25^\circ\text{C}$ 120	A	
<b>Mounted on Large Heat Sink</b>				
$I_D$	Drain Current-Continuous	$T_C = 25^\circ\text{C}$	30	A
		$T_C = 100^\circ\text{C}$	19.5	A
$P_D$	Maximum Power Dissipation	42	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3.6	°C/W	
<b>Drain-Source Avalanche Ratings</b>				
EAS	Avalanche Energy, Single Pulsed (Note 2)	70	mJ	

**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub>=25°C (unless otherwise stated)</b>						
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.7	2.2	V
RDS(on)	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =15A	--	6.2	8.2	mΩ
RDS(on)	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A	--	10.0	13.5	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
Ciss	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	--	1060	--	pF
Coss	Output Capacitance		--	122	--	pF
Crss	Reverse Transfer Capacitance		--	102	--	pF
Rg	Gate Resistance	f=1MHz	--	3	--	Ω
Qg	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V	--	21	--	nC
Qgs	Gate-Source Charge		--	3	--	nC
Qgd	Gate-Drain Charge		--	5	--	nC
<b>Switching Characteristics (Note 3)</b>						
Td(on)	Turn-on Delay Time	V <sub>DS</sub> =15V, I <sub>D</sub> =30A, R <sub>L</sub> =1.6Ω, V <sub>GS</sub> =10V	--	4	--	ns
Tr	Turn-on Rise Time		--	2	--	ns
Td(off)	Turn-Off Delay Time		--	13	--	ns
Tf	Turn-Off Fall Time		--	7	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
IS	Diode Forward Current		--	--	30	A
ISM	Maximum Pulsed Drain-Source Diode Forward Current		--	--	120	A
VSD	Forward on voltage	I <sub>SD</sub> =10A, V <sub>GS</sub> =0V	--	--	1.2	V

**Notes:**

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=20V, V<sub>G</sub>=10V, L=0.5mH.
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

N- Channel Typical Characteristics

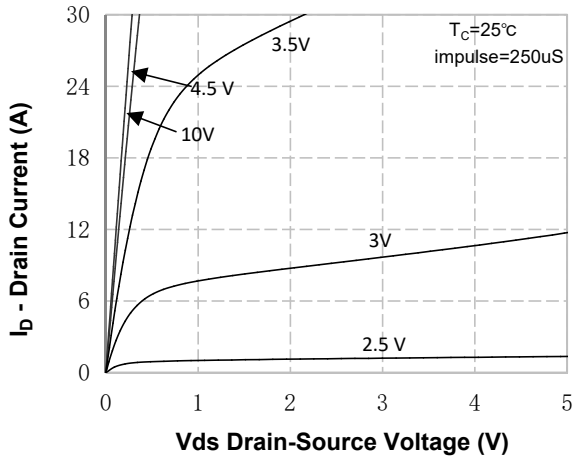


Figure 1. On-Region Characteristics

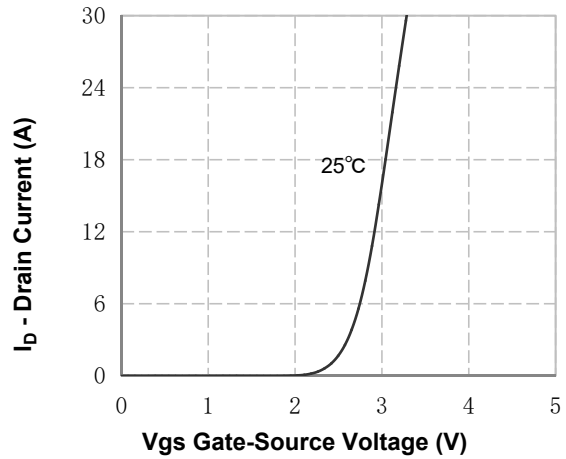


Figure 4. Transfer Characteristics

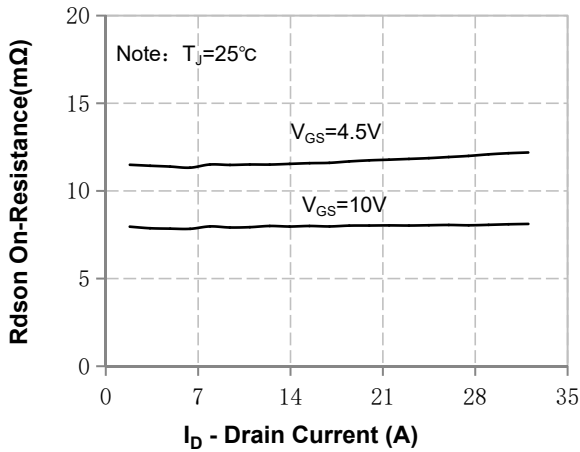


Figure 2. On-Resistance Variation vs Drain Current and Gate Voltage

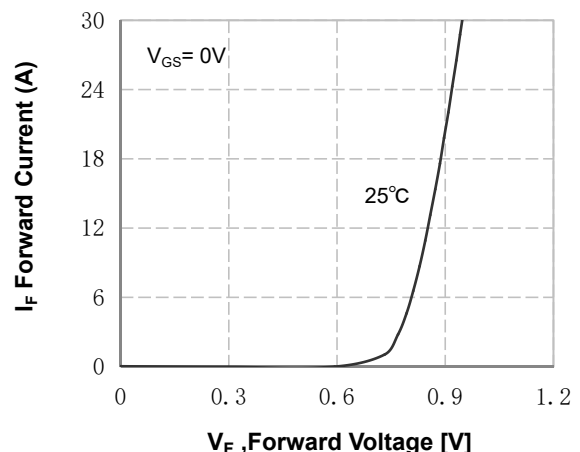


Figure 5. Body Diode Forward Voltage Variation vs Source Current

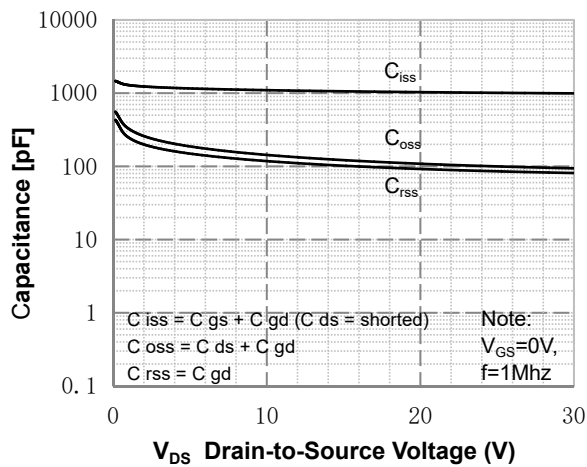


Figure 3. Capacitance Characteristics

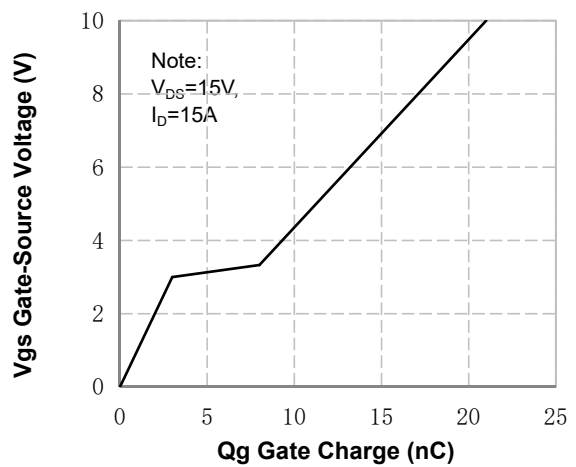


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

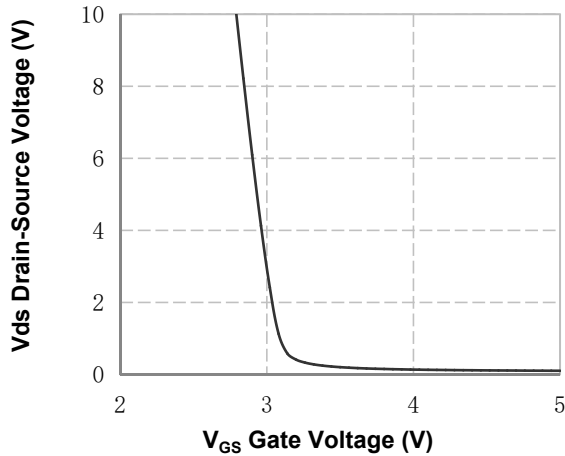


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

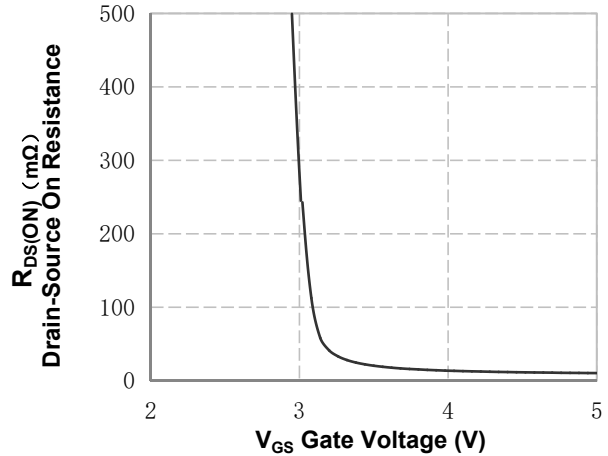


Figure 9. On-Resistance vs Gate Voltage

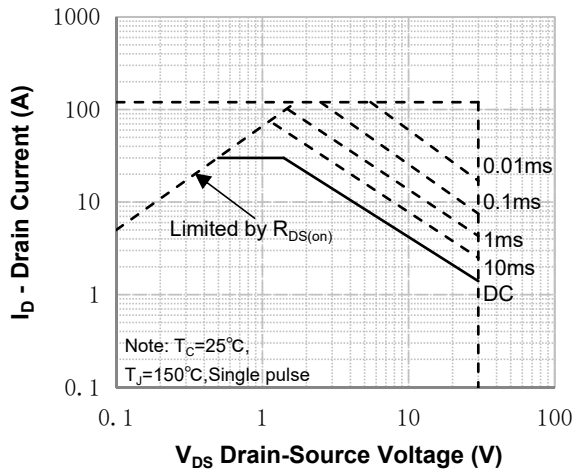


Figure 8. Maximum Safe Operating Area

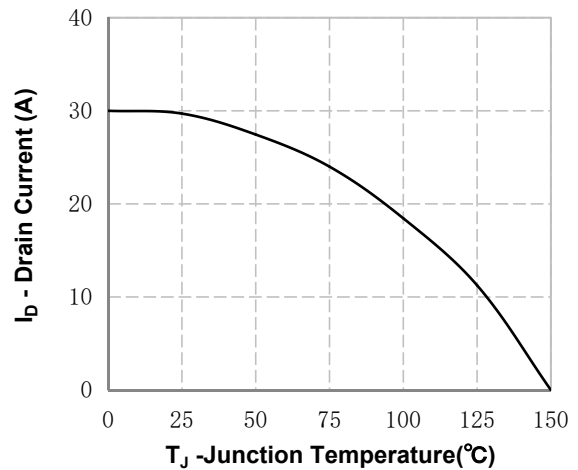


Figure 10. Maximum Continuous Drain Current vs Temperature

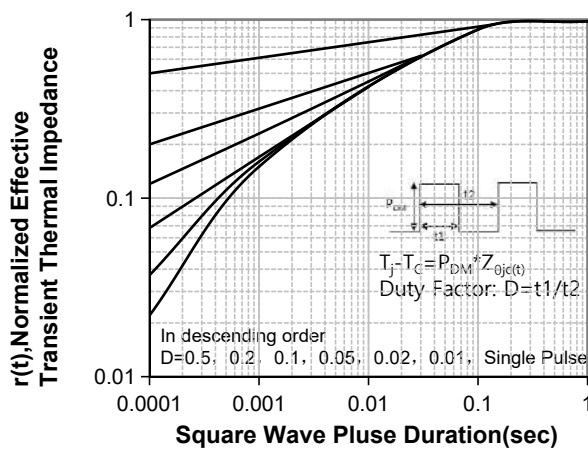
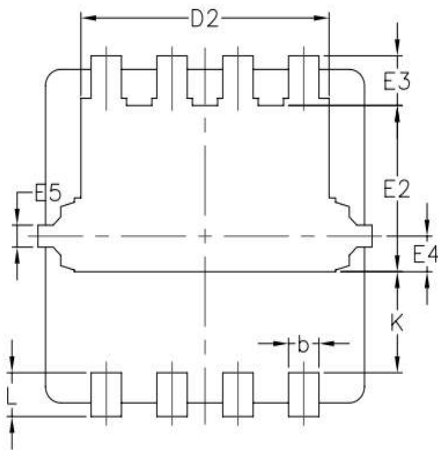
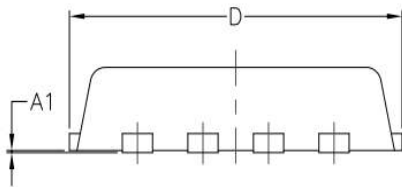
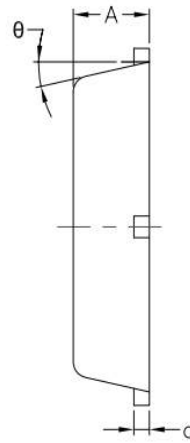
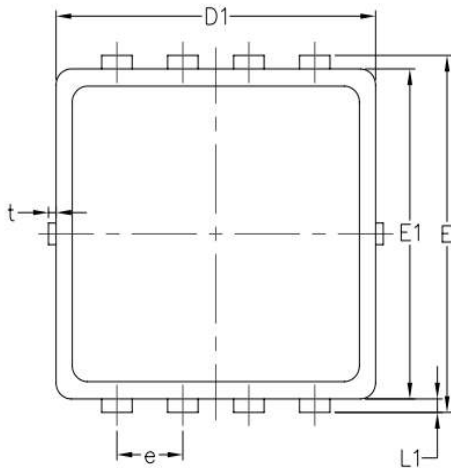


Figure 11. Transient Thermal Response Curve



## 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
$\theta$	10°	12°	14°

## Customer Service

Sales and Service:

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