

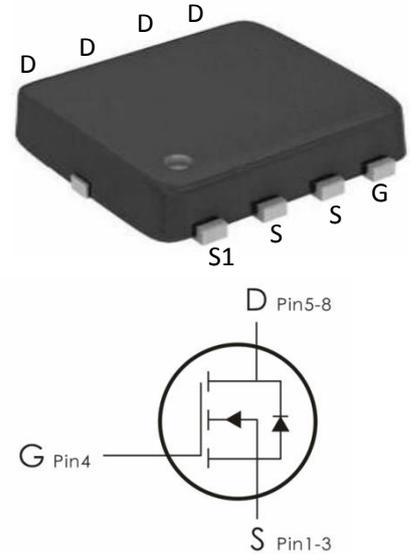
## Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge.

It can be used in a wide variety of applications.

## Features:

- 1)  $V_{DS}=30V, I_D=100A, R_{DS(ON)}<3m\ \Omega @V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(ON)}$ .
- 5) Excellent package for good heat dissipation.



## Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
ZC003NG	C003N	DFN3*3-8	5000 pcs/Reel

## Absolute Maximum Ratings: ( $T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	100	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	60	
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	320	
$P_D$	Power Dissipation	31.7	W
$E_{AS}$	Single pulse avalanche energy <sup>2</sup>	156	mJ
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

## Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.94	$^\circ\text{C}/\text{W}$

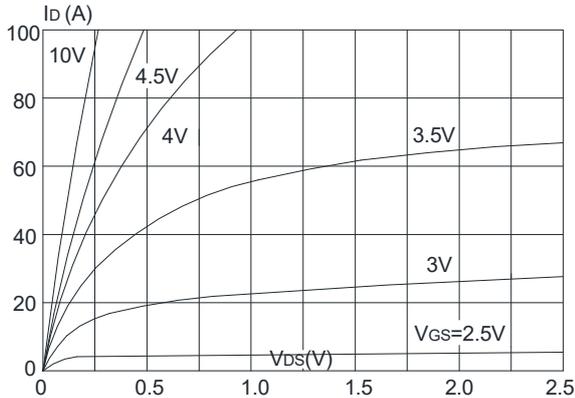
**Electrical Characteristics:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1	1.6	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance <sup>3</sup>	$V_{GS}=10V, I_D=30A$	---	2.5	3	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	---	3.7	5	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	3499	---	pF
$C_{oss}$	Output Capacitance		---	499	--	
$C_{rss}$	Reverse Transfer Capacitance		---	430	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, I_D=30A,$ $R_G=3\ \Omega, V_{GS}=10V$	---	12	---	ns
$t_r$	Rise Time		---	119	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	59	---	ns
$t_f$	Fall Time		---	109	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=15V,$ $I_D=30A$	---	69	---	nC
$Q_{gs}$	Gate-Source Charge		---	10	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	17	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=30A$	---	---	1.2	V
$I_S$	Continuous Drain Current	$V_D=V_G=0V$	---	---	100	A
$I_{SM}$	Pulsed Drain Current		---	---	320	A
$T_{rr}$	Reverse Recovery Time	$I_F=20A, T_J=25^\circ\text{C}$	---	21	---	NS
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu\text{s}$	---	9	---	NC

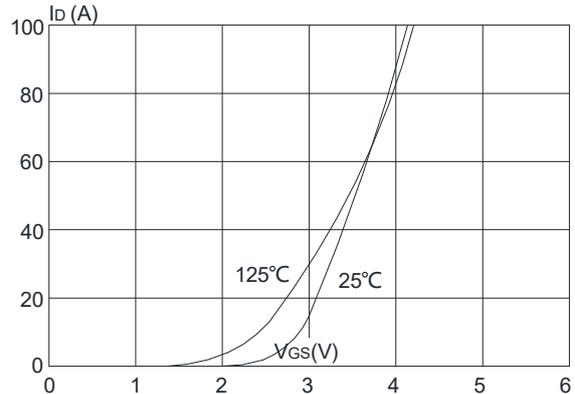
### Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition:  $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=15\text{V}$ ,  $V_G=10\text{V}$ ,  $R_G=25\ \Omega$ ,  $L=0.5\text{mH}$ ,  $I_{AS}=25\text{A}$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 0.5\%$

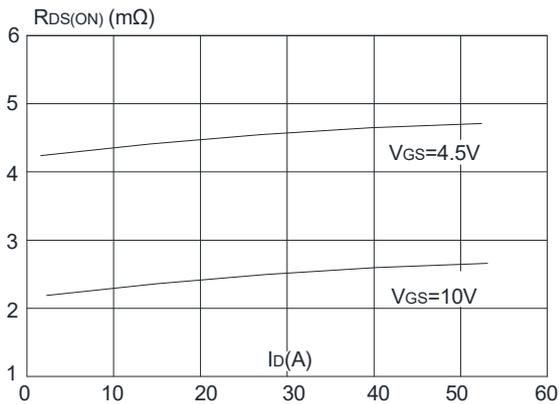
### Typical Characteristics: ( $T_c=25^{\circ}\text{C}$ unless otherwise noted)



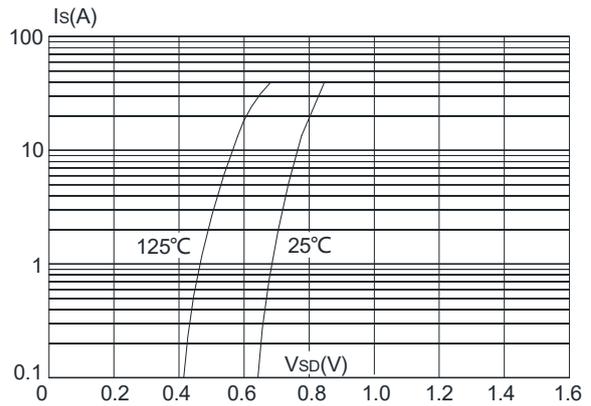
**Figure 1:** Output Characteristics



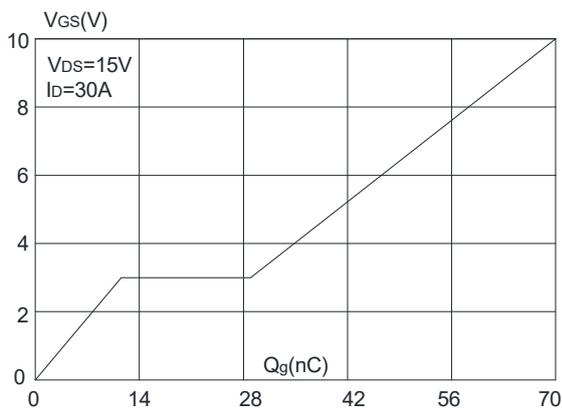
**Figure 2:** Typical Transfer Characteristics



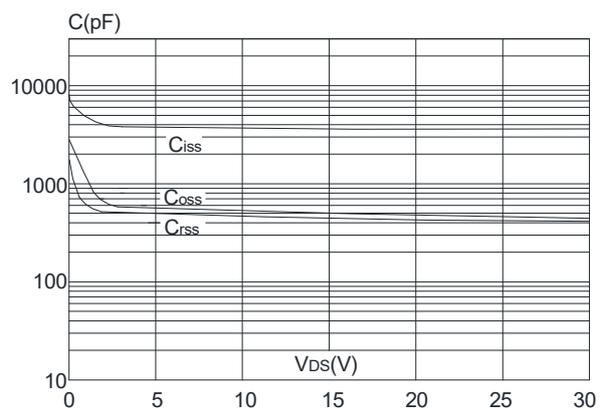
**Figure 3:** On-resistance vs. Drain Current



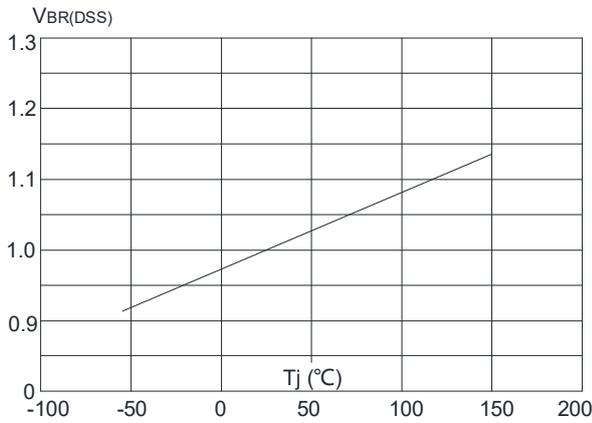
**Figure 4:** Body Diode Characteristics



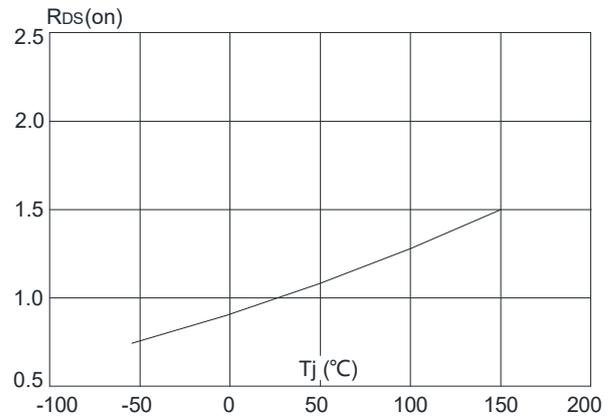
**Figure 5:** Gate Charge Characteristics



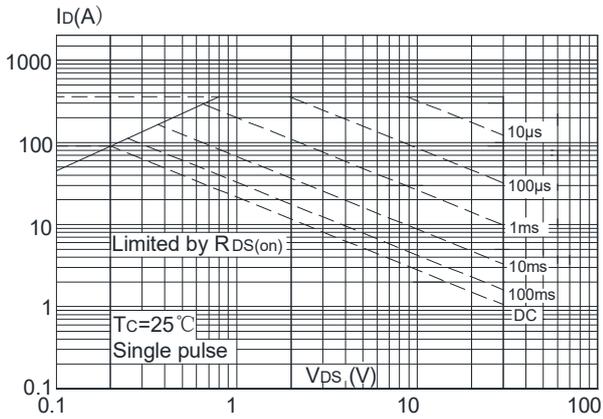
**Figure 6:** Capacitance Characteristics



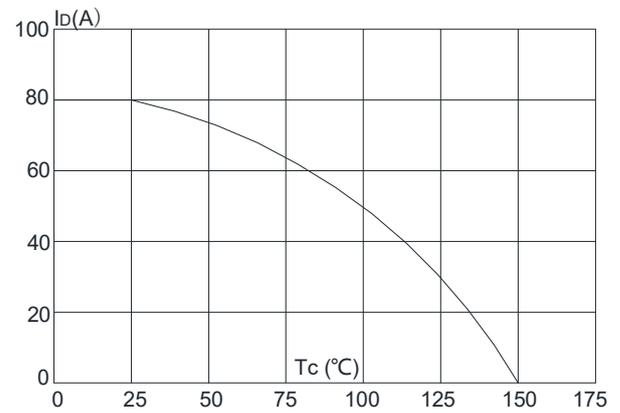
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



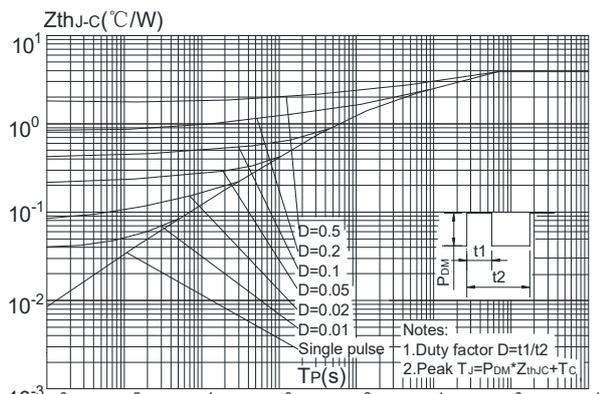
**Figure 8:** Normalized on Resistance vs. Junction Temperature



**Figure 9:** Maximum Safe Operating Area

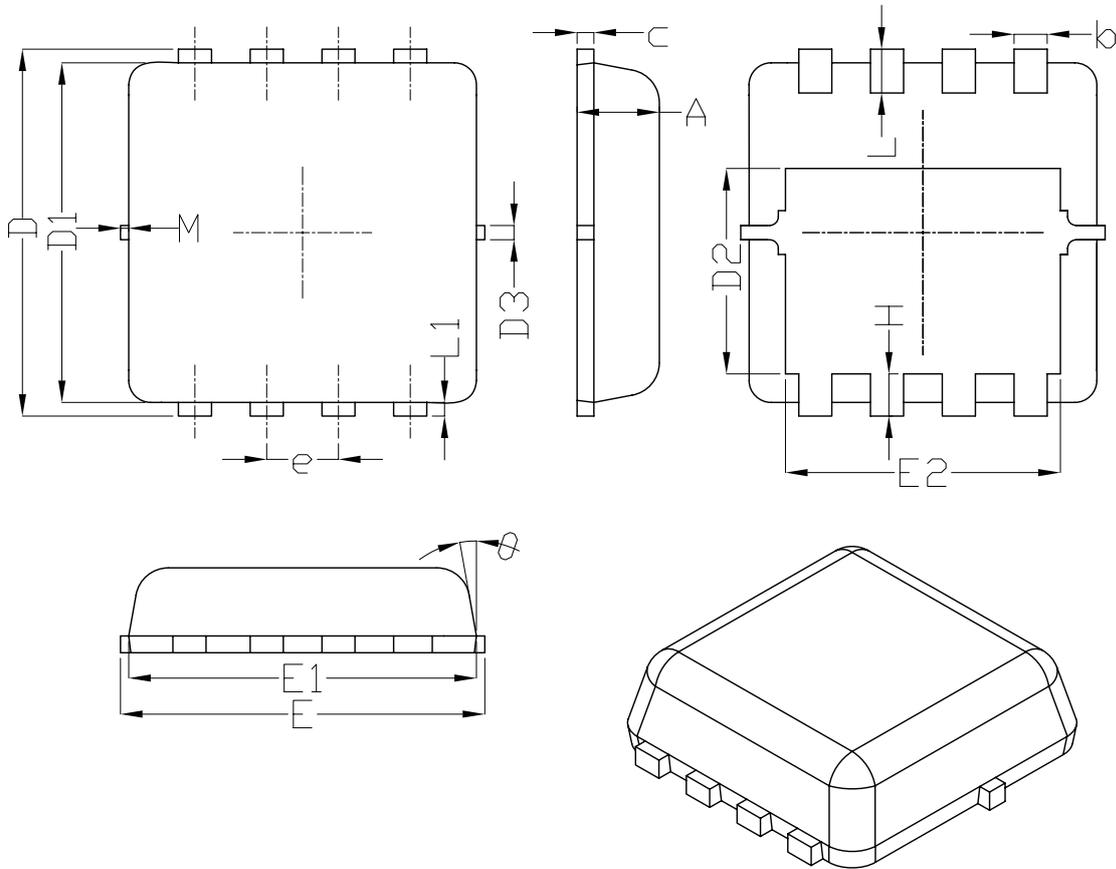


**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

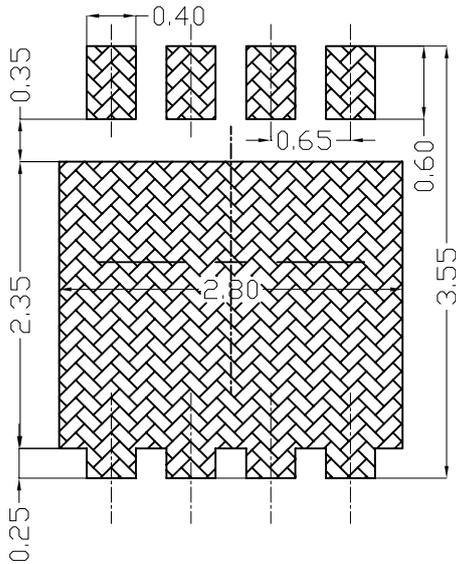


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case

## DFN3X3-8 Package Outline Data



**Land Pattern  
(Only for Reference)**



UNIT: mm

SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15

\* Not specified

## Package Information:

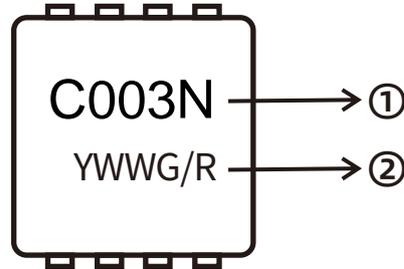
①. Part NO.

②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)

**Previous Version**

Version	Date	Subjects (major changes since last revision)
2.0	2024-07-11	Release of final version

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