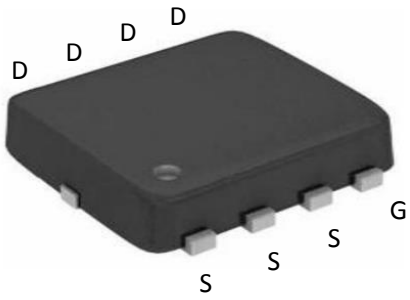
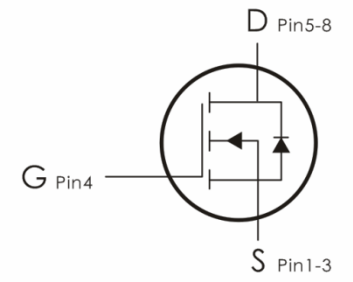
Description：

This N-Channel MOSFET uses advanced trench technology to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.





Features：

1) V_{DS}=30V,I_D=46A,$R_{DS(ON)}$<8.5mΩ @V_{GS}=10V
2) Improved dv/dt capability
3) Fast switching
4) 100% EAS Guaranteed
5) Green Device Available.

Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current-Continuous (TC=25℃)	46	A
	Continuous Drain Current-TC=100℃	29	
I_{DM}	Drain Current – Pulsed[1]	92	A
E_{AS}	Single Pulse Avalanche Energy[2]	57.8	mJ
P_D	Power Dissipation (TC=25℃)	29	W
	Power Dissipation – Derate above 25℃	1.67	W/℃
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	4.32	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	75	

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Package Marking and Ordering Information：

Part NO.	Marking	Package
ZC009NG	C009N	DFN3*3-8

Electrical Characteristics： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	30	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{GS}=0V, V_{DS}=24V, T_J=25℃	---	---	1	μA
		V_{GS}=0V, V_{DS}=24V, T_J=55℃			5	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	---	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[3]	V_{GS}=10V,I_D=12A	---	7	8.5	mΩ
		V_{GS}=4.5V,I_D=10A	---	10	13	
G_{FS}	Forward Transconductance	V_{DS}=5V, I_D=15A	---	9.8	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	1317	---	pF
C_{oss}	Output Capacitance		---	163	---	
C_{rss}	Reverse Transfer Capacitance		---	131	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time[3.4]	V_{DD}=12V , V_{GS}=10V , R_G=3.3,I_D=5A	---	4.5	---	ns
t_r	Rise Time[3.4]		---	10.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time[3.4]		---	25.5	---	ns
t_f	Fall Time[3.4]		---	9.6	---	ns
Q_g	Total Gate Charge[3.4]	V_{DS}=20V , V_{GS}=4.5V , I_D=12A	---	12.8	---	nC
Q_{gs}	Gate-Source Charge[3.4]		---	3.3	---	nC
Q_{gd}	Gate-Drain “Miller” Charge[3.4]		---	6.5	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V

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Note :
1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=34A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics: (T_C=25℃ unless otherwise noted)

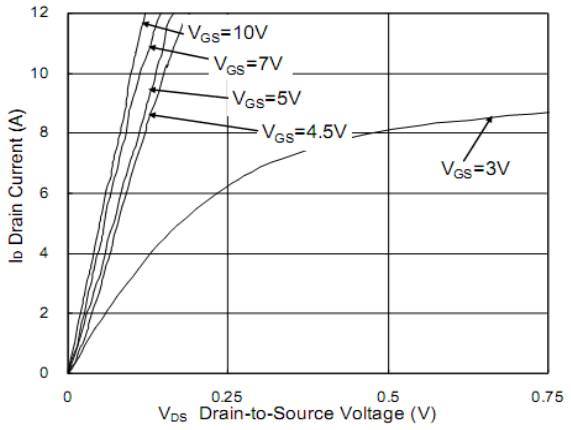


Fig.1 Typical Output Characteristics

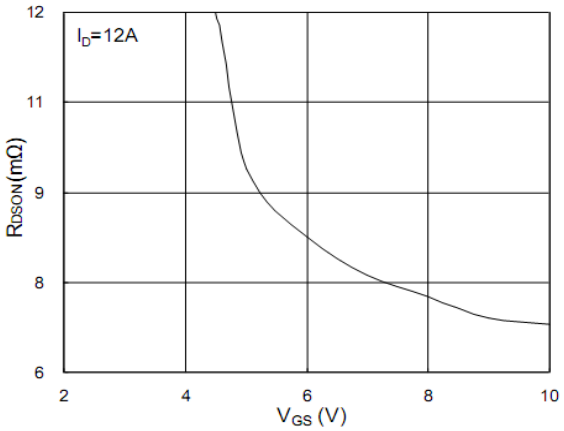


Fig.2 OnResistance v. G-SVoltage

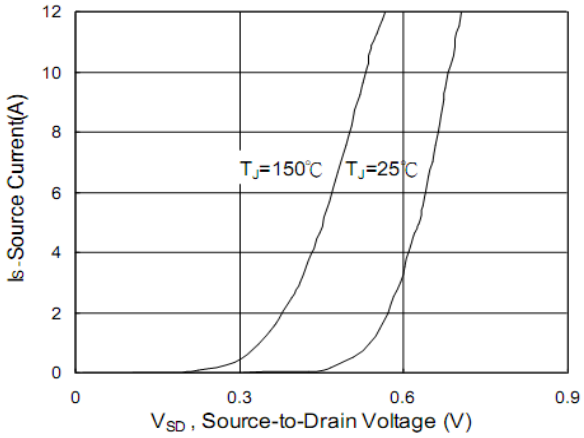


Fig. 3ForwardCharacteristicsofReverse

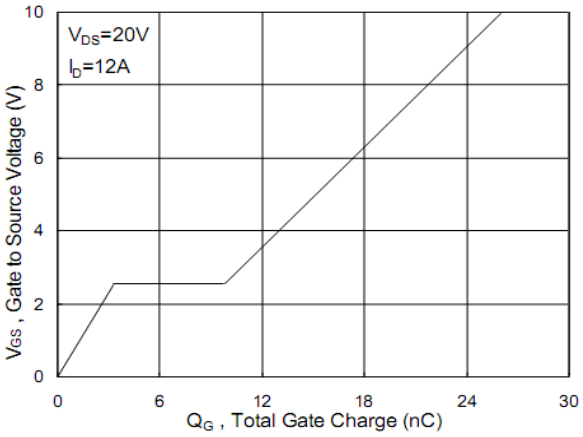


Fig. 4Gate-Charge Characteristics

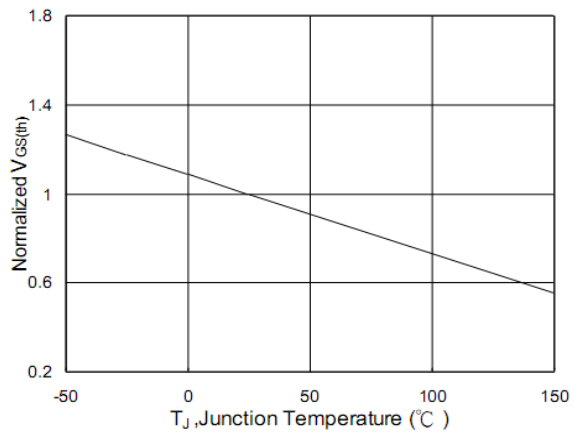


Fig. 5 Normalized VGS(th) vs. TJ

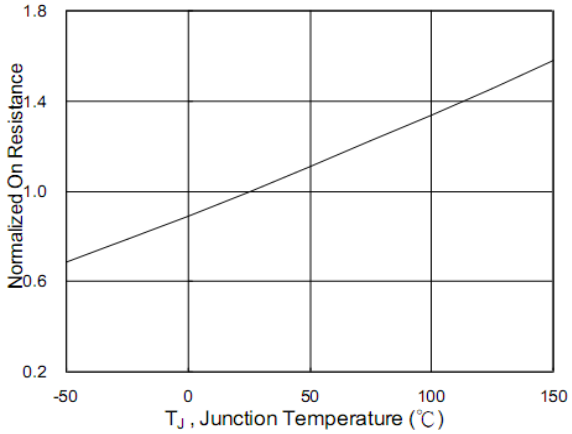


Fig. 6 Normalized RDSON vs. T

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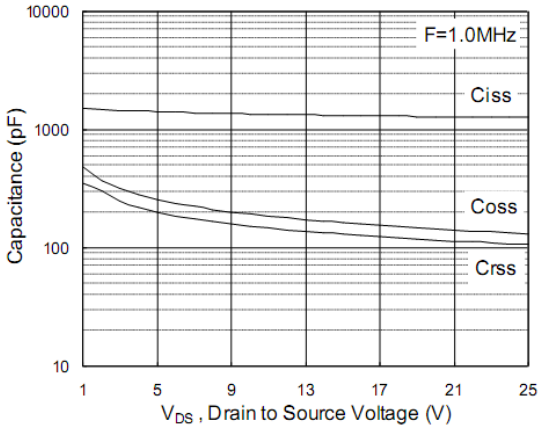


Fig. 7 Capacitance

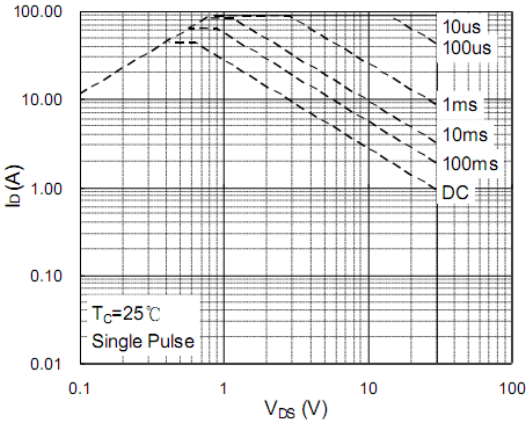


Fig. 8 Safe Operating Area

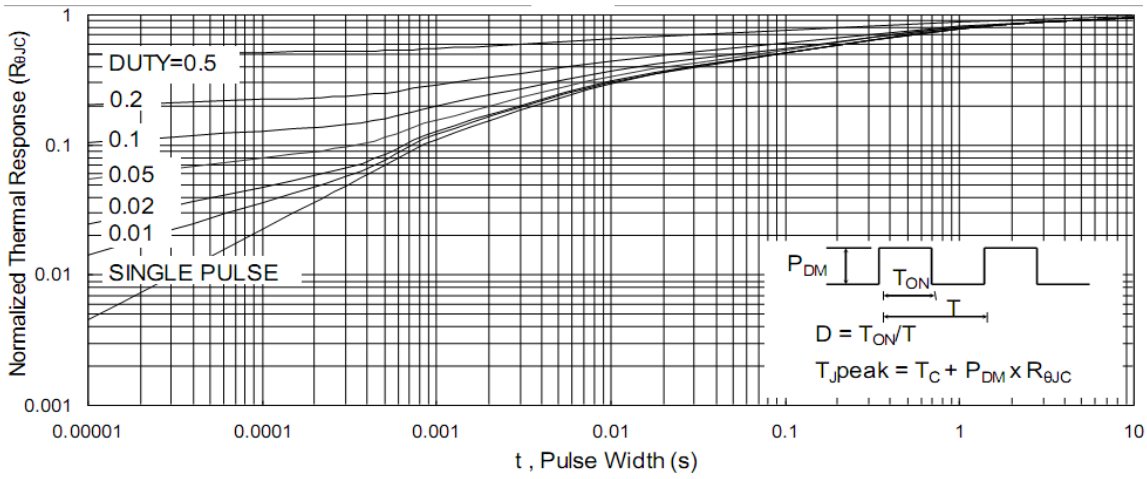


Fig. 9 Normalized Maximum Transient Thermal Impedance

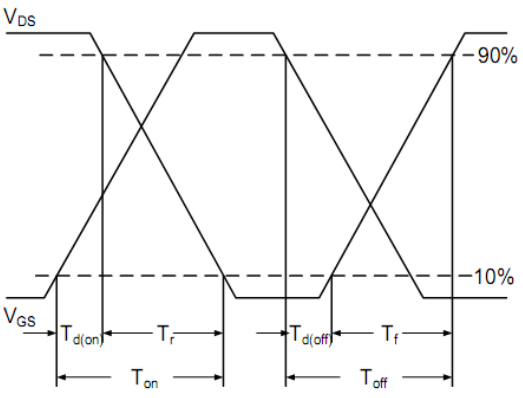


Fig. 10 Switching Time Waveform

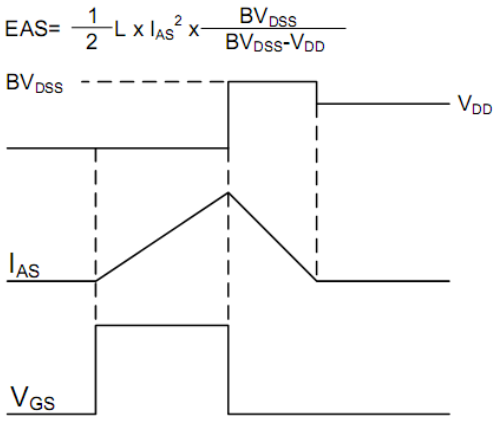


Fig. 11Unclamped InductivSwitching Waveform

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