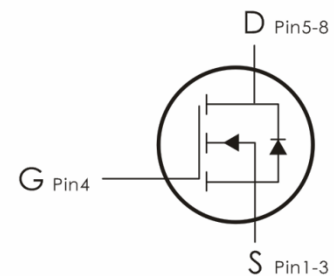
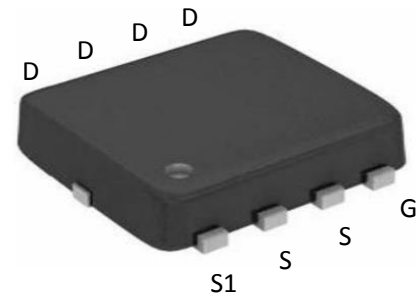


Description:

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) $V_{DS}=30V, I_D=40A, R_{DS(ON)} < 10m\Omega @ V_{GS}=10V$
- 2) Improved dv/dt capability
- 3) Fast switching
- 4) 100% EAS Guaranteed
- 5) Green Device Available.



Absolute Maximum Ratings: ($T_C=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	40	A
	Continuous Drain Current- ($T_C=100^\circ\text{C}$)	24	
I_{DM}	Drain Current – Pulsed ¹	160	A
E_{AS}	Single Pulse Avalanche Energy ²	24.2	mJ
I_{AS}	Avalanche Current ²	22	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	31	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	4	$^\circ\text{C}/\text{W}$

R_{θJA}	Thermal Resistance, Junction to Ambient ¹	62	°C/W
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Package Marking and Ordering Information:

Part NO.	Marking	Package
ZC010NG	C010N	DFN3*3-8

Electrical Characteristics: (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{GS} =0V, V _{DS} =30V, T _J =25 °C	---	---	1	μ A
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 =250 μ A	1	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D = 15A	---	8.5	10	m Ω
		V _{GS} =4.5V, I _D = 10A	---	11	17	
G _{FS}	Forward Transconductance	V _{DS} =5V, I _D =15A	---	24.4	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	896	---	pF
C _{oss}	Output Capacitance		---	126	---	
C _{rss}	Reverse Transfer Capacitance		---	108	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ^{3. 4.}	V _{DD} =15V , V _{GS} =10V , R _G =3 Ω , I _D =10A	---	6.4	---	ns
t _r	Rise Time ^{3. 4.}		---	5	---	ns
t _{d(off)}	Turn-Off Delay Time ^{3. 4.}		---	25	---	ns
t _f	Fall Time ^{3. 4.}		---	7	---	ns
Q _g	Total Gate Charge ^{3. 4.}	V _{DS} =15V , V _{GS} =10V , I _D =20	---	19	---	nC
Q _{gs}	Gate-Source Charge ^{3. 4.}		---	6.54	---	nC
Q _{gd}	Gate-Drain “Miller” Charge ^{3. 4.}		---	4.54	---	nC

Drain-Source Diode Characteristics						
I_S	Continuous Source Current	---	---	40	A	
I_{SM}	Pulsed Source Current	---	---	160	A	
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=40A$		---	---	1.2 V
t_{rr}	Reverse Recovery Time	$I_F=20A, di/dt=100A/\mu s$		---	7	nS
Q_{rr}	Reverse Recovery Charge			---	6.3	nC

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22A, R_G=25\Omega$, Starting $T_J=25^\circ C$.
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

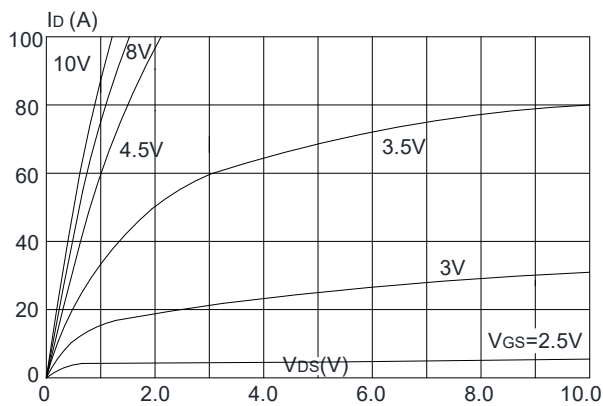


Figure1: Output Characteristics

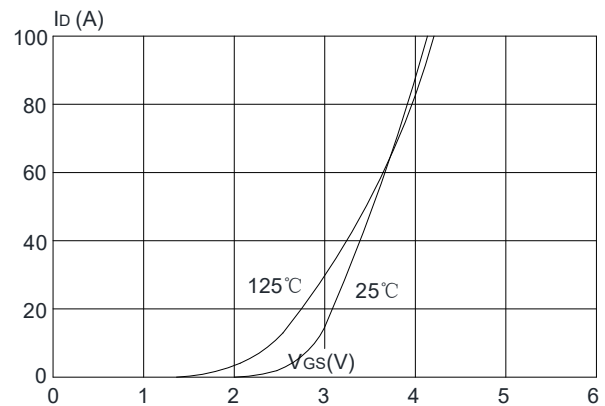


Figure 2: Typical Transfer Characteristics

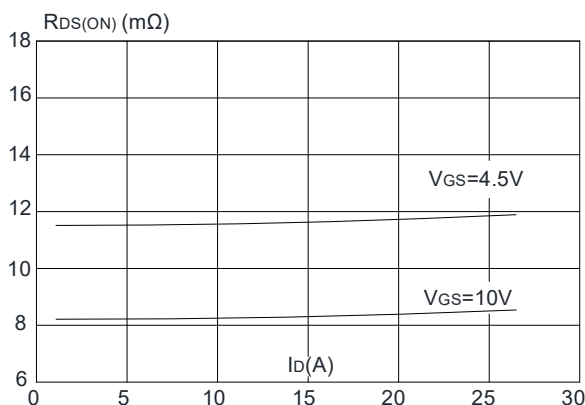


Figure 3: On-resistance vs. Drain Current

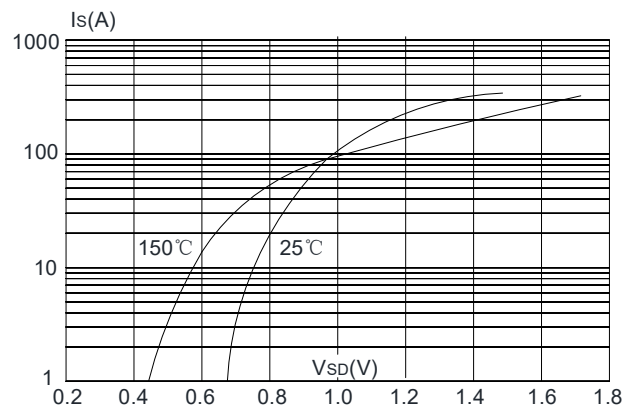


Figure 4: Body Diode Characteristics

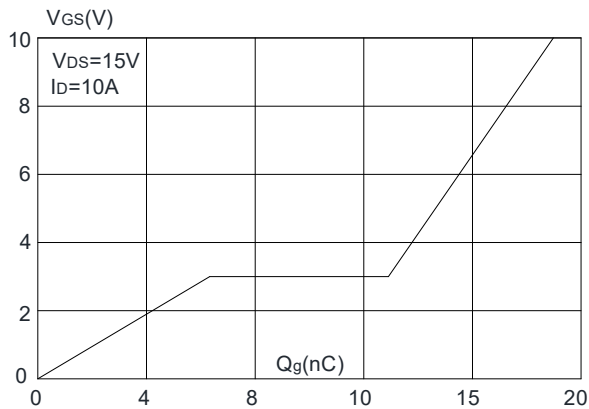


Figure 5: Gate Charge Characteristics

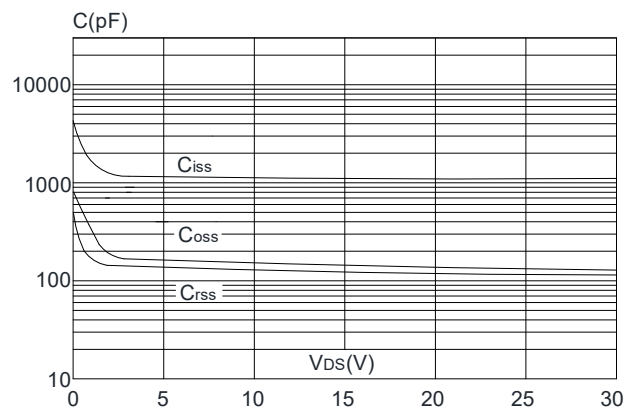


Figure 6: Capacitance Characteristics

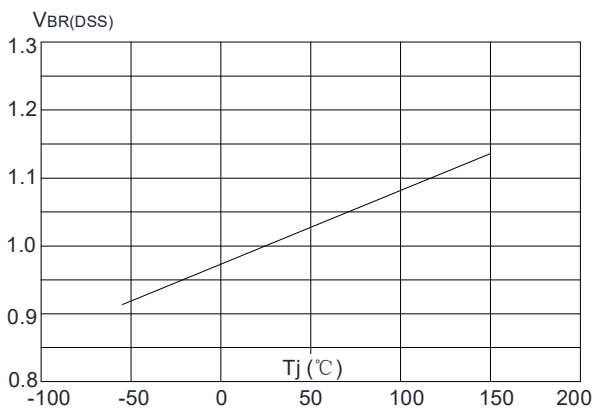


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

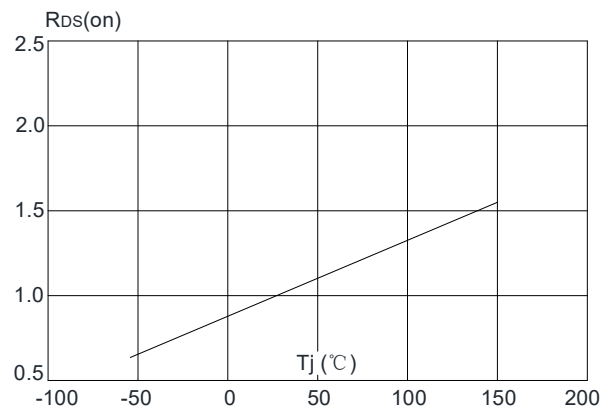


Figure 8: Normalized on Resistance vs. Junction Temperature

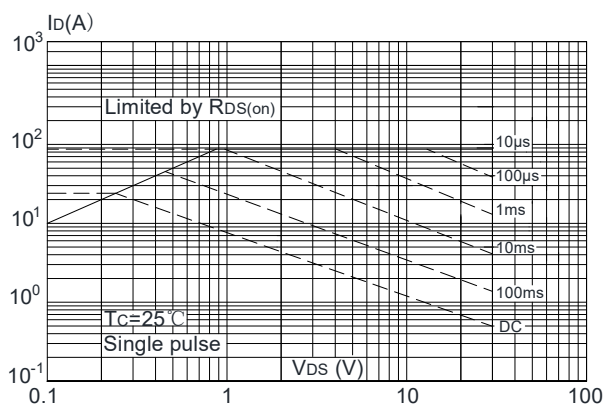


Figure 9: Maximum Safe Operating Area

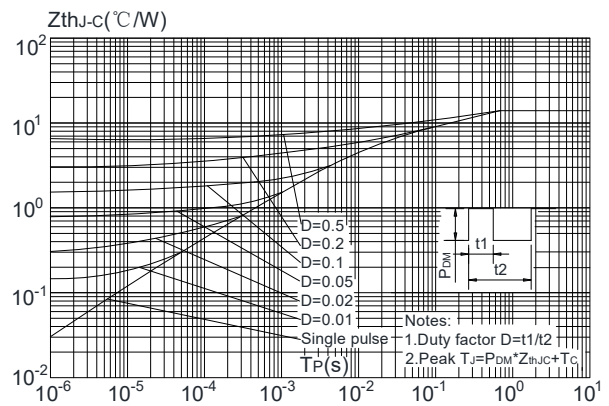


Figure.10: Maximum Effective Transient Thermal Impedance, Junction-to-Case