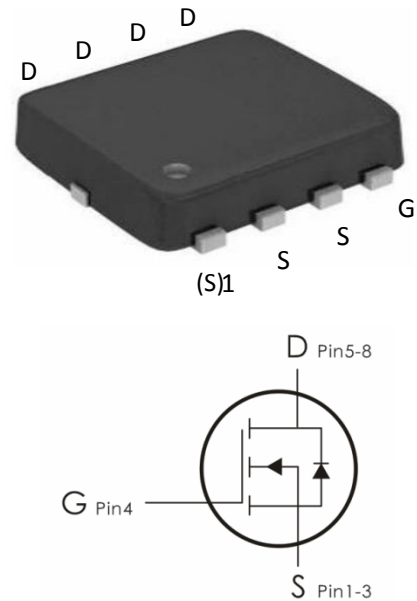


Description:

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) $V_{DS}=30V, I_D=90A, R_{DS(ON)} < 4.2m\ \Omega @ V_{GS}=10V$
- 2) Improved dv/dt capability
- 3) Fast switching
- 4) 100% EAS Guaranteed
- 5) Green Device Available.



Absolute Maximum Ratings: ($T_C=25^\circ C$ 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 ($T_C=25^\circ C$)	90	A
	Continuous Drain Current- $T_C=100^\circ C$	53	
I_{DM}	Drain Current – Pulsed ¹	330	A
E_{AS}	Single Pulse Avalanche Energy	240	mJ
P_D	Power Dissipation ($T_C=25^\circ C$)	45	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ³	62.5	

Package Marking and Ordering Information:

Part NO.	Marking	Package
ZC005NG	C005N	DFN3*3-8

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{GS}=0V, V_{DS}=24V, T_J=25^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1	1.5	3	V
$R_{DS(on)}$	Drain-Source On Resistance ²	$V_{GS}=10V, I_D=30A$	---	3.6	4.2	m Ω
		$V_{GS}=4.5V, I_D=20A$	---	---	7	
G_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=6A$	---	13	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	1950	2350	pF
C_{oss}	Output Capacitance		---	320	---	
C_{rss}	Reverse Transfer Capacitance		---	240	---	
R_g	Gate Resistance	$f=1\text{MHz}$	---	0.9	---	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, R_G=3.3\ \Omega, I_D=15A$	---	13	---	ns
t_r	Rise Time		---	36	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	43	---	ns
t_f	Fall Time		---	16	---	ns
Q_g	Total Gate Charge	$V_{DS}=24V, V_{GS}=10V, I_D=20A$	---	42	---	nC
Q_{gs}	Gate-Source Charge		---	3.9	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	14	---	nC
Drain-Source Diode Characteristics						

V_{SD}	Source-Drain Diode Forward Voltage ²	V _{GS} =0V, I _S =30A, T _J =25°C	---	---	1.2	V
t_{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =10A, di/dt=100A	---	16	---	nS
Q_{rr}	Reverse Recovery Charge		---	5	---	nC

Notes:

1. Pulse width limited by max. junction temperature
2. Pulse test
3. Surface mounted on 1 in² copper pad of FR4 board

Typical Characteristics: (T_C=25°C unless otherwise noted)

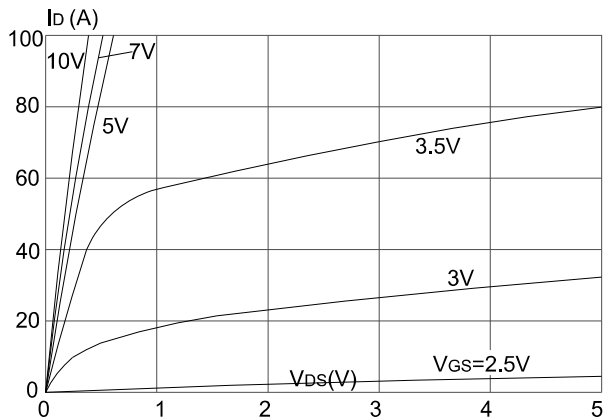


Figure 1: Output Characteristics

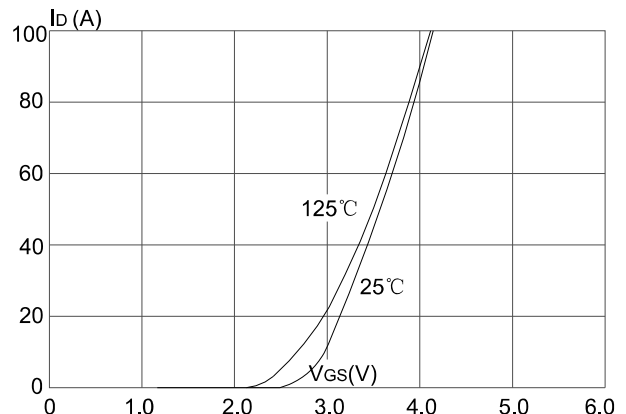


Figure 2: Typical Transfer Characteristics

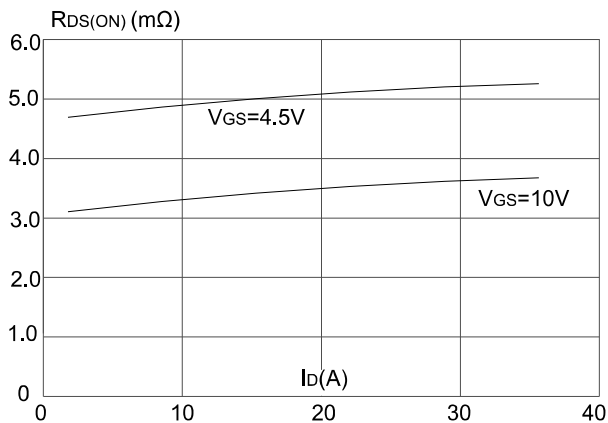


Figure 3: On-resistance vs Drain Current

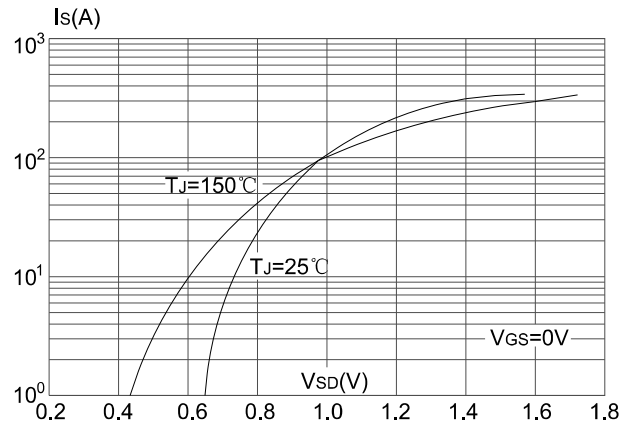


Figure 4: Body Diode Characteristics

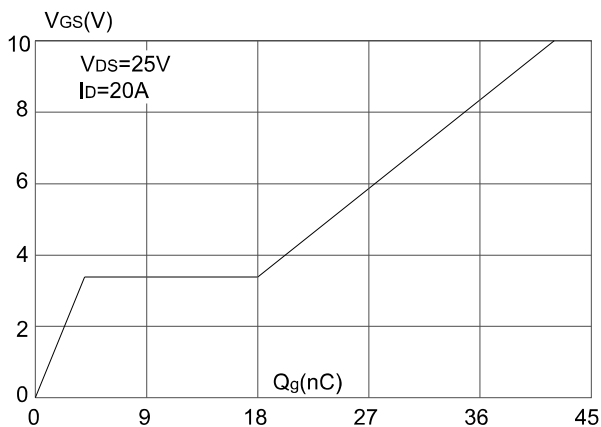


Figure 5: Gate Charge Characteristics

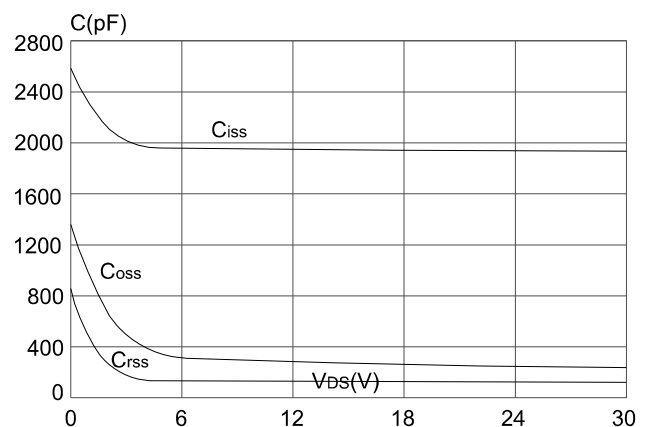


Figure 6: Capacitance Characteristics

Junction Temperature

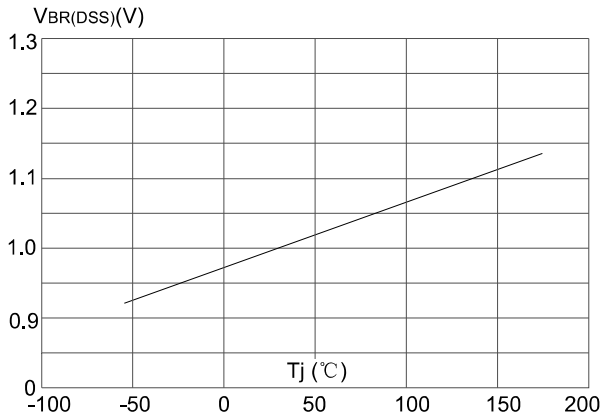


Figure 7: Normalized Breakdown Voltage vs.

Junction Temperature

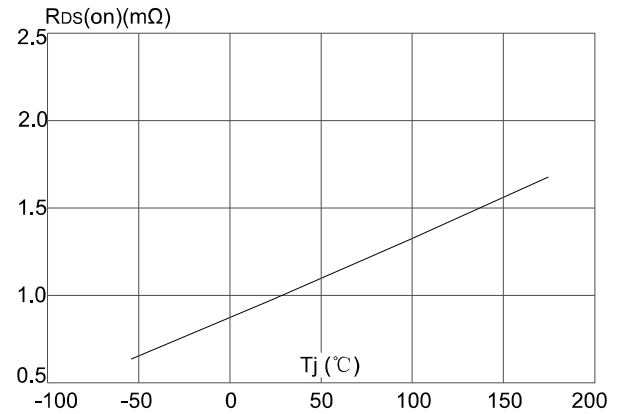


Figure 8: Normalized on Resistance vs.

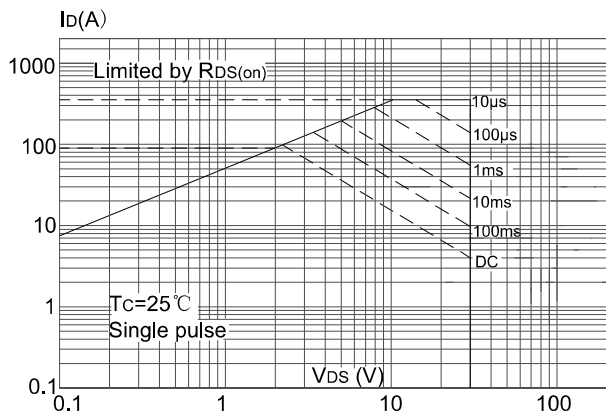


Figure 9: Maximum Safe Operating Area

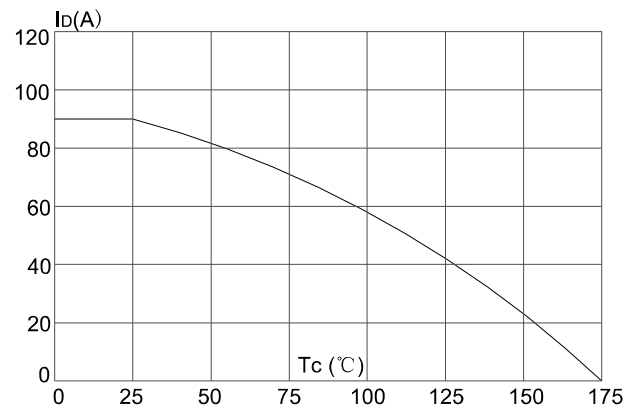


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

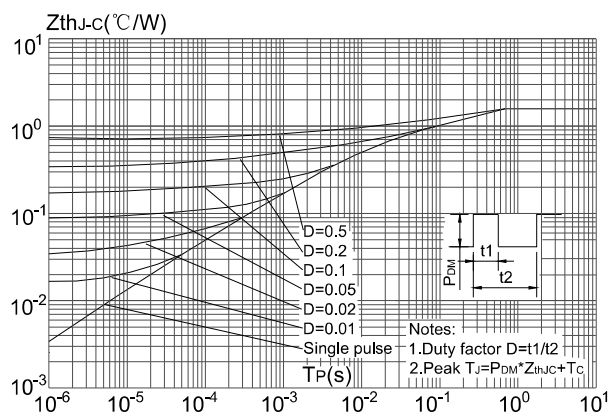


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case