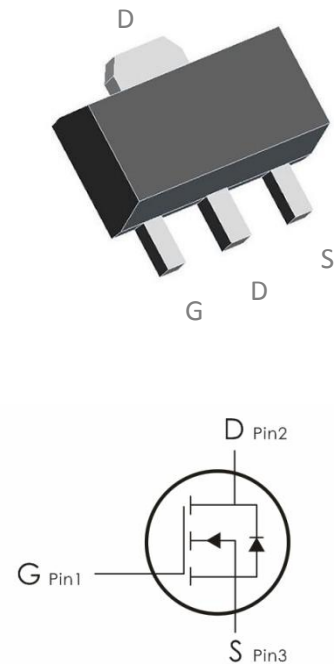


Description:

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) $V_{DS}=30V, I_D=18A, R_{DS(ON)}<6.5m\ \Omega @V_{GS}=10V$
- 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.



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- $T_C=25^\circ\text{C}$	18	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	12	A
I_{DM}	Pulsed Drain Current ¹	140	A
P_D	Total Power Dissipation @ $T_C=25^\circ\text{C}$	17	W
EAS	Single Pulsed Avalanche Energy ²	56	mJ
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	7.4	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
WC007NG	C007N	SOT-89

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}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	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	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance ³	$V_{GS}=10V, I_D=20A$	---	4.9	6.5	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	7.9	12.5	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1613	---	pF
C_{oss}	Output Capacitance		---	244	---	
C_{rss}	Reverse Transfer Capacitance		---	214	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V,$ $R_G=3\Omega, I_D=30A$	---	8.4	---	ns
t_r	Rise Time		---	102	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	35	---	ns
t_f	Fall Time		---	104	---	ns
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=15V,$ $I_D=30A$	---	34	---	nC
Q_{gs}	Gate-Source Charge		---	5	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	8	---	nC
Drain-Source Diode Characteristics						
I_S	Body-Diode Continuous Current	$V_D=V_G=0V$	---	---	18	A
I_{SM}	Pulsed Drain Current	$V_D=V_G=0V$	---	---	140	A

V_{SD}	Diode Forward Voltage	I _S =30A, V _{GS} =0V	---	---	1.2	V
T_{rr}	Reverse Recovery Time	IF=20A, di/dt=100A/μs	---	12	---	ns
Q_{rr}	Reverse Recovery Charge		---	4	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, R_G=25 Ω, L=0.5mH, I_{AS}=15A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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

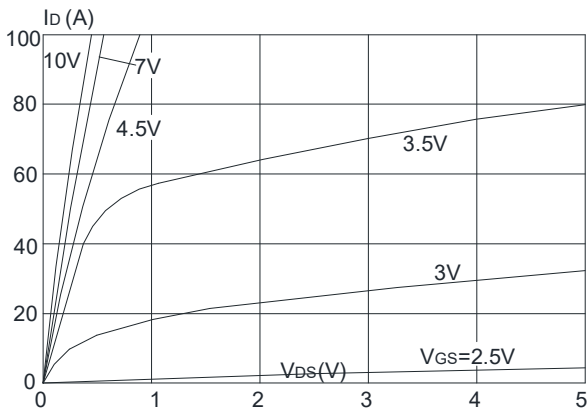


Figure 1: Output Characteristics

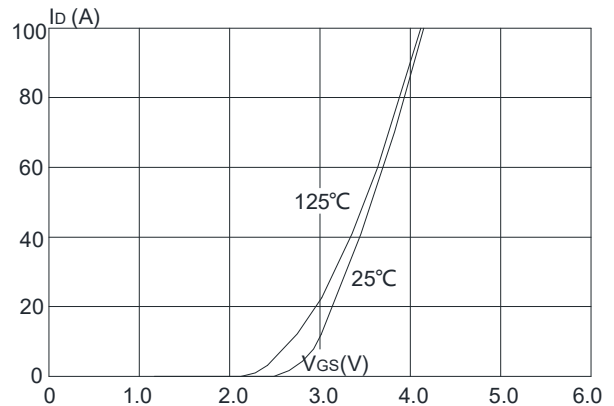


Figure 2: Typical Transfer Characteristics

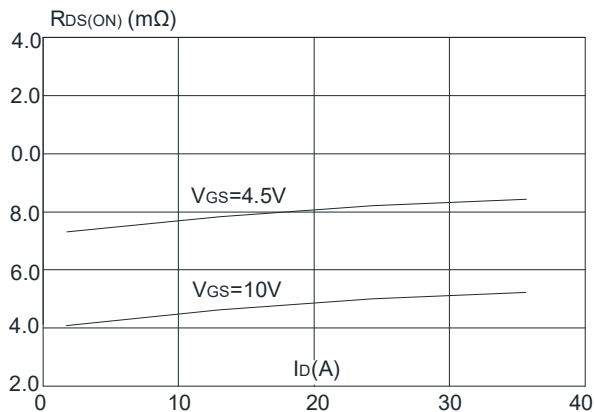


Figure 3: On-resistance vs. Drain Current

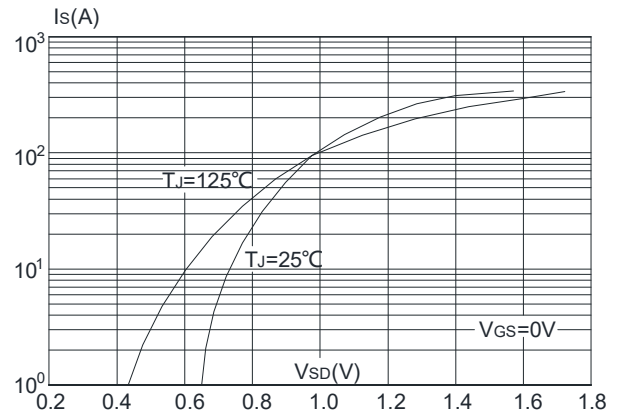


Figure 4: Body Diode Characteristics

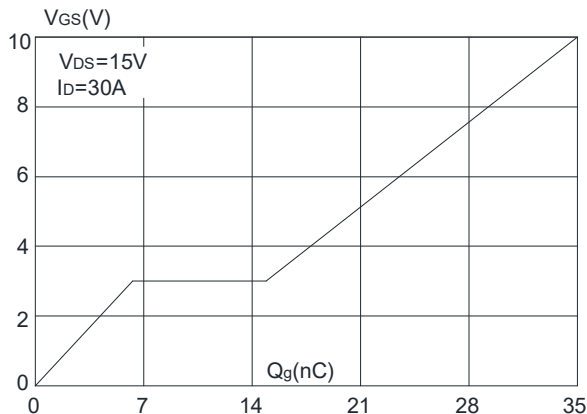


Figure 5: Gate Charge Characteristics

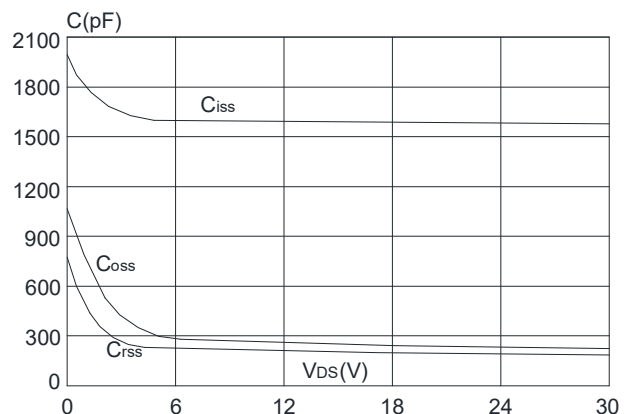


Figure 6: Capacitance Characteristics

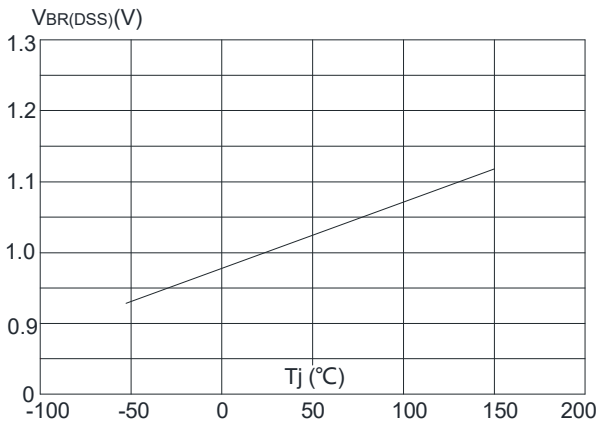


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

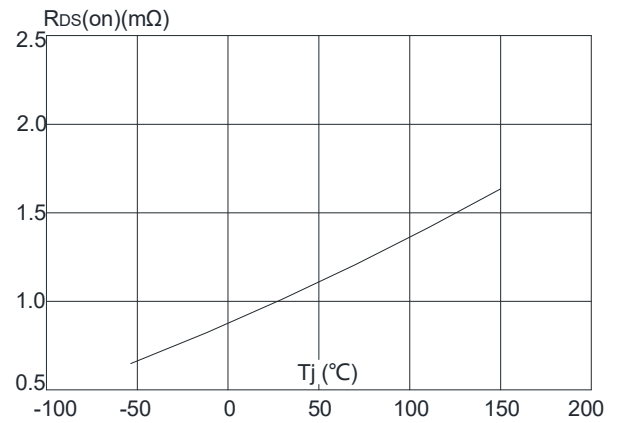


Figure 8: Normalized on Resistance vs. Junction Temperature

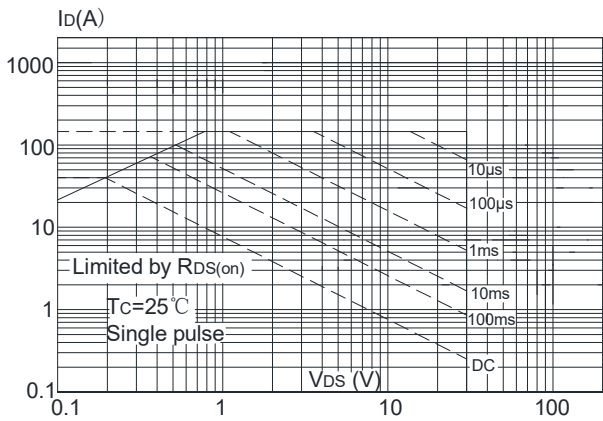


Figure 9: Maximum Safe Operating Area

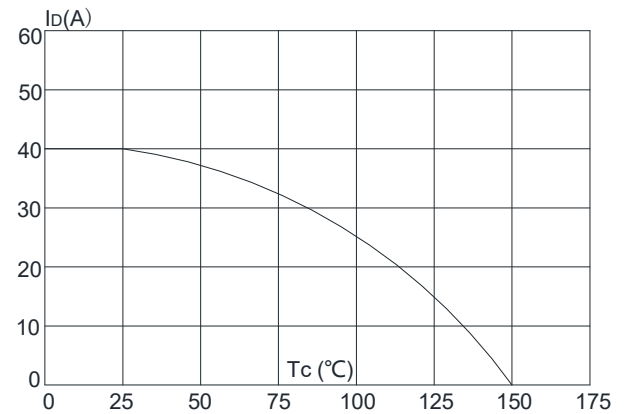


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

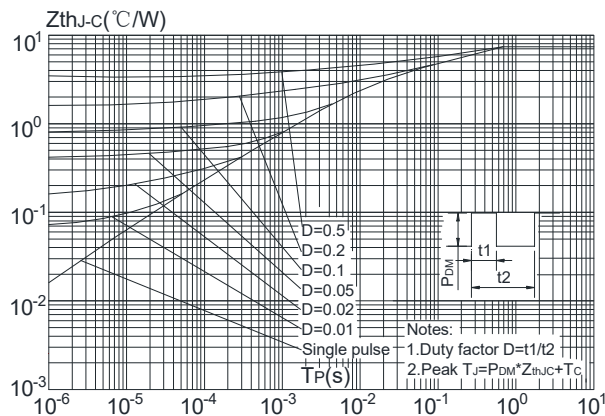


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case