

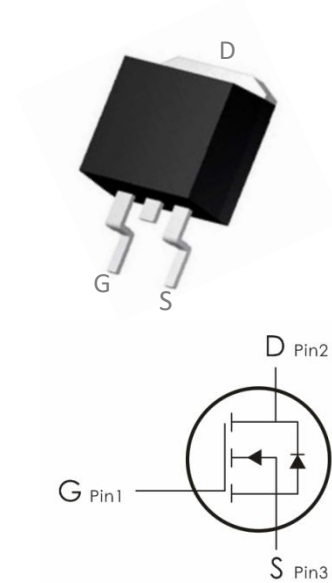
Description:

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) $V_{DS}=30V, I_D=30A, R_{DS(ON)} < 22m\ \Omega @ V_{GS}=10V$
- 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: ($T_C=25^\circ C$ 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- $T_C=25^\circ C^1$	30	A
	Continuous Drain Current- $T_C=100^\circ C$	16	
	Pulsed Drain Current ²	92	
E_{AS}	Single Pulse Avalanche Energy ³	36	mJ
P_D	Power Dissipation, $T_C=25^\circ C$	37	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

Thermal Characteristics:

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

Package Marking and Ordering Information:

Part NO.	Marking	Package
BC022NG	C022N	TO-263

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	$V_{GS}=10V, I_D=20A$	---	18	22	m Ω
		$V_{GS}=4.5V, I_D=15A$	---	28	40	
G_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=6A$	---	10	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	540	---	pF
C_{oss}	Output Capacitance		---	59	---	
C_{rss}	Reverse Transfer Capacitance		---	51	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V,$ $V_{GS}=10V, R_{GEN}=3\Omega$	---	3	---	ns
t_r	Rise Time		---	10	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	12	---	ns
t_f	Fall Time		---	3	---	ns
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=15V,$ $I_D=3.6A$	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	4	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	---	---	1.2	V

LsD	Source-Drain Current(Body Diode)		---	23	A
trr	Reverse Recovery Time	$I_F=20A, di/dt=100A/\mu s$	4	---	Ns
qrr	Reverse Recovery Charge		2	---	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: $T_J=25^\circ C, V_{DD}=30V, V_G=10V, R_G=25\Omega$

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

Figure 1. Output Characteristics

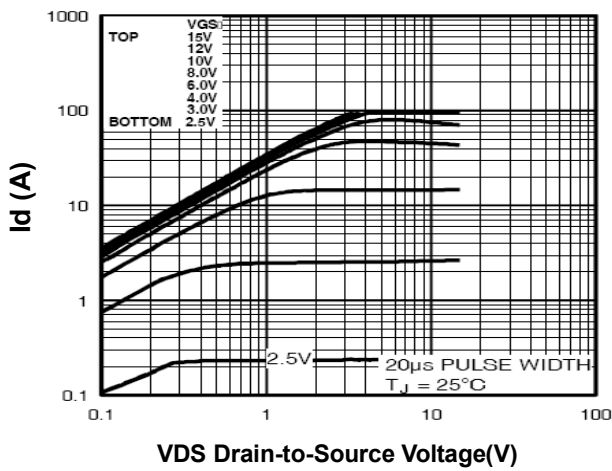


Figure 2. Transfer Characteristics

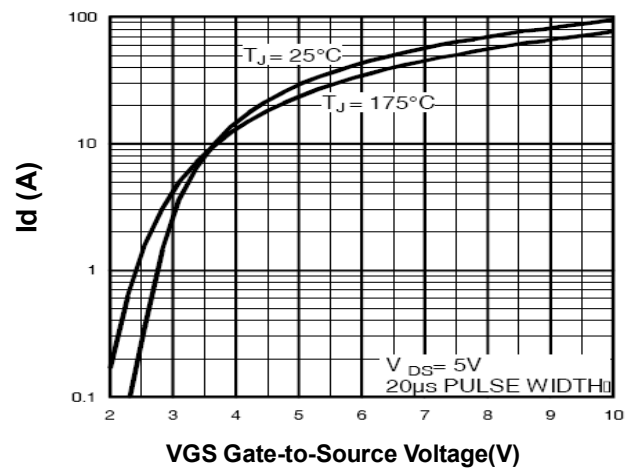


Figure 3. Max BV_{DSS} vs Junction Temperature

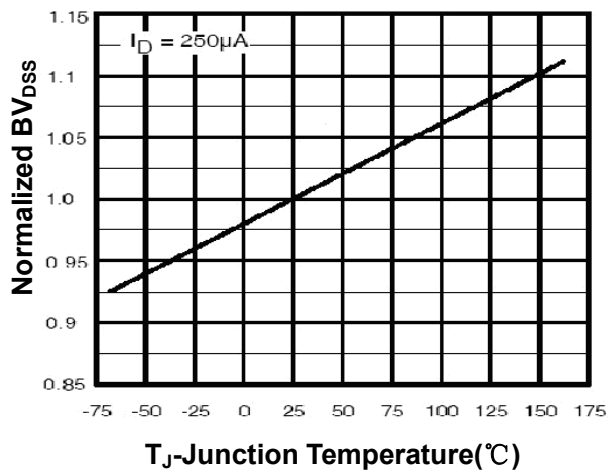


Figure 4. Drain Current

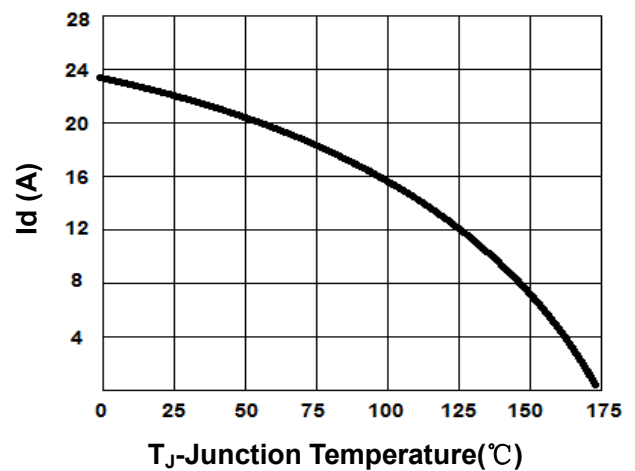


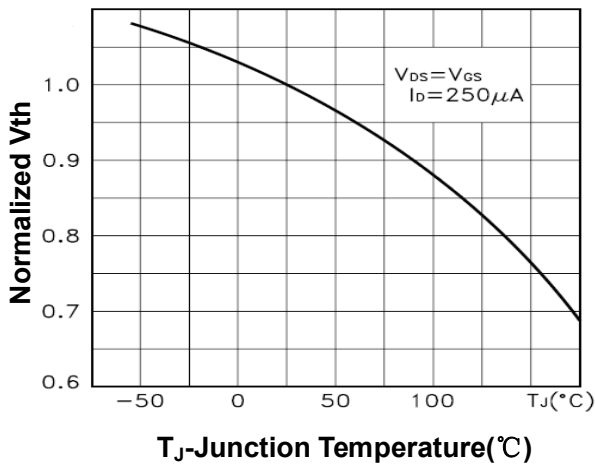
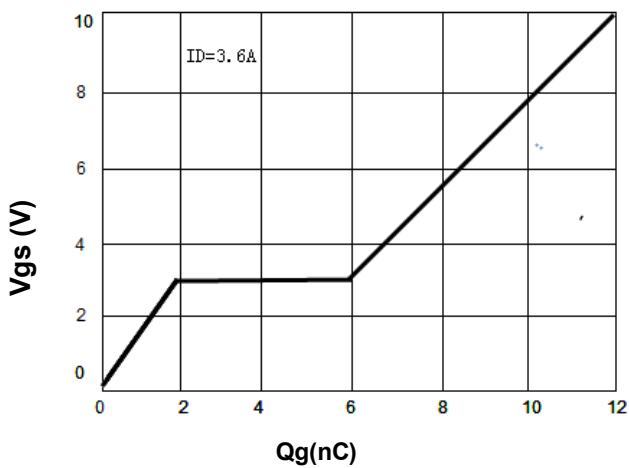
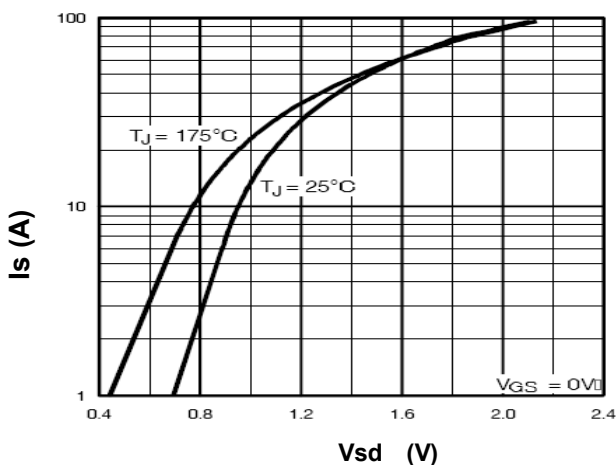
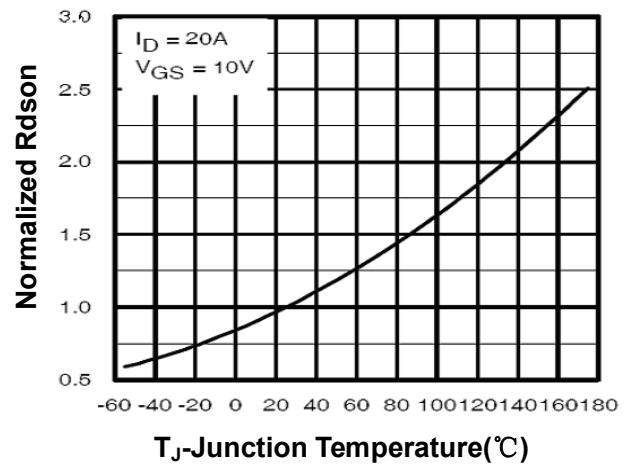
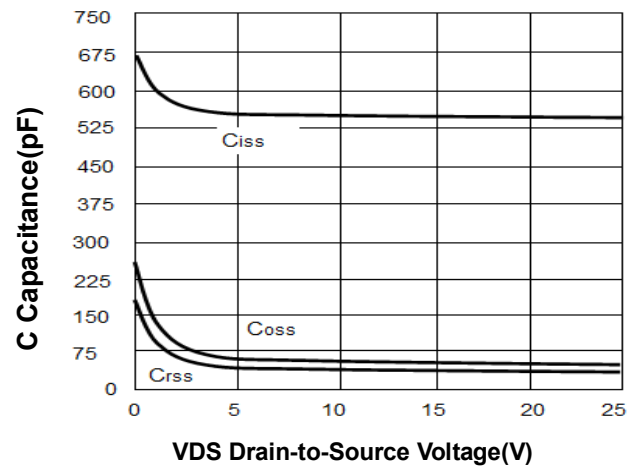
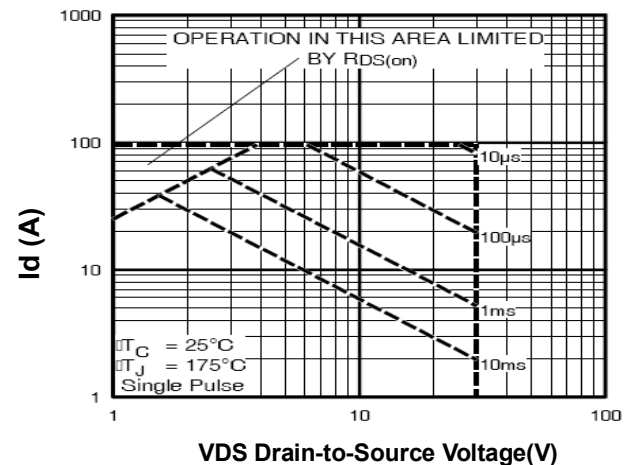
Figure 5. $V_{GS(th)}$ vs Junction Temperature

Figure 7. Gate Charge Waveforms

Figure 9. Body-Diode Characteristics

Figure 6. $R_{DS(ON)}$ vs Junction Temperature

Figure 8. Capacitance

Figure 10. Maximum Safe Operating Area


Figure 11. Normalized Maximum Transient Thermal Impedance

