

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) $V_{DS}=30V, I_D=50A, R_{DS(ON)} < 7\text{ m}\Omega @ V_{GS}=10V$ (Typ: $5.5\text{ m}\Omega$)
- 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.
- 6) MSL3

Package Marking and Ordering Information:

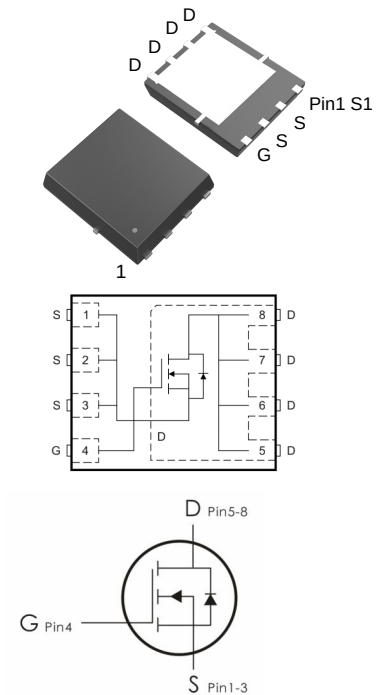
Part NO.	Marking	Package	Packing
NC007NG-B	C007N-B	DFN5*6-8	5000 pcs/Reel

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	50	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	35	
I_{DM}	Pulsed Drain Current ¹	200	
P_D	Power Dissipation	31	W
E_{AS}	Single pulse avalanche energy ²	28.3	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ³	39	$^\circ\text{C}/\text{W}$



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =30V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics (Note3)						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.0	1.36	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =10V, I _D =20A	---	5.5	7	m Ω
		V _{GS} =4.5V, I _D =15A	---	8.5	13	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1200	---	pF
C _{oss}	Output Capacitance		---	170.1	--	
C _{rss}	Reverse Transfer Capacitance		---	136.5	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =15V, I _D =15A, R _G =3 Ω , V _{GS} =10V	---	7.35	---	ns
t _r	Rise Time		---	15.7	---	ns
t _{d(off)}	Turn-Off Delay Time		---	26.2	---	ns
t _f	Fall Time		---	6.3	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A	---	22	---	nC
Q _{gs}	Gate-Source Charge		---	4.7	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	5.7	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =30A	---	---	1.2	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	41.6	A
I _{SM}	Pulsed Drain Current		---	---	166.6	A
T _{rr}	Reverse Recovery Time	I _F =20A, T _J =25 °C	---	10	---	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/us	---	3	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : $T_J=25^{\circ}C, V_{DD}=15V, V_G=10V, L=0.1mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

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

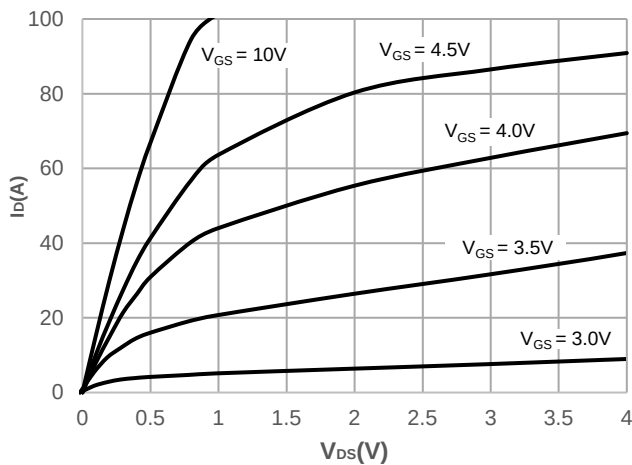


Figure 1: Output Characteristics

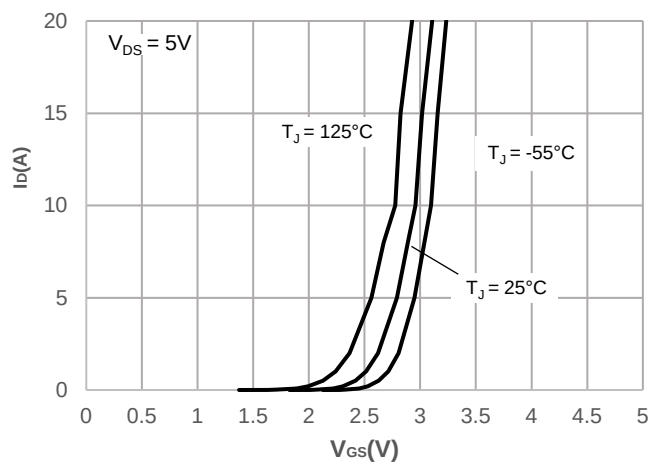


Figure 2: Typical Transfer Characteristics

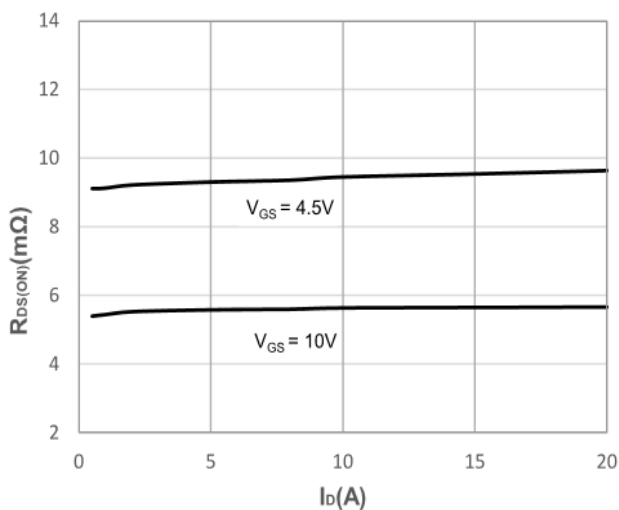


Figure 3: On-resistance vs. Drain Current

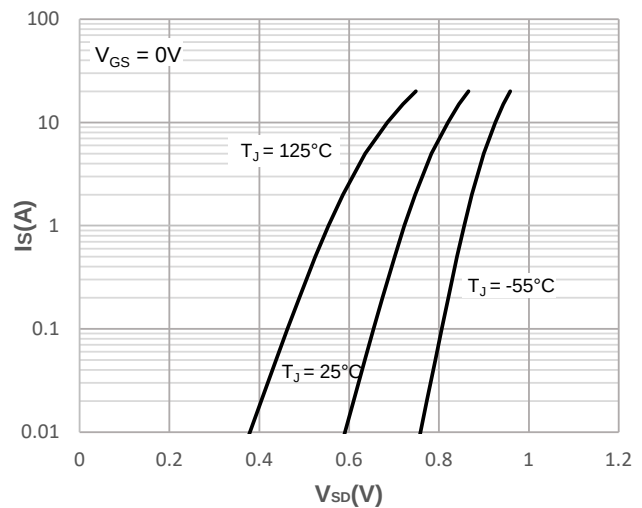


Figure 4: Body Diode Characteristics

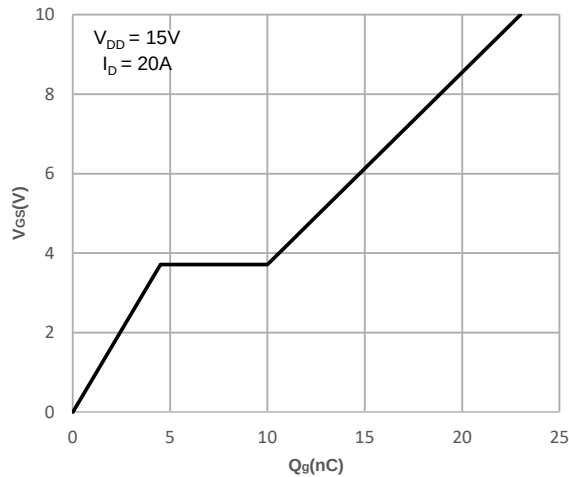


Figure 5: Gate Charge Characteristics

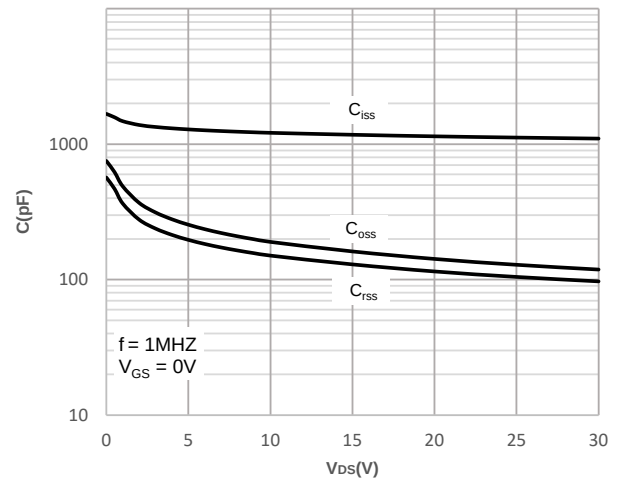


Figure 6: Capacitance Characteristics

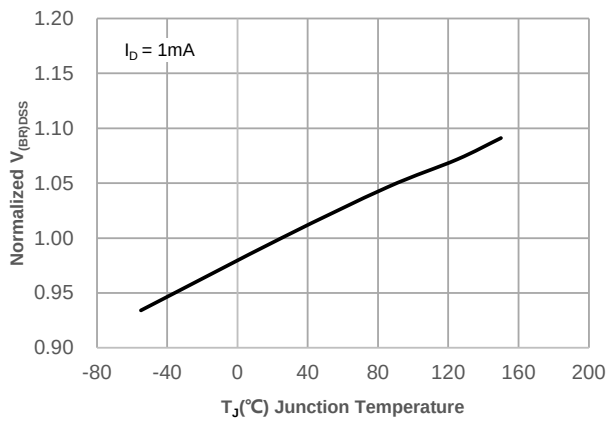


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

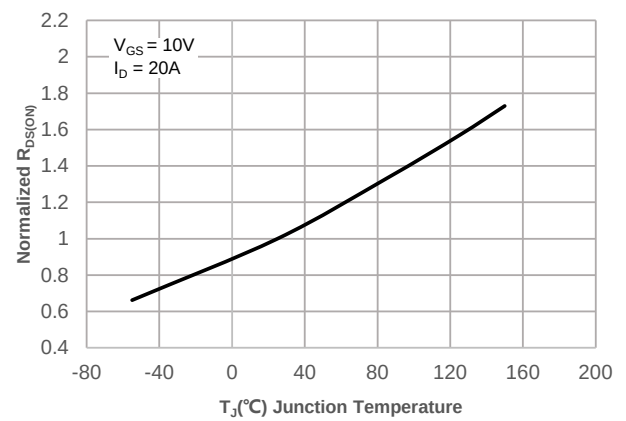


Figure 8: Normalized on Resistance vs. Junction Temperature

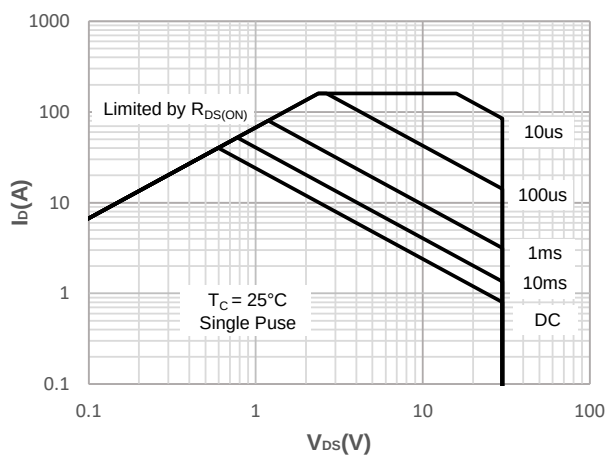


Figure 9: Maximum Safe Operating Area

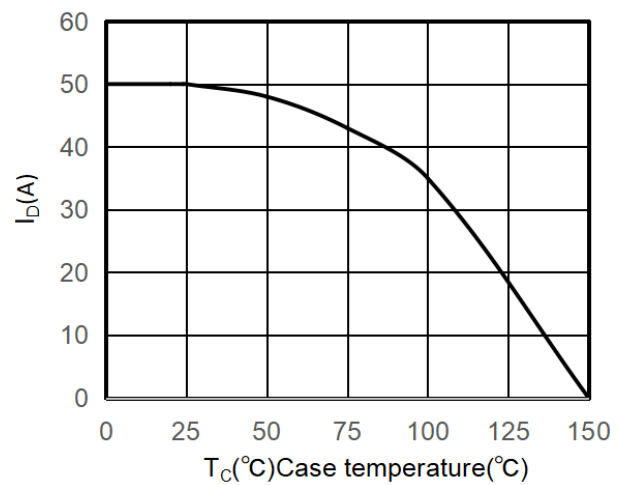


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

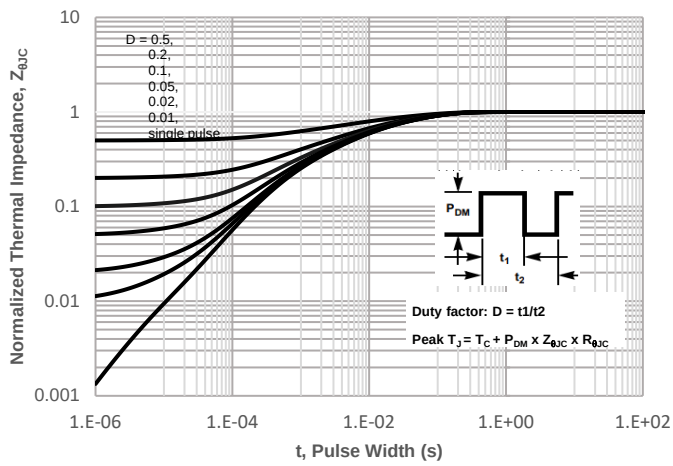


Figure 11: Normalized Maximum Transient Thermal Impedance

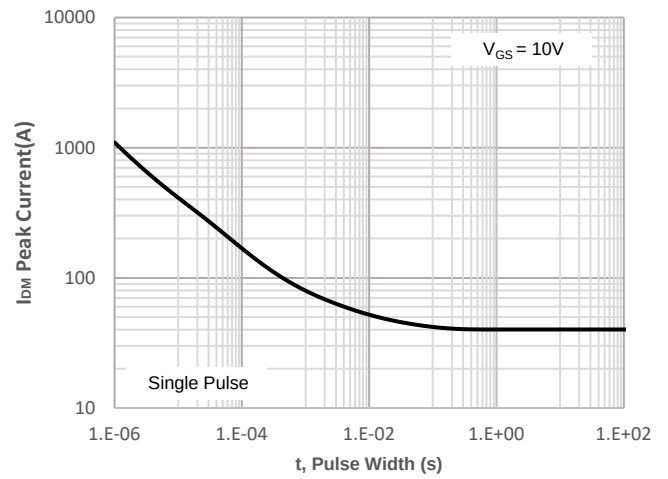
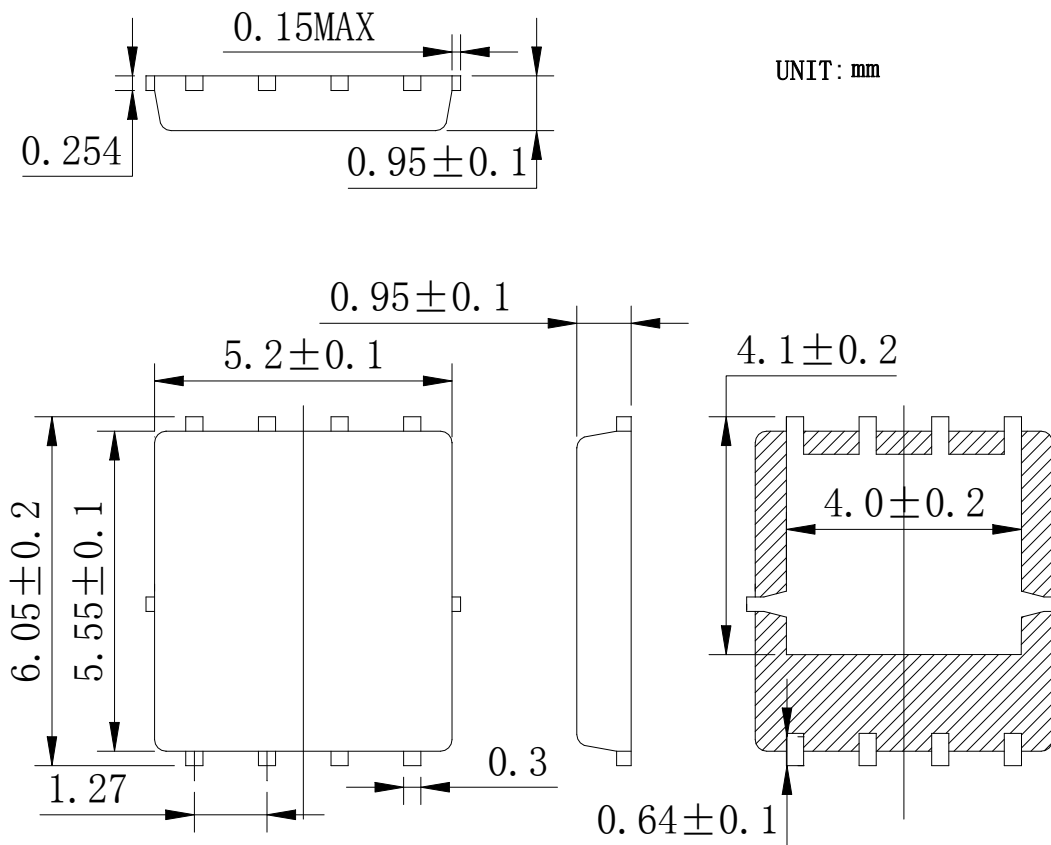


Figure 12: Peak Current Capacity

DFN5×6-8 Package Information:



Marking Information:

①. Doingter LOGO

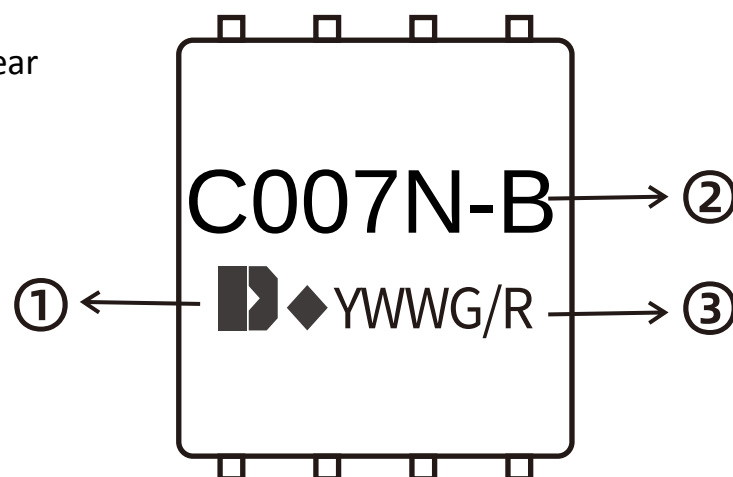
②. Part NO.

③. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)

**Previous Version**

Version	Date	Subjects (major changes since last revision)
2.1	2025-09-08	Release of final version

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