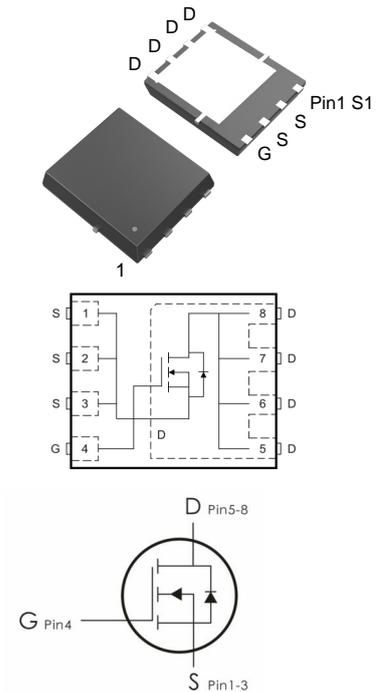


## Description:

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)  $V_{DS}=20V, I_D=190A, R_{DS(ON)} < 2.2m\Omega @ V_{GS}=4.5V$  (Typ:  $1.85m\Omega$ )
- 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
NB002NG	B002N	DFN5*6-8	5000 pcs/Reel

## Absolute Maximum Ratings: ( $T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Continuous Drain Current <sup>1</sup>	190	A
	Continuous Drain Current- $T_C=100^\circ C$ <sup>1</sup>	133	
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	570	
$P_D$	Power Dissipation	52	W
$E_{AS}$	Single pulse avalanche energy <sup>3</sup>	120	mJ
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55-+150	$^\circ C$

## Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.4	$^\circ C/W$

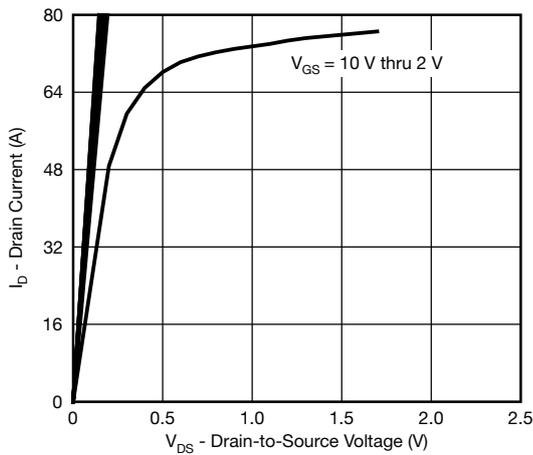
**Electrical Characteristics:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	20	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=20V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b> <small>(Note3)</small>						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	0.4	0.7	1.0	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>4</sup>	$V_{GS}=4.5V, I_D=10A$	---	1.85	2.2	$\text{m}\Omega$
		$V_{GS}=2.5V, I_D=5A$	---	2.6	3	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	5600	---	pF
$C_{oss}$	Output Capacitance		---	920	--	
$C_{rss}$	Reverse Transfer Capacitance		---	890	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V, I_D=30A,$ $R_G=1.8\ \Omega, V_{GS}=4.5V$	---	9.5	---	ns
$t_r$	Rise Time		---	35	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	62	---	ns
$t_f$	Fall Time		---	50	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=10V,$ $I_D=30A$	---	66	---	nC
$Q_{gs}$	Gate-Source Charge		---	7.1	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	36	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=30A$	---	---	1.1	V
$I_S$	Continuous Drain Current	$V_D=V_G=0V$	---	---	190	A
$I_{SM}$	Pulsed Drain Current		---	---	570	A
$T_{rr}$	Reverse Recovery Time	$I_F=30A, T_J=25^\circ\text{C}$	---	23	---	ns
$Q_{rr}$	Reverse Recovery Charge	$dI/dt=100A/\mu\text{s}$	---	10	---	nC

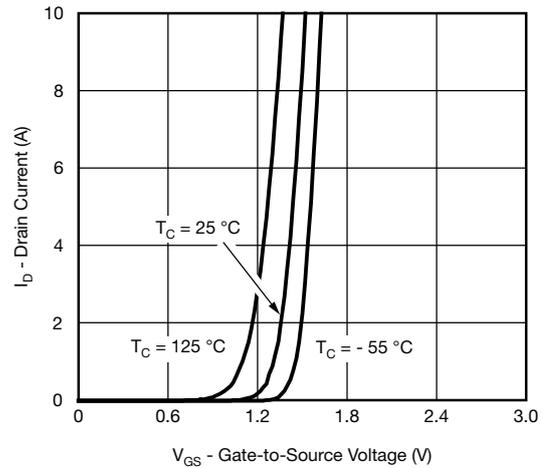
## Notes:

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 :  $T_J=25^{\circ}C, V_{DD}=10V, V_G=4.5V, L=0.5mH$
4. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$

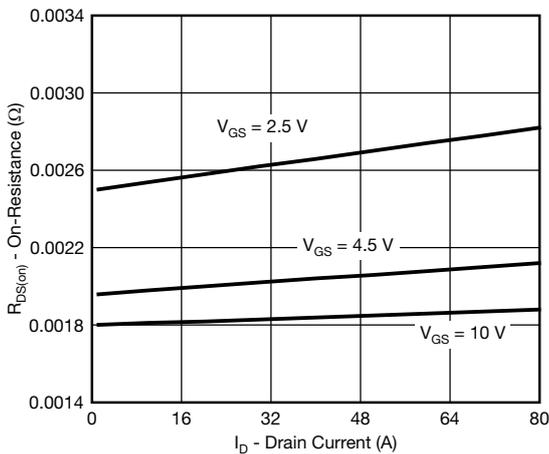
## Typical Characteristics: ( $T_C=25^{\circ}C$ unless otherwise noted)



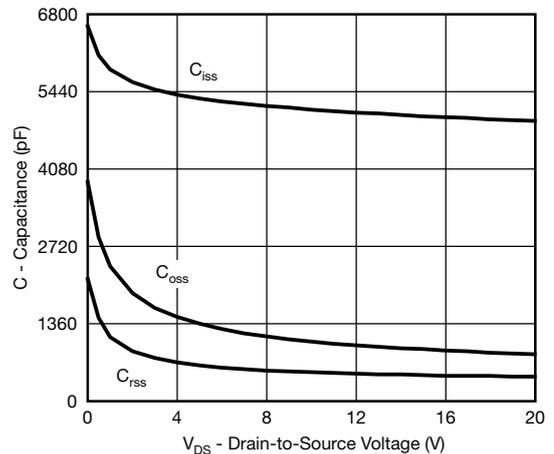
**Figure 1 Output Characteristics**



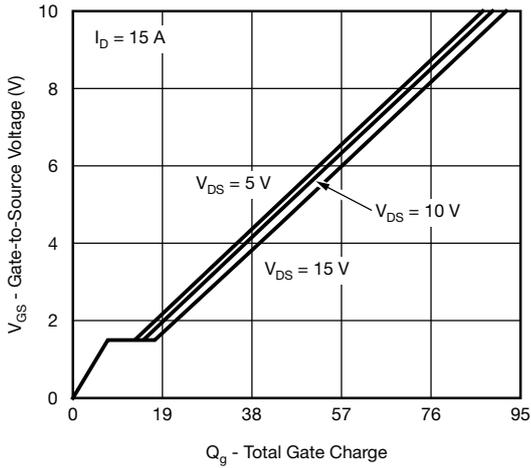
**Figure 2 Transfer Characteristics**



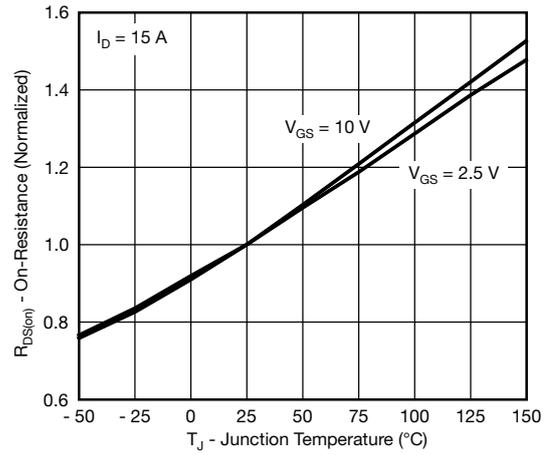
**Figure 3 On-Resistance vs. Drain Current and Gate Voltage**



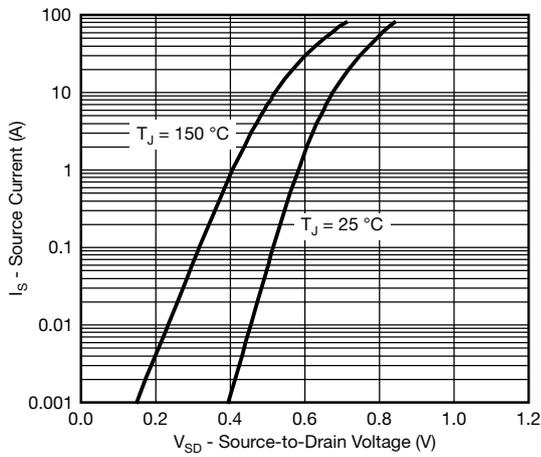
**Figure 4 Capacitance**



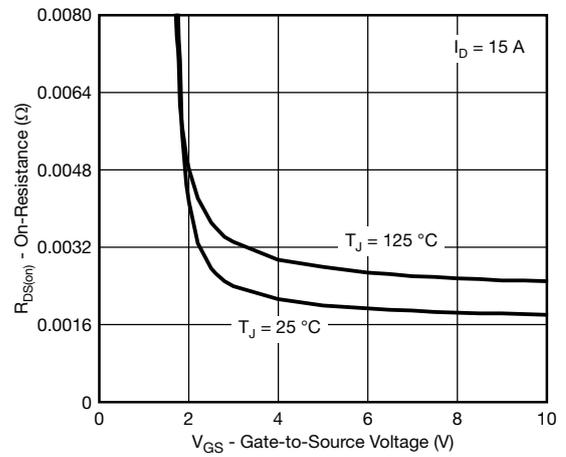
**Figure 5 Gate Charge**



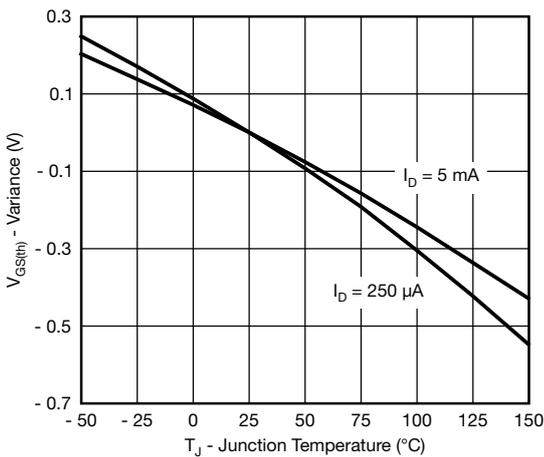
**Figure 6 On-Resistance vs. Junction Temperature**



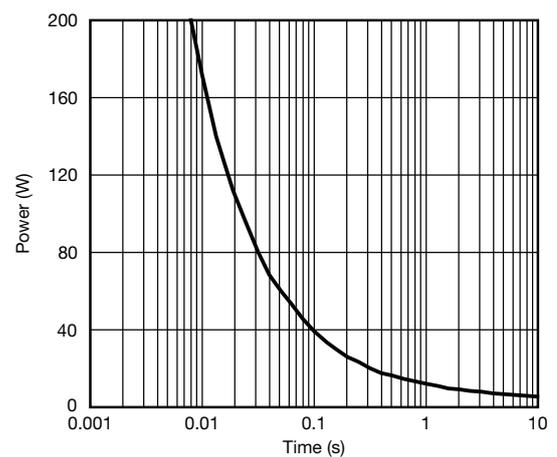
**Figure 7 Source-Drain Diode Forward Voltage**



**Figure 8 On-Resistance vs. Gate-to-Source Voltage**



**Figure 9 Threshold Voltage**



**Figure 10 Single Pulse Power, Junction-to-Ambient**

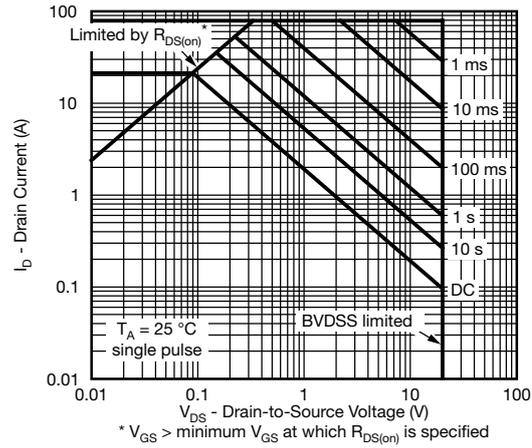
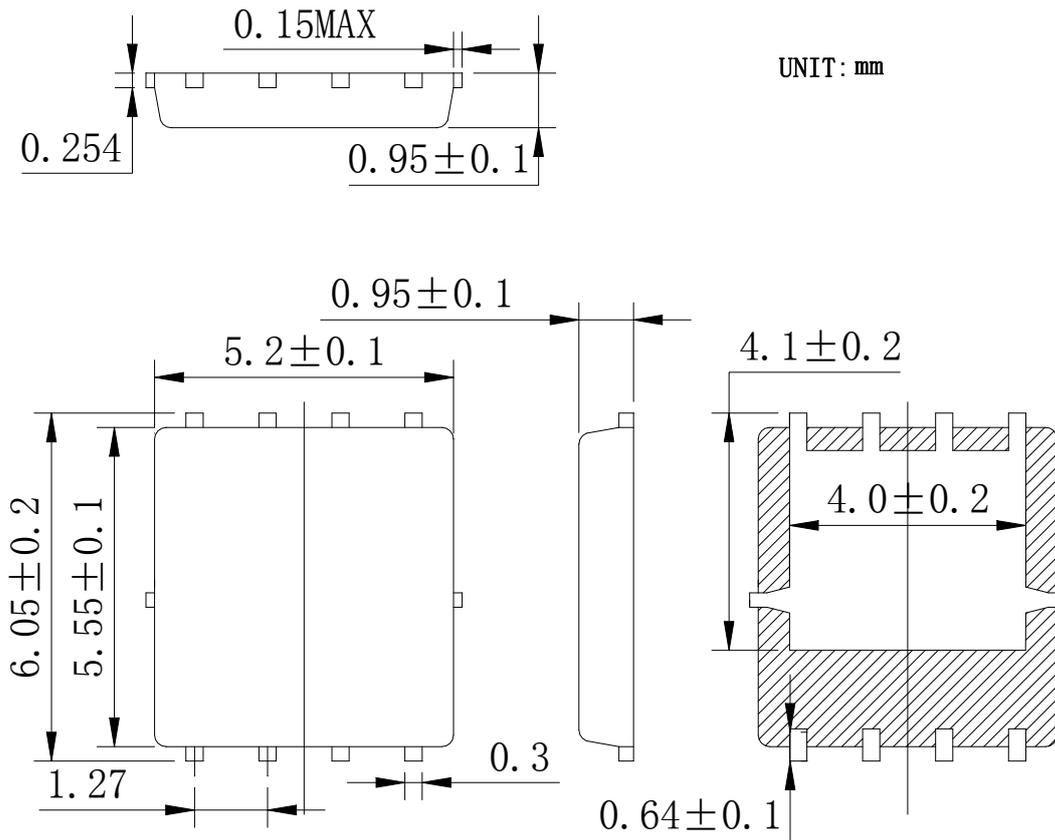


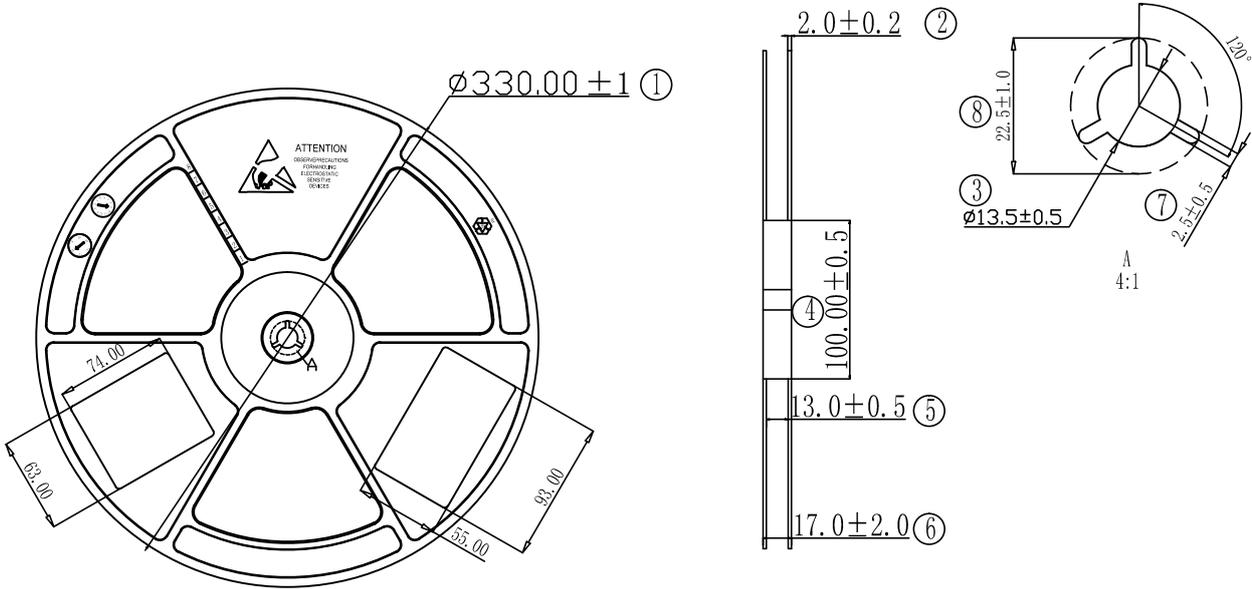
Figure 11 Safe Operating Area, Junction-to-Ambient

DFN5x6-8 Package Information:

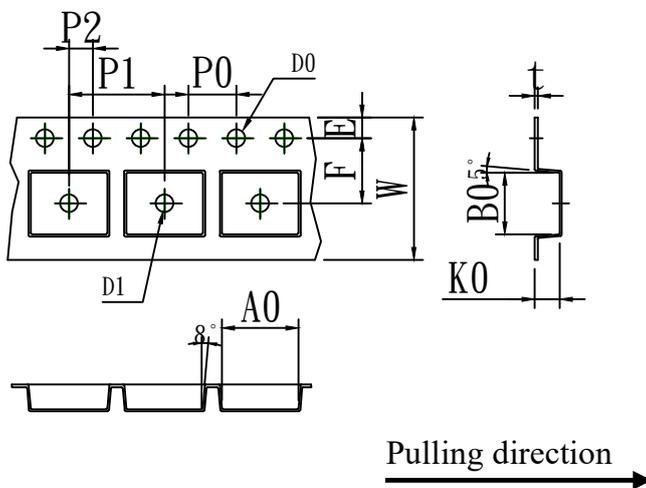


## Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	6.15±0.10	5.40±0.10	1.30±0.10	1.55±0.10	1.55±0.10	4.00±0.10	8.00±0.10	40.00±0.10
Symbol	W	E	F	P2	t			
Spec	12.00±0.10	1.75±0.10	5.50±0.10	2.00±0.10	0.20±0.05			



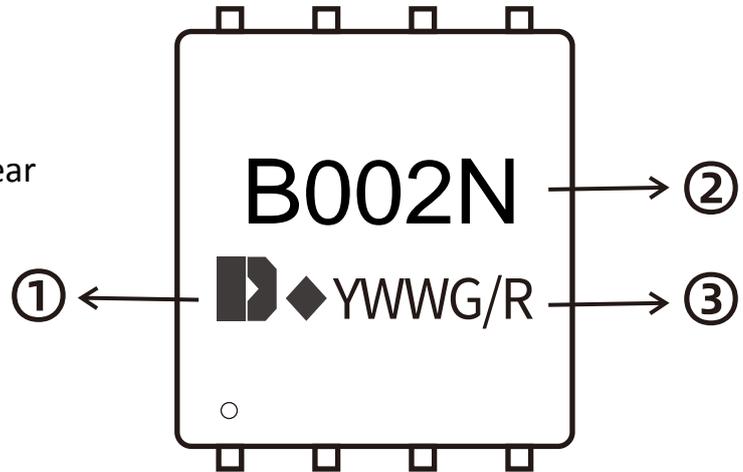
**Marking Information:**

- 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)
1.0	2025-06-20	Release of final version

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