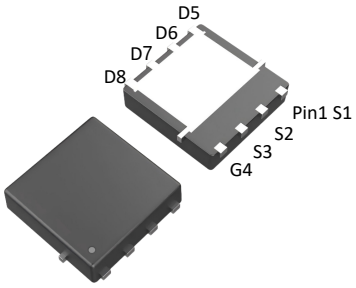
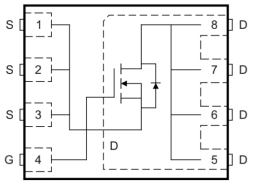
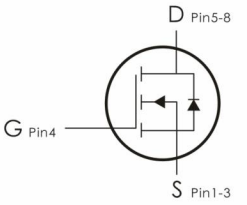
Description：

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=45A,$R_{DS(ON)}$<5.5mΩ @V_{GS}=4.5V（Typ：4.8mΩ）
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity 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
ZB5R5NAG-K	B5R5NA-K	DFN3*3-8	5000 pcs/Reel

Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Continuous Drain Current-T_C=25℃[1]	45	A
	Continuous Drain Current-T_C=100℃[1]	31	
I_{DM}	Drain Current – Pulsed [2]	180	A
P_D	Power Dissipation -T_A=25℃	23	W
E_{AS}	Single pulse avalanche energy[3]	49	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	5.5	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	℃/W

Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	20	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{GS}=0V, V_{DS}=40V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	0.5	0.7	1	V
$R_{DS(ON)}$	Drain-Source On Resistance[4]	V_{GS}=4.5V,I_D=10A	---	4.8	5.5	mΩ
		V_{GS}=2.5V,I_D=5A	---	6.5	7.5	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=500KHz	---	1862	---	pF
C_{oss}	Output Capacitance		---	267	---	
C_{rss}	Reverse Transfer Capacitance		---	253	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=16V , V_{GS}=4.5V , R_G=1.5Ω ,I_D=32A	---	13	---	ns
t_r	Rise Time		---	48	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	57.7	---	ns
t_f	Fall Time		---	89	---	ns
Q_g	Total Gate Charge	V_{DS}=16V , V_{GS}=4.5V , I_D=32A	---	25	---	nC
Q_{gs}	Gate-Source Charge		---	4	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	12	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain Curren	V_D=V_G=0V	---	---	40.9	A
I_{SM}	Pulsed Drain Current		---	---	163.6	A
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V , I_F=20A	---	0.86	1.1	V
Trr	Reverse Recovery Time	I_F=32A,T_J=25℃ dI/dt=39A/us	---	43	---	ns
Qrr	Reverse Recovery C45rge		---	0.03	---	μC

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 : TJ=25℃,VDD=10V,V_G=4.5V,L=0.5mH
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics： (T_C=25℃ unless otherwise noted)

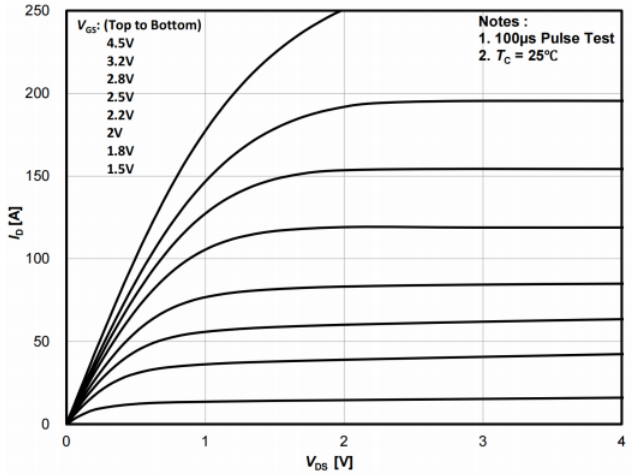


Figure 1. **On-Region Characteristics**

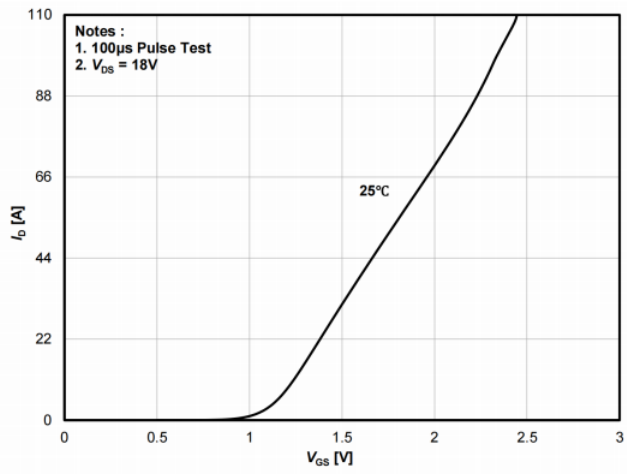


Figure 2. **Transfer Characteristics**

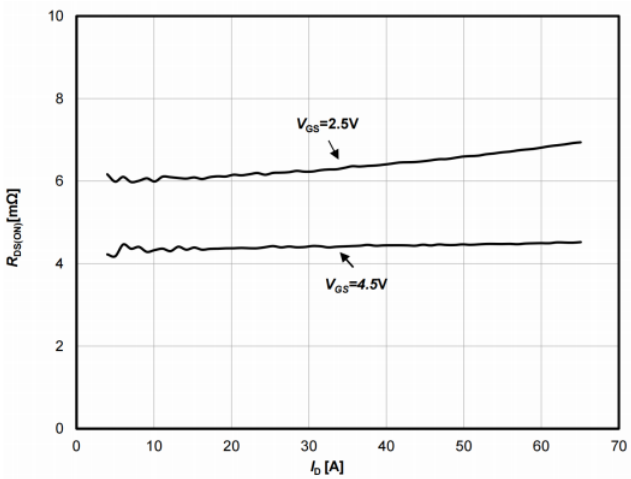


Figure 3. **On Resistance vs. Drain Current**

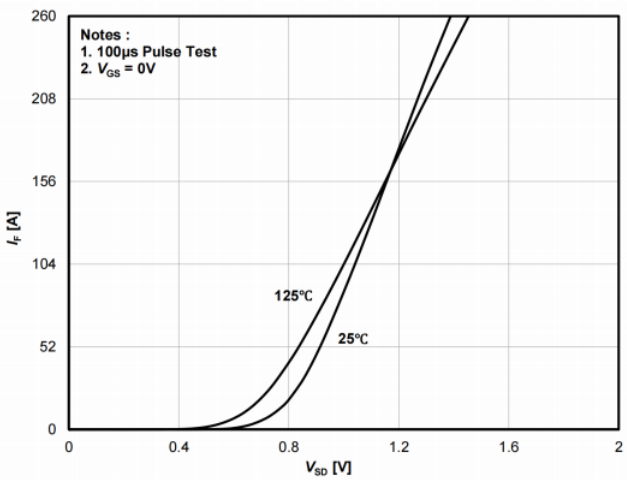


Figure 4. **Diode Forward Voltage vs. Current**

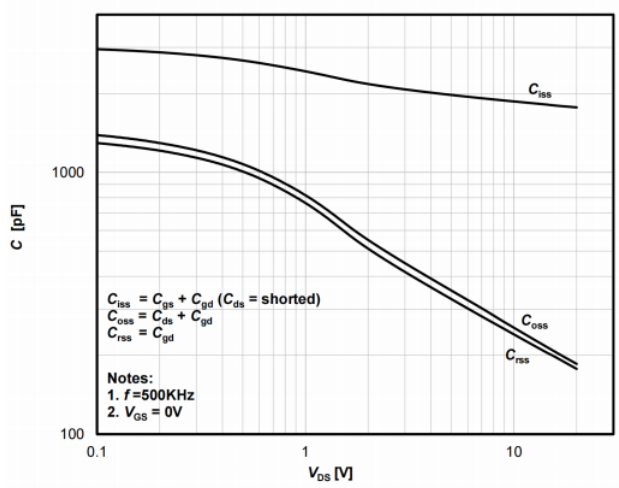


Figure 5. **Capacitance Characteristics**

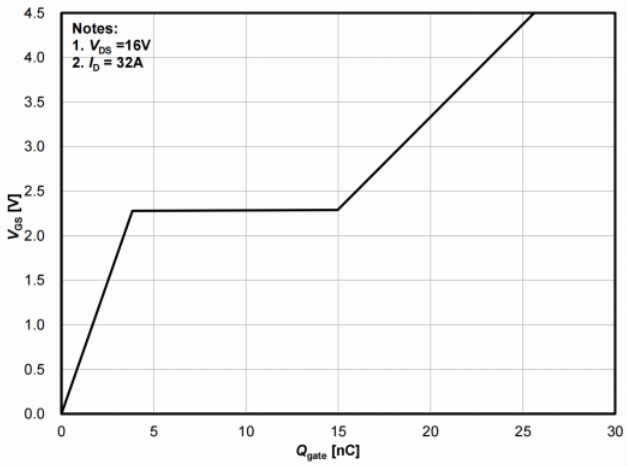


Figure 6. **Gate Charge Characteristics**

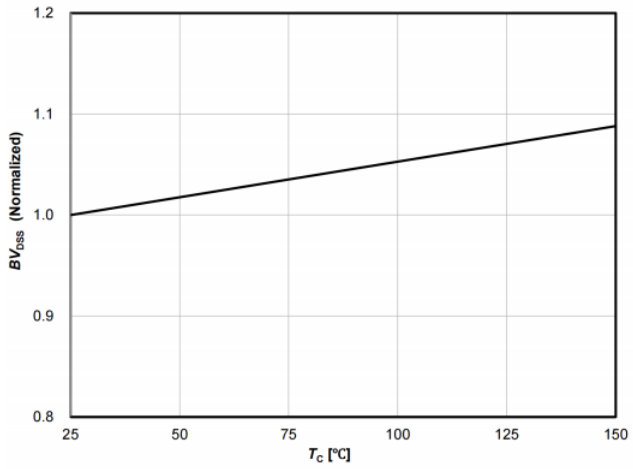


Figure 7. **Normalized BV_{DSS} vs. Temperature**

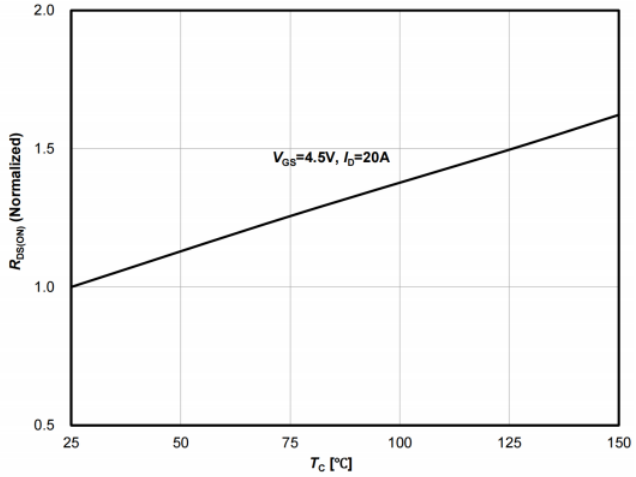


Figure 8. **Normalized On-Resistance Variation vs. Temperature**

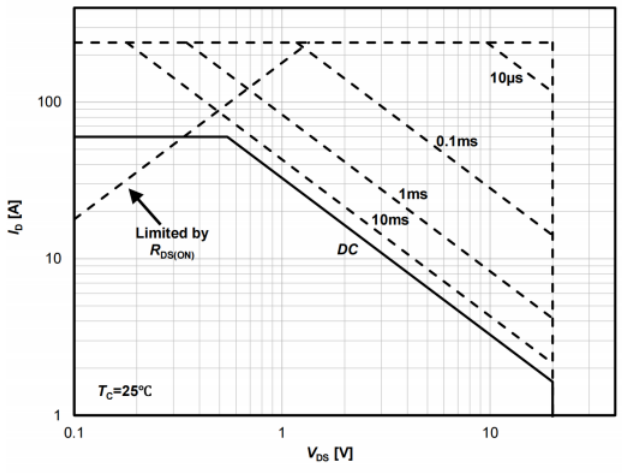


Figure 9. **Safe Operating Area** [3)]

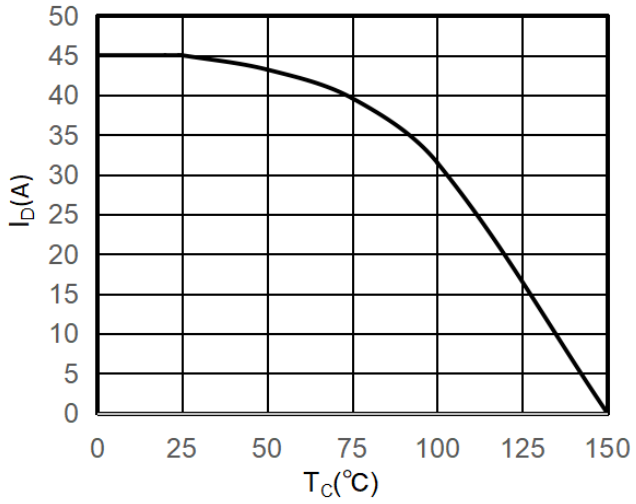


Figure 10. **Drain Current vs. Temperature**

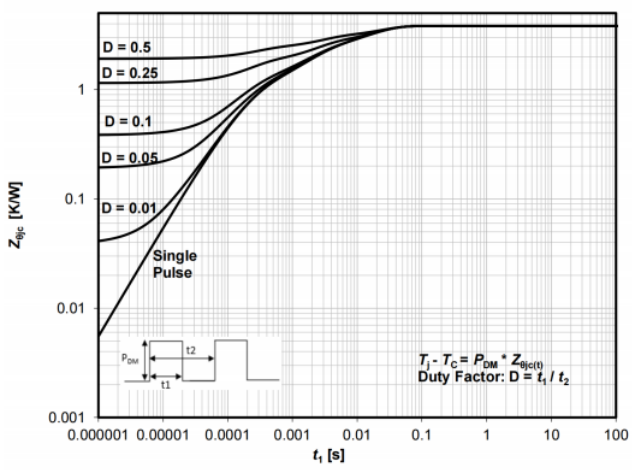
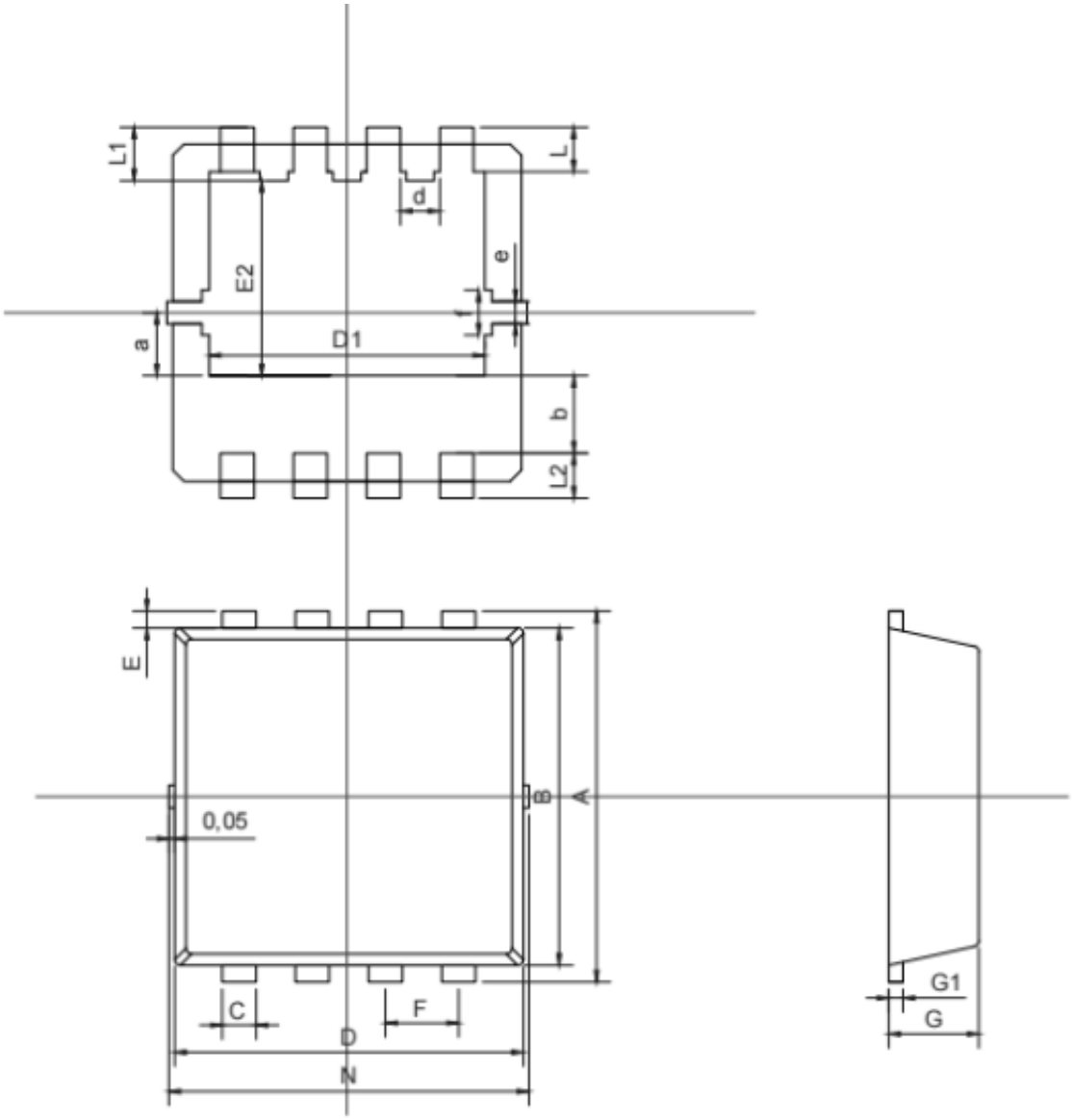


Figure 11. **Transient Thermal Impedance**

DFN3X3-8 Package Information：

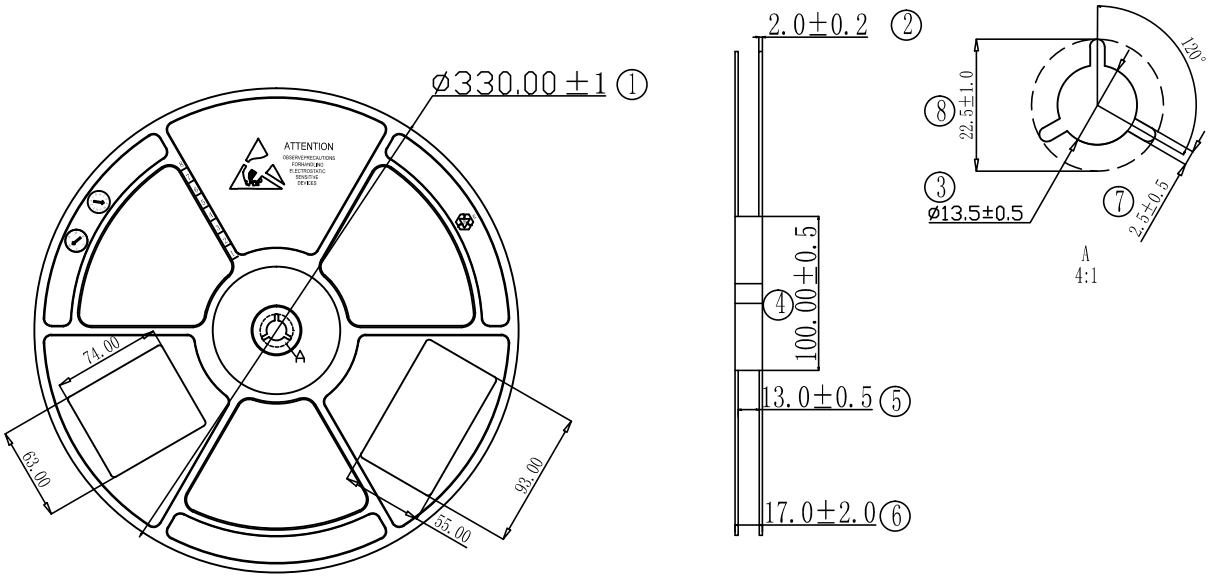


Dimensions

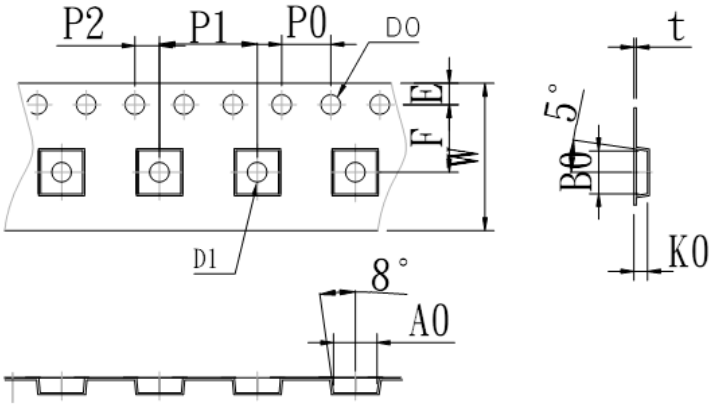
Unit	A	B	C	D	E	F	G	G1	D1	L	N	E2	L1	L2	a	b	d	e	f	n
mm	3.25 (3.35) 3.45	2.95 (3.05) 3.15	0.25 (0.30) 0.35	3.05 (3.10) 3.15	0.12 (0.15) 0.20	– (0.65) –	0.75 (0.80) 0.85	0.135 (0.15) 0.17	2.40 (2.45) 2.50	0.365 (0.41) 0.565	3.15 (3.20) 3.25	1.685 (1.73) 1.785	0.43 (0.48) 0.53	0.35 (0.40) 0.45	0.515 (0.56) 0.615	0.635 (0.68) 0.735	0.35 (0.40) 0.45	0.17 (0.20) 0.25	0.37 (0.40) 0.45	2.08 (2.58) 3.08

Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	3.55±0.10	3.45±0.10	1.13±0.10	1.55±0.10	1.55±0.10	4.00±0.10	8.00±0.10	40.0±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			



Pulling direction

Marking Information：

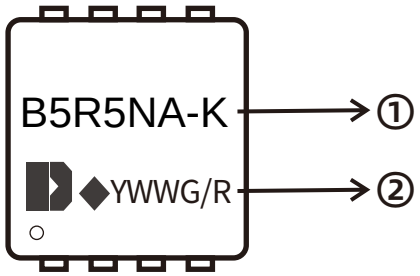
①. Part NO.

②. 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)
1.1	2026-05-29	Release of final version

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