CN-B110 Series

Application Note
For Railway (EN50155)

Product Line up list

Model Name	Input Voltage (Vdc)	Output Power (W)	Output Voltage (Vdc)	Output Current (A)
CN200B110-12	43 - 160	200.4	12	16.7
CN200B110-13.8	43 - 160	200.1	13.8	14.5
CN200B110-15	43 - 160	201	15	13.4
CN200B110-24	43 - 160	201.6	24	8.4
CN300B110-12	43 - 160	300	12	25
CN300B110-13.8	43 - 160	299.5	13.8	21.7
CN300B110-15	43 - 160	300	15	20
CN300B110-24	43 - 160	300	24	12.5

⚠ **This application note is explanation conformance against List of tests (Table 12) in EN50155-2017.**
Our product is considered a component which be installed into a final equipment. The final equipment should be re-evaluated whether specifications in the equipment can be met.

1. The Contents Based on EN50155-2017

No.	Test Items	Test Criterion	Test Conditions	Type Test (*1)	Routine Test (*1)	Result
1	Visual inspection	EN 50155-2017 section 13.4.1	Specification and Outline	M	M	Pass
2	Performance test					
2.1	Function test	EN 50155-2017 section 13.4.2	Test Specification	M	M	Pass
2.2	Conducted emission test	EN 50155-2017 section 13.4.2 EN 50121-3-2	EN55011/EN55032-A (+20 dB relaxed)	M	NA	Pass
2.3	Radio frequency interference emission test (RE)	EN 50155-2017 section 13.4.2 EN 50121-3-2	EN55011/EN55032-A	M	NA	Pass
3	Supply variations and interruption test	EN 50155-2017 section 13.4.3.2 (Temporary supply over voltages)	Supply voltage: Un to 1.4Un Duration: 1 s, Criterion A	M	NA	Pass
		EN 50155-2017 section 13.4.3.3 (Temporary supply dips)	Supply voltage: Un to 0.6Un Duration: 0.1 s, Criterion A	M	NA	Pass
		EN 50155-2017 section 13.4.3.4 (Interruption of supply voltage)	Interruption: Un to 0 V (Low supply impedance) Duration: 0.01 s (Class S2), Criterion A	M	NA	Pass (*2)
4	Low temperature start up test	EN 50155-2017 section 13.4.4 (Table 1, Class OT4) EN 60068-2-1 Test Ad	Temperature: -40℃ Dwell Time: 2 hrs/cycle Criterion A	M	NA	Pass
5	Dry Heat Test	EN 50155-2017 section 13.4.5.4 (Table 1, Class OT4 & Table 2, ST2 Cycle C) EN 60068-2-2 Test Be	Temperature: 70℃ / 85℃ Duration: 6 hrs / 10 min Criterion A	M	NA	Pass (*3)
6	Low temperature storage test	EN 50155-2017 section 13.4.6 (Table 1, Class OT4) EN 60068-2-1 Test Ab	Temperature: -40℃ Duration: 16 hrs	M	NA	Pass
7	Cyclic damp heat test	EN 50155-2017 section 13.4.7 EN 60068-2-30 Test Db	Temperature: 25℃~ 55℃ Humidity: 90%~100% RH Number of cycles: 2 (respiration effect) Duration: 2 x 24 hrs	M	NA	Pass (*4)
8	Electric discharge susceptibility test (ESD)	EN 50155-2017 section 13.4.8 IEC61000-4-2, EN 50121-3-2	Air: 8 kV, Contact: 8 kV Criterion A	M	NA	Pass

No.	Test Items	Test Criterion	Test Conditions	Type Test (*1)	Routine Test (*1)	Result
9	Radiated, radio-frequency, electromagnetic field immunity test (RS)	EN 50155-2017 section 13.4.8 IEC61000-4-3, EN 50121-3-2	80 M～1000 MHz : 20 V/m, 1.4～2.0 GHz : 10 V/m, 2.0～2.7 GHz : 5 V/m, 2.7～6 GHz: 3 V/m, 80 % AM, 1 kHz Criterion A	M	NA	Pass
10	Electrical fast transient/burst immunity test (EFT)	EN 50155-2017 section 13.4.8 IEC61000-4-4, EN 50121-3-2	Input, Output : 4 kV, Signal : 2 kV, 5/50 ns, 5 kHz Criterion A	M	NA	Pass
11	Surges	EN 50155-2017 section 13.4.8 IEC61000-4-5, EN 50121-3-2	L - L: 2kV (2 ohm, 18 uF) L - Case: 2kV (12 ohm, 9 uF) Criterion A	M	NA	Pass
12	Conducted disturbances induced by radio-frequency field immunity test (CS)	EN 50155-2017 section 13.4.8 IEC61000-4-6, EN 50121-3-2	0.15 M～80 MHz : 10 Vrms Criterion A	M	NA	Pass
13	Insulation test	EN 50155-2017 section 13.4.9 (Insulation resistance test)	Output - Case : 500 Vdc Resistance: ≥100 Mohm No failure	M	M	Pass
		EN 50155-2017 section 13.4.9 (Voltage withstand test)	Input - Output : 3.0 kVac (20mA) Input - Case : 2.5 kVac (20mA) Output - Case : 0.5 kVac (100mA) for 1min. No failure	M	M	Pass
14	Salt mist test	EN 50155-2017 section 13.4.10 EN 60068-2-11 Test Ka	48 hrs	O	NA	Not tested (*5)
15	Vibration, shock and bump test	EN 50155-2017 section 13.4.11.2 (Simulated long life testing) IEC61373-Category1-Grade B.	Sweep Frequency: 5 ~ 150 Hz Acceleration: 7.9 m/s2 (rms) Duration: 5 hrs / X,Y,Z	M	NA	Pass
		EN 50155-2017 section 13.4.11.3 (Shock testing) IEC61373-Category1-Grade B.	Acceleration: 50 m/s2 (rms) Duration: 30 ms * 18	M	NA	Pass
		EN 50155-2017 section 13.4.11.4 (Functional random testing) IEC61373-Category1-Grade B.	Sweep Frequency: 5 ~ 150 Hz Acceleration: 1.0 m/s2 (rms) Duration: 10 min / X,Y,Z	M	NA	Pass
16	Enclosure protection test (IP code)	EN 50155-2017 section 13.4.12	Not Applicable	NA	NA	Not tested (*6)
17	Equipment stress screening test	EN 50155-2017 section 13.4.13 EN 61163-2-11 Test Ka	To be applied to completed equipment: Operation at elevated temperature, Thermal cycling, Vibration	O	NA	Not tested (*7)
18	Rapid temperature variation test	EN 50155-2017 section 13.4.14	Temperature: -55℃ ~ +100℃ Cycle: 500cycles (1 Hr/Cycle)	O	NA	Pass

2. Notes

*1) The marked "M" is mandatory.
The marked "O" is subject to contract agreement between the user and the manufacturer.
The marked "NA" is not applicable.

*2) For the ***Interruption of Supply Voltage Test***, the input voltage interruption duration performance is closely dependent on the actual load power and the capacitance of the input capacitor.
According to the regulation of EN50155, the output impedance of the input source presents a low resistance characteristic during the interruption test, so please put a suitable diode and capacitor at input side as shown in Fig.A.

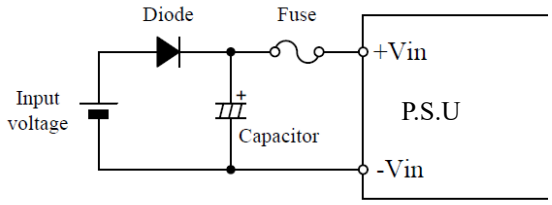

Fig.A Put diode and capacitor at input side

*3) For the ***Dry Heat Test***, as a component level power supply, the CN300B100 & CN200B110 can operate at 100℃ of baseplate temperature, refer to the specification for the derating curve.
For a complete power supply product, the high temperature operation ability is closely related to heat dissipation performance and the actual load power.
This test was performed based on a DEMO power supply which a CN300B110-24 is built-in side.

*4) For the ***Cyclic Damp Heat Test***, this test was performed based on a DEMO power supply which a CN300B110-24 is built-in side.
Moreover, the standard CN-B110 product had passed the following tests,
Temperature: 85℃
Humidity: 95%RH
Duration: 500 hrs (P.S.U 1 hour ON, 3 hours OFF)

*5) For the ***Salt Mist Test***, no test under power supply only. Please verify in final equipment if necessary.

*6) For the ***Enclosure Protection Test***, as electronic equipment is generally mounted either inside the body of the vehicle or in boxes outside, so according to EN50155, there is no need to carry out this tests.

*7) For the ***Equipment Stress Screening Test***, we did not test it by power supply stand alone. When our product is adopted on your equipment, discuss it if necessary.

3. Detail of Test Data

Refer to EVALUATION DATA, RELIABILITY DATA and TEST DATA IEC61000 SERIES of each model.