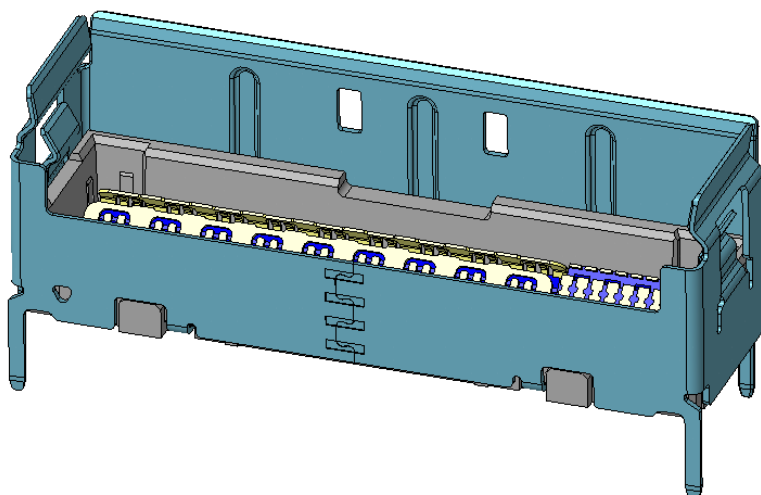


NearStack VT Series Shielded Conn.



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1 SCOPE

This specification defines the performance, tests, quality and reliability requirements of the NearStack VT Shielded Connector product.

2 APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, latest edition of the specification applies. In the event of conflict between requirements of this specification and product drawing, product drawing shall take precedence.

2.1 Industry standards

- 2.1.1 GB/T 5095.2-1997-1a and 1b, Examination of product.
- 2.1.2 GB/T 5095.3-1997-5a, Temperature rise vs current
- 2.1.3 GB/T 5095.2-1997-2a, Low Level Contact Resistance(LLCR)
- 2.1.4 GB/T 5095.2-1997-3a, Insulation resistance
- 2.1.5 GB/T 5095.2-1997-4a, Withstanding voltage
- 2.1.6 GB/T5095.7-1997-13b, Mating force & Unmating force
- 2.1.7 GB/T 5095.8-1997-15a, Wafer Retention Force
- 2.1.8 GB/T 5095.8-1997-15a, Plug Destructive Force
- 2.1.9 GB/T 5095.5-1997-9a, Durability
- 2.1.10 GB/T 5095.5-1997-9a, Pre-durability
- 2.1.11 GB/T5095.4-1997-6c, Mechanical shock
- 2.1.12 GB/T 5095.4-1997-6d, Random vibration
- 2.1.13 GB/T5095.6-1997-11d, Thermal shock
- 2.1.14 GB/T 5095.6-1997-11m, Humidity/temperature cycling
- 2.1.15 EIA-364-110, Thermal Cycling
- 2.1.16 EIA-364-110, Thermal Disturbance
- 2.1.17 GB/T 5095.6-1997-11i, Temperature life
- 2.1.18 GB/T 5095.6-1997-11i, Temperature life(Pre-conditioning)
- 2.1.19 GB/T 5095.6-1997-11f, Salt Spray
- 2.1.20 EIA-364-65B-IIA, Mixed flowing gas
- 2.1.21 GB/T 5095.6-1997-12a, Solder ability
- 2.1.22 GB/T 5095.6-1997, 12d, Resistance to Soldering heat

3 MECHANIC DIMENSIONS

3.1 Dimensions:

Refer to customer drawing

4 REQUIREMENTS

4.1 Qualification

Connectors furnished under this specification shall be capable of meeting the qualification test requirements specified herein. Unless otherwise specified, all measurements shall be performed within the following lab conditions:

- a. Temperature: 25°C±10°C.
- b. Relative Humidity: 20% to 80%
- c. Atmospheric Pressure: 650mm to 800mm of Hg (86 ~106Kpa)

4.2 Materials

- a. Contacts: Copper and Copper alloy.
- b. Insulator: High temperature Engineering plastics, UL94 V-0.
- c. Other material: Stainless steel

4.3 Finish

Plated spec for qualification components shall be meet the connector's application.

4.4 Workmanship

Connectors shall be uniform in quality and free from burrs, scratches, cracks, voids, chips, blisters, sharp edges, and other defects that may impair performance.

5 RATING

5.1 Operating Voltage Rating = 30 VDC

5.2 Operating Temperature Range = -40°C TO 85°C

6 ELECTRICAL CHARACTERISTIC

6.1 Temperature Rise

Apply 0.25 Amperes current through 8 adjacent signal contacts within a single wafer, which are connected in series.

The following details shall apply:

- a. Ambient Conditions: 30°C Max.
- b. Reference: GB/T 5095.3-1997 5a

6.2 Low Level Contact Resistance (LLCR)

The low level contact resistance shall not exceed 30 milliohms initially. The low level contact resistance shall also not exceed 10 milliohms increase in resistance (from the initial measurement) after any treatment and/or environmental exposure.

Measurements shall be in accordance with GB/T 5095.2-1997 2a.

The following details shall apply:

- a. Method of Connection – 4-wire
- b. Test Voltage - 20 milli-volts DC max open circuit.
- c. Test Current - Not to exceed 100 milli-amperes.

6.3 Insulation Resistance

The insulation resistance of mated connectors shall not be less than 1000M ohms initially and 1000M ohms after environmental exposure.

Measurements shall be in accordance with GB/T 5095.2-1997 3a.

The following details shall apply:

- a. Test Voltage - 1000 volts DC.
- b. Electrification Time - 1 minutes min., unless otherwise specified.
- c. Points of Measurement - Between adjacent contacts
or between contacts and other conductive surfaces, if applicable.

6.4 Dielectric Withstanding voltage

There shall be no evidence of arc-over, insulation breakdown, or excessive leakage current > 5m amperes when mated connectors are tested in accordance with GB/T 5095.2-1997 4a.

The following details shall apply:

- a. Test Voltage - 300 volts (AC RMS, 60Hz).
- b. Test Duration - 60 seconds min.
- c. Test Condition - 1 (760 Torr - sea level).
- d. Points of Measurement - Between adjacent contacts
or between contacts and other conductive surfaces, if applicable.



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5 / 10**7 MECHANICAL CHARACTERISTICS****7.1 Durability**

Mating and un-mating with applicable PCB, Durability tested in accordance with GB/T 5095.5-1997 9a.

The following details shall apply:

- a. Number of Cycles: 200 cycles.
- b. Cycling Rates: 500 ± 50 cycles/hour

7.2 Durability (Preconditioning)

Mating and un-mating with applicable PCB, Durability tested in accordance with GB/T 5095.5-1997 9a. The following details shall apply:

- a. Number of Cycles: 20 cycles.
- b. Cycling Rates: 500 ± 50 cycles/hour.
- c. No physical damage.

7.3 Mating/un-mating Force

The force to mate a receptacle connector and compatible header shall not exceed 40N (Without latch). The un-mating force shall not be less than 7N (Without latch). The following details shall apply:

- a. Cross Head Speed: 25.4 ± 3 mm or inch per minute.
- b. Utilize free floating fixtures.
- c. Reference GB/T5095.7-1997 13b.

7.4 Wafer Retention Force

The wafer and the insulator are axially pull out at the speed rate of 25.4 ± 3 mm/minute

- a. Reference: GB/T 5095.8-1997 15a.
- b. Wafer Retention force: 1.0 N Min per married wafer set.

7.5 Destructive Force

Pull on mated connector cables at 60° and 90° from cable exit at a rate of 25.4 ± 3 mm/minute

- a. Reference: GB/T 5095.8-1997 15a.
- b. Contact Retention force for plug: 65N/pin Min, Discontinuity less than $1\mu\text{s}$, No damaged happened. Plug and receptacle is not separated.

7.6 Four axle Lifting Load

Plug and connector @ mated condition, no mechanical problem and discontinuity less than $1\mu\text{s}$.

- a. Test Direction: 4directions that perpendicular to mating direction.
- b. Test Time: 30~60 seconds
- c. Test Cable Length: 320mm Min.
- d. Lifting load: 25N.

7.7 Vibration

Mated plug and connector with fixture and placed on the test bench.

- a Reference: GB/T5095.4-1997, 6d, test condition VII, 20-500Hz Random, 3.1g's, 15 minutes.
- b 3 mutually perpendicular directions, No interrupts greater than 1 microsecond.

7.8 Mechanical Shock

Mated plug and connector with fixture and placed on the test bench.

- a. Reference: GB/T5095.4-1997, 6c
- b. Peak Value: 30G, Duration: 11mSec. Waveform: Half Sine. 3 shocks in each axis for total of 18, with 10ns event detection. Discontinuity less than 1μs, No damage.

8 ENVIRONMENTAL CHARACTERISTICS

After exposure to the following environmental conditions in accordance with the specified test procedure and/or details, the product shall show no physical damage and shall meet the electrical and mechanical requirements per paragraphs 5.0 and 6.0 as specified in the Table 1 test sequences. Unless specified otherwise, assemblies shall be mated during exposure.

8.1 Thermal Shock GB/T5095.6-1997, 11d.

- a. Number of Cycles: 25 cycles
- b. Temperature Range: Between -65 to 105°C
- c. Time at Each Temperature: 60 minutes

8.2 Humidity GB/T 5095.6-1997 11m (cyclic temperature)

- a. Environmental condition: 25±3°C at 80% to 98% RH ~ 65±3°C at 80% to 98% RH;
- b. 10 cycles at 24 hours/cycle (240 hrs. total).
- c. No damage.

8.3 Thermal Cycling

Mated with applicable card. No physical damages shall be observed after tested in accordance with EIA-364-110,

- a. Test condition: Cycle the connector between 15°C ±3°C and 85°C±3°C, Humidity is not controlled

b. Test Duration: Ramps should be a minimum of 2 °C per minute, and dwell times should insure that the contacts reach the temperature extremes (a minimum of 5 minutes)

c. Number of cycles: Perform 500 such cycles.

8.4 Thermal Disturbance

Mated with applicable card. No physical damages shall be observed after tested in accordance with EIA-364-110,

a. Test condition: Cycle the connector between 15°C ±3°C and 85°C±3°C, Humidity is not controlled

b. Test Duration: Ramps should be a minimum of 2°C per minute, and dwell times should insure that the contacts reach the temperature extremes (a minimum of 5 minutes)

c. Number of cycles: Perform 10 such cycles.

8.5 Temperature Life.

No physical damage shall be observed after tested in accordance with GB/T 5095.6-1997 11i. The following details shall apply:

a. Test Duration: 240 hours.

b. Temperature: 105°C±2°C.

8.6 Temperature Life (Preconditioning).

No physical damage shall be observed after tested in accordance with GB/T 5095.6-1997 11i. The following details shall apply:

a. Test Duration: 120 hours.

b. Temperature: 105°C±2°C.

8.7 Salt Spray GB/T 5095.6-1997, 11f

a. Temperature: 35°C+1/-2°C

b. Humidity: 95%~98%RH

c. Test Condition : 5% Salt Concentration

d. Duration: 48 (hours if not specified by selected condition above)

e. Acceptance criteria – (visual examination requirements and/or LLCR criteria)

8.8 Mixed Flowing Gas corrosion (MFG) EIA-364-65B

a. Class – IIA

b. Duration - 14 days

c. 1/2 samples Mated for 14 days, 1/2 samples unmated for 7 days, mated for 7 days.

8.9 Solder ability GB/T 5095.6-1997, 12a

- a. Test Time: 2~3 seconds;
- b. Solder able area shall have a minimum 95% solder coverage.

8.10 Resistance to Solder Heat GB/T 5095.6-1997, 12d

- a. Test Temperature: 250°C+10°C/-0°C
- b. Test Time: 10s
- c. There shall be no evidence of physical or mechanical damage.

9 QUALITY ASSURANCE PROVISIONS

9.1 Equipment Calibration

All test equipment and inspection facilities used in the performance of any test shall be maintained in a calibration system in accordance with MIL-C-45662 and ISO 9000.

9.2 Sample Quantity and Description

The sample size to be tested in each group shown in Qualification Testing Sequences should follow Table 1; All samples must be free of defects that would impair normal connector operation. All samples must meet dimensional requirements of connector.

9.3 Acceptance

9.3.1 Electrical and mechanical requirements placed on test samples as indicated in Paragraphs 6 and Paragraphs 7 shall be established from test data using appropriate statistical techniques or shall otherwise be customer specified, and all samples tested in accordance with this product specification shall meet the stated requirements.

9.3.2 Failures attributed to equipment, test set up, or operator error shall not disqualify the product. If product failure occurs, corrective actions shall not disqualify the product. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

9.4 Qualification Testing

Qualification testing shall be performed on sample units produced with equipment and procedures, normally used in production. The test sequence shall be as shown in Qualification Testing Sequences Visual Examination: GB/T 5095.2-1997-1a and 1b.

9.5 Re-qualification Testing

If any of the following conditions occur, the responsible product engineer shall initiate re-qualification testing consisting of all applicable parts of the qualification test matrix Table 1.

- A significant design change is made to the existing product which impacts the product form, fit or function. Examples of significant changes shall include, but not be limited to, changes in the plating material composition or thickness, contact force, contact surface geometry, insulator design, contact base material, or contact lubrication requirements.
- A significant change is made to the manufacturing process, which impacts the product form, fit or function.
- A significant event occurs during production or end use requiring corrective action to be taken relative to the product design or manufacturing process.

10 QUALIFICATION TESTING SEQUENCES

NO.	Test Items	Test Group														Test Method
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	Examination of product	1,6	1,8	1,10	1,10	1,8	1,9	1	1,5	1	1	1	1,4	1	1	3.1
2	T-Rise							2								6.1
3	LLCR	2,5	2,5,7	2,5,7,9	2,5,7,9	2,,5,7	4,6						3			6.2
4	Insulation resistance						3,8									6.3
5	Withstanding voltage						2,7									6.4
6	Durability						5									7.1
7	Durability (Preconditioning)	3	3	3	3	3										7.2
8	Mating and Unmating force								2,4							7.3
9	Wafer retection force									2						7.4
10	Shell destructive force										2					7.5
11	Four axle lifting load											2				7.6
12	Thermal shock		4													8.1
13	Humidity/temperature cycling		6													8.2
14	Thermal cycling					6										8.3
15	Thermal disturbance				8											8.4
16	Temperature life	4							3							8.5
17	Temperature life (Preconditioning)			4	4	4										8.6
18	Mechanical shock			8												7.8
19	Vibration			6												7.7
20	Salt spray												2			8.7
21	MFG				6											8.8
22	Solderability													2		8.9
23	Resistance to soldering Heat														2	8.10
SAMPLES SIZE PER TEST GROUP		10	10	10	10	10	10	5	5	5	5	5	5	5	5	

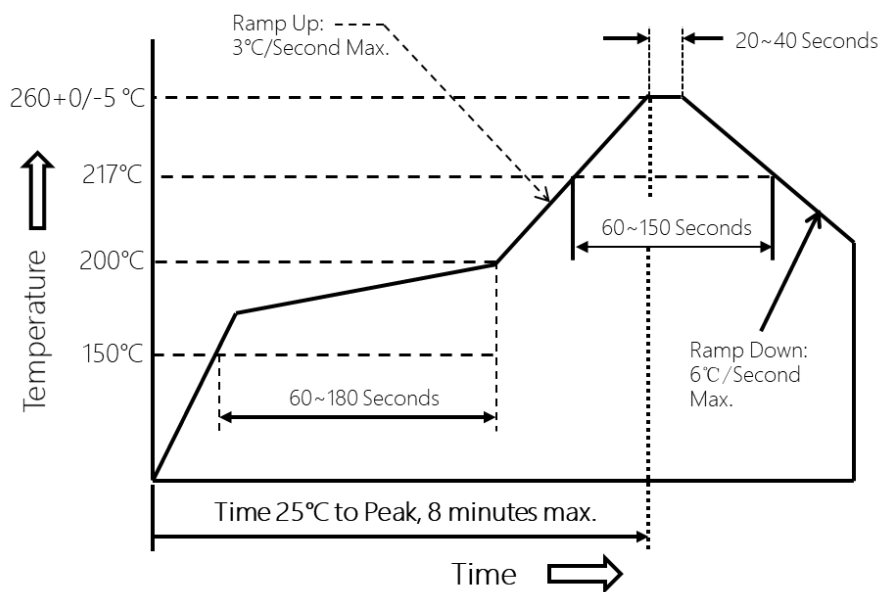
Table 1



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Recommended Reflow Curve Pb-Free Process

REVISION RECORD

Rev	Page	Description	EC#	Date
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