

規 格 书

SPECIFICATION

PRODUCTSPECIFICATION	M2000 (2.00MM) SERIES
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PRODUCT SPECIFICATION | **M2000 (2.00MM) SERIES**
1. Scope:

This product specification contains the test results that general performances of M2000 connector were examined.

2. Part name&part number:

Part name	Part number
Male connector	M2000S/M2000R/M2000M/M2000H
Female connector	M2000-XXP-01-A
Terminal	M2000T-PX

3. Construction、dimensions、material&surface finish:

Construction and dimensions shall be in accordance with the referenced drawings.

Material and surface finish shall be as specified below.

Part name	Material	Contact	Surface finish
Female connector	PA66	Copper alloy	UL94V-0
Male connector	LCP	Copper alloy	UL94V-0

4. Characteristics:

Current rating per contact: up to 8A(depends on cable)

Voltage rating: 300V AC/DC

Temperature range: -40°C ~ +125°C

Storage temperature range: 10°C ~ 30°C

Storage humidity range: <75 %

5. Condition:

Please refer to the table below for the condition.

Number	Item	Requirement
(1)	Bend up	4° max.
	Bend down	4° max.
	Twisting	3° max.
	Rolling	8° max.
(2)	Bell mouth (flare)	0.2-0.5mm
(3)	Cut-off tab length	0.2mm max.
(4)	Extruded wire length	0-0.3mm
(5)	Seam	Seam shall not be opened and no wire allowed out of crimping area
(6)	Wire strip length	1.2-1.7mm ref.
(7)	Lance height	0.3mm ref.

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Pitch: 2.00mm

No.Of pins: 2, 3, 4, 5, 6, 8, 10, 12 possible

Current rating per contact: up to 8 A (depends on cable)

Termination technology: Male connectors with Surface Mount Technology (SMT) or DIP solder termination
Female connectors with crimp termination

Cables: Discrete wire AWG 22 and AWG 24

Connectors: Vertical male connector

Right angle male connector

Female connector with 180°cable outlet

Automotive Standard: developed based on the USCAR-2 and USCAR-21 automotive test specifications.

7. Mechanical test

Male connector to female connector unmating force.

No.of position	Unmating force
2-3 Pin	>40N
4-6 Pin	>50N
6-20 Pin	>60N

8. Electrical test**8.1. Contact resistance**

8.1.1. Requirement: Initial:5mΩ(max.);After environmental test:5mΩ(max.)

8.1.2. Condition: Test current:10mA(DC);Open voltage:20mV(max.)

8.1.3. Test result: See items 9.1~9.4

8.2. Insulation resistance

8.2.1. Requirement: Initial:1000MΩ(min.)

After humidity test: 1000MΩ(min.)

After thermal shock test: 1000MΩ(min.)

8.2.2. Test method: DC 500V shall be applied between outer surface of housing and terminal and between adjacent terminals to measure insulation resistance(DIN EN 60512-3-1).

8.2.3. Test result: See items 9.1&9.3

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9. Environment test:

9.1. Humidity

9.1.1. Requirement: Contact resistance shall be 5milliohms (max.) after the test. Insulation resistance shall be 1000megohms (min.) after the test.

9.1.2. Test method: Mated connector shall be placed in a humidity chamber of the following conditions. After the test , contact resistance and insulation resistance shall be measured(DIN EN 60068-2-30).

Temperatures: $T_I=25^{\circ}\text{C}$, $T_U=55^{\circ}\text{C}$

Humidity: 95% constant

Duration: 10 cycles per 24h

9.1.3. Test results:

Test item	Initial(mΩ)			After test(mΩ)		
	Max.	Min.	Ave.	Max	Min	Ave
Contact resistance	4.13	3.82	3.90	4.43	3.91	4.20

Test item	Housing-Terminal(MΩ)		Terminal-Terminal(MΩ)	
	Initial	After test	Initial	After test
Insulation resistance	1000min.	1000min.	1000min.	1000min.

9.2. Salt spray

9.2.1. Requirement: Contact resistance shall be 5milliohms(max.) after the test.

9.2.2. Test method: One cycle is seven days. One cycle shall consist of spraying the specimen with a salt solution at $35^{\circ}\text{C}\pm 2\text{ K}$ for 2 h, followed by the humid condition at $40^{\circ}\text{C}\pm 2\text{ K}$, $93\% \pm 3\% \text{ RH}$ for 22h. This shall be repeated four times. Then the test specimens shall be stored under standard atmosphere at $23^{\circ}\text{C}\pm 2\text{ K}$ and $50\% \pm 5\% \text{ RH}$ for three days. The required number of cycle is one(seven days).

In the case of manual handling, the transition time (maximum 2 h) should be included in the humid condition period of 22 h and standard atmosphere period of three days(DIN EN 60068-2-52 Severity 3).

9.2.3. Test result:

Test item	Initial(mΩ)			After test (mΩ)		
	Max.	Min.	Ave.	Max.	Min.	Ave.
Contact resistance	4.35	4.16	4.21	4.59	4.22	4.43

9.3. Thermal shock

9.3.1. Requirement: Contact resistance shall be 5milliohms (max.) after the test. Insulation resistance shall be 1000megohms (min.) after the test.

9.3.2. Test method: Mated connector shall be subjected to thermal shock test of the following conditions. After the test , contact resistance and insulation resistance shall be measured(DIN EN 60068-2-14* VDE 0468-2-14).

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1 cycle consists of:

Duration: 144 cycles

Temperature: $-40^{\circ}\text{C}/T_{\max}$ per 15min

9.3.3. Test results:

Test item	Initial(mΩ)			After test(mΩ)		
	Max.	Min.	Ave.	Max	Min	Ave
Contact resistance	4.73	4.27	4.51	4.66	4.13	4.33

Test item	Housing-Terminal(MΩ)		Terminal-Terminal(MΩ)	
	Initial	After test	Initial	After test
Insulation resistance	1000min.	1000min.	1000min.	1000min.

9.4. Vibration

9.4.1. Requirements: Contact resistance shall be 5milliohms (max.) after the test. There shall be no current discontinuity longer than 1 microsecond during the test.

9.4.2. Test method: Mated connector shall be mounted on a PCB and subjected to a vibration test of the following conditions. During the test , current continuity shall be checked. After the test , contact resistance shall be measured(DIN EN 60512).

Direction:

- 1.Axis of up and down
- 2.Axis of right and left
- 3.Axis of front and back

9.4.3. Test result:

Test item	Initial(mΩ)			After test(mΩ)		
	Max.	Min.	Ave.	Max.	Min	Ave.
Contact resistance	4.31	4.13	3.58	4.63	4.11	4.39

Current discontinuity: There shall be no current discontinuity longer than 1 microsecond during the test.

9.5. Solderability

9.5.1. Requirements: Minimum 95% solder-dipping section shall be covered by solder smooth solder.

9.5.2. Test method: Fluxed soldering section of shrouded header shall be dipped in solder of the following conditions.

Solder temperature : $245 \pm 5^{\circ}\text{C}$

Immersion period : 3-5 seconds

9.5.3. Test result: Good.

9.6. Resistance to soldering heat

9.6.1. By soldering iron (Attention: The process is suitable for both high and low temperature plastic materials)

9.6.2. By wave soldering

(1) Requirements: There shall be no deformation nor damage which may affect the performance.

(2) Test method: The specimen shall be soldered by soldering iron of the following conditions.

No abnormal force such as lateral load shall be applied to the specimen during the test.

Soldering iron temperature: $360 \pm 10^{\circ}\text{C}$

Immersion period: 1-3 seconds

(3) Test result: Good.

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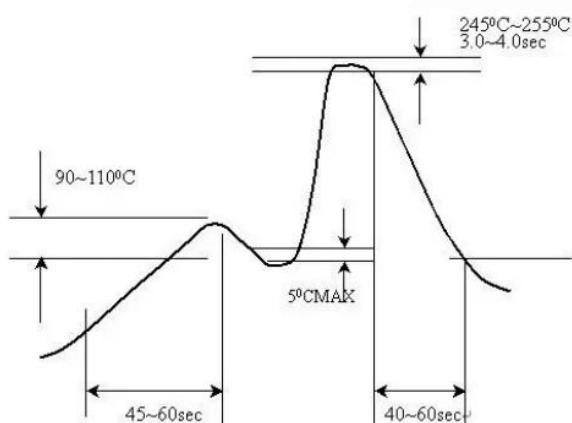
9.6.3. By wave soldering (Attention: The process is suitable for both high and low temperature plastic materials)

(1) Requirements: There shall be no deformation nor damage which may affect the performance.

(2) Test method : Specimen shall be mounted on a PCB (inserted only) and subjected to resistance to soldering heat test of the following conditions.

Solder temperature: $250 \pm 5^\circ\text{C}$

Immersion period: 3-4 seconds



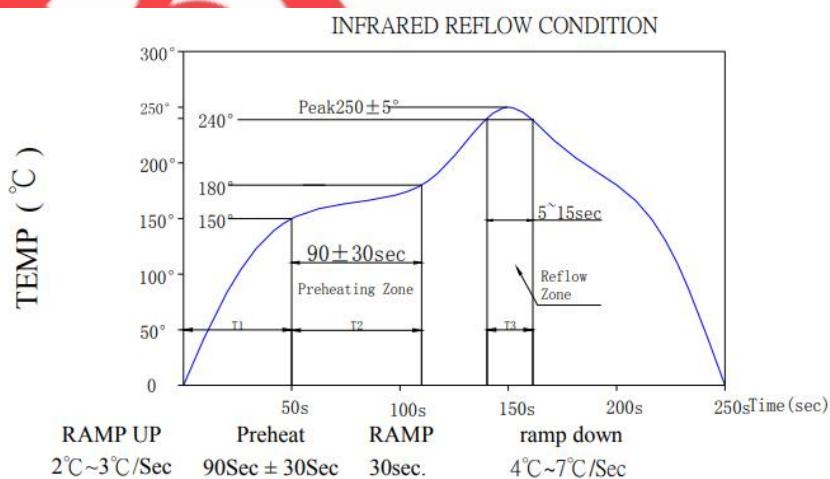
TEMPERATURE CONDITION GRAPH

(3) Test result: Good.

9.6.4. By reflow soldering (Attention: The process is only suitable for high temperature plastic materials)

(1) Requirements: Solder-dipping section shall be covered by solder entirely.

(2) Test method:



T1:	Temperature ramp up rate:	$2^\circ\text{C} \sim 3^\circ\text{C}/\text{sec}$
T2:	Preheat: $150^\circ\text{C} \sim 160^\circ\text{C}$	$60 \sim 120\text{sec}$
T3:	Time Over 240°C :	$5 \sim 15\text{sec}$
	Ramp down rate during cooling:	$4^\circ\text{C} \sim 7^\circ\text{C}/\text{sec}$
	Peak temperature:	250°C Max

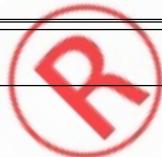
(3) Test result: Good.

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**Notice:**

1. The values specified in this specification are only for reference. The products and their specifications are subject to change without notice. Contact our sales for further information before considering or ordering any of our products.

For purchase, a product specification must be agreed upon.

2. Users are requested to provide protection circuits and redundancy circuits to ensure safety of the equipment, and sufficiently review the suitability of BRIGHT-E's products to the equipment.

3. The products presented in this series are designed for the uses recommended below.
We strongly suggest you contact our sales staff when considering use of any of the products in any other way than the recommended applications or for a specific use that requires an extremely high reliability.

(1) Applications that require consultation:

(i) Please contact us if you are considering use involving a quality assurance program that you specify or that is peculiar to the industry, such as:

Automotive electrical components, train control, telecommunications devices (mainline), traffic light control, electric power, combustion control, fire prevention or security systems, disaster prevention equipment, etc.

(ii) We may separately give you our support with a quality assurance program that you specify, when you think of a use such as:

Aviation or space equipment, submarine repeaters, nuclear power control systems, medical equipment for life support, etc.

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