

COMPONENT SPECIFICATION**M40 SERIES CONNECTORS****AUGUST 2012****CONTENTS:**

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Issue: 6
Date: 09th August 2012
C/Note: 11790

COMPONENT SPECIFICATION

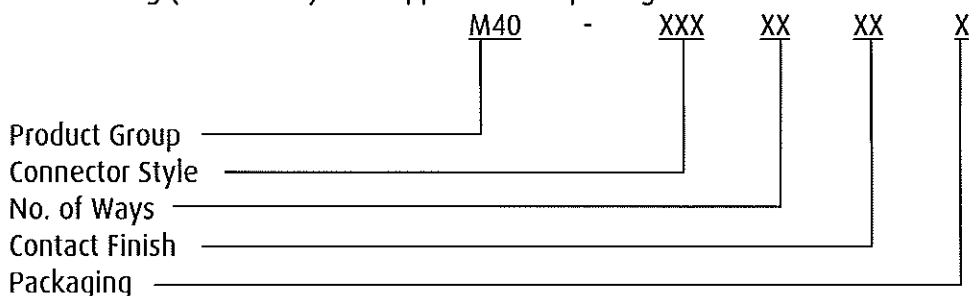
M40 SERIES CONNECTORS

1. DESCRIPTION OF CONNECTOR AND INTENDED APPLICATION.

A selection of 1.00mm pitch connectors, comprising vertical board to board surface mount plugs and sockets.

2. MARKING OF THE CONNECTOR AND/OR PACKAGE (ORDER CODE).

The marking (order code) shall appear on the package and shall be of the following style:



Connector Style:

Surface Mount Plug	600
Surface Mount Socket	620
Surface Mount Socket	310
Surface mount Pin Header	320

No. of Ways, Finish & Packaging:
See individual drawings

3. RATINGS.

3.1. MATERIAL & FINISH.

Materials:

Mouldings:

M40-310/320	Glass-Filled PA6T, UL94V-0
M40-600/620	LCP, UL94V-0

Contacts.....	Phosphor Bronze
Retainer.....	Brass

Finish: See Individual Drawings

3.2. ENVIRONMENTAL CHARACTERISTICS.

Temperature Range:

M40-310/320	-40°C to +105°C
M40-600/620	-20°C to +125°C

COMPONENT SPECIFICATION

M40 SERIES CONNECTORS (continued)

3. RATINGS (continued).

3.3. ELECTRICAL CHARACTERISTICS.

Current Rating:

M40-310	1.0A AC/DC
M40-320	1.0A AC/DC
M40-600/620	0.5A AC/DC

Voltage Rating: 150V AC/DC

Contact Resistance (initial):

M40-310/320	20 mΩ max
M40-600/620	50 mΩ max

Contact Resistance (after conditioning):

M40-310/320	30 mΩ max
M40-600/620	75 mΩ max

Dielectric Withstanding Voltage:

M40-310/320	500V AC for 1 minute
M40-600/620	250V AC for 1 minute

Insulation resistance:

M40-310/320	1,000 MΩ min
M40-600/620	500 MΩ min

3.4. MECHANICAL CHARACTERISTICS.

Contact Retention in moulding:

M40-320	1.47N min
M40-600	4.9N min
M40-620	5.9N min

Retainer retention in moulding:

M40-600/620	7.8N min
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Soldered retainer retention on PC Board:

M40-600/620	29.4N min
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Insertion force (per contact):

M40-310/320	1.5N max
M40-600/620	2.7N max

Withdrawal force (per contact):

M40-310/320	0.1N min
M40-600/620	0.4N min

Durability

M40-310/320	300 cycles
M40-600/620	30 cycles

COMPONENT SPECIFICATION

M40 SERIES CONNECTORS (continued)

APPENDIX A - TEST METHODS AND PERFORMANCE – M40-310/320.

A1.1. TEST CONDITIONS.

Unless otherwise specified, all tests and measurements shall be performed under the conditions and in accordance with EIA 364.

A1.2. TEST METHODS.

A1.2.1. Electrical.

i) Contact Resistance.

Test Method EIA 364-23

Solder a plug and a socket to PC Boards and mate them together. Measure the contact resistance between the two mated boards. Apply the low-level condition of 20mV max. for the open circuit voltage and 100mA max. for the closed circuit current. Contact resistance must not exceed the values stated in section 3.3.

ii) Dielectric Withstanding Voltage.

Mate a plug and socket together (not soldered to a PC Board). Apply between neighbouring contacts a 500V AC current for 1 minute in accordance with EIA 364-20. No creeping discharge, flash-over or insulator break-down is allowed. Current leakage must be less than 0.5mA.

iii) Insulation Resistance.

Mate a plug and socket together (not soldered to a PC Board). Apply between neighbouring contacts a 500V DC voltage for 1 minute. Measurement is taken in accordance with EIA 364-21. Insulation resistance must not be less than the value stated in section 3.3.

A1.2.2. Mechanical.

i) Contact Retention Force.

Test Method EIA 364-29

Place a connector on a push-on/pull-off machine. Apply force onto the contact head and push the contact in the direction opposite to insertion. Measure the force when the contact dislodges from the moulding. Contact retention must conform to the figure stated in section 3.4.

ii) Insertion/Withdrawal Force.

Test Method EIA 364-13

Place a mated connector pair on a push-on/pull-off machine. Repeat insertion and withdrawal for 30 cycles, at a speed of 50mm/min. along the mating axis. Insertion and withdrawal forces before, during and after the test must conform to those stated in section 3.4.

iii) Durability.

Place a mated connector pair on a push-on/pull-off machine. Repeat insertion and withdrawal for 300 cycles, at a speed of 200 cycles per hour, along the mating axis. Contact resistance before and after the test must meet the values stated in section 3.3.

COMPONENT SPECIFICATION
M40 SERIES CONNECTORS (continued)

APPENDIX A - TEST METHODS AND PERFORMANCE – M40-310/320 (continued).

A1.2. TEST METHODS (continued).

A1.2.3. Environmental.

i) Solderability

Test Method	EIA-364-52 Category 3
Steam Aging Temperature	90 to 96°C
Steam Aging Duration	8 Hours ±5 minutes
Soldering Temperature	245°C ±5°C
Soldering Time	4 to 5 seconds

Result: More than 95% of the surface must have continuous solder coating.

ii) Vibration.

Test Method	EIA-364-28, Condition V, Test letter A
Test Condition.....	Random
Frequency.....	50 – 2000Hz
PSD Value	3.13 G _{rms} min
Directions.....	Three mutually perpendicular directions
Duration.....	15 minutes / axis.

Contact resistance before and after testing must meet the values specified in section 3.3. No electrical discontinuity greater than 1µs must occur during testing. Looseness amongst parts, chipping, breakage or other detrimental damage must not occur.

iii) Shock.

Test Method	EIA-364-27, Condition H
Wave form.....	Half-sinusoidal
Peak acceleration.....	30G (294m/s ²)
Shock Duration	11 milliseconds
Directions.....	Three mutually perpendicular directions
Test Duration	3 shocks in each direction, totalling 18 shocks

Contact resistance before and after testing must meet the values specified in section 3.3. No electrical discontinuity greater than 1µs must occur during testing. Looseness amongst parts, chipping, breakage or other detrimental damage must not occur.

iv) Humidity.

Test Method	EIA-364-31, Method III, Test Condition A
Temperature.....	25°C to 65°C
Humidity	90% to 95% RH
Duration.....	96 Hours

Contact resistance before and after the test must meet the values stated in section 3.3. There must be no evidence of damage.

v) Thermal Shock.

Test Method	EIA 364-32, Test Condition I
Temperature.....	-55°C to +85°C
Cycles.....	5
Exposure times at temperature extremes	30 Minutes

Contact resistance before and after the test must meet the values stated in section 3.3. There must be no evidence of damage.

COMPONENT SPECIFICATION

M40 SERIES CONNECTORS (continued)

APPENDIX A - TEST METHODS AND PERFORMANCE – M40-310/320 (continued).

A1.2. TEST METHODS (continued).

A1.2.3. Environmental (continued).

vi) Salt Spray.

Test Method	EIA364-26, Test Condition A
Temperature.....	35°C ±1.1°C
Humidity	95 to 98% RH
PH Value	6.5 to 7.2
Duration.....	8 Hours

Contact resistance before and after the test must meet the values stated in section 3.3. There must be no evidence of damage.

vii) Heat Resistant.

Test Method	EIA-364-17, Test Condition 3, Method A
Temperature.....	85°C ±2°C
Duration.....	96 Hours

Contact resistance before and after the test must meet the values stated in section 3.3. There must be no evidence of damage.

viii) Resistance to Soldering Heat

Test Method	EIA-364-56, Procedure 3, Test Condition C
Temperature.....	260 ±5°C
Time.....	5 to 10 seconds

Contact resistance before and after the test must meet the values stated in section 3.3. There must be no evidence of damage. Mechanical performance before and after the test must meet the values stated in section 3.4.

IR Reflow Temperature profile.....	220°C, 225°C, 230°C, 240°C, 265°C
Speed.....	8mm/second

At 217°C, the connector needs to stay in the IR Reflow oven for 90 seconds min.

At 260°C, the connector needs to stay in the IR Reflow oven for 5 seconds min.

Contact resistance before and after the test must meet the values stated in section 3.3. There must be no evidence of damage. Mechanical performance before and after the test must meet the values stated in section 3.4.

COMPONENT SPECIFICATION

M40 SERIES CONNECTORS

APPENDIX B - TEST METHODS AND PERFORMANCE - M40-600/620.

B1.1. TEST CONDITIONS.

Unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with EIA-364 Standards:

Temperature.....	15°C to 35°C
Humidity	45% to 75% RH
Atmospheric pressure.....	650 to 850mmHg

B1.2. TEST METHODS.

B1.2.1. Electrical.

i) Contact Resistance.

Solder a plug and a socket to PC Boards and mate them together. Measure the contact resistance using the 4-terminal method as shown in Figure 1. Apply 10mV DC max. at a current of 10mA in accordance with EIA-364-06B. for the closed circuit current. Contact resistance must not exceed the values stated in section 3.3.

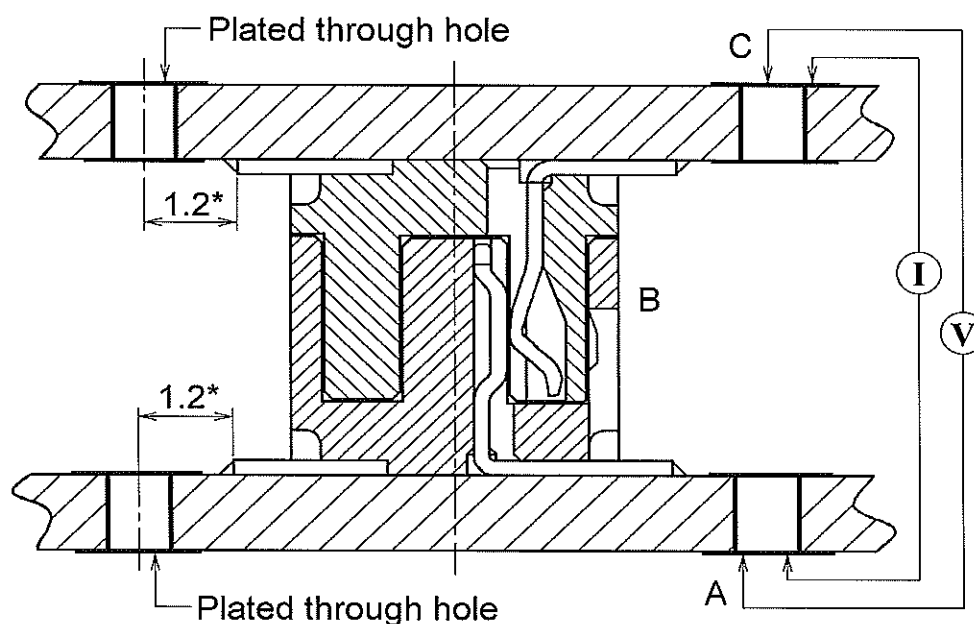


Figure 1: Contact Resistance

Note: Contact resistance is defined as R_{ABC} , i.e. the electrical resistance from point A on the back face of the lower PCB, through contact point B, to point C on the back face of the upper PCB. * = 2.7mm on the next line.

ii) Dielectric Withstanding Voltage.

Mate a plug and socket together (not soldered to a PC Board). Apply between neighbouring contacts a 250V AC rms current for 1 minute in accordance with EIA-364-20B. No creeping discharge, flash-over or insulator break-down is allowed.

iii) Insulation Resistance.

Mate a plug and socket together (not soldered to a PC Board). Apply between neighbouring contacts a 100V DC voltage. Measurement is taken in accordance with EIA-364-21C. Insulation resistance must not be less than the value stated in section 3.3.

COMPONENT SPECIFICATION
M40 SERIES CONNECTORS (continued)

APPENDIX B - TEST METHODS AND PERFORMANCE – M40-600/620 (continued).

B1.2. TEST METHODS (continued).

B1.2.2. Environmental (continued).

vi) Gas.

Solder a plug and a socket to PC Boards and mate them together. Expose the mated connectors to the following environment:

Chamber temperature	25° ±2°C
Gas	H ₂ S, 10ppm
Duration	24 hours

Contact resistance before and after the test must meet the values stated in section 3.3. Detrimental damage affecting the performance must not occur.

vii) Vibration.

Solder a plug and a socket to PC Boards and mate them together. Place the mated connectors on a vibrator machine, and apply the following vibration in accordance with EIA-364-28D. Care should be taken to fix the boards firmly to the vibrator machine to avoid any unnecessary resonance of the boards. During the testing, run a 100mA DC current to check for any electrical discontinuity. The test cycle must cover the following parameters:

- a) Frequency 10Hz - 55Hz - 10Hz over 1 minute approx.
- b) Directions..... Three mutually perpendicular directions
- c) Total amplitude1.50mm
- d) Sweep duration.....Two hours for each direction, totalling 6 hours.

Contact resistance before and after testing must meet the values specified in section 3.3. No electrical discontinuity greater than 10µs must occur during testing. Looseness amongst parts, chipping, breakage or other detrimental damage must not occur.

viii) Shock.

Solder a plug and a socket to PC Boards and mate them together. Place the mated connectors on a shock machine, and apply the following shock in accordance with EIA-364-27B. Care should be taken to fix the boards firmly to the shock machine to avoid any unnecessary resonance of the boards. During the testing, run a 100mA DC current to check for any electrical discontinuity. The test cycle must cover the following parameters:

- a) Maximum shock.....50g (490m/s²)
- b) Standard duration 11 milliseconds
- c) Wave form..... Half-sinusoidal

No electrical discontinuity greater than 10µs must occur during testing. Looseness amongst parts, chipping, breakage or other detrimental damage must not occur.

ix) Solderability.

Dip the solder tine of a plug and socket connector in a flux of RMA or R type for 5 to 10 seconds. Then dip the tine into a solder bath (210°C ±5°C) for 5 ±0.5 seconds. This test is in accordance with MIL-STD-202, Method 208. More than 90% of the dipped surface must be evenly wet.

COMPONENT SPECIFICATION
M40 SERIES CONNECTORS (continued)

APPENDIX B - TEST METHODS AND PERFORMANCE - M40-600/620 (continued).

B1.2. TEST METHODS (continued).

B1.2.2. Environmental (continued).

x) Soldering Heat Resistance (Surface Mount).

Subject a surface mount connector to the following reflow soldering profile, no more than twice:

Pre-heat.....	150-216°C for 30-90 seconds
Reflow solder	235° ±5°C
	220°C min. within 20 seconds
	240°C max. within 5 seconds

Detrimental damage affecting the performance of the connector must not occur.

xi) Soldering Heat Resistance (Hand-soldered).

Hand-solder a plug and a socket connector to a PC Board, using a temperature of 350°C for no more than 3 seconds. Detrimental damage affecting the performance of the connector must not occur.

B1.2.3. Mechanical.

i) Contact Retention Force.

Place a connector on a push-on/pull-off machine. Apply force onto the contact head and push the contact in the direction opposite to insertion, at a speed of 25 ±3mm/min. Measure the force when the contact dislodges from the moulding. Plug and socket contact retention must conform to the figures stated in section 3.4.

ii) Retainer Retention Force.

Place a connector on a push-on/pull-off machine. Apply force onto the retainer in the direction opposite to insertion, at a speed of 25 ±3mm/min. Measure the force when the retainer dislodges from the connector. Retainer retention must conform to the figure stated in section 3.4.

iii) Soldered Retainer Retention Force.

Solder a connector to a PC Board, using only the retainers. Place the board onto a push-on/pull-off machine. Pull the connector at a speed of 25 ±3mm/min. Measure the force when the retainer breaks away from the board. Soldered retainer retention must conform to the figure stated in section 3.4.

iv) Repeated Insertion/Withdrawal Force.

Solder a plug and a socket to PC Boards. Place the boards onto a push-on/pull-off machine. Repeat insertion and withdrawal for 30 cycles, at a speed of 25 ±3mm/min. along the mating axis. Insertion and withdrawal forces before, during and after the test must conform to those stated in section 3.4.

v) Electrical Continuity Durability.

Solder a plug and a socket to PC Boards. Place the boards onto a push-on/pull-off machine. Repeat insertion and withdrawal for 30 cycles, at a speed of 25 ±3mm/min. along the mating axis. Contact resistance before and after the test must meet the values stated in section 3.3.