



**MULTIGIG RT\*2 Eight Column, 25mm Mezzanine Connector**

**1. INTRODUCTION**

**1.1 Purpose**

Testing was performed on the TE Connectivity\* MULTIGIG RT 2 Eight Column 25mm Mezzanine Connector, with three power, three single ended, and two differential wafer PCBs. Testing was performed to determine product conformance to the requirements of Product Specification 108-2072, Rev H, Figure 2C.

**1.2 Scope**

This report covers the electrical, mechanical, and environmental performance of the MULTIGIG RT 2 Eight Column 25mm Mezzanine Connector, when tested per Product Specification 108-2072, Rev H, Figure 2C. Testing was performed at the Harrisburg Electrical Components Test Laboratory between November 15, 2021 and April 13, 2022.

**1.3 Conclusion**

The MULTIGIG RT 2 specimens listed in Table 1 conformed to the electrical, mechanical, and environmental performance requirements of 108-2072, Rev H, Figure 2C.

**1.4 Product Description**

The MULTIGIG RT 2 Eight Column, 25mm Mezzanine Connector uses wafer PCBs as the interface, which are designed for mating to typical MULTIGIG RT 2 backplane connectors, enabling an interconnection between two parallel printed circuit boards. Typical MULTIGIG RT 2 mating backplane connectors are attached to the parallel printed circuit boards (PCBs) using press fit terminations.

**1.5 Test Specimens**

The test specimens were representative of normal production lots, and the following part numbers were used for test:

**Table 1 – Specimen Identification**

Test Group	Quantity	Part Number	Description (a)
1	3	2375971-1	MULTIGIG RT 2, Eight Column, 25mm Mezzanine Connector with three power, three single ended, and two differential wafer PCB's
	6	2102737-1	MULTIGIG RT 2 Vertical Backplane Connector (b)
2	3	2375971-1	MULTIGIG RT 2, Eight Column, 25mm Mezzanine Connector with three power, three single ended, and two differential wafer PCB's
	6	2102737-1	MULTIGIG RT 2 Vertical Backplane Connector (b)

**NOTE** (a) When mated, two vertical backplane connectors were required for each mezzanine connector  
(b) The backplane connectors were mounted on test PCB 60-1966592-1, Rev A and 60-1966593-1, Rev A

**1.6 Qualification Test Sequence**

**Table 2 – Test Sequences**

Test or Examination	Test Groups	
	1	2
	Test Sequences (a)	
Initial Visual Examination	1	1
Low Level Contact Resistance	2, 4, 6, 9	2, 4, 6, 8, 10, 12, 14, 16
Durability (500 cycles)	3	
Durability (250 cycles)		3, 15
Dust Contamination	5	
Vibration	7	
Mechanical Shock	8	
Mating Force	10	
Unmating Force	11	
Mixed Flowing Gas (MFG) (b)		5, 7, 9, 11
Minute Disturbance		13
Final Visual Examination	12	17

**NOTE** (a) Numbers indicate the sequence in which tests were performed for each Test Set  
 (b) MFG includes 10 days exposure with specimens unmated, followed by 10 days Exposure with specimens mated.

**1.7 Environmental Conditions**

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15°C to 35°C  
 Relative Humidity 20% to 80%

**2. SUMMARY OF TESTING**

**2.1 Initial Examination of Product – All Test Sets**

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by Product Assurance. Where specified, specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

## 2.2 Low Level Contact Resistance, Circuit – All Test Sets

All LLCR measurements taken at 100 milliamperes maximum and 20 millivolts maximum open circuit voltage were less than 80 milliohms initially, had a maximum average change in resistance ( $\Delta R$ ) of less than 5 milliohms after testing, and a maximum individual change in resistance ( $\Delta R$ ) of less than 10 milliohms after testing.

## 2.3 Durability (500 cycles) – Test Set 1

No physical damage detrimental to product performance occurred as a result of the 500 mating and unmating cycles of the specimens.

## 2.4 Durability (250 cycles, 2X) – Test Set 2

No physical damage detrimental to product performance occurred as a result of the initial 250 mating and unmating cycles of the specimens, or the final 250 mating and unmating cycles of the specimens.

## 2.5 Dust Contamination – Test Set 1

No physical damage detrimental to product performance occurred as a result of the Dust Contamination exposure.

## 2.6 Vibration – Test Set 1

No discontinuities were detected during vibration. Following vibration, no cracks, breaks, or loose parts on the specimens were visible.

## 2.7 Mechanical Shock – Test Set 1

No discontinuities were detected during mechanical shock. Following mechanical shock testing, no cracks, breaks, or loose parts on the specimens were visible.

## 2.8 Mating Force – Test Set 1

All mating force measurements were less than 0.75 N per contact.

## 2.9 Unmating Force – Test Set 1

All unmating force measurements were greater than 0.15 N per contact.

## 2.10 Mixed Flowing Gas – Test Set 2

No physical damage detrimental to product performance occurred as a result of Mixed Flowing Gas exposure.

## 2.11 Minute Disturbance – Test Set 2

No physical damage detrimental to product performance occurred as a result of Minute Disturbance.

## 2.12 Final Visual Examination – All Test Sets

No visible evidence of physical damage detrimental to product performance was observed upon final visual examination of the test specimens.

### 3. TEST METHODS

#### 3.1. Initial Examination of Product – All Test Sets

A Certification of Conformance was issued stating that all specimens in this test package have been produced, inspected, and accepted as conforming to product drawing requirements, and made using the same core manufacturing processes and technologies as production parts. Specimens were visually examined in accordance with EIA-364-18B.

#### 3.2 Low Level Contact Resistance, Circuit – All Test Sets

Low Level Contact Resistance testing was conducted in accordance with EIA-364-23C, and 108-2072 Rev H. Signal contact measurements at low level current were made using a four terminal measuring technique. The test current was maintained at 100 milliamperes maximum with a 20 millivolt maximum open circuit voltage.

#### 3.3 Durability (500 cycles) – Test Set 1

Testing was conducted in accordance with EIA 364-09D, and 108-2072 Rev H. Each side of the mezzanine connector under test was fully mated and unmated by hand for 500 durability cycles at a rate of less than 500 cycles per hour.

#### 3.4 Durability (250 cycles, 2X) – Test Set 2

Testing was conducted in accordance with EIA 364-09D, and 108-2072 Rev H. Each side of the mezzanine connector under test was fully mated and unmated by hand for 250 durability cycles prior to the mixed flowing gas exposures, and 250 durability cycles after the post minute disturbance LLCR measurement. Testing was conducted at a rate of less than 500 cycles per hour.

#### 3.5 Dust Contamination – Test Set 1

Testing was conducted in accordance with EIA-364-91B, and 108-2072 Rev. H. Following the exposure, each specimen was tapped 5 times as specified for removal of excess dust.

#### 3.6 Vibration – Test Set 1

Testing was conducted in accordance with specification EIA-364-28F, Test Condition II, and 108-2072 Rev H. The test specimens were subjected to a sinusoidal vibration test. The parameters of this test condition are a simple harmonic motion having an amplitude of either 0.06 inch double amplitude (maximum total excursion) or 10 gravity unit (g's peak) whichever is less. The vibration frequency was varied logarithmically between the approximate limits of 10 to 500 Hertz (Hz). The entire frequency range of 10 to 500 Hz and return to 10 Hz was traversed in approximately 15 minutes. This cycle was performed for two hours in each of three mutually perpendicular axes, so that the motion was applied for a total period of approximately six hours. The test specimens were monitored for discontinuities of one microsecond or greater using an energizing current of 100 milliamperes.

#### 3.7 Mechanical Shock – Test Set 1

Testing was conducted in accordance with specification EIA-364-28F, Test Condition II, and 108-2072 Rev H. The parameters of this test condition are a half-sine waveform with an acceleration amplitude of 30 gravity units (g's peak) and a duration of 11 milliseconds. Three shocks in each direction were applied along the three mutually perpendicular axes of the test specimens, for a total of eighteen shocks. The test specimens were monitored for discontinuities of one microsecond or greater using an energizing current of 100 milliamperes.

**3.8 Mating Force – Test Set 1**

Testing was conducted in accordance with EIA-364-13E, and 108-2072 Rev H. The force required to mate connectors was measured using a tensile/compression device with a maximum rate of travel at 0.5 inch/minute and a free floating fixture. The average force per contact was calculated.

**3.9 Unmating Force – Test Set 1**

Testing was conducted in accordance with EIA-364-13E, and 108-2072 Rev H. The force required to unmate connectors was measured using a tensile/compression device with a maximum rate of travel at 0.5 inch/minute and a free floating fixture. The average force per contact was calculated.

**3.10 Mixed Flowing Gas – Test Set 2**

Testing was conducted in accordance with EIA 364-65B, Class IIA for 20 days, and 108-2072 Rev H. See Table 3 for MFG test parameters. All specimens were exposed in the unmated condition for the first 10 days and mated for the final 10 days. The test specimens were removed from the test chamber for LLCR measurements at the required 5-day intervals.

**Table 3 – MFG Test Parameters**

Environment	Class IIA
Temperature (°C)	30+1
Relative Humidity (%)	70+2
Chlorine (Cl <sub>2</sub> ) Concentration (ppb)	10+3
Hydrogen Sulfide (H <sub>2</sub> S) Concentration (ppb)	10+5
Nitrogen Dioxide (NO <sub>2</sub> ) Concentration (ppb)	200+50
Sulfur Dioxide (SO <sub>2</sub> ) Concentration (ppb)	100+20
Exposure Period	20 days
Chamber Volume Exchange Rate [minimum of 6/hr.]	8.8/hr.*

\*Volume exchange rate for 105-liter test chamber [Total flow rate of 15.4 L/Min]

**3.11 Minute Disturbance – Test Set 2**

Minute Disturbance was conducted in accordance with 108-2072 Rev. H. The mezzanine connector was slowly unmated a distance of 0.004 inch. The procedure was repeated for the other side of the mezzanine connector.

**3.12 Final Visual Examination – All Test Sets**

Specimens were visually examined in accordance with 108-2072 Rev. H, section 3.5 and EIA-364-18B. Visual examinations were performed by the unaided eye, corrected to normal vision.