40 GHz Board to Board Pin-Less Interposer™ Connectors

- **Conductive Diamonds with Gold Plated Final Finish**
- **14ps Interconnect Rise Time Bandwidth**
- **High Pin Count, High Current, High Temperature Range**
- **Cost Similar To Existing Connector Solutions**
- **Simple Reliable Connection with no Soldering**
- **.026” Low Profile Connector can reduce Design Footprint**

GIGA CONNECTIONS, inc

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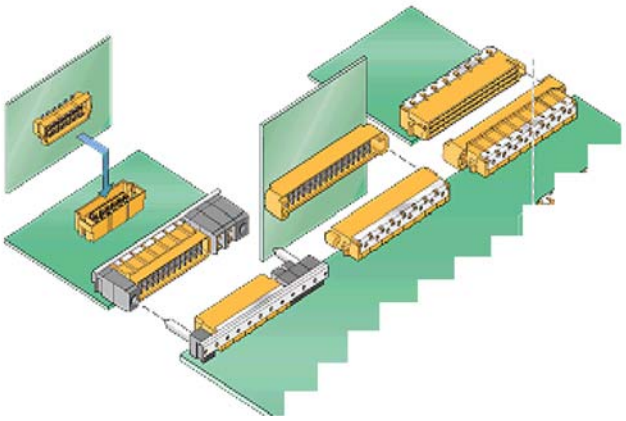
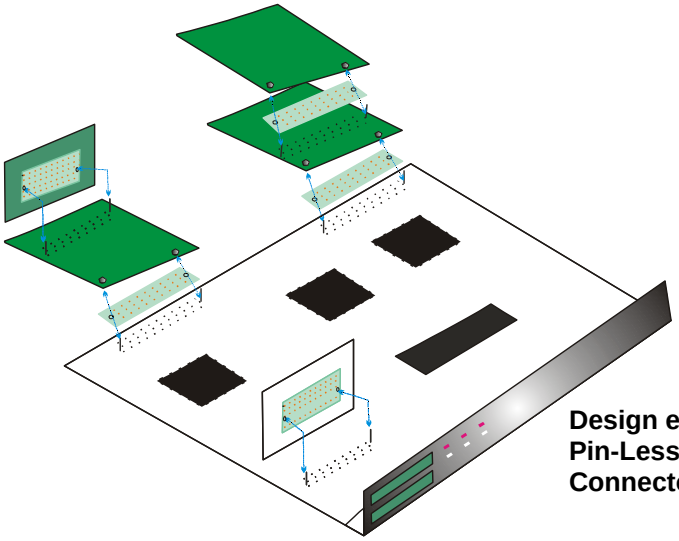
"Performance as good as solder"



Standard Board to Board Connectors



Design example with Pin-Less Interposer™ Connectors

Board to Board Pin-Less Interposer™ Connector Specifications

Electrical Specification
- > 40 GHZ bandwidth / ~14ps rise time
- No measurable inductance or capacitance
- ~1 % increase in impedance measured at 10G/bits data rate

Interconnect Technology
- 4-20 um conductive diamonds
- Surface mount connector
- 10 micro-inches of gold plated final finish
- Contact point size is 10 um; 20 mil (0.5 mm) pitch can be achieved
- RoHs compliance - lead free
- ~25 mils mechanical stack up height

Pin Density Count
- >2000

RoHS

Maintenance
- Surface can be refurbished
- Clean with ultrasound bath

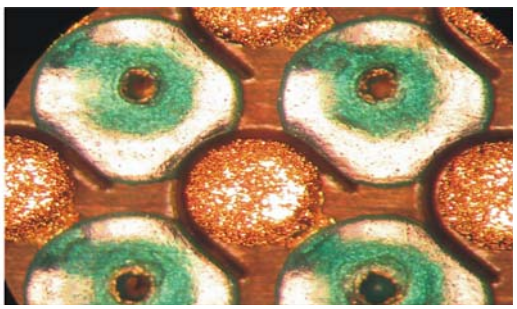
Reliability
- Hundreds of thousands of insertions without measurable degradation in signal integrity

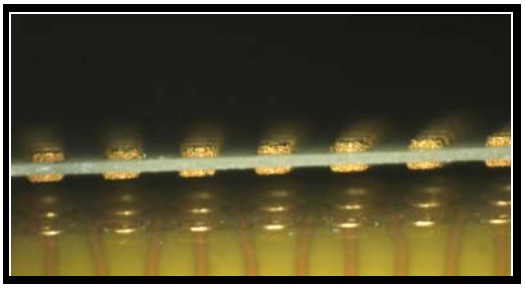
Force
- 15 - 30 Grams force per pad required to achieve electrical continuity

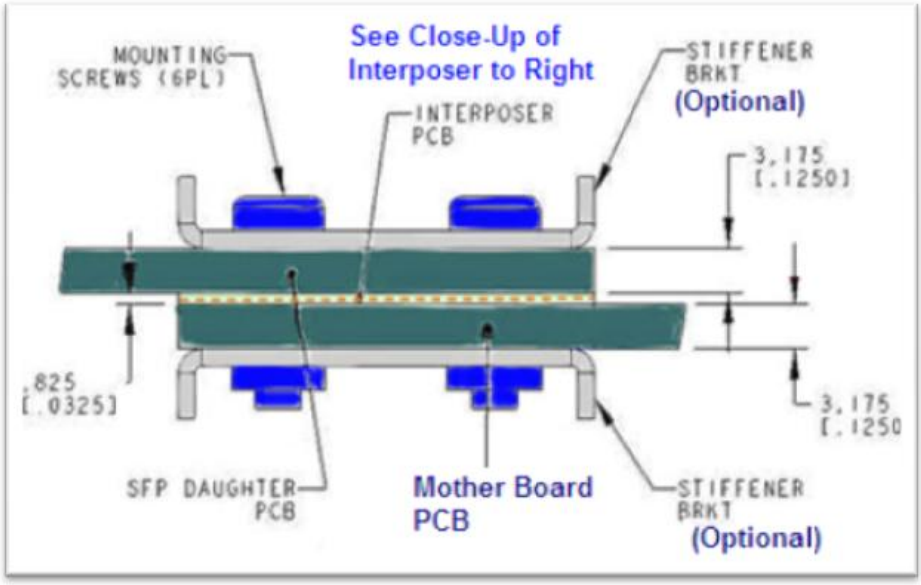
Current Handling:
- ~15 amps per 10 mil (0.25 mm) diameter pad

Temperature Range
- –60C to 200C for Kapton film Interposer

Top view of Gold Plated Conductive Diamond Pin-Less Interposer™

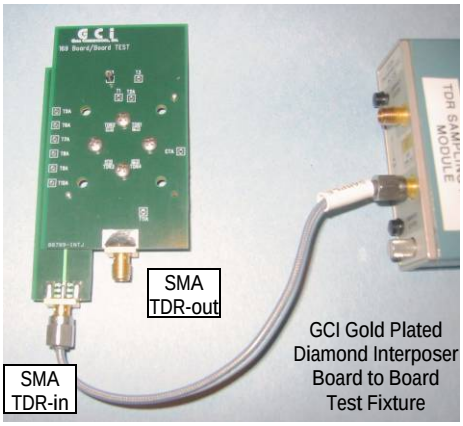


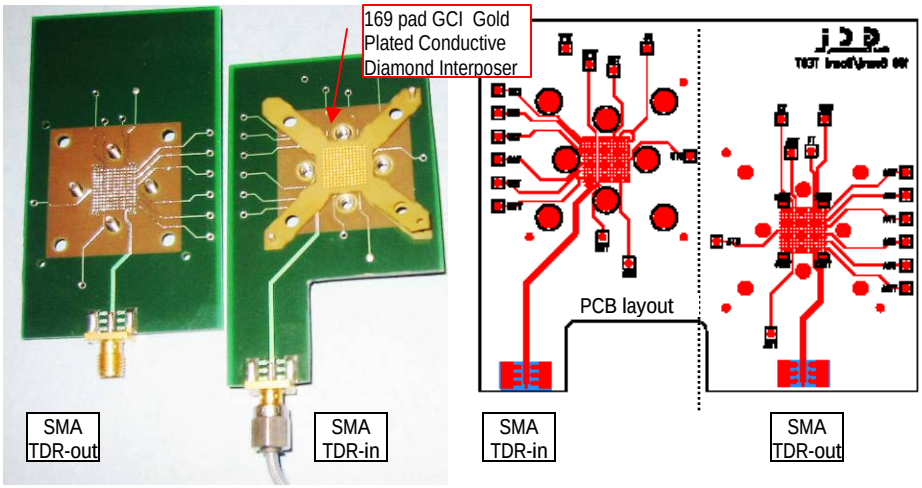




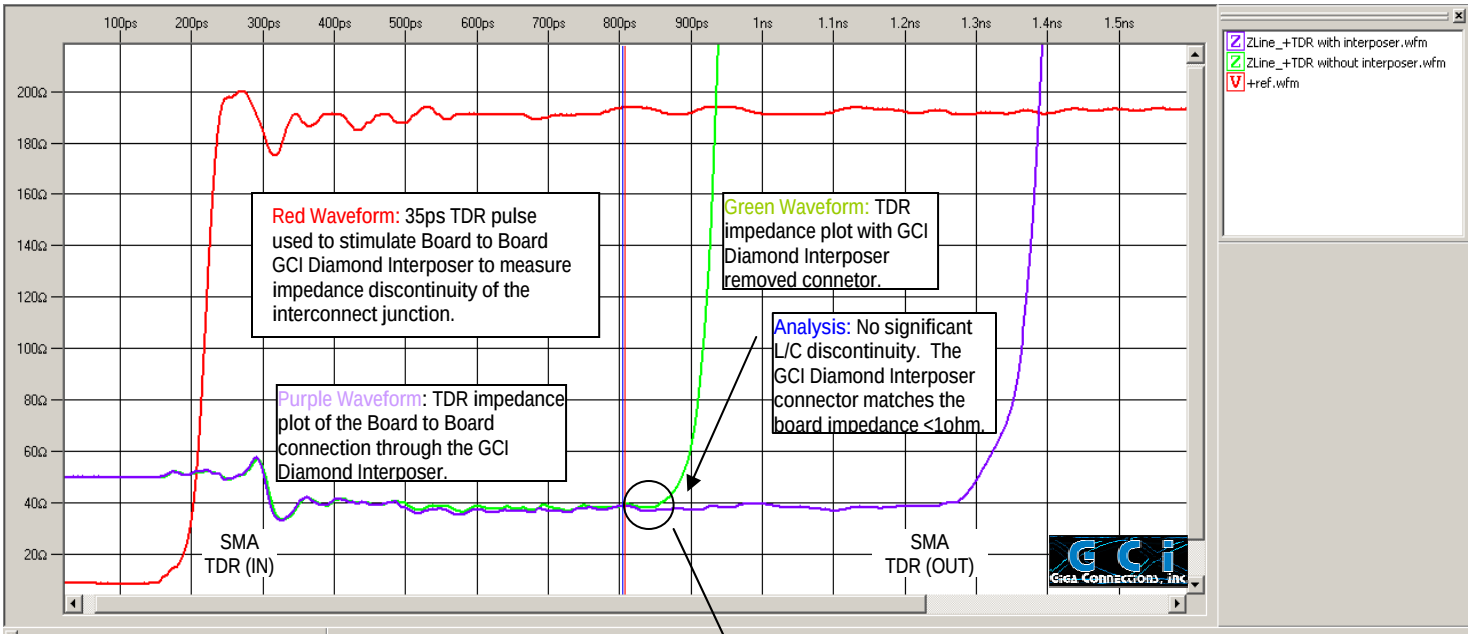
Board to Board Interface side of Pin-Less Interposer™ Connector

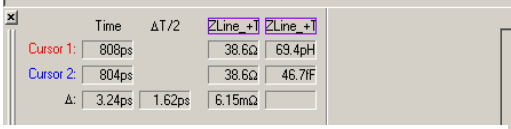
TDR Impedance Discontinuity Analysis of Pin-Less Interposer™ Connector

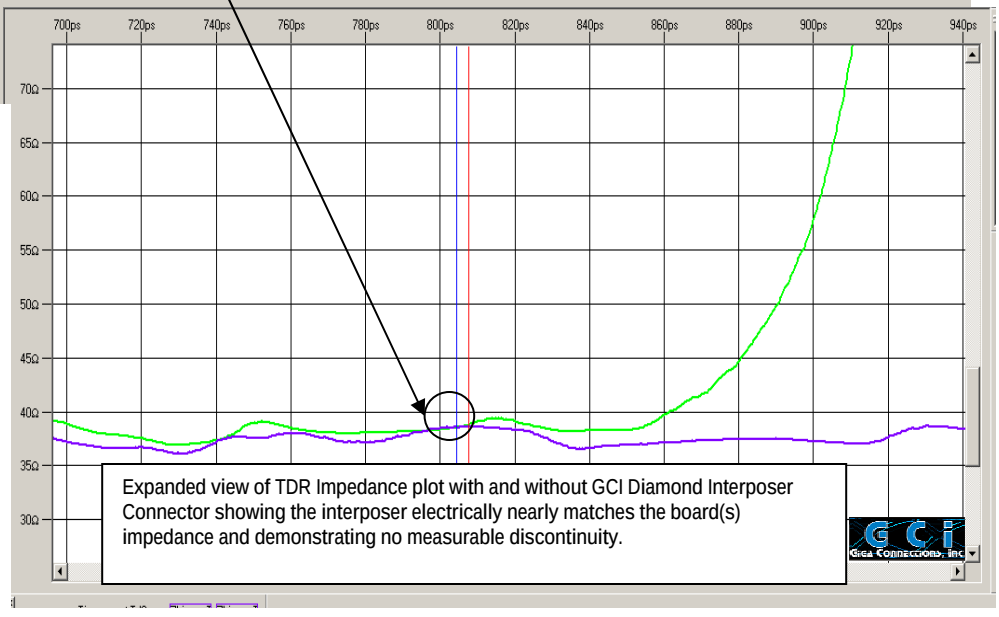




The board to board test fixture shown in the above left figure was developed to test the impedance discontinuity for the gold plated diamond Pin-Less Interposer™ connector. A single board to board test path comprised of two over/under board pads, directly in line, and connected with traces to SMA connectors was used for this test. A GCI diamond Pin-Less Interposer™ connector was sandwiched between the two boards to electrically connect the pads together. To measure the impedance discontinuity of the interposer, a 35ps TDR pulse (see red waveform plot below) was connected to the SMA TDR- in. The pulse traveled through the board and through the interposer to the un-terminated SMA TDR output port on the second board. The impedance discontinuity was recorded and graphed below.







Test Procedure and Analysis

A 35ps TDR pulse was injected into the SMA TDR-in port (red waveform) to measure the impedance discontinuity where the GCI Diamond Interposer connector connected the two boards together. The GCI Diamond Interposer connector was removed to create a physical reference point shown as the green TDR impedance plot. The re-assembled test board with the GCI Diamond Interposer connector was tested again to measure the impedance discontinuity shown as the purple TDR impedance plot. All the TDR waveforms were recalled and overlapped to identify where the board's test pads connected though the Diamond Interposer connector. The measured impedance discontinuity was so small an expanded impedance plot had to be created but no measurable discontinuity through the GCI Diamond Interposer Connector was detected.