Compression Coax Board-to-board and Stripline Coax RF Connectors

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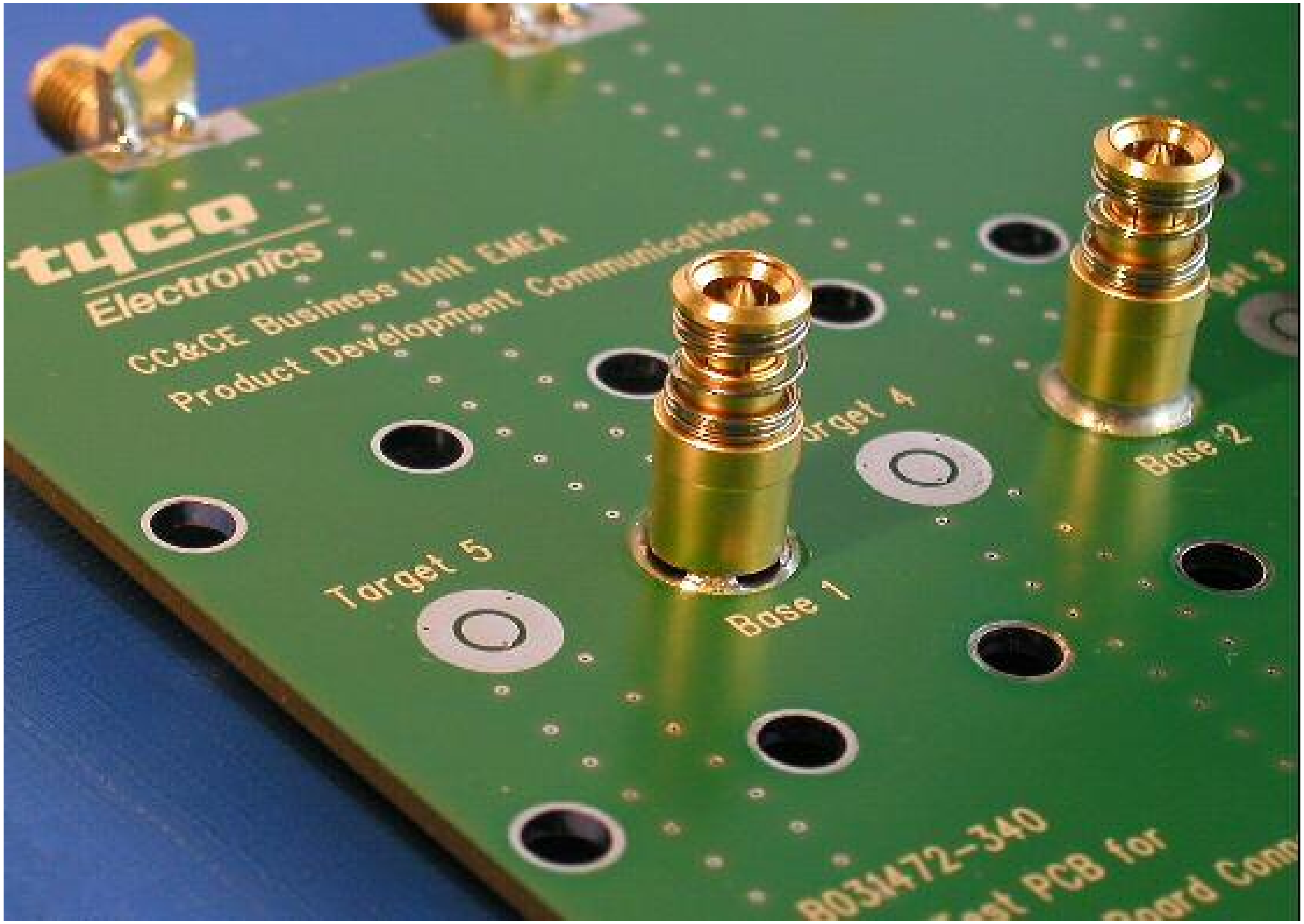
Compression Coax
Board-to-Board Connector



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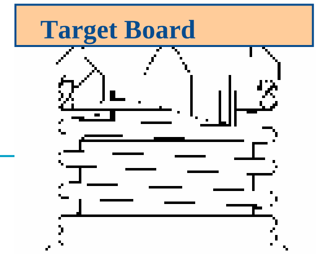
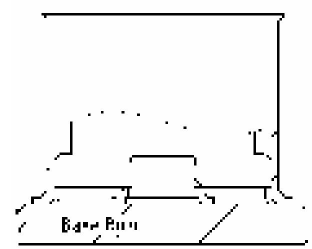


- Features/Benefits
  - Single connector design – no mating connector needed
  - Available in four sizes for varied board spacing: 14mm, 10mm, 6.65mm, and 4mm



  - Large radial and axial misalignment: for positioning boards and for gap between boards
  - Surface mount device for standard pick & place compatibility
  - Mating directly on target board
  - Easy connection without risk of solder breakage
  - Low applied material and assembly costs

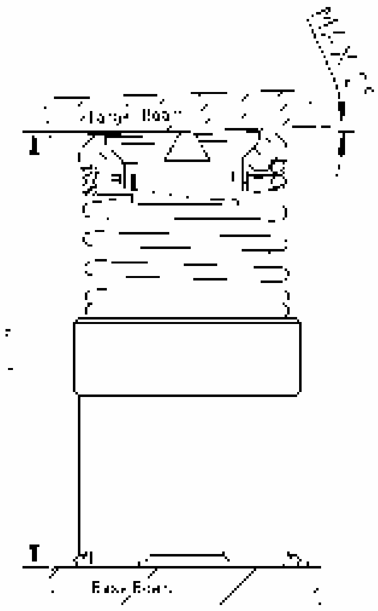
Compression Coax
Board-to-Board Connector

- Markets/Applications
  - Modular parallel board-to-board blind mate
  - Base Station/sub station systems
  - PDA/PCS/Cellular handset
  - Wireless Communications systems (GSM,PCS,WCDMA,UMTS)

Compression Coax Board-to-Board Connector

- Performance Requirements
  - Characteristic Impedance: 50 Ohms
  - Frequency Range: Up to 6 GHz
  - Return Loss: -20 dB min up to 2.2 GHz (all misalignments)
  - Insertion Loss: -0.2 dB max up to 2.2 GHz (all misalignments)
  - Shielding Effectiveness: -60 dB min up to 2.5 GHz (interface only)
  - Termination Resistance:
    - Inner Contact: ≤ 100 milliohms with **tinned** Target Pad
      ≤ 20 milliohms with **gold plated** Target Pad
    - Outer Contact: ≤ 20 milliohms
  - Working Voltage: ≤ 125 VAC, 50 Hz (at sea level)
  - Diel. Withstanding Voltage: 500 VAC, 50 Hz (at sea level)
  - Insulation Resistance: ≥ 100 Megohms

Compression Coax Board-to-Board Connector

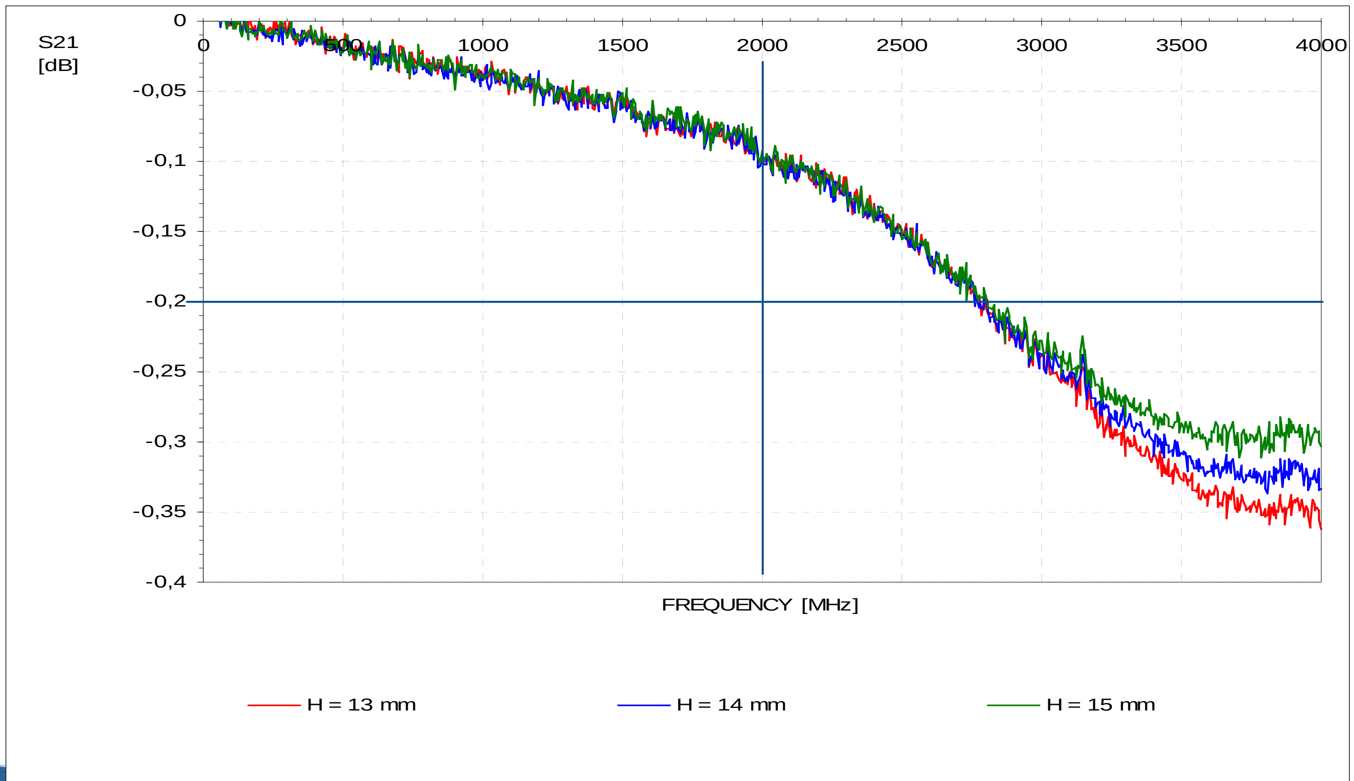


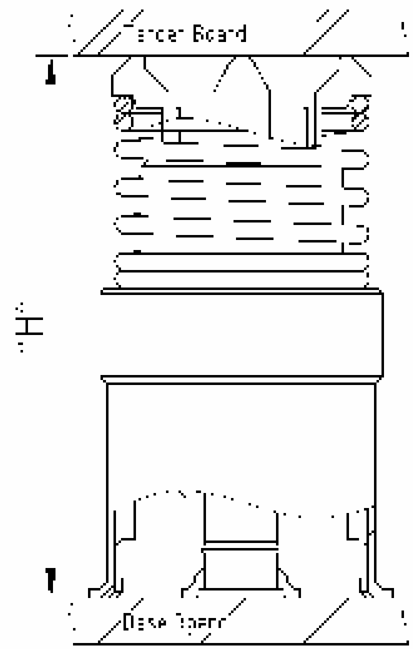
- Performance Requirements (continued)
  - Operating Temperature: -40 to +125°C
  - Mating Force: 10 N
  - Durability: 25 cycles
  - Angle between Boards: ±2° max
  - Axial Misalignment: ±1.0 mm from nominal boards stacking height
    ±0.3 mm for shortest model
  - Radial Misalignment: ±0.8 mm from center line in any direction
  - Vibration: 20 g between 58-500 Hz
    (Amplitude of 1.5 mm between 10-58 Hz)
  - Soldering Temperature: 250°C max (brief exposure)

Compression Coax
Board-to-Board Connector

RF Characteristics

Insertion loss curves: (Min, Nominal, and Max mating heights)

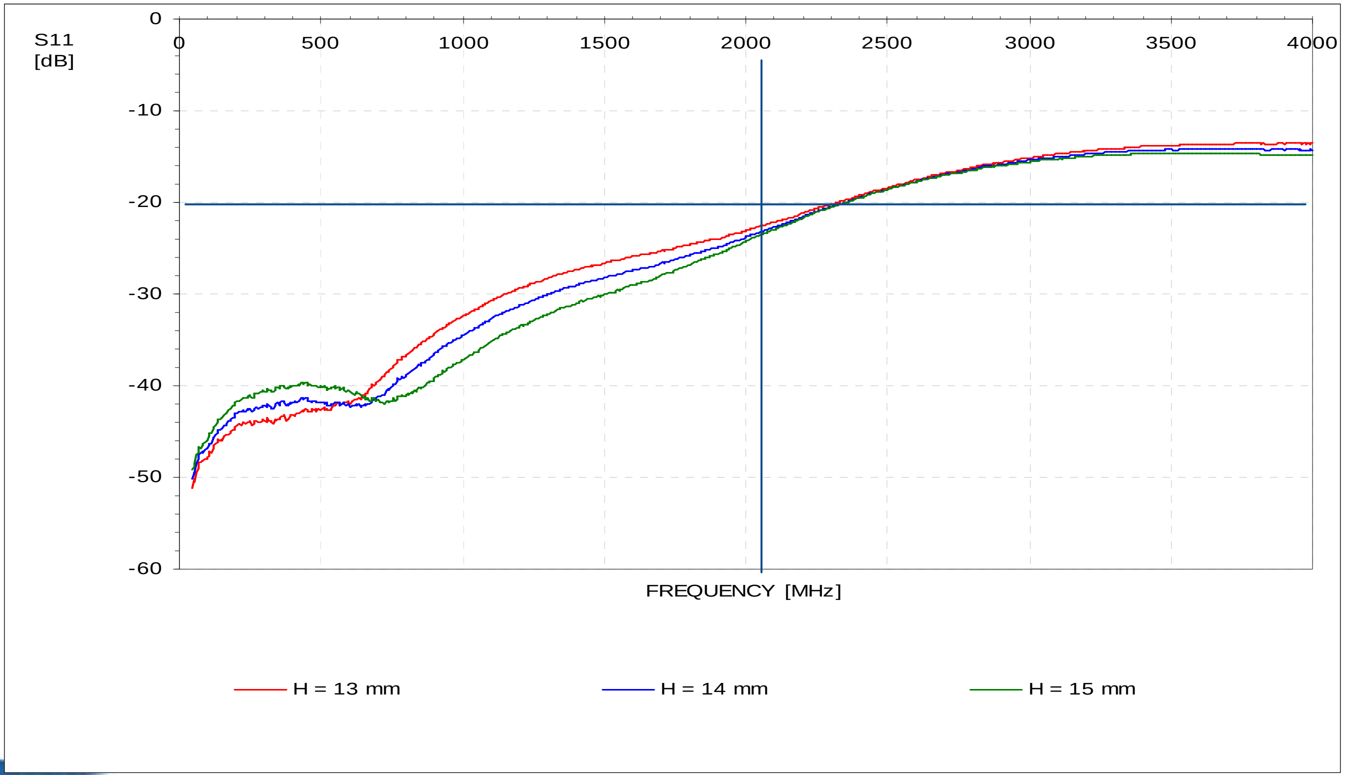


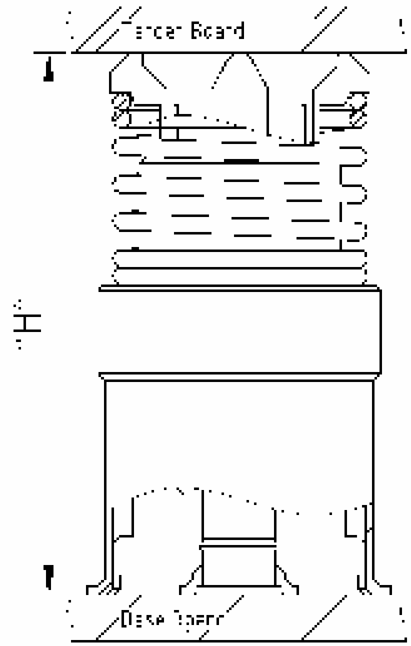


Compression Coax
Board-to-Board Connector

RF Characteristics

Return loss curves: (Min, Nominal, and Max mating heights)





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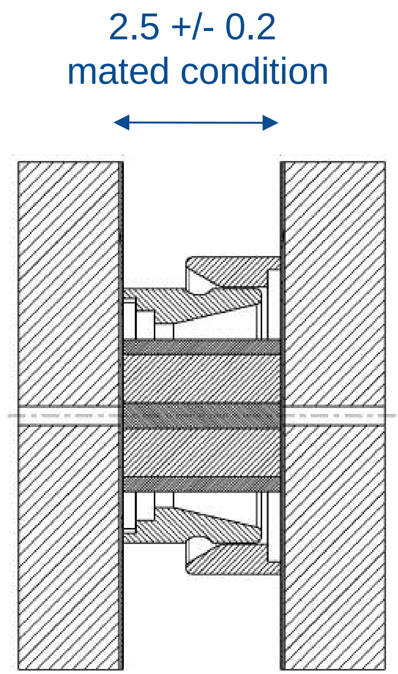
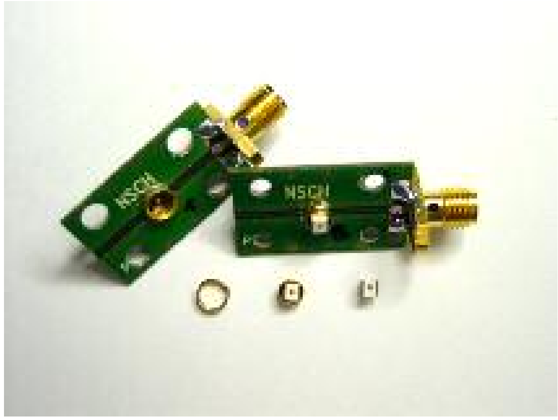
Compression Coax - Ongoing Development

STAX® Polymeric Coax Connector

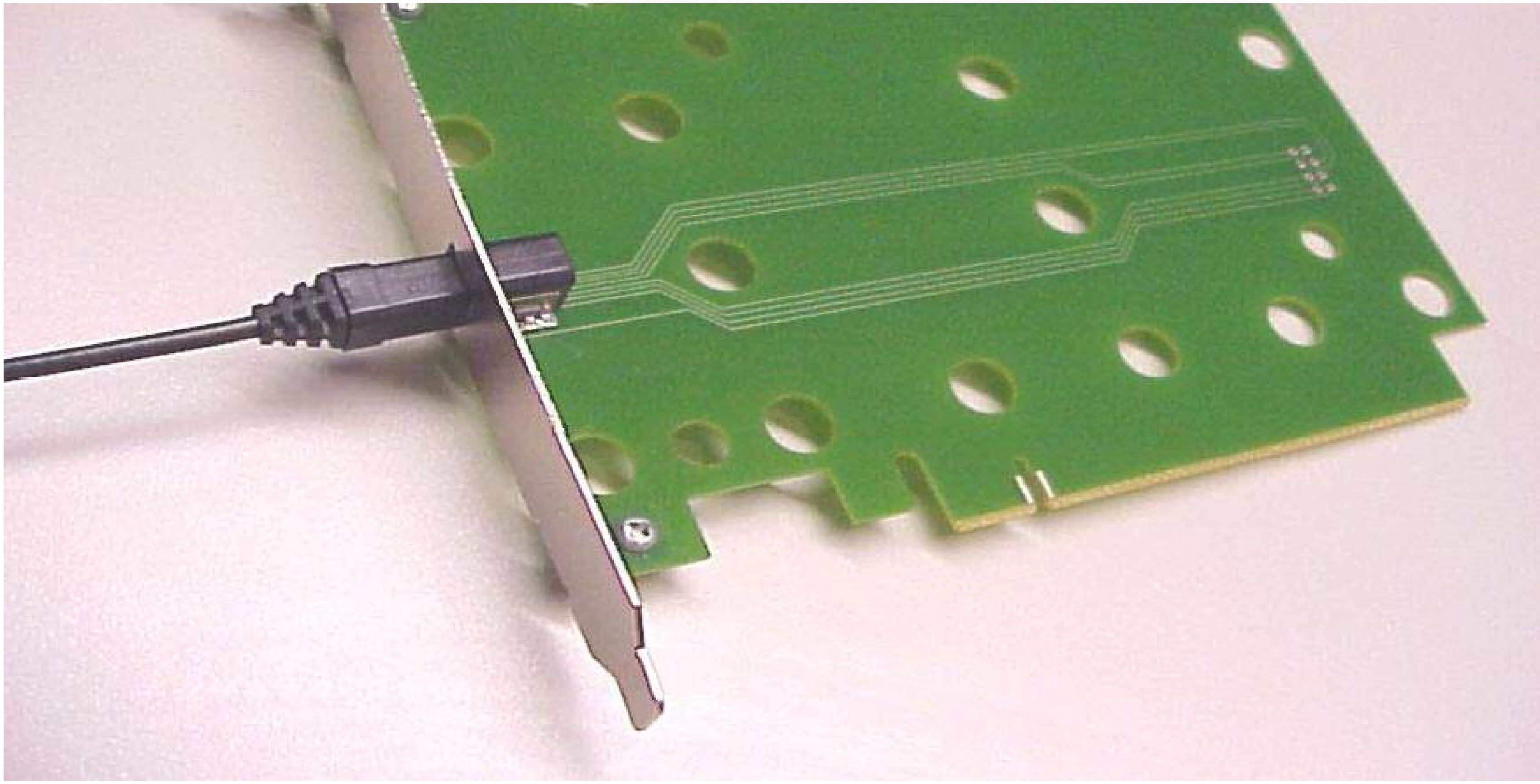
KEY FEATURES

- Elastomeric technology
- Low board separation ≤ 2.5mm
- VSWR <1.07 from 0 to 6GHz
- Wide working range of deflection.
- Long term reliability and durability
- Surface mount / pick and place
- Technology can support board separations ≤ 1.5mm





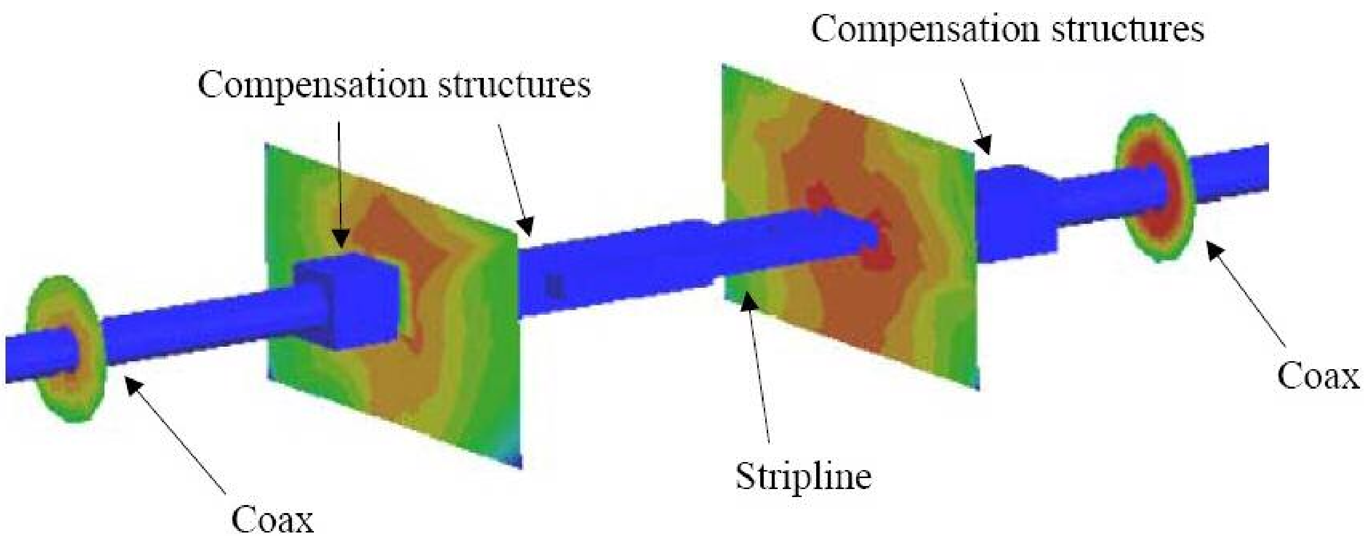
RF Stripline Connector



Stripline Concept

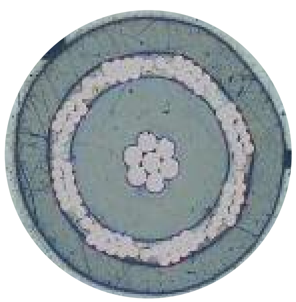
RF Transitions

- Coax and Stripline are both transverse electromagnetic transmission modes
  - Coax is based on circumferential symmetry
  - Stripline is based on linear symmetry
- Compensation structures at coax stripline interface were designed using complex 3D electromagnetic modeling tools

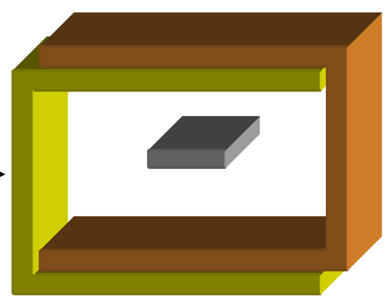


Design Feature - Stripline Based Concept

- Stripline components are easily stamped, formed, molded and assembled.
- Transitions between coax and stripline can be compensated by design.
- Improved VSWR above higher frequencies (3GHz) compared to traditional, coaxial designs.



Coax

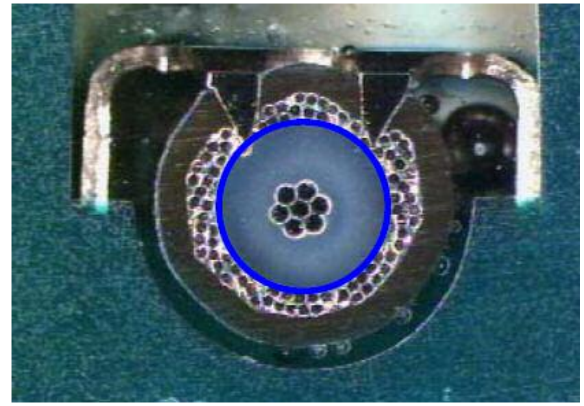


Stripline

Coax assembly

Stripline assembly

Unique RF Stripline Design Features



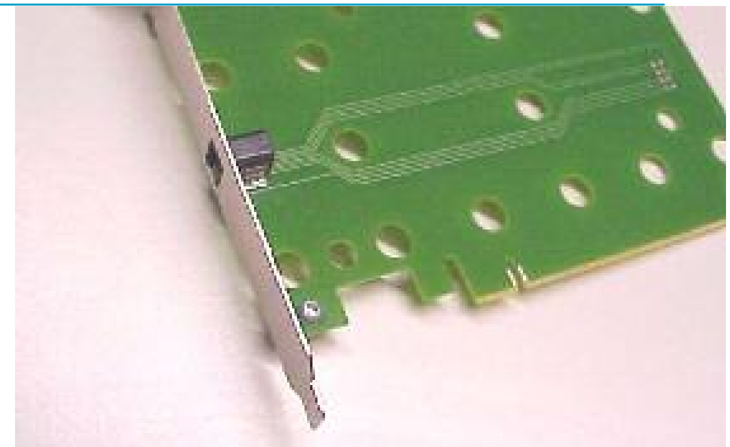
- Stripline based transmission – replace coax design
- Braid interface – "coax cable displacement"
- Center contact termination – "F" crimp
- Center contact interface – tuning fork and blade
- Outer plastic housing – provide alignment and mating retention
- Strain relief – survive 110 N pull force

RF Stripline Connector

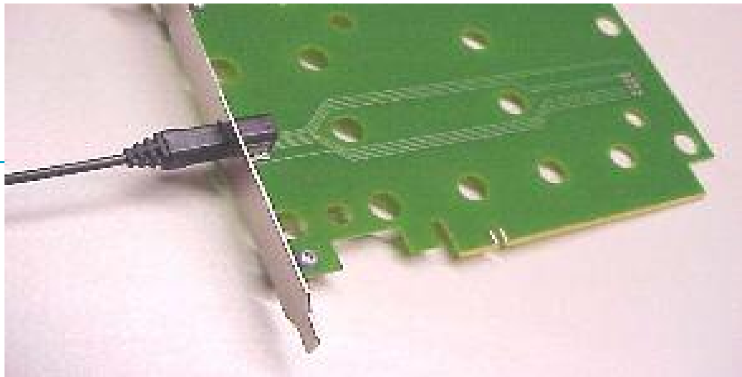
- Features/Benefits
  - ROHS Compliant
    {Lead-free SMT process compatible}
  - PCI / PCI Express Compatible
  - Designed for RG 174 & RG 316 Cables
  - Stamped/Formed and molded components
  - Low Profile: Overall Height < 10 mm
  - 10mm x 10.6mm max. footprint (w/o panel extension)

RF Stripline Connector

- Markets/Applications
  - PCI, Mini PCI, PCI Express
  - Mobile Antenna/GPS/Radio Systems
  - PDA / PCS / Cellular Handset applications
  - Wireless Communications systems
  - Satellite Communications, Broadcast, Multimedia
  - Automotive Telematics



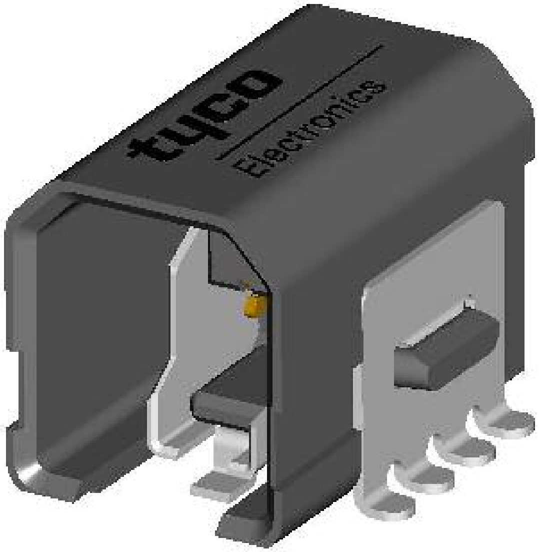
RF Stripline Connector



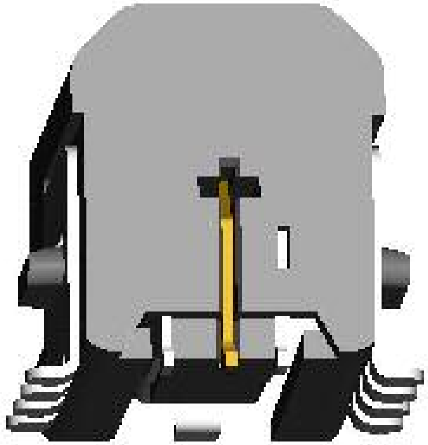
- Performance Requirements

– Characteristic Impedance:	50 Ohms	
– Frequency Range:	dc to 6 GHz	
– VSWR:	1.3 max	up to 3 GHz
	1.5 max	3 GHz to 6 GHz
– Insertion Loss:	0.3 dB max	up to 3GHz
	0.8 dB max	3GHz up to 6GHz
– Rated voltage:	60 VAC (rms)	
– Diel. Withstanding Voltage:	800 VAC, 50 Hz for 1 min (at sea level)	
– Insulation Resistance:	100 Megohms min	
– Contact Resistance:		
Center:	20 milliohms max	
Outer:	20 milliohms max	

RF Stripline Connector

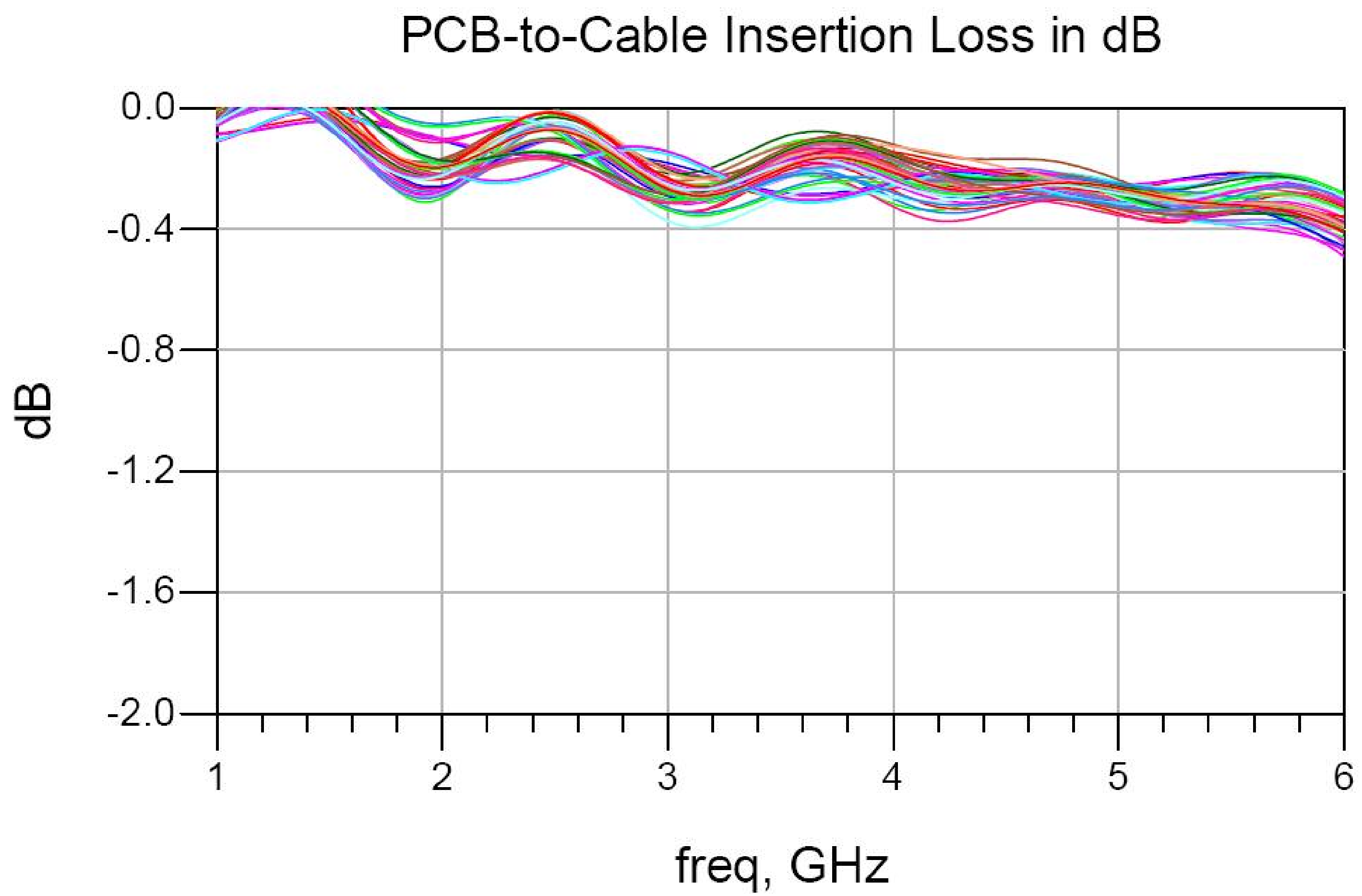


- Performance Requirements (continued)
  - Operating Temperature: -40 to +125°C
  - Engagement Force: < 30 N
  - Disengagement Force < 20 N
  - Cable Retention: > 110 N
  - Durability: 250 cycles



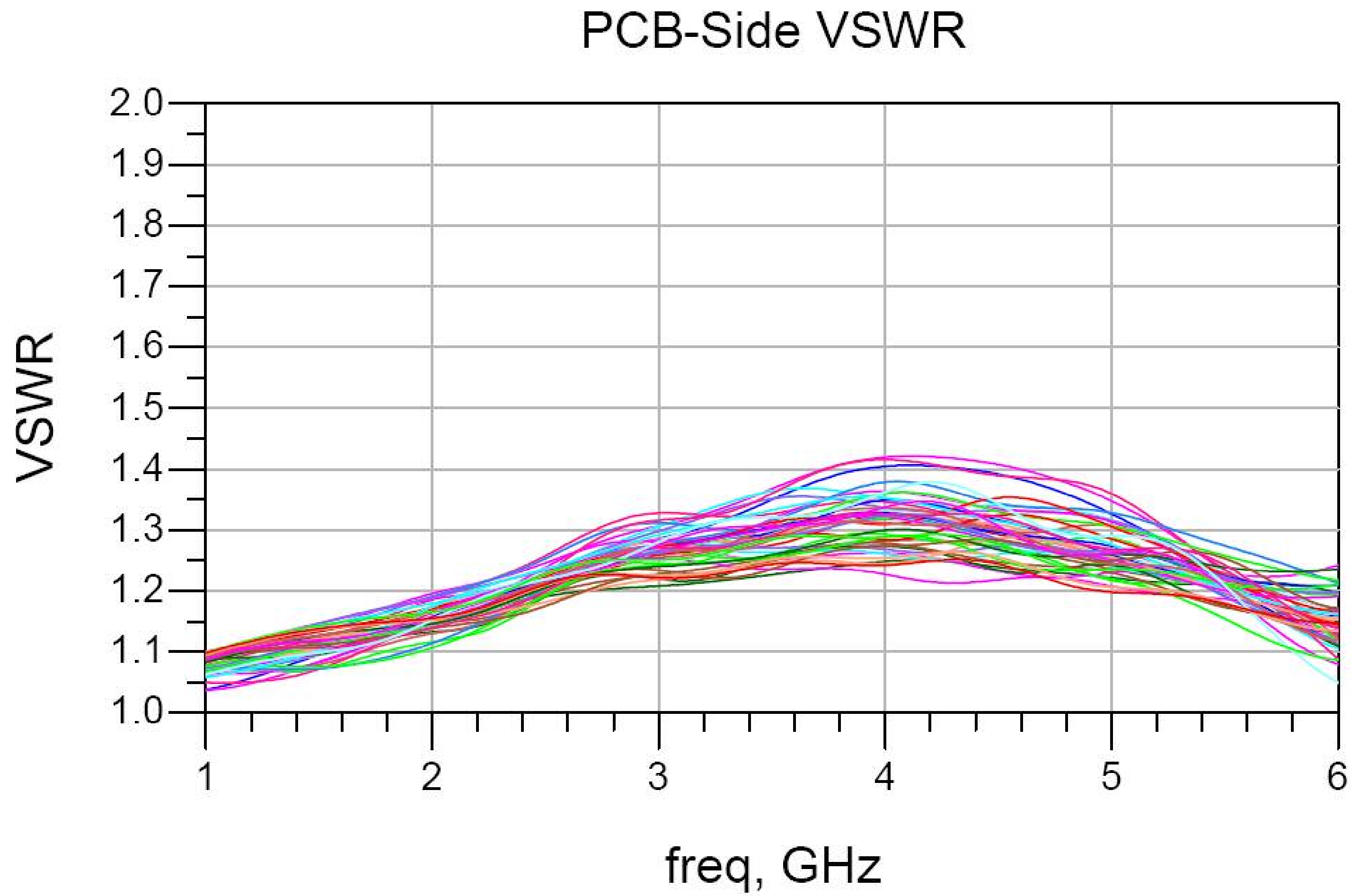
RF Stripline Connector

RF Characteristics



RF Stripline Connector

RF Characteristics



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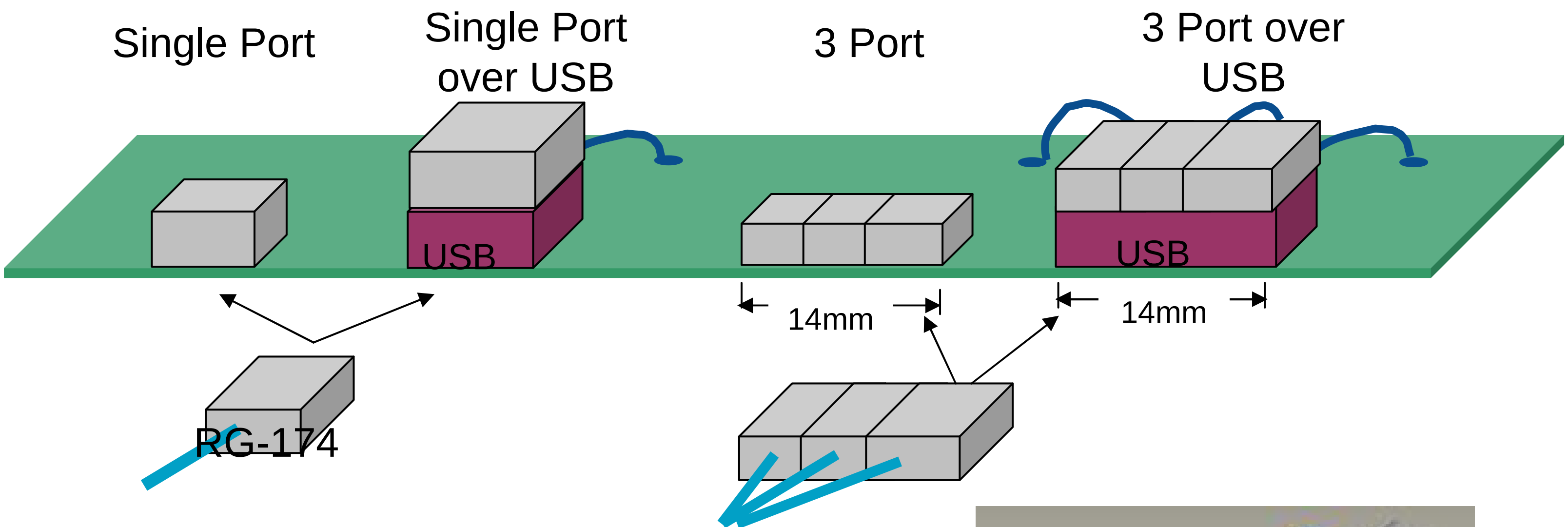
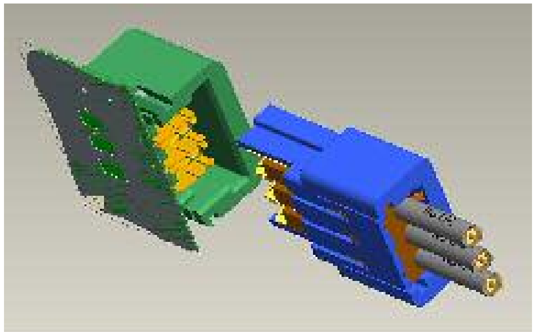
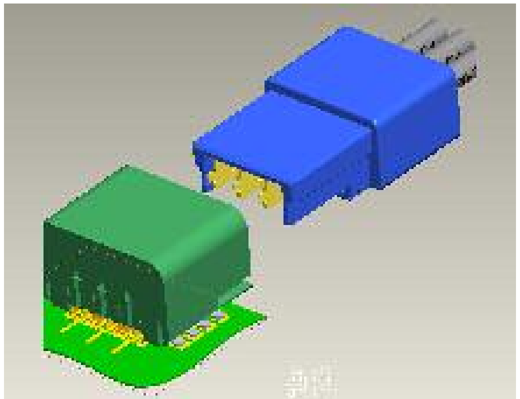
RF Stripline Connector - Ongoing Development

Addressing the need for multi-port configurations:







Tyco RF Connector Information

Catalogue/Datasheets

- 1307191 RF Catalogue
- 1-1773441-2 Compression Coax Conn
- 1903134-2 Stripline Coax Conn

Webpage

- www.tycoelectronics.com/products/rfcoax

Thank You!

Q&A Session Begins Now

Resources & Links:

http://www.ttiinc.com/object/ME_TS_20060405Resources