

smiths interconnect

SpaceNXT™ MWC Series

Ku-Band Multiway Isolated Splitter



SpaceNXT™ MWC Series

Ku-Band Multiway Isolated 1:2 Splitter



Smiths Interconnect's SpaceNXT™ MWC Series is part of an overarching initiative aimed at creating a broad range of high-reliability connectivity solutions that are readily available to the market and are pre-tested and qualified for next generation space applications. SpaceNXT™ solutions provide customers with high reliability technology while reducing their cost of ownership by shifting the testing responsibility away from them. This enables operators to overcome potential market entry barriers while enjoying the benefits of an established technology partner.

The SpaceNXT™ MWC Series is a 2-way Ku-Band isolated splitter that operates from 10.7 to 12.8 GHz. The current solution is qualified to operate in Ku-Band frequencies, however the processes and package are suitable from S to K-Band using a suite of existing modular designs. MWC Series is ideally designed to offer the commercial satellite uplink band (downlink also available) with specific attention to achieving phase stable output amplitude characteristics. It is suitable for a variety of space application from MEO/GEO satellites to deep space probes.

The MWC isolated splitter Series offers a compact and low mass structure featuring field replaceable connectors that can be adapted for alternative mechanical or electrical arrangements. It provides an insertion loss under 1.4 dB and ad inter channel isolation of 35dB. The devices are housed in an EMC shielded, RoHS compliant stackable aluminum casing and offer a factory configurable solution to operate as a combiner or a splitter.

Testing is performed in house and in compliance with general space qualification flows, incorporating industry-standard environmental requirements or custom screening and qualification flows provided by users as preferred.

Specifically designed and tested for space applications from MEO/GEO satellites to deep space probes

Product Features

- 2-port Ku-Band isolated splitter
- Operating from 10.7 to 12.8 GHz
- Return loss all ports 18 dB min
- Low insertion loss, <1.4 dB over temperature
- Independently isolated outputs
- Field replaceable SMA connectors
- EMC shielded, RoHS stackable housing
- Factory configuration to operate as a combiner or a splitter
- Qualified in accordance with a generic environmental test sequence. Test report available on request

Applications

- MEO/GEO satellites
- Deep space probes
- Ground support equipment, suitable for TVAC

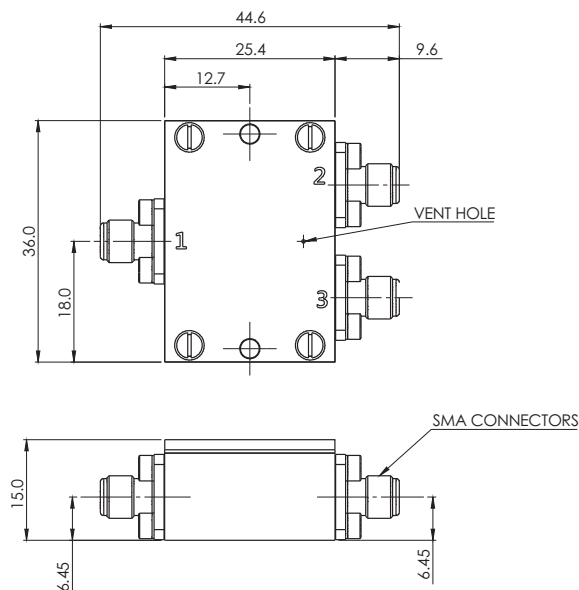
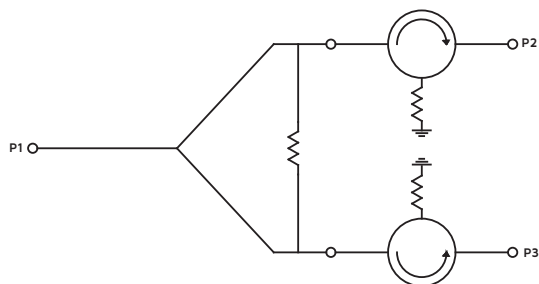
Technical Characteristics

Isolated 1:2 Splitter

Specifications



Frequency	10.70 – 12.80 GHz
Operating Temperature	-20°C to +70°C
Storage Temperature	-40°C to +85°C
Qualification Temperature	-25°C to +80°C
Isolation	20 dB min (P1 to P2 or P3) 35dB min (P2-P3, P3-P2)
Return Loss (50 Ohms)	18 dB min
Insertion Loss	1.40 dB max (over operating temperature)
Transmission Loss	4.4 dB max (includes coupling loss)
Transmission Loss Stability	0.45 dB max (over temperature and life)
Transmission Loss Flatness	0.08/100 dB/MHz max
Coupling Loss	3.0 dB nom
Power	1 Watt CW incident at P1
EMC	-80 dBi max
Mass	39g nom
Output Amplitude Balance	0.5 dB max
Phase Balance	+/- 10° max
Phase Stability vs Temperature	< 4° phase/15°
Group Delay Variation	5.0 ns
Material / Finish	Passivated Aluminium



Schematic of an Isolated Splitter and Combiner

Technical Characteristics

Isolated 1:2 Splitter

Qualification

Random Vibration (3-Axis)	Frequency	Level
	20 - 50 Hz	+6.0 dB/Octave
	50 - 600 Hz	0.5 g ² /Hz
	600 - 2000 Hz	-4.5 dB/Octave
	Overall	23.6 gRMS
	Duration	180 seconds in each of the 3 mutually perpendicular axes
Sine Vibration (3-Axis)	Frequency	Level
	5 - 22.6 Hz	6.4 mm (0.25 in.) (0-peak)
	22.6 - 50 Hz	13.0 g
	50 - 100 Hz	10.0 g
	Duration	Sweep rate 2 octave/min, 3 mutually perpendicular axes
Mechanical Shock	Frequency (Hz)	Level [SRS Q = 10]
	200	280 g
	850	1,260 g
	4,000	4,200 g
	10,000	4,200 g
	Number of events	3 shocks per axis (18 in total)

TVAC Test at Operational Qualification Temperature

Pressure in TVAC chamber to	1 x 10 ⁻⁶ Torr max
Temperature	-25°C and +80°C
Low Power	1 Watts CW at P1

Thermal Cycle (Non-Operating Temperature Limits)

Conditions	-25°C to +80°C 1 Hour dwell at each temperature extreme
Transition Rate	4°C per minute Nominal (52 mm Hg per second)
Relative Humidity	70%
Number of Cycles	50
Applicable Standard	MIL-STD-202 Method 7

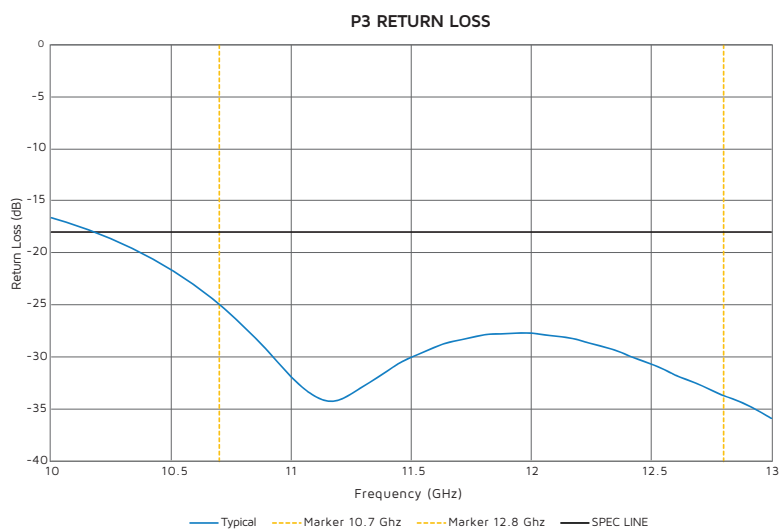
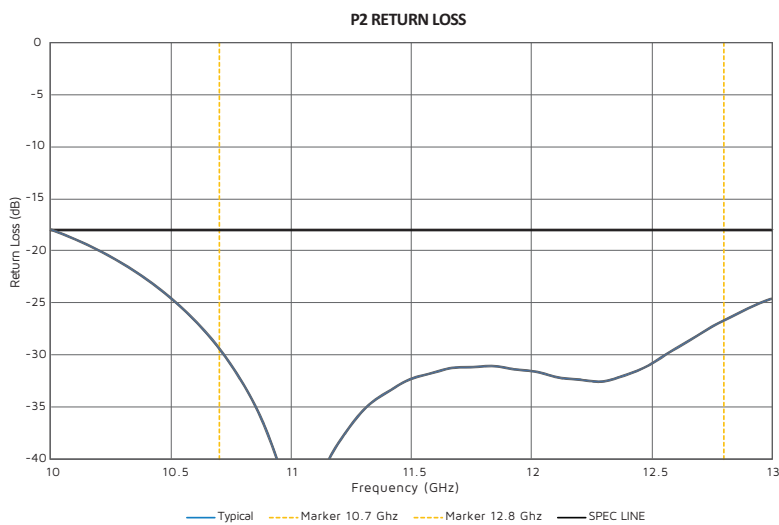
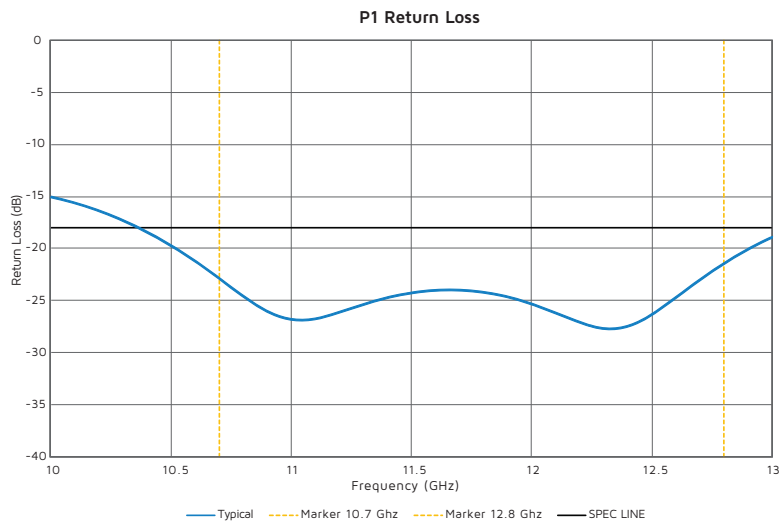
Particle Impact Noise Detection (P.I.N.D.)

Conditions	Ambient Temperature 40Hz
Acceleration	20g peak
Standard	MIL-STD-883

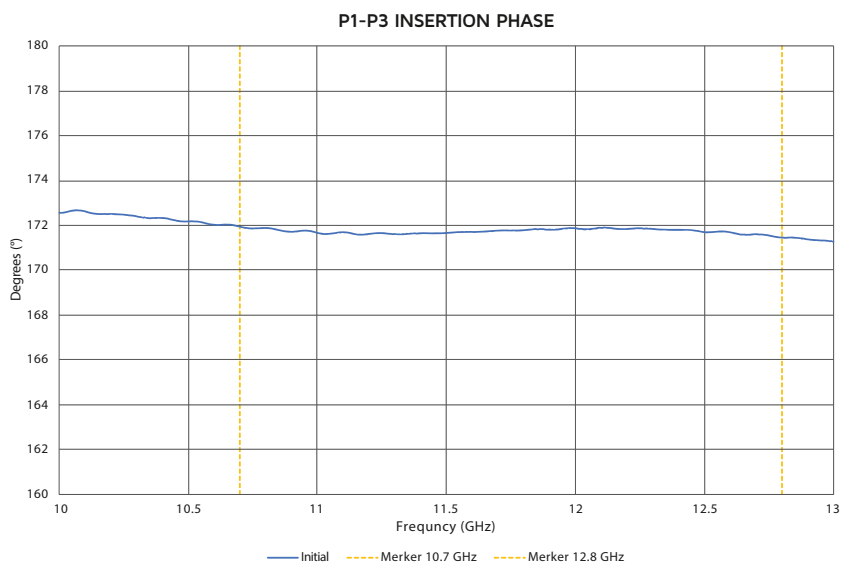
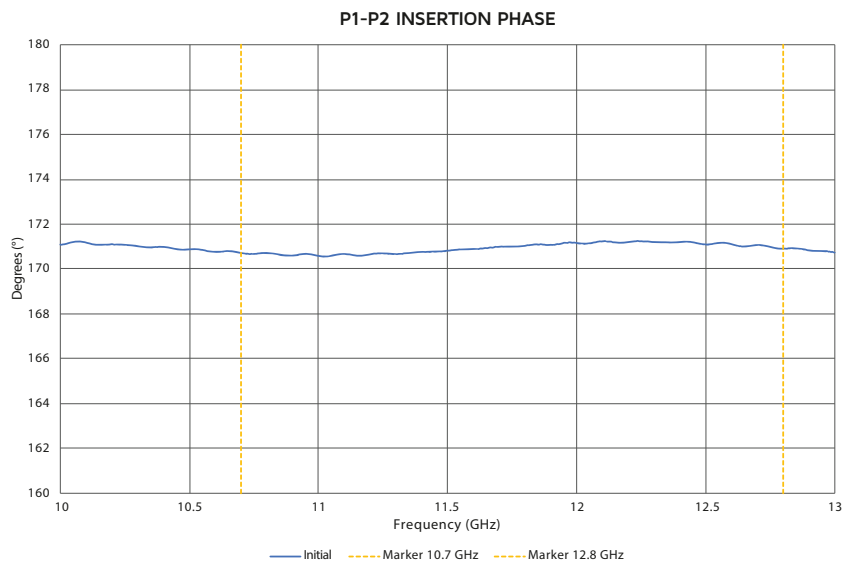
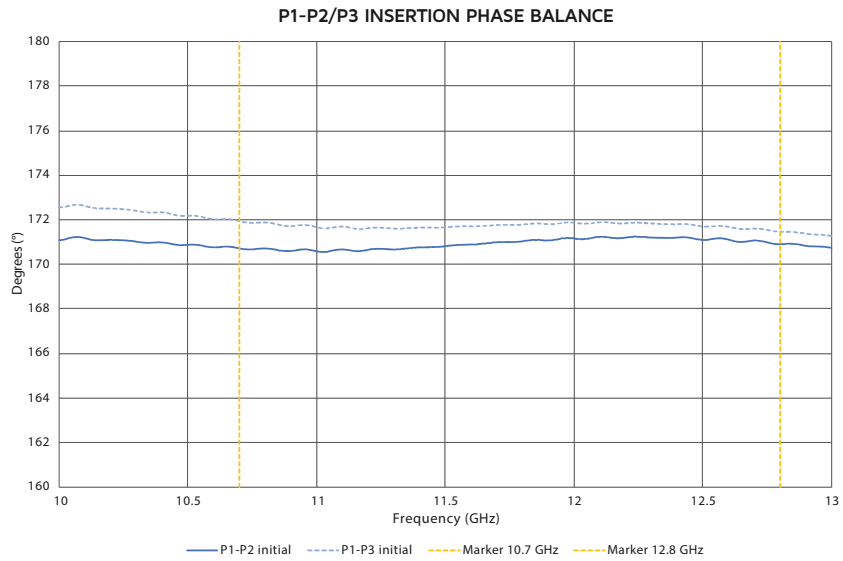
Technical Characteristics

Isolated 1:2 Splitter

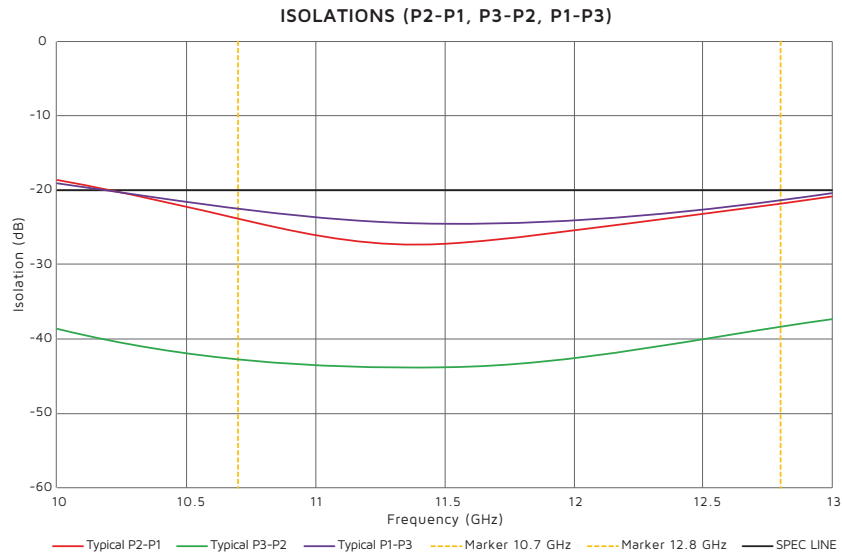
Ambient Test Results - Return Loss



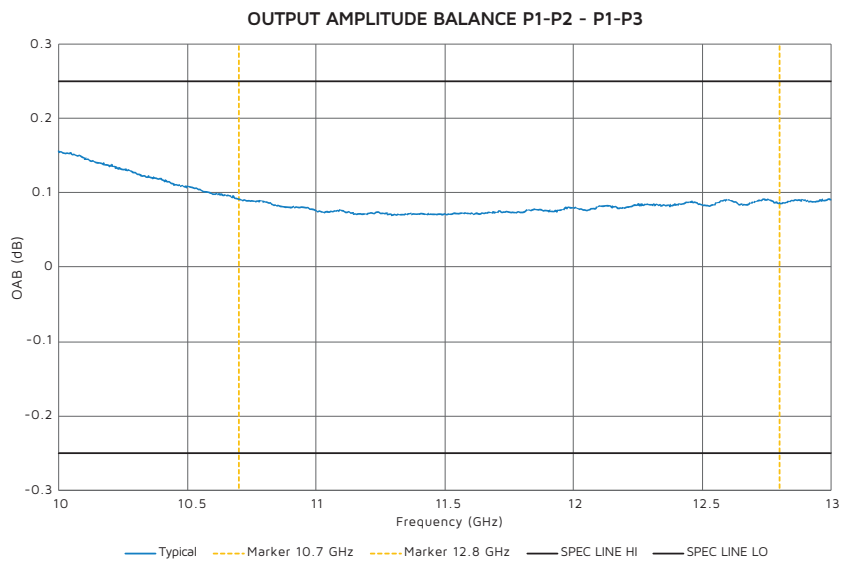
Ambient Test Results - Insertion Phase



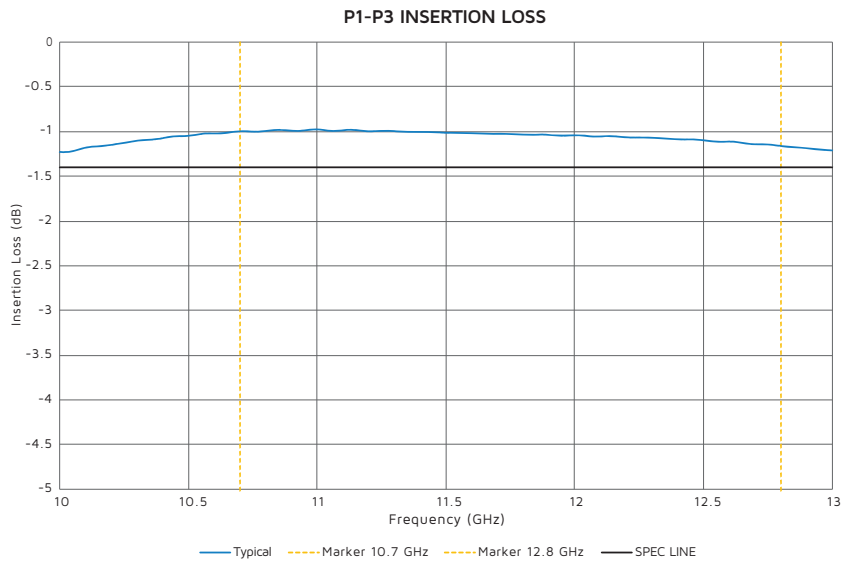
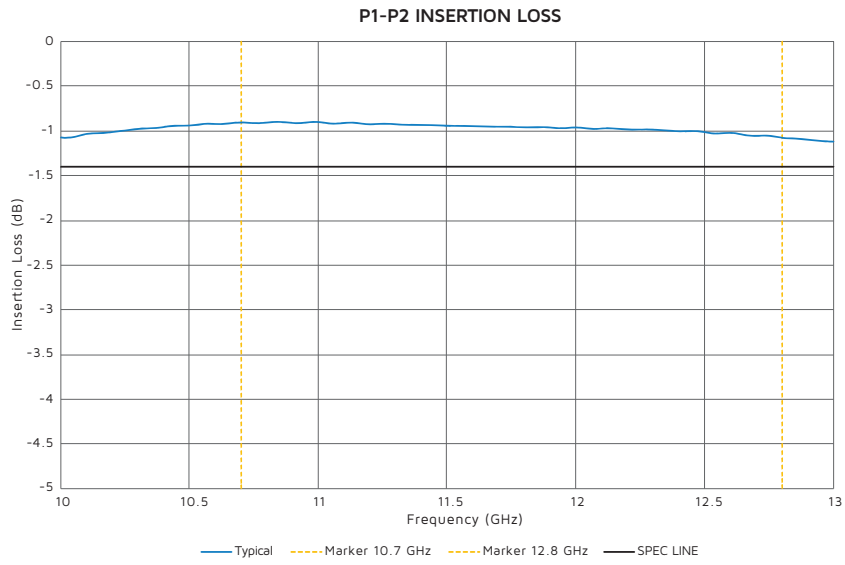
Ambient Test Results - Insertions



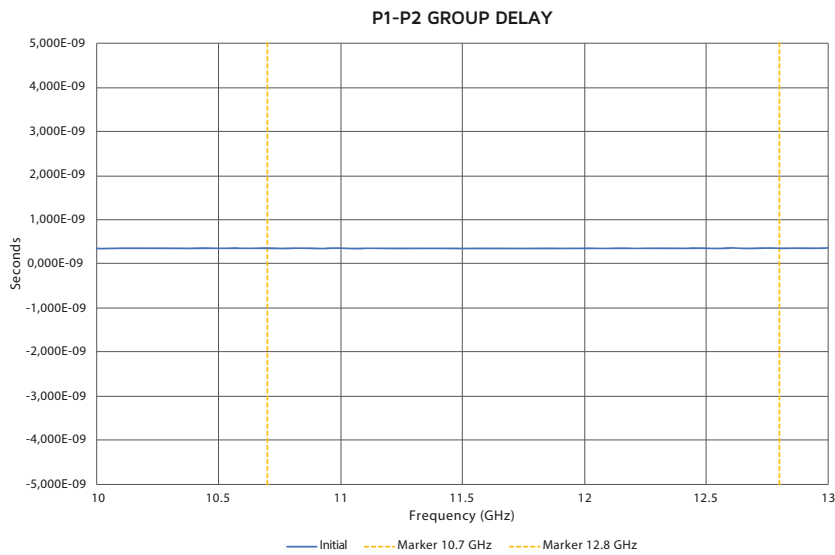
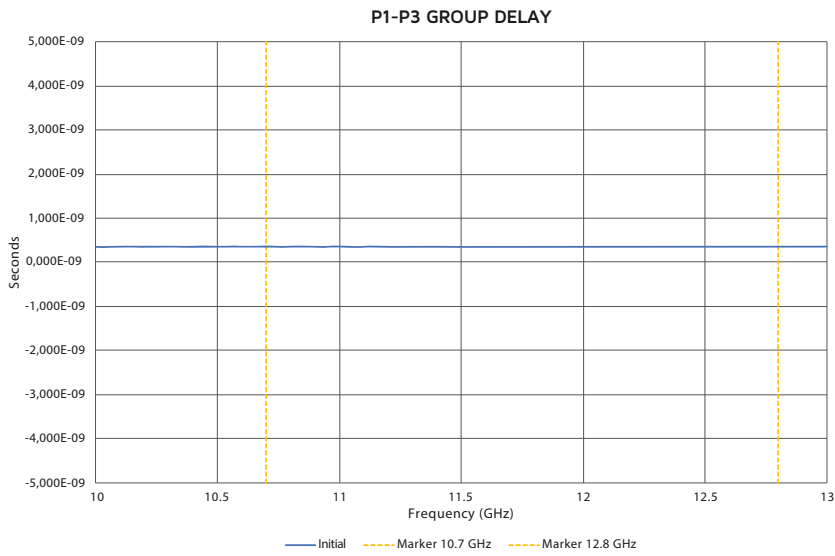
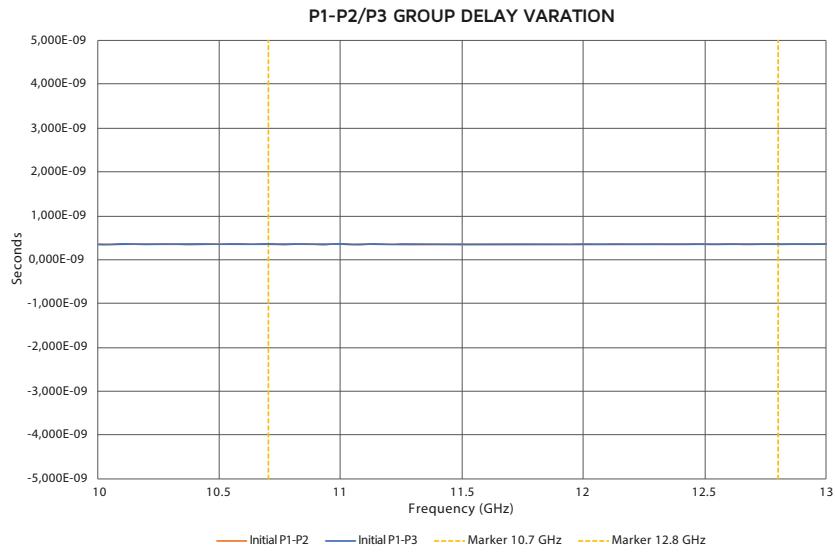
Ambient Test Results - Amplitude Balance



Ambient Test Results - Insertion Loss



Ambient Test Results - Group Delay



Disclaimer 2020

All of the information included in this catalogue is believed to be accurate at the time of printing. It is recommended, however, that users should independently evaluate the suitability of each product for their intended application and be sure that each product is properly installed, used and maintained to achieve desired results.

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