

Performance Specification: 20/26 GHz Coax Contacts & Modules

1. Scope

1.1 Content

This specification covers the performance, tests and quality requirements for VPC 20/26 GHz coax contacts and modules. These are separable electrical connection devices for assembly to coax cable. All VPC 20/26 GHz coax contacts are to be used with compatible VPC modules.

1.2 Qualification Testing

When tests are performed on a specific product line, the following procedures will be used: All inspections will be performed using applicable inspection plans and product drawings. Upon completion of qualification testing, this specification will be assigned a number and be classified, as a Product Qualification Report which will be identified in section 2.

2. Applicable Documents

2.1 Content

The following documents form a part of this specification to the extent specified. Unless otherwise specified, the latest edition of each document applies. In the event of a conflict between requirements of this specification and the product drawing, the product drawing will take precedence. In the event of a conflict between requirements of this specification and referenced documents, this specification will take precedence.

2.2 Documents

A. Standards

- EIA 364-09
- EIA 364-13
- EIA 364-108
- Mil STD 1344
- Mil STD 202

B. Product Qualification Reports

- TR2006-162
- TR2006-173
- TR2007-186
- TR2013-283
- TR2016-313
- TR2016-313

C. Product Drawings

Modules

- 510108240
- 510109298
- 510109296
- 510160114

- 510160115
- 510161115
- 510104281

Contacts

- 610102109
- 610102119
- 610102135
- 610102110
- 610102118
- 610102134



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3. Requirements

3.1 Design & Construction

Product is of design, construction and physical dimensions specified on applicable product drawings.

3.2 Materials

A. Female Contact

Shield:	Brass with gold over nickel plating
Shield Conductor:	Beryllium Copper with gold over nickel plating
Center Conductor:	Beryllium Copper with gold over nickel plating
Dielectric:	PTFE (polytetrafluoroethylene)

B. Male Contact

Shield:	Brass with gold over nickel plating
Center Conductor:	Beryllium Copper with gold over nickel plating
Dielectric:	PTFE (polytetrafluoroethylene)

C. Housing

Black PPS or FR4 Glass Filled Epoxy

3.3 Ratings

A. Impedance

50 Ohms

B. Frequency Range

DC – 26 GHz
Dependent upon RF cable and other connectors

C. Temperature

-55°C to +125°C

3.4 Performance & Test Description

Product is designed to meet electrical, mechanical, and environmental requirements specified in Table 3.5. Unless otherwise specified, all tests should be performed in ambient environmental conditions.



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3.5 Test Requirements & Procedures Summary

TABLE 3.5	TEST DESCRIPTION	REQUIREMENT	PROCEDURE
PRELIMINARY	Examination of Product	Meets requirements of product drawing	Visual, dimensional, and functional examination per applicable quality inspection plan
	ELECTRICAL	Initial Contact Resistance	5 mΩ center contact max 3 mΩ shield contact max
Current Rating		5 Amp DC max	Material Specification
ELECTRICAL	Dielectric Withstanding Voltage	800 V rms shield to center conductor	EIA-364-20: Application of voltage between conductors and in module between contacts for 60 seconds with current level ≤ 0.5 mA
		1000 V rms between contacts in module	
	Insulation Resistance	2000 MΩ min.	EIA 364-21: Testing between adjacent contacts assembled in module at 500VDC
	Insertion Loss	.06x√f(GHz) dB Single Contact	Measurement with Network Analyzer
	Impedance	50 Ohms	Characteristic Impedance
	Crosstalk/Isolation	≤ 90dB	Crosstalk between adjacent contacts assembled in module
	VSWR	1.15+0.01(f) GHz Single Contact	Measurement with a Network Analyzer. Cable type dependent.
	Frequency Range	DC to 26 GHz	Measurement with Network Analyzer
MECHANICAL	Durability	20,000 cycles	EIA-364-09: Mating and unmating of sample
	Mating Force	≤ 3.0 lbs.	EIA-364-13: Measurement of force necessary to mate samples at a normal rate of engagement of the ITA, Repeat sequence for unmating
	Unmating Force	≤ 4.0 lbs.	
	Axial Mating	.090 inch max	Axial mating tolerance
ENVIRONMENTAL	Operating Temperature Range	-55°C to +125°C	Material specifications



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3.6 Product Qualification & Requalification Test Sequence

	TEST OR EXAMINATION	TEST GROUP		
		I	II	III
TABLE 3.6	Examination of Product	1	1	1
	Termination Resistance	4	2,9	
	Current Rating		4	6
	Dielectric Withstanding Voltage	2	5	7
	Insulation Resistance	3		8
	Frequency Range	6		
	Insertion Loss	5	3,10	
	VSWR			4
	Durability		8	
	Mating Force		6,11	2
	Un-mating Force		7,12	3
	Crosstalk			5

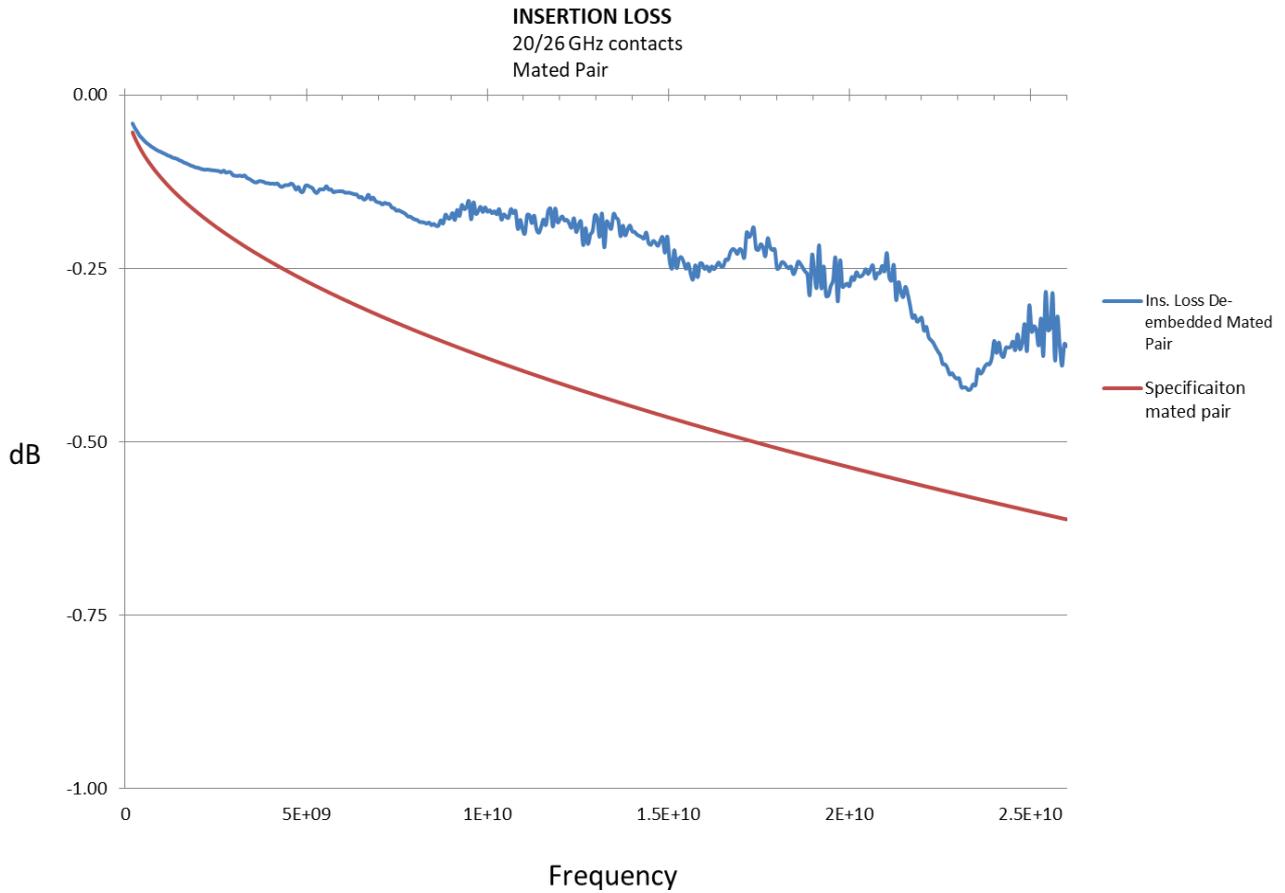
*Test Sequence: Numbers indicate the sequence in which the tests are performed. For test group sample selection process see 4.1 A.



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3.7 Insertion Loss

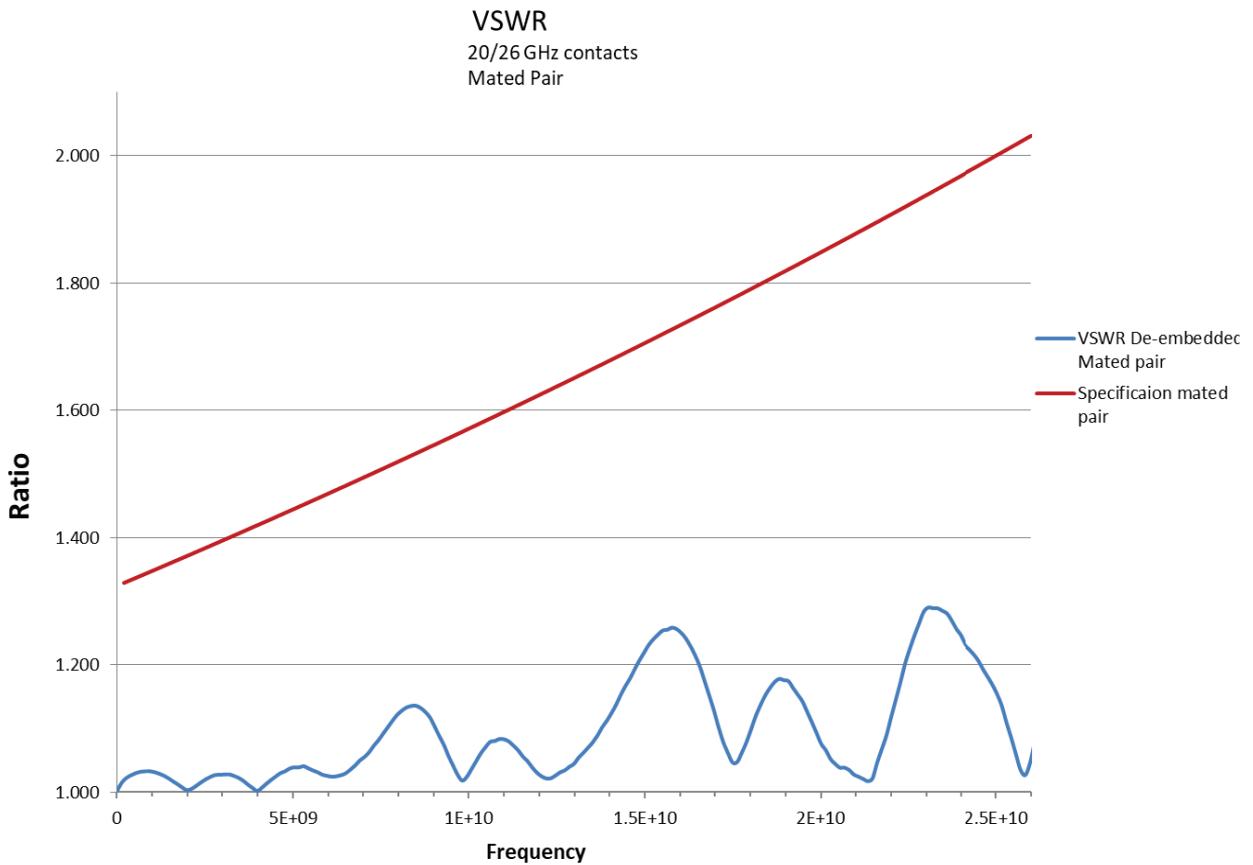
Figure A. De-embedded mated contact pair- (Receiver and ITA)



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3.8 Voltage Standing Wave Ratio (VSWR)

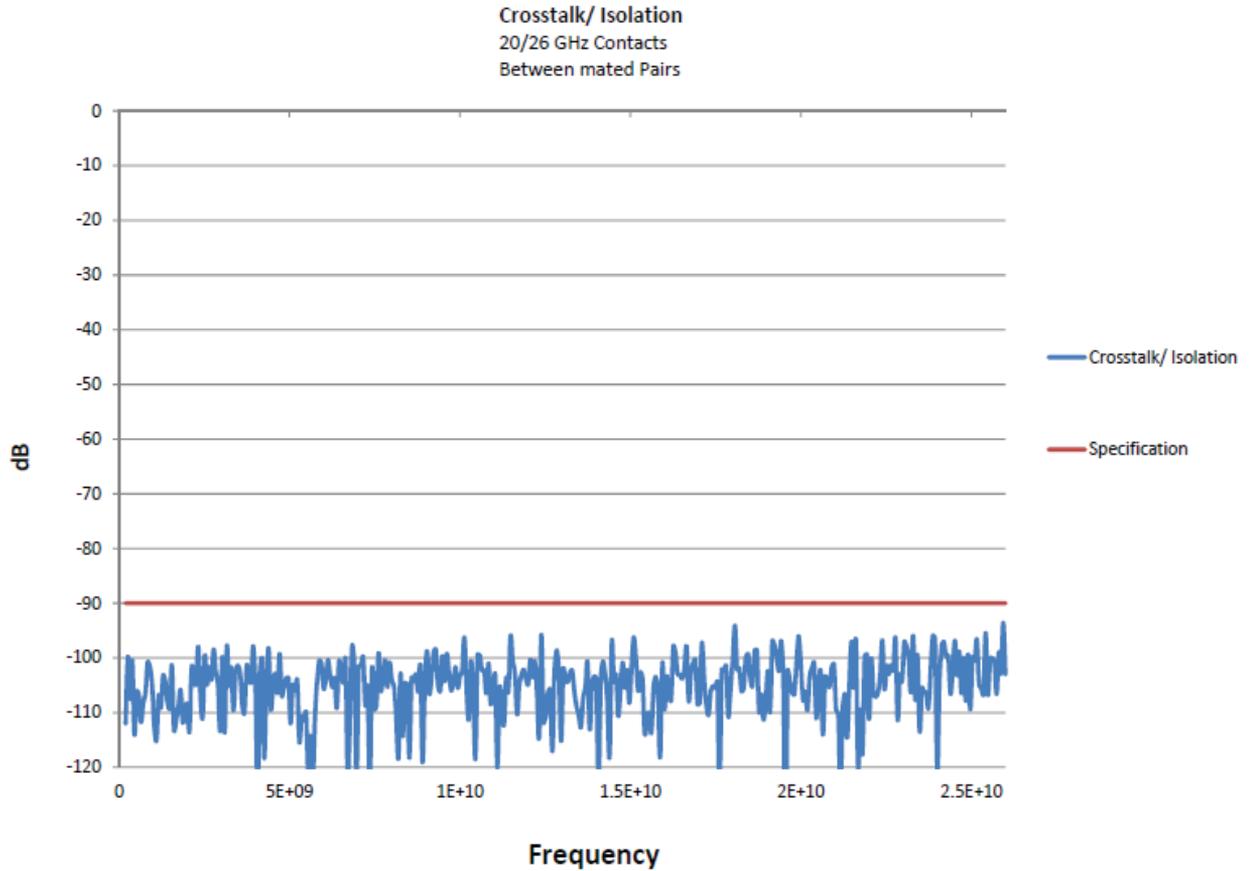
Figure A. De-embedded mated contact pair- (Receiver and ITA)



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3.9 Crosstalk/ Isolation

Figure A. De-embedded mated contact pair- (Receiver and ITA)



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4. Quality Assurance Provisions

4.1 Qualification Testing

A. Sample Selection

Samples are to be prepared in accordance with applicable instruction sheets and are to be selected at random from current production.

B. Test Sequence

Qualification inspection will be verified by testing samples as specified in Figure 3.5.

4.2 Requalification Testing

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance will coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

4.3 Acceptance

Acceptance is based on verification that product meets requirements of Figure 3.5. Failures attributed to equipment, test set-up or operator deficiencies will not disqualify product. When product failure occurs, corrective action will be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4 Quality Conformance Inspection

A Certificate of Conformance (C of C) dimensional inspection must be completed for all samples prior to Qualification testing. The applicable quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements will be in accordance with applicable product drawing and this specification.

