

Section VII.2



Standard Product Specifications

1. Cable Specifications	187
2. Connector Specifications	199
3. Connector Codes	203
4. Interface Mating Dimensions	207













Connector Specifications (Example)



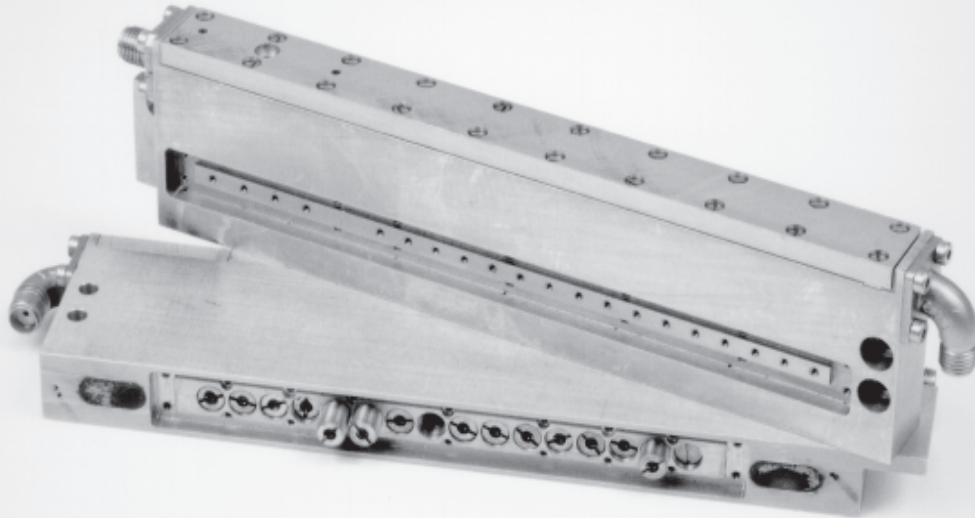
The specifications below are general specifications for connectors. Specific Data for VSWR, Insertion loss, R.F. leakage etc., are available from the factory upon request. Specifications in the following table are recommended for any procurement documents or drawings. In the event of any conflict between these specifications and other documentation, these specifications shall govern. These specifications are subject to change according to the latest revision.

REQUIREMENT	GENERAL SPECIFICATIONS
GENERAL	
Standard Materials	STEEL corrosion resistant 1.4305 per DIN 17440 (QQ-S-764, class 303 or ASTM-A-582-80). ALUMINUM AlMg4.5Mn per DIN 1725, AlMgSi0.5 per DIN 1725, AlMgSi1 per DIN 1725 (6061-T6 per QQ-A-225/8). BRASS CuZn39Pb3 per DIN 17660 (QQ-B-626, half hard). COPPER BERYLLIUM 33-25 CuBe2Pb H per DIN 17666 (QQ-C-530). TFE Fluorocarbon per DIN 52900 (MIL-P-19468 and L-P403). SILICONE RUBBER per DIN 3771 (MIL-R-5847 and ZZ-R-765, Class II B,) Grade 65 - 75. BORRIUM NITRITE Dielectric for high power applications per inhouse specification.
Finish for COPPER BERYLLIUM STAINLESS STEEL ALUMINUM BRASS VARIOUS	Center Contacts shall be gold plated to a minimum thickness of .00005 inch (1.27 µm) in accordance with MIL-G-45204, Type II, Grade C. shall be passivated per QQ-P-35. Conductive Parts shall have an iridited finish per MIL-C-5541. Other parts, such as Coupling Nuts and Back-Bodies shall be anodized per MIL-A-8625. .00003 inch (0.8 µm) min. gold plating per MIL-G-45204, or nicle plating per QQ-N-190, as specified. Imoloy .0001 inch (2.5 µm) min. plating, consisting of 55% Copper / 20% Zinc / 25% Tin (on special request).
Design	The design shall be such that the outline dimensions in this catalog are met. In addition, the assembled connector shall meet the interface dimensions.
ELECTRICAL	
Frequency Range Insulation Resistance Voltage Standing Wave Ratio (VSWR) Contact Resistance Dielectric Withstanding Voltage RF High Potential Withstanding Voltage RF Leakage Insertion Loss	Please refer to the appropriate data sheet as shown in: "The '97 Handbook Adapters" and "The '98 Handbook Microwave Connectors".
MECHANICAL	
Connector Durability Cable Retention Force Coupling Nut Retention Force Force to Engage and Disengage Longitudinal Force max. Mating Characteristics Recommended Mating Torque	Please refer to the appropriate data sheet as shown in: "The '97 Handbook Adapters" and "The '98 Handbook Microwave Connectors".
ENVIRONMENTAL	
Corrosion (Salt Spray) Vibration Shock Thermal Shock Moisture Resistance	Specification MIL-STD-202, Method 101, Test Condition B. The salt solution shall be 5%. Specification MIL-STD-202, Method 204, Test Condition B. Specification MIL-STD-202, Method 213, Test Condition 1. Specification MIL-STD-202, Method 107, Test Condition B, except high temperature shall be + 200°C. Specification MIL-STD-202, Method 106. Step 7b (vibration) shall be omitted. Insulation resistance shall be 200 megohms min. within 5 minutes of removal from humidity.

All the connectors manufactured and used by Spectrum Elektrotechnik GmbH, if not specified differently in the order, will meet the following standard specifications:

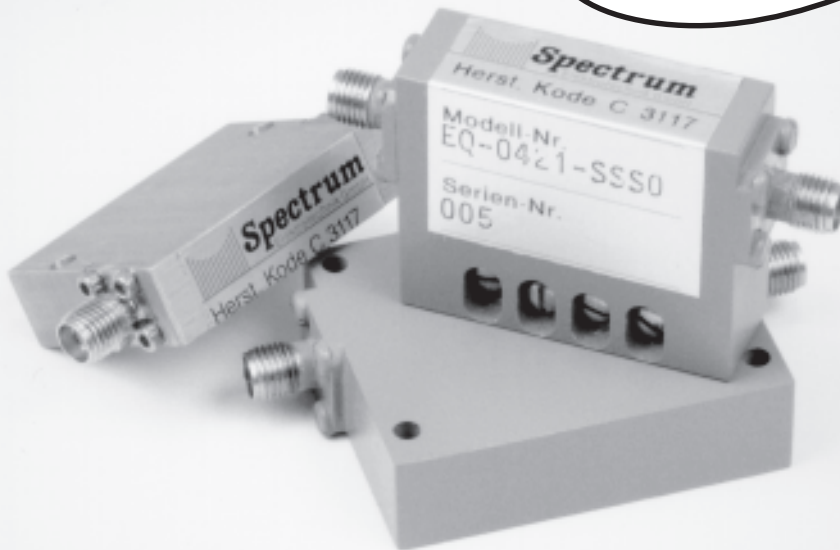
1.4/4.4	DIN 47298
1.8/5.6	DIN 47226
2/5.5	 Spectrum Specifications
2.4mm	 Spectrum Specifications
3.5mm	 Spectrum Specifications
7mm	IEC 457-2
7/16	DIN 47223
BMA	 Spectrum Specifications
BNC	MIL-C-39012 (IEC 169-2)
C	MIL-C-39012 (IEC 169-7)
HN	MIL-C-3643
K*	 Spectrum Specifications
N	MIL-C-39012
N 75 Ohms	 Spectrum Specifications
SBX	 Spectrum Specifications
SBY	 Spectrum Specifications
SC	MIL-C-39012
SMA	MIL-C-39012
SSMA	 Spectrum Specifications
SMB	MIL-C-39012
SMC	MIL-C-39012
SMP	DESC 94007 and DESC 94008
SMP Test Connector	 Spectrum Specifications
SPM	 Spectrum Specifications
TNC	MIL-C-39012 or MIL-C-87104/2
TNX	 Spectrum Specifications

The Specifications listed above are available upon request. The Specifications are also shown in full detail in "The '97 Handbook Adapters", and "The '98 Handbook Microwave Connectors". The Handbooks can be supplied free of charge. Connectors that do not meet the appropriate specifications can ruin the mating connectors, test sets, etc.



Gain Amplitude Equalizers

Please refer to
"The '98 Handbook
Passive Components"



Section VII.3

Standard Product Specifications

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Connector Codes



INTRODUCTION: Spectrum Elektrotechnik GmbH has set up an easy to use part number system. The customer can compose his part number, describing completely the component he is ordering. The table below explains the system and describes the possible alternatives.

THE CONNECTORS: The six letters **JKL** and **MNO** in the part number, as shown in the part number system below, are to be replaced with the two or three digit codes, identifying the connector configuration. The possible connector configurations and its codes are listed on the next two pages, identifying a large variety of connectors. If you require these connectors at your cable assembly, then just simply replace the letters **JKL** and **MNO** with their appropriate code. The code does not necessarily have to be of three digits, it also can be two digits only. Besides regular connectors you may require one or both ends of the cable assembly to be supplied with **Push-On Connectors**, either in locking, or non locking configuration. The Push-On with locking mechanism is preferred where the cable assembly is connected to the device under test and has to remain there safely for some time. For short term testing, when the assembly is only connected for seconds, the non-locking Push-On Connector may be chosen. For additional information on **Push-Ons** please refer to pages 163 f.f.

If you require **Interchangeable Connectors** on one or both ends of the cable assembly, it needs to be supplied with the **Primary Unit 'PU'** on those ends. In no time the Interchangeable Connectors of the required series, male or female, can be mounted then, as needed for the application. **Primary Units** have been developed for the Phase Stable ANA Test Cable of Type 22, and as well as for a variety of other Test Cables Spectrum Elektrotechnik GmbH is offering, such as the cables of Types 10, 14 17, 100 and 140. The Interchangeable Connector Heads are available in most popular connector series, such as 7mm, N, SMA and TNC. All these connector heads, although of different connector series, are of the same electrical length (exception: the short Nf). For additional Information please refer to pages 153 f.f.

If you are specifying a **Phase Stable Cable** assembly, and you require one end of the assembly to be terminated with an NMD 2.4mm, 2.9mm, 3.5mm, or N. Please refer to page 173 f.f. for additional information and the appropriate connector code.

THE CABLE: The first three letters in the part number, **ABC**, are used to identify the cable by its code. The cable code does not necessarily have to be of three digits, it also can be two digits only. Some cables are listed on pages 187 f.f. Full data on those cables and additional information on other cables, armouring, etc. can be obtained from "The '97 Handbook Cable Assemblies".

THE ARMORING: For strenuous applications or harsh environment, armoring of the cable may be needed. A variety of armors are available as standard, as outlined in "The '97 Handbook Cable Assemblies". The Customer may replace the **D** in the part number with the code for the armor requested, or he may rely on Spectrum's suggestions by replacing the **'D'** with a temporary code **'A'**. Spectrum will then change that temporary code **'A'** with the appropriate code, describing the armor recommended.

THE LENGTH: The letters **EFGH** are describing the length of the cable in millimeters, from reference plane to reference plane of the connectors. For lengths longer than 9999mm (10m), three digits with a leading **'d'** are used to identify the length in decimeters (dm). Example: for a cable length of 30 meters the length code will be **'d300'**.

A	B	C	D	-	E	F	G	H	-	J	K	L	-	M	N	O
Cable Code			Armoring		Length					Connector Code				Connector Code		

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Type	Sex	Description	Remarks	Code	Finish	
1.4/4.4	Connector	straight		03	silver plated Brass	
1.8/5.6	Male	straight		07	gold plated Brass	
		Right Angle		05		
	Female	straight		04		
		Right Angle		06		
2/5.5	Male	Right Angle		02	anodized aluminum	
2.4 mm	Male	straight	Maxi-Nut	HM	passivated Stainless Steel	
			NMD	M2		
		2-Hole Flange Mount		H2M		
	Female	straight	HP-direct connection	HN		
		Bulkhead Feedthrough		HF		
		2-Hole Flange Mount		H2		
		4-Hole Flange Mount		HB		
				HF2		
				HF4		
3.5 mm	Male	straight	Maxi-Nut	91	passivated Stainless Steel	
			NMD	M3		
				H3M		
	Female	straight	HP-direct connection	92		
		direct Connection		H3		
		Bulkhead Feedthrough		92B		
		2-Hole Flange Mount		922		
				924		
				924		
7 mm	Connector	straight, 4 equally spaced Contact slots	Interchangeable Connector	E90	passivated Stainless Steel	
				90		
		straight, 6 equally spaced Contact slots	Interchangeable Connector	E96		
				96		
7/16	Male	straight	PUSH-ON, Locking	7SB	silver plated Brass	
					7S	passivated Stainless Steel
			PUSH-ON, NON-Locking	7N	silver plated Brass	
					7NB	
	Female	straight			75	passivated Stainless Steel
			Bulkhead Feedthrough		76	
			4-Hole Flange Mount		753	
				754		
BMA	Male	Bulkhead Feedthrough		BM	passivated Stainless Steel	
		2-Hole Flange Mount		BF		
	Female	Bulkhead Feedthrough		BB		
		straight		BW		
BNC	Male	straight		71	nickel plated Brass	
	Female	straight		81		
C	Male	straight		88	passivated Stainless Steel	
	Female	straight		89		
HN	Male	straight		69	passivated Stainless Steel	
		Right Angle		67		
	Female	straight		68		
K*	Male	straight	Regular length	KM	passivated Stainless Steel	
			Maxi-Nut	MK		
			Short	KMS		
			NMD	WIM		
	Female	straight	Wiltron direct connection	KF		
			Bulkhead Feedthrough	WI		
			2-Hole Flange	KFB		
			4-Hole Flange	KF2		
				KF4		
N	Male	straight	PUSH-ON, Locking	NSB	silver plated Brass	
			PUSH-ON, NON-Locking	NNB		
			PUSH-ON, Locking, Double "D"	NDB		
			PUSH-ON, Locking	NDS		
			PUSH-ON, Locking	NS		
			PUSH-ON, NON-Locking	NN		
			Hexagonal Knuri Nut	510		
				51		
			Interchangeable Connector	E51		
			High Power	51H		
	Female	Right Angle			55	passivated Stainless Steel
					61	
			Interchangeable Connector	E61		
			High Power	E62		
			High Power	61H		
			straight	63		
			Bulkhead Feedthrough	Right Angle	5A	
		5B				
4-Hole Flange Mount	straight			65		
				5C		
		Right Angle		5C		
SBX	Male	straight		XM	passivated Stainless Steel	
	Female	straight		XF		
SBY	Male	straight		YM	passivated Stainless Steel	
	Female	straight		YF		

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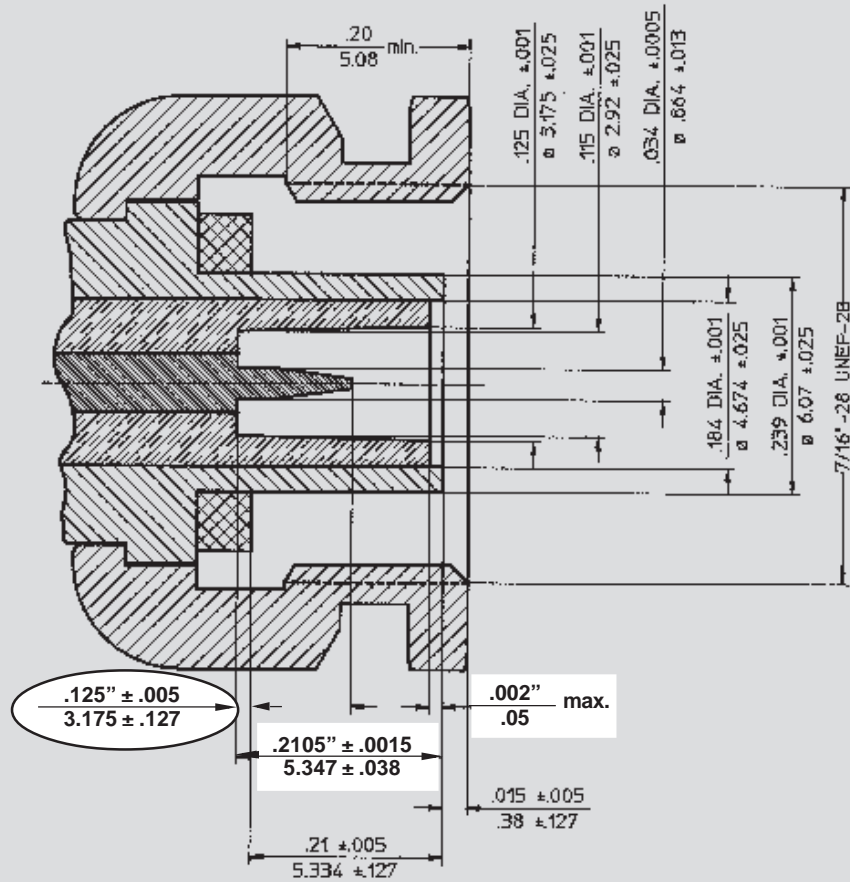
* 'K' Connector is a trademark of Wiltron Company.

Connector Selection Chart 50 Ω



Type	Sex	Description	Remarks	Code	Finish			
SC	Male	straight		80	passivated Stainless Steel			
		Right Angle		77				
		straight	High Power	80H				
	Female	straight		79				
		Bulkhead Feedthrough		78				
SMA	Male	straight	High Power	79H	passivated Stainless Steel			
			Across Flats	1S				
			Maxi-Nut	MA				
			PUSH-ON, NON-Locking	SM				
			PUSH-ON, Locking	SML				
			Phase Adjustable	PH				
			Regular	11				
			Interchangeable Connector	E11				
			Short	11S				
			Short	10S				
			Regular	10				
			Low Cost	101				
			Right Angle	DC-12.0 GHz		Regular	14	gold plated Stainless Steel
						Short	15	
						Long	151	
	DC-18.0 GHz	Regular (w/o wire holes)		152				
		Short (w/o wire holes)		153				
		Long (w/o wire holes)		153				
	Radius Right Angle	DC - 25.0 GHz	Regular (with wire holes)	154	passivated Stainless Steel			
			Short (with wire holes)	155				
			Long (with wire holes)	156				
		Long	17L					
		DC - 25.0 GHz	Regular	17				
		DC - 25.0 GHz	Long	16				
	Female	straight	DC - 18.0 GHz	20	gold plated Stainless Steel			
			Interchangeable Connector	21				
			Interchangeable Connector	E21				
		Bulkhead Feedthrough	DC - 18.0 GHz		23	passivated Stainless Steel		
					22			
					24			
				25				
				27				
				26				
4-Hole Flange Mount		DC - 18.0 GHz		18R	gold plated Stainless Steel			
				18L				
				18				
2-Hole Flange Mount		DC - 18.0 GHz		19	passivated Stainless Steel			
				19				
				19				
Right Angle	DC - 25.0 GHz	Regular	28	gold plated Stainless Steel				
		Long	28					
Radius Right Angle	DC - 25.0 GHz		28	gold plated Stainless Steel				
			19					
SMB	Male	straight	DC - 4.0 GHz	MB	gold plated Brass			
	Female			FB				
SMC	Male	straight	DC - 10.0 GHz	MC	gold plated Brass			
		Right Angle		CW				
	Female	straight		FC				
SMP Test Connector	Male	straight	DC - 40.0 GHz	TMJ	passivated Stainless Steel			
	Female			TMP				
SMP	Male	straight	DC - 40.0 GHz	MJ	passivated Stainless Steel			
	Female	straight	DC - 18.0 GHz	MP				
		Right Angle		MPR				
SPM	Male	straight		PM	passivated Stainless Steel			
		straight		PJ				
	Female	Bulkhead Feedthrough		PGF				
		2-Hole Flange Mount		PG2				
		4-Hole Flange Mount		PG4				
SSMA	Male	straight		SSM	passivated Stainless Steel			
	Female			SSF				
TNC	Male	straight	PUSH-ON, Locking	TS	passivated Stainless Steel			
			PUSH-ON, NON-Locking	TN				
			Interchangeable Connector	31				
			Interchangeable Connector	E31				
			High Power	31H				
	Right Angle	straight	High Power	35	gold plated Stainless Steel			
				40				
				41				
			Interchangeable Connector	E41				
			High Power	41H				
	Female	Bulkhead Feedthrough	High Power	43	passivated Stainless Steel			
				45				
				44				
			Interchangeable Connector	44				
			High Power	44				
4-Hole Flange Mount	straight		45	gold plated Stainless Steel				
			44					
			44					
Radius Right Angle	DC - 25.0 GHz		46	gold plated Stainless Steel				
			46					
TNX	Male	straight		39	passivated Stainless Steel			
	Female			49				

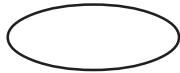
Section VII.4



Standard Product Specifications

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2. Connector Specifications	199
3. Connector Codes	203
4. Interface Mating Dimensions	207

Complete interface dimensions of the connectors are shown in this chapter. The important measurements are marked clearly for every connector series:



Dimensions, highlighted in an oval shape, are recommended for verification as a minimum. The connector gauges measuring these dimensions are included in the Expanded Calibration Kit and the Professional Kit as well.



Dimensions, highlighted in a rectangular shape are recommended for verification in addition to the dimensions highlighted in an oval shape. Checking all these dimensions will guarantee optimum performance of the connectors. The necessary connector gauges to measure all those dimensions are included in the Professional Calibration Kit only.

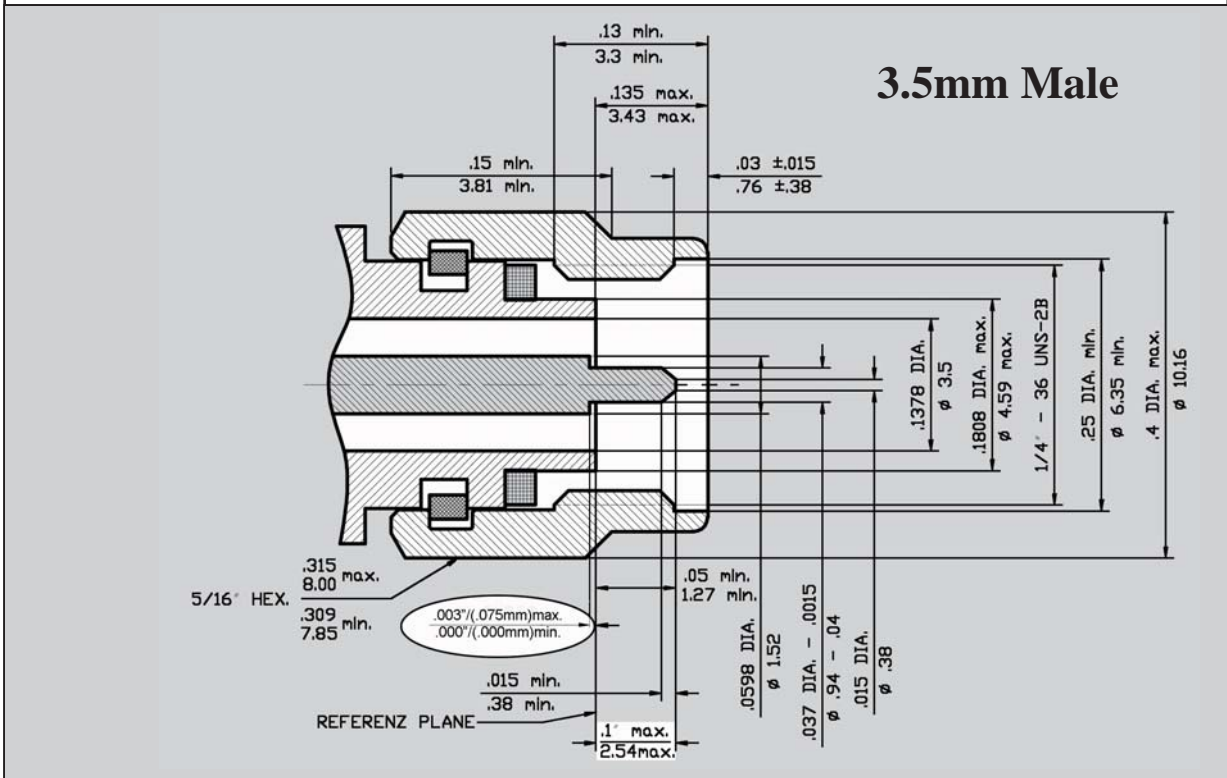
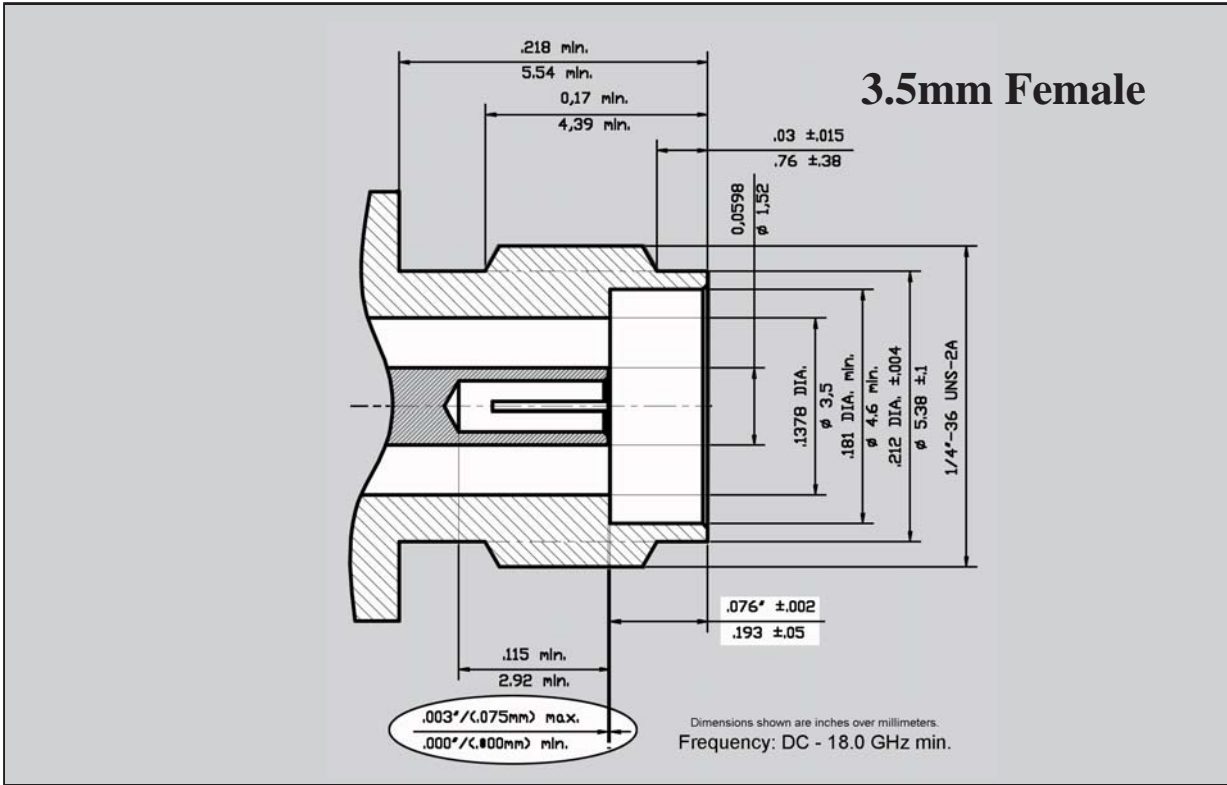
Testing the interfaces of connectors and adapters upon incoming inspection is not only highly recommended, it is definitely a necessity. Interfaces not meeting specification will lead to degraded specification of the components. In addition: These out of specification interfaces may damage the connectors of mating components or ruin the connectors of the test equipment.

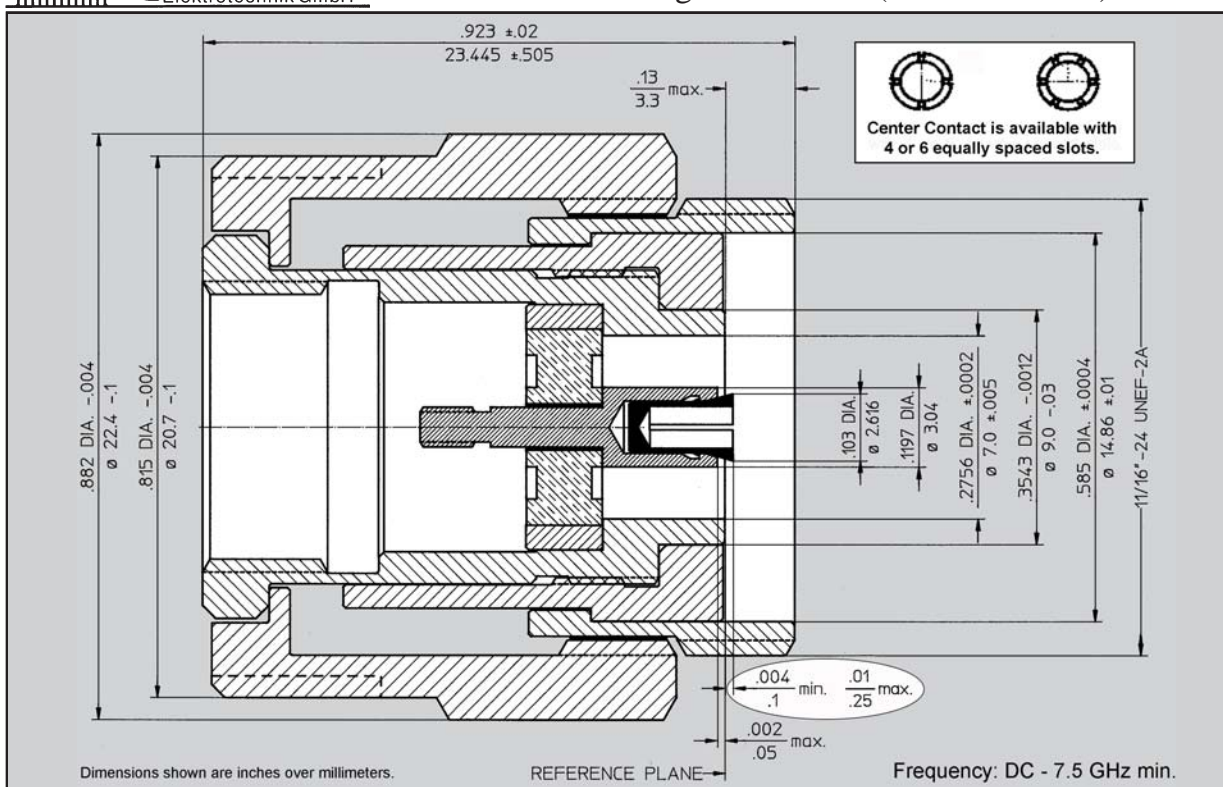
Spectrum Elektrotechnik GmbH manufactures a comprehensive line of connector gauges for measuring the critical interface dimensions of coaxial connectors. These connector gauges consist of an especially adapted dial indicator with appropriate bushings and pins that are designed to mate with the specific connector under test. The indicator is zero set by a calibration block (master). When engaged to a connector, it measures the specific interface dimension from a reference plane.

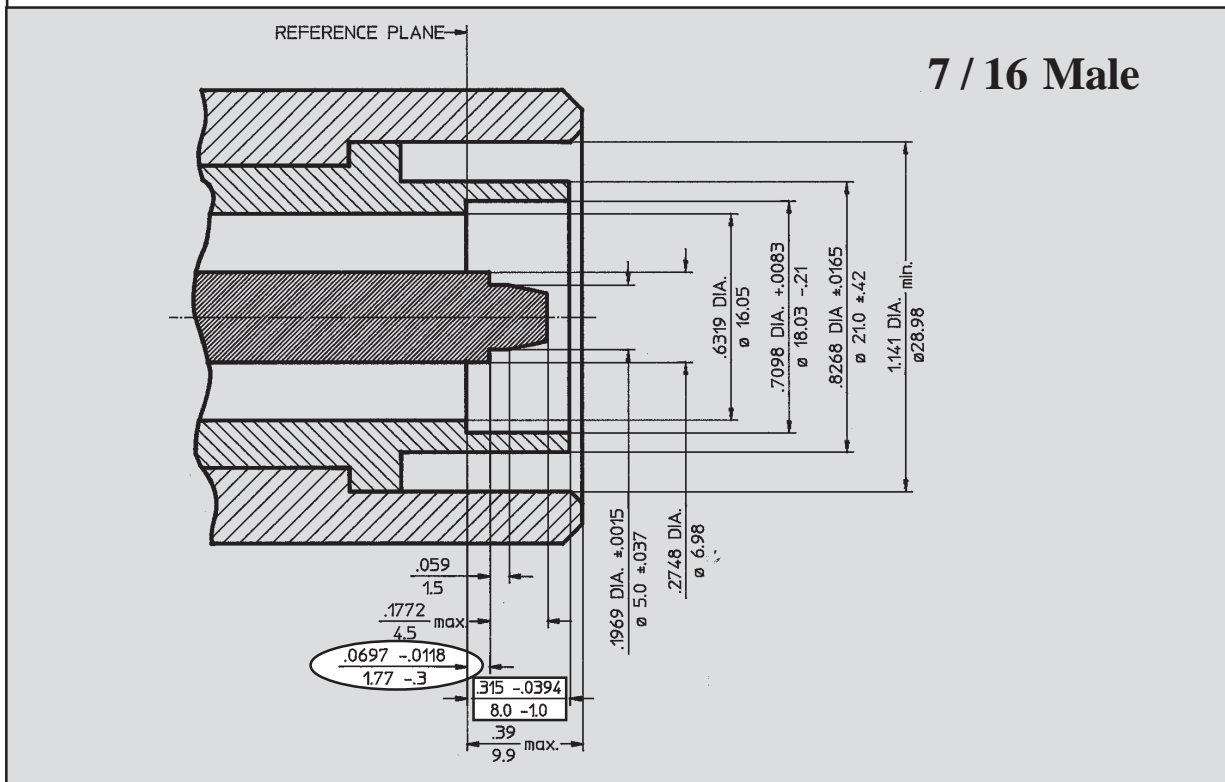
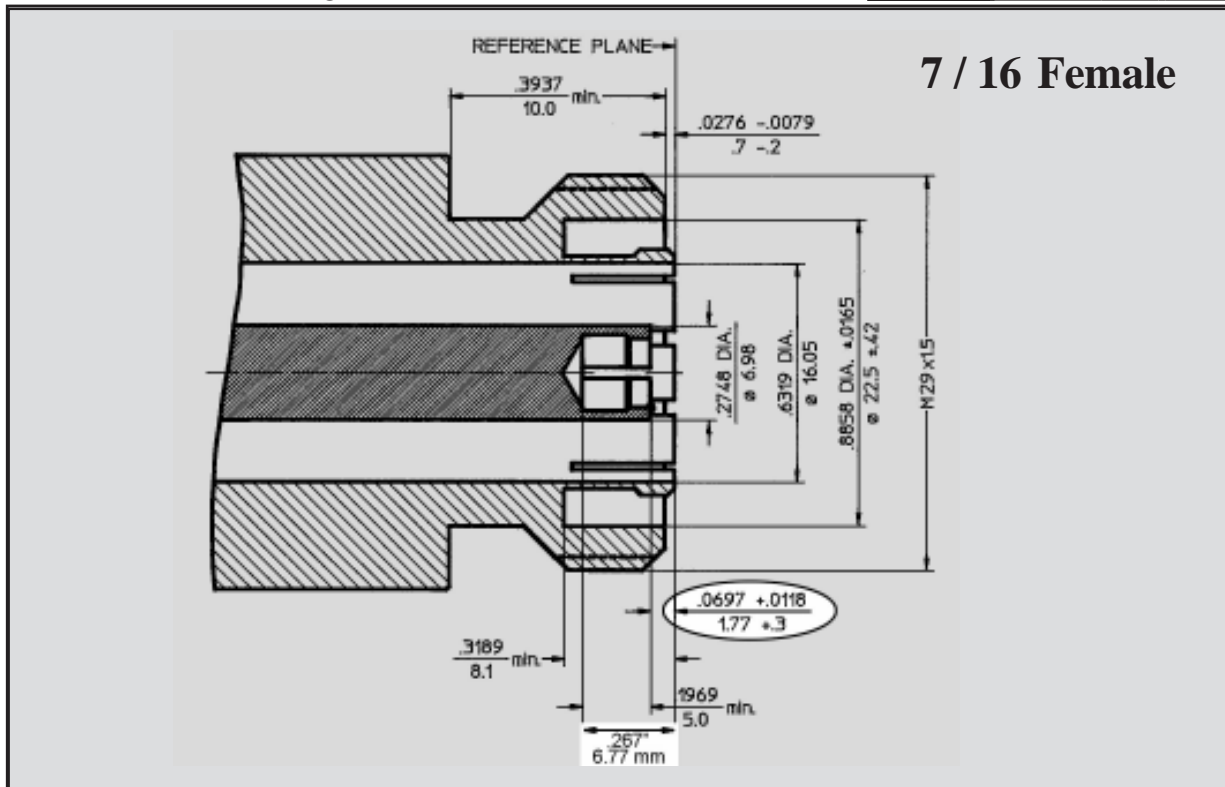
For every dimension of interest, a special gauge is offered. This gives the most accurate results, allows easy calibration, fast testing and helps to avoid mistakes.

A number of gauges are available. The main difference between the gauges is in the resolution, and the units of measurement, inches, or metric. Only the digital gauges can be switched from metric to inch and vice versa. Normally the Connector Gauges are supplied in an instrument case that protects them from getting damaged. In the box, there is also space for the appropriate torque wrench, which can be supplied on a separate order.

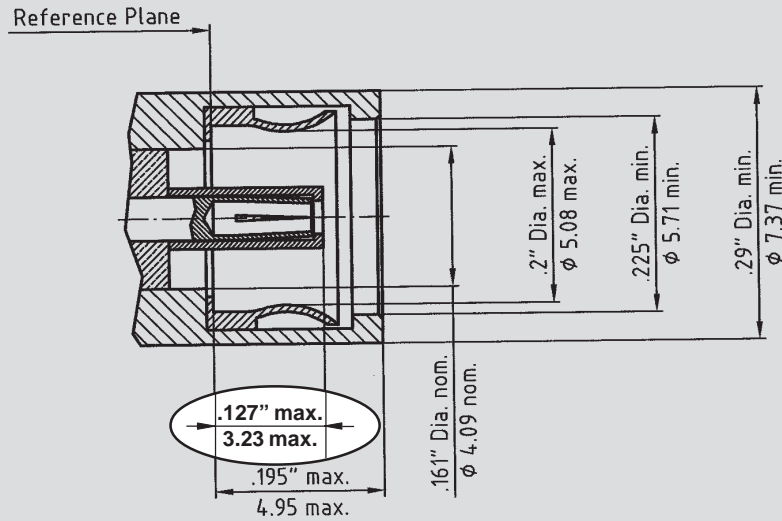
3.5mm Interface Mating Dimensions







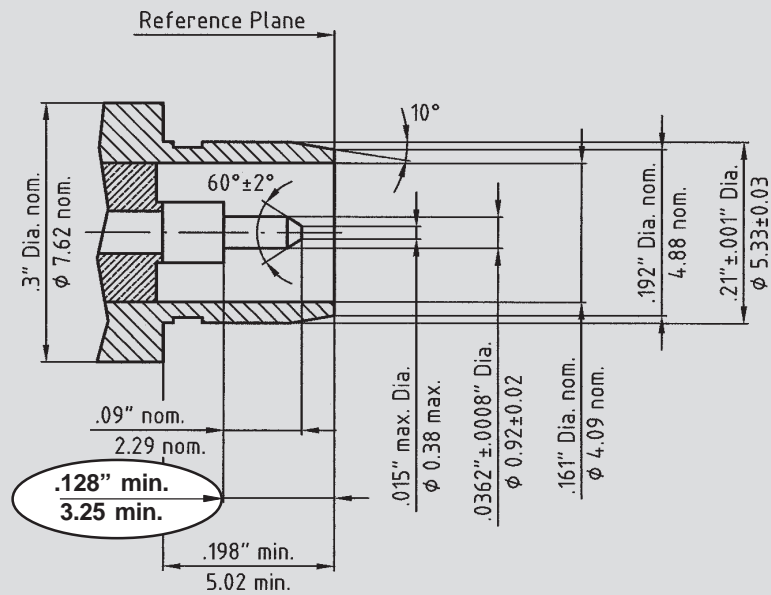
BMA Female



Dimensions shown are inches over millimeters.

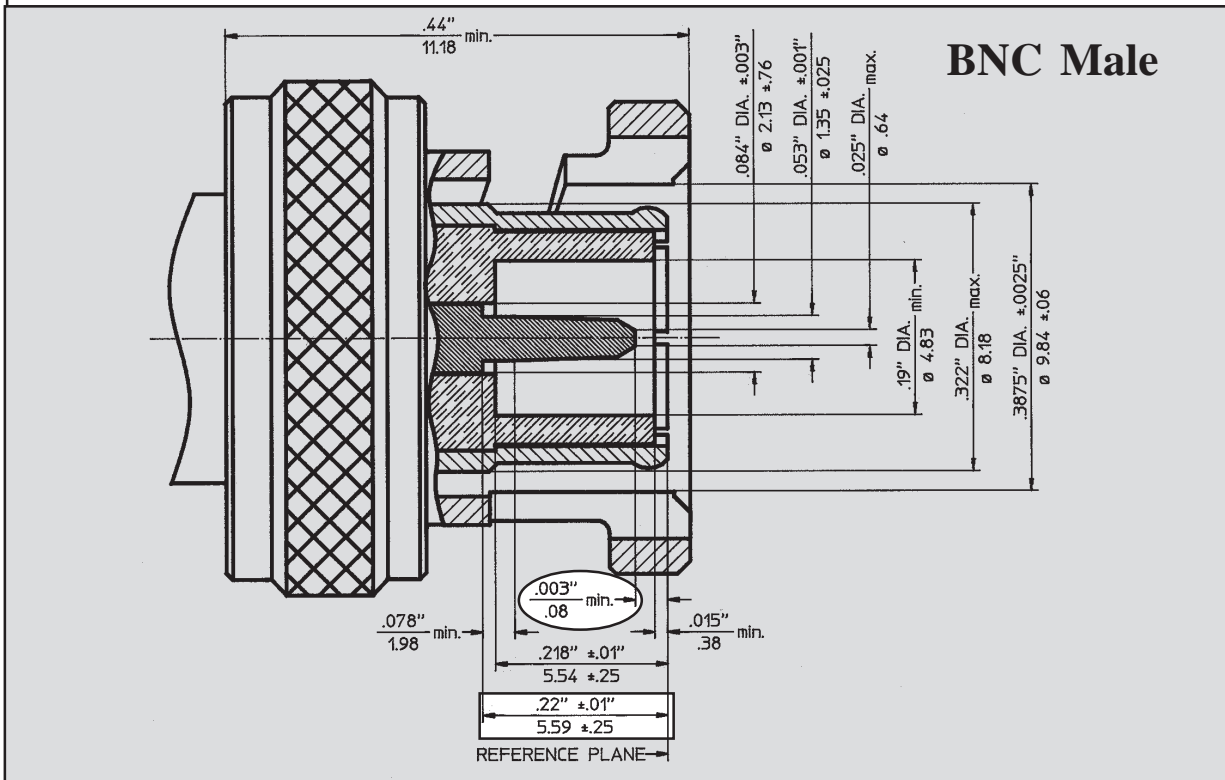
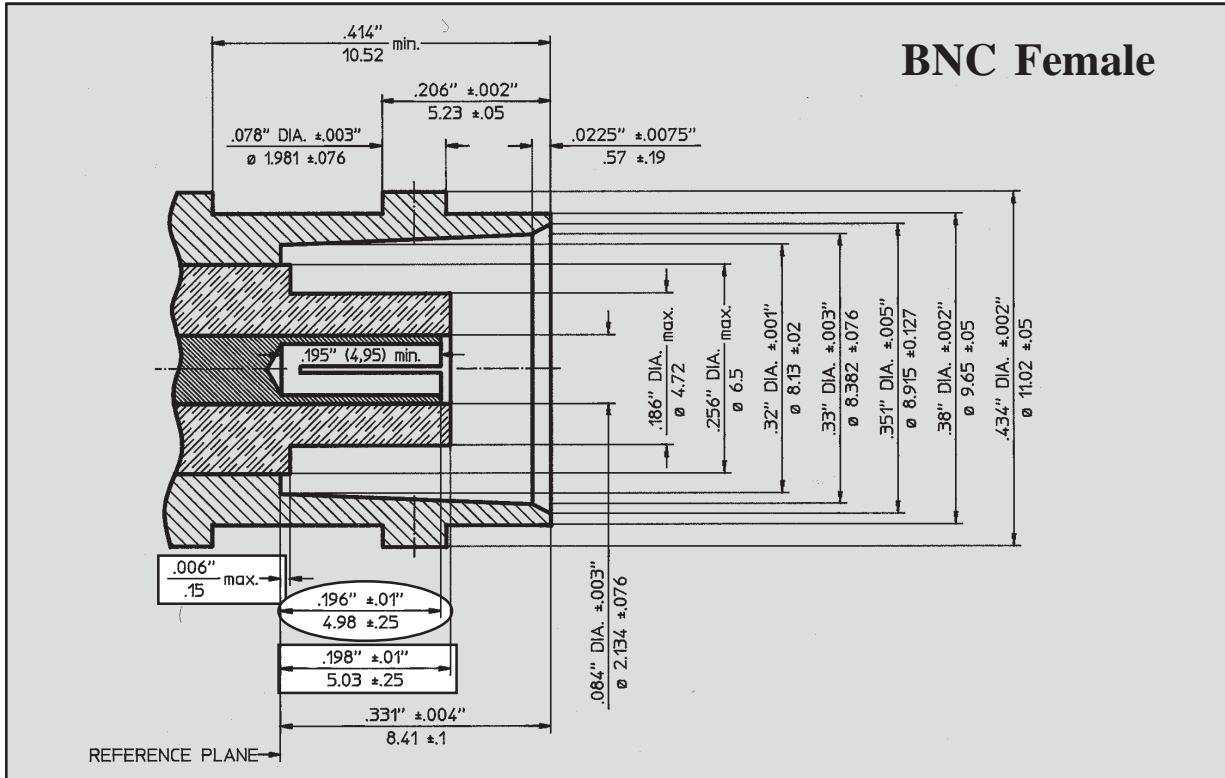
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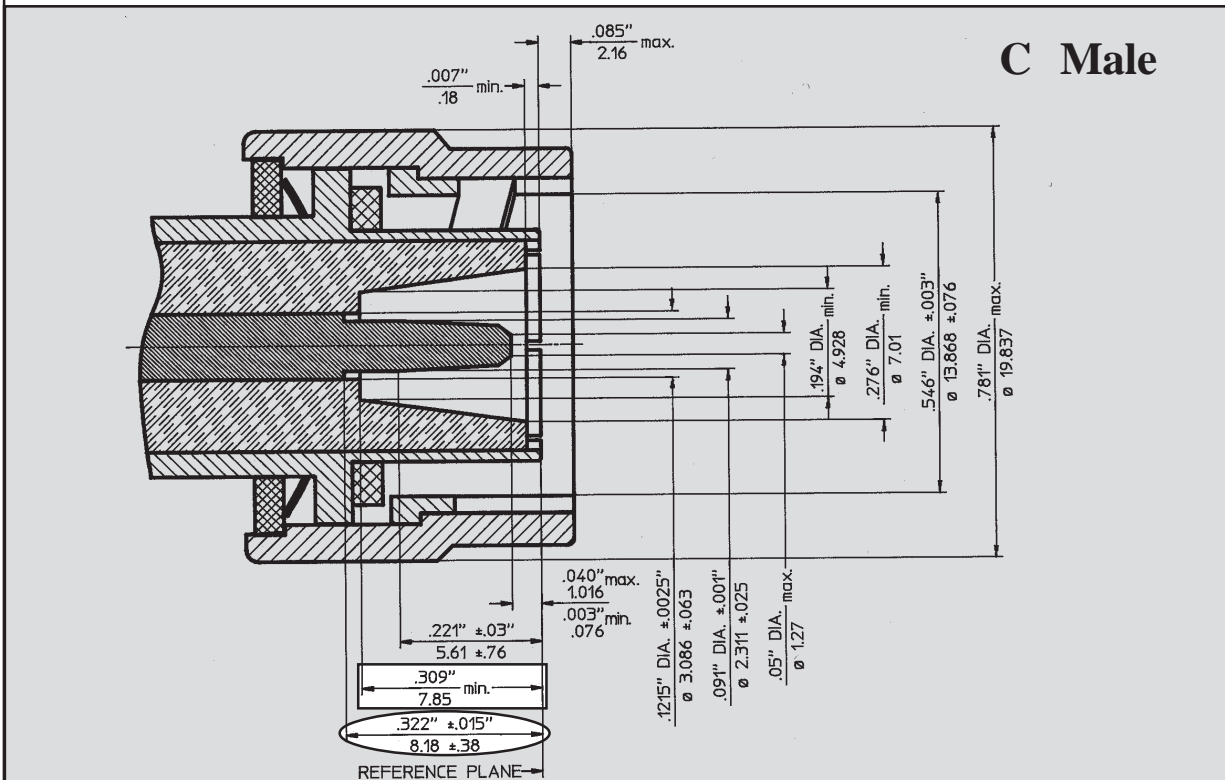
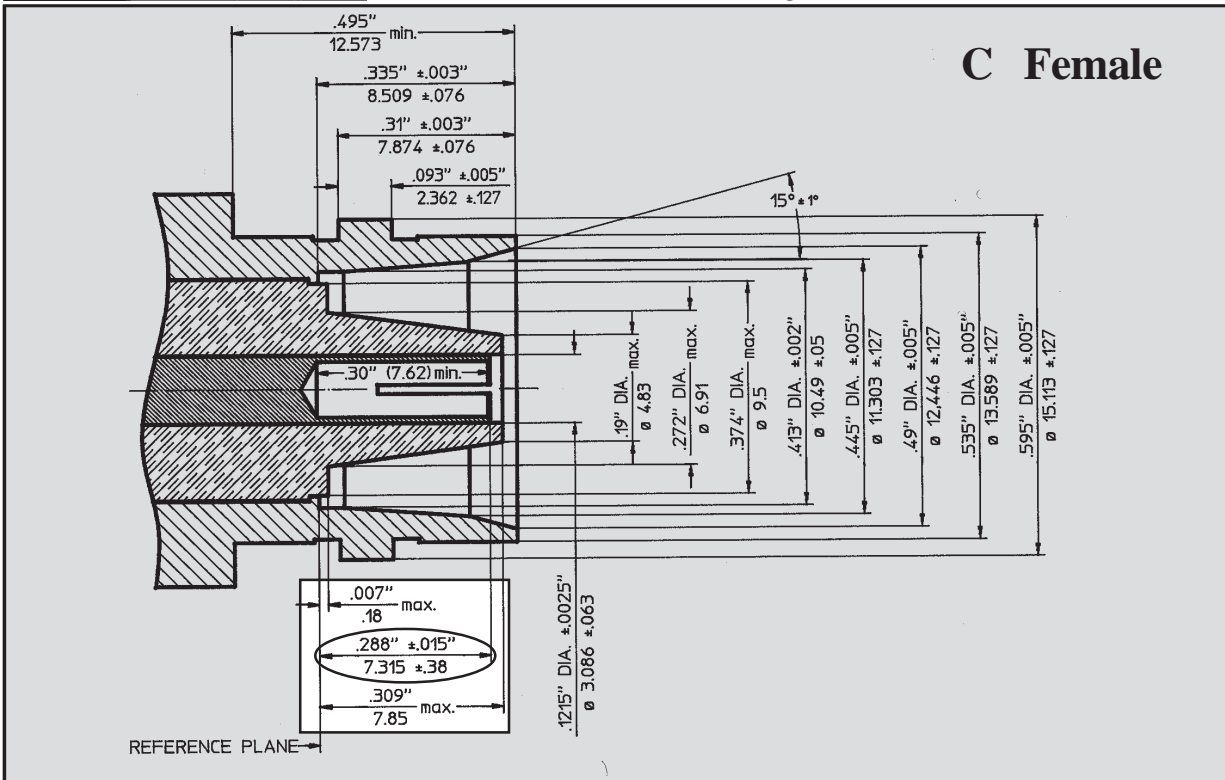
BMA Male



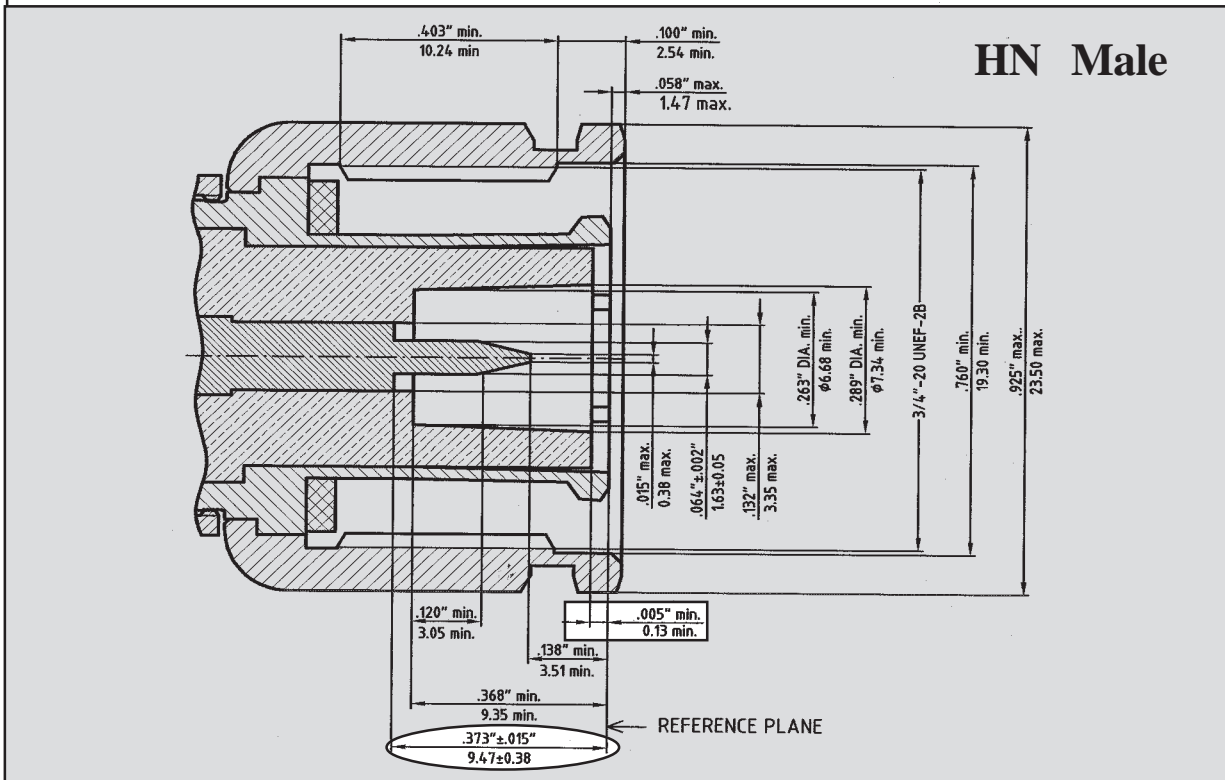
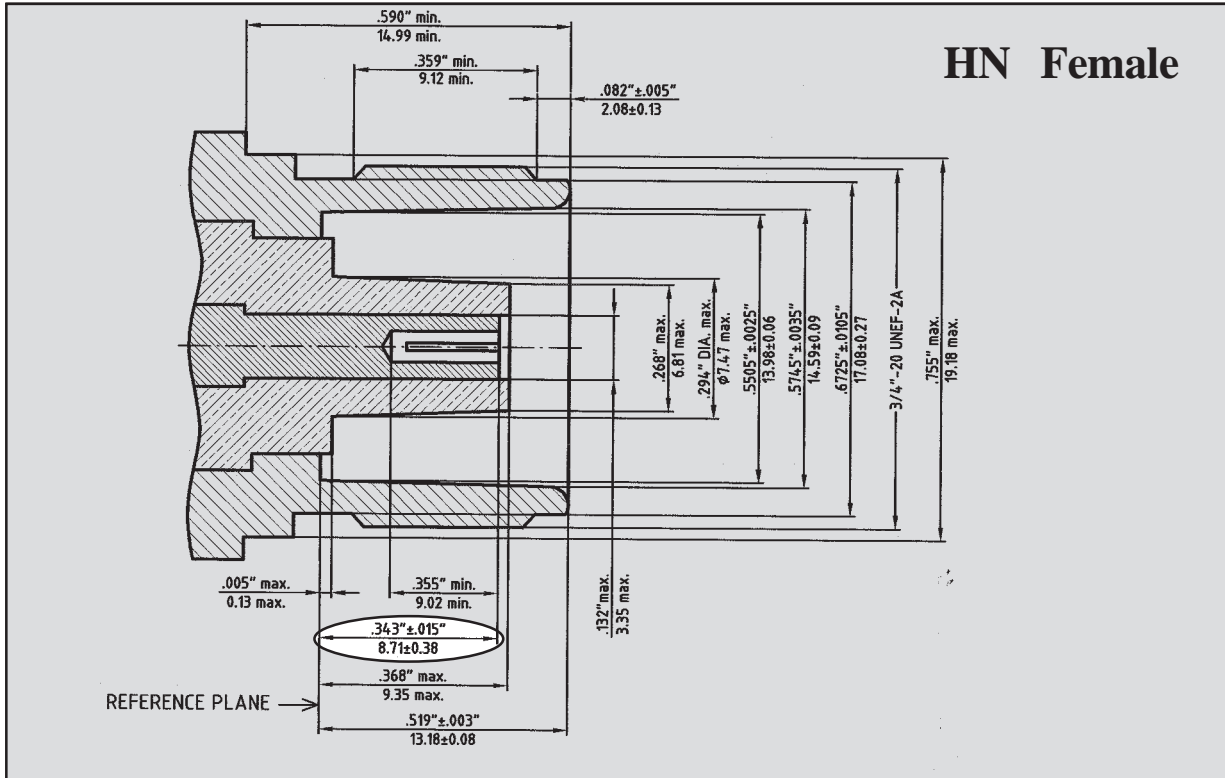
Dimensions shown are inches over millimeters.

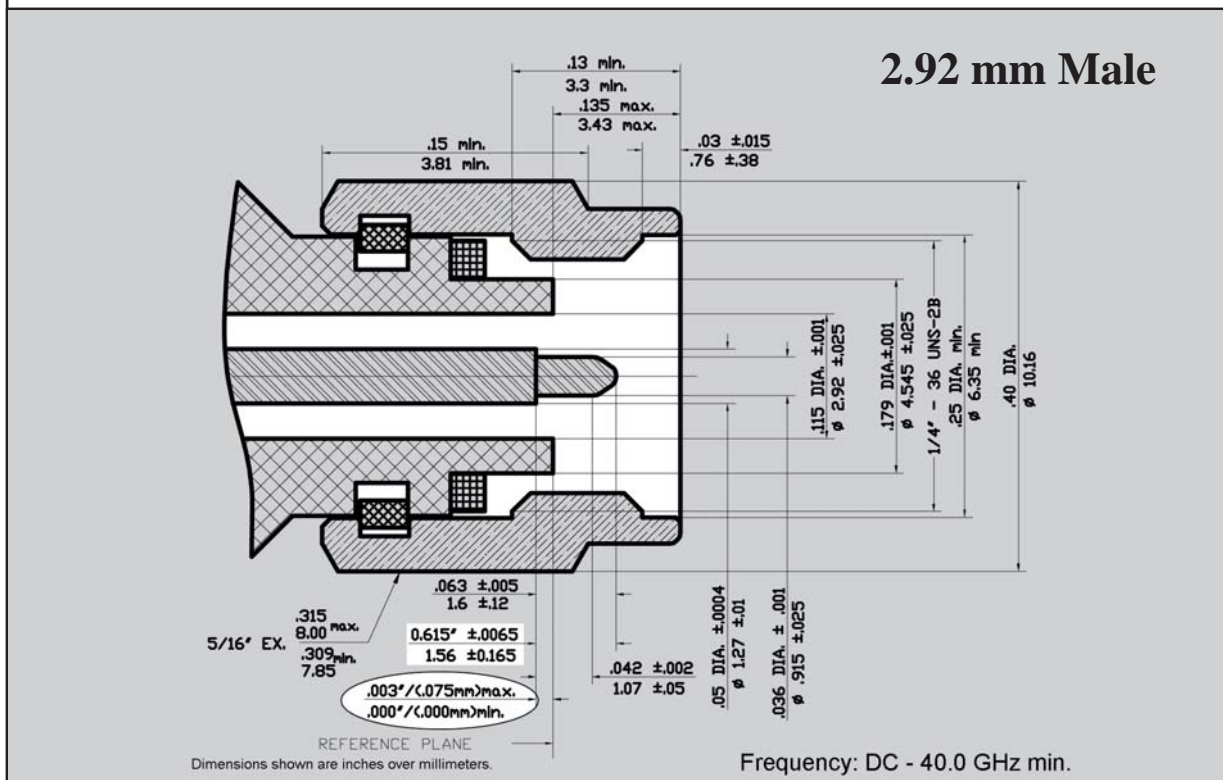
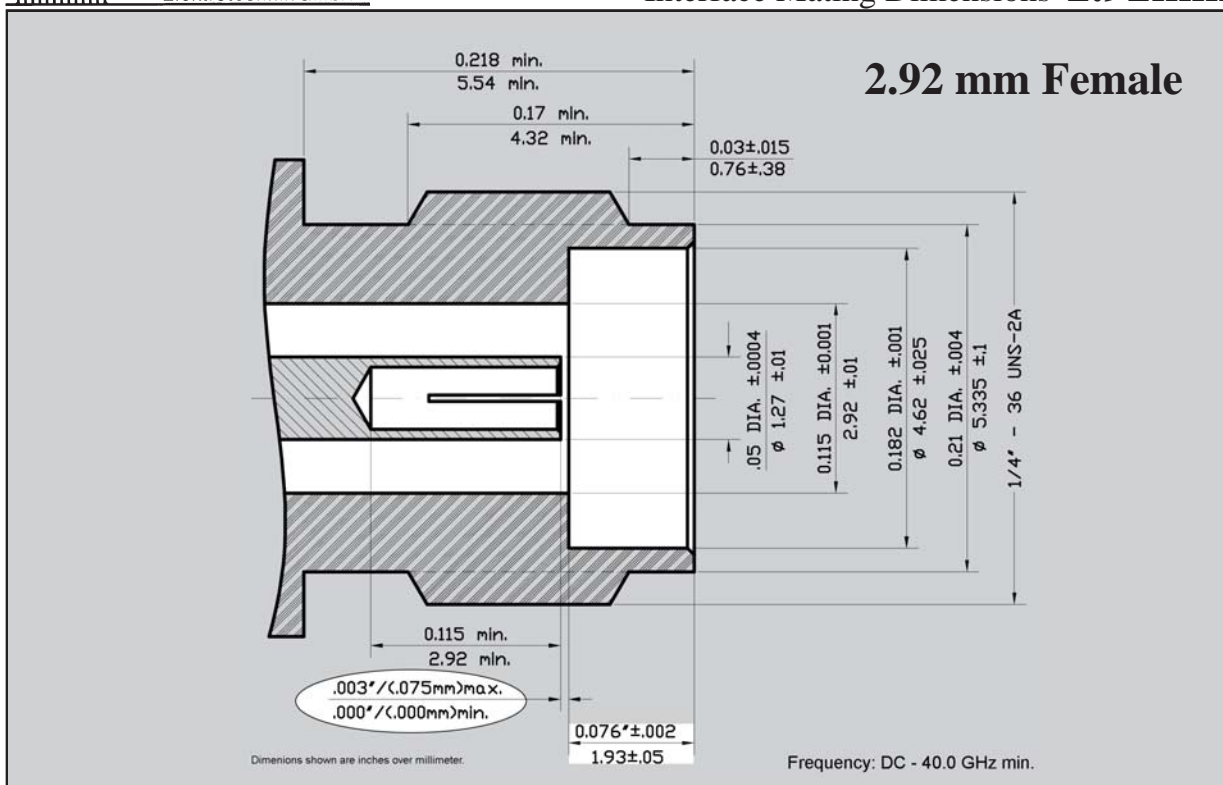
Frequency: DC - 22.0 GHz min.



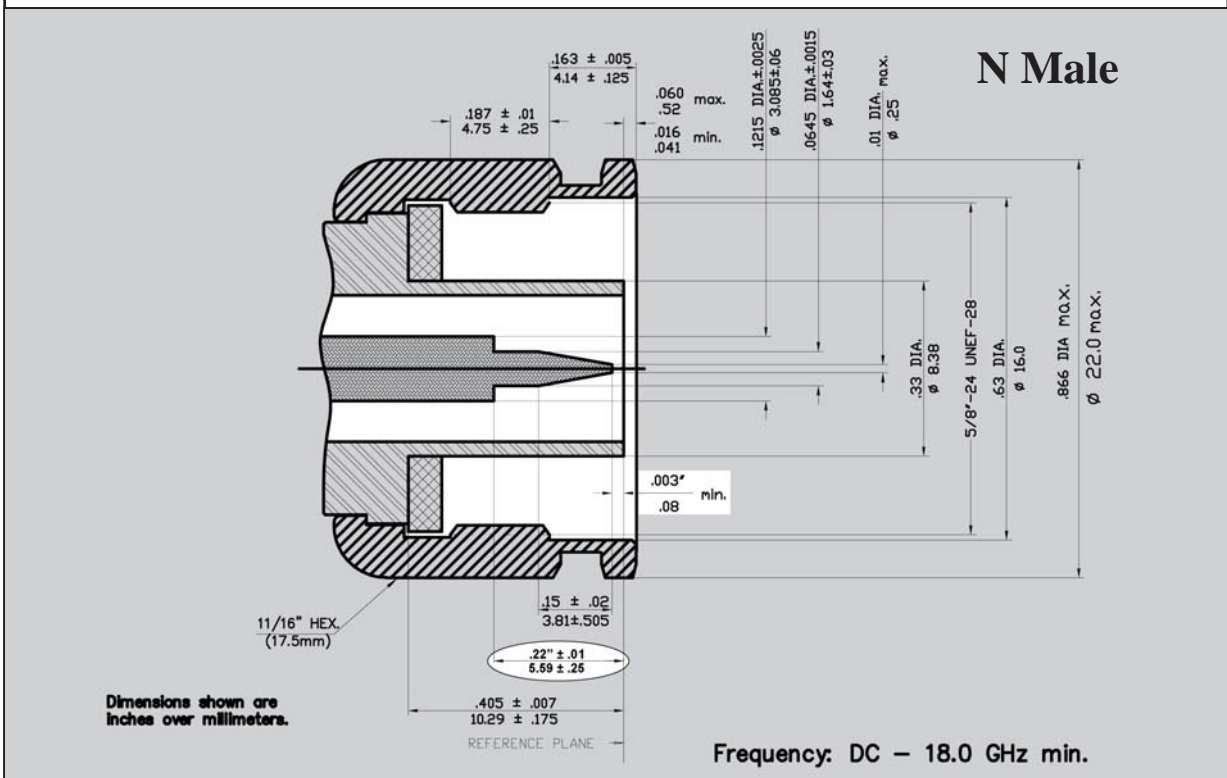
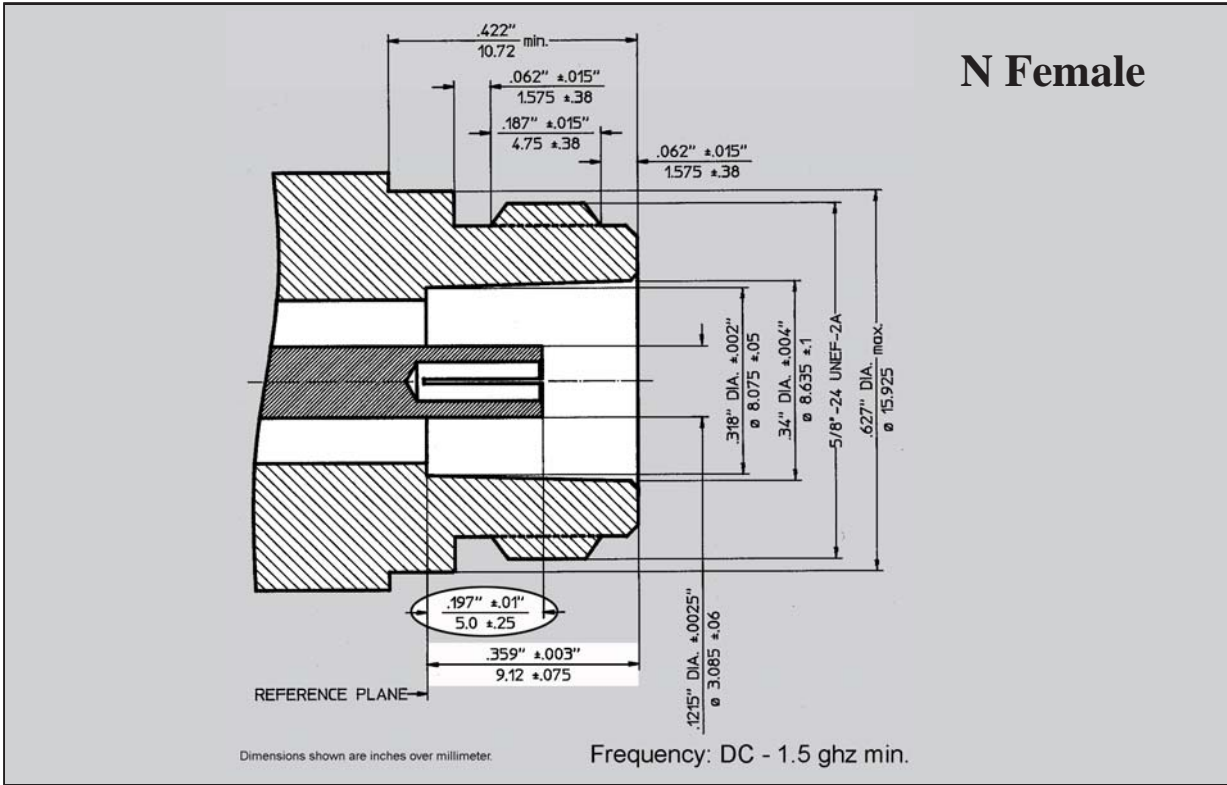


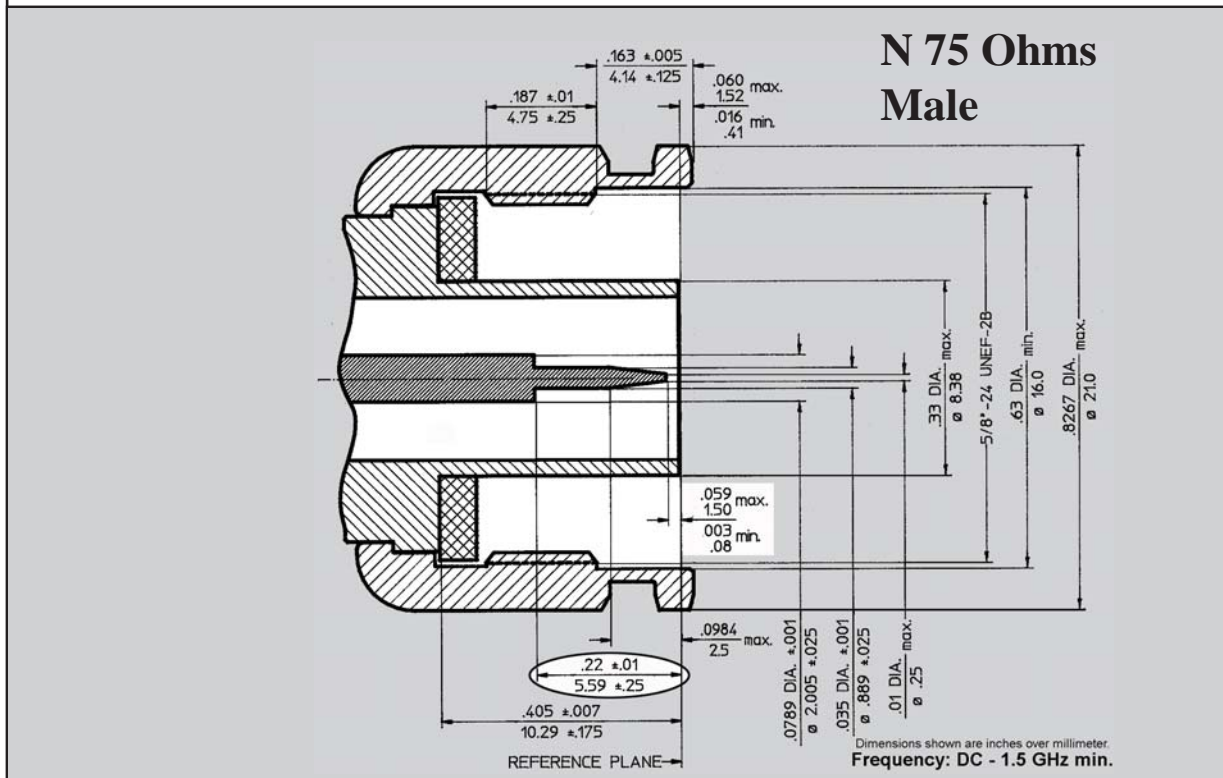
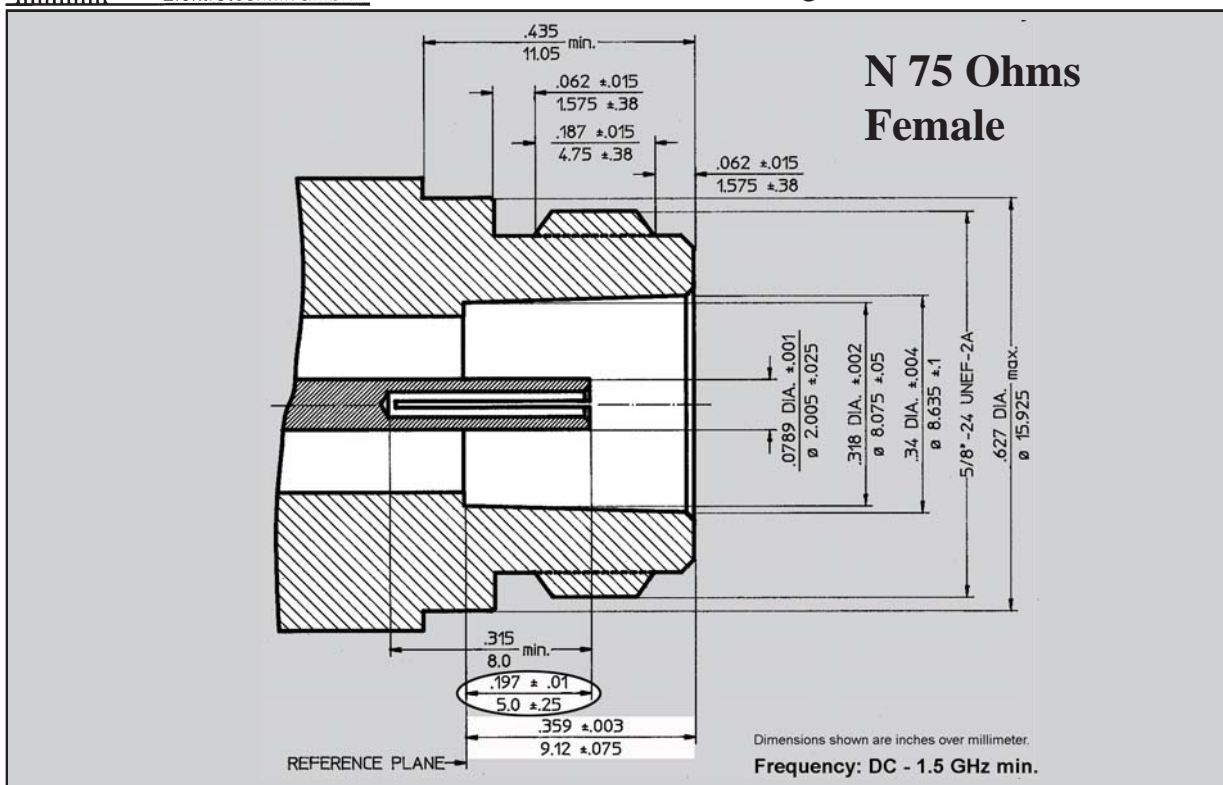
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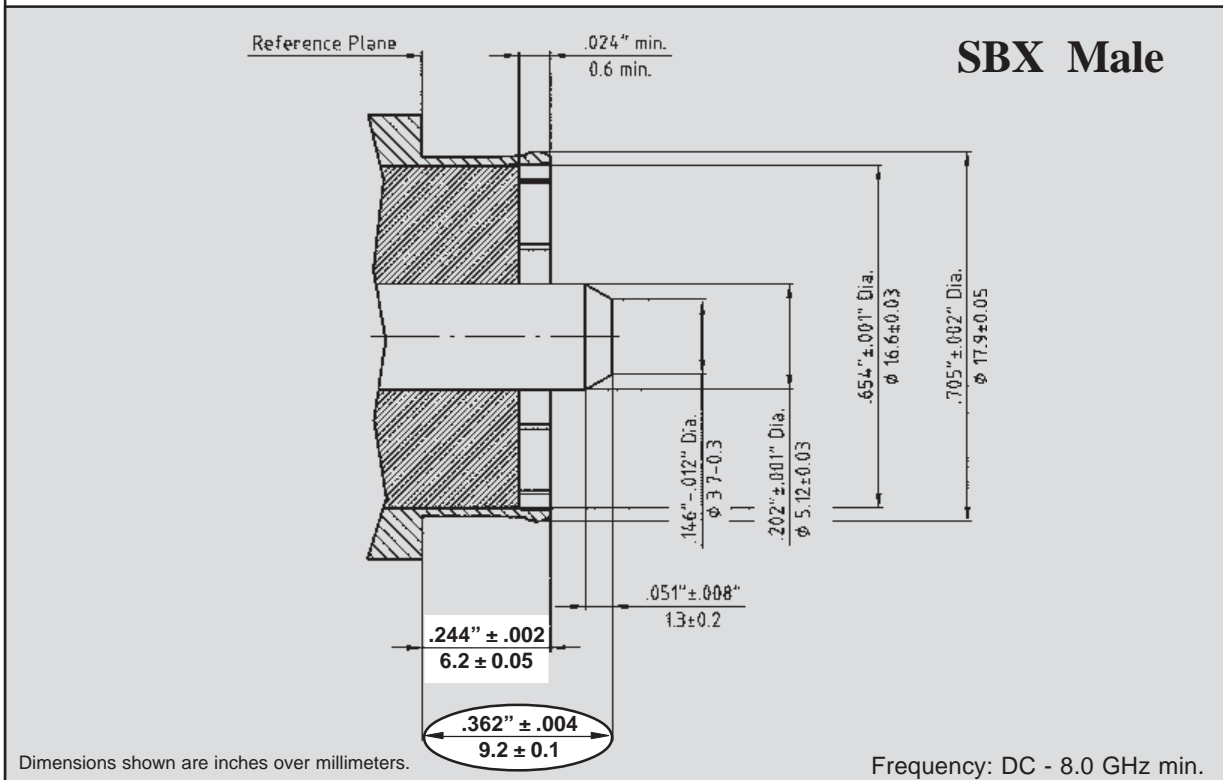
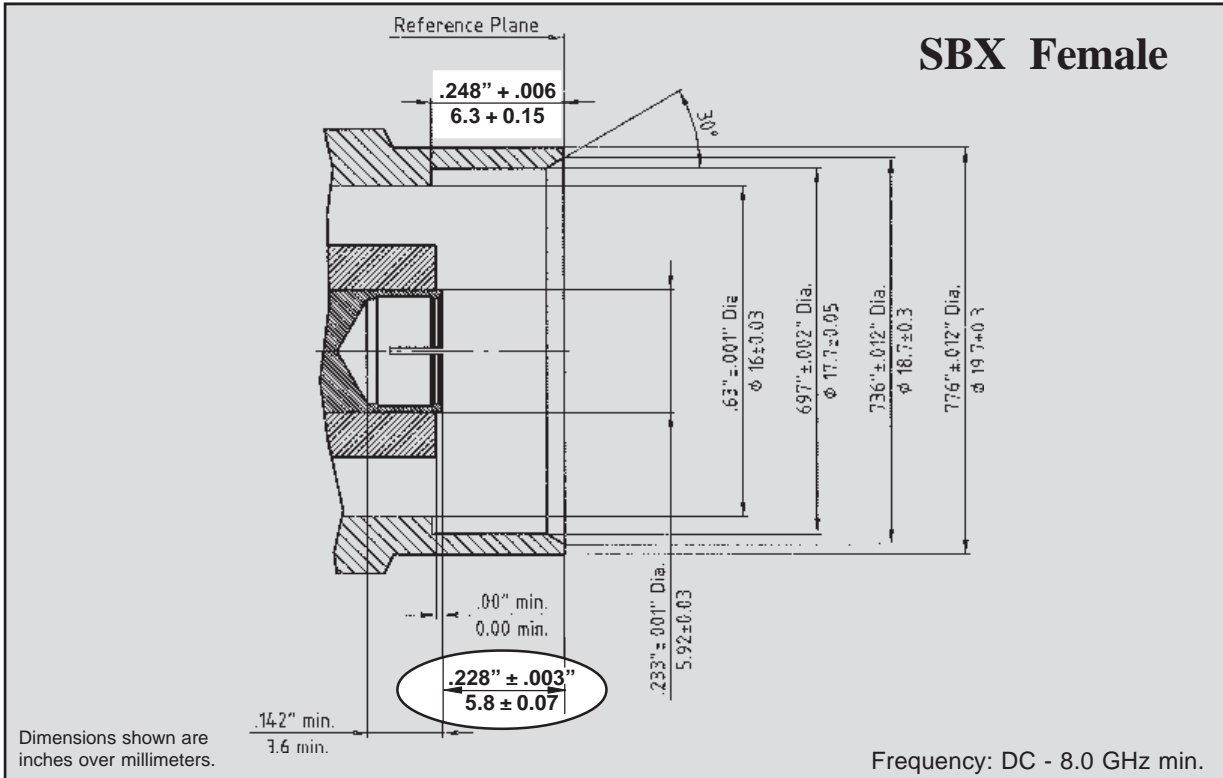


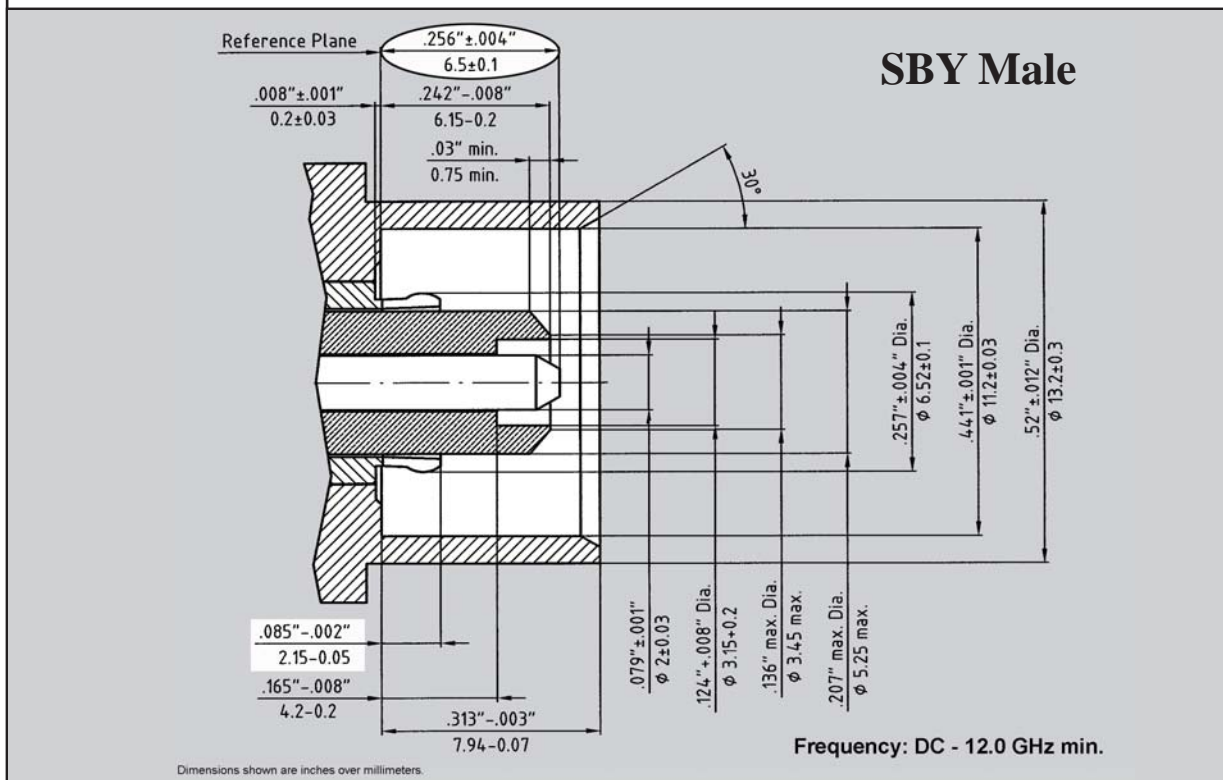
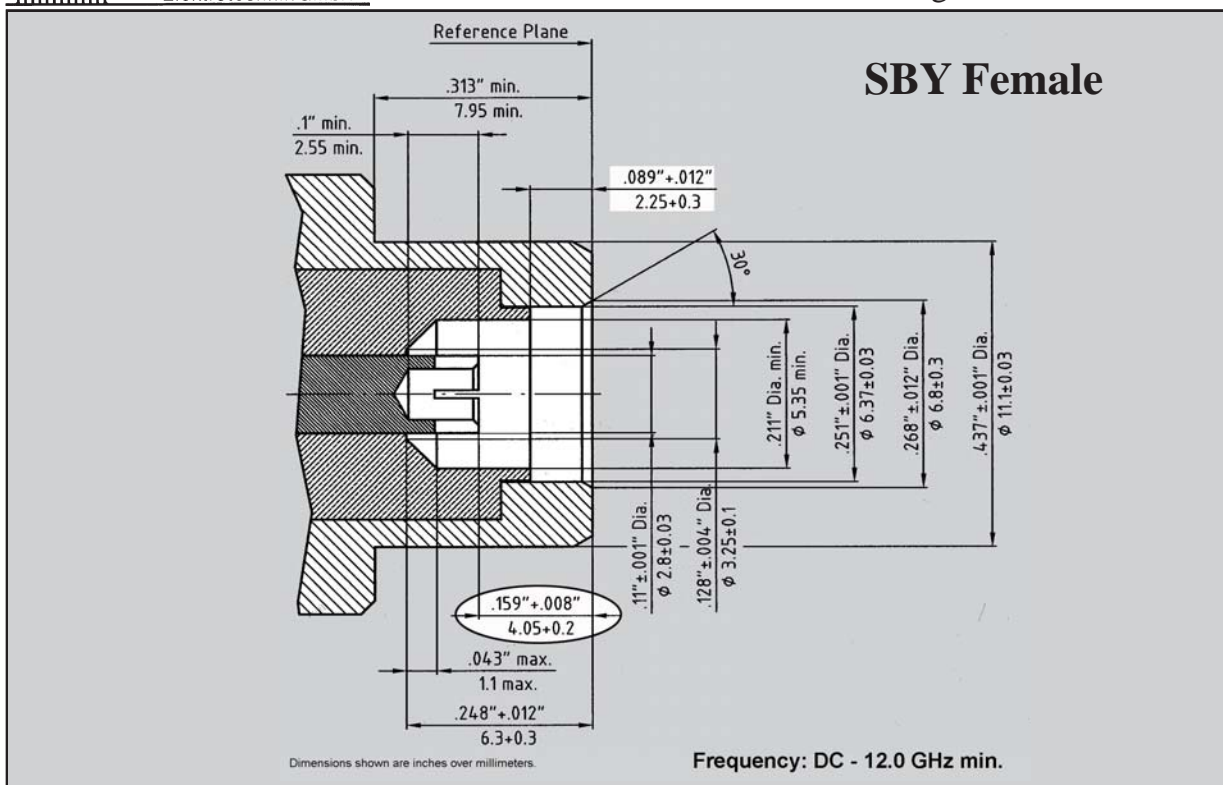
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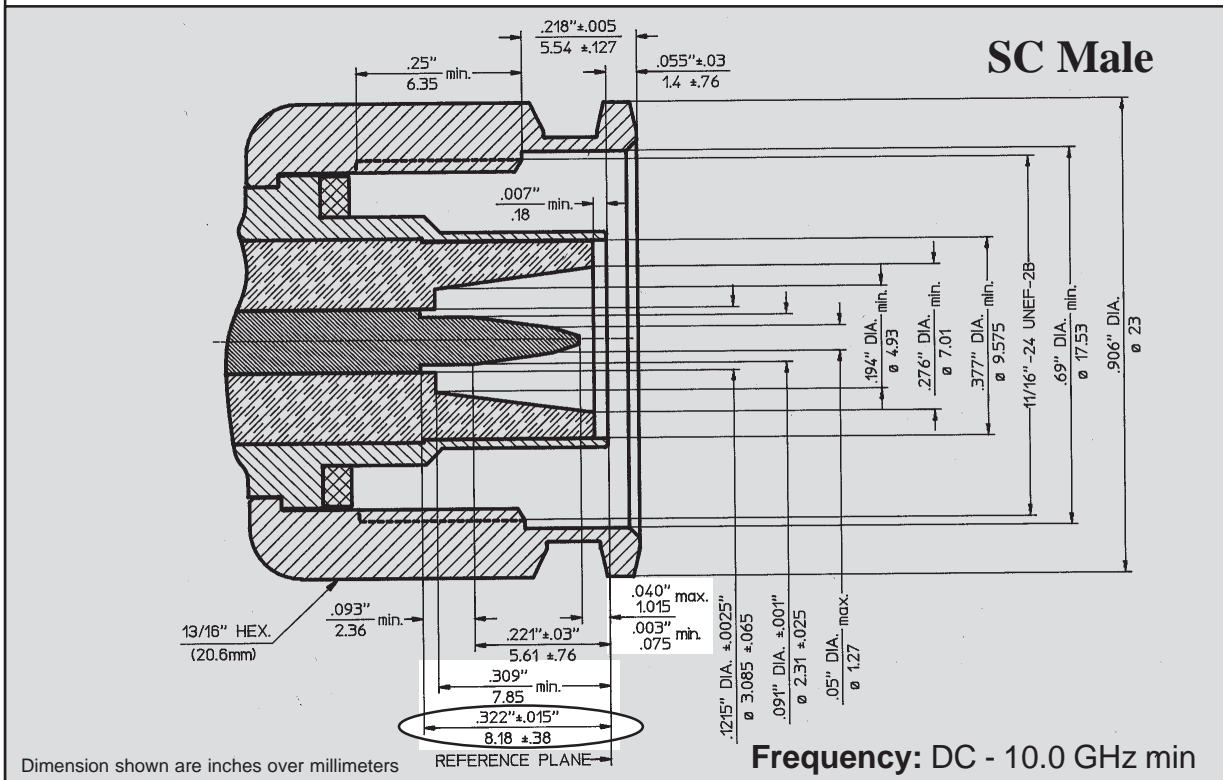
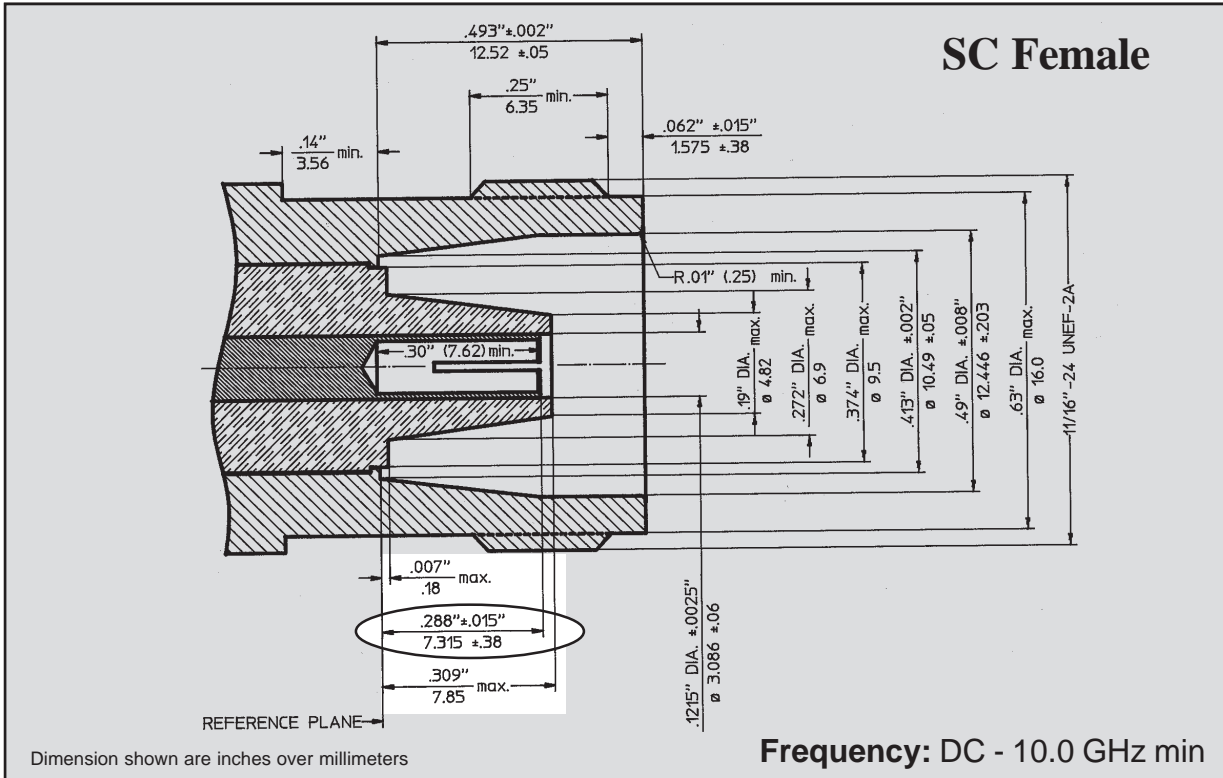


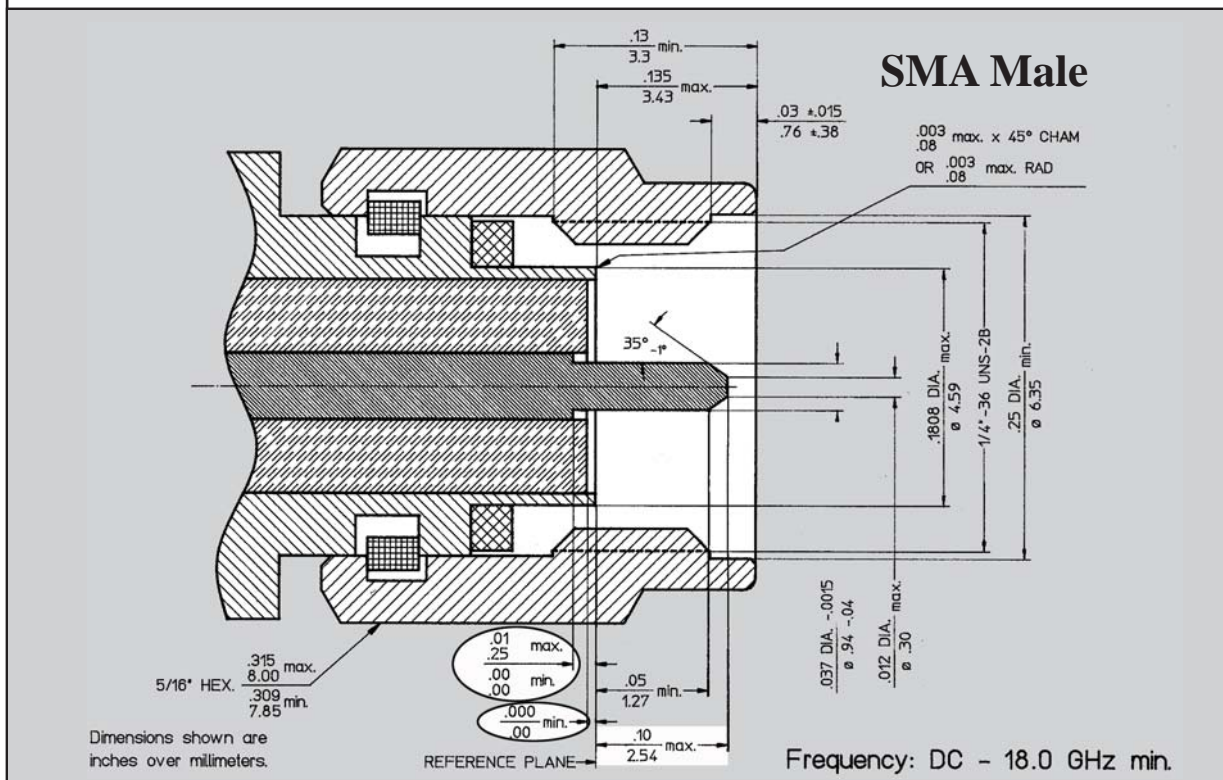
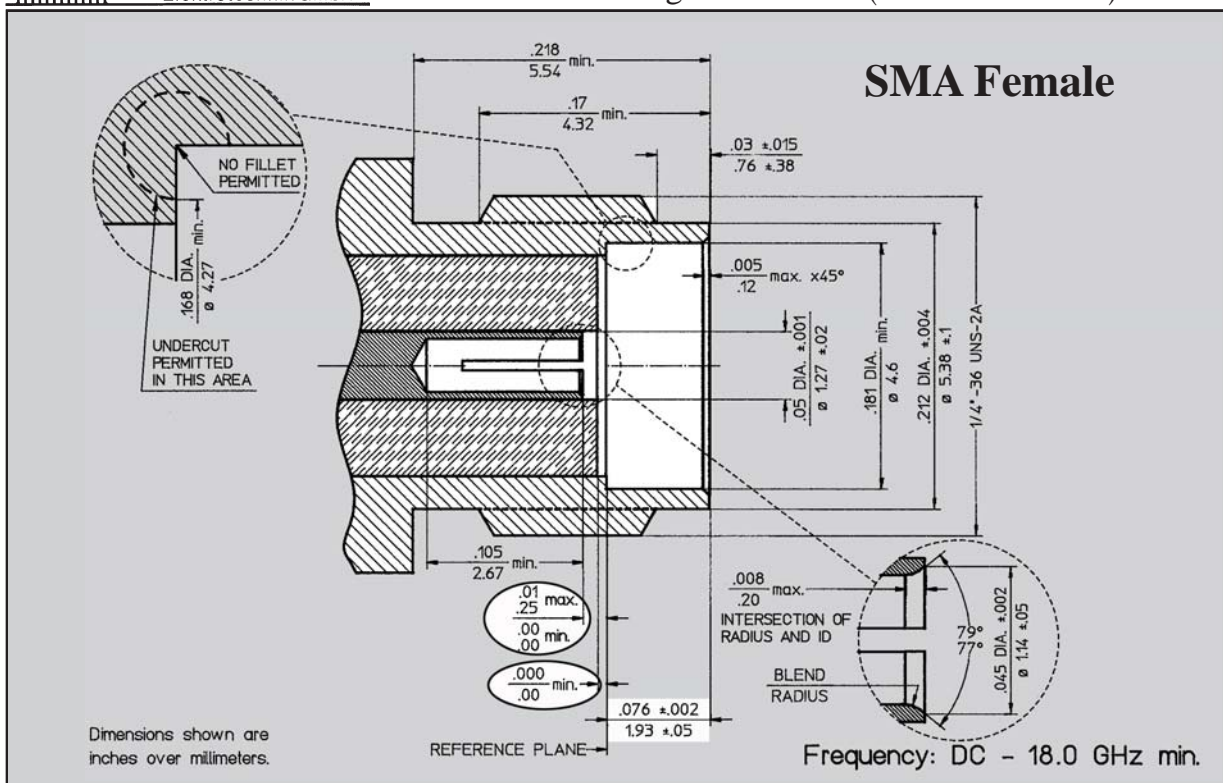
interface.pmo





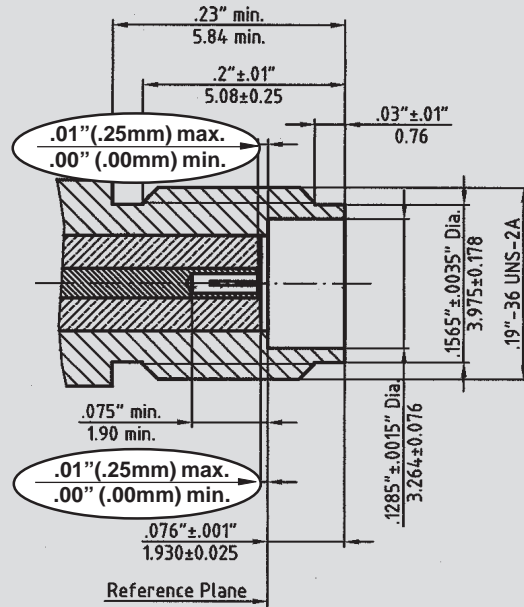
interface.pmo6





interface.pmg

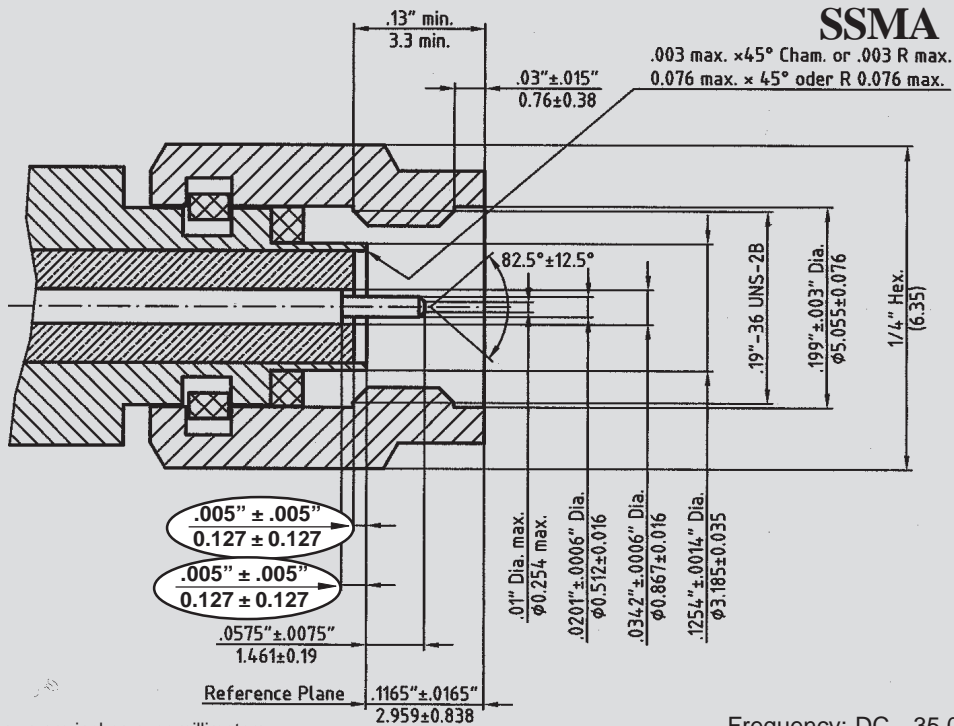
SSMA Female



Dimensions shown are inches over millimeters.

Frequency: DC - 35.0 GHz min.

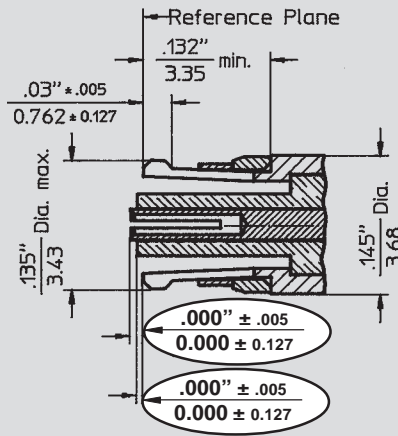
SSMA Male



Dimensions shown are inches over millimeters.

Frequency: DC - 35.0 GHz min.

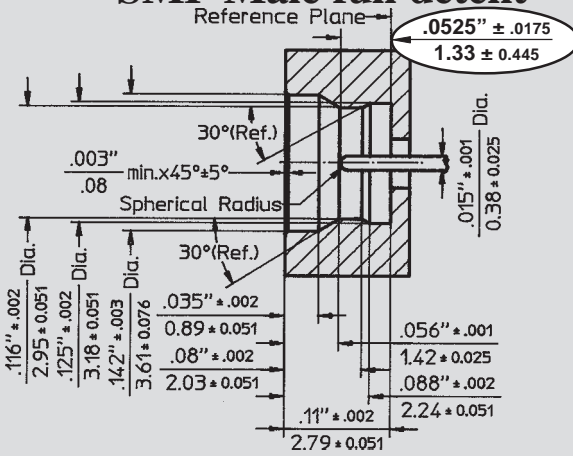
SMP Female



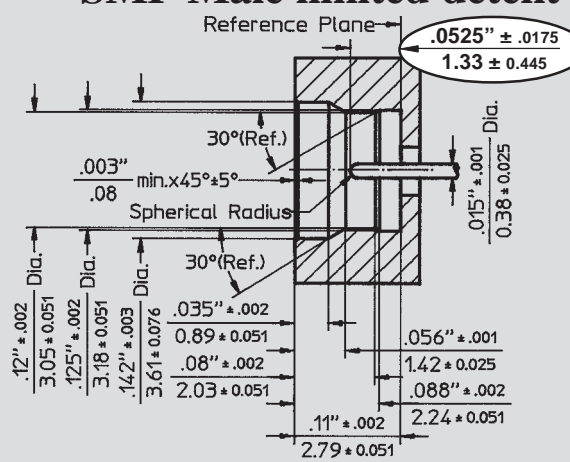
Dimensions shown are inches over millimeters.

Frequency: DC - 40.0 GHz min.

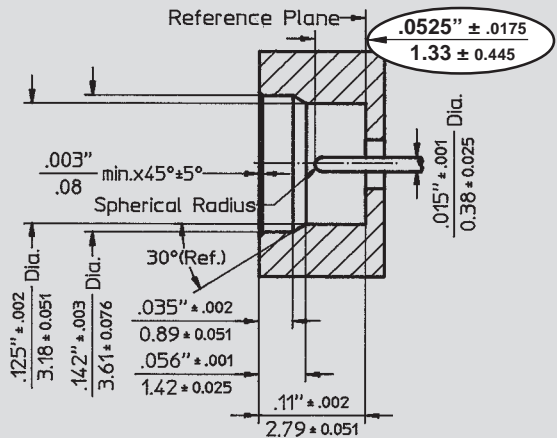
SMP Male full detent



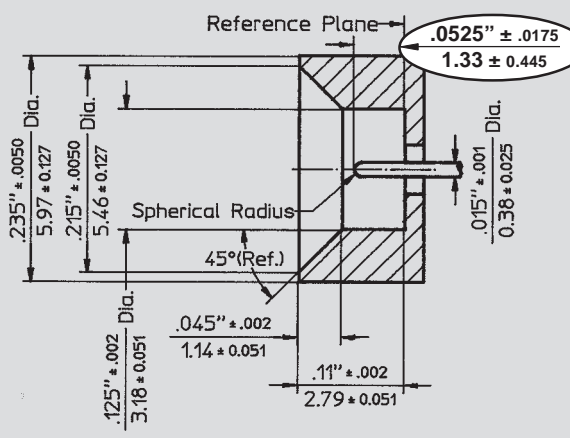
SMP Male limited detent



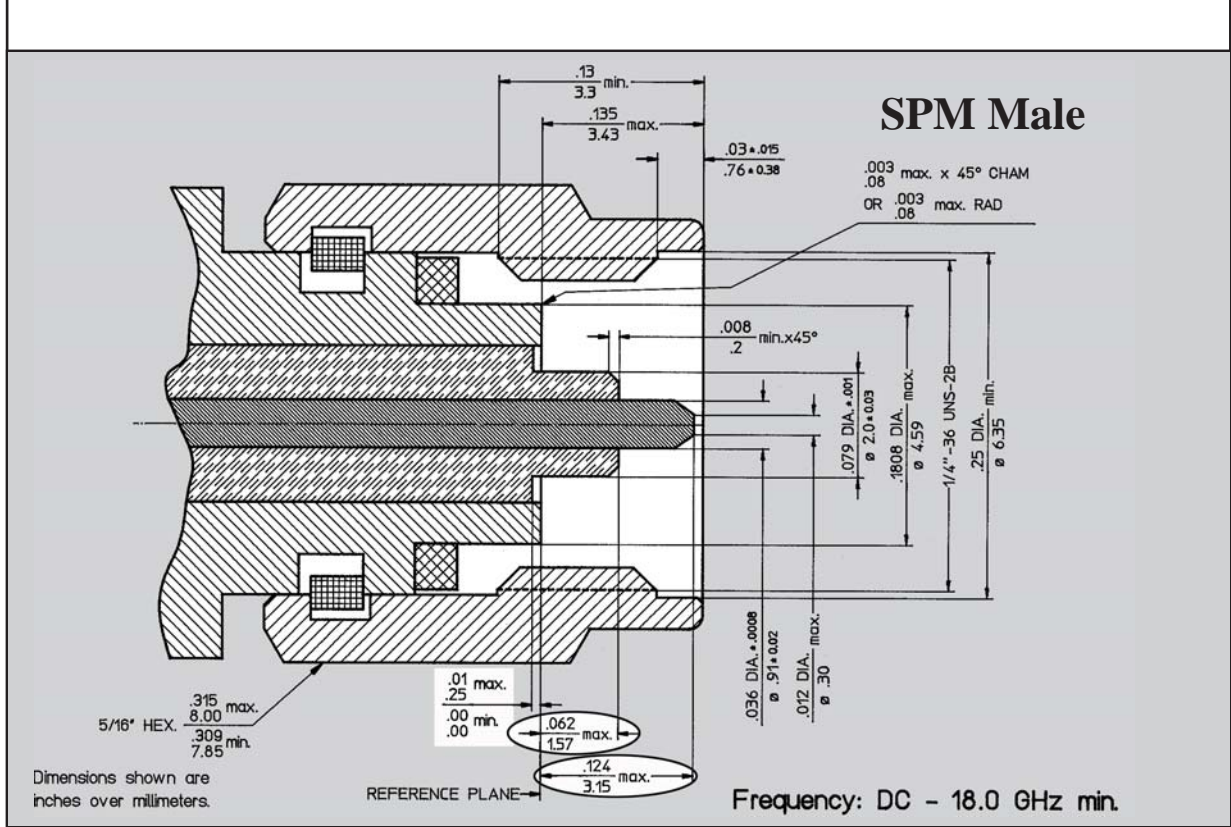
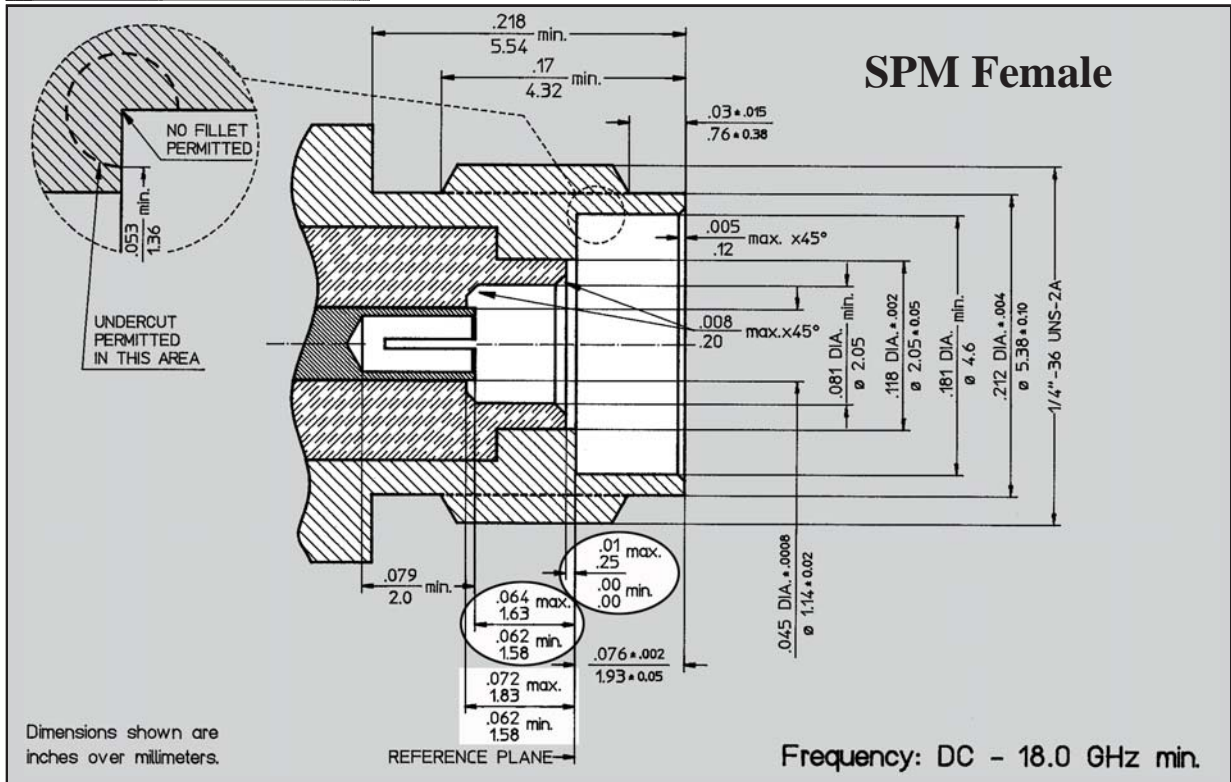
SMP Male smooth bore



SMP Male



interfac.pmo6



interface.pmo

