Society of Cable Telecommunications Engineers

ENGINEERING COMMITTEE
Interface Practices Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 146 2017

Outdoor “F” Female to “F” Female Inline Splice

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1. Introduction

1.1. Scope

The purpose of this document is to recommend mechanical and electrical standards for 75 ohm broadband radio frequency (RF) devices whose purpose is to provide an outdoor inline connection between two type "F" male connectors that conform to ANSI/SCTE 123; Specification for "F" Connector, Male, Feed-Through or ANSI/SCTE 124; Specification for "F" Connector, Male, Pin Type and ANSI SCTE 160, Specification for Mini F connector male Pin type. The mechanical configuration is designed to accommodate sealing rings for external applications.

This specification is not intended to restrict any manufacturer's innovation and improvement. The specification may be amended in the future as deemed appropriate.

2. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

2.1. SCTE References

- ANSI/SCTE 123 Specification for "F" Connector, Male, Feed-Through
- ANSI/SCTE 124, Specification for "F" Connector, Male, Pin Type
- ANSI/SCTE 144, Test Procedure for Measuring Transmission and Reflection
- ANSI/SCTE 04, Test Method for "F" Connector Return Loss
- ANSI/SCTE 48-1, Test Method for Measuring Shielding Effectiveness of Passive and Active Devices Using a GTEM Cell
- ANSI/SCTE 103, Test Method for DC Contact Resistance, Drop Cable to F- Connectors and F81 Barrels
- ANSI/SCTE 143, Test Method for Salt Spray
- ANSI/SCTE 81 Surge Withstand Test Procedure

2.2. Standards from Other Organizations

- No informative references are applicable.

2.3. Published Materials

- No informative references are applicable.

3. Compliance Notation

shall	This word or the adjective "***required***" means that the item is an absolute requirement of this document.
shall not	This phrase means that the item is an absolute prohibition of this document.
forbidden	This word means the value specified shall never be used.
should	This word or the adjective "*recommended*" means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
should not	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
may	This word or the adjective "*optional*" means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
deprecated	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

4. Mechanical

4.1. Dimensions

The physical dimension of the inline splice shall meet the dimensional requirements of Figure 1.

4.2. Center Conductor Mating

The center conductor contact of both ends ***shall*** accept male "F" connector center conductors whose diameters are between 0.0250" (0.64 mm) diameter and 0.0420" (1.07 mm) diameter. The junction ***shall*** have a minimum retention force of 50 grams with a 0.0320" (0.812 mm) diameter conductor inserted after the contact is mated 25 times with a center conductor whose diameter is 0.0403" (1.02 mm) when tested in accordance to IPS TP 417, Test Method for F Connector Center Conductor Retention.

5. Electrical

5.1. Bandwidth

Bandwidth ***shall*** be a minimum of 5 MHz to 1,218 MHz.

Unless otherwise specified, all performance parameters listed ***shall*** be tested in this frequency range.

5.2. Insertion Loss

Shall not exceed 0.1 dB for frequencies between 5 MHz and 600 MHz, 0.2 dB, for frequencies between 600 MHz and 1,002 MHz, and 0.25 dB for frequencies between 1002 MHz and 1,218 MHz when tested in accordance to ANSI/SCTE 144 2012, Test Procedure for Measuring Transmission and Reflection

5.3. Return Loss

Shall be no worse than 30 dB, when tested in accordance to ANSI/SCTE 04, ANS Test Method for ”F” Connector Return Loss or ANSI/SCTE 144 Procedure for Measuring Transmission and Reflection.

5.4. Shielding Effectiveness

The shielding effectiveness of the assembled components shall be a minimum of 100dB, when tested in accordance with ANSI/SCTE 48-1, Test Method for Measuring Shielding Effectiveness of Passive and Active Devices Using a GTEM Cell.

5.5. Surge Withstand

The surge withstand when measured in accordance with ANSI/SCTE 81 shall be a minimum of IEEE C62.41-1991 Category A3 Ring Wave, 6KV, 200 Amps.

5.6. Center Conductor Contact Resistance

The center conductor junction of the female to male F center conductor ***shall*** have a DC contact resistance of less than 25 milliohms after the testing performed in IPS TP 417 and then tested in accordance to ANSI/SCTE 103.

5.7. Outer Conductor Contact Resistance

The outer conductor junction of the indoor female “F” port to male F connector ***shall*** have a DC contact resistance less than 10 milliohms when tightened to 40 lb.-in. and tested to ANSI/SCTE 103.

5.8. Current Carrying Capacity

The center conductor junction of the outdoor female “F” port to male F center conductor ***shall*** be capable of carrying a minimum of 1 ampere DC continuous current at an ambient temperature of 40°C without degradation.

6. Environmental

6.1. Salt Spray

Components shall meet the electrical performance as outlined in section 4, after 1000 Hours of the salt spray when tested in accordance to ANSI/SCTE 143.

6.2. Temperature

Components shall meet all performance requirements during and after exposure to temperatures ranging from -40°F (-40°C) to +140°F (+60°C) inclusive.

7. Dimensions

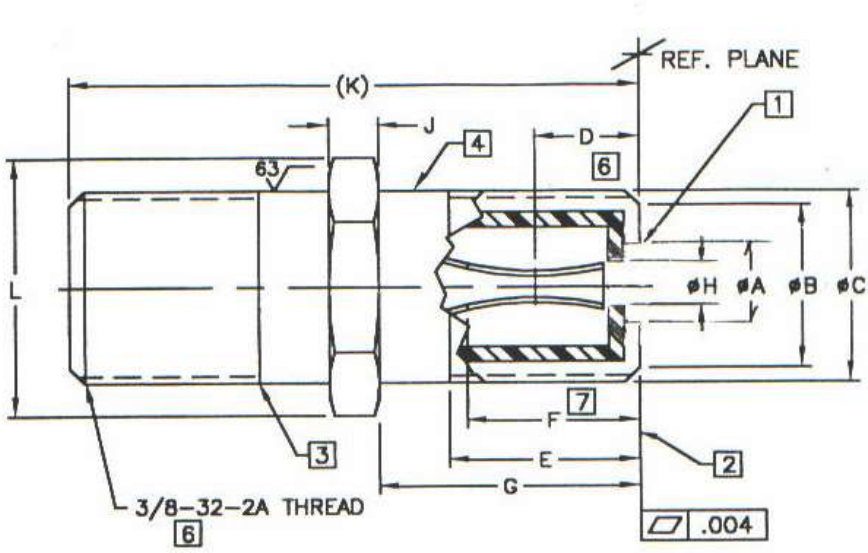

Figure 1 – Dimensions

Table 1 – Descriptions of Dimensions

DESCRIPTION	DIM	mm		INCHES		NOTES
		min	max	Min	max	
Reference Plane Opening Diameter	A	4.32	6.10	0.170	0.240	
Reference Plane Outer Diameter	B	7.11	8.00	0.280	0.315	
Base Outer Diameter	C	9.35	9.65	0.368	0.380	
Positive Contact Point Depth	D	-	5.08	-	0.200	5
Full Thread Depth	E	8.26	8.89	0.325	0.350	
Mating Male Center Conductor Clearance	F	9.65	-	0.380	-	7
Port Length	G	12.07	13.21	0.475	0.520	
Center Conductor Guide Inner Diameter	H	-	1.73	-	0.068	
Length	J	2.29	-	0.090	-	
Over All Length (Reference)	K	27.67	-	1.090	-	
Maximum Crown Envelope Dimension	L	-	16.58	-	0.653	

Notes:

1. No material shall impede the entry of the male connector.
2. Reference Plane
3. Thread relief not to exceed 1 full thread.
4. Finish required for port seal ring.
5. Dimension to point of positive contact of terminal.
6. ANSI specification B1.1 (Major DIA 0.368/0.374)
7. Minimum clearance for maximum center conductor.
8. Recommended Mating Male Center Conductor Diameter Range is 0.030 in. (0.76 mm) Min. to 0.042 in. (1.07 mm) Max.
9. All Dimensions Typical, unless specified.