

# SCTE • ISBE<sup>®</sup>

## S T A N D A R D S

---

**Interface Practices Subcommittee**

---

**AMERICAN NATIONAL STANDARD**

**ANSI/SCTE 160 2018**

**Specification for Mini 'F' Connector, Male, Pin Type**

## NOTICE

The Society of Cable Telecommunications Engineers (SCTE) Standards and Operational Practices (hereafter called “documents”) are intended to serve the public interest by providing specifications, test methods and procedures that promote uniformity of product, interchangeability, best practices and ultimately the long term reliability of broadband communications facilities. These documents shall not in any way preclude any member or non-member of SCTE from manufacturing or selling products not conforming to such documents, nor shall the existence of such standards preclude their voluntary use by those other than SCTE members.

SCTE assumes no obligations or liability whatsoever to any party who may adopt the documents. Such adopting party assumes all risks associated with adoption of these documents, and accepts full responsibility for any damage and/or claims arising from the adoption of such documents.

Attention is called to the possibility that implementation of this document may require the use of subject matter covered by patent rights. By publication of this document, no position is taken with respect to the existence or validity of any patent rights in connection therewith. SCTE shall not be responsible for identifying patents for which a license may be required or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Patent holders who believe that they hold patents which are essential to the implementation of this document have been requested to provide information about those patents and any related licensing terms and conditions. Any such declarations made before or after publication of this document are available on the SCTE web site at <http://www.scte.org>.

All Rights Reserved

© Society of Cable Telecommunications Engineers, Inc. 2018  
140 Philips Road  
Exton, PA 19341

# Table of Contents

<b>Title</b>	<b>Page Number</b>
NOTICE	2
Table of Contents	3
1. Introduction	4
1.1. Executive Summary	4
1.2. Scope	4
1.3. Benefits	4
1.4. Intended Audience	4
1.5. Areas for Further Investigation or to be Added in Future Versions	4
2. Normative References	4
2.1. SCTE References	4
2.2. Standards from Other Organizations	5
2.3. Published Materials	5
3. Informative References	5
3.1. SCTE References	5
3.2. Standards from Other Organizations	5
3.3. Published Materials	5
4. Compliance Notation	6
5. Abbreviations and Definitions	6
5.1. Abbreviations	6
5.2. Definitions	6
6. Electrical Requirements	7
6.1. Impedance	7
6.2. Return Loss	7
6.3. Outer Conductor Junction	7
6.4. Center Conductor Junction	7
6.5. Shielding Effectiveness	7
7. Mechanical Requirements	7
7.1. Physical dimensions	7
7.2. Mechanical Strength	9
7.2.1. Tightening Torque	9
7.2.2. Axial Pull Force	9

## List of Figures

<b>Title</b>	<b>Page Number</b>
Figure 1 - Recommended Male "F" Pin Type Connector Drawing	8

## List of Tables

<b>Title</b>	<b>Page Number</b>
Table 1 - Recommended Male "F" Pin Type Return Loss Performance	7
Table 2 - Recommended Male "F" Pin Type Connector Dimensions	8

## 1. Introduction

### 1.1. Executive Summary

When introducing products into a complex system, such as a cable plant, it is desirable to have those products meet certain basic criteria. This is necessary to ensure the installation of new products do not adversely affect the overall performance of the system. Documents, such as this provide a basic set of dimensional and performance criteria to alleviate the issues of basic form, fit, and function performance of a product prior to its introduction.

### 1.2. Scope

The purpose of this document is to specify requirements for indoor male “F” pin type connectors that are used on ANSI/SCTE 117 2010 and SCTE IPS SP 009 mini coaxial cable in the 75 ohm RF broadband communications industry.

All requirements of this document are measured after installation per manufacturer’s instructions of the cable into the connector.

### 1.3. Benefits

This specification is necessary to provide manufacturers and users of this product a basic set of standard dimensional and performance requirements from which to gauge design performance. It’s useful for cable and equipment manufacturers to ensure proper mating with varied connector manufactured designs.

This specification provides confidence to end users that designs which meet these minimum criteria will perform properly in their systems.

### 1.4. Intended Audience

This document is intended for manufacturers and end users of this product, and products to which this connector type is intended to be terminated.

### 1.5. Areas for Further Investigation or to be Added in Future Versions

None at this time.

## 2. Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

### 2.1. SCTE References

- ANSI/SCTE 04 2014, Test Method for “F” Connector Return Loss
- ANSI/SCTE 98 2014, Test Method for Withstand Tightening Torque - 'F' Male
- ANSI/SCTE 99 2014, Test Method for Axial Pull Connector/Drop Cable

- ANSI/ SCTE 103 2018, Test Method for DC Contact Resistance, Drop cable to F-Connectors and F81 Barrels
- ANSI/SCTE 117 2010, Specification for Braided 75 Ohm Mini-series Broadband Coaxial Drop Cable

## **2.2. Standards from Other Organizations**

- No normative references are applicable.

## **2.3. Published Materials**

- No normative references are applicable.

# **3. Informative References**

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

## **3.1. SCTE References**

- IPS SP 009, Specification for Braided 75 Ohm Mini-series Baseband Coaxial Drop Cable

## **3.2. Standards from Other Organizations**

- No informative references are applicable.

## **3.3. Published Materials**

- No informative references are applicable.

## 4. Compliance Notation

<i>shall</i>	This word or the adjective “ <i>required</i> ” means that the item is an absolute requirement of this document.
<i>shall not</i>	This phrase means that the item is an absolute prohibition of this document.
<i>forbidden</i>	This word means the value specified shall never be used.
<i>should</i>	This word or the adjective “ <i>recommended</i> ” 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.
<i>should not</i>	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.
<i>may</i>	This word or the adjective “ <i>optional</i> ” 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.
<i>deprecated</i>	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.

## 5. Abbreviations and Definitions

### 5.1. Abbreviations

ANSI	American National Standards Institute
dB	decibel
DC	direct current
IPS	Interface Practices Subcommittee
Lb-in	pound-inch
MHz	megahertz
RF	radio frequency
SCTE	Society of Cable Telecommunications Engineers

### 5.2. Definitions

Center Conductor	The pin conductor inside the male “F” pin type connector that accepts the coaxial cable center conductor and contacts the “F” female socket of the mating connector
Dielectric	The material that is used to insulate the center conductor contact from the outer housing.
Reference Plan	The reference plane on the male “F” pin type connector is the mating surface that seats against the female F port. It is also the plane from where all horizontal dimensions are taken.

## 6. Electrical Requirements

### 6.1. Impedance

The male “F” pin type connector shall have a nominal impedance of 75 ohms.

### 6.2. Return Loss

The connector return loss shall meet the requirements of Table 1 when mated to a cable section meeting the requirements of ANSI/SCTE 117 2010 Specification for Braided 75 Ohm Mini-Series Broadband Coaxial Drop Cable or IPS-SP-009, Specification for Braided 75 Ohm Mini-Series Baseband Coaxial Drop Cable, whichever is applicable, and tested in accordance with ANSI/SCTE 04 2014.

**Table 1 - Recommended Male “F” Pin Type Return Loss Performance**

Frequency Range	Minimum Performance Requirement (dB)
5 MHz to 1002 MHz	26
1002 MHz to 1218 MHz	26
1218 MHz to 1794 MHz	20

### 6.3. Outer Conductor Junction

The outer conductor junction of the female F port to male “F” pin type connector shall have a DC contact resistance less than 10 milliohms when tightened to manufacturers specification and tested to ANSI/SCTE 103 2018.

### 6.4. Center Conductor Junction

The center conductor junction of the female F port to the center conductor of the cable shall have a DC contact resistance less than 10 milliohms when tested in accordance to ANSI/SCTE 103 2018.

### 6.5. Shielding Effectiveness

The shielding effectiveness for male “F” pin type connectors, when attached to cables manufactured to SCTE approved standards, shall meet shielding performance levels of an unspliced section of the same cable when both are tested with the same method.

## 7. Mechanical Requirements

### 7.1. Physical dimensions

The recommended physical dimensions for the male “F” pin type connector shall be as specified in Figure 1, Table 2, and per the notes below.

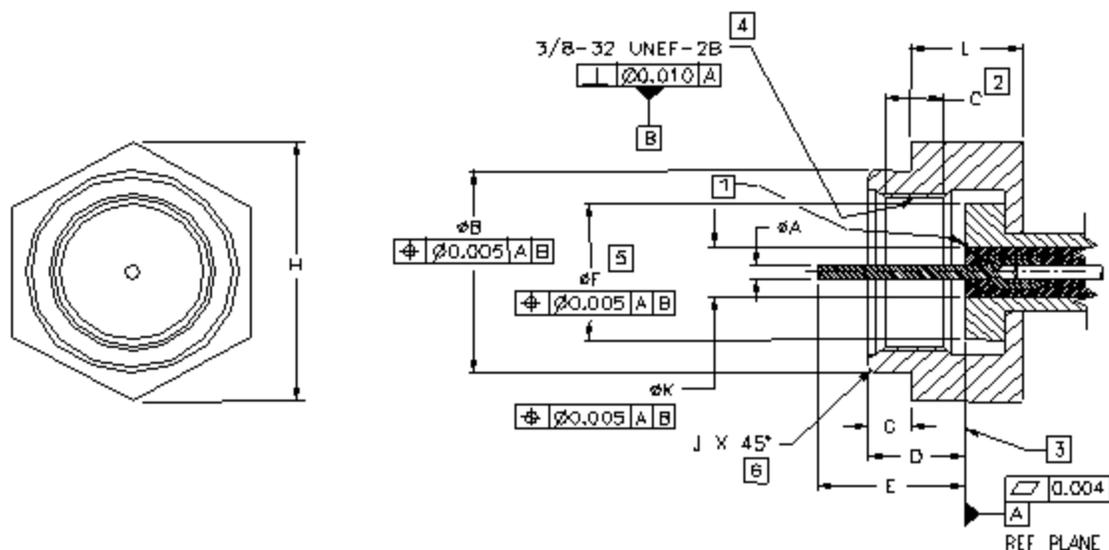


Figure 1 - Recommended Male "F" Pin Type Connector Drawing

Table 2 - Recommended Male "F" Pin Type Connector Dimensions

DESCRIPTION	DIM	mm		inches		NOTES
		MIN	MAX	MIN	MAX	
PIN DIAMETER	A	0.76	1.07	0.030	0.042	
SEALING SLEEVE DIAMETER	B	10.41	11.05	0.410	0.435	
NUT THREADED LENGTH	C	3.18	-	0.125	-	2
MANDREL FACE DEPTH TO NUT LEADING EDGE	D	4.29	6.10	0.169	0.240	
CENTER CONDUCTOR TO MANDREL FACE LENGTH	E	6.35	9.53	0.250	0.375	
MANDREL FACE OUTER DIAMETER	F	7.11	-	0.280	-	5
NUT TO SEALING SLEEVE INTERFACE LENGTH	G	1.78	4.45	0.070	0.175	
MAXIMUM ENVELOPE DIMENSION	H	-	16.61	-	0.654	
CHAMFER BREAK	J	0.25	0.76	0.010	0.030	6
MANDREL FACE INNER DIAMETER	K	-	5.84	-	0.230	
NUT HEX LENGTH	L	4.75	-	0.187	-	

## Notes

1. Dielectric must not protrude beyond ref. Plane
2. Minimum 4 full threads
3. Reference plane after installation on standard port, tightened to 30 lb-in and removed
4. Minimum 1 thread lead in
5. Minimum diameter of reference plane
6. Radius optional
7. Drawing not to scale
8. Interpret drawing in accordance with ASmEY 14.5m-2009

## **7.2. Mechanical Strength**

### **7.2.1. Tightening Torque**

The male “F” pin type connector shall withstand a minimum tightening torque of 60 lb-in, without damage when measured per ANSI/SCTE 98 2014, Test Method for Withstand Tightening Torque - 'F' Male.

### **7.2.2. Axial Pull Force**

The male “F” pin type connector, when attached to cables manufactured to SCTE approved standards, shall withstand a minimum axial pull force of 30 lbs. for indoor applications when tested per ANSI/SCTE 99 2014, Test Method for Axial Pull Connector/ Drop Cable.