

SCTE | **STANDARDS**

Interface Practices Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 160 2023

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, interoperability, interchangeability, best practices, and 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.

NOTE: The user’s attention is called to the possibility that compliance with this document may require the use of an invention covered by patent rights. By publication of this document, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details may be obtained from the standards developer. 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 <https://scte.org>.

All Rights Reserved
© 2023 Society of Cable Telecommunications Engineers, Inc.
140 Philips Road
Exton, PA 19341

Document Tags

<input checked="" type="checkbox"/> Specification	<input type="checkbox"/> Checklist	<input type="checkbox"/> Facility
<input type="checkbox"/> Test or Measurement	<input type="checkbox"/> Metric	<input checked="" type="checkbox"/> Access Network
<input type="checkbox"/> Architecture or Framework	<input type="checkbox"/> Cloud	<input checked="" type="checkbox"/> Customer Premises
<input type="checkbox"/> Procedure, Process or Method		

Document Release History

Release	Date
SCTE 160 2010	<i>10/19/2010</i>
SCTE 160 2018	<i>2/5/2019</i>
SCTE 160 2023	<i>11/2/2023</i>

Note: Standards that are released multiple times in the same year use: a, b, c, etc. to indicate normative balloted updates and/or r1, r2, r3, etc. to indicate editorial changes to a released document after the year.

Table of Contents

Title	Page Number
NOTICE.....	2
Document Tags.....	3
Document Release History	3
Table of Contents	4
1. Introduction.....	5
1.1. Executive Summary	5
1.2. Scope	5
1.3. Benefits	5
1.4. Intended Audience	5
1.5. Areas for Further Investigation or to be Added in Future Versions.....	5
2. Normative References	5
2.1. SCTE References	5
2.2. Standards from Other Organizations	6
2.3. Other Published Materials	6
3. Informative References	6
3.1. SCTE References	6
3.2. Standards from Other Organizations	6
3.3. Other Published Materials	6
4. Compliance Notation	7
5. Abbreviations and Definitions.....	7
5.1. Abbreviations.....	7
5.2. Definitions.....	7
6. Electrical Requirements	8
6.1. Impedance.....	8
6.2. Return Loss	8
6.3. Outer Conductor Junction	8
6.4. Center Conductor Junction	8
6.5. Shielding Effectiveness	8
7. Mechanical Requirements.....	8
7.1. Physical dimensions.....	8
7.2. Mechanical Strength	10
7.2.1. Tightening Torque.....	10
7.2.2. Axial Pull Force	10

List of Figures

Title	Page Number
Figure 1 - Recommended Male “F” Pin Type Connector Drawing.....	9

List of Tables

Title	Page Number
Table 1 - Recommended Male “F” Pin Type Return Loss Performance	8
Table 2 - Recommended Male “F” Pin Type Connector Dimensions	9

1. Introduction

1.1. Executive Summary

This specification applies to the Pin Type “F” Male connector interface used to interconnect mini coaxial cables to “F” Female ports on devices used in head end facilities.

1.2. Scope

The purpose of this document is to specify requirements for indoor male “F” pin type connectors that are used on [SCTE 177] 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 with 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. The editions indicated were valid at the time of subcommittee approval. 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

[SCTE 04]	ANSI/SCTE 04 2021 , Test Method for “F” Connector Return Loss
[SCTE 98]	ANSI/SCTE 98 2020 , Test Method for Withstand Tightening Torque - 'F' Male
[SCTE 99]	ANSI/SCTE 99 2019 , Test Method for Axial Pull Connector/Drop Cable
[SCTE 103]	ANSI/ SCTE 103 2018, Test Method for DC Contact Resistance, Drop cable to F-Connectors and F81 Barrels

[SCTE 177] ANSI/SCTE 177 2018 Specification for Braided 75 Ω , Mini-Series Quad Shield Coaxial Cable for CMTS and SDI cables

2.2. Standards from Other Organizations

[Y14.5-2009] ASME Y14.5-2009 The American Society of Mechanical Engineers; ` Dimensioning and Tolerancing

2.3. Other 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

[SCTE 02] ANSI/SCTE 02 2021, Specification for “F” Port Female, Indoor

[SCTE 124] ANSI/SCTE 124 2021, Specification for “F” Connector, Male, Pin Type

3.2. Standards from Other Organizations

No informative references are applicable.

3.3. Other 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 <i>shall</i> never be used.
<i>should</i>	This word or the adjective “ <i>recommended</i> ” means that there <i>may</i> exist valid reasons in particular circumstances to ignore this item, but the full implications <i>should</i> be understood and the case carefully weighed before choosing a different course.
<i>should not</i>	This phrase means that there <i>may</i> exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications <i>should</i> 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> ” indicate a course of action permissible within the limits of the document.
deprecated	Use is permissible for legacy purposes only. Deprecated features <i>may</i> be removed from future versions of this document. Implementations <i>should</i> 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

5.2. Definitions

Definitions of terms used in this document are provided in this section. Defined terms that have specific meanings are capitalized. When the capitalized term is used in this document, the term has the specific meaning as defined in this section.

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 [SCTE 177] and tested in accordance with [SCTE 04].

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
1794 MHz to 3 GHz	15

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 [SCTE 103].

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 [SCTE 103].

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.

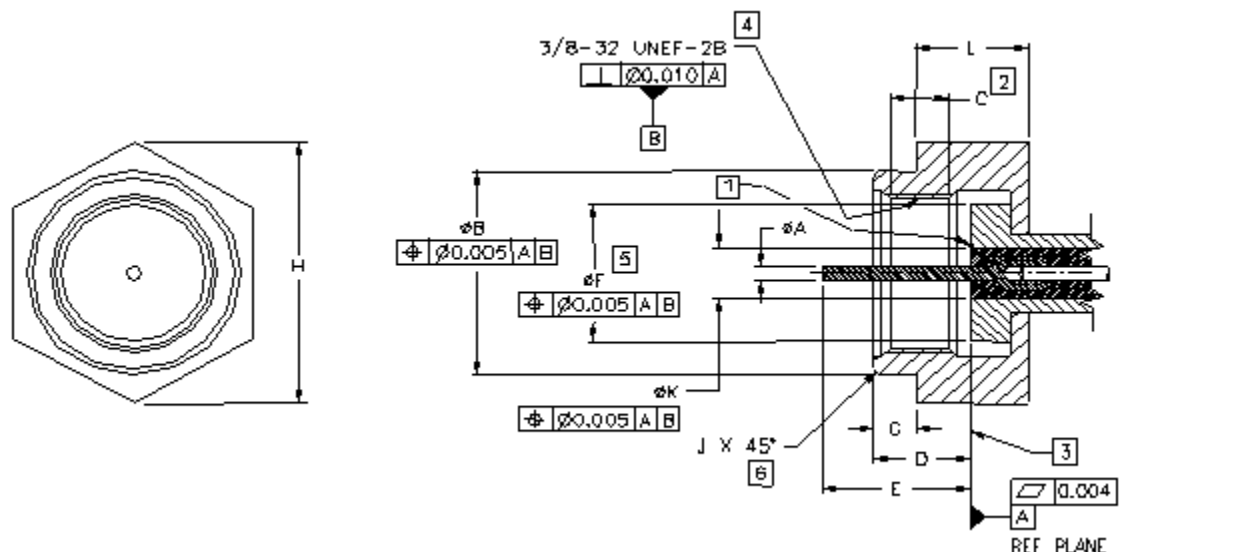


Figure 1 - Recommended Male "F" Pin Type Connector Drawing

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 [Y14.5-2009], www.asme.org/codes-standards/find-codes-standards

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 [SCTE 98] 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 [SCTE 99], Test Method for Axial Pull Connector/ Drop Cable.