

SCTE | **STANDARDS**

Interface Practices Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 147 2022

Specification for 75 Ohm Inline Attenuators

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Document Types and Tags

Document Type: Specification

Document Tags:

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

Document Release History

Release	Date
SCTE 147 2008	3/21/2008
SCTE 147 2013	4/8/2013
SCTE 147 2022	TBD

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.

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1. Introduction

1.1. Executive Summary

This document outlines the mechanical, electrical and environmental requirements for 75 ohm inline attenuators.

1.2. Scope

The purpose of this specification is to provide the mechanical, electrical, and environmental requirements for 75 ohm “F” type inline attenuators generally used for indoor residential applications. DOCSIS 4.0 specifications include operation at frequencies up to 1794 MHz. This document provides specifications or procedures for frequencies up to 3000 MHz.

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 performance.

1.4. Intended Audience

This document is intended for manufacturers and end users of this product.

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

None

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

- [SCTE 01] ANSI/SCTE 01 2021 – Specification for “F” Port, Female, Outdoor
- [SCTE 48-1] ANSI/SCTE 48-1 2021 – Test Method for Measuring Shielding Effectiveness of Passive and Active Devices Using a GTEM Cell.
- [SCTE 81] ANSI/SCTE 81 2018 – Surge Withstand Test Procedure
- [SCTE 98] ANSI/SCTE 98 2020 – Test Method for Withstand Tightening Torque - 'F' Male
- [SCTE 124] ANSI/SCTE 124 2021 – Specification for “F” Connector, Male, Pin Type
- [SCTE 143] ANSI/SCTE 143 2018 – Test Method for Salt Spray
- [SCTE 144] ANSI/SCTE 144 2017 – Test Procedure for Measuring Transmission and Reflection

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[SCTE 149] ANSI/SCTE 149 2019 – Test Method for Withstand Tightening Torque - “F” Female

2.2. Standards from Other Organizations

[IEEE] IEEE C62.41-1991 – Recommended Practice for Surge Voltages in low voltage AC Power Circuits

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

No informative references are applicable.

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.
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<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

° C	degree Celsius
° F	degree Fahrenheit
dB	decibel
lb-in	pound inch force
MHz	megahertz
SCTE	Society of Cable Telecommunications Engineers

5.2. Definitions

attenuator	Electronic device that reduces the power of a signal without appreciably distorting its waveform
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6. Electrical Requirements

6.1. Bandwidth

The bandwidth *shall* be a minimum of 5 MHz to 3000 MHz, unless otherwise specified. All performance parameters listed *shall* be tested in this frequency range.

6.2. Return Loss

The return loss *shall* be ≥ 20 dB, when tested in accordance with [SCTE 144].

6.3. Shielding Effectiveness

The shielding effectiveness *shall* be a minimum of 100 dB, when measured in accordance with [SCTE 48-1].

6.4. Surge Withstand

The 75 ohm inline attenuator *should* meet all specifications after being subjected to the [IEEE] C62.41-1991 Category A3 Ring Wave, 6 kV, 200 A at the “F” port. All surges *should* be tested in accordance with [SCTE 81].

6.5. Insertion Loss

The insertion loss *shall* not exceed the values listed in Table 1, when tested in accordance with [SCTE 144].

Table 1 – Attenuation (loss)

Attenuation Value	Insertion Loss
1	1.0 dB ± 0.25 dB
2	2.0 dB ± 0.25 dB
3	3.0 dB ± 0.25 dB
4	4.0 dB ± 0.25 dB
5	5.0 dB ± 0.25 dB
6	6.0 dB ± 0.25 dB
7	7.0 dB ± 0.25 dB
8	8.0 dB ± 0.25 dB
9	9.0 dB ± 0.25 dB
10	10.0 dB ± 0.25 dB
11	11.0 dB ± 0.25 dB
12	12.0 dB ± 0.25 dB
13	13.0 dB ± 0.25 dB
14	14.0 dB ± 0.25 dB
15	15.0 dB ± 0.40 dB
16	16.0 dB ± 0.40 dB
17	17.0 dB ± 0.40 dB
18	18.0 dB ± 0.50 dB
19	19.0 dB ± 0.50 dB
20	20.0 dB ± 0.50 dB

7. Mechanical Requirements

7.1. Physical dimensions – “F” Male

The physical dimensions for the Male “F” connector *shall* conform to [SCTE 124].,

7.2. Physical dimensions – “F” Female

The physical dimensions for the “F” female connector *shall* conform to [SCTE 01].

7.3. Withstand Tightening Torque – Male “F”

The Male “F” connector interface *shall* withstand a minimum tightening torque of 40 lb-in without damage when measured per [SCTE 98].

7.4. Withstand Tightening Torque – “F” Female

The female “F” connector interface *shall* withstand a minimum tightening torque of 40 lb-in without damage and there *shall* be no relative movement of the outer housings to the “F” female interface when tested per [SCTE 149].

There *shall not* be relative movement of the outer housings to the “F” female interface.

7.5. Labeling

Each device *shall* be marked with nominal attenuation value and manufacturer.

7.6. Envelope Dimensions

The recommended envelope dimensions are shown in Table 2, Figure 1, and Figure 2.

8. Environmental Requirements

8.1. Temperature

The devices *shall* meet all performance requirements after exposure to temperatures ranging from -40 °F (-40 °C) to +140 °F (+60 °C) inclusive.

8.2. Salt Spray

Devices *shall* be exposed to 500 hours of continuous salt spray per [SCTE 143] with no degradation in electrical or mechanical performance.

9. Physical Dimensions

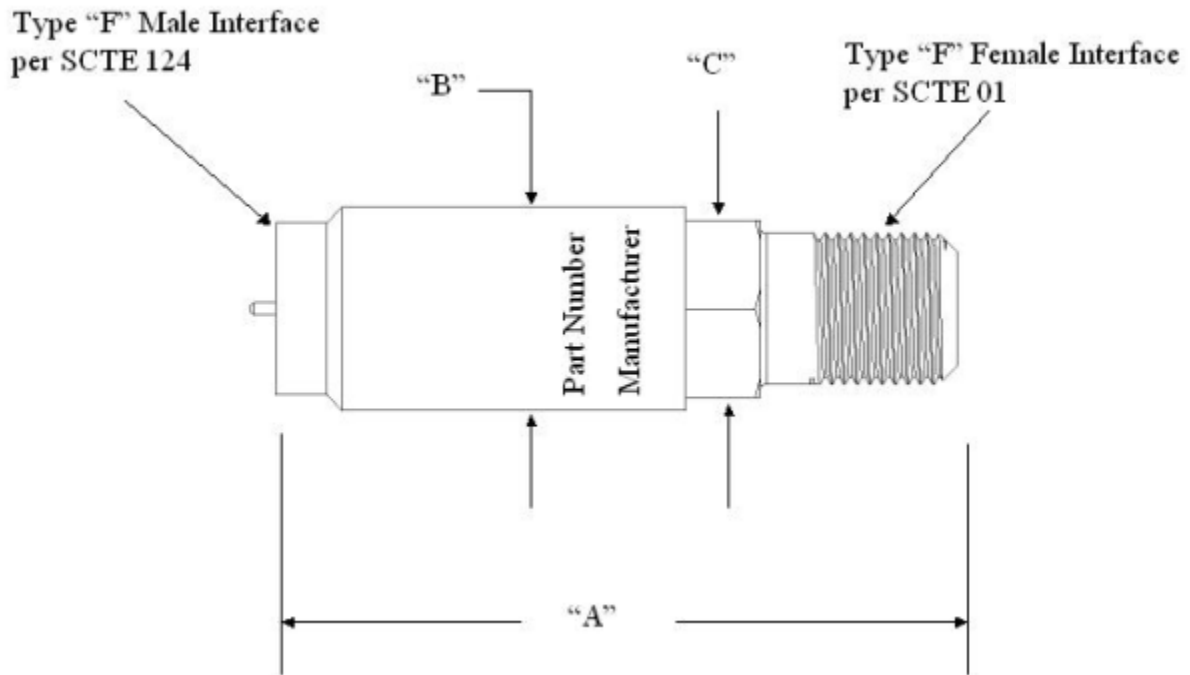


Figure 1 - In-line Attenuator with fixed nut Envelope Requirements

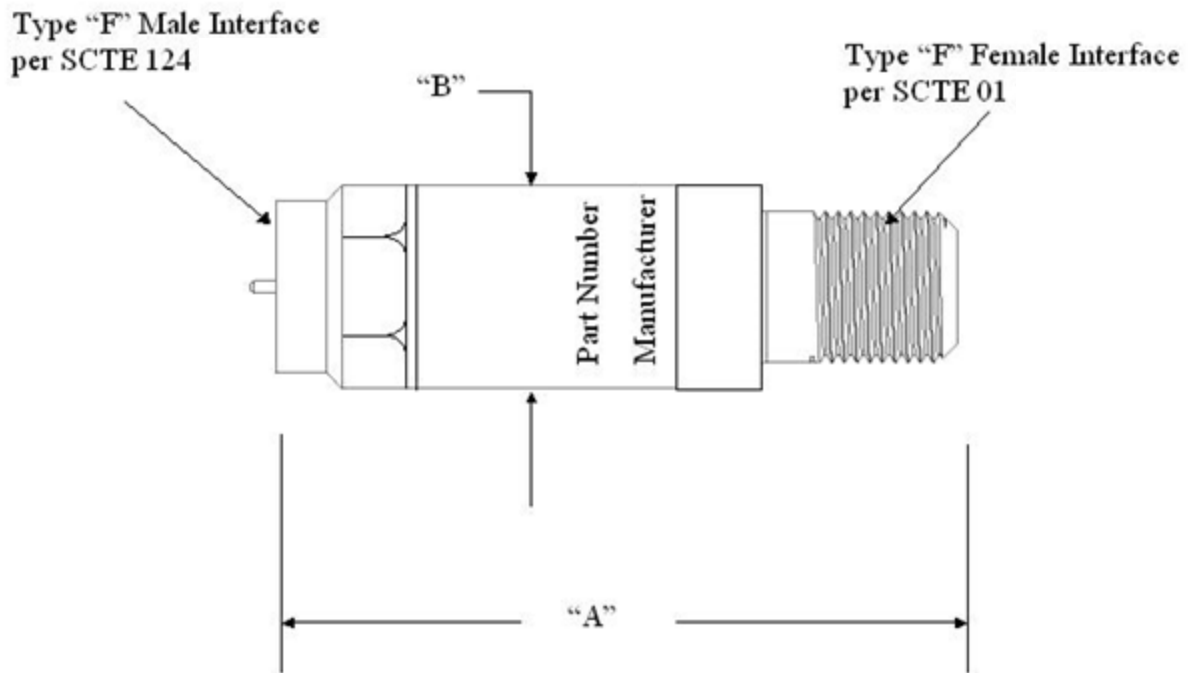


Figure 2 - In-line Attenuator with movable nut Envelope Requirements

Table 2 – Dimensions

DESCRIPTION	DIM.	mm		inches		Notes
	Ref.	min.	max.	min.	max.	
Over All Length	A	-	44.42	-	1.75	
Envelope Dimension	B	-	22.85	-	0.90	
Hex Size	C	-	11.10	-	0.437	Ref.