



***Society of Cable  
Telecommunications  
Engineers***

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**ENGINEERING COMMITTEE  
Interface Practices Subcommittee**

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**AMERICAN NATIONAL STANDARD**

**ANSI/SCTE 76 2007**

**Antenna Selector Switches**

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## **1.0 SCOPE**

The purpose of this document is to specify recommended mechanical and electrical standards for broadband radio frequency (RF) devices whose primary purpose is to allow signals presented to an input port to be routed selectively to one of two or more output ports. Alternately, such devices can be used to select which one of the multiple input sources is routed to the common output port. Its scope is limited to 75 ohm devices whose ports are provided with F connectors. The most common use for such devices is on-premises RF signal distribution.

Products covered by this specification include switches commonly known as “A/B Switches” and “A/B/C Switches”. These devices are regulated by the Federal Communications Commission as “Cable Input Selector Switches” under C.F.R 47 §15 which is incorporated by reference into this standard. This standard is intended to supplement, not replace the FCC requirements. Where a conflict between §15 and this standard may occur, the stricter of the requirements applies.

Not covered are devices, which are intended for use in configurations where no port is presented with a broadband spectrum of signals such as is commonly, delivered by cable television systems. These are commonly known as “Video Game Switches.”

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

## **2.0 MECHANICAL**

### **2.1 RF Ports**

2.1.1 All RF ports shall be type F. Female ports shall conform to the requirements of ANSI/SCTE 01 2006. Male ports shall conform to the requirements of ANSI/SCTE 123 2006.

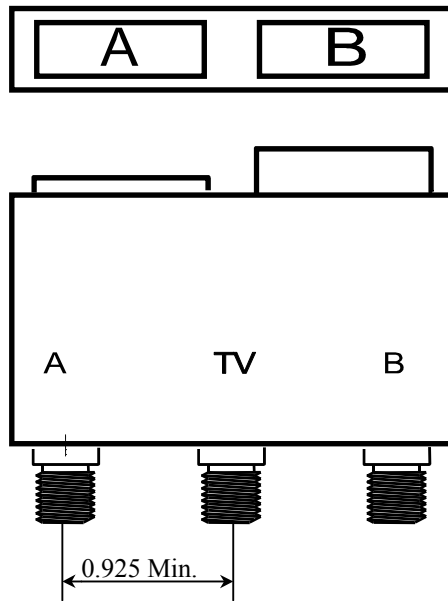
2.1.2 If the device includes an attached cable, which is terminated with a male F connector, the cable shall meet the requirements of SCTE 74 2003, the installed connector shall meet the requirements of ANSI/SCTE 123 2006.

2.1.3 Where more than one connector exits from a common surface of the device, connectors will be spaced a minimum of 0.925 inches apart, center-to-center.

### **2.2 Labeling**

Each RF port of the device must be labeled. Designations must be in accordance with the following:

- 2.2.1 The common port may be labeled “common”, “in”, “input” or “TV” at the manufacturer’s option.
- 2.2.2 The switched ports may be labeled “out”, “output”, may be numbered or lettered or labeled, at the manufacturer’s option, to indicate a specific intended purpose. See Figure 1 for an example of conforming labeling and mechanical configuration.
- 2.2.3 The actuator or control must be clearly labeled to indicate which position corresponds to the signal routing to each output port, such as letter or number designations, which correspond to port labels.



**Fig. 1**

- 2.2.4 Switches must be additionally be labeled in accordance with the requirements of C.F.R47 §15.19(a)(2) and any other requirements imposed by the FCC.

### **3.0 ELECTRICAL**

- 3.1 Bandwidth. All devices shall be designed to operate over a bandwidth of at least 5 to 1,002 MHz.
- 3.2 Passband Response. The Passband response measured from the input port to the connected output port shall not exceed  $\pm 0.25$  dB relative to the slope loss of the device as measured and defined in SCTE 144 2007.
- 3.3 Insertion Loss. The insertion loss of the device, measured from the input port to the connected output port shall not exceed 0.5 dB between the frequencies of 5 MHz and 600 MHz inclusively and shall not exceed 0.7 dB from 600 MHz up to and including

1,002 MHz. All measurements shall be made using the methods specified in SCTE 144 2007.

- 3.4 Return Loss. The return loss at any RF port, with other ports properly terminated, shall be a minimum of 18 dB. This specification applies regardless of the position of the switch and, for powered devices, applies whether the device is powered or not. All measurements shall be made in accordance with the procedures outlined in SCTE 144 2007 or ANSI/SCTE 05 1999.
- 3.5 Isolation. The isolation between any two RF output ports and between any non-selected output port and the common port shall meet the requirements of C.F.R47 §15.115(h). In addition, they shall provide an isolation of at least 70 dB over the entire frequency range when tested using the procedures specified in SCTE 144 2007. For powered devices this requirement applies in both the powered and unpowered condition.
- 3.6 Ingress Shielding. The shielding effectiveness of the devices when measured in accordance with ANSI/SCTE 48-2 2003 or SCTE 48-2 2008 shall be a minimum of 100dB.
- 3.7 3.7 Surge Withstand. The devices when measured in accordance with ANSI/SCTE 81 2007 shall be a minimum of compliance with IEEE C62.41-1991 Category A-3 Ring Wave, 1KV, 200 Amps at the F Ports.

#### **4.0 NORMATIVE REFERENCES**

The following documents contain provisions that, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent edition of the documents listed below.

1. ANSI/SCTE 01 2006: Specification for “F” Port, Female, Outdoor
2. ANSI/SCTE 05 1999: “F” Connector Return Loss In-line Pair
3. ANSI/SCTE 81 2007: Surge Withstand Test Procedure
4. C.F.R 47 §15 (October 1, 2002): Code of Federal Regulations, Title 47, Part 15
5. IEEE C62.41-1991: IEEE Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits”
6. SCTE 48-2 2008: Test Procedure for Measuring Relative Shielding Properties of Active and Passive Coaxial Cable Devices Using H-P Magnetic Close Field Probe.
7. SCTE 74 2003: Specification for Braided 75  $\Omega$  Flexible RF Coaxial Drop Cable
8. ANSI/SCTE 123 2006: Specification for “F” Connector, Male, Feed-Through

9. SCTE 144 2007: Test Procedure for Measuring Transmission and Reflection
10. ANSI/SCTE 48-3 2003: Test Method for Shielding Effectiveness of Actives and Passives Using GTEM Cell