



***Society of Cable
Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Interface Practices Subcommittee**

American National Standard

ANSI/SCTE 129 2007

Drop Passives: Bonding Blocks (Without Surge Protection)

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1.0 SCOPE

The purpose of this document is to recommend mechanical and electrical standards for broadband radio frequency (RF) devices whose primary purpose is to provide a transition point between the network operator's service cable (the "drop") and the distribution wiring within premises. An important function of the device is to provide a connection point for a bonding conductor in accordance with requirements of the National Electrical Code or local building requirements. The scope of this specification is limited to 75 ohm devices whose ports are provided with female type F ports.

The specification is not intended to restrict any manufacturer's innovation and improvement.

2.0 MECHANICAL

2.1 RF Ports

2.1.1 All RF ports shall be type F female and shall conform to the requirements of ANSI/SCTE 01 2006 for Outdoor use.

2.1.2 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 Mounting

Mounting holes or slots may be located at the manufacturers preferred location provided that they meet the requirements of 2.2.1 and 2.2.2 herein.

2.2.1 Mounting holes or slots shall be of such size and location as to allow orthogonal mounting of the device on a hole pattern grid of 0.500" by 0.500" (12.7mm x 12.7mm), capable of employing standard #6 (M3.5) hardware. (Figure 1)

2.2.2 Mounting holes, slots or Bonding points shall be located as to not interfere with open-end wrench access to the F ports.

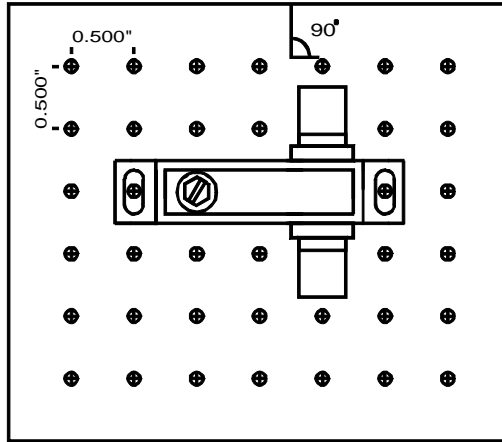


Figure 1:
Orthogonal Mounting of Device on 0.500" hole pattern

2.3 Bonding

2.3.1 Bonding wire attachment points must use, multi-drive head, flat point (or mechanically equivalent non-piercing) bonding device to maximize surface area contact.

2.3.1.1 Bonding fastener multi-drive screw head must be a triple drive type incorporating Slot, Phillips, and Hexagon drive. Figure 2

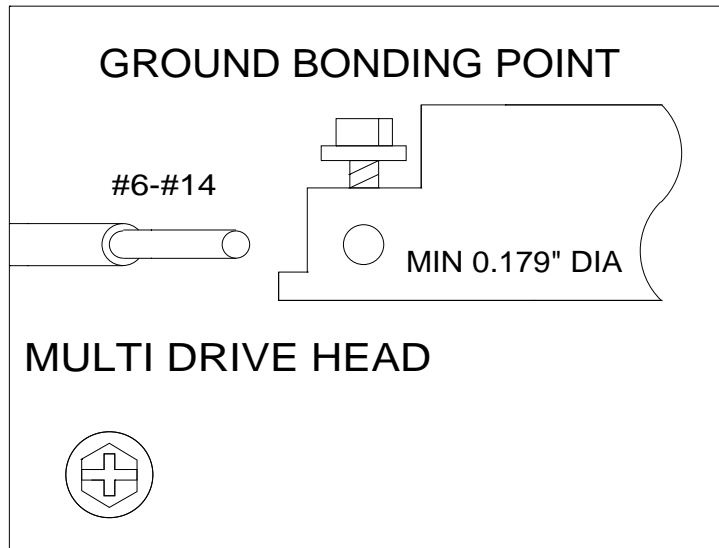


Figure 2: Shows a bonding wire seizure arrangement and recommended screw head for the Bonding fastener

2.3.2 The bonding wire attachment point must accommodate wire sizes from #6 to #14, minimum wire access 0.179" (4.55 mm) diameter.

2.3.3 Neither the seizure screw, nor the mating part shall break nor shall the threads strip when 30 inch-pounds of torque is applied to the screw head.

2.3.4 Penetration of the seizure screw or clamp device into a #6 or #10 annealed copper wire shall not exceed 25% of the wire outside diameter, when 30 inch-pounds of torque is applied to the screw head. Penetration into a #12 or #14 annealed copper wire shall not exceed 25% at 20 inch-pounds of torque applied to the screw head. Compliance shall be tested using ANSI/SCTE 29 2001.

2.3.5 GALVANIC COMPATABILITY

The Bonding Block wire attachment point shall be Galvanically Compatible with bond wire employed.

Cable Communications industry standard practice has established this wire type to be Bare Annealed Copper, which has an Anodic Index of 0.35 V.

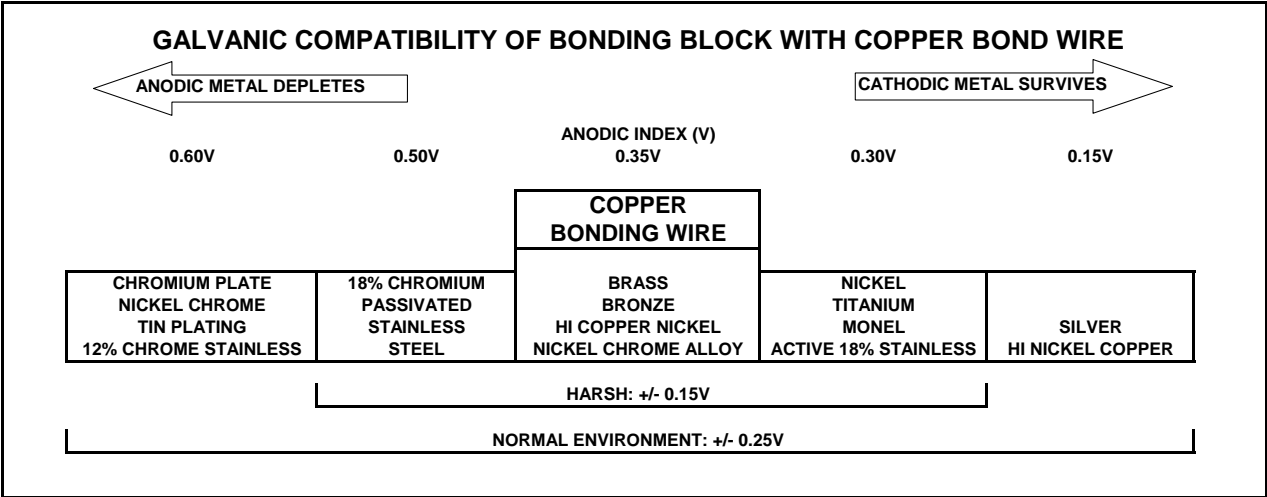


Figure 3: An example of Galvanic Compatibility as per MIL-STD-889

Galvanic Compatibility is defined as the differential in Anodic Index Voltage between the various metals at the junction. MIL-STD-889 (Dissimilar Metals) shows the Anodic Index (V) of various common Metals and Platings. (Figure 3)

The allowable Military/Aviation/Marine limits are:

Harsh Environment: Salt Spray, Outdoor, High Humidity	+/-0.15 V
Normal Environment: Indoor non-temperature and non-humidity controlled	+/-0.25 V
Controlled Environments:	+/-0.50V

As this device may be installed in harsh outdoor environments in the presence of salt and humidity, an allowable Anodic Index (V) differential limit of +/-0.15 Volt shall be met.

2.4 Labeling

No labeling is required.

3.0 ELECTRICAL

3.1 Bandwidth

All devices shall be designed to operate over a bandwidth of DC to 1002MHz

3.2 Insertion Loss

The insertion loss of the device, measured from the input port to the output port shall not exceed 0.2 dB for frequencies between 5 and 600 MHz inclusive. For frequencies between 600 MHz up to and including 1,002MHz, the insertion loss shall not exceed 0.3 dB. All measurements shall be made using the methods specified in SCTE IPS TP 201.

3.3 Return Loss

The return loss, as measured at either RF port, with the other port terminated into 75 ohms, shall be a minimum of 30 dB from 5MHz to 1,002MHz, when mated with cables of size 59 through size 6 which meet the requirement of ANSI/SCTE 74 2003 and which have male F connectors meeting and installed in accordance with SCTE 123 2006. All measurements shall be made in accordance with the procedures outlined in ANSI/SCTE 05 1999, with the bonding block substituted for the appropriate adapter.

3.4 Shielding Effectiveness

The shielding of components when measured in accordance with SCTE 48-1 2006 or ANSI/SCTE 48-2 2003 shall be at least 100 dB.

3.5 Surge Withstand

The surge withstand of components when measured in accordance with ANSI/SCTE 81 2003 shall be a minimum of IEEE C62.41-1991 Category B3 Combo Wave, 6 kV, 3 kA at the F Port, with the second port terminated into a short circuit.

3.6 Bonding effectiveness

The Bonding wire attachment method employed shall exhibit a contact resistance between the device and bonding wire of less than 50 milliohms as measured with a standard low resistance milliohm meter.

4.0 ENVIRONMENTAL

4.1 Salt Spray

Devices must meet all performance requirements after conditioning as specified in SCTE IPS TP 406 for a minimum of 1,000 hours. The device must exhibit less than 0.050 Inch (1.25mm) material depth corrosion, and maintain <50 milliohm contact resistance as specified in Section 3.6.

4.2 Temperature

The devices must meet all performance requirements during and after exposure to temperatures ranging from -40°F (-40°C) to +140°F (+60°C).

Temperature cycle shall be:

2 hours at low limit

1hour transition to high limit

2 hours at high limit

1 hour transition to low limit

repeat for 15 cycles.

5.0 NORMATIVE REFERENCES

The following documents contain provisions, which, 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 editions of the documents listed below.

SCTE References

1. ANSI/SCTE 01 2006: “F” Port (Female Outdoor) Physical Dimensions.
2. ANSI/SCTE 02 2006: “F” Port (Female Indoor) Physical Dimensions.
3. ANSI/SCTE 05 1999: Test Method for “F” Connector Return Loss In-Line Pair.
4. ANSI/SCTE 29 2001: Torque Requirements for Bond Wire Penetration of Bonding Set Screw.
5. ANSI/SCTE 48-2 2003: Test Procedure for Measuring Relative Shielding Properties of Active and Passive Coaxial Cable Devices using H-P magnetic Close Field Probe.
6. ANSI/SCTE 74 2003: Specification for Braided 75 Ohm Flexible RF Coaxial Drop Cable.
7. ANSI/SCTE 81 2003: Test Method for Surge Withstand
8. SCTE 123 2006: Specification for “F” Connector, Male, Feed-Through
9. SCTE IPS TP 201: Test Method for Gain Isolation and Return Loss
10. SCTE 48-1 2006: Test Method for Shielding Effectiveness of Actives and Passives Using GTEM Cell
11. SCTE IPS TP 406: Test Method for Salt Spray

Standards from other Organizations

12. Military Standard MIL-STD-889 (Dissimilar Metals)