



75-Ohm Coaxial Cable

Coaxial cable is used for satellite, cable television (CATV) and closed circuit television (CCTV) systems. Satellite and CATV systems use Series 6 outlet cable, known as RG6 (Radio Grade). Coaxial backbone cable is typically RG 11, which runs from the street to the network interface device located in the distribution center. RG6, as well as trunk line cable, may also be used for backbone applications. Series 59 cable is used only for baseband CCTV systems and for patch and equipment cords. All coaxial cables meet the requirements of SCTE IPS-SP-001 or ANSI/SCTE 15 2001, as specified, up to a bandwidth of 1000 MHz for CATV or 2200 MHz for satellite. The characteristic impedance of these cables is 75 +/- 3 ohms.

A coaxial cable is comprised of the following:

The center conductor of a coaxial cables can be copper, copper-coated steel (CCS) or copper-coated aluminum (CCA). Bare copper is used typically for baseband video because it has lower direct current (DC) resistance than the other types. CCS is the most commonly used material. CCA is used typically for semi-rigid distribution cables and larger flexible coaxial designs.

The core surrounding the center conductor, called the **dielectric**, consists of a continuous layer of polymeric material. The dielectric separates

the center conductor (found inside the dielectric) from the ground shields located outside the dielectric material.

In **quad shielded** coaxial cable, the shielding layer consists of a laminated foil tape covered by a metallic braid, a second foil shield, and the final metallic braid.

The **cable jacket** is a continuous layer of a polymeric material. Series 6 and 11 cables are capable of being installed at temperatures ranging from -20 °C to +60 °C. Certain plenum cables have a lower temperature limit of 0 °C.

Equipment and patch cords

Series 59 coaxial cable is commonly used for equipment and patch cords. For lengths longer than 3.05 m (10 ft), Series 6 coaxial cable should be used. Factory terminated cords are recommended. In addition patch cords that are used for low frequency signals, such as baseband video, should contain a solid copper center conductor. The reason for this is the skin effect. In addition, stranded cables are recommended for all patch cords.

Stranded center conductors have a longer flex life, which is the ability of a conductor or cable to withstand repeated bending.

Skin Effect

The skin effect is the tendency of an alternating electric current (AC) to distribute itself within a conductor so that as the frequency increases the current flows closer to the surface. That is, the electric current tends to flow at the “skin” of the conductor.

Skin Depth for Copper

Frequency	Depth
60 Hz	0.337 in (8.57 mm)
10 kHz	0.026 in 0.66 mm
100 kHz	0.008 in (0.21 mm)
1 MHz	0.003 in (66 μ m)
10 MHz	0.001 in (21 μ m)

Copyright ©2007 by DPartner. No part of this article may be reproduced, stored in a retrieval system, or transmitted in any form, or by any means, electronic, mechanical, photocopying, recording, scanning, or otherwise, except as permitted under Section 107 or 108 of the 1976 United States Copyright Act, without prior written permission of DPartner. Trademarked names may appear in this book. Rather than use a trademark symbol with every occurrence of the trademarked name, we use the name only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark. The information in this article is distributed on an “as is” basis, without warranty. Although every precaution has been taken in the preparation of this work, neither the authors nor DPartner shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this article.



PARTNER

5020 Fairways Circle, Unit 205
Vero Beach, FL 32967
772.539.9433
www.DPartner.com