



ATT-TP-76418

BITS Clock Timing Cable Standards for the AT&T LOCAL EXCHANGE companies

Abstract

Presented in this document are the standards for the manufacturing and installation of BITS Clock Timing Cables within AT&T central offices.

Audience: The primary audience for this document are AT&T LOCAL EXCHANGE companies in the following disciplines: Switch Capacity Planner/Engineer, Transport Equipment Engineer (TEE), Facility Equipment Engineer (FEE), Digital Transport Engineer (DTE) and Maintenance Engineer. This document is to be used internally within AT&T LOCAL EXCHANGE companies and their Authorized Vendors and has a limited distribution subject to the header/footer information.

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1. Copyright Page

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2. Reasons for Reissue

Issue 2. A new Section 7, Testing, for AT&T Differential Impedance Testing requirements by manufacturers of BITS Clock Timing Cable products is now included.

Issue 3. Section 4, Description, adds a statement that BITS Clock timing cables are to be used within AT&T central offices. Section 6, Electrical Characteristics and Operating Temperature, extends the maximum temperature to 85 degrees C. Section 8, References, adds the Fujitsu Test Method using Agilent equipment, Oscilloscope and Time Domain Reflectometer, for Differential Cable Impedance measurements and qualification.

Issue 4. Cover page, Header, Section 3, Introduction, Section 4, Description, and Section 7, Testing, all contain changes in the wording from “Bits” to “BITS Clock” or to “TSG(Timing Signal Generator)” to more accurately state the nature of BITS Clock Synchronous Timing.

Issue 5. Section 5, Construction & Packaging, corrects the Cable Nominal Outside Diameter from 0.015” to 0.15”. Section 9, Contact List, updates Associate Director from Steve Weinert to Bruce Jones and updates other contact’s email addresses.

3. Introduction

BITS Clock or TSG(Timing Signal Generator)Timing Cables, which are also known as Synchronous Timing Cables, act as the copper cable transport link between various BITS Clock timed network elements, including switches, and the actual BITS TSG timing source, or synchronous timing equipment. The application speed for these BITS Clock timing cables include the following: DS1 – 1.544 Mb/sec(higher) and 64 Kb/sec(lower) speeds. It is important that these BITS Clock timing cables, as manufactured, meet rigorous AT&T manufacturing and transport performance requirements, since failure to perform up to the bit error rate demands of the BITS Clock timing source network elements and the synchronous timing equipment will cause disruption to vital network services.

4. Description

Synchronous BITS Clock Timing Cables will be manufactured as a single pair, 22 AWG, insulated copper primary, and will be shielded with tinned copper drain wire and will be “red” jacketed. The cable must meet the AT&T mechanical and transmission performance specifications for twisted pair BITS Clock timing cables. The differential impedance of these cables must be 100 ohms +/- 15 ohms up to 20MHz. The cable must be UL Listed Type MPR/CMR(Riser Rated) and comply to ICEA S-90-661 and NEC 800 Type CMR. These cables are to be used within AT&T central offices in concert with, and to connect to, various timing traceable network elements.

5. Construction & Packaging

- Conductors: 22 AWG Solid Tinned Annealed Copper
- Insulation: Polyethylene(PE), Nominal Diameter 0.073”
- Pairing: Twisting Sufficient to Meet Attenuation Requirements
- Insulation Color Coding: Solid Blue and Solid White
- Shielding: Aluminum Foil Laminate, with Blue Mylar Side Facing the Cable Core, and Aluminum Foil Side Facing the Outer Cable Jacket
- Drain Wire: 24 AWG Solid Tinned Copper
- Ripcord: Applied Between Drain Wire and Outer Jacket
- Outer Jacket: Polyvinyl Chloride(PVC) Colored Red with Nominal Thickness of 0.020” and Cable Nominal Outside Diameter of 0.15”
- Packaging: Available on Reels

6. Electrical Characteristics & Operating Temperature

- Electrical Characteristics are defined at 20 degrees C
- DC Conductor Resistance: 17.8 Ohms/1000 ft, maximum
- Mutual Capacitance: 18 pF/ft, nominal
- Attenuation: (all values are nominal)
 - 4.5 dB/1000 ft @ 0.772MHz
 - 5.0 dB/1000 ft @ 1.0 MHz
 - 8.8 dB/1000 ft @ 4.0 MHz
 - 14.0 dB/1000 ft @ 10.0 MHz
 - 20.0 dB/1000 ft @ 20.0 MHz
- Differential Impedance: 100 +/- 15 Ohms Up to 20 MHz
- Operating Temperature: 85 degrees C, maximum

7. Testing

All production of manufactured BITS Clock Timing Cables must pass the AT&T testing criteria for Differential Cable Impedance found in the Fujitsu test method, which uses Agilent equipment. See Word Document Attachment entitled ATT-TP-76418-001, *Differential Impedance Cable Test*, Issue 4, dated September 3, 2004. Both the Hardware and Software included in this method, or its equivalence, must be used to qualify all lots of manufactured BITS Clock Timing Cables before potential purchase by AT&T.

8. References

ATT-TP-76418-001, *Differential Impedance Cable Test*, Issue 2, dated May 25, 2005

Westek Electronics: Differential Impedance Testing – Protocol using Tektronix Oscilloscope, Model TDS8000, specifically designed for differential impedance testing, with Electrical Sampling Module #80E04.

ICEA S-90-661

GR-137-CORE

Fujitsu Network Communications (05-12-04) - Agilent Oscilloscope and TDR Set Up for measurement of differential cable impedance.

9. Contact List

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