ATIS-0600016.2018(R2023)

Remote End PON Splitter Requirements

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American National Standard on

Remote End POTS Splitter Requirements

Alliance for Telecommunications Industry Solutions

Approved January 2018

American National Standards Institute, Inc.

Abstract

This Standard presents static Plain Old Telephone Service (POTS) splitter requirements for remote end splitters operating in the xDSL band between 32 kHz and 30 MHz. This standard is not intended to provide specific details on physical attributes, industry standard safety considerations, or configuration of remote end splitters.

This document describes the electrical characteristics of remote end splitters that reduce the xDSL signal impact on voice band communication and provide isolation between voice band equipment and xDSL equipment. Common remote end splitter architectures are also described for informative purposes.

Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Sustainability in Telecom: Energy and Protection (STEP) Committee – formerly the Network Interface, Power, and Protection (NIPP) Committee – engages industry expertise to develop standards and technical reports for telecommunications equipment and environments in the areas of energy efficiency, environmental impacts, power, and protection. The work products of STEP enable vendors, operators, and their customers to deploy and operate reliable, environmentally sustainable, energy efficient communications technologies. STEP is committed to proactive engagement with national, regional, and international standards development organizations and forums that share its scope of work.

ANSI guidelines specify two categories of requirements: mandatory and recommendation. The mandatory requirements are designated by the word shall and recommendations by the word should. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, STEP, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time of consensus on this document, STEP, which was responsible for its development, had the following leadership:

E. Gallo, STEP Chair and STEP NEP Vice Chair (Ericsson)

J. Fuller, STEP Vice Chair and STEP NEP Chair (AT&T)

The Network Electrical Protection (NEP) Subcommittee was responsible for the development of this document.

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1 Scope, Purpose, & Other Considerations

1.1 Scope

This technical requirement document defines a minimal set of static electrical requirements for a remote end splitter. The parameters defined include terminations, frequencies, testing, test signatures, DC characteristics, voice band characteristics, attenuation, envelope delay distortion, impedance, longitudinal balance, and metallic balance. Additional features and performance characteristics such as dynamic testing are beyond the scope of this document.

Dynamic testing of a splitter is performed in a live Plain Old Telephone Service (POTS) and xDSL modem environment. This includes, but is not limited to, a complete system setup using Central Office (CO) and remote splitters, DSL Transceiver Unit - Central Office End (TU-C) and DSL Transceiver Unit - Remote End (TU-R) modems, CO ringers, and a telephone. Performance of the splitter is measured by evaluating the Layer 1 primitives reported by the TU-C and TU-R (CRCs, FECs, etc.) during on-hook, off-hook, ringing, and ring trip events. This work is being covered by the Broadband Forum.

The reader should note that implementations addressing the applications described herein may also be subject to other industry specifications such as TIA-968-A, GR-1089-CORE, and UL documents.

1.2 Purpose

This technical requirement document is intended to facilitate the provisioning of various digital subscriber line (DSL) technologies and voice band services over the same loop. The document is written broadly to permit the remote end splitter to be used for current DSL technologies and potential new DSL technologies that use the same frequency spectra.

1.3 Other Considerations

Network systems apply various electrical signals to the subscriber loop for the purpose of network maintenance and alerting the customer of an incoming call. These signals vary considerably in amplitude and can reach values of -/+ 200 Volts of Direct Current (VDC) for maintenance functions and 276.2 Volts peak for alerting signals. When these signals are applied to an access line that also has a remote end splitter wired in series with the subscriber loop, the low pass section of the splitter may see the full magnitude of these signals. Therefore, consideration should be given to the selection of circuit components used for the splitter design. During the times these signals are applied, it is acceptable that the low pass filter does not perform all of its functions nor meet all of the technical requirements in this document. However, the filter components should not be permanently damaged.

Such phenomena as lightning and over voltage due to inductive interference or power cross lie beyond the scope of this Technical Requirements document.

The detailed technical parameters of the network maintenance, alerting signals, and safety referenced here can be found in the informative references in clause 2.2.

Some combinations of splitters and telephone sets may experience problems with excessive side tone – i.e., the user's speech or room noise, heard by the user. This topic is currently under study. Future versions of this standard could include new specifications.