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Composite Distortion Measurements (CSO & CTB)

ANSI/SCTE 06 2019

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1. Introduction

1.1. Executive Summary

Cable systems are traditionally comprised of multiple analog channels with an even frequency spacing between channels. When this channel lineup passes through devices in the cable plant, especially active devices, distortion products are generated which interfere with the analog channels.

With multiple, evenly spaced channels, the second and third order distortion products combine and add at constant frequencies across the band around and on top of the channel frequencies themselves, creating composite second order (CSO) and composite third order (CTB) distortion products.

Having a standard consistent method of measuring the CSO and CTB distortion products allows system operators a method of setting standard performance criteria for the individual components, and vendors a method of validating the performance of their products. A standard method of measurement is critical in determining the distortion of individual components and the end to end performance of the complete cable plant.

1.2. Scope

This document describes a test procedure for the laboratory and production measurement of composite distortion products. There are two types of composite distortions considered: Composite Second Order and Composite Triple Beat. In order to obtain a stable, repeatable measurement, this test procedure describes testing performed with continuous wave (CW) carriers. See ANSI/SCTE 96 2008 for a discussion of the selection of CW carrier frequencies.

1.3. Benefits

Test Procedure for Composite Distortion Measurements (CSO & CTB), when executed per this procedure, will yield accurate and consistent CSO and CTB characteristics, for the device under test. Use of this test method provides user a means to verify manufacturer test reports and certificates of compliance when available. When industry utilizes a standard test method, especially for CSO and CTB parameters, comparative analysis is more accurate.

1.4. Intended Audience

The intended audience for this test method, are manufactures and end-users with proper laboratories and equipment to perform this test..

1.5. Areas for Further Investigation or to be Added in Future Versions

At this time, there are no considerations being giving for further investigation.