



**ATIS-0900105.2015(P2020)**

**Synchronous Optical Network (SONET) –  
Basic Description including Multiplex Structure, Rates,  
and Formats**

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## ATIS-0900105.2015(R2020), *Synchronous Optical Network (SONET) – Basic Description including Multiplex Structure, Rates, and Formats*

Is an American National Standard developed by the ATIS **Copper/Optical Access, Synchronization and Transport Committee (COAST)**.

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American National Standard for Telecommunications

**Synchronous Optical Network (SONET) -  
Basic Description including  
Multiplex Structure, Rates, and Formats**

Alliance for Telecommunications Industry Solutions

Approved April 7, 2015

American National Standards Institute, Inc.

**Abstract**

The purpose of this standard is to specify the multiplexing format and basic overhead definitions for the Synchronous Optical Network (SONET) signal. Other standards in the ATIS-0900105.2008 series build upon this base document by providing additional detailed information about other, specific aspects of SONET.

## Foreword

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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 Copper/Optical Access, Synchronization and Transport (COAST) Committee -- formerly the Optical Transport and Synchronization Committee (OPTXS) -- engages industry expertise to develop and recommend standards and technical reports for home, access and transport network and synchronization technologies over copper and optical mediums. COAST is committed to proactive engagement with national, regional and international standards development organizations and forums that share its scope of work. The technical requirements, measurement techniques, metrics, and operational practices documented in COAST's work products encompass copper and optical network interfaces and transceiver functionality required for access to, and transport through, telecommunications networks.

This standard is the baseline of a set of standards that were created when T1.105-1995 (now ATIS-0900105) was broken up into its constituent parts. This document describes a base rate and format along with a multiplex scheme. This revision of ATIS-0900105 includes clarifications or revisions to the J0, RDI, J1, J2, AIS-P, and AIS-S; new signal labels; definition of virtual concatenation; and definition of STS-768. Other documents included in the ATIS-0900105 series (at the time that this document was approved) are listed below.

- ATIS-0900105.01.2000(R2010), *Synchronous Optical Network (SONET) – Automatic Protection Switching.*
- ATIS-0900105.02.2007(R2012), *Synchronous Optical Network (SONET) – Payload Mappings.*
- ATIS-0900105.03.2013, *Synchronous Optical Network (SONET) – Jitter at Network Interfaces.*
- ATIS-0900105.04.1995(R2010), *Synchronous Optical Network (SONET) – Data Communication Channel Protocols and Architectures.*
- ATIS-0900105.05.2002(R2013), *Synchronous Optical Network (SONET) – Tandem Connection Maintenance.*
- ATIS-0900105.06.2002(R2012), *Synchronous Optical Network (SONET) – Physical Layer Specifications.*
- ATIS-0900105.08, *Synchronous Optical Network (SONET) – In-band Forward Error Correcting Code Specification.*
- ATIS-0900105.09.2013, *Synchronous Optical Network (SONET) - Timing and Synchronization.*

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 element, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages.

This standard has 2 annexes. One is normative and is part of the standard; that is, this annex includes requirements that are a part of the specifications of this standard. One is informative and is not considered part of this standard; that is, this annex does not include requirements for the interface, but provides information about the interface specified.

This standard is technically consistent with work in ITU-T on the Network Node Interface (NNI) using synchronous multiplexing techniques, and is compatible with ITU-T Recommendations G.707, G.783, and G.784 Synchronous Digital Hierarchy (SDH).

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

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

K. Bihorac, COAST Chair (Alcatel-Lucent)

W. J. J. J., COAST Vice-Chair (Xtera)

The Optical Hierarchical Interfaces (OHI) Subcommittee was responsible for the development of this document.

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American National Standard for Telecommunications on –

# Synchronous Optical Network (SONET) -- Basic Description including Multiplex Structure, Rates, and Formats

## 1 Scope

This document is the baseline of a series of standards that define a modular family of rates and formats available for use in interfaces generally referred to as SONET. This series of documents is identified by the ATIS-0900105 prefix.

This document (ATIS-0900105) describes a base rate and format along with a multiplex structure. Other characteristics described in this standard are: layering of overhead, definitions of functions and position of overhead, frequency justification, scrambling, conditions for setting overhead values, and a standardized set of payload-carrying envelopes. As an aid to the reader, a mapping is provided between SONET and SDH terminology. Any differences between the SDH and SONET specifications at the time of approval of this standard that affect interworking are highlighted. The differences are relative to the SDH Recommendations under review in SG 15 at that time. Other ATIS-0900105.xx standards are listed in clause 2 and describe such items as payload mappings, protection switching, data communications interfaces, tandem connection, and physical layer specifications.

## 2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ATIS-0900101.2013, *Synchronization Interface Standards for Digital Networks*.<sup>1</sup>

ATIS-0900102.1993 (R2010), *Digital Hierarchy – Electrical Interfaces*<sup>2</sup>

ATIS-0900105.01.2000 (R2010), *Synchronous Optical Network (SONET) – Automatic Protection Switching*.<sup>3</sup>

ATIS-0900105.02.2007(R2012), *Synchronous Optical Network (SONET) – Payload Mappings*.<sup>4</sup>

ATIS-0900105.03.2013, *Synchronous Optical Network (SONET) – Jitter at Network Interfaces*.<sup>5</sup>

ATIS-0900105.04.1995(R2010), *Synchronous Optical Network (SONET) – Data Communication Channel Protocols and Architectures*.<sup>6</sup>

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