

SONET 图形概述

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简介

本文档用图片表示的方式概述了同步光网络 (SONET)。

注意： 表格和图示由 *JDS Uniphase Corporation* 提供

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档不限于特定的软件和硬件版本。

规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

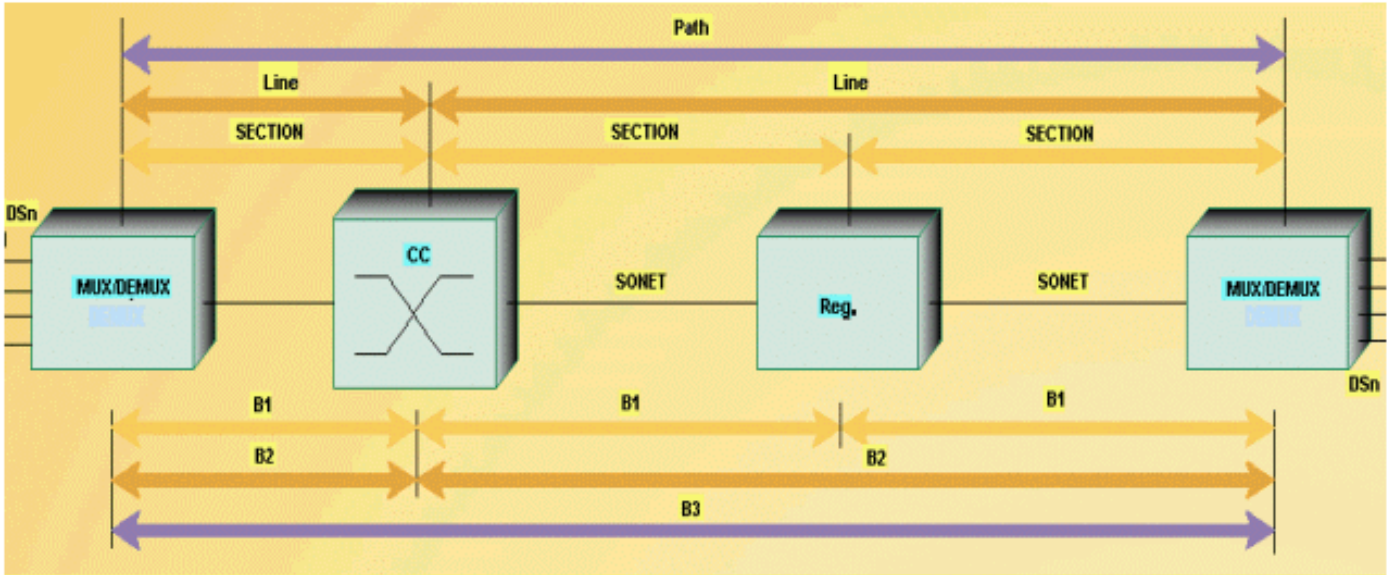
SONET 概述

此部分概述了图形格式的 SONET。

SONET 链路

图 1 显示了 SONET 链路的外形。

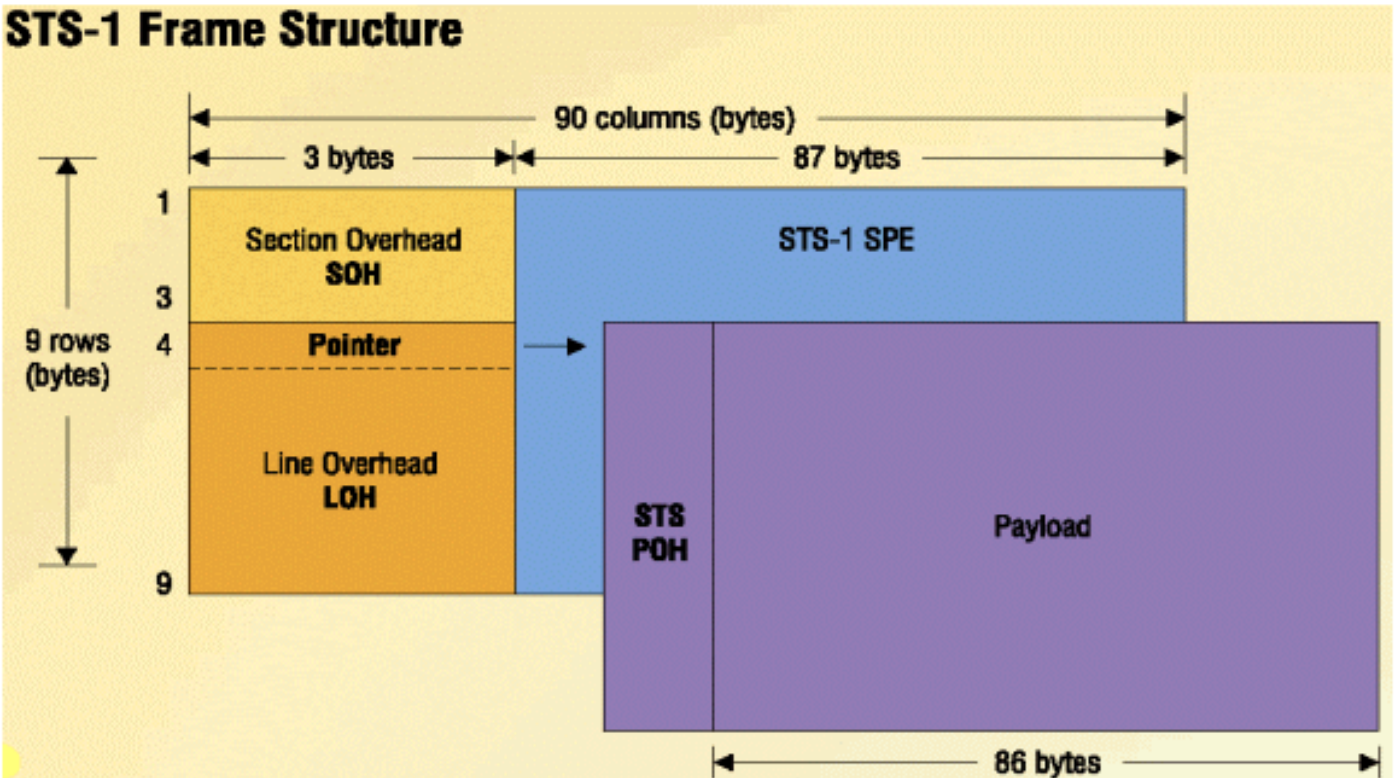
图 1 - SONET 链路



STS-1 帧

图 2 显示了同步传输信号级别 1 (STS-1) 帧结构。

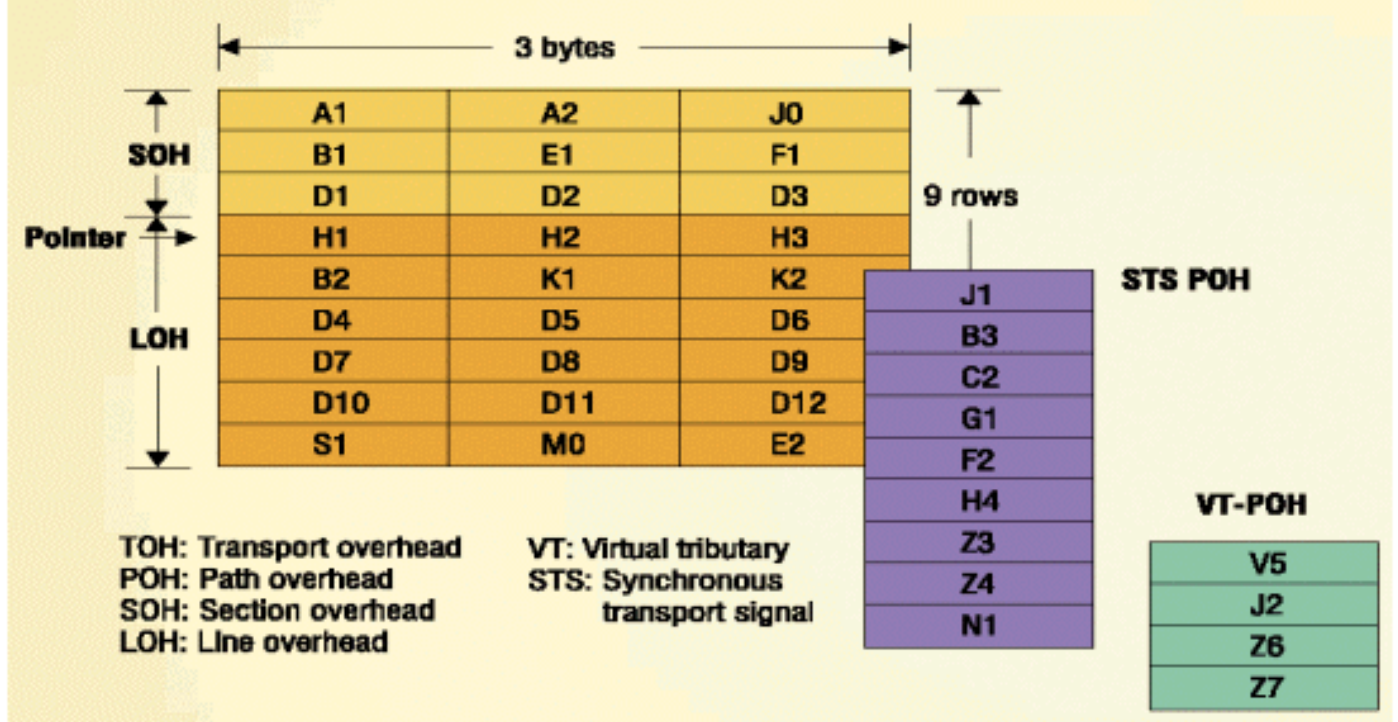
图 2 - STS-1 帧结构



STS-1 SONET 开销

图 3 显示了 STS-1 传输和路径开销 (SONET 开销)。

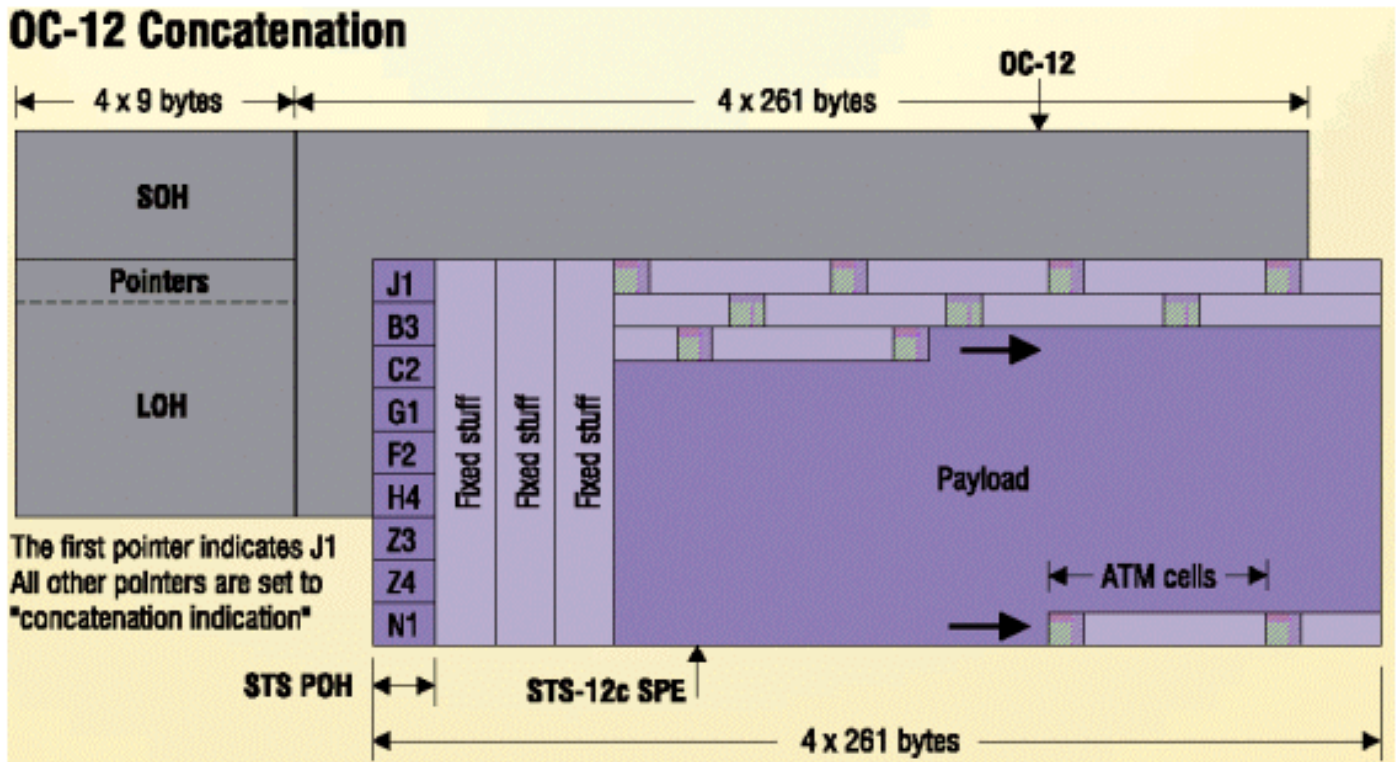
图 3 - STS-1 传输和路径开销
STS-1 TOH & POH



OC-12 串联

图 4 显示了 OC-12 串联。

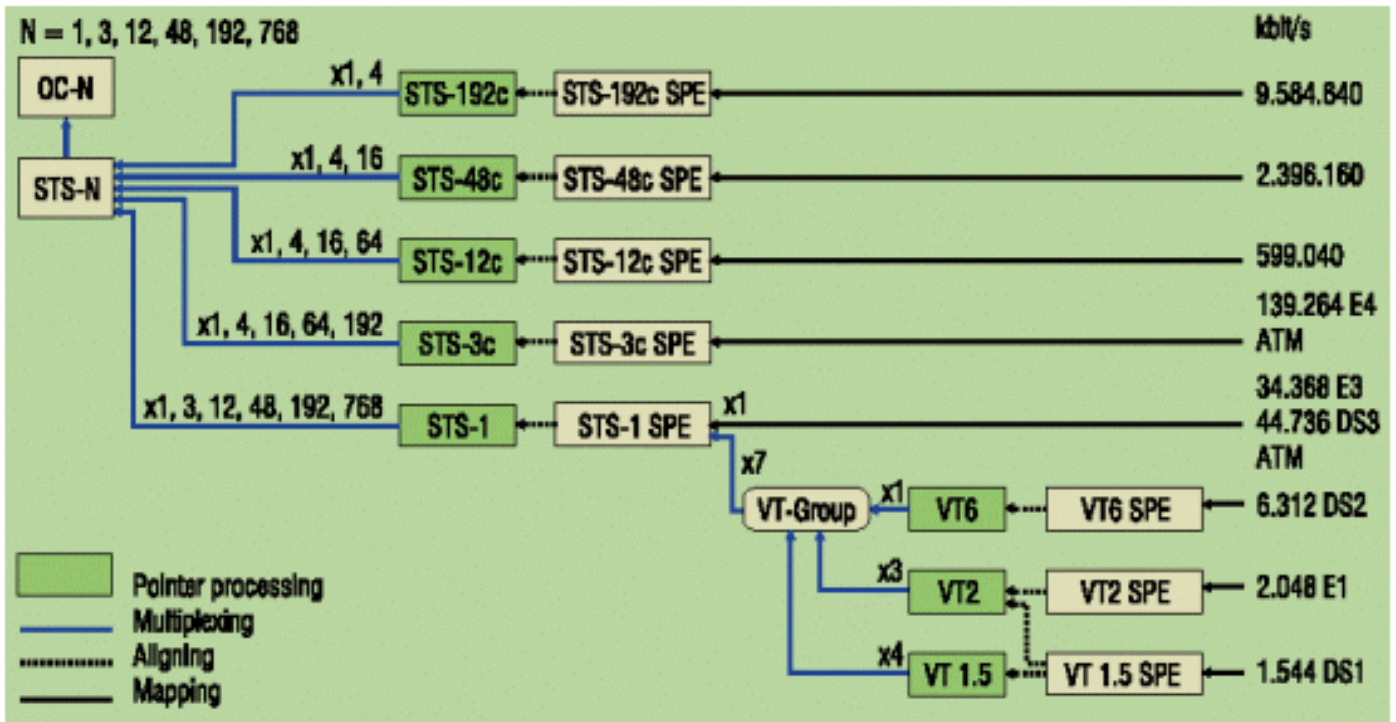
图 4 - OC-12 串联



SONET 层次结构

图 5 显示了 SONET 层次结构。

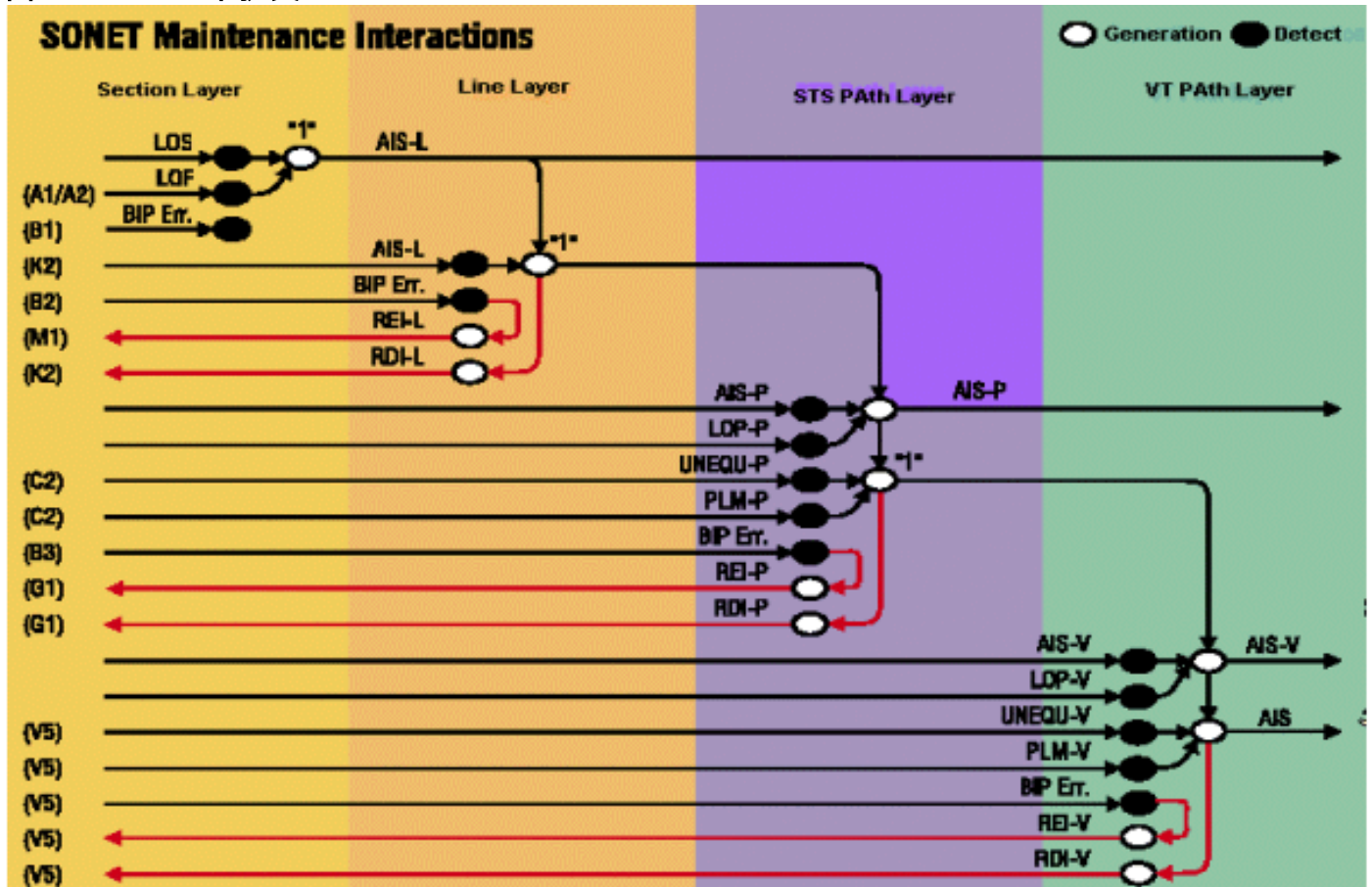
图 5 - SONET 层次结构



SONET 维护交互

图 6 显示了 SONET 维护交互显示的方式。

图 6 - SONET 维护交互



报警和检测标准

表 1 列出了不同警报的含义及其检测标准。

表 1 - 不同警报的含义及其检测标准

	Anomalies / Defects	Detection criteria	Bellcore ANSI
LOS	Loss of Signal	All-zero pattern for $2.3 \mu\text{s} \leq T \leq 100 \mu\text{s}$	GR-253 T1.231
SEF	Severely Error Framing	A1, A2 errored for $\geq 625 \mu\text{s}$	GR-253 T1.231
LOF	Loss of Frame	If SEF persists for $\geq 3 \text{ ms}$	GR-253 T1.231
S-BIP Error	Section BIP Error (B1)	Mismatch of the recovered and computed BIP-8 covers the whole STS-N frame	GR-253 T1.105
L-BIP Error	Line BIP Error (B2)	Mismatch of the recovered and computed N x BIP-8 covers the whole frame, except section overhead	GR-253 T1.105
AIS-L	Line-AIS	K2 (bits 6, 7, 8) = 111 for ≥ 5 frames	GR-253 T1.231
REI-L	Line Remote Error Indication	Number of detected B2 errors in the sink side encoded in byte M0 or M1 of the source side	GR-253 T1.105
RDI-L	Line Remote Defect Indication	K2 (bits 6, 7, 8) = 110 for $\geq z$ frames ($z = 5 - 10$)	GR-253 T1.231
AIS-P	STS Path AIS	All "1" in the STS pointer bytes H1, H2 for ≥ 3 frames	GR-253 T1.231
LOP-P	STS Path Loss of Pointer	8 - 10 NDF enable 8 - 10 invalid pointers	GR-253 T1.231
P-BIP Error	STS Path BIP Error (B3)	Mismatch of the recovered and computed BIP-8 covers entire STS-SPE	GR-253 T1.105
UNEQ-P	STS Path Unequipped	G2 = "0" for ≥ 5 (≥ 3 as per T1.231) frames	GR-253 T1.231
TIM-P	STS Path Trace Identifier Mismatch	Mismatch of the accepted and expected Trace Identifier in byte J1 (64 bytes sequence)	GR-253 T1.105
REI-P	STS Path Remote Error Indication	Number of detected B3 errors in the sink side encoded in byte G1 (bits 1, 2, 3, 4) of the source side	GR-253 T1.105
RDI-P	STS Path Remote Defect Indication	G1 (bit 5) = 1 for ≥ 10 frames	GR-253 T1.231
PLM-P	STS Path Payload Label Mismatch	Mismatch of the accepted and expected Payload Label in byte C2 for ≥ 5 (≥ 3 as per T1.231) frames	GR-253 T1.231
LOM	Loss of Multiframe	Loss of synchronization on H4 (bits 7, 8) superframe sequence	GR-253 T1.105
AIS-V	VT Path AIS	All "1" in the VT pointer bytes V1, V2 for ≥ 3 superframes	GR-253 T1.231
LOP-V	VT Loss of Pointer	8 - 10 NDF enable 8 - 10 invalid pointers	GR-253 T1.231
V-BIP Error	VT Path BIP Error (BIP-2)	Mismatch of the recovered and computed BIP-2 (V5 bits 1, 2) covers entire VT	GR-253 T1.105
UNEQ-P	VT Path Unequipped	V5 (bits 5, 6, 7) = 000 for ≥ 5 (≥ 3 as per T1.231) superframes	GR-253 T1.231
TIM-V	VT Path Trace Identifier Mismatch	Mismatch of the accepted and expected Trace Identifier in byte J2	for further study
REI-V	VT Path Remote Error Indication	If one or more BIP-2 errors detected in the sink side, byte V5 (bits 3) = 1 on the source side	GR-253 T1.105
RDI-V	VT Path Remote Defect Indication	V5 (bit 8) = 1 for ≥ 10 superframes	GR-253 T1.231
PLM-V	VT Path Payload Label Mismatch	Mismatch of the accepted and expected Payload Label in byte V5 (bits 5, 6, 7) for ≥ 5 (≥ 3 as per T1.231) superframes	GR-253 T1.231

STS-1 SOH、LOH、POH 和 VT POH 字节

图 7 和图 8 提供了对来自 STS-1 SOH、线路开销 (LOH)、路径开销 (POH) 和虚拟辅助路径开销 (VT POH) 的所有字节的描述。

图 7 - SOH 段开销

SOH Section Overhead

A1, A2: Indicates the beginning of each STS-1 within a STS-n frame. The pattern is Hex F628.

J0: Section trace. It is defined only for STS-1 number 1 of an STS-N signal. Used to transmit a one byte fixed length string or a 16 byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter.

Z0: Section growth. It is defined in each STS-1 for future growth except for STS-1 number 1 (which is defined as J0).

B1: Section error monitoring. The BIP-8 is calculated over all bits of the previous STS-N frame after scrambling and is placed in the B1 byte of STS-1 number 1 before scrambling. Defined only for STS-1 number 1 of an STS-N signal.

E1: Allocated to be used as local orderwire channels for voice communication between section terminating equipments, hubs and remote terminal locations.

F1: Reserved for user purposes (e.g. temporary data/voice channel connections for special maintenance purposes).

D1 - D3: Data communication channels (DCC). A 192 kbit/s message based channel for alarms, maintenance, control, monitoring, administration and other communication needs.

图 8 - LOH 线路开销

