

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](#)。

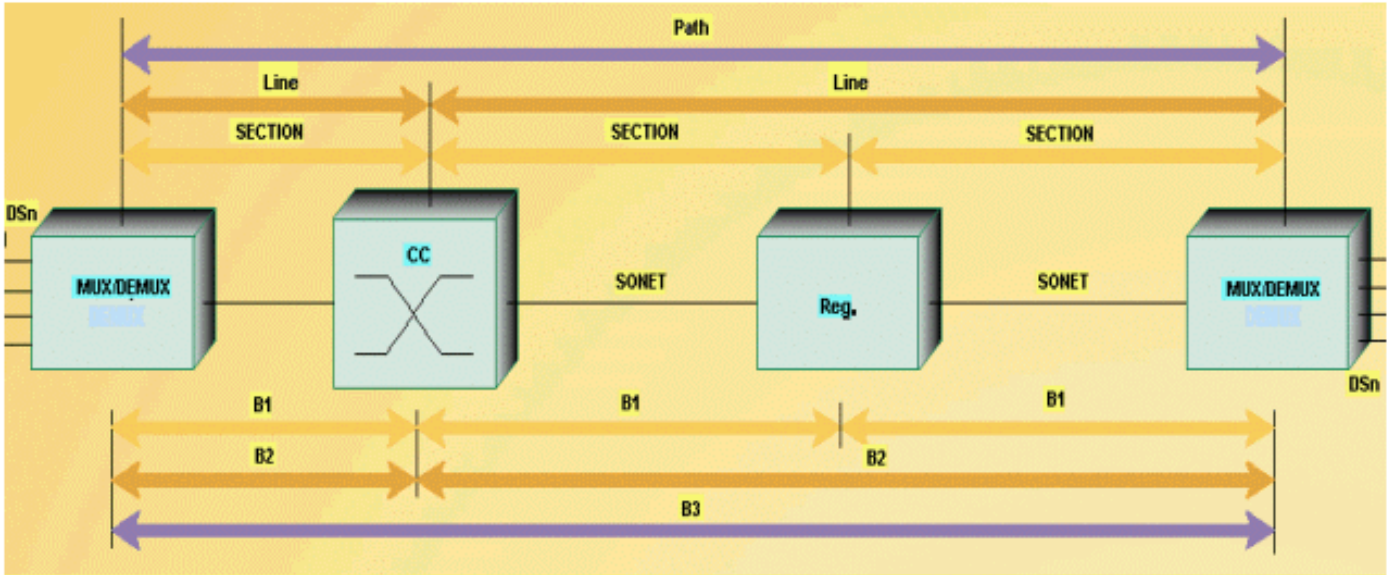
SONET 概述

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。

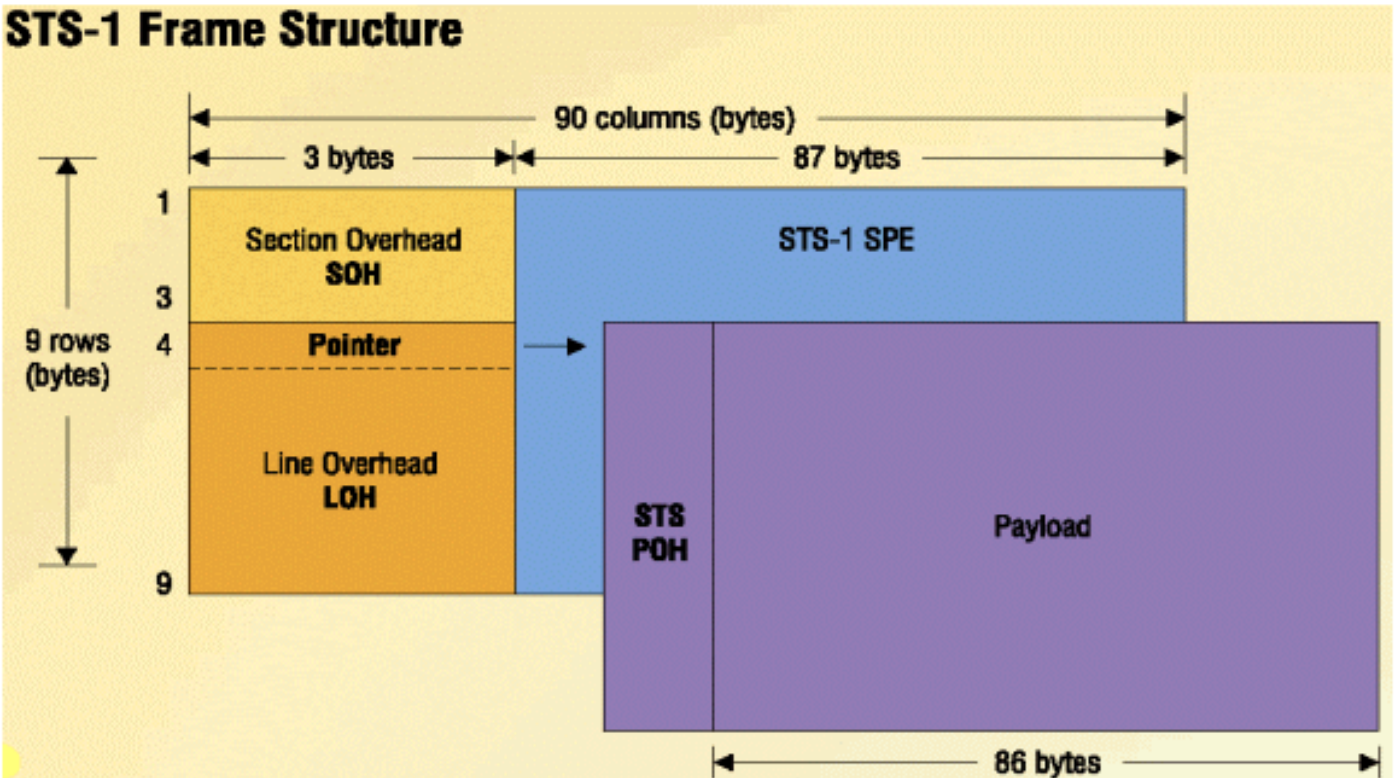
图 1 - SONET 链路



STS-1 帧

图 2 显示了同步传输信号级别 1 (STS-1) 帧结构。

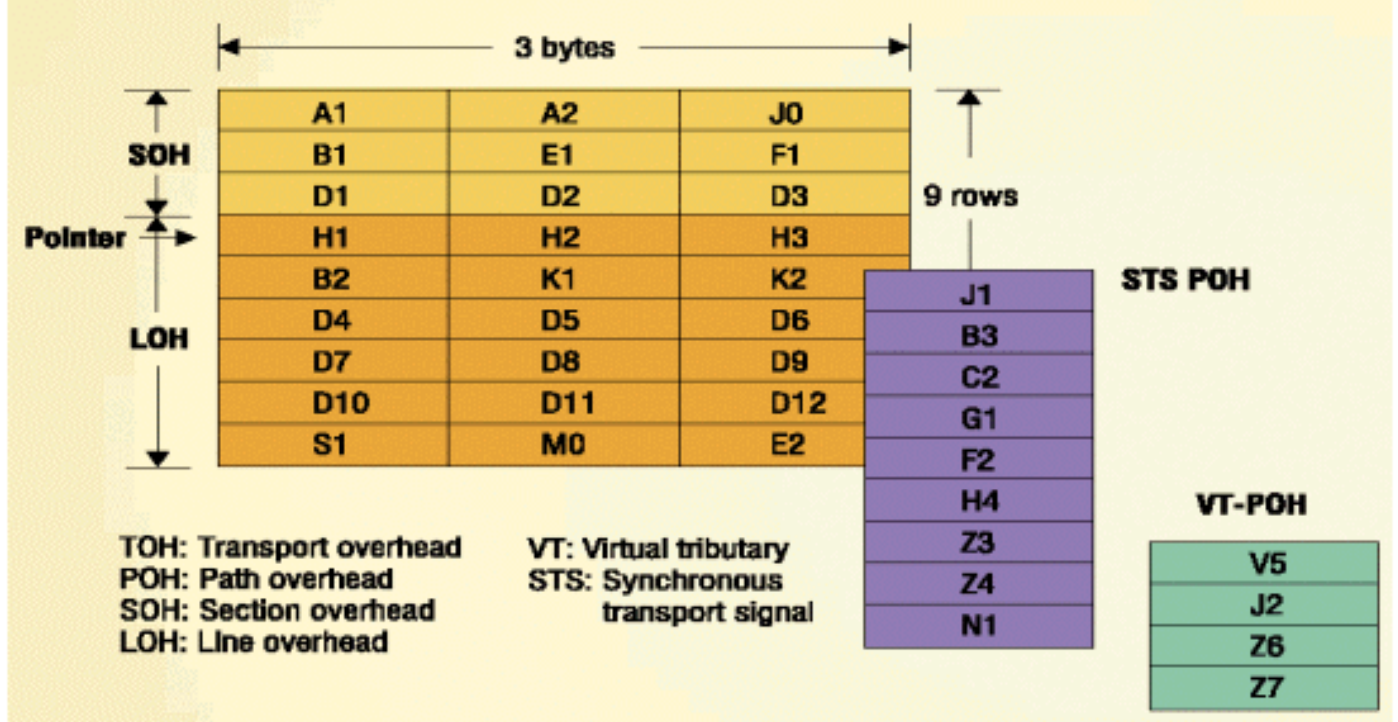
图 2 - STS-1 帧结构



STS-1 SONET 开销

图 3 显示了 STS-1 传输和路径开销 (SONET 开销)。

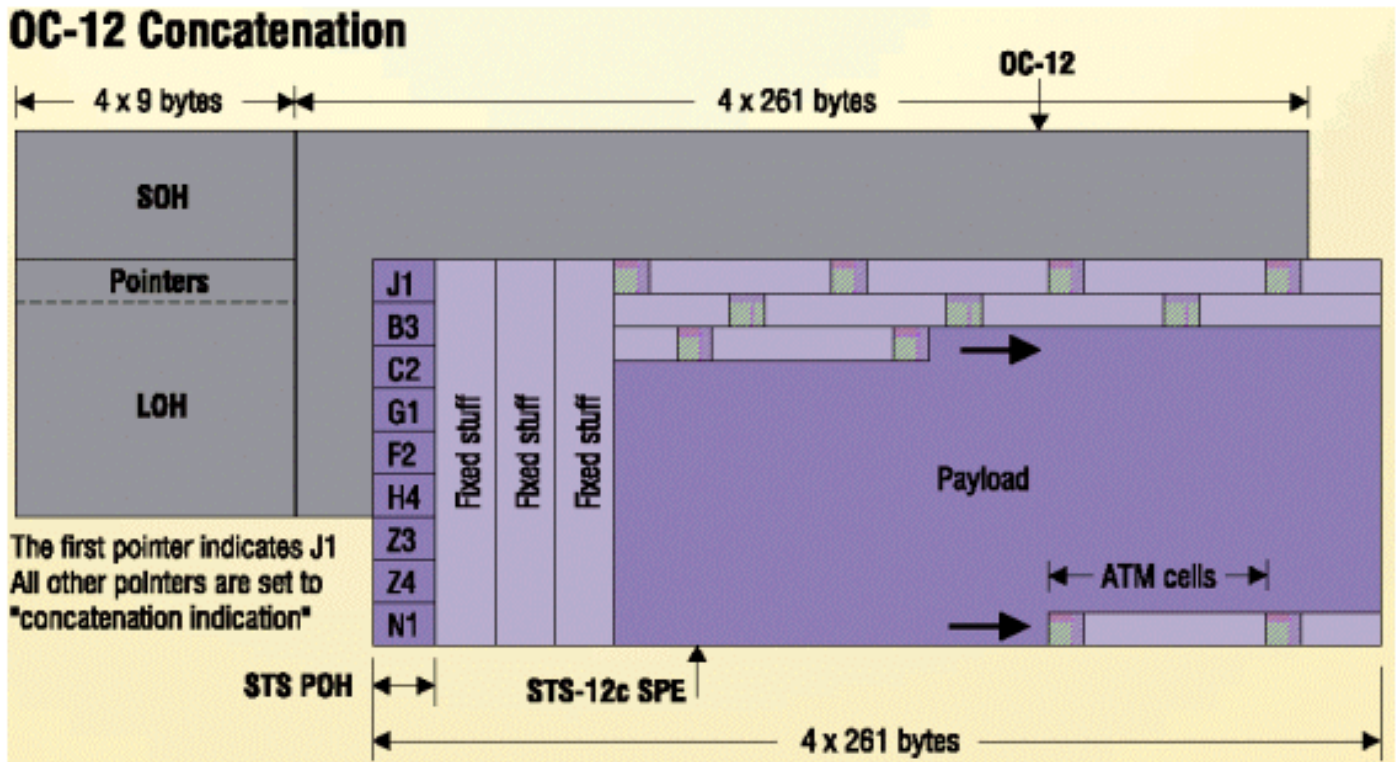
图 3 - STS-1 传输和路径开销
STS-1 TOH & POH



OC-12 串联

图 4 显示了 OC-12 串联。

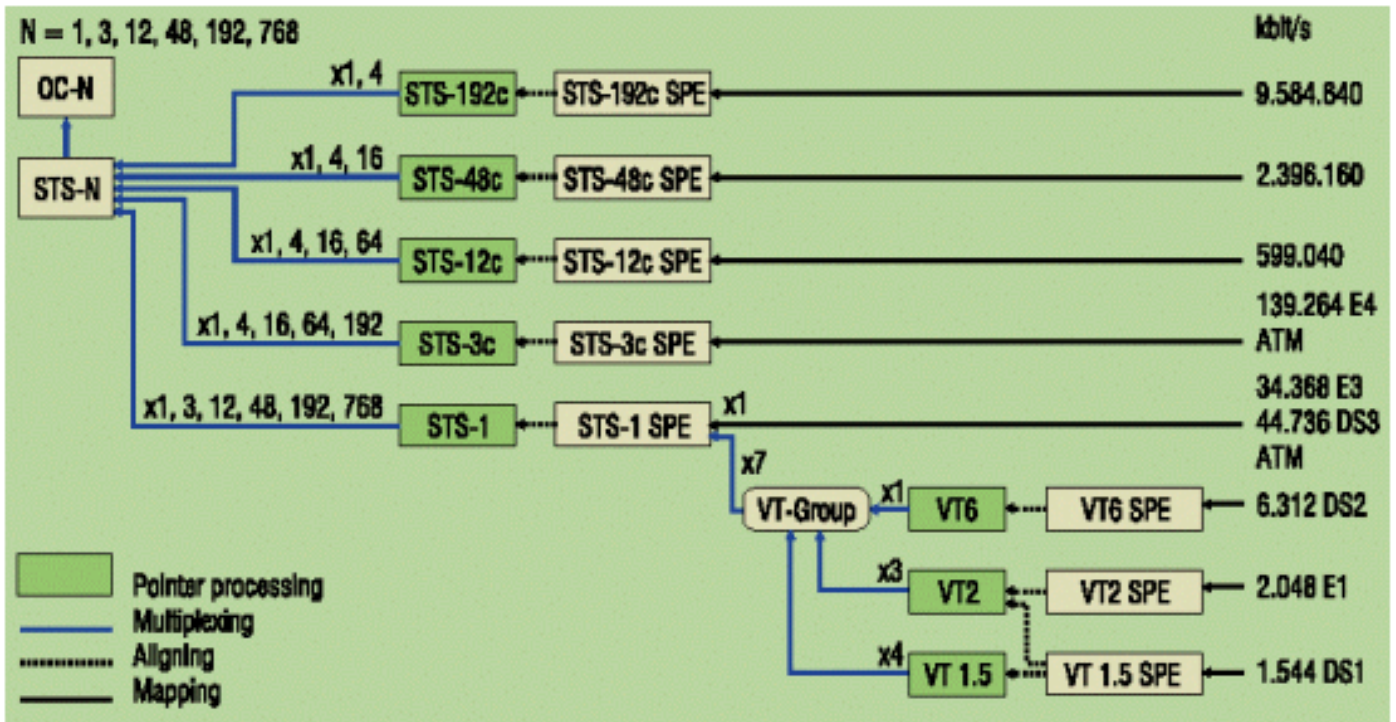
图 4 - OC-12 串联



SONET 层次结构

图 5 显示了 SONET 层次结构。

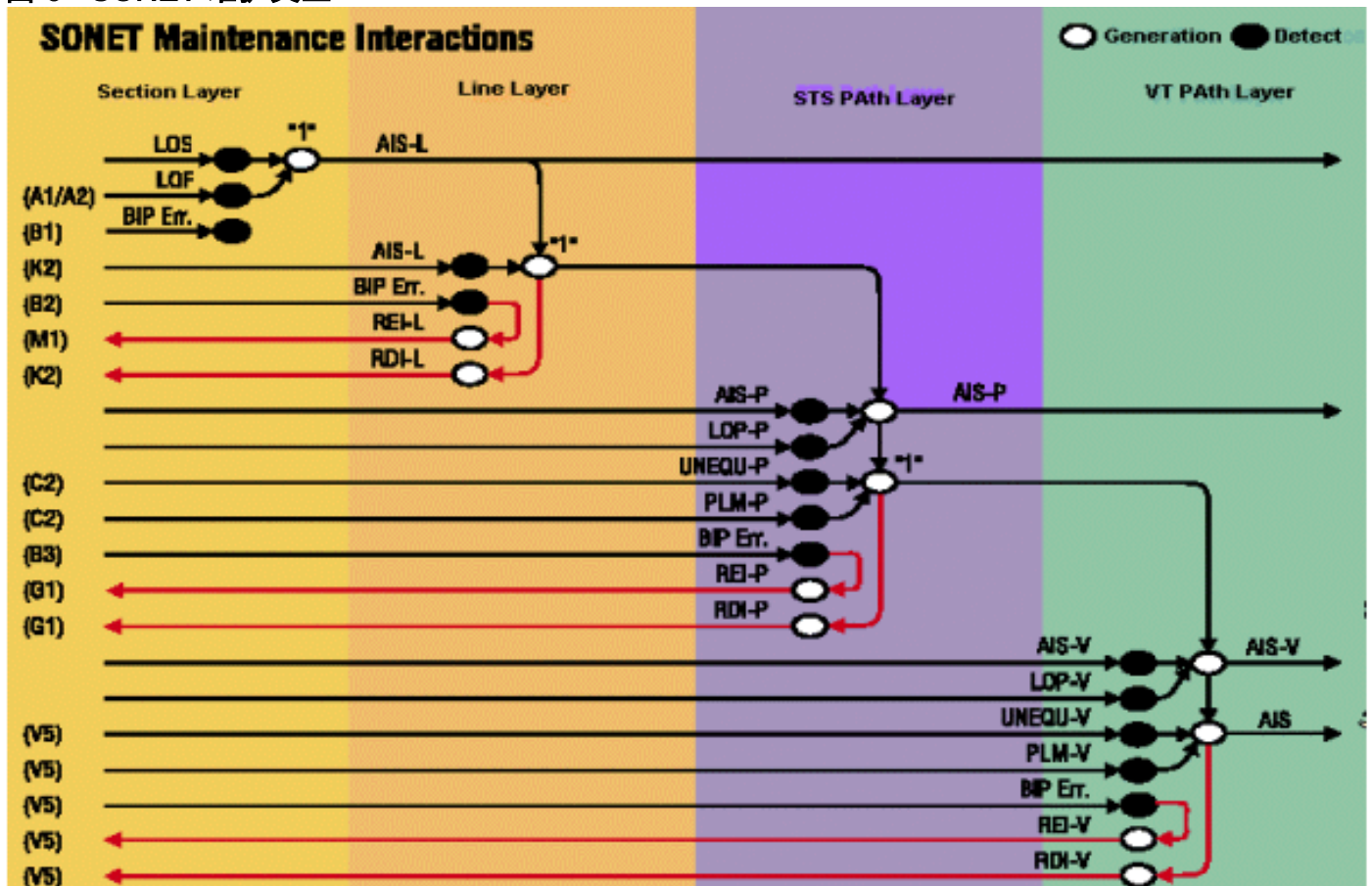
图 5 - SONET 层次结构



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 $2.3 \mu s \leq T \leq 100 \mu s$ | GR-253 T1.231 |
| SEF | Severely Error Framing | A1, A2 errored for $\geq 625 \mu s$ | GR-253 T1.231 |
| LOF | Loss of Frame | If SEF persists for ≥ 3 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

