Electrical Cards

This chapter describes Cisco ONS 15454 electrical card features and functions. For installation and card turn-up procedures, refer to the *Cisco ONS 15454 Procedure Guide*. For information on the electrical interface assemblies (EIAs), see the "1.5 Electrical Interface Assemblies" section on page 1-14.

Chapter topics include:

3.1 Electrical Card Warnings

Warning **Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.**

Caution When working with cards, wear the supplied ESD wristband to avoid ESD damage to the card. Plug the wristband cable into the ESD jack located on the lower-right outside edge of the shelf assembly.

Note Each card is marked with a symbol that corresponds to a slot (or slots) on the ONS 15454 shelf assembly. The cards are then installed into slots displaying the same symbols. See the "1.13.1 Card Slot Requirements" section on page 1-38 for a list of slots and symbols.

3.2 EC1-12 Card

The EC1-12 card provides 12 Telcordia-compliant, GR-253 STS-1 electrical ports per card. Each port operates at 51.840 Mbps over a single 75 ohm 728A or equivalent coaxial span.

STS path selection for UNEQ-P, AIS-P, and bit error rate (BER) thresholds is done on the SONET ring interfaces (optical cards) in conjunction with the STS cross-connect. The EC1-12 terminates but does not select the 12 working STS-1 signals from the backplane. The EC1-12 maps each of the 12 received EC1 signals into 12 STS-1s with visibility into the SONET path overhead.

An EC1-12 card can be 1:1 protected with another EC1-12 card but cannot protect more than one EC1-12 card. You must install the EC1-12 in an even-numbered slot to serve as a working card and in an odd-numbered slot to serve as a protect card.

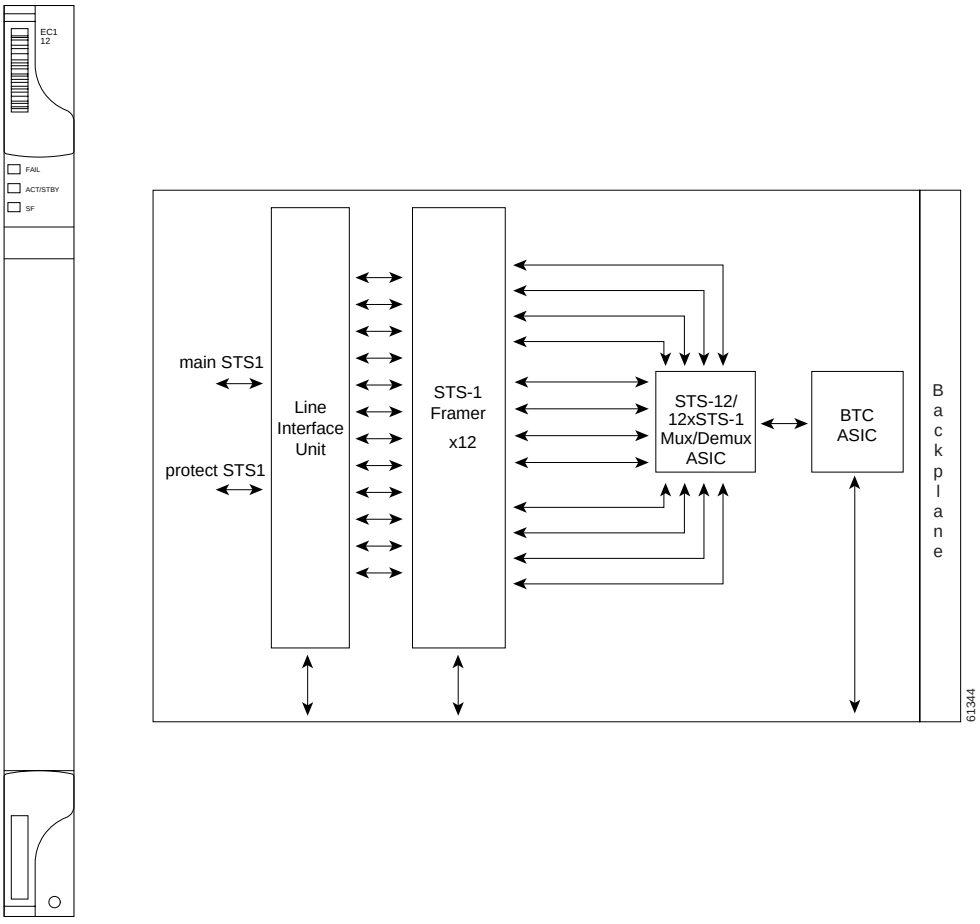
3.2.1 EC1-12 Slots and Connectors

You can install the EC1-12 card in Slots 1 to 6 or 12 to 17 (multispeed or high-speed card slot) on the ONS 15454. Each EC1-12 interface features DSX-level (digital signal cross-connect frame) outputs supporting distances up to 450 feet (137 meters) depending on facility conditions.

3.2.2 EC1-12 Faceplate and Block Diagram

Figure 3-1 shows the EC1-12 faceplate and a block diagram of the card.

Figure 3-1 EC1-12 Faceplate and Block Diagram



3.2.3 EC1-12 Hosted by XC, XCVT, or XC10G

All 12 STS-1 payloads from an EC1-12 card are carried to the XC, XCVT, or XC10G card where the payload is further aggregated for efficient transport. XC and XCVT cards can host a maximum of 288 bidirectional STS-1s. XC10G can host up to 1152 bidirectional STS-1s.

3.2.4 EC1-12 Card-Level Indicators

The EC1-12 card faceplate has three card-level LEDs, see Table 3-1.

Table 3-1 EC1-12 Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED signifies that the EC1-12 card's processor is not ready. Replace the unit if the FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the EC1-12 card is operational and ready to carry traffic.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as loss of signal (LOS), loss of frame (LOF) or high bit error rate (BER) on one or more of the card's ports.

3.2.5 EC1-12 Port-Level Indicators

You can obtain the status of the EC1-12 card ports using the LCD screen on the ONS 15454 fan-tray. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.

3.2.6 EC1-12 Specifications

The EC1-12 card specifications are shown in Table 3-2 on page 3-4.

Table 3-2 EC1-12 Card Specifications

Specification Type	Description
EC1-12 Input	Bit Rate: 51.84 Mbps +/- 20 ppm Frame Format: SONET Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant
EC1-12 Output	Bit Rate: 51.84 Mbps +/- 20 ppm Frame Format: SONET Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant Power Level: -1.8 - +5.7 dBm Pulse Shape: ANSI T1.102-1988 Figure 8 Pulse Amplitude: 0.36 - 0.85 V peak to peak Loopback Modes: Terminal and Facility Line Build Out: 0-225 ft.; 226-450 ft.
EC1-12 Electrical Interface	Connectors: BNC or SMB
Operating Temperature	C-Temp (15454-EC1-12): 0 to +55 degrees Celsius I-Temp (15454-EC1-12-T): -40 to +65 degrees Celsius **Note** The I-Temp symbol is displayed on the faceplate of an I-Temp compliant card. A card without this symbol is C-Temp compliant.
Operating Humidity	5 - 95%, non-condensing
Power Consumption	36.60 W, 0.76 amps, 124.97 BTU/Hr.
Dimensions	Height: 12.650 in. Width: 0.716 in. Depth: 9.000 in. Card Weight: 2.0 lbs, 0.9 kg
Compliance	ONS 15454 cards, when installed in a system, comply with these standards: Safety: UL 1950, CSA C22.2 No. 950, EN 60950, IEC 60950

3.3 DS1-14 and DS1N-14 Cards

The ONS 15454 DS1-14 card provides 14 Telcordia-compliant, GR-499 DS-1 ports. Each port operates at 1.544 Mbps over a 100 ohm twisted-pair copper cable. The DS1-14 card can function as a working or protect card in 1:1 protection schemes and as a working card in 1:N protection schemes.

The DS1-14 card supports 1:1 protection. The DS1-14 can be a working card in a 1:N protection scheme with the proper backplane EIA and wire-wrap or AMP Champ connectors. You can also provision the DS1-14 to monitor for line and frame errors in both directions.

You can group and map DS1-14 card traffic in STS-1 increments to any other card in an ONS 15454 except DS-3 cards. Each DS-1 is asynchronously mapped into a SONET VT1.5 payload and the card carries a DS-1 payload intact in a VT1.5. For performance monitoring purposes, you can gather bidirectional DS-1 frame-level information (loss of frame, parity errors, cyclic redundancy check [CRC] errors, etc.).

3.3.1 DS1N-14 Features and Functions

The DS1N-14 card supports the same features as the DS1-14 card in addition to enhanced protection schemes. The DS1N-14 is capable of 1:N ($N \leq 5$) protection with the proper backplane EIA and wire-wrap or AMP Champ connectors. The DS1N-14 card can function as a working or protect card in 1:1 or 1:N protection schemes.

3.3.2 DS1-14 and DS1N-14 Slots and Connectors

- DS1-14

  You can install the DS1-14 card in Slots 1 to 6 or 12 to 17 on the ONS 15454. Each DS1-14 port has DSX-level (digital signal cross-connect frame) outputs supporting distances up to 655 feet.

- DS1N-14

  If you use the DS1N-14 as a standard DS-1 card in a 1:1 protection group, you can install the DS1N-14 card in Slots 1 to 6 or 12 to 17 on the ONS 15454. If you use the card's 1:N functionality, you must install a DS1N-14 card in Slots 3 and 15. Each DS1N-14 port features DSX-level outputs supporting distances up to 655 feet depending on facility conditions.

3.3.3 DS1-14 and DS1N-14 Faceplate and Block Diagram

Figure 3-2 on page 3-6 shows the DS1-14 faceplate and the block diagram of the card.

Figure 3-2 DS1-14 Faceplate and Block Diagram

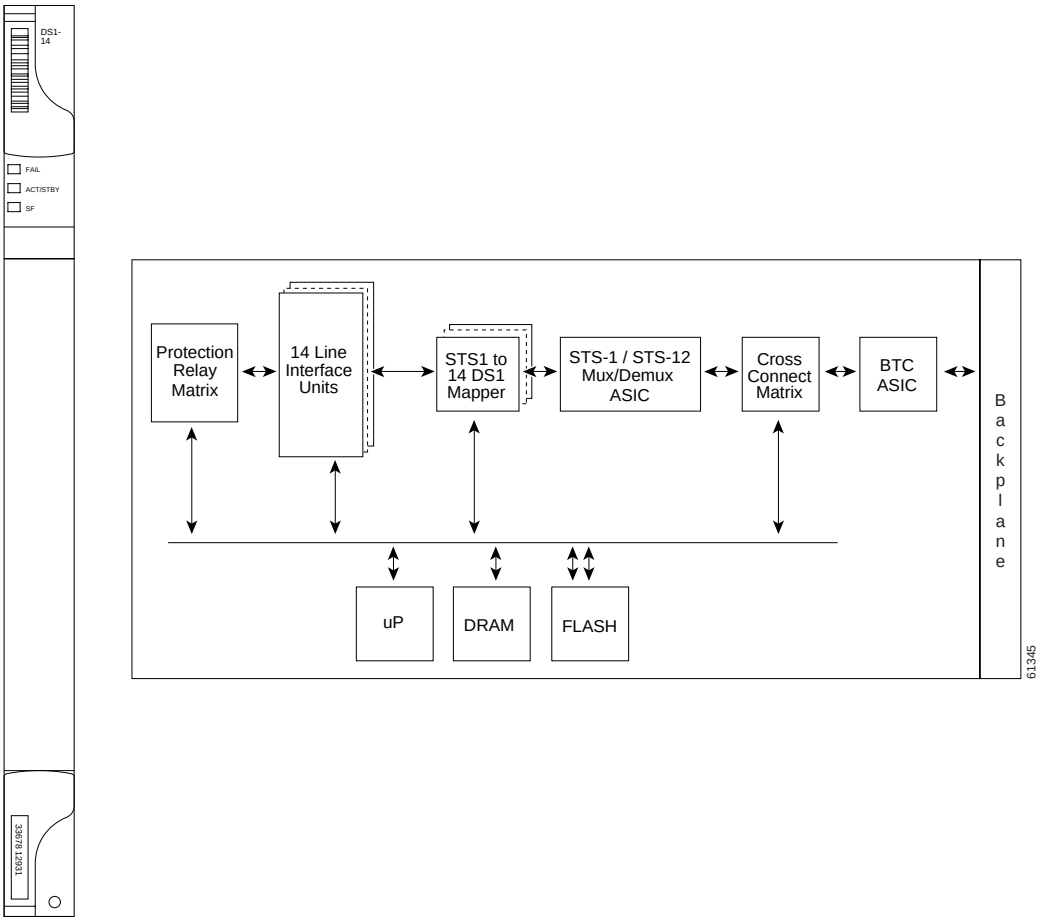
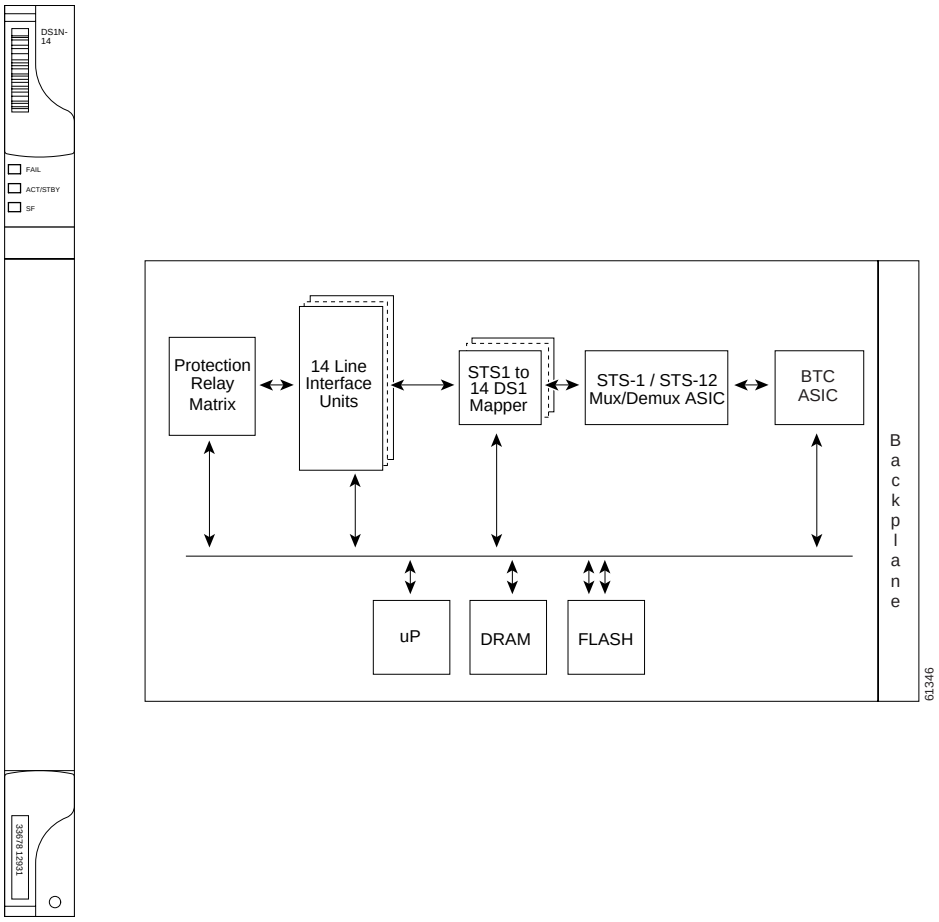


Figure 3-3 on page 3-7 shows the DS1N-14 faceplate and a block diagram of the card.

Figure 3-3 DS1N-14 Faceplate and Block Diagram



3.3.4 DS1-14 and DS1N-14 Hosted by the Cross-Connect

All 14 VT1.5 payloads from DS1-14 and DSIN-14 cards are carried in a single STS-1 to the XCVT or XC10G card where the payload is further aggregated for efficient STS-1 transport. The XC10G and XCVT cards manage up to 336 bidirectional VT1.5 ports.

3.3.5 DS1-14 and DS1N-14 Card-Level Indicators

The DS1-14 and DS1N-14 card faceplate has three LEDs shown in Table 3-3 on page 3-8.

Table 3-3 DS1-14 and DS1N-14 Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. Replace the card if the red FAIL LED persists.
ACT/STBY LED **Green (Active)** **Amber (Standby)**	The green/amber ACT/STBY LED indicates whether the DS1-14 card is operational and ready to carry traffic (green) or in standby mode (amber).
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS, LOF or high BERs on one or more of the card's ports.

3.3.6 DS1-14 and DS1N-14 Port-Level Indicators

You can obtain the status of the DS1-14 and DS1N-14 card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.

3.3.7 DS1-14 and DS1N-14 Specifications

Table 3-4 on page 3-9 shows the DS1-14 and DS1N-14 card specifications.

Table 3-4 DS1-14 and DS1N-14 Card Specifications

Specification Type	Description
DS1-14/DS1N-14 Input	Bit Rate: 1.544 Mbps +/- 32 ppm Frame Format: Off, SF (D4), ESF Line Code: AMI, B8ZS Termination: Wire-wrap, AMP Champ Input Impedance:100 ohms Cable Loss: Max 655 ft. ABAM #22 AWG AIS: TR-TSY-000191-compliant
DS1-14/DS1N-14 Output	Bit Rate: 1.544 Mbps +/- 32 ppm Frame Format: Off, SF (D4), ESF Line Code: AMI, B8ZS Termination: Wire-wrap, AMP Champ Input Impedance:100 ohms Cable Loss: Max 655 ft. ABAM #22 AWG AIS: TR-TSY-000191-compliant Power Level: 12.5 to 17.9 dBm centered @ 772 KHz, -16.4 to -11.1 dBm centered at 1544 KHz Pulse Shape: GR-499-CORE Figure 9-5 Pulse Amplitude: 2.4- 3.6 V peak-to-peak Loopback Modes: Terminal and Facility
DS1-14/DS1N-14 Electrical Interface	Connectors: BNC or SMB
Surge Protection	GR-1089
Operating Temperature	C-Temp (15454-DS1-14 and 15454-DS1N-14): 0 to +55 degrees Celsius I-Temp (15454-DS1-14-T and 15454-DS1N-14-T): -40 to +65 degrees Celsius **Note** The I-Temp symbol is displayed on the faceplate of an I-Temp compliant card. A card without this symbol is C-Temp compliant.
Operating Humidity	5 - 95%, non-condensing
Power Consumption	12.60 W, 0.26 amps, 43.02 BTU/Hr.
Dimensions	Height: 12.650 in. Width: 0.716 in. Depth: 9.000 in. Card Weight: 1.8 lbs, 0.8 kg
Compliance	ONS 15454 cards, when installed in a system, comply with these standards: Safety: UL 1950, CSA C22.2 No. 950, EN 60950, IEC 60950

3.4 DS3-12 and DS3N-12 Cards

The ONS 15454 DS3-12 card provides 12 Telcordia-compliant, GR-499 DS-3 ports per card. Each port operates at 44.736 Mbps over a single 75 ohm 728A or equivalent coaxial span. The DS3-12 card operates as a working or protect card in 1:1 protection schemes and as a working card in 1:N protection schemes.

The DS3-12 card supports 1:1 protection with the proper backplane EIA. EIAs are available with BNC or SMB connectors.

Caution When a protection switch moves traffic from the DS3-12 working/active card to the DS3-12 protect/standby card, ports on the now active/standby card cannot be taken out of service. Lost traffic can result if you take a port out of service even if the DS3-12 standby card no longer carries traffic.

3.4.1 DS3N-12 Features and Functions

Other than the protection capabilities, the DS3-12 and DS3N-12 cards are identical. The DS3N-12 can operate as the protect card in a 1:N ($N \leq 5$) DS-3 protection group. It has additional circuitry not present on the basic DS3-12 card that allows it to protect up to five working DS3-12 cards. The basic DS3-12 card can only function as the protect card for one other DS3-12 card.

3.4.2 DS3-12 and DS3N-12 Slots and Connectors

You can install the DS3-12 or DS3N-12 card in Slots 1 to 6 or 12 to 17 on the ONS 15454. Each DS3-12 or DS3N-12 card port features DSX-level outputs supporting distances up to 450 feet (137 meters) depending on facility conditions. With the proper backplane EIA, the card supports BNC or SMB connectors.

3.4.3 DS3-12 and DS3N-12 Faceplate and Block Diagram

Figure 3-4 on page 3-11 shows the DS3-12 faceplate and a block diagram of the card.

Figure 3-4 DS3-12 Faceplate and Block Diagram

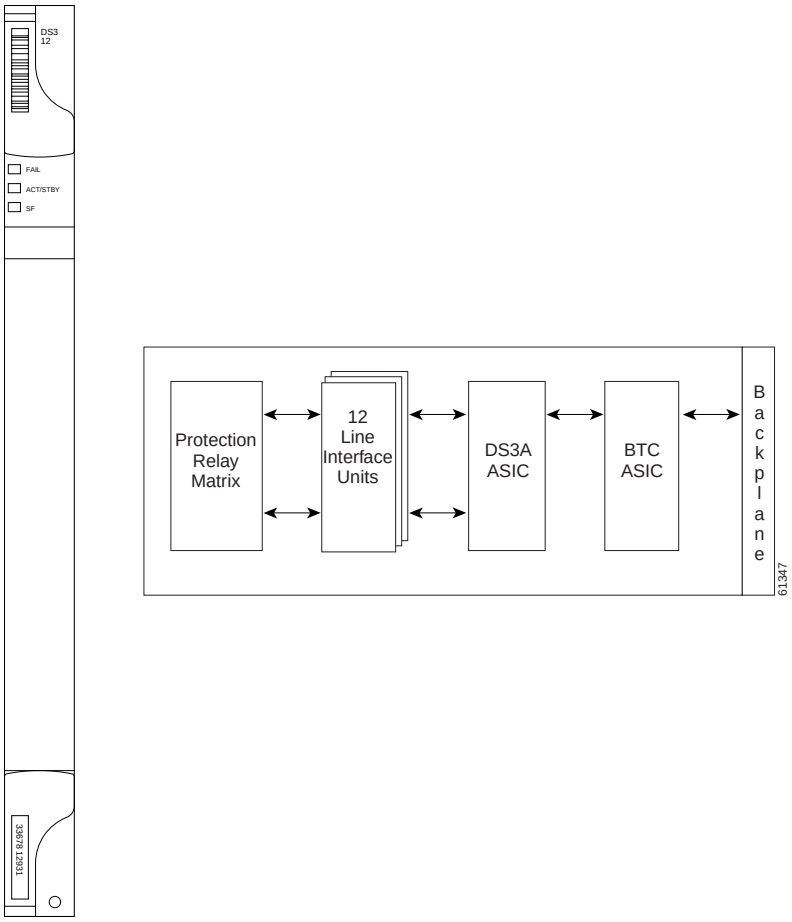
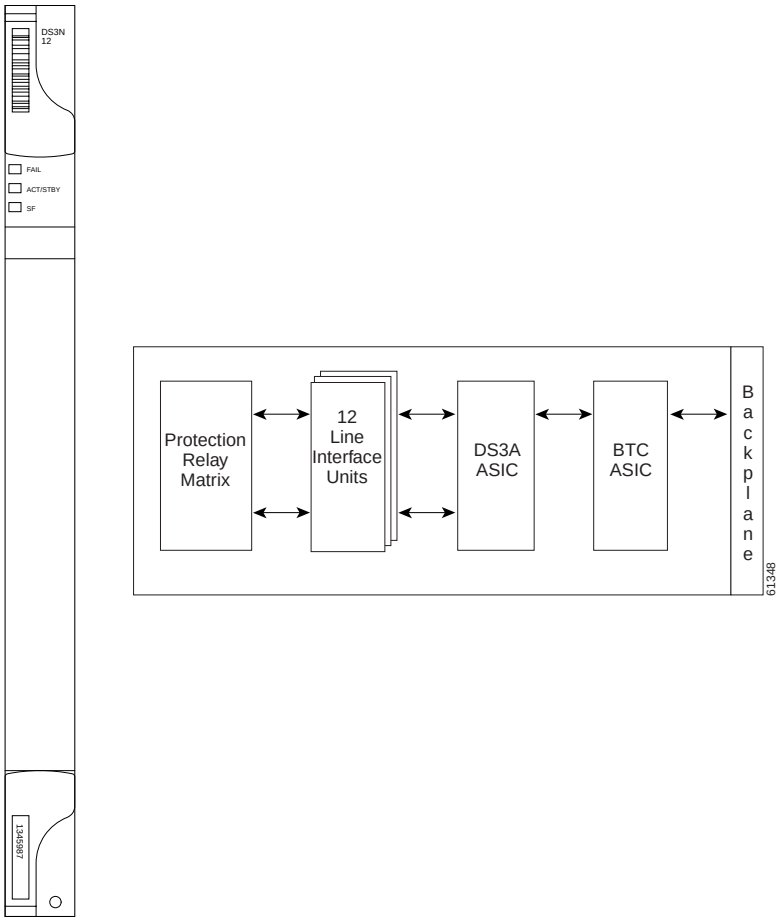


Figure 3-5 on page 3-12 shows the DS3N-12 faceplate and a diagram of the card.

Figure 3-5 DS3N-12 Faceplate and Block Diagram



3.4.4 DS3-12 and DS3N-12 Card-Level Indicators

The DS3-12 and DS3N-12 card faceplates have three LEDs shown in Table 3-5.

Table 3-5 DS3-12 and DS3N-12 Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. Replace the card if the red FAIL LED persists.
ACT/STBY LED **Green (Active)** **Amber (Standby)**	When the ACTV/STBY LED is green, the DS3-12 card is operational and ready to carry traffic. When the ACTV/STBY LED is amber, the DS3-12 card is operational and in standby (protect) mode.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as port LOS.

3.4.5 DS3-12 and DS3N-12 Port-Level Indicators

You can find the status of the 12 DS3-12 and 12 DS3N-12 card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.

3.4.6 DS3-12 and DS3N-12 Specifications

Table 3-6 shows the DS3-12 and DS3N-12 card specifications.

Table 3-6 DS3-12 and DS3N-12 Card Specifications

Specification Type	Description
DS3-12/DS3N-12 Input	Bit Rate: 44.736 Mbps +/- 20 ppm Frame Format: DS-3 ANSI T1.107-1988 Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant
DS3-12/DS3N-12 Output	Bit Rate: 44.736 Mbps +/- 20 ppm Frame Format: DS-3 ANSI T1.107-1988 Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant Power Level: -1.8 - +5.7 dBm Pulse Shape: ANSI T1.102-1988 Figure 8 Pulse Amplitude: 0.36 - 0.85 V peak-to-peak Loopback Modes: Terminal and Facility Line Build Out: 0-225 ft.; 226-450 ft.
DS3-12/DS3N-12 Electrical Interface	Connectors: BNC or SMB
Surge Protection	GR-1089
Operating Temperature	C-Temp (15454-DS3-12 and 15454-DS3N-12): 0 to +55 degrees Celsius I-Temp (15454-DS3-12-T and 15454-DS3N-12-T): -40 to +65 degrees Celsius **Note** The I-Temp symbol is displayed on the faceplate of an I-Temp compliant card. A card without this symbol is C-Temp compliant.
Operating Humidity	5 - 95%, non-condensing

Table 3-6 DS3-12 and DS3N-12 Card Specifications (continued)

Specification Type	Description
Power Consumption	38.20 W, 0.79 amps, 130.43 BTU/Hr.
Dimensions	Height: 12.650 in. Width: 0.716 in. Depth: 9.000 in. DS3-12: Card Weight: 1.7 lbs, 0.7 kg DS3N-12: Card Weight: 1.8 lbs, 0.8 kg
Compliance	ONS 15454 cards, when installed in a system, comply with these standards: Safety: UL 1950, CSA C22.2 No. 950, EN 60950, IEC 60950

3.5 DS3-12E and DS3N-12E Cards

The ONS 15454 DS3-12E card provides 12 Telcordia-compliant ports per card. Each port operates at 44.736 Mbps over a single 75 ohm 728A or equivalent coaxial span. The DS3-12E card provides enhanced performance monitoring functions. The DS3-12E can detect several different errored logic bits within a DS-3 frame. This function allows the ONS 15454 to identify a degrading DS-3 facility caused by upstream electronics (DS-3 Framer). In addition, DS3 frame format auto detection and J1 path trace are supported. By monitoring additional overhead in the DS-3 frame, subtle network degradations can be detected.

The following list summarizes DS3-12E card features:

- Provisionable framing format M23, C-bit or unframed
- Autorecognition and provisioning of incoming framing
- P-bit monitoring
- C-bit parity monitoring
- X-bit monitoring
- M-bit monitoring
- F-bit monitoring
- Far-end block errors (FEBE) monitoring
- Far-end alarm and control (FEAC) status and loop code detection
- Path trace byte support with TIM-P alarm generation

The DS3-12E supports a 1:1 protection scheme, meaning it can operate as the protect card for one other DS3-12E card.

3.5.1 DS3N-12E Features and Functions

The DS3N-12E can operate as the protect card in a 1:N ($N \leq 5$) DS-3 protection group. It has additional circuitry not present on the basic DS3-12E card that allows it to protect up to five working DS3-12E cards. The basic DS3-12E card can only function as the protect card for one other DS3-12E card.

3.5.2 DS3-12E and DS3N-12E Slots and Connectors

You can install the DS3-12E and DS3N-12E cards in Slots 1 to 6 or 12 to 17 on the ONS 15454. Each DS3-12E and DS3N-12E port features DSX-level outputs supporting distances up to 450 feet (137 meters). With the proper backplane EIA, the card supports BNC or SMB connectors.

3.5.3 DS3-12E Faceplate and Block Diagram

Figure 3-6 shows the DS3-12E faceplate and a diagram of the card.

Figure 3-6 DS3-12E Faceplate and Block Diagram

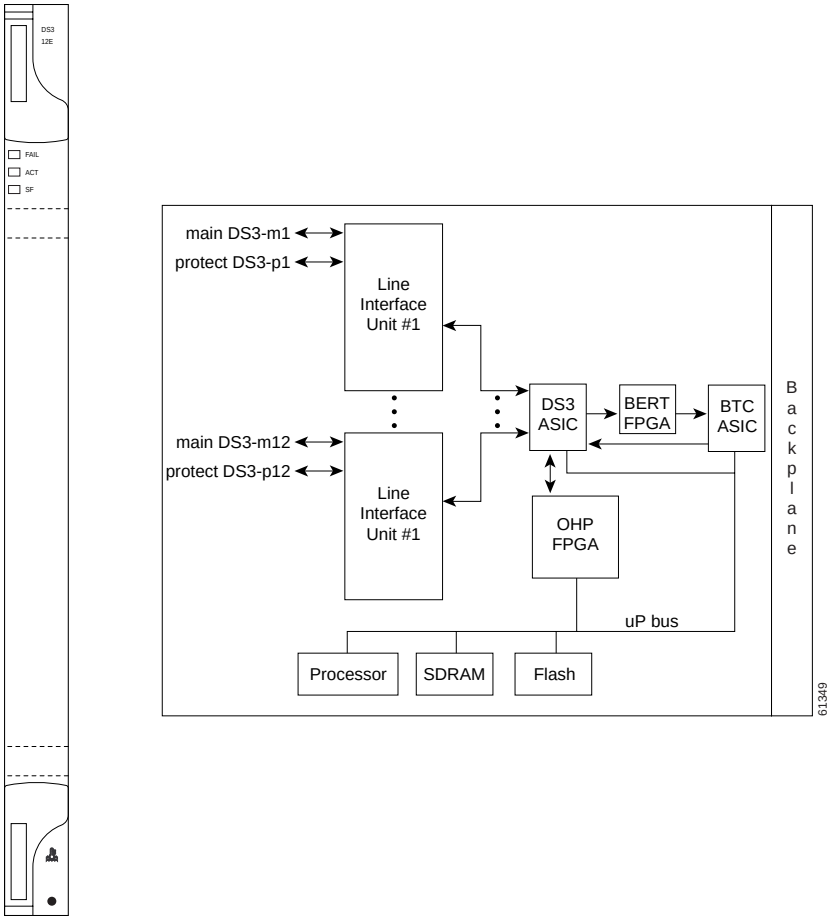
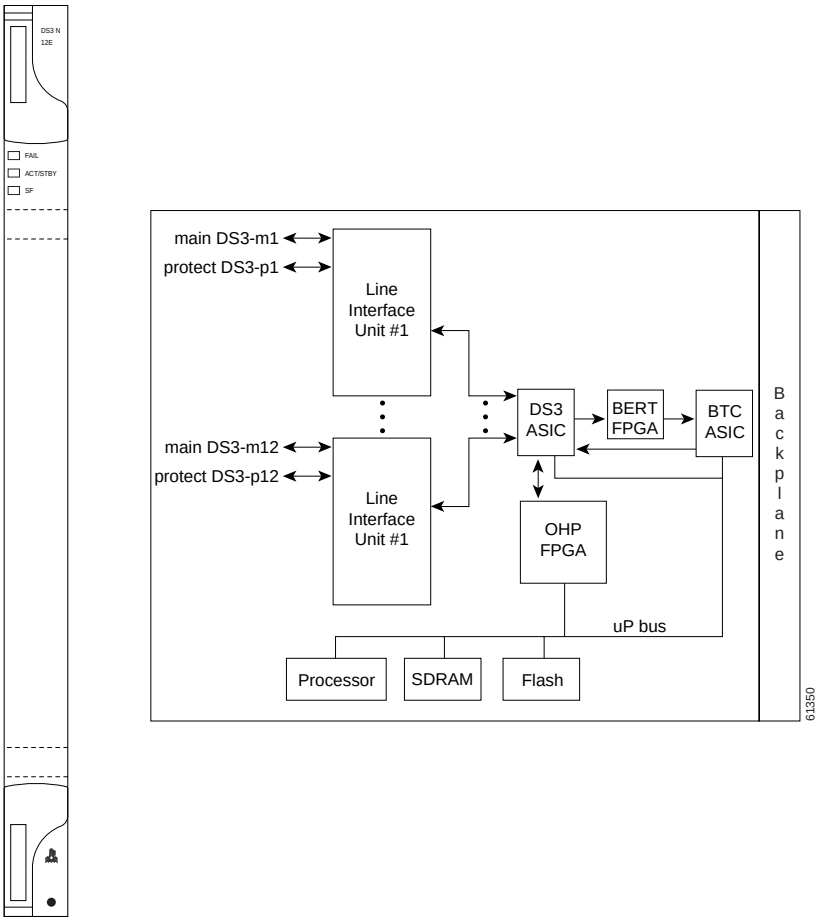


Figure 3-7 on page 3-16 shows the DS3N-12E faceplate and a diagram of the card.

Figure 3-7 DS3N-12E Faceplate and Block Diagram



3.5.4 DS3-12E and DS3N-12E Card-Level Indicators

The DS3-12E and DS3-12E card faceplate has three LEDs shown in Table 3-7.

Table 3-7 DS3-12E and DS3N-12E Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. Replace the card if the red FAIL LED persists.
ACT/STBY LED **Green (Active)** **Amber (Standby)**	When the ACTV/STBY LED is green, the DS3-12E card is operational and ready to carry traffic. When the ACTV/STBY LED is amber, the DS3-12E card is operational and in standby (protect) mode.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as port LOS, AIS, etc.

3.5.5 DS3-12E and DS3N-12E Port-Level Indicators

You can find the status of the DS3-12E and DS3N-12E card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to quickly view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.

3.5.6 DS3-12E and DS3N-12E Specifications

The DS3-12E and DS3N-12E card specifications are shown in Table 3-8.

Table 3-8 DS3-12E and DS3N-12E Card Specifications

Specification Type	Description
DS3-12E/DS3N-12E Input	Bit Rate: 44.736 Mbps +/- 20 ppm Frame Format: DS-3 ANSI T1.107-1988 Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant
DS3-12E/DS3N-12E Output	Bit Rate: 44.736 Mbps +/- 20 ppm Frame Format: DS-3 ANSI T1.107-1988 Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant Power Level: -1.8 - +5.7 dBm (The power level is for a signal of all ones and is measured at a center frequency of 22.368 MHz (+/-KHz) bandwidth.) Pulse Shape: ANSI T1.102-1988 Figure 8 Pulse Amplitude: 0.36 - 0.85 V peak-to-peak Loopback Modes: Terminal and Facility Line Build Out: 0-225 ft.; 226-450 ft.
DS3-12E/DS3N-12E Electrical Interface	Connectors: BNC or SMB
Surge Protection	GR-1089
Operating Temperature	I-Temp (15454-DS3-12E-T and 15454-DS3N-12E-T): -40 to +65 degrees Celsius **Note** The I-Temp symbol is displayed on the faceplate of an I-Temp compliant card. A card without this symbol is C-Temp compliant.
Operating Humidity	5 - 95%, non-condensing

Table 3-8 DS3-12E and DS3N-12E Card Specifications (continued)

Specification Type	Description
Power Consumption	26.80 W, 0.56 amps, 91.51 BTU/Hr.
Dimensions	Height: 12.650 in. Width: 0.716 in. Depth: 9.000 in. Depth with backplane connector: 9.250 in. DS3-12E Card Weight: 1.8 lbs, 0.8 kg DS3N-12E Card Weight: 1.9 lbs, 0.8 kg
Compliance	ONS 15454 cards, when installed in a system, comply with these standards: Safety: UL 1950, CSA C22.2 No. 950, EN 60950, IEC 60950

3.6 DS3XM-6 Card

The DS3XM-6 card, commonly referred to as a transmux card, provides six Telcordia-compliant, GR-499-CORE M13 multiplexing functions. The DS3XM-6 converts six framed DS-3 network connections to 28x6 or 168 VT1.5s. You cannot create circuits from a DS3XM-6 card to a DS-3 card. DS3XM-6 cards operate at the VT1.5 level.

3.6.1 DS3XM-6 Slots and Connectors

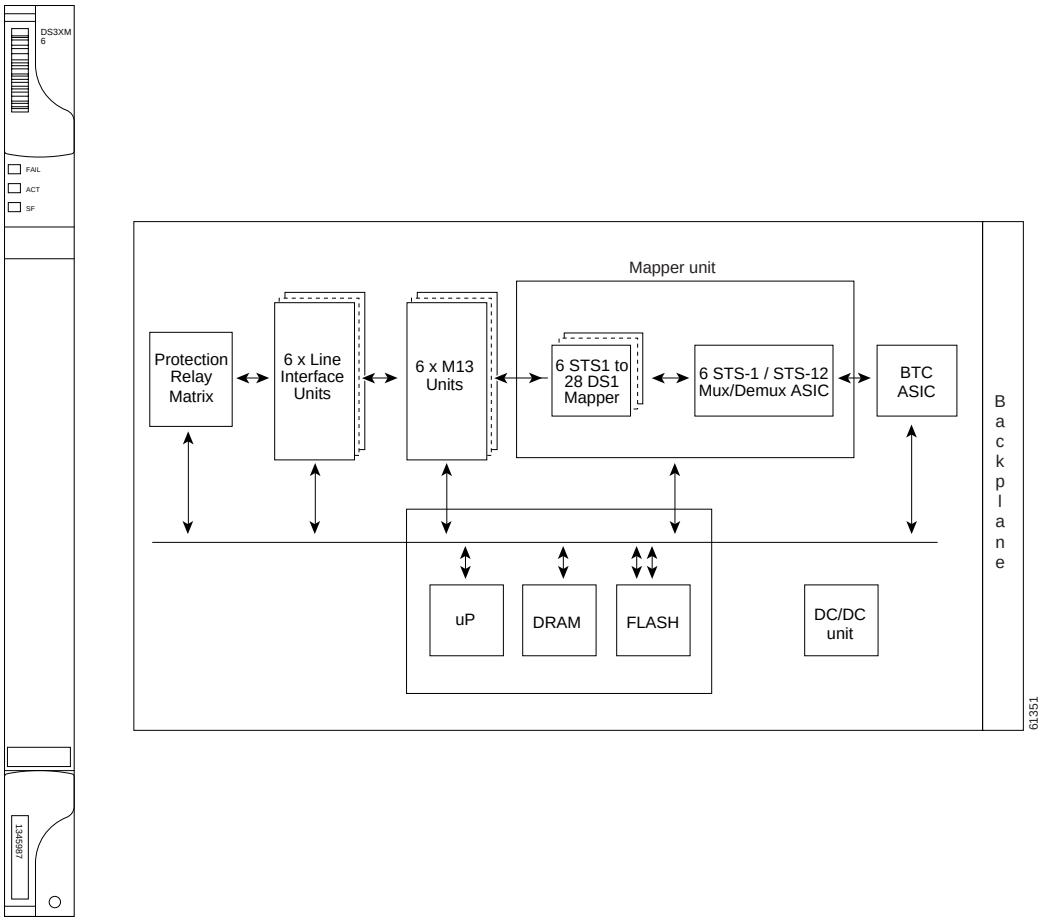
The DS3XM-6 card supports 1:1 protection with the proper backplane EIA. EIAs are available with BNC or SMB connectors.

You can install the DS3XM-6 in Slots 1 to 6 or 12 to 17. Each DS3XM-6 port features DSX-level outputs supporting distances up to 450 feet (137 meters) depending on facility conditions.

3.6.2 DS3XM-6 Faceplate and Block Diagram

Figure 3-8 on page 3-19 shows the DS3XM-6 faceplate and a block diagram of the card.

Figure 3-8 DS3XM-6 Faceplate and Block Diagram



3.6.3 DS3XM-6 Hosted By XCVT

The DS3XM-6 card works in conjunction with the XCVT card. A single DS3XM-6 can demultiplex (map down to a lower rate) six DS-3 signals into 168 VT1.5s that the XCVT card then manages and cross connects. XCVT cards host a maximum of 336 bidirectional VT1.5s or two DS3XM-6 cards. In most network configurations two DS3XM-6 cards are paired together as working and protect cards.

3.6.4 DS3XM-6 Card-Level Indicators

The DS3XM-6 card faceplate has three LEDs, see Table 3-9.

Table 3-9 DS3XM-6 Card-Level Indicators

Card-Level Indicators	Description
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready. Replace the card if the red FAIL LED persists.
ACT/STBY LED **Green (Active)** **Amber (Standby)**	When the ACTV/STBY LED is green, the DS3XM-6 card is operational and ready to carry traffic. When the ACTV/STBY LED is amber, the DS3XM-6 card is operational and in standby in a 1:1 protection group.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS, LOF, or high BER on one or more of the card's ports.

3.6.5 DS3XM-6 Port-Level Indicators

You can find the status of the six DS3XM-6 card ports using the LCD screen on the ONS 15454 fan-tray assembly. Use the LCD to quickly view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.

3.6.6 DS3XM-6 Specifications

The DS3XM-6 card specifications are shown in Table 3-10 on page 3-21.

Table 3-10 DS3XM-6 Card Specifications

Specification Type	Description
DS3XM-6 Input	Bit Rate: 44.736 Mbps +/- 20 ppm Frame Format: DS-3 ANSI T1.107-1988 Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant
DS3XM-6 Output	Bit Rate: 44.736 Mbps +/- 20 ppm Frame Format: DS-3 ANSI T1.107-1988 Line Code: B3ZS Termination: Unbalanced coaxial cable Input Impedance: 75 ohms +/-5% Cable Loss: Max 450 ft. 734A, RG-59, 728A/Max 79 ft. RG-179 AIS: TR-TSY-000191-compliant Power Level: -1.8 - +5.7 dBm Pulse Shape: ANSI T1.102-1988 Figure 8 Pulse Amplitude: 0.36 - 0.85 V peak-to-peak Loopback Modes: Terminal and Facility Line Build Out: 0-225 ft.; 226-450 ft.
DS3XM-6 Electrical Interface	Connectors: BNC or SMB
Surge Protection	GR-1089
Operating Temperature	C-Temp (15454-DS3XM-6): 0 to +55 degrees Celsius I-Temp (15454-DS3XM-6-T): -40 to +65 degrees Celsius **Note** The I-Temp symbol is displayed on the faceplate of an I-Temp compliant card. A card without this symbol is C-Temp compliant.
Operating Humidity	5 - 95%, non-condensing
Power Consumption	20 W, 0.42 amps, 68 BTU/Hr.
Dimensions	Height: 12.650 in. Width: 0.716 in. Depth: 9.000 in. Card Weight: 1.8 lbs, 0.8 kg
Compliance	ONS 15454 cards, when installed in a system, comply with these standards: Safety: UL 1950, CSA C22.2 No. 950, EN 60950, IEC 60950

3.7 Electrical Card Comparisons

Table 3-11 shows the power requirements of the electrical cards.

Table 3-11 Electrical Card Power Requirements

Card Type	Card Name	Watts	Amps	BTU/Hr.
Electrical Cards	EC1-12	36.60	0.76	124.97
	DS1-14	12.60	0.26	43.02
	DS1N-14	12.60	0.26	43.02
	DS3-12	38.20	0.79	130.43
	DS3N-12	38.20	0.79	130.43
	DS3-12E	26.80	0.56	91.51
	DS3N-12E	26.80	0.56	91.51
	DS3XM-6 Transmux *	20	0.42	68

Table 3-12 shows the temperature ranges of the electrical cards.

Table 3-12 Electrical Card Temperature Ranges

Card	C-Temp Product Name (0 to +55 degrees Celsius)	I-Temp Product Name (–40 to +65 degrees Celsius)
EC1-12	15454-EC1-12	15454-EC1-12-T
DS1-14	15454-DS1-14	15454-DS1-14-T
DS1N-14	15454-DS1N-14	15454-DS1N-14-T
DS3-12	15454-DS3-12	15454-DS3-12-T
DS3N-12	15454-DS3N-12	15454-DS3N-12-T
DS3-12E	—	15454-DS3-12E-T
DS3N-12E	—	15454-DS3N-12E-T
DS3XM-6 (Transmux)	15454-DS3XM-6	15454-DS3XM-6-T