APPLICATION NOTE 368

Examples of DS3134 CHATEAU Applications

This application note provides some possible application examples for the DS3134, such as T1/E1/T3, xDSL and SONET/SDH.

Overview

CHATEAU DS3134 has 256 independent directional HDLC channels, which supports up to 64 T1 or E1 data streams. Sixteen channelized or unchannelized ports and each channelized port can handle one, two or four T1 or E1 lines. There are also two fast ports on Chateau, which can speed up to 52 Mbps in both transmit and receive directions, suitable for HSSI or clear channel T3 applications. All sixteen ports can operated from zero to 10 Mbps when configured in unchannelized mode of operations.

This application note describes some possible applications for the DS3134. The number of potential configurations is numerous and only a few are shown. Users are encouraged to contact the factory for support of their particular application. Contact information is shown below:

Telecom Applications Support Contact Information
Voice: 972.371.3721 or 972.371.6186
FAX: 972.371.3715
Email: telecom.support@dalsemi.com
Web: www.dalsemi.com

Types of T1/E1 Applications
There are two types of channelized T1 and E1applications:

1. The first type is where a single T1 or E1 data stream is routed to and from one of the sixteen physical port of the DS3134. This first type is represented as a thin arrow in the application examples and the electrical connections are shown in Figure 2.
2. The second type is where four T1 or E1 data streams have been Time Division Multiplexed (TDM) into a single 8.192 MHz data stream, which is routed to and from the DS3134. This second type is represented as a thick arrow and the electrical connections are shown in Figure 3.
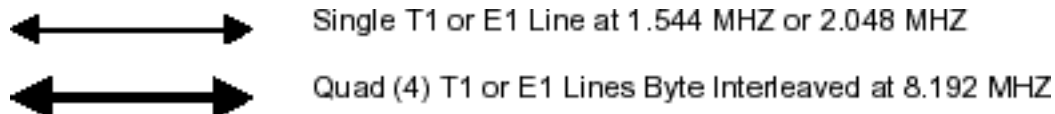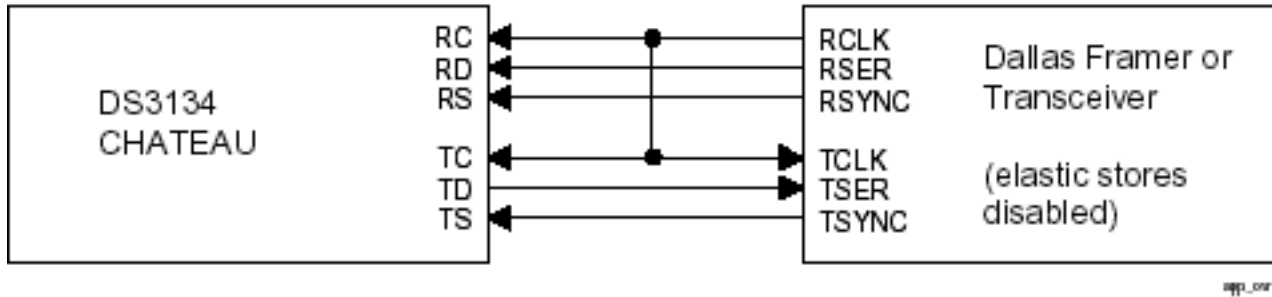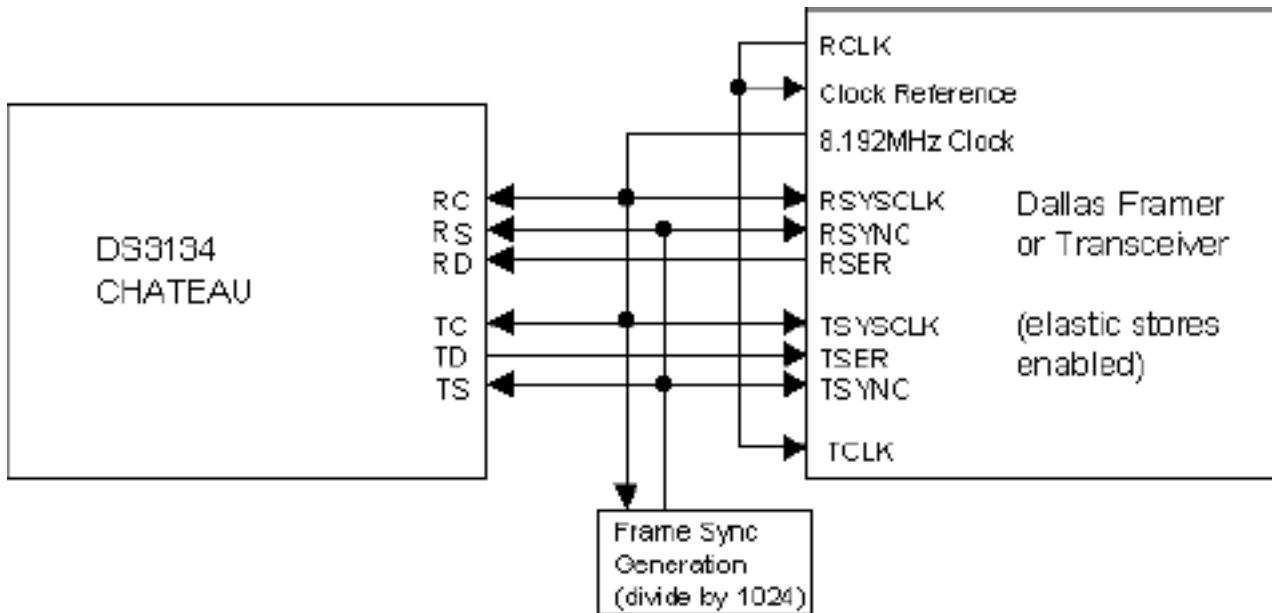
Single T1 or E1 Line at 1.544 MHZ or 2.048 MHZ

Quad (4) T1 or E1 Lines Byte Interleaved at 8.192 MHZ

Figure 1. Application Drawing Key

Single T1/E1 Line Connection

Note:
A looped timed application is shown. The transmit clock may be decoupled from the receive in applications that are a timing master.

Figure 2. Single T1/E1 Connection

Note:
A looped timed application is shown. The transmit clock may be decoupled from the receive in applications that are a timing master.

Figure 3. Quad T1/E1 Connection

Channelized T1/E1 applications
16 Port T1 or E1 with 256 HDLC Channel Support
Figure 4 shows an application where 16 T1 ports are interfaced to a single DS3134. In this application, the T1 lines can be either clear channel or channelized. The DS21Q552 Quad T1 Transceiver performs the line interface function and frames to the T1 line. To convert this application to an E1 design, the DS21Q552 is replaced with the DS21Q554 Quad E1 Transceiver, which is pin-for-pin compatible. The DS21Q552 and DS21Q554 devices also are available in 3.3V versions (DS21Q352 and DS21Q354 respectively).
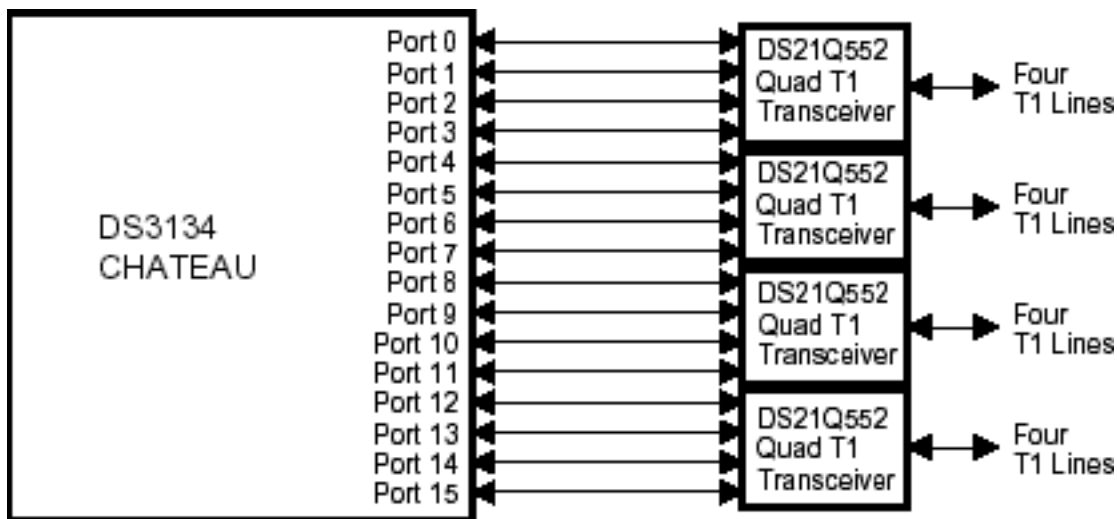
Figure 4. 16 Port T1 Application

16 Port with 16 T1 or E1 line and 256 HDLC Channel Support
Figure 5 shows an application where 64 T1/E1 lines interfaced to a single DS3134. In this application, the T1 lines can be either clear channel or channelized. The DS21FF42, sixteen, T1 Transceiver performs the line interface function and frames to the T1 line. To convert this application to an E1 design, the DS21FF42 is replaced with the DS21FF44, sixteen E1 Transceiver, which is pin-for-pin compatible.
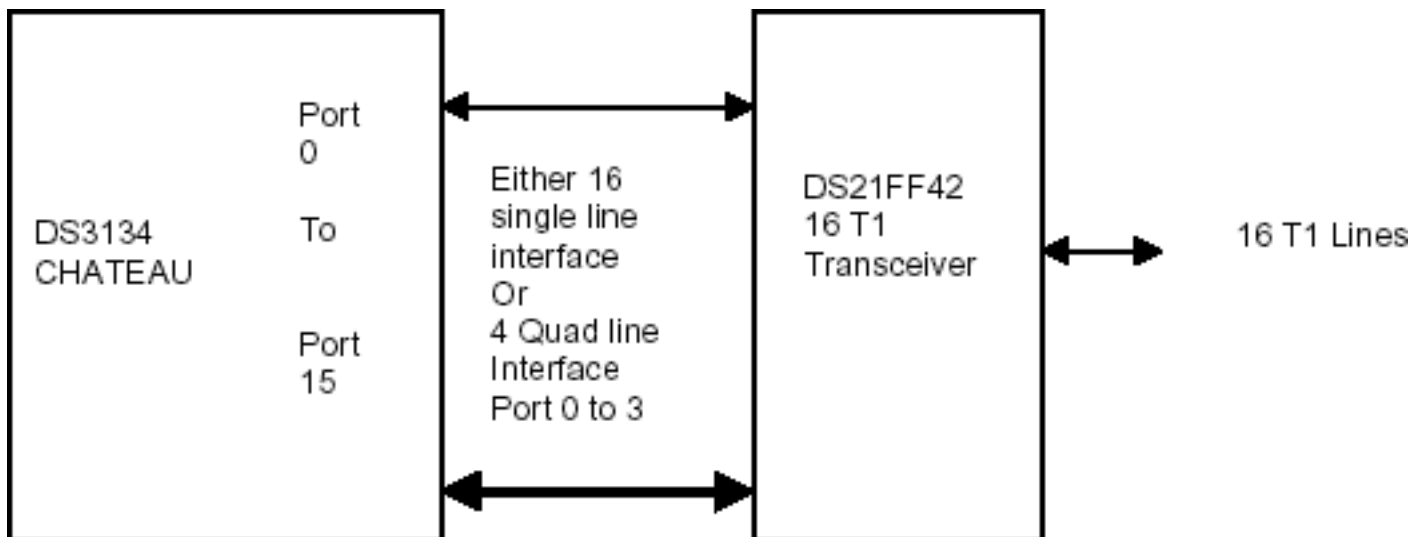

Figure 5. 16 Port T1 Application

16 Port with 48 T1 or E1 line and 256 HDLC Channel Support
Figure 6 shows an application where 48 T1/E1 lines interfaced to a single DS3134. In this application, the T1 lines can be either clear channel or channelized. The DS21FF42, sixteen T1 Transceiver performs the line interface function and frames to the T1 line. To convert this application to an E1 design, the DS21FF42 is replaced with the DS21FF44, sixteen E1 Transceiver, which is pin-for-pin compatible.
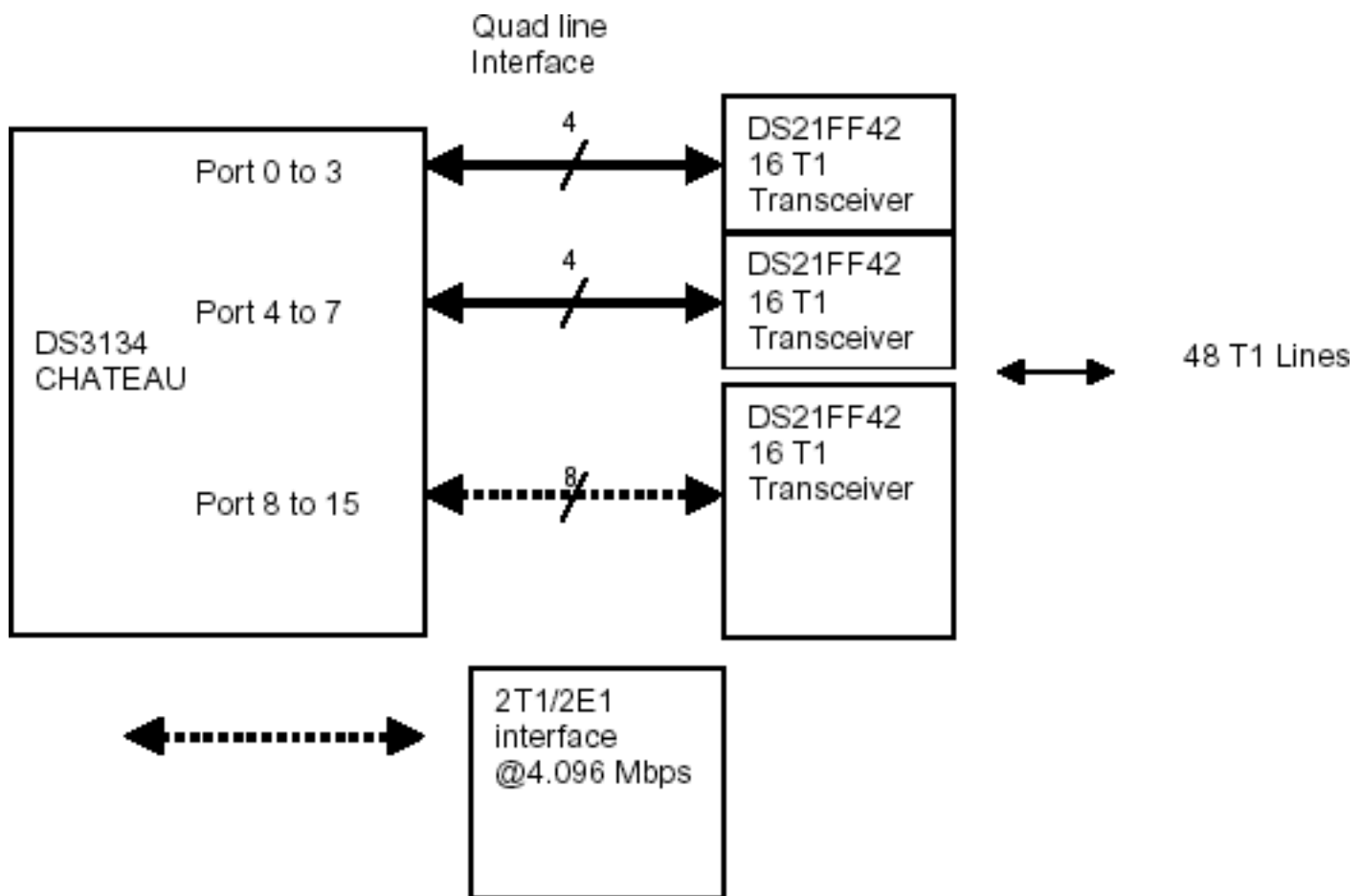
Figure 6. 64 T1 Application

Single T3 with 256 HDLC Channel Support
Figure 7 shows an application where one T3 line is interfaced to a single DS3134. In this application, the T3 lines are demultiplexed by the DS3112 M13 block and passed to the DS21FF42 16 Channel T1 Framer and DS21FT42 12 Channels T1 Framer devices. The T1 framers locate the frame and multiframe boundaries and interface to the DS3134 by aggregating four T1 lines into a single 8.192MHz data stream, which then flows into and out of the DS3134. The T1 lines can be either clear channel or channelized.
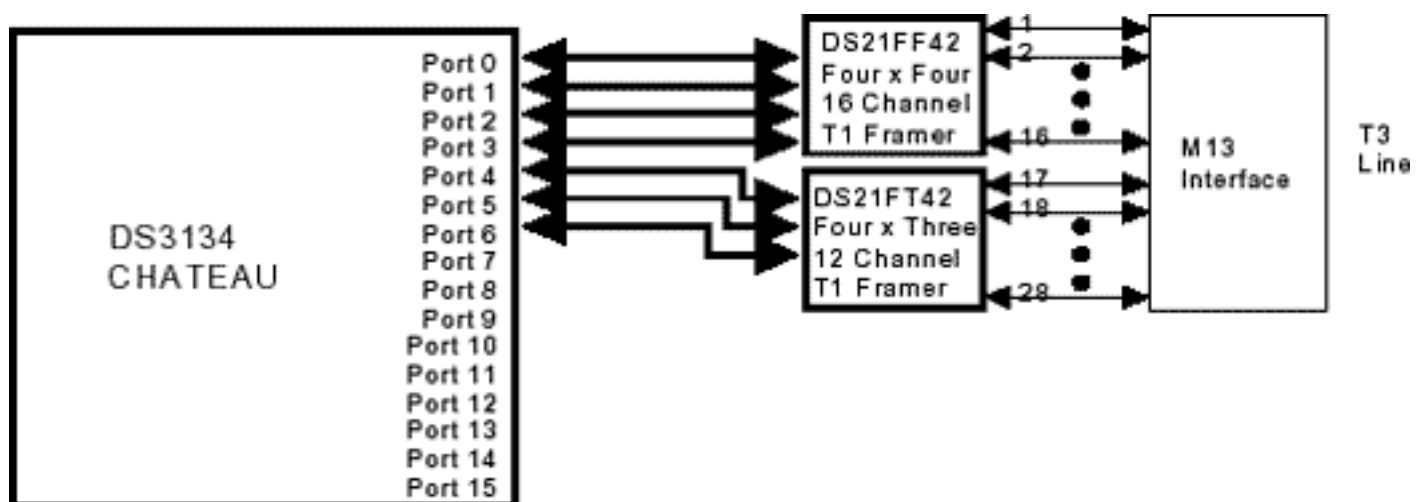

Figure 7. Single T3 Application

Direct Dual T3 application
Figure 8 shows an application where two T3 lines are interfaced to a single DS3134. In this application, the T3 lines are demultiplexed by the DS3112 M13 block. The payload of DS3 #1 is passed onto Port zero (High-Speed

port). The payload of DS3 #2 is passed to port #1 (the other High-speed port) of DS3134.

This application shows that a host can put two T3 worth of IP data, HDLC packet data, onto two T3 lines over only one DS3134.
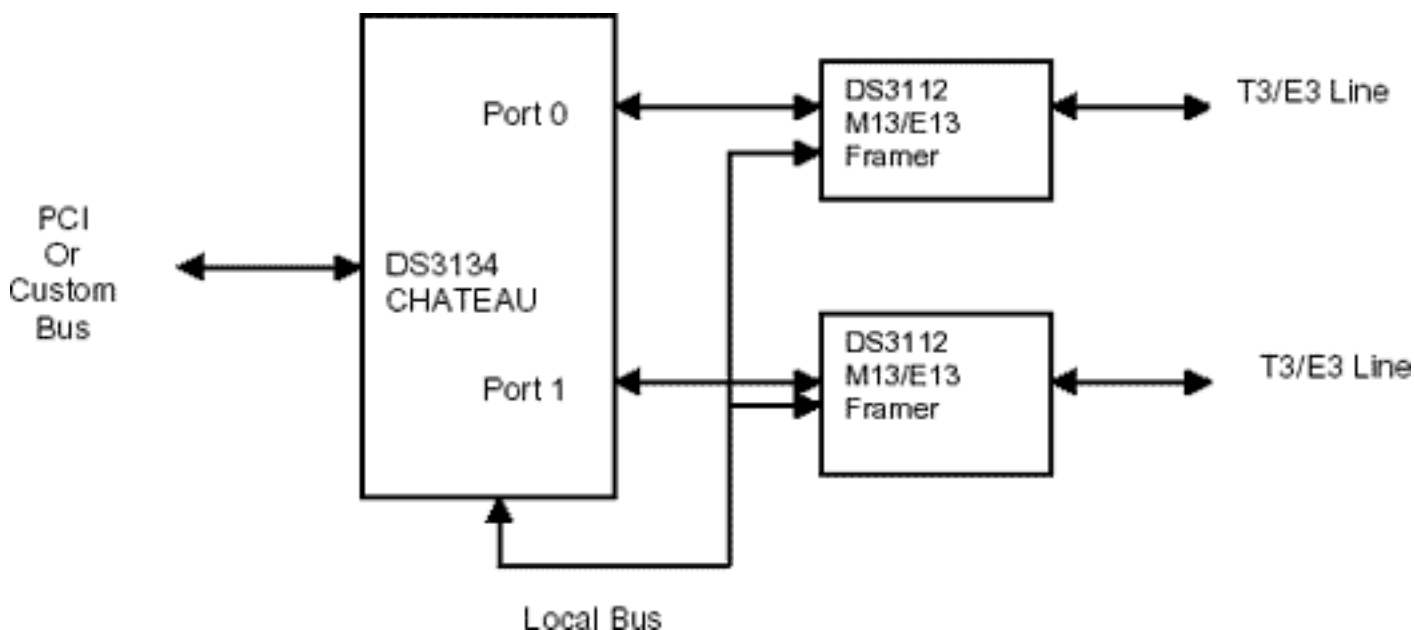

Figure 8. Direct Dual T3 Application

Single T3 with 512 HDLC Channel Support
Figure 9 shows an application where a T3 line is interfaced to two DS3134. In this application, the T3 line is demultiplexed by the DS3112 M13 block and passed to the DS21FF42 16 T1 Framer and DS21FT42 12 T1 Framer devices. The T1 framers locate the frame and multiframe boundaries and interface to the DS3134. In this application, aggregating four T1 lines into a single 8.192 MHz data stream is not required since the DS3134 has enough physical ports to support the application but aggregation could be done to cut down on the number of electrical connections between the DS3134 and the T1 framers.
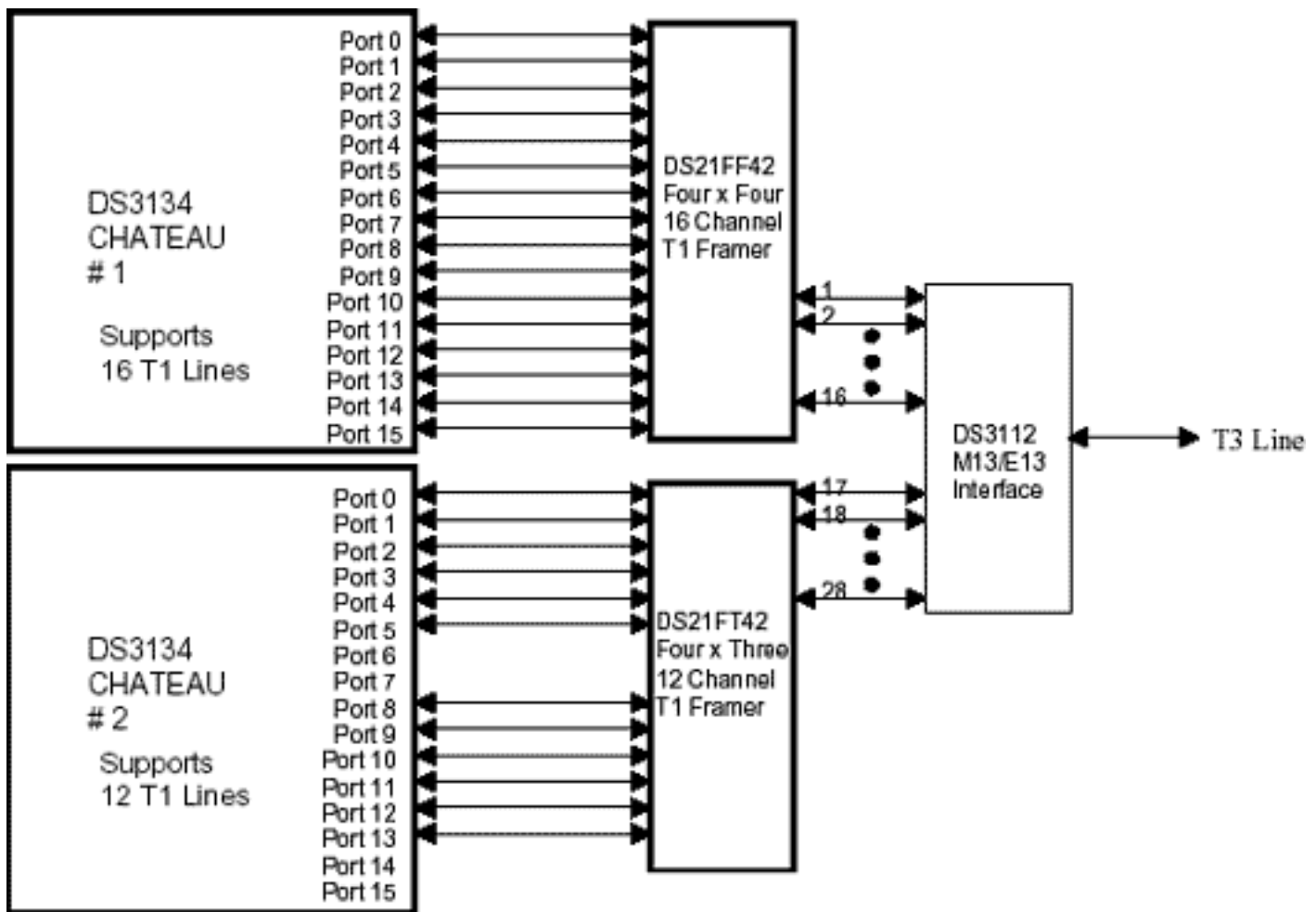
Figure 9. T3 Application (512 HDLC Channels)

Single T3 with 672 HDLC Channel Support

Figure 10 shows an application where a T3 line is interfaced to three DS3134. In this application, the T3 line is demultiplexed by the M13 block and passed to the DS21FF42 16 Channel T1 Framer and DS21FT42 12 Channel T1 Framer devices. The T1 framers locate the frame and multiframe boundaries and interface to the DS3134. In this application, aggregating four T1 lines into a single 8.192MHz data stream is not required since the DS3134 has enough physical ports to support the application but aggregation could be done to cut down on the number of electrical connections between the DS3134 and the T1 framers. The T1 lines can be either clear channel or channelized.
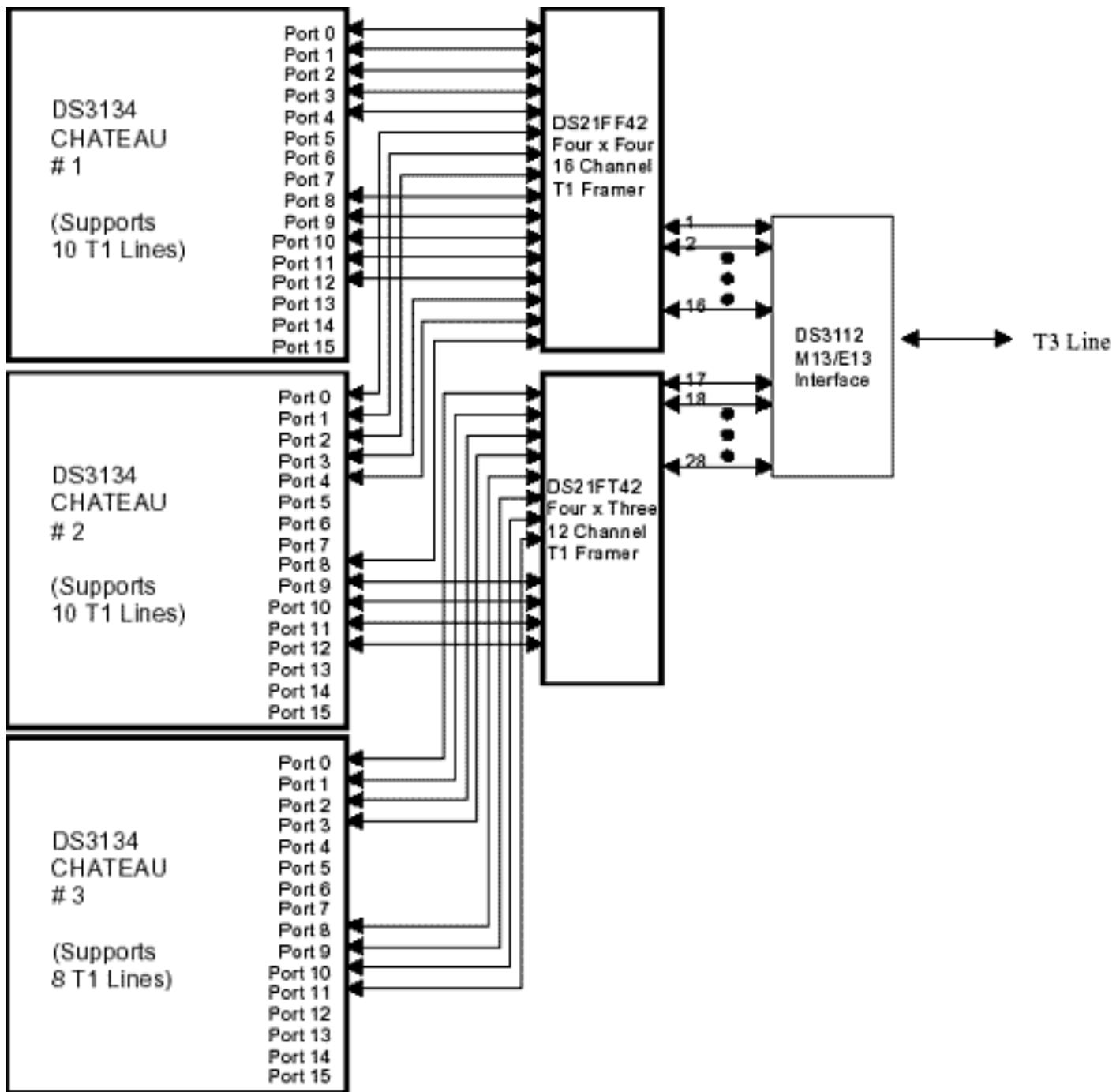
Figure 10. T3 Application (672 HDLC Channels)

XDSL with HSSI Port Access

Figure 11 shows an application where several xDSL Modem and a HISS port is interfaced to one DS3134. In this application, the xDSL line is demultiplexed by the xDSL Modem and passed to the DS3134.

In this application, it also show one of the high speed port is connected to a HISS port. This HISS port can speed up to 52 Mbps.
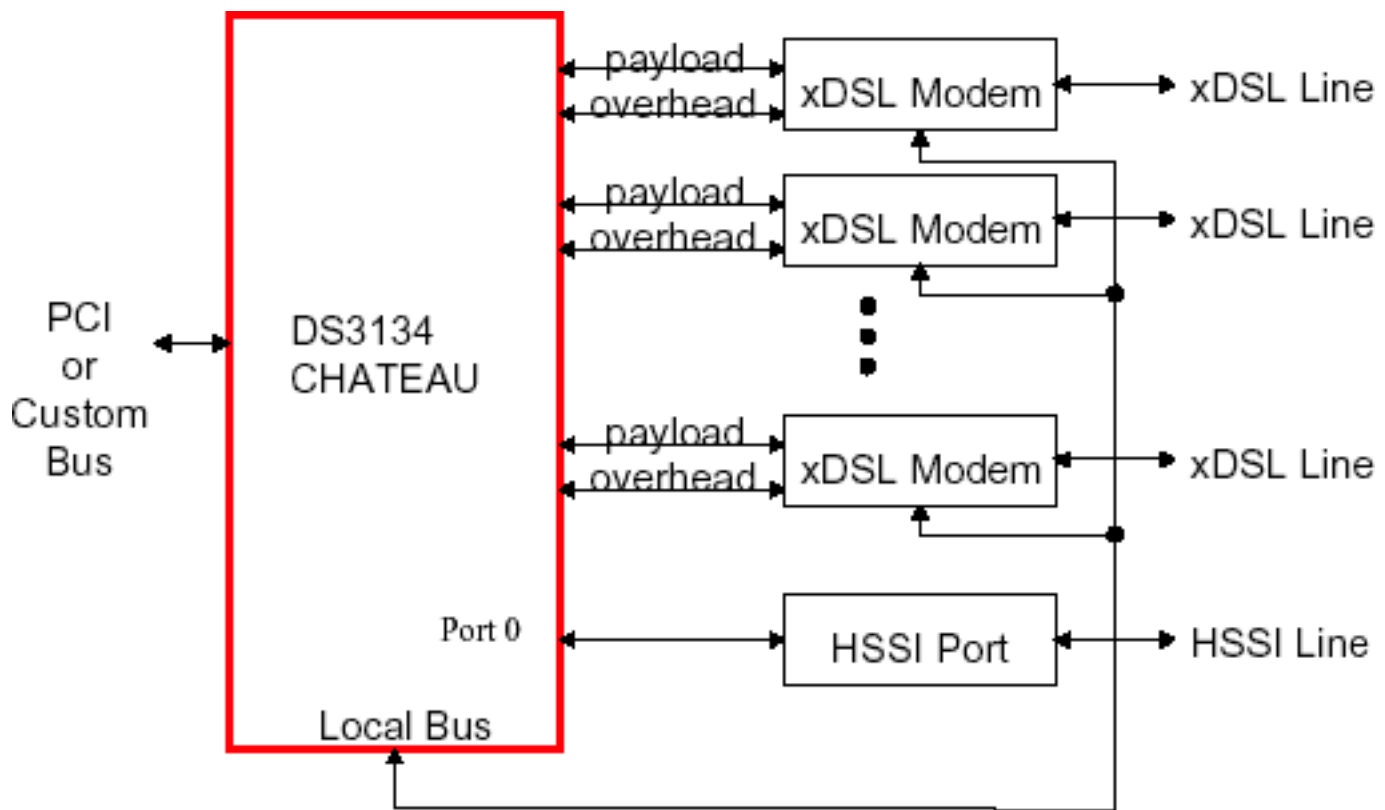
Figure 11. XDSL with HSSI Port Access

SONET/SDH EOC/ECC Terminations

Figure 12 shows an application where a DS3134 is terminating a group of SONET Embedded Operations Channels (EOC). A SONET EOC is use to carry the LDCC (Line Data Communication Channel, 576 kbps), and the SDCC (Section Data Communication Channel, 192 kbps), where both these channels are use for overhead maintain purpose and they are HDLC base. For SDH application there is no change in the DS3134 side because the SDH ECC (Embedded Communication Channel) has the same kind of structure as the SONET ECC.

Figure 12. SONET/SDH EOC/ECC Terminations
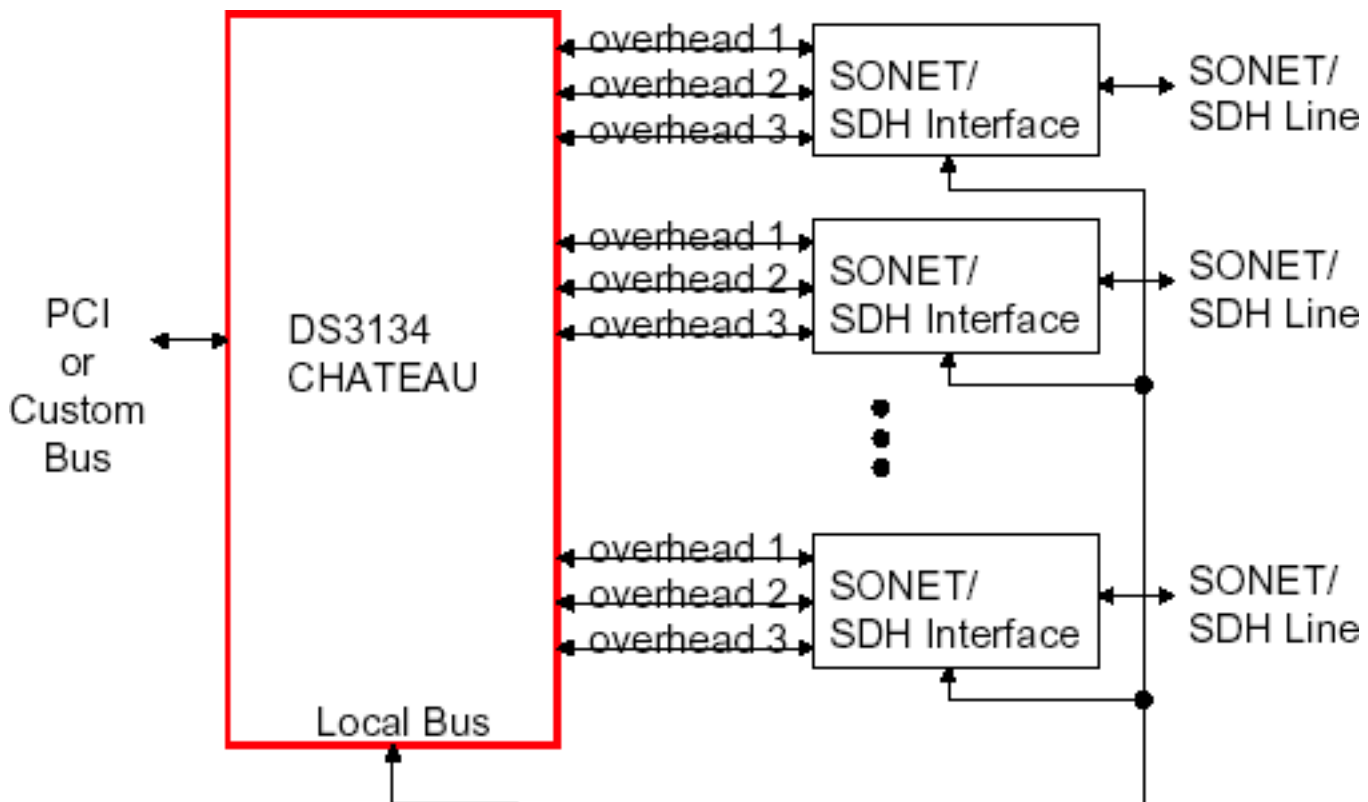
Application Note 368: http://www.maxim-ic.com/an368

More Information
For technical questions and support: http://www.maxim-ic.com/support
For samples: http://www.maxim-ic.com/samples
Other questions and comments: http://www.maxim-ic.com/contact

Related Parts
 DS3134: QuickView -- Full (PDF) Data Sheet