DALLAS **SEMICONDUCTOR** **/MAXI/M**

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INTRODUCTION

This application note shows how to connect the Dallas DS3150 or DS315x series of T3/E3 LIUs to the Agere Systems Inc. *Ultramapper*™ device family. The DS3150 and DS315x series of T3/E3 LIUs perform all the functions necessary for interfacing at the physical layer to T3 and E3 lines. The DS3150 is a hardware-only, single-port T3/E3 LIU, while the DS3151, DS3152, DS3153, and DS3154 offer both hardware and CPU bus modes in 1, 2, 3, or 4 ports, respectively. This application note will illustrate how to connect to the DS3150 with the connection to the DS315x series being similar.

The Agere *Ultramapper* Device Family includes the following: *Ultramapper*, *Ultramapper*Lite, *Ultramapper* Full Transport, and Ultraframer. This application note will discuss applications that pertain only to the following Agere devices: *Ultramapper*Lite and Ultraframer.

The following diagrams will illustrate Dallas T3/E3 LIUs from the DS315x series or multiples of the DS3150. Depending on the linecard/system design, the designer will need to choose which of the five Dallas LIUs to use.

Ultramapper *is a trademark of Agere Systems Inc.*

REV: 032404

APPLICATIONS

T3/E3 Clear-Channel Application

In this application, two *Ultramapper*Lites are configured to terminate/transmit 12 T3/E3 signals from/to T3/E3 mapped STS-12/STM-4 signals.
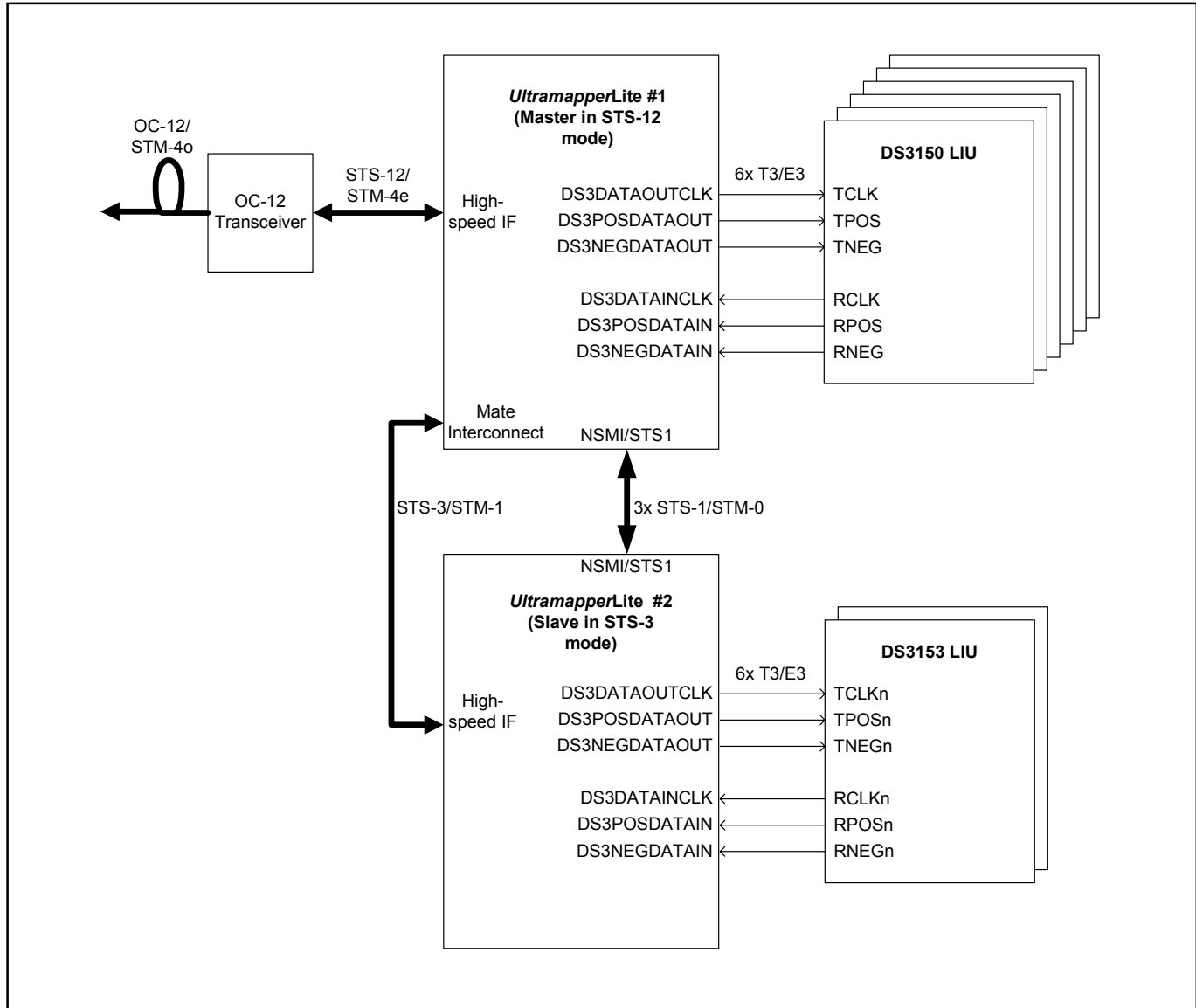

Figure 1. T3/E3 Clear-Channel Application

T3/E3 TransMUX Application

In this application, four *Ultramapper*Lites are configured to transMUX between two different scenarios: between one VT1.5/VC11 mapped STS-12 and 12 T1 channelized T3 signals; and between one VT2/VC12 mapped STS-12 and 12 E1 channelized E3 signals.
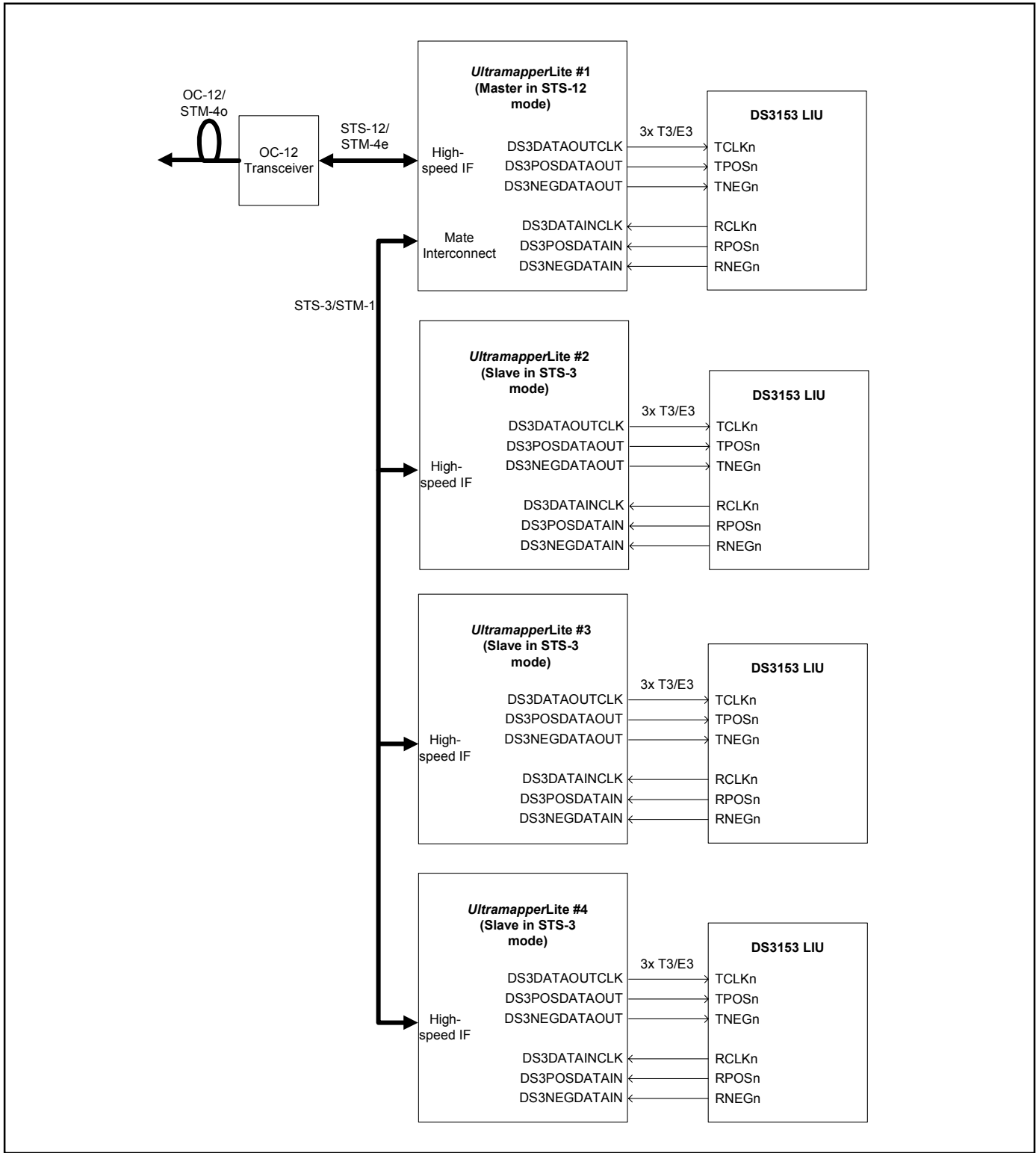

Figure 2. T3/E3 TransMUX Application

T3/E3 and T1/E1 Map/Demap Application

In this application, one Ultraframer is configured to map/demap between three channelized T3/E3 signals and 84/48 T1/E1 signals.
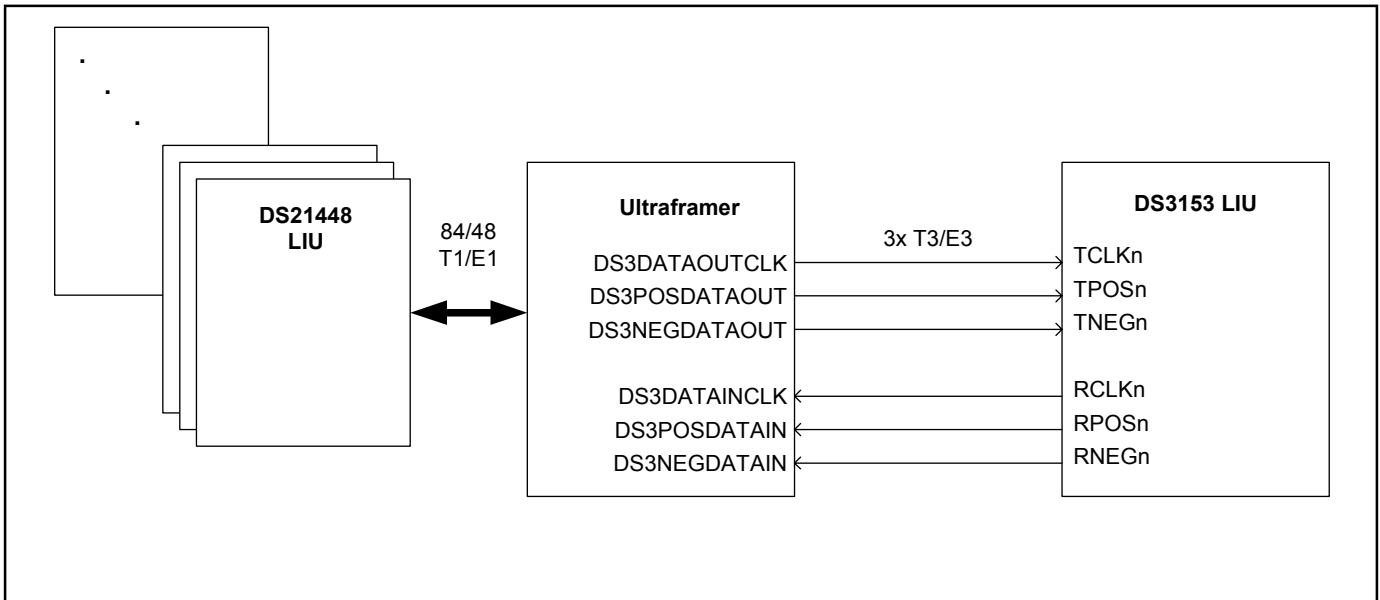

Figure 3. T3/E3 and T1/E1 Map/Demap Application

T3/E3 and DS0/E0 Map/Demap Application

In this application, one Ultraframer is configured to map/demap between three channelized T3/E3 signals and up to 2016/1536 time slots of DS0/E0 signals.
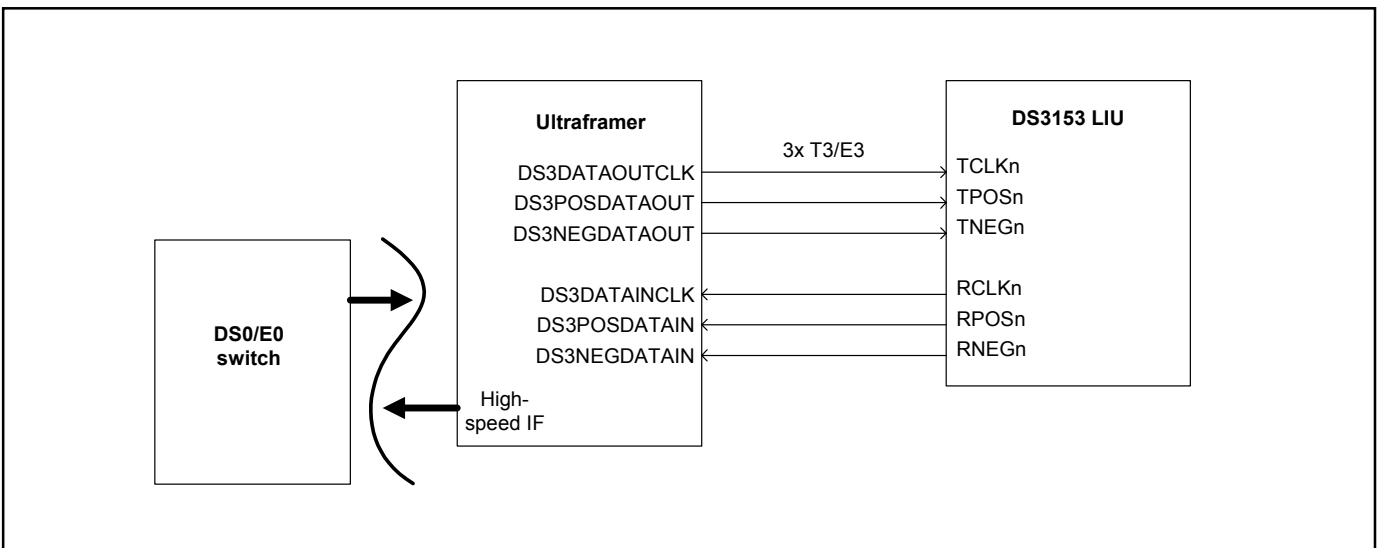

Figure 4. T3/E3 and DS0/E0 Map/Demap Application

DALLAS T3/E3 LINE INTERFACE UNIT CONFIGURATION

With the Agere *Ultramappers* in M13/E13 MUX/DeMUX applications, a free-running 44.736 MHZ T3 or 34.368 MHz E3 clock should be provided to pin DS3DATAOUTCLK for M13/E13 functionality. In SONET/SDH to T3/E3 applications where DS3/E3 Digital Jitter Attenuator is used on the receive path: SONET/SDH ←→ TMUX/STS-1LT ←→ SPE ←→ (DS3/E3 Digital Jitter Attenuator) ←→ T3/E3; the DS3DATAOUT input is not needed for M13/E13 functionality. Instead, a free-running 44.736 MHz DS3XCLK clock and a 34.368 MHz E3XCLK clock are required for T3/E3 Digital Jitter Attenuator functionality. The Agere *Ultramappers* T3/E3 line interface is straightforward to connect to the Dallas T3/E3 LIUs. As far as T3/E3 connections are concerned, there are no differences between the master *Ultramapper* and slave *Ultramapper.*

The interface between a T3/E3 analog line and a Line Interface Unit can be in either bipolar or unipolar mode. Table 1 lists the register settings of the Agere *Ultramappers* for DS3/E3 Bipolar/Unipolar control.

Table 1. Agere *Ultramapper* DS3/E3 Bipolar/Unipolar Control Bits

BLOCK NAME	REGISTER NAME	ADDRESS	DESCRIPTION
SPEMPR	SPEMPR_TDS3_BIPOLAR	0x19 [1]	**Transmit DS3/E3 Bipolar/Unipolar.** Note this is valid only if register 0x0018 [13:12] = 11.
SPEMPR	SPEMPR_RDS3_BIPOLAR	0x19 [0]	**Receive DS3/E3 Bipolar/Unipolar.** Note this is valid only if register 0x0018 [5:4] = 11.
DS3DJA	DS3DJA_DS3_BIPOLAR	0x15 [5:0]	**Per Channel Control Bit** 1: HBD3 or B3ZS. 0: Unipolar.
DS3DJA	DS3DJA_DS3_B3ZS	0x14 [5:0]	**Per Channel Control Bit** 1: B3ZS coding. 0: HDB3 coding.
M13	M13_BIPOLAR	0x5D [0]	1: B3ZS encoding/decoding, i.e., DS3 I/O is in dual-rail mode where each rail carries a polarity of a bipolar I/O. 0: DS3 I/O is a single-rail, unencoded NRZ signal.
E13	E13_TE3_BIPOLAR	0x23 [2]	1: E3 output is HDB3 encoded and dual-rail. 0: E3 output is single-rail unencoded.
E13	E13_RE3_IN_CTL	0x26 [5:4]	00: HDB3 decode disabled (input data on positive rail only). 01: HDB3 decoder enabled, input on P/N rails. 10: HDB3 decoder disabled (input data on positive rail only). 11: HDB3 decoder disabled, negative input rail carries HDB3 error count from external LIU.

CONCLUSION

This application note has shown how to connect our T3/E3 LIUs to the Agere *Ultramapper* Device Family.

If you have further questions about connecting any of our T3/E3 LIUs, then please contact the Telecommunication Applications support team via email telecom.support@dalsemi.com or call 972-371-6555.

DALLAS DS3/E3 LIU INFORMATION

For more information about our T3/E3 LIUs, please consult the data sheets available on our website at www.maxim-ic.com/telecom.