

1.0 Introduction

Traditionally, IMA (Inverse Multiplexing for ATM) is widely adopted in E1/DS1 applications. With the emergence of G.SHDSL (Single-pair High rate Digital Subscribe Line) standards, it is now viable to apply IMA over SHDSL lines.

This application note provides a solution of IMA over up to 16 G.SHDSL lines. It serves as a reference design of interfacing ZL30228 to GlobespanVirata's Orion chipset.

ZL30228 is the second-generation IMA device from Zarlink, which supports IMA over 16 serial bit streams running at a maximum of 2.5Mbps. It also incorporates a UTOPIA Level 2 (and Level 1) bus as ATM interface.

The Orion chipset contains a dual-channel DSL framer and two analog front-ends (AFE). It offers a low-power high-density solution for G.SHDSL applications.

Connecting ZL30228 and Orion chipset together provides us a complete solution for IMA over G.SHDSL that meets both IMA version 1.1/1.0 specification and G.SHDSL specification.

2.0 Notification

This reference design aims at showing how to connect ZL30228 to Orion chipset. In the schematic that follows, ZL30228 is shown with full pinout and with surrounding circuitry. Only the data interface pins on Orion chipset are presented to illustrate the interconnection. For details about Orion chipset please contact GlobespanVirata.

The ZL30228 IMA device shown in this reference design can be replaced by ZL30227 (Octal) or ZL30226 (Quad), two IMA devices from the same family. Both ZL30227 and ZL30226 are pin and functional compatible to ZL30228.

3.0 Content of the Schematics

- The top-level diagram is represented on the first page.
- Second and third pages contain the detailed schematics of ZL30228.
- Data interface of Orion chipset is shown on the fourth page.

For detailed reference design of the Orion chipset in G.SHDSL applications please contact GlobespanVirata.

4.0 Modes of Operation

For ZL30228, the following modes of operation must be selected and programmed:

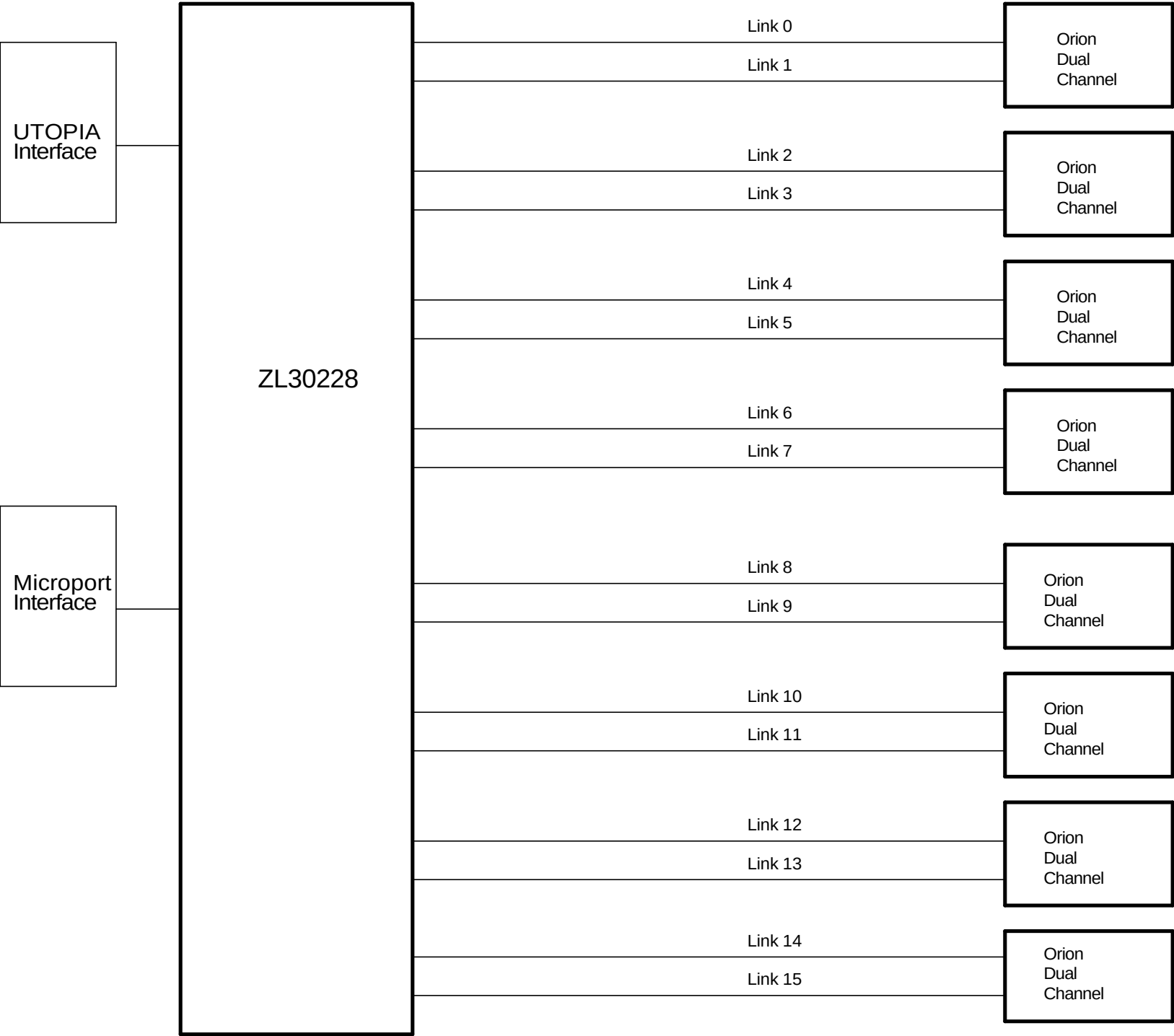
- 1. Unframed serial bit stream mode of up to 2.5Mb/s per link.
- 2. TxCK is configured as input.
- 3. Recommended register settings:

TDM Tx Link Control Register	(0x0600 - 0x060F)	should be set to 0x02A3.
TDM Tx Mapping Registers	(0x0610 - 0x061F)	should be set to 0xFFFF.
TDM Tx Mapping Registers	(0x0620 - 0x062F)	should be set to 0xFFFF.
TDM Rx Link Control Register	(0x0700 - 0x070F)	should be set to 0x04A3.
TDM Rx Mapping Registers	(0x0710 - 0x071F)	should be set to 0xFFFF.
TDM Rx Mapping Registers	(0x0720 - 0x072F)	should be set to 0xFFFF.
Rx Automatic Synchronization Register	(0x0741)	should be set to 0x0036.

- 4. Orion chipset provides both TxCLK and RxCLK to ZL30228.
- 5. Orion chipset should be configured in serial interface mode.

For detailed programming of Orion chipset, please refer to Globespan's application note AN-073.

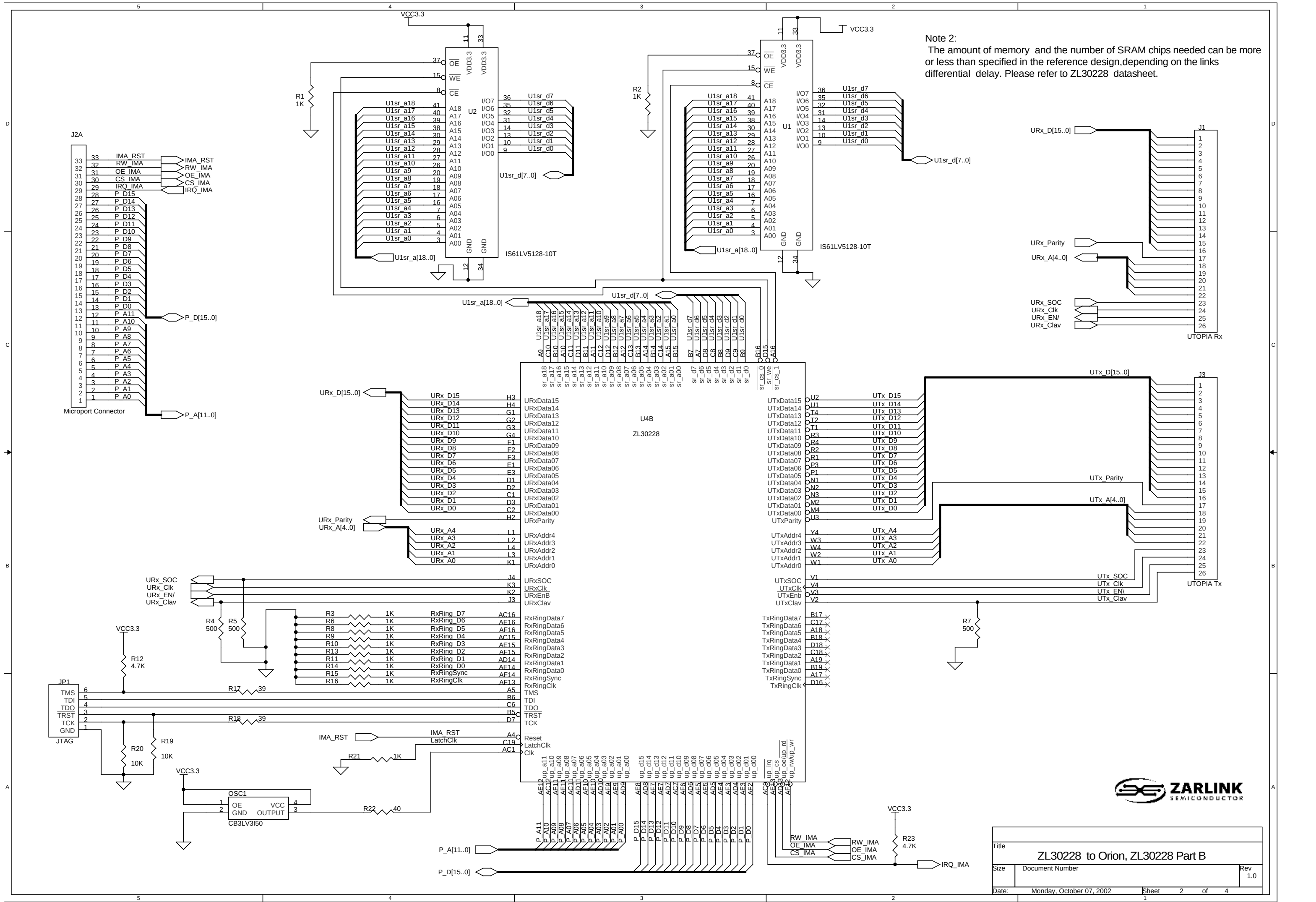
Interfacing Zarlink ZL30228 IMA device
to Globespan Orion SHDSL chipset



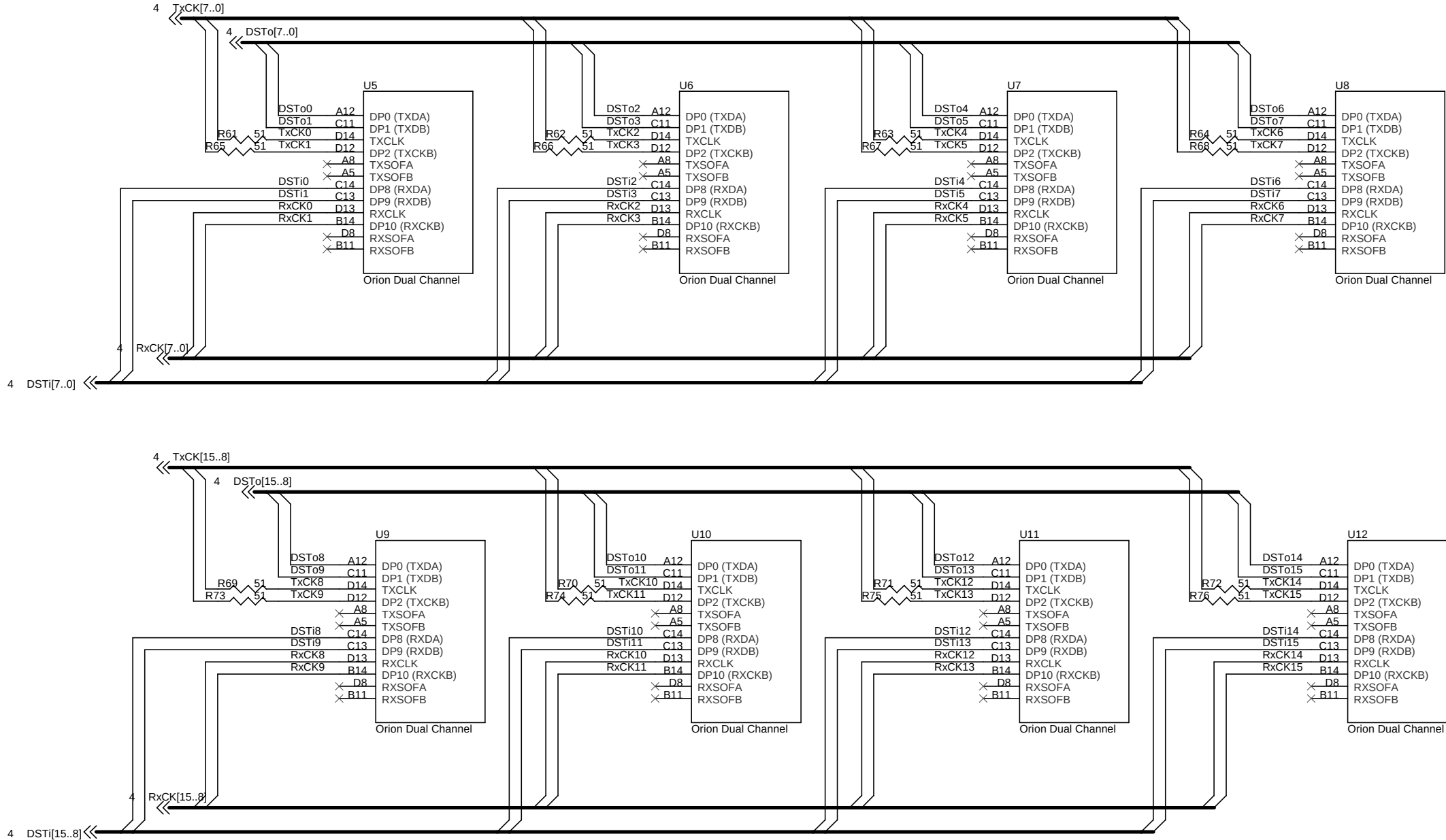
Note 1:
Decoupling capacitors are not shown in the reference design.
They should be placed where needed.



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ZL30228 to Orion, Block Diagram		
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Note 3:
Orion chipset configuration:

- ATM TPS-TC mode of SHDSL.
- Serial ATM mode.
- Refer to Globespan's

Application Note AN-073 for details.



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