Application Note

DTA-116 – Digital I/Q Baseband Interface

1. General

The DTA-116's digital I/Q baseband interface is a point-to-point interface carrying I and Q samples in a digital format. The baseband I and Q words are 2's complement 16-bit integers. Sample rate is 36.0MHz[1].

2. Data Transfer

The synchronous interface is based on 6 LVDS pairs, 4 data signals and 2 clocks. Both clocks, **TxClk** and **RefClk**, run at 36MHz. **TxClk** is the transmit clock that serves as a reference for the data signals on the digital interface. Data rate at the 4 data lines is 288Mb/s; In 8 consecutive cycles one I- and one Q-word is being transferred. Figure 1 shows the timing relationship of **TxClk** and data signals.

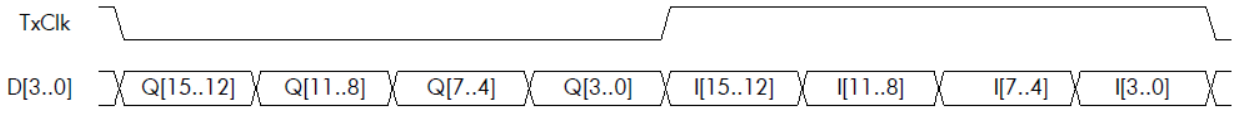

Figure 1: Timing Relationship of clock and data signals

The Q-sample is transferred in 4 cycles while **TxClk** is low, the I-sample is transferred while **TxClk** is high. In the receiver, an x8 clock-multiplying PLL shall be used to regenerate the 288MHz data clock.

A jitter-free 36MHz reference clock, **RefClk**, is provided for de-jittering purposes. Optimal jitter performance is achieved when the recovered I and Q samples are written into a small FIFO. **RefClk** then serves as the read clock of the FIFO. Figure 2 shows a typical application.

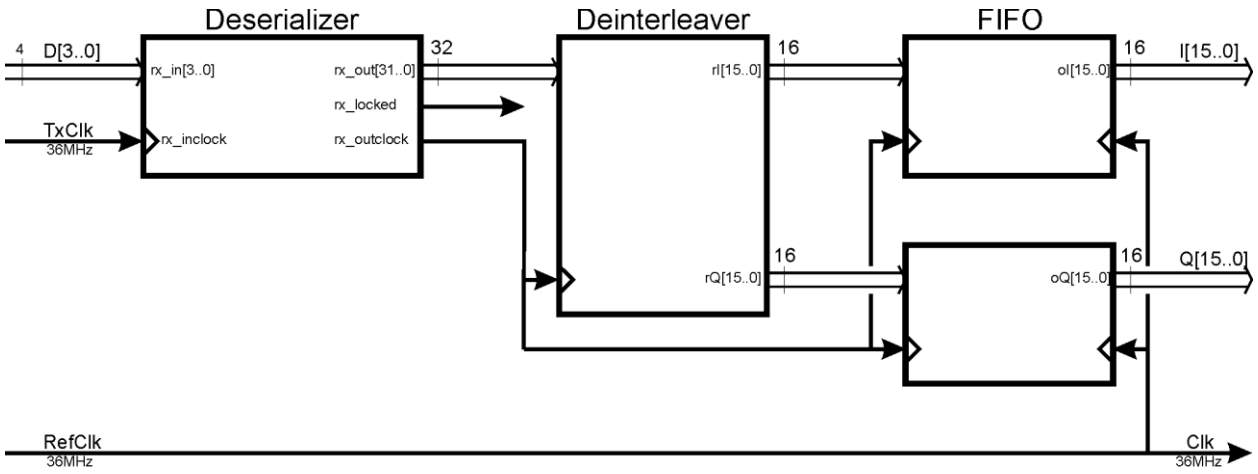

Figure 2: Typical Receiver Application

[1] 44.0MHz for the DTA-117

3. Specifications

The Digital Baseband Output supports all available modulation schemes. The following specifications apply to the physical interface:

Output Connector		Pin header, 14-pins
Transmission Standard		LVDS
Clock Rate RefClk		36.0MHz ±1ppm
Clock Rate TxClk		36.0MHz ±1ppm
Data Rate		288Mb/s
Skew	t_{sk}	≤±0.5ns
TxClk position relative to RefClk	t_{pos}	Arbitrary, may include some jitter

Figure 3 Timing Digital Baseband Interface

4. Physical Interface

Pin Header J7 carries the signals of the Digital I/Q Baseband Interface. It is a standard dual-row right-angle pin header with 0.1" pitch. To connect the DTA-116 to an upconverter or other peripheral, a standard twisted ribbon cable shall be used. All signal pairs require a 100Ω differential termination at the far end, even if they are not being used. Figure 4 shows the pin allocation of J7:

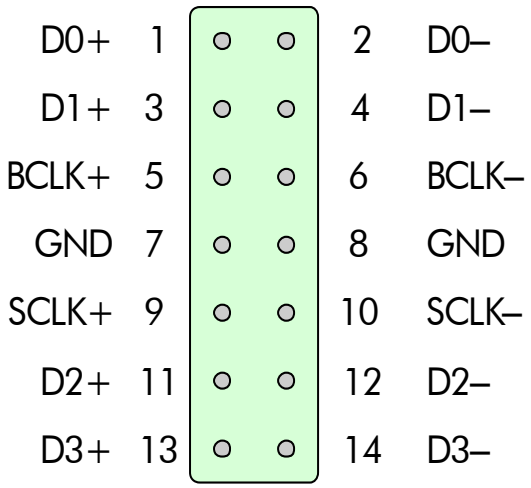

Figure 4: Digital I/Q Baseband Interface connector J7, pin-out