 Andrey Karpenko <andreykarpenko@ymail.com>

BorLink

BorLink is a type of digital DC balanced synchronous audio interconnect interface for use in consumer audio equipment. The signal is transmitted over full duplex balanced twisted pair cable or optical link. *BorLink* is capable to transmit digital signals of a number of formats with sample frequencies from 44.1 to 384 kHz and resolution from 16 to 32 bits. Using of error correction code allows to transmit data on long distances.

The data stream is coded using DC balanced 4b/6b coding scheme. Hamming distances of all numbers from 0 to 15 are greater than or equal to two. Such coding is capable to detect one bit errors. This feature is used like horizontal parity for error correction. 'Comma A' and 'Comma B' symbols are used for bit and packet synchronization.

6'b001110	0
6'b010110	1
6'b100110	2
6'b001011	3
6'b010011	4
6'b100011	5
6'b001101	6
6'b010101	7
6'b100101	8
6'b101001	9
6'b101010	10
6'b101100	11
6'b110001	12
6'b110010	13
6'b011001	14
6'b011010	15
6'b011110	Comma A
6'b100001	Comma B
6'b011100	Special symbol

Table 1: 4b/6b encoding

The data stream consists of 32 bytes packets (48 bytes encoded). Each packet begins from 'Comma A' and 'Comma B' symbols. It is followed by 24-28 data bytes, 2-6 control bytes and 1 byte vertical parity (Illustration 1).

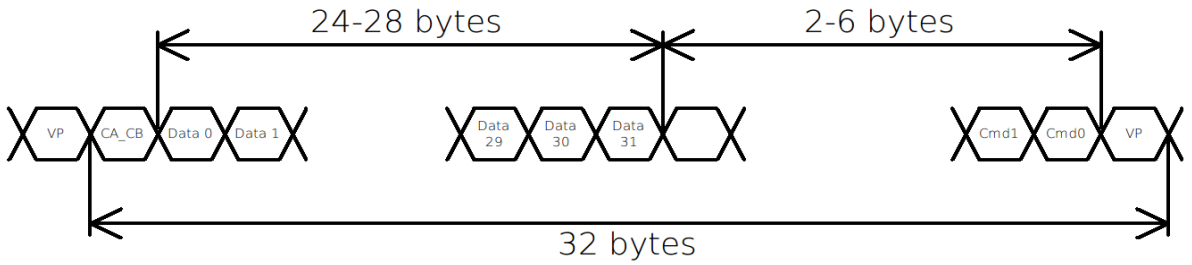

Illustration 1: BorLink Packet

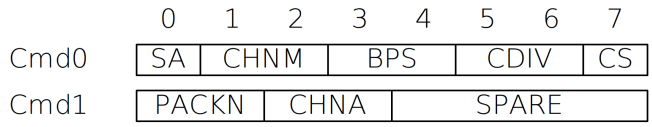

Illustration 2: Cotrol data

SA — For PCM stream audio it must be 1'b1.

CHNM — Maximum number of channels
- 2'b00 – mono
- 2'b01 – stereo
- 2'b10 – 4 channels
- 2'b11 – 8 channels

BPS — Bits per sample
- 2'b00 – 16 bits
- 2'b01 – 24 bits
- 2'b10 – 32 bits
- 2'b11 – reserved

CDIV — Master clock divider
- 2'b00 – 2
- 2'b01 – 4
- 2'b10 – 8
- 2'b11 – 16

CS — Clock source select
- 1'b0 – 45.1584 MHz or 90.3168 MHz
- 1'b1 – 49.152 MHz or 98.304 MHz

PACKN — Packet number. It is used for multipacket mode.

CHNA — Number of used channels. There is a possibility to use it to meet minimum link bandwidth requirements.
- 2'b00 – mono
- 2'b01 – stereo
- 2'b10 – 4 channels
- 2'b11 – 8 channels