TV-ULV Industrial Low Latency Codec Board

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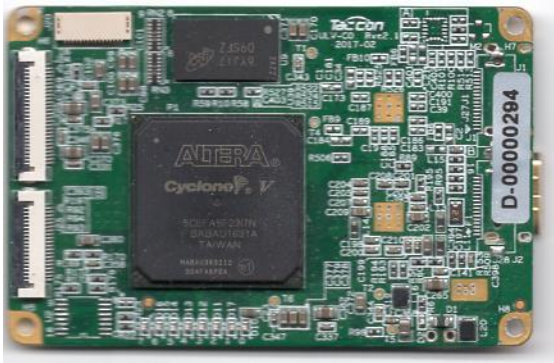
Photos

Encoder board, Labeled with “E”

Decoder board, Labeled with “D”



Key Features

- Ultra Low Latency H.264 Encoder and Decoder board
- Resolution 1080p60/50/30/25, 1080i60/50, 720p60/50, 720x576, 720x480
- Color format: 4:2:0
- Bitrate of encoded stream: configurable, up to 8Mbps
- Automatically detect input put video and start encoding and decoding
- No user setting requirement for frame rate changing and format changing
- Codec latency: 50ms for 1920x1080@30fps
- Boot time: Less than 100ms

Hardware Component

- Mini HDMI Connector video input for encoder board and output for decoder board, compliant with HDMI1.4, max resolution 1080p30, with CEA-861-D timing parameters.
- Eight LEDs to indicate working status
- Program connector to program firmware into flash. *Factory Use Only*
- 26p FPC connector with multiple function, PIN1 is marked by a small silkscreen triangle
  - DC IN (7~18V)
  - FastEther PHY interface, the default bitstream channel
  - Configuration and GPIO pins as settings (for those versions of firmware supporting configurations)
- 20p FPC connector, PIN1 is marked by a small silkscreen triangle. *Factory Use Only*

LED Status

Encoder Board

LED0	On: DDR controller is initialized successfully Off: DDR controller is not working
LED1	On: ERROR, Entropy FIFO overflows Off: Good
LED2	After power ON, LED2 is ON at first, then will be OFF is input signal (SDI or HDMI) is good
LED3	Flashing: The encoder is outputting stream Off: No stream is outputting

LED4	connect to Vsync signal of video inputting interface
LED5	connect to Data Enable (or Href) signal of video inputting interface
LED6	Flashing: Firmware is optimized for video quality at low bitrate, at a cost of smaller higher latency Off: Firmware is optimized for lowest latency, and can be configured to very high bitrate for visual lossless quality
LED7	Reserved

Decoder Board

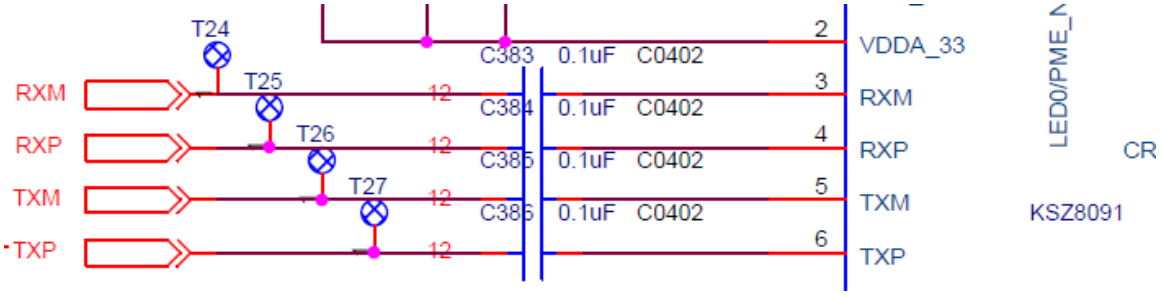
LED0	On: DDR controller is initialized successfully Off: DDR controller doesn't work
LED1	
LED2	Off: All received ethernet packets have no CRC32 error On: After One or more ethernet packets CRC32 error detected, will be On for a few seconds, then will be off again
LED3	Off: All received ethernet packets are consecutive, no packets dropping On: One or more ethernet packets dropping detected, will be On for a few seconds then will be Off again
LED4	Reserved
LED5	On: Ethernet RX fifo overflows Off: Good
LED6	Flashing: Firmware is optimized for video quality at low bitrate, at a cost of smaller higher latency Off: firmware is optimized for lowest latency, and can be configured to very high bitrate for visual lossless quality
LED7	On: Input stream is detected OFF: No input stream detected

PIN Assignment of 26P FPC Connector

PIN	Function
1	DIP5
2	DIP6
3	SPI_DIP_SEL, (need support by firmware) pullup to 3.3V: config firmware by DIP pulldown: config firmware by SPI bus
4	SPI_CLK or DIP1
5	SPI_nCS or DIP2
6	GPIO
7	SPI_MOSI or DIP3
8	SPI_MISO or DIP4
9	RSTN, to reset the board, low active
10	GPIO
11	GPIO

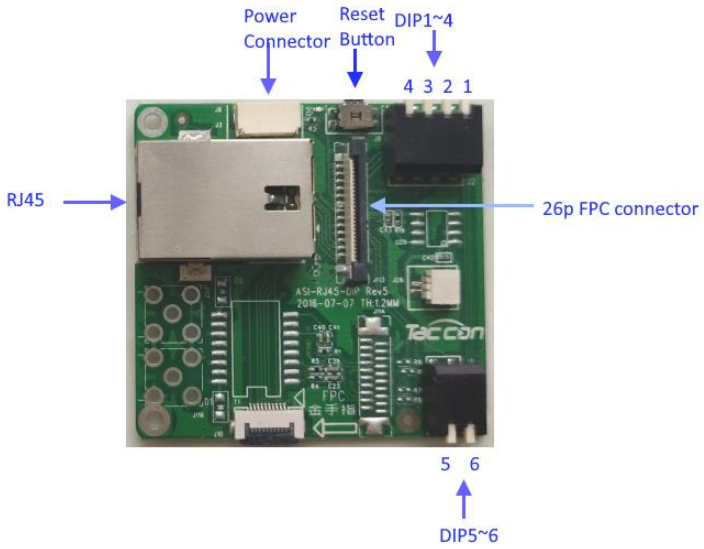
12	GND
13	DC input, 7~18V
14	DC input, 7~18V
15	GND
16	GPIO
17	GPIO
18	GPIO
19	GPIO
20	Reserved
21	GND
22	FastEther PHY RXM
23	FastEther PHY RXP
24	GND
25	FastEther PHY TXM
26	FastEther PHY TXP

FastEther PHY schematics on board, the PHY chip is Microchip **KSZ8091RNA**



Base Board

To test the encoder or decoder board (also called main board), a base board is required



- One Power connector is a eGH 4p connector, a DC5.5*2.1—GH4p cable is required to connect it to send 7~18 DC power to main board
- Six DIPs, to configure firmware in mainboard if it supports DIP settings
- One RJ45 jack for FastEthernet
- One reset button to reset the mainboard manually during test
- One 26p FPC connector to connect main board's 26 FPC connector.
  A 26p, 0.5mm pitch, 50mm or longer (max 150mm), typeB FPC or FFC is used to connect base and main board. (typeB means golden fingers are on different side)

When insert the FPC or FFC to based board, the gold finger to be insert should face left side as shown by the arrow on base board

the main board should be above the base board, and the gold finger to

Size

TOP

components height less than 1.6 mm

Bottom (looking through from top)

Componenets height less than 2mm, except MiniHDMI (3.6mm)

Only one MiniHDMI Jack is solded on board

Parameters

Operation Temperature Range	-40 ~ 85 Celsius (both main and base boards)
Power consumption	Encoder board: 3.5W Decoder board: 3.0W