Thunder Link is a family of small form factor modules for formatting and converting generic digital video streams to standard compliant formats. Different interface standards are supported from the transmitter side including DVI / HDMI, VGA, 3G-SDI, HD-SDI, SDI, CVBS and USB. Supported physical media are copper and fibre cables.

The modules connect to the digital video interface of Sony's FCB-EV, FCB-EH, FCB-H and FCB-SE block cameras and support several progressive and interlace HDTV or SDTV formats. As no analog to digital conversion is done on these modules, excellent output image quality is guaranteed.

TL6035 - Features

+ Provides a small size, easy to use HDTV USB 3.0 compliant video streaming capture solution

+ Up to 1080p30 uncompressed HDTV video data, 4:2:2 YUV format

+ The module receives digital video signals at the input and sends UVC (USB Video Class) compliant data packets containing digital video payload to a connected host computer

+ Operates always as Super Speed USB3.0 device (Host or OTG operation modes are not supported)

+ Host computer must run a UVC capable operating system (e.g. Microsoft Windows 7)

+ Parallel up- and downstream of camera control and status data is possible (USB CDC)

+ The input supports multiplexed LVDS based video data

+ LVDS data format provided by FCB-EV, -EH, -SE and FCB-H11 camera blocks

+ Full USB bus powered camera solution possible depending on camera

+ Power supply voltage for camera is generated onboard
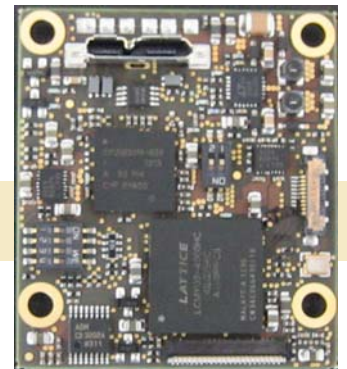
Block Diagram TL6035
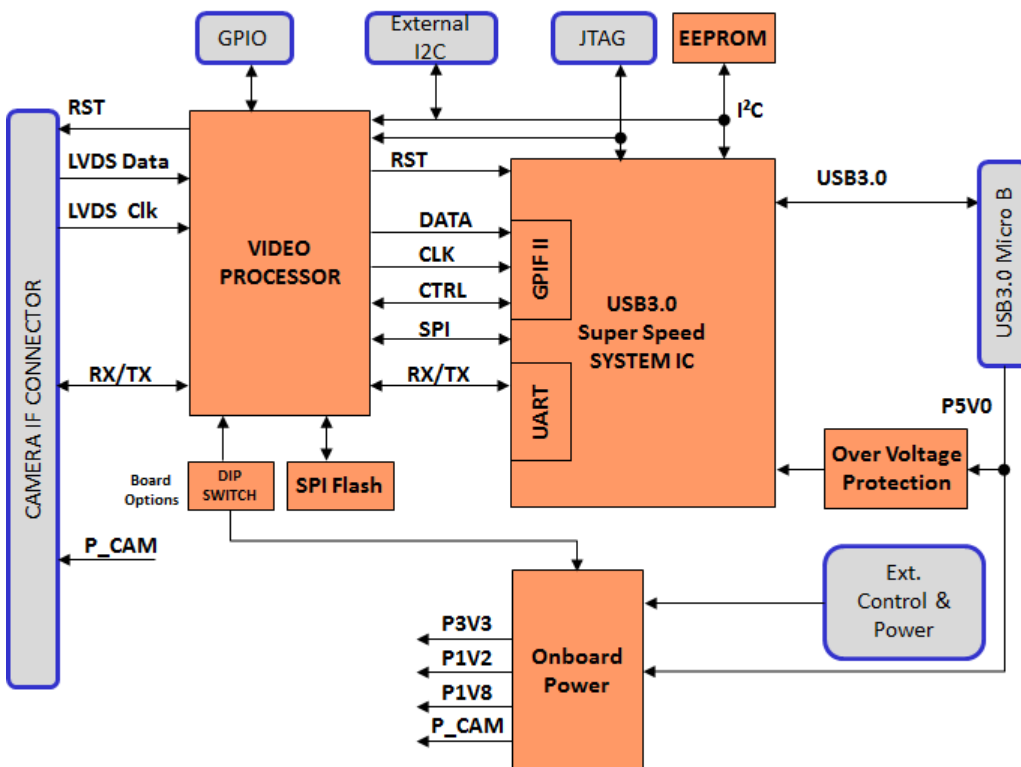
Supports all FCB-EV cameras in HD progressive modes

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Supported Camera Blocks

Model	Comment
FCB-EV75xx/73xx/7100	Progressive HD Video Standards, Camera Register [74] must be set to 00.
FCB-EV5500/5300	HD Video Standards
FCB-EH6500/6300	Progressive HD Video Standards
FCB-EH3410/3400	HD Video Standards
FCB-EH3310/3300	HD Video Standards
FCB-EH3150	HD Video Standards
FCB-SE600	Progressive HD Video Standards
FCB-H11	Progressive HD Video Standards

Supported Video Standards

The following HDTV video standards are supported by the TL6035. Note that video standard availability is always
dependent on the capability of the camera block used.

+ 1920x1080p @ 25Hz, 29.97Hz, 30 Hz
+ 1280x720p @ 50Hz, 59.94Hz, 60Hz, 25Hz, 29.97Hz, 30Hz

Note: As interlace video modes are not supported, make sure to set camera to any supported progressive video mode to enable correct video image data transmision to any host PC.

Host (PC) - Device Communication

TL6035 operates always as USB device which sends UVC compliant video data to a host PC. The host also
communicates with the TL6035 via a serial communication channel (USB UART).

Connecting the TL6035 to the Host PC

Operating System Support
TL6035 can be operated with operating systems which fully support USB UVC type data and communication. Currently Microsoft Windows 7 & 8 (32 and 64bit) operating systems are supported.

Driver Requirements
Full UVC compliant driver is required. Such drivers are supplied with Microsoft Windows 7 and 8 *<usbvideo.sys>*. Manual driver installation is not necessary. For the USB UART feature, the *<usbser.sys>* class driver is used. Aivion provides suitable driver assignment files.

Video Application on Host PC
Video display and recording can be done with standard application programs like VLC player, Mplayer or similar. VLC and Mplayer are open source based applications and can be free downloaded. If users want to design their own applications software, they are free to do so. All software programming tasks are OS based and have to be built upon UVC drivers. For further information please refer to Microsoft Windows API information.

Controlling TL6035 from the Host PC via USB UART
TL6035 supports the USB UART functionality. FCB cameras connected to TL6035 can be controlled via a virtual COM part. Any host software which uses COM ports can be used. The USB UART channel is transparent for any protocol. Communication speed is 9600bit/s or 38400bit/s maximum. Other COM port settings are (8N1).
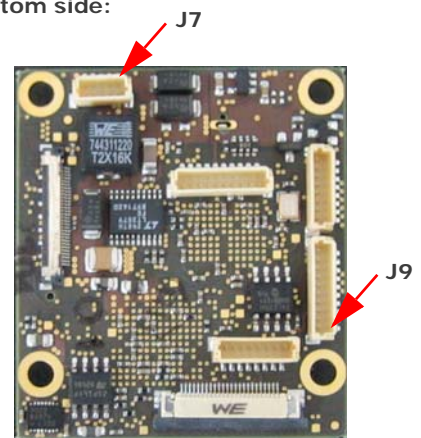
Board Connector Layout (Bottom View)

PCB top side:

USB3 microB connector

FCB-H11 signal connector

PCB bottom side:

J7

J9
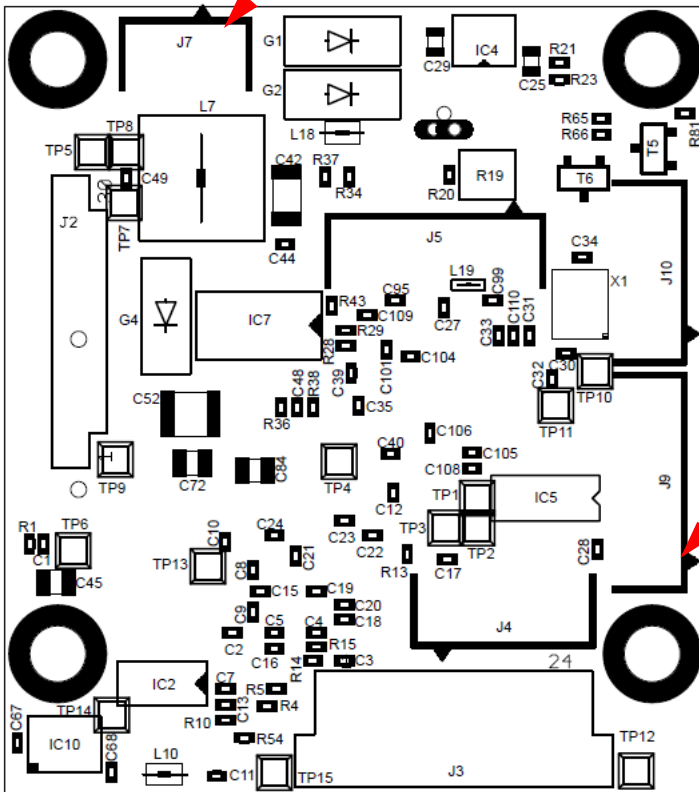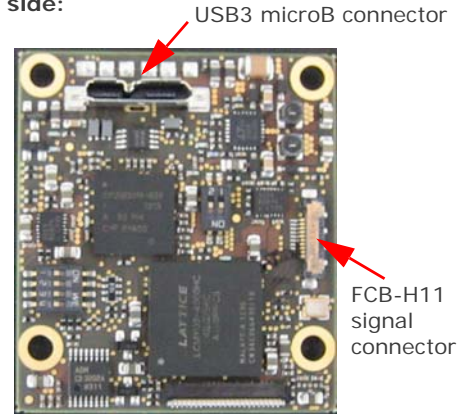
Dual Select Switch 1:

The dual slide Switch 1 must be used to setup the camera operating conditions.

SW 1-1:

OFF: Camera Power = 8V

ON: Camera Power = 5.6V (for FCB-SE600 only)

SW 1-2:

OFF: FCB-EH/FCB-SE600 mode

ON: FCB-H11 or FCB-EV mode

Quad Select Switch 2:

The quad slide Switch 2 is used to setup special features.

SW 2-3:

OFF: Camera control over USB (USB UART, default)

ON: Camera control over RS232 UART (connector J9)

SW 2-4: ON for FCB-EV mode, OFF for all other modes

Switches 2-1 and 2-2 must be kept in OFF position.

Note: For FCB-EV series cameras, register [74] must be set to value 00.

J2: FCB-EV, -EH, -SE LVDS connector

J3: FCB-H11 FFC connector

J9: RS232 UART connector

J7: External power connector

(arrow marks pin 1):

Pins 1, 2: Input voltage 5V to 7V DC

Pins 4, 5: GND

Pin 3: System reset, pull to GND for reset

J4, J5, J10: do not connect

RS232 UART Connector J9

(arrow marks pin 1):

Pins 1 to 7: do not connect

Pin 8: GND

Pin 9: RXD (host to camera)

Pin 10: TXD (camera to host)

Note: External power mode is recommended for FCB-H11, FCB-EH and -EV series camera blocks

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Board Mechanical (Top View)

Mounting Holes Drill=3.2mm, Land=5.6mm

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