![GEMAC - Gesellschaft für Mikroelektronikanwendung Chemnitz mbH](logo)
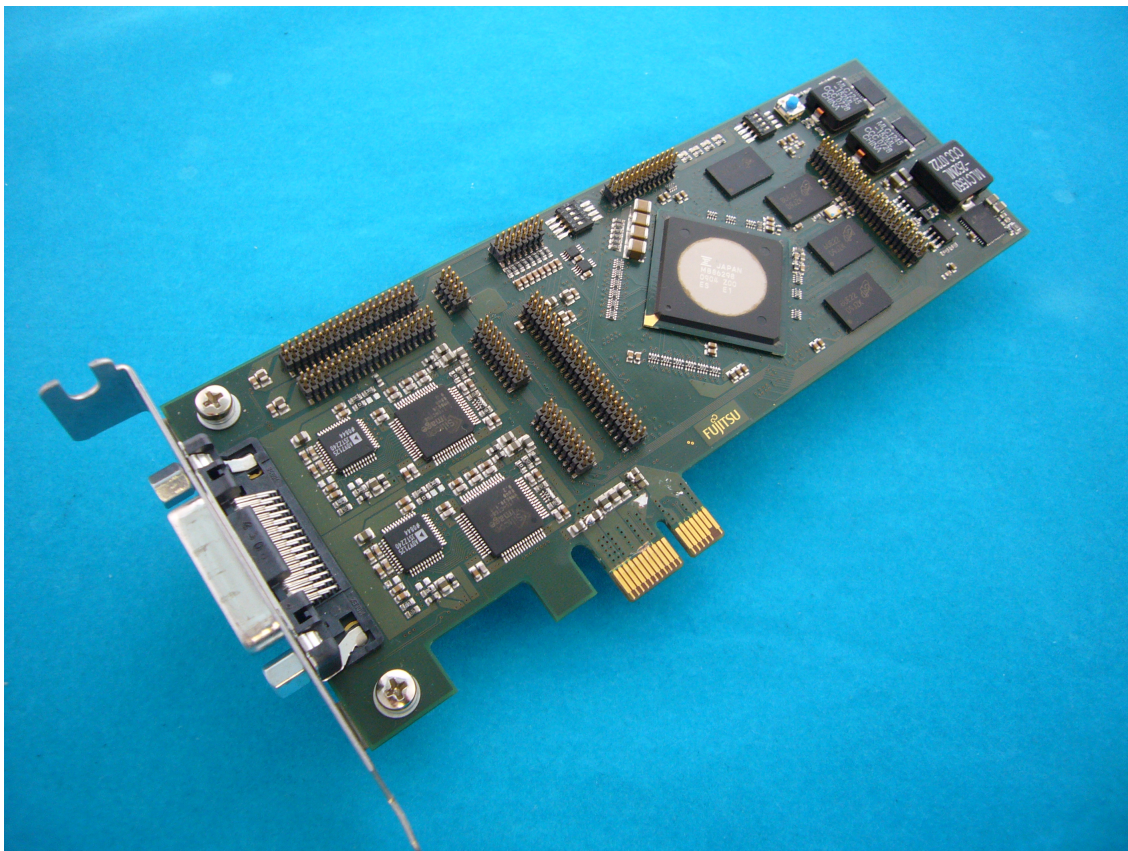
MB86298-EB01
Ruby Evaluation Board
Documentation

Version: 1.11
Datum: 03/12/2009

Document Revision History

Date	Revision	Changes
02/10/09	1.00	First Version for Board Revision 01
02/17/09	1.10	Diagram of Ruby evaluation board connection to analog video input slot added
03/13/09	1.11	First Page changed

Evaluation Board Revision History

Date	Revision	Changes
02/09/09	01	First Version

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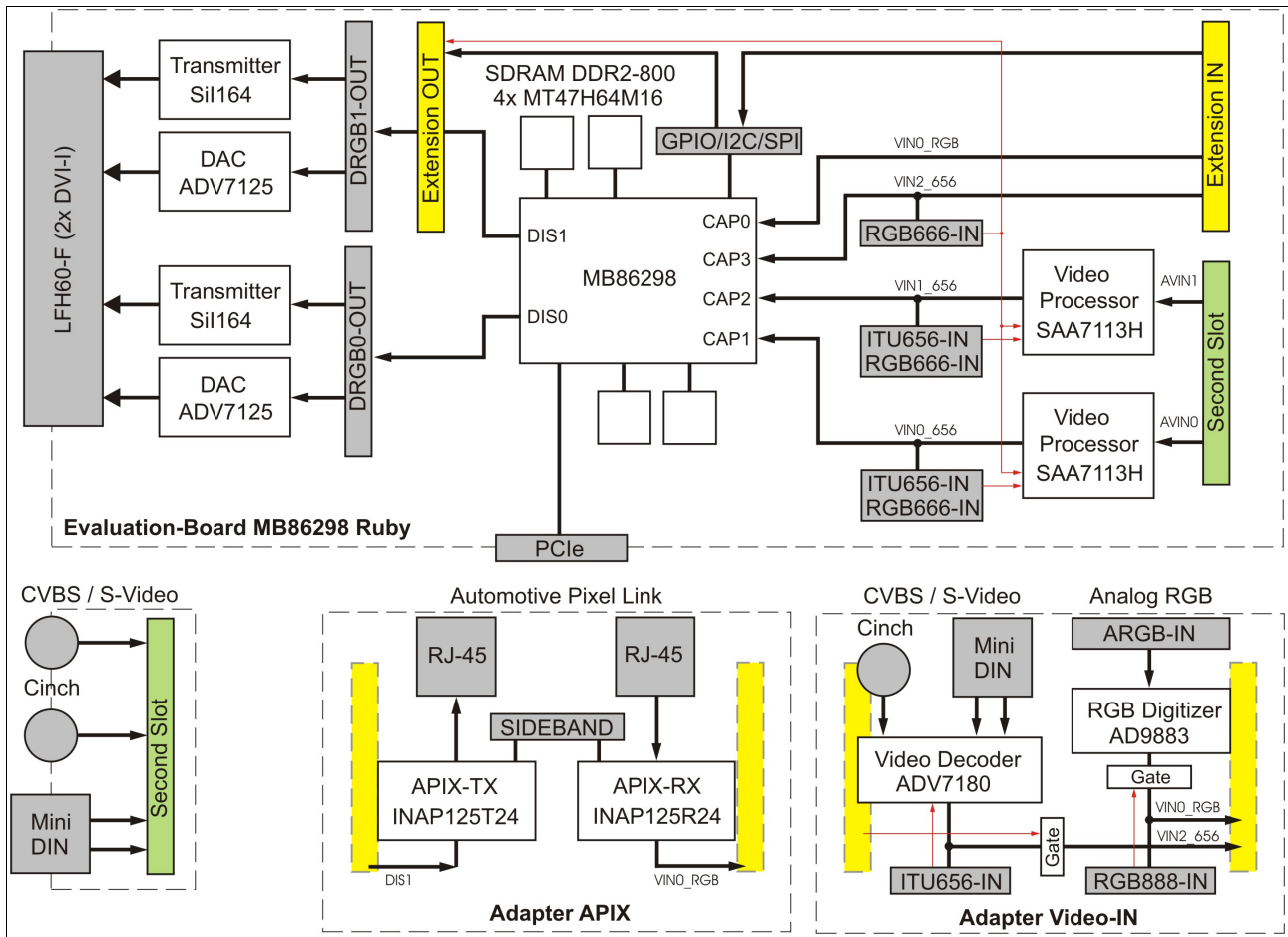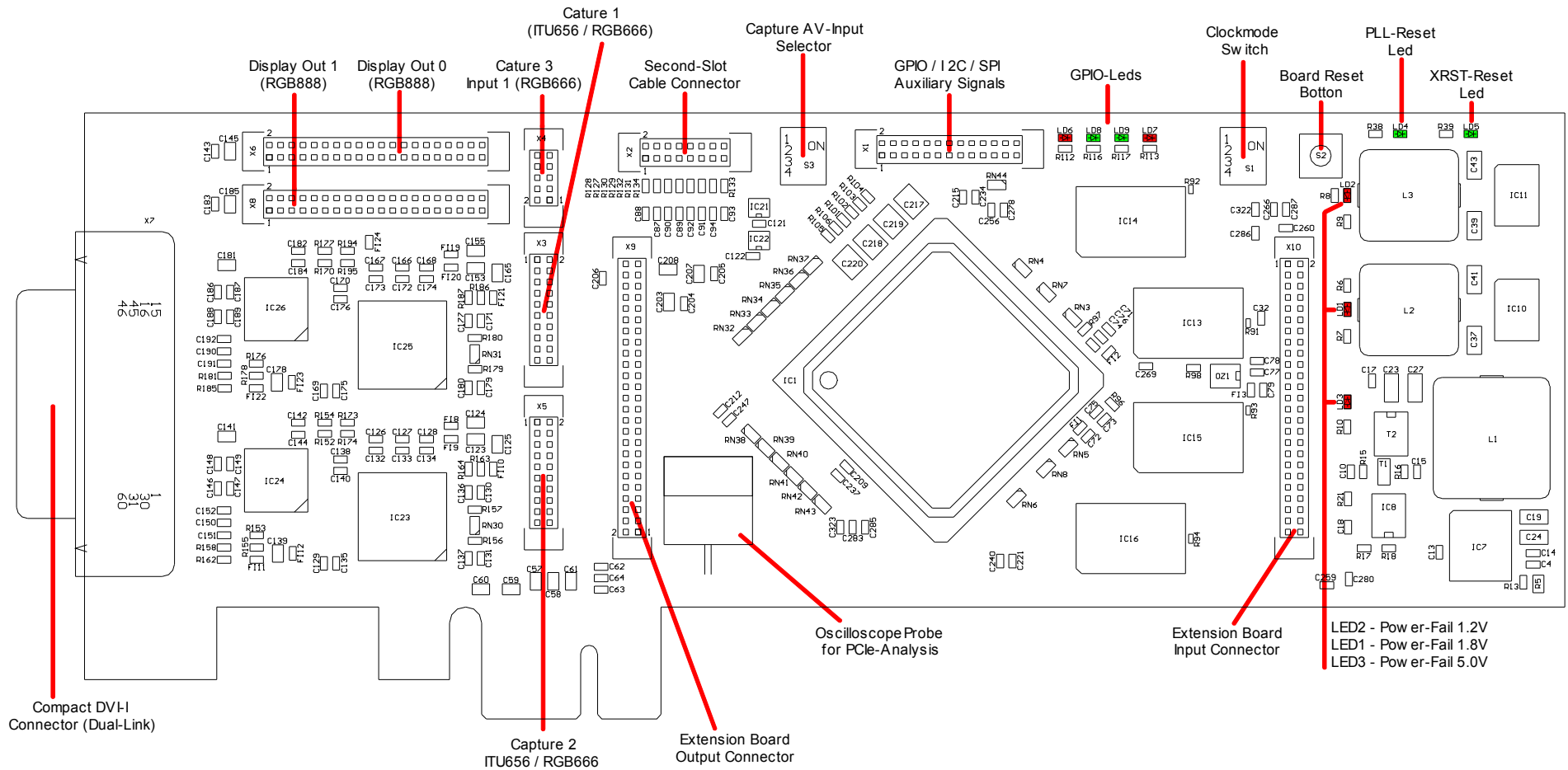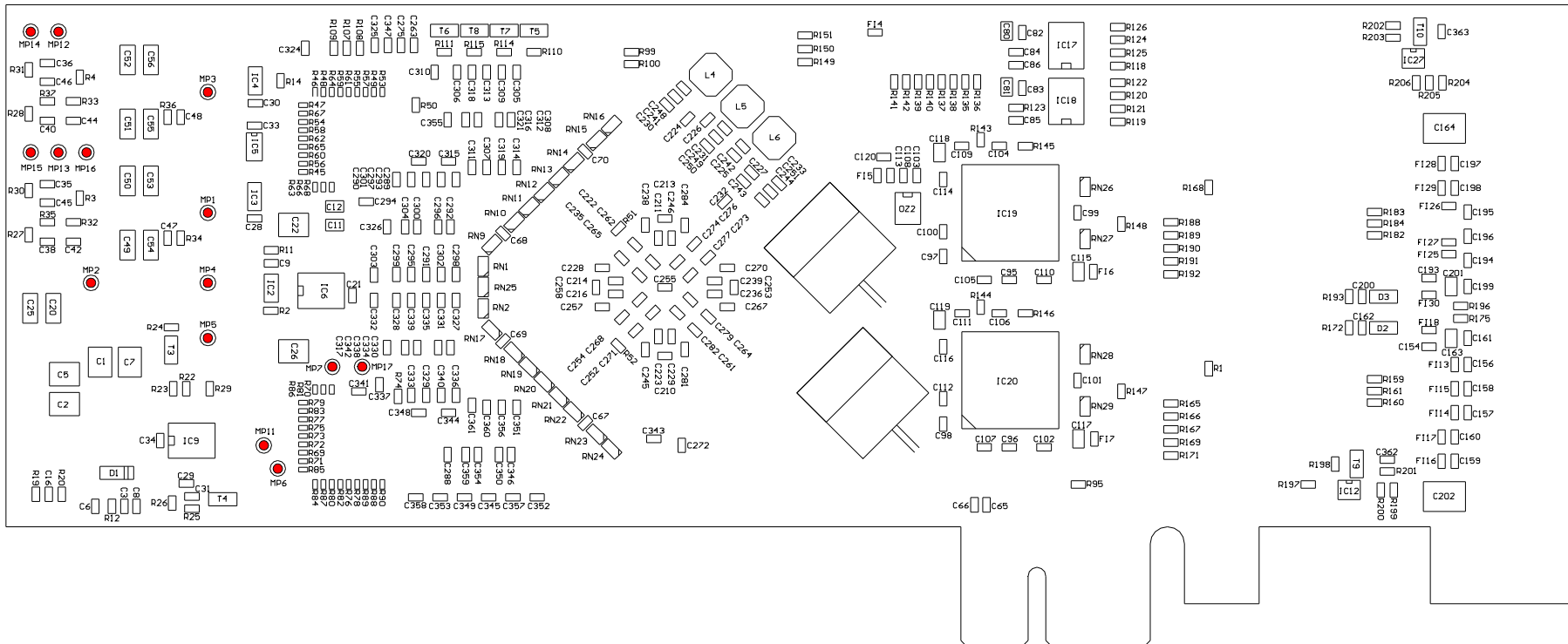# 1. Overview Ruby Evaluation Board

Figure 1: Block Diagram

2. Main Board External Appearance

Figure 2: Interfaces on the evaluation board top side

Figure 3: Test points on the evaluation board bottom side

3. Test Points

The following table shows the assignment of the test points on bottom side of the evaluation board to their corresponding signals.

Tables 1: Test Points

MP	Signal	MP	Signal
1	1.8V (Ruby-Core-Voltage)	6	VTTDDR2 (DDR2-RAM Terminator Voltage)
2	5.0V	7	VREFDDR2 (DDR2-RAM Reference Voltage)
3	1.2V (Ruby-Core-Voltage)	11-17	Ground
4	3.3V (Board-I/O-Voltage)		
5	3.3V (From PCI-Express)		

4. LEDs

The evaluation board contains various LED's on the top side to visualize different board conditions. The following table contains all LED's with a condition description.

Tables 2: LEDs

LED	Function	Color	OK-Con-dition	Description
LD1	Power-Fail 1.8VCore	Red	Off	Led illuminates, if the DC-DC-Converter output produces no stable 1.8V. In OK condition the LED should be switched off!
LD2	Power-Fail 1.2VCore	Red	Off	Led illuminates, if the DC-DC-Converter output produces no stable 1.2V. In OK condition the LED should be switched off!
LD3	Power-Fail 5.0V	Red	Off	Led illuminates, if the DC-DC-Converter output produces no stable 5.0V. In OK condition the LED should be switched off!
LD4	MB86298-PLL-Reset	Green	On	Led illuminates, if PLL-Reset is released (OK condition).
LD5	MB86298-XRST-Reset	Green	On	Led illuminates, if XRST-Reset is released (OK condition).
LD6	GPIO0-Led	Red	-	Led illuminates, if GPIO0 is output and programed to high level.
LD7	GPIO2-Led	Red	-	Led illuminates, if GPIO2 is output and programed to high level.
LD8	GPIO1-Led	Green	-	Led illuminates, if GPIO1 is output and programed to high level.
LD9	GPIO3-Led	Green	-	Led illuminates, if GPIO3 is output and programed to high level.

5. DIP-Switches

Switch S1 settings are responsible for the Ruby clock configuration.

Tables 3: Switch S1

Switch	Function	Description
1	Unused	-
2	CLKMODE0	**CLKMODE0** is **low** level if switched to position **ON**.
3	CLKMODE1	**CLKMODE1** is **low** level if switched to position **ON**.
4	CLKSEL0	**CLKSEL0** is **low** level if switched to position **ON**.

With switch S3 it is possible to disable the on board video input processors circuits SAA7113H, which are connected to the Ruby video capture inputs units. With disabled SAA7113H it is possible to source the video capture inputs units directly with digital signals via corresponding interface connectors.

Tables 4: Switch S3

Switch	Function	Description
1	Disable AV-Input 0 to 2 (CAP1 to 3)	If set to condition **ON**, on signal **AVIN_OFF#** (sheet 7) appears **low** level. This leads to a **disable** of both video input processors SAA7113H (IC19 and IC20). The signal appears also on the extension connector (sheet 10).
2	Disable AV-Input 1 (CAP2)	If set to condition **ON**, IC20 (SAA7113H) will be **disabled**.
3	Disable AV-Input 0 (CAP1)	If set to condition **ON**, IC19 (SAA7113H) will be **disabled**.
4	Unused	-

6. GPIO

On the evaluation board there are some auxiliary signals. With use of connector X1 it is possible to connect these signal with the Ruby GPIO lines if necessary.

Tables 5:   Connector X1

Description	Name	Pin	Pin	Name	Description
Ruby-GPIO0	GPIO0	1	2	DIS0_AUX	Display Out0 AUX-Signal to connector X6 (sheet 8)
Ruby-GPIO1	GPIO1	3	4	DIS1_AUX	Display Out1 AUX-Signal to connector X8 (sheet 9)
Ruby-GPIO2	GPIO2	5	6	EXT_AUX_A	AUX-Signal A to Extension Connector X9 (sheet 10)
Ruby-GPIO3	GPIO3	7	8	EXT_AUX_B	AUX-Signal B to Extension Connector X9 (sheet 10)
Ruby-GPIO4, enable signal for I2C-Bridge, Monitor0 on DVI-Connector (sheet 8)	GPIO4 (EN_DDC0#)	9	10	EXT_AUX_C	AUX-Signal C to Extension Connector X10 (sheet 10)
Ruby-GPIO5, enable signal for I2C-Bridge, Monitor1 on DVI-Connector (sheet 9)	GPIO5 (EN_DDC1#)	11	12	APIX_TX_ERR	APIX TX-Error-Signal from APIX-Board (if present on X9/X10)
Ruby-GPIO6	GPIO6_COMP_RETRIG	13	14	APIX_RX_ERR	APIX RX-Error-Signal from APIX-Board (if present on X9/X10)
Ruby-GPIO7	GPIO7_INT_OUT	15	16	I2C_SDA	Ruby I2C SDA-Signal
Ruby I2C SCL-Signal	I2C_SCL	17	18	GND	Ground
Ruby SPI CLK-Signal	SPI_CLK	19	20	GND	Ground
Ruby SPI MOSI-Signal	SPI_MOSI	21	22	GND	Ground
Ruby SPI MISO-Signal	SPI_MISO	23	24	GND	Ground
Ruby SPI CS-Signal	SPI_CS	25	26	+3.3V	Supply Voltage

The AUX-signals are responsible for various auxiliary functions.

With a plugged APIX adapter board the APIX status signals **TX-Error** and **RX-Error** can be observed and with the signal **EXT_AUX_A** a manipulation of **APIX reset signals** is possible.

With a plugged video in adapter board instead, on pin **EXT_AUX_C** the signal **VIN2_656_IRQ** from the **AD-V7180** circuit appears.

7. Connection of Ruby Evaluation Board to Analog-Video-Input-Slot Adapter

The following diagram shows how to connect the Ruby evaluation board and the Analog-Video-Input-Slot adapter correctly via the red marked connection cable.
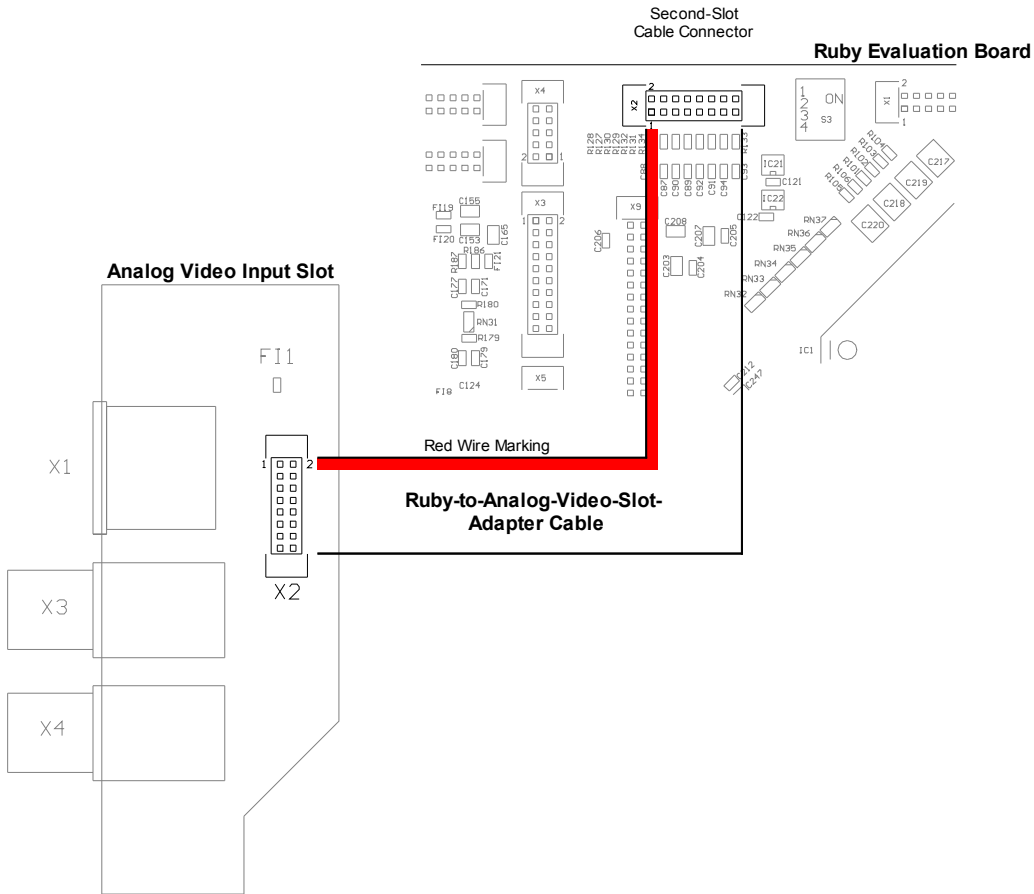

Figure 4:   Diagram of connection between Ruby evaluation board and Analog-Video-Input-Slot Adapter