

THSB-FMC-01Vx1 User Manual

GENERAL DESCRIPTION

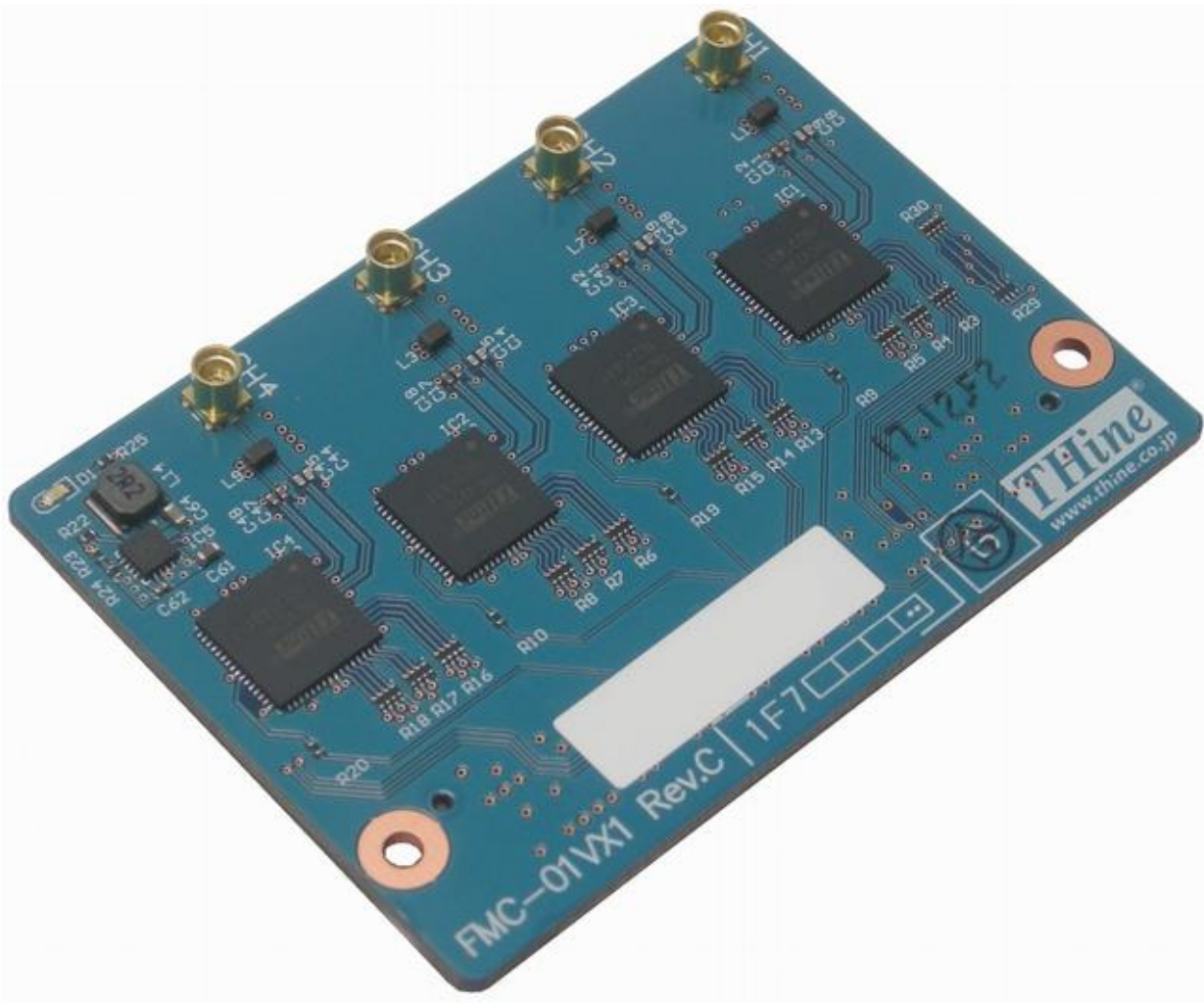
THSB-FMC-01Vx1 is an FMC/LPC daughter card supporting V-by-One® HS receiver for the high-speed serial interface. Allows to receive four video streamings of V-by-One® HS.

THCV236 is applied as V-by-One® HS receiver to provide a stable communication system on long-distance cables.

THSB-FMC-01Vx1 also supports Power over Coax (PoC) system and enables to use V-by-One® HS camera only with one coax cable.

FEATURE

- * W 70mm x H 50mm small size
- * FMC/LPC Standard [Vita 57.1] Connector
- * Four MMCX connectors for V-by-One® HS receiver
- * V-by-One® HS receiver THCV236, integrates adaptive equalizer and stabilize communication system on long-distance cable.
- * Support POWER over COAX (PoC) using 5V
- * Support 2.5 V or 3.3 V for VADJ power supply



FOR SAFETY PURPOSES, SEE 'PRECAUTIONS FOR PoC' OF CHAPTER 3

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1. SAFETY PRECAUTIONS




Observe the precautions listed below to prevent injuries to you or other personnel or damage to property.

- Before using the product, read these safety precautions carefully.
- These precautions contain serious safety instructions that must be observed.
- After reading through this manual, be sure to keep it always handy.

The following conventions are used to indicate the possibility of injury/damage and classify precautions if the product is handled incorrectly.










 Danger	Indicates the high possibility of serious injury or death if the product is handled incorrectly.
 Warning	Indicates the possibility of serious injury or death if the product is handled incorrectly.
 Caution	Indicates the possibility of injury or physical damage in connection with houses or household goods if the product is handled incorrectly.

The following graphical symbols are used to indicate and classify precautions in this manual. (Examples)

	Turn off the power switch.
	Do not disassemble the product.
	Do not attempt this.





Warning

	<p>In the event of a failure, disconnect the power supply. If the product is used as is, a fire or electric shock may occur. Disconnect the power supply immediately and contact our sales personnel for repair.</p>
	<p>If an unpleasant smell or smoking occurs, disconnect the power supply. If the product is used as is, a fire or electric shock may occur. Disconnect the power supply immediately. After verifying that no smoking is observed, contact our sales personnel for repair.</p>
	<p>Do not disassemble, repair or modify the product. Otherwise, a fire or electric shock may occur due to a short circuit or heat generation. For inspection, modification or repair, contact our sales personnel.</p>
	<p>Do not place the product on unstable locations. Otherwise, it may drop or fall, resulting in injury to persons or failure.</p>
	<p>If the product is dropped or damaged, do not use it as is. Otherwise, a fire or electric shock may occur.</p>
	<p>Do not touch the product with a metallic object. Otherwise, a fire or electric shock may occur.</p>
	<p>Do not place the product in a place with dusty or humidity or getting water. Otherwise, a fire or electric shock may occur.</p>
	<p>Do not get the product wet or touch it with a wet hand. Otherwise, the product may break down or it may cause a fire, smoking or electric shock.</p>
	<p>Do not touch a connector on the product (gold-plated portion). Otherwise, the surface of a connector may be contaminated with sweat or skin oil, resulting in contact failure of a connector or it may cause a malfunction, fire or electric shock due to static electricity.</p>



Caution

	<p>Do not use or place the product in the following locations.</p> <ul style="list-style-type: none"> - Humid and dusty locations - Airless locations such as closet or bookshelf - Locations which receive oily smoke or steam - Locations exposed to direct sunlight - Locations close to heating equipment - Closed inside of a car where the temperature becomes high - Sticky locations - Locations close to water or chemicals <p>Otherwise, a fire, electric shock, accident or deformation may occur due to a short circuit or heat generation.</p>
	<p>Do not place heavy things on the product.</p> <p>Otherwise, the product may be damaged.</p>

2. Disclaimer

This product is an evaluation board intended for **FMC interface Card** function. THine Electronics, Inc. assumes no responsibility for any damages resulting from the use of this product for purposes other than those stated.

Even if the product is used properly, THine Electronics, Inc. assumes no responsibility for any damages caused by:

- (1) Earthquake, thunder, natural disaster or fire resulting from the use beyond our responsibility, acts by a third party or other accidents, the customer's willful or accidental misuse or use under other abnormal conditions.
- (2) Secondary impact arising from use of this product or its unusable state (business interruption or others)
- (3) Use of this product against the instructions given in this manual.
- (4) Malfunctions due to connection to other devices.

THine Electronics, Inc. assumes no responsibility or liability for:

- (1) Erasure or corruption of data arising from use of this product.
- (2) Any consequences or other abnormalities arising from use of this product, or
- (3) Damage of this product not due to our responsibility or failure due to modification

This product has been developed by assuming its use for research, testing or evaluation. It is not authorized for use in any system or application that requires high reliability.

Repair of this product is carried out by replacing it on a chargeable basis, not repairing the faulty devices. However, non-chargeable replacement is offered for initial failure if such notification is received within two weeks after delivery of the product.

The specification of this product is subject to change without prior notice. The product is subject to discontinuation without prior notice.

3. Precautions for PoC

This product is applied POWER over COAX (PoC) system and output signals of MMCX are superimposed 5 V Power Supply. Before using the product, read this special precaution carefully.



Special Precaution



Do not short output signals via MMCX connector to GND or other signals.

Otherwise, the product may break down or it may cause a fire, smoking or electric shock.

4. Block Diagram

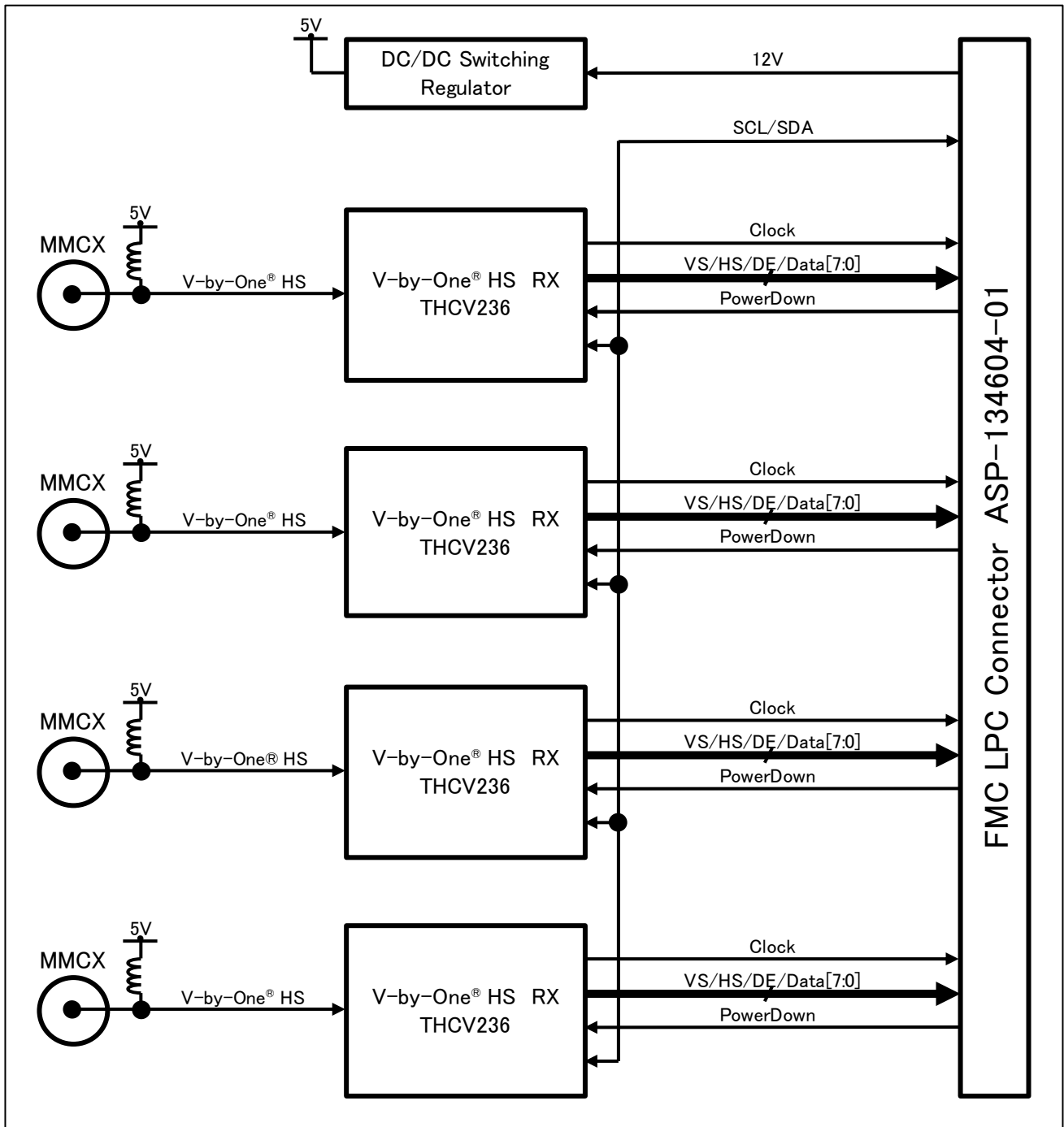


Fig 4-1 Block Diagram

5. Top & Bottom View

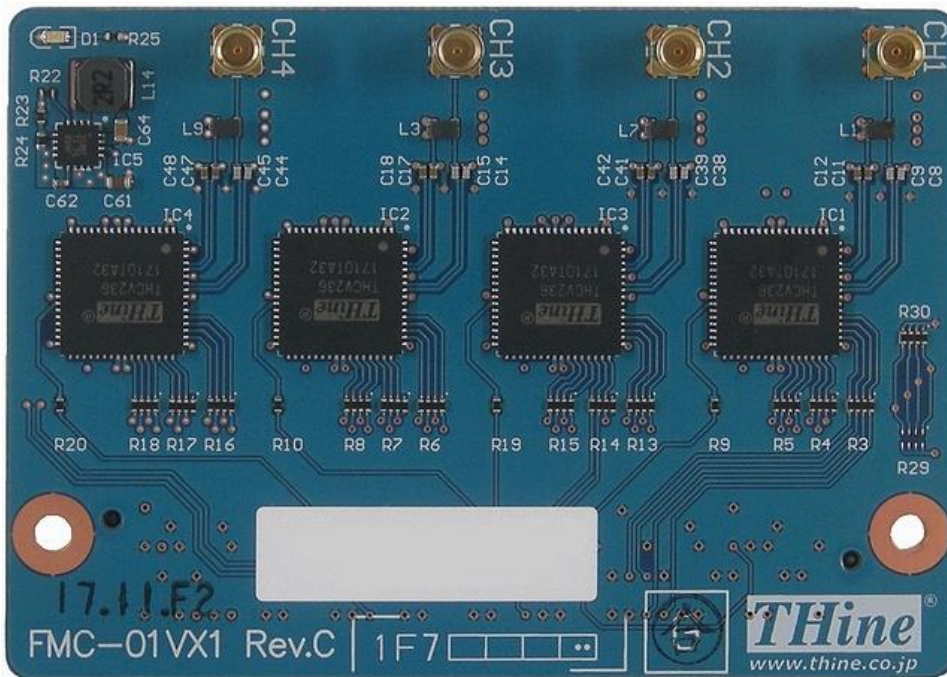


Fig 5-1 Top View

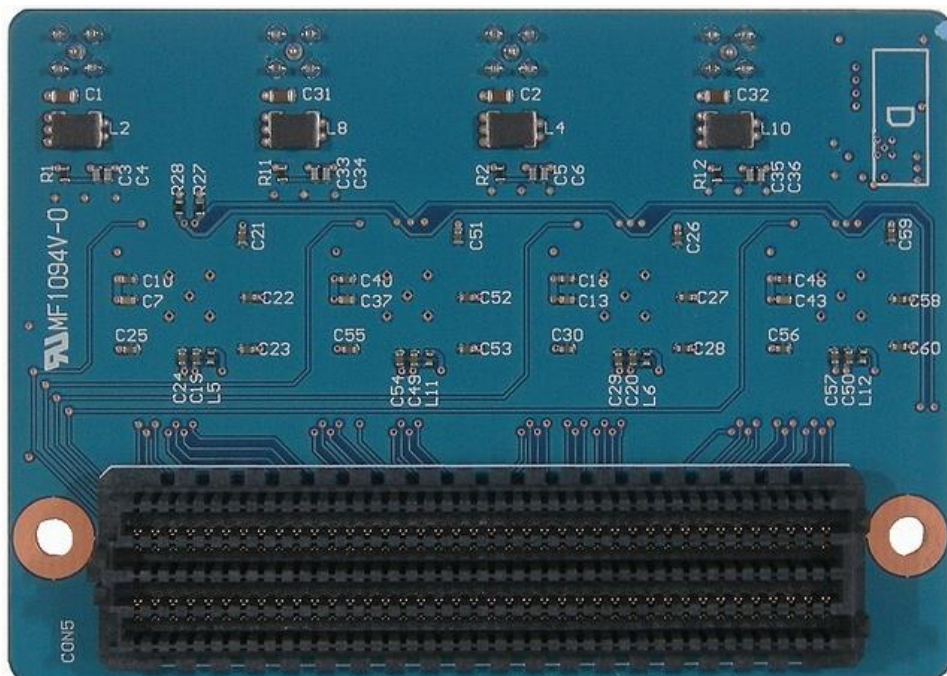


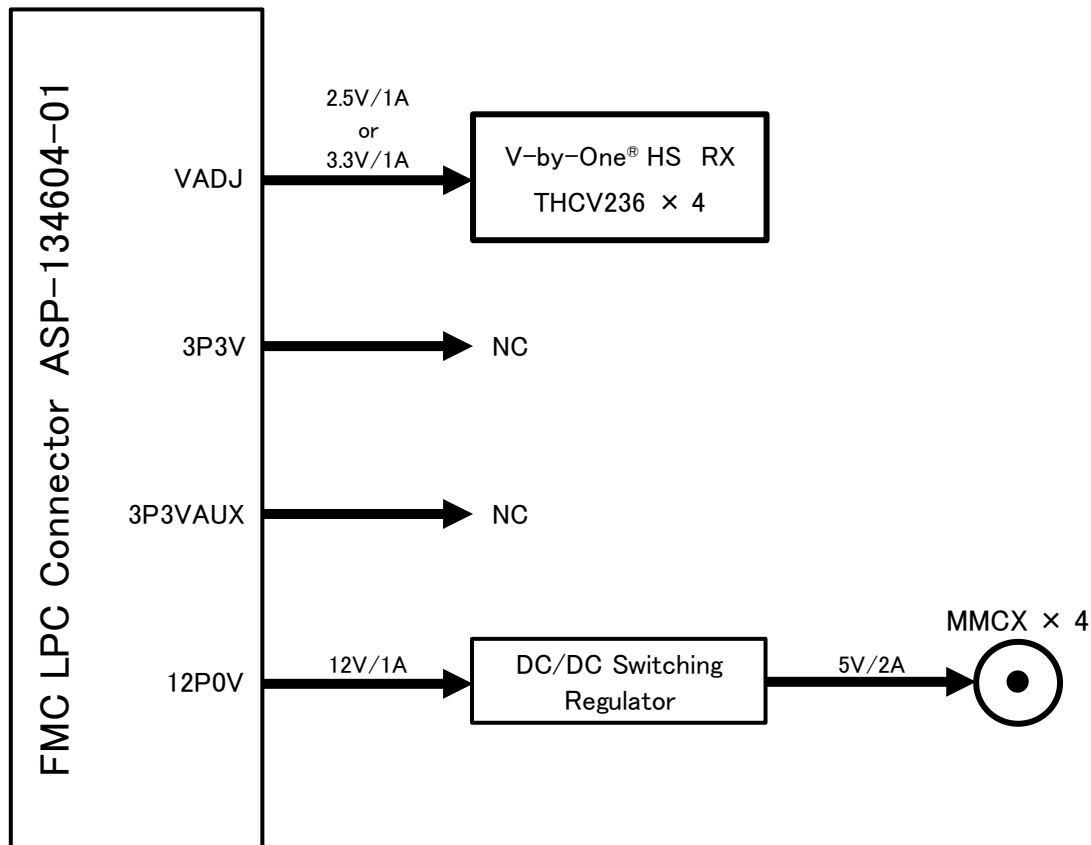
Fig 5-2 Bottom View

6. Board Specification

Outline Size	: W: 70mm x H: 50mm
Layer Structure	: 4 Layer
Thickness of PCB	: 1.6 mm
Material	: FR-4
FMC Connector	: Samtec, ASP-134604-01
MMCX Connector	: Molex, 0734151471
V-by-One® HS Receiver	: THine Electronics, THC236
DC/DC Switching Regulator	: Texas Instruments, TLV62130RGTR

7. Power Supply System

Use 2.5 V or 3.3 V for VADJ voltage on your FPGA board. Other voltage is not supported.



Use 2.5 V or 3.3 V for VADJ Power Supply on your FPGA board

Fig 7-1 Power Supply System

8. Pin Assignment of FMC Connector

Table 8-1 Color Indicator for Pin Assignment

Color Indicator	Description
	V-by-One® HS channel 1
	V-by-One® HS channel 2
	V-by-One® HS channel 3
	V-by-One® HS channel 4

Table 8-2 Pin Assignment of FMC C/D columns

THSB-FMC-01Vx1 Signal Name	Column C		Column D	THSB-FMC-01Vx1 Signal Name
GND	GND	1	PG_C2M	NC
NC	DP0_C2M_P	2	GND	GND
NC	DP0_C2M_N	3	GND	GND
GND	GND	4	GBTCLK0_M2C_P	NC
GND	GND	5	GBTCLK0_M2C_N	NC
NC	DP0_M2C_P	6	GND	GND
NC	DP0_M2C_N	7	GND	GND
GND	GND	8	LA01_P_CC	VBO1-PDN
GND	GND	9	LA01_N_CC	VBO2-PDN
VBO1-D0	LA06_P	10	GND	GND
VBO1-D1	LA06_N	11	LA05_P	VBO1-DEI
GND	GND	12	LA05_N	VBO1-HSI
GND	GND	13	GND	GND
NC	LA10_P	14	LA09_P	NC
NC	LA10_N	15	LA09_N	NC
GND	GND	16	GND	GND
GND	GND	17	LA13_P	VBO2-D2
VBO2-CLK	LA14_P	18	LA13_N	VBO2-D3
NC	LA14_N	19	GND	GND
GND	GND	20	LA17_P_CC	VBO3-CLK
GND	GND	21	LA17_N_CC	NC
NC	LA18_P_CC	22	GND	GND
NC	LA18_N_CC	23	LA23_P	NC
GND	GND	24	LA23_N	NC
GND	GND	25	GND	GND
NC	LA27_P	26	LA26_P	NC
VBO-SCL	LA27_N	27	LA26_N	VBO-SDA
GND	GND	28	GND	GND
GND	GND	29	TCK	NC
NC	SCL	30	TDI	FMC-TDI
NC	SDA	31	TDO	FMC-TDO
GND	GND	32	3P3VAUX	NC
GND	GND	33	TMS	NC
NC	GA0	34	TRST_L	NC
12P0V	12P0V	35	GA1	NC
GND	GND	36	3P3V	NC
12P0V	12P0V	37	GND	GND
GND	GND	38	3P3V	NC
NC	3P3V	39	GND	GND
GND	GND	40	3P3V	NC

Table 8-3 Pin Assignment of FMC G/H columns

THSB-FMC-01Vx1 Signal Name	Column G		Column H	THSB-FMC-01Vx1 Signal Name
GND	GND	1	VREF_A_M2C	NC
VBO3-PDN	CLK1_M2C_P	2	PRSNT_M2C_L	GND
VBO4-PDN	CLK1_M2C_N	3	GND	GND
GND	GND	4	CLK0_M2C_P	NC
GND	GND	5	CLK0_M2C_N	NC
VBO1-CLK	LA00_P_CC	6	GND	GND
NC	LA00_N_CC	7	LA02_P	VBO1-VSI
GND	GND	8	LA02_N	VBO1-D2
VBO1-D3	LA03_P	9	GND	GND
VBO1-D5	LA03_N	10	LA04_P	VBO1-D4
GND	GND	11	LA04_N	VBO1-D6
VBO1-D7	LA08_P	12	GND	GND
NC	LA08_N	13	LA07_P	NC
GND	GND	14	LA07_N	VBO2-D0
VBO2-D1	LA12_P	15	GND	GND
VBO2-HSI	LA12_N	16	LA11_P	VBO2-DEI
GND	GND	17	LA11_N	VBO2-VSI
VBO2-D4	LA16_P	18	GND	GND
VBO2-D6	LA16_N	19	LA15_P	VBO2-D5
GND	GND	20	LA15_N	VBO2-D7
VBO3-D0	LA20_P	21	GND	GND
VBO3-DEI	LA20_N	22	LA19_P	VBO3-D1
GND	GND	23	LA19_N	VBO3-HSI
VBO3-VSI	LA22_P	24	GND	GND
VBO3-D3	LA22_N	25	LA21_P	VBO3-D2
GND	GND	26	LA21_N	VBO3-D4
VBO3-D5	LA25_P	27	GND	GND
VBO3-D7	LA25_N	28	LA24_P	VBO3-D6
GND	GND	29	LA24_N	VBO4-D0
VBO4-CLK	LA29_P	30	GND	GND
NC	LA29_N	31	LA28_P	VBO4-D1
GND	GND	32	LA28_N	VBO4-DEI
VBO4-HSI	LA31_P	33	GND	GND
VBO4-D2	LA31_N	34	LA30_P	VBO4-VSI
GND	GND	35	LA30_N	VBO4-D3
VBO4-D4	LA33_P	36	GND	GND
VBO4-D6	LA33_N	37	LA32_P	VBO4-D5
GND	GND	38	LA32_N	VBO4-D7
VADJ	VADJ	39	GND	GND
GND	GND	40	VADJ	VADJ

9. Pin Description of FMC Connector

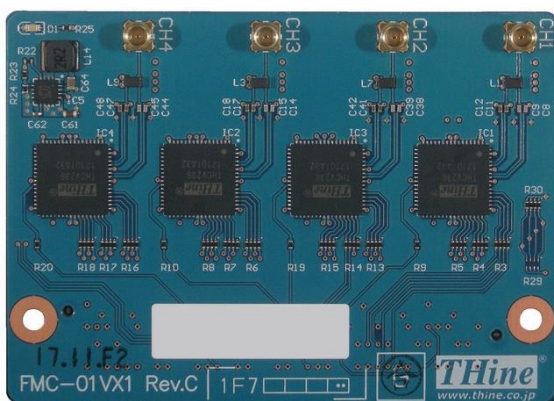
Table 9-1 Pin Description of FMC Connector

Signal Name	FMC Pin Name	Pin Direction	Description
VBO1-CLK	LA00_CC_P	Output	THCV236 channel1 pixel clock
VBO1-VSI	LA02_P	Output	THCV236 channel1 Vertical SYNC
VBO1-HSI	LA05_N	Output	THCV236 channel1 Horizontal SYNC
VBO1-DEI	LA05_P	Output	THCV236 channel1 Data Enable
VBO1-D0	LA06_P	Output	THCV236 channel1 pixel data bit 0
VBO1-D1	LA06_N	Output	THCV236 channel1 pixel data bit 1
VBO1-D2	LA02_N	Output	THCV236 channel1 pixel data bit 2
VBO1-D3	LA03_P	Output	THCV236 channel1 pixel data bit 3
VBO1-D4	LA04_P	Output	THCV236 channel1 pixel data bit 4
VBO1-D5	LA03_N	Output	THCV236 channel1 pixel data bit 5
VBO1-D6	LA04_N	Output	THCV236 channel1 pixel data bit 6
VBO1-D7	LA08_P	Output	THCV236 channel1 pixel data bit 7
VBO1-PDN	LA01_CC_P	Input	THCV236 channel1 Power Down (Active High)
VBO2-CLK	LA14_P	Output	THCV236 channel2 pixel clock
VBO2-VSI	LA11_N	Output	THCV236 channel2 Vertical SYNC
VBO2-HSI	LA12_N	Output	THCV236 channel2 Horizontal SYNC
VBO2-DEI	LA11_P	Output	THCV236 channel2 Data Enable
VBO2-D0	LA07_N	Output	THCV236 channel2 pixel data bit 0
VBO2-D1	LA12_P	Output	THCV236 channel2 pixel data bit 1
VBO2-D2	LA13_P	Output	THCV236 channel2 pixel data bit 2
VBO2-D3	LA13_N	Output	THCV236 channel2 pixel data bit 3
VBO2-D4	LA16_P	Output	THCV236 channel2 pixel data bit 4
VBO2-D5	LA15_P	Output	THCV236 channel2 pixel data bit 5
VBO2-D6	LA16_N	Output	THCV236 channel2 pixel data bit 6
VBO2-D7	LA15_N	Output	THCV236 channel2 pixel data bit 7
VBO2-PDN	LA01_CC_N	Input	THCV236 channel2 Power Down (Active High)
VBO3-CLK	LA17_CC_P	Output	THCV236 channel3 pixel clock
VBO3-VSI	LA22_P	Output	THCV236 channel3 Vertical SYNC
VBO3-HSI	LA19_N	Output	THCV236 channel3 Horizontal SYNC
VBO3-DEI	LA20_N	Output	THCV236 channel3 Data Enable
VBO3-D0	LA20_P	Output	THCV236 channel3 pixel data bit 0
VBO3-D1	LA19_P	Output	THCV236 channel3 pixel data bit 1
VBO3-D2	LA21_P	Output	THCV236 channel3 pixel data bit 2
VBO3-D3	LA22_N	Output	THCV236 channel3 pixel data bit 3
VBO3-D4	LA21_N	Output	THCV236 channel3 pixel data bit 4
VBO3-D5	LA25_P	Output	THCV236 channel3 pixel data bit 5
VBO3-D6	LA24_P	Output	THCV236 channel3 pixel data bit 6
VBO3-D7	LA25_N	Output	THCV236 channel3 pixel data bit 7
VBO3-PDN	CLK1_M2C_P	Input	THCV236 channel3 Power Down (Active High)

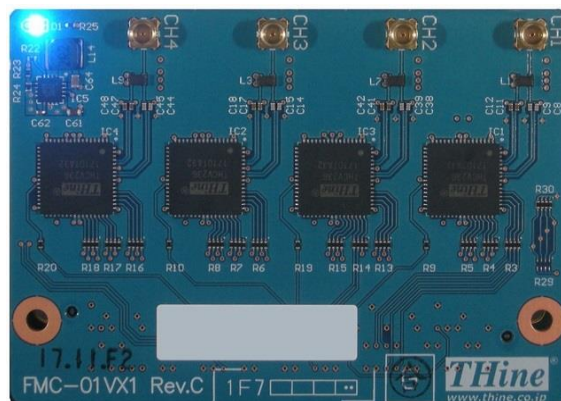
VBO4-CLK	LA29_P	Output	THCV236 channel4 pixel clock
VBO4-VSI	LA30_P	Output	THCV236 channel4 Vertical SYNC
VBO4-HSI	LA31_P	Output	THCV236 channel4 Horizontal SYNC
VBO4-DEI	LA28_N	Output	THCV236 channel4 Data Enable
VBO4-D0	LA24_N	Output	THCV236 channel4 pixel data bit 0
VBO4-D1	LA28_P	Output	THCV236 channel4 pixel data bit 1
VBO4-D2	LA31_N	Output	THCV236 channel4 pixel data bit 2
VBO4-D3	LA30_N	Output	THCV236 channel4 pixel data bit 3
VBO4-D4	LA33_P	Output	THCV236 channel4 pixel data bit 4
VBO4-D5	LA32_P	Output	THCV236 channel4 pixel data bit 5
VBO4-D6	LA33_N	Output	THCV236 channel4 pixel data bit 6
VBO4-D7	LA32_N	Output	THCV236 channel4 pixel data bit 7
VBO4-PDN	CLK1_M2C_N	Input	THCV236 channel4 Power Down (Active High)
VBO-SCL	LA27_N	Input	I2C serial clock for THCV236 all channels
VBO-SDA	LA26_N	Input / Output	I2C serial data for THCV236 all channels

10. Power-on LED

THSB-FMC-01Vx1 has power-on LED. It turns on the blue light upon suppling 12V power through FMC connector.



LED turns off



LED turns on

Fig 10-1 Power-on LED

Notices and Requests

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2. This material contains our copyright, know-how or other proprietary. Copying or disclosing to third parties the contents of this material without our prior permission is prohibited.
3. Note that if infringement of any third party's industrial ownership should occur by using this product, we will be exempted from the responsibility unless it directly relates to the production process or functions of the product.
4. Please note that this product is not designed to be radiation-proof.
5. Customers are asked, if required, to judge by themselves if this product falls under the category of strategic goods under the Foreign Exchange and Foreign Trade Control Law.

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