THEVA241A-SMA-FFC

Hardware Manual

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1. Overview

THEVA241A-SMA-FFC is a board equipped with THCV241A-P that converts maximum 1.5Gbps / lane MIPI® CSI-2 (or MIPI®) to V-by-One® HS.

This board can be connected to a V-by-One® HS receiver (THEVA242-SMA or THEVA236).

As shown here by this example connections.

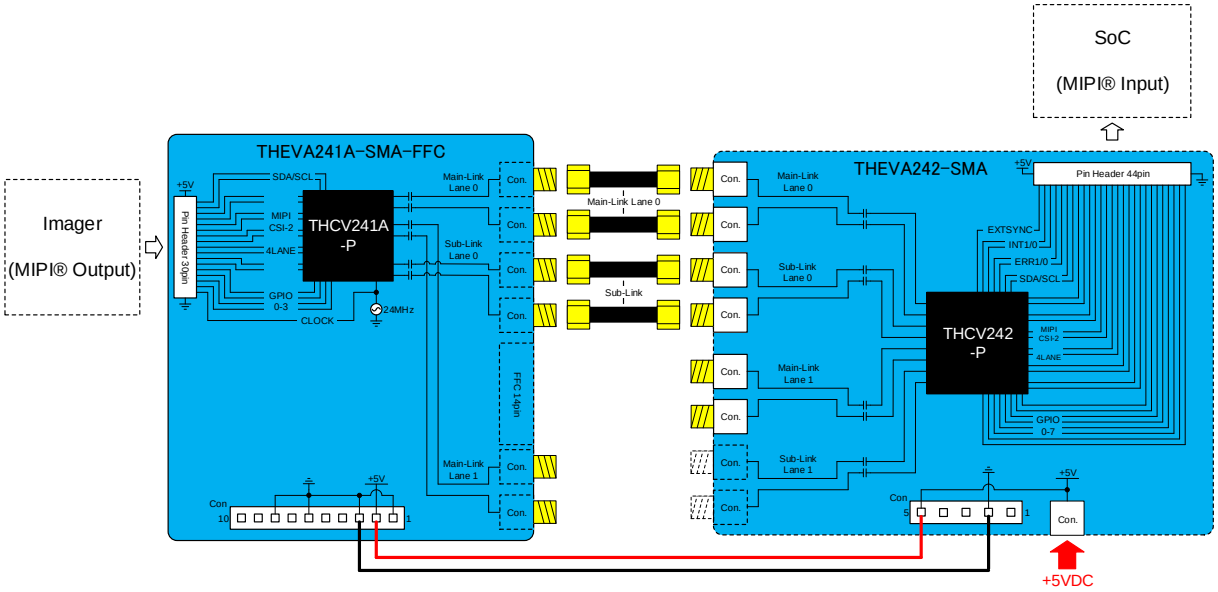


Figure 1 THEVA241A-SMA-FFC and THEVA242-SMA connection example

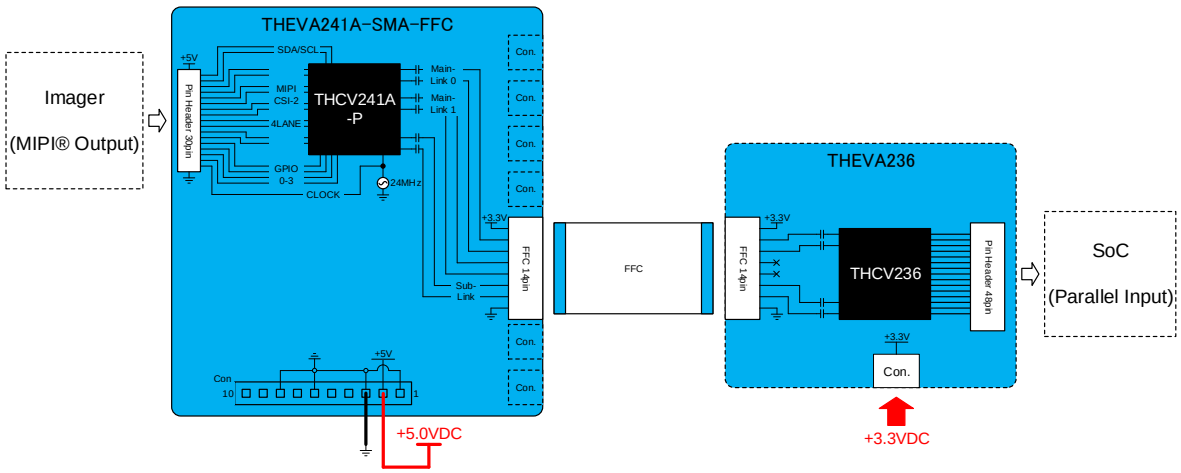


Figure 2 THEVA241A-SMA-FFC and THEVA236 connection example

2. Connection with V-by-One® HS receiver board (THEVA242-SMA)

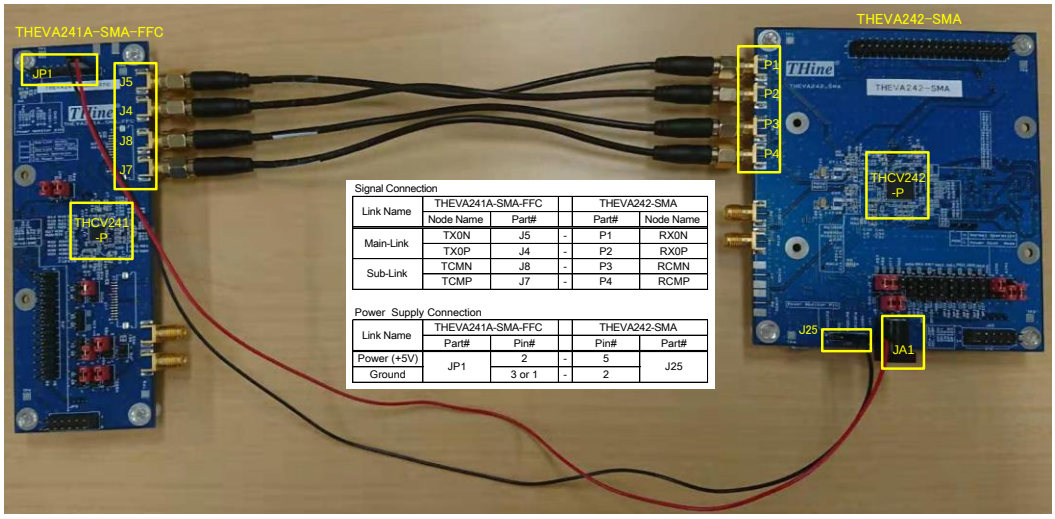
Refer to the following figure for the THEVA241A-SMA-FFC and the THEVA242-SMA connections.

(It is possible to connect to THEVA236 with this method.)

The power supply (+5.0V) is supplied to JA1 of the THEVA242-SMA.

When power is supplied correctly, the green LED lights on both boards.

*The SMA-Connector, the Coaxial-cable, the DC-cable and the power supply should be prepared by users.



Signal Connection

Link Name	THEVA241A-SMA-FFC			THEVA242-SMA	
	Node Name	Part#		Part#	Node Name
Main-Link	TX0N	J5	-	P1	RX0N
	TX0P	J4	-	P2	RX0P
Sub-Link	TCMN	J8	-	P3	RCMN
	TCMP	J7	-	P4	RCMP

Power Supply Connection

Link Name	THEVA241A-SMA-FFC			THEVA242-SMA	
	Part#	Pin#		Pin#	Part#
Power (+5V)	JP1	2	-	5	J25
Ground		3 or 1	-	2	

Figure 3 THEVA241A-SMA-FFC and THEVA242-SMA 1-lane connection

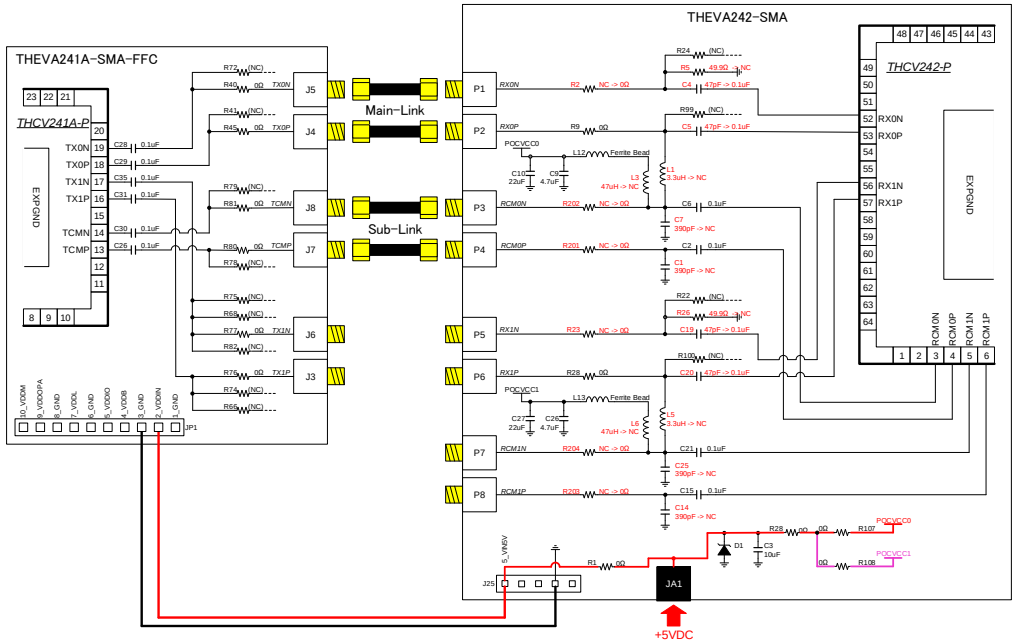


Figure 4 THEVA241A-SMA-FFC and THEVA242-SMA 1-lane connection

3. Connection with V-by-One® HS receiver board (THEVA236)

Connect JP9 of the THEVA241A-SMA-FFC and CON5 of the THEVA236 with FFC.

The power supply is supplied to each boards.

THEVA241A-SMA-FFC: supply +5.0V to JP1.

THEVA236: supply +3.3V to CON4.

When power is supplied correctly, the green LED lights on both boards.

*The FFC-cable, the DC-cable and the power supply should be prepared by users.

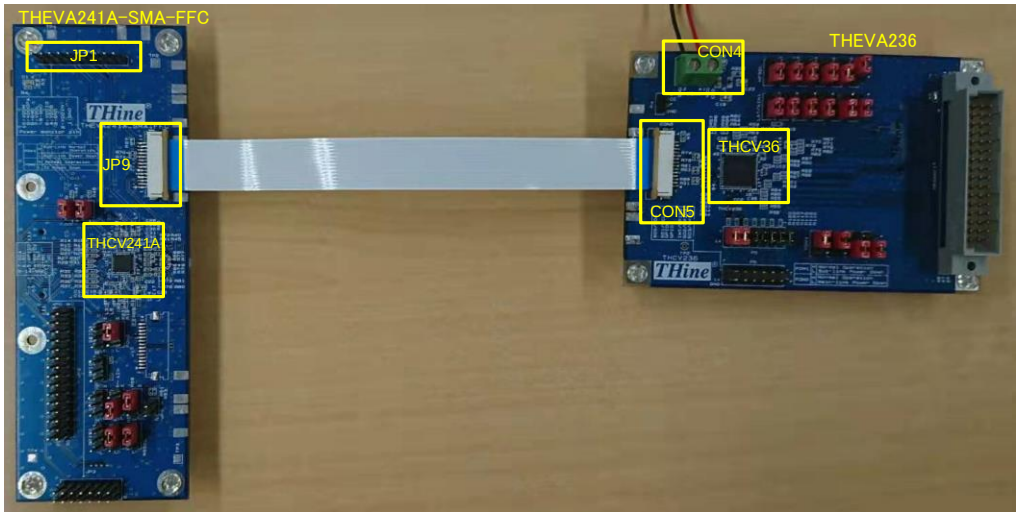


Figure 5 THEVA241A-SMA-FFC and THEVA236 connection

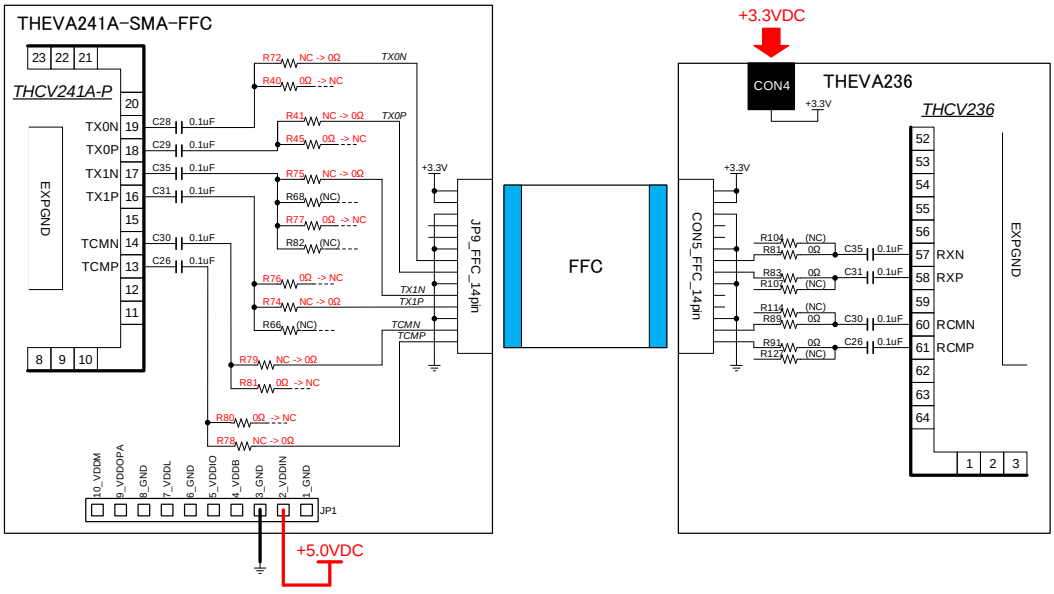


Figure 6 THEVA241A-SMA-FFC and THEVA236 connection

4. Note on connecting with THEVA236

When connecting THEVA241A-SMA-FFC and THEVA236, some parts need to be changed.

As shown here by this some parts.

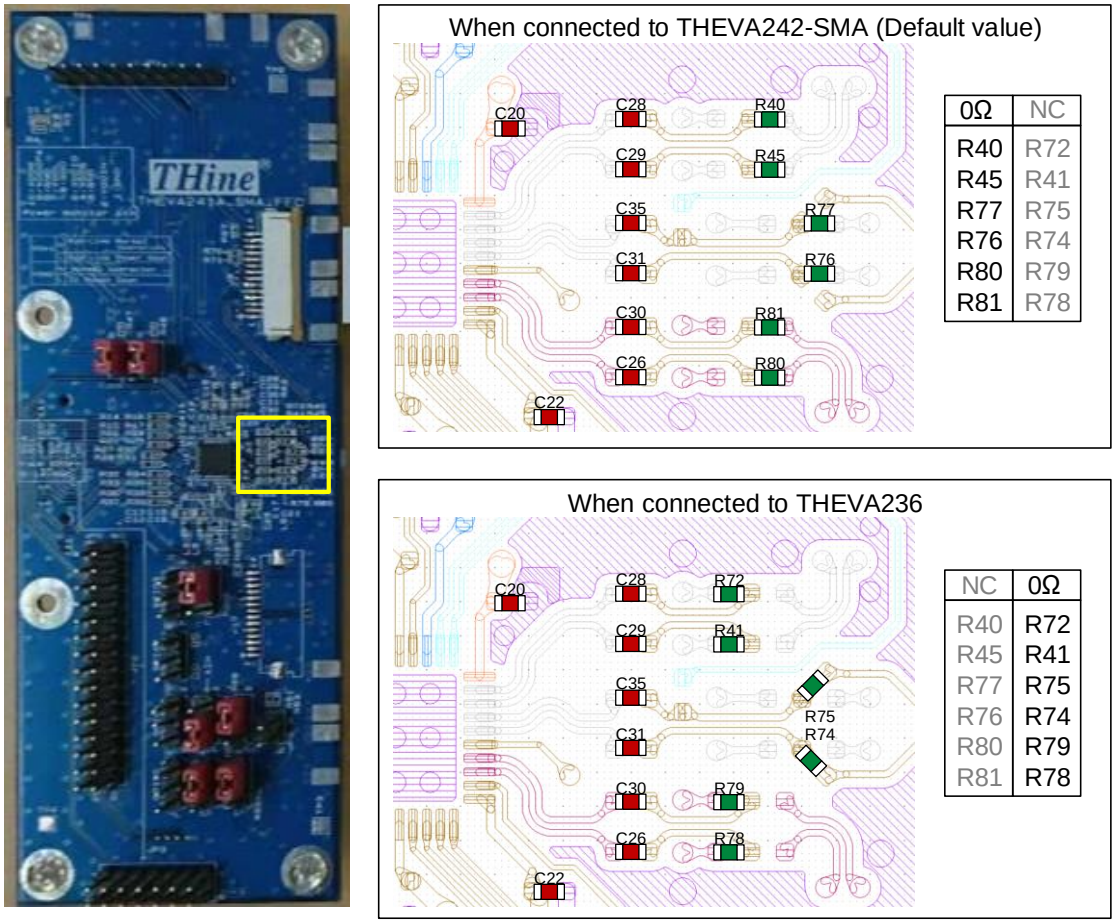


Figure 7 Changing parts of THEVA241A-SMA-FFC

5. Connection with THEVA241A-SMA-FFC and Imager by the MIPI®

JP2 pin-header can be used to connect THEVA241A-SMA-FFC and Imager.

(J2 on the bottom side can also be used connect Imager. See the schematic on page 9 for details.)

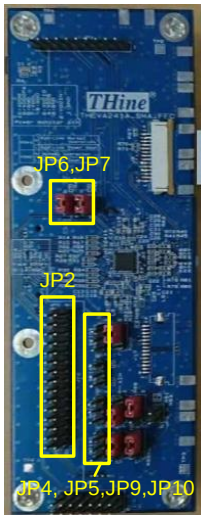
When connecting 2-wire serial (SDA and SCL) to Imager, the J6 and J7 shall be shorted respectively.

Set the GPIO (JP4, JP5, JP9, and JP10) to pull-up or pull-down as required.

The reference clock (CKI, CKO) uses a 24MHz oscillator.

If the Imager does not require an external reference clock, CKO need not be connected.

*The Jumper-Pin should be prepared by users.



Pin#	Pin Name	Type	Pin Name
1	CKO	O	Reference Clock Output
4	RD3P	MI	MIPI® differential data inputs lane3
6	RD3N	MI	
10	RD1P	MI	MIPI® differential data inputs lane1
12	RD1N	MI	
16	RCKP	MI	MIPI® differential clock inputs
18	RCKN	MI	
22	RD0P	MI	MIPI® differential data inputs lane0
24	RD0N	MI	
28	RD2P	MI	MIPI® differential data inputs lane2
30	RD2N	MI	
5	SCL	B	2-wire Serial Interface
7	SDA	B	
11	GPIO0	B	General Purpose Input/Output
13	GPIO1	B	
15	GPIO2	B	
17	GPIO3	B	
23,25,27,29	+5V	P	+5V Power Supply
2,3,8,9,14, 19,20,21,26	GND	G	Ground

Figure 8 Connection with THEVA241A-SMA-FFC and Imager

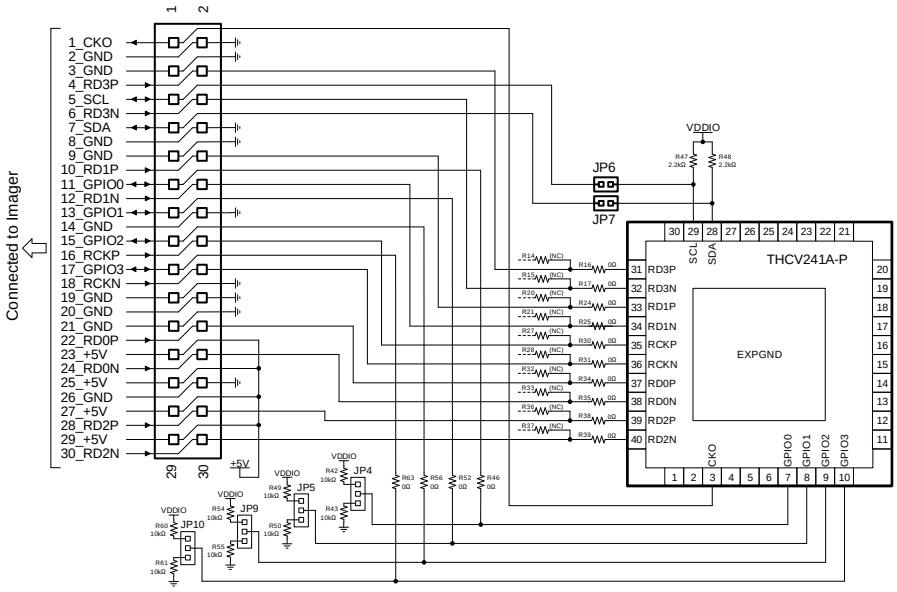


Figure 9 Connection with THEVA241A-SMA-FFC and Imager

6. Pin setting of the THEVA241A-SMA-FFC

As shown here by the Pin-settings.

*The Jumper-Pin should be prepared by users.

Ports#	Node Name	Def.	Description
JP11	PDN0	High / Low	Whole IC Power Down Low : Power Down High : Normal Operation
JP12	PDN1	High / Low	Sub-Link Power Down Low : Sub-Link Power Down High : Sub-Link Normal Operation
JP13	AIN	High / Low	Select Slave Address Low : 2-wire serial Address = 7'b000_1011 High : 2-wire serial Address = 7'b011_0100
JP14	MSSEL	R58 1kΩ, High / Low	Sub-Link Master/Slave Select. Low : Sub-Link Master side (inside 2-wire serial I/F is slave) High : Sub-Link Slave side (inside 2-wire serial I/F is master) Sub-Link Master is connected to HOST MCU.
JP15	LOCKN	R59 30kΩ, High / Low	LOCK detect input Negative polarity. If external LOCKN connection is used, it is supposed to be connected to Rx LOCKN with a 30kΩ pull-up resistor.

Figure 10 Pin setting of the THEVA241A-SMA-FFC

7. Monitor pins

The power supply (+5.0V) is supplied to JP1-#2 of the THEVA241A-SMA-FFC.

And, each power supply can be monitored by the J25 pin-header.

The 2-wire serial, the GPIO, and the INT signal can be monitored by the JP3 pin-header.

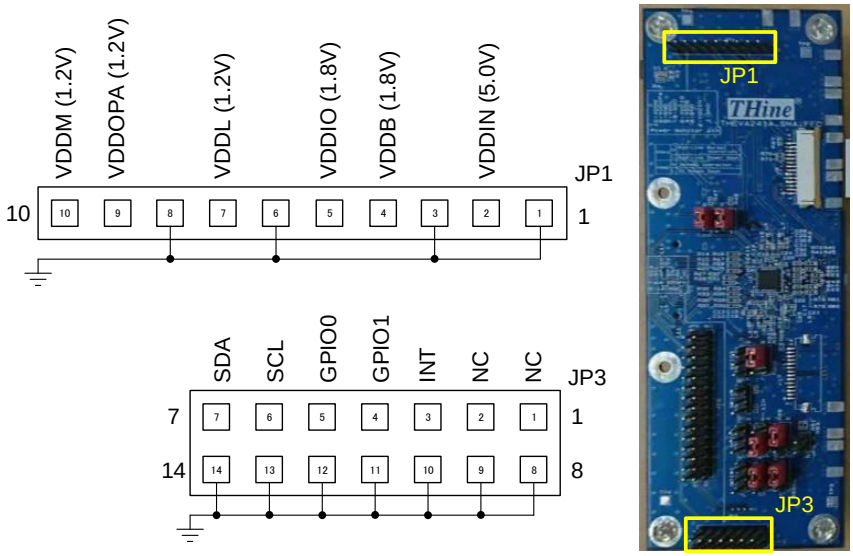
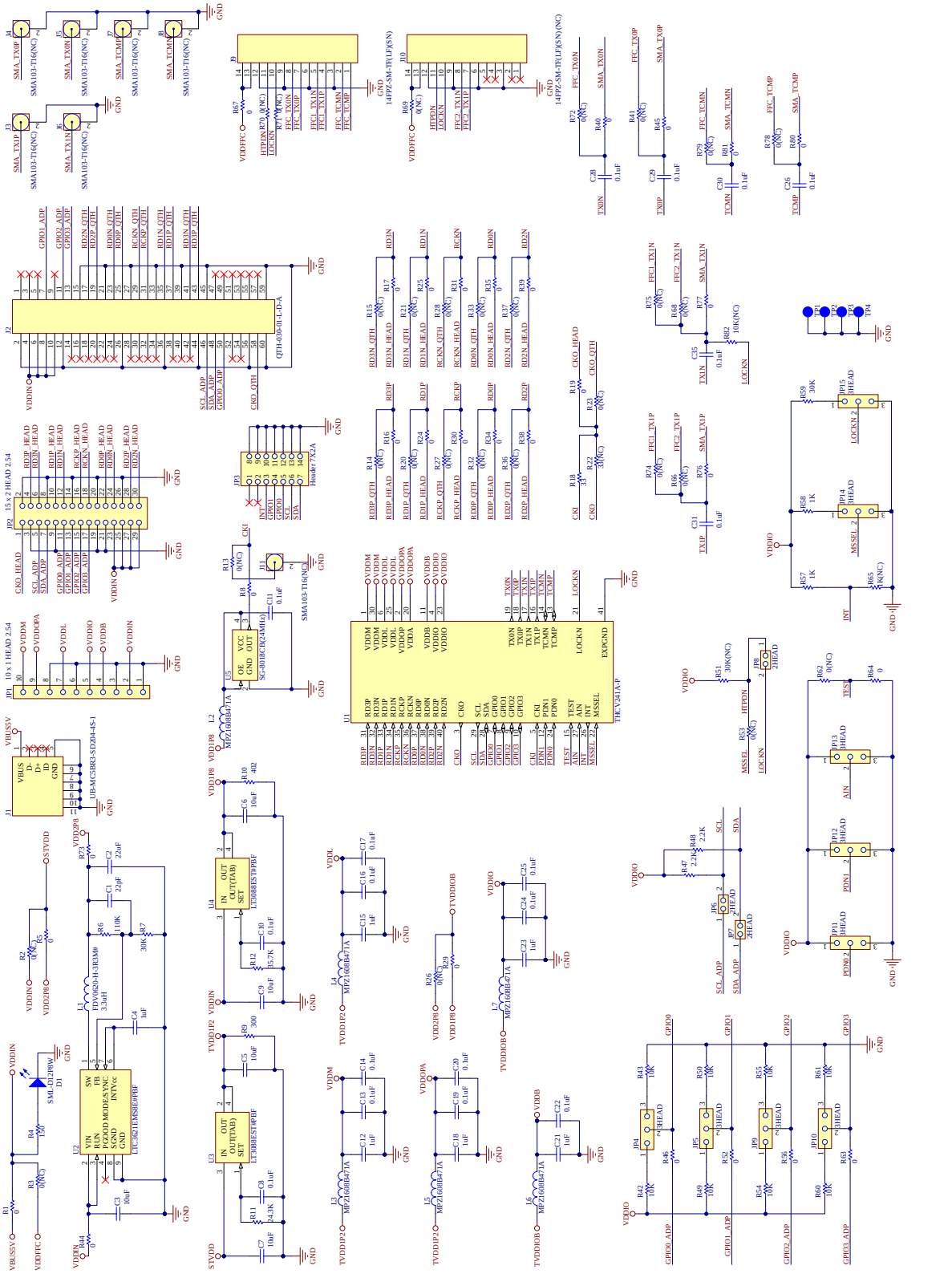


Figure 11 Monitor pin

8. THEVA241A-SMA-FFC Schematic



9. THEVA241A-SMA-FFC Bill of Material

	Designator	Parts type	Quantity	Parts name	Specification	Value
	C1	Capacitor	1	GRM1552C1H220JA01D	50V/1005	22pF
	C2	Capacitor	1	GRT31CC81C226ME01L	16V/3216	22uF
	C3, C5, C6, C7, C9	Capacitor	5	GRM188R61E106MA73D	16V/1608	10uF
	C4, C12, C15, C18, C21, C23	Capacitor	6	GRM188B31E105KA75D	25V/1608	1uF
	C8, C10, C11, C13, C14, C16, C17, C19, C20, C22, C24, C25, C26, C28, C29, C30, C31, C35	Capacitor	18	GRM155B31H104KE14D	50V/1005	0.1uF
	D1	LED	1	SML-D12P8WT86	-	-
	J1	USB 2.0 micro	1	UB-MC5BR3-SD204-4S-1-TBNMP	-	-
	J2	Connector	1	QTH-030-01-L-D-A	-	-
*	J3, J4, J5, J6, J7, J8, J11	SMA Connector	7	SMA103-T16	-	NC
	J9	FFC Connector	1	14FPZ-SM-TF(LF)(SN)	-	-
*	J10	FFC Connector	1	14FPZ-SM-TF(LF)(SN)	-	NC
	JP1	Pin header	1	TCHM13-70-010S-803R	-	-
	JP2	Pin header	1	TCHM23-70-030S-803R	-	-
	JP3	Pin header	1	TCHM23-70-014S-803R	-	-
	JP4, JP5, JP9, JP10, JP11, JP12, JP13, JP14, JP15	Pin header	9	TCHM13-70-003S-803R	-	-
	JP6, JP7, JP8	Pin header	3	TCHM13-70-002S-803R	-	-
	L1	Inductor	1	RLF7030T-3R3M4R1	-	3.3uH
	L2, L3, L4, L5, L6, L7	Ferrite beads	6	MPZ1608B471ATA00	-	-
	R1, R5, R8, R16, R17, R19, R24, R25, R29, R30, R31, R34, R35, R38, R39, R40, R44, R45, R46, R52, R56, R63, R64, R67, R73, R76, R77, R80, R81	Resistor	29	RK73Z1ETTP	1A/1005	0
*	R2, R3, R13, R14, R15, R20, R21, R23, R26, R27, R28, R32, R33, R36, R37, R41, R53, R62, R66, R68, R69, R70, R71, R72, R74, R75, R78, R79	Resistor	28	RK73Z1ETTP	1A/1005	0(NC)
	R4	Resistor	1	RK73H1ETTP1500F	0.1W/1005	150
	R6	Resistor	1	RK73H1ETTP1103F	0.1W/1005	110K
	R7, R59	Resistor	2	RK73H1ETTP3002F	0.1W/1005	30K
	R9	Resistor	1	RK73H1ETTP3000F	0.1W/1005	300
	R10	Resistor	1	RK73H1ETTP 4020F	0.1W/1005	402
	R11	Resistor	1	RK73H1ETTP2432F	0.1W/1005	24.3K
	R12	Resistor	1	RK73H1ETTP3572F	0.1W/1005	35.7K
	R18	Resistor	1	RK73H1ETTP33R0F	0.1W/1005	33
*	R22	Resistor	1	RK73B1ETTP330J	0.1W/1005	33(NC)
	R42, R43, R49, R50, R54, R55, R60, R61	Resistor	8	RK73H1ETTP1002F	0.1W/1005	10K
	R47, R48	Resistor	2	RK73H1ETTP2201F	0.1W/1005	2.2K
*	R51	Resistor	1	RK73B1ETTP303J	0.1W/1005	30K(NC)
	R57, R58	Resistor	2	RK73H1ETTP1001F	0.1W/1005	1K
*	R65	Resistor	1	RK73B1ETTP102J	0.1W/1005	1K(NC)
*	R82	Resistor	1	RK73B1ETTP103J	0.1W/1005	10K(NC)
*	TP1, TP2, TP3, TP4	TP	4	2mmX2mm	-	NC
	U1	THCV241A-P	1	THCV241A-P	See datasheet (QFN package)	-
	U2	LTC3621EMS8E#PBF	1	LTC3621EMS8E#PBF	See datasheet (MS8E package)	-
	U3, U4	LT3088EST#PBF	2	LT3088EST#PBF	See datasheet (ST package)	-
	U5	SG-8018CB24.000000MHz TJHPA	1		See datasheet	24MHz

*Un-mount

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