THEVA353-Q_HSD_FAKRA

THEVA334-Q_HSD_FAKRA

Hardware Manual

Contents

1. Purpose of THEVA353-Q_HSD_FAKRA and THEVA334-Q_HSD_FAKRA

The THEVA353-Q_HSD_FAKRA receives the MIPI video stream and transmits V-by-One® HSII. The THEVA334-Q_HSD_FAKRA receives the V-by-One® HSII and transmits the LVDS video stream for the Open-LDI panel. These evaluation boards demonstrate the functionality and operation of the THCV353-Q and THCV334-Q.

The evaluation boards are not for EMC testing. These two boards have tap points to monitor and apply signals, pads for termination, and multiple connector options so that the user can easily access the device pins for evaluation.

2. Features

- Verified Tx and Rx Board to Bridge MIPI DSI and open-LDI LVDS with the V-by-One® HSII
  - The Pixel Rate is from 50MHz to 232MHz with Dual-Link
  - The Pixel Rate is from 5MHz to 116 with Single-Link
- 18bit and 24bit Color Depth per Pixel
- Selectable Connector for Multiple Cable Types
  - Factory installed the 6-pin HSD connector that has two V-by-One® HSII differential pairs, a dedicated power line, and GND.
  - Factory also installed a FAKRA connector for Single-End cable.
- Dedicated Tap Points to Monitor and Apply Signals
  - Audio I2S Bridge
  - 2-wire Bi-directional Bridge
  - Remote GPIOs Control
- Single +12V Power Supply for the Two Boards with Panel
- Support Quick and Easy Testing Software, VDesignTool-HSII(*1)
  - FC and BC Margin Quick Test without High-Speed Oscilloscope
  - Internal Pattern Generator Configuration for Quick Cable and Panel Test without MIPI DSI Source
  - For details, refer to the *THEVA353-334-Q_VDesignTool-HSII_UserManual*.

(*1) Contact THine to provide the VDesignTool-HSII and THEVA353-334-Q_VDesignTool-HSII_UserManual.

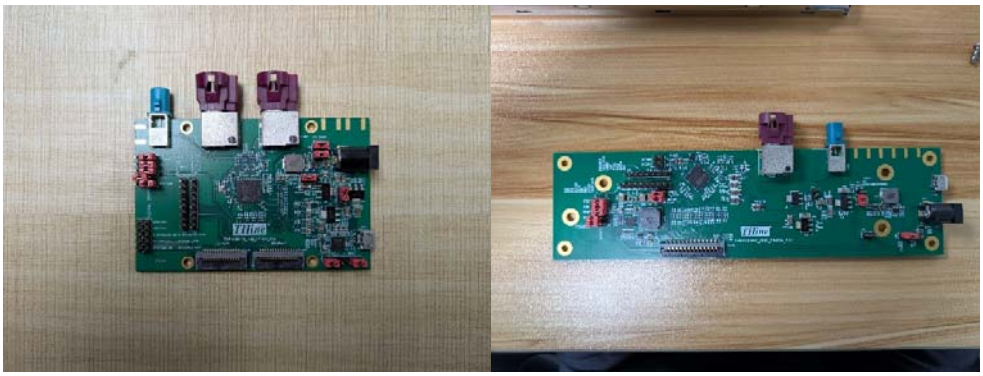


Figure 1. THEVA353-Q_HSD_FAKRA (Left), and THEVA334-Q_HSD_FAKRA(Right) Pictures

3. Contents in Package

- THEVA353-Q_HSD_FAKRA

Item	Description
THEVA353-Q_HSD_FAKRA (1pc)	THCV353-Q Serializer Evaluation Board with HSD and FAKRA Connector
FFC(2pc)	FFC to MIPI Source

- THEVA334-Q_HSD_FAKRA

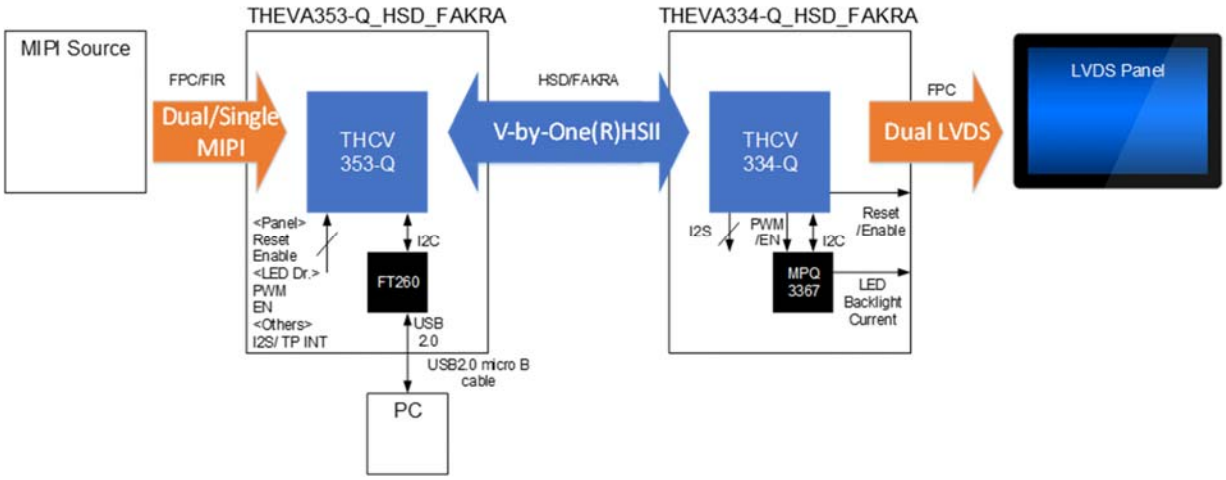
Item	Description
THEVA334-Q_HSD_FAKRA (1pc)	THCV334-Q Deserializer Evaluation Board with HSD and FAKRA Connector
THEVA334-Q_CONV_A (1pc)	FFC/FPC to Pin Header Conversion Board
THEVA333-Q_334-Q_LVDS_FPC (1pc)	Impedance Controlled FPC

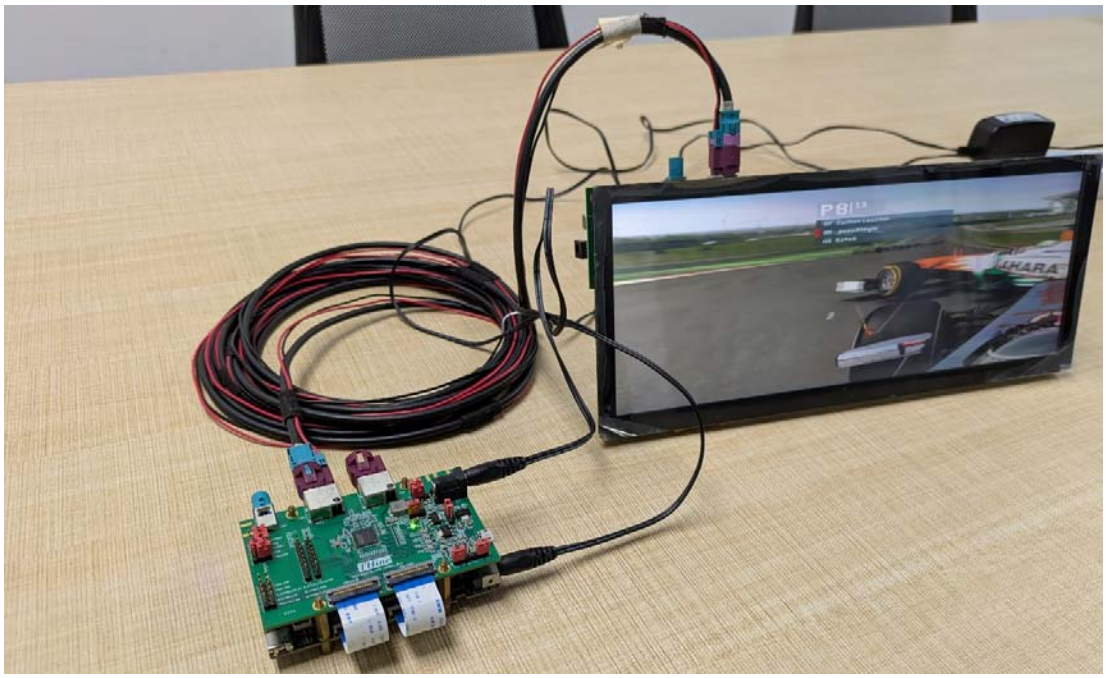
4. Required Items for Demonstrations

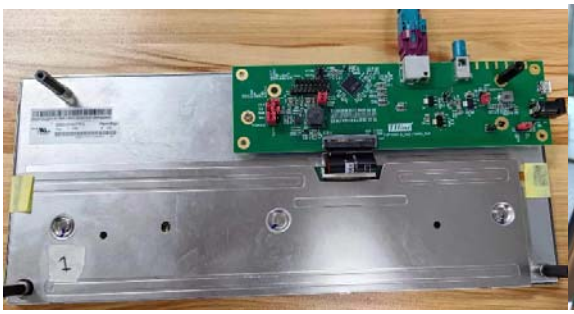
The demonstration requires the following items with THEVA353-Q_HSD_FAKRA and THEVA334-Q_HSD_FAKRA.

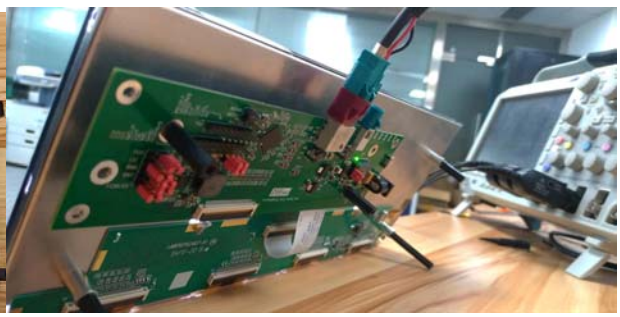
- MIPI DSI Video Source.
  - THEVA353-Q_HSD_FAKRA has compatible FFC connectors for the following source.
    - ✓ ROC-RK3588S-PC-V1.2
- LVDS Panel
  - THEVA334-Q_HSD_FAKRA has a compatible FFC connector to the following LVDS input panels.
    - ✓ HSD123KPW1-Axx: 1920x720p 60Hz
    - ✓ TDO-1230K92467:1920x720p 60Hz
      - Requires 50pin 0.5mm pitch FFC
    - ✓ HSD156JUW2-Axx: 1920x1080p 60Hz
- Power Supply +12V@2A from DC Jack (@1A if LVDS panel drive is NOT required)
- HSD Cable or FAKRA Cable
- 2.54mm Pitch Jumpers
- [Optional] Windows PC
  - VDesignTool-HSII, Windows Software
  - USB2.0 Micro B Cable
- [Optional] SMA Connectors and Cables

5. Typical Demonstration Block Diagram







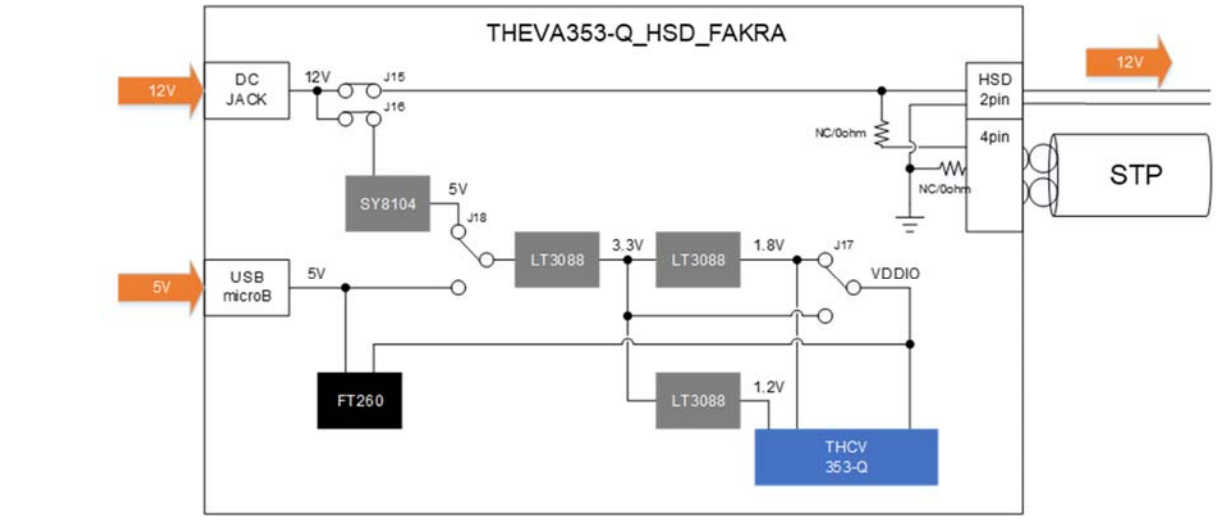


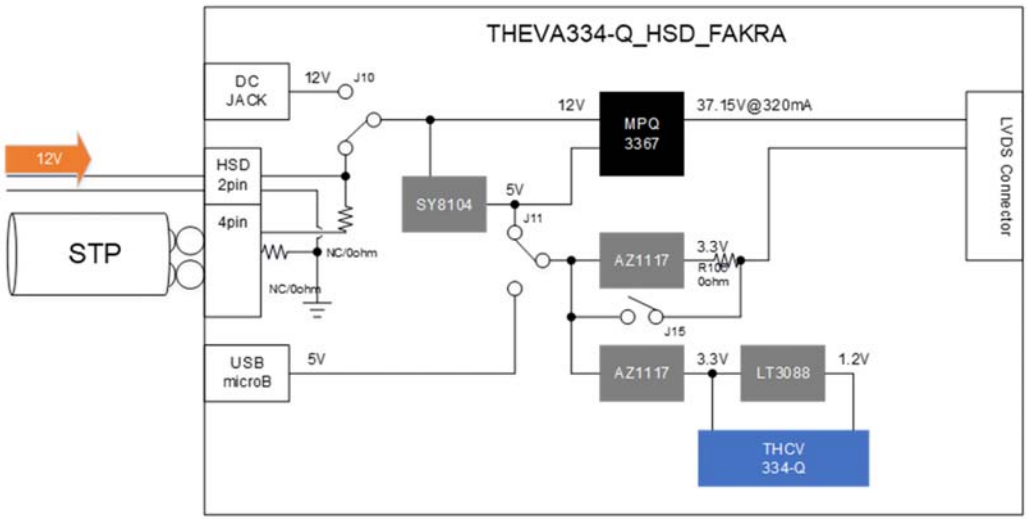
6. Power Connection

6.1. Power Supply for all Blocks with HSD Cable

THEVA353-Q_HSD_FAKRA needs both the 12V@2A DC input and the USB 2.0 micro B connection with the PC to supply power for all blocks in the following connection diagram. THEVA353-Q_HSD_FAKRA can share the 12V power with THEVA334-Q_HSD_FAKRA via the dedicated power and GND line in the 6-pin HSD cable. THEVA353-Q_HSD_FAKRA can share the 12V@2A power with THEVA334-Q_HSD_FAKRA via one pair in 4-pin HSD cable if there are 0-ohm resistors on THEVA353-Q_HSD_FAKRA and THEVA353-Q_HSD_FAKRA.

THEVA334-Q has MPQ3367 to generate the 37.15V@320mA for the LVDS open-LDI panel from the 12V@2A source. Set the jumper pins to the correct positions to use this connection.

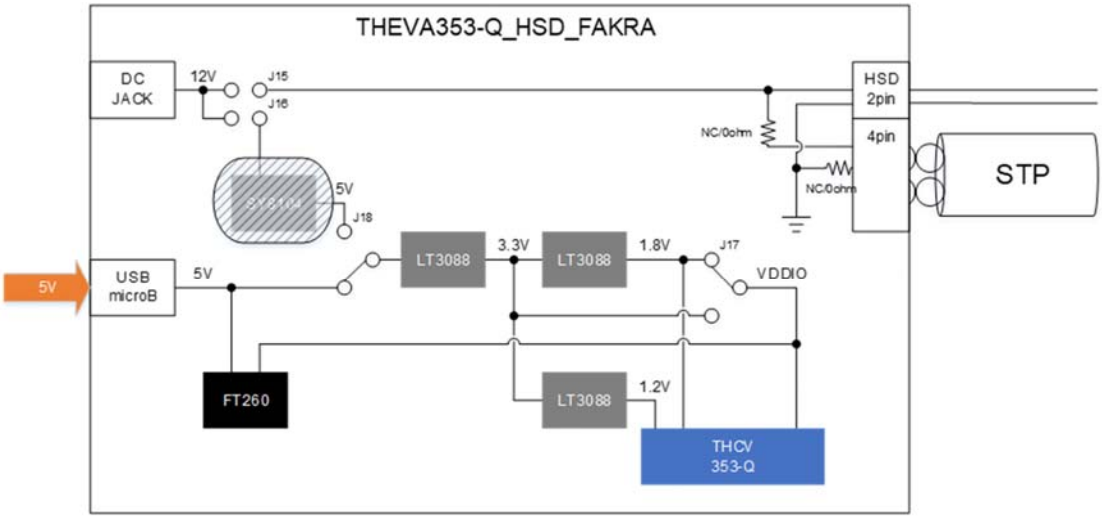


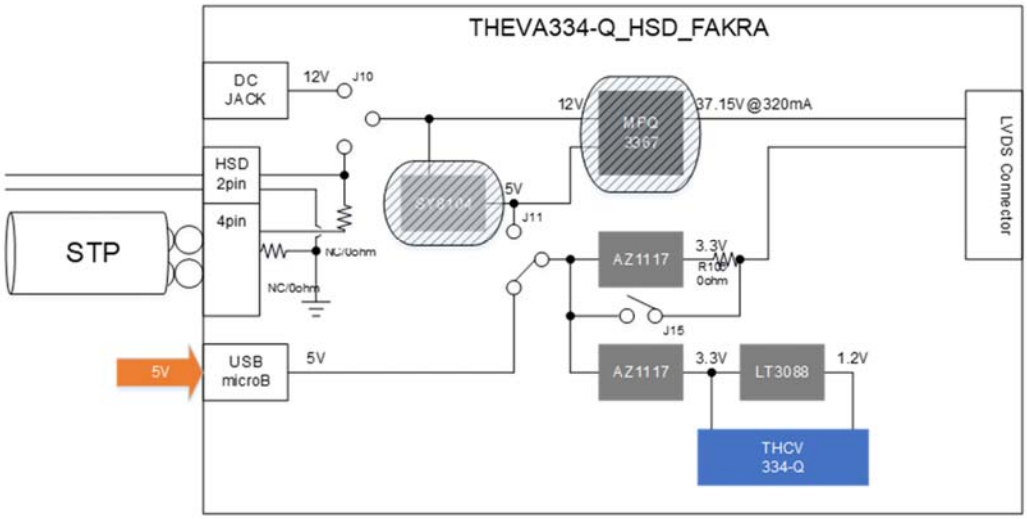


6.2. Power Supply for THCV353-Q, THCV334-Q and FT260 with USB Cables

THEVA353-Q_HSD_FAKRA and THEVA334-Q_HSD_FAKRA may get power from the USB 2.0 micro B connector on each board. The panel would need another drive source because the MPQ3367 would not work due to the USB2 supply current capability.

Set the jumper pins to the correct positions to use this connection.





7. Cable Selections for V-by-One®HSII, Power, and GND

There are resistor lands to select the HSD connector, FAKRA connector, or SMA connectors on both THEVA353-Q_HSD_FAKRA and THEVA334-Q_HSD_FAKRA for the user-selected cable type. The board has lands to select the signal path for each connector without any stub by mounting and unmounting the 0-ohm resistor on those lands.

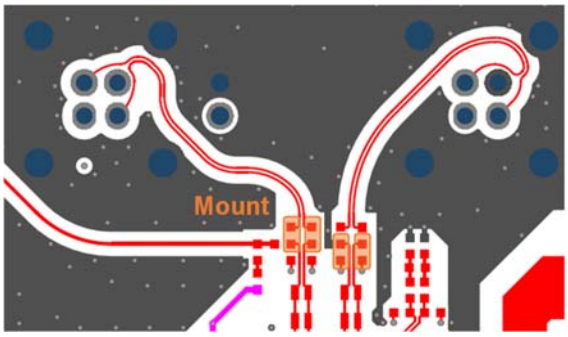
7.1. 6pin-HSD Cable (with Factory Mounted Resistors)

6pin-HSD cable connection supports;

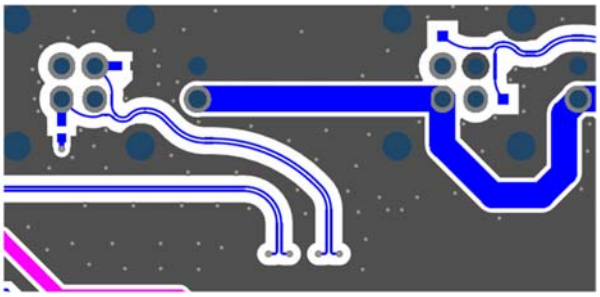
- V-by-One®HSII Dual-Link and 12V Power/GND Transmission

Table 1. Mount/unmount Components for 6pin-HSD Cable (Factory Mounted)

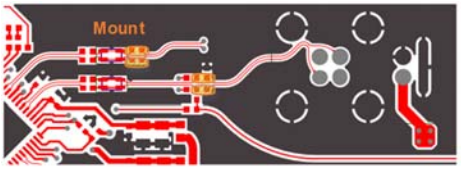
Board Name	Mount	Unmount
THEVA353-Q_HSD_FAKRA	R21, R22, R26, R27	R16, R17, R18, R19, R20, R23, R24, R25, R28, R29
THEVA334-Q_HSD_FAKRA	R5, R6, R51, R53	R4, R7, R50, R54, R98, R107, R108



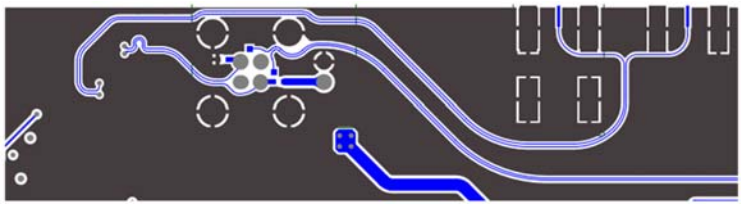
(a) THEVA353-Q_HSD_FAKRA Top



(b) THEVA353-Q_HSD_FAKRA Bottom



(a) THEVA334-Q_HSD_FAKRA Top



(b) THEVA334-Q_HSD_FAKRA Bottom

Figure 2. Mount/Unmount Components Locations for 6pin-HSD Cable

7.2. 4pin-HSD Cable

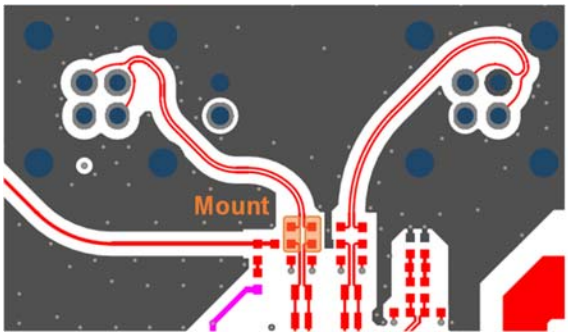
HSD 4pin cable connection supports one of the following;

- V-by-One®HSII Single-Link and 12V Power/GND Transmission
- V-by-One®HSII Dual-Link

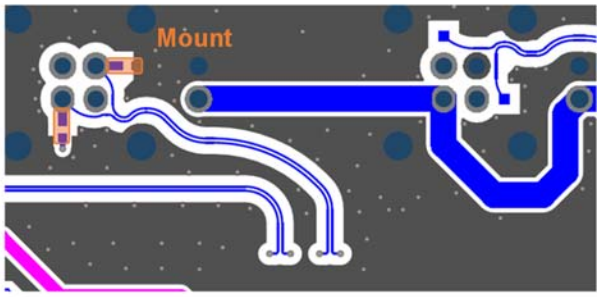
Table 2. Mount/unmount Components for V-by-One®HSII Single Link and 12V Power/GND with 4pin-HSD Cable

Board Name	Mount	Unmount
THEVA353-Q_HSD_FAKRA	R21, R22, R25, R29	R16, R17, R18, R19, R20, R23, R24, R26,R27, R28
THEVA334-Q_HSD_FAKRA	R5, R6, R50, R54	R4, R7, R51, R53, R98, R107, R108

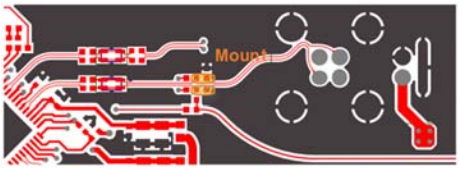
The mounting/unmounting components for the V-by-One®HSII Dual Link with 4-pin-HSD cable are identical to those for the 6-pin-HSD cable. In this case, the THEVA334-Q_HSD_FAKRA needs power supply separately via DC Jack or USB2.0 micro B cable.



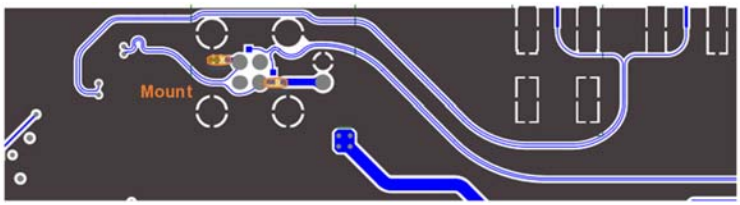
(a) THEVA353-Q_HSD_FAKRA Top



(b) THEVA353-Q_HSD_FAKRA Bottom



(a) THEVA334-Q_HSD_FAKRA Top



(b) THEVA334-Q_HSD_FAKRA Bottom

Figure 3. Component Locations for V-by-One®HSII Single Link and 12V Power/GND with 4pin-HSD Cable

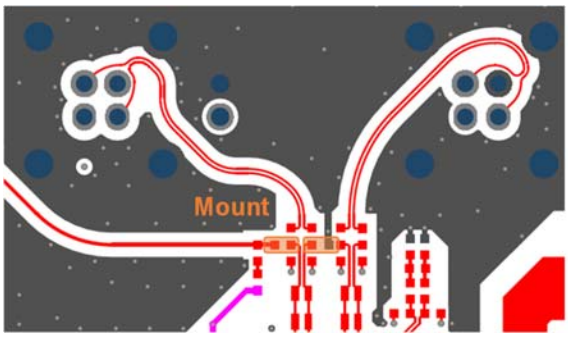
7.3. FAKRA Cable

FAKRA cable supports;

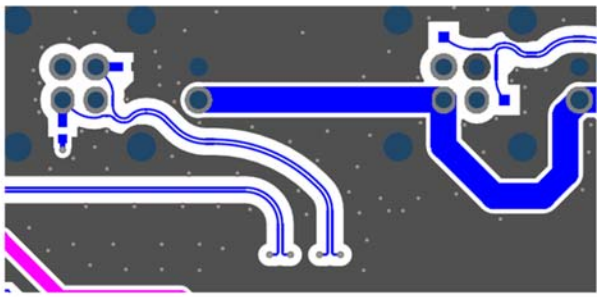
- V-by-One®HSII Single-Link

Table 3. Mount/unmount Components for V-by-One®HSII Single-Link with FAKRA Cable

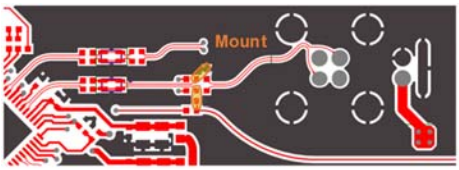
Board Name	Mount	Unmount	Don't care
THEVA353-Q_HSD_FAKRA	R20, R23	R16, R17, R18, R19, R21, R22	R24, R25, R26, R27, R28, R29
THEVA334-Q_HSD_FAKRA	R4, R7	R5, R6, R98, R107, R108	R50, R51, R53, R54



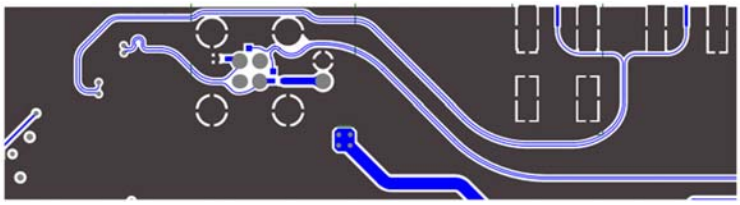
(a) THEVA353-Q_HSD_FAKRA Top



(b) THEVA353-Q_HSD_FAKRA Bottom



(a) THEVA334-Q_HSD_FAKRA Top



(b) THEVA334-Q_HSD_FAKRA Bottom

Figure 4. Component Locations for V-by-One®HSII Single Link with FAKRA Cable

7.4. SMA Cable

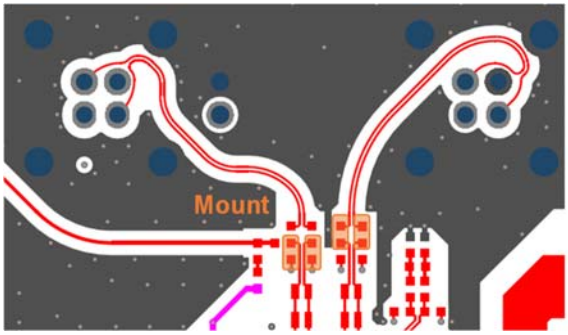
SMA cables support;

- V-by-One®HSII Dual-Link

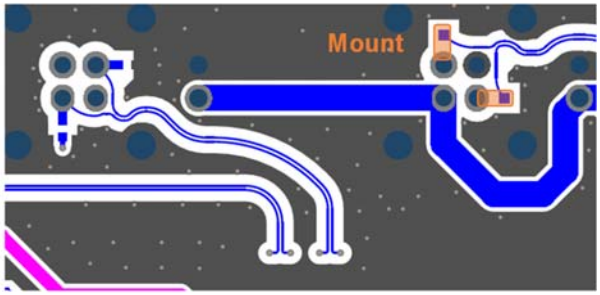
Table 4. Mount/unmount Components for V-by-One®HSII Dual-Link with SMA Cables

Board Name	Mount	Unmount
THEVA353-Q_HSD_FAKRA	R18, R19, R24, R28, TP1, TP2 P1, P2, P3, P4 (SMA Connectors)	R16, R17, R20, R21, R22, R23, R25, R26, R27, R29 CON3 (HSD Connector),
THEVA334-Q_HSD_FAKRA	R51, R53, R107, R108, TP1, TP2 P1, P2, P3, P4 (SMA Connectors)	R4, R5, R6, R50, R54, R7, R98, CON3 (FAKRA Connector), CON4 (HSD Connector)

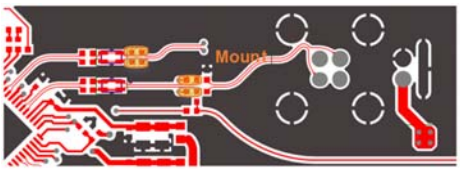
Remove HSD and FAKRA connectors to avoid stubs and ensure reliable transmission.



(a) THEVA353-Q_HSD_FAKRA Top



(b) THEVA353-Q_HSD_FAKRA Bottom



(a) THEVA334-Q_HSD_FAKRA Top

(b) THEVA334-Q_HSD_FAKRA Bottom

Figure 5. Component Locations for V-by-One®HSII Dual Link with SMA Cables

8. FFC/FPC Connectors on THEVA334-Q_HSD_FAKRA for LVDS Panel

THEVA334-Q_HSD_FAKRA has lands to select the signal path for the connectors without any stub by mounting and unmounting the 0-ohm resistor on those lands. The board provides the three signal mappings of the following three LVDS panels and one connector conversion board.

A) HSD123KPW1-Axx: 1920x720p 60Hz

B) HSD156JUW2-Axx: 1920x1080p 60Hz

C) TDO-1230K92467: 1920x720p 60Hz

D) THEVA334-Q_CONV_A

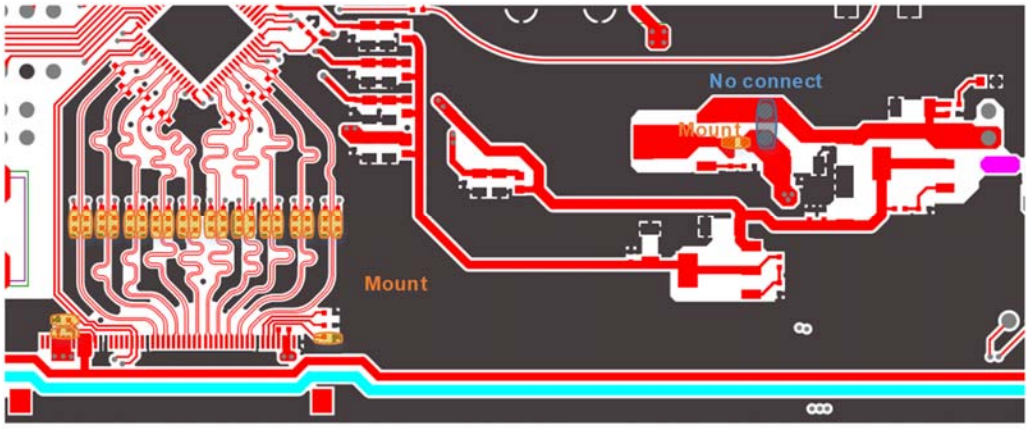
8.1. HSD123KPW1-Axx and THEVA334-Q_CONV_A

The factory-mounted resistors setup in Table 5 supports the HSD123KPW1-Axx with CON2. Also, J15 shall open (No Connect) to supply 3.3V for the HSD123KPW1-Axx. The Table 5 register mount/unmount setting with CON2 also supports the signal mapping for THEVA334-Q_CONV_A.

Use the THEVA333-Q_334-Q_LVDS_FPC impedance-controlled cable to connect the HSD123KPW1-Axx or THEVA334-Q_CONV_A with the board.

Table 5. Mount/unmount Components for FFC Connector CON2 to Use HSD123KPW1-Axx or THEVA334-Q_CONV_A (Factory Mounted)

Board Name	Mount	Unmount
THEVA334-Q_FAKRA_HSD	R40, R44, R46, R49, R55, R58, R60, R63, R71, R78, R65, R73, R80, R86, R66, R74, R81, R87, R90, R93, R101, R104, R105, R106(U5 3.3V output)	R42, R45, R47, R52, R56, R59, R61, R64, R72, R79, R67, R76, R68, R77, R82, R88, R83, R89, R91, R94, R100, R102, R103



THEVA334-Q_HSD_FAKRA Top

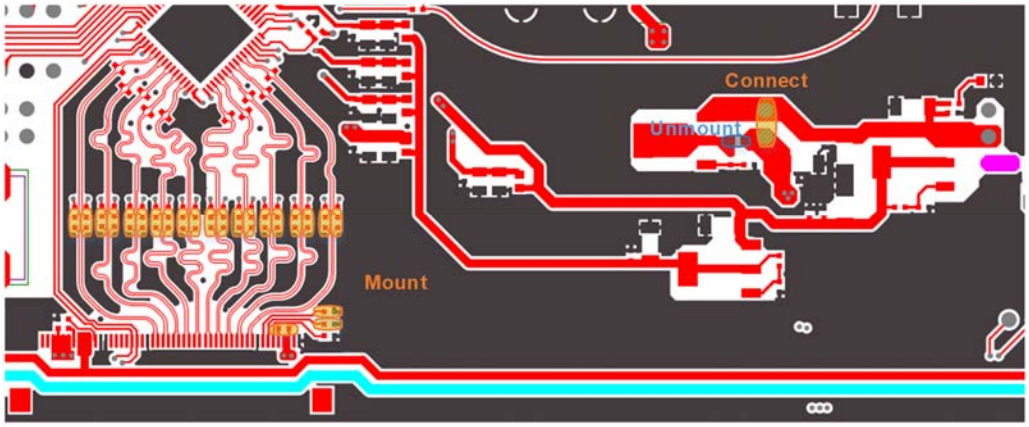
Figure 6. Component Locations to Use HSD123KPW1-Axx or THEVA334-Q_CONV_A

8.2. HSD156JUW2-Axx

The resistors setup in Table 6 supports the HSD156JUW2-Axx with CON2. Also, J15 shall short (Connect) to supply 5 V for the HSD156JUW2-Axx. Use THEVA333-Q_334-Q_LVDS_FPC impedance-controlled cable to connect the panel with the HSD156JUW2-Axx.

Table 6. Mount/unmount components for FFC Connector CON2 to Use HSD156JUW2-Axx

Board Name	Mount	Unmount
THEVA334-Q_FAKRA_HSD	R40, R44, R46, R49, R55, R58, R60, R63, R71, R78, R65, R73, R80, R86, R66, R74, R81, R87, R90, R93, R100, R102, R103,	R42, R45, R47, R52, R56, R59, R61, R64, R72, R79, R67, R76, R68, R77, R82, R88, R83, R89, R91, R94, R101, R104, R105, R106(U5 3.3V output)



THEVA334-Q_HSD_FAKRA Top

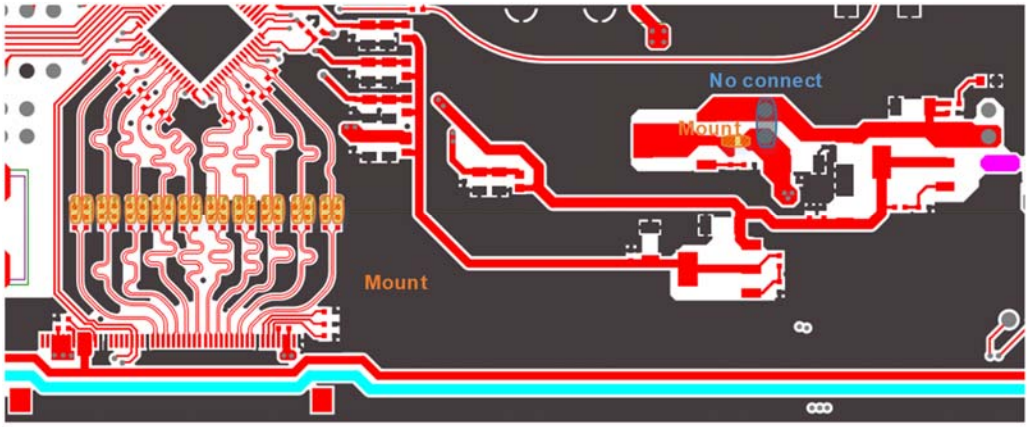
Figure 7. Component Locations to Use HSD156JUW2-Axx

8.3. TDO-1230K92467

The resistors setup in Table 7 supports the TDO-1230K92467 with CON1. Also, J15 shall open (No Connect) to supply 3.3 V for the TDO-1230K92467. Use a 50pin 0.5mm pitch FFC because THEVA333-Q_334-Q_LVDS_FPC impedance control is for the signal mapping of CON2.

Table 7. Mount/unmount Components for FFC Connector CON1 to Use TDO-1230K92467

Board Name	Mount	Unmount	Don't care
THEVA334-Q_HSD_FAKRA	R42, R45, R47, R52, R56, R59, R61, R64, R72, R79, R67, R76, R68, R77, R82, R88, R83, R89, R91, R94, R106(U5 3.3V output)	R40, R44, R46, R49, R55, R58, R60, R63, R71, R78, R65, R73, R80, R86, R66, R74, R81, R87, R90, R93,	R100, R101, R102, R103, R104, R105,

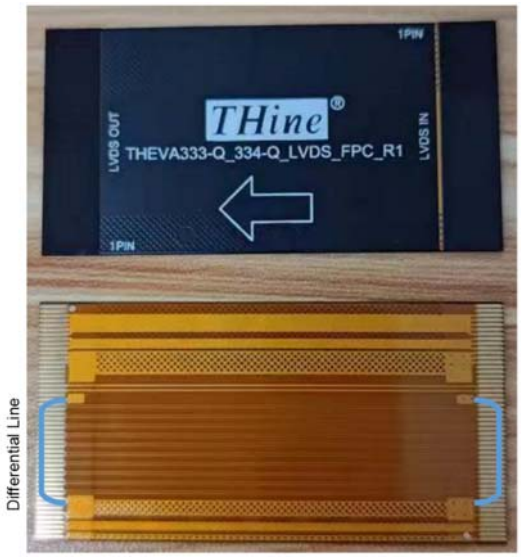


THEVA334-Q_HSD_FAKRA Top

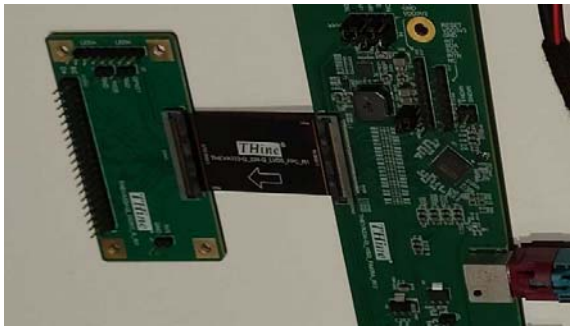
Figure 8. Component Locations to Use TDO-1230K92467

9. THEVA333-Q_334-Q_LVDS_FPC Input and Output Direction

The THEVA333-Q_334-Q_LVDS_FPC has input/output direction as follows because LVDS differential lines are impedance-controlled.



"LVDS OUT" side should connect to the panel, and "LVDS IN" side should connect to the THEVA334-Q_HSD_FAKRA as follows to avoid damage to the board and/or panel.



10. Jumper Pin Connections

Table 8. Power Supply

Board Name	Component	Signal	Description
THEVA353-Q_HSD_FAKRA	J15	12V	12V Power Connector for the HSD Connectors Connect: Supply 12V Power to CON2 and CON3 No Connect: No Power Supply to CON2 and CON3
	J16	12V	12V Power Connector for the Board Main Power Connect: Supply 12V Power to the Board Main Power No Connect: No 12V Supply to the Board Main Power
	J18	5V	5V Power Selector for U2 from U5 5V or USB VBUS Connect 1 and 2 Pin: 5V that U5 Bucks from Board Main Power Connect 2 and 3 Pin: 5V of USB VBUS
	J17	1.8 or 3.3V	IO Power Selector from 1.8V or 3.3V Connect 1 and 2 pin: 3.3V Connect 2 and 3 pin: 1.8V
THEVA334-Q_HSD_FAKRA	J10	12V	12V Power Selector from HSD Connector or DC Jack Connect 1 and 2 Pin: DC Jack Connect 2 and 3 Pin: HSD Connector
	J11	5V	5V Power Selector from U2 or USB VBUS Connect 1 and 2 Pin: 5V from U2 Connect 2 and 3 Pin: 5V from USB VBUS
	J15	3.3 or 5V	LVDS Panel Power Selector from 3.3V or 5V Connect: 5V (Unmount R106 to avoid short 5V with 3.3V.) No Connect: 3.3V (Mount R106)

Table 9. Mode Setting

Board Name	Component	Signal	Description
THEVA353-Q_HSD_FAKRA	J8	PDN	PDN Pin Setting Connect 1 and 2 Pin: THCV353-Q Normal Operation Connect 2 and 3 Pin: THCV353-Q Power Down
	J7	OEN	BCMONP_OEN Pin Setting Connect 1 and 2 Pin: Output Enable Connect 2 and 3 Pin: Output Disable
	J9	MODE0	REM_INTN1_MODE0 Pin Setting(*1) Connect 1 and 2 Pin: Set to High Connect 2 and 3 Pin: Set to Low
	J10	MODE1	BCMONN_MODE1 Pin Setting(*1) Connect 1 and 2 Pin: Set to High Connect 2 and 3 Pin: Set to Low
	J11	RXLANE	REM_INTN0_RXLANE Pin Setting Connect 1 and 2 Pin: 4 Lane MIPI DSI Rx Connect 2 and 3 Pin: 2 Lane MIPI DSI Rx
THEVA334-Q_HSD_FAKRA	J5	PDN	PDN Pin Setting Connect 1 and 2 Pin: THCV334-Q Normal Operation Connect 2 and 3 Pin: THCV334-Q Power Down
	J6	OE	OE Pin Setting Connect 1 and 2 Pin: LVDS Output Enable, and Pin Entry Mode Connect 2 and 3 Pin: LVDS Output Disable, and Register Entry Mode
	J7	BM0	LOUTPUTMODE_BM0 Pin Setting Connect 1 and 2 Pin: Dual-Link Open-LDI LVDS Output Connect 2 and 3 Pin: Single-Link Open-LDI LVDS Output
	J8	BM1	FCINPUTMODE_BM1 Pin Setting Connect 1 and 2 Pin: 2 Lane V-by-One® HS II Input Connect 2 and 3 Pin: 1 Lane V-by-One® HS II Input
	J9	FCMODE	FCTHRIO_MODE Pin Setting Connect 1 and 2 Pin: 4 Cycle Mode (Enhanced Audio Bandwidth) Connect 2 and 3 Pin: 8 Cycle Mode (Default/Audio-video Balanced)

*1: See THCV353-Q datasheet to select the mode.

Table 10. I2S

Board Name	Component	Signal	Description
THEVA353-Q_HSD_FAKRA	J12	I2S	I2S Audio Signal Input
THEVA334-Q_HSD_FAKRA	J12	I2S	I2S Audio Signal Output

Table 11. Touch Panel

Board Name	Component	Signal	Description
THEVA353-Q_HSD_FAKRA	J13	TP	Touch Panel Signals at Local Side
THEVA334-Q_HSD_FAKRA	J13	TP	Touch Panel Signals at Remote Side

Table 12. Others

Board Name	Component	Signal	Description
THEVA353-Q_HSD_FAKRA	J2	SDA	SDA Selector from FT260 or SoC Connect 1 pin and 2 pin: FT260 Connect 3 pin and 2 pin: SoC (CON5 and CON6) Note: Please ignore the silk screen.
	J3	SCL	SCL Selector from FT260 or SoC Connect 1 pin and 2 pin: FT260 Connect 3 pin and 2 pin: SoC (CON5 and CON6)
	J5	MON0	MON0 Pin Monitor 1 Pin: Connect with MON0 Pin 2 Pin: Connect with GND
	J6	MON1	MON1 Pin Monitor 1 Pin: Connect with MON1 Pin 2 Pin: Connect with GND
	J4	GPIO10 GPIO11	GPIO10 (353_BL1_PWM) and GPIO11 (353_BL1_EN) Monitor and Input 1 Pin: GPIO11 (353_BL1_EN) connects with the 11 pin of CON6 2 Pin: GPIO10 (353_BL1_PWM) connects with the 12 pin of CON6
	J1	D_GPIO0 D_GPIO1	D_GPIO0 (353_LCD0_EN) and D_GPIO1 (353_LCD0_RESET) Monitor and Input 1 Pin: D_GPIO1 (353_LCD0_RESET) connects with the 9 pin of CON5. 2 Pin: D_GPIO0 (353_LCD0_EN) connects with the 13 pin of CON5
	J14	GPIO0 GPIO1	GPIO0 (353_BL0_PWM) and GPIO1 (353_BL0_EN) Monitor and Input 1 Pin: GPIO1 (353_BL0_EN) connects with the 11 pin of CON5 2 Pin: GPIO1 (353_BL0_PWM) connects with the 12 pin of CON5
THEVA334-Q_HSD_FAKRA	J1	GPIO1	GPIO1 (334_HI_POW) connector to U1 MPQ3367GR EN pin Connect: GPIO1 connects with U1 MPQ3367GR EN pin. No Connect: U1 MPQ3367GR EN pin connects with GND via pull-down resistor.

Board Name	Component	Signal	Description
	J2	GPIO0	GPIO0 (334_LCD_PWM) connector to U1 MPQ3367GR DIM pin Connect: GPIO0 connects with U1 MPQ3367GR DIM pin. No Connect: U1 MPQ3367GR DIM pin open.
	J3	MON0	MON0 Pin Monitor 1 Pin: Connect with GND 2 Pin: Connect with MON0 Pin
	J4	MON1	MON1 Pin Monitor 1 Pin: Connect with GND 2 Pin: Connect with MON1 Pin
	J14	D_GPIO0 D_GPIO1	1 Pin: D_GPIO1 Monitor and Input D_GPIO1 connects with the 11 pin of CON1 and also the 18 pin of CON2. The 11 pin of CON1 connects with the RESET of the TDO-1230K92467 panel. The 18 pin of CON2 connects with the STBYB of the HSD123KPW1-Axx panel The 18 pin of CON2 connects with the EN of the HSD156JUW2-Axx panel. 2 Pin: D_GPIO0 Monitor and Input D_GPIO0 connects with the 12 pin of CON2 and also the 19 pin of CON2. The 12 pin of CON1 connects with STBYB of the TDO-1230K92467 panel. The 18 pin of CON2 connects with the NC of the HSD123KPW1-Axx panel. The 18 pin of CON2 connects with the RESETB of the HSD156JUW2-Axx panel.

11. Bill of Materials

Table 13. THEVA353-Q_HSD_FAKRA Bill of Materials -1/2

Part Number	Description	Value	Designator	Footprint	Quantity
-	Capacitor	0.1uF	C6, C13, C18, C23, C31, C32, C33, C34, C35, C36, C37, C41, C42, C45, C46, C48, C49, C52, C53, C59, C62, C63, C65, C67, C69, C71	R0402	26
-	Capacitor	1uF	C7, C12, C15, C17, C19, C22	R0402	6
-	Capacitor	10uF	C8, C11, C20, C21, C38	R0805	5
-	Capacitor	0.01uF	C9, C10, C14, C16, C24, C25, C26, C27, C28, C29, C30	R0402	11
-	Capacitor	1uF	C39	R0805	1
-	Capacitor	22uF	C40, C43, C44, C47, C51, C54	R1206	6
-	Capacitor	10uF	C50, C58	R0603	2
-	Capacitor	100pF	C55	R0402	1
-	Capacitor	22uF	C56, C57	R0805	2
-	Capacitor	nc	C60, C61, C76	R0402	8
-	Capacitor	4.7uF	C64, C66, C68, C70, C72, C75	R0805	6
-	Capacitor	47pF	C73, C74	R0402	2
TE_2040002-1	Micro USB 2.0 Type B	-	CN1	TE_2040002-1	1
59S2AQ-40MT5-Z_1	FAKRA Connector	-	CON1	59S2AQ-40MT5-Z_1	1
99S20D-40MA5-D	HSD Connector	-	CON2, CON3	99S20D-40MA5-D	2
FH28D-30S-0.5SH(05)	30pin 0.5mm pitch FFC	-	CON5, CON6	FH28D-30S-0.5SH(05)	2
D Zener	Zener Diode	-	D1	SOD123	1
SML-D12P8WT86	LED	-	D2	LED-0603	1
-	HEADER1x2	-	J1, J4, J5, J6, J14, J15, J16	HEARER_2P	7
-	HEADER1x3	-	J2, J3, J7, J8, J9, J10, J11, J17, J18	HEARER_3P	9
-	HEADER1x8	-	J12	1x8P_2.54	1
-	HEADER1x8	-	J13	1x8P_2.54	1
MJ-179PH	DC-Jack	-	JA1	DC-JACK	1
DLW21SZ900HQ2L	Chip Common Mode Choke Coil	NC	L1, L6	FIL_DLW21SZ900HQ2L	2
MPZ1608B471A	Inductor	-	L2, L3, L4, L5, L9	R0603	5
MWSA0603S-4R7MT	DCR=33mR,Isat=9,Irms=6	-	L8	MWSA0603S-4R7MT	1
PGB1010603MR	No Description Available	-	L10, L11	IND_PGB_0603_LTF	2
SMAJ103-T16	SMA Connector	NC	P1, P2, P3, P4	SMA-SMAJ103	4
-	Resistor	nc	R1, R11, R71, R72, R77	R0402	8

Table 14. THEVA353-Q_HSD_FAKRA Bill of Materials -2/2

Part Number	Description	Value	Designator	Footprint	Quantity
-	Resistor	10kohm	R2	R0402	1
-	Resistor	0	R3, R5, R15, R21, R22, R26, R27, R30, R32, R88, R91, R94, R95	R0402	13
-	Resistor	nc/0	R4, R12, R18, R19, R20, R24, R25, R28, R29, R87, R92	R0402	11
-	Resistor	2.2k	R6, R7	R0402	2
-	Resistor	10k	R8, R9, R10, R82, R85, R89, R90	R0402	7
-	Resistor	100	R13	R0402	1
-	Resistor	nc/50	R14, R23	R0402	2
-	Resistor	nc/1k	R16	R0402	1
-	Resistor	nc/30k	R17	R0402	1
-	Resistor	0	R31, R33, R35, R37, R39, R41, R43, R45, R47, R50, R51, R54, R55, R58, R59, R62, R63, R66, R67, R69	R0402	20
-	Resistor	62	R70	R0402	1
-	Resistor	66.5k	R73	R0402	1
-	Resistor	35.7k	R74	R0402	1
-	Resistor	0	R75	R0603	1
-	Resistor	47k	R76	R0402	1
-	Resistor	100k	R78	R0402	1
-	Resistor	24.3k	R79	R0402	1
-	Resistor	13.3k	R80	R0402	1
-	Resistor	5.1k	R81	R0402	1
-	Resistor	33	R83, R84	R0402	2
-	Resistor	4.7k	R86	R0402	1
-	Resistor	10	R93	R0402	1
-	Test Point	-	TP1, TP2, TP3	TP0.8	3
THCV353-Q	V-by-One®HSII Serializer	-	U1		1
LT3088EST#PBF	LDO	-	U2, U3, U4	SOT-223_DIO	3
SY8104IADC	DCDC Converter	-	U5	TSOT23-6	1
FT260	USB to UART/I2C Brigde	-	U6	WQFN-28	1
FJ2400011	Oscillator	-	Y1	SMD2520-4P	1

Table 15. THEVA334-Q_HSD_FAKRA Bill of Materials -1/2

Part Number	Description	Value	Designator	Footprint	Quantity
-	Capacitor	10uF	C1, C6, C11, C19, C20, C27, C49	R0805	7
-	Capacitor	1uF	C2, C5, C12, C18, C21, C28, C41, C44, C45, C50	R0805	10
-	Capacitor	0.1uF	C3, C4, C13, C17, C22, C25, C26, C29, C32, C33, C34, C35, C38, C51, C52, C59, C60, C63, C64, C67, C68, C79	R0402	22
-	Capacitor	0.01uF	C7, C8, C9, C10, C14, C15, C16, C23, C24, C30, C31, C36	R0402	12
-	Capacitor	4.7uF	C37, C39	R0805	2
-	Capacitor	100uF	C40, C43	R1210	2
-	Capacitor	47u	C42	R1206	1
-	Capacitor	1nF	C46, C47	R0402	2
-	Capacitor	0.47uF	C48	R0805	1
-	Capacitor	10uF	C53, C57	R0603	2
-	Capacitor	100pF	C54	R0402	1
-	Capacitor	22uF	C55, C56	R0805	2
-	Capacitor	22uF	C58, C61, C62, C65, C66, C69	R1206	6
-	Capacitor	nc/0.1uF	C74, C75, C76	R0402	3
-	Capacitor	nc/33nF	C77, C78	R0402	2
-	Capacitor	NC/100pF	C80, C81, R13, R36	R0402	1
-	Capacitor	NC/22pF	C81	R0402	1
DLW21SZ900HQ2L	Chip Common Mode Choke Coil	NC	L7, L8	FIL_DLW21SZ900HQ2L	2
SY8104IADC	DCDC Converter	-	U2	TSOT23-6	1
LT3088EST#PBF	DCDC Converter	-	U4	SOT-223_DIO	1
MJ-179PH	DC-JACK	-	JA1	DC-JACK	1
1N4148W-7-F	Diode	-	CR1	SOD123_DIO	1
59S2AQ-40MT5-Z_1	FAKRA Connector	-	CON3	59S2AQ-40MT5-Z_1	1
SSM3K16FS	FET	-	Q1	2H1B	1
-	HEADER1x2	-	J1, J2, J3, J4, J14, J15	1x2P_2.54	6
-	HEADER1x3	-	J5, J6, J7, J8, J9, J10, J11	1x3P_2.54	7
-	HEADER1x8	-	J13	1x8P_2.54	1
-	HEADER1x9	-	J12	1x9P_2.54	1
99S20D-40MA5-D	HSD Connector	-	CON4	99S20D-40MA5-D	1
MPZ1608B471A	Inductor	-	L1, L2, L3, L4, L5, L6	R0603	6
MPZ1608S600ATAH0	Inductor	-	L9	IND_1608_TDK	1
DD1274AS-H-220M=P3	Inductor	22uH	L10	IND_DD1274AS-H-220M=P3	1
MWSA0603S-4R7MT	Inductor	4.7uH	L17	MWSA0603S-4R7MT	1

Table 16. THEVA334-Q_HSD_FAKRA Bill of Materials -2/2

Part Number	Description	Value	Designator	Footprint	Quantity
AZ1117CH-ADJTRG1	LDO	-	U3, U5	SOT-223_DIO	2
SML-D12M8WT86	LED	-	D1	LED-0603	1
SML-D12P8WT86	LED	-	D3	LED-0603	1
MPQ3367GR-AEC1	LED Driver	-	U1	QFN-24	1
-	Resistor	NC/0ohm	R13	R0402	1
-	Resistor	NC/0ohm	R36	R0402	1
-	Resistor	nc/0ohm	R1, R4, R50, R54, R107, R108	R0402	6
-	Resistor	0ohm	R2, R5, R6, R11, R18, R19, R21, R24, R28, R29, R51, R53, R96, R97	R0402	14
-	Resistor	10kohm	R3, R14, R22	R0402	3
-	Resistor	nc / 50ohm	R7	R0402	1
-	Resistor	2.2kohm	R8, R9	R0402	2
-	Resistor	220ohm	R10	R0402	1
-	Resistor	200kohm	R12	R0402	1
-	Resistor	33kohm	R15	R0402	1
-	Resistor	1kohm	R16	R0402	1
-	Resistor	82kohm	R17	R0402	1
-	Resistor	33ohm	R20, R23	R0402	2
-	Resistor	270ohm	R25	R0402	1
-	Resistor	20kohm	R26, R27	R0402	2
-	Resistor	3.3kohm	R30	R0402	1
-	Resistor	0ohm	R31, R106	R0603	2
-	Resistor	47Kohm	R32	r0402	1
-	Resistor	100Kohm	R33	r0402	1
-	Resistor	62ohm	R34	R0402	1
-	Resistor	475ohm	R35, R39	R0402	2
-	Resistor	768ohm	R37, R40	R0402	2
-	Resistor	24.3kohm	R38	R0402	1
-	Resistor	0ohm	R41, R44, R46, R49, R55, R58, R60, R63, R65, R66, R71, R73, R74, R78, R80, R81, R86, R87, R90, R93, R101, R104, R105	R0402	23
-	Resistor	nc/0ohm	R42, R45, R47, R52, R56, R59, R61, R64, R67, R68, R72, R76, R77, R79, R82, R83, R88, R89, R91, R94, R100, R102, R103	R0402	23
-	Resistor	nc/100ohm	R43, R48, R57, R62, R69, R70, R75, R84, R85, R92, R95	R0402	11
-	Resistor	nc/1kohm	R98	R0402	1
-	Resistor	13.3Kohm	R99	R0402	1
SMAJ103-T16	SMA Connector	NC	P1, P2, P3, P4	SMA-SMAJ103	4
-	TestPoint	-	TP1, TP2	TP0.8	2
F31L-1A7H1-21050	TFT Connector	-	CON1, CON2	F31L-50P	2
TE_2040002-1	USB 2.0 Micro Type B	-	CN1	TE_2040002-1	1
THCV334-Q	V-by-One®HSII Deserializer	-	IC1	QFN64-2	1
KDZLVTF82	Zener Diode	-	D2	SOD123	1

12. Schematics

Figure 9. THEVA353-Q_HSD_FAKRA Schematics -1/5

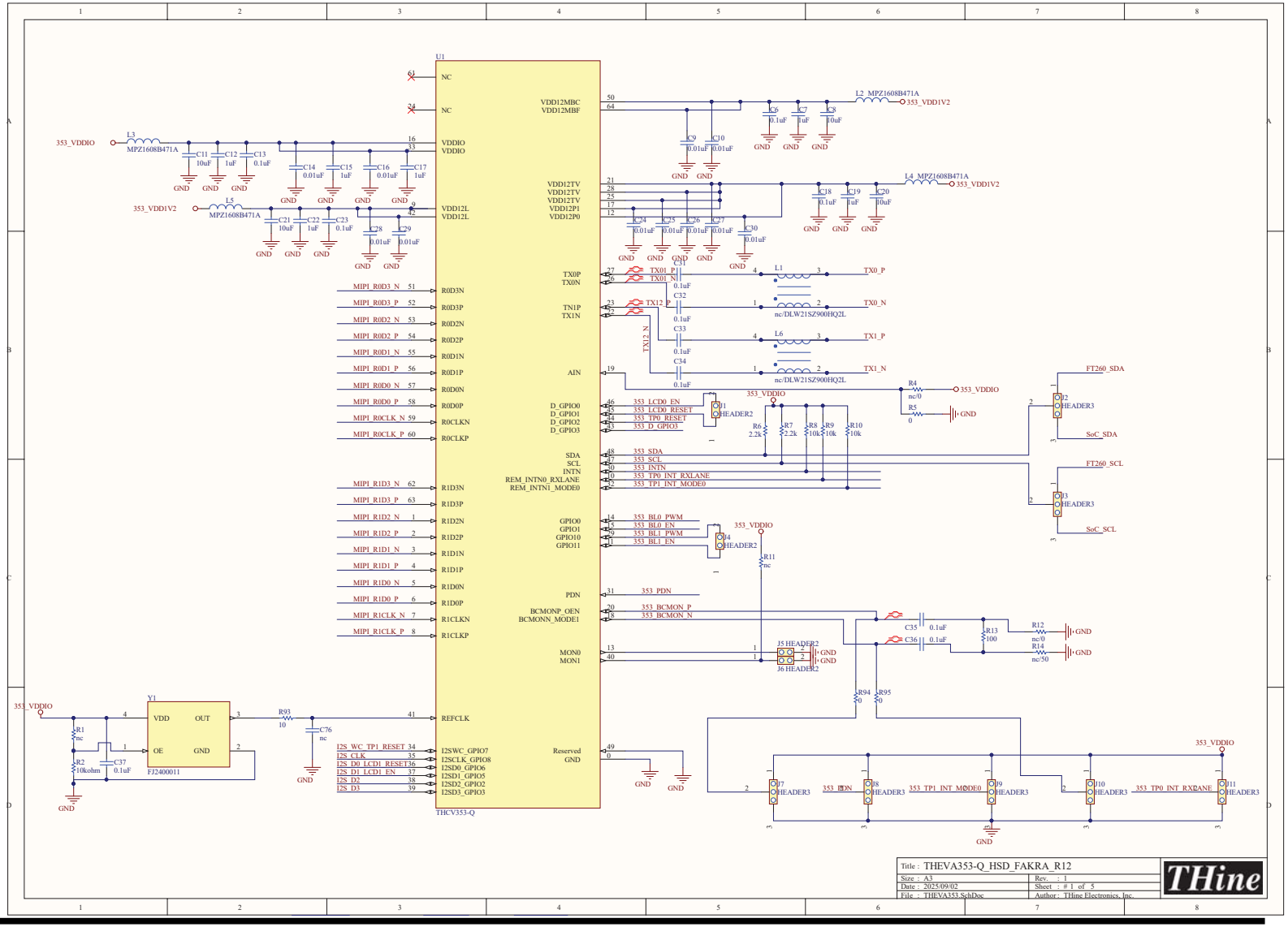


Figure 10. THEVA353-Q_HSD_FAKRA Schematics -2/5

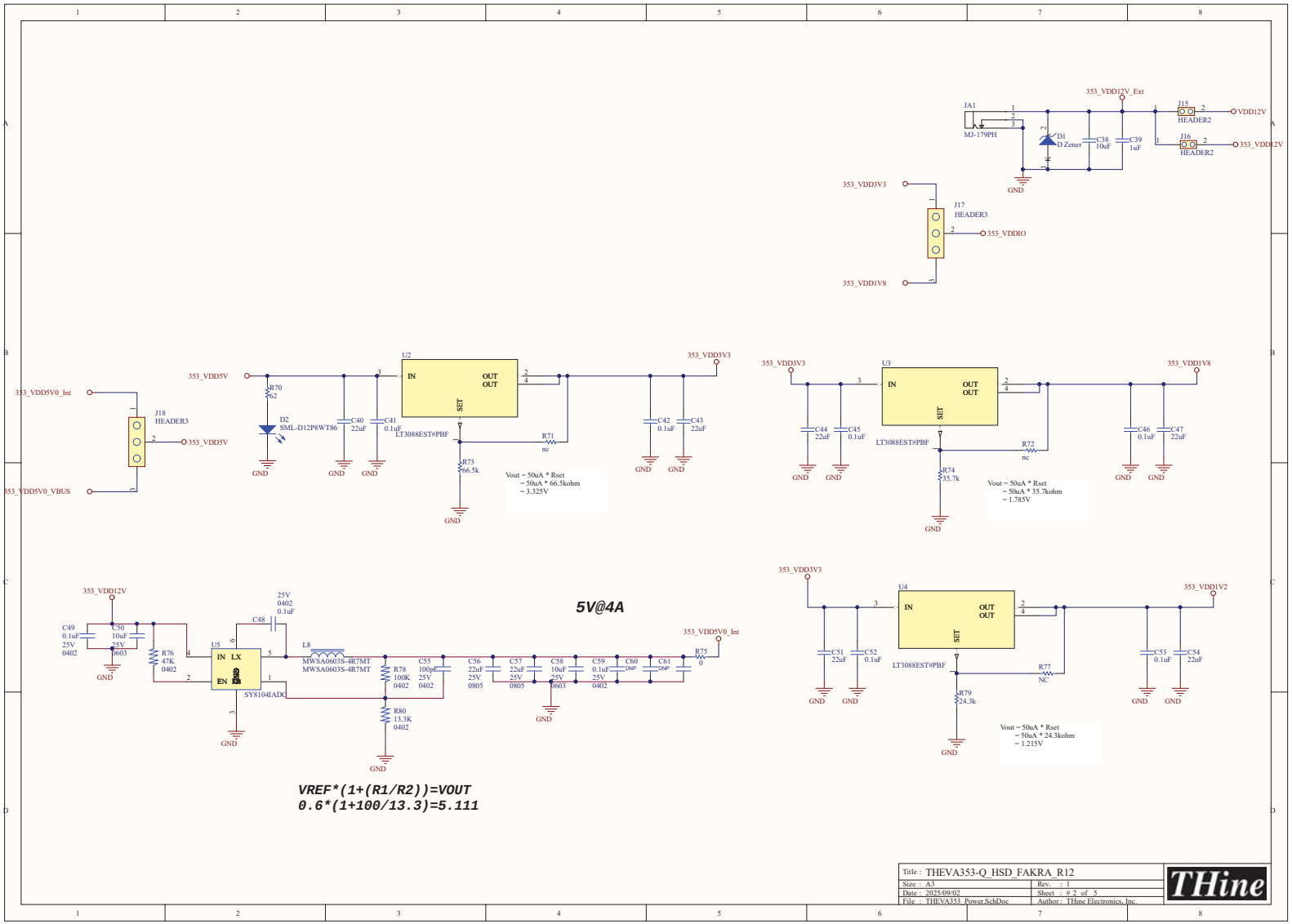


Figure 11. THEVA353-Q_HSD_FAKRA Schematics -3/5

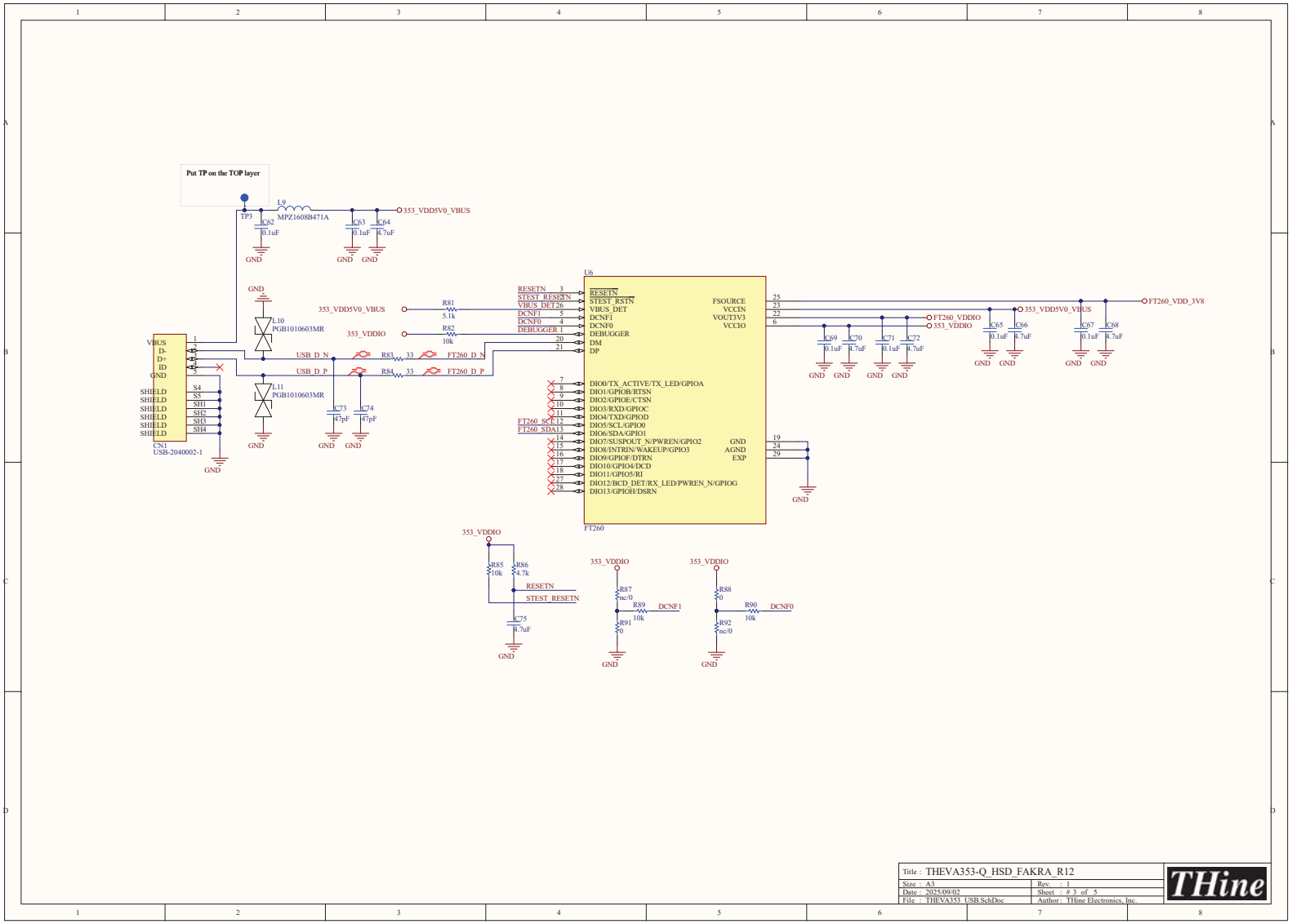


Figure 12. THEVA353-Q_HSD_FAKRA Schematics -4/5

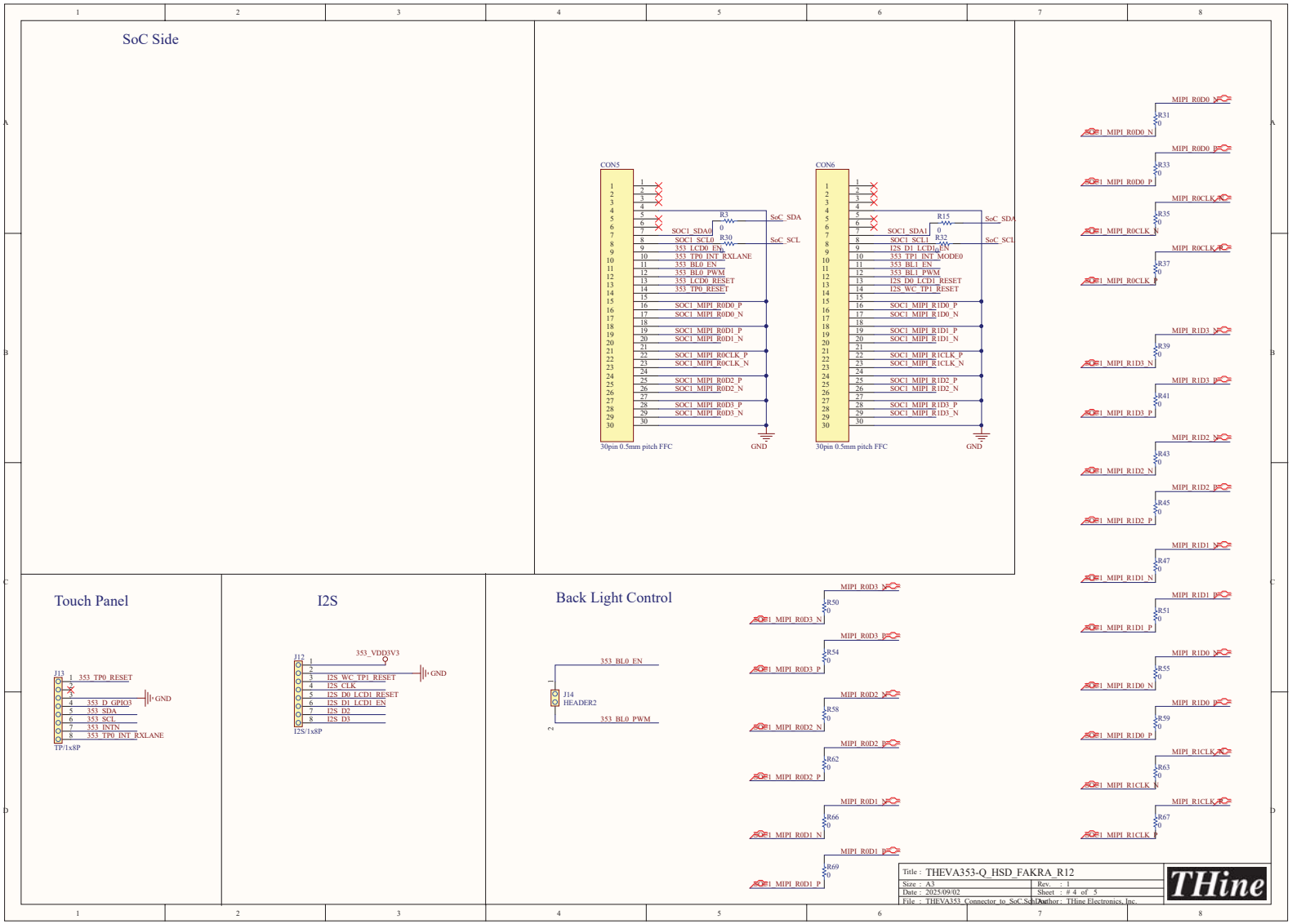


Figure 13. THEVA353-Q_HSD_FAKRA Schematics -5/5

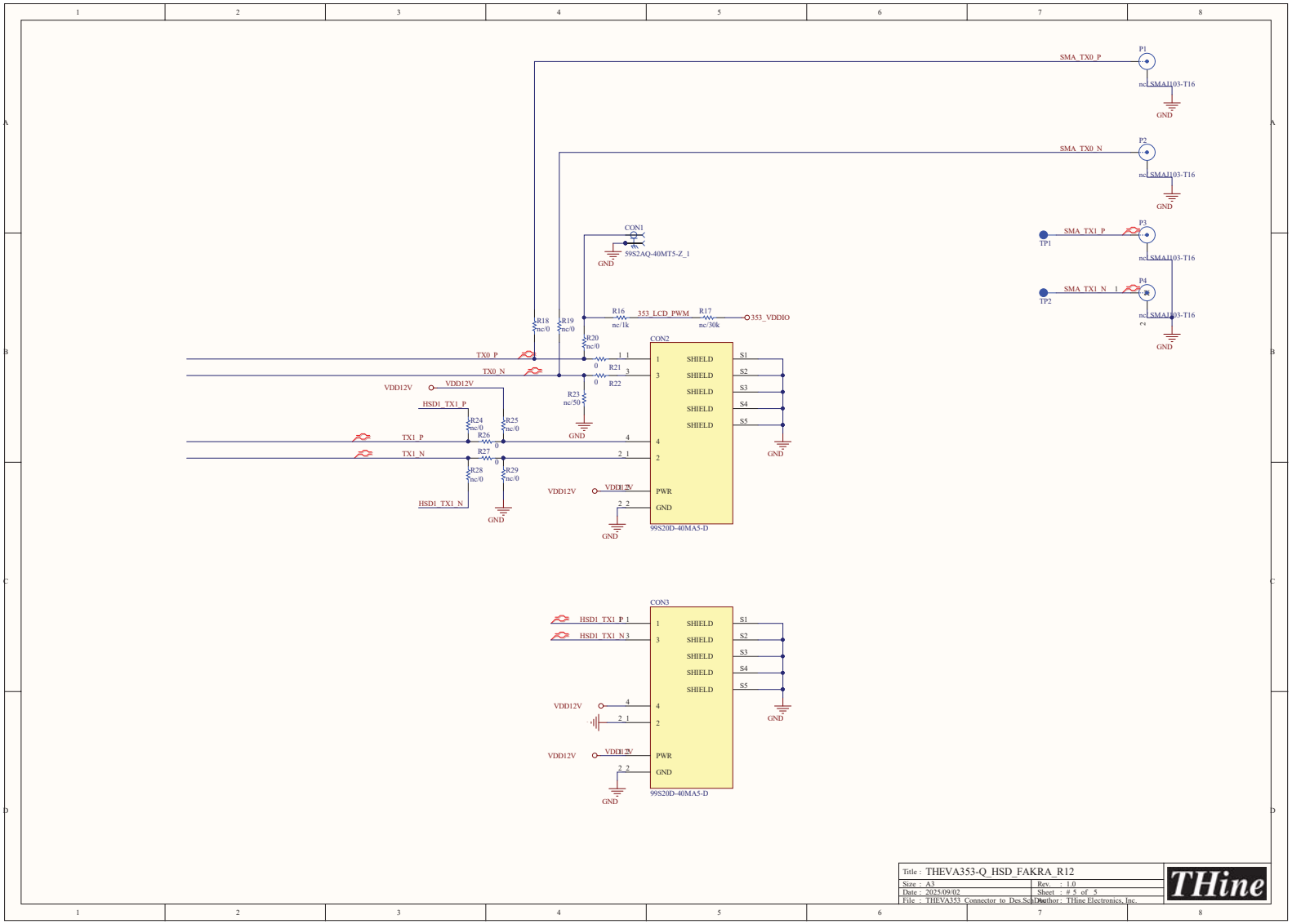


Figure 14. THEVA334-Q_HSD_FAKRA Schematics -1/4

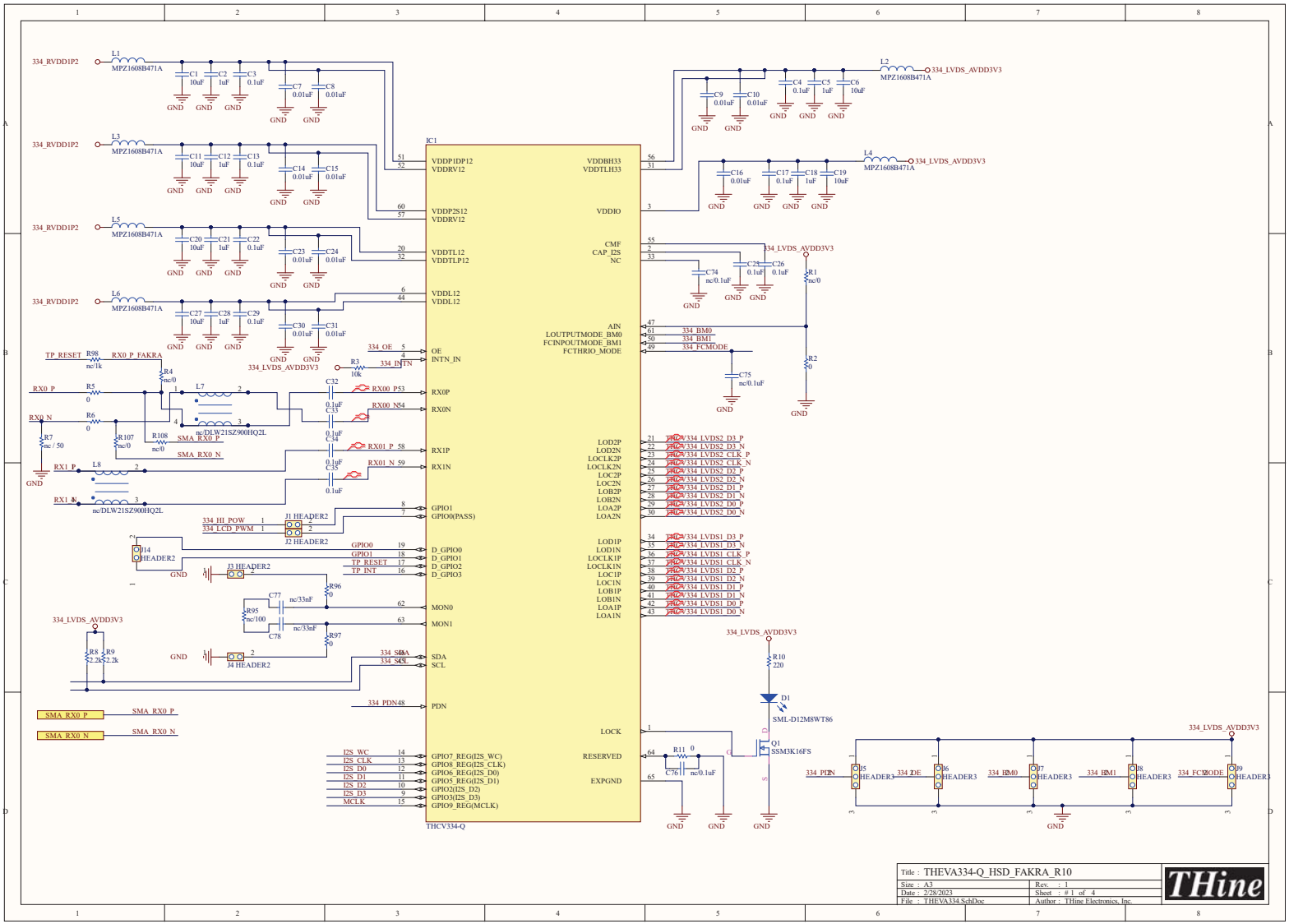


Figure 15. THEVA334-Q_HSD_FAKRA Schematics -2/4

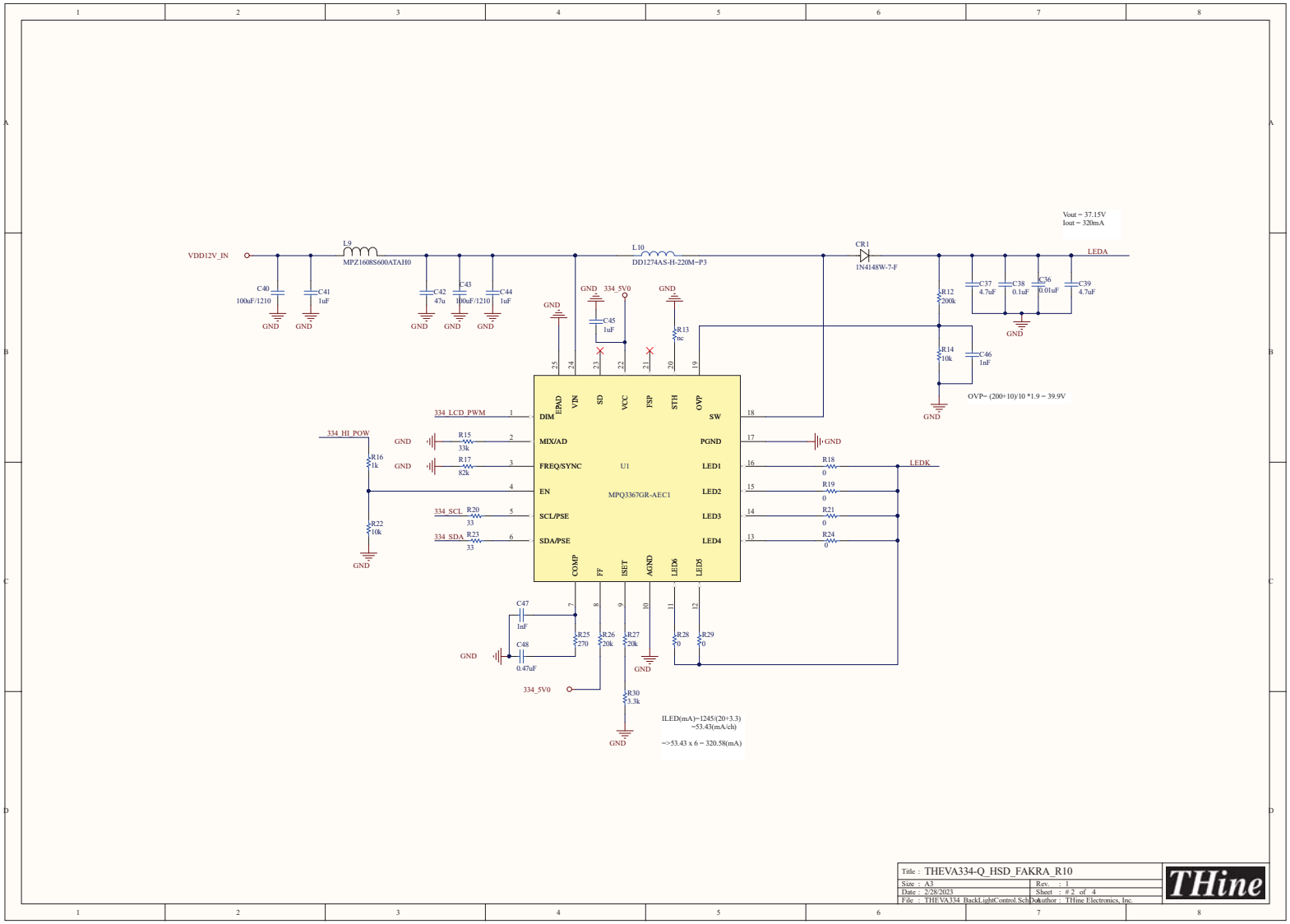


Figure 16. THEVA334-Q_HSD_FAKRA Schematics -3/4

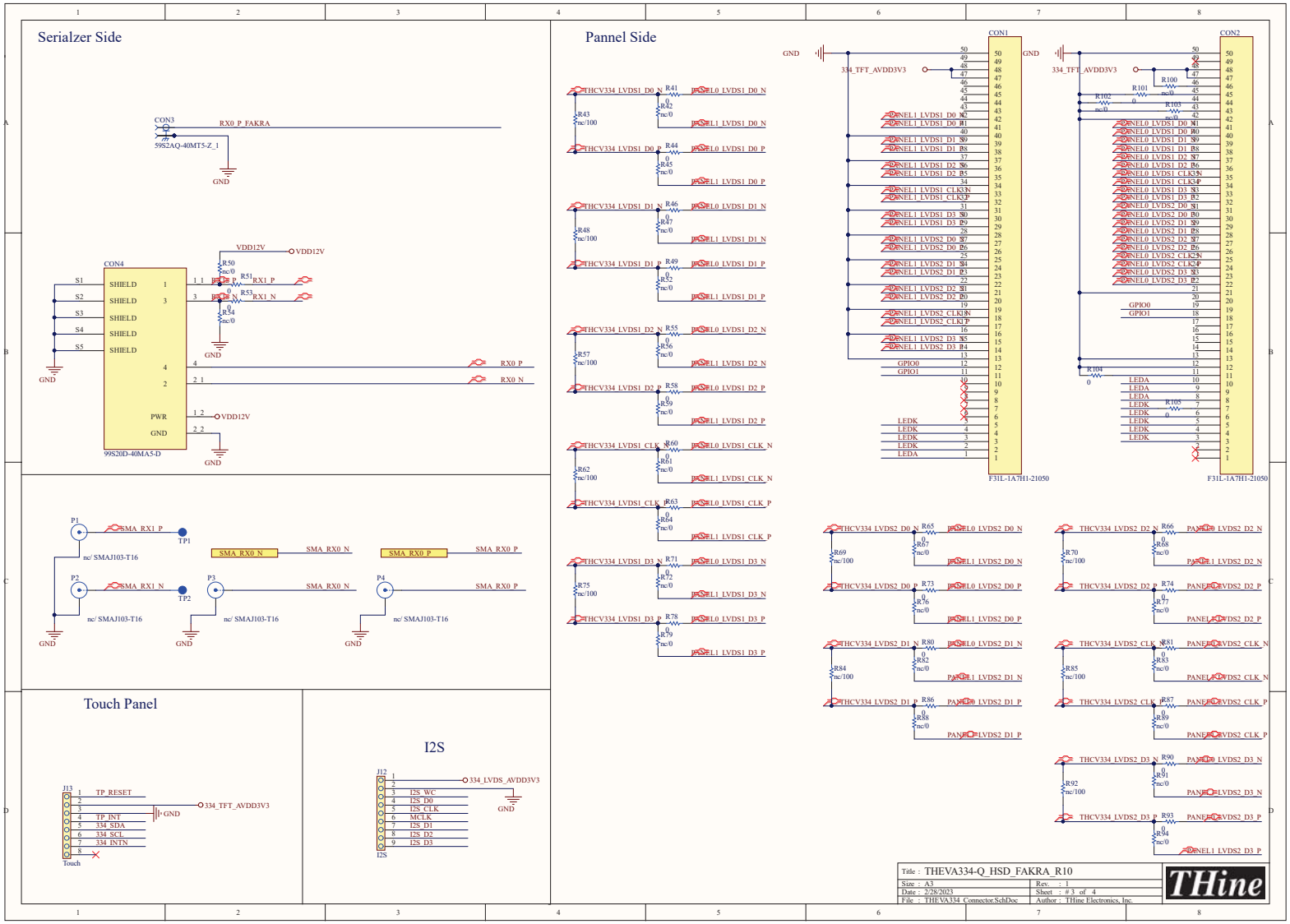


Figure 17. THEVA334-Q_HSD_FAKRA Schematics -4/4

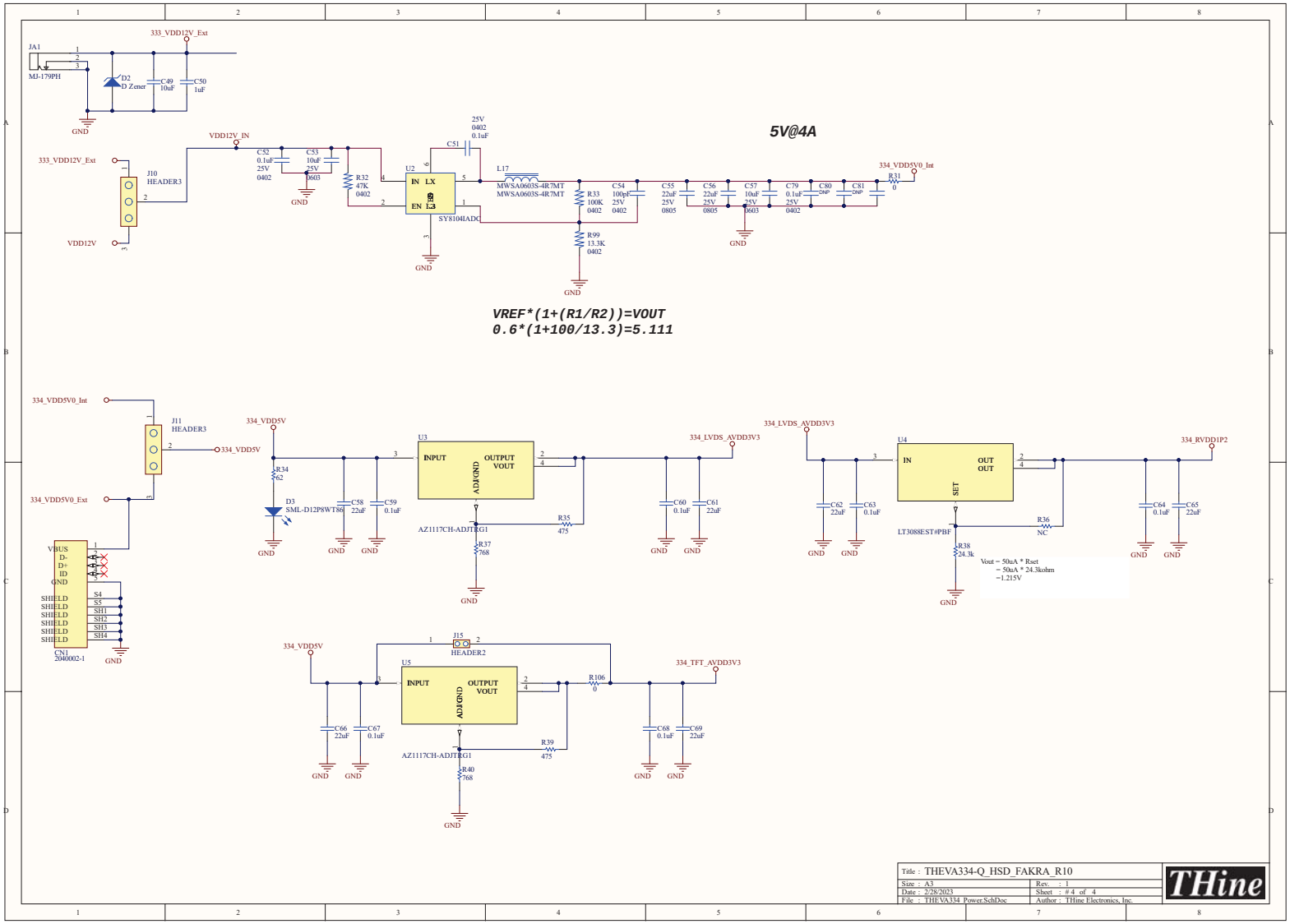
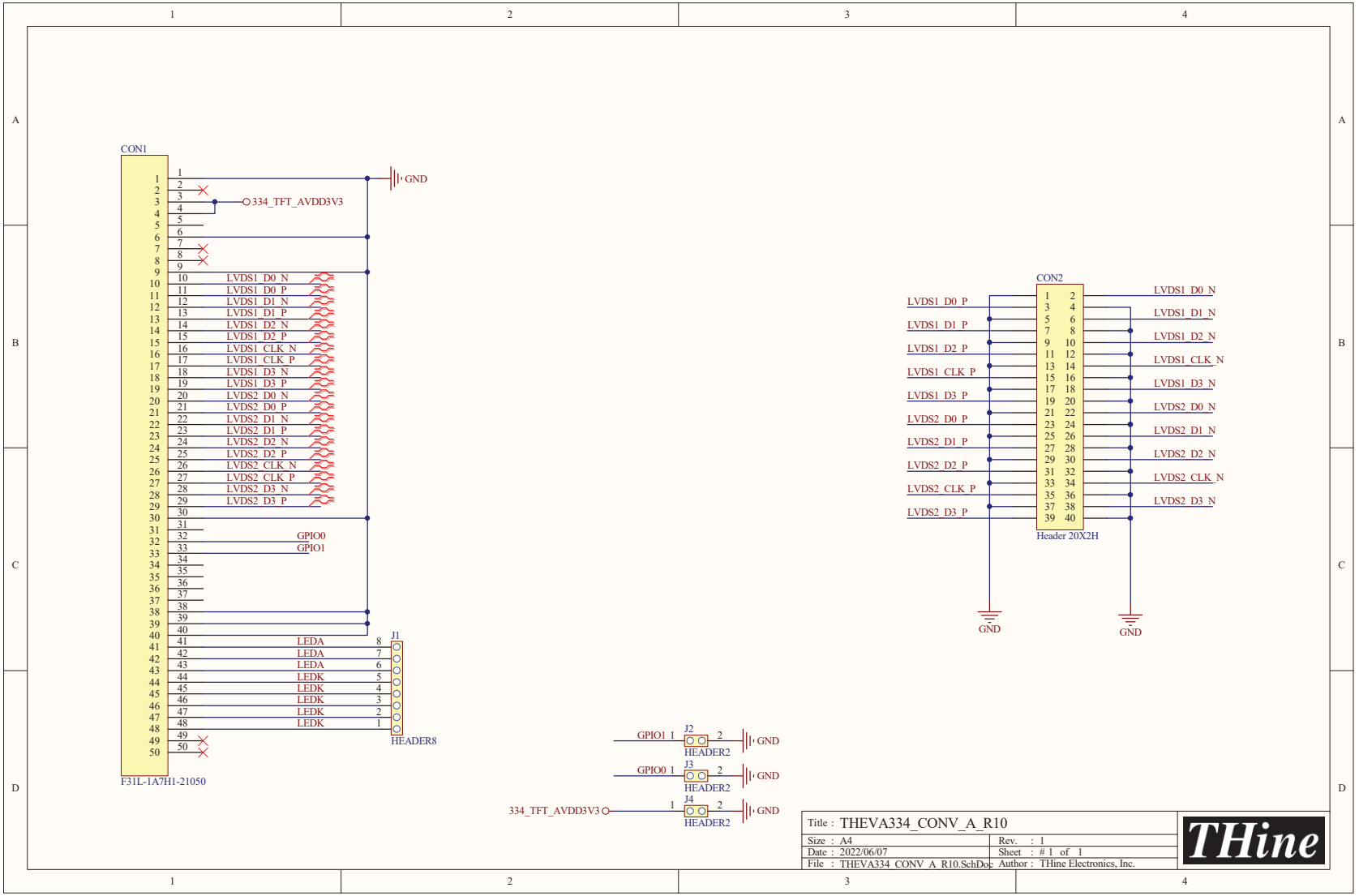


Figure 18. THEVA334-Q_CONV_A Schematics -1/1



13. Layouts

Figure 19. THEVA353-Q_HSD_FAKRA Layout -1/3

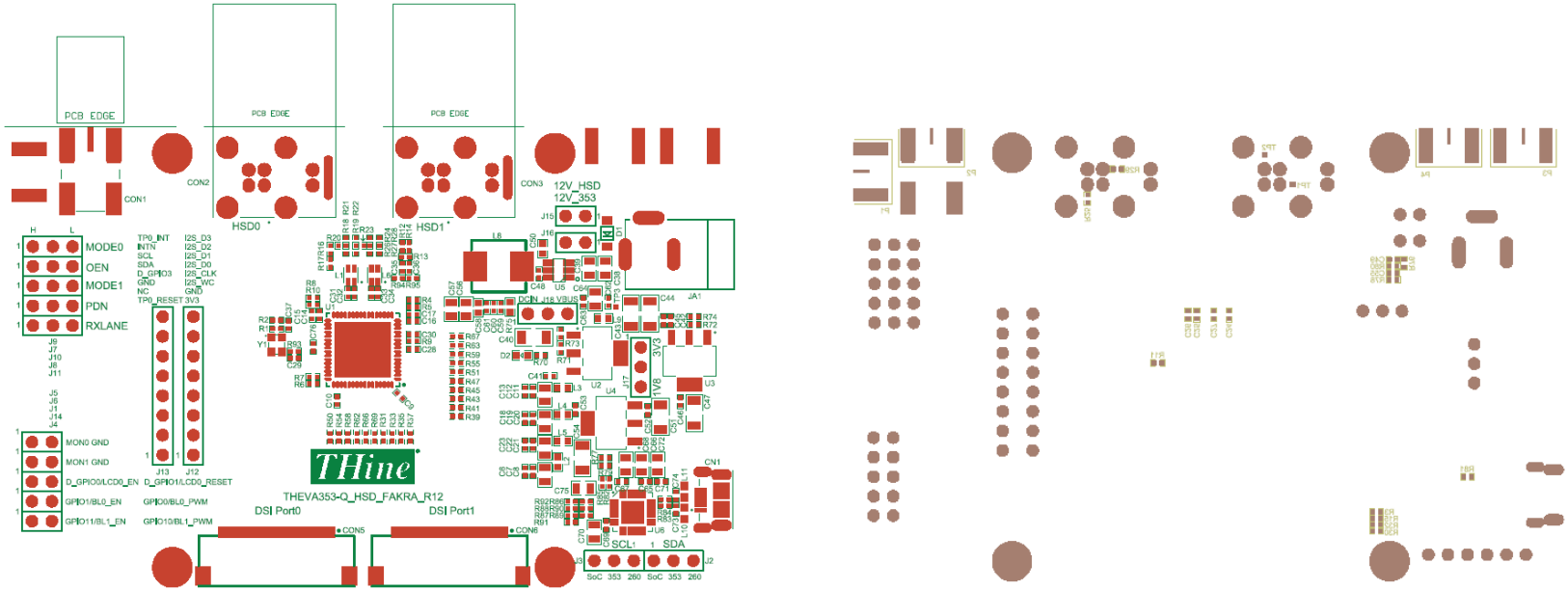


Figure 20. THEVA353-Q_HSD_FAKRA Layout -2/3

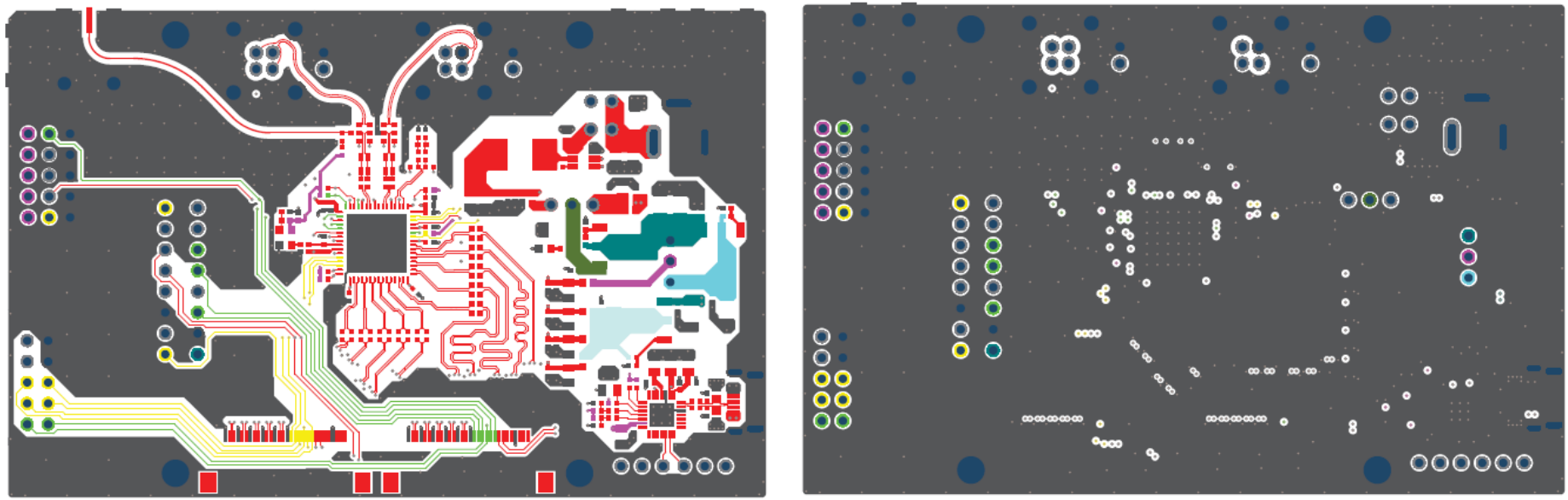


Figure 21. THEVA353-Q_HSD_FAKRA Layout -3/3

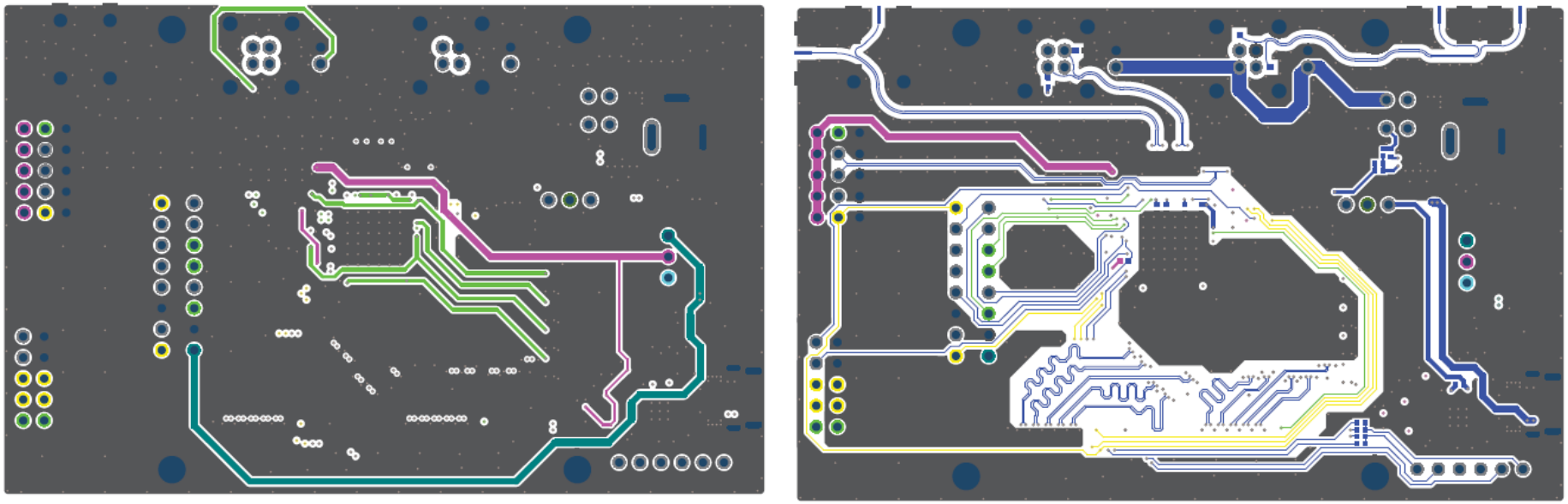


Figure 22. THEVA334-Q_HSD_FAKRA Layout -1/2

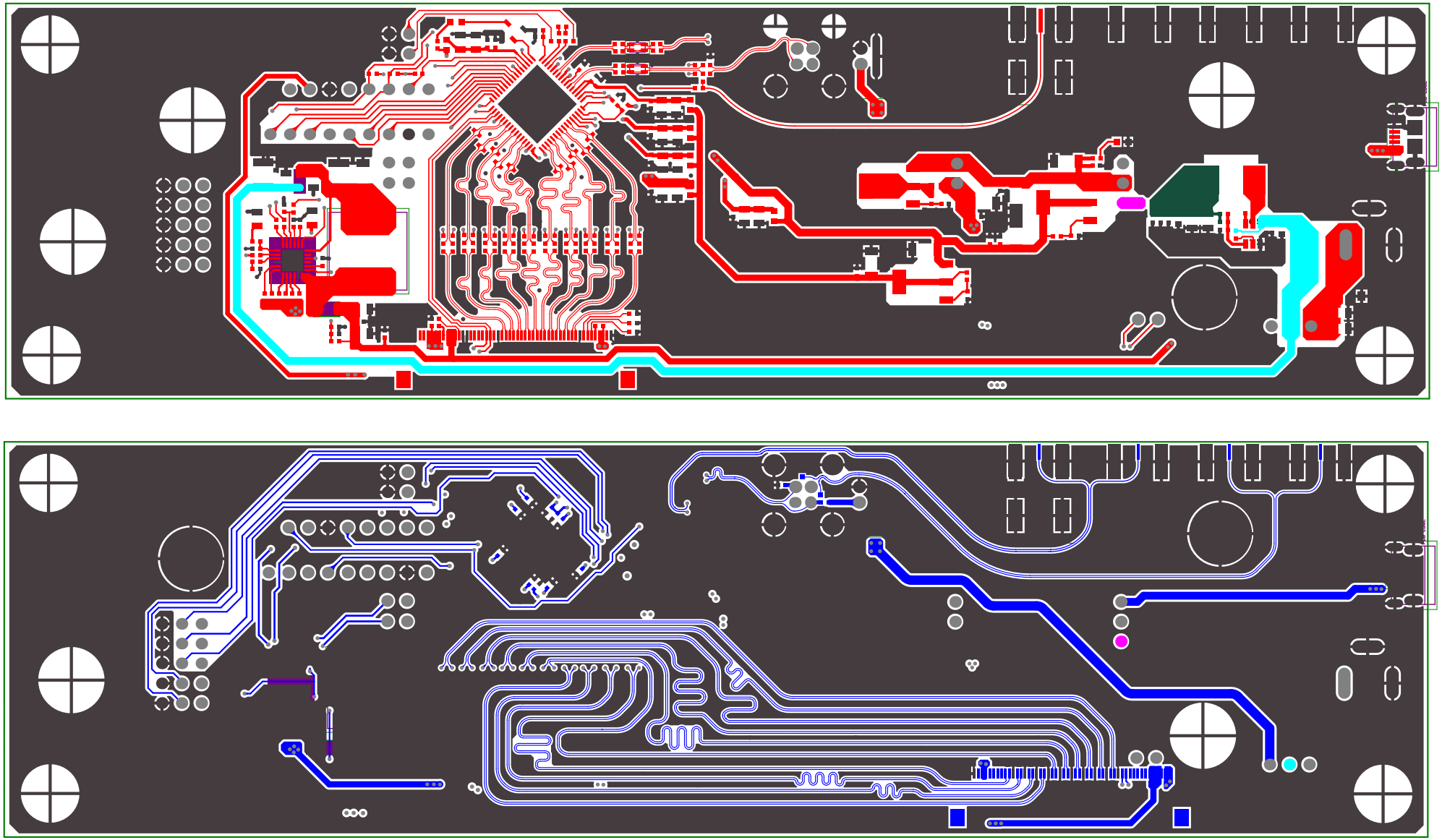


Figure 23. THEVA334-Q_HSD_FAKRA Layout -2/2

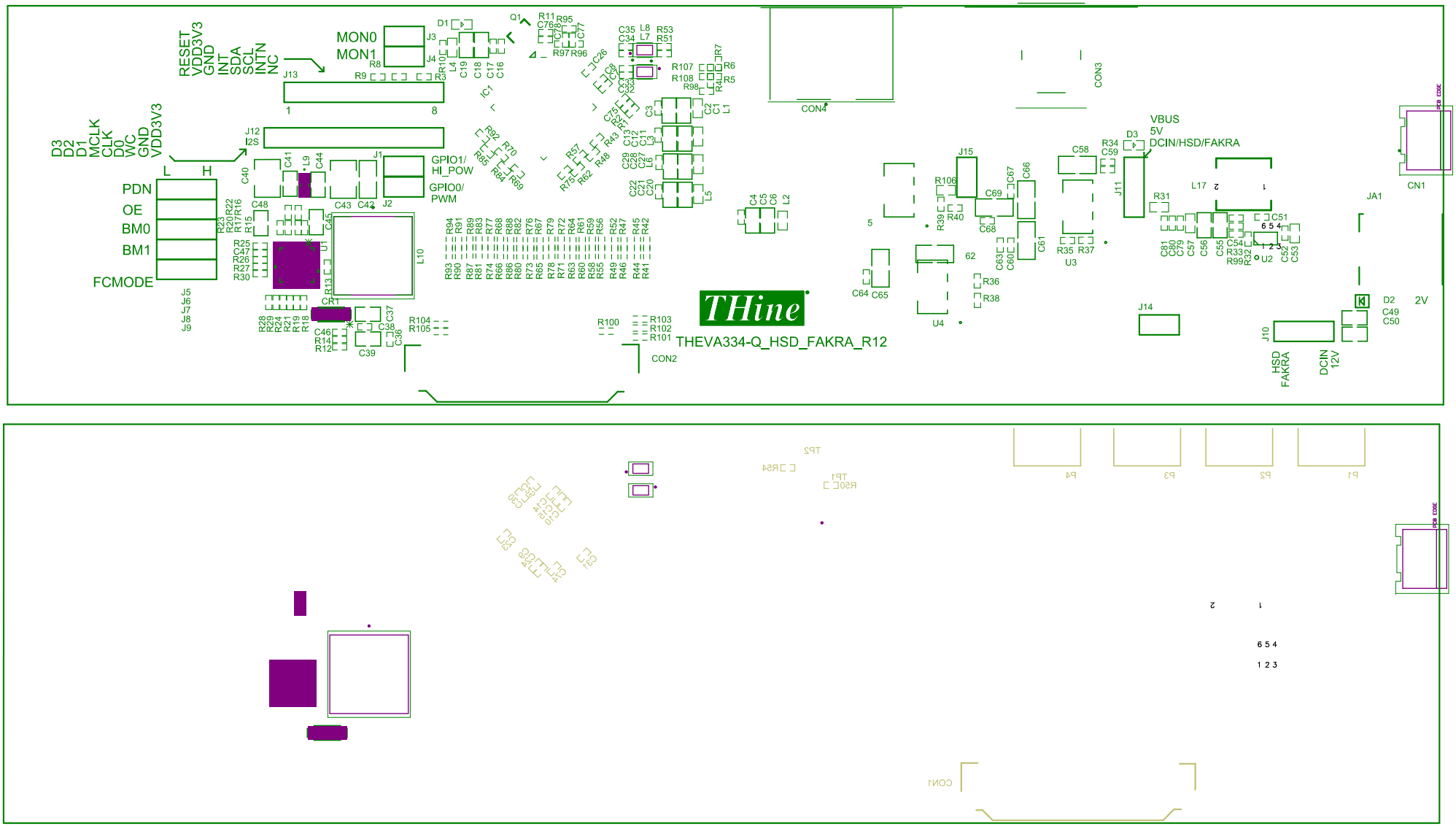
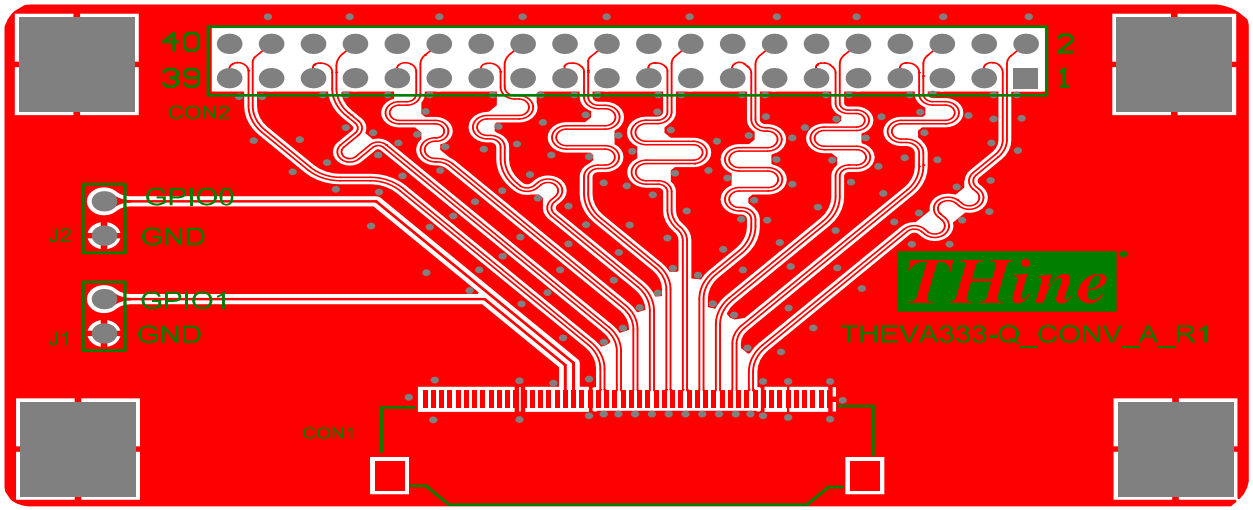


Figure 24. THEVA334-Q_CONV_A Layout



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Please kindly read, understand and accept this "Notices and Requests" before using this product.

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2. The circuit diagrams described in this material are examples of the application which may not always apply to design of respective customers. THine Electronics, Inc. ("THine") is not responsible for possible errors and omissions in this material. Please note even if the errors or omissions should be found in this material, THine may not be able to correct them immediately.

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