



# THCV215/216-8LANE Evaluation Kits

SerDes transmitter and receiver evaluation board

## 1. General Discription

THCV215/216-8LANE Evaluation Kits are designed to evaluate THCV215 and THCV216 for transmission of video data. Each has four THCV215's or four THCV216's.

This kits can transmit video data of "Full-HD / 240 Hz / 30 bit" and "4Kx2K / 60 Hz / 30 bit".

The supply voltage range are "3.0V to 3.6V" or "5.0V to 12.0V".

## 2. Block Diagram

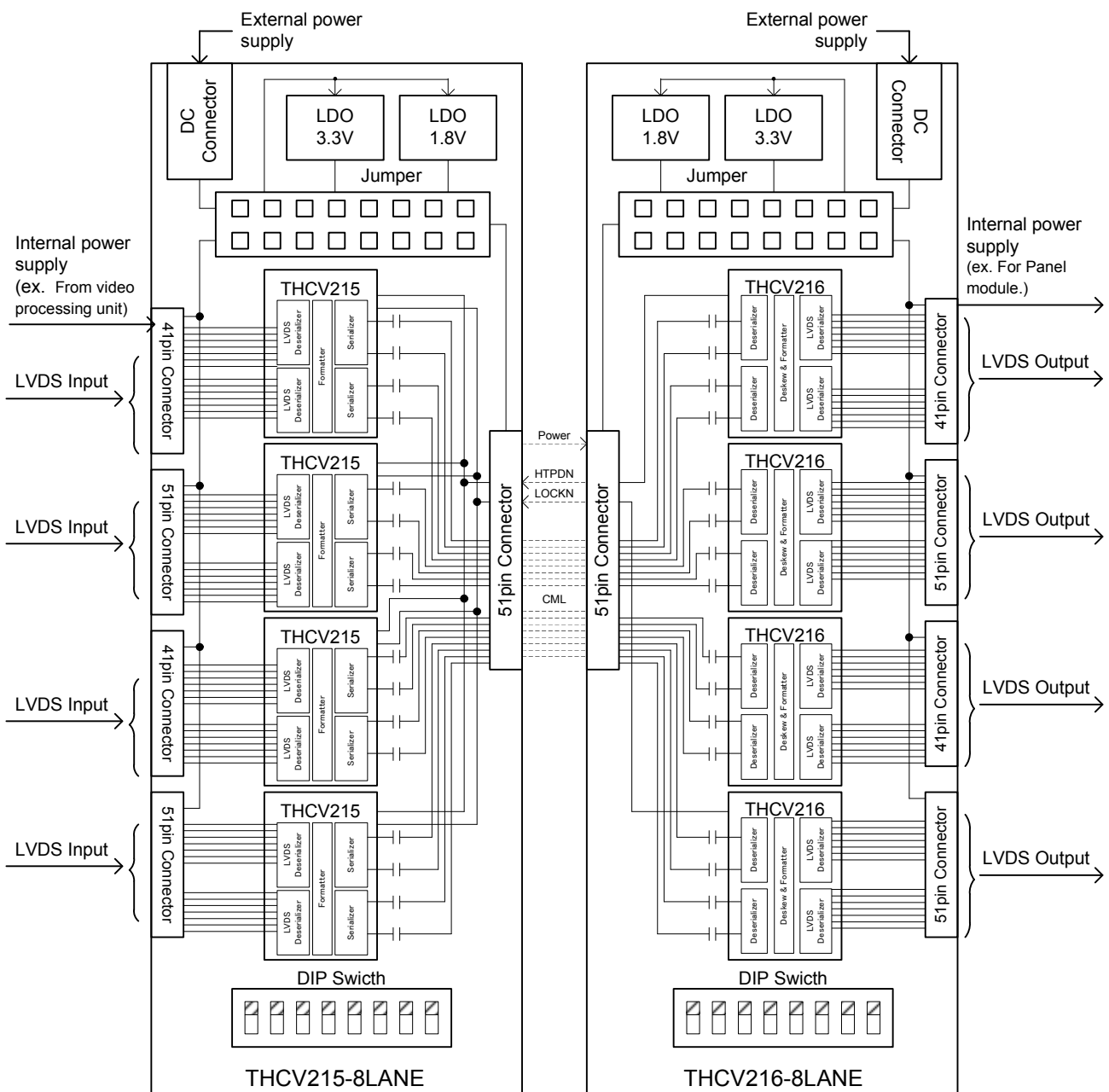


Figure 2-1. Block Diagram



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## 3. Connector

This chapter shows the connector to connect the THCV215 and THCV216.

Table 3-1. Pin assignments of LVDS connector ( 41 pin )

| THCV215<br>CN101 & CN301 |         | Descriptions  | THCV216<br>CN102 & CN104 |         |
|--------------------------|---------|---|--------------------------|---------|
| Pin No.                  | Symbol  |   | Symbol                   | Pin No. |
| 1                        | Vcc     | Supply voltage from video processing unit, And for Panel module (Internal Supply) | Vcc                      | 41      |
| 2                        |         |   |                          | 40      |
| 3                        |         |   |                          | 39      |
| 4                        |         |   |                          | 38      |
| 5                        |         |   |                          | 37      |
| 6                        | NC      | Non Connected   | NC                       | 36      |
| 7                        | GND     | Ground  | GND                      | 35      |
| 8                        |         |   |                          | 34      |
| 9                        |         |   |                          | 33      |
| 10                       | TLA0-   | LVDS data input/output  | RLA0-                    | 32      |
| 11                       | TLA0+   |   | RLA0+                    | 31      |
| 12                       | TLB0-   |   | RLB0-                    | 30      |
| 13                       | TLB0+   |   | RLB0+                    | 29      |
| 14                       | TLC0-   |   | RLC0-                    | 28      |
| 15                       | TLC0+   | RLC0+   | 27                       |         |
| 16                       | GND     | Ground  | GND                      | 26      |
| 17                       | TLCLK0- | LVDS clock input/output   | RLCLK0-                  | 25      |
| 18                       | TLCLK0+ |   | RLCLK0+                  | 24      |
| 19                       | GND     | Ground  | GND                      | 23      |
| 20                       | TLD0-   | LVDS data input/output  | RLD0-                    | 22      |
| 21                       | TLD0+   |   | RLD0+                    | 21      |
| 22                       | TLE0-   |   | RLE0-                    | 20      |
| 23                       | TLE0+   |   | RLE0+                    | 19      |
| 24                       | GND     | Ground  | GND                      | 18      |
| 25                       | TLA1-   | LVDS data input/output  | RLA1-                    | 17      |
| 26                       | TLA1+   |   | RLA1+                    | 16      |
| 27                       | TLB1-   |   | RLB1-                    | 15      |
| 28                       | TLB1+   |   | RLB1+                    | 14      |
| 29                       | TLC1-   |   | RLC1-                    | 13      |
| 30                       | TLC1+   |   | RLC1+                    | 12      |
| 31                       | GND     | Ground  | GND                      | 11      |
| 32                       | TLCLK1- | LVDS clock input/output   | RLCLK1-                  | 10      |
| 33                       | TLCLK1+ |   | RLCLK1+                  | 9       |
| 34                       | GND     | Ground  | GND                      | 8       |
| 35                       | TLD1-   | LVDS data input/output  | RLD1-                    | 7       |
| 36                       | TLD1+   |   | RLD1+                    | 6       |
| 37                       | TLE1-   |   | RLE1-                    | 5       |
| 38                       | TLE1+   |   | RLE1+                    | 4       |
| 39                       | GND     | Ground  | GND                      | 3       |
| 40                       | NC      | Non Connected   | NC                       | 2       |
| 41                       |         |   |                          | 1       |

Table 3-2. Pin assignments of LVDS connector ( 51 pin )

| THCV215<br>CN201 & CN401 |         | Descriptions  | THCV216<br>CN103 & CN105 |         |
|--------------------------|---------|---|--------------------------|---------|
| Pin No.                  | Symbol  |   | Symbol                   | Pin No. |
| 1                        | Vcc     | Supply voltage from video processing unit, And for Panel module (Internal Supply) | Vcc                      | 51      |
| 2                        |         |   |                          | 50      |
| 3                        |         |   |                          | 49      |
| 4                        |         |   |                          | 48      |
| 5                        |         |   |                          | 47      |
| 6                        | NC      | Non Connected   | NC                       | 46      |
| 7                        | GND     | Ground  | GND                      | 45      |
| 8                        |         |   |                          | 44      |
| 9                        |         |   |                          | 43      |
| 10                       | TLA0-   | LVDS data input/output  | RLA0-                    | 42      |
| 11                       | TLA0+   |   | RLA0+                    | 41      |
| 12                       | TLB0-   |   | RLB0-                    | 40      |
| 13                       | TLB0+   |   | RLB0+                    | 39      |
| 14                       | TLC0-   |   | RLC0-                    | 38      |
| 15                       | TLC0+   | RLC0+   | 37                       |         |
| 16                       | GND     | Ground  | GND                      | 36      |
| 17                       | TLCLK0- | LVDS clock input/output   | RLCLK0-                  | 35      |
| 18                       | TLCLK0+ |   | RLCLK0+                  | 34      |
| 19                       | GND     | Ground  | GND                      | 33      |
| 20                       | TLD0-   | LVDS data input/output  | RLD0-                    | 32      |
| 21                       | TLD0+   |   | RLD0+                    | 31      |
| 22                       | TLE0-   |   | RLE0-                    | 30      |
| 23                       | TLE0+   |   | RLE0+                    | 29      |
| 24                       | GND     | Ground  | GND                      | 28      |
| 25                       | TLA1-   | LVDS data input/output  | RLA1-                    | 27      |
| 26                       | TLA1+   |   | RLA1+                    | 26      |
| 27                       | TLB1-   |   | RLB1-                    | 25      |
| 28                       | TLB1+   |   | RLB1+                    | 24      |
| 29                       | TLC1-   |   | RLC1-                    | 23      |
| 30                       | TLC1+   |   | RLC1+                    | 22      |
| 31                       | GND     | Ground  | GND                      | 21      |
| 32                       | TLCLK1- | LVDS clock input/output   | RLCLK1-                  | 20      |
| 33                       | TLCLK1+ |   | RLCLK1+                  | 19      |
| 34                       | GND     | Ground  | GND                      | 18      |
| 35                       | TLD1-   | LVDS data input/output  | RLD1-                    | 17      |
| 36                       | TLD1+   |   | RLD1+                    | 16      |
| 37                       | TLE1-   |   | RLE1-                    | 15      |
| 38                       | TLE1+   |   | RLE1+                    | 14      |
| 39                       | GND     | Ground  | GND                      | 13      |
| 40                       | NC      | Non Connected   | NC                       | 12      |
| 41                       |         |   |                          | 11      |
| 42                       |         |   |                          | 10      |
| 43                       |         |   |                          | 9       |
| 44                       |         |   |                          | 8       |
| 45                       |         |   |                          | 7       |
| 46                       |         |   |                          | 6       |
| 47                       |         |   |                          | 5       |
| 48                       |         |   |                          | 4       |
| 49                       |         |   |                          | 3       |
| 50                       |         |   |                          | 2       |
| 51                       | 1       |   |                          |         |



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## 3. Connector and Cable ( Continued )

Table 3-3. Pin assignments of CML connector ( 51 pin )

| THCV215_CN501 |        | Descriptions                         | THCV216_CN101 |         |
|---------------|--------|--------------------------------------|---------------|---------|
| Pin No.       | Symbol |                                      | Symbol        | Pin No. |
| 51            | Vcc    | Supply voltage from THC215 to THC216 | Vcc           | 1       |
| 50            |        |                                      |               | 2       |
| 49            |        |                                      |               | 3       |
| 48            |        |                                      |               | 4       |
| 47            |        |                                      |               | 5       |
| 46            |        |                                      |               | 6       |
| 45            |        |                                      |               | 7       |
| 44            |        |                                      |               | 8       |
| 43            |        |                                      |               | 9       |
| 42            |        |                                      |               | 10      |
| 41            | GND    | Ground                               | GND           | 11      |
| 40            |        |                                      |               | 12      |
| 39            |        |                                      |               | 13      |
| 38            |        |                                      |               | 14      |
| 37            |        |                                      |               | 15      |
| 36            | HTPDN  | Hot plug detect                      | HTPDN         | 16      |
| 35            | LOCKN  | Lock detect                          | LOCKN         | 17      |
| 34            | GND    | Ground                               | GND           | 18      |
| 33            | Tx0n   | V-by-One® HS Channel 0 (CML)         | Rx0n          | 19      |
| 32            | Tx0p   |                                      | Rx0p          | 20      |
| 31            | GND    | Ground                               | GND           | 21      |
| 30            | GND    |                                      | GND           | 22      |
| 29            | Tx1n   | V-by-One® HS Channel 1 (CML)         | Rx1n          | 23      |
| 28            | Tx1p   |                                      | Rx1p          | 24      |
| 27            | GND    | Ground                               | GND           | 25      |
| 26            | GND    |                                      | GND           | 26      |
| 25            | Tx2n   | V-by-One® HS Channel 2 (CML)         | Rx2n          | 27      |
| 24            | Tx2p   |                                      | Rx2p          | 28      |
| 23            | GND    | Ground                               | GND           | 29      |
| 22            | GND    |                                      | GND           | 30      |
| 21            | Tx3n   | V-by-One® HS Channel 3 (CML)         | Rx3n          | 31      |
| 20            | Tx3p   |                                      | Rx3p          | 32      |
| 19            | GND    | Ground                               | GND           | 33      |
| 18            | GND    |                                      | GND           | 34      |
| 17            | Tx4n   | V-by-One® HS Channel 4 (CML)         | Rx4n          | 35      |
| 16            | Tx4p   |                                      | Rx4p          | 36      |
| 15            | GND    | Ground                               | GND           | 37      |
| 14            | GND    |                                      | GND           | 38      |
| 13            | Tx5n   | V-by-One® HS Channel 5 (CML)         | Rx5n          | 39      |
| 12            | Tx5p   |                                      | Rx5p          | 40      |
| 11            | GND    | Ground                               | GND           | 41      |
| 10            | GND    |                                      | GND           | 42      |
| 9             | Tx6n   | V-by-One® HS Channel 6 (CML)         | Rx6n          | 43      |
| 8             | Tx6p   |                                      | Rx6p          | 44      |
| 7             | GND    | Ground                               | GND           | 45      |
| 6             | GND    |                                      | GND           | 46      |
| 5             | Tx7n   | V-by-One® HS Channel 7 (CML)         | Rx7n          | 47      |
| 4             | Tx7p   |                                      | Rx7p          | 48      |
| 3             | GND    | Ground                               | GND           | 49      |
| 2             | NC     |                                      | Non Connected | NC      |
| 1             |        | 51                                   |               |         |



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## 4. Power supply setting

This chapter shows the power supply setting with the jumper.

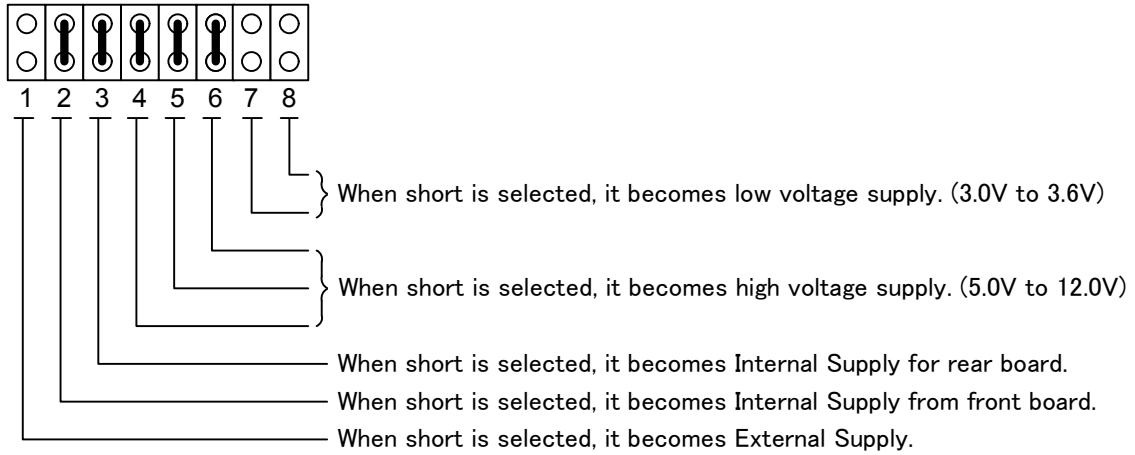


Figure 4. power supply setting with the jumper

Example4-1 : Internal Supply 5.0 V to 12.0V ( Default Setting )

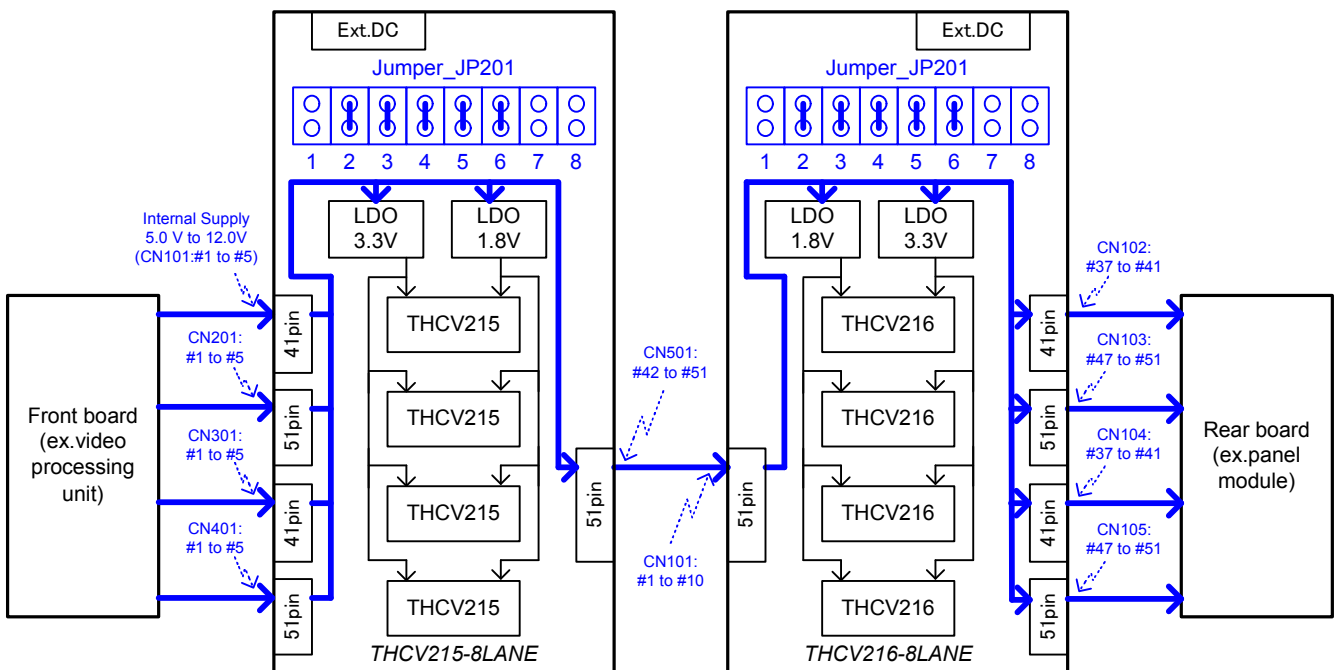


Figure 4-1. Internal Supply 5.0V to 12.0V



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## 4. Power supply setting ( Continued )

Example4-2 : External Supply 5.0V to 12.0V

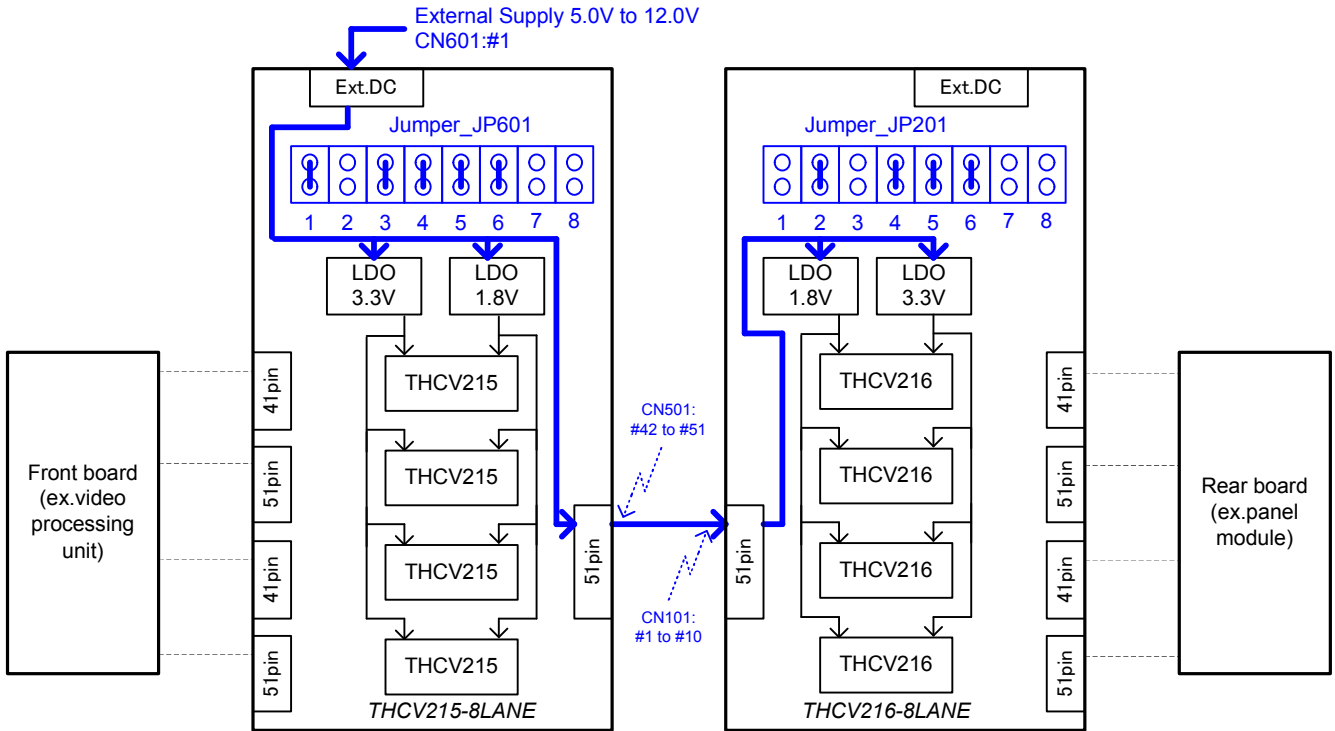


Figure 4-2. External Supply 5.0V to 12.0V

Example4-3 : External Supply 3.0V to 3.6V

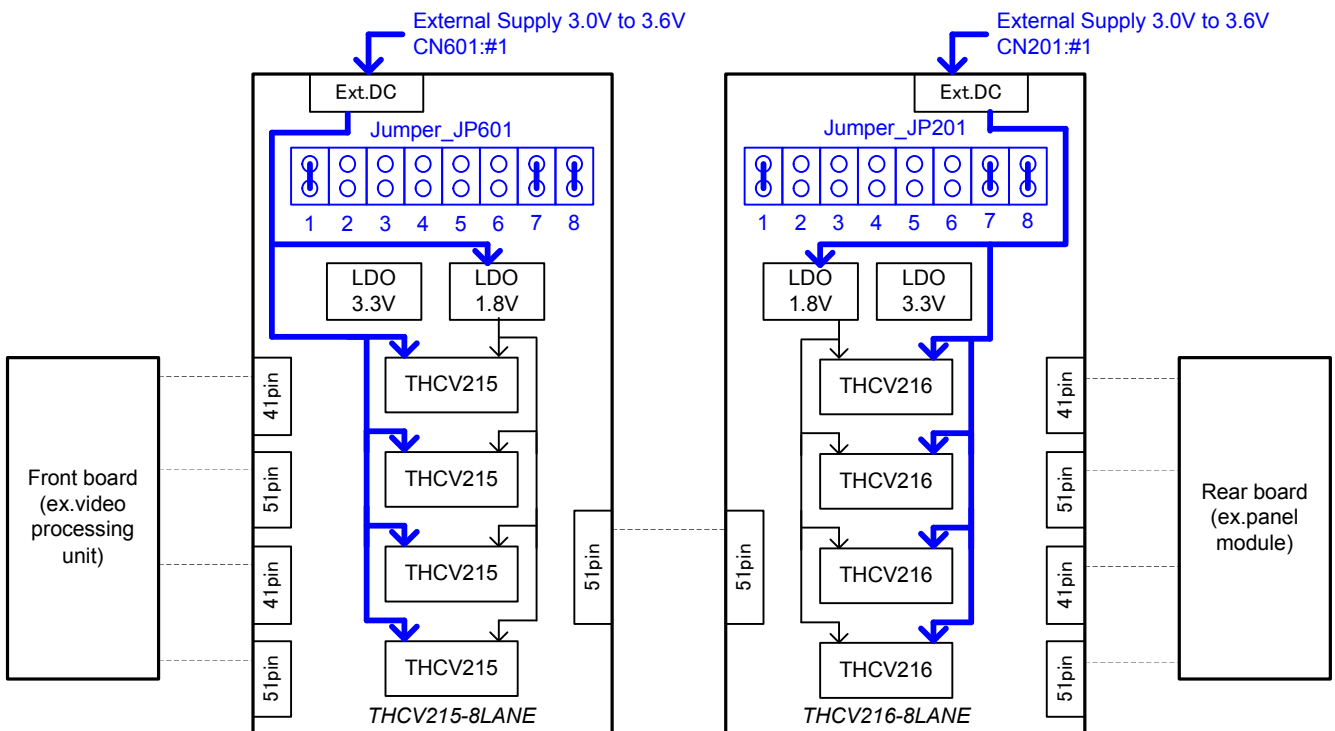


Figure 4-3. External Supply 3.0V to 3.6V



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## 5. Function setting

This chapter shows the DIP switches of the control settings.

Table 5-1. DIP switches on the THCV215-8LANE Board

| SW#  | Symbol | Default Setting | Function   |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
|------|--------|-----------------|--|------|------|----------|-----|-----|------------|------|-----|------------|-----|------|-------------|------|------|---------------|
| 1    | SDSEL  | High ( 8 lane ) | Selects the Lanes.<br>Low : Not available<br>High : 8 lane   |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| 2    | COL0   | Low             | Selects the color depth.<br><table border="1"> <thead> <tr> <th>COL0</th> <th>COL1</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Low</td> <td>Low</td> <td>6 bit mode</td> </tr> <tr> <td>High</td> <td>Low</td> <td>8 bit mode</td> </tr> <tr> <td>Low</td> <td>High</td> <td>10 bit mode</td> </tr> <tr> <td>High</td> <td>High</td> <td>Not available</td> </tr> </tbody> </table> | COL0 | COL1 | Function | Low | Low | 6 bit mode | High | Low | 8 bit mode | Low | High | 10 bit mode | High | High | Not available |
| COL0 | COL1   | Function        |  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| Low  | Low    | 6 bit mode      |  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| High | Low    | 8 bit mode      |  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| Low  | High   | 10 bit mode     |  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| High | High   | Not available   |  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| 3    | COL1   | High            |  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| 4    | PDN    | High ( Normal ) | Selects the power down.<br>Low : Power down ( CML output High Fix, other Hi-Z )<br>High : Normal operation   |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| 5    | DRV1   | Low             | Selects the drive strength.<br>Must be set to DRV1=Low and to DRV0=High  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| 6    | DRV0   | High            |  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| 7    | PRE1   | Low ( 0% )      | Selects the pre-emphasis level.<br>Low : 0%<br>High : 100%   |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |
| 8    | RES1   | Low ( Normal )  | Selects the Field BET Mode. *<br>Low : Normal operation (default)<br>High : Field BET Mode enable  |      |      |          |     |     |            |      |     |            |     |      |             |      |      |               |

\* Please see the datasheet for details. ( THCV215-THCV216\_Rev.x.xx\_E.pdf )

Table 5-2. DIP switches on the THCV216-8LANE Board

| SW#  | Symbol | Default Setting | Function   |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
|------|--------|-----------------|--|------|------|----------|-----|-----|------------|-----|------|------------|------|-----|-------------|------|------|---------------|
| 1    | SDSEL  | High ( 8 lane ) | Selects the Lanes.<br>Low : Not available<br>High : 8 lane   |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| 2    | COL1   | High            | Selects the color depth.<br><table border="1"> <thead> <tr> <th>COL1</th> <th>COL0</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Low</td> <td>Low</td> <td>6 bit mode</td> </tr> <tr> <td>Low</td> <td>High</td> <td>8 bit mode</td> </tr> <tr> <td>High</td> <td>Low</td> <td>10 bit mode</td> </tr> <tr> <td>High</td> <td>High</td> <td>Not available</td> </tr> </tbody> </table> | COL1 | COL0 | Function | Low | Low | 6 bit mode | Low | High | 8 bit mode | High | Low | 10 bit mode | High | High | Not available |
| COL1 | COL0   | Function        |  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| Low  | Low    | 6 bit mode      |  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| Low  | High   | 8 bit mode      |  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| High | Low    | 10 bit mode     |  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| High | High   | Not available   |  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| 3    | COL0   | Low             |  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| 4    | PDN    | High ( Normal ) | Selects the power down.<br>Low : Power down<br>High : Normal operation   |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| 5    | RES3   | Low ( Normal )  | Selects the Field BET Mode. *<br>Low : Normal operation (default)<br>High : Field BET Mode enable  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| 6    | NC     | Low             | Not connected  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| 7    | NC     | Low             |  |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |
| 8    | RS     | Low ( Normal )  | Direction of RS pin depends on RES3.<br>Selects the LVDS swing range when RES3=Low<br>High : Normal swing ( 350 mV typ. )<br>Low : Reduced swing ( 200mV typ. )<br>Field BET output when RES3=High *   |      |      |          |     |     |            |     |      |            |      |     |             |      |      |               |

\* Please see the datasheet for details. ( THCV215-216\_Rev.x.xx\_E.pdf )



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## **6. Other functional Descriptions**

This chapter shows other function.

### 6-1. About LED on the board.

| Board         | Power On detect. | Lock detect. |
|---------------|------------------|--------------|
| THCV215-8LANE | D601             | D701         |
| THCV216-8LANE | D201             | -            |

### 6-2. THCV215 Link Ready function ( RDY )

This is a CMOS output for indicating the link status. If link is ready RDY = High.

### 6-3. THCV216 Field BET mode settings.

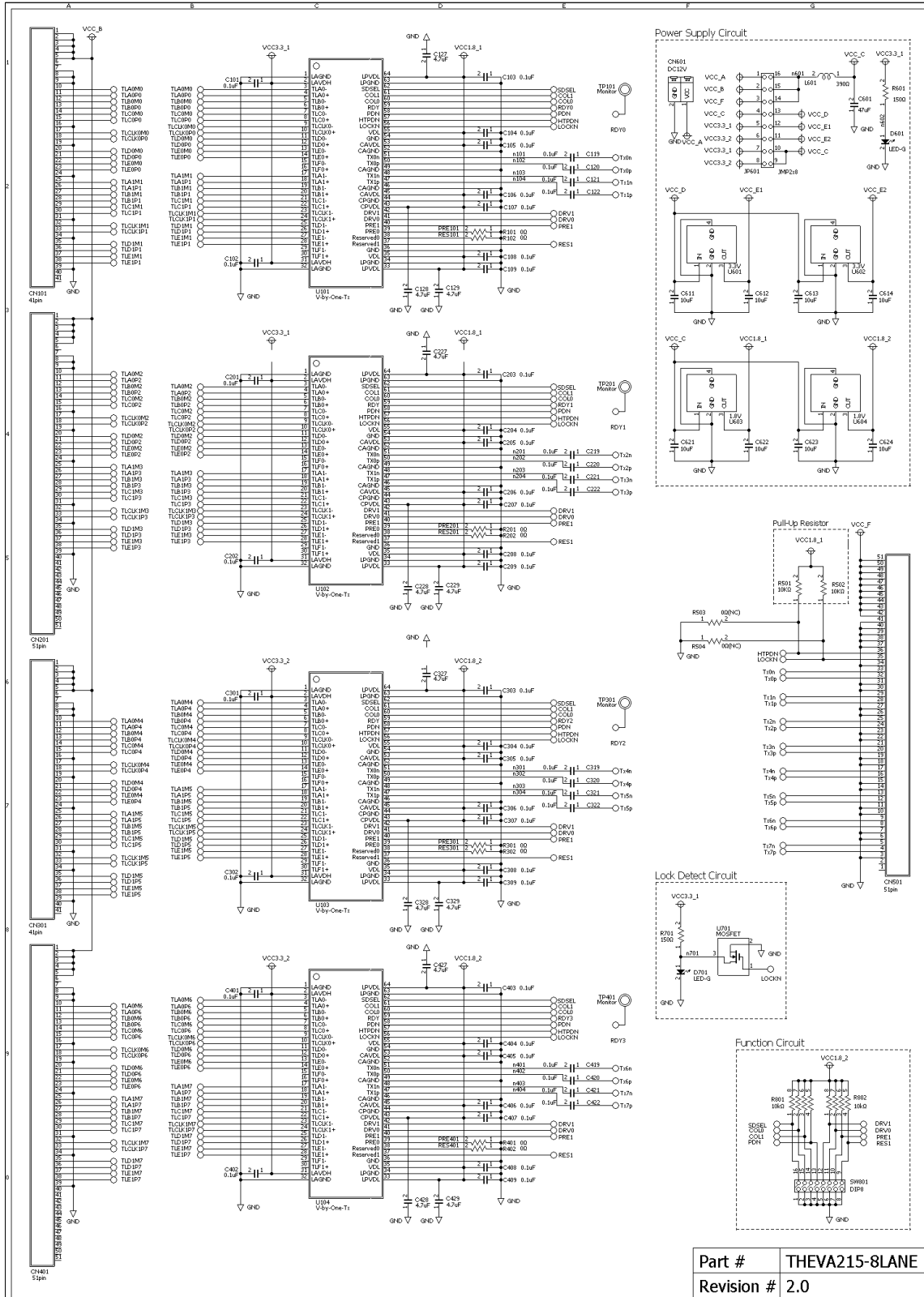
Please detach Jumper ( JP101 to JP104 ) for Field BET mode.



# THCV215/216-8LANE Evaluation Kits

SerDes transmitter and receiver evaluation board

## 7. Schematic



|            |                |
|------------|----------------|
| Part #     | THEVA215-8LANE |
| Revision # | 2.0            |

Figure 7-1. THCV215-8LANE schematic

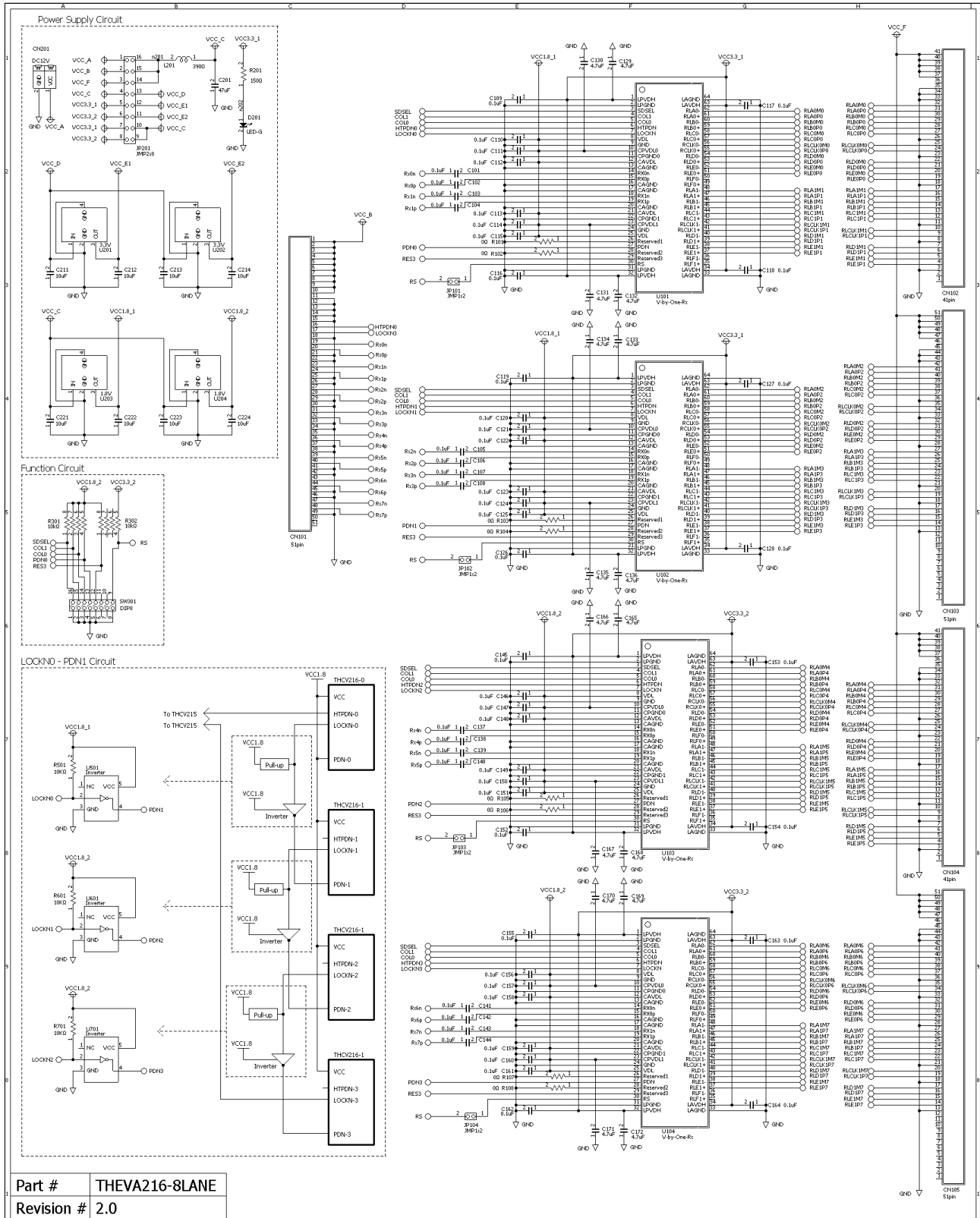




# THCV215/216-8LANE Evaluation Kits

SerDes transmitter and receiver evaluation board

## 7. Schematic



Part # THEVA216-8LANE  
Revision # 2.0

Figure 7-2. THCV216-8LANE schematic





# THCV215/216-8LANE Evaluation Kits

SerDes transmitter and receiver evaluation board

## 9. Layout

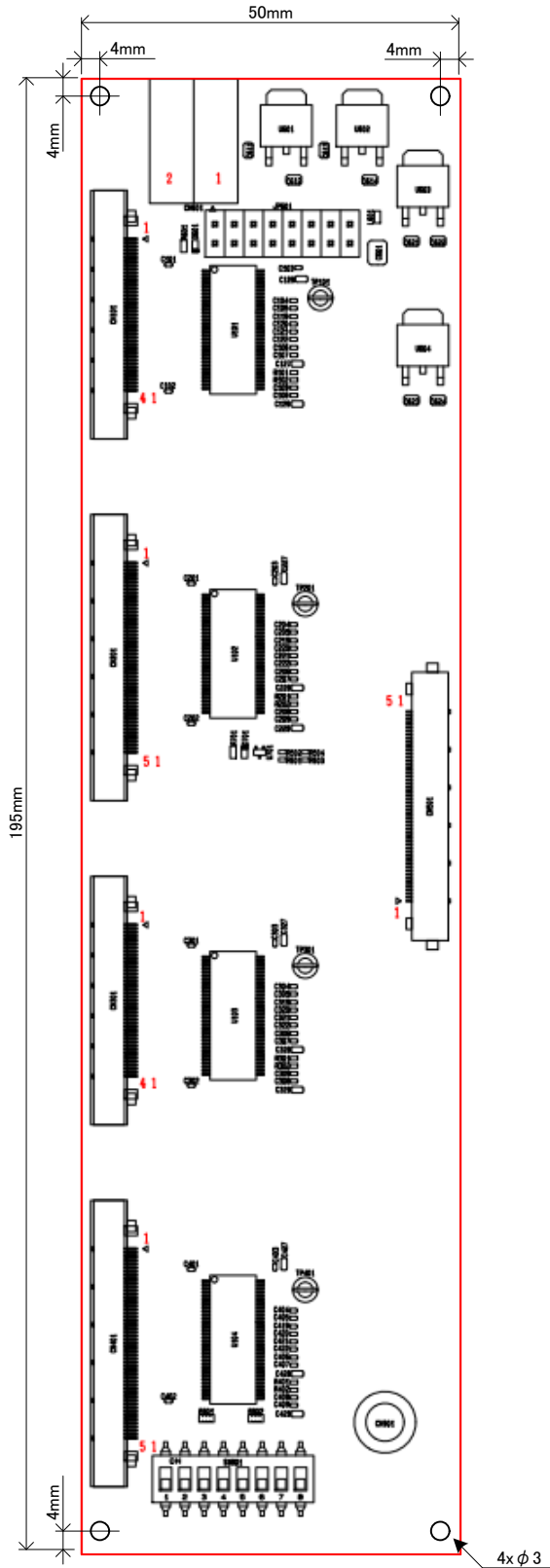


Figure 9-1. Component Placement Guide of THCV215-8LANE

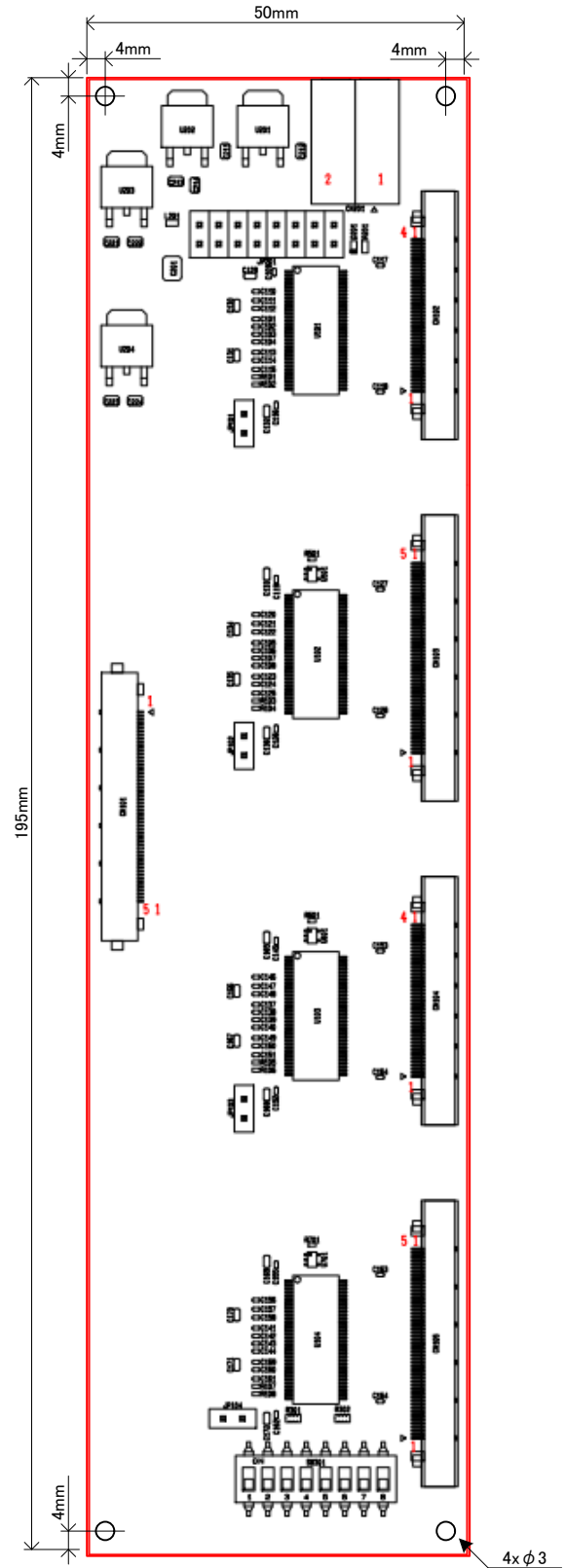


Figure 9-2. Component Placement Guide of THCV216-8LANE



# THCV215/216-8LANE Evaluation Kits

SerDes transmitter and receiver evaluation board

## 10. Cable

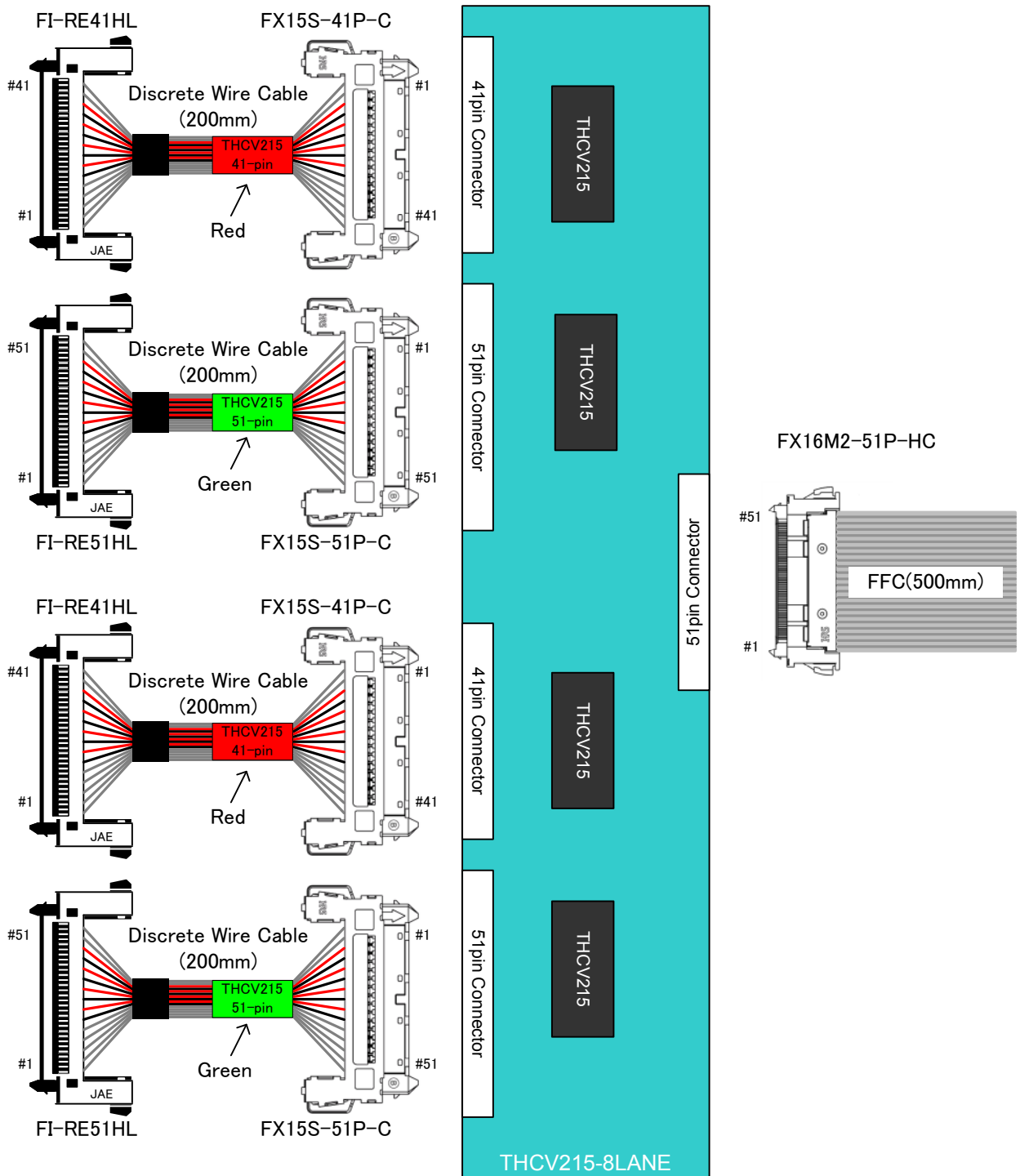


Figure 10-1. Cable of THCv215-8LANE



# THCV215/216-8LANE Evaluation Kits

SerDes transmitter and receiver evaluation board

## 10. Cable

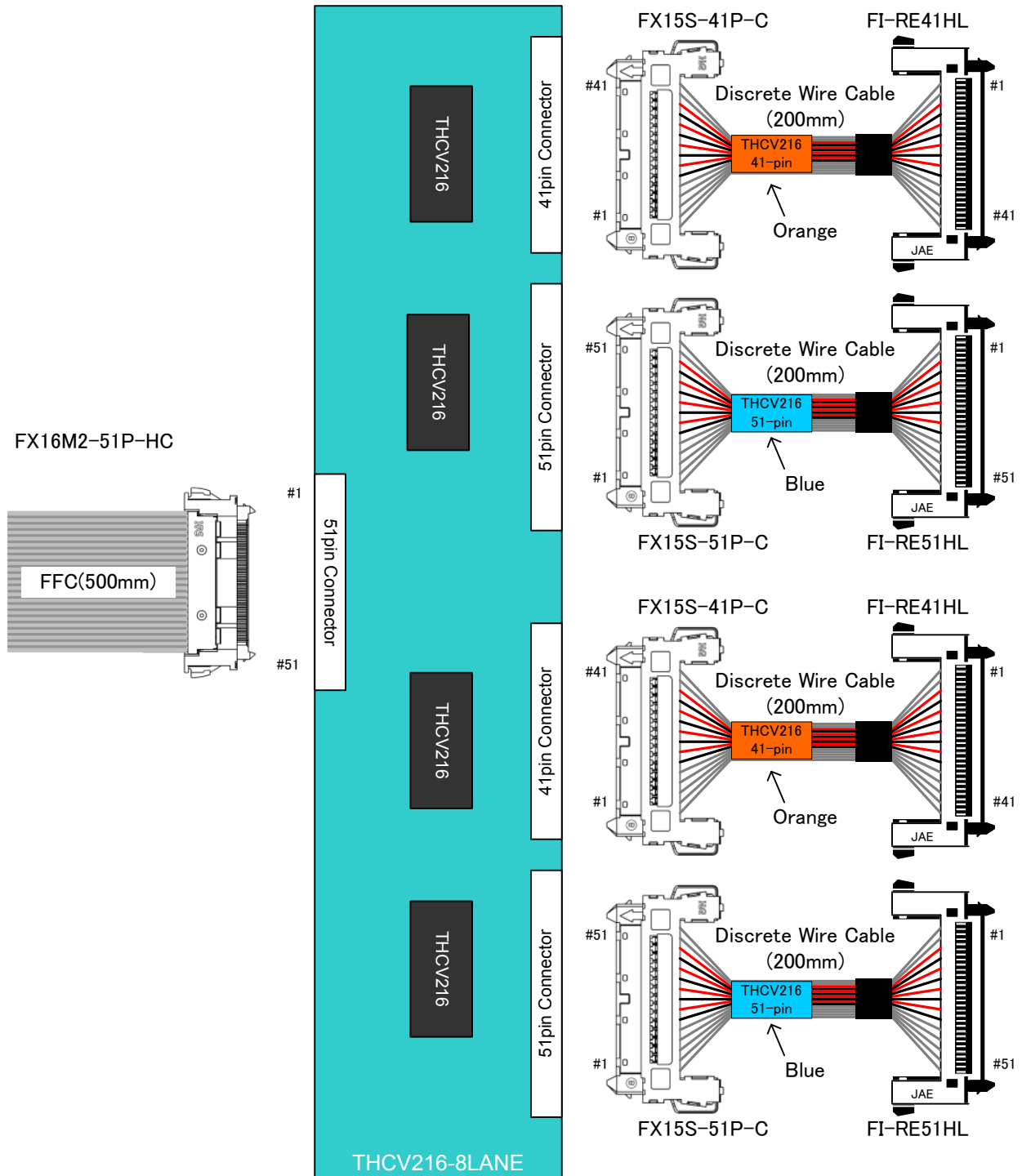


Figure 10-2. Cable of THCV216-8LANE



# THCV215/216-8LANE Evaluation Kits

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## Notices and Requests

1. The product specifications described in this material are subject to change without prior notice.
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7. Please note that this product is not designed to be radiation-proof.
8. 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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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9