



# 050-344

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**DATA SHEET**  
FMC CONNECTIVITY CARD  
FOR GLENAIR PCB MOUNT OPTO-ELECTRONIC CONVERTERS  
TRANSCEIVERS, TRANSMITTERS AND RECEIVERS

| REV | DESCRIPTION     | DATE      | APPROVED |
|-----|-----------------|-----------|----------|
| A   | Initial Release | 3/14/2016 | BD       |

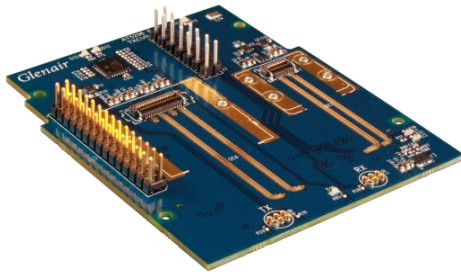
14U2-7544

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050-344

## FMC CONNECTIVITY CARD

For Glenair PCB Mount Opto-Electronic Converters



Glenair 050-344 FPGA Mezzanine Card (FMC) Connectivity Card provides a convenient method to easily incorporate a wide range of Glenair Harsh Environment PCB Mount Transceiver, Transmitter and Receiver products as well as Glenair size 8 Opto-electronic transmitter and receiver contacts into FPGA based systems. It is compatible with Xilinx® evaluation boards with FMC connector(s) board and uses the High Pin Count (HPC) version of the FMC connector.

This FMC card is offered in three configurations, see how to order information, to support all categories of Glenair PCB Mount devices. Electrical connections to PCB Mount Opto-electronic devices are through high speed Samtec connector mounted on the 050-344 card. The card has an FMC High Pin Count (HPC) connector to mate to the Host FPGA carrier board which interface with four high-speed serial transceivers on the FPGA carrier board. It is compatible with either HPC or Low Pin Count (LPC) connector (restricted to single high-speed serial transceiver for LPC) on the host board. The 050-344 card also incorporates LEDs for RX LOS indications as well as a low-jitter 156.25MHz oscillator for use as a clock source for the high-speed serial transceivers. The board also incorporates I<sup>2</sup>C current monitor IC and an I<sup>2</sup>C GPIO IC so each DUT can be monitored. 22 GPIO pins are also made available for the user.

### KEY FEATURES/BENEFITS

- Industry standard, modular FPGA I/O in FMC (VITA 57.1) module
- Supports large variety of Opto-Electronic devices suitable for Harsh Environment (Wide temperature ranges and Extremely High Vibration)
  - 10 Mbps to 12.5 Gbps
- Direct connections between Glenair PCB Mount transceivers and host FPGA ensures maximum throughput and minimum latency
- HPC – High Pin Count FMC
  - Provides access to 4 high speed transceivers
  - Compatible with LPC Host board connectors as well but then restricted to single high-speed transceiver (DP0)

- Low-jitter 156.25 MHz Clock source available on-board
- SFF 8472 Digital Diagnostic Monitoring (DMI) can be accessed from host board via I<sup>2</sup>C or via connector Header
- I<sup>2</sup>C GPIO for current monitoring, RX\_LOS, TX\_FAULT, TX\_DISABLE control and signaling

### APPLICATIONS

- As an evaluation tool for Glenair Opto-electronic modules which are suited to Harsh Environment Applications such as: Airborne, Tactical Military, Oil and Gas, Railway and Shipboard
  - Ethernet, Fibre Channel, 1x, 2x, 4x, 8x, SFPDP, Aurora
  - Video (DVI, SMPTE, ARINC818, etc)

### HOW TO ORDER

| Part Number | Description of Products to be tested | Glenair Opto-Electronic Existing and Planned Products supported:   |
|-------------|--------------------------------------|--|
| 050-344-A   | Transceivers,                        | 050-315, 050-318, 050-321, 050-324, 050-327, 050-340, 050-341, 050-342, 050-343, 050-352, 050-354, 050-356, 050-357, 050-362, 050-361, 050-369 |
|             | Dual-Transceivers                    | 050-333  |
|             | Size 8 TX & RX OE Contacts           | 050-301, 050-307   |
| 050-344-B   | Dual-Transmitters                    | 050-316, 050-319, 050-325, 050-331,  |
|             | Dual-Receivers                       | 050-317, 050-320, 050-326, 050-332   |
| 050-344-C   | Quad-Transmitters                    | 050-336, 050-363, 050-374,   |
|             | Quad-Receivers                       | 050-337, 050-364, 050-375  |

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**What is included with 050-344:**

- FMC Connectivity Card (050-344)
- 050-344 Datasheet

**Opto-Electronic Devices and Test cables sold separately: Many options can be supported.**

- Glenair PCB Mount devices Selection Guide
  - [http://www.glenair.com/opto\\_electronic/b.htm](http://www.glenair.com/opto_electronic/b.htm)
- Fiber Optic Test cables as required:
  - MMF & SMF test cables can be configured to support all Glenair Opto-electronic components
  - FA03216: [http://www.glenair.com/opto\\_electronic/pdf/b/fa03216.pdf](http://www.glenair.com/opto_electronic/pdf/b/fa03216.pdf)

**FMC I/O PINOUT**

FMC HPC SAMTEC P/N:(ASP-134488-01)

|    | A         | B    | C         | D             | E    | F   | G         | H      | I   | J   |
|----|-----------|------|-----------|---------------|------|-----|-----------|--------|-----|-----|
| 1  | GND       | RES1 | GND       | PG_C2M        | GND  | NC  | GND       | NC     | GND | NC  |
| 2  | DP1_M2C_P | GND  | DPO_C2M_P | GND           | NC   | GND | NC        | NC     | NC  | GND |
| 3  | DP1_M2C_N | GND  | DPO_C2M_N | GND           | NC   | GND | NC        | GND    | NC  | GND |
| 4  | GND       | NC   | GND       | GBTCLK0_M2C_P | GND  | NC  | GND       | NC     | NC  | NC  |
| 5  | GND       | NC   | GND       | GBTCLK0_M2C_N | GND  | NC  | GND       | NC     | GND | NC  |
| 6  | DP2_M2C_P | GND  | DPO_M2C_P | GND           | NC   | GND | LA00_P_CC | GND    | NC  | GND |
| 7  | DP2_M2C_N | GND  | DPO_M2C_N | GND           | NC   | NC  | LA00_N_CC | LA02_P | NC  | NC  |
| 8  | GND       | NC   | GND       | SCL1          | GND  | NC  | GND       | LA02_N | GND | NC  |
| 9  | GND       | NC   | GND       | SDA1          | NC   | GND | LA03_P    | GND    | NC  | GND |
| 10 | DP3_M2C_P | GND  | LA06_P    | GND           | NC   | NC  | LA03_N    | LA04_P | NC  | NC  |
| 11 | DP3_M2C_N | GND  | LA06_N    | LA05_P        | GND  | NC  | GND       | LA04_N | GND | NC  |
| 12 | GND       | NC   | GND       | LA05_N        | NC   | GND | LA08_P    | GND    | NC  | GND |
| 13 | GND       | NC   | GND       | GND           | NC   | NC  | LA08_N    | LA07_P | NC  | NC  |
| 14 | NC        | GND  | LA10_P    | LA09_P        | GND  | NC  | GND       | LA07_N | GND | NC  |
| 15 | NC        | GND  | LA10_N    | LA09_N        | NC   | GND | SDA2      | GND    | NC  | GND |
| 16 | GND       | NC   | GND       | GND           | NC   | NC  | SCL2      | LA11_P | NC  | NC  |
| 17 | GND       | NC   | GND       | NC            | GND  | NC  | GND       | LA11_N | GND | NC  |
| 18 | NC        | GND  | NC        | NC            | NC   | GND | NC        | GND    | NC  | GND |
| 19 | NC        | GND  | NC        | GND           | NC   | NC  | NC        | NC     | NC  | NC  |
| 20 | GND       | NC   | GND       | NC            | GND  | NC  | GND       | NC     | GND | NC  |
| 21 | GND       | NC   | GND       | NC            | NC   | GND | NC        | GND    | NC  | GND |
| 22 | DP1_C2M_P | GND  | NC        | GND           | NC   | NC  | NC        | NC     | NC  | NC  |
| 23 | DP1_C2M_N | GND  | NC        | NC            | GND  | NC  | GND       | NC     | GND | NC  |
| 24 | GND       | NC   | GND       | NC            | NC   | GND | NC        | GND    | NC  | GND |
| 25 | GND       | NC   | GND       | GND           | NC   | NC  | NC        | NC     | NC  | NC  |
| 26 | DP2_C2M_P | GND  | NC        | NC            | GND  | NC  | GND       | NC     | GND | NC  |
| 27 | DP2_C2M_N | GND  | NC        | NC            | NC   | GND | NC        | GND    | NC  | GND |
| 28 | GND       | NC   | GND       | GND           | NC   | NC  | NC        | NC     | NC  | NC  |
| 29 | GND       | NC   | GND       | NC            | GND  | NC  | GND       | NC     | GND | NC  |
| 30 | DP3_C2M_P | GND  | NC        | TDI/TDO_LOOP  | NC   | GND | NC        | GND    | NC  | GND |
| 31 | DP3_C2M_N | GND  | NC        | TDO/TDI_LOOP  | NC   | NC  | NC        | NC     | NC  | NC  |
| 32 | GND       | NC   | GND       | NC            | GND  | NC  | GND       | NC     | GND | NC  |
| 33 | GND       | NC   | GND       | NC            | NC   | GND | NC        | GND    | NC  | GND |
| 34 | NC        | GND  | NC        | NC            | NC   | NC  | NC        | NC     | NC  | NC  |
| 35 | NC        | GND  | NC        | NC            | GND  | NC  | GND       | NC     | GND | NC  |
| 36 | GND       | NC   | GND       | 3P3V          | NC   | GND | NC        | GND    | NC  | GND |
| 37 | GND       | NC   | NC        | GND           | NC   | NC  | NC        | NC     | NC  | NC  |
| 38 | NC        | GND  | GND       | 3P3V          | GND  | NC  | GND       | NC     | GND | NC  |
| 39 | NC        | GND  | 3P3V      | GND           | VADJ | GND | NC        | GND    | NC  | GND |
| 40 | GND       | NC   | GND       | 3P3V          | GND  | NC  | GND       | NC     | GND | NC  |

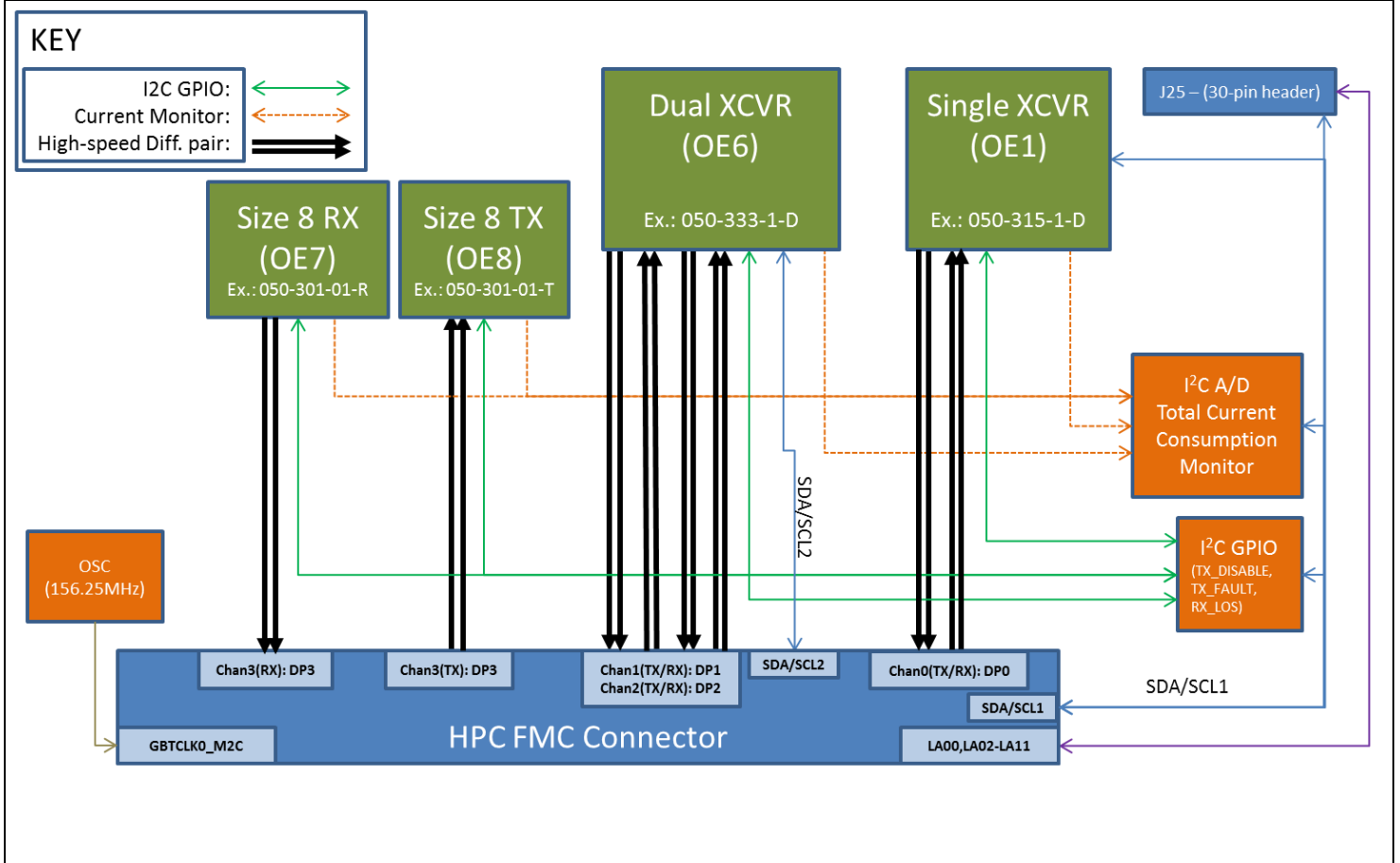
050-344

# FMC CONNECTIVITY CARD

For Glenair PCB Mount Opto-Electronic Converters



## Functional Block Diagram (050-344-A)



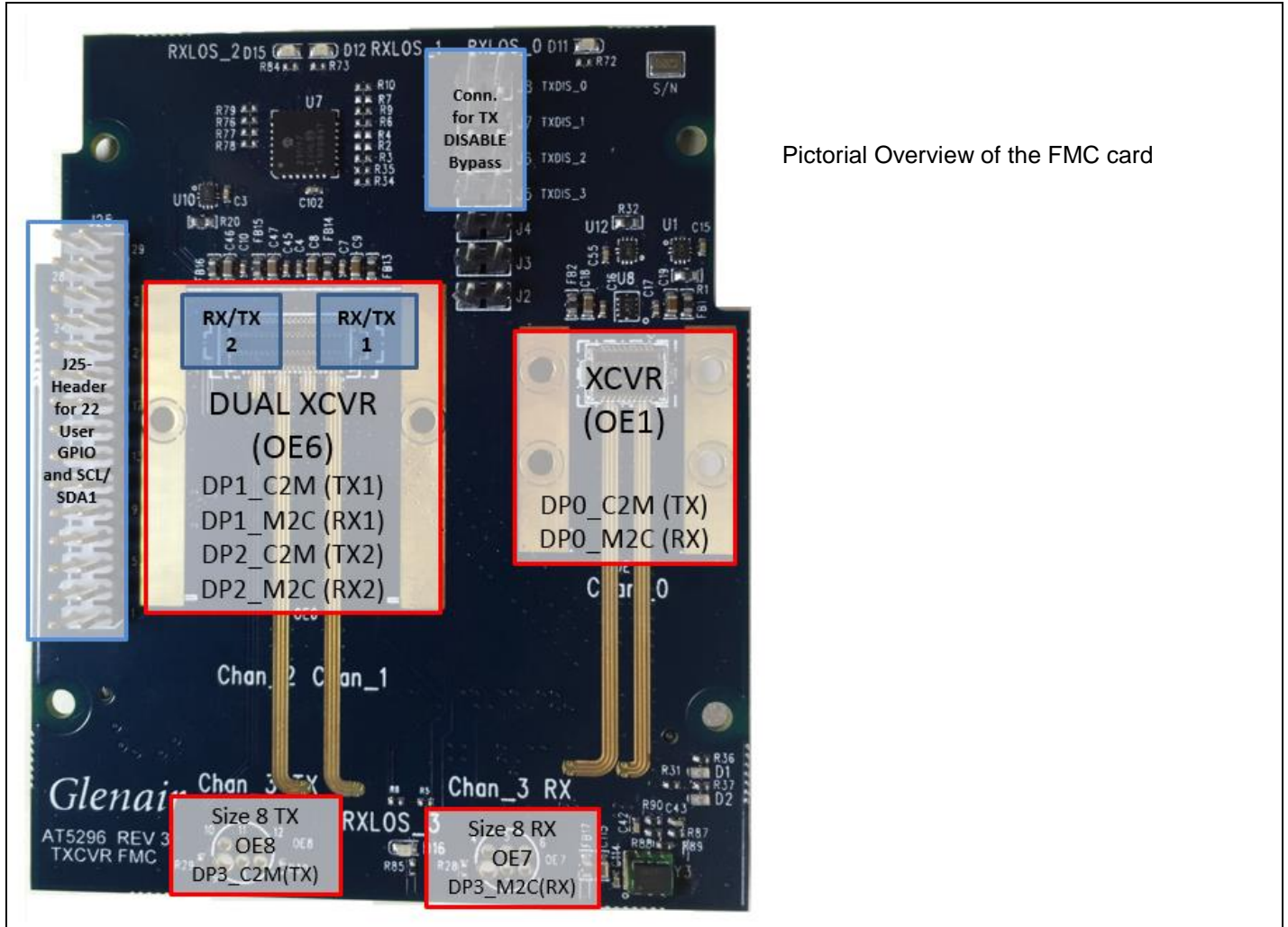
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# FMC CONNECTIVITY CARD

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## Pictorial Block Diagram (050-344-A)



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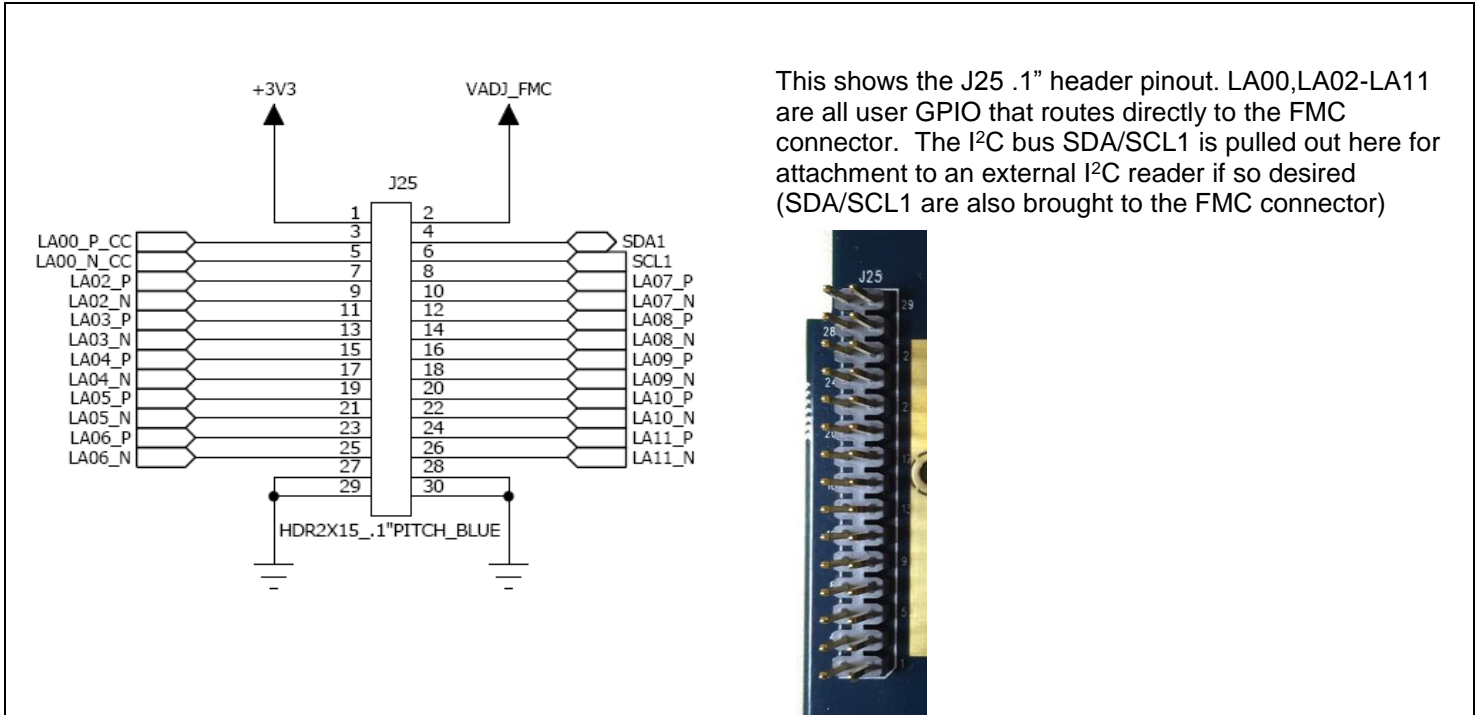
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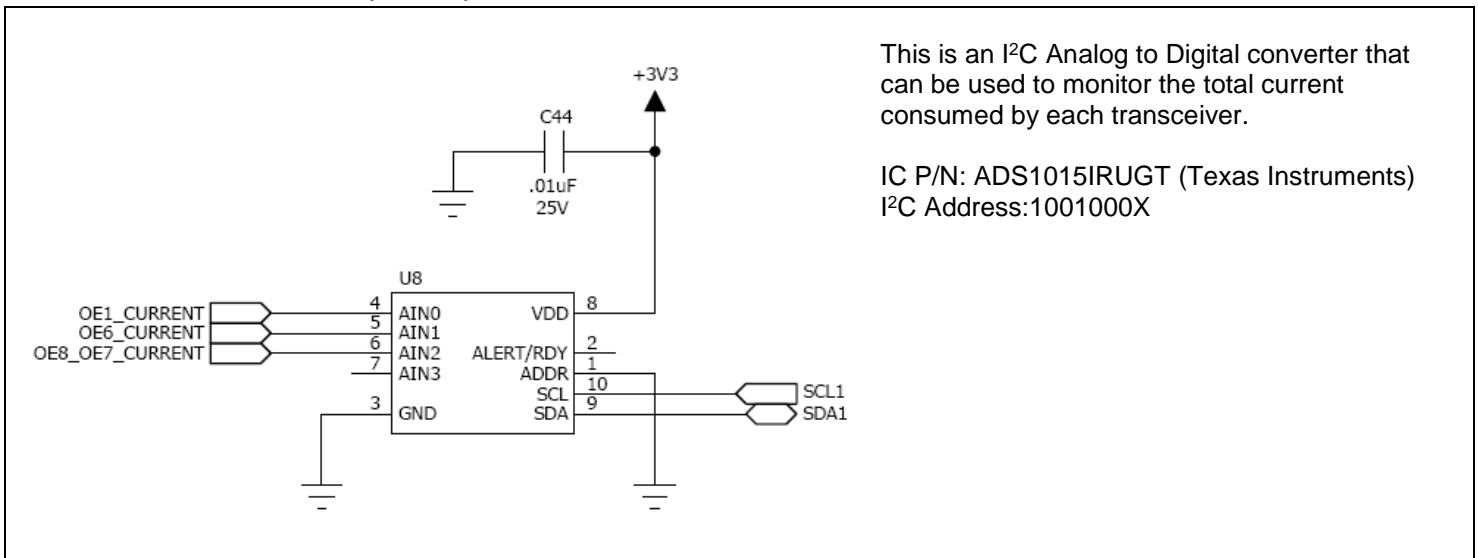


## Schematic User interface Blocks (050-344-A)

### J25 Header pinout



### U8 Current Monitor (I<sup>2</sup>C A/D)





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# FMC CONNECTIVITY CARD

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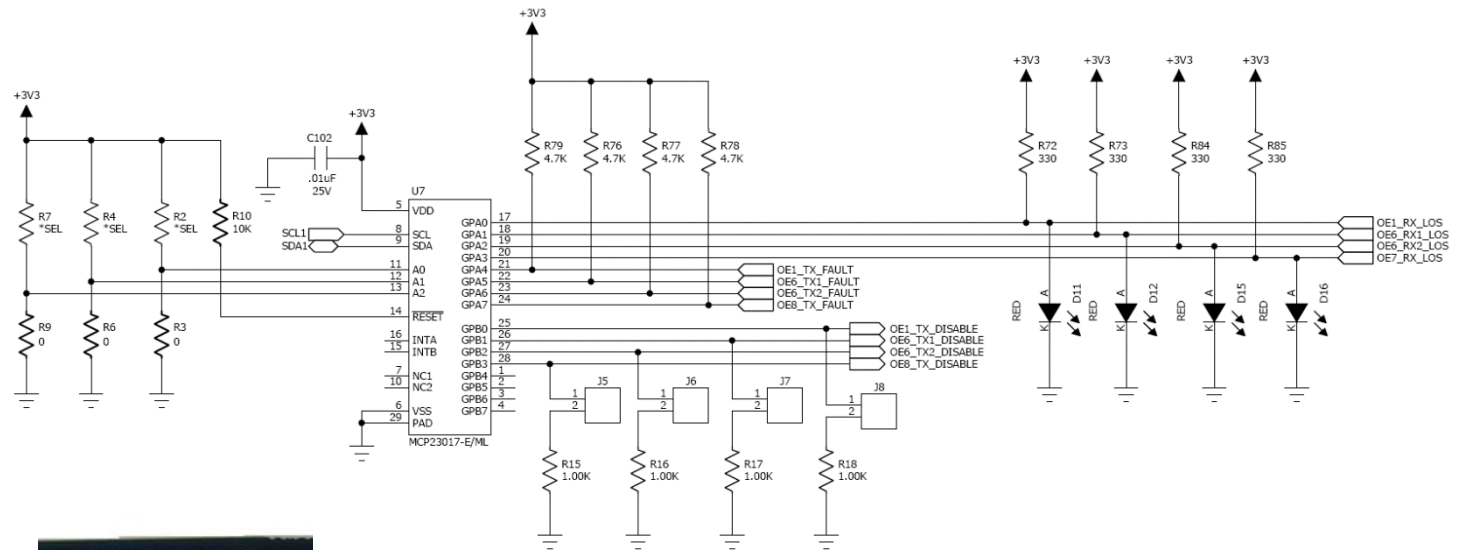


### Schematic User interface Blocks (050-344-A) continued

#### U7 I<sup>2</sup>C GPIO

This is an I2C controlled GPIO device that can be used to read the RX\_LOS signal and TX\_FAULT status of each transceiver as well as set the TX\_DISABLE lines to disable the transmitter output. If control of this is not desired the user can use a jumper on the J5, J6, J7 and J8 headers to manually enable the transmitter output. The headers are also marked on the board as TXDIS\_0 for channel 0 (single XCVR) TXDIS\_1 for channel 1 (Dual XCVR first chan.) and so on.

IC P/N: MCP23017-E/ML (Microchip)  
I2C address: 0100000X



←Headers to manually enable the transmitters

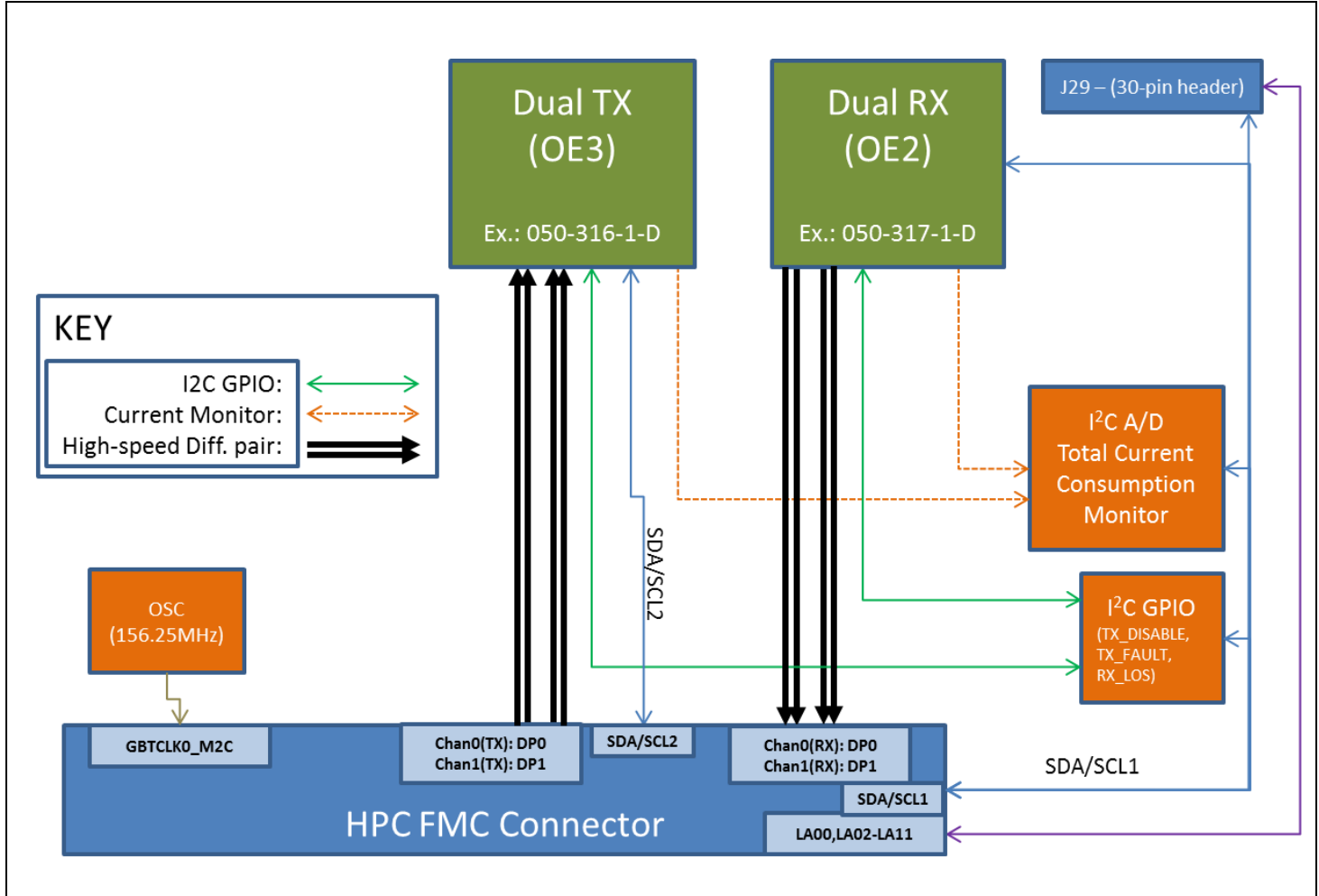
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# FMC CONNECTIVITY CARD

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## Functional Block Diagram (050-344-B)





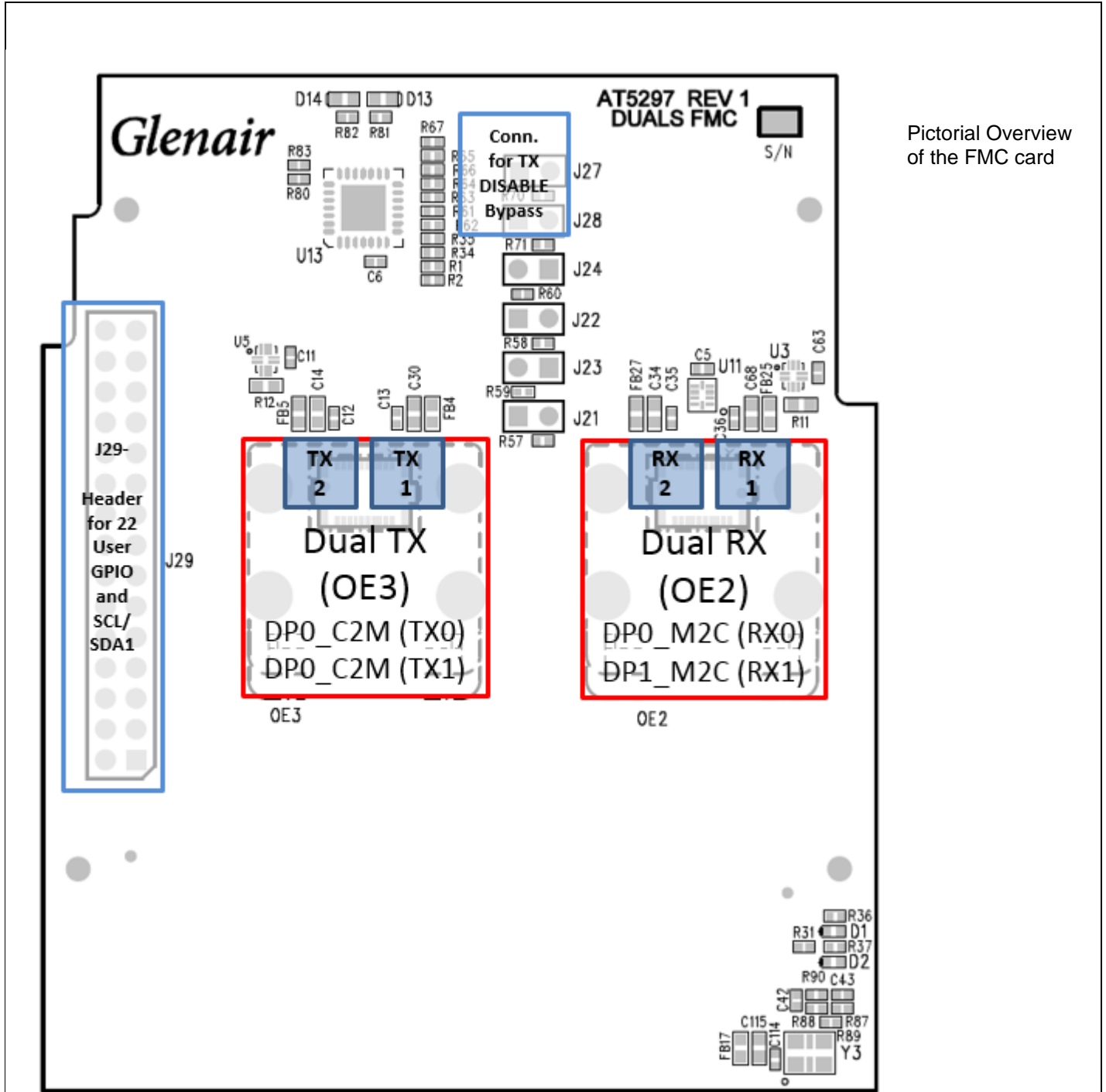
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# FMC CONNECTIVITY CARD

For Glenair PCB Mount Opto-Electronic Converters



Pictorial Block Diagram (050-344-B)



Pictorial Overview of the FMC card

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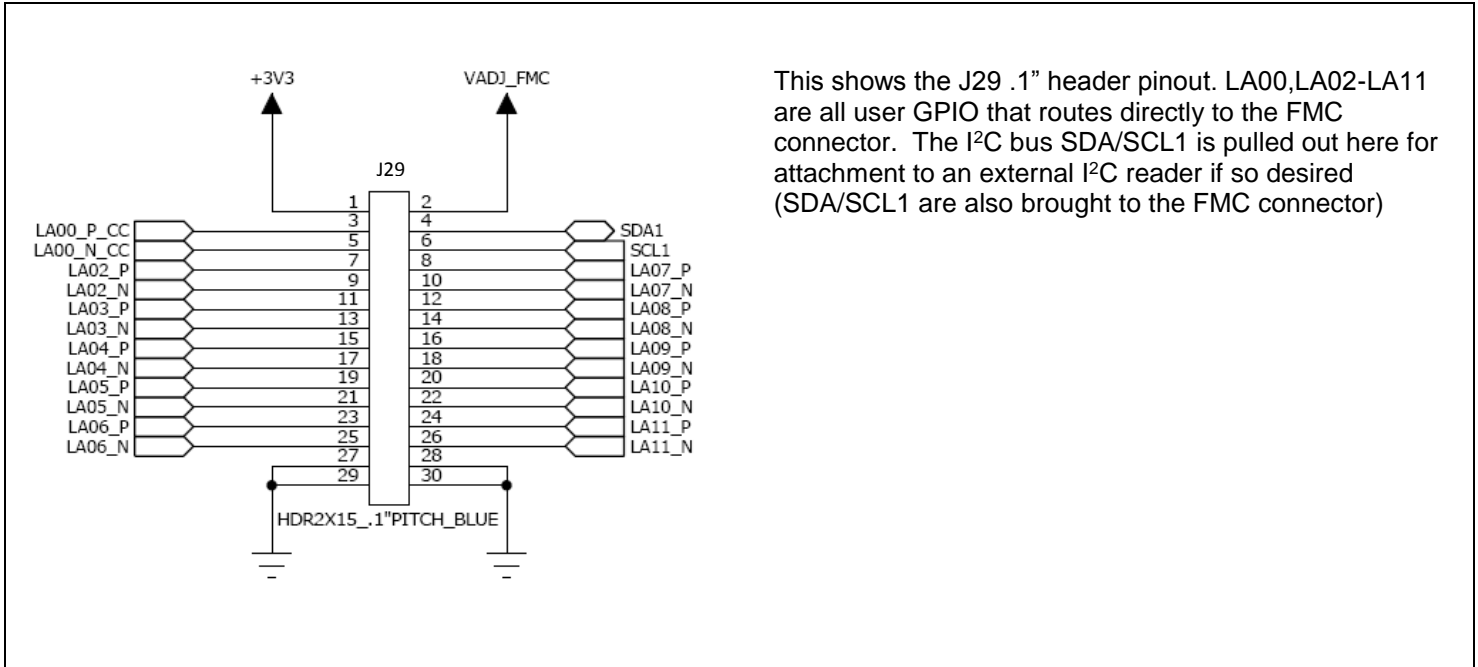
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## For Glenair PCB Mount Opto-Electronic Converters

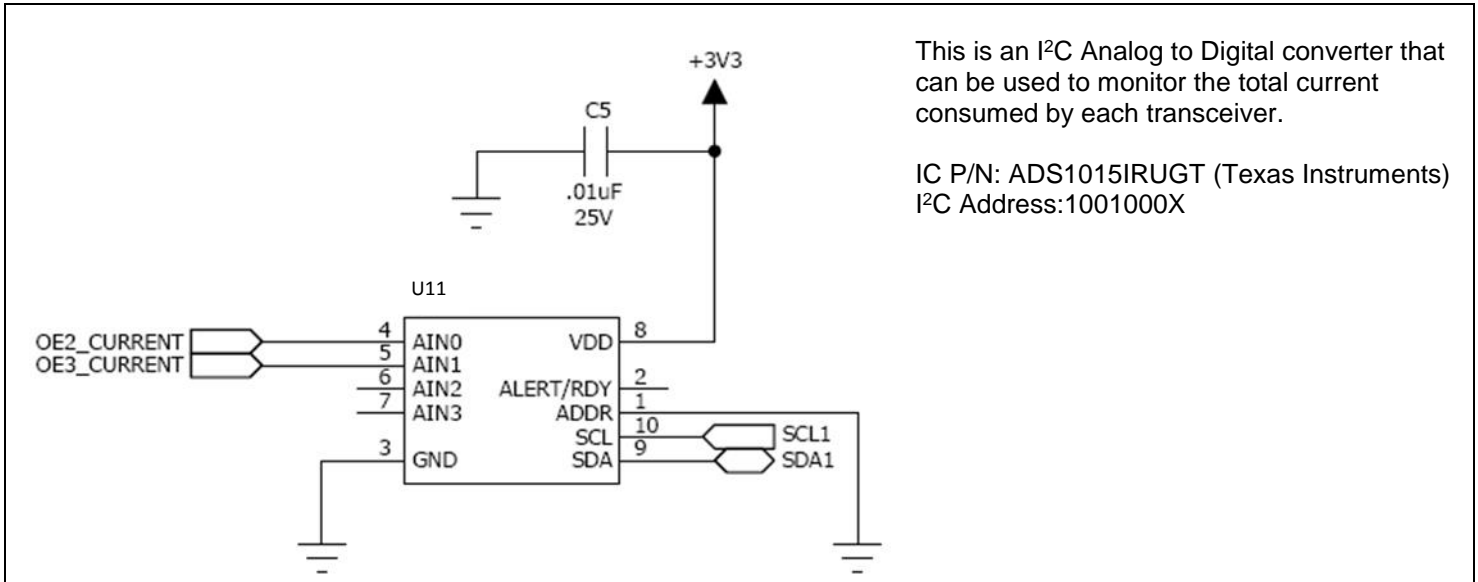


### Schematic User interface Blocks (050-344-B)

#### J29 Header pinout



#### U11 Current Monitor (I<sup>2</sup>C A/D)



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FMC CONNECTIVITY CARD

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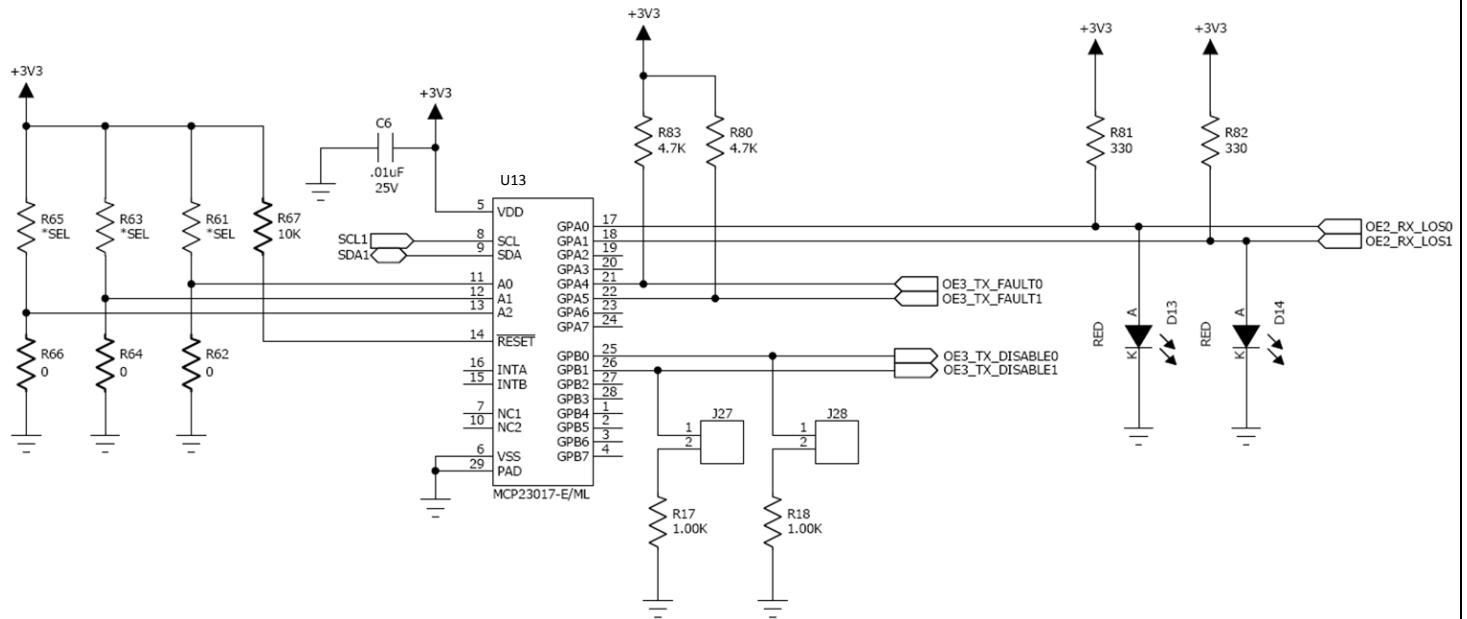


Schematic User interface Blocks (050-344-B) continued

U13 I<sup>2</sup>C GPIO

This is an I2C controlled GPIO device that can be used to read the RX\_LOS signal and TX\_FAULT status of each transceiver as well as set the TX\_DISABLE lines to disable the transmitter output. If control of this is not desired the user can use a jumper on the J27 and J28 headers to manually enable the transmitter output. The headers are also marked on the board as TXDIS\_0 for channel 0 (single XCVR) TXDIS\_1 for channel 1(Dual XCVR first chan.) and so on.

IC P/N: MCP23017-E/ML (Microchip)  
I2C address: 0100000X



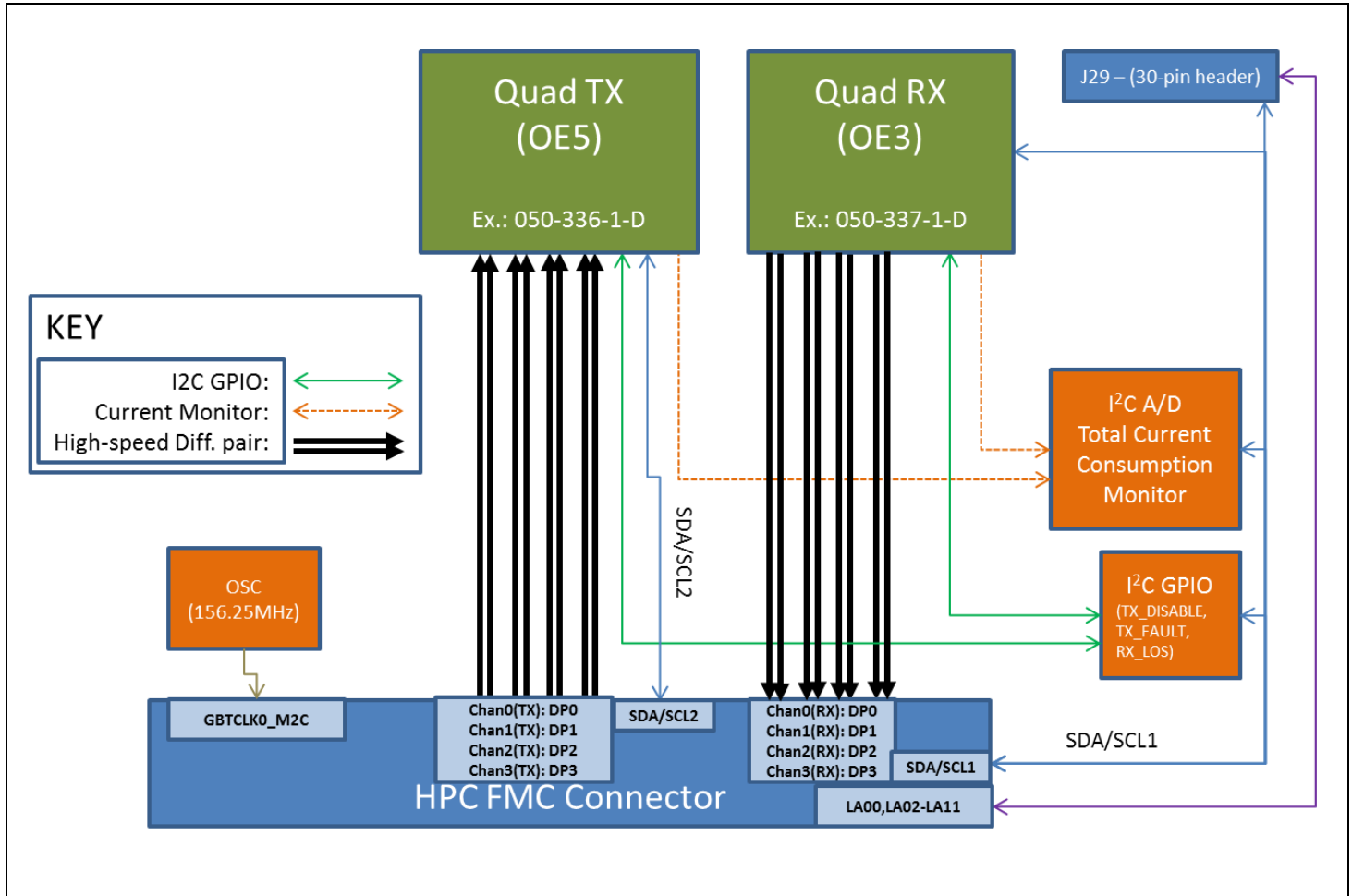
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# FMC CONNECTIVITY CARD

For Glenair PCB Mount Opto-Electronic Converters



## Functional Block Diagram (050-344-C)



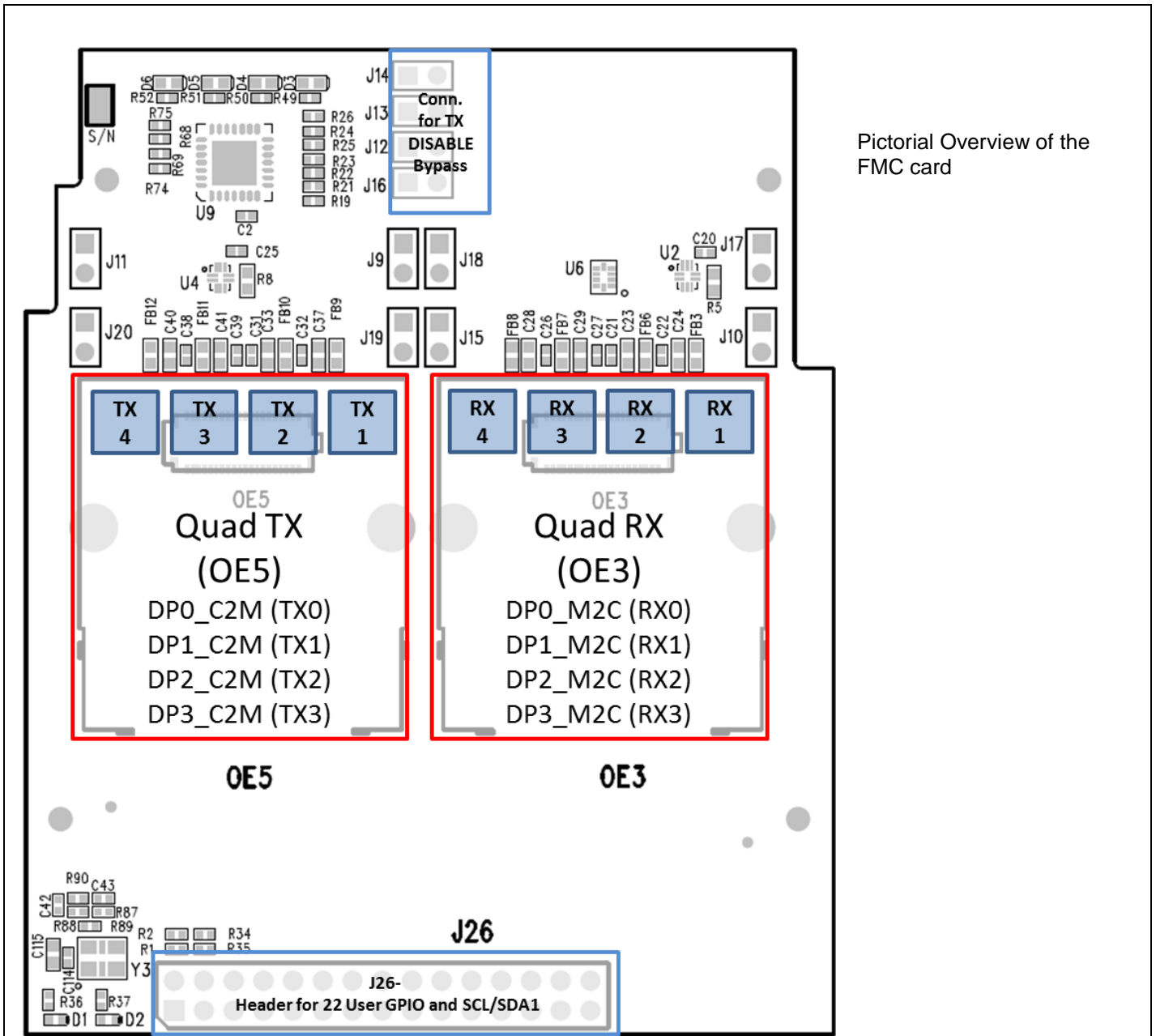
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# FMC CONNECTIVITY CARD

For Glenair PCB Mount Opto-Electronic Converters



## Pictorial Block Diagram (050-344-C)



Pictorial Overview of the FMC card

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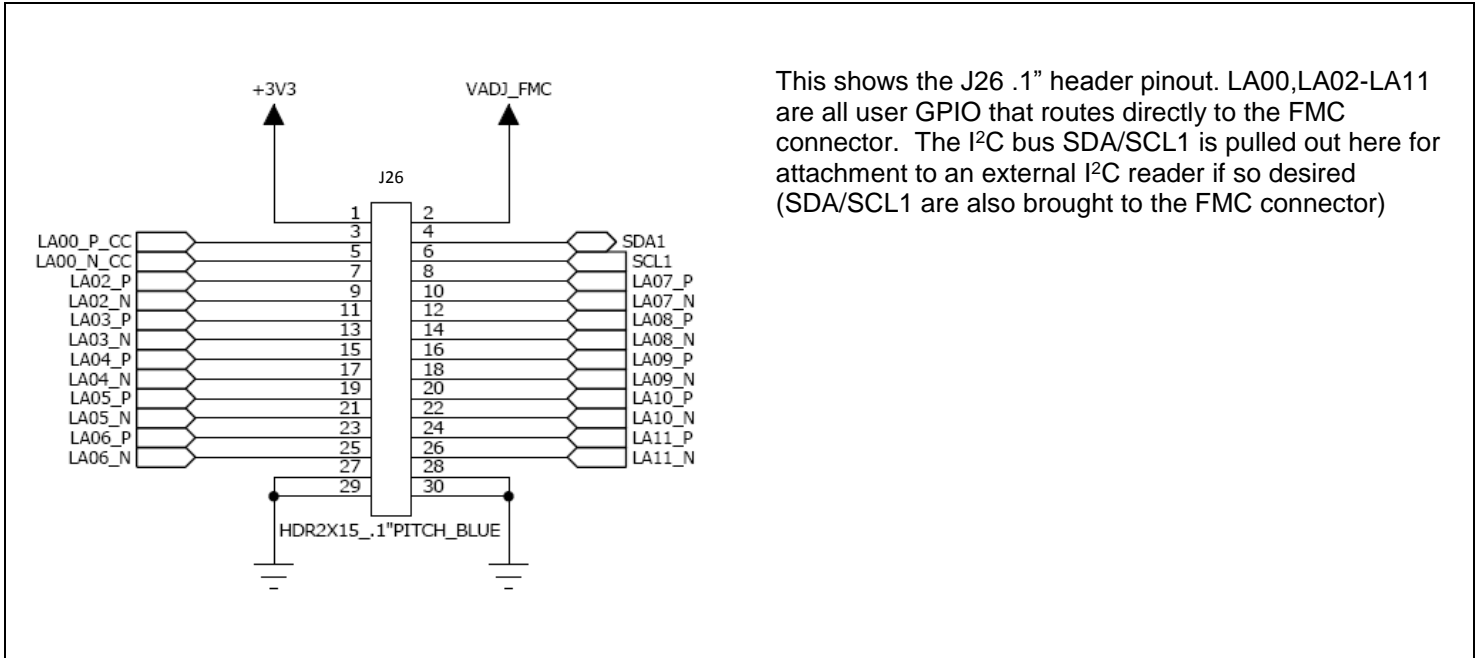
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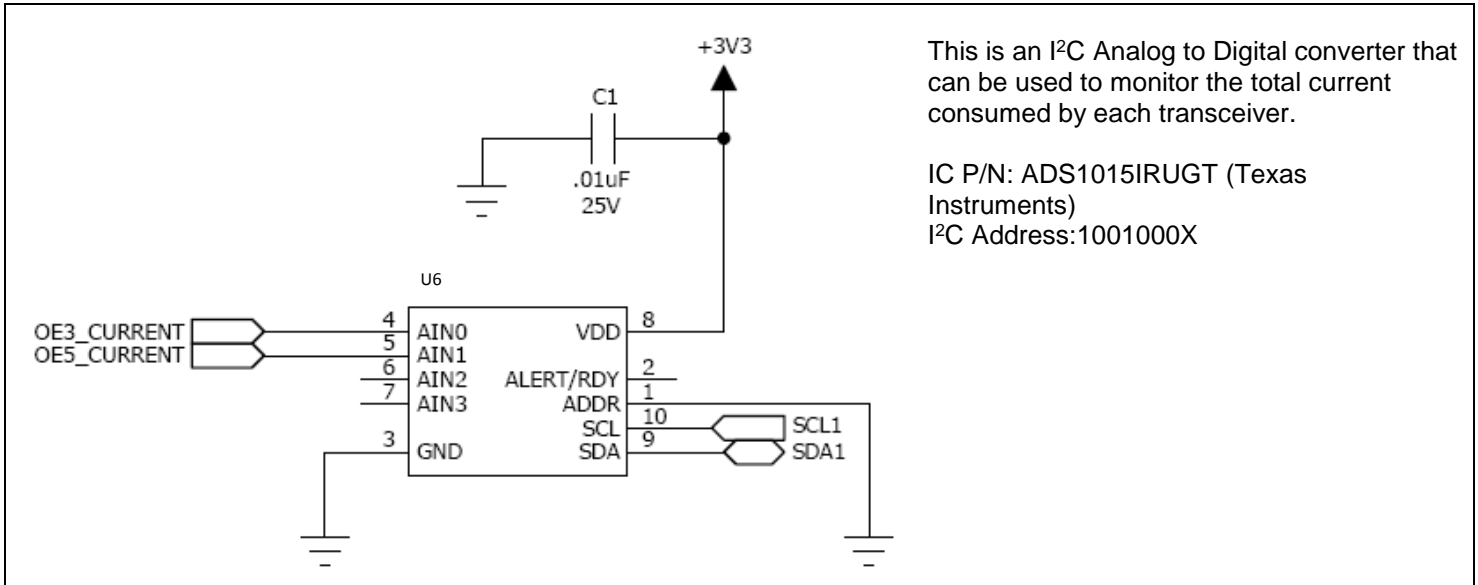


## Schematic User interface Blocks (050-344-C)

### J26 Header pinout



### U6 Current Monitor (I<sup>2</sup>C A/D)



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FMC CONNECTIVITY CARD

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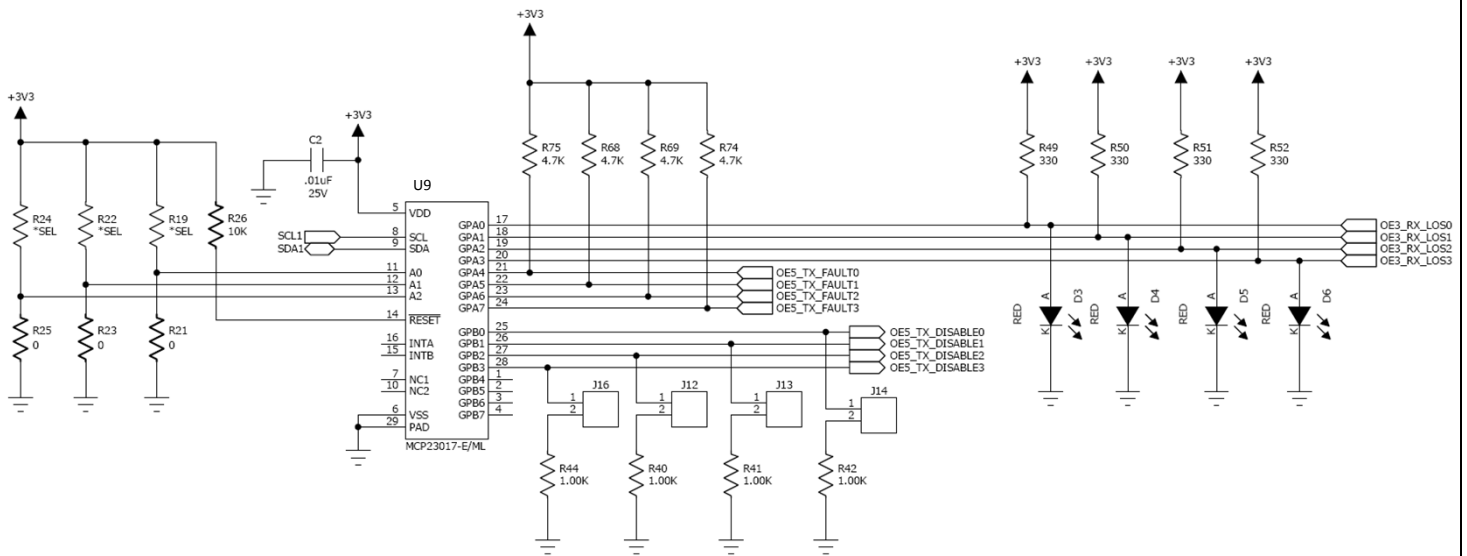


Schematic User interface Blocks (050-344-C) continued

U9 I<sup>2</sup>C GPIO

This is an I2C controlled GPIO device that can be used to read the RX\_LOS signal and TX\_FAULT status of each transceiver as well as set the TX\_DISABLE lines to disable the transmitter output. If control of this is not desired the user can use a jumper on the J16, J12, J13 or J14 headers to manually enable the transmitter output.

IC P/N: MCP23017-E/ML (Microchip)  
I2C address: 0100000X





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## FMC CONNECTIVITY CARD

For Glenair PCB Mount Opto-Electronic Converters



### Supported Media

Glenair Fiber Optic Transceivers, Transmitters, Receivers from 100Mbps to 10Gbps

### FPGA Interface

- FMC High Pin Count (HPC) connector
  - Four (4) high-speed serial FMC links DP0 – DP3 differential pairs
  - 22 GPIO for user signals (LA00,LA02-LA11)
  - Two (2) I<sup>2</sup>C buses for transceiver status and control
    - I<sup>2</sup>C A/D to read transceiver current
    - I<sup>2</sup>C GPIO to control TX\_DISABLE and read TX\_FAULT and RX\_LOS status
  - Jumpers to bypass TX\_DISABLE signals
  - LED indication for Loss of Signal (RX\_LOS)

### Reference clock

- 156.25 MHz LVPECL differential Clock Oscillator input on GBTCLK0 pins [ABRACON (ASEMPLP-156.250MHZ-LR-T)]

### Host boards:

- Spartan-6 Xilinx EK-S6-SP605
- Virtex-6 Xilinx EK-V6-ML605
- Kintex-7 Xilinx EK-K7-KC705
- Virtex-7 Xilinx EK-V7-VC707
- Zynq-7000 Avnet AES-MINI-ITX-7Z045

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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