



050-344

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 |

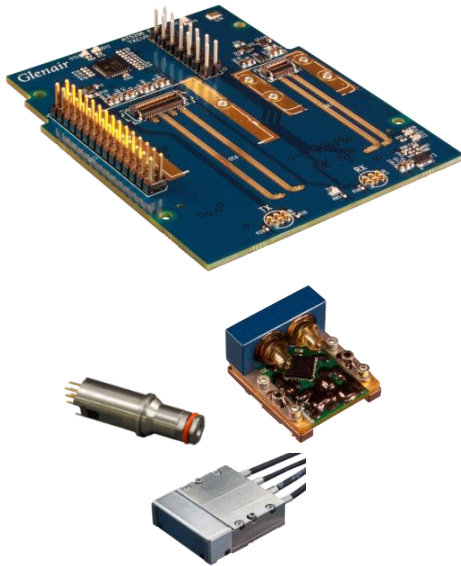
14U2-7544

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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 I²C current monitor IC and an I²C 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 I²C or via connector Header
- I²C 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 |

050-344

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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
- 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

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 | DP0_C2M_P | GND | NC | GND | NC | NC | NC | GND |
| 3 | DP1_M2C_N | GND | DP0_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 | DP0_M2C_P | GND | NC | GND | LA00_P_CC | GND | NC | GND |
| 7 | DP2_M2C_N | GND | DP0_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 |

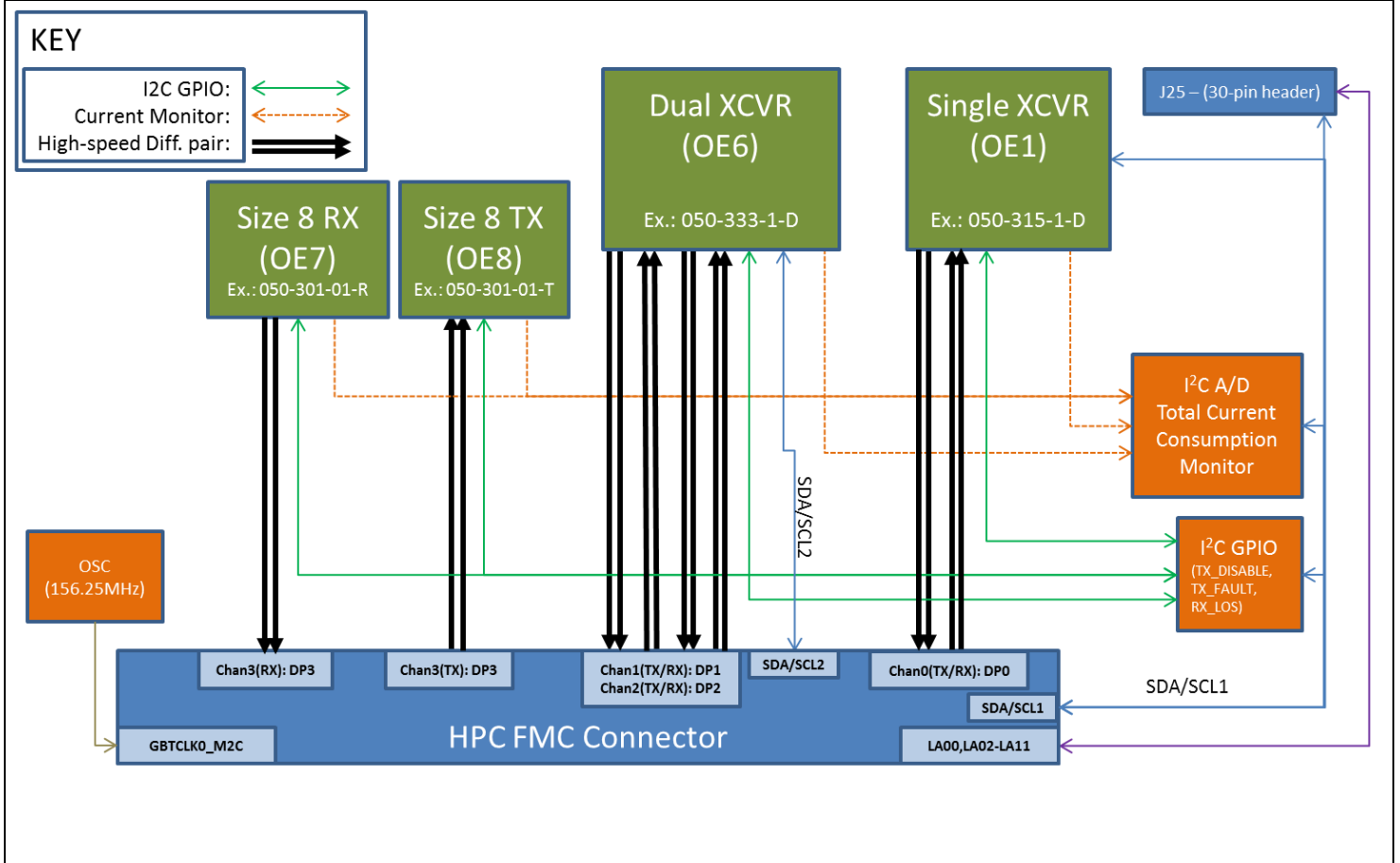
050-344

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Functional Block Diagram (050-344-A)



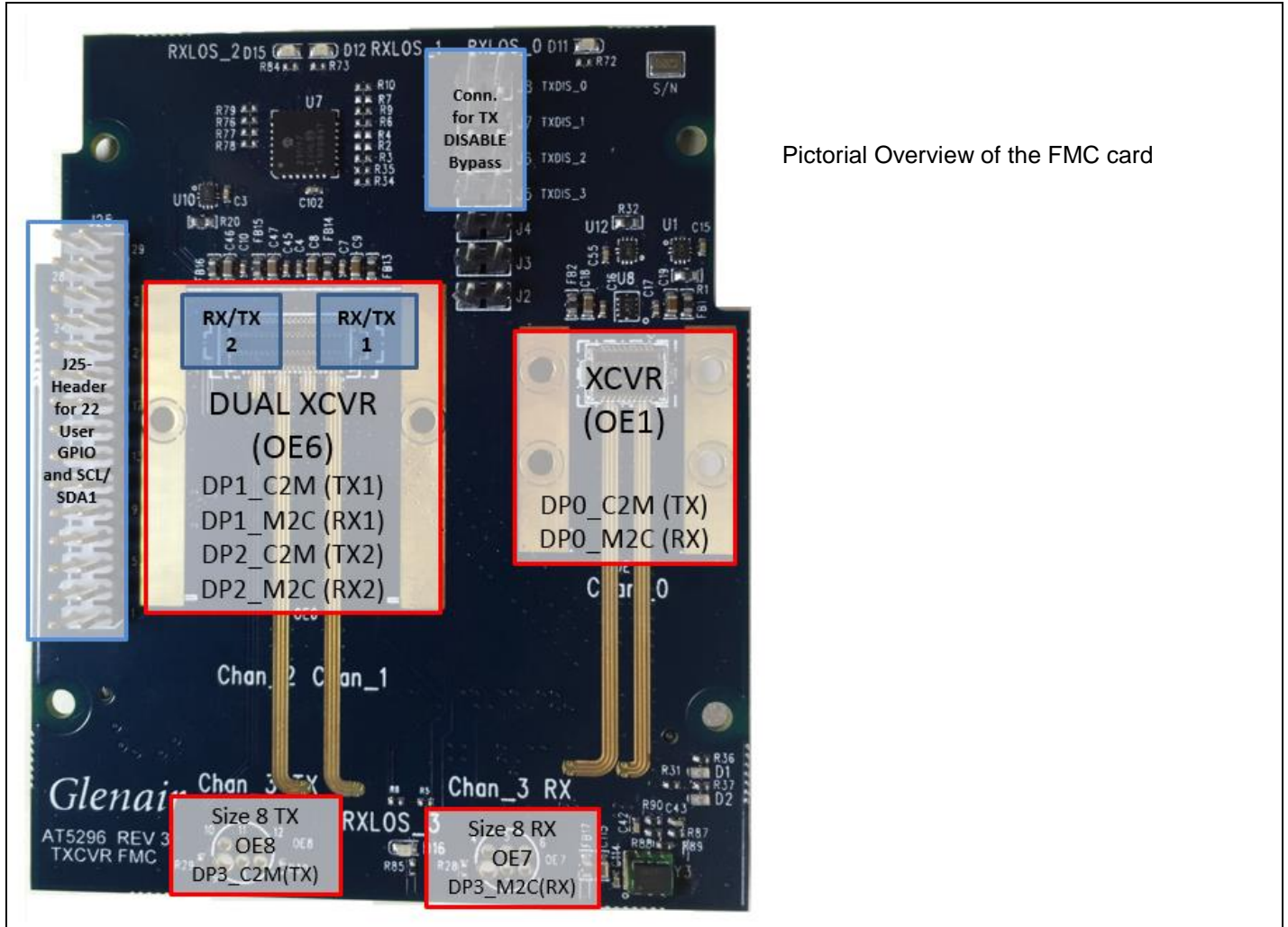
050-344

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Pictorial Block Diagram (050-344-A)



050-344

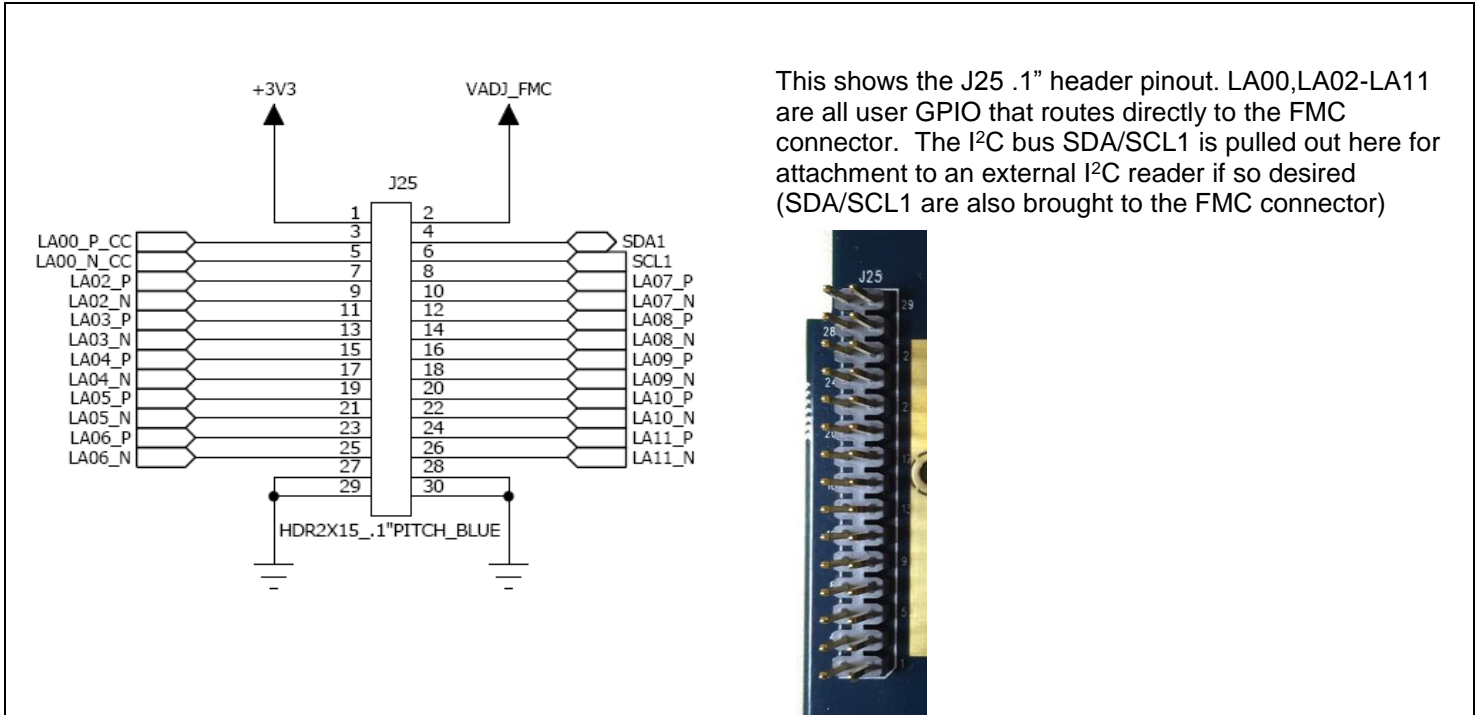
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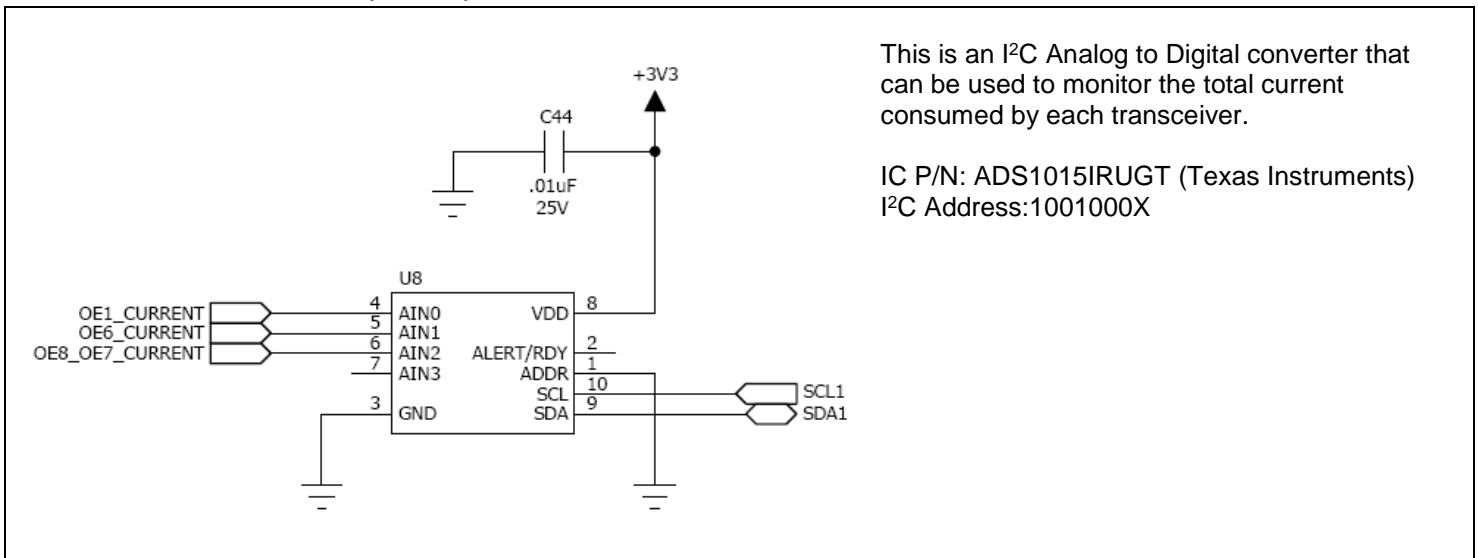


Schematic User interface Blocks (050-344-A)

J25 Header pinout



U8 Current Monitor (I²C A/D)



050-344

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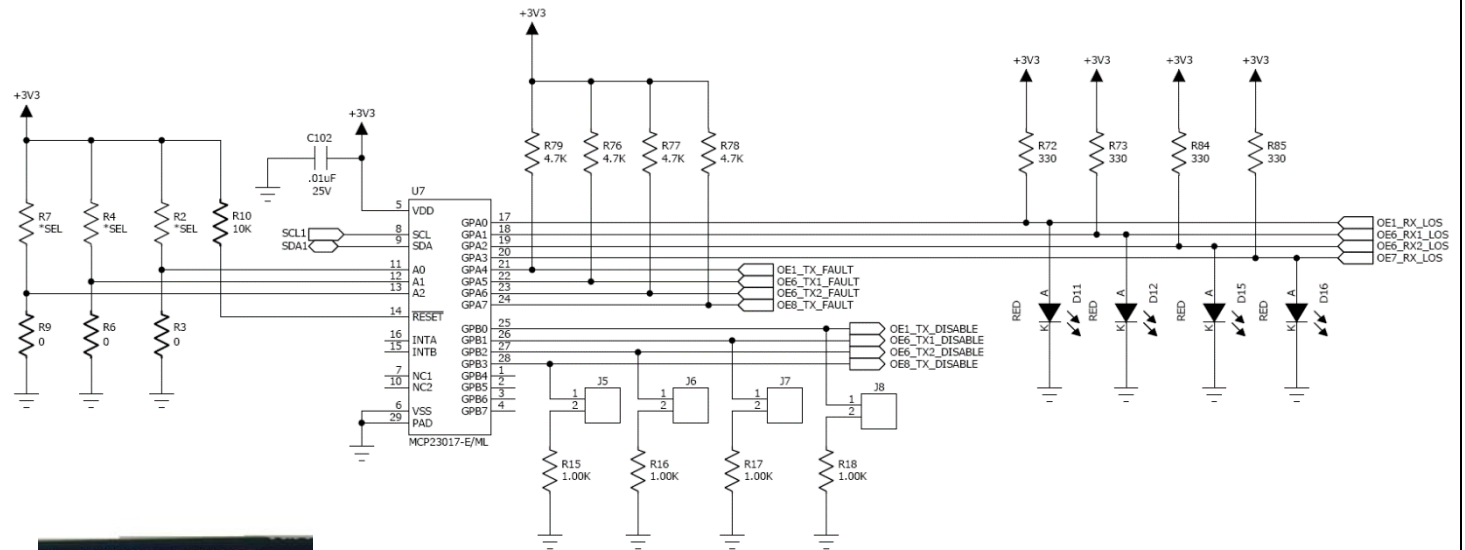


Schematic User interface Blocks (050-344-A) continued

U7 I²C 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

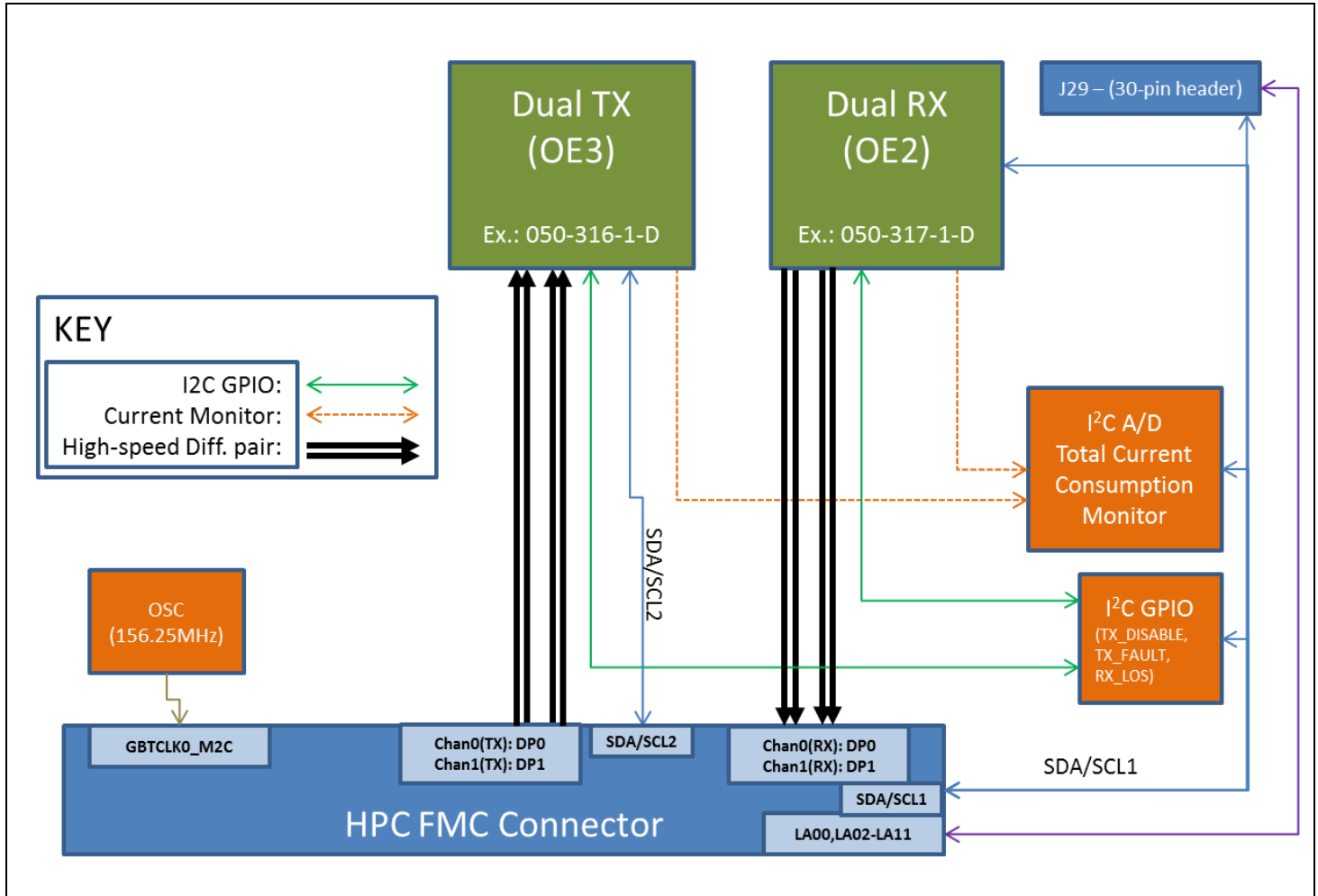
050-344

FMC CONNECTIVITY CARD

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Functional Block Diagram (050-344-B)



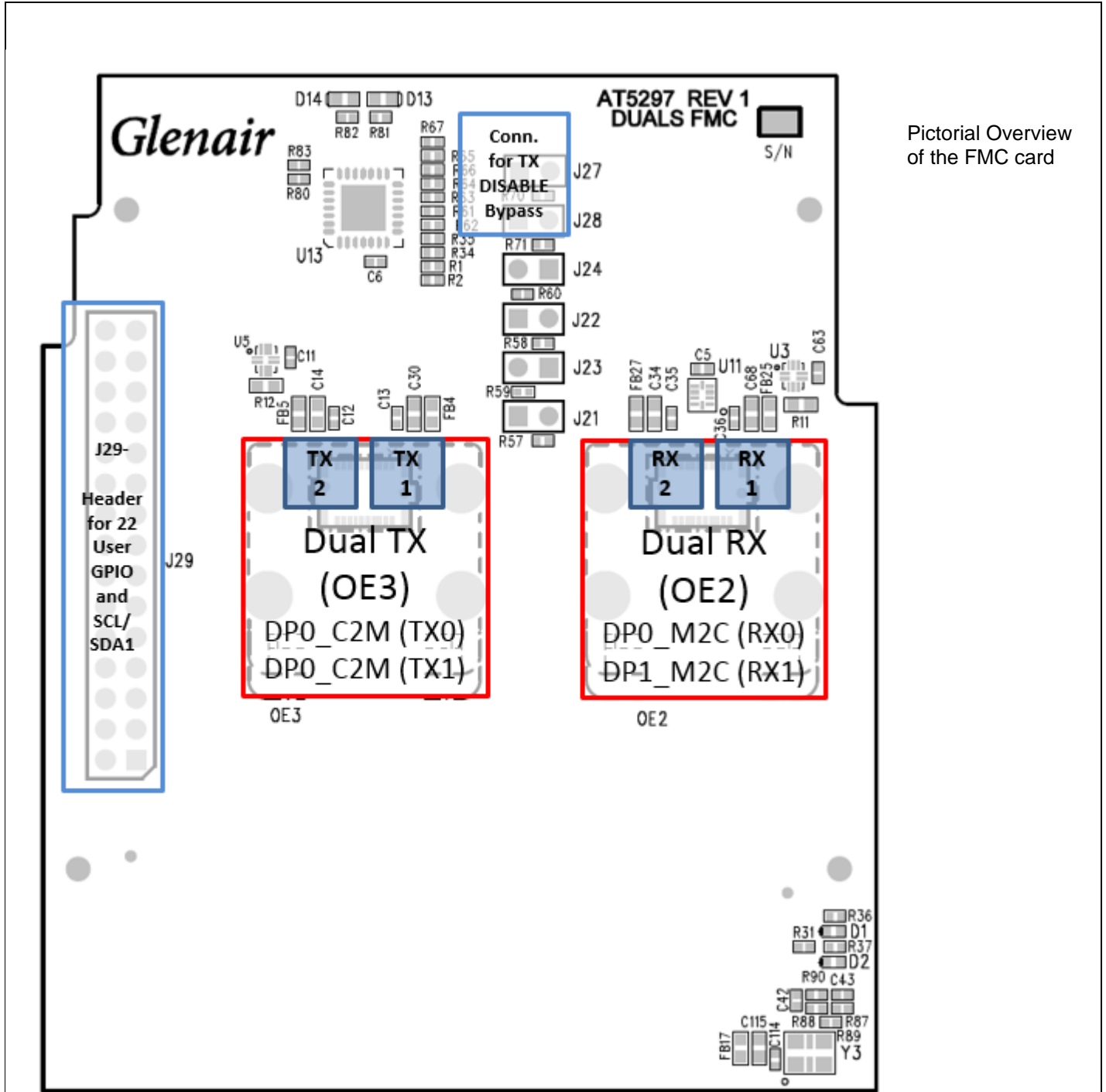
050-344

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For Glenair PCB Mount Opto-Electronic Converters



Pictorial Block Diagram (050-344-B)



Pictorial Overview of the FMC card

050-344

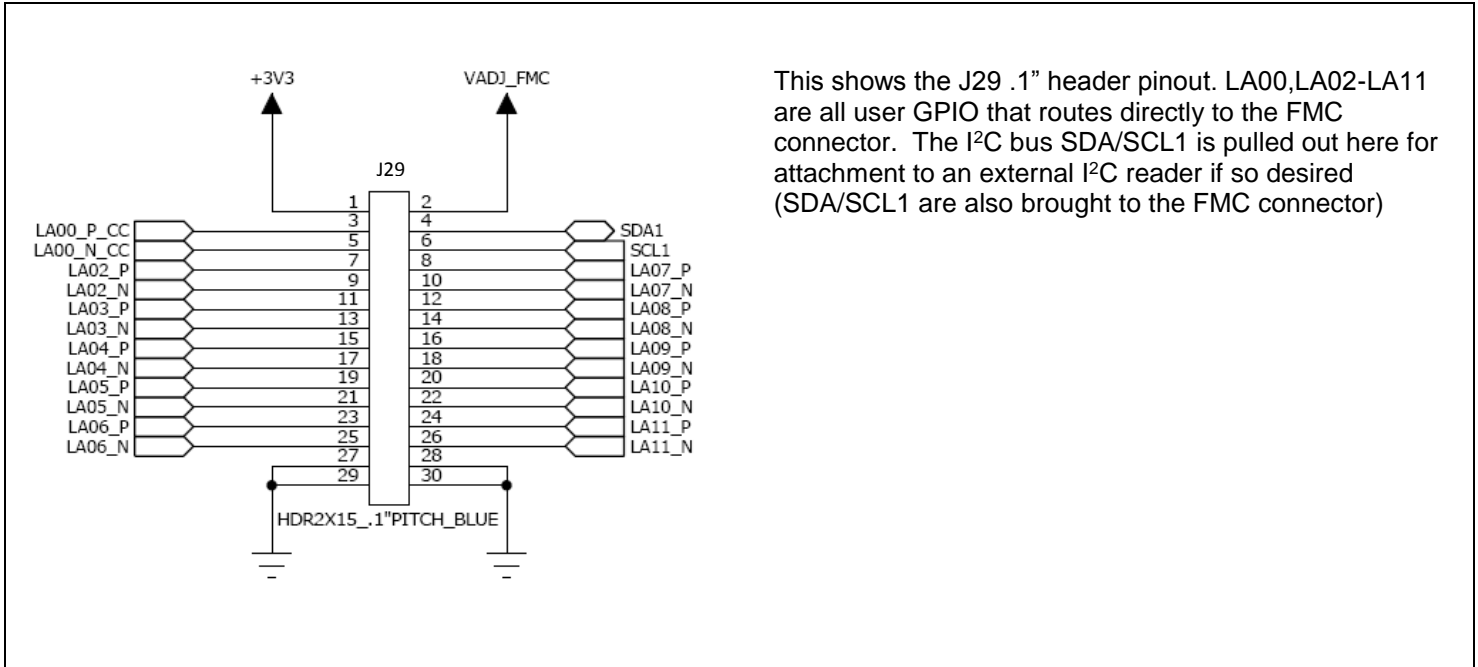
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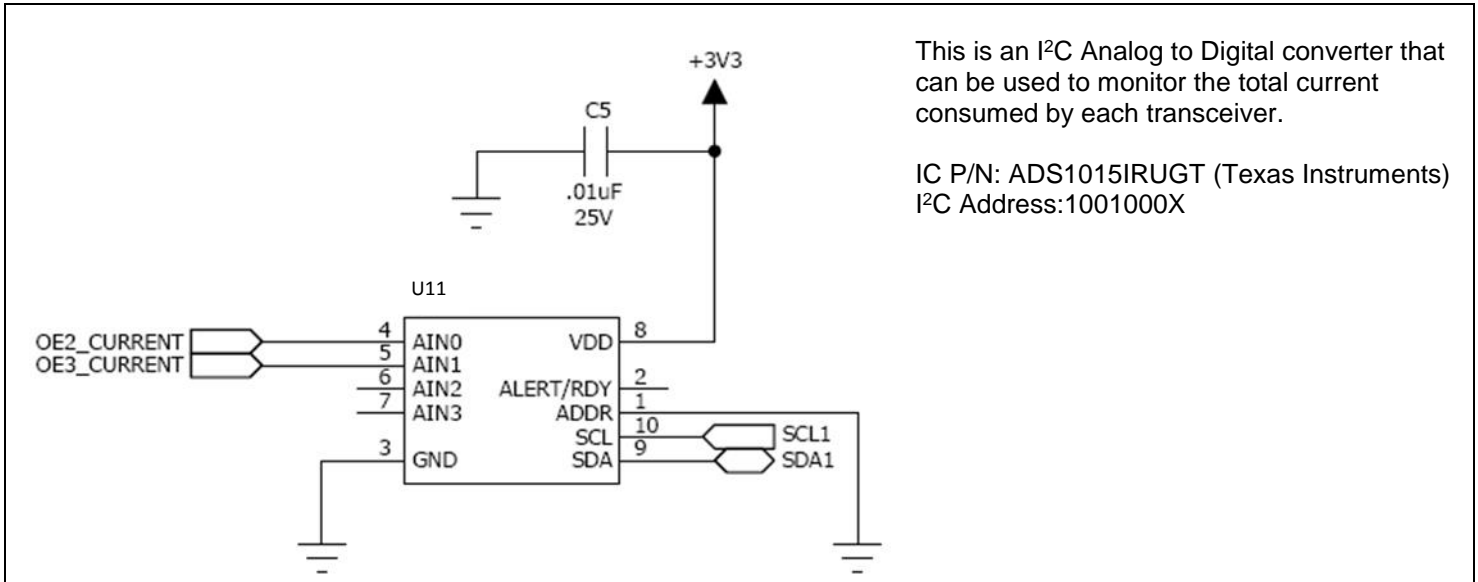


Schematic User interface Blocks (050-344-B)

J29 Header pinout



U11 Current Monitor (I²C A/D)



050-344

FMC CONNECTIVITY CARD

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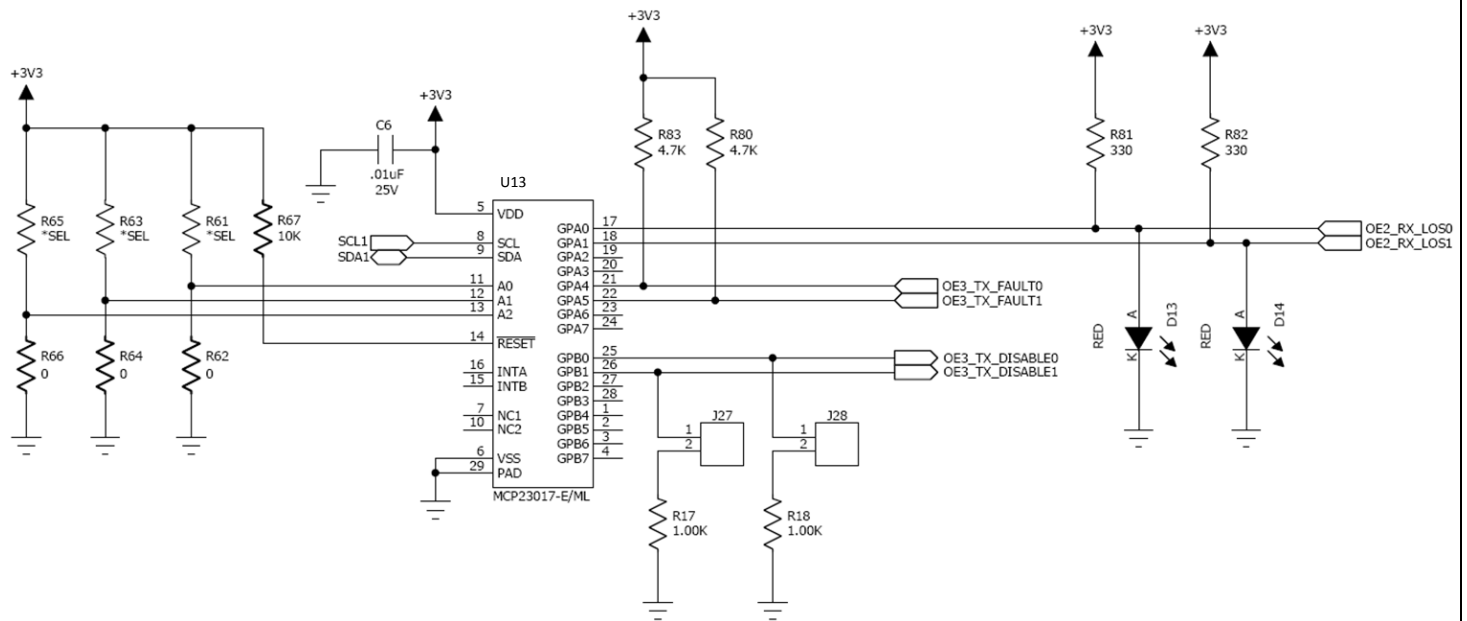


Schematic User interface Blocks (050-344-B) continued

U13 I²C 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



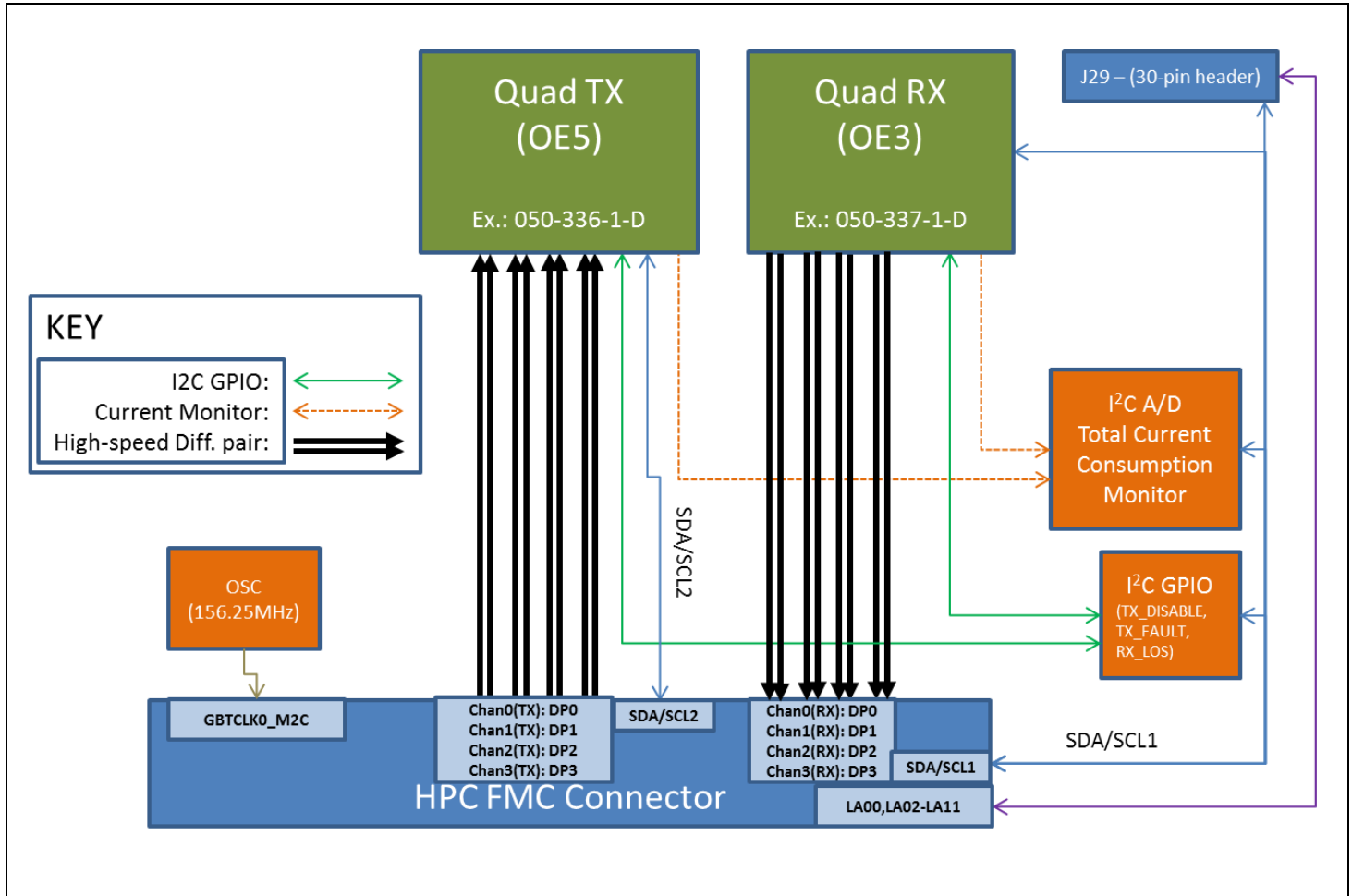
050-344

FMC CONNECTIVITY CARD

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Functional Block Diagram (050-344-C)



050-344

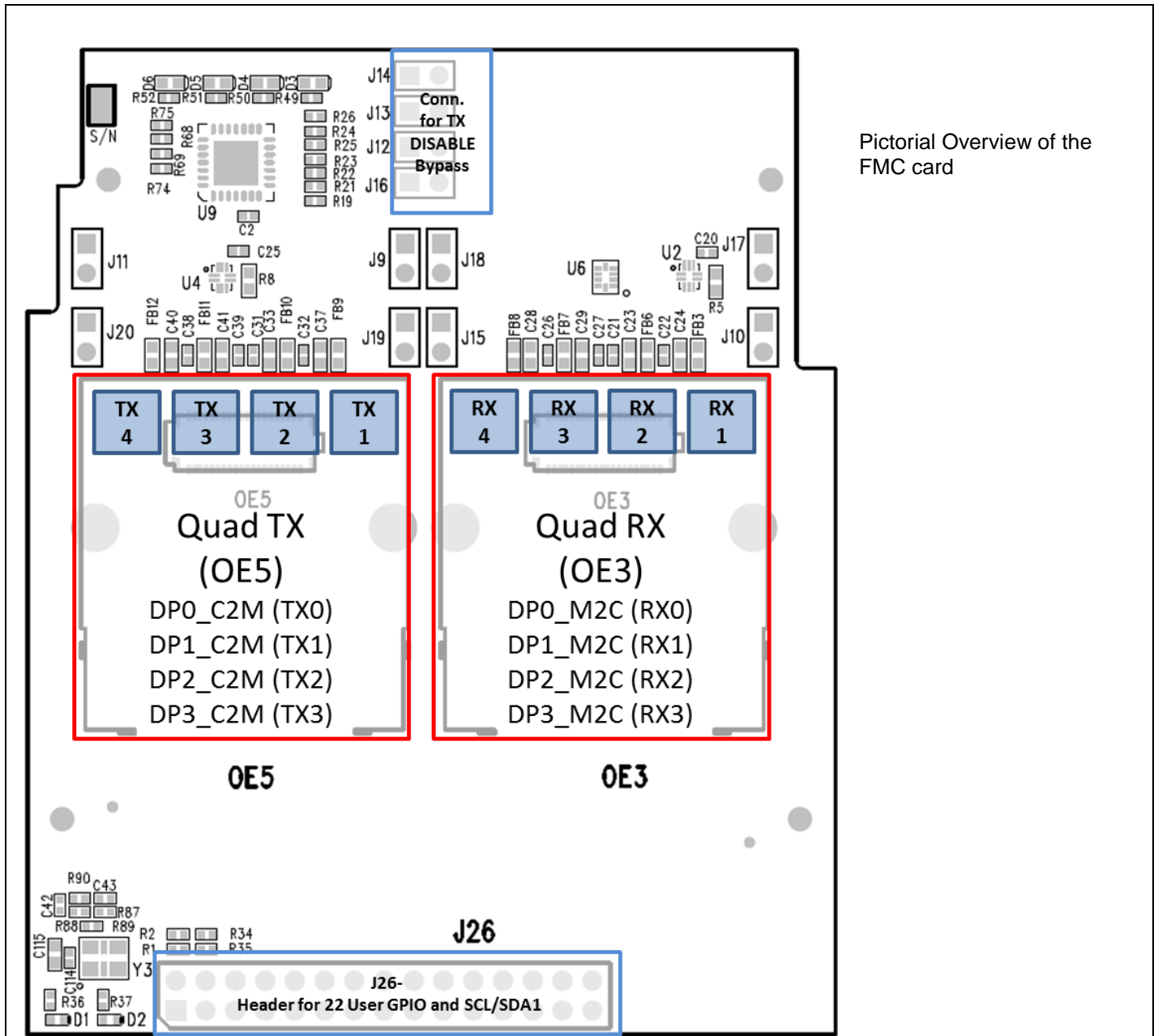
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Pictorial Block Diagram (050-344-C)

Pictorial Overview of the FMC card



050-344

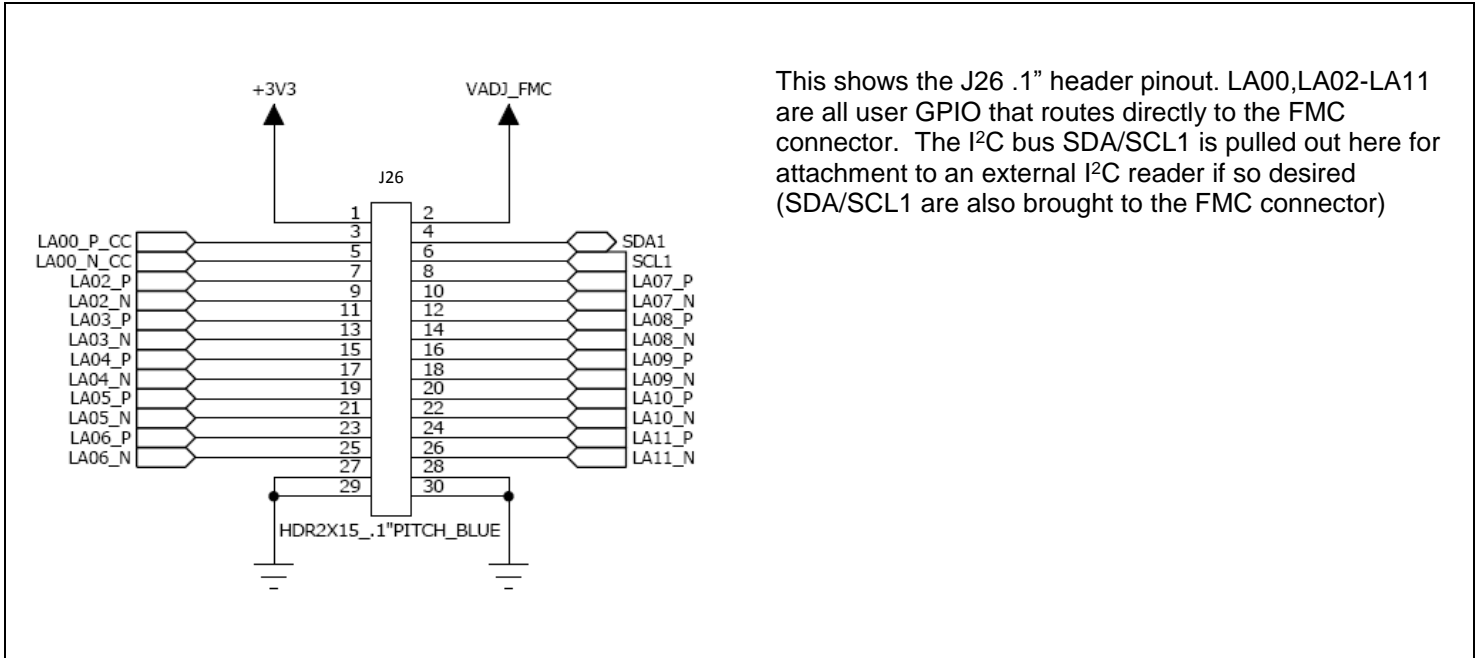
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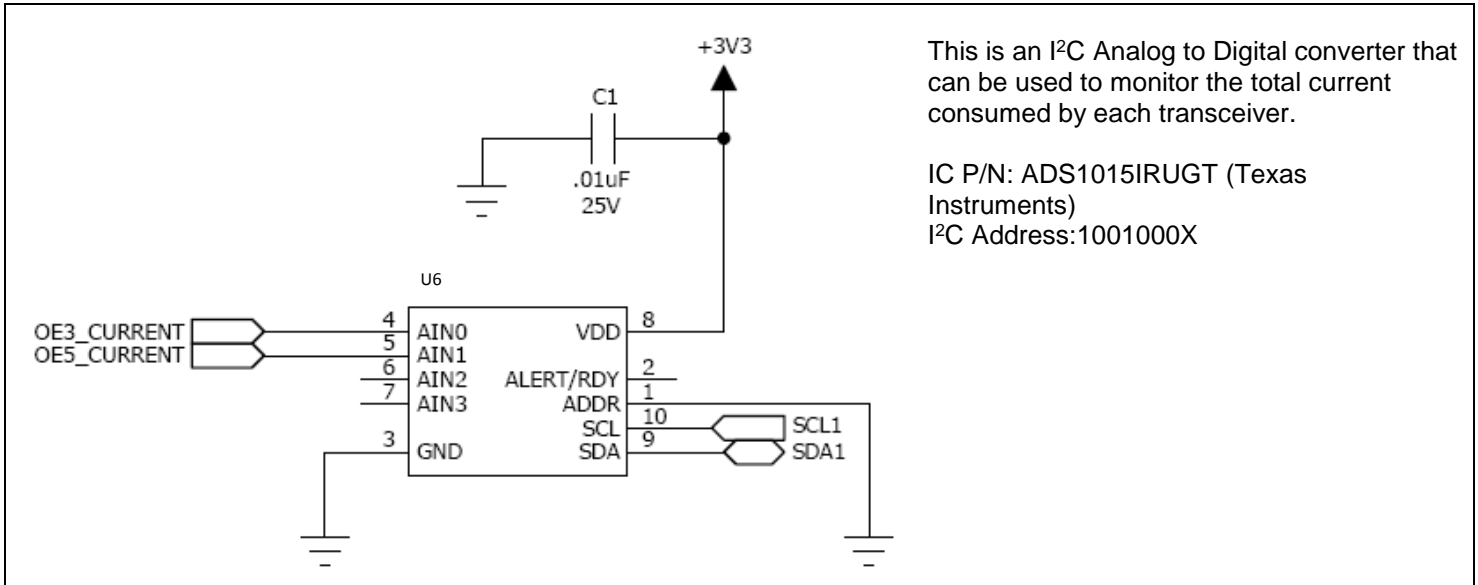


Schematic User interface Blocks (050-344-C)

J26 Header pinout



U6 Current Monitor (I²C A/D)



050-344

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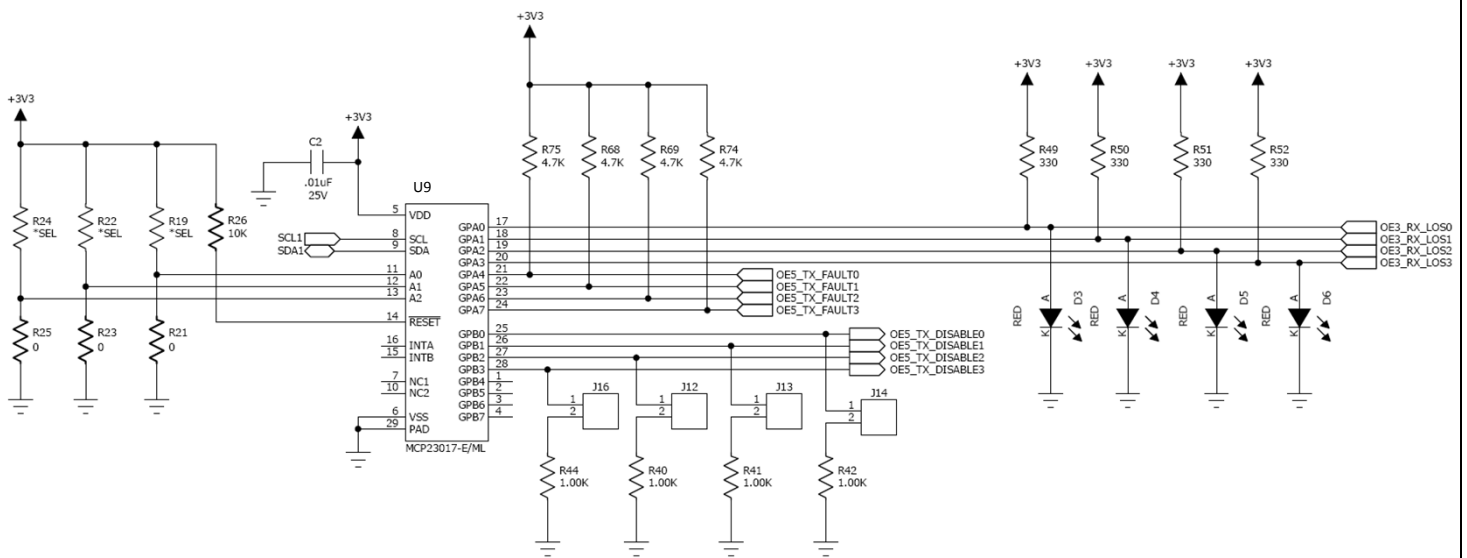


Schematic User interface Blocks (050-344-C) continued

U9 I²C 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



050-344

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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) I²C buses for transceiver status and control
 - I²C A/D to read transceiver current
 - I²C 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