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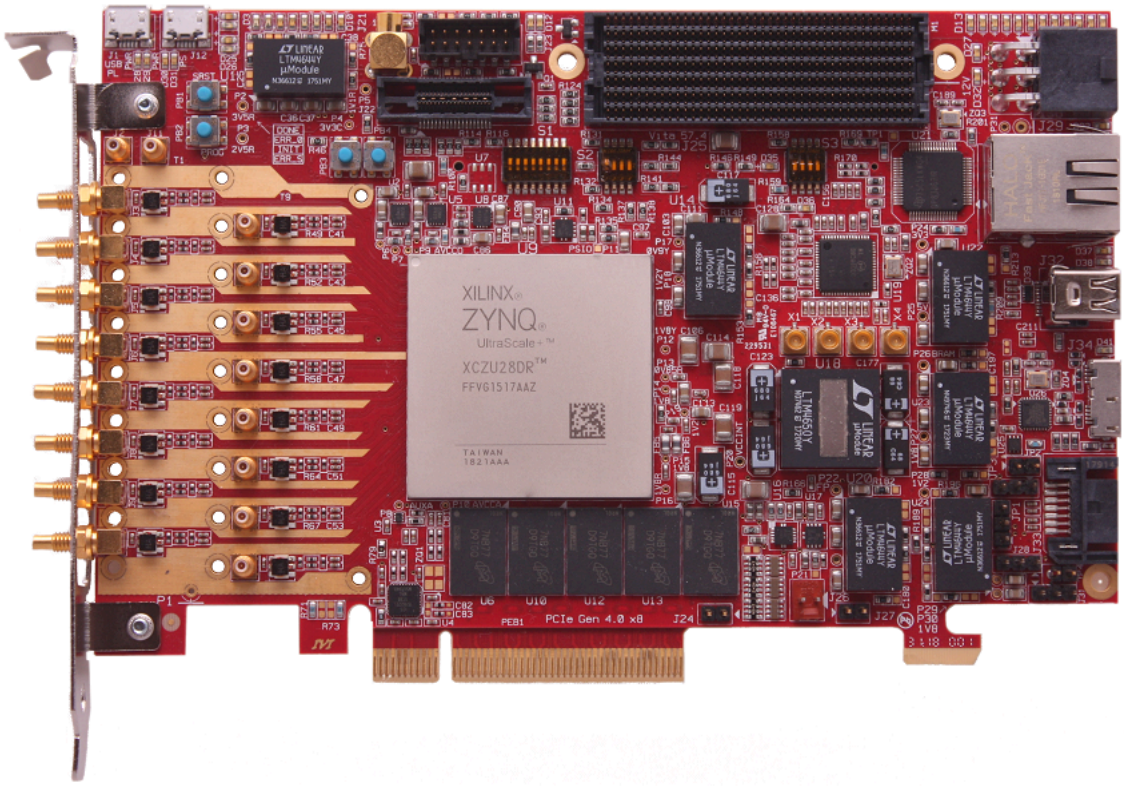





►FPGA Boards Selection Guide

►FMC Modules Selection Guide

# HTG-ZRF8: Xilinx Zynq® UltraScale+™ RFSoC Development Platform




Populated with one Xilinx **ZYNQ UltraScale+ RFSoC** ZU28DR or ZU48DR, the HTG-ZRF8 provides access to large FPGA gate densities, eight ADC/DAC ports, expandable I/Os port and DDR4 memory for variety of different programmable applications.

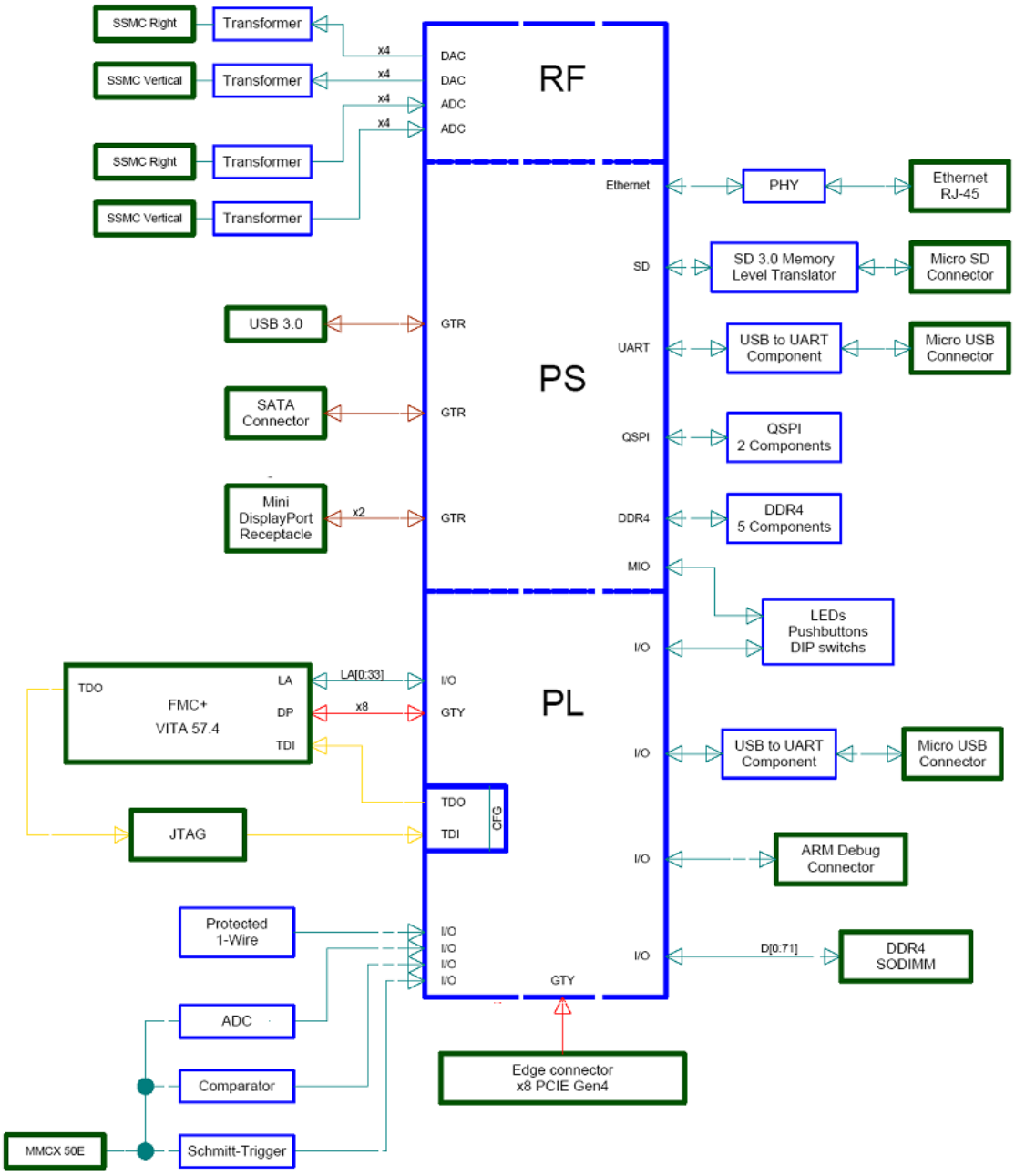
The HTG-ZRF8 is supported by eight 12-bit ADC **4.096 GSPS** (ZU28DR) or 14-bit ADC **5 GSPS** (ZU48DR) and eight 14-bit DAC **6.4 GSPS** (ZU28DR) or **10 GSPS** (ZU48DR) ports. The ADC and DAC ports are supported through high-performance front panel micro Rf connectors.

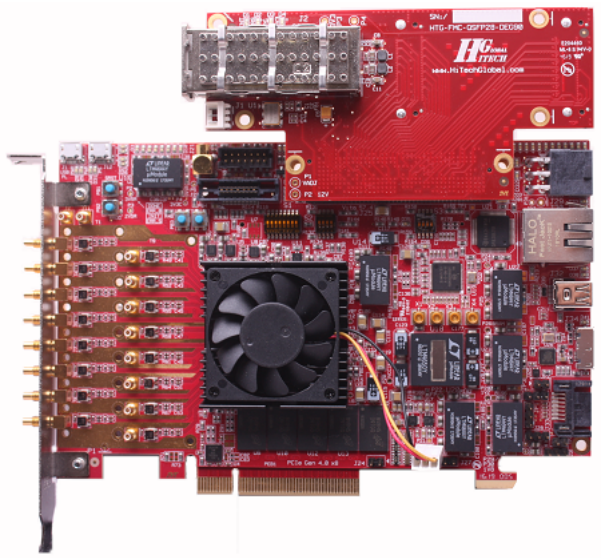
The HTG-ZRF8 architecture allows easy and versatile functional expansion through one Vita 57.4 compliant High-Pin-Count FPGA Mezzanine Card (FMC+) port. The HTG-ZRF8 can host wide range of Vita57.1 /Vita57.4 compliant daughter cards.

The HTG-ZRF8 is supported by one 72-bit ECC DDR4 SODIMM socket providing access to up to 16 GB of SDRAM memory. The processor's side is supported by up to 4GB of DDR4 memory.

The HTG-ZRF8 can be used in PCI Express and Standalone mode and powered through its 6-pin Molex PCIe connector.

The HTG-ZRF8-R2 model is supported by commercially available **Multi-Tile Synchronization** (MTS) reference design.





**Supported Devices (red boxes)**

| | Device Name | ZU21DR | ZU25DR | ZU27DR | ZU28DR | ZU29DR | ZU39DR | ZU43DR | ZU46DR | ZU47DR | ZU48DR | ZU49DR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Gen 1 | | | Gen 2 | | | Gen 3 | | |
| PS | | Quad-core Arm® Cortex™-A53 MPCore™ up to 1.3GHz, Dual-core Arm Cortex-R5 MPCore up to 533MHz | | | | | | | | | | |
| RF Data Converter | 12-bit RF-ADC # of ADCs | 0 | 8 | 8 | 8 | 16 | 16 | – | – | – | – | – |
| | 12-bit RF-ADC w/DDC Max Rate (GSPS) | 0 | 4.096 | 4.096 | 4.096 | 2.058 | 2.220 | – | – | – | – | – |
| | 14-bit RF-ADC # of ADCs | – | – | – | – | – | – | 4 | 8 4 | 8 | 8 | 16 |
| | 14-bit RF-ADC w/DDC Max Rate (GSPS) | – | – | – | – | – | – | 5.0 | 2.5 5.0 | 5.0 | 5.0 | 2.5 |
| | 14-bit RF-DAC # of DACs | 0 | 8 | 8 | 8 | 16 | 16 | 4 | 12 | 8 | 8 | 16 |
| | 14-bit RF-DAC w/DUC Max Rate (GSPS) | 0 | 6.554 | 6.554 | 6.554 | 6.554 | 6.554 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| | SD-FEC | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 8 | 0 | 8 | 0 |
| | Number of DDCs per RF-ADC[1] | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| | RF input Freq max. GHz | | | 4 | | | 5 | | | 6 | | |
| | Decimation / Interpolation | | | 1x, 2x, 4x, 8x | | | 1x, 2x, 4x, 8x | 1x, 2x, 3x, 4x, 5x, 6x, 8x, 10x, 12x, 16x, 20x, 24x, 40x | | | | |
| Programmable Logic (PL) | System Logic Cells (K) | 930 | 678 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 | 930 |
| | CLB LUTs (K) | 425 | 310 | 425 | 425 | 425 | 425 | 425 | 425 | 425 | 425 | 425 |
| | Max. Dist. RAM (Mb) | 13.0 | 9.6 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 |
| | Total Block RAM (Mb) | 38.0 | 27.8 | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 | 38.0 |
| | UltraRAM (Mb) | 22.5 | 13.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| | DSP Slices | 4,272 | 3,145 | 4,272 | 4,272 | 4,272 | 4,272 | 4,272 | 4,272 | 4,272 | 4,272 | 4,272 |
| | GTY Transceivers | 16 | 8 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| | PCIe® Gen3 x16 | 2 | 1 | 2 | 2 | 2 | 2 | – | – | – | – | – |
| | PCIeGen3 x16/Gen4 x8 / CCIX[2] | – | – | – | – | – | – | 2 | 2 | 2 | 2 | 2 |
| | 150G Interlaken | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 100G Ethernet MAC/PCS w/RS-FEC | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | System Monitor | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Speed Grades | -1E, -1I, -1LI, -2E, -2LE, -2I, -2LI | -1E, -1I, -1LI, -2E, -2LE, -2I, -2LI | -1E, -1I, -1LI, -2E, -2LE, -2I, -2LI | -1E, -1I, -1LI, -2E, -2LE, -2I, -2LI | -1E, -1I, -1LI, -2E, -2LE, -2I, -2LI | -2I, -2LI | -1E, -1I, -1LI, -2E, -2I, -2LI | -1E, -1I, -1LI, -2E, -2I, -2LI | -1E, -1I, -1LI, -2E, -2I, -2LI | -1E, -1I, -1LI, -2E, -2I, -2LI | -1E, -1I, -1LI, -2E, -2I, -2LI |
| Package Footprint | Package Dimensions | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC | PSIO, HDIO, HPIO GTR, GTY RF-ADC, RF-DAC |
| G1517 | 40x40 | | 214, 48, 299<br>4, 8<br>8, 8 | 214, 48, 299<br>4, 16<br>8, 8 | 214, 48, 299<br>4, 16<br>8, 8 | | | 214, 48, 299<br>4, 16<br>4, 4 | | 214, 48, 299<br>4, 16<br>8, 8 | 214, 48, 299<br>4, 16<br>8, 8 | |

**Main Features:**

►Xilinx Zynq UltraScale+ RFSoCZU28DR or ZU48DR
►x8 ADC (12-bit or 14-bit) ports
►x8 DAC (14-bit) ports
►x8 PCI Express Gen3 /Gen4
►x1 Vita57.4 FPGA Mezzanine Connector (FMC+) with 68 single-ended I/Os and 8 GTY (32.75Gbps) Serial Transceivers
►Independent DDR4 memory for the FPGA (up to 32GB SODIMM) and the ARM Processors ( 4GB component)
►Configuration Flash
►x1 10/100/1000 Ethernet (RJ45) port (Processor)
►x1 MicroSD (Processor side)
►x1 SATA port (Processor side)
►x1 Display Port (Processor side)
►x1 USB 3.0 port (Processor side)
►x2 USB/UART ports (FPGA and Processor sides)
►Programmable Clocks (with default frequencies but programmable through I2C bus)
►ARM Debug Header
►FPGA JTAG Header
►External Synchronous Clock port
►6.6" x 4.25"
►Supports both PCI Express and Standalone operations
- 12V/10A Power adapter for standalone operation

**Kit Content:**

**Hardware:**
- HTG-ZRF8 Xilinx Zynq UltraScale+ RFSoC platform

**Reference Designs/Demos:**
- x8 PCI Express
- DDR4 Memory Controller
- Petalinux (unsupported sample design)

**Documents:**
- User Manual
- Schematics (partial in searchable .pdf format)

**Ordering & Availability Information**

HTG-ZRF8-28
HTG-ZRF8-R2-28 (supporting Multi-Tile Synchronization)-

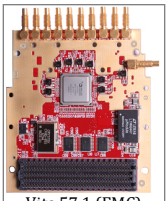
HTG-ZRF8-48
HTG-ZRF8-48-I (**industrial** grade)

HTG-ZRF8-R2-48 (supporting Multi-Tile Synchronization)
HTG-ZRF8-R2-48 -I (**Industrial** grade)

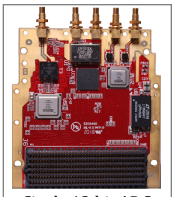
Price: please contact us

12" SSMC To SMA Cable
24" SSMC To SMA Cable
36" Meter SSMC To SMA Cable

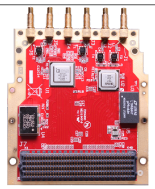
**Accessories (FMC Modules)**



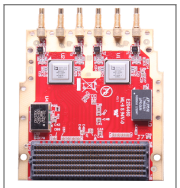
Vita 57.1 (FMC)
Quad 12-Bit ADC
(4 GSPS)
Quad16-Bit DAC
(12 GSPS)
More info..



Single 12-bit ADC
(10.25 GSPS)
Dual 16-bit DAC
(12.6 GSPS)
FMC+ Module
More info...



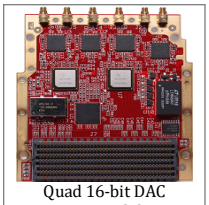
Dual14-bit ADC
(3 GSPS)
Dual 16-bit DAC
(12.6 GSPS)
FMC Module
More info..



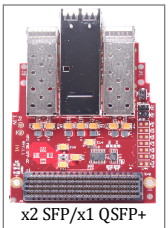
Quad 14-bit ADC (3
GSPS) FMC+ Module
(Vita57.4)
More info..



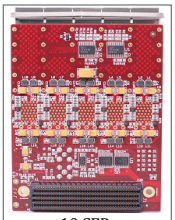
Quad 16-bit ADC
FMC Module
More info..



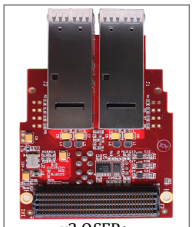
Quad 16-bit DAC
FMC Module
More info.



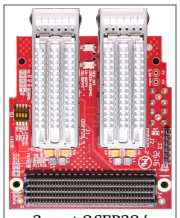
x2 SFP/x1 QSFP+
FMC Module
More info



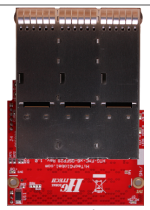
x10 SFP+
FMC Module
More info..



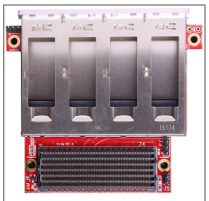
x2 QSFP+
FMC Module
More Info..



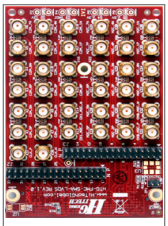
2-port QSFP28/
QSFP+ 56G) FMC
Module More Info.



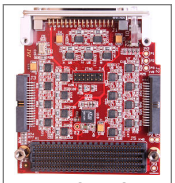
x6 QSFP28 / QSFP+
FMC+ Module
More info..



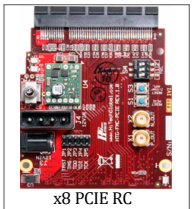
x4 QSFP28/QSFP+
FMC+ Module
More info..



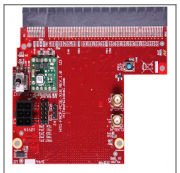
x8 SMA / x33 LVDS
FMC Module
More Info.



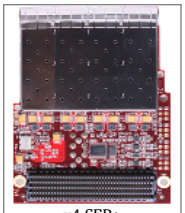
42-channel
RS485/RS422
FMC Module
More Info..



x8 PCIE RC
FMC Module
More info..



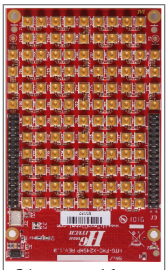
X16 PCI Express Root
Complex FMC Module
More info..



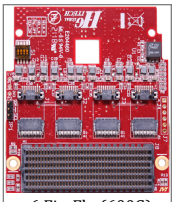
x4 SFP+
FMC Module
More Info..



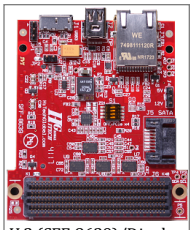
Carrier board to daughter
card and carrier board
to carrier board
FMC cable
More Info..



24-port or 16-port
Mini SMP/GPPO
/ 34-pair LVDS FMC
Module
More info..



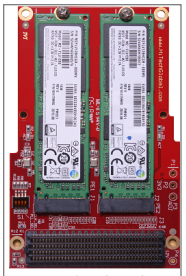
x6 FireFly (600G)
FMC+ Module



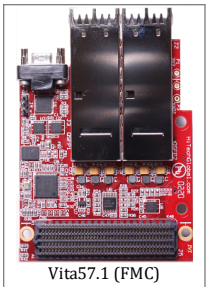
U.2 (SFF-8639)/Display
Port/ SATA/ Ethernet /
USB FMC Module
More info..



x4 RJ45 (SGMII)
FMC Module
More Info..



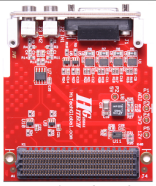
Vita 57.1(FMC)
x2 M.2 SSD FMC
Module
More info



Vita57.1 (FMC)
x2 QSFP28 / SpaceWire/
LVDS
FMC Module
More info..



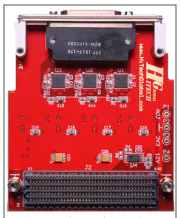
x4 SMA
FMC Module
More Info..



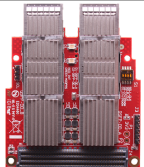
Vita57.1 (FMC)
4-channel
RS485/RS422 FMC
Module
More Info..



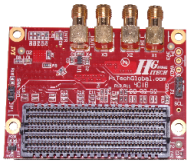
Vita 57.4 (FMC+)
Low-profile x4 FireFly
FMC+ Modules with
left and right turn
options
More info..



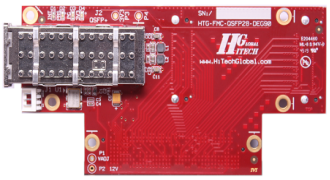
Vita57.1 (FMC)
26-port LVDS FMC
Module
More Info..

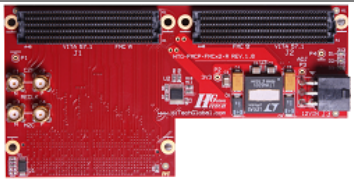


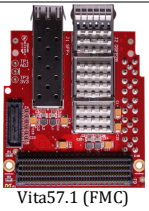
Vita 57.4 (FMC+)
x2 QSFP-DD (Double
Density) FMC+ Module
More Info.



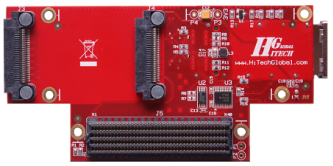
I/O Loopback FMC/FMC+
/ Clock Generator Module
More Info..



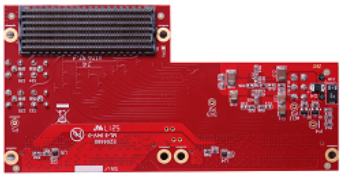




Vita57.1 (FMC)
QSFP28 (100G) /
SFP+ (25G) / QSE FMC
Module
More Info..



Vita57.1 (FMC)
90-degree turn QSFP28 (100G) /LVDS
FMC Module
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FMC+ to FMC Splitter Module
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