



# XILINX-BASED

## System-On-Modules Selector Guide



# / DESIGN IT OR BUY IT?

## Xilinx-based Ready-made SoC Modules Will Shorten Your Development Cycle

Today's quick time-to-market demands are forcing you to rethink how you design, build, and deploy your products. Typically, it's faster, less costly, and lower risk to incorporate an off-the-shelf solution instead of designing from the beginning. Xilinx-based System-On-Module (SOM) solutions for the Xilinx Zynq-7000 SoC, Zynq UltraScale+ MPSoC and Zynq UltraScale+ RFSoc can reduce development times by up to nine months, allowing you to focus your efforts on adding differentiating features and unique capabilities.

### Xilinx-based SoC Modules Offer the Following Benefits:

- Reduce risk by building your application upon a known working system
- Get running quickly with example designs, tutorials, and board support packages
- Start software development immediately
- Eliminate costly board re-spins
- Start with proven carrier designs

With over fifteen years of experience building customized SOM and carrier products, Avnet Design Services has helped many companies attain a jump start on their products and get to market faster. Contact us today to get started!

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### Kria KV260 ..... 4

The Kria KV260 Vision AI Starter Kit is an evaluation platform for the K26 SOM focused on machine learning (ML) acceleration in vision applications. The kit brings together a Zynq UltraScale+ MPSoC-based SOM with user selectable, vision focused peripherals and a set of pre-built accelerated applications.

### Kria K26 ..... 5

The Kria K26 SOM is a compact embedded platform that integrates a custom built Zynq UltraScale+ MPSoC that runs optimally (and exclusively) on the K26 SOM with DDR memory, nonvolatile storage devices, a security module, and an aluminum thermal heat spreader. The SOM is designed to be plugged into a carrier card with solution-specific peripherals.

### MicroZed ..... 6

MicroZed is a low-cost board based on the Xilinx Zynq-7000 SoC. MicroZed is unique as both a standalone board for basic SoC experimentation or combined with a carrier card as a SOM. MicroZed is available in 7010 and 7020 varieties as well as both C- and I-temp grades.

### PicoZed ..... 8

PicoZed is a highly flexible, rugged SOM based on the Xilinx Zynq-7000 SoC. Family members allow migration between the 7010, 7015, 7020, and 7030 Zynq-7000 devices in a pin-compatible footprint. The 7015/7030 also include transceivers. All are offered in Industrial temperature grade.

### UltraZed-EG ..... 9

The UltraZed-EG SOM is a highly flexible, rugged SOM based on the Xilinx Zynq UltraScale+ MPSoC. Designed in a smaller form factor (7 sq in), this SOM uses the 3EG device and packages the RAM, Flash, Ethernet, USB, and configuration memory needed for an embedded processing system.

### UltraZed-EV ..... 11

The UltraZed-EV is a flexible SOM-based on the Xilinx Zynq UltraScale+ MPSoC. The 7EV device includes the Xilinx VCU and is an ideal platform for embedded video processing. On-board features include dual system memory, configuration memory, high-speed transceivers, Ethernet, and USB.

### XRF RFSoc SOMs ..... 15

Avnet XRF™ RFSoc System-on-Modules are designed for large-scale integration into deployed RF systems demanding a small footprint, low power, and real-time processing. XRF modules feature the Xilinx Zynq® UltraScale+™ RFSoc Gen 2 / Gen 3 with up to 16 RF-ADC and 16 RF-DAC channels and up to 6 GHz analog bandwidth.

## Avnet and Xilinx SOM Solutions

Features	Kria	PicoZed				MicroZed		UltraZed -EG <sup>4</sup>	UltraZed -EV <sup>5</sup>
	K26	7010	7015	7020	7030	7010	7020	ZU3EG	ZU7EV
Zynq Device	XCK26	7Z010-1	7Z015-1	7Z020-1	7Z030-1	7Z010-1	7Z020-1	ZU3EG-1	ZU7EV-1
Programmable Logic Cells	256K	28 K	74 K	85 K	125 K	28 K	85 K	154 K	504 K
DDR Memory	4 GB DDR4	1 GB DDR3L	1 GB DDR3L	1 GB DDR3L	1 GB DDR3L	1 GB DDR3	1 GB DDR3	2 GB DDR4	5 GB DDR4
QSPI	512 Mb	128 Mb	128 Mb	128 Mb	128 Mb	128 Mb	128 Mb	512 Mb	512 Mb
uSD Card Cage	No	No	No	No	No	Yes	Yes	No	No
eMMC Memory	16 GB	8 GB	8 GB	8 GB	8 GB	No	No	8 GB	8 GB
User I/O <sup>1</sup>	185/49	100/13	135/13	125/13	135/13	100/8	115/8	180/26	152/26
GTP/GTX/GTR Ports	4 GTH, 4 GTR	-	4	-	4	-	-	4 PS	4 PS, 16 PL
10/100/1000 Ethernet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USB 2.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USB-UART	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Other Peripherals	USB 3.0, PCIe Gen3 x4, SLVS-EC, HDMI 2.0, DisplayPort 1.4	-	-	-	-	Pmod™	Pmod™	USB 3.0	USB 3.0
Size	3" x 2.36" x .43" 77mm x 60mm x 11mm	4" x 2.25" 102 x 57 mm	4" x 2.25" 102 x 57 mm	4" x 2.25" 102 x 57 mm	4" x 2.25" 102 x 57 mm	4" x 2.25" 102 x 57 mm	4" x 2.25" 102 x 57 mm	3.5" x 2" 89 x 51 mm	4" x 2.5" 102 x 63.5 mm
Temperature Grade	Commercial <sup>3</sup>	Commercial <sup>3</sup>	Industrial	Commercial <sup>3</sup>	Industrial	Commercial <sup>3</sup>	Commercial <sup>3</sup>	Commercial <sup>3</sup>	Commercial <sup>3</sup>

1: Zynq: PL IO / PS MIO. 2: Resale based on 1 piece - call for volume pricing. 3: Industrial Grade also available. 4: Custom versions also available in the ZU4EV, ZU4EG, ZU5EV, ZU5EG, and ZU7EG. Pmod is a registered trademark of Digilent.

## Avnet XRF RFSoc SOMs Product Table

Features	XRF16 Gen 2	XRF8 Gen3		XRF16 Gen 3
RFSoc Device	XCZU39DR-2	XCZU47DR-1	XCZU48DR-1	XCZU49DR-2
# of 12-bit RF-ADCs w/ DDC	16	0	0	0
Max Sample Rate (GSPS)	2.22	-	-	-
# of 14-bit RF-ADC w/ DDC	0	8	8	16
Max Sample Rate (GSPS)	-	5	5	2.5
# of 14-bit RF-DAC w/DUC	16	8	8	16
Max Sample Rate (GSPS)	6.554	8.92 <sup>(1)</sup>	8.92 <sup>(1)</sup>	9.85 <sup>(1)</sup>
SD-FEC	0	0	8	0
RF Input Freq max (GHz)	5	6	6	6
System Logic Cells (K)	930	930	930	930
PL / PS DDR4 Memory	4GB / 4GB	4GB / 4GB	4GB / 4GB	4GB / 4GB
QSPI Flash Memory	128 MB	128 MB	128 MB	128 MB
eMMC Memory	32 GB	32 GB	32 GB	32 GB
Programmable RF PLL Subsystem	Yes	Yes	Yes	Yes
Multi-module sync	Yes	Yes	Yes	Yes
GTY Ports (28 Gbps)	16	16	16	16
10/100/1000 Ethernet	Yes	Yes	Yes	Yes
USB 3.0	Yes	Yes	Yes	Yes
User I/O (2)	72 / 24	72 / 24	72 / 24	72 / 24
High Speed Data Transport <sup>2</sup>	10/25/100 GbE	10/25/100 GbE	10/25/100 GbE	10/25/100 GbE
	Xilinx Aurora PCIe Gen3	Xilinx Aurora PCIe Gen3/4	Xilinx Aurora PCIe Gen3/4	Xilinx Aurora PCIe Gen3/4
Size	4.0" x 5.0" 101 x 127 mm	4.0" x 5.0" 101 x 127 mm	4.0" x 5.0" 101 x 127 mm	4.0" x 5.0" 101 x 127 mm
Temperature Grade	Industrial	Industrial	Industrial	Industrial
Resale (4)	\$21,995	\$22,995	Call	\$24,995

1: For operation up to 10GSPS, contact your local Avnet Sales Representative. 2: RFSoc: PL IO / PS MIO. 3: RFSoc integrated 100GbE and PCIe blocks are not provisioned in standard Avnet XRF IP/reference designs. Custom design services are available. 4: Resale based on 1 piece - call for volume pricing.

# KRIA™ KV260



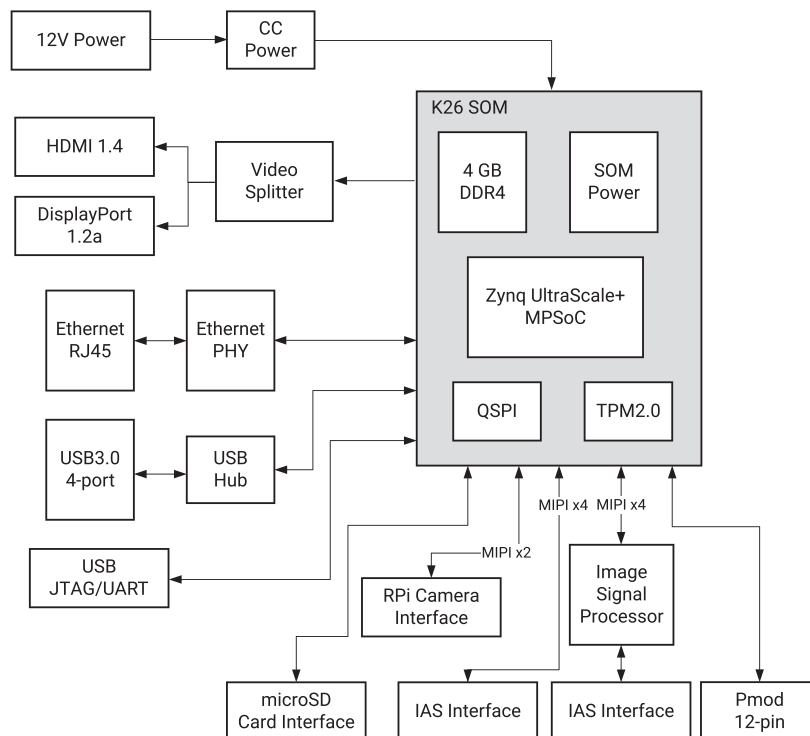
The KV260 Vision AI Starter Kit is an out-of-the-box platform for advanced vision application development. The KV260 is equipped with a non-production version of the production K26 SOM. This SOM and fansink are mounted to an evaluation carrier card optimized for vision applications, featuring multi-camera support via onsemi Imager Access System (IAS) and Raspberry Pi connectors.

Enabled by a growing ecosystem of accelerated applications for the KV260 Vision AI Starter Kit, developers of all types can get applications up and running in under 1 hour, with no FPGA experience needed. From there, customization and differentiation can be added via preferred design environments, at any level of abstraction—from application software to AI model to FPGA design.

With both hardware and software development requirements simplified, the KV260 Vision AI Starter Kit is the fastest and easiest platform for application development with the goal of volume deployment on Kria K26 SOMs.

## Parts

Part number	Description	Resale
SK-KV260-G	Xilinx Kria™ KV260 Vision AI Starter Kit	\$199 USD



## Features

### SoC

- XCK26

### Memory

- 4 GB DDR4
- 512 Mb of QSPI
- SDHC card

### Communications

- 10/100/1000 Ethernet
- USB 3.0 / USB 2.0
- USB-UART

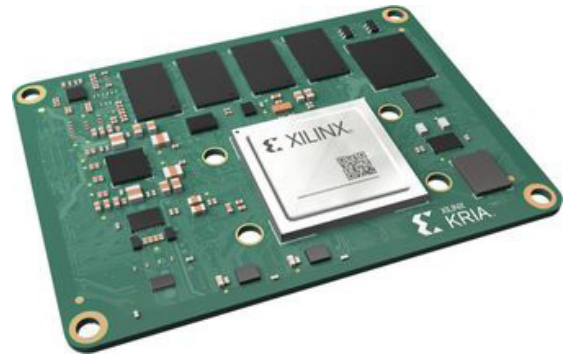
### Other

- Multi-camera Support: Up to 8 interfaces
- onsemi IAS MIPI sensor interfaces
- Raspberry Pi MIPI sensor interface
- USB camera support
- Dedicated ISP (onsemi AP1302)
- HDMI, DisplayPort outputs
- Pmod 12-pin interface

### Mechanical

- 119mm x 140mm x 36mm

# KRIA™ K26



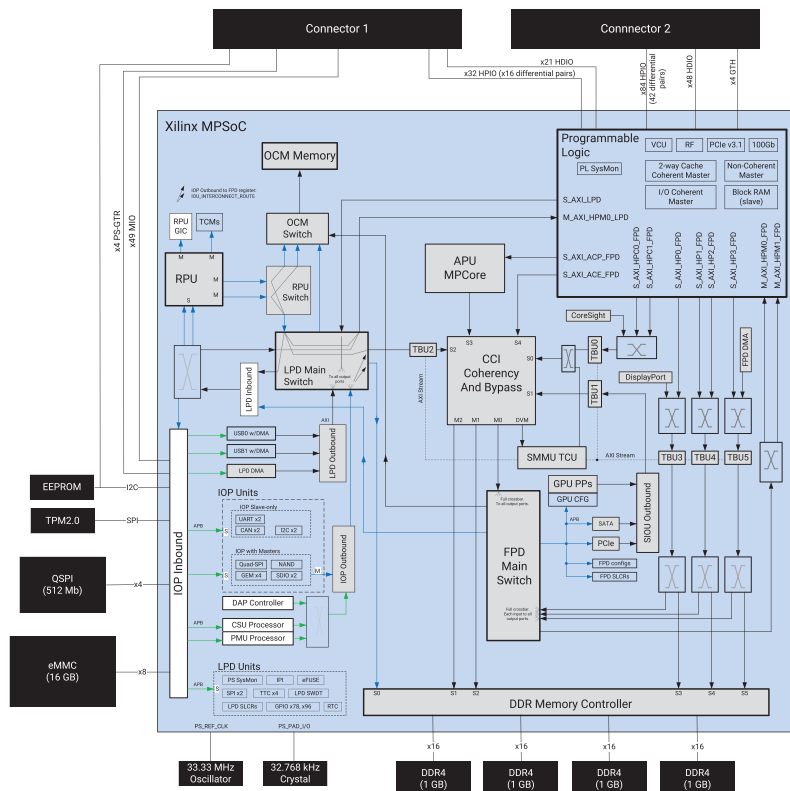
The Kria™ K26 SOM is the fastest path to achieving whole application acceleration at the edge. Optimized for Vision AI applications, the K26 SOM combines high AI performance with the adaptability necessary to keep up with evolving algorithms and sensor requirements. With credit-card-sized form factor, and available in production-qualified and certified Commercial and Industrial grades, K26 SOMs are built for volume edge deployment.

Based on the Zynq® UltraScale+™ MPSoC architecture, the K26 SOM is capable of up to 1.4TOPS AI processing and has an integrated H.264/265 video codec. With 245 I/Os, the K26 SOM can adapt to virtually any requirement – you can connect up to 15 cameras across multiple interfaces, connect to networks at up to 40Gb/s, and have access to a wide range of USB peripherals. The resulting platform is highly scalable, with many possible end applications, and expandable for evolving system requirements.

Developed with software developers in mind, the K26 SOM is out-of-the-box ready and enabled by pre-built accelerated applications for common vision functions.

## Parts

Part number	Description	Resale
SM-K26-XCL2GC	Xilinx Kria™ K26 SOM (Commercial)	\$325 USD
SM-K26-XCL2GI	Xilinx Kria™ K26 SOM (Industrial)	\$455 USD



## Features

### SoC

- XCK26

### Memory

- 26.6 Mb On-Chip SRAM
- 4GB 64-bit DDR4 (non-ECC) and 16GB eMMC On-SOM

### Connectivity

- High-Speed PS Connectivity (GTR): PCIe® Gen2 x4, 2x USB3.0, SATA 3.1, DisplayPort, 4x Tri-mode Gigabit Ethernet
- General PS Connectivity (MIO): 2xUSB 2.0, 2x SD/SDIO, 2x UART, 2x CAN 2.0B, 2x I2C, 2x SPI, 4x 32b GPIO

### Transceivers

- 4 (PCIe Gen3 x4, SLVS-EC, HDMI 2.0, DisplayPort 1.4) GTH 12.5Gb/s Transceivers
- 4 GTR 6Gb/s Transceivers

### User I/O

- PS MIO (1.8V): 49
- PL High-density (HD) I/O (3.3V): 69
- PL High-performance (HP) I/O (1.8V): 116

### Speed and Temperature Grade

- Commercial: -2 speed grade, low voltage and 0 to 85°C temperature range
- Industrial: -2 speed grade, low voltage and -40 to 100°C temperature range

### Mechanical

- 77mm x 60mm x 11mm

Additional information and downloadable documentation for Kria can be obtained at [avnet.me/kria](http://avnet.me/kria)

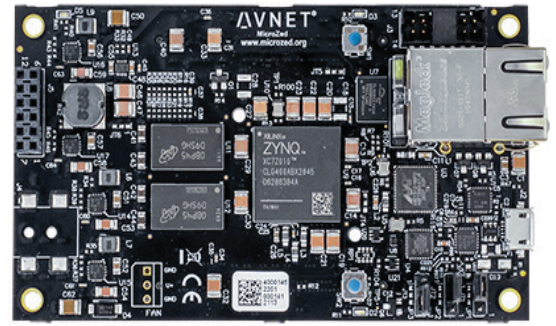
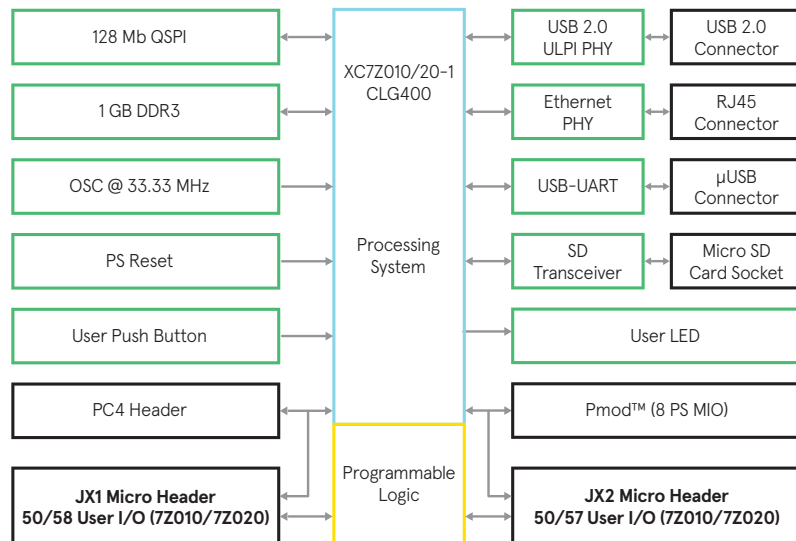
# MICROZED™

MicroZed™ is a low-cost SOM that is based on the Xilinx Zynq-7000 SoC. In addition to the Zynq-7000 SoC, the module contains the common functions and interfaces required to support the core of most SoC designs, including memory, configuration, Ethernet, USB, and clocks. On the bottom side of the module, MicroZed contains two 100-pin I/O headers that provide connection to two I/O banks on the programmable logic (PL) side of the Zynq-7000 SoC device. When plugged onto a user designed baseboard or carrier card, these 100-pin connectors provide connectivity between the Zynq-7000 SoC PL I/Os and the user circuits on the carrier card. MicroZed also includes on-board power regulation that supports 5 V input with an option to support 12 V input.

Industrial Temperature MicroZed SOMs are built with components supporting extended temperatures of -40 to +85 °C, with the exception of the use of the microSD card connector. Due to the configurability of the Zynq device, the user must perform final temperature testing validation.

## Parts

Part number	Description	Resale
AES-Z7MB-7Z010-SOM-G/REV-H	MicroZed 7Z010 SOM, C Grade	\$178 USD
AES-Z7MB-7Z010-SOM-I-G/REV-H	MicroZed 7Z010 SOM, I Grade	\$217 USD
AES-Z7MB-7Z020-SOM-G/REV-H	MicroZed 7Z020 SOM, C Grade	\$213 USD
AES-Z7MB-7Z020-SOM-I-G/REV-H	MicroZed 7Z010 SOM, I Grade	\$265 USD



## Features

### SoC

- XC7Z010-1CLG400 or
- XC7Z020-1CLG400

### Memory

- 1 GB of DDR3 SDRAM
- 128 Mb of QSPI Flash
- MicroSD card interface

### Communications

- 10/100/1000 Ethernet
- USB 2.0 OTG
- USB-UART

### User I/O (via dual board-to-board connectors)

- 7Z010 Version
  - 108 User I/O (100 PL, 8 PS MIO)
  - PL I/O configurable as up to 48 LVDS pairs or 100 single-ended I/O
- 7Z020 Version
  - 123 User I/O (115 PL, 8 PS MIO)
  - PL I/O configurable as up to 55 LVDS pairs or 115 single-ended I/O

### Other

- 2x6 Digilent Pmod compatible interface providing 8 PS MIO connections for user I/O
- Xilinx PC4 JTAG configuration port
- PS JTAG pins accessible via Pmod or I/O headers
- 33.33 MHz oscillator
- User LED and push button

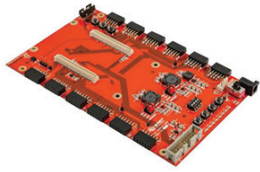
### Software

- Linux BSP and reference designs

### Mechanical

- 4 inches x 2.25 inches (102 mm x 57 mm)

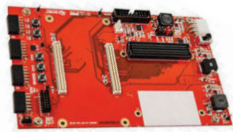
# MICROZED™ ACCESSORIES



## MicroZed I/O Carrier Card

Part number	Resale	SURL
AES-MBCC-IO-G	\$149 USD	<a href="http://avnet.me/mz-io-cc">avnet.me/mz-io-cc</a>

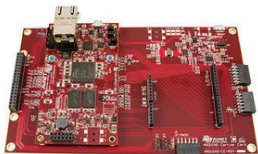
The I/O Carrier Card supports the System-on-Module (SOM), providing easy access to the full 108 user I/O available from the MicroZed SOM. Two 100-pin MicroHeaders on the carrier card mate with the MicroZed, connecting over 80 of the MicroZed Programmable Logic (PL) I/O to 12 Digilent Pmod™ compatible interfaces. The remaining MicroZed I/O are connected to various I/O Carrier Card features, including push button switches, DIP switches, LEDs, EEPROM, Xilinx XADC, and clock oscillator. The I/O Carrier Card also generates the necessary power rails for MicroZed, providing 5 V to the MicroZed core, user selectable bank voltages for the PL I/O, and the necessary voltages for the XADC. The I/O Carrier Card speeds prototype and evaluation of MicroZed and provides an excellent starting point for creating your own MicroZed carrier card.



## MicroZed FMC Carrier Card

Part number	Resale	SURL
AES-MBCC-FMC-G	\$199 USD	<a href="http://avnet.me/mz-fmc-cc">avnet.me/mz-fmc-cc</a>

The FMC Carrier Card supports the System-on-Module (SOM), providing easy access to the full 108 user I/O available from the MicroZed SOM. Two 100-pin MicroHeaders on the carrier card mate with the MicroZed, connecting 75 of the MicroZed Programmable Logic (PL) I/O to a low-pin-count Vita 57 FPGA Mezzanine Connector (FMC) interface. The remaining MicroZed I/O are connected to various FMC Carrier Card features, including push button switches, LEDs, EEPROMs, and five Digilent Pmod compatible interfaces. The FMC Carrier Card also generates the necessary power rails for MicroZed, providing 5 V to the MicroZed core and a user selectable bank voltage for the PL I/O and FMC Vadj. The FMC Carrier Card accelerates complex prototyping by interconnecting a MicroZed SOM and industry-standard FMC Modules.



## MicroZed Arduino Carrier Card

Part number	Resale	SURL
AES-ARDUINO-CC-G	\$89 USD	<a href="http://avnet.me/mz-arduino-cc">avnet.me/mz-arduino-cc</a>

The MicroZed™ Carrier Card Kit for Arduino™ brings both Shield expansion and Peripheral Module expansion (2x6 pin connectors) to the MicroZed System-On-Module. The carrier card is ideal for building quick prototypes that leverage the large number of Arduino-compatible Shields.

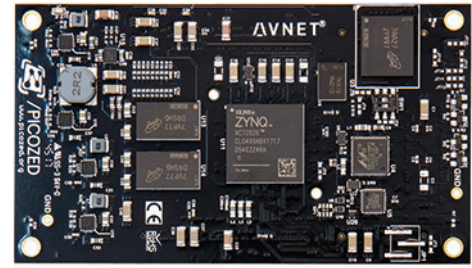
This low-cost platform facilitates:

- Expansion of platform functionality via a wide range of 3rd party Arduino™-compatible “Shields”
- Design partitioning to include ultra low-power MCU to offload and control the Apps Processor
- Power management and scheduling of the MicroZed board by an optional Microcontroller board
- 2x6 Peripheral expansion connectors for MicroZed as well as the optional MCU sub-system

# PICOZED™

PicoZed™ is a highly flexible, rugged SOM that is based on the Xilinx Zynq-7000 SoC. It offers designers the flexibility to migrate between the 7010, 7015, 7020, and 7030 Zynq-7000 SoC devices in a pin-compatible footprint. The PicoZed module contains the common functions required to support the core of most SoC designs, including memory, configuration, Ethernet, USB, clocks, and power. It provides easy access to over 100 user I/O pins through three I/O connectors on the backside of the module. These connectors also support access to dedicated interfaces for Ethernet, USB, JTAG, power and other control signals, as well as the GTP/GTX transceivers on the 7015/7030 models. The transceiver-based 7015 and 7030 versions of PicoZed are a superset of the 7010/7020 version, adding four highspeed serial transceiver ports to the I/O connectors. Designers can simply design their own carrier card, plug-in PicoZed, and start their application development with a proven Zynq-7000 SoC sub-system.

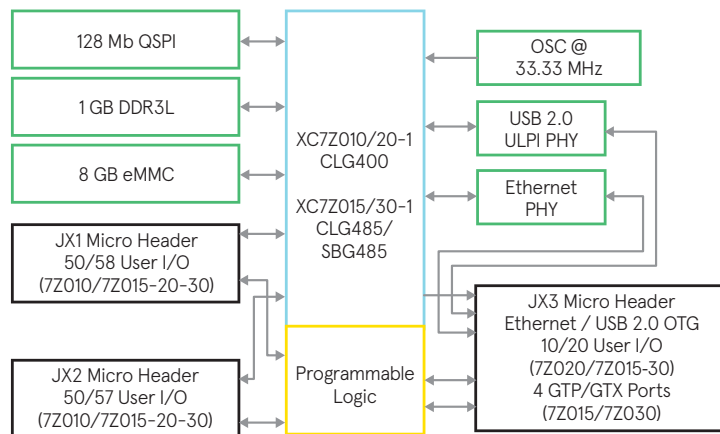
Industrial Temperature PicoZed SOMs are built with components supporting extended temperatures of -40 to +85 C. Due to the configurability of the Zynq device, the user must perform final temperature testing validation.



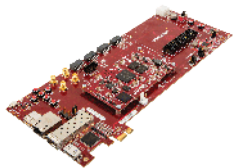
## Parts

Part number	Description	Resale 1-99
AES-Z7PZ-7Z010-SOM-G/REV-E	PicoZed 7010 SOM, C Grade	\$178 USD
AES-Z7PZ-7Z010-SOM-I-G/REV-E	PicoZed 7010 SOM, I Grade	\$217 USD
AES-Z7PZ-7Z015-SOM-I-G/REV-E	PicoZed 7015 SOM, I Grade	\$265 USD
AES-Z7PZ-7Z020-SOM-G/REV-E	PicoZed 7020 SOM, C Grade	\$213 USD
AES-Z7PZ-7Z020-SOM-I-G/REV-E	PicoZed 7020 SOM, I Grade	\$265 USD
AES-Z7PZ-7Z030-SOM-I-G/REV-E	PicoZed 7030 SOM, I Grade	\$375 USD

\*Contact your local Avnet sales office for pricing on higher quantities



PicoZed Carrier Card v2



Part number	Resale	SURL
AES-PZCC-FMC-V2-G	\$349 USD	<a href="http://avnet.me/pz-fmc-v2-cc">avnet.me/pz-fmc-v2-cc</a>

## Features

### SoC options

- XC7Z010-1CLG400
- XC7Z015-1CLG485
- XC7Z020-1CLG400
- XC7Z030-1SBG485

### Memory

- 1 GB of DDR3L SDRAM
- 8 GB eMMC
- 128 Mb of QSPI Flash

### Communications

- 10/100/1000 Ethernet PHY
- USB 2.0 OTG PHY

### User I/O (via three board-to-board connectors)

- 7Z010 Version
  - 113 User I/O (100 PL, 13 PS MIO)
  - PL I/O configurable as up to 48 LVDS
  - pairs or 100 single-ended I/O
- 7Z015 Version
  - 148 User I/O (135 PL, 13 PS MIO)
  - PL I/O configurable as up to 65 LVDS pairs or 135 single-ended I/O
  - 4 GTP Transceivers
- 7Z020 Version
  - 138 User I/O (125 PL, 13 PS MIO)
  - PL I/O configurable as up to 60 LVDS pairs or 125 single-ended I/O
- 7Z030 Version
  - 148 User I/O (135 PL, 13 PS MIO)
  - PL I/O configurable as up to 65 LVDS
  - pairs or 135 single-ended I/O
  - 4 GTX Transceivers

### Other

- JTAG configuration port accessible via I/O connectors
- PS JTAG pins accessible via I/O connectors
- 33.33 MHz oscillator

### Software

- Linux BSP and reference designs

### Mechanical

- 4 inches x 2.25 inches (102 mm x 57 mm)

Additional information and downloadable documentation for PicoZed can be obtained at [avnet.me/picozed](http://avnet.me/picozed)



# ULTRAZED-EG™

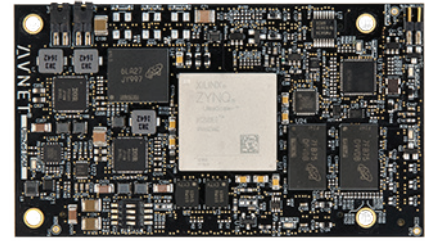
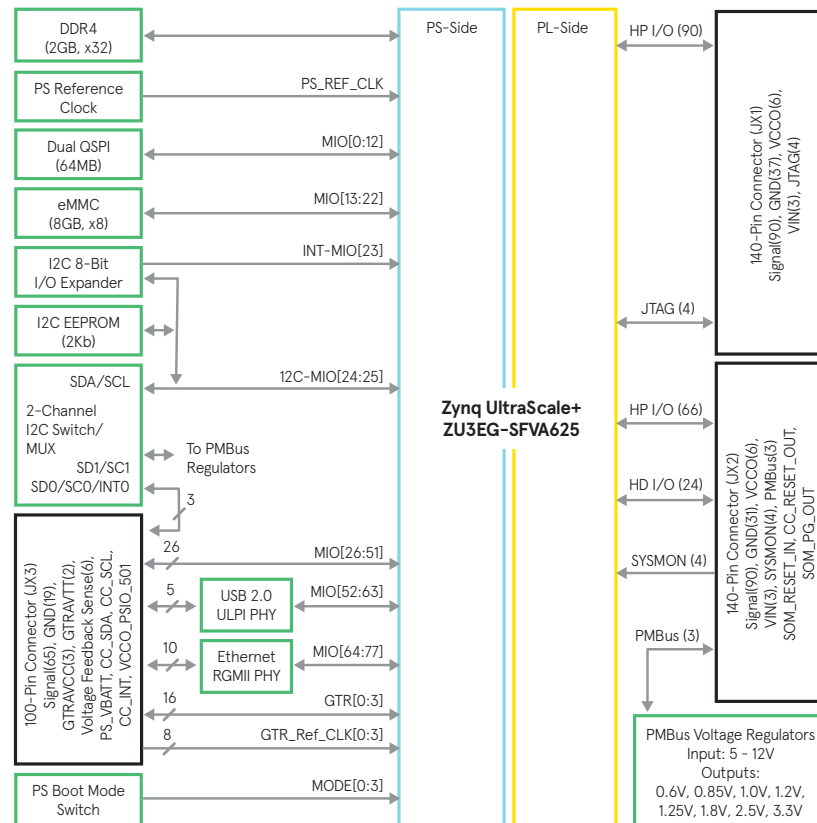
UltraZed-EG™ SOM is a highly flexible, rugged, System-On-Module (SOM) based on the Xilinx Zynq UltraScale+™ MPSoC. Designed in a small form factor, the UltraZed-EG SOM packages all the necessary functions such as system memory, Ethernet, USB, and configuration memory needed for an embedded processing system. The UltraZed-EG provides easy access to 180 user I/O pins, 26 PS MIO pins, and 4 high-speed PS GTR transceivers along with 4 GTR reference clock inputs through three I/O connectors on the backside of the module.

Designers can simply design their own carrier card, plug-in UltraZed-EG SOM, and start their application development with a proven Zynq UltraScale+ MPSoC sub-system. Available with the Zynq UltraScale+ MPSoC XCZU3EG-1SFVA625 device, the UltraZed-EG SOM enables designers to build high performance systems with confidence and ease. By simply plugging the off-the-shelf UltraZed-EG SOM into an application specific carrier card, system bring-up and debug time can be cut in half, while overall system cost can be reduced by 20% or more versus a standard chip-down design.

## Parts

Part number	Description	Resale 1-99
AES-ZU3EG-1-SOM-G	UltraZed-EG SOM (Commercial Temp)	\$485 USD
AES-ZU3EG-1-SOM-I-G	UltraZed-EG SOM (Industrial Temp)	\$535 USD

\*Contact your local Avnet sales office for pricing on higher quantities



## Features

### MPSoC

- Xilinx XCZU3EG-1SFVA625 device
- Other options are available with MOQ=100

### Memory

- DDR4 SDRAM (2GB, in x32 configuration)
- Dual QSPI Flash (64MB)
- I2C EEPROM (2Kb)
- eMMC Flash (8GB, in x8 configuration)

### Communications

- USB 2.0 ULPI PHY
- Gigabit Ethernet PHY

### Other

- PS reference clock input
- On-board voltage regulators
- Power-On Reset (POR) circuit
- 4-position boot mode slide switch
- Heatsink included

### User I/O (via three board-to-board connectors)

- 3 JX micro-header connectors (2 x 140-pin, 1 x 100-pin) providing the following connections to the Carrier Cards
- 180 user PL I/O pins
- 26 user PS MIO pins (one full MIO bank)
- 4 PS GTR transceivers
- 4 PS GTR reference clock inputs
- PS JTAG interface
- PL SYSMON interface
- USB 2.0 connector interface
- PMBus interface
- Carrier Card I2C interface
- SOM Reset input
- Carrier Card interrupt input
- Carrier Card Reset output
- Power Good output

### Software

- Linux BSP and reference designs

### Mechanical

- 3.5 inches x 2 inches (89 x 51 mm)

# / ULTRAZED-EG™ ACCESSORIES



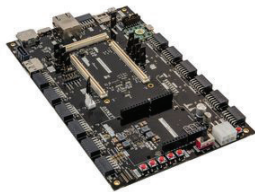
## UltraZed-EG Starter Kit

Part number	Resale	SURL
AES-ZU3EG-1-SK-G	\$995 USD	<a href="http://avnet.me/ultrazed-sk">avnet.me/ultrazed-sk</a>

The UltraZed-EG Starter Kit consists of the UltraZed-EG System-on-Module (SOM) and IO Carrier Card bundled to provide a complete system for prototyping and evaluating systems based on the Xilinx powerful Zynq UltraScale+ MPSoC device family.

### Kit includes

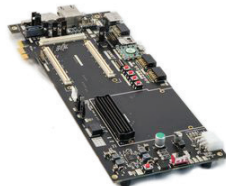
- UltraZed - EG SOM
- UltraZed IO Carrier Card
- 12V AC/DC Power Supply
- Quick Getting Started Card
- microUSB Cable
- UltraZed-EG SOM Mounting Hardware
- microSD Card 8GB
- RJ45 Cable



## UltraZed-EG IO Carrier Card

Part number	Resale	SURL
AES-ZU-IOCC-G	\$499 USD	<a href="http://avnet.me/ultrazed-cc">avnet.me/ultrazed-cc</a>

The UltraZed IO Carrier Card supports the UltraZed-EG System-on-Module (SOM), providing easy access to the full 180 user I/O, 26 PS MIO, and 4 PS GTR transceivers available from the UltraZed-EG SOM via three Micro Headers. Two 140-pin Micro Headers on the carrier card mate with the UltraZed-EG SOM, connecting 180 of the UltraZed-EG Programmable Logic (PL) I/O to 12 Digilent Pmod compatible interfaces, Arduino Shield, LVDS Touch Panel interface, push button switches, DIP switches, LEDs, Xilinx SYSMON, and clock oscillator.



## UltraZed-EG PCIe Carrier Card

Part number	Resale	SURL
AES-ZU-PCIECC-G	\$499 USD	<a href="http://avnet.me/ultrazed-pcie">avnet.me/ultrazed-pcie</a>

The UltraZed PCIe Carrier Card supports the UltraZed-EG System-on-Module (SOM), providing easy access to the full 180 user I/O, 26 PS MIO, and 4 PS GTR transceivers available from the UltraZed-EG SOM via three Micro Headers. Two 140-pin Micro Headers on the carrier card mate with the UltraZed-EG SOM, connecting 180 of the UltraZed-EG Programmable Logic (PL) I/O to 2 Digilent Pmod™ compatible interfaces, FMC LPC slot, LVDS Touch Panel interface, push button switches, DIP switches, LEDs, Xilinx SYSMON, and clock oscillator.

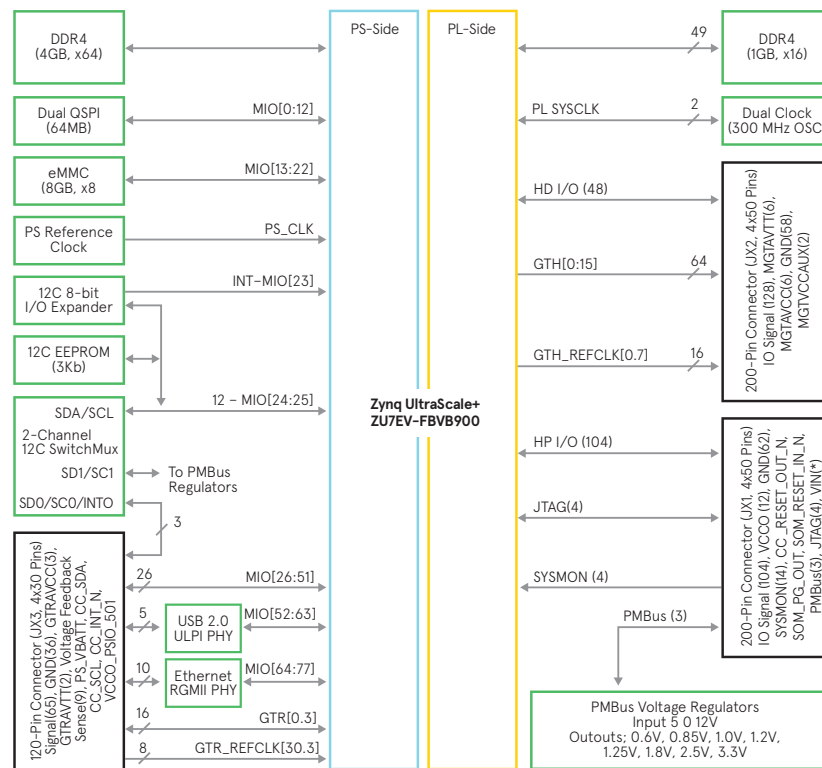
# ULTRAZED-EV™

UltraZed-EV™ SOM is a high performance, full-featured, System-On-Module (SOM) based on the Xilinx Zynq UltraScale+™ MPSoC EV family of devices. Designed in a small form factor, the UltraZed-EV SOM on-board dual system memory, high-speed transceivers, Ethernet, USB, and configuration memory provides an ideal platform for embedded video processing systems. The UltraZed-EV provides easy access to 152 user I/O pins, 26 PS MIO pins, 4 highspeed PS GTR transceivers along with 4 GTR reference clock inputs, and 16 PL high-speed GTH transceivers along with 8 GTH reference clock inputs through three I/O connectors on the backside of the module. These connectors provide USB 2.0, USB 3.0, PCIe Gen2, DisplayPort, SATA 3.0, FMC-HPC and more! The MPSoC EV device with its integrated H.264 / H.265 video codec unit is capable of simultaneous encode and decode up to 4Kx2K (60fps).

## Parts

Part number	Description	Resale 1-99
AES-ZU7EV-1-SOM-G	UltraZed-EV SOM (Commercial Temp)	\$999 USD
AES-ZU7EV-1-SOM-I-G	UltraZed-EV SOM (Industrial Temp)	\$1,199 USD

\*Contact your local Avnet sales office for pricing on higher quantities



## Features

### MPSoC

- Xilinx XCZU7EV-1FBVB900 device (SOM also supports 4EV, 5EV, 4EG, 5EG, or 7EG device in the FBVB900 package)

### Memory

- PS DDR4 SDRAM (4GB, in x64 configuration)
- PL DDR4 SDRAM (1GB, in x16 configuration)
- Dual QSPI Flash (64MB)
- I2C EEPROM (2Kb)
- eMMC Flash (8GB, x8)

### Communications

- USB 2.0 ULPI PHY
- Ethernet PHY

### Other

- On-board voltage regulators
- PS reference clock input

### User I/O (via three board to-board connectors)

- Three JX connectors, providing
- PS JTAG interface
- PL SYSMON interface
- Gigabit Ethernet RJ45 connector interface
- PMBus interface
- Power Good output, input voltages, and output sense pins

### Software

- Linux BSP and reference designs

### Mechanical

- 4 inches x 2.5 inches (102 x 63.5 mm)

# / ULTRAZED-EV™ ACCESSORIES



## UltraZed-EV Starter Kit

Part number	Resale	SURL
AES-ZU7EV-1-SK-G	\$1,595 USD	<a href="http://avnet.me/ultrazed-ev-sk">avnet.me/ultrazed-ev-sk</a>

The UltraZed-EV™ Starter Kit consists of the UltraZed-EV System-on-Module (SOM) and Carrier Card bundled to provide a complete system for prototyping and evaluating systems based on the Xilinx powerful Zynq® UltraScale+™ MPSoC EV device family.

## Kit includes

- UltraZed-EV SOM
- UltraZed-EV Carrier Card
- 12V AC/DC Power Supply
- Quick Start Card
- microUSB Cable
- UltraZed-EV SOM Mounting Hardware
- microSD Card 8GB
- RJ45 Cable



## UltraZed-EV Carrier Card

Part number	Resale	SURL
AES-ZUEV-CC-G	\$649 USD	<a href="http://avnet.me/ultrazed-ev-cc">avnet.me/ultrazed-ev-cc</a>

The UltraZed-EV Carrier Card supports the UltraZed-EV System-on-Module (SOM), providing easy access to the full 152 user I/O, 26 PS MIO, 4 PS GTR transceivers, and 16 GTH transceivers available from the UltraZed-EV SOM via three Micro Headers. Two 200-pin Micro Headers on the carrier card mate with the UltraZed-EV SOM, connecting 152 of the UltraZed-EV Programmable Logic (PL) I/O along with 16 GTH transceivers to FMC HPC slot, LVDS Touch Panel interface, SFP+ interface, HDMI In/Out, 3G-SDI In/Out, push button switches, DIP switches, LEDs, Xilinx SYSMON, clock generators, and 2 Digilent Pmod compatible interfaces.

# / FMC ACCESSORIES

## Network FMC Module

Part number	Resale	SURL
AES-FMC-NETW1-G	\$149 USD	<a href="http://avnet.me/fmc-network1">avnet.me/fmc-network1</a>

The Avnet Network FMC Module enables Industrial Ethernet digital communications, which is a key component to Industry 4.0 applications. The module is designed to operate with any Avnet or Xilinx base board that is FMC enabled. Utilizing the dual compatible 10/100/1000 Ethernet PHYs, the Network FMC Module can quickly get you started with Xilinx FPGA and SoC-based designs.

## ISM Networking FMC v2 Module

Part number	Resale	SURL
AES-FMC-ISMNET2-G	\$250 USD	<a href="http://avnet.me/fmc-ismnet2">avnet.me/fmc-ismnet2</a>

The FMC-ISMNET2 enables a variety of digital communication interfaces common to industrial applications, including Industrial Ethernet. From dual 1588 compatible 10/100 Ethernet PHYs, to CAN, RS232, and RS485, the ISM Networking FMC can quickly get you started with Xilinx FPGA and SoC based designs.

## Multicamera FMC Module

Part number	Resale	SURL
AES-FMC-MULTICAM4-G	\$299 USD	<a href="http://avnet.me/fmc-multicam">avnet.me/fmc-multicam</a>

The Avnet Multi-Camera FMC module supports up to four (4) high definition camera modules using MAXIM Integrated's GMSL technology (Gigabit Multimedia Serial Link), that is widely used in the automotive industry for in-vehicle high speed communication of video streams.

## Quad AR0231AT Camera FMC Bundle

Part number	Resale	SURL
AES-FMC-MC4-AR0231AT-G	\$1,699 USD	<a href="http://avnet.me/fmc-quad-cam">avnet.me/fmc-quad-cam</a>

The Quad AR0231AT Camera FMC Bundle combines the Avnet Multi-Camera FMC module, four AR0231AT camera modules with GMSL serialization and a cable assembly as a complete add-on solution for vision-guided applications.

## HDMI I/O FMC Module

Part number	Resale	SURL
AES-FMC-HDMI-CAM-G	\$250 USD	<a href="http://avnet.me/fmc-hdmi-cam">avnet.me/fmc-hdmi-cam</a>

The FMC-HDMI-CAM FMC module provides high-definition video interfaces for Xilinx FMC-enabled baseboards. An HDMI video source can provide video content to the module. The module also provides an HDMI output to display FPGA-driven video content. The FMC module also provides a camera interface for optional camera modules.

# OTHER ACCESSORIES

## ZedBoard

Part number	Resale	SURL
AES-Z7EV-7Z020-G	\$449 USD	<a href="http://avnet.me/zedboard-dev-kit">avnet.me/zedboard-dev-kit</a>

ZedBoard is a low-cost development board for the Xilinx Zynq-7000 All Programmable SoC. This board contains everything necessary to create a Linux, Android, Windows or other OS/RTOS-based design. Additionally, several expansion connectors expose the processing system and programmable logic I/Os for easy user access.

## Infineon TPM v2.0 Peripheral Module

Part number	Resale	SURL
AES-PMOD-TPM20-SLB9670-G	\$29.95 USD	<a href="http://avnet.me/tpm2.0">avnet.me/tpm2.0</a>

The Trusted Platform Module (TPM) 2.0 Security Peripheral Module (Pmod) enables a root of trust for platform integrity, remote attestation, and cryptographic services as required by Industrial Internet of Things (IIoT) Applications.

## ON Python 1300C Camera Module

Part number	Resale	SURL
AES-CAM-ON-P1300C-G	\$499 USD	<a href="http://avnet.me/python1300">avnet.me/python1300</a>

The camera module features onsemi's PYTHON-1300 color image sensor. The PYTHON-1300 is a 1/2 inch Super-eXtended Graphics Array (SXGA) CMOS image sensor with a pixel array of 1280 by 1024 pixels.

## Murata 1DX Ble WiFi Bluetooth Pmod WiFi/BLE Module

Part number	Resale	SURL
AES-PMOD-MUR-1DX-G	\$59 USD	<a href="http://avnet.me/pmod_1dx">avnet.me/pmod_1dx</a>

The Murata 1DX Wi-Fi Bluetooth Pmod allows you to add wireless capabilities to your existing development kit. Examples for ZedBoard and UltraZed-EG Development Kits are provided that show how to enable and use the wireless functions from PetaLinux software. This product is an evaluation kit and for development only. This kit should not be placed on the market for resale and is not certified for production use.

## JTAG HS3 Programming

Part number	Resale	SURL
210-299P-KIT	\$59 USD	<a href="http://avnet.me/jtaghs3">avnet.me/jtaghs3</a>

The HS3 builds on the successful JTAG-HS1 by adding an open-drain buffer to pin 14 allowing for the debugging of Xilinx Zynq-SOC processors. It can be attached to target boards using Xilinx's 2x7 connector, and is compatible with all Xilinx tools.

# XRF™ RFSOC SYSTEM-ON-MODULES

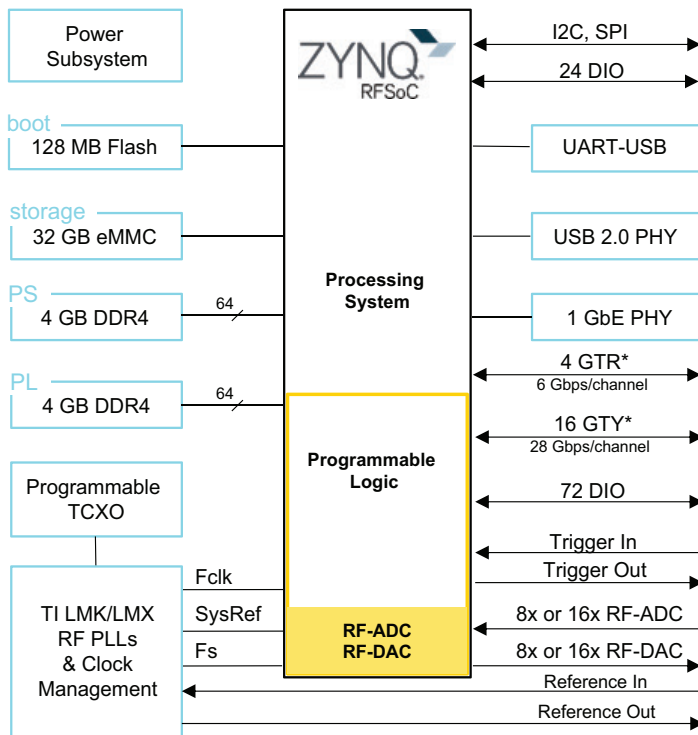


Avnet XRF™ RFSOC System-on-Modules are designed for large-scale integration into deployed RF systems demanding small footprint, low power, and real-time processing. XRF modules feature the Xilinx Zynq® UltraScale+™ RFSOC Gen 2 / Gen 3 with up to 16 RF-ADC and 16 RF-DAC channels supporting up to 6 GHz analog bandwidth.

Combine the production-ready XRF module with an XRF Carrier Card and Avalon™ software suite to jump-start proof-of-concept and application development. Then deploy your system with the same XRF module used for proof-of-concept. Example code and tutorials demonstrate Xilinx RFSOC multi-tile sync (multi-converter sync) and multi-module synchronized analog capture.

## Parts

Part number	Description	Resale
AES-XRF16-ZU39-G	XRF16 Xilinx RFSOC Gen2 System-On-Module	\$21,995 USD
AES-XRF8-ZU47-G	XRF8 Xilinx RFSOC Gen3 System-On-Module	\$22,995 USD
AES-XRF8-ZU48-G	XRF8 Xilinx RFSOC Gen3 System-On-Module	TBD
AES-XRF16-ZU49-G	XRF8 Xilinx RFSOC Gen3 System-On-Module	\$24,995 USD



\* Xilinx GTY high-speed serial transceivers available to implement high-speed communication links including 100GbE, PCIe, Xilinx Aurora. GTR transceiver can implement USB3, SATA, and PCIe.

## Features

### XRF16 Gen2 with Xilinx ZU+ RFSOC ZU39DR-2

- 5 GHz analog bandwidth
- 16x ADCs, 12-bit up to 2.22 GSPS
- 16x DACs, 14-bit up to 6.554 GSPS

### XRF16 Gen3 with Xilinx ZU+ RFSOC ZU49DR-2

- 6 GHz analog bandwidth
- 16x ADCs, 14-bit up to 2.5 GSPS
- 16x DACs, 14-bit up to 9.85 GSPS (10 GSPS available)

### XRF8 Gen3 with Xilinx ZU+ RFSOC ZU47DR/48DR-1

- 6 GHz analog bandwidth
- 8x ADCs, 14-bit up to 5.0 GSPS
- 8x DACs, 14-bit up to 8.92 GSPS (10 GSPS available)
- Optional ZU48DR enables 8x SD-FEC engines

### High-Speed Data Transfer

- 16x serial links up to 28 Gbps available for 10/25/100 GbE, PCIe Gen 3x16, eCPRI, OCuLink, and Aurora
- Quad Mesh™ firmware achieves 4x 61.6 Gbps full-duplex Aurora data exchange, facilitating tiling in multi-module high performance real-time systems

### Clocks & Synchronization

- Ultra-low jitter programmable sampling clocks using Texas Instruments LMK/LMX RF PLLs
- External or onboard programmable TCXO reference clock
- Phase coherent synchronous sampling across all converters & multiple modules
- External input for PPS and trigger

### Memory

- 4 GB DDR4 @ Programmable Logic
- 4 GB DDR4 @ Processor Subsystem
- 32 GB eMMC persistent storage
- 128 MB QSPI boot storage

# XRF SOM ACCESSORIES



## XRF8 Carrier Card

Part number	Resale	SURL
AES-XRF8-CC-G	\$4,995 USD	<a href="https://avnet.me/xrf8-cc">avnet.me/xrf8-cc</a>



## XRF16 Carrier Card

Part number	Resale	SURL
AES-XRF-CC-G	\$4,995 USD	<a href="https://avnet.me/xrf16-cc">avnet.me/xrf16-cc</a>

The XRF Xilinx RFSoc System-on-Modules (SOM) are designed for integration into your deployed system. The XRF Carrier Cards and Avalon software suite provide a rapid prototype platform, enabling you to develop application code for XRF SOMs that is ready for deployment when your custom carrier arrives.

The XRF Carrier provides connection to standard SOM peripherals including USB2.0, 1 Gb Ethernet, PCIe, UART, SPI, I2C, GPIO, and JTAG. High-speed digital connectivity is available through sixteen 28Gbps Xilinx GTY transceivers, enabling standards like PCIe over OCuLink, 10/25/100 GbE, and Xilinx Aurora.

The SOM RF-ADC and RF-DAC ports are made available using Samtec IsoRate connectors that easily convert to SMA with cable adapters. Synchronization is enabled by external reference clock connection, external in/out triggers, and software examples demonstrating RFSoc multi-tile sync (multi-converter sync) and multi-board synchronized analog capture.



## XRF Fansink Active Cooling Solution

Part number	Resale	SURL
AES-XRF-FANSINK-G	\$185 USD	<a href="https://avnet.me/xrf-fansink">avnet.me/xrf-fansink</a>

Avnet XRF RFSoc System-on-Modules require heat dissipation solutions for most applications. An active heatsink, consisting of a heat frame plus fansink, was created to meet this need. The heat frame makes a mechanical connection to the RFSoc device via thermal pad. The entire assembly is secured to the board with precision spacers and screws.



## XRF Heatsink Passive Cooling Solution

Part number	Resale	SURL
AES-XRF-HEATSINK-G	\$295 USD	<a href="https://avnet.me/xrf-passive-cooling">avnet.me/xrf-passive-cooling</a>

Avnet XRF RFSoc System-on-Modules require heat dissipation solutions for most applications. A passive heatsink was created to meet this need within enclosed systems. The AES-XRF-HEATSINK-G kit is compatible with all Avnet XRF modules. The assembly is shown below attached to an XRF16 Gen2 module, mounted to the XRF16 Carrier.



## XRF Samtec IsoRate®-to-SMA Breakout Board

Part number	Resale	SURL
AES-XRF-ISORATEBB-G	\$285 USD	<a href="https://avnet.me/isorate-board">avnet.me/isorate-board</a>

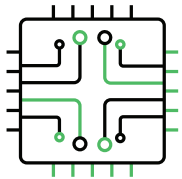
A compact, high performance breakout board which converts the XRF carrier Samtec IsoRate® 8 position connector to 8 standard SMA.



# ACCELERATE TIME TO MARKET

Optimize and simplify your product design process

Avnet AVID offers full service product development solutions including hardware and software design services, PCB layout services, high-speed design analysis, and prototype assembly and testing for electronic products in the defense, medical, commercial, consumer, automotive and industrial markets.



## Services

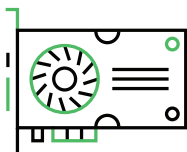
- Engineering – HW, SW, RF, analog, wireless
- Turnkey Design and Manufacturing
- Design Customization
- PCB Design & Simulation
- Consultation – review, debug, feasibility study, compliance



## Areas of expertise



- IoT
- Wireless / RF
- Industrial Controls
- Wireless Charging
- Military / Aerospace
- Medical Devices
- Automotive



## Development Tools

- Wireless Charging Design Tools
- Embedded Development Platforms
- IoT Solutions
- Starter / Development kits



## CONTACT US

Online: [www.avid-tech.com](http://www.avid-tech.com)  
Email: [sales@avid-tech.com](mailto:sales@avid-tech.com)  
Phone: (330) 487-0770

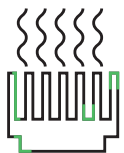
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AVID DESIGN SERVICES



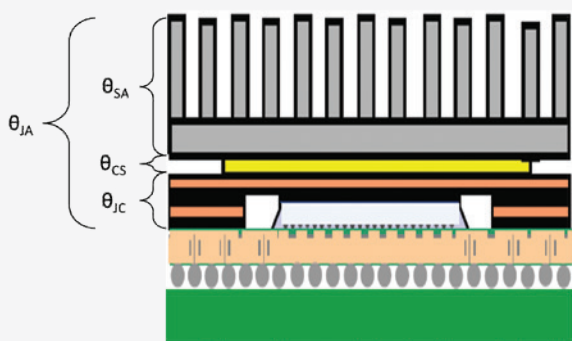
# LOOKING FOR THERMAL SOLUTIONS?

Semiconductors require thermal relief - the importance of the thermal solution will continue to be a critical piece of any design

Thermal solutions are not just "fans", the largest component to proper thermal management is the heatsink and interface material which for most high-performance devices is semi-custom to full custom.



Avnet is focused helping customers manage their thermal performance by helping in the selection and design of thermal relief solutions.



## Diagram

- Junction to Ambient -  $\Theta_{JA}$
- Sink to Ambient -  $\Theta_{SA}$
- Case to Sink -  $\Theta_{CS}$
- Junction to Case -  $\Theta_{JC}$

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2211 S 47th Street  
Phoenix, Arizona 85034  
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1-800-585-1602

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- Automation Testing
- Cloud Infrastructure
- Long Term Support



## Experience and Integration

- **Vivado** and **PetaLinux** Tools to achieve a working **embedded Linux kernel** on Zynq/ZU+ platforms.
- Vivado and **Vitis** tools to run FreeRTOS on Zynq platforms, **modifications on BSP and application** to interact with the programmable logic side.
- Address the **bottlenecks in SoC** system-level integration and implementation.

## Embedded Linux Development & Debugging

- **Linux kernel architecture** on Zynq/ZU+.
- **Linux drivers** for custom FPGA IPs, and write applications to test and verify them.
- Embedded Linux **application debug** on various platforms.
- **Linux BSP adaptation** for the Zynq and Zynq UltraScale+ MPSoC platforms.



## CONTACT US

Online: [witekio.com](http://witekio.com)

Email: [sales@witekio.com](mailto:sales@witekio.com)

## ABOUT AVNET

Avnet is a global electronic components distributor with extensive design, product, marketing and supply chain expertise for customers and suppliers at every stage of the product lifecycle. For the past 100 years, Avnet has helped its customers and suppliers around the world realize the transformative possibilities of technology.

Learn more about Avnet at [www.avnet.com](http://www.avnet.com)

### Contact information

**North America**  
2211 S 47<sup>th</sup> Street  
Phoenix, Arizona 85034  
United States of America  
1-800-585-1602

**Europe (Silica)**  
Gruber Str. 60c  
85586 Poing  
Germany  
+49-8121-77702

**Europe (EBV)**  
Im Technologypark 2-8  
85586 Poing  
Germany  
<http://ebv.com/contact>

**Japan**  
Yebisu Garden Place Tower, 23F  
4-20-3 Ebisu, Shibuya-ku  
Tokyo 150-6023 Japan  
[eval-kits-jp@avnet.com](mailto:eval-kits-jp@avnet.com)  
+81-(0)3-5792-8210

**Asia**  
151 Lorong Chuan  
#06-03 New Tech Park  
Singapore 556741  
[XilinxAPAC@avnet.com](mailto:XilinxAPAC@avnet.com)  
+65-6580-6000