Xilinx Development Kits and Accessories
Xilinx Artix™-7 FPGAs

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<td>CMTs (1 MMCM + 1 PLL)</td>
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<td>I/O Resources</td>
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<td>Maximum Single-Ended I/O</td>
<td>300</td>
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<td>600</td>
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<tr>
<td>Maximum Differential I/O Pairs</td>
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<td>Embedded Hard IP Resources</td>
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<td>GTP 5.4 / 6.6 Gb/s Transceivers</td>
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<td>CMTs (1 MMCM + 1 PLL)</td>
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<td>-1, -2</td>
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<td>-2L, -3</td>
<td>-2L, -3</td>
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### FOOTPRINT COMPATIBLE

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<th>AVAILABLE USER I/O: 3.3 V SelectIO™ PINS (GTP TRANSCEIVERS)</th>
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<td>FTG256</td>
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<td>FBG484</td>
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<td>FGSG764</td>
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<tr>
<td>FFG1152</td>
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<td>500 (16)</td>
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</table>

**Notes:**
1. Supports PCI Express Base 2.1 specification at Gen1 and Gen2 data rates.
2. Leaded package options available.
3. Device migration is available within the Artix-7 family for like packages but is not supported between other 7 series families.

**Important:** Preliminary product information, subject to change. Please contact your local Avnet or Xilinx representative for the latest information or consult the device data sheets found on www.xilinx.com.
## Xilinx Kintex™-7 FPGAs

### PART NUMBER
- **XC7K70T**
- **XC7K160T**
- **XC7K325T**
- **XC7K355T**
- **XC7K410T**
- **XC7K420T**
- **XC7K480T**

#### Logic Resources
- **Slices**
  - 10,250
  - 25,350
  - 50,950
  - 55,950
  - 63,550
  - 65,150
  - 74,650
- **Logic Cells**
  - 65,600
  - 162,240
  - 326,080
  - 356,160
  - 406,720
  - 416,960
  - 477,760
- **CLB Flip-Flops**
  - 82,000
  - 202,800
  - 407,600
  - 445,200
  - 508,400
  - 521,200
  - 597,200

#### Memory Resources
- **Maximum Distributed RAM (Kbits)**
  - 838
  - 2,188
  - 4,000
  - 5,088
  - 5,663
  - 5,938
  - 6,788
- **Block RAM/FIFO w/ ECC (36Kbits each)**
  - 135
  - 325
  - 445
  - 715
  - 795
  - 835
  - 965
- **Total Block RAM (Kbits)**
  - 4,860
  - 11,700
  - 16,020
  - 25,740
  - 26,620
  - 30,060
  - 34,380

#### Clock Resources
- **CMs (1 MMCM + 1 PLL)**
  - 6
  - 8
  - 10
  - 6
  - 8
  - 8
  - 8

#### I/O Resources
- **Maximum Single-Ended I/O**
  - 300
  - 400
  - 500
  - 300
  - 500
  - 400
  - 400
- **Maximum Differential I/O Pairs**
  - 144
  - 192
  - 240
  - 144
  - 192
  - 192
  - 192

#### Embedded Hard IP Resources
- **DSP48E1 Slices**
  - 240
  - 600
  - 840
  - 1,440
  - 1,540
  - 1,680
  - 1,920
- **PCI Express**
  - 1
  - 1
  - 1
  - 1
  - 1
  - 1
  - 1
- **Agile Mixed Signal (AMS) / XADC**
  - 1
  - 1
  - 1
  - 1
  - 1
  - 1
  - 1
- **Configuration AES / HMAC Blocks**
  - 1
  - 1
  - 1
  - 1
  - 1
  - 1
  - 1
- **GTX 12.5 Gbps Transceivers**
  - 8
  - 8
  - 16
  - 24
  - 16
  - 32
  - 32

#### Speed Grades
- **Commercial**
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2
- **Extended**
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  - -2L, -3
  - -2L, -3
  - -2L, -3
  - -2L, -3
  - -2L, -3
  - -2L, -3
- **Industrial**
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2
  - -1, -2

#### Configuration
- **Configuration Memory (Mbits)**
  - 23.0
  - 51.1
  - 87.3
  - 107.3
  - 121.1
  - 143.0
  - 143.0

#### FOOTPRINTS
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<thead>
<tr>
<th>PACKAGE</th>
<th>DIMENSIONS (MM)</th>
<th>AVAILABLE USER I/O: 3.3 V SelectIO™ Pins, 1.8 V SelectIO Pins (GTX TRANSCEIVERS)</th>
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<td>FBG484</td>
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<td>FFG901</td>
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<tr>
<td>FFG1156</td>
<td>35 x 35</td>
<td>400, 0 (32)</td>
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</table>

**FBG** 1.0 mm Lidless flip-chip; **FFG** 1.0 mm Flip-chip fine-pitch

1. EasyPath™ solutions provide a fast and conversion-free path for cost reduction.
2. Hard block supports PCI Express Base 2.1 specification at Gen 1 and Gen 2 data rates. Gen 3 supported with soft IP.
3. Leaded package options ("FBxxx" or "FFxxx") available for the following Kintex-7 devices: XC7K160T, XC7K325T, XC7K355T, XC7K410T, XC7K420T, XC7K480T.

**Important:** Preliminary product information, subject to change. Please contact your local Avnet or Xilinx representative for the latest information or consult the device data sheets found on www.xilinx.com.

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## Xilinx Virtex®-7 FPGAs

### VIRTEx-7 FPGAgs

#### Optimized for Highest System Performance and Capacity

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>XC7V300T</th>
<th>XC7V500T</th>
<th>XC7V2000T</th>
<th>XC7V4100T</th>
<th>XC7V8500T</th>
<th>XC7V1650T</th>
<th>XC7V3050T</th>
<th>XC7V6150T</th>
<th>XC7V11400T</th>
<th>XC7V2900T</th>
<th>XC7V5800T</th>
<th>XC7V8900T</th>
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<td>900</td>
<td>1,100</td>
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<td>288</td>
<td>336</td>
<td>336</td>
<td>288</td>
<td>480</td>
<td>432</td>
<td>528</td>
<td>144</td>
<td>288</td>
<td>312</td>
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<tr>
<td>Maximum Distributed I/O Pairs</td>
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<td>600</td>
<td>720</td>
<td>600</td>
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<td>300</td>
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<td>106.1</td>
<td>131.5</td>
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<td>219.2</td>
<td>269.4</td>
<td>367.2</td>
<td>91.8</td>
<td>183.6</td>
</tr>
</tbody>
</table>

**などのトピックを含む**

1. EasyPath® solutions provide a fast and conversion-free path for cost reduction.
2. A single Virtex-7 FPGA CLB comprises two cells, each containing four 6-input LUTs and eight Flip-Flops, for a total of eight 6-LUTs and 16 Flip-Flops per CLB.
3. Virtex-7 FPGA logic cell ratings reflect the increased logic capacity offered by the six-input LUT architecture.
4. Refer to data sheet for details on I/O standards support.
5. 12.5 Gb/s support in "-4E" and "-5E" speed grades; 10.3125 Gb/s support in "-2C", "-2LE", and "-2LE" speed grade.
7. See data sheet for information on low power operating modes.

### Important notices

- **Leased package options** ("F2Fxxx","F3Lxxx","F4Hxxx","F5Cxxx") are available for all packages.
- Virtex-7 FPGAs in FG4176, FLG176, and FG1761 packages are footprint compatible. Please see package guide for differences.
- Virtex-7 FPGAs in FG4190 and FLG1900 packages are footprint compatible. Please see package guide for differences.
- 0.6G supports in "-3E", "-3LE", and "-4E" speed grades.

To view all available kits, visit the Avnet Design Resource Center at [www.xilinx.com](http://www.xilinx.com).
## Xilinx Zynq™-7000 Extensible Processing Platform (EPP)

**DEVICE NAME** | **Z-7010** | **Z-7020** | **Z-7030** | **Z-7045**
---|---|---|---|---
**PART NUMBER** | XCLZ1B0 | XCLZ2B0 | XCLZ3B0 | XCLZ4B0

### Processing System
- **Processor Core**: Artix™-7 FPGA
- **Processor Extensions**: Arria®-10 MP Core™
- **Maximum Frequency**: 800 MHz
- **L1 Cache**: 32 KB Instruction, 32 KB Data Per Processor
- **L2 Cache**: 512 KB
- **On-Chip Memory**: 256 KB
- **Peripheral Memory**: 256 KB
- **External Memory Support**: DDR3, DDR2, LPDDR2
- **DMA Channels**: 8 (4 dedicated to Programmable Logic)
- **Security**: AES and SHA 256b Encryption and Authentication for Secure Boot
- **Peripherals**: 2x UART, 2x GAN 2.0B, 2x PC, 2x SPI, 4x 32b GPIO

### Programmable Logic
- **Programmable Logic Cells (Approximate ASIC Gates)**:
  - Xilinx 7 Series Programmable Logic Equivalent
  - Arria®-7 FPGAs
  - 28K Logic Cells (~430K)
  - 85K Logic Cells (~1.3M)
  - 125K Logic Cells (~1.9M)
  - 350K Logic Cells (~5.2M)
- **Look-Up Tables (LUTs)**: 17,600
- **Flip-Flops**: 35,200
- **Extensible Block RAM (32 KB Blocks)**: 240 KB (65)
- **Programmable DSP Slices (18 x 25 MACs)**: 80
- **Peak DSP Performance (Symmetric FIR)**: 58 GMACS
- **PCI Express® (Root Complex or Endpoint)**: —
- **Agile Mixed Signal (AMS) / XADC**: 2x 12-bit, 1 MSPS ADCs with up to 17 Differential Inputs
- **Speed Grades**: Commercial (0 °C to 85 °C)
- **Packages**: SCS400, SCS404, SCS409, SCS414, FGB424, FPS076, FPS176, FPS276, FPS376, FPS476

### Packages
- **Package Type**: CLG400, CLG404, CLG409, CLG414, FGB424, FPS076, FPS176, FPS276, FPS376, FPS476
- **Size (mm)**: 17 x 17, 19 x 19
- **Pitch (mm)**: 0.8
- **Processing System User I/Os (Excludes DDR-dedicated I/Os)**: 54, 54
- **Multi-Standards and Multi-Voltage SelectIO® Interfaces (1.2 V, 1.35 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V)**: —
- **Multi-Standards and Multi-Voltage High-Performance SelectIO Interfaces (1.2 V, 1.35 V, 1.5 V, 1.8 V)**: —
- **Serial Transceivers**: 4
- **Maximum Transceiver Speed (Speed Grade Dependent)**: 6.6 Gb/s

### Notes
1. Security is shared by the Processing System and the Programmable Logic.
2. Static memory interface combined with the usage of many peripherals could require more than 54 I/Os. In that case the designer can use the Programmable Logic SelectIO interface.
3. Equivalent ASIC gate count is dependent of the function implemented. The assumption is 1 Logic Cell = ~15 ASIC Gates.

**Important**: Preliminary product information, subject to change. Please contact your local Avnet or Xilinx representative for the latest information or consult the device data sheets found on www.xilinx.com.
Xilinx Spartan®-6 FPGAs

SPARTAN-6 LX FPGAS OPTIMIZED FOR LOWEST-COST LOGIC, DSP, AND MEMORY (1.2 V, 1.0 V)

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>XC6SLX8</th>
<th>XC6SLX16</th>
<th>XC6SLX25</th>
<th>XC6SLX45</th>
<th>XC6SLX75</th>
<th>XC6SLX100</th>
<th>XC6SLX150</th>
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<tbody>
<tr>
<td>Logic Cells</td>
<td>3,840</td>
<td>9,152</td>
<td>14,579</td>
<td>24,051</td>
<td>43,661</td>
<td>74,637</td>
<td>101,261</td>
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<tr>
<td>CLB Flip-Flops</td>
<td>4,800</td>
<td>11,440</td>
<td>18,224</td>
<td>30,064</td>
<td>54,576</td>
<td>93,296</td>
<td>126,576</td>
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<td>Memory Resources</td>
<td>Maximum Distributed RAM (Mb)</td>
<td>2.7</td>
<td>2.7</td>
<td>3.7</td>
<td>6.4</td>
<td>11.9</td>
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<tr>
<td></td>
<td>Block RAM (1.8 Mb each)</td>
<td>12</td>
<td>32</td>
<td>52</td>
<td>116</td>
<td>268</td>
<td>52</td>
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<td></td>
<td>Total Block RAM (Mb)</td>
<td>216</td>
<td>576</td>
<td>576</td>
<td>936</td>
<td>2,088</td>
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<td>Clock Resources</td>
<td>Clock Management Ticks (CMT)</td>
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<td>4</td>
<td>6</td>
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<td>LQ Resources</td>
<td>Maximum Single-Ended IO</td>
<td>132</td>
<td>200</td>
<td>232</td>
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<td>358</td>
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<td>Maximum Differential IO Pairs</td>
<td>66</td>
<td>100</td>
<td>116</td>
<td>133</td>
<td>179</td>
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<td>Embedded Hard IP Resources</td>
<td>DSP48A1 Slices</td>
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<td>GTP Low-Power Transceivers</td>
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CHIP SCALE PACKAGES (CSG): PB-FREE, WIRE-BOND, CHIP SCALE BGA (0.5 MM BALL SPACING)

<table>
<thead>
<tr>
<th>PACKAGE</th>
<th>BODY AREA</th>
<th>MAXIMUM USER I/O</th>
<th>SELECTED INTERFACE PINS (GTP TRANSEIVERS)</th>
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</thead>
<tbody>
<tr>
<td>CGS196F</td>
<td>8 x 8 mm</td>
<td>106</td>
<td>106</td>
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| TQFP PACKAGES (TQG): PB-FREE, THIN QFP (0.5 MM LEAD SPACING)

<table>
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<th>PACKAGE</th>
<th>BODY AREA</th>
<th>MAXIMUM USER I/O</th>
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<tbody>
<tr>
<td>TQG144(6)</td>
<td>20 x 20 mm</td>
<td>102</td>
<td>102</td>
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CHIP SCALE PACKAGES (CPS): PB-FREE, WIRE-BOND, CHIP SCALE BGA (0.8 MM BALL SPACING)

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<th>PACKAGE</th>
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<th>MAXIMUM USER I/O</th>
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<tbody>
<tr>
<td>CGS225F</td>
<td>13 x 13 mm</td>
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<td>CGS324</td>
<td>15 x 15 mm</td>
<td>200</td>
<td>226</td>
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<tr>
<td>CGS484F</td>
<td>19 x 19 mm</td>
<td>320</td>
<td>338</td>
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<tr>
<td>FGSG84F</td>
<td>23 x 23 mm</td>
<td>266</td>
<td>316</td>
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<tr>
<td>FGSG676</td>
<td>27 x 27 mm</td>
<td>358</td>
<td>408</td>
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<tr>
<td>FGSG850</td>
<td>31 x 31 mm</td>
<td>376</td>
<td>488</td>
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BGA PACKAGES (FBG): PB AND PB-FREE, WIRE-BOND, FINE-PITCH THIN BGA (1.0 MM BALL SPACING)

<table>
<thead>
<tr>
<th>PACKAGE</th>
<th>BODY AREA</th>
<th>MAXIMUM USER I/O</th>
<th>SELECTED INTERFACE PINS (GTP TRANSEIVERS)</th>
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</thead>
<tbody>
<tr>
<td>FTG1225</td>
<td>17 x 17 mm</td>
<td>186</td>
<td>186</td>
</tr>
</tbody>
</table>
| BGA PACKAGES (FGD): PB AND PB-FREE, WIRE-BOND, FINE-PITCH BGA (1.0 MM BALL SPACING)

1. Each slice contains four LUTs and eight Flip-Flops.
2. Spartan 6 FPIA logic cell ratings reflect the increased logic capacity offered by the new 6-input LUT architecture.
3. Block RAM are fundamentally 1.8-kb in size. Each block can be used as two independent 9-kb blocks.
4. Each CM7 contains two DCMs and one PLL.
5. Each DSP48A1 slice contains 18 x 18 multiplier, an adder, and an accumulator.
6. The LX device pinouts are not compatible with the LX7 device pinouts.
7. CGS196 and TQG144 do not have memory controller support. -3N is not available for these packages.
8. CGS225 has X0 memory controller support in the LX7 and LX16 devices. There is no memory controller in the LX7 devices.
9. Devices in the FGSG484 and FSGG444 packages have support for two memory controllers.
10. Devices with -3N speed grade do not support MCB functionality.

Important: Preliminary product information, subject to change. Please contact your local Avnet or Xilinx representative for the latest information or consult the device data sheets found on www.xilinx.com.
# Xilinx Virtex-6 FPGAs

**Virtex-6 LX FPGAs**
Optimized for high-performance logic and DSP with low-power serial connectivity (1.0 V, 0.9 V)

<table>
<thead>
<tr>
<th>Logic Resources</th>
<th>Resources Mixed Mode Clock Managers (MMCM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slices (4)</td>
<td>1,045</td>
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<tr>
<td>Logic Cells (5)</td>
<td>344</td>
</tr>
<tr>
<td>CB Flip-Flops</td>
<td>16</td>
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<tr>
<td>Memory Resources</td>
<td></td>
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<tr>
<td>Block RAM/FIFO</td>
<td>156</td>
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<tr>
<td>Resources</td>
<td></td>
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<tr>
<td>Clock Resources</td>
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<td>Mixed Mode Clock Managers (MMCM)</td>
<td>6</td>
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<tr>
<td>I/O Resources</td>
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<tr>
<td>Maximum Single-Ended I/O</td>
<td>360</td>
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<td>Maximum Differential I/O Pairs</td>
<td>180</td>
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<tr>
<td>Embedded HardIP Resources</td>
<td></td>
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<tr>
<td>DSP48E1 Slices</td>
<td>288</td>
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<tr>
<td>PCI Express® Interface Blocks</td>
<td>1</td>
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<tr>
<td>10/100/1000 Ethernet MAC Blocks</td>
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<tr>
<td>GTX Low-Power Transceivers</td>
<td>12</td>
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<td>GTI High-Speed Transceivers</td>
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<td>Speed Grades</td>
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<td>Extended</td>
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<tr>
<td>Industrial</td>
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<tr>
<td>Configuration</td>
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</tbody>
</table>

## Package Selection

**FFA Package (FF): Flip-Chip, Fine-Pitch BGA (1.0 mm Ball Spacing)**

<table>
<thead>
<tr>
<th>Package</th>
<th>Area</th>
<th>Available User I/O: SelectIO® Pins <strong>(5)</strong> (GTI Low-Power Transceivers, GTI High-Speed Transceivers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FF484</td>
<td>23 x 23 mm</td>
<td>240 (8, 0) to 240 (8, 0)</td>
</tr>
<tr>
<td>FF784</td>
<td>29 x 29 mm</td>
<td>360 (12, 0) to 400 (12, 0) 400 (12, 0) 400 (12, 0)</td>
</tr>
<tr>
<td>FF1156</td>
<td>35 x 35 mm</td>
<td>600 (20, 0) to 600 (20, 0) 600 (20, 0)</td>
</tr>
<tr>
<td>FF1759</td>
<td>42.5 x 42.5 mm</td>
<td>720 (24, 0) to 840 (36, 0) 720 (24, 0) 840 (36, 0)</td>
</tr>
<tr>
<td>FF1770</td>
<td>42.5 x 42.5 mm</td>
<td>1,200 (0, 0) 1,200 (0, 0)</td>
</tr>
<tr>
<td>FF1154</td>
<td>35 x 35 mm</td>
<td>320 (48, 0) to 320 (48, 0)</td>
</tr>
<tr>
<td>FF1155</td>
<td>35 x 35 mm</td>
<td>440 (24, 12) 440 (24, 12)</td>
</tr>
<tr>
<td>FF1283</td>
<td>45 x 45 mm</td>
<td>480 (24, 24) 720 (40, 24) 720 (40, 24) 720 (40, 24)</td>
</tr>
<tr>
<td>FF1284</td>
<td>45 x 45 mm</td>
<td>640 (48, 24) 640 (48, 24)</td>
</tr>
</tbody>
</table>

1. EasyPath™ solutions provide a conversion-free, low-risk path for volume production.
2. A single Virtex-6 FPGA CLB comprises two slices, with each containing four 6-input LUTs and eight Flip-Flops (twice the number found in a Virtex-4 FPGA slice), for a total of 6-LUTs and 16 Flip-Flops per CLB.
3. Virtex-6 FPGA logic cell ratings reflect the increased logic capacity offered by the 6-input LUT architecture.
4. Digitally Controlled Impedance (DCI) is available on I/Os of all devices.
5. I/O standards supported: HSTL, LVCOS (1.2, 1.5 & 2.5 V), HSTL II (1.5 & 1.8 V), LVDL, Extended LVDL, RSIO, Bus LVDS, LVPECL, SSTL I (1.8 & 2.5 V), SSTL II (1.5 & 2.5 V), SSTL III (1.5 V).
6. One system monitor block included in all devices.

All products available Pb-free and RoHS-Compliant (FFG). Product information, subject to change. Please contact your local Avnet or Xilinx representative for the latest information or consult the device data sheets found on www.xilinx.com.

To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc

XILINX DEVELOPMENT KITS AND ACCESSORIES 6
# Xilinx 7 Series FPGA and EPP Targeted Design Platforms

## Platform Summaries

<table>
<thead>
<tr>
<th>Platform</th>
<th>Summary</th>
<th>Base</th>
<th>Vx7</th>
<th>Z7k</th>
<th>Connect</th>
<th>DSP</th>
<th>Video</th>
<th>Analog</th>
<th>Wired</th>
<th>Wireless</th>
<th>Broadcast</th>
<th>Audio</th>
<th>HPC</th>
<th>Industrial</th>
<th>Medical</th>
<th>Consumer</th>
<th>Auto</th>
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<td><strong>Kintex-7 FPGAs</strong></td>
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**Notes:**
- **X** = Primary Option(s)
- **X** = Secondary Option(s)
# Xilinx 7 Series FPGA and EPP Baseboard Features

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<thead>
<tr>
<th>KINETEX-7 FPGAS</th>
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<th>MEMORY</th>
<th>CONFIGURATION MEMORY</th>
<th>ON-BOARD USB CONFIGURATION</th>
<th>PCIe*</th>
<th>ETHERNET</th>
<th>SFP</th>
<th>USB</th>
<th>FMC (LPC)</th>
<th>FMC (HPC)</th>
<th>GPIO</th>
<th>DISPLAY</th>
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<tbody>
<tr>
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<td>XCKJ325T-2FFG900</td>
<td>DDR3 512 DDIMM (1600 Mbps)</td>
<td>256 MB Flash (BI) 16 MB QSPI</td>
<td>Yes x8 Gen 2 10/100/1000 Ethernet PHY</td>
<td>SFP / SFP+</td>
<td>USB-Serial Bridge</td>
<td>1 1 N/A</td>
<td>16 x 2 LCD HDMI/DVI Output</td>
<td>Power Bus Manager</td>
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<td>XCKJ325T-1FFG676</td>
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<td>USB-Serial Bridge</td>
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<th>SFP</th>
<th>USB</th>
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<td>ZedBoard</td>
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<td>Audio I/O</td>
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To view all available kits, visit the Avnet Design Resource Center at [www.em.avnet.com/drc](http://www.em.avnet.com/drc)
## Spartan®-6 and Virtex®-6 FPGA Targeted Design Platforms

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<th>MCU</th>
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Visit FMC Central at [www.xilinx.com/fmc](http://www.xilinx.com/fmc) for additional information on FMC modules.

X = Primary Option(s)
X = Secondary Option(s)
# Spartan®-6 and Virtex®-6 FPGA Baseboard Features

## Spartan-6 FPGAs

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<th>FPGA PART NUMBER</th>
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<th>CONFIGURATION MEMORY</th>
<th>ON-BOARD USB CONFIGURATION</th>
<th>PCI®</th>
<th>ETHERNET</th>
<th>SFP</th>
<th>USB</th>
<th>FMC (LPC)</th>
<th>FMC (HPC)</th>
<th>GPIO</th>
<th>DISPLAY</th>
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<td>N/A</td>
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## Virtex-6 FPGAs

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<td>32 MB Flash (BPI)</td>
<td>System ACE Compact Flash</td>
<td>128 MB Platform Flash XL</td>
<td>x8 Gen1/x4 Gen2</td>
<td>USB-Serial Bridge</td>
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<td>USB-Serial Bridge</td>
<td>N/A</td>
<td>(2) 2.5 V</td>
<td>N/A</td>
<td>N/A</td>
<td>40 Pairs of SMA Super Clock Module</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: FMC connector supports 4 GTPs

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To view all available kits, visit the Avnet Design Resource Center at [www.em.avnet.com/drc](http://www.em.avnet.com/drc)
Mini-Module Plus Development Kit Supporting the Kintex™-7 FPGA Family

The Xilinx Kintex™-7 FPGA Mini-Module Plus Development Kit is a completely customizable development kit, perfect for system architects and FPGA designers looking for a flexible, high performance and upgradable platform. The Avnet Mini-Module Plus system consists of a modular baseboard with three slots supporting an FPGA module, a power supply module and an optional FPGA mezzanine card (FMC) application module. The FPGA module is a complete system on a module, packaging all the necessary functions needed for an embedded processor system onto a small footprint. The Xilinx Kintex™-7 FPGA version of the kit is the first of three planned kit offerings, with future modules planned for Xilinx Artix™-7 FPGA and Zynq™-7000 EPP devices.

WHAT'S INCLUDED
- Kintex-7 FPGA Mini-Module Plus
  - Kintex-7 FPGA XC7K410T-1FFG676
  - 256 MB DDR3 SDRAM
  - 64 MB of configuration/user data Flash
  - 8 KB of I2C EEPROM
  - 10/100/1000 Ethernet PHY
  - USB 3.0 interface
  - Programmable LVDS clock source (GTX reference clock input)
  - 200 MHz LVDS oscillator (system clock)
  - 50 MHz UVCMS configuration oscillator
  - JTAG programming/configuration port
  - USB 3.0 controller ARM® JTAG header
  - XADC header
  - Eight GTX ports
  - 132 user I/O pins

- Mini-Module Plus Baseboard 2
  - 12 V power supply (US/UK/Euro AC cords)
  - Two USB A-mini-B cables
  - Ethernet cable
  - One power module
  - Xilinx ISE® Design Suite: Logic Edition (device locked to XC7K325T FPGA)

- Kintex-7 FPGA Mini-Module Plus Features
  - Xilinx Kintex-7 FPGA XC7K410T-1FFG676 or XC7K325T-1FFG676
  - 256 MB DDR3 SDRAM
  - 64 MB of configuration/user data Flash
  - 8 KB of I2C EEPROM

- Mini-Module Plus Baseboard 2 Features
  - One Mini-Module Plus slot
  - One FMC LPC slot (2.5 or 3.3 V VADJ)
  - PCIe x4 edge connector
  - One SFP socket
  - DisplayPort® output
  - One general-purpose MGT via SMA connectors
  - Eight GTX ports
  - 132 user I/O pins

- Power Module Features
  - Designed to meet a common specification
  - Accepts a 12 V DC input
  - Generates all required voltage rails to power the FPGA module, FMC slot and baseboard circuits
  - Available power modules:
    - Analog Devices
    - GE Power
    - Maxim
    - STMicroelectronics
    - Texas Instruments
    - Texas Instruments SIMPLE SWITCHER®

Call for volume pricing.

Mini-Module Plus Baseboard 2
AES-MMP-BB2-G | $500 USD
Kintex-7 FPGA Mini-Module Plus
AES-MMP-7K325T-G | $895 USD
Power Module (see pages 28-29 for details)
$300 USD
www.em.avnet.com/k7mmp

To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc
The Xilinx Kintex™-7 FPGA KG705 Evaluation Kit includes all the basic components of hardware, design tools, IP, and pre-verified reference designs, including a Targeted Reference Design, enabling high-performance serial connectivity and advanced memory interfacing. The included pre-verified reference designs and industry-standard FPGA Mezzanine Card (FMC) connectors allow scaling and customization with daughter cards.

**WHAT'S INCLUDED**
- Xilinx Kintex-7 FPGA KG705 evaluation board
- Agile mixed-signal evaluation card
- ISE® Design Suite: Logic Edition (device locked to XC7K325T FPGA)
- Cables for connectivity (USB, Ethernet, HDMI) and power
- USB Flash drive containing reference designs and documentation

**FEATURES**
- Xilinx Kintex-7 FPGA XC7K325T-2FFG900C
- DDR3 SODIMM (64-bit wide, 1 GB module, 800 MHz)
- PCIe edge connector (8 lanes)
- 16 MB Quad-SP flash
- 128 MB BPI Flash
- 10/100/1000 Ethernet PHY
- SFP/SFP+ cage
- Serial (UART) to USB bridge
- Two FMC expansion headers, LPC and HPC
- Onboard configuration circuitry

**Kintex™-7 FPGA DSP Development Kit with High-Speed Analog**

The Xilinx Kintex™-7 FPGA DSP Development Kit is comprised of two critical elements. The first is the Xilinx Kintex-7 FPGA KG705 baseboard. The KG705 combines high-performance, serial connectivity and advanced memory interfacing with the flexibility of the 28 nm Kintex-7 FPGA that delivers maximum power efficiency and up to 1200 GMACs of DSP processing bandwidth. The second component is the 4DSP FMC150, an integrated high-speed FPGA Mezzanine Card (FMC) that interfaces with signals from the outside world. Together, these components create a development kit that melds the performance of Xilinx’s 7 series FPGA with the high-speed data conversion of the FMC150, enabling designers to focus on their application at the beginning of the design process. DSP designers will also benefit from intuitive MathWorks tools for system modeling, simulation and auto-code generation.

**WHAT'S INCLUDED**
- Xilinx Kintex-7 FPGA KG705 evaluation board
- 4DSP FMC150 dual 14-bit 250 Msps A/D, dual 16-bit 800 Msps D/A
- ISE® Design Suite: System Edition (device locked to XC7K325T FPGA)
- Reference designs, example designs and demos
- Board design files
- Step-by-step Getting Started Guide and other documentation
- Cables and power supply

**FEATURES**
- Xilinx Kintex-7 FPGA KG705 evaluation board
- FPGA XC7K325T-2FFG900C
- Onboard configuration circuitry
- 128 MB Parallel (BPI) Flash
- 16 MB Quad-SP flash
- 10/100/1000 tri-speed Ethernet
- SFP+ transceiver connector

**EK-K7-KC705-G | $1,695 USD**
www.xilinx.com/kc705

**AES-K7DSP-325T-G | $3,995 USD**
www.em.avnet.com/k7dspkit
Kintex™-7 FPGA Embedded Kit

Based on the Xilinx Kintex™-7 325T FPGA, the Kintex-7 FPGA Embedded Kit contains an extensible development board and the key design tools and IP needed for efficient embedded application development. The pre-verified reference designs and tutorials will jump-start your development. Software developers can get started in a familiar Eclipse IDE without using the FPGA hardware design tools.

WHAT’S INCLUDED
- Xilinx Kintex-7 FPGA KC705 evaluation board
- Agile mixed-signal evaluation card
- ISE® Design Suite: Embedded Edition (device locked to XC7K325T FPGA)
- USB and Ethernet cables
- Downloadable reference designs and documentation
- USB Flash drive containing kit documents
- Ecosystem OS/RTOS support

FEATURES
- Xilinx Kintex-7 FPGA XC7K325T-2FFG900C
- MicroBlaze™ processor sub-system targeted reference design
- 32-bit MicroBlaze soft processor
- Integrated Memory Management Unit (MMU)
- 16 KB instruction and data caches
- All development tools needed to support embedded hardware and software development
- Onboard configuration circuitry

DK-K7-EMBD-G | $1,895 USD
www.xilinx.com/k7embkit

Kintex™-7 FPGA Connectivity Kit

The Xilinx Kintex™-7 FPGA Connectivity Kit is a complete development and demonstration platform for designing with standards-based protocols – such as PCIe® and Ethernet, implementing low-cost protocol bridging, and providing a higher efficiency alternative to LVDS communication in multiple market segments. Provided with each Kintex-7 FPGA Connectivity Kit is an evaluation seat of Northwest Logic’s PCIe Packet DMA IP Core in Netlist format for implementing high-speed and maintaining efficient data transfer on the PCIe link.

WHAT’S INCLUDED
- Xilinx Kintex-7 FPGA KC705 evaluation board
- Agile mixed-signal evaluation card
- High-speed FMC daughter card
- ISE® Design Suite: Logic Edition (device locked to XC7K325T FPGA)
- Two USB cables, Ethernet cable, four SMA cables
- Downloadable reference designs and documentation
- Fedora 10 Live CD – Linux operating system

FEATURES
- Xilinx Kintex-7 FPGA XC7K325T-2FFG900C
- Supports PCIe (x8 Gen 2), DMA Virtual FIFO memory controller and dual 10G Ethernet
- Evaluation seat of Northwest Logic’s PCIe Packet DMA IP Core in Netlist format
- Software drivers
- ChipScope Pro Serial I/O Toolkit IBERT Transceiver Test Design
- Onboard configuration circuitry

DK-K7-CONN-G | $2,895 USD
www.xilinx.com/k7connkit

To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc
Virtex®-7 FPGA VC707 Evaluation Kit

Xilinx

The Xilinx Virtex®-7 FPGA VC707 Evaluation Kit is a full-featured, highly-flexible, high-speed serial base platform using the Virtex-7 FPGA XC7VX485T-2FFG1761. The kit includes the basic components of hardware, design tools, IP, and pre-verified reference designs for system designs that demand high-performance, serial connectivity and advanced memory interfacing. The included pre-verified reference designs and industry-standard FPGA Mezzanine Card (FMC) connectors allow scaling and customization with daughter cards.

WHAT’S INCLUDED
- Xilinx Virtex-7 FPGA VC707 evaluation board
- Agile mixed-signal evaluation card
- ISE® Design Suite: Logic Edition (device locked to VX485T-2 FPGA)
- USB and Ethernet cables
- Downloadable reference designs and documentation
- USB Flash drive containing kit documents
- Printed documentation and getting started demo

FEATURES
- Xilinx Virtex-7 FPGA XC7VX485T-2FFG1761
- 128 MB BPI Flash
- Gigabit Ethernet RGMII/GMII, SGMII
- PCI Express x8 Gen 2 edge connector (layout for Gen 3)
- Serial (UART) to USB bridge
- Two FMC expansion headers, LPC and HPC
- Onboard configuration circuitry

EK-V7-VC707-G | $3,495 USD
www.xilinx.com/vc707

To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc
ZedBoard is a low-cost development board for the Xilinx Zynq™-7000 Extensible Processing Platform (EPP). 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. Take advantage of the Zynq-7000 EPP’s tightly coupled ARM® processing system and 7 series programmable logic to create unique and powerful designs with the ZedBoard. The ZedBoard kit is supported by the www.zedboard.org community website where users can collaborate with other engineers also working on Zynq designs.

**WHAT’S INCLUDED**
- Avnet ZedBoard 7020 baseboard
- 12 V AC/DC power supply
- Micro-USB cable
- Getting Started Guide
- ISE® WebPACK™

**FEATURES**
- Zynq-7000 EPP XC7Z020-CLG484-1
- Memory
- 512 MB DDR3
- 256 Mb Quad-SPI Flash
- 4 GB SD card
- Onboard USB-JTAG Programming
- 10/100/1000 Ethernet
- USB OTG 2.0 and USB-UART
- PS & PL I/O expansion (FMC, Pmod™, XADC)
- Multiple displays (1080p HDMI, 8-bit VGA, 128 x 32 OLED)
- 78S Audio CODEC

AES-Z7EV-7Z020-G | $395 USD
www.zedboard.org

AES-ALI2-ZED-G | $499 USD
www.em.avnet.com/zedboard7touch

7-INCH ZEDBOARD TOUCH DISPLAY KIT

The 7-inch ZedBoard Touch Display Kit from Avnet Electronics Marketing provides an engineer everything needed to develop products with interactive GUIs and touchscreen capabilities. The kit combines an 800 x 480 WVGA TFT-LCD display from Sharp Microelectronics with a projective capacitive touch sensor, I2C-based touch controller, LED backlight supply, and necessary cables. See page 30 for details.

Zynq™-7000 EPP ZC702 Evaluation Kit

The Zynq™-7000 EPP ZC702 Evaluation Kit includes all the basic components of hardware, design tools, IP, and pre-verified reference designs, including a Targeted Reference Design, enabling a complete embedded processing platform. The included pre-verified reference designs and industry-standard FPGA Mezzanine Card (FMC) connectors allow scaling and customization with daughter cards.

**WHAT’S INCLUDED**
- Xilinx ZC702 evaluation board
- Agile mixed-signal evaluation card
- ISE® WebPACK™
- Reference designs, design examples and demos
- Board design files
- Documentation
- Cables & power supply
- USB Flash drive & SD card

**FEATURES**
- Zynq-7000 EPP XC7Z020-CLG484-1
- 128 Mb Quad-SPI Flash
- 10/100/1000 Ethernet PHY
- HDMI output
- USB OTG, Serial (UART) to USB Bridge, I2C & CAN
- Two LPC FMC expansion headers
- Onboard configuration circuitry

EK-Z7-ZC702-G | $895 USD
www.xilinx.com/zc702
The Zynq™-7000 EPP Video and Imaging Kit features the hardware, design tools, IP, and pre-verified reference designs needed to enable high-resolution video and imaging applications. The included kit contents enable out-of-the-box application development.

**WHAT'S INCLUDED**
- Xilinx ZC702 evaluation board
- Video FMC board with HDMI I/O and image sensor input
- ON Semiconductor VITA 2000 color image sensor
- IR cut filter and tripod
- Agile mixed-signal evaluation card
- ISE® Design Suite: Embedded Edition (device locked to XC7Z020-CLG484-1 EPP)
- Reference designs, design examples and demos
- Cables & power supply, USB Flash drive & SD card

**FEATURES**
- Zynq-7000 EPP XC7Z020-CLG484-1
- Video FMC board with HDMI I/O, image sensor input
- ON Semiconductor VITA 2000 color image sensor
- High frame rates: pipelined and triggered global shutter, rolling shutter
- Standard interchangeable 8 mm C-mount lens

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Combining the Xilinx Zynq™-7000 EPP ARM® dual-core Cortex™-A9 + 28 nm programmable logic with the latest generation Analog Devices high-speed data converters and frequency-agile RF components, this kit enables wireless communications from baseband to RF.

**WHAT'S INCLUDED**
- Avnet ZedBoard 7020 baseboard
- ISE® Design Suite: Embedded Edition (device locked to XC7Z020 EPP)
- MathWorks Model-Based Design Evaluation Tools
- Analog Devices FMCCOMMS1-EBZ FMC Module
- Linux drivers, applications software, HDL source, reference designs, full schematics and Gerbers
- Two Pulse 4G LTE blade antennas (2500 - 2700 MHz)
- Two MMIC to MMX coax cables

**FEATURES**
- Analog Devices FMCCOMMS1-EBZ FMC Module
  - AD9643, 14-bit, 250 Msps dual ADC
  - AD9122, 16-bit, 1200 Msps dual DAC
  - Software tunable across wide bandwidth spectrum (400 MHz to 4 GHz)
  - Bypass RF section for baseband sampling
  - Extensible to multiple FMCs for MIMO

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Combining the Xilinx Zynq™-7000 EPP ARM® dual-core Cortex™-A9 + 28 nm programmable logic with the highly integrated TI AFE7225 analog front end and RF components, this kit enables software-defined radio optimized for low power consumption.

**WHAT'S INCLUDED**
- Avnet ZedBoard 7020 baseboard
- ISE® Design Suite: Embedded Edition (device locked to XC7Z020 EPP)
- MathWorks Model-Based Design Evaluation Tools
- 4DSP FMC30RF FMC Module
- HDL source, reference designs, and schematics
- Two Pulse 4G LTE blade antennas (2500 - 2700 MHz)
- Two MMIC to SMA coax cables

**FEATURES**
- 4DSP FMC30RF FMC Module
  - Integrated Texas Instruments AFE7225 analog front end for full- or half-duplex radios
  - Software-tunable across wide bandwidth spectrum 300 MHz - 3 GHz
  - TDD and FDD support for up to 30 MHz of signal bandwidth
  - On-board clock and reference generation
  - 2 x 2 MIMO support with optional 2nd FMC30RF

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**Zynq™-7000 EPP Kits**

**EK-Z7-VIDEO-G | $1,495 USD**

**AES-ZSDR-ADI-G | $1,450 USD**
www.em.avnet.com/adizynqsdra

**AES-ZSDR-TI-G | $1,850 USD**
www.em.avnet.com/tizynqsdrt
The Xilinx Spartan®-6 FPGA Motor Control Development Kit emphasizes ease-of-use and flexibility, driving multiple motors and motor types. HDL-based projects provide introductory designs for quick integration with larger systems. Demonstrations of field-oriented control, Space Vector Modulation (SVM) and Regenerative Pulse Frequency Modulation (RPFM), created by Xilinx Alliance partner QDESYS, are also available.

**WHAT’S INCLUDED**
- Spartan-6 FPGA LX75T baseboard
- Motor Control Low Pin Count (LPC) FMC Module
- Two Portescap motors - one BLDC and one Stepper
- 12 V power supply and adapter cable
- USB and Ethernet cable
- JTAG HS1 programming cable
- One license voucher for ISE® Design Suite: System Edition (device locked to Spartan-6 FPGA LX75T)

**FEATURES**
- Spartan-6 FPGA XC6SLX75T-3FGG676C
- PCIe x1 edge connector
- 10/100 Ethernet PHY
- Drives Stepper, Brushed DC (BDC), Brushless DC (BLDC) and Permanent Magnet Synchronous Motors (PMSM)
- Spins two motors (12-24 V) simultaneously under FPGA control
- TI DRV8312 integrated motor drivers
- TI ADS1204 Delta-Sigma ADCs for high precision sensing

**Aes-s6mc1-lx75t-g | $1,095 USD**
www.em.avnet.com/spartan6motor

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The low-cost Xilinx Spartan®-6 LX9 MicroBoard is the perfect solution for designers interested in exploring the MicroBlaze™ soft processor or Spartan®-6 FPGAs in general. The kit comes with several pre-built MicroBlaze™ “systems,” allowing users to start software development like they would with any standard off-the-shelf microprocessor. The included Software Development Kit (SDK) provides a familiar Eclipse-based environment for writing and debug code. Experienced FPGA users will find the MicroBoard a valuable tool for general purpose prototyping and testing. The included peripherals and expansion interfaces make the kit ideal for a wide variety of applications. From a system running an RTOS to a Linux-based web server, the LX9 MicroBoard can help you validate your next design idea.

**WHAT’S INCLUDED**
- Spartan®-6 LX9 MicroBoard
- ISE® WebPACK® software with device-locked SDK license and ChipScope license
- USB cables
- Printed documentation and Getting Started Demo

**FEATURES**
- Spartan-6 FPGA XC6SLX9-2CSG324C
- 64 MB LPDDR SDRAM
- 128 Mb Multi-I/O SPI Flash
- 10/100 Ethernet PHY
- USB-to-UART port
- Onboard JTAG configuration

**Aes-s6mb-lx9-g | $89 USD**
www.em.avnet.com/s6microboard

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The low-cost Xilinx Spartan®-6 FPGA LX16 Evaluation Kit showcases low-power and battery-power design techniques for Spartan-6 applications. On-board FPGA configuration and power measurement is possible with the included Cypress PSoC® 3 Programmable System-on-Chip.

**WHAT’S INCLUDED**
- Spartan LX16 baseboard
- LCD add-on panel
- ISE® WebPACK® software
- USB-A-mini B cable
- AvProg configuration and programming utility
- Printed documentation and Getting Started Demo
- Downloadable documentation and reference designs

**FEATURES**
- Spartan-6 FPGA XC6SLX16-2CSG324C
- 64 MB LPDDR SDRAM
- 128 Mb Multi-I/O SPI Flash
- 10/100 Ethernet PHY
- USB 2.0 full-speed port
- LPC FMC expansion header
- Cypress PSoC 3 controller
- Two 2 x 6 Pmod™ expansion ports
- Single cell Li-Ion battery (~2500 mAh)

**Aes-s6ev-lx16-g | $225 USD**
www.em.avnet.com/spartan6lx16-evl
To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc

**Spartan®-6 FPGA SP605 Evaluation Kit**

The Xilinx Spartan®-6 FPGA SP605 Evaluation Kit provides a flexible environment for system design and provides pre-verified reference designs and examples of how to leverage features such as high-speed serial transceivers, PCI Express®, DVI, and/or DDR3.

**WHAT'S INCLUDED**
- SP605 baseboard
- ISE® Design Suite: Logic Edition (device-locked to Spartan-6 FPGA LX45T)
- Universal 12 V power supply
- USB and Ethernet cables
- DVI-VGA adapter
- USB Flash drive containing kit documents
- Documentation, Getting Started Demo and reference designs

**FEATURES**
- Spartan-6 FPGA XC6SLX45T-3FGG484C
- 1 GB DDR3 SDRAM
- 64 Mb Quad-SPI Flash
- 32 MB Parallel (BP) Flash
- PCIe® x1 edge connector
- 10/100 Ethernet PHY
- 32 MB Parallel Flash
- 128 Mb Multi-i/O SPI Flash
- PCIe® x1 edge connector
- Onboard configuration circuitry
- System ACE™ CF with 2 GB CompactFlash (CF) Card

**AES-S6PCIE-LX75T-G | $425 USD**

www.xilinx.com/products/devkits/AES-S6PCIE-LX75T-G.htm

**Spartan®-6 FPGA LX75T Development Kit**

The streamlined Xilinx Spartan®-6 FPGA LX75T board offers a standard set of features in a compact PCIe® form factor. With dual banks of DDR3 memory and a card edge-aligned FMC slot, the LX75T board is ideal for embedded PCIe applications.

**WHAT'S INCLUDED**
- LX75T baseboard
- ISE® Design Suite: Logic Edition (device-locked to Spartan-6 FPGA LX75T)
- Universal 12 V power supply and adapter cable
- Printed documentation and Getting Started Demo
- Downloadable documentation and reference designs

**FEATURES**
- Spartan-6 FPGA XC6SLX75T-3FGG676C
- Dual 128 MB DDR3 banks (256 MB total)
- 32 MB Parallel Flash
- 128 Mb Multi-i/O SPI Flash
- PCIe® x1 edge connector
- 10/100 Ethernet PHY
- LPC FMC expansion header
- Two 2 x 6 Pmod expansion ports
- GPIO header with LVDS support
- 16-bit ADC / 10-bit DAC
- Maxim SHA-1 security device

**AES-S6DEV-LX150T-G | $995 USD**

www.em.avnet.com/spartan6lx150t-dev

**Spartan®-6 FPGA LX150T Development Kit**

The Xilinx Spartan®-6 FPGA LX150T Development Kit provides a complete development platform for designing and verifying applications based on the Spartan-6 LXT FPGA family. Available with the Spartan-6 LX150T, this kit enables designers to prototype high-performance designs with ease, while providing expandability and customization through the dual FMC LPC expansion slots.

**WHAT'S INCLUDED**
- LX150T baseboard
- ISE® Design Suite: Logic Edition (device-locked to Spartan-6 FPGA LX150T)
- Universal 12 V power supply
- USB and Ethernet cables
- Printed documentation and Getting Started Demo
- Downloadable documentation and reference designs

**FEATURES**
- Spartan-6 FPGA XC6SLX150T-3FGG676C
- 1 GB DDR3 SDRAM
- 32 MB Parallel Flash
- Platform Flash configuration memory
- PCIe® x4 edge connector
- 10/100/1000 Ethernet PHY
- One SFP module connector
- SATA host connector
- Two LPC FMC expansion headers
- Avnet LCD Interface (ALI) connector
The Xilinx Spartan®-6 FPGA SP623 Characterization Kit provides the hardware environment for characterizing and evaluating the GTP transceivers available on the Spartan-6 LXT FPGA (up to 3.125 Gbps). Each GTP transceiver is accessible through four SMA connectors.

**WHAT’S INCLUDED**
- SP623 baseboard
- ISE® Design Suite: Logic Edition (device locked to Spartan-6 FPGA LX150T)
- Universal 12 V power supply
- USB A-mini B cable
- Six SMA to SMA cables
- Printed documentation and Getting Started Demo
- Downloadable documentation and reference designs

**FEATURES**
- Spartan-6 FPGA XC6SLX150T-3FGG676C
- Onboard power supplies for all necessary voltages
- Power supply jacks for optional use of external power supplies
- A fixed, 200 MHz 2.5 V LVDS oscillator wired to global clock inputs
- One pair of user SMA global clock inputs
- SuperClock-2 module supporting multiple frequencies
- 16 pairs of SMA connectors for the GTP transceivers
- Eight differential SMA connector pairs for GTP transceiver clock inputs
- Two VITA 57.1 FMC HPC connectors

**CK-S6-SP623-G | $3,995 USD**
www.xilinx.com/sp623

The Xilinx Spartan®-6 FPGA DSP Kit brings together hardware, tools, methodologies, IP, and verified reference, accelerating DSP development for experienced users and simplifying FPGA-based DSP adoption for new users.

**WHAT’S INCLUDED**
- LX150T baseboard & associated hardware items
- ISE® Design Suite: System Edition (device locked to Spartan-6 FPGA LX150T)
- Evaluation versions of MathWorks tools
- Xilinx Platform Cable USB-II
- Printed documentation and Getting Started Demo
- Downloadable documentation and reference designs

**FEATURES**
- Simulink / System Generation and RTL-based Targeted Reference Designs (TRD), including:
  - Digital Up Converter (DUC)
  - Digital Down Converter (DDC)
  - CORE Generator System-based IPs
- All development tools needed support DSP Development
- In-depth, step-by-step implementation tutorials

**AES-S6DSP-LX150T-G | $1,995 USD**
www.em.avnet.com/spartan6dsp

The Nano-ITX/Spartan®-6 FPGA Development Kit connects an Intel® Atom™ E640 based motherboard with a Spartan-6 LX75T based daughter card. The Emerson Nano-ITX motherboard provides a complete Atom E640 embedded system, with all the necessary standard PC peripherals. The Spartan-6 LX75T FPGA daughter card connects to the motherboard through a x1 PCIe® flex cable and shares a similar 120 x 120 mm physical outline.

**WHAT’S INCLUDED**
- Emerson NITX-315 Atom E640 motherboard
- LX75T PCIe daughter board
- ISE® Design Suite: Logic Edition (device locked to Spartan-6 FPGA LX75T)
- 12 V power supply
- PCIe Flex cable
- 6 GB Solid State Drive (SSD)

**FEATURES**
- Nano-ITX motherboard
  - 1 GHz Intel Atom E640 processor
  - 1 GB DDR2 memory
  - LX75T PCIe board
  - Spartan-6 FPGA XC6SLX75T-3FGG676C
  - Dual 128 MB DDR3 banks (256 MB total)
  - PCIe x1 edge connector

**AES-S6NITX-LX75T-G | $1,695 USD**
www.em.avnet.com/spartan6atom

**AES-S6NITX-LX75T-AOK-G | $995 USD**
www.em.avnet.com/spartan6atom

To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc
Xilinx Spartan®-6 FPGA Industrial Ethernet Kit

The Xilinx Spartan®-6 FPGA Industrial Ethernet Kit enables easy prototyping and development of the different industrial networking standards. The flexibility of the Spartan-6 LX150T baseboard combined with the ISM Networking FMC provides an ideal environment for protocol bridges, motor control, and general purpose industrial control.

WHAT’S INCLUDED

- LX150T baseboard and associated hardware items (see LX150T kit)
- ISM Networking FMC daughter card (see FMC section)
  - Dual 10/100 Ethernet PHY’s (1588 compatible)
  - ISE® Design Suite: Embedded Edition (device locked to Spartan-6 FPGA LX150T)
  - Includes Platform Studio and SDK (Eclipse IDE)
  - Xilinx Platform Cable USB-II
  - Printed documentation and Getting Started Demo
  - Downloadable documentation and reference designs

FEATURES

- Industrial Ethernet Targeted Reference Designs (TRD)
  - EtherCAT/TwinCAT design
  - All development tools needed to support embedded hardware and software development
  - In-depth, step-by-step hardware and software tutorials

AES-S6IEK-LX150T-G | $1,895 USD
www.em.avnet.com/spartan6ethernet

Xilinx Spartan®-6 FPGA Industrial Video Processing Kit

The Xilinx Spartan®-6 FPGA Industrial Video Processing Kit offers a comprehensive design environment for the rapid prototyping and development of high resolution video conferencing, video surveillance, and machine vision systems. Designed specifically for industrial imaging, this kit enables developers to build camera and imaging applications.

WHAT’S INCLUDED

- Avnet LX150T baseboard and associated hardware items (see LX150T kit)
- Dual Image Sensor FMC daughter card (see FMC section)
- DVI I/O FPGA daughter card (see FMC section)
- ISE® Design Suite: System Edition (device locked to LX150T FPGA)
  - Includes System Generator, Platform Studio, and SDK (Eclipse IDE)
  - Omnivision OV9715 image sensor
  - Xilinx Platform Cable USB-II
  - Image sensor mounting assembly and video cables
  - Printed documentation and Getting Started Demo
  - Downloadable documentation and reference designs

FEATURES

- Industrial video processing Targeted Reference Designs (TRD)
  - Camera processing with external memory
  - DVI video processing
  - DVI with external memory buffer
  - Hardware co-simulation demonstration
  - All development tools needed to support embedded hardware and software development
  - In-depth, step-by-step hardware and software tutorials

AES-S6IVK-LX150T-G | $2,695 USD
www.em.avnet.com/spartan6video
The Xilinx Virtex®-6 FPGA ML605 Evaluation Kit provides a development environment for system designs that demand high-performance, serial connectivity and advanced memory interfacing.

WHAT’S INCLUDED
- Xilinx ML605 baseboard
- ISE® Design Suite: Logic Edition (device locked to LX240T FPGA)
- Universal 12 V power supply
- USB and Ethernet cables
- DVI-VGA adapter

EK-V6-ML605-G | $1,795 USD
www.xilinx.com/ml605

The Xilinx Virtex®-6 FPGA ML623 GTX Characterization Kit provides the hardware environment for characterizing and evaluating the GTX transceivers available on the on-board Virtex-6 FPGA LX240T (up to 6.6 Gbps).

WHAT’S INCLUDED
- Xilinx ML623 baseboard
- ISE® Design Suite: Logic Edition (device locked to LX240T FPGA)
- USB A-mini B cable, six SMA to SMA cables
- Universal 12 V power supply
- Six SMA to SMA cables

CK-V6-ML623-G | $4,995 USD
www.xilinx.com/ml623

The Xilinx Virtex®-6 FPGA DSP Kit with High-Speed Analog brings development tools, methodologies, IP and support together into solutions for FPGA-based high-speed data acquisition and digital signal processing.

WHAT’S INCLUDED
- Xilinx ML605 baseboard and associated hardware items
- 4DSP FMC150 High-Speed ADC/ DAC FMC Module (see FMC section)
- ISE® Design Suite: System Edition (device locked to LX240T FPGA)
  - Includes System Generator, Platform Studio, and SDK (Eclipse IDE)
  - MathWorks Simulink® evaluation tools

AES-V6DSP2-LX240T-G | $3,995 USD
www.em.avnet.com/virtex6dsp2

The Xilinx Virtex®-6 FPGA Broadcast Connectivity Kit addresses the rapidly evolving requirements in the broadcast market for greater bandwidth, improved jitter performance and lower power consumption.

WHAT’S INCLUDED
- Xilinx ML605 baseboard and associated hardware items
- Broadcast connectivity FMC card from Cook Technologies
- Two clock modules for direct reference clock generation and/or jitter reduction of retransmitted reference clocks
- ISE® Design Suite: Logic Edition (device locked to LX240T FPGA)

DK-V6-BCCN-G | $3,495 USD

To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc
The HDMI Input/Output 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.

**WHAT'S INCLUDED**
- HDMI Input/Output FMC Module
- Downloadable documentation and reference designs

**FEATURES**
- HDMI Input/Output FMC Module
  - HDMI input (based on ADI ADV7611)
  - HDMI output (based on ADI ADV7511)
  - Video clock synthesizer
  - Interface for ON Semiconductor VITA image sensor modules

The ON Semiconductor Image Sensor FMC Bundle provides several high-definition video interfaces for Xilinx® FMC-enabled baseboards. The FMC module has onboard HDMI input/output interfaces. The ON Semiconductor VITA-2000 color image sensor module provides a high definition camera that supports high frame rates and features a global shutter.

**WHAT'S INCLUDED**
- ON Semiconductor Image Sensor FMC Adapter with HDMI Input/Output (FMC-IMAGEON)
- LCEDi cable
- VITA-2000 Color Image Sensor Module
- Lens (2/3”, 8 mm) & lens holder
- IR cut filter
- Tripod

**FEATURES**
- ON Semiconductor Image Sensor FMC Adapter with HDMI Input/Output (FMC-IMAGEON)
  - FMC module
    - HDMI I/O
    - Video clock synthesizer
  - VITA-2000 Color Image Sensor Module
    - WUXGA Resolution: 1920 (H) x 1200 (V) format
    - 92 frames per second (fps) at full resolution
    - Pipelined and triggered global shutter, rolling shutter

The DVI I/O FMC Module provides a direct interface for digital video to Xilinx and Avnet FMC-enabled baseboards. A digital DVI video source can provide video content to the module. The module also provides digital DVI and DisplayPort outputs to display FPGA driven video content.

**WHAT'S INCLUDED**
- DVI I/O FMC Module
- Downloadable documentation and reference designs

**FEATURES**
- FMC HPC single-width module
  - HPC required for DisplayPort only
- DVI-D input and output (digital only)
  - HDMI connectors
  - Video clock generator
  - DisplayPort output
    - One lane (on FMC LPC carriers)
    - Four lanes (on FMC HPC carriers)
  - Low-jitter clock generator

AES-FMC-IMAGEON-G | $250 USD  
www.em.avnet.com/fmc-imageon

AES-FMC-IMAGEON-V2000C-G | $750 USD  
www.em.avnet.com/fmc-imageon-v2000c

AES-FMC-DVI-G | $250 USD  
www.em.avnet.com/fmc-dvi
Dual Image Sensor FMC Module

The Dual Image Sensor FMC Module provides a direct interface for high-definition image sensor cameras to FMC-enabled baseboards. The module also provides a DVI-based HDMI style output connector to display FPGA driven video outputs.

WHAT’S INCLUDED
- Dual Image Sensor FMC Module
- Downloadable documentation and reference designs

FEATURES
- FMC LPC single-width module
- Dual image sensor interface
- Supports Omnivision HD sensors
- DVI-D output (digital only)
- HDMI connector
- Video clock generator

AES-FMC-IMAGEOV-G | $250 USD
www.em.avnet.com/fmc-image

OmniVision 1 MP Camera Kit with Ribbon Cable

The OmniVision 1 MP Camera Kit with Ribbon Cable combines the high-performance, 1 M pixel OV9715 image sensor module with a ribbon cable for easy connection to the Avnet Dual Image Sensor FMC Module. The image sensor module interfaces via the ribbon cable using Omnivision’s 10-bit raw RGB Digital Video Port standard. This kit can add dual image sensor capabilities to the Dual Image Sensor FMC Module (AES-FMC-IMAGEOV-G).

WHAT’S INCLUDED
- Camera assembly with image sensor
- Ribbon cable

FEATURES
- OmniVision OV9715 Image Sensor Module
  - High definition video
  - 1280 x 800 @ 30 frames per sec
  - 640 x 400 @ 60 frames per sec
  - Zero degree microlens shift: extreme wide angle field of view
  - Low light performance: 3300 mV/lux-sec
  - Mates with Dual Image Sensor FMC Module (AES-FMC-IMAGEOV-G)

AES-ACC-OV9517-G | $135 USD
www.em.avnet.com/ov9715kit

ISM Networking FMC Module

The ISM Networking FMC Module adds key interfaces to support a wide range of industrial, scientific and measurement requirements. From dual 1588 compatible 10/100 Ethernet PHYs, to CAN, RS-232, and RS-485, the ISM Networking FMC can quickly get you started with any FMC-enabled baseboard.

WHAT’S INCLUDED
- ISM Networking FMC Module
- Downloadable documentation and reference design

FEATURES
- FMC LPC single-width module
- Dual IEEE 1588 10/100 PHY
- Dual CAN interfaces
- RS-232 port
- RS-485 port
- GPIO connectors

AES-FMC-ISMNET-G | $250 USD
www.em.avnet.com/fmc-ismnet
As a companion to the Xilinx Spartan-6 LX75T FPGA baseboard, the Motor Control FMC Module features the Low Pin Count (LPC) form factor, enabling attachment to any Avnet or Xilinx FMC-enabled platform. Each Motor Control FMC can drive one Stepper, two Brushed DC (BDC), two Brushless DC (BLDC) or two Permanent Magnet Synchronous Motors (PMSM).

**What's Included**
- Motor Control FMC Module
- Two Portescap motors (one BLDC and one Stepper)

**Features**
- Low Pin Count (LPC) form factor
- Plugs into any Avnet or Xilinx FMC-enabled platform
- Drives Stepper, Brushed DC (BDC), Brushless DC (BLDC) and Permanent Magnet Synchronous Motors (PMSM)
- Spins two motors (12-24 V) simultaneously under FPGA control
- TI integrated motor drivers
- TI Delta-Sigma ADCs for high precision sensing
- Xilinx XADC header enables low-cost 7 series FPGA integration
- Hall sensor / encoder and GPIO ports
- User prototyping area
- Powered from FPGA baseboard or external source

**AES-FMC-MC1-G | $499 USD**
[www.em.avnet.com/fmc-mc1](http://www.em.avnet.com/fmc-mc1)

The Analog Devices Industrial I/O FMC module provides a direct interface with various analog and digital I/Os, CAN, and serial communication to any Avnet or Xilinx FMC-enabled baseboard. The assortment of analog and digital I/Os make this FMC ideal for industrial applications.

**What's Included**
- Analog Devices Industrial I/O FMC Module
- Downloadable documentation and reference designs

**Features**
- Four channels of filtered analog input with selectable voltage ranges
- Four channels of analog output with programmable ranges
- Two channels of 4-20 mA current loop drivers
- Eight isolated discrete inputs
- Eight isolated discrete outputs
- Eight non-isolated bi-directional discrete I/O
- RTD temperature sensor input
- Onboard temperature sensor
- Two-channel serial UART with RS-232 / 422 / 485 capability
- CAN (PHY)
- Optional plug-in /Sensor® evaluation board

**AES-FMC-INDIO-G | $349 USD**
[www.em.avnet.com/fmc-indio](http://www.em.avnet.com/fmc-indio)

The Analog Devices FMCCOMMS1-EBZ FMC Module features the company’s latest generation data conversion and frequency-agile RF components. Designed in single LPC FMC form factor for compatibility with Xilinx FPGA baseboards, FMCCOMMS1-EBZ provides the analog front-end for a variety of wireless communications functions at the physical layer, from baseband to RF.

**What's Included**
- Analog Devices FMCCOMMS1-EBZ FMC Module
- Downloadable documentation and reference designs

**Features**
- AD9643, 14-bit, 250 Msps dual ADC
- AD9122, 16-bit, 1200 Msps dual DAC
- Software tunable across wide bandwidth spectrum 400 MHz - 4 GHz
- Bypass RF section for baseband sampling
- Extensible to multiple FMCs for MIMO

**FMCCOMMS1-EBZ | $895 USD**
[www.em.avnet.com/fmccomms1](http://www.em.avnet.com/fmccomms1)
The Analog Devices AD9739 RF DAC can synthesize the entire cable spectrum into a single RF port and can increase the number of QAM channels per D/A converter by up to 20 times. This enables the device to meet cable infrastructure demands while significantly lowering power consumption and system cost. This new RF DAC FMC card allows rapid system prototyping and verification using Avnet or Xilinx FMC-enabled baseboards that have an FMC header.

**WHAT’S INCLUDED**
- Analog Devices RF DAC FMC Module
- Software tools:
  - Linux device driver
  - PC-based graphical user interface
- Downloadable documentation and reference designs

**FEATURES**
- Analog Devices AD9739A 14-bit/2.5 Gsps RF DAC
- Synthesizes high-quality signals over a DC to 1.25 GHz bandwidth
- Onboard ADF4350 programmable clock synthesizer
- Input for optional external clock
- SPI interface controls ADF4350 and/or AD9739A from either:
  - FPGA
  - Onboard USB microcontroller
- Low Pin Count (LPC) FMC format

**AD9739A-FMC-EBZ | $349 USD**
[www.em.avnet.com/rfdac](http://www.em.avnet.com/rfdac)

The Analog Devices AD9467 FMC contains a single-channel, 16-bit, 250 Msps ADC that allows users to rapidly prototype and verify system developments using Xilinx FPGA development boards equipped with an FMC header. This card can help engineers de-risk the development cycle and accelerate time-to-market by providing production-ready reference HDL code and software for use in end products.

**WHAT’S INCLUDED**
- Analog Devices ADC FMC module
- Software tools:
  - Linux device driver
  - PC-based graphical user interface
- Online access to:
  - Downloadable documentation
  - Reference designs
  - Schematics, BOM

**FEATURES**
- 16-bit resolution/250 Msps sample rate
- Single channel
- Differential unipolar & single-ended unipolar analog input types
- IF optimization capability delivers outstanding SFDR
- LVDS interface
- Targets IF sampling applications
- Clock duty cycle stabilizer (DCS)
- Standard serial port interface (SPI)

**AD9467-FMC-250EBZ | $349 USD**
[www.em.avnet.com/fmcad9467](http://www.em.avnet.com/fmcad9467)

The 4DSP FMC30RF module features the latest generation Texas Instruments data conversion and RF components. Designed in single LPC FMC form factor for compatibility with Avnet and Xilinx FPGA baseboards, FMC30RF enables development of highly integrated software-defined radio optimized for low-power consumption.

**WHAT’S INCLUDED**
- 4DSP FMC30RF FMC Module
- Downloadable documentation and reference designs

**FEATURES**
- 4DSP FMC30RF FMC Module
- Integrated Texas Instruments AFE7225 analog front-end for full- or half-duplex radios
- Software tunable across wide bandwidth spectrum 300 MHz - 3 GHz
- TDD and FDD support for up to 30 MHz of signal bandwidth
- Onboard clock and reference generation
- 2 x 2 MIMO support with optional 2nd FMC30RF

**AES-FMC-4DSP30RF-G | $1,495 USD**
[www.em.avnet.com/fmc30rf](http://www.em.avnet.com/fmc30rf)
The FMC150 is a dual channel A/D and dual channel D/A FMC daughter card. The card provides two 14-bit A/D channels and two 16-bit D/A channels. The design is based on TI’s ADS62P49 dual channel 14-bit 250 Msps ADC and TI’s DAC3283 dual channel 16-bit 800 Msps DAC. The FMC150 allows flexible control of the clock source, analog input gain, and offset correction through a serial communication bus.

WHAT’S INCLUDED
- FMC150 daughter card
- Documentation and reference designs

FEATURES
- Quad channel operation
- 2-channel 14-bit A/D up to 250 Msps
- 2-channel 16-bit D/A up to 800 Msps
- LPC FMC connector
- Single-ended AC-coupled analog signals
- Six MMCX/SSMC front panel connectors
- Flexible clock tree
- Power-down modes

The Maxim Low-Cost ADC/DAC FMC Module is designed to facilitate the use of Maxim ADCs and DACs with any FMC-based evaluation board made for Xilinx Spartan-6 series FPGAs. The FMC contains the MAX11612 and MAX11040 ADCs and two cascaded MAX5135 DACs. The MAX11612 is a very-low-power, 4-channel, 2-wire, 12-bit, SAR ADC. This ADC operates with a 5 V supply and has an internal reference of 4.096 V. The MAX11040 is an SPI™-compatible, 4-channel, simultaneous-sampling, cascadable, 24-bit, Sigma-Delta ADC. The MAX5135 is the industry’s smallest, 12-bit, voltage-output DAC.

WHAT’S INCLUDED
- Maxim Low-Cost ADC/DAC FMC Module
- Documentation

FEATURES
- 12-bit, 2-/4-channel, SAR ADC support (MAX11612)
- 24-bit, 4-channel, programmable data rate, Sigma-Delta ADC support (MAX11040)
- 12-bit, 4-channel DAC support (MAX5135)
- Connects with any Spartan-6 evaluation board through a standard FMC LPC connector

The FMC XM101 LVDS QSE Mezzanine Card is designed to provide access to the LVDS pin pairs on the FMC connector found on Xilinx FMC-enabled boards, including the SP601, SP605 and ML605. The FMC XM101 LVDS QSE Mezzanine Card provides a number of QSE headers and connectors that break out FPGA interface signals to and from the FMC HPC signal set.

WHAT’S INCLUDED
- FMC XM101 LVDS QSE Mezzanine Card
- One Samtec EQDP-028-12.00-TEU-TED-1 28-pair, 12-inch loopback cable
- Four mounting screws; two standoffs
- Board documentation, schematics, and PCB design files

FEATURES
- FMC HPC connector
- Single-ended signals from the carrier board, clocks, JTAG power
- LVDS pairs on QSE connectors
- SMA connectors for clocking
- Re-programmable LVDS clock source
- 2 Kb EEPROM
- Power good LEDs

AES-FMC-4DSP150-G | $1,995 USD
www.em.avnet.com/fmc150

MAXSPCSPARTAN6+ | $85 USD
www.em.avnet.com/maxspcspartan6evkit

HW-FMC-XM101 | $695 USD
www.xilinx.com/xm101
FMC XM104 Connectivity Card

The FMC XM104 Connectivity Card is designed to provide access to eight serial transceivers on the FMC HPC connector found on Xilinx FMC-enabled boards, including the Virtex-6 ML605. These eight serial transceivers can be accessed through one CX4 (x4 transceiver), two SATA (x2 transceivers), and eight SMA (x2 transceivers) connectors.

**What's Included**
- FMC XM104 Connectivity Card
- Four SMA to SMA cables
- One SATA cable
- Four mounting screws; two standoffs
- Module user manual, schematics, and PCB design files

**Features**
- FMC HPC connector
- One CX4 connector
- Two SATA connectors
- Eight SMA connectors
- Re-programmable LVDS clock source
- 2 Kb EEPROM

**HW-FMC-XM104-G | $595 USD**
www.xilinx.com/xm104

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TI High-Speed DAC to FMC Adapter Card

The TI High-Speed DAC to FMC Adapter Card features a passive interconnect board that enables the output of TI’s LVDS input high-speed DACs to be directly connected to a standard FMC interconnect header, a typical input on the latest Xilinx FPGA evaluation and development kits. This enables users of TI’s high-speed DAC EVMs to directly interface to Xilinx FPGAs for prototyping purposes, saving the time and cost of producing a custom prototyping board.

**What’s Included**
- Adapter board
- Kit documentation

**Features**
- Enables direct connection to TI high-speed DAC EVM LVDS inputs from the FMC standard header

**FMC-DAC-ADAPTER | $49 USD**
www.ti.com/tool/fmc-dac-adapter

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TI High-Speed ADC to FMC Adapter Card

The TI High-Speed ADC to FMC Adapter Card features a passive interconnect board that enables the output of TI’s LVDS output high-speed ADCs to be directly connected to a standard FMC interconnect header, a typical input on the latest Xilinx FPGA evaluation and development kits. This enables users of TI’s high-speed data converter EVMs to directly interface to Xilinx FPGAs for prototyping purposes, saving the time and cost of producing a custom prototyping board.

**What’s Included**
- Adapter board
- Kit documentation

**Features**
- Enables direct connection from TI high-speed ADC EVMs with LVDS outputs to the FMC standard header

**FMC-ADC-ADAPTER | $49 USD**
www.ti.com/tool/fmc-adc-adapter
The Avnet Mini-Module Plus power supply designed by Texas Instruments interfaces directly to the Avnet Mini-Module Plus baseboard. The power module provides eight regulated outputs and features high accuracy designs in a low cost total power solution.

**What's Included**
- TI Power Module
- Downloadable documentation & reference designs

**Features**
- 12 V input
- Eight regulated outputs
- Remote sense for greater regulation accuracy at the load on all outputs
- Sequencing is implemented per Xilinx recommendations for 7 series FPGA devices
  - Vccint (1 V) → Vccaux (1.8 V) → Vccauxio (2.0 V) → Vcco (1.35, 1.5, 2.5, 3.3 V)

The Avnet Mini-Module Plus power supply designed by Texas Instruments features the ease of use provided by SIMPLE SWITCHER® power modules as well as excellent performance and scalability to meet the needs of the Xilinx 7 series FPGA systems.

**What's Included**
- TI SIMPLE SWITCHER® Power Module
- Downloadable documentation & reference designs

**Features**
- 12 V input
- Eight regulated outputs
- Remote sense for greater regulation accuracy at the load on all outputs
- WEBENCH® design tool support at www.ti.com/webench

The Avnet Mini-Module Plus power supply designed by Maxim Integrated Products provides a robust, high accuracy design while maintaining a small form factor. The MAX8686 synchronous step-down converter provides power for five of the eight required output rails. The MAX8686 is capable of providing up to 25 A from a 6 x 6 mm package, a remarkable power density.

**What's Included**
- Maxim Power Module
- Downloadable documentation & reference designs

**Features**
- 12 V input
- Eight regulated outputs
- Remote sense for greater regulation accuracy at the load on all outputs

*AES-POM-TIS1-G | $300 USD*
[www.em.avnet.com/POM-TIS1](http://www.em.avnet.com/POM-TIS1)

*AES-POM-TISN-G | $300 USD*
[www.em.avnet.com/POM-TISN](http://www.em.avnet.com/POM-TISN)

*AES-POM-MXM1-G | $300 USD*
[www.em.avnet.com/POM-MXM1](http://www.em.avnet.com/POM-MXM1)

*Call for volume pricing.

To view all available kits, visit the Avnet Design Resource Center at [www.em.avnet.com/drc](http://www.em.avnet.com/drc)
The Avnet Mini-Module Plus power supply designed by GE Energy provides a high accuracy, simple to use design to support the powering needs of Xilinx 7 series FPGAs. The power module incorporates GE Energy’s latest generation of the DLynx™ family of non-isolated Point-of-Load (POL) DC/DC power converters. The GE Energy Power Module supports either the Avnet Mini-Module Plus baseboard or a user board designed to meet the Avnet standard.

**WHAT’S INCLUDED**
- GE Energy Power Module
- Downloadable documentation & reference designs

**FEATURES**
- 12 V input
- Eight regulated outputs
- Remote sense for greater regulation accuracy at the load on all outputs
- Power up sequencing per Xilinx recommendations for 7 series FPGAs
  - Vccint (1 V) → Vccaux (1.8 V) → Vccauxio (2.0 V) → Vcco (1.35, 1.5, 2.5, 3.3 V)

**AES-POM-LTM1-G | $300 USD**
www.em.avnet.com/POM-LTM1
*Call for volume pricing.

The Avnet Mini-Module Plus power supply designed by STMicroelectronics features a mix of integrated regulators as well as power controllers, combining great design flexibility with ease of use. These devices combine to provide a robust, proven design for powering Xilinx 7 series FPGAs.

**WHAT’S INCLUDED**
- STMicroelectronics Power Module
- Downloadable documentation & reference designs

**FEATURES**
- 12 V input
- Eight regulated outputs
- Remote sense for greater regulation accuracy at the load on all outputs
- Start up sequencing per Xilinx 7 series recommendations
  - Vccint → Vccaux → Vccauxio → Vcco

**AES-POM-SGS1-G | $300 USD**
www.em.avnet.com/POM-SGS1
*Call for volume pricing.

The Avnet Mini-Module Plus power supply designed by Analog Devices provides a proven robust design for powering Xilinx 7 series FPGAs. Designed to meet the tolerance and sequencing guidelines set forth by Xilinx, the Analog Devices Power Module provides a highly optimized controller-based design utilizing the ADP1850 dual output synchronous buck controller.

**WHAT’S INCLUDED**
- Analog Devices Power Module
- Downloadable documentation & reference designs

**FEATURES**
- 12 V input
- Eight regulated outputs (four dual output ADP1850 devices)
- Remote sense for greater regulation accuracy at the load on all outputs
- Meets recommended start up sequencing for Xilinx 7 series FPGAs
  - Vccint → Vccaux → Vccauxio → Vcco

**AES-POM-ANA1-G | $300 USD**
www.em.avnet.com/POM-ANA1
*Call for volume pricing.
The 7-inch ZedBoard Touch Display Kit from Avnet Electronics Marketing provides an engineer with everything needed to develop products with interactive GUIs and touchscreen capabilities. The kit combines an 800 x 480 WVGA TFT-LCD display from Sharp Microelectronics with an industrial projective capacitive touch sensor, PC-based touch controller, LED backlight supply and all the necessary cables. The touch display connects to the ZedBoard through a flexible, 12-inch cable and adapter card, which are also included in the kit.

**What's Included**
- 7-inch LCD display assembly with stands
- 12-inch display interface cable
- Industrial PCAP touch sensor
- Adapter card
- 12 V power supply

**Features**
- LCD Panel Assembly
  - 7-inch, 800 x 480 WVGA color TFT LCD (Sharp LQ070Y3LG4A)
  - Serial LVDS interface
  - LED backlight
- PCAP touch sensor and controller
  - Supports industrial requirements
  - Auto-calibration capabilities for improved performance
  - Single finger touch
  - Up to 6 mm glass overlay
  - Gloved operation
  - Water rejection
  - Water immunity

The Avnet CC3000-Pmod™ is a self-contained, certified 802.11b/g Wi-Fi adapter based on the Texas Instruments SimpleLink CC3000. Conforming to the Digilent Pmod form factor and 2 x 6 pinout, it has been designed to attach to Avnet FPGA development boards containing the Pmod interface. The built-in IP networking stack provides universal Wi-Fi and Internet access without need for a complex CPU and OS. The module’s small API command set is easily incorporated into the FPGA using a Microblaze microcontroller core. Example VHDL code and application software are included.

**What's Included**
- Pmod-CC3000 WiFi board
- FPGA-based webserver application example
- Getting Started User Guide

**Features**
- Uses 802.11b/g TiWi-SL Module from LS Research and onboard chip-antenna
- RF link budget:
  - TX power: +20 dBm
  - RX sensitivity: -89 dBm
- Data throughput: 4 Mbps (TCP), 7 Mbps (UDP)
- Wi-Fi security modes: WEP, WPA/WPA2 (AES and TKIP – Personal)
- Networking support: TCP/IP stack (IPv4 - DHCP client, DNS, ARP), Wi-Fi driver, security supplicant, auto-transmit calibration
- Host Interface: SPI @ 15 MHz
- Host code size: up to 8 K Flash, 3 K RAM
- Connections: four sockets (UDP or TCP)
- Power: includes a shutdown mode <5 uA

AES-Ali2-Zed-G | $499 USD*  
www.em.avnet.com/zedboard7touch  
* Call for customization options and volume pricing.

AES-Pmod-TiWi-G | $59 USD  
www.em.avnet.com/pmodwifi
The Freescale i.MX53 Quick Start Break-out with 7-inch LCD and PCAP Touch Kit provides embedded system developers an alternative to existing Freescale i.MX53 Quick Start Board expansion options. The projected capacitive touch overlay provides enhanced touch ruggedness, which is suitable for outdoor or industrial environments.

**WHAT’S INCLUDED**
- i.MX53 Quick Start Break-out Board*
- Sharp LQ070Y3DG3A 7-inch WVGA LED Backlight TFT Panel
- Avnet 7-inch Projected Capacitive (PCAP) Touch Overlay
- Getting Started Guide
- SD card with Android demo plus USB card reader
- Samtec 4-inch i.MX53 expansion cable

* i.MX53QSB, Camera Module and Pmods Not Included

**FEATURES**
- Demonstrates a complete embedded display system
- Output to integrated 7-inch WVGA display
- Provides benefits of Avnet PCAP touch solution
- Ability to connect range of image sensors
- Touch overlay capabilities
  - Up to 6 mm glass panel thickness
  - Gloved operation
  - Suitable for high humidity environments

AES-FRS-DISADP-G | $499 USD*

www.avnet.com/imx53

* Call for customization options and volume pricing.

The Universal 12 V DC Power Supply is a replacement or add-on supply for the 6-pin connector format included on various kits developed by Avnet and Xilinx for 6 and 7 series FPGAs. It outputs 12 volts at up to 5 amps and is compatible with global AC standards.

**WHAT’S INCLUDED**
- 12 V AC / DC power supply
- North America power cord
- EMEA power cord
- UK power cord

**FEATURES**
- 120 / 240 V AC input at 50 Hz or 60 Hz
- 12 V DC output at up to 5 amps
  - Mates with Molex connector (part number: 39-29-1067)
  - 12 V on pins 1 and 4
  - GND on pins 3 and 6
  - No connect on pins 2 and 5
- Selectable power cord

AES-SLP-12V5A-G | $40 USD

www.avnet.com/12vpower

The USB Platform JTAG Programming Cable provides integrated firmware to deliver high-performance, reliable and user-friendly configuration of Xilinx FPGAs and programming of Xilinx PROM and CPLD devices. This optimizes direct programming of third-party SPI Flash memory devices and indirect programming of SPI or parallel NOR Flash memory devices via the FPGA JTAG port.

**WHAT’S INCLUDED**
- Programming pod
- Ribbon cable
- Fly lead set
- USB cable
- Documentation

**FEATURES**
- Fully integrated and optimized for use with Xilinx IMPACT software
- Bus-powered USB device (no power supply required)
- Automatically senses and adapts to target I/O voltage

HW-USB-II-G | $225 USD

www.xilinx.com/products/devkits/HW-USB-II-G.htm

Aes-Frs-Disadp-G | $499 Usd*

www.avnet.com/imx53

* Call for customization options and volume pricing.
The Digilent JTAG HS1 Programming Cable is a high-speed programming solution for Xilinx FPGAs. It is compatible with all Xilinx tools, including IMPACT, ChipScope, and EDK. The HS1 attaches to target boards using Digilent’s 6-pin, 100-mil spaced programming header, or Xilinx’s 2x7, 2 mm connector (using the included adapter).

**WHAT’S INCLUDED**
- Digilent JTAG HS1 Programming Cable

**FEATURES**
- Small, complete, all-in-one JTAG programming solution for Xilinx FPGAs
- High-speed USB 2.0 port can drive JTAG/SPI bus at up to 30 Mbps
- Compatible with all Xilinx tools
- Fully supported by the Adept SDK, allowing custom JTAG/SPI applications to be created
- Separate VREF drives JTAG/SPI signal voltages; VREF can be any voltage between 1.8 and 5 V
- JTAG/SPI frequency settable by user
- SPI programming solution (modes 0 and 2 supported)
- Uses micro-AB USB 2.0 connector

**JTAG-HS1 | $50 USD**
www.em.avnet.com/jtaghs1

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The Digilent JTAG SMT1 Surface-Mount Programming Module is a compact, complete and fully self-contained surface-mount programming module for Xilinx FPGAs. It can be accessed directly from all Xilinx tools, including IMPACT, ChipScope, and EDK. The module can be loaded directly onto a target board and reflored like any other component.

**WHAT’S INCLUDED**
- Digilent JTAG SMT1 Surface-Mount Programming Module

**FEATURES**
- Small, complete, all-in-one JTAG programming solution for Xilinx FPGAs
- Small form factor (less than one square inch) surface-mount module
- Compatible with all Xilinx tools
- Fully supported by the Adept SDK, allowing custom JTAG applications to be created
- Able to drive JTAG bus at up to 30 Mbps
- Single 3.3 V supply
- High-speed USB 2.0 port
- Separate VREF drives JTAG signal voltages; VREF can be any voltage between 1.8 and 5 V
- JTAG/TCK frequency settable by user
- Uses micro-AB USB 2.0 connector

**JTAG-SMT1 | $40 USD***
www.em.avnet.com/jtagsmt1

* Call for volume pricing.
## Xilinx Software Matrix

### ISE Design Suite Device Support

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Virtex® FPGAs</td>
<td>Virtex-4 FPGAs</td>
<td>LX: XC4VLX15, XC4VLX25, SX: XC4VSX25, FX: XC4VFX12</td>
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<td></td>
<td>Virtex-5 FPGAs</td>
<td>LX: XC5VLX30, XC5VLX50, LXT: XC5VLX20T - XC5VLX30T, FX: XC5VFX30T</td>
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<tr>
<td></td>
<td>Virtex-6 FPGAs</td>
<td>XLX7ST</td>
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<tr>
<td></td>
<td>Virtex-7 FPGAs</td>
<td>XPLA3, XC7K160T</td>
</tr>
<tr>
<td>Kintex® FPGAs</td>
<td>Kintex-7 FPGAs</td>
<td>XPLA3, XC7K160T</td>
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<tr>
<td>Spartan® FPGAs</td>
<td>Spartan-3 FPGAs</td>
<td>XC3S50 - XC3S1500</td>
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<tr>
<td></td>
<td>Spartan-3A FPGAs</td>
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<td>Spartan-3E FPGAs</td>
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<td>Spartan-3DSP FPGAs</td>
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<td></td>
<td>Spartan-4 FPGAs</td>
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<td>XA (Xilinx Automotive)</td>
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<td>Spartan-9 FPGAs</td>
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<td>XA (Xilinx Automotive) Spartan-3 FPGAs</td>
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<td>XA (Xilinx Automotive) Spartan-6 FPGAs</td>
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<tr>
<td>CoolRunner™ XPLA3</td>
<td>All</td>
<td>XCG100 Series (Except 9500XV Family)</td>
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### ISE Design Suite Comparison Table

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>ISE® Foundation™ Tools with ISE® Simulator (ISim)</td>
<td>x</td>
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<tr>
<td>PlanAhead® Design Analysis Tool</td>
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<tr>
<td>ChipScope® Pro Logic Analyzer</td>
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<td>Embedded Development Kit (EDK)</td>
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<tr>
<td>Software Development Kit (SDK)</td>
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<tr>
<td>System Generator for DSP</td>
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### Targeted Stand-Alone Products

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<thead>
<tr>
<th>Targeted Stand-Alone Products</th>
<th>Usage</th>
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</thead>
<tbody>
<tr>
<td>Software Development Kit (SDK)</td>
<td>Embedded software who do not require ISE tools</td>
</tr>
<tr>
<td>ChipScope Pro and ChipScope Pro Serial I/O Toolkit</td>
<td>Lab environments</td>
</tr>
<tr>
<td>Embedded Development Kit (EDK)</td>
<td>Spartan FPGA Design and ISE WebPACK Tool Users</td>
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<tr>
<td>System Generator for DSP</td>
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### ISE Design Suite Operating System Support

<table>
<thead>
<tr>
<th>ISE Design Entry and Implementation Tools</th>
<th>Windows XP Professional 32/64-bit</th>
<th>Windows 7 Professional 32/64-bit</th>
<th>Windows Server 2008</th>
<th>Win 64/32/16-bit</th>
<th>Red Hat Enterprise Linux 5 64-bit</th>
<th>Red Hat Enterprise Linux 6 64-bit</th>
<th>Solaris 10 2/3 SE 32/64-bit</th>
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</thead>
<tbody>
<tr>
<td>ISE® Foundation™ Tools with ISE® Simulator (ISim)</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>ISE® WebPACK®</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>ChipScope® Pro and ChipScope Pro Serial I/O Toolkit</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Embedded Development Kit (EDK) and Platform Studio</td>
<td>x</td>
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<td>x</td>
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<tr>
<td>Software Development Kit (SDK)</td>
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<tr>
<td>System Generator for DSP</td>
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<td>x</td>
<td>x</td>
<td>x</td>
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Important: Verify all data in this document with the device data sheets found at www.xilinx.com

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33 XILINX DEVELOPMENT KITS AND ACCESSORIES

To view all available kits, visit the Avnet Design Resource Center at [www.em.avnet.com/drc](http://www.em.avnet.com/drc)
## Xilinx Development Kits and Accessories

### Virtex-7 FPGA Kits

<table>
<thead>
<tr>
<th>Kit Part Number</th>
<th>Description</th>
<th>ReSale</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EK-K7KCI755-G</td>
<td>Virtex-7 FPGA XC7Z05 Evaluation Kit</td>
<td>$1,895</td>
<td><a href="http://www.xilinx.com/kc705">www.xilinx.com/kc705</a> Xilinx</td>
</tr>
<tr>
<td>AES-MMP-7K9225T-G</td>
<td>Virtex-7 FPGA Mini-Module Plus</td>
<td>$895</td>
<td><a href="http://www.em.avnet.com/k9225">www.em.avnet.com/k9225</a> Amnet</td>
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<tr>
<td>AES-MMP-8BB2-G</td>
<td>Mini-Module Plus Baseboard 2</td>
<td>$520</td>
<td><a href="http://www.em.avnet.com/k8bb2">www.em.avnet.com/k8bb2</a> Amnet</td>
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<tr>
<td>AES-7K7P32-Z7ST-G</td>
<td>Virtex-7 FPGA DSP Kit with High-Speed Analog</td>
<td>$3,895</td>
<td><a href="http://www.em.avnet.com/k7p32avnet">www.em.avnet.com/k7p32avnet</a> Xilinx</td>
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<tr>
<td>DK-K7-EMBED-G</td>
<td>Virtex-7 FPGA Embedded Kit</td>
<td>$1,895</td>
<td><a href="http://www.xilinx.com/k7embed">www.xilinx.com/k7embed</a> Xilinx</td>
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<tr>
<td>DK-K7-CONN-G</td>
<td>Virtex-7 FPGA Connectivity Kit</td>
<td>$2,895</td>
<td><a href="http://www.xilinx.com/k7connect">www.xilinx.com/k7connect</a> Xilinx</td>
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### Spartan-7000 EPP Kits

<table>
<thead>
<tr>
<th>Kit Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>AES-270Z-7Z020-G</td>
<td>Spartan-7000 EPP ZC702 Evaluation Kit</td>
<td>$395</td>
<td><a href="http://www.zedboard.org">www.zedboard.org</a> Xilinx</td>
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<tr>
<td>EK-Z7-VIDEO-G</td>
<td>Zynq-7000 EPP Video &amp; Imaging Kit</td>
<td>$1,495</td>
<td><a href="http://www.xilinx.com/products/boards-and-kits/ek-z7-video">www.xilinx.com/products/boards-and-kits/ek-z7-video</a></td>
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<tr>
<td>AES-S25R-TH-G</td>
<td>Zynq-7000 EPP/TV Software-Defined Radio Kit</td>
<td>$1,850</td>
<td><a href="http://www.em.avnet.com/k7zyqdr">www.em.avnet.com/k7zyqdr</a> Avnet</td>
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### Power Modules

<table>
<thead>
<tr>
<th>Kit Part Number</th>
<th>Description</th>
<th>ReSale</th>
<th>URL</th>
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</thead>
<tbody>
<tr>
<td>AES-POM-TEC-1-G</td>
<td>Texas Instruments Power Module</td>
<td>$300</td>
<td><a href="http://www.em.avnet.com/POM-TEC">www.em.avnet.com/POM-TEC</a> Xilinx</td>
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<tr>
<td>AES-POM-TSM-1-G</td>
<td>Texas Instruments SIMPLE SWITCHER Power Module</td>
<td>$300</td>
<td><a href="http://www.em.avnet.com/POM-TSM">www.em.avnet.com/POM-TSM</a> Xilinx</td>
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<tr>
<td>AES-POM-MM1-1-G</td>
<td>Maxim Power Module</td>
<td>$300</td>
<td><a href="http://www.em.avnet.com/POM-MM1">www.em.avnet.com/POM-MM1</a> Xilinx</td>
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<tr>
<td>AES-POM-LTM1-1-G</td>
<td>GE Energy Power Module</td>
<td>$300</td>
<td><a href="http://www.em.avnet.com/POM-LTM1">www.em.avnet.com/POM-LTM1</a> Xilinx</td>
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<tr>
<td>AES-POM-SS1-1-G</td>
<td>STMelectronics Power Module</td>
<td>$300</td>
<td><a href="http://www.em.avnet.com/POM-SS1">www.em.avnet.com/POM-SS1</a> Xilinx</td>
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<tr>
<td>AES-POM-ARA-1-G</td>
<td>Analog Devices Power Module</td>
<td>$300</td>
<td><a href="http://www.em.avnet.com/POM-ARA">www.em.avnet.com/POM-ARA</a> Xilinx</td>
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### Accessories

<table>
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<tr>
<th>Kit Part Number</th>
<th>Description</th>
<th>ReSale</th>
<th>URL</th>
</tr>
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<tbody>
<tr>
<td>AES-AZS-7Z05-1-G</td>
<td>7-inch Zedboard Touch Display Kit</td>
<td>$499</td>
<td><a href="http://www.xilinx.com/zedboardtouch">www.xilinx.com/zedboardtouch</a> Xilinx</td>
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<tr>
<td>AES-FMB-6506P-G</td>
<td>Freescale Semiconductor MMC02 Touch Panel</td>
<td>$499</td>
<td><a href="http://www.em.avnet.com/mmc02">www.em.avnet.com/mmc02</a> Xilinx</td>
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<tr>
<td>AES-POM-603-1-G</td>
<td>CC3000 Proof-M-F Adapter</td>
<td>$95</td>
<td><a href="http://www.em.avnet.com/proofm">www.em.avnet.com/proofm</a> Xilinx</td>
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<tr>
<td>AES-SUP-12VDC-1-G</td>
<td>Universal 12 V DC Power Supply</td>
<td>$40</td>
<td><a href="http://www.em.avnet.com/12vpower">www.em.avnet.com/12vpower</a> Xilinx</td>
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<tr>
<td>HW-USB-6-G</td>
<td>USB Platform JTAG Programming Cable</td>
<td>$225</td>
<td><a href="http://www.xilinx.com/products/boards-and-kits/_hw-usb-6-gl">www.xilinx.com/products/boards-and-kits/_hw-usb-6-gl</a> Xilinx</td>
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<tr>
<td>JTAG-HST</td>
<td>Digilent JTAG HST Programming Cable</td>
<td>$50</td>
<td><a href="http://www.em.avnet.com/jtaghst">www.em.avnet.com/jtaghst</a> Xilinx</td>
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<tr>
<td>JTAG-SMT1</td>
<td>Digilent JTAG SMT1 Surface Mount Programming Cable</td>
<td>$40</td>
<td><a href="http://www.em.avnet.com/jtagsmt">www.em.avnet.com/jtagsmt</a> x Xilinx</td>
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Kit pricing and product information presented in this brochure are subject to change. Please check www.em.avnet.com/drc or www.xilinx.com/kit for the most current information.

To view all available kits, visit the Avnet Design Resource Center at www.em.avnet.com/drc

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