

钛金系列 FPGAs

You only have a few square millimeters to spare, and you need to pack in as much computing power as you can. 易灵思's next-generation 钛金系列 FPGAs can help. 钛金系列 FPGAs are fabricated on a 16 nm process, delivering high performance with the lowest possible power and a small physical size. They feature the innovative Quantum™ compute fabric that, with its enhanced compute capability, makes 钛金系列 FPGAs ideal for embedded hardware acceleration applications. With a wide range of logic element (LE) densities from 35K to 1M, and compatibility with the 易灵思 RISC-V SoC cores, they can help you turn a tiny chip into an accelerated embedded compute system.

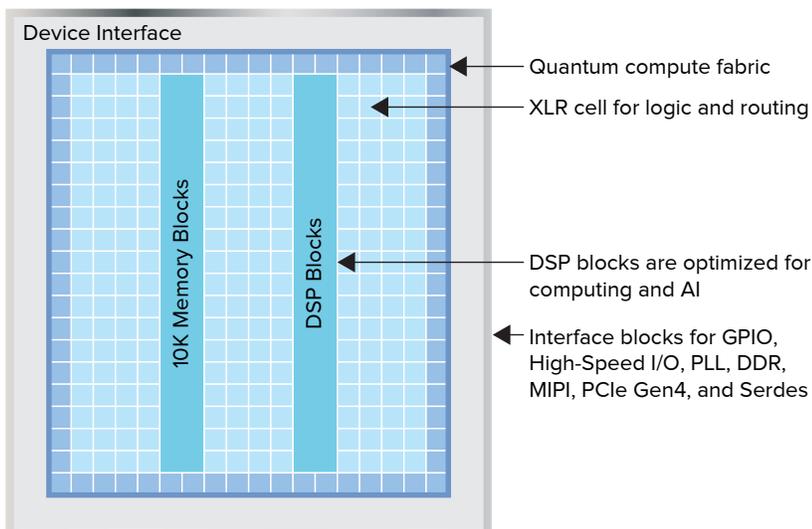


Quantum Compute Fabric

The Quantum compute fabric is made up of configurable tiles, the eXchangeable logic and routing (XLR) cell, that optimizes routing efficiency and speed while achieving high utilization ratios. The fabric also has highly configurable, 10K embedded memory blocks along with dedicated, high-speed, DSP blocks. Together, these features deliver optimum performance for a wide array of applications from edge compute to industrial automation and video processing.

The 16 nm process node gives 钛金系列 FPGAs a small footprint with low power consumption, making them ideal for highly integrated applications.

Figure 1 钛金系列 FPGA Block Diagram



- 16 nm process
- Low power
- High performance
- Small size
- Quantum compute fabric

Table 1 Resources and Interfaces

| Feature | Ti35 | Ti60 | Ti90 | Ti120 | Ti180 | Ti240 | Ti375 | Ti550 | Ti750 | Ti1000 |
|------------------------|--------|--------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Logic Elements (LEs) | 36,176 | 62,016 | 92,534 | 123,379 | 176,256 | 236,888 | 370,137 | 533,174 | 727,056 | 969,408 |
| 10K RAM blocks (Mb) | 1.53 | 2.62 | 6.88 | 9.18 | 13.11 | 19.37 | 27.53 | 39.65 | 54.07 | 72.09 |
| DSP blocks | 93 | 160 | 336 | 448 | 640 | 946 | 1,344 | 1,936 | 2,640 | 3,520 |
| PLLs | 4 | 4 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| GPIO | 34 | 34 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| High-speed I/O | 146 | 146 | 232 | 232 | 232 | 172 | 172 | 268 | 268 | 268 |
| LPDDR4/4x | — | — | x32 | x32 | x32 | 2 x32 | 2 x32 | 2 x72 | 2 x72 | 2 x72 |
| MIPI D-PHY 2.5 Gbps | — | — | 4 TX 4 RX | 4 TX 4 RX | 4 TX 4 RX | 3 TX 3 RX |
| 16 Gbps Serdes | — | — | x8 | x8 | x8 | x12 | x12 | x16 | x16 | x16 |
| 25.8 Gbps Serdes | — | — | — | — | — | — | — | x8 | x8 | x8 |
| PCI Express Gen4 (16G) | — | — | 1 Gen4 x4 | 1 Gen4 x4 | 1 Gen4 x4 | 2 Gen4 x4 | 2 Gen4 x4 | 2 Gen4 x8 | 2 Gen4 x8 | 2 Gen4 x8 |

Ti35 and Ti60

Designed for highly integrated mobile and edge devices that need low power, a small footprint, and a multitude of I/Os.

- Mobile
- Edge
- AI IoT
- Sensor fusion

Ti90, Ti120, and Ti180

2.5 Gbps MIPI interfaces for multi-camera, high definition vision systems, edge computing, and hardware acceleration.

- Vision systems
- Edge computing
- Hardware acceleration
- Machine learning

Ti240, Ti375, Ti550

Combines the compute power and transceiver interfaces required for compute and industrial automation.

- Industrial automation
- Automotive
- Adaptive acceleration
- Fog computing

Ti750 and Ti1000

High-performance platform with the density and interfaces needed in the most demanding applications.

- Communications
- PCI Express accelerator cards
- FPGA-based servers
- Smart storage

Table 2 Package Options

| Package | Pitch (mm) | Size (mm) | Ti35 | Ti60 | Ti90 | Ti120 | Ti180 | Ti240 | Ti375 | Ti550 | Ti750 | Ti1000 |
|-----------------|------------|-----------|------|------|------|-------|-------|-------|-------|-------|-------|--------|
| 64-ball WLCSP | 0.4 | 3.5x3.4 | | ✓ | | | | | | | | |
| 100-ball FBGA | 0.5 | 5.5x5.5 | ✓ | ✓ | | | | | | | | |
| 225-ball FBGA | 0.65 | 10x10 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| 361-ball FBGA | 0.65 | 13x13 | | | ✓ | ✓ | ✓ | | | | | |
| 484-ball FBGA | 0.8 | 18x18 | | | ✓ | ✓ | ✓ | | | | | |
| 529-ball FBGA | 0.8 | 19x19 | | | ✓ | ✓ | ✓ | | | | | |
| 625-ball FBGA | 0.65 | 17x17 | | | | | | ✓ | ✓ | ✓ | ✓ | |
| 784-ball FBGA | 0.8 | 23x23 | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1,156-ball FBGA | 1.0 | 35x35 | | | | | | | | ✓ | ✓ | ✓ |

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