



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.

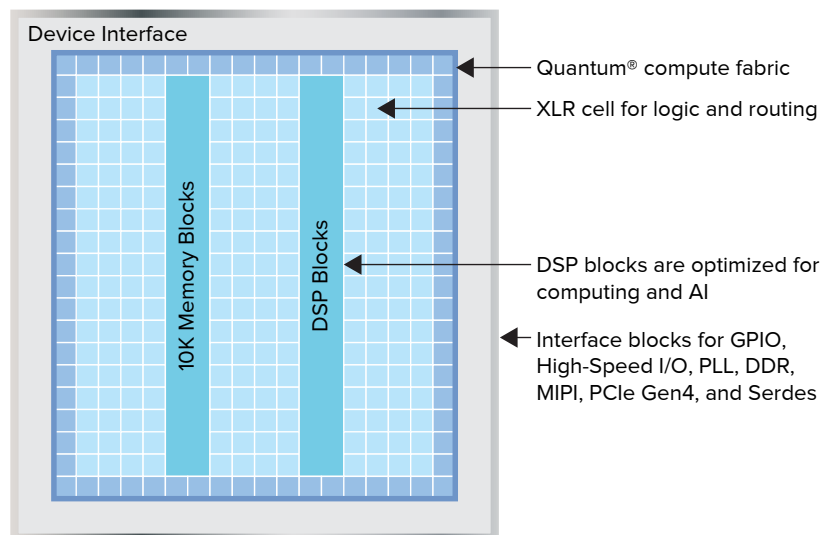
Quantum® Compute Fabric

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	168	168	168	168	168
High-speed I/O	146	146	232	232	232	232	232	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	3 TX 3 RX	3 TX 3 RX	3 TX 3 RX	3 TX 3 RX
16 Gbps Serdes	—	—	x8	x8	x8	x16	x16	x16	x16	x16
25.8 Gbps Serdes	—	—	—	—	—	—	—	x8	x8	x8
Embedded Hardened Processor	—	—	—	—	—	Quad RISC-V	Quad RISC-V	Quad RISC-V	Quad RISC-V	Quad RISC-V
PCIe Gen4 (16G)	—	—	1 x4	1 x4	1 x4	2 x4	2 x4	2 x8	2 x8	2 x8

Refer to the **FPGA data sheet** or **钛金系列 Selector Guide** for details on which resources are available in each package.

Ti35 and Ti60	Ti90, Ti120, and Ti180	Ti240, Ti375, Ti550	Ti750 and Ti1000
Designed for highly integrated mobile and edge devices that need low power, a small footprint, and a multitude of I/Os. <ul style="list-style-type: none">• Mobile• Edge• AI IoT• Sensor fusion	2.5 Gbps MIPI interfaces for multi-camera, high definition vision systems, edge computing, and hardware acceleration. <ul style="list-style-type: none">• Vision systems• Edge computing• Hardware acceleration• Machine learning	Combines the compute power and transceiver interfaces required for compute and industrial automation. <ul style="list-style-type: none">• Industrial automation• Automotive• Adaptive acceleration• Fog computing	High-performance platform with the density and interfaces needed in the most demanding applications. <ul style="list-style-type: none">• Communications• PCIe 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			✓	✓	✓					
400-ball FBGA	0.8	16x16			✓	✓	✓					
484-ball FBGA	0.65	15x15			✓	✓	✓	✓	✓			
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								✓	✓	✓