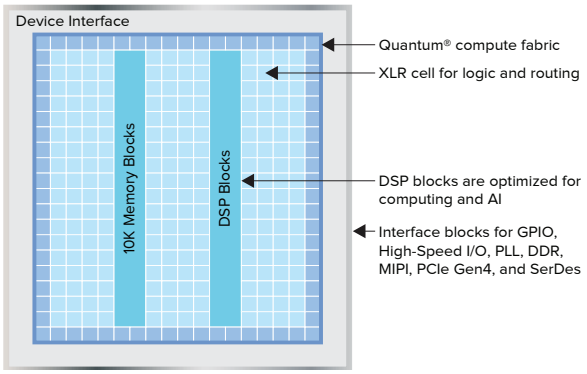
Titanium™ FPGA Family

Enabling the AI-Driven World

You only have a few square millimeters to spare, and you need to pack in as much computing power as you can. Efinix's Titanium™ family includes the Titanium, Titanium Edge, and Titanium Transceiver series. With a wide range of logic element (LE) densities from 35K to 2M, and compatibility with the Efinix RISC-V SoCs, they can help you turn a tiny chip into an accelerated embedded compute system. Titanium™ FPGAs enable AI acceleration, data analysis, real-time decision making, and other compute-intensive workloads for applications such as machine vision, automotive, hand-held medical devices, and next-generation edge applications.

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 optimized performance for a wide array of applications from edge compute to industrial automation and video processing. The 16 nm process node gives Titanium™ FPGAs a small footprint with low power consumption, making them ideal for highly integrated applications.



- Broad, scalable FPGA platform for high-performance, mainstream application
- Optimized balance of performance, power efficiency, and small-footprint design
- Flexible XLR architecture enabling adaptability across diverse markets and applications

Table 1 Titanium™ FPGAs - Scalable Performance Platform

Feature			Ti35	Ti60	Ti90	Ti120	Ti165	Ti180	Ti240	Ti375
Logic Elements (LEs)			36,176	62,016	92,534	123,379	162,800	176,256	236,888	370,137
10K RAM blocks (Mb)			1.53	2.62	6.88	9.18	12.1	13.11	17.62	27.53
DSP blocks			93	160	336	448	590	640	860	1,344
PLLs			4	4	8	8	12	8	12	12
High-voltage I/O			27	27	74	74	51	74	51	51
High-speed I/O (MIPI 1.5 Gbps)			142	142	210	210	176	210	176	176
MIPI D-PHY, support CSI–2/DSI (Gbps)			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
LPDDR4/4x			—	—	1 x32	1 x32	1 x32	1 x32	1 x32	1 x32
MIPI D-PHY 2.5 Gbps (Hard IP)			—	—	4 TX 4 RX	4 TX 4 RX	—	4 TX 4 RX	—	—
Hardened Quad-Core RISC-V Processor			—	—	—	—	RV32	—	RV32	RV32
Package	**Pitch (mm)**	**Size (mm)**	**Ti35**	**Ti60**	**Ti90**	**Ti120**	**Ti165**	**Ti180**	**Ti240**	**Ti375**
64-ball WLCSP	0.4	3.5x3.4		✓						
100-ball FBGA [1]	0.5	5.5x5.5	✓	✓						
225-ball FBGA	0.65	10x10	✓	✓						
256-ball FBGA	0.8	13x13	✓	✓						
361-ball FBGA	0.65	13x13			✓	✓		✓		
400-ball FBGA	0.8	16x16			✓	✓		✓		
484-ball FBGA [2]	0.65	15x15						✓		
484-ball FBGA	0.8	18x18			✓	✓		✓		
529-ball FBGA	0.8	19x19			✓	✓	✓	✓	✓	✓

1. The 100 pin package is available as a regular package as well as a SIP that incorporates SPI flash and HyperRAM in addition to the FPGA.
2. The 484 pin package is a SIP that incorporates LPDDR DRAM in addition to the FPGA.


Machine Vision


Medical Imaging


Industrial Automation


Automotive

Table 2 Titanium™ Edge FPGAs - Intelligent Edge Optimization

Feature			Ti40	Ti70	Ti95	Ti125
Logic Elements (LEs)			38,925	68,218	93,200	122,792
10K RAM blocks (Mb)			1.53	2.62	4.5	5.9
DSP blocks			100	160	210	288
PLLs			4	4	7	7
High-voltage I/O			36	36	36	36
High-speed I/O (MIPI 1.5 Gbps)			—	—	95	95
High-speed I/O (MIPI 2.5 Gbps)			147	147	110	110
Package	**Pitch (mm)**	**Size (mm)**	**Ti40**	**Ti70**	**Ti95**	**Ti125**
64-ball WLCSP	0.4	3.5x3.4		✓		
100-ball FBGA [3]	0.5	5.5x5.5		✓		
225-ball FBGA [4]	0.5	8x8				✓
225-ball FBGA	0.65	10x10	✓	✓	✓	✓
324-ball FBGA	0.8	15x15			✓	✓

3. The 100 pin package is available as a regular package as well as a SIP that incorporates SPI flash and HyperRAM in addition to the FPGA.
4. The 225 pin package is a SIP that incorporates SPI flash and two HyperRAM devices in addition to the FPGA.

- Compact, low-power platform designed for intelligent edge systems
- Enhanced HSIO with SEU detection/ correction and ultra-low static power for robust operation
- Optimized for real-time edge applications where size, thermal efficiency, and power matter most

- Optimized for high-throughput and data-intensive workloads
- Advanced serial interfaces for fast data movement
- Designed for communications, networking, video, and high-performance embedded systems

Table 3 Titanium™ Transceiver FPGAs - High-Speed Connectivity Platform

Feature			Ti85	Ti135	Ti140	Ti165	Ti240	Ti260	Ti375	Ti450	Ti660	Ti800	Ti1250	Ti1600	Ti2000
Logic Elements (LEs)			83,232	132,192	142,300	162,800	236,888	264,384	370,137	447,890	656,916	796,262	1,233,020	1,578,000	1,974,067
10K RAM blocks (Mb)			6.18	9.83	10.6	12.1	17.62	19.7	27.53	26.6	38.9	47.2	73.1	93.6	117
DSP blocks			300	480	510	590	860	960	1,344	862	1,260	1,536	2,380	3,050	3,808
PLLs			9	9	12	12	12	12	12	12	12	12	12	12	12
High-voltage I/O			84	84	150	103	103	150	103	180	180	180	180	180	180
High-speed I/O (MIPI 1.5 Gbps)			139	139	160	234	234	160	234	300	300	300	300	300	300
MIPI D-PHY, support CSI–2/DSI (Gbps)			1.5	1.5	2.5	1.5	1.5	2.5	1.5	2.5	2.5	2.5	2.5	2.5	2.5
LPDDR4/4x			1 x32	1 x32	2 x32	2 x32	2 x32	2 x32	2 x32	3 x32	3 x32	3 x32	4 x32	4 x32	4 x32
MIPI D-PHY 2.5 Gbps (Hard IP)			2 TX 2 RX	2 TX 2 RX	—	3 TX 3 RX	3 TX 3 RX	—	3 TX 3 RX	—	—	—	—	—	—
16 Gbps Transceivers			x8	x8	x16	x16	x16	x16	x16	—	—	—	—	—	—
25.8 Gbps Transceivers			—	—	—	—	—	—	—	x24	x24	x24	x40	x40	x40
PCIe® Gen4 (16G)			1 x4	1 x4	2 x4	2 x4	2 x4	2 x4	2 x4	2 x8	2 x8	2 x8	3 x8	3 x8	3 x8
Hardened Quad-Core RISC-V Processor			RV32	RV32	RV64	RV32	RV32	RV64	RV32	RV64	RV64	RV64	RV64	RV64	RV64
Package	**Pitch (mm)**	**Size (mm)**	**Ti85**	**Ti135**	**Ti140**	**Ti165**	**Ti240**	**Ti260**	**Ti375**	**Ti450**	**Ti660**	**Ti800**	**Ti1250**	**Ti1600**	**Ti2000**
441-ball FBGA	0.5	11x11	✓	✓											
484-ball FBGA	0.8	18x18	✓	✓	✓	✓	✓	✓	✓						
576-ball FBGA [5]	0.65	16x16	✓	✓											
676-ball FBGA	0.65	18x18			✓	✓	✓	✓	✓						
676-ball FBGA	0.8	22x22	✓	✓											
900-ball FBGA	0.8	25x25			✓	✓	✓	✓	✓	✓	✓	✓			
1156-ball FBGA	1.0	35x35				✓	✓		✓	✓	✓	✓	✓	✓	✓
1521-ball FBGA	1.0	40x40											✓	✓	✓

5. The Ti135 576-ball FBGA is offered as a standard FPGA package or as a SiP integrating SPI flash and LPDDR4/4x DRAM.

Refer to the FPGA data sheet or Titanium™ Selector Guide for details on which resources are available in each package.

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