



## INTEL® STRATIX® 10 TX PRODUCT TABLE

PRODUCT LINE		TX 1650		TX 2100		TX 2500			TX 2800		
Resources	Logic elements (LEs) <sup>1</sup>	1,679,000		2,073,000		2,422,000			2,753,000		
	Adaptive logic modules (ALMs)	569,200		702,720		821,150			933,120		
	ALM registers	2,276,800		2,810,880		3,284,600			3,732,480		
	Hyper-Registers from Intel® Hyperflex™ FPGA architecture	Millions of Hyper-Registers distributed throughout the monolithic FPGA fabric									
	Programmable clock trees synthesizable	Hundreds of synthesizable clock trees									
	eSRAM memory blocks	2		2		-			-		
	eSRAM memory size (Mb)	90		90		-			-		
	M20K memory blocks	6,162		6,847		9,963			11,721		
	M20K memory size (Mb)	120		134		195			229		
	MLAB memory size (Mb)	9		11		13			15		
	Variable-precision digital signal processing (DSP) blocks	3,326		3,960		5,011			5,760		
	18 x 19 multipliers	6,652		7,920		10,022			11,520		
	Peak fixed-point performance (TMACS) <sup>2</sup>	13.3		15.8		20.0			23.0		
	Peak floating-point performance (TFLOPS) <sup>3</sup>	5.3		6.3		8.0			9.2		
I/O and Architectural Features	Secure device manager	AES-256/SHA-256 bitstream encryption/authentication, physically unclonable function (PUF), ECDSA 256/384 boot code authentication, side channel attack protection									
	Hard processor system	Quad-core 64-bit ARM® Cortex®-A53 up to 1.5 GHz with 32KB I/D cache, NEON® coprocessor, 1 MB L2 Cache, direct memory access (DMA), system memory management unit, cache coherency unit, hard memory controllers, USB 2.0 x2, 1G EMAC x3, UART x2, SPI x4, I <sup>2</sup> C x5, general purpose timers x7, watchdog timer x4									
	Maximum user I/O pins	544		440		544		440		296	
	Maximum LVDS pairs 1.6 Gbps (RX or TX)	264		216		264		216		144	
	Total full duplex transceiver count	72		96		72		96		144	
	GXE transceiver count - PAM-4 (up to 58 Gbps) or NRZ (up to 30 Gbps)	12 PAM-4 24 NRZ		36 PAM-4 72 NRZ		12 PAM-4 24 NRZ		36 PAM-4 72 NRZ		60 PAM-4 120 NRZ	
	GXT transceiver count - NRZ (up to 28.3 Gbps)	32		16		32		16		16	
	GX transceiver count - NRZ (up to 17.4 Gbps)	16		8		16		8		8	
	PCI Express* (PCIe*) hard intellectual property (IP) blocks (Gen3 x16)	2		1		2		1		1	
	100G Ethernet MAC (no FEC) hard IP blocks	2		1		2		1		1	
	100G Ethernet MAC + FEC hard IP blocks	4		12		4		12		20	
	Memory devices supported	DDR4, DDR3, DDR2, DDR, QDR II, QDR II+, RDRAM II, RDRAM 3, HMC, MoSys									
	Package Options and I/O Pins: General-Purpose I/O (GPIO) Count, High-Voltage I/O count, LVDS pairs, GXE (E-Tile) Transceiver Count, and GXT+GX (H-Tile) Transceiver Count <sup>4</sup>										
F2112 pin (47.5 mm x 47.5 mm, 1.0 mm pitch)	544,16,264,24,48		544,16,264,24,48		544,16,264,24,48			544,16,264,24,48			
F2397 pin (50 mm x 50 mm, 1.0 mm pitch)	440,8,216,72,24		440,8,216,72,24		440,8,216,72,24			440,8,216,72,24			
F2912 pin (55 mm x 55 mm, 1.0 mm pitch)	-		-		296,8,144,120,24			296,8,144,120,24			

Notes:

- LE counts valid in comparing across Intel FPGA devices, and are conservative vs. competing FPGAs.
- Fixed-point performance assumes the use of pre-adder.
- Floating-point performance is IEEE 754 compliant single precision.
- A subset of pins for each package are used for high-voltage, 3.0 V and 2.5 V interfaces.
- All data is preliminary, and may be subject to change without prior notice.

544,16,264,24,48 Numbers indicate total GPIO count, high-voltage I/O count, LVDS pairs, GXE (E-Tile) transceiver count, and GXT+GX (H-Tile) transceiver count

Indicates pin migration path.



## INTEL STRATIX 10 TX PRODUCT TABLE

PRODUCT LINE	TX 2500	TX 2800
Processor	Quad-core 64 bit ARM Cortex-A53 MPCore* processor	
Maximum processor frequency	1.5 GHz <sup>1</sup>	
Processor cache and co-processors	<ul style="list-style-type: none"> <li>• L1 instruction cache (32 KB)</li> <li>• L1 data cache (32 KB) with error correction code (ECC)</li> <li>• Level 2 cache (1 MB) with ECC</li> <li>• Floating-point unit (FPU) single and double precision</li> <li>• ARM NEON media engine</li> <li>• ARM CoreSight* debug and trace technology</li> <li>• System Memory Management Unit (SMMU)</li> <li>• Cache Coherency Unit (CCU)</li> </ul>	
Scratch pad RAM	256 KB	
HPS DDR memory	DDR4, DDR3, and LP DDR3 (Up to 64 bit with ECC)	
Direct memory access (DMA) controller	8 channels	
EMAC	3X 10/100/1000 Ethernet media access controller (EMAC) with integrated DMA	
USB on-the-go (OTG) controller	2X USB OTG with integrated DMA	
UART controller	2X UART 16550 compatible	
Serial peripheral interface (SPI) controller	4X SPI	
I <sup>2</sup> C controller	5X I <sup>2</sup> C	
Quad SPI flash controller	1X SIO, DIO, QIO SPI flash supported	
SD/SDIO/MMC controller	1X eMMC 4.5 with DMA and CE-ATA support	
NAND flash controller	<ul style="list-style-type: none"> <li>• 1X ONFI 1.0 or later</li> <li>• 8 and 16 bit support</li> </ul>	
General-purpose timers	4X	
Software-programmable general-purpose I/Os (GPIOs)	Maximum 48 GPIOs	
HPS DDR Shared I/O	3X 48 - May be assigned to HPS for HPS DDR access	
Direct I/Os	48 I/Os to connect HPS peripherals directly to I/O	
Watchdog timers	4X	
Security	Secure device manager, Advanced Encryption Standard (AES) AES-256/SHA-256 bitsream encryption/authentication, PUF, ECDSA 256/384 boot code authentication, side channel attack protection	

**Notes:**

1. With overdrive feature.