

- Up to 532 user I/Os
 - LVDS interfaces up to 840 Mbps transmitter (Tx), 875 Mbps Rx
 - Support for DDR2 SDRAM interfaces up to 200 MHz
 - Support for QDRII SRAM and DDR SDRAM up to 167 MHz
- Up to eight phase-locked loops (PLLs) per device
- Offered in commercial and industrial temperature grades

Device Resources

Table 1-1 lists Cyclone IV E device resources.

Table 1-1. Resources for the Cyclone IV E Device Family

Resources	EP4CE6	EP4CE10	EP4CE15	EP4CE22	EP4CE30	EP4CE40	EP4CE55	EP4CE75	EP4CE115
Logic elements (LEs)	6,272	10,320	15,408	22,320	28,848	39,600	55,856	75,408	114,480
Embedded memory (Kbits)	270	414	504	594	594	1,134	2,340	2,745	3,888
Embedded 18 × 18 multipliers	15	23	56	66	66	116	154	200	266
General-purpose PLLs	2	2	4	4	4	4	4	4	4
Global Clock Networks	10	10	20	20	20	20	20	20	20
User I/O Banks	8	8	8	8	8	8	8	8	8
Maximum user I/O ⁽¹⁾	179	179	343	153	532	532	374	426	528

Note to Table 1-1:

(1) The user I/Os count from pin-out files includes all general purpose I/O, dedicated clock pins, and dual purpose configuration pins. Transceiver pins and dedicated configuration pins are not included in the pin count.

Package Matrix

Table 1–3 lists Cyclone IV E device package offerings.

Table 1–3. Package Offerings for the Cyclone IV E Device Family ⁽¹⁾, ⁽²⁾

Package	E144		M164		M256		U256		F256		F324		U484		F484		F780	
Size (mm)	22 x 22		8 x 8		9 x 9		14 x 14		17 x 17		19 x 19		19 x 19		23 x 23		29 x 29	
Pitch (mm)	0.5		0.5		0.5		0.8		1.0		1.0		0.8		1.0		1.0	
Device	User I/O	LVDS ⁽³⁾																
EP4CE6	↑91	21	—	—	—	—	↑179	66	↑179	66	—	—	—	—	—	—	—	—
EP4CE10	↑91	21	—	—	—	—	↑179	66	↑179	66	—	—	—	—	—	—	—	—
EP4CE15	↓81	18	89	21	165	53	↓165	53	↓165	53	—	—	—	—	↑343	137	—	—
EP4CE22	↓79	17	—	—	—	—	↓153	52	↓153	52	—	—	—	—	—	—	—	—
EP4CE30	—	—	—	—	—	—	—	—	—	—	↑193	68	—	—	↑328	124	↑532	224
EP4CE40	—	—	—	—	—	—	—	—	—	—	↑193	68	↑328	124	↑328	124	↑532	224
EP4CE55	—	—	—	—	—	—	—	—	—	—	—	—	↓324	132	↓324	132	↓374	160
EP4CE75	—	—	—	—	—	—	—	—	—	—	—	—	↓292	110	↓292	110	↓426	178
EP4CE115	—	—	—	—	—	—	—	—	—	—	—	—	—	—	↓280	103	↓528	230

Notes to Table 1–3:

- (1) The E144 package has an exposed pad at the bottom of the package. This exposed pad is a ground pad that must be connected to the ground plane of your PCB. Use this exposed pad for electrical connectivity and not for thermal purposes.
- (2) Use the Pin Migration View window in Pin Planner of the Quartus II software to verify the pin migration compatibility when you perform device migration. For more information, refer to the *I/O Management* chapter in volume 2 of the *Quartus II Handbook*.
- (3) This includes both dedicated and emulated LVDS pairs. For more information, refer to the *I/O Features in Cyclone IV Devices* chapter.