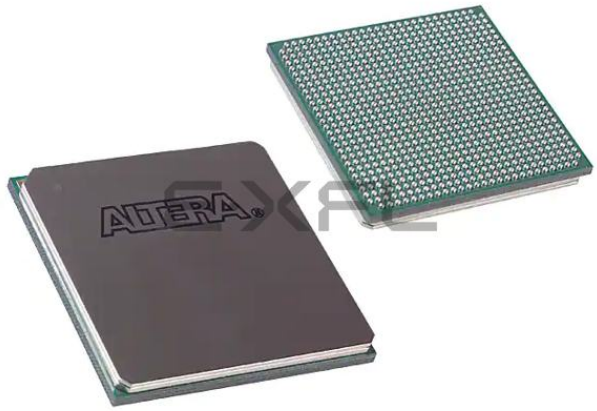

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Details	
Product Status	Obsolete
Number of LABs/CLBs	1900
Number of Logic Elements/Cells	47500
Total RAM Bits	2184192
Number of I/O	488
Number of Gates	-
Voltage - Supply	0.86V ~ 1.15V
Mounting Type	Surface Mount
Operating Temperature	0°C ~ 85°C (TJ)
Package / Case	780-BBGA, FCBGA
Supplier Device Package	780-FBGA (29x29)
Purchase URL	https://www.e-xfl.com/product-detail/intel/ep3sl50f780c4n

Visual Cue	Meaning
`Courier type`	Signal and port names are shown in lowercase Courier type. Examples: `data1`, `tdi`, `input`. Active-low signals are denoted by suffix `n`, e.g., `resetn`. Anything that must be typed exactly as it appears is shown in Courier type. For example: `c:\qdesigns\tutorial\chiptrip.gdf`. Also, sections of an actual file, such as a Report File, references to parts of files (e.g., the AHDL keyword `SUBDESIGN`), as well as logic function names (e.g., `TRI`) are shown in Courier.
1., 2., 3., and a., b., c., etc.	Numbered steps are used in a list of items when the sequence of the items is important, such as the steps listed in a procedure.
■ ■	Bullets are used in a list of items when the sequence of the items is not important.
✓	The checkmark indicates a procedure that consists of one step only.
	The hand points to information that requires special attention.
	A caution calls attention to a condition or possible situation that can damage or destroy the product or the user's work.
	A warning calls attention to a condition or possible situation that can cause injury to the user.
↵	The angled arrow indicates you should press the Enter key.
	The feet direct you to more information on a particular topic.

Table 1–20. PLL Specifications for Stratix III Devices (Part 1 of 3)

Symbol	Parameter	C2			C3, I3			C4, I4			C4L, I4L						Unit
		V_{CCL} = 1.1 V			V_{CCL} = 1.1 V			V_{CCL} = 1.1 V			V_{CCL} = 1.1 V			V_{CCL} = 0.9 V			
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f_{IN}	Input clock frequency	5	—	800 *(1)*	5	—	717 *(1)*	5	—	717 *(1)*	5	—	717 *(1)*	5	—	717 *(1)*	MHz
f_{INPFD}	Input frequency to the PFD	5	—	325	5	—	325	5	—	325	5	—	325	5	—	325	MHz
f_{VCO}	PLL VCO operating range	600	—	1600	600	—	1300	600	—	1300	600	—	1300	600	—	1300	MHz
$t_{EINDUTY}$	Input clock or external feedback clock input duty cycle	40	—	60	40	—	60	40	—	60	40	—	60	40	—	60	%
f_{OUT}	Output frequency for internal global or regional clock	—	—	600 *(2)*	—	—	500 *(2)*	—	—	450 *(2)*	—	—	450 *(2)*	—	—	375 *(2)*	MHz
f_{OUT_EXT}	Output frequency for dedicated external clock output	—	—	800 *(2)*	—	—	717 *(2)*	—	—	717 *(2)*	—	—	717 *(2)*	—	—	717 *(2)*	MHz
$t_{OUTDUTY}$	Duty cycle for external clock output (when set to 50%)	45	50	55	45	50	55	45	50	55	45	50	55	45	50	55	%
t_{FCOMP}	External feedback clock compensation time	—	—	10	—	—	10	—	—	10	—	—	10	—	—	10	ns
$t_{CONFIGPLL}$	Time required to reconfigure scan chain	—	3.5	—	—	3.5	—	—	3.5	—	—	3.5	—	—	3.5	—	scanclk cycles
$t_{CONFIGPHASE}$	Time required to reconfigure phase shift	—	1	—	—	1	—	—	1	—	—	1	—	—	1	—	scanclk cycles
$f_{SCANCLK}$	`scanclk` frequency	—	—	100	—	—	100	—	—	100	—	—	100	—	—	100	MHz
t_{LOCK}	Time required to lock from end of device configuration	—	—	1	—	—	1	—	—	1	—	—	1	—	—	1	ms
t_{DLOCK}	Time required to lock dynamically (after switchover or reconfiguring any non-post-scale counters/delays)	—	—	1	—	—	1	—	—	1	—	—	1	—	—	1	ms

Table 1–25. True and Emulated LVDS Specifications for Stratix III Devices *(Note 1), (2)* (Part 2 of 3)

Symbol	Conditions	C2			C3, I3			C4, I4			C4L, I4L			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
LVDS_E_1R -f_{HSDR} (data rate)	SERDES factor J = 4 to 10	*(4)*	—	311	*(4)*	—	200	*(4)*	—	200	*(4)*	—	200	Mbps
$t_{x\ Jitter}$ *(5)*	Total Jitter for Data Rate, 600 Mbps – 1.6 Gbps	—	—	160	—	—	160	—	—	160	—	—	160	ps
	Total Jitter for Data Rate, < 600 Mbps	—	—	0.1	—	—	0.1	—	—	0.1	—	—	0.1	UI
t_{DUTY}	T_X output duty cycle for both True and Emulated Differential I/O	45	50	55	45	50	55	45	50	55	45	50	55	%
t_{RISE} & t_{FALL}	True Differential I/O Standards	—	—	160	—	—	200	—	—	200	—	—	200	ps
t_{RISE} & t_{FALL}	Emulated Differential I/O Standards with Three External Output Resistor Network	—	—	310	—	—	310	—	—	350	—	—	350	ps
t_{RISE} & t_{FALL}	Emulated Differential I/O Standards with One External Output Resistor Network	—	—	460	—	—	500	—	—	500	—	—	500	ps
TCCS	True Differential I/O Standards	—	—	100	—	—	100	—	—	100	—	—	100	ps
TCCS	Emulated Differential I/O Standards	—	—	250	—	—	250	—	—	250	—	—	250	ps
Receiver														
$f_{HSDRDPA}$ (data rate)	SERDES factor J = 3 to 10	150	—	1600	150	—	1250	150	—	1250	150	—	1250	Mbps
f_{HSDR} (data rate)	SERDES factor J = 3 to 10	*(4)*	—	*(6)*	*(4)*	—	*(6)*	*(4)*	—	*(6)*	*(4)*	—	*(6)*	Mbps
	SERDES factor J = 2, Uses DDR Registers	*(4)*	—	*(6)*	*(4)*	—	*(6)*	*(4)*	—	*(6)*	*(4)*	—	*(6)*	Mbps
	SERDES factor J = 1, Uses an SDR Register	*(4)*	—	*(6)*	*(4)*	—	*(6)*	*(4)*	—	*(6)*	*(4)*	—	*(6)*	Mbps
DPA														
DPA run length	—	—	—	10000	—	—	10000	—	—	10000	—	—	10000	UI
Soft CDR mode														
Soft-CDR PPM tolerance	—	—	—	300	—	—	300	—	—	300	—	—	300	± PPM

Table 1–47 lists the EP3SL50 column pins output timing parameters for differential I/O standards.

Table 1–47. EP3SL50 Column Pins Output Timing Parameters (Part 1 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
LVDS_E_1R	—	GCLK	t_{co}	3.029	3.246	4.575	4.976	5.487	5.347	5.565	5.101	5.612	5.474	5.631	ns
		GCLK PLL	t_{co}	3.025	3.249	4.622	5.031	5.549	5.409	5.627	5.160	5.678	5.540	5.697	ns
LVDS_E_3R	—	GCLK	t_{co}	3.029	3.246	4.575	4.976	5.487	5.347	5.565	5.101	5.612	5.474	5.631	ns
		GCLK PLL	t_{co}	3.025	3.249	4.622	5.031	5.549	5.409	5.627	5.160	5.678	5.540	5.697	ns
MINI-LVDS_E_1R	—	GCLK	t_{co}	3.029	3.246	4.575	4.976	5.487	5.347	5.565	5.101	5.612	5.474	5.631	ns
		GCLK PLL	t_{co}	3.025	3.249	4.622	5.031	5.549	5.409	5.627	5.160	5.678	5.540	5.697	ns
MINI-LVDS_E_3R	—	GCLK	t_{co}	3.056	3.279	4.646	5.054	5.571	5.431	5.649	5.181	5.698	5.560	5.717	ns
		GCLK PLL	t_{co}	3.046	3.269	4.636	5.043	5.561	5.421	5.639	5.170	5.688	5.550	5.707	ns
RSDS_E_1R	—	GCLK	t_{co}	3.046	3.269	4.639	5.047	5.565	5.425	5.643	5.175	5.693	5.555	5.712	ns
		GCLK PLL	t_{co}	3.039	3.263	4.632	5.041	5.559	5.419	5.637	5.168	5.687	5.549	5.706	ns
RSDS_E_3R	—	GCLK	t_{co}	3.038	3.261	4.629	5.038	5.556	5.416	5.634	5.165	5.683	5.545	5.702	ns
		GCLK PLL	t_{co}	3.060	3.283	4.650	5.058	5.575	5.435	5.653	5.185	5.703	5.565	5.722	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.050	3.272	4.629	5.035	5.550	5.410	5.628	5.161	5.676	5.538	5.695	ns
		GCLK PLL	t_{co}	3.045	3.268	4.629	5.035	5.551	5.411	5.629	5.162	5.678	5.540	5.697	ns
	6mA	GCLK	t_{co}	3.043	3.266	4.628	5.034	5.549	5.409	5.627	5.161	5.677	5.539	5.696	ns
		GCLK PLL	t_{co}	3.035	3.257	4.618	5.024	5.540	5.400	5.618	5.151	5.667	5.529	5.686	ns
	8mA	GCLK	t_{co}	3.036	3.259	4.624	5.031	5.548	5.408	5.626	5.159	5.676	5.538	5.695	ns
		GCLK PLL	t_{co}	3.035	3.256	4.607	5.012	5.526	5.386	5.604	5.138	5.652	5.514	5.671	ns
	10mA	GCLK	t_{co}	3.047	3.269	4.625	5.030	5.544	5.404	5.622	5.157	5.671	5.533	5.690	ns
		GCLK PLL	t_{co}	3.043	3.266	4.626	5.032	5.548	5.408	5.626	5.159	5.675	5.537	5.694	ns
	12mA	GCLK	t_{co}	3.033	3.255	4.615	5.021	5.536	5.396	5.614	5.148	5.663	5.525	5.682	ns
		GCLK PLL	t_{co}	3.031	3.253	4.613	5.018	5.534	5.394	5.612	5.146	5.661	5.523	5.680	ns
DIFFERENTIAL 1.2-V HSTL CLASS II	16mA	GCLK	t_{co}	3.031	3.254	4.616	5.023	5.539	5.399	5.617	5.150	5.667	5.529	5.686	ns
		GCLK PLL	t_{co}	3.035	3.257	4.613	5.018	5.533	5.393	5.611	5.145	5.660	5.522	5.679	ns

Table 1–48. EP3SL50 Row Pins Output Timing Parameters (Part 2 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
RSDS_E_1R	—	GCLK	t_{co}	3.082	3.315	4.710	5.123	5.649	5.505	5.704	5.258	5.787	5.643	5.772	ns
		GCLK PLL	t_{co}	3.093	3.325	4.711	5.124	5.648	5.504	5.703	5.257	5.785	5.641	5.770	ns
RSDS_E_3R	—	GCLK	t_{co}	3.083	3.316	4.709	5.122	5.647	5.503	5.702	5.257	5.785	5.641	5.770	ns
		GCLK PLL	t_{co}	3.069	3.302	4.694	5.107	5.633	5.489	5.688	5.242	5.770	5.626	5.755	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.066	3.298	4.690	5.103	5.629	5.485	5.684	5.238	5.766	5.622	5.751	ns
		GCLK PLL	t_{co}	3.063	3.296	4.691	5.106	5.632	5.488	5.687	5.241	5.770	5.626	5.755	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	6mA	GCLK	t_{co}	3.064	3.296	4.681	5.094	5.619	5.475	5.674	5.228	5.756	5.612	5.741	ns
		GCLK PLL	t_{co}	3.113	3.349	4.752	5.167	5.695	5.551	5.750	5.302	5.832	5.688	5.817	ns
DIFFERENTIAL 1.2-V HSTL CLASS I	8mA	GCLK	t_{co}	3.089	3.325	4.734	5.150	5.678	5.534	5.733	5.285	5.817	5.673	5.802	ns
		GCLK PLL	t_{co}	3.071	3.306	4.712	5.128	5.656	5.512	5.711	5.263	5.795	5.651	5.780	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	4mA	GCLK	t_{co}	3.117	3.352	4.752	5.167	5.694	5.550	5.749	5.302	5.832	5.688	5.817	ns
		GCLK PLL	t_{co}	3.102	3.337	4.738	5.152	5.679	5.535	5.734	5.287	5.817	5.673	5.802	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	6mA	GCLK	t_{co}	3.091	3.326	4.733	5.149	5.676	5.532	5.731	5.284	5.815	5.671	5.800	ns
		GCLK PLL	t_{co}	3.071	3.306	4.710	5.125	5.653	5.509	5.708	5.261	5.791	5.647	5.776	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	8mA	GCLK	t_{co}	3.068	3.302	4.706	5.122	5.649	5.505	5.704	5.257	5.788	5.644	5.773	ns
		GCLK PLL	t_{co}	3.073	3.306	4.697	5.110	5.635	5.491	5.690	5.244	5.772	5.628	5.757	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	4mA	GCLK	t_{co}	3.066	3.299	4.696	5.111	5.638	5.494	5.693	5.247	5.777	5.633	5.762	ns
		GCLK PLL	t_{co}	3.094	3.328	4.724	5.138	5.664	5.520	5.719	5.273	5.802	5.658	5.787	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	6mA	GCLK	t_{co}	3.076	3.311	4.709	5.123	5.649	5.505	5.704	5.258	5.787	5.643	5.772	ns
		GCLK PLL	t_{co}	3.062	3.295	4.686	5.099	5.624	5.480	5.679	5.234	5.762	5.618	5.747	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	8mA	GCLK	t_{co}	2.668	2.842	3.979	4.346	4.821	4.685	4.892	4.453	4.930	4.795	4.940	ns
		GCLK PLL	t_{co}	3.062	3.288	4.646	5.055	5.575	5.431	5.630	5.186	5.709	5.565	5.694	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	10mA	GCLK	t_{co}	3.044	3.278	4.684	5.101	5.629	5.485	5.684	5.237	5.770	5.626	5.755	ns
		GCLK PLL	t_{co}	2.668	2.842	3.979	4.346	4.821	4.685	4.892	4.453	4.930	4.795	4.940	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	12mA	GCLK	t_{co}	3.062	3.288	4.646	5.055	5.575	5.431	5.630	5.186	5.709	5.565	5.694	ns
		GCLK PLL	t_{co}	3.044	3.278	4.684	5.101	5.629	5.485	5.684	5.237	5.770	5.626	5.755	ns

Table 1–64. EP3SL110 Row Pins Output Timing Parameters (Part 3 of 4)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
SSTL-18 CLASS I	4mA	GCLK	t_{co}	3.049	3.284	4.636	5.022	5.516	5.390	5.652	5.141	5.635	5.508	5.728	ns
		GCLK PLL	t_{co}	1.281	1.457	1.859	1.947	2.145	2.165	2.150	2.046	2.246	2.265	2.139	ns
	6mA	GCLK	t_{co}	3.034	3.270	4.633	5.020	5.514	5.388	5.650	5.139	5.633	5.506	5.726	ns
		GCLK PLL	t_{co}	1.266	1.443	1.856	1.945	2.143	2.163	2.148	2.044	2.244	2.263	2.137	ns
	8mA	GCLK	t_{co}	3.023	3.258	4.616	5.003	5.497	5.371	5.633	5.122	5.617	5.490	5.710	ns
		GCLK PLL	t_{co}	1.255	1.431	1.839	1.928	2.126	2.146	2.131	2.027	2.228	2.247	2.121	ns
	10mA	GCLK	t_{co}	2.999	3.235	4.600	4.987	5.482	5.356	5.618	5.107	5.602	5.475	5.695	ns
		GCLK PLL	t_{co}	1.231	1.408	1.823	1.912	2.111	2.131	2.116	2.012	2.213	2.232	2.106	ns
	12mA	GCLK	t_{co}	2.999	3.234	4.599	4.986	5.481	5.355	5.617	5.106	5.601	5.474	5.694	ns
		GCLK PLL	t_{co}	1.231	1.407	1.822	1.911	2.110	2.130	2.116	2.011	2.212	2.231	2.106	ns
SSTL-18 CLASS II	8mA	GCLK	t_{co}	3.009	3.243	4.597	4.982	5.475	5.349	5.611	5.101	5.594	5.467	5.687	ns
		GCLK PLL	t_{co}	1.241	1.416	1.820	1.907	2.104	2.124	2.111	2.006	2.205	2.224	2.100	ns
	16mA	GCLK	t_{co}	3.004	3.238	4.596	4.983	5.477	5.351	5.613	5.103	5.598	5.471	5.691	ns
		GCLK PLL	t_{co}	1.235	1.411	1.819	1.908	2.106	2.126	2.121	2.008	2.209	2.228	2.111	ns
SSTL-15 CLASS I	4mA	GCLK	t_{co}	3.045	3.280	4.647	5.036	5.533	5.407	5.669	5.154	5.651	5.524	5.744	ns
		GCLK PLL	t_{co}	1.277	1.453	1.870	1.961	2.162	2.182	2.167	2.059	2.262	2.281	2.155	ns
	6mA	GCLK	t_{co}	3.022	3.258	4.629	5.019	5.516	5.390	5.652	5.138	5.635	5.508	5.728	ns
		GCLK PLL	t_{co}	1.254	1.431	1.852	1.944	2.145	2.165	2.150	2.043	2.246	2.265	2.139	ns
	8mA	GCLK	t_{co}	3.005	3.241	4.612	5.001	5.498	5.372	5.634	5.120	5.618	5.491	5.711	ns
		GCLK PLL	t_{co}	1.237	1.414	1.835	1.926	2.127	2.147	2.132	2.025	2.229	2.248	2.122	ns

Table 1–70 lists the EP3SL110 row pin delay adders when using the regional clock.

Table 1–70. EP3SL110 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
RCLK input adder	0.086	0.109	0.158	0.16	0.161	0.159	0.281	0.137	0.153	0.153	0.285	ns
RCLK PLL input adder	0.075	0.075	0.117	0.123	0.129	0.125	0.222	0.113	0.118	0.114	0.226	ns
RCLK output adder	-0.072	-0.097	-0.137	-0.135	-0.116	-0.134	-0.24	-0.11	-0.104	-0.124	-0.244	ns
RCLK PLL output adder	-0.063	-0.065	-0.097	-0.1	-0.104	-0.101	-0.198	-0.088	-0.09	-0.088	-0.201	ns

EP3SL150 I/O Timing Parameters

Table 1–71 through Table 1–74 list the maximum I/O timing parameters for EP3SL150 devices for single-ended I/O standards.

Table 1–71 lists the EP3SL150 column pins input timing parameters for single-ended I/O standards.

Table 1–71. EP3SL150 Column Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
3.3-V LVTTL	GCLK	t_{su}	-0.986	-0.964	-1.402	-1.558	-1.797	-1.778	-2.106	-1.558	-1.797	-1.778	-2.106	ns
		t_h	1.119	1.093	1.584	1.767	2.027	1.996	2.327	1.767	2.027	1.996	2.327	ns
	GCLK PLL	t_{su}	-1.278	-1.221	-1.771	-1.984	-2.197	-2.123	-2.542	-1.984	-2.197	-2.123	-2.542	ns
		t_h	1.556	1.499	2.175	2.439	2.697	2.598	3.034	2.439	2.697	2.598	3.034	ns
3.3-V LVCMOS	GCLK	t_{su}	-0.986	-0.964	-1.402	-1.558	-1.797	-1.778	-2.106	-1.558	-1.797	-1.778	-2.106	ns
		t_h	1.119	1.093	1.584	1.767	2.027	1.996	2.327	1.767	2.027	1.996	2.327	ns
	GCLK PLL	t_{su}	-1.278	-1.221	-1.771	-1.984	-2.197	-2.123	-2.542	-1.984	-2.197	-2.123	-2.542	ns
		t_h	1.556	1.499	2.175	2.439	2.697	2.598	3.034	2.439	2.697	2.598	3.034	ns
3.0-V LVTTL	GCLK	t_{su}	-0.997	-0.975	-1.401	-1.560	-1.796	-1.777	-2.105	-1.560	-1.796	-1.777	-2.105	ns
		t_h	1.130	1.104	1.583	1.769	2.026	1.995	2.326	1.769	2.026	1.995	2.326	ns
	GCLK PLL	t_{su}	-1.289	-1.232	-1.770	-1.986	-2.196	-2.122	-2.541	-1.986	-2.196	-2.122	-2.541	ns
		t_h	1.567	1.510	2.174	2.441	2.696	2.597	3.033	2.441	2.696	2.597	3.033	ns
3.0-V LVCMOS	GCLK	t_{su}	-0.997	-0.975	-1.401	-1.560	-1.796	-1.777	-2.105	-1.560	-1.796	-1.777	-2.105	ns
		t_h	1.130	1.104	1.583	1.769	2.026	1.995	2.326	1.769	2.026	1.995	2.326	ns
	GCLK PLL	t_{su}	-1.289	-1.232	-1.770	-1.986	-2.196	-2.122	-2.541	-1.986	-2.196	-2.122	-2.541	ns
		t_h	1.567	1.510	2.174	2.441	2.696	2.597	3.033	2.441	2.696	2.597	3.033	ns
2.5 V	GCLK	t_{su}	-0.992	-0.970	-1.410	-1.572	-1.815	-1.796	-2.124	-1.572	-1.815	-1.796	-2.124	ns
		t_h	1.125	1.099	1.592	1.781	2.045	2.014	2.345	1.781	2.045	2.014	2.345	ns
	GCLK PLL	t_{su}	-1.284	-1.227	-1.779	-1.998	-2.215	-2.141	-2.560	-1.998	-2.215	-2.141	-2.560	ns
		t_h	1.562	1.505	2.183	2.453	2.715	2.616	3.052	2.453	2.715	2.616	3.052	ns

Table 1–91. EP3SL340 Column Pins Input Timing Parameters (Part 4 of 4)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
3.0-V PCI-X	GCLK	t_{su}	-1.356	-1.346	-2.016	-2.063	-2.329	-2.244	-2.541	-2.063	-2.329	-2.244	-2.541	ns
		t_h	1.497	1.487	2.231	2.286	2.573	2.475	2.782	2.286	2.573	2.475	2.782	ns
	GCLK PLL	t_{su}	-1.702	-1.702	-2.553	-2.587	-2.889	-2.798	-3.372	-2.587	-2.889	-2.798	-3.372	ns
		t_h	2.007	2.007	3.030	3.083	3.433	3.312	3.911	3.083	3.433	3.312	3.911	ns

Table 1–92 lists the EP3SL340 row pins input timing parameters for single-ended I/O standards.

Table 1–92. EP3SL340 Row Pins Input Timing Parameters (Part 1 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
3.3-V LVTTL	GCLK	t_{su}	-1.239	-1.296	-1.925	-1.956	-2.199	-2.135	-2.587	-1.973	-2.204	-2.142	-2.522	ns
		t_h	1.362	1.435	2.137	2.177	2.442	2.366	2.822	2.205	2.456	2.382	2.763	ns
	GCLK PLL	t_{su}	0.879	0.945	1.670	1.687	1.786	1.680	1.689	1.689	1.807	1.695	1.746	ns
		t_h	-0.615	-0.660	-1.216	-1.217	-1.263	-1.188	-1.178	-1.208	-1.273	-1.193	-1.231	ns
3.3-V LVCMOS	GCLK	t_{su}	-1.239	-1.296	-1.925	-1.956	-2.199	-2.135	-2.587	-1.973	-2.204	-2.142	-2.522	ns
		t_h	1.362	1.435	2.137	2.177	2.442	2.366	2.822	2.205	2.456	2.382	2.763	ns
	GCLK PLL	t_{su}	0.879	0.945	1.670	1.687	1.786	1.680	1.689	1.689	1.807	1.695	1.746	ns
		t_h	-0.615	-0.660	-1.216	-1.217	-1.263	-1.188	-1.178	-1.208	-1.273	-1.193	-1.231	ns
3.0-V LVTTL	GCLK	t_{su}	-1.245	-1.307	-1.922	-1.957	-2.202	-2.138	-2.590	-1.972	-2.209	-2.147	-2.527	ns
		t_h	1.368	1.446	2.134	2.178	2.445	2.369	2.825	2.204	2.461	2.387	2.768	ns
	GCLK PLL	t_{su}	0.873	0.934	1.673	1.686	1.783	1.677	1.686	1.690	1.802	1.690	1.741	ns
		t_h	-0.609	-0.649	-1.219	-1.216	-1.260	-1.185	-1.175	-1.209	-1.268	-1.188	-1.226	ns
3.0-V LVCMOS	GCLK	t_{su}	-1.245	-1.307	-1.922	-1.957	-2.202	-2.138	-2.590	-1.972	-2.209	-2.147	-2.527	ns
		t_h	1.368	1.446	2.134	2.178	2.445	2.369	2.825	2.204	2.461	2.387	2.768	ns
	GCLK PLL	t_{su}	0.873	0.934	1.673	1.686	1.783	1.677	1.686	1.690	1.802	1.690	1.741	ns
		t_h	-0.609	-0.649	-1.219	-1.216	-1.260	-1.185	-1.175	-1.209	-1.268	-1.188	-1.226	ns
2.5 V	GCLK	t_{su}	-1.233	-1.300	-1.931	-1.970	-2.217	-2.153	-2.605	-1.981	-2.219	-2.157	-2.537	ns
		t_h	1.356	1.439	2.143	2.191	2.460	2.384	2.840	2.213	2.471	2.397	2.778	ns
	GCLK PLL	t_{su}	0.885	0.941	1.664	1.673	1.768	1.662	1.671	1.681	1.792	1.680	1.731	ns
		t_h	-0.621	-0.656	-1.210	-1.203	-1.245	-1.170	-1.160	-1.200	-1.258	-1.178	-1.216	ns
1.8 V	GCLK	t_{su}	-1.251	-1.343	-1.980	-1.995	-2.204	-2.138	-2.582	-2.003	-2.208	-2.153	-2.621	ns
		t_h	1.377	1.482	2.193	2.216	2.447	2.369	2.817	2.234	2.461	2.393	2.859	ns
	GCLK PLL	t_{su}	0.827	0.910	1.624	1.634	1.857	1.742	1.565	1.620	1.886	1.762	1.619	ns
		t_h	-0.562	-0.624	-1.170	-1.164	-1.330	-1.246	-1.060	-1.140	-1.347	-1.255	-1.107	ns

Table 1–92. EP3SL340 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
1.5 V	GCLK	t_{su}	-1.241	-1.332	-1.956	-1.963	-2.136	-2.070	-2.514	-1.972	-2.143	-2.088	-2.556	ns
		t_h	1.367	1.471	2.169	2.184	2.379	2.301	2.749	2.203	2.396	2.328	2.794	ns
	GCLK PLL	t_{su}	0.837	0.921	1.648	1.666	1.925	1.810	1.633	1.651	1.951	1.827	1.684	ns
		t_h	-0.572	-0.635	-1.194	-1.196	-1.398	-1.314	-1.128	-1.171	-1.412	-1.320	-1.172	ns
1.2 V	GCLK	t_{su}	-1.181	-1.279	-1.877	-1.862	-1.977	-1.911	-2.355	-1.876	-1.988	-1.933	-2.401	ns
		t_h	1.307	1.418	2.090	2.083	2.220	2.142	2.590	2.107	2.241	2.173	2.639	ns
	GCLK PLL	t_{su}	0.897	0.974	1.727	1.767	2.084	1.969	1.792	1.747	2.106	1.982	1.839	ns
		t_h	-0.632	-0.688	-1.273	-1.297	-1.557	-1.473	-1.287	-1.267	-1.567	-1.475	-1.327	ns
SSTL-2 CLASS I	GCLK	t_{su}	-1.176	-1.242	-1.845	-1.861	-1.997	-1.933	-2.385	-1.869	-2.002	-1.940	-2.320	ns
		t_h	1.300	1.382	2.057	2.082	2.240	2.164	2.620	2.101	2.254	2.180	2.561	ns
	GCLK PLL	t_{su}	0.942	1.000	1.750	1.782	1.988	1.882	1.891	1.793	2.009	1.897	1.948	ns
		t_h	-0.677	-0.714	-1.296	-1.312	-1.465	-1.390	-1.380	-1.312	-1.475	-1.395	-1.433	ns
SSTL-2 CLASS II	GCLK	t_{su}	-1.176	-1.242	-1.845	-1.861	-1.997	-1.933	-2.385	-1.869	-2.002	-1.940	-2.320	ns
		t_h	1.300	1.382	2.057	2.082	2.240	2.164	2.620	2.101	2.254	2.180	2.561	ns
	GCLK PLL	t_{su}	0.942	1.000	1.750	1.782	1.988	1.882	1.891	1.793	2.009	1.897	1.948	ns
		t_h	-0.677	-0.714	-1.296	-1.312	-1.465	-1.390	-1.380	-1.312	-1.475	-1.395	-1.433	ns
SSTL-18 CLASS I	GCLK	t_{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t_h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t_{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t_h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns
SSTL-18 CLASS II	GCLK	t_{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t_h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t_{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t_h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns
SSTL-15 CLASS I	GCLK	t_{su}	-1.141	-1.232	-1.824	-1.825	-1.954	-1.887	-2.333	-1.833	-1.964	-1.908	-2.377	ns
		t_h	1.267	1.371	2.038	2.044	2.195	2.117	2.564	2.062	2.214	2.147	2.611	ns
	GCLK PLL	t_{su}	0.937	1.021	1.778	1.804	2.104	1.990	1.814	1.790	2.127	2.005	1.863	ns
		t_h	-0.672	-0.735	-1.323	-1.336	-1.580	-1.496	-1.313	-1.312	-1.591	-1.499	-1.355	ns
1.8-V HSTL CLASS I	GCLK	t_{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t_h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t_{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t_h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns
1.8-V HSTL CLASS II	GCLK	t_{su}	-1.155	-1.244	-1.839	-1.835	-1.972	-1.905	-2.351	-1.844	-1.981	-1.925	-2.394	ns
		t_h	1.281	1.383	2.052	2.054	2.213	2.135	2.582	2.073	2.231	2.164	2.628	ns
	GCLK PLL	t_{su}	0.923	1.009	1.765	1.794	2.086	1.972	1.796	1.779	2.110	1.988	1.846	ns
		t_h	-0.658	-0.723	-1.311	-1.326	-1.562	-1.478	-1.295	-1.301	-1.574	-1.482	-1.338	ns

Table 1–96. EP3SL340 Row Pins Input Timing Parameters (Part 2 of 2)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t_{su}	-1.074	-1.147	-1.725	-1.737	-1.879	-1.813	-2.259	-1.747	-1.885	-1.823	-2.304	ns
		t_h	1.201	1.288	1.944	1.961	2.124	2.047	2.496	1.980	2.138	2.066	2.542	ns
	GCLK PLL	t_{su}	0.984	0.997	1.754	1.867	2.076	1.965	1.868	1.884	2.097	1.985	1.922	ns
		t_h	-0.717	-0.712	-1.300	-1.395	-1.552	-1.471	-1.362	-1.403	-1.562	-1.479	-1.410	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t_{su}	-1.060	-1.135	-1.716	-1.727	-1.861	-1.795	-2.241	-1.736	-1.868	-1.806	-2.287	ns
		t_h	1.187	1.276	1.935	1.951	2.106	2.029	2.478	1.969	2.121	2.049	2.525	ns
	GCLK PLL	t_{su}	0.998	1.009	1.767	1.877	2.094	1.983	1.886	1.895	2.114	2.002	1.939	ns
		t_h	-0.731	-0.724	-1.312	-1.405	-1.570	-1.489	-1.380	-1.414	-1.579	-1.496	-1.427	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t_{su}	-1.060	-1.135	-1.716	-1.727	-1.861	-1.795	-2.241	-1.736	-1.868	-1.806	-2.287	ns
		t_h	1.187	1.276	1.935	1.951	2.106	2.029	2.478	1.969	2.121	2.049	2.525	ns
	GCLK PLL	t_{su}	0.998	1.009	1.767	1.877	2.094	1.983	1.886	1.895	2.114	2.002	1.939	ns
		t_h	-0.731	-0.724	-1.312	-1.405	-1.570	-1.489	-1.380	-1.414	-1.579	-1.496	-1.427	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t_{su}	-1.074	-1.147	-1.725	-1.737	-1.879	-1.813	-2.259	-1.747	-1.885	-1.823	-2.304	ns
		t_h	1.201	1.288	1.944	1.961	2.124	2.047	2.496	1.980	2.138	2.066	2.542	ns
	GCLK PLL	t_{su}	0.984	0.997	1.754	1.867	2.076	1.965	1.868	1.884	2.097	1.985	1.922	ns
		t_h	-0.717	-0.712	-1.300	-1.395	-1.552	-1.471	-1.362	-1.403	-1.562	-1.479	-1.410	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t_{su}	-1.074	-1.147	-1.725	-1.737	-1.879	-1.813	-2.259	-1.747	-1.885	-1.823	-2.304	ns
		t_h	1.201	1.288	1.944	1.961	2.124	2.047	2.496	1.980	2.138	2.066	2.542	ns
	GCLK PLL	t_{su}	0.984	0.997	1.754	1.867	2.076	1.965	1.868	1.884	2.097	1.985	1.922	ns
		t_h	-0.717	-0.712	-1.300	-1.395	-1.552	-1.471	-1.362	-1.403	-1.562	-1.479	-1.410	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t_{su}	-1.083	-1.156	-1.739	-1.748	-1.886	-1.821	-2.265	-1.754	-1.886	-1.826	-2.306	ns
		t_h	1.210	1.297	1.959	1.975	2.134	2.057	2.507	1.990	2.144	2.071	2.549	ns
	GCLK PLL	t_{su}	0.985	0.998	1.749	1.861	2.075	1.963	1.867	1.883	2.101	1.987	1.925	ns
		t_h	-0.718	-0.713	-1.295	-1.387	-1.548	-1.467	-1.357	-1.399	-1.563	-1.480	-1.409	ns
	GCLK	t_{su}	-1.083	-1.156	-1.739	-1.748	-1.886	-1.821	-2.265	-1.754	-1.886	-1.826	-2.306	ns
		t_h	1.210	1.297	1.959	1.975	2.134	2.057	2.507	1.990	2.144	2.071	2.549	ns
	GCLK PLL	t_{su}	0.985	0.998	1.749	1.861	2.075	1.963	1.867	1.883	2.101	1.987	1.925	ns
		t_h	-0.718	-0.713	-1.295	-1.387	-1.548	-1.467	-1.357	-1.399	-1.563	-1.480	-1.409	ns

Table 1–98. EP3SL340 Row Pins Output Timing Parameters (Part 3 of 3)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
DIFFERENTIAL 1.8-V SSTL CLASS I	4mA	GCLK	t_{co}	3.459	3.732	5.492	5.690	6.234	6.081	6.458	5.828	6.368	6.218	6.538	ns
		GCLK PLL	t_{co}	1.510	1.701	2.233	2.329	2.560	2.564	2.601	2.440	2.672	2.674	2.590	ns
	6mA	GCLK	t_{co}	3.444	3.717	5.478	5.675	6.219	6.066	6.443	5.813	6.353	6.203	6.523	ns
		GCLK PLL	t_{co}	1.495	1.686	2.219	2.314	2.545	2.549	2.586	2.425	2.657	2.659	2.575	ns
	8mA	GCLK	t_{co}	3.433	3.706	5.473	5.672	6.216	6.063	6.440	5.810	6.351	6.201	6.521	ns
		GCLK PLL	t_{co}	1.484	1.675	2.214	2.311	2.542	2.546	2.583	2.422	2.655	2.657	2.573	ns
	10mA	GCLK	t_{co}	3.413	3.686	5.450	5.648	6.193	6.040	6.417	5.787	6.327	6.177	6.497	ns
		GCLK PLL	t_{co}	1.464	1.655	2.191	2.287	2.519	2.523	2.560	2.399	2.631	2.633	2.549	ns
	12mA	GCLK	t_{co}	3.410	3.682	5.446	5.645	6.189	6.036	6.413	5.783	6.324	6.174	6.494	ns
		GCLK PLL	t_{co}	1.461	1.651	2.187	2.284	2.515	2.519	2.556	2.395	2.628	2.630	2.546	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	8mA	GCLK	t_{co}	3.415	3.686	5.437	5.633	6.175	6.022	6.399	5.770	6.308	6.158	6.478	ns
		GCLK PLL	t_{co}	1.466	1.655	2.178	2.272	2.501	2.505	2.542	2.382	2.612	2.614	2.530	ns
	16mA	GCLK	t_{co}	3.408	3.679	5.436	5.634	6.178	6.025	6.402	5.773	6.313	6.163	6.483	ns
		GCLK PLL	t_{co}	1.459	1.648	2.177	2.273	2.504	2.508	2.545	2.385	2.617	2.619	2.535	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	8mA	GCLK	t_{co}	3.446	3.718	5.474	5.671	6.214	6.061	6.438	5.809	6.348	6.198	6.518	ns
		GCLK PLL	t_{co}	1.487	1.677	2.205	2.300	2.530	2.534	2.571	2.411	2.642	2.644	2.560	ns
	12mA	GCLK	t_{co}	3.428	3.701	5.459	5.656	6.199	6.046	6.423	5.794	6.333	6.183	6.503	ns
		GCLK PLL	t_{co}	1.469	1.660	2.190	2.285	2.515	2.519	2.556	2.396	2.627	2.629	2.545	ns
DIFFERENTIAL 2.5-V SSTL CLASS II	16mA	GCLK	t_{co}	3.414	3.685	5.436	5.632	6.174	6.021	6.398	5.770	6.308	6.158	6.478	ns
		GCLK PLL	t_{co}	1.455	1.644	2.167	2.261	2.490	2.494	2.531	2.372	2.602	2.604	2.520	ns

Table 1–103. EP3SE50 Column Pins Output Timing Parameters (Part 6 of 6)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
1.2-V HSTL CLASS I	4mA	GCLK	t_{co}	3.048	3.058	4.317	4.683	5.208	5.088	5.302	4.683	5.208	5.088	5.302	ns
		GCLK PLL	t_{co}	3.397	3.371	4.777	5.212	5.710	5.565	5.864	5.212	5.710	5.565	5.864	ns
	6mA	GCLK	t_{co}	3.040	3.050	4.308	4.668	5.191	5.071	5.290	4.668	5.191	5.071	5.290	ns
		GCLK PLL	t_{co}	3.389	3.363	4.768	5.203	5.701	5.556	5.855	5.203	5.701	5.556	5.855	ns
	8mA	GCLK	t_{co}	3.041	3.051	4.315	4.674	5.187	5.067	5.293	4.674	5.187	5.067	5.293	ns
		GCLK PLL	t_{co}	3.390	3.364	4.775	5.212	5.710	5.565	5.864	5.212	5.710	5.565	5.864	ns
	10mA	GCLK	t_{co}	3.030	3.040	4.302	4.661	5.164	5.044	5.287	4.661	5.164	5.044	5.287	ns
		GCLK PLL	t_{co}	3.379	3.353	4.762	5.198	5.696	5.551	5.850	5.198	5.696	5.551	5.850	ns
	12mA	GCLK	t_{co}	3.030	3.040	4.302	4.661	5.165	5.045	5.279	4.661	5.165	5.045	5.279	ns
		GCLK PLL	t_{co}	3.379	3.353	4.762	5.198	5.697	5.552	5.851	5.198	5.697	5.552	5.851	ns
1.2-V HSTL CLASS II	16mA	GCLK	t_{co}	3.061	3.061	4.318	4.685	5.243	5.123	5.316	4.685	5.243	5.123	5.316	ns
		GCLK PLL	t_{co}	3.400	3.374	4.778	5.213	5.710	5.565	5.864	5.213	5.710	5.565	5.864	ns
3.0-V PCI	—	GCLK	t_{co}	3.154	3.164	4.363	4.710	5.218	5.098	5.347	4.710	5.218	5.098	5.347	ns
		GCLK PLL	t_{co}	3.503	3.477	4.823	5.247	5.735	5.590	5.889	5.247	5.735	5.590	5.889	ns
3.0-V PCI-X	—	GCLK	t_{co}	3.154	3.164	4.363	4.710	5.218	5.098	5.347	4.710	5.218	5.098	5.347	ns
		GCLK PLL	t_{co}	3.503	3.477	4.823	5.247	5.735	5.590	5.889	5.247	5.735	5.590	5.889	ns

Table 1–104 lists the EP3SE50 row pins output timing parameters for single-ended I/O standards.

Table 1–104. EP3SE50 Row Pins Output Timing Parameters (Part 1 of 5)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
3.3-V LVTTL	4mA	GCLK	t_{co}	3.161	3.395	4.722	5.117	5.622	5.486	5.755	5.247	5.754	5.618	5.832	ns
		GCLK PLL	t_{co}	1.488	1.692	2.101	2.185	2.381	2.400	2.349	2.304	2.505	2.523	2.344	ns
	8mA	GCLK	t_{co}	3.095	3.324	4.612	5.005	5.508	5.372	5.611	5.134	5.638	5.502	5.683	ns
		GCLK PLL	t_{co}	1.395	1.587	1.971	2.047	2.237	2.256	2.205	2.163	2.356	2.374	2.195	ns
	12mA	GCLK	t_{co}	3.016	3.235	4.506	4.905	5.412	5.276	5.483	5.035	5.539	5.403	5.551	ns
		GCLK PLL	t_{co}	1.314	1.493	1.852	1.924	2.109	2.128	2.077	2.036	2.224	2.242	2.063	ns

Table 1–106. EP3SE50 Row Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{su}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t_h	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t_{su}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t_h	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{su}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t_h	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t_{su}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t_h	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{su}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t_h	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t_{su}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t_h	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t_{su}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t_h	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t_{su}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t_h	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t_{su}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t_h	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t_{su}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t_h	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t_{su}	-0.749	-0.785	-1.110	-1.211	-1.317	-1.267	-1.542	-1.219	-1.323	-1.275	-1.579	ns
		t_h	0.865	0.914	1.297	1.418	1.547	1.483	1.757	1.436	1.564	1.502	1.795	ns
	GCLK PLL	t_{su}	1.072	1.074	1.770	2.010	2.245	2.124	2.149	2.013	2.249	2.128	2.196	ns
		t_h	-0.819	-0.810	-1.368	-1.561	-1.741	-1.652	-1.671	-1.555	-1.736	-1.646	-1.716	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t_{su}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t_h	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t_{su}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t_h	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t_{su}	-0.763	-0.797	-1.123	-1.221	-1.335	-1.285	-1.560	-1.230	-1.340	-1.292	-1.596	ns
		t_h	0.879	0.926	1.309	1.428	1.565	1.501	1.775	1.447	1.581	1.519	1.812	ns
	GCLK PLL	t_{su}	1.058	1.062	1.757	2.000	2.227	2.106	2.131	2.002	2.232	2.111	2.179	ns
		t_h	-0.805	-0.798	-1.356	-1.551	-1.723	-1.634	-1.653	-1.544	-1.719	-1.629	-1.699	ns
DIFFERENTIAL 2.5-V SSTL CLASS I	GCLK	t_{su}	-0.762	-0.796	-1.128	-1.227	-1.336	-1.287	-1.561	-1.231	-1.336	-1.290	-1.593	ns
		t_h	0.878	0.925	1.314	1.436	1.569	1.505	1.780	1.451	1.580	1.518	1.813	ns
	GCLK PLL	t_{su}	1.049	1.053	1.742	1.984	2.216	2.094	2.120	1.991	2.226	2.103	2.172	ns
		t_h	-0.796	-0.789	-1.341	-1.533	-1.709	-1.620	-1.638	-1.530	-1.710	-1.620	-1.688	ns

Table 1–132. EP3SE260 Row Pins Input Timing Parameters (Part 3 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
SSTL-15 CLASS I	GCLK	t_{su}	1.064	0.995	-1.974	-1.378	-1.541	-1.455	-1.458	-1.477	-1.526	-1.455	-1.458	ns
		t_h	1.325	1.487	2.209	-2.007	-2.128	-2.081	-2.534	-1.932	-2.182	-2.081	-2.534	ns
	GCLK PLL	t_{su}	-1.173	-1.324	1.773	2.248	2.393	2.331	2.783	2.185	2.457	2.331	2.783	ns
		t_h	1.078	1.007	-1.294	1.874	2.092	1.974	1.990	1.986	2.088	1.974	1.990	ns
1.8-V HSTL CLASS I	GCLK	t_{su}	1.311	1.475	-1.974	-1.378	-1.541	-1.455	-1.458	-1.477	-1.526	-1.455	-1.458	ns
		t_h	-1.173	-1.324	-1.303	1.884	2.110	1.992	2.008	1.997	2.105	1.992	2.008	ns
	GCLK PLL	t_{su}	1.078	1.007	-1.965	-1.388	-1.559	-1.473	-1.476	-1.488	-1.543	-1.473	-1.476	ns
		t_h	1.311	1.475	2.200	-1.997	-2.110	-2.063	-2.516	-1.921	-2.165	-2.063	-2.516	ns
1.8-V HSTL CLASS II	GCLK	t_{su}	-1.164	-1.312	1.782	2.238	2.375	2.313	2.765	2.174	2.440	2.313	2.765	ns
		t_h	1.087	1.019	-1.303	1.884	2.110	1.992	2.008	1.997	2.105	1.992	2.008	ns
	GCLK PLL	t_{su}	1.302	1.463	-1.965	-1.388	-1.559	-1.473	-1.476	-1.488	-1.543	-1.473	-1.476	ns
		t_h	-1.164	-1.312	-1.303	1.894	2.126	2.008	2.024	2.006	2.121	2.008	2.024	ns
1.5-V HSTL CLASS I	GCLK	t_{su}	1.087	1.019	-2.056	-1.398	-1.575	-1.489	-1.492	-1.497	-1.559	-1.489	-1.492	ns
		t_h	1.302	1.463	1.752	-1.987	-2.094	-2.047	-2.500	-1.912	-2.149	-2.047	-2.500	ns
	GCLK PLL	t_{su}	-1.225	-1.385	2.290	2.228	2.359	2.297	2.749	2.165	2.424	2.297	2.749	ns
		t_h	1.361	1.535	-2.056	1.894	2.126	2.008	2.024	2.006	2.121	2.008	2.024	ns
1.5-V HSTL CLASS II	GCLK	t_{su}	0.977	0.972	1.752	-1.398	-1.575	-1.489	-1.492	-1.497	-1.559	-1.489	-1.492	ns
		t_h	-0.698	-0.674	2.290	-1.987	-2.094	-2.047	-2.500	-1.912	-2.149	-2.047	-2.500	ns
	GCLK PLL	t_{su}	-1.225	-1.385	2.290	2.228	2.359	2.297	2.749	2.165	2.424	2.297	2.749	ns
		t_h	1.361	1.535	2.290	1.894	2.126	2.008	2.024	2.006	2.121	2.008	2.024	ns
1.2-V HSTL CLASS I	GCLK	t_{su}	0.977	0.972	2.290	-1.398	-1.575	-1.489	-1.492	-1.497	-1.559	-1.489	-1.492	ns
		t_h	-0.698	-0.674	2.290	-1.987	-2.094	-2.047	-2.500	-1.912	-2.149	-2.047	-2.500	ns
	GCLK PLL	t_{su}	-1.219	-1.374	-2.059	-1.988	-2.283	-2.177	-2.643	-2.003	-2.382	-2.177	-2.643	ns
		t_h	1.355	1.524	1.749	1.864	1.862	1.767	1.884	1.864	1.883	1.767	1.884	ns
1.2-V HSTL CLASS II	GCLK	t_{su}	0.983	0.983	2.293	2.233	2.553	2.431	2.902	2.260	2.659	2.431	2.902	ns
		t_h	-0.704	-0.685	-2.059	-1.988	-2.283	-2.177	-2.643	-2.003	-2.382	-2.177	-2.643	ns
	GCLK PLL	t_{su}	-1.219	-1.374	-2.059	-1.988	-2.283	-2.177	-2.643	-2.003	-2.382	-2.177	-2.643	ns
		t_h	1.355	1.524	1.749	1.864	1.862	1.767	1.884	1.864	1.883	1.767	1.884	ns
3.0-V PCI	GCLK	t_{su}	0.983	0.983	2.293	2.233	2.553	2.431	2.902	2.260	2.659	2.431	2.902	ns
		t_h	-0.704	-0.685	-2.056	-1.989	-2.286	-2.180	-2.646	-2.002	-2.387	-2.180	-2.646	ns
	GCLK PLL	t_{su}	-1.225	-1.385	2.290	2.234	2.556	2.434	2.905	2.259	2.664	2.434	2.905	ns
		t_h	1.361	1.535	-2.056	-1.989	-2.286	-2.180	-2.646	-2.002	-2.387	-2.180	-2.646	ns
3.0-V PCI-X	GCLK	t_{su}	0.977	0.972	1.752	1.863	1.859	1.764	1.881	1.865	1.878	1.764	1.881	ns
		t_h	-0.698	-0.674	2.290	2.234	2.556	2.434	2.905	2.259	2.664	2.434	2.905	ns
	GCLK PLL	t_{su}	-1.225	-1.385	2.299	2.247	2.571	2.449	2.920	2.268	2.674	2.449	2.920	ns
		t_h	1.361	1.535	-2.065	-2.002	-2.301	-2.195	-2.661	-2.011	-2.397	-2.195	-2.661	ns

Table 1–133. EP3SE260 Column Pins Output Timing Parameters (Part 2 of 7)

I/O Standard	Current Strength	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
				Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
3.0-V LVCMOS	4mA	GCLK	t_{co}	3.522	3.555	5.173	5.328	5.996	5.703	6.123	5.328	5.996	5.703	6.123	ns
		GCLK PLL	t_{co}	3.965	3.954	5.808	6.012	6.566	6.395	7.044	6.012	6.566	6.395	7.044	ns
	8mA	GCLK	t_{co}	3.443	3.476	5.049	5.199	5.814	5.568	5.988	5.199	5.814	5.568	5.988	ns
		GCLK PLL	t_{co}	3.886	3.875	5.684	5.883	6.431	6.260	6.862	5.883	6.431	6.260	6.862	ns
	12mA	GCLK	t_{co}	3.438	3.471	5.042	5.192	5.746	5.558	5.980	5.192	5.746	5.558	5.980	ns
		GCLK PLL	t_{co}	3.881	3.870	5.677	5.876	6.422	6.250	6.795	5.876	6.422	6.250	6.795	ns
	16mA	GCLK	t_{co}	3.429	3.462	5.028	5.177	5.744	5.543	5.965	5.177	5.744	5.543	5.965	ns
		GCLK PLL	t_{co}	3.872	3.861	5.663	5.861	6.407	6.235	6.792	5.861	6.407	6.235	6.792	ns
2.5 V	4mA	GCLK	t_{co}	3.644	3.677	5.380	5.555	6.278	5.950	6.370	5.555	6.278	5.950	6.370	ns
		GCLK PLL	t_{co}	4.087	4.076	6.015	6.239	6.813	6.642	7.326	6.239	6.813	6.642	7.326	ns
	8mA	GCLK	t_{co}	3.544	3.577	5.261	5.429	6.081	5.818	6.238	5.429	6.081	5.818	6.238	ns
		GCLK PLL	t_{co}	3.987	3.976	5.896	6.113	6.681	6.510	7.129	6.113	6.681	6.510	7.129	ns
	12mA	GCLK	t_{co}	3.500	3.533	5.174	5.338	5.941	5.721	6.143	5.338	5.941	5.721	6.143	ns
		GCLK PLL	t_{co}	3.943	3.932	5.809	6.022	6.585	6.413	6.989	6.022	6.585	6.413	6.989	ns
	16mA	GCLK	t_{co}	3.462	3.495	5.135	5.296	5.891	5.678	6.100	5.296	5.891	5.678	6.100	ns
		GCLK PLL	t_{co}	3.905	3.894	5.770	5.980	6.542	6.370	6.939	5.980	6.542	6.370	6.939	ns

Table 1–135. EP3SE260 Column Pins Input Timing Parameters (Part 2 of 3)

I/O Standard	Clock	Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
			Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
DIFFERENTIAL 1.2-V HSTL CLASS II	GCLK	t_{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t_h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t_{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t_h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V HSTL CLASS I	GCLK	t_{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t_h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t_{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t_h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V HSTL CLASS II	GCLK	t_{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t_h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t_{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t_h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.8-V HSTL CLASS I	GCLK	t_{su}	-1.161	-1.233	-1.889	-1.922	-2.083	-2.003	-2.475	-1.939	-2.099	-2.003	-2.475	ns
		t_h	1.297	1.388	2.124	2.161	2.346	2.253	2.727	2.188	2.370	2.253	2.727	ns
	GCLK PLL	t_{su}	1.095	1.110	1.872	1.975	2.191	2.083	2.080	1.987	2.202	2.083	2.080	ns
		t_h	-0.816	-0.809	-1.393	-1.482	-1.643	-1.564	-1.546	-1.482	-1.644	-1.564	-1.546	ns
DIFFERENTIAL 1.8-V HSTL CLASS II	GCLK	t_{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t_h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t_{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t_h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V SSTL CLASS I	GCLK	t_{su}	-1.173	-1.244	-1.898	-1.933	-2.102	-2.022	-2.494	-1.950	-2.117	-2.022	-2.494	ns
		t_h	1.309	1.399	2.133	2.172	2.365	2.272	2.746	2.199	2.388	2.272	2.746	ns
	GCLK PLL	t_{su}	1.083	1.099	1.863	1.964	2.172	2.064	2.061	1.976	2.184	2.064	2.061	ns
		t_h	-0.804	-0.798	-1.384	-1.471	-1.624	-1.545	-1.527	-1.471	-1.626	-1.545	-1.527	ns
DIFFERENTIAL 1.5-V SSTL CLASS II	GCLK	t_{su}	-1.180	-1.250	-1.910	-1.938	-2.102	-2.024	-2.493	-1.954	-2.112	-2.024	-2.493	ns
		t_h	1.316	1.405	2.146	2.180	2.368	2.275	2.750	2.206	2.388	2.275	2.750	ns
	GCLK PLL	t_{su}	1.076	1.093	1.851	1.959	2.172	2.062	2.062	1.972	2.189	2.062	2.062	ns
		t_h	-0.797	-0.792	-1.371	-1.463	-1.621	-1.542	-1.523	-1.464	-1.626	-1.542	-1.523	ns
DIFFERENTIAL 1.8-V SSTL CLASS I	GCLK	t_{su}	-1.180	-1.250	-1.910	-1.938	-2.102	-2.024	-2.493	-1.954	-2.112	-2.024	-2.493	ns
		t_h	1.316	1.405	2.146	2.180	2.368	2.275	2.750	2.206	2.388	2.275	2.750	ns
	GCLK PLL	t_{su}	1.076	1.093	1.851	1.959	2.172	2.062	2.062	1.972	2.189	2.062	2.062	ns
		t_h	-0.797	-0.792	-1.371	-1.463	-1.621	-1.542	-1.523	-1.464	-1.626	-1.542	-1.523	ns
DIFFERENTIAL 1.8-V SSTL CLASS II	GCLK	t_{su}	-1.153	-1.221	-1.879	-1.911	-2.067	-1.987	-2.459	-1.928	-2.084	-1.987	-2.459	ns
		t_h	1.289	1.376	2.114	2.150	2.330	2.237	2.711	2.177	2.355	2.237	2.711	ns
	GCLK PLL	t_{su}	1.103	1.122	1.882	1.986	2.207	2.099	2.096	1.998	2.217	2.099	2.096	ns
		t_h	-0.824	-0.821	-1.403	-1.493	-1.659	-1.580	-1.562	-1.493	-1.659	-1.580	-1.562	ns

Table 1–139 and Table 1–140 list the EP3SE260 regional clock (RCLK) adder values that must be added to the GCLK values. Use these adder values to determine I/O timing when the I/O pin is driven using the regional clock. This applies to all I/O standards supported by Stratix III devices.

Table 1–139 lists the EP3SE260 column pin delay adders when using the regional clock.

Table 1–139. EP3SE260 Column Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
RCLK input adder	0.233	0.311	0.488	0.489	0.45	0.439	0.515	0.416	0.458	0.439	0.515	ns
RCLK PLL input adder	-0.036	0.028	0.059	0.06	0.113	0.11	-0.005	-0.038	0.121	0.11	-0.005	ns
RCLK output adder	-0.204	-0.237	-0.334	-0.331	-0.413	-0.405	-0.44	-0.32	-0.371	-0.405	-0.44	ns
RCLK PLL output adder	1.899	1.965	3.193	3.323	3.677	3.512	3.802	3.346	3.705	3.512	3.802	ns

Table 1–140 lists the EP3SE260 row pin delay adders when using the regional clock in Stratix III devices.

Table 1–140. EP3SE260 Row Pin Delay Adders for Regional Clock

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
RCLK input adder	0.244	0.293	0.438	0.412	0.471	0.427	0.577	0.421	0.452	0.427	0.577	ns
RCLK PLL input adder	0.124	0.134	0.21	0.215	0.234	0.228	0.297	0.217	0.239	0.228	0.297	ns
RCLK output adder	-0.256	-0.289	-0.418	-0.424	-0.484	-0.438	-0.591	-0.443	-0.464	-0.438	-0.591	ns
RCLK PLL output adder	-0.134	-0.147	-0.228	-0.233	-0.254	-0.261	-0.322	-0.236	-0.262	-0.261	-0.322	ns

EP3SL70 Clock Timing Parameters

Table 1–148 and Table 1–149 list the global clock timing specifications for EP3SL70 devices.

Table 1–148. EP3SL70 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.749	1.735	2.434	2.702	3.056	2.950	3.403	2.702	3.056	2.950	3.403	ns
t_{COUT}	1.749	1.735	2.434	2.702	3.056	2.950	3.403	2.702	3.056	2.950	3.403	ns
t_{PLLCIN}	-0.012	-0.021	-0.255	-0.306	-0.251	-0.203	-0.044	-0.306	0.161	-0.203	-0.044	ns
$t_{PLLCOUT}$	-0.012	-0.021	-0.255	-0.306	-0.251	-0.203	-0.044	-0.306	0.161	-0.203	-0.044	ns

Table 1–149. EP3SL70 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.732	1.840	2.524	2.758	3.083	2.986	3.227	2.811	3.157	3.042	3.260	ns
t_{COUT}	1.650	1.749	2.382	2.595	2.902	2.815	3.068	2.641	2.968	2.863	3.101	ns
t_{PLLCIN}	0.051	0.115	-0.144	-0.219	-0.193	-0.144	-0.188	-0.170	0.275	-0.097	-0.234	ns
$t_{PLLCOUT}$	-0.031	0.024	-0.286	-0.382	-0.374	-0.315	-0.347	-0.340	0.086	-0.276	-0.393	ns

Table 1–150 and Table 1–151 list the regional clock timing parameters for EP3SL70 devices.

Table 1–150. EP3SL70 Column Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.689	1.689	2.388	2.649	3.004	2.723	3.132	2.649	3.014	2.723	3.132	ns
t_{COUT}	1.689	1.689	2.388	2.649	3.004	2.723	3.132	2.649	3.014	2.723	3.132	ns
t_{PLLCIN}	-0.011	-0.022	-0.261	-0.308	-0.256	-0.207	-0.054	-0.308	0.224	-0.207	-0.054	ns
$t_{PLLCOUT}$	-0.011	-0.022	-0.261	-0.308	-0.256	-0.207	-0.054	-0.308	0.224	-0.207	-0.054	ns

Table 1–151. EP3SL70 Row Pin Regional Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.637	1.726	2.353	2.566	2.885	2.786	2.964	2.625	2.948	2.839	3.001	ns
t_{COUT}	1.555	1.635	2.211	2.403	2.704	2.615	2.805	2.455	2.759	2.660	2.842	ns
t_{PLLCIN}	0.018	0.085	-0.176	-0.252	-0.230	-0.180	-0.226	-0.203	0.307	-0.139	-0.272	ns
$t_{PLLCOUT}$	-0.064	-0.006	-0.318	-0.415	-0.411	-0.351	-0.385	-0.373	0.118	-0.318	-0.431	ns

Table 1–176 and Table 1–177 list the periphery clock timing parameters for EP3SL340 devices.

Table 1–176. EP3SL340 Column Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.778	1.760	2.687	2.847	3.240	3.099	3.718	2.847	3.240	3.099	3.718	ns
t_{COUT}	1.778	1.760	2.687	2.847	3.240	3.099	3.718	2.847	3.240	3.099	3.718	ns
t_{PLLCIN}	0.086	0.061	-0.164	-0.161	-0.140	-0.097	0.101	-0.161	-0.140	-0.097	0.101	ns
$t_{PLLCOUT}$	0.086	0.061	-0.164	-0.161	-0.140	-0.097	0.101	-0.161	-0.140	-0.097	0.101	ns

Table 1–177. EP3SL340 Row Pin Periphery Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.524	1.616	2.435	2.567	2.958	2.823	3.141	2.605	3.002	2.861	3.165	ns
t_{COUT}	1.442	1.525	2.280	2.404	2.777	2.652	2.982	2.435	2.813	2.682	3.006	ns
t_{PLLCIN}	0.116	0.211	-0.039	-0.116	-0.055	-0.030	-0.051	-0.040	-0.006	0.050	-0.098	ns
$t_{PLLCOUT}$	0.034	0.120	-0.191	-0.279	-0.236	-0.201	-0.210	-0.210	-0.195	-0.129	-0.257	ns

EP3SE50 Clock Timing Parameters

Table 1–178 and Table 1–179 list the global clock timing parameters for EP3SE50 devices.

Table 1–178. EP3SE50 Column Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.786	1.789	2.495	2.748	3.111	2.993	3.489	2.748	3.105	2.993	3.489	ns
t_{COUT}	1.786	1.789	2.495	2.748	3.111	2.993	3.489	2.748	3.105	2.993	3.489	ns
t_{PLLCIN}	0.023	0.027	-0.204	-0.268	-0.226	-0.180	0.025	-0.268	0.249	-0.180	0.025	ns
$t_{PLLCOUT}$	0.083	0.103	-0.068	-0.131	-0.226	-0.010	0.025	-0.131	0.249	-0.010	0.025	ns

Table 1–179. EP3SE50 Row Pin Global Clock Timing Specifications

Parameter	Fast Model		C2	C3	C4	C4L		I3	I4	I4L		Units
	Industrial	Commercial	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 1.1 V	V_{CCL}= 0.9 V	
t_{CIN}	1.739	1.849	2.536	2.769	3.112	3.010	3.250	2.830	3.171	3.069	3.276	ns
t_{COUT}	1.657	1.758	2.394	2.606	2.931	2.839	3.091	2.660	2.982	2.890	3.117	ns
t_{PLLCIN}	0.044	0.117	-0.143	-0.220	-0.183	-0.135	-0.189	-0.171	0.345	-0.088	-0.242	ns
$t_{PLLCOUT}$	-0.038	0.026	-0.285	-0.383	-0.364	-0.306	-0.348	-0.341	0.156	-0.267	-0.401	ns