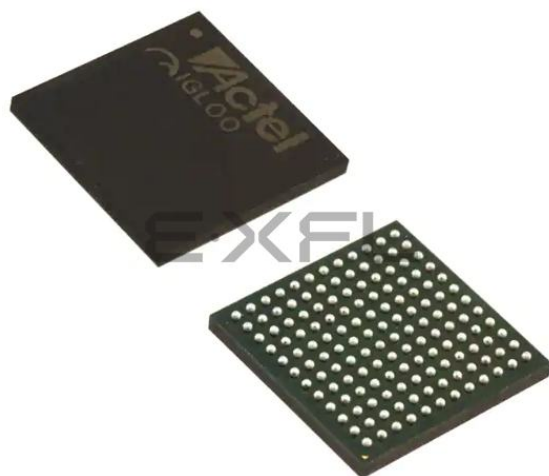




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Applications of Embedded - FPGAs

The versatility of Embedded - FPGAs makes them indispensable in numerous fields. In telecommunications.

Details

Product Status	Active
Number of LABs/CLBs	-
Number of Logic Elements/Cells	-
Total RAM Bits	147456
Number of I/O	97
Number of Gates	1000000
Voltage - Supply	1.425V ~ 1.575V
Mounting Type	Surface Mount
Operating Temperature	-55°C ~ 125°C (TJ)
Package / Case	144-LBGA
Supplier Device Package	144-FPBGA (13x13)
Purchase URL	https://www.e-xfl.com/product-detail/microchip-technology/a3p1000-1fgg144m

Calculating Power Dissipation

Quiescent Supply Current

Table 2-8 • Power Supply State Per Mode

	Power Supply Configurations				
Modes/Power Supplies	VCC	VCCPLL	VCCI	VJTAG	VPUMP
Flash*Freeze	On	On	On	On	On/off/floating
Sleep	Off	Off	On	Off	Off
Shutdown	Off	Off	Off	Off	Off
Static and Active	On	On	On	On	On/off/floating

Table 2-9 • Quiescent Supply Current (IDD) Characteristics, Flash*Freeze Mode*

	Core Voltage	A3PE600L	A3PE3000L	Units
Nominal (25°C)	1.2 V	0.55	2.75	mA
	1.5 V	0.83	4.2	mA
Typical maximum (25°C)	1.2 V	9	17	mA
	1.5 V	12	20	mA
Military maximum (125°C)	1.2 V	65	165	mA
	1.5 V	85	185	mA

Note: *IDD includes VCC, VPUMP, VCCI, VJTAG, and VCCPLL currents. Values do not include I/O static contribution (PDC6 and PDC7).

Table 2-10 • Quiescent Supply Current (IDD) Characteristics, Sleep Mode (VCC = 0 V)*

	Core Voltage	A3PE600L	A3PE3000L	Units
VCCI / VJTAG = 1.2 V (per bank) Typical (25°C)	1.2 V	1.7	1.7	μA
VCCI / VJTAG = 1.5 V (per bank) Typical (25°C)	1.2 V / 1.5 V	1.8	1.8	μA
VCCI / VJTAG = 1.8 V (per bank) Typical (25°C)	1.2 V / 1.5 V	1.9	1.9	μA
VCCI / VJTAG = 2.5 V (per bank) Typical (25°C)	1.2 V / 1.5 V	2.2	2.2	μA
VCCI / VJTAG = 3.3 V (per bank) Typical (25°C)	1.2 V / 1.5 V	2.5	2.5	μA

Note: *IDD = $N_{BANKS} \times ICCI$. Values do not include I/O static contribution, which is shown in Table 2-22 on page 2-14 (PDC6 and PDC7).

Table 2-11 • Quiescent Supply Current (IDD) Characteristics, Shutdown Mode*

	Core Voltage	A3P250	A3P1000	A3PE600L	A3PE3000L	Units
Nominal (25°C)	1.2 V / 1.5 V	N/A		0		μA
Military (125°C)	1.2 V / 1.5 V	N/A		0		μA

Note: *This is applicable to A3PE600L and A3PE3000L only for cold-sparable I/O devices. Not available on A3P250 or A3P1000.

Power per I/O Pin

Table 2-14 • Summary of I/O Input Buffer Power (Per Pin) – Default I/O Software Settings
Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

	VCCI (V)	Static Power PDC6 (mW) ¹	Dynamic Power PAC9 (μW/MHz) ²
Single-Ended			
3.3 V LVTTTL/LVCMOS	3.3	–	16.34
3.3 V LVTTTL/LVCMOS – Schmitt trigger	3.3	–	24.49
3.3 V LVCMOS Wide Range	3.3	–	16.34
3.3 V LVCMOS – Schmitt trigger Wide Range	3.3	–	24.49
2.5 V LVCMOS	2.5	–	4.71
2.5 V LVCMOS – Schmitt trigger	2.5	–	6.13
1.8 V LVCMOS	1.8	–	1.66
1.8 V LVCMOS – Schmitt trigger	1.8	–	1.78
1.5 V LVCMOS (JESD8-11)	1.5	–	1.01
1.5 V LVCMOS (JESD8-11) – Schmitt trigger	1.5	–	0.97
1.2 V LVCMOS	1.2	–	0.60
1.2 V LVCMOS (JESD8-11) – Schmitt trigger	1.2	–	0.53
1.2 V LVCMOS Wide Range	1.2	–	0.60
1.2 V LVCMOS Schmitt trigger Wide Range	1.2	–	0.53
3.3 V PCI	3.3	–	17.76
3.3 V PCI – Schmitt trigger	3.3	–	19.10
3.3 V PCI-X	3.3	–	17.76
3.3 V PCI-X – Schmitt trigger	3.3	–	19.10
Voltage-Referenced			
3.3 V GTL	3.3	2.90	7.14
2.5 V GTL	2.5	2.13	3.54
3.3 V GTL+	3.3	2.81	2.91
2.5 V GTL+	2.5	2.57	2.61
HSTL (I)	1.5	0.17	0.79
HSTL (II)	1.5	0.17	0.79
SSTL2 (I)	2.5	1.38	3.26
SSTL2 (II)	2.5	1.38	3.26
SSTL3 (I)	3.3	3.21	7.97
SSTL3 (II)	3.3	3.21	7.97
Differential			
LVDS	2.5	2.26	0.89
LVPECL	3.3	5.71	1.94

Notes:

1. PDC6 is the static power (where applicable) measured on VCCI.
2. PAC9 is the total dynamic power measured on VCCI.

Table 2-34 • Summary of I/O Timing Characteristics—Software Default Settings
–1 Speed Grade, Military-Case Conditions: TJ = 125°C, Worst Case VCC = 1.425 V,
Worst Case VCCI
Applicable to Standard Plus I/O Banks for A3P250 and A3P1000 Only

I/O Standard	Drive Strength (mA)	Equivalent Software Default Drive Strength Option ¹	Slew Rate	Capacitive Load (pF) ²	External Resistor	t _{DOU} (ns)	t _{DP} (ns)	t _{DIN} (ns)	t _{PY} (ns)	t _{EOUT} (ns)	t _{ZL} (ns)	t _{ZH} (ns)	t _{LZ} (ns)	t _{HZ} (ns)	t _{ZLS} (ns)	t _{ZHS} (ns)
3.3 V LVTTTL / 3.3 V LVCMOS	12 mA	12 mA	High	5	–	0.54	1.90	0.04	0.94	0.39	1.94	1.47	2.61	3.01	4.03	3.56
3.3 V LVCMOS Wide Range ³	100 µA	12 mA	High	5	–	0.54	2.94	0.04	1.42	0.39	2.94	2.22	4.03	4.66	6.12	5.40
2.5 V LVCMOS	12 mA	12 mA	High	5	–	0.54	1.94	0.04	1.21	0.39	1.97	1.62	2.64	2.91	4.07	3.71
1.8 V LVCMOS	8 mA	8 mA	High	5	–	0.54	1.94	0.04	1.21	0.39	1.97	1.62	2.64	2.91	4.07	3.71
1.5 V LVCMOS	4 mA	4 mA	High	5	–	0.54	2.62	0.04	1.33	0.39	2.67	2.23	2.84	2.93	4.77	4.32
3.3 V PCI	Per PCI spec.	–	High	10	25 ⁴	0.54	2.16	0.04	0.80	0.39	2.20	1.60	2.61	3.01	4.29	3.69
3.3 V PCI-X	Per PCI-X spec.	–	High	10	25 ⁴	0.54	2.16	0.04	0.78	0.39	2.20	1.60	2.61	3.01	4.29	3.69

Notes:

1. Note that 3.3 V LVCMOS wide range is applicable to 100 µA drive strength only. The configuration will not operate at the equivalent software default drive strength. These values are for normal ranges only.
2. Output delays provided in this table were extracted with an output load indicated in the Capacitive Load column. For a specific output load, refer to Designer software. Software default load is higher.
3. All LVCMOS 3.3 V software macros support LVCMOS 3.3 V wide range as specified in the JESD8-B specification.
4. Resistance is used to measure I/O propagation delays as defined in PCI specifications. See [Figure 2-14 on page 2-71](#) for connectivity. This resistor is not required during normal operation.
5. For specific junction temperature and voltage supply levels, refer to [Table 2-7 on page 2-6](#) for derating values.

Detailed I/O DC Characteristics

Table 2-35 • Input Capacitance

Symbol	Definition	Conditions	Min.	Max.	Units
C _{IN}	Input capacitance	VIN = 0, f = 1.0 MHz		8	pF
C _{INCLK}	Input capacitance on the clock pin	VIN = 0, f = 1.0 MHz		8	pF

1.5 V DC Core Voltage

Table 2-52 • 3.3 V LVTTTL / 3.3 V LVCMOS Low Slew

Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 3.0\text{ V}$

Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{PYS}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
4 mA	Std.	0.61	5.90	0.04	1.45	2.09	0.40	5.98	4.73	2.52	2.24	7.45	6.19	ns
	–1	0.52	5.02	0.03	1.23	1.78	0.34	5.09	4.02	2.15	1.90	6.34	5.27	ns
8 mA	Std.	0.61	4.80	0.04	1.45	2.09	0.40	4.86	4.02	2.87	2.85	6.32	5.49	ns
	–1	0.52	4.08	0.03	1.23	1.78	0.34	4.13	3.42	2.44	2.43	5.38	4.67	ns
12 mA	Std.	0.61	4.02	0.04	1.45	2.09	0.40	4.06	3.49	3.09	3.23	5.53	4.96	ns
	–1	0.52	3.42	0.03	1.23	1.78	0.34	3.46	2.97	2.63	2.75	4.70	4.22	ns
16 mA	Std.	0.61	3.79	0.04	1.45	2.09	0.40	3.84	3.38	3.14	3.34	5.30	4.84	ns
	–1	0.52	3.23	0.03	1.23	1.78	0.34	3.26	2.87	2.67	2.84	4.51	4.12	ns
24 mA	Std.	0.61	3.67	0.04	1.45	2.09	0.40	3.72	3.39	3.20	3.74	5.18	4.86	ns
	–1	0.52	3.13	0.03	1.23	1.78	0.34	3.16	2.88	2.72	3.18	4.41	4.13	ns

Note: For specific junction temperature and voltage supply levels, refer to [Table 2-6 on page 2-6](#) for derating values.

Table 2-53 • 3.3 V LVTTTL / 3.3 V LVCMOS High Slew

Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 3.0\text{ V}$

Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{PYS}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
4 mA	Std.	0.61	3.26	0.04	1.45	2.09	0.40	3.30	2.48	2.52	2.38	4.76	3.95	ns
	–1	0.52	2.77	0.03	1.23	1.78	0.34	2.80	2.11	2.15	2.03	4.05	3.36	ns
8 mA	Std.	0.61	2.66	0.04	1.45	2.09	0.40	2.68	1.97	2.87	3.00	4.15	3.43	ns
	–1	0.52	2.26	0.03	1.23	1.78	0.34	2.28	1.67	2.44	2.55	3.53	2.92	ns
12 mA	Std.	0.61	2.32	0.04	1.45	2.09	0.40	2.33	1.72	3.09	3.40	3.80	3.18	ns
	–1	0.52	1.97	0.03	1.23	1.78	0.34	1.99	1.46	2.63	2.89	3.23	2.71	ns
16 mA	Std.	0.61	2.26	0.04	1.45	2.09	0.40	2.28	1.67	3.15	3.51	3.74	3.14	ns
	–1	0.52	1.92	0.03	1.23	1.78	0.34	1.94	1.42	2.68	2.98	3.18	2.67	ns
24 mA	Std.	0.61	2.28	0.04	1.45	2.09	0.40	2.30	1.61	3.21	3.90	3.77	3.07	ns
	–1	0.52	1.94	0.03	1.23	1.78	0.34	1.96	1.37	2.73	3.32	3.20	2.61	ns

Notes:

- Software default selection highlighted in gray.
- For specific junction temperature and voltage supply levels, refer to [Table 2-6 on page 2-6](#) for derating values.

Table 2-78 • 2.5 V LVC MOS Low Slew

Military-Case Conditions: $T_J = 125^\circ\text{C}$, Worst-Case $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 2.3\text{ V}$
Applicable to Advanced I/O Banks

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
4 mA	Std.	0.63	7.07	0.05	1.44	0.45	7.20	6.32	2.95	2.43	9.66	8.78	ns
	–1	0.54	6.02	0.04	1.23	0.39	6.13	5.38	2.51	2.06	8.22	7.47	ns
6 mA	Std.	0.63	5.91	0.05	1.44	0.45	6.02	5.42	3.35	3.18	8.48	7.88	ns
	–1	0.54	5.03	0.04	1.23	0.39	5.12	4.61	2.85	2.70	7.21	6.70	ns
8 mA	Std.	0.63	5.91	0.05	1.44	0.45	6.02	5.42	3.35	3.18	8.48	7.88	ns
	–1	0.54	5.03	0.04	1.23	0.39	5.12	4.61	2.85	2.70	7.21	6.70	ns
12 mA	Std.	0.63	5.05	0.05	1.44	0.45	5.15	4.79	3.63	3.66	7.61	7.25	ns
	–1	0.54	4.30	0.04	1.23	0.39	4.38	4.07	3.09	3.11	6.47	6.17	ns
16 mA	Std.	0.63	4.78	0.05	1.44	0.45	4.86	4.65	3.70	3.78	7.32	7.10	ns
	–1	0.54	4.06	0.04	1.23	0.39	4.14	3.95	3.14	3.22	6.23	6.04	ns
24 mA	Std.	0.63	4.71	0.05	1.44	0.45	4.73	4.71	3.78	4.26	7.19	7.17	ns
	–1	0.54	4.01	0.04	1.23	0.39	4.03	4.01	3.21	3.62	6.12	6.10	ns

Note: For specific junction temperature and voltage supply levels, refer to [Table 2-7 on page 2-6](#) for derating values.

Table 2-79 • 2.5 V LVC MOS High Slew

Military-Case Conditions: $T_J = 125^\circ\text{C}$, Worst-Case $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 2.3\text{ V}$
Applicable to Advanced I/O Banks

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
4 mA	Std.	0.63	3.63	0.05	1.44	0.45	3.70	3.34	2.94	2.53	6.16	5.80	ns
	–1	0.54	3.09	0.04	1.23	0.39	3.15	2.84	2.51	2.16	5.24	4.94	ns
6 mA	Std.	0.63	2.99	0.05	1.44	0.45	3.04	2.59	3.35	3.30	5.50	5.05	ns
	–1	0.54	2.54	0.04	1.23	0.39	2.59	2.20	2.85	2.81	4.68	4.30	ns
8 mA	Std.	0.63	2.99	0.05	1.44	0.45	3.04	2.59	3.35	3.30	5.50	5.05	ns
	–1	0.54	2.54	0.04	1.23	0.39	2.59	2.20	2.85	2.81	4.68	4.30	ns
12 mA	Std.	0.63	2.65	0.05	1.44	0.45	2.70	2.23	3.63	3.78	5.16	4.69	ns
	–1	0.54	2.26	0.04	1.23	0.39	2.30	1.89	3.09	3.22	4.39	3.99	ns
16 mA	Std.	0.63	2.59	0.05	1.44	0.45	2.64	2.16	3.70	3.90	5.10	4.62	ns
	–1	0.54	2.21	0.04	1.23	0.39	2.25	1.83	3.15	3.32	4.34	3.93	ns
24 mA	Std.	0.63	2.61	0.05	1.44	0.45	2.66	2.08	3.78	4.40	5.12	4.54	ns
	–1	0.54	2.22	0.04	1.23	0.39	2.26	1.77	3.22	3.74	4.35	3.87	ns

Notes:

1. Software default selection highlighted in gray.
2. For specific junction temperature and voltage supply levels, refer to [Table 2-7 on page 2-6](#) for derating values.

Table 2-80 • 2.5 V LVC MOS Low Slew
Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, Worst-Case $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 2.3\text{ V}$
Applicable to Standard Plus I/O Banks

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
4 mA	Std.	0.63	6.45	0.05	1.43	0.45	6.56	5.71	2.48	2.19	9.02	8.17	ns
	–1	0.54	5.48	0.04	1.21	0.39	5.58	4.86	2.11	1.86	7.68	6.95	ns
6 mA	Std.	0.63	5.28	0.05	1.43	0.45	5.38	4.92	2.85	2.88	7.84	7.38	ns
	–1	0.54	4.50	0.04	1.21	0.39	4.58	4.19	2.42	2.45	6.67	6.28	ns
8 mA	Std.	0.63	5.28	0.05	1.43	0.45	5.38	4.92	2.85	2.88	7.84	7.38	ns
	–1	0.54	4.50	0.04	1.21	0.39	4.58	4.19	2.42	2.45	6.67	6.28	ns
12 mA	Std.	0.63	4.48	0.05	1.43	0.45	4.56	4.35	3.11	3.31	7.02	6.81	ns
	–1	0.54	3.81	0.04	1.21	0.39	3.88	3.70	2.65	2.82	5.97	5.79	ns

Note: For specific junction temperature and voltage supply levels, refer to [Table 2-7 on page 2-6](#) for derating values.

Table 2-81 • 2.5 V LVC MOS High Slew
Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, Worst-Case $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 2.3\text{ V}$
Applicable to Standard Plus I/O Banks

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
4 mA	Std.	0.63	3.18	0.05	1.43	0.45	3.23	2.92	2.48	2.28	5.69	5.38	ns
	–1	0.54	2.70	0.04	1.21	0.39	2.75	2.48	2.11	1.94	4.84	4.58	ns
6 mA	Std.	0.63	2.57	0.05	1.43	0.45	2.62	2.24	2.84	2.98	5.08	4.70	ns
	–1	0.54	2.19	0.04	1.21	0.39	2.23	1.90	2.42	2.54	4.32	4.00	ns
8 mA	Std.	0.63	2.57	0.05	1.43	0.45	2.62	2.24	2.84	2.98	5.08	4.70	ns
	–1	0.54	2.19	0.04	1.21	0.39	2.23	1.90	2.42	2.54	4.32	4.00	ns
12 mA	Std.	0.63	2.28	0.05	1.43	0.45	2.32	1.90	3.11	3.42	4.78	4.36	ns
	–1	0.54	1.94	0.04	1.21	0.39	1.97	1.62	2.64	2.91	4.07	3.71	ns

Notes:

1. Software default selection highlighted in gray.
2. For specific junction temperature and voltage supply levels, refer to [Table 2-7 on page 2-6](#) for derating values.

1.5 V DC Core Voltage

Table 2-88 • 1.8 V LVCMOS Low Slew

Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 1.7\text{ V}$

Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{PYS}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
2 mA	Std.	0.61	9.02	0.04	1.69	2.52	0.40	9.17	7.57	2.61	1.01	10.63	9.04	ns
	–1	0.52	7.68	0.03	1.44	2.14	0.34	7.80	6.44	2.22	0.86	9.04	7.69	ns
4 mA	Std.	0.61	7.41	0.04	1.69	2.52	0.40	7.52	6.36	3.07	2.56	8.99	7.83	ns
	–1	0.52	6.30	0.03	1.44	2.14	0.34	6.40	5.41	2.62	2.18	7.64	6.66	ns
6 mA	Std.	0.61	6.26	0.04	1.69	2.52	0.40	6.35	5.53	3.38	3.14	7.82	7.00	ns
	–1	0.52	5.33	0.03	1.44	2.14	0.34	5.40	4.71	2.88	2.67	6.65	5.95	ns
8 mA	Std.	0.61	5.88	0.04	1.69	2.52	0.40	5.96	5.37	3.45	3.30	7.42	6.83	ns
	–1	0.52	5.00	0.03	1.44	2.14	0.34	5.07	4.57	2.94	2.81	6.32	5.81	ns
12 mA	Std.	0.61	5.76	0.04	1.69	2.52	0.40	5.85	5.38	3.55	3.88	7.31	6.84	ns
	–1	0.52	4.90	0.03	1.44	2.14	0.34	4.97	4.57	3.02	3.30	6.22	5.82	ns
16 mA	Std.	0.61	5.76	0.04	1.69	2.52	0.40	5.85	5.38	3.55	3.88	7.31	6.84	ns
	–1	0.52	4.90	0.03	1.44	2.14	0.34	4.97	4.57	3.02	3.30	6.22	5.82	ns

Note: For specific junction temperature and voltage supply levels, refer to [Table 2-6 on page 2-6](#) for derating values.

Table 2-89 • 1.8 V LVCMOS High Slew

Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, $V_{CC} = 1.425\text{ V}$, Worst-Case $V_{CCI} = 1.7\text{ V}$

Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{PYS}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
2 mA	Std.	0.61	4.01	0.04	1.69	2.52	0.40	4.06	3.94	2.60	1.03	5.52	5.40	ns
	–1	0.52	3.41	0.03	1.44	2.14	0.34	3.45	3.35	2.21	0.88	4.70	4.60	ns
4 mA	Std.	0.61	3.22	0.04	1.69	2.52	0.40	3.26	2.89	3.07	2.65	4.72	4.36	ns
	–1	0.52	2.74	0.03	1.44	2.14	0.34	2.77	2.46	2.61	2.26	4.02	3.71	ns
6 mA	Std.	0.61	2.74	0.04	1.69	2.52	0.40	2.77	2.38	3.38	3.23	4.23	3.84	ns
	–1	0.52	2.33	0.03	1.44	2.14	0.34	2.36	2.02	2.88	2.75	3.60	3.27	ns
8 mA	Std.	0.61	2.65	0.04	1.69	2.52	0.40	2.68	2.28	3.45	3.40	4.14	3.75	ns
	–1	0.52	2.26	0.03	1.44	2.14	0.34	2.28	1.94	2.93	2.89	3.52	3.19	ns
12 mA	Std.	0.61	2.64	0.04	1.69	2.52	0.40	2.66	2.16	3.55	4.01	4.13	3.63	ns
	–1	0.52	2.24	0.03	1.44	2.14	0.34	2.26	1.84	3.02	3.41	3.51	3.08	ns
16 mA	Std.	0.61	2.64	0.04	1.69	2.52	0.40	2.66	2.16	3.55	4.01	4.13	3.63	ns
	–1	0.52	2.24	0.03	1.44	2.14	0.34	2.26	1.84	3.02	3.41	3.51	3.08	ns

Notes:

- Software default selection highlighted in gray.
- For specific junction temperature and voltage supply levels, refer to [Table 2-6 on page 2-6](#) for derating values.

Table 2-96 • Minimum and Maximum DC Input and Output Levels
Applicable to Standard Plus I/O Banks

1.5 V LVCMOS	VIL		VIH		VOL	VOH	I _{OL}	I _{OH}	I _{OSL}	I _{OSH}	I _{IL} ¹	I _{IH} ²
Drive Strength	Min. V	Max. V	Min. V	Max. V	Max. V	Min. V	mA	mA	Max. mA ³	Max. mA ³	μA ⁴	μA ⁴
2 mA	−0.3	0.35 * VCCI	0.65 * VCCI	1.575	0.25 * VCCI	0.75 * VCCI	2	2	13	16	15	15
4 mA	−0.3	0.35 * VCCI	0.65 * VCCI	1.575	0.25 * VCCI	0.75 * VCCI	4	4	25	33	15	15

Notes:

1. I_{IL} is the input leakage current per I/O pin over recommended operation conditions where −0.3 V < V_{IN} < V_{IL}.
2. I_{IH} is the input leakage current per I/O pin over recommended operating conditions V_{IH} < V_{IN} < V_{CCI}. Input current is larger when operating outside recommended ranges
3. Currents are measured at 100°C junction temperature and maximum voltage.
4. Currents are measured at 125°C junction temperature.
5. Software default selection highlighted in gray.

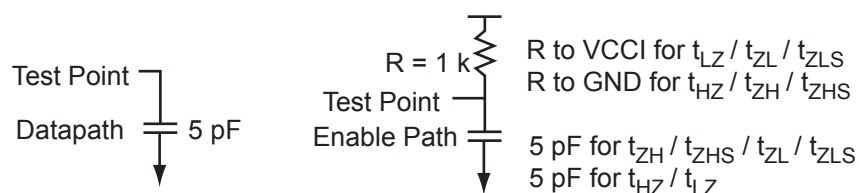


Figure 2-11 • AC Loading

Table 2-97 • AC Waveforms, Measuring Points, and Capacitive Loads

Input Low (V)	Input High (V)	Measuring Point* (V)	VREF (Typ) (V)	C _{LOAD} (pF)
0	1.5	0.75	–	5

Note: *Measuring point = V_{trip}. See Table 2-29 on page 2-25 for a complete table of trip points.

Table 2-102 • 1.5 V LVC MOS Low Slew

Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, Worst-Case VCC = 1.425 V, Worst-Case VCCI = 1.4 V
Applicable to Advanced I/O Banks

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
2 mA	Std.	0.63	9.78	0.05	1.44	0.45	9.96	8.57	3.74	2.91	12.42	11.03	ns
	–1	0.54	8.32	0.04	1.23	0.39	8.47	7.29	3.18	2.47	10.56	9.38	ns
4 mA	Std.	0.63	8.44	0.05	1.44	0.45	8.60	7.59	4.12	3.60	11.06	10.05	ns
	–1	0.54	7.18	0.04	1.23	0.39	7.32	6.46	3.51	3.06	9.41	8.55	ns
6 mA	Std.	0.63	7.95	0.05	1.44	0.45	8.10	7.39	4.21	3.78	10.56	9.85	ns
	–1	0.54	6.77	0.04	1.23	0.39	6.89	6.29	3.58	3.21	8.98	8.38	ns
8 mA	Std.	0.63	7.84	0.05	1.44	0.45	7.98	7.47	4.35	4.45	10.44	9.92	ns
	–1	0.54	6.67	0.04	1.23	0.39	6.79	6.35	3.70	3.79	8.88	8.44	ns
12 mA	Std.	0.63	7.84	0.05	1.44	0.45	7.98	7.47	4.35	4.45	10.44	9.92	ns
	–1	0.54	6.67	0.04	1.23	0.39	6.79	6.35	3.70	3.79	8.88	8.44	ns

Note: For specific junction temperature and voltage supply levels, refer to [Table 2-7 on page 2-6](#) for derating values.

Table 2-103 • 1.5 V LVC MOS High Slew

Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, Worst-Case VCC = 1.425 V, Worst-Case VCCI = 1.4 V
Applicable to Advanced I/O Banks

Drive Strength	Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
2 mA	Std.	0.63	3.98	0.05	1.58	0.45	4.06	3.80	3.73	3.04	6.52	6.26	ns
	–1	0.54	3.39	0.04	1.35	0.39	3.45	3.23	3.17	2.59	5.54	5.32	ns
4 mA	Std.	0.63	3.47	0.05	1.58	0.45	3.53	3.15	4.11	3.74	5.99	5.61	ns
	–1	0.54	2.95	0.04	1.35	0.39	3.01	2.68	3.50	3.18	5.10	4.77	ns
6 mA	Std.	0.63	3.37	0.05	1.58	0.45	3.43	3.02	4.20	3.92	5.89	5.48	ns
	–1	0.54	2.87	0.04	1.35	0.39	2.92	2.57	3.57	3.33	5.01	4.66	ns
8 mA	Std.	0.63	3.35	0.05	1.58	0.45	3.41	2.88	4.34	4.62	5.87	5.34	ns
	–1	0.54	2.85	0.04	1.35	0.39	2.90	2.45	3.69	3.93	4.99	4.55	ns
12 mA	Std.	0.63	3.35	0.05	1.58	0.45	3.41	2.88	4.34	4.62	5.87	5.34	ns
	–1	0.54	2.85	0.04	1.35	0.39	2.90	2.45	3.69	3.93	4.99	4.55	ns

Notes:

1. Software default selection highlighted in gray.
2. For specific junction temperature and voltage supply levels, refer to [Table 2-7 on page 2-6](#) for derating values.

Table 2-123 • 3.3 V GTL
Military-Case Conditions: $T_J = 125^{\circ}\text{C}$, $V_{CC} = 1.425\text{ V}$,
Worst-Case $V_{CCI} = 3.0\text{ V}$, $V_{REF} = 0.8\text{ V}$
Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

Speed Grade	t_{DOUT}	t_{DP}	t_{DIN}	t_{PY}	t_{EOUT}	t_{ZL}	t_{ZH}	t_{LZ}	t_{HZ}	t_{ZLS}	t_{ZHS}	Units
Std.	0.61	1.97	0.04	2.11	0.40	1.86	1.97	—	—	3.32	3.43	ns
–1	0.52	1.68	0.03	1.79	0.34	1.58	1.68	—	—	2.83	2.92	ns

Note: For specific junction temperature and voltage supply levels, refer to [Table 2-6 on page 2-6](#) for derating values.

2.5 V GTL+

Gunning Transceiver Logic Plus is a high-speed bus standard (JESD8-3). It provides a differential amplifier input buffer and an open-drain output buffer. The V_{CCI} pin should be connected to 2.5 V.

Table 2-132 • Minimum and Maximum DC Input and Output Levels

2.5 V GTL+	VIL		VIH		VOL	VOH	IOL	IOH	IOSL	IOSH	IIL ¹	I _{IH} ²
Drive Strength	Min. V	Max. V	Min. V	Max. V	Max. V	Min. V	mA	mA	Max. mA ³	Max. mA ³	μA ⁴	μA ⁴
33 mA	−0.3	VREF − 0.1	VREF + 0.1	3.6	0.6	−	33	33	169	124	15	15

Notes:

- I_{IL} is the input leakage current per I/O pin over recommended operating conditions where $−0.3\text{ V} < V_{IN} < V_{IL}$.
- I_{IH} is the input leakage current per I/O pin over recommended operating conditions $V_{IH} < V_{IN} < V_{CCI}$. Input current is larger when operating outside recommended ranges.
- Currents are measured at 100°C junction temperature and maximum voltage.
- Currents are measured at 125°C junction temperature.

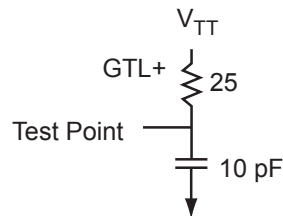


Figure 2-18 • AC Loading

Table 2-133 • AC Waveforms, Measuring Points, and Capacitive Loads

Input Low (V)	Input High (V)	Measuring Point* (V)	VREF (typ.) (V)	VTT (typ.) (V)	C _{LOAD} (pF)
VREF − 0.1	VREF + 0.1	1.0	1.0	1.5	10

Note: *Measuring point = V_{trip} . See Table 2-29 on page 2-25 for a complete table of trip points.

Timing Characteristics

Table 2-134 • 2.5 V GTL+

Military-Case Conditions: $T_J = 125^\circ\text{C}$, Worst-Case VCC = 1.14 V,
Worst-Case VCCI = 2.3 V, VREF = 1.0 V
Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

Speed Grade	t _{DOUT}	t _{DP}	t _{DIN}	t _{PY}	t _{EOUT}	t _{ZL}	t _{ZH}	t _{LZ}	t _{HZ}	t _{ZLS}	t _{ZHS}	Units
Std.	0.80	2.19	0.05	2.27	0.52	2.22	2.08	−	−	4.43	4.28	ns
−1	0.68	1.86	0.05	1.93	0.44	1.89	1.77	−	−	3.77	3.64	ns

Note: For specific junction temperature and voltage supply levels, refer to Table 2-6 on page 2-6 for derating values.

Table 2-135 • 2.5 V GTL+

Military-Case Conditions: $T_J = 125^\circ\text{C}$, VCC = 1.425 V,
Worst-Case VCCI = 2.3 V, VREF = 1.0 V
Applicable to Pro I/Os for A3PE600L and A3PE3000L Only

Speed Grade	t _{DOUT}	t _{DP}	t _{DIN}	t _{PY}	t _{EOUT}	t _{ZL}	t _{ZH}	t _{LZ}	t _{HZ}	t _{ZLS}	t _{ZHS}	Units
Std.	0.61	2.05	0.04	2.04	0.40	2.07	1.99	−	−	3.53	3.46	ns
−1	0.52	1.75	0.03	1.73	0.34	1.76	1.69	−	−	3.00	2.94	ns

Note: For specific junction temperature and voltage supply levels, refer to Table 2-6 on page 2-6 for derating values.

FIFO

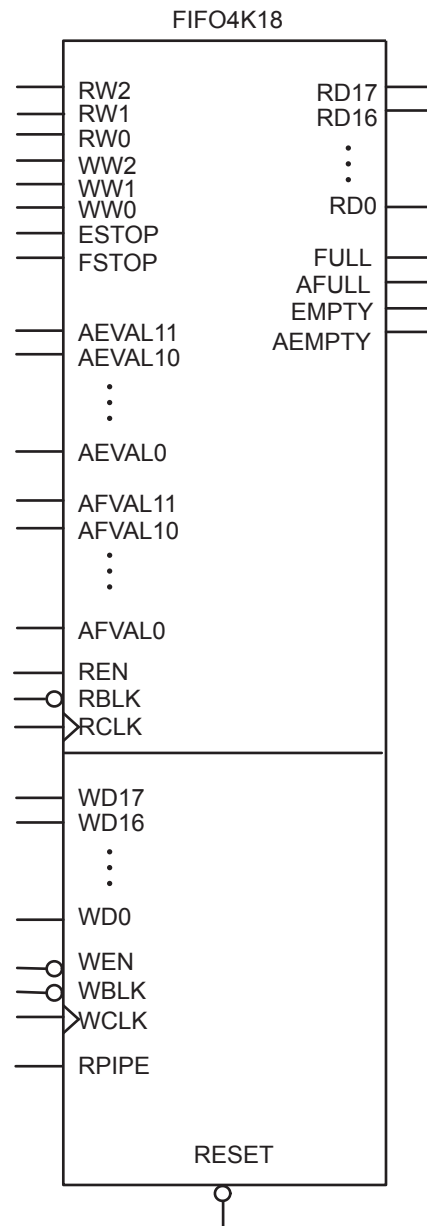


Figure 2-49 • FIFO Model

FG144	
Pin Number	A3P1000 Function
K1	GEB0/IO189NDB3
K2	GEA1/IO188PDB3
K3	GEA0/IO188NDB3
K4	GEA2/IO187RSB2
K5	IO169RSB2
K6	IO152RSB2
K7	GND
K8	IO117RSB2
K9	GDC2/IO116RSB2
K10	GND
K11	GDA0/IO113NDB1
K12	GDB0/IO112NDB1
L1	GND
L2	VMV3
L3	GEB2/IO186RSB2
L4	IO172RSB2
L5	VCCIB2
L6	IO153RSB2
L7	IO144RSB2
L8	IO140RSB2
L9	TMS
L10	VJTAG
L11	VMV2
L12	TRST
M1	GNDQ
M2	GEC2/IO185RSB2
M3	IO173RSB2
M4	IO168RSB2
M5	IO161RSB2
M6	IO156RSB2
M7	IO145RSB2
M8	IO141RSB2
M9	TDI
M10	VCCIB2
M11	VPUMP
M12	GNDQ

FG484		FG484		FG484	
Pin Number	A3PE600L Function	Pin Number	A3PE600L Function	Pin Number	A3PE600L Function
E18	GBA2/IO36PDB2V0	G9	IO09NDB0V1	H22	NC
E19	IO42NDB2V0	G10	IO09PDB0V1	J1	IO123NDB7V0
E20	GND	G11	IO13PDB0V2	J2	IO123PDB7V0
E21	NC	G12	IO21PDB1V0	J3	NC
E22	NC	G13	IO25PDB1V0	J4	IO124PDB7V0
F1	NC	G14	IO27NDB1V0	J5	IO125PDB7V0
F2	IO131NDB7V1	G15	GNDQ	J6	IO126PDB7V0
F3	IO131PDB7V1	G16	VCOMPLB	J7	IO130NDB7V1
F4	IO133NDB7V1	G17	GBB2/IO37PDB2V0	J8	VCCIB7
F5	IO134NDB7V1	G18	IO39PDB2V0	J9	GND
F6	VMV7	G19	IO39NDB2V0	J10	VCC
F7	VCCPLA	G20	IO43PDB2V0	J11	VCC
F8	GAC0/IO02NDB0V0	G21	IO43NDB2V0	J12	VCC
F9	GAC1/IO02PDB0V0	G22	NC	J13	VCC
F10	IO15NDB0V2	H1	NC	J14	GND
F11	IO15PDB0V2	H2	NC	J15	VCCIB2
F12	IO20PDB1V0	H3	VCC	J16	IO38NDB2V0
F13	IO25NDB1V0	H4	IO128NDB7V1	J17	IO40NDB2V0
F14	IO27PDB1V0	H5	IO129NDB7V1	J18	IO40PDB2V0
F15	GBC0/IO33NDB1V1	H6	IO132NDB7V1	J19	IO45PDB2V1
F16	VCCPLB	H7	IO130PDB7V1	J20	NC
F17	VMV2	H8	VMV0	J21	IO48PDB2V1
F18	IO36NDB2V0	H9	VCCIB0	J22	IO46PDB2V1
F19	IO42PDB2V0	H10	VCCIB0	K1	IO121NDB7V0
F20	NC	H11	IO13NDB0V2	K2	IO121PDB7V0
F21	NC	H12	IO21NDB1V0	K3	NC
F22	NC	H13	VCCIB1	K4	IO124NDB7V0
G1	IO127NDB7V1	H14	VCCIB1	K5	IO125NDB7V0
G2	IO127PDB7V1	H15	VMV1	K6	IO126NDB7V0
G3	NC	H16	GBC2/IO38PDB2V0	K7	GFC1/IO120PPB7V0
G4	IO128PDB7V1	H17	IO37NDB2V0	K8	VCCIB7
G5	IO129PDB7V1	H18	IO41NDB2V0	K9	VCC
G6	GAC2/IO132PDB7V1	H19	IO41PDB2V0	K10	GND
G7	VCOMPLA	H20	VCC	K11	GND
G8	GNDQ	H21	NC	K12	GND

FG484		FG484		FG484	
Pin Number	A3PE600L Function	Pin Number	A3PE600L Function	Pin Number	A3PE600L Function
K13	GND	M4	GFA2/IO117PDB6V1	N17	IO57NPB3V0
K14	VCC	M5	GFA1/IO118PDB6V1	N18	IO55NPB3V0
K15	VCCIB2	M6	VCCPLF	N19	IO57PPB3V0
K16	GCC1/IO50PPB2V1	M7	IO116NDB6V1	N20	NC
K17	IO44NDB2V1	M8	GFB2/IO116PDB6V1	N21	IO56NDB3V0
K18	IO44PDB2V1	M9	VCC	N22	IO58PDB3V0
K19	IO49NPB2V1	M10	GND	P1	NC
K20	IO45NDB2V1	M11	GND	P2	IO111PDB6V1
K21	IO48NDB2V1	M12	GND	P3	IO115NDB6V1
K22	IO46NDB2V1	M13	GND	P4	IO113NPB6V1
L1	NC	M14	VCC	P5	IO109PPB6V0
L2	IO122PDB7V0	M15	GCB2/IO54PPB3V0	P6	IO108PDB6V0
L3	IO122NDB7V0	M16	GCA1/IO52PPB3V0	P7	IO108NDB6V0
L4	GFB0/IO119NPB7V0	M17	GCC2/IO55PPB3V0	P8	VCCIB6
L5	GFA0/IO118NDB6V1	M18	VCCPLC	P9	GND
L6	GFB1/IO119PPB7V0	M19	GCA2/IO53PDB3V0	P10	VCC
L7	VCOMPLF	M20	IO53NDB3V0	P11	VCC
L8	GFC0/IO120NPB7V0	M21	IO56PDB3V0	P12	VCC
L9	VCC	M22	NC	P13	VCC
L10	GND	N1	IO114PDB6V1	P14	GND
L11	GND	N2	IO111NDB6V1	P15	VCCIB3
L12	GND	N3	NC	P16	GDB0/IO66NPB3V1
L13	GND	N4	GFC2/IO115PDB6V1	P17	IO60NDB3V1
L14	VCC	N5	IO113PPB6V1	P18	IO60PDB3V1
L15	GCC0/IO50NPB2V1	N6	IO112PDB6V1	P19	IO61PDB3V1
L16	GCB1/IO51PPB2V1	N7	IO112NDB6V1	P20	NC
L17	GCA0/IO52NPB3V0	N8	VCCIB6	P21	IO59PDB3V0
L18	VCOMPLC	N9	VCC	P22	IO58NDB3V0
L19	GCB0/IO51NPB2V1	N10	GND	R1	NC
L20	IO49PPB2V1	N11	GND	R2	IO110PDB6V0
L21	IO47NDB2V1	N12	GND	R3	VCC
L22	IO47PDB2V1	N13	GND	R4	IO109NPB6V0
M1	NC	N14	VCC	R5	IO106NDB6V0
M2	IO114NDB6V1	N15	VCCIB3	R6	IO106PDB6V0
M3	IO117NDB6V1	N16	IO54NPB3V0	R7	GEC0/IO104NPB6V0

FG484		FG484		FG484	
Pin Number	A3PE600L Function	Pin Number	A3PE600L Function	Pin Number	A3PE600L Function
R8	VMV5	T21	IO64PDB3V1	V12	IO83PDB5V0
R9	VCCIB5	T22	IO62NDB3V1	V13	IO77NDB4V1
R10	VCCIB5	U1	NC	V14	IO77PDB4V1
R11	IO84NDB5V0	U2	IO107PDB6V0	V15	IO69NDB4V0
R12	IO84PDB5V0	U3	IO107NDB6V0	V16	GDB2/IO69PDB4V0
R13	VCCIB4	U4	GEB1/IO103PDB6V0	V17	TDI
R14	VCCIB4	U5	GEB0/IO103NDB6V0	V18	GNDQ
R15	VMV3	U6	VMV6	V19	TDO
R16	VCCPLD	U7	VCCPLE	V20	GND
R17	GDB1/IO66PPB3V1	U8	IO101NPB5V2	V21	NC
R18	GDC1/IO65PDB3V1	U9	IO95PPB5V1	V22	IO63NDB3V1
R19	IO61NDB3V1	U10	IO92PDB5V1	W1	NC
R20	VCC	U11	IO90PDB5V1	W2	NC
R21	IO59NDB3V0	U12	IO82PDB5V0	W3	NC
R22	IO62PDB3V1	U13	IO76NDB4V1	W4	GND
T1	NC	U14	IO76PDB4V1	W5	IO100NDB5V2
T2	IO110NDB6V0	U15	VMV4	W6	FF/GEB2/IO100PDB5V2
T3	NC	U16	TCK	W7	IO99NDB5V2
T4	IO105PDB6V0	U17	VPUMP	W8	IO88NDB5V0
T5	IO105NDB6V0	U18	TRST	W9	IO88PDB5V0
T6	GEC1/IO104PPB6V0	U19	GDA0/IO67NDB3V1	W10	IO89NDB5V0
T7	VCOMPLE	U20	NC	W11	IO80NDB4V1
T8	GNDQ	U21	IO64NDB3V1	W12	IO81NDB4V1
T9	GEA2/IO101PPB5V2	U22	IO63PDB3V1	W13	IO81PDB4V1
T10	IO92NDB5V1	V1	NC	W14	IO70NDB4V0
T11	IO90NDB5V1	V2	NC	W15	GDC2/IO70PDB4V0
T12	IO82NDB5V0	V3	GND	W16	IO68NDB4V0
T13	IO74NDB4V1	V4	GEA1/IO102PDB6V0	W17	GDA2/IO68PDB4V0
T14	IO74PDB4V1	V5	GEA0/IO102NDB6V0	W18	TMS
T15	GNDQ	V6	GNDQ	W19	GND
T16	VCOMPLD	V7	GEC2/IO99PDB5V2	W20	NC
T17	VJTAG	V8	IO95NPB5V1	W21	NC
T18	GDC0/IO65NDB3V1	V9	IO91NDB5V1	W22	NC
T19	GDA1/IO67PDB3V1	V10	IO91PDB5V1	Y1	VCCIB6
T20	NC	V11	IO83NDB5V0	Y2	NC

FG484		FG484		FG484	
Pin Number	A3P1000 Function	Pin Number	A3P1000 Function	Pin Number	A3P1000 Function
A1	GND	B14	IO58RSB0	D5	GAA0/IO00RSB0
A2	GND	B15	IO63RSB0	D6	GAA1/IO01RSB0
A3	VCCIB0	B16	IO66RSB0	D7	GAB0/IO02RSB0
A4	IO07RSB0	B17	IO68RSB0	D8	IO16RSB0
A5	IO09RSB0	B18	IO70RSB0	D9	IO22RSB0
A6	IO13RSB0	B19	NC	D10	IO28RSB0
A7	IO18RSB0	B20	NC	D11	IO35RSB0
A8	IO20RSB0	B21	VCCIB1	D12	IO45RSB0
A9	IO26RSB0	B22	GND	D13	IO50RSB0
A10	IO32RSB0	C1	VCCIB3	D14	IO55RSB0
A11	IO40RSB0	C2	IO220PDB3	D15	IO61RSB0
A12	IO41RSB0	C3	NC	D16	GBB1/IO75RSB0
A13	IO53RSB0	C4	NC	D17	GBA0/IO76RSB0
A14	IO59RSB0	C5	GND	D18	GBA1/IO77RSB0
A15	IO64RSB0	C6	IO10RSB0	D19	GND
A16	IO65RSB0	C7	IO14RSB0	D20	NC
A17	IO67RSB0	C8	VCC	D21	NC
A18	IO69RSB0	C9	VCC	D22	NC
A19	NC	C10	IO30RSB0	E1	IO219NDB3
A20	VCCIB0	C11	IO37RSB0	E2	NC
A21	GND	C12	IO43RSB0	E3	GND
A22	GND	C13	NC	E4	GAB2/IO224PDB3
B1	GND	C14	VCC	E5	GAA2/IO225PDB3
B2	VCCIB3	C15	VCC	E6	GNDQ
B3	NC	C16	NC	E7	GAB1/IO03RSB0
B4	IO06RSB0	C17	NC	E8	IO17RSB0
B5	IO08RSB0	C18	GND	E9	IO21RSB0
B6	IO12RSB0	C19	NC	E10	IO27RSB0
B7	IO15RSB0	C20	NC	E11	IO34RSB0
B8	IO19RSB0	C21	NC	E12	IO44RSB0
B9	IO24RSB0	C22	VCCIB1	E13	IO51RSB0
B10	IO31RSB0	D1	IO219PDB3	E14	IO57RSB0
B11	IO39RSB0	D2	IO220NDB3	E15	GBC1/IO73RSB0
B12	IO48RSB0	D3	NC	E16	GBB0/IO74RSB0
B13	IO54RSB0	D4	GND	E17	IO71RSB0

FG484		FG484		FG484	
Pin Number	A3PE3000L Function	Pin Number	A3PE3000L Function	Pin Number	A3PE3000L Function
H13	VCCIB1	K4	IO279NDB7V0	L17	GCA0/IO114NPB3V0
H14	VCCIB1	K5	IO283NDB7V1	L18	VCOMPLC
H15	VMV1	K6	IO281NDB7V0	L19	GCB0/IO113NPB2V3
H16	GBC2/IO84PDB2V0	K7	GFC1/IO275PPB7V0	L20	IO110PPB2V3
H17	IO83NDB2V0	K8	VCCIB7	L21	IO111NDB2V3
H18	IO100NDB2V2	K9	VCC	L22	IO111PDB2V3
H19	IO100PDB2V2	K10	GND	M1	GNDQ
H20	VCC	K11	GND	M2	IO255NPB6V2
H21	VMV2	K12	GND	M3	IO272NDB6V4
H22	IO105PDB2V2	K13	GND	M4	GFA2/IO272PDB6V4
J1	IO285NDB7V1	K14	VCC	M5	GFA1/IO273PDB6V4
J2	IO285PDB7V1	K15	VCCIB2	M6	VCCPLF
J3	VMV7	K16	GCC1/IO112PPB2V3	M7	IO271NDB6V4
J4	IO279PDB7V0	K17	IO108NDB2V3	M8	GFB2/IO271PDB6V4
J5	IO283PDB7V1	K18	IO108PDB2V3	M9	VCC
J6	IO281PDB7V0	K19	IO110NPB2V3	M10	GND
J7	IO287NDB7V1	K20	IO106NPB2V3	M11	GND
J8	VCCIB7	K21	IO109NDB2V3	M12	GND
J9	GND	K22	IO107NDB2V3	M13	GND
J10	VCC	L1	IO257PSB6V2	M14	VCC
J11	VCC	L2	IO276PDB7V0	M15	GCB2/IO116PPB3V0
J12	VCC	L3	IO276NDB7V0	M16	GCA1/IO114PPB3V0
J13	VCC	L4	GFB0/IO274NPB7V0	M17	GCC2/IO117PPB3V0
J14	GND	L5	GFA0/IO273NDB6V4	M18	VCCPLC
J15	VCCIB2	L6	GFB1/IO274PPB7V0	M19	GCA2/IO115PDB3V0
J16	IO84NDB2V0	L7	VCOMPLF	M20	IO115NDB3V0
J17	IO104NDB2V2	L8	GFC0/IO275NPB7V0	M21	IO126PDB3V1
J18	IO104PDB2V2	L9	VCC	M22	IO124PSB3V1
J19	IO106PPB2V3	L10	GND	N1	IO255PPB6V2
J20	GNDQ	L11	GND	N2	IO253NDB6V2
J21	IO109PDB2V3	L12	GND	N3	VMV6
J22	IO107PDB2V3	L13	GND	N4	GFC2/IO270PPB6V4
K1	IO277NDB7V0	L14	VCC	N5	IO261PPB6V3
K2	IO277PDB7V0	L15	GCC0/IO112NPB2V3	N6	IO263PDB6V3
K3	GNDQ	L16	GCB1/IO113PPB2V3	N7	IO263NDB6V3

FG484		FG484		FG484	
Pin Number	A3PE3000L Function	Pin Number	A3PE3000L Function	Pin Number	A3PE3000L Function
N8	VCCIB6	P21	IO130PDB3V2	T12	IO194NDB5V0
N9	VCC	P22	IO128NDB3V1	T13	IO186NDB4V4
N10	GND	R1	IO247NDB6V1	T14	IO186PDB4V4
N11	GND	R2	IO245PDB6V1	T15	GNDQ
N12	GND	R3	VCC	T16	VCOMPLD
N13	GND	R4	IO249NPB6V1	T17	VJTAG
N14	VCC	R5	IO251NDB6V2	T18	GDC0/IO151NDB3V4
N15	VCCIB3	R6	IO251PDB6V2	T19	GDA1/IO153PDB3V4
N16	IO116NPB3V0	R7	GEC0/IO236NPB6V0	T20	IO144PDB3V3
N17	IO132NPB3V2	R8	VMV5	T21	IO140PDB3V3
N18	IO117NPB3V0	R9	VCCIB5	T22	IO134NDB3V2
N19	IO132PPB3V2	R10	VCCIB5	U1	IO240PPB6V0
N20	GNDQ	R11	IO196NDB5V0	U2	IO238PDB6V0
N21	IO126NDB3V1	R12	IO196PDB5V0	U3	IO238NDB6V0
N22	IO128PDB3V1	R13	VCCIB4	U4	GEB1/IO235PDB6V0
P1	IO247PDB6V1	R14	VCCIB4	U5	GEB0/IO235NDB6V0
P2	IO253PDB6V2	R15	VMV3	U6	VMV6
P3	IO270NPB6V4	R16	VCCPLD	U7	VCCPLE
P4	IO261NPB6V3	R17	GDB1/IO152PPB3V4	U8	IO233NPB5V4
P5	IO249PPB6V1	R18	GDC1/IO151PDB3V4	U9	IO222PPB5V3
P6	IO259PDB6V3	R19	IO138NDB3V3	U10	IO206PDB5V1
P7	IO259NDB6V3	R20	VCC	U11	IO202PDB5V1
P8	VCCIB6	R21	IO130NDB3V2	U12	IO194PDB5V0
P9	GND	R22	IO134PDB3V2	U13	IO176NDB4V2
P10	VCC	T1	IO243PPB6V1	U14	IO176PDB4V2
P11	VCC	T2	IO245NDB6V1	U15	VMV4
P12	VCC	T3	IO243NPB6V1	U16	TCK
P13	VCC	T4	IO241PDB6V0	U17	VPUMP
P14	GND	T5	IO241NDB6V0	U18	TRST
P15	VCCIB3	T6	GEC1/IO236PPB6V0	U19	GDA0/IO153NDB3V4
P16	GDB0/IO152NPB3V4	T7	VCOMPLE	U20	IO144NDB3V3
P17	IO136NDB3V2	T8	GNDQ	U21	IO140NDB3V3
P18	IO136PDB3V2	T9	GEA2/IO233PPB5V4	U22	IO142PDB3V3
P19	IO138PDB3V3	T10	IO206NDB5V1	V1	IO239PDB6V0
P20	VMV3	T11	IO202NDB5V1	V2	IO240NPB6V0

5 – Datasheet Information

List of Changes

The following table lists critical changes that were made in each revision of the datasheet.

Revision	Changes	Page
Revision 5 (September 2014)	Updated FG896 package in the "I/Os Per Package ¹ " table (SAR34171).	I-II
	Removed reference to JTAG interface operated at 3.3 V from "Advanced Architecture" section (SAR 34686).	1-4
	Fixed table note (1) in Table 2-1 (SAR 47815).	2-1
	Deleted ambient temp row and modified notes in Table 2-2 (SAR 59413).	2-2
	Removed "5 V-tolerant input buffer and push-pull output buffer" from "2.5 V LVCMOS" section" (SAR 24916).	2-49
	Removed table notes referencing +/-5% and 350mV differential voltage from Table 2-160 (SAR 34810).	2-86
	DDR frequency added to Table 2-182, Table 2-183, Table 2-184, Table 2-186, Table 2-187, Table 2-188 (SAR 56034).	2-105– 2-109
	Table note (3) added to Table 2-201 and Table 2-202 to clarify delay increments (SAR 34821).	2-123
	Terminology clarified in Table 2-203, Table 2-204, Table 2-205, Table 2-206, Table 2-207, Table 2-208, Table 2-209, Table 2-210, Table 2-211, Table 2-212, Table 2-213, Table 2-214, Table 2-215, Table 2-216, Figure 2-44, Figure 2-45, Figure 2-46, Figure 2-47, Figure 2-48, and Figure 2-50 (SAR 38237).	2-129 - 2-145
	Revised statement in "VMVx I/O Supply Voltage (quiet)" section per (SAR 38324).	3-1
	Libero IDE revised to SoC throughout (SAR 40287).	N/A
Revision 4 (April 2014)	Added FG256 under A3P1000 in Table 1 • Military ProASIC3/EL Low-Power Devices, in "I/Os Per Package ¹ ", "Temperature Grade Offerings", "FG256" section, and Table 2-5 • Package Thermal Resistivities (SAR 56384). Added Note for Speed Grade in "Military ProASIC3/EL Ordering Information" section. Also added missing details for FG484 for A3P1000 to Table 2-5 • Package Thermal Resistivities (SAR 56384).	I, III, 2-6 and 4-9
	Added details related to Speed Grade 2 to the "Military ProASIC3/EL Ordering Information" section and the "Speed Grade and Temperature Grade Matrix" section (SAR 56384).	III
	Changed Actel references to Microsemi.	NA
Revision 3 (Sept 2012)	The "Security" section was modified to clarify that Microsemi does not support read-back of programmed data.	1-2
Revision 2 (June 2012)	The FG484 package was added for A3P1000 in Table 1 • Military ProASIC3/EL Low-Power Devices, the I/Os Per Package ¹ table, and the "Temperature Grade Offerings" table (SAR 39010).	I, II, III
	The "FG484" pin table for A3P1000 has been added (SAR 39010).	4-19