

## QL24x32BL pASIC<sup>®</sup> 1 Family Low Power 3.3 Volt Operation FPGA

### pASIC HIGHLIGHTS

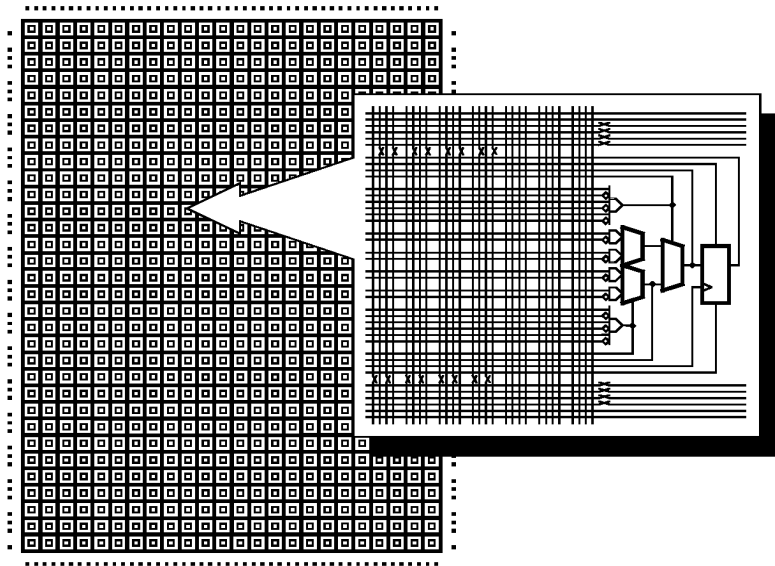
*...8000  
usable ASIC gates,  
180 I/O pins*

### QL24x32BL Block Diagram

*768 Logic Cells*



- ✕ **High Speed** – ViaLink<sup>®</sup> metal-to-metal programmable–via antifuse technology, allows counter speeds over 80 MHz at 3.3 Volt operation.
- ✕ **5V Tolerant I/Os** – Support interface to 5 Volt CMOS, NMOS and bipolar devices by sinking up to 12 mA (see I/O specification).
- ✕ **High Usable Density** – A 24-by-32 array of 768 logic cells provides 8,000 usable ASIC gates (14,000 PLD gates) in 144-pin TQFP and 208-pin PQFP packages.
- ✕ **Compatible with Standard 5.0V product** – The "-L" series is fully pin-out and function compatible with the High Speed 5.0V product. See QL24x32B for pin-out and AC Characteristics.
- ✕ **Low-Cost, Easy-to-Use Design Tools** – Designs entered and simulated using QuickLogic's new QuickWorks<sup>®</sup> development environment, or with third-party CAE tools including Viewlogic, Synopsys, Mentor, Cadence and Veribest. Fast, fully automatic place and route on PC and workstation platforms using QuickLogic software.



▪ = Up to 172 prog. I/O cells, 6 Input high-drive cells, 2 Input/Clk (high-drive) cells

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pASIC 1

**ABSOLUTE MAXIMUM RATINGS**

Supply Voltage ..... -0.5 to 7.0V  
Input Voltage ..... -0.5 to VCC +0.7V  
ESD Pad Protection .....  $\pm 2000V$   
DC Input Current .....  $\pm 20$  mA  
Latch-up Immunity .....  $\pm 200$  mA

Storage Temperature ..... -65°C to + 150°C  
Lead Temperature ..... 300°C

**OPERATING RANGE**

| Symbol | Parameter           | Commercial     |      | Unit |
|--------|---------------------|----------------|------|------|
|        |                     | Min            | Max  |      |
| VCC    | Supply Voltage      | 3.0            | 3.6  | V    |
| TA     | Ambient Temperature | 0              | 70   | °C   |
| TC     | Case Temperature    |                |      | °C   |
| K      | Delay Factor        | -0 Speed Grade | 0.46 | 2.61 |
|        |                     | -1 Speed Grade | 0.46 | 2.23 |

**DC CHARACTERISTICS over operating range**

| Symbol | Parameter                                                | Conditions           | Min     | Max | Unit    |
|--------|----------------------------------------------------------|----------------------|---------|-----|---------|
| VIH    | Input HIGH Voltage                                       |                      | 2.0     |     | V       |
| VIL    | Input LOW Voltage                                        |                      |         | 0.8 | V       |
| VOH    | Output HIGH Voltage                                      | IOH = -2.4 mA        | 2.4     |     | V       |
|        |                                                          | IOH = -10 mA         | VCC-0.1 |     | V       |
| VOL    | Output LOW Voltage                                       | IOL = 4 mA           |         | 0.4 | V       |
|        |                                                          | IOL = 10 $\mu A$     |         | 0.1 | V       |
| IIH    | Input HIGH Current Sink<br>(for tolerance to 5V devices) | VCC+0.6V > VI > VCC  |         | 12  | mA      |
| II     | Input Leakage Current                                    | VI = VCC or GND      | -10     | 10  | $\mu A$ |
| IOZ    | 3-State Output Leakage Current                           | VI = VCC or GND      | -10     | 10  | $\mu A$ |
| CI     | Input Capacitance [1]                                    |                      |         | 10  | pF      |
| IOS    | Output Short Circuit Current [2]                         | VO = GND             | -5      | -50 | mA      |
|        |                                                          | VO = VCC             | 15      | 100 | mA      |
| ICC    | Supply Current [3]                                       | VI, VIO = VCC or GND |         | 650 | $\mu A$ |

Notes:

- [1] Capacitance is sample tested only. CI = 20 pF max on I/(SI) and I/(P).  
[2] Only one output at a time. Duration should not exceed 30 seconds.  
[3] For AC conditions use the formula described in the Data Book, Section 9 — Power vs Operating Frequency.

**ORDERING INFORMATION**