

Enhanced MachXO3™ Family Overview

The MachXO3™ family is Lattice's latest instant-on, lowest cost per I/O, non-volatile FPGA line, ideally suited for control PLD and bridging applications across many types of systems in communications, computing, industrial and consumer segments. Spanning from 640 to 9400 LUTs and available in lower power E (1.2 V core) or easy-to-use C (3.3/2.5 V core) versions, the MachXO3 family offers the latest in small packaging, microwatt power consumption and high I/O count. Designed for an easy integration of advanced control and security functions in servers and communication systems, this family also meets the high-bandwidth and high-resolution requirements for mobile consumer, industrial, and medical applications. The MachXO3L devices include multi-time programmable Non-Volatile Configuration Memory (NVCM), while the MachXO3LF devices support infinitely programmable Flash.

Key Features

- 640 – 9400 LUTs density options
- Up to 384 I/Os
 - 900 Mbps
 - 1.0 V to 3.3 V I/O Interface
- High performance PLLs, built-in oscillator with low-skew edge clock routing
- Password protection against malicious erasure/updates
- Soft Error Correction (SEC) to deterministically recover from Soft Errors
- Hitless I/O to support device reconfiguration in high availability systems
- Hardware Management in combination with Lattice L-ASC10 devices
- Available in Commercial, Industrial and Automotive temperature grades




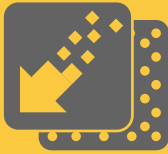

| Enhanced MachXO3L Family | XO3L-640 | XO3L-1300 | XO3L-2100 | XO3L-4300 | XO3L-6900 | XO3L-9400 |
|---------------------------------|-----------|------------------------|------------------------|------------------------|------------|------------|
| Features | XO3LF-640 | XO3LF-1300 | XO3LF-2100 | XO3LF-4300 | XO3LF-6900 | XO3LF-9400 |
| Density LUTs | 640 | 1300 | 2100 | 4300 | 6900 | 9400 |
| EBR RAM (Kbits) | 64 | 64 | 74 | 92 | 240 | 432 |
| PLL | 1 | 1 | 1 | 2 | 2 | 2 |
| Multi Time Programmable NVCM | XO3L-640 | XO3L-1300 | XO3L-2100 | XO3L-4300 | XO3L-6900 | XO3L-9400 |
| Flash | XO3LF-640 | XO3LF-1300 | XO3LF-2100 | XO3LF-4300 | XO3LF-6900 | XO3LF-9400 |
| SPI Interface | 1 | 1 | 1 | 1 | 1 | 1 |
| I ² C interface | 2 | 2 | 2 | 2 | 2 | 2 |
| Oscillator | 1 | 1 | 1 | 1 | 1 | 1 |
| Timer/Counter | 1 | 1 | 1 | 1 | 1 | 1 |
| MIPI D-PHY Support | Yes | Yes | Yes | Yes | Yes | Yes |
| Temperature Grades ¹ | C / I | C / I / A ² | C / I / A ² | C / I / A ² | C / I | C / I |
| Packages | | | | | | |
| 36-ball WLCSP (0.4, 2.5 x 2.5) | | 28 | | | | |
| 49-ball WLCSP (0.4, 3.2 x 3.2) | | | 38 | | | |
| 81-ball WLCSP (0.4, 3.8 x 3.8) | | | | 63 | | |
| 121-ball csfBGA (0.5, 6 x 6) | 100 | 100 | 100 | 100 | | |
| 256-ball csfBGA (0.5, 9 x 9) | | 206 | 206 | 206 | 206 | 206 |
| 324-ball csfBGA (0.5, 10 x 10) | | | 268 | 268 | 269 | |
| 256-ball caBGA (0.8, 14 x 14) | | 206 ³ | 206 ³ | 206 ³ | 206 | 206 |
| 324-ball caBGA (0.8, 15 x 15) | | | 279 ³ | 279 ³ | 279 | |
| 400-ball caBGA (0.8, 17 x 17) | | | | 335 | 335 | 335 |
| 484-ball caBGA (0.8, 19 x 19) | | | | | | 384 |

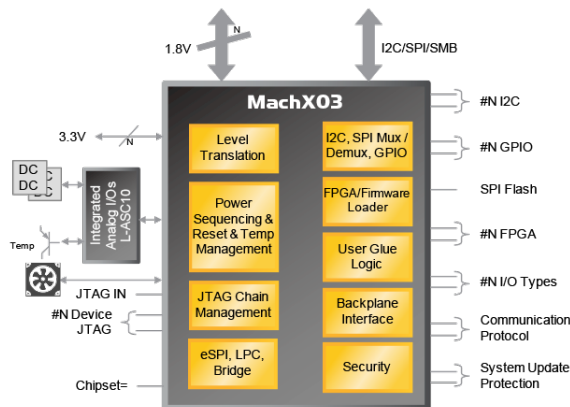
¹ C = Commercial, I = Industrial, A = Automotive

² Automotive grade devices available in MachXO3LF only

³ Automotive in MachXO3LF only

Enhanced Features

| Hitless I/O | SEC / SED | 900 Mbps I/O |
|---|---|---|
|  <ul style="list-style-type: none"> Power recycling not needed for reconfiguration Improved SED immunity for critical nets No software modifications needed |  <ul style="list-style-type: none"> Detect and log soft error events Background soft error mitigation Controlled soft error injection for debugging soft error mitigation |  <ul style="list-style-type: none"> Bridging support for high-resolution images Futureproof your designs for sensors and displays Coupled with increased EBR for improved image sharpness |

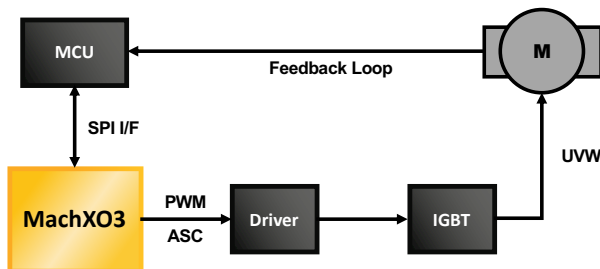


Control PLD

- Embedded I²C, SPI hardware blocks simplify designs
- Non-volatile PLD (640 to 9400 LUTs & 28 to 384 I/O) provides widest application coverage in servers, communication boxes and Industrial controllers
- Perform voltage level translation with ease
- Reduce hardware management cost by integrating power manager and temperature sense ICs with Lattice L-ASC10

Motor Control Interface

- Flexibility to interface with variety of motors used in Industrial, Automotive and other embedded systems
- IGBT Protection and SPI interface allows real-time feedback to the MCU
- Flexibility to support different communication standards at low power and fast response
- Small footprint to accommodate space constrained applications



DSI LCD Display Interfacing

- Supports DSI transmit signaling
 - HS (High Speed) Mode transmit
 - LP (Low Power) Mode transmit and receive
- Can be implemented in a 49 WLCSP (3.2 x 3.2mm)
- Supports DSI formats RGB, YCbCr and User Defined
- Input can also be DSI to enable LCD screen replacements



Applications Support
www.latticesemi.com/support

