# Lattice Semiconductor Corporation - LCMXO640C-3TN144C Datasheet

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## Understanding Embedded - FPGAs (Field Programmable Gate Array)

Embedded - FPGAs, or Field Programmable Gate Arrays, are advanced integrated circuits that offer unparalleled flexibility and performance for digital systems. Unlike traditional fixed-function logic devices, FPGAs can be programmed and reprogrammed to execute a wide array of logical operations, enabling customized functionality tailored to specific applications. This reprogrammability allows developers to iterate designs quickly and implement complex functions without the need for custom hardware.

## 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 | 80 |
| Number of Logic Elements/Cells | 640 |
| Total RAM Bits | - |
| Number of I/O | 113 |
| Number of Gates | - |
| Voltage - Supply | 1.71V ~ 3.465V |
| Mounting Type | Surface Mount |
| Operating Temperature | 0°C ~ 85°C (TJ) |
| Package / Case | 144-LQFP |
| Supplier Device Package | 144-TQFP (20x20) |
| Purchase URL | https://www.e-xfl.com/product-detail/lattice-semiconductor/lcmxo640c-3tn144c |

*Figure 2-20. MachXO640 Banks*

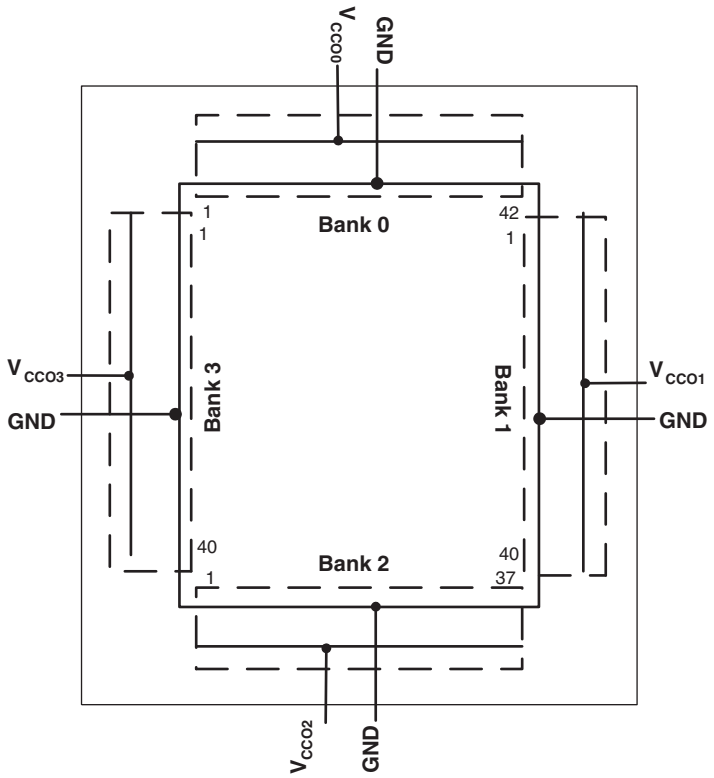
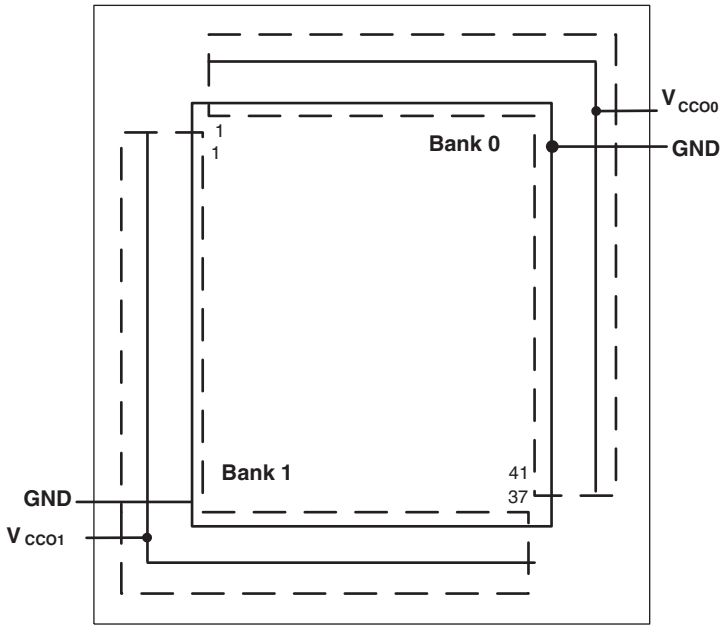



*Figure 2-21. MachXO256 Banks*




## Hot Socketing

The MachXO devices have been carefully designed to ensure predictable behavior during power-up and power-down. Leakage into I/O pins is controlled to within specified limits. This allows for easy integration with the rest of

the system. These capabilities make the MachXO ideal for many multiple power supply and hot-swap applications.

## Sleep Mode

The MachXO "C" devices ($V_{CC}$ = 1.8/2.5/3.3V) have a sleep mode that allows standby current to be reduced dramatically during periods of system inactivity. Entry and exit to Sleep mode is controlled by the SLEEPN pin.

During Sleep mode, the logic is non-operational, registers and EBR contents are not maintained, and I/Os are tri-stated. Do not enter Sleep mode during device programming or configuration operation. In Sleep mode, power supplies are in their normal operating range, eliminating the need for external switching of power supplies. Table 2-11 compares the characteristics of Normal, Off and Sleep modes.

***Table 2-11. Characteristics of Normal, Off and Sleep Modes***

| Characteristic | Normal | Off | Sleep |
|---|---|---|---|
| SLEEPN Pin | High | — | Low |
| Static Icc | Typical <10mA | 0 | Typical <100uA |
| I/O Leakage | <10µA | <1mA | <10µA |
| Power Supplies VCC/VCCIO/VCCAUX | Normal Range | 0 | Normal Range |
| Logic Operation | User Defined | Non Operational | Non operational |
| I/O Operation | User Defined | Tri-state | Tri-state |
| JTAG and Programming circuitry | Operational | Non-operational | Non-operational |
| EBR Contents and Registers | Maintained | Non-maintained | Non-maintained |

### SLEEPN Pin Characteristics

The SLEEPN pin behaves as an LVCMOS input with the voltage standard appropriate to the VCC supply for the device. This pin also has a weak pull-up, along with a Schmidt trigger and glitch filter to prevent false triggering. An external pull-up to VCC is recommended when Sleep Mode is not used to ensure the device stays in normal operation mode. Typically, the device enters sleep mode several hundred nanoseconds after SLEEPN is held at a valid low and restarts normal operation as specified in the Sleep Mode Timing table. The AC and DC specifications portion of this data sheet shows a detailed timing diagram.

## Oscillator

Every MachXO device has an internal CMOS oscillator. The oscillator can be routed as an input clock to the clock tree or to general routing resources. The oscillator frequency can be divided by internal logic. There is a dedicated programming bit to enable/disable the oscillator. The oscillator frequency ranges from 18MHz to 26MHz.

## Configuration and Testing

The following section describes the configuration and testing features of the MachXO family of devices.

### IEEE 1149.1-Compliant Boundary Scan Testability

All MachXO devices have boundary scan cells that are accessed through an IEEE 1149.1 compliant test access port (TAP). This allows functional testing of the circuit board, on which the device is mounted, through a serial scan path that can access all critical logic nodes. Internal registers are linked internally, allowing test data to be shifted in and loaded directly onto test nodes, or test data to be captured and shifted out for verification. The test access port consists of dedicated I/Os: TDI, TDO, TCK and TMS. The test access port shares its power supply with one of the VCCIO Banks (MachXO256: $V_{CCIO1}$; MachXO640: $V_{CCIO2}$; MachXO1200 and MachXO2280: $V_{CCIO5}$) and can operate with LVCMOS3.3, 2.5, 1.8, 1.5, and 1.2 standards.

For more details on boundary scan test, please see information regarding additional technical documentation at the end of this data sheet.

## Supply Current (Sleep Mode)[1, 2]

| Symbol | Parameter | Device | Typ.[3] | Max. | Units |
|---|---|---|---|---|---|
| $I_{CC}$ | Core Power Supply | LCMXO256C | 12 | 25 | µA |
| | | LCMXO640C | 12 | 25 | µA |
| | | LCMXO1200C | 12 | 25 | µA |
| | | LCMXO2280C | 12 | 25 | µA |
| $I_{CCAUX}$ | Auxiliary Power Supply | LCMXO256C | 1 | 15 | µA |
| | | LCMXO640C | 1 | 25 | µA |
| | | LCMXO1200C | 1 | 45 | µA |
| | | LCMXO2280C | 1 | 85 | µA |
| $I_{CCIO}$ | Bank Power Supply[4] | All LCMXO 'C' Devices | 2 | 30 | µA |

1. Assumes all inputs are configured as LVCMOS and held at the VCCIO or GND.
2. Frequency = 0MHz.
3. $T_A$ = 25°C, power supplies at nominal voltage.
4. Per Bank.

## Supply Current (Standby)[1, 2, 3, 4]

**Over Recommended Operating Conditions**

| Symbol | Parameter | Device | Typ.[5] | Units |
|---|---|---|---|---|
| $I_{CC}$ | Core Power Supply | LCMXO256C | 7 | mA |
| | | LCMXO640C | 9 | mA |
| | | LCMXO1200C | 14 | mA |
| | | LCMXO2280C | 20 | mA |
| | | LCMXO256E | 4 | mA |
| | | LCMXO640E | 6 | mA |
| | | LCMXO1200E | 10 | mA |
| | | LCMXO2280E | 12 | mA |
| $I_{CCAUX}$ | Auxiliary Power Supply $V_{CCAUX}$ = 3.3V | LCMXO256E/C | 5 | mA |
| | | LCMXO640E/C | 7 | mA |
| | | LCMXO1200E/C | 12 | mA |
| | | LCMXO2280E/C | 13 | mA |
| $I_{CCIO}$ | Bank Power Supply[6] | All devices | 2 | mA |

1. For further information on supply current, please see details of additional technical documentation at the end of this data sheet.
2. Assumes all outputs are tristated, all inputs are configured as LVCMOS and held at $V_{CCIO}$ or GND.
3. Frequency = 0MHz.
4. User pattern = blank.
5. $T_J$ = 25ºC, power supplies at nominal voltage.
6. Per Bank. $V_{CCIO}$ = 2.5V. Does not include pull-up/pull-down.

## Initialization Supply Current[1, 2, 3, 4]

**Over Recommended Operating Conditions**

| Symbol | Parameter | Device | Typ.[5] | Units |
|---|---|---|---|---|
| $I_{CC}$ | Core Power Supply | LCMXO256C | 13 | mA |
| | | LCMXO640C | 17 | mA |
| | | LCMXO1200C | 21 | mA |
| | | LCMXO2280C | 23 | mA |
| | | LCMXO256E | 10 | mA |
| | | LCMXO640E | 14 | mA |
| | | LCMXO1200E | 18 | mA |
| | | LCMXO2280E | 20 | mA |
| $I_{CCAUX}$ | Auxiliary Power Supply $V_{CCAUX}$ = 3.3V | LCMXO256E/C | 10 | mA |
| | | LCMXO640E/C | 13 | mA |
| | | LCMXO1200E/C | 24 | mA |
| | | LCMXO2280E/C | 25 | mA |
| $I_{CCIO}$ | Bank Power Supply[6] | All devices | 2 | mA |

1. For further information on supply current, please see details of additional technical documentation at the end of this data sheet.
2. Assumes all I/O pins are held at $V_{CCIO}$ or GND.
3. Frequency = 0MHz.
4. Typical user pattern.
5. $T_J$ = 25°C, power supplies at nominal voltage.
6. Per Bank, $V_{CCIO}$ = 2.5V. Does not include pull-up/pull-down.

## Programming and Erase Flash Supply Current[1, 2, 3, 4]

| Symbol | Parameter | Device | Typ.[5] | Units |
|---|---|---|---|---|
| $I_{CC}$ | Core Power Supply | LCMXO256C | 9 | mA |
| | | LCMXO640C | 11 | mA |
| | | LCMXO1200C | 16 | mA |
| | | LCMXO2280C | 22 | mA |
| | | LCMXO256E | 6 | mA |
| | | LCMXO640E | 8 | mA |
| | | LCMXO1200E | 12 | mA |
| | | LCMXO2280E | 14 | mA |
| $I_{CCAUX}$ | Auxiliary Power Supply $V_{CCAUX}$ = 3.3V | LCMXO256C/E | 8 | mA |
| | | LCMXO640C/E | 10 | mA |
| | | LCMXO1200/E | 15 | mA |
| | | LCMXO2280C/E | 16 | mA |
| $I_{CCIO}$ | Bank Power Supply[6] | All devices | 2 | mA |

1. For further information on supply current, please see details of additional technical documentation at the end of this data sheet.
2. Assumes all I/O pins are held at $V_{CCIO}$ or GND.
3. Typical user pattern.
4. JTAG programming is at 25MHz.
5. $T_J$ = 25°C, power supplies at nominal voltage.
6. Per Bank. $V_{CCIO}$ = 2.5V. Does not include pull-up/pull-down.

*Table 3-2. BLVDS DC Conditions[1]*

**Over Recommended Operating Conditions**

| Symbol | Description | Nominal | | Units |
|---|---|---|---|---|
| | | Zo = 45 | Zo = 90 | |
| $Z_{OUT}$ | Output impedance | 100 | 100 | Ohms |
| $R_{TLEFT}$ | Left end termination | 45 | 90 | Ohms |
| $R_{TRIGHT}$ | Right end termination | 45 | 90 | Ohms |
| $V_{OH}$ | Output high voltage | 1.375 | 1.48 | V |
| $V_{OL}$ | Output low voltage | 1.125 | 1.02 | V |
| $V_{OD}$ | Output differential voltage | 0.25 | 0.46 | V |
| $V_{CM}$ | Output common mode voltage | 1.25 | 1.25 | V |
| $I_{DC}$ | DC output current | 11.2 | 10.2 | mA |

1. For input buffer, see LVDS table.

## LVPECL

The MachXO family supports the differential LVPECL standard through emulation. This output standard is emulated using complementary LVCMOS outputs in conjunction with a parallel resistor across the driver outputs on all the devices. The LVPECL input standard is supported by the LVDS differential input buffer on certain devices. The scheme shown in Figure 3-3 is one possible solution for point-to-point signals.

*Figure 3-3. Differential LVPECL*

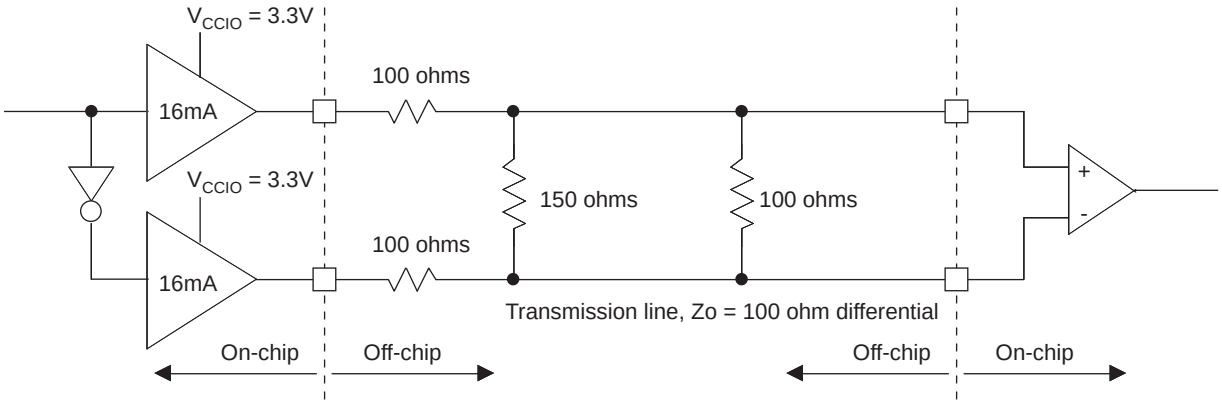



*Table 3-3. LVPECL DC Conditions[1]*

**Over Recommended Operating Conditions**

| Symbol | Description | Nominal | Units |
|---|---|---|---|
| $Z_{OUT}$ | Output impedance | 100 | Ohms |
| $R_P$ | Driver parallel resistor | 150 | Ohms |
| $R_T$ | Receiver termination | 100 | Ohms |
| $V_{OH}$ | Output high voltage | 2.03 | V |
| $V_{OL}$ | Output low voltage | 1.27 | V |
| $V_{OD}$ | Output differential voltage | 0.76 | V |
| $V_{CM}$ | Output common mode voltage | 1.65 | V |
| $Z_{BACK}$ | Back impedance | 85.7 | Ohms |
| $I_{DC}$ | DC output current | 12.7 | mA |

1. For input buffer, see LVDS table.

# sysCLOCK PLL Timing

**Over Recommended Operating Conditions**

| Parameter | Descriptions | Conditions | Min. | Max. | Units |
|---|---|---|---|---|---|
| $f_{IN}$ | Input Clock Frequency (CLKI, CLKFB) | | 25 | 420 | MHz |
| | | Input Divider (M) = 1; Feedback Divider (N) <= 4[5, 6] | 18 | 25 | MHz |
| $f_{OUT}$ | Output Clock Frequency (CLKOP, CLKOS) | | 25 | 420 | MHz |
| $f_{OUT2}$ | K-Divider Output Frequency (CLKOK) | | 0.195 | 210 | MHz |
| $f_{VCO}$ | PLL VCO Frequency | | 420 | 840 | MHz |
| $f_{PFD}$ | Phase Detector Input Frequency | | 25 | — | MHz |
| | | Input Divider (M) = 1; Feedback Divider (N) <= 4[5, 6] | 18 | 25 | MHz |
| **AC Characteristics** | | | | | |
| $t_{DT}$ | Output Clock Duty Cycle | Default duty cycle selected[3] | 45 | 55 | % |
| $t_{PH}$[4] | Output Phase Accuracy | | — | 0.05 | UI |
| $t_{OPJIT}$[1] | Output Clock Period Jitter | $f_{OUT}$ >= 100 MHz | — | +/-120 | ps |
| | | $f_{OUT}$ < 100 MHz | — | 0.02 | UIPP |
| $t_{SK}$ | Input Clock to Output Clock Skew | Divider ratio = integer | — | +/-200 | ps |
| $t_{W}$ | Output Clock Pulse Width | At 90% or 10%[3] | 1 | — | ns |
| $t_{LOCK}$[2] | PLL Lock-in Time | | — | 150 | µs |
| $t_{PA}$ | Programmable Delay Unit | | 100 | 450 | ps |
| $t_{IPJIT}$ | Input Clock Period Jitter | $f_{OUT} \geq$ 100 MHz | — | +/-200 | ps |
| | | $f_{OUT}$ < 100 MHz | — | 0.02 | UI |
| $t_{FBKDLY}$ | External Feedback Delay | | — | 10 | ns |
| $t_{HI}$ | Input Clock High Time | 90% to 90% | 0.5 | — | ns |
| $t_{LO}$ | Input Clock Low Time | 10% to 10% | 0.5 | — | ns |
| $t_{RST}$ | RST Pulse Width | | 10 | — | ns |

1. Jitter sample is taken over 10,000 samples of the primary PLL output with a clean reference clock.
2. Output clock is valid after $t_{LOCK}$ for PLL reset and dynamic delay adjustment.
3. Using LVDS output buffers.
4. CLKOS as compared to CLKOP output.
5. When using an input frequency less than 25 MHz the output frequency must be less than or equal to 4 times the input frequency.
6. The on-chip oscillator can be used to provide reference clock input to the PLL provided the output frequency restriction for clock inputs below 25 MHz are followed.

Rev. A 0.19

## Power Supply and NC

| Signal | 100 TQFP[1] | 144 TQFP[1] | 100 csBGA[2] |
|---|---|---|---|
| VCC | **LCMXO256/640**: 35, 90<br>**LCMXO1200/2280**: 17, 35, 66, 91 | 21, 52, 93, 129 | P7, B6 |
| VCCIO0 | **LCMXO256**: 60, 74, 92<br>**LCMXO640**: 80, 92<br>**LCMXO1200/2280**: 94 | **LCMXO640**: 117, 135<br>**LCMXO1200/2280**: 135 | **LCMXO256**: H14, A14, B5<br>**LCMXO640**: B12, B5 |
| VCCIO1 | **LCMXO256**: 10, 24, 41<br>**LCMXO640**: 60, 74<br>**LCMXO1200/2280**: 80 | **LCMXO640**: 82, 98<br>**LCMXO1200/2280**: 117 | **LCMXO256**: G1, P1, P10<br>**LCMXO640**: H14, A14 |
| VCCIO2 | **LCMXO256**: None<br>**LCMXO640**: 29, 41<br>**LCMXO1200/2280**: 70 | **LCMXO640**: 38, 63<br>**LCMXO1200/2280**: 98 | **LCMXO256**: None<br>**LCMXO640**: P4, P10 |
| VCCIO3 | **LCMXO256**: None<br>**LCMXO640**: 10, 24<br>**LCMXO1200/2280**: 56 | **LCMXO640**: 10, 26<br>**LCMXO1200/2280**: 82 | **LCMXO256**: None<br>**LCMXO640**: G1, P1 |
| VCCIO4 | **LCMXO256/640**: None<br>**LCMXO1200/2280**: 44 | **LCMXO640**: None<br>**LCMXO1200/2280**: 63 | — |
| VCCIO5 | **LCMXO256/640**: None<br>**LCMXO1200/2280**: 27 | **LCMXO640**: None<br>**LCMXO1200/2280**: 38 | — |
| VCCIO6 | **LCMXO256/640**: None<br>**LCMXO1200/2280**: 20 | **LCMXO640**: None<br>**LCMXO1200/2280**: 26 | — |
| VCCIO7 | **LCMXO256/640**: None<br>**LCMXO1200/2280**: 6 | **LCMXO640**: None<br>**LCMXO1200/2280**: 10 | — |
| VCCAUX | **LCMXO256/640**: 88<br>**LCMXO1200/2280**: 36, 90 | 53, 128 | B7 |
| GND[3] | **LCMXO256**: 40, 84, 62, 75, 93, 12, 25, 42<br>**LCMXO640**: 40, 84, 81, 93, 62, 75, 30, 42, 12, 25<br>**LCMXO1200/2280**: 9, 41, 59, 83, 100, 76, 50, 26 | 16, 59, 88, 123, 118, 136, 83, 99, 37, 64, 11, 27 | **LCMXO256**: N9, B9, G14, B13, A4, H1, N2, N10<br>**LCMXO640**: N9, B9, A10, A4, G14, B13, N3, N10, H1, N2 |
| NC[4] | | | — |

1. Pin orientation follows the conventional order from pin 1 marking of the top side view and counter-clockwise.
2. Pin orientation A1 starts from the upper left corner of the top side view with alphabetical order ascending vertically and numerical order ascending horizontally.
3. All grounds must be electrically connected at the board level. For fpBGA and ftBGA packages, the total number of GND balls is less than the actual number of GND logic connections from the die to the common package GND plane.
4. NC pins should not be connected to any active signals, VCC or GND.

## Power Supply and NC (Cont.)

| Signal | 132 csBGA[1] | 256 caBGA / 256 ftBGA[1] | 324 ftBGA[1] |
|---|---|---|---|
| VCC | H3, P6, G12, C7 | G7, G10, K7, K10 | F14, G11, G9, H7, L7, M9 |
| VCCIO0 | **LCMXO640**: B11, C5<br>**LCMXO1200/2280**: C5 | **LCMXO640**: F8, F7, F9, F10<br>**LCMXO1200/2280**: F8, F7 | G8, G7 |
| VCCIO1 | **LCMXO640**: L12, E12<br>**LCMXO1200/2280**: B11 | **LCMXO640**: H11, G11, K11, J11<br>**LCMXO1200/2280**: F9, F10 | G12, G10 |
| VCCIO2 | **LCMXO640**: N2, M10<br>**LCMXO1200/2280**: E12 | **LCMXO640**: L9, L10, L8, L7<br>**LCMXO1200/2280**: H11, G11 | J12, H12 |
| VCCIO3 | **LCMXO640**: D2, K3<br>**LCMXO1200/2280**: L12 | **LCMXO640**: K6, J6, H6, G6<br>**LCMXO1200/2280**: K11, J11 | L12, K12 |
| VCCIO4 | **LCMXO640**: None<br>**LCMXO1200/2280**: M10 | **LCMXO640**: None<br>**LCMXO1200/2280**: L9, L10 | M12, M11 |
| VCCIO5 | **LCMXO640**: None<br>**LCMXO1200/2280**: N2 | **LCMXO640**: None<br>**LCMXO1200/2280**: L8, L7 | M8, R9 |
| VCCIO6 | **LCMXO640**: None<br>**LCMXO1200/2280**: K3 | **LCMXO640**: None<br>**LCMXO1200/2280**: K6, J6 | M7, K7 |
| VCCIO7 | **LCMXO640**: None<br>**LCMXO1200/2280**: D2 | **LCMXO640**: None<br>**LCMXO1200/2280**: H6, G6 | H6, J7 |
| VCCAUX | P7, A7 | T9, A8 | M10, F9 |
| GND[2] | F1, P9, J14, C9, A10, B4, L13, D13, P2, N11, E1, L2 | A1, A16, F11, G8, G9, H7, H8, H9, H10, J7, J8, J9, J10, K8, K9, L6, T1, T16 | E14, F16, H10, H11, H8, H9, J10, J11, J4, J8, J9, K10, K11, K17, K8, K9, L10, L11, L8, L9, N2, P14, P5, R7 |
| NC[3] | — | **LCMXO640**: E4, E5, F5, F6, C3, C2, G4, G5, H4, H5, K5, K4, M5, M4, P2, P3, N5, N6, M7, M8, N10, N11, R15, R16, P15, P16, M11, L11, N12, N13, M13, M12, K12, J12, F12, F13, E12, E13, D13, D14, B15, A15, C14, B14, E11, E10, E7, E6, D4, D3, B3, B2<br>**LCMXO1200**: None<br>**LCMXO2280**: None | — |

1. Pin orientation A1 starts from the upper left corner of the top side view with alphabetical order ascending vertically and numerical order ascending horizontally.
2. All grounds must be electrically connected at the board level. For fpBGA and ftBGA packages, the total number of GND balls is less than the actual number of GND logic connections from the die to the common package GND plane.
3. NC pins should not be connected to any active signals, VCC or GND.

## LCMXO1200 and LCMXO2280 Logic Signal Connections: 100 TQFP (Cont.)

| Pin Number | LCMXO1200 | | | | LCMXO2280 | | | |
|---|---|---|---|---|---|---|---|---|
| | Ball Function | Bank | Dual Function | Differential | Ball Function | Bank | Dual Function | Differential |
| 82 | PT9A | 1 | | | PT12C | 1 | | T |
| 83 | GND | - | | | GND | - | | |
| 84 | PT8B | 1 | | C | PT11B | 1 | | C |
| 85 | PT8A | 1 | | T | PT11A | 1 | | T |
| 86 | PT7D | 1 | PCLK1_1**** | | PT10B | 1 | PCLK1_1**** | |
| 87 | PT6F | 0 | PCLK0_0**** | | PT9B | 1 | PCLK1_0**** | |
| 88 | PT6D | 0 | | C | PT8F | 0 | | C |
| 89 | PT6C | 0 | | T | PT8E | 0 | | T |
| 90 | VCCAUX | - | | | VCCAUX | - | | |
| 91 | VCC | - | | | VCC | - | | |
| 92 | PT5B | 0 | | | PT6D | 0 | | |
| 93 | PT4B | 0 | | | PT6F | 0 | | |
| 94 | VCCIO0 | 0 | | | VCCIO0 | 0 | | |
| 95 | PT3D | 0 | | C | PT4B | 0 | | C |
| 96 | PT3C | 0 | | T | PT4A | 0 | | T |
| 97 | PT3B | 0 | | | PT3B | 0 | | |
| 98 | PT2B | 0 | | C | PT2B | 0 | | C |
| 99 | PT2A | 0 | | T | PT2A | 0 | | T |
| 100** | GNDIO0 GNDIO7 | - | | | GNDIO0 GNDIO7 | - | | |

*Supports true LVDS outputs.
**Double bonded to the pin.
***NC for "E" devices.
****Primary clock inputs are single-ended.

# LCMXO640, LCMXO1200 and LCMXO2280 Logic Signal Connections: 132 csBGA (Cont.)

| LCMXO640 | | | | | LCMXO1200 | | | | | LCMXO2280 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ball # | Ball Function | Bank | Dual Function | Differential | Ball # | Ball Function | Bank | Dual Function | Differential | Ball # | Ball Function | Bank | Dual Function | Differential |
| M9 | PB7B | 2 | | C | M9 | PB9B | 4 | | C | M9 | PB12B | 4 | | C |
| N10 | PB7E | 2 | | T | N10 | PB9C | 4 | | T | N10 | PB12C | 4 | | T |
| P10 | PB7F | 2 | | C | P10 | PB9D | 4 | | C | P10 | PB12D | 4 | | C |
| N11 | GNDIO2 | 2 | | | N11 | GNDIO4 | 4 | | | N11 | GNDIO4 | 4 | | |
| P11 | PB8C | 2 | | T | P11 | PB10A | 4 | | T | P11 | PB13C | 4 | | T |
| M11 | PB8D | 2 | | C | M11 | PB10B | 4 | | C | M11 | PB13D | 4 | | C |
| P12 | PB9C | 2 | | T | P12 | PB10C | 4 | | | P12 | PB15B | 4 | | |
| P13 | PB9D | 2 | | C | P13 | PB11C | 4 | | T | P13 | PB16C | 4 | | T |
| N12** | SLEEPN | - | SLEEPN | | N12** | SLEEPN | - | SLEEPN | | N12** | SLEEPN | - | SLEEPN | |
| P14 | PB9F | 2 | | | P14 | PB11D | 4 | | C | P14 | PB16D | 4 | | C |
| N14 | PR11D | 1 | | C | N14 | PR16B | 3 | | C | N14 | PR19B | 3 | | C |
| M14 | PR11C | 1 | | T | M14 | PR15B | 3 | | C* | M14 | PR18B | 3 | | C* |
| N13 | PR11B | 1 | | C | N13 | PR16A | 3 | | T | N13 | PR19A | 3 | | T |
| M12 | PR11A | 1 | | T | M12 | PR15A | 3 | | T* | M12 | PR18A | 3 | | T* |
| M13 | PR10B | 1 | | C | M13 | PR14B | 3 | | C* | M13 | PR17B | 3 | | C* |
| L14 | PR10A | 1 | | T | L14 | PR14A | 3 | | T* | L14 | PR17A | 3 | | T* |
| L13 | GNDIO1 | 1 | | | L13 | GNDIO3 | 3 | | | L13 | GNDIO3 | 3 | | |
| K14 | PR8D | 1 | | C | K14 | PR12B | 3 | | C* | K14 | PR15B | 3 | | C* |
| K13 | PR8C | 1 | | T | K13 | PR12A | 3 | | T* | K13 | PR15A | 3 | | T* |
| K12 | PR8B | 1 | | C | K12 | PR11B | 3 | | C* | K12 | PR14B | 3 | | C* |
| J13 | PR8A | 1 | | T | J13 | PR11A | 3 | | T* | J13 | PR14A | 3 | | T* |
| J12 | PR7C | 1 | | | J12 | PR10B | 3 | | C* | J12 | PR13B | 3 | | C* |
| H14 | PR7B | 1 | | C | H14 | PR10A | 3 | | T* | H14 | PR13A | 3 | | T* |
| H13 | PR7A | 1 | | T | H13 | PR9B | 3 | | C* | H13 | PR11B | 3 | | C* |
| H12 | PR6D | 1 | | C | H12 | PR9A | 3 | | T* | H12 | PR11A | 3 | | T* |
| G13 | PR6C | 1 | | T | G13 | PR8B | 2 | | C* | G13 | PR10B | 2 | | C* |
| G14 | PR6B | 1 | | | G14 | PR8A | 2 | | T* | G14 | PR10A | 2 | | T* |
| G12 | VCC | - | | | G12 | VCC | - | | | G12 | VCC | - | | |
| F14 | PR5D | 1 | | C | F14 | PR6C | 2 | | | F14 | PR8C | 2 | | |
| F13 | PR5C | 1 | | T | F13 | PR6B | 2 | | C* | F13 | PR8B | 2 | | C* |
| F12 | PR4D | 1 | | C | F12 | PR6A | 2 | | T* | F12 | PR8A | 2 | | T* |
| E13 | PR4C | 1 | | T | E13 | PR5B | 2 | | C* | E13 | PR7B | 2 | | C* |
| E14 | PR4B | 1 | | | E14 | PR5A | 2 | | T* | E14 | PR7A | 2 | | T* |
| D13 | GNDIO1 | 1 | | | D13 | GNDIO2 | 2 | | | D13 | GNDIO2 | 2 | | |
| D14 | PR3D | 1 | | C | D14 | PR4B | 2 | | C* | D14 | PR5B | 2 | | C* |
| D12 | PR3C | 1 | | T | D12 | PR4A | 2 | | T* | D12 | PR5A | 2 | | T* |
| C14 | PR2D | 1 | | C | C14 | PR3D | 2 | | C | C14 | PR4D | 2 | | C |
| B14 | PR2C | 1 | | T | B14 | PR2B | 2 | | C | B14 | PR3B | 2 | | C* |
| C13 | PR2B | 1 | | C | C13 | PR3C | 2 | | T | C13 | PR4C | 2 | | T |
| A14 | PR2A | 1 | | T | A14 | PR2A | 2 | | T | A14 | PR3A | 2 | | T* |
| A13 | PT9F | 0 | | C | A13 | PT11D | 1 | | C | A13 | PT16D | 1 | | C |
| A12 | PT9E | 0 | | T | A12 | PT11B | 1 | | C | A12 | PT16B | 1 | | C |
| B13 | PT9D | 0 | | C | B13 | PT11C | 1 | | T | B13 | PT16C | 1 | | T |
| B12 | PT9C | 0 | | T | B12 | PT10F | 1 | | | B12 | PT15D | 1 | | |
| C12 | PT9B | 0 | | C | C12 | PT11A | 1 | | T | C12 | PT16A | 1 | | T |
| A11 | PT9A | 0 | | T | A11 | PT10D | 1 | | C | A11 | PT14B | 1 | | C |
| C11 | PT8C | 0 | | | C11 | PT10C | 1 | | T | C11 | PT14A | 1 | | T |
| A10 | GNDIO0 | 0 | | | A10 | GNDIO1 | 1 | | | A10 | GNDIO1 | 1 | | |
| B10 | PT7F | 0 | | C | B10 | PT9F | 1 | | C | B10 | PT12F | 1 | | C |
| C10 | PT7E | 0 | | T | C10 | PT9E | 1 | | T | C10 | PT12E | 1 | | T |

# LCMXO640, LCMXO1200 and LCMXO2280 Logic Signal Connections: 132 csBGA (Cont.)

| LCMXO640 | | | | | LCMXO1200 | | | | | LCMXO2280 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ball # | Ball Function | Bank | Dual Function | Differential | Ball # | Ball Function | Bank | Dual Function | Differential | Ball # | Ball Function | Bank | Dual Function | Differential |
| B9 | PT7B | 0 | | C | B9 | PT9B | 1 | | C | B9 | PT12D | 1 | | C |
| A9 | PT7A | 0 | | T | A9 | PT9A | 1 | | T | A9 | PT12C | 1 | | T |
| A8 | PT6B | 0 | PCLK0_1*** | C | A8 | PT7D | 1 | PCLK1_1*** | | A8 | PT10B | 1 | PCLK1_1*** | |
| B8 | PT6A | 0 | | T | B8 | PT7B | 1 | | | B8 | PT9D | 1 | | |
| C8 | PT5B | 0 | PCLK0_0*** | C | C8 | PT6F | 0 | PCLK1_0*** | | C8 | PT9B | 1 | PCLK1_0*** | |
| B7 | PT5A | 0 | | T | B7 | PT6D | 0 | | | B7 | PT8D | 0 | | |
| A7 | VCCAUX | - | | | A7 | VCCAUX | - | | | A7 | VCCAUX | - | | |
| C7 | VCC | - | | | C7 | VCC | - | | | C7 | VCC | - | | |
| A6 | PT4D | 0 | | C | A6 | PT5D | 0 | | C | A6 | PT7B | 0 | | C |
| B6 | PT4C | 0 | | T | B6 | PT5C | 0 | | T | B6 | PT7A | 0 | | T |
| C6 | PT3F | 0 | | C | C6 | PT5B | 0 | | C | C6 | PT6D | 0 | | |
| B5 | PT3E | 0 | | T | B5 | PT5A | 0 | | T | B5 | PT6E | 0 | | T |
| A5 | PT3D | 0 | | | A5 | PT4B | 0 | | | A5 | PT6F | 0 | | C |
| B4 | GNDIO0 | 0 | | | B4 | GNDIO0 | 0 | | | B4 | GNDIO0 | 0 | | |
| A4 | PT3B | 0 | | | A4 | PT3D | 0 | | C | A4 | PT4B | 0 | | C |
| C4 | PT2F | 0 | | | C4 | PT3C | 0 | | T | C4 | PT4A | 0 | | T |
| A3 | PT2D | 0 | | C | A3 | PT3B | 0 | | C | A3 | PT3B | 0 | | C |
| A2 | PT2C | 0 | | T | A2 | PT2B | 0 | | C | A2 | PT2B | 0 | | C |
| B3 | PT2B | 0 | | C | B3 | PT3A | 0 | | T | B3 | PT3A | 0 | | T |
| A1 | PT2A | 0 | | T | A1 | PT2A | 0 | | T | A1 | PT2A | 0 | | T |
| F1 | GND | - | | | F1 | GND | - | | | F1 | GND | - | | |
| P9 | GND | - | | | P9 | GND | - | | | P9 | GND | - | | |
| J14 | GND | - | | | J14 | GND | - | | | J14 | GND | - | | |
| C9 | GND | - | | | C9 | GND | - | | | C9 | GND | - | | |
| C5 | VCCIO0 | 0 | | | C5 | VCCIO0 | 0 | | | C5 | VCCIO0 | 0 | | |
| B11 | VCCIO0 | 0 | | | B11 | VCCIO1 | 1 | | | B11 | VCCIO1 | 1 | | |
| E12 | VCCIO1 | 1 | | | E12 | VCCIO2 | 2 | | | E12 | VCCIO2 | 2 | | |
| L12 | VCCIO1 | 1 | | | L12 | VCCIO3 | 3 | | | L12 | VCCIO3 | 3 | | |
| M10 | VCCIO2 | 2 | | | M10 | VCCIO4 | 4 | | | M10 | VCCIO4 | 4 | | |
| N2 | VCCIO2 | 2 | | | N2 | VCCIO5 | 5 | | | N2 | VCCIO5 | 5 | | |
| D2 | VCCIO3 | 3 | | | D2 | VCCIO7 | 7 | | | D2 | VCCIO7 | 7 | | |
| K3 | VCCIO3 | 3 | | | K3 | VCCIO6 | 6 | | | K3 | VCCIO6 | 6 | | |

*Supports true LVDS outputs.
**NC for “E” devices.
***Primary clock inputs arer single-ended.

# LCMXO640, LCMXO1200 and LCMXO2280 Logic Signal Connections: 144 TQFP (Cont.)

| Pin Number | LCMXO640 | | | | LCMXO1200 | | | | LCMXO2280 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ball Function | Bank | Dual Function | Differential | Ball Function | Bank | Dual Function | Differential | Ball Function | Bank | Dual Function | Differential |
| 51 | TDI | 2 | TDI | | TDI | 5 | TDI | | TDI | 5 | TDI | |
| 52 | VCC | - | | | VCC | - | | | VCC | - | | |
| 53 | VCCAUX | - | | | VCCAUX | - | | | VCCAUX | - | | |
| 54 | PB5A | 2 | | T | PB6F | 5 | | | PB8F | 5 | | |
| 55 | PB5B | 2 | PCLKT2_1*** | C | PB7B | 4 | PCLK4_1*** | | PB10F | 4 | PCLK4_1*** | |
| 56 | PB5D | 2 | | | PB7C | 4 | | T | PB10C | 4 | | T |
| 57 | PB6A | 2 | | T | PB7D | 4 | | C | PB10D | 4 | | C |
| 58 | PB6B | 2 | PCLKT2_0*** | C | PB7F | 4 | PCLK4_0*** | | PB10B | 4 | PCLK4_0*** | |
| 59 | GND | - | | | GND | - | | | GND | - | | |
| 60 | PB7C | 2 | | | PB9A | 4 | | T | PB12A | 4 | | T |
| 61 | PB7E | 2 | | | PB9B | 4 | | C | PB12B | 4 | | C |
| 62 | PB8A | 2 | | | PB9E | 4 | | | PB12E | 4 | | |
| 63 | VCCIO2 | 2 | | | VCCIO4 | 4 | | | VCCIO4 | 4 | | |
| 64 | GNDIO2 | 2 | | | GNDIO4 | 4 | | | GNDIO4 | 4 | | |
| 65 | PB8C | 2 | | T | PB10A | 4 | | T | PB13A | 4 | | T |
| 66 | PB8D | 2 | | C | PB10B | 4 | | C | PB13B | 4 | | C |
| 67 | PB9A | 2 | | T | PB10C | 4 | | T | PB13C | 4 | | T |
| 68 | PB9C | 2 | | T | PB10D | 4 | | C | PB13D | 4 | | C |
| 69 | PB9B | 2 | | C | PB10F | 4 | | | PB14D | 4 | | |
| 70** | SLEEPN | - | SLEEPN | | SLEEPN | - | SLEEPN | | SLEEPN | - | SLEEPN | |
| 71 | PB9D | 2 | | C | PB11C | 4 | | T | PB16C | 4 | | T |
| 72 | PB9F | 2 | | | PB11D | 4 | | C | PB16D | 4 | | C |
| 73 | PR11D | 1 | | C | PR16B | 3 | | C | PR20B | 3 | | C |
| 74 | PR11B | 1 | | C | PR16A | 3 | | T | PR20A | 3 | | T |
| 75 | PR11C | 1 | | T | PR15B | 3 | | C* | PR19B | 3 | | C |
| 76 | PR10D | 1 | | C | PR15A | 3 | | T* | PR19A | 3 | | T |
| 77 | PR11A | 1 | | T | PR14D | 3 | | C | PR17D | 3 | | C |
| 78 | PR10B | 1 | | C | PR14C | 3 | | T | PR17C | 3 | | T |
| 79 | PR10C | 1 | | T | PR14B | 3 | | C* | PR17B | 3 | | C* |
| 80 | PR10A | 1 | | T | PR14A | 3 | | T* | PR17A | 3 | | T* |
| 81 | PR9D | 1 | | | PR13D | 3 | | | PR16D | 3 | | |
| 82 | VCCIO1 | 1 | | | VCCIO3 | 3 | | | VCCIO3 | 3 | | |
| 83 | GNDIO1 | 1 | | | GNDIO3 | 3 | | | GNDIO3 | 3 | | |
| 84 | PR9A | 1 | | | PR12B | 3 | | C* | PR15B | 3 | | C* |
| 85 | PR8C | 1 | | | PR12A | 3 | | T* | PR15A | 3 | | T* |
| 86 | PR8A | 1 | | | PR11B | 3 | | C* | PR14B | 3 | | C* |
| 87 | PR7D | 1 | | | PR11A | 3 | | T* | PR14A | 3 | | T* |
| 88 | GND | - | | | GND | - | | | GND | - | | |
| 89 | PR7B | 1 | | C | PR10B | 3 | | C* | PR13B | 3 | | C* |
| 90 | PR7A | 1 | | T | PR10A | 3 | | T* | PR13A | 3 | | T* |
| 91 | PR6D | 1 | | C | PR8B | 2 | | C* | PR10B | 2 | | C* |
| 92 | PR6C | 1 | | T | PR8A | 2 | | T* | PR10A | 2 | | T* |
| 93 | VCC | - | | | VCC | - | | | VCC | - | | |
| 94 | PR5D | 1 | | | PR6B | 2 | | C* | PR8B | 2 | | C* |
| 95 | PR5B | 1 | | | PR6A | 2 | | T* | PR8A | 2 | | T* |
| 96 | PR4D | 1 | | | PR5B | 2 | | C* | PR7B | 2 | | C* |
| 97 | PR4B | 1 | | C | PR5A | 2 | | T* | PR7A | 2 | | T* |
| 98 | VCCIO1 | 1 | | | VCCIO2 | 2 | | | VCCIO2 | 2 | | |
| 99 | GNDIO1 | 1 | | | GNDIO2 | 2 | | | GNDIO2 | 2 | | |
| 100 | PR4A | 1 | | T | PR4C | 2 | | | PR5C | 2 | | |

# LCMXO640, LCMXO1200 and LCMXO2280 Logic Signal Connections: 144 TQFP (Cont.)

| Pin Number | LCMXO640 | | | | LCMXO1200 | | | | LCMXO2280 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ball Function | Bank | Dual Function | Differential | Ball Function | Bank | Dual Function | Differential | Ball Function | Bank | Dual Function | Differential |
| 101 | PR3D | 1 | | C | PR4B | 2 | | C* | PR5B | 2 | | C* |
| 102 | PR3C | 1 | | T | PR4A | 2 | | T* | PR5A | 2 | | T* |
| 103 | PR3B | 1 | | C | PR3D | 2 | | C | PR4D | 2 | | C |
| 104 | PR2D | 1 | | C | PR3C | 2 | | T | PR4C | 2 | | T |
| 105 | PR3A | 1 | | T | PR3B | 2 | | C* | PR4B | 2 | | C* |
| 106 | PR2B | 1 | | C | PR3A | 2 | | T* | PR4A | 2 | | T* |
| 107 | PR2C | 1 | | T | PR2B | 2 | | C | PR3B | 2 | | C* |
| 108 | PR2A | 1 | | T | PR2A | 2 | | T | PR3A | 2 | | T* |
| 109 | PT9F | 0 | | C | PT11D | 1 | | C | PT16D | 1 | | C |
| 110 | PT9D | 0 | | C | PT11C | 1 | | T | PT16C | 1 | | T |
| 111 | PT9E | 0 | | T | PT11B | 1 | | C | PT16B | 1 | | C |
| 112 | PT9B | 0 | | C | PT11A | 1 | | T | PT16A | 1 | | T |
| 113 | PT9C | 0 | | T | PT10F | 1 | | C | PT15D | 1 | | C |
| 114 | PT9A | 0 | | T | PT10E | 1 | | T | PT15C | 1 | | T |
| 115 | PT8C | 0 | | | PT10D | 1 | | C | PT14B | 1 | | C |
| 116 | PT8B | 0 | | C | PT10C | 1 | | T | PT14A | 1 | | T |
| 117 | VCCIO0 | 0 | | | VCCIO1 | 1 | | | VCCIO1 | 1 | | |
| 118 | GNDIO0 | 0 | | | GNDIO1 | 1 | | | GNDIO1 | 1 | | |
| 119 | PT8A | 0 | | T | PT9F | 1 | | C | PT12F | 1 | | C |
| 120 | PT7E | 0 | | | PT9E | 1 | | T | PT12E | 1 | | T |
| 121 | PT7C | 0 | | | PT9B | 1 | | C | PT12D | 1 | | C |
| 122 | PT7A | 0 | | | PT9A | 1 | | T | PT12C | 1 | | T |
| 123 | GND | - | | | GND | - | | | GND | - | | |
| 124 | PT6B | 0 | PCLK0_1*** | C | PT7D | 1 | PCLK1_1*** | | PT10B | 1 | PCLK1_1*** | |
| 125 | PT6A | 0 | | T | PT7B | 1 | | C | PT9D | 1 | | C |
| 126 | PT5C | 0 | | | PT7A | 1 | | T | PT9C | 1 | | T |
| 127 | PT5B | 0 | PCLK0_0*** | | PT6F | 0 | PCLK1_0*** | | PT9B | 1 | PCLK1_0*** | |
| 128 | VCCAUX | - | | | VCCAUX | - | | | VCCAUX | - | | |
| 129 | VCC | - | | | VCC | - | | | VCC | - | | |
| 130 | PT4D | 0 | | | PT5D | 0 | | C | PT7B | 0 | | C |
| 131 | PT4B | 0 | | C | PT5C | 0 | | T | PT7A | 0 | | T |
| 132 | PT4A | 0 | | T | PT5B | 0 | | C | PT6D | 0 | | |
| 133 | PT3F | 0 | | | PT5A | 0 | | T | PT6E | 0 | | T |
| 134 | PT3D | 0 | | | PT4B | 0 | | | PT6F | 0 | | C |
| 135 | VCCIO0 | 0 | | | VCCIO0 | 0 | | | VCCIO0 | 0 | | |
| 136 | GNDIO0 | 0 | | | GNDIO0 | 0 | | | GNDIO0 | 0 | | |
| 137 | PT3B | 0 | | C | PT3D | 0 | | C | PT4B | 0 | | T |
| 138 | PT2F | 0 | | C | PT3C | 0 | | T | PT4A | 0 | | C |
| 139 | PT3A | 0 | | T | PT3B | 0 | | C | PT3B | 0 | | C |
| 140 | PT2D | 0 | | C | PT3A | 0 | | T | PT3A | 0 | | T |
| 141 | PT2E | 0 | | T | PT2D | 0 | | C | PT2D | 0 | | C |
| 142 | PT2B | 0 | | C | PT2C | 0 | | T | PT2C | 0 | | T |
| 143 | PT2C | 0 | | T | PT2B | 0 | | C | PT2B | 0 | | C |
| 144 | PT2A | 0 | | T | PT2A | 0 | | T | PT2A | 0 | | T |

*Supports true LVDS outputs.
**NC for “E” devices.
***Primary clock inputs arer single-ended.

# LCMXO640, LCMXO1200 and LCMXO2280 Logic Signal Connections: 256 caBGA / 256 ftBGA (Cont.)

| LCMXO640 | | | | | LCMXO1200 | | | | | LCMXO2280 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ball Number | Ball Function | Bank | Dual Function | Differential | Ball Number | Ball Function | Bank | Dual Function | Differential | Ball Number | Ball Function | Bank | Dual Function | Differential |
| J4 | PL8A | 3 | | T | J4 | PL13A | 6 | | T* | J4 | PL16A | 6 | | T* |
| J5 | PL8B | 3 | | C | J5 | PL13B | 6 | | C* | J5 | PL16B | 6 | | C* |
| R1 | PL11A | 3 | | T | R1 | PL13C | 6 | | T | R1 | PL16C | 6 | | T |
| R2 | PL11B | 3 | | C | R2 | PL13D | 6 | | C | R2 | PL16D | 6 | | C |
| - | - | - | | | - | - | - | | | GND | GND | - | | |
| K5 | NC | | | | K5 | PL14A | 6 | LLM0_PLLT_FB_A | T* | K5 | PL17A | 6 | LLM0_PLLT_FB_A | T* |
| K4 | NC | | | | K4 | PL14B | 6 | LLM0_PLLC_FB_A | C* | K4 | PL17B | 6 | LLM0_PLLC_FB_A | C* |
| L5 | PL10C | 3 | | T | L5 | PL14C | 6 | | T | L5 | PL17C | 6 | | T |
| L4 | PL10D | 3 | | C | L4 | PL14D | 6 | | C | L4 | PL17D | 6 | | C |
| M5 | NC | | | | M5 | PL15A | 6 | LLM0_PLLT_IN_A | T* | M5 | PL18A | 6 | LLM0_PLLT_IN_A | T* |
| M4 | NC | | | | M4 | PL15B | 6 | LLM0_PLLC_IN_A | C* | M4 | PL18B | 6 | LLM0_PLLC_IN_A | C* |
| N4 | PL11C | 3 | | T | N4 | PL16A | 6 | | T | N4 | PL19A | 6 | | T |
| N3 | PL11D | 3 | | C | N3 | PL16B | 6 | | C | N3 | PL19B | 6 | | C |
| VCCIO3 | VCCIO3 | 3 | | | VCCIO6 | VCCIO6 | 6 | | | VCCIO6 | VCCIO6 | 6 | | |
| GND | GNDIO3 | 3 | | | GND | GNDIO6 | 6 | | | GND | GNDIO6 | 6 | | |
| GND | GNDIO2 | 2 | | | GND | GNDIO5 | 5 | | | GND | GNDIO5 | 5 | | |
| VCCIO2 | VCCIO2 | 2 | | | VCCIO5 | VCCIO5 | 5 | | | VCCIO5 | VCCIO5 | 5 | | |
| P4 | TMS | 2 | TMS | | P4 | TMS | 5 | TMS | | P4 | TMS | 5 | TMS | |
| P2 | NC | | | | P2 | PB2A | 5 | | T | P2 | PB2A | 5 | | T |
| P3 | NC | | | | P3 | PB2B | 5 | | C | P3 | PB2B | 5 | | C |
| N5 | NC | | | | N5 | PB2C | 5 | | T | N5 | PB2C | 5 | | T |
| R3 | TCK | 2 | TCK | | R3 | TCK | 5 | TCK | | R3 | TCK | 5 | TCK | |
| N6 | NC | | | | N6 | PB2D | 5 | | C | N6 | PB2D | 5 | | C |
| T2 | PB2A | 2 | | T | T2 | PB3A | 5 | | T | T2 | PB3A | 5 | | T |
| T3 | PB2B | 2 | | C | T3 | PB3B | 5 | | C | T3 | PB3B | 5 | | C |
| R4 | PB2C | 2 | | T | R4 | PB3C | 5 | | T | R4 | PB3C | 5 | | T |
| R5 | PB2D | 2 | | C | R5 | PB3D | 5 | | C | R5 | PB3D | 5 | | C |
| P5 | PB3A | 2 | | T | P5 | PB4A | 5 | | T | P5 | PB4A | 5 | | T |
| P6 | PB3B | 2 | | C | P6 | PB4B | 5 | | C | P6 | PB4B | 5 | | C |
| T5 | PB3C | 2 | | T | T5 | PB4C | 5 | | T | T5 | PB4C | 5 | | T |
| M6 | TDO | 2 | TDO | | M6 | TDO | 5 | TDO | | M6 | TDO | 5 | TDO | |
| T4 | PB3D | 2 | | C | T4 | PB4D | 5 | | C | T4 | PB4D | 5 | | C |
| R6 | PB4A | 2 | | T | R6 | PB5A | 5 | | T | R6 | PB5A | 5 | | T |
| GND | GNDIO2 | 2 | | | GND | GNDIO5 | 5 | | | GND | GNDIO5 | 5 | | |
| VCCIO2 | VCCIO2 | 2 | | | VCCIO5 | VCCIO5 | 5 | | | VCCIO5 | VCCIO5 | 5 | | |
| T6 | PB4B | 2 | | C | T6 | PB5B | 5 | | C | T6 | PB5B | 5 | | C |
| N7 | TDI | 2 | TDI | | N7 | TDI | 5 | TDI | | N7 | TDI | 5 | TDI | |
| T8 | PB4C | 2 | | T | T8 | PB5C | 5 | | T | T8 | PB6A | 5 | | T |
| T7 | PB4D | 2 | | C | T7 | PB5D | 5 | | C | T7 | PB6B | 5 | | C |
| M7 | NC | | | | M7 | PB6A | 5 | | T | M7 | PB7C | 5 | | T |
| M8 | NC | | | | M8 | PB6B | 5 | | C | M8 | PB7D | 5 | | C |
| T9 | VCCAUX | - | | | T9 | VCCAUX | - | | | T9 | VCCAUX | - | | |
| R7 | PB4E | 2 | | T | R7 | PB6C | 5 | | T | R7 | PB8C | 5 | | T |
| R8 | PB4F | 2 | | C | R8 | PB6D | 5 | | C | R8 | PB8D | 5 | | C |
| - | - | | | | VCCIO5 | VCCIO5 | 5 | | | VCCIO5 | VCCIO5 | 5 | | |
| - | - | | | | GND | GNDIO5 | 5 | | | GND | GNDIO5 | 5 | | |
| P7 | PB5C | 2 | | T | P7 | PB6E | 5 | | T | P7 | PB9A | 4 | | T |
| P8 | PB5D | 2 | | C | P8 | PB6F | 5 | | C | P8 | PB9B | 4 | | C |
| N8 | PB5A | 2 | | T | N8 | PB7A | 4 | | T | N8 | PB10E | 4 | | T |
| N9 | PB5B | 2 | PCLK2_1*** | C | N9 | PB7B | 4 | PCLK4_1*** | C | N9 | PB10F | 4 | PCLK4_1*** | C |
| P10 | PB7B | 2 | | C | P10 | PB7D | 4 | | C | P10 | PB10D | 4 | | C |
| P9 | PB7A | 2 | | T | P9 | PB7C | 4 | | T | P9 | PB10C | 4 | | T |
| M9 | PB6B | 2 | PCLK2_0*** | C | M9 | PB7F | 4 | PCLK4_0*** | C | M9 | PB10B | 4 | PCLK4_0*** | C |

# LCMXO640, LCMXO1200 and LCMXO2280 Logic Signal Connections: 256 caBGA / 256 ftBGA (Cont.)

| LCMXO640 | | | | | LCMXO1200 | | | | | LCMXO2280 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ball Number | Ball Function | Bank | Dual Function | Differential | Ball Number | Ball Function | Bank | Dual Function | Differential | Ball Number | Ball Function | Bank | Dual Function | Differential |
| - | - | | | | VCCIO4 | VCCIO4 | 4 | | | VCCIO4 | VCCIO4 | 4 | | |
| - | - | | | | GND | GNDIO4 | 4 | | | GND | GNDIO4 | 4 | | |
| M10 | PB6A | 2 | | T | M10 | PB7E | 4 | | T | M10 | PB10A | 4 | | T |
| R9 | PB6C | 2 | | T | R9 | PB8A | 4 | | T | R9 | PB11C | 4 | | T |
| R10 | PB6D | 2 | | C | R10 | PB8B | 4 | | C | R10 | PB11D | 4 | | C |
| T10 | PB7C | 2 | | T | T10 | PB8C | 4 | | T | T10 | PB12A | 4 | | T |
| T11 | PB7D | 2 | | C | T11 | PB8D | 4 | | C | T11 | PB12B | 4 | | C |
| N10 | NC | | | | N10 | PB8E | 4 | | T | N10 | PB12C | 4 | | T |
| N11 | NC | | | | N11 | PB8F | 4 | | C | N11 | PB12D | 4 | | C |
| VCCIO2 | VCCIO2 | 2 | | | VCCIO4 | VCCIO4 | 4 | | | VCCIO4 | VCCIO4 | 4 | | |
| GND | GNDIO2 | 2 | | | GND | GNDIO4 | 4 | | | GND | GNDIO4 | 4 | | |
| R11 | PB7E | 2 | | T | R11 | PB9A | 4 | | T | R11 | PB13A | 4 | | T |
| R12 | PB7F | 2 | | C | R12 | PB9B | 4 | | C | R12 | PB13B | 4 | | C |
| P11 | PB8A | 2 | | T | P11 | PB9C | 4 | | T | P11 | PB13C | 4 | | T |
| P12 | PB8B | 2 | | C | P12 | PB9D | 4 | | C | P12 | PB13D | 4 | | C |
| T13 | PB8C | 2 | | T | T13 | PB9E | 4 | | T | T13 | PB14A | 4 | | T |
| T12 | PB8D | 2 | | C | T12 | PB9F | 4 | | C | T12 | PB14B | 4 | | C |
| R13 | PB9A | 2 | | T | R13 | PB10A | 4 | | T | R13 | PB14C | 4 | | T |
| R14 | PB9B | 2 | | C | R14 | PB10B | 4 | | C | R14 | PB14D | 4 | | C |
| GND | GND | - | | | GND | GND | - | | | GND | GND | - | | |
| T14 | PB9C | 2 | | T | T14 | PB10C | 4 | | T | T14 | PB15A | 4 | | T |
| T15 | PB9D | 2 | | C | T15 | PB10D | 4 | | C | T15 | PB15B | 4 | | C |
| P13** | SLEEPN | - | SLEEPN | | P13** | SLEEPN | - | SLEEPN | | P13** | SLEEPN | - | SLEEPN | |
| P14 | PB9F | 2 | | | P14 | PB10F | 4 | | | P14 | PB15D | 4 | | |
| R15 | NC | | | | R15 | PB11A | 4 | | T | R15 | PB16A | 4 | | T |
| R16 | NC | | | | R16 | PB11B | 4 | | C | R16 | PB16B | 4 | | C |
| P15 | NC | | | | P15 | PB11C | 4 | | T | P15 | PB16C | 4 | | T |
| P16 | NC | | | | P16 | PB11D | 4 | | C | P16 | PB16D | 4 | | C |
| VCCIO2 | VCCIO2 | 2 | | | VCCIO4 | VCCIO4 | 4 | | | VCCIO4 | VCCIO4 | 4 | | |
| GND | GNDIO2 | 2 | | | GND | GNDIO4 | 4 | | | GND | GNDIO4 | 4 | | |
| GND | GNDIO1 | 1 | | | GND | GNDIO3 | 3 | | | GND | GNDIO3 | 3 | | |
| VCCIO1 | VCCIO1 | 1 | | | VCCIO3 | VCCIO3 | 3 | | | VCCIO3 | VCCIO3 | 3 | | |
| M11 | NC | | | | M11 | PR16B | 3 | | C | M11 | PR20B | 3 | | C |
| L11 | NC | | | | L11 | PR16A | 3 | | T | L11 | PR20A | 3 | | T |
| N12 | NC | | | | N12 | PR15B | 3 | | C* | N12 | PR18B | 3 | | C* |
| N13 | NC | | | | N13 | PR15A | 3 | | T* | N13 | PR18A | 3 | | T* |
| M13 | NC | | | | M13 | PR14D | 3 | | C | M13 | PR17D | 3 | | C |
| M12 | NC | | | | M12 | PR14C | 3 | | T | M12 | PR17C | 3 | | T |
| N14 | PR11D | 1 | | C | N14 | PR14B | 3 | | C* | N14 | PR17B | 3 | | C* |
| N15 | PR11C | 1 | | T | N15 | PR14A | 3 | | T* | N15 | PR17A | 3 | | T* |
| L13 | PR11B | 1 | | C | L13 | PR13D | 3 | | C | L13 | PR16D | 3 | | C |
| L12 | PR11A | 1 | | T | L12 | PR13C | 3 | | T | L12 | PR16C | 3 | | T |
| M14 | PR10B | 1 | | C | M14 | PR13B | 3 | | C* | M14 | PR16B | 3 | | C* |
| VCCIO1 | VCCIO1 | 1 | | | VCCIO3 | VCCIO3 | 3 | | | VCCIO3 | VCCIO3 | 3 | | |
| GND | GNDIO1 | 1 | | | GND | GNDIO3 | 3 | | | GND | GNDIO3 | 3 | | |
| L14 | PR10A | 1 | | T | L14 | PR13A | 3 | | T* | L14 | PR16A | 3 | | T* |
| N16 | PR10D | 1 | | C | N16 | PR12D | 3 | | C | N16 | PR15D | 3 | | C |
| M16 | PR10C | 1 | | T | M16 | PR12C | 3 | | T | M16 | PR15C | 3 | | T |
| M15 | PR9D | 1 | | C | M15 | PR12B | 3 | | C* | M15 | PR15B | 3 | | C* |
| L15 | PR9C | 1 | | T | L15 | PR12A | 3 | | T* | L15 | PR15A | 3 | | T* |
| L16 | PR9B | 1 | | C | L16 | PR11D | 3 | | C | L16 | PR14D | 3 | | C |
| K16 | PR9A | 1 | | T | K16 | PR11C | 3 | | T | K16 | PR14C | 3 | | T |
| K13 | PR8D | 1 | | C | K13 | PR11B | 3 | | C* | K13 | PR14B | 3 | | C* |

## LCMXO2280 Logic Signal Connections: 324 ftBGA (Cont.)

| LCMXO2280 | | | | |
|---|---|---|---|---|
| **Ball Number** | **Ball Function** | **Bank** | **Dual Function** | **Differential** |
| G2 | PL11A | 6 | | T* |
| H2 | PL11B | 6 | | C* |
| L3 | PL11C | 6 | | T |
| L5 | PL11D | 6 | | C |
| H1 | PL12A | 6 | | T* |
| VCCIO6 | VCCIO6 | 6 | | |
| GND | GNDIO6 | 6 | | |
| J2 | PL12B | 6 | | C* |
| L4 | PL12C | 6 | | T |
| L6 | PL12D | 6 | | C |
| K2 | PL13A | 6 | | T* |
| K1 | PL13B | 6 | | C* |
| J1 | PL13C | 6 | | T |
| VCC | VCC | - | | |
| L2 | PL13D | 6 | | C |
| M5 | PL14D | 6 | | C |
| M3 | PL14C | 6 | TSALL | T |
| L1 | PL14B | 6 | | C* |
| M2 | PL14A | 6 | | T* |
| M1 | PL15A | 6 | | T* |
| N1 | PL15B | 6 | | C* |
| M6 | PL15C | 6 | | T |
| M4 | PL15D | 6 | | C |
| VCCIO6 | VCCIO6 | 6 | | |
| GND | GNDIO6 | 6 | | |
| P1 | PL16A | 6 | | T* |
| P2 | PL16B | 6 | | C* |
| N3 | PL16C | 6 | | T |
| N4 | PL16D | 6 | | C |
| GND | GND | - | | |
| T1 | PL17A | 6 | LLM0_PLLT_FB_A | T* |
| R1 | PL17B | 6 | LLM0_PLLC_FB_A | C* |
| P3 | PL17C | 6 | | T |
| N5 | PL17D | 6 | | C |
| R3 | PL18A | 6 | LLM0_PLLT_IN_A | T* |
| R2 | PL18B | 6 | LLM0_PLLC_IN_A | C* |
| P4 | PL19A | 6 | | T |
| N6 | PL19B | 6 | | C |
| U1 | PL20A | 6 | | T |
| VCCIO6 | VCCIO6 | 6 | | |
| GND | GNDIO6 | 6 | | |
| GND | GNDIO5 | 5 | | |
| VCCIO5 | VCCIO5 | 5 | | |

## LCMXO2280 Logic Signal Connections: 324 ftBGA (Cont.)

| LCMXO2280 | | | | |
|---|---|---|---|---|
| **Ball Number** | **Ball Function** | **Bank** | **Dual Function** | **Differential** |
| G8 | VCCIO0 | 0 | | |
| G7 | VCCIO0 | 0 | | |

* Supports true LVDS outputs.
** NC for “E” devices.
*** Primary clock inputs are single-ended.

## Conventional Packaging

**Commercial**

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO256C-3T100C | 256 | 1.8V/2.5V/3.3V | 78 | -3 | TQFP | 100 | COM |
| LCMXO256C-4T100C | 256 | 1.8V/2.5V/3.3V | 78 | -4 | TQFP | 100 | COM |
| LCMXO256C-5T100C | 256 | 1.8V/2.5V/3.3V | 78 | -5 | TQFP | 100 | COM |
| LCMXO256C-3M100C | 256 | 1.8V/2.5V/3.3V | 78 | -3 | csBGA | 100 | COM |
| LCMXO256C-4M100C | 256 | 1.8V/2.5V/3.3V | 78 | -4 | csBGA | 100 | COM |
| LCMXO256C-5M100C | 256 | 1.8V/2.5V/3.3V | 78 | -5 | csBGA | 100 | COM |

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO640C-3T100C | 640 | 1.8V/2.5V/3.3V | 74 | -3 | TQFP | 100 | COM |
| LCMXO640C-4T100C | 640 | 1.8V/2.5V/3.3V | 74 | -4 | TQFP | 100 | COM |
| LCMXO640C-5T100C | 640 | 1.8V/2.5V/3.3V | 74 | -5 | TQFP | 100 | COM |
| LCMXO640C-3M100C | 640 | 1.8V/2.5V/3.3V | 74 | -3 | csBGA | 100 | COM |
| LCMXO640C-4M100C | 640 | 1.8V/2.5V/3.3V | 74 | -4 | csBGA | 100 | COM |
| LCMXO640C-5M100C | 640 | 1.8V/2.5V/3.3V | 74 | -5 | csBGA | 100 | COM |
| LCMXO640C-3T144C | 640 | 1.8V/2.5V/3.3V | 113 | -3 | TQFP | 144 | COM |
| LCMXO640C-4T144C | 640 | 1.8V/2.5V/3.3V | 113 | -4 | TQFP | 144 | COM |
| LCMXO640C-5T144C | 640 | 1.8V/2.5V/3.3V | 113 | -5 | TQFP | 144 | COM |
| LCMXO640C-3M132C | 640 | 1.8V/2.5V/3.3V | 101 | -3 | csBGA | 132 | COM |
| LCMXO640C-4M132C | 640 | 1.8V/2.5V/3.3V | 101 | -4 | csBGA | 132 | COM |
| LCMXO640C-5M132C | 640 | 1.8V/2.5V/3.3V | 101 | -5 | csBGA | 132 | COM |
| LCMXO640C-3B256C | 640 | 1.8V/2.5V/3.3V | 159 | -3 | caBGA | 256 | COM |
| LCMXO640C-4B256C | 640 | 1.8V/2.5V/3.3V | 159 | -4 | caBGA | 256 | COM |
| LCMXO640C-5B256C | 640 | 1.8V/2.5V/3.3V | 159 | -5 | caBGA | 256 | COM |
| LCMXO640C-3FT256C | 640 | 1.8V/2.5V/3.3V | 159 | -3 | ftBGA | 256 | COM |
| LCMXO640C-4FT256C | 640 | 1.8V/2.5V/3.3V | 159 | -4 | ftBGA | 256 | COM |
| LCMXO640C-5FT256C | 640 | 1.8V/2.5V/3.3V | 159 | -5 | ftBGA | 256 | COM |

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO1200C-3T100C | 1200 | 1.8V/2.5V/3.3V | 73 | -3 | TQFP | 100 | COM |
| LCMXO1200C-4T100C | 1200 | 1.8V/2.5V/3.3V | 73 | -4 | TQFP | 100 | COM |
| LCMXO1200C-5T100C | 1200 | 1.8V/2.5V/3.3V | 73 | -5 | TQFP | 100 | COM |
| LCMXO1200C-3T144C | 1200 | 1.8V/2.5V/3.3V | 113 | -3 | TQFP | 144 | COM |
| LCMXO1200C-4T144C | 1200 | 1.8V/2.5V/3.3V | 113 | -4 | TQFP | 144 | COM |
| LCMXO1200C-5T144C | 1200 | 1.8V/2.5V/3.3V | 113 | -5 | TQFP | 144 | COM |
| LCMXO1200C-3M132C | 1200 | 1.8V/2.5V/3.3V | 101 | -3 | csBGA | 132 | COM |
| LCMXO1200C-4M132C | 1200 | 1.8V/2.5V/3.3V | 101 | -4 | csBGA | 132 | COM |
| LCMXO1200C-5M132C | 1200 | 1.8V/2.5V/3.3V | 101 | -5 | csBGA | 132 | COM |
| LCMXO1200C-3B256C | 1200 | 1.8V/2.5V/3.3V | 211 | -3 | caBGA | 256 | COM |
| LCMXO1200C-4B256C | 1200 | 1.8V/2.5V/3.3V | 211 | -4 | caBGA | 256 | COM |
| LCMXO1200C-5B256C | 1200 | 1.8V/2.5V/3.3V | 211 | -5 | caBGA | 256 | COM |
| LCMXO1200C-3FT256C | 1200 | 1.8V/2.5V/3.3V | 211 | -3 | ftBGA | 256 | COM |
| LCMXO1200C-4FT256C | 1200 | 1.8V/2.5V/3.3V | 211 | -4 | ftBGA | 256 | COM |
| LCMXO1200C-5FT256C | 1200 | 1.8V/2.5V/3.3V | 211 | -5 | ftBGA | 256 | COM |

## Conventional Packaging

**Industrial**

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO256C-3T100I | 256 | 1.8V/2.5V/3.3V | 78 | -3 | TQFP | 100 | IND |
| LCMXO256C-4T100I | 256 | 1.8V/2.5V/3.3V | 78 | -4 | TQFP | 100 | IND |
| LCMXO256C-3M100I | 256 | 1.8V/2.5V/3.3V | 78 | -3 | csBGA | 100 | IND |
| LCMXO256C-4M100I | 256 | 1.8V/2.5V/3.3V | 78 | -4 | csBGA | 100 | IND |

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO640C-3T100I | 640 | 1.8V/2.5V/3.3V | 74 | -3 | TQFP | 100 | IND |
| LCMXO640C-4T100I | 640 | 1.8V/2.5V/3.3V | 74 | -4 | TQFP | 100 | IND |
| LCMXO640C-3M100I | 640 | 1.8V/2.5V/3.3V | 74 | -3 | csBGA | 100 | IND |
| LCMXO640C-4M100I | 640 | 1.8V/2.5V/3.3V | 74 | -4 | csBGA | 100 | IND |
| LCMXO640C-3T144I | 640 | 1.8V/2.5V/3.3V | 113 | -3 | TQFP | 144 | IND |
| LCMXO640C-4T144I | 640 | 1.8V/2.5V/3.3V | 113 | -4 | TQFP | 144 | IND |
| LCMXO640C-3M132I | 640 | 1.8V/2.5V/3.3V | 101 | -3 | csBGA | 132 | IND |
| LCMXO640C-4M132I | 640 | 1.8V/2.5V/3.3V | 101 | -4 | csBGA | 132 | IND |
| LCMXO640C-3B256I | 640 | 1.8V/2.5V/3.3V | 159 | -3 | caBGA | 256 | IND |
| LCMXO640C-4B256I | 640 | 1.8V/2.5V/3.3V | 159 | -4 | caBGA | 256 | IND |
| LCMXO640C-3FT256I | 640 | 1.8V/2.5V/3.3V | 159 | -3 | ftBGA | 256 | IND |
| LCMXO640C-4FT256I | 640 | 1.8V/2.5V/3.3V | 159 | -4 | ftBGA | 256 | IND |

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO1200C-3T100I | 1200 | 1.8V/2.5V/3.3V | 73 | -3 | TQFP | 100 | IND |
| LCMXO1200C-4T100I | 1200 | 1.8V/2.5V/3.3V | 73 | -4 | TQFP | 100 | IND |
| LCMXO1200C-3T144I | 1200 | 1.8V/2.5V/3.3V | 113 | -3 | TQFP | 144 | IND |
| LCMXO1200C-4T144I | 1200 | 1.8V/2.5V/3.3V | 113 | -4 | TQFP | 144 | IND |
| LCMXO1200C-3M132I | 1200 | 1.8V/2.5V/3.3V | 101 | -3 | csBGA | 132 | IND |
| LCMXO1200C-4M132I | 1200 | 1.8V/2.5V/3.3V | 101 | -4 | csBGA | 132 | IND |
| LCMXO1200C-3B256I | 1200 | 1.8V/2.5V/3.3V | 211 | -3 | caBGA | 256 | IND |
| LCMXO1200C-4B256I | 1200 | 1.8V/2.5V/3.3V | 211 | -4 | caBGA | 256 | IND |
| LCMXO1200C-3FT256I | 1200 | 1.8V/2.5V/3.3V | 211 | -3 | ftBGA | 256 | IND |
| LCMXO1200C-4FT256I | 1200 | 1.8V/2.5V/3.3V | 211 | -4 | ftBGA | 256 | IND |

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO2280C-3T100I | 2280 | 1.8V/2.5V/3.3V | 73 | -3 | TQFP | 100 | IND |
| LCMXO2280C-4T100I | 2280 | 1.8V/2.5V/3.3V | 73 | -4 | TQFP | 100 | IND |
| LCMXO2280C-3T144I | 2280 | 1.8V/2.5V/3.3V | 113 | -3 | TQFP | 144 | IND |
| LCMXO2280C-4T144I | 2280 | 1.8V/2.5V/3.3V | 113 | -4 | TQFP | 144 | IND |
| LCMXO2280C-3M132I | 2280 | 1.8V/2.5V/3.3V | 101 | -3 | csBGA | 132 | IND |
| LCMXO2280C-4M132I | 2280 | 1.8V/2.5V/3.3V | 101 | -4 | csBGA | 132 | IND |
| LCMXO2280C-3B256I | 2280 | 1.8V/2.5V/3.3V | 211 | -3 | caBGA | 256 | IND |
| LCMXO2280C-4B256I | 2280 | 1.8V/2.5V/3.3V | 211 | -4 | caBGA | 256 | IND |
| LCMXO2280C-3FT256I | 2280 | 1.8V/2.5V/3.3V | 211 | -3 | ftBGA | 256 | IND |
| LCMXO2280C-4FT256I | 2280 | 1.8V/2.5V/3.3V | 211 | -4 | ftBGA | 256 | IND |
| LCMXO2280C-3FT324I | 2280 | 1.8V/2.5V/3.3V | 271 | -3 | ftBGA | 324 | IND |
| LCMXO2280C-4FT324I | 2280 | 1.8V/2.5V/3.3V | 271 | -4 | ftBGA | 324 | IND |

## Lead-Free Packaging

**Commercial**

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO256C-3TN100C | 256 | 1.8V/2.5V/3.3V | 78 | -3 | Lead-Free TQFP | 100 | COM |
| LCMXO256C-4TN100C | 256 | 1.8V/2.5V/3.3V | 78 | -4 | Lead-Free TQFP | 100 | COM |
| LCMXO256C-5TN100C | 256 | 1.8V/2.5V/3.3V | 78 | -5 | Lead-Free TQFP | 100 | COM |
| LCMXO256C-3MN100C | 256 | 1.8V/2.5V/3.3V | 78 | -3 | Lead-Free csBGA | 100 | COM |
| LCMXO256C-4MN100C | 256 | 1.8V/2.5V/3.3V | 78 | -4 | Lead-Free csBGA | 100 | COM |
| LCMXO256C-5MN100C | 256 | 1.8V/2.5V/3.3V | 78 | -5 | Lead-Free csBGA | 100 | COM |

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO640C-3TN100C | 640 | 1.8V/2.5V/3.3V | 74 | -3 | Lead-Free TQFP | 100 | COM |
| LCMXO640C-4TN100C | 640 | 1.8V/2.5V/3.3V | 74 | -4 | Lead-Free TQFP | 100 | COM |
| LCMXO640C-5TN100C | 640 | 1.8V/2.5V/3.3V | 74 | -5 | Lead-Free TQFP | 100 | COM |
| LCMXO640C-3MN100C | 640 | 1.8V/2.5V/3.3V | 74 | -3 | Lead-Free csBGA | 100 | COM |
| LCMXO640C-4MN100C | 640 | 1.8V/2.5V/3.3V | 74 | -4 | Lead-Free csBGA | 100 | COM |
| LCMXO640C-5MN100C | 640 | 1.8V/2.5V/3.3V | 74 | -5 | Lead-Free csBGA | 100 | COM |
| LCMXO640C-3TN144C | 640 | 1.8V/2.5V/3.3V | 113 | -3 | Lead-Free TQFP | 144 | COM |
| LCMXO640C-4TN144C | 640 | 1.8V/2.5V/3.3V | 113 | -4 | Lead-Free TQFP | 144 | COM |
| LCMXO640C-5TN144C | 640 | 1.8V/2.5V/3.3V | 113 | -5 | Lead-Free TQFP | 144 | COM |
| LCMXO640C-3MN132C | 640 | 1.8V/2.5V/3.3V | 101 | -3 | Lead-Free csBGA | 132 | COM |
| LCMXO640C-4MN132C | 640 | 1.8V/2.5V/3.3V | 101 | -4 | Lead-Free csBGA | 132 | COM |
| LCMXO640C-5MN132C | 640 | 1.8V/2.5V/3.3V | 101 | -5 | Lead-Free csBGA | 132 | COM |
| LCMXO640C-3BN256C | 640 | 1.8V/2.5V/3.3V | 159 | -3 | Lead-Free caBGA | 256 | COM |
| LCMXO640C-4BN256C | 640 | 1.8V/2.5V/3.3V | 159 | -4 | Lead-Free caBGA | 256 | COM |
| LCMXO640C-5BN256C | 640 | 1.8V/2.5V/3.3V | 159 | -5 | Lead-Free caBGA | 256 | COM |
| LCMXO640C-3FTN256C | 640 | 1.8V/2.5V/3.3V | 159 | -3 | Lead-Free ftBGA | 256 | COM |
| LCMXO640C-4FTN256C | 640 | 1.8V/2.5V/3.3V | 159 | -4 | Lead-Free ftBGA | 256 | COM |
| LCMXO640C-5FTN256C | 640 | 1.8V/2.5V/3.3V | 159 | -5 | Lead-Free ftBGA | 256 | COM |

| Part Number | LUTs | Supply Voltage | I/Os | Grade | Package | Pins | Temp. |
|---|---|---|---|---|---|---|---|
| LCMXO1200C-3TN100C | 1200 | 1.8V/2.5V/3.3V | 73 | -3 | Lead-Free TQFP | 100 | COM |
| LCMXO1200C-4TN100C | 1200 | 1.8V/2.5V/3.3V | 73 | -4 | Lead-Free TQFP | 100 | COM |
| LCMXO1200C-5TN100C | 1200 | 1.8V/2.5V/3.3V | 73 | -5 | Lead-Free TQFP | 100 | COM |
| LCMXO1200C-3TN144C | 1200 | 1.8V/2.5V/3.3V | 113 | -3 | Lead-Free TQFP | 144 | COM |
| LCMXO1200C-4TN144C | 1200 | 1.8V/2.5V/3.3V | 113 | -4 | Lead-Free TQFP | 144 | COM |
| LCMXO1200C-5TN144C | 1200 | 1.8V/2.5V/3.3V | 113 | -5 | Lead-Free TQFP | 144 | COM |
| LCMXO1200C-3MN132C | 1200 | 1.8V/2.5V/3.3V | 101 | -3 | Lead-Free csBGA | 132 | COM |
| LCMXO1200C-4MN132C | 1200 | 1.8V/2.5V/3.3V | 101 | -4 | Lead-Free csBGA | 132 | COM |
| LCMXO1200C-5MN132C | 1200 | 1.8V/2.5V/3.3V | 101 | -5 | Lead-Free csBGA | 132 | COM |
| LCMXO1200C-3BN256C | 1200 | 1.8V/2.5V/3.3V | 211 | -3 | Lead-Free caBGA | 256 | COM |
| LCMXO1200C-4BN256C | 1200 | 1.8V/2.5V/3.3V | 211 | -4 | Lead-Free caBGA | 256 | COM |
| LCMXO1200C-5BN256C | 1200 | 1.8V/2.5V/3.3V | 211 | -5 | Lead-Free caBGA | 256 | COM |
| LCMXO1200C-3FTN256C | 1200 | 1.8V/2.5V/3.3V | 211 | -3 | Lead-Free ftBGA | 256 | COM |
| LCMXO1200C-4FTN256C | 1200 | 1.8V/2.5V/3.3V | 211 | -4 | Lead-Free ftBGA | 256 | COM |
| LCMXO1200C-5FTN256C | 1200 | 1.8V/2.5V/3.3V | 211 | -5 | Lead-Free ftBGA | 256 | COM |