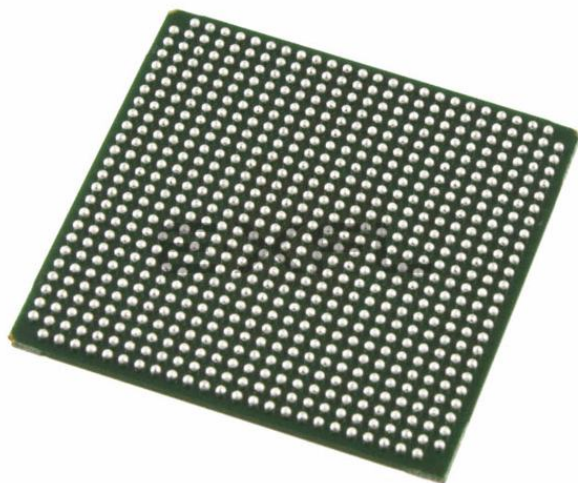




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### Understanding [Embedded - FPGAs \(Field Programmable Gate Array\)](#)

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                 | Obsolete                                                                                                                                                            |
| Number of LABs/CLBs            | 8500                                                                                                                                                                |
| Number of Logic Elements/Cells | 68000                                                                                                                                                               |
| Total RAM Bits                 | 1056768                                                                                                                                                             |
| Number of I/O                  | 500                                                                                                                                                                 |
| Number of Gates                | -                                                                                                                                                                   |
| Voltage - Supply               | 1.14V ~ 1.26V                                                                                                                                                       |
| Mounting Type                  | Surface Mount                                                                                                                                                       |
| Operating Temperature          | 0°C ~ 85°C (TJ)                                                                                                                                                     |
| Package / Case                 | 672-BBGA                                                                                                                                                            |
| Supplier Device Package        | 672-FPBGA (27x27)                                                                                                                                                   |
| Purchase URL                   | <a href="https://www.e-xfl.com/product-detail/lattice-semiconductor/lfe2-70e-5f672c">https://www.e-xfl.com/product-detail/lattice-semiconductor/lfe2-70e-5f672c</a> |

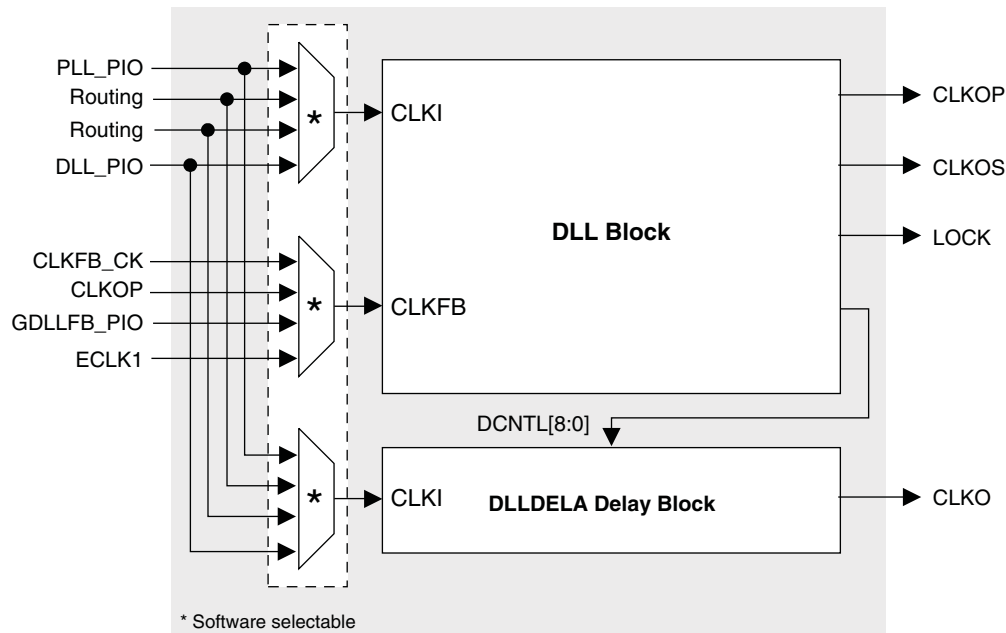
**Table 2-5. DLL Signals**

| Signal     | I/O | Description                                                                   |
|------------|-----|-------------------------------------------------------------------------------|
| CLKI       | I   | Clock input from external pin or routing                                      |
| CLKFB      | I   | DLL feed input from DLL output, clock net, routing or external pin            |
| RSTN       | I   | Active low synchronous reset                                                  |
| ALUHOLD    | I   | Active high freezes the ALU                                                   |
| UDDCNTL    | I   | Synchronous enable signal (hold high for two cycles) from routing             |
| DCNTL[8:0] | O   | Encoded digital control signals for PIC INDEL and slave delay calibration     |
| CLKOP      | O   | The primary clock output                                                      |
| CLKOS      | O   | The secondary clock output with fine phase shift and/or division by 2 or by 4 |
| LOCK       | O   | Active high phase lock indicator                                              |

## DLLDELA Delay Block

Closely associated with each DLL is a DLLDELA block. This is a delay block consisting of a delay line with taps and a selection scheme that selects one of the taps. The DCNTL[8:0] bus controls the delay of the CLKO signal. Typically this is the delay setting that the DLL uses to achieve phase alignment. This results in the delay providing a calibrated 90° phase shift that is useful in centering a clock in the middle of a data cycle for source synchronous data. The CLKO signal feeds the edge clock network. Figure 2-7 shows the connections between the DLL block and the DLLDELA delay block. For more information, please see the list of additional technical documentation at the end of this data sheet.

**Figure 2-7. DLLDELA Delay Block**



## PLL/DLL Cascading

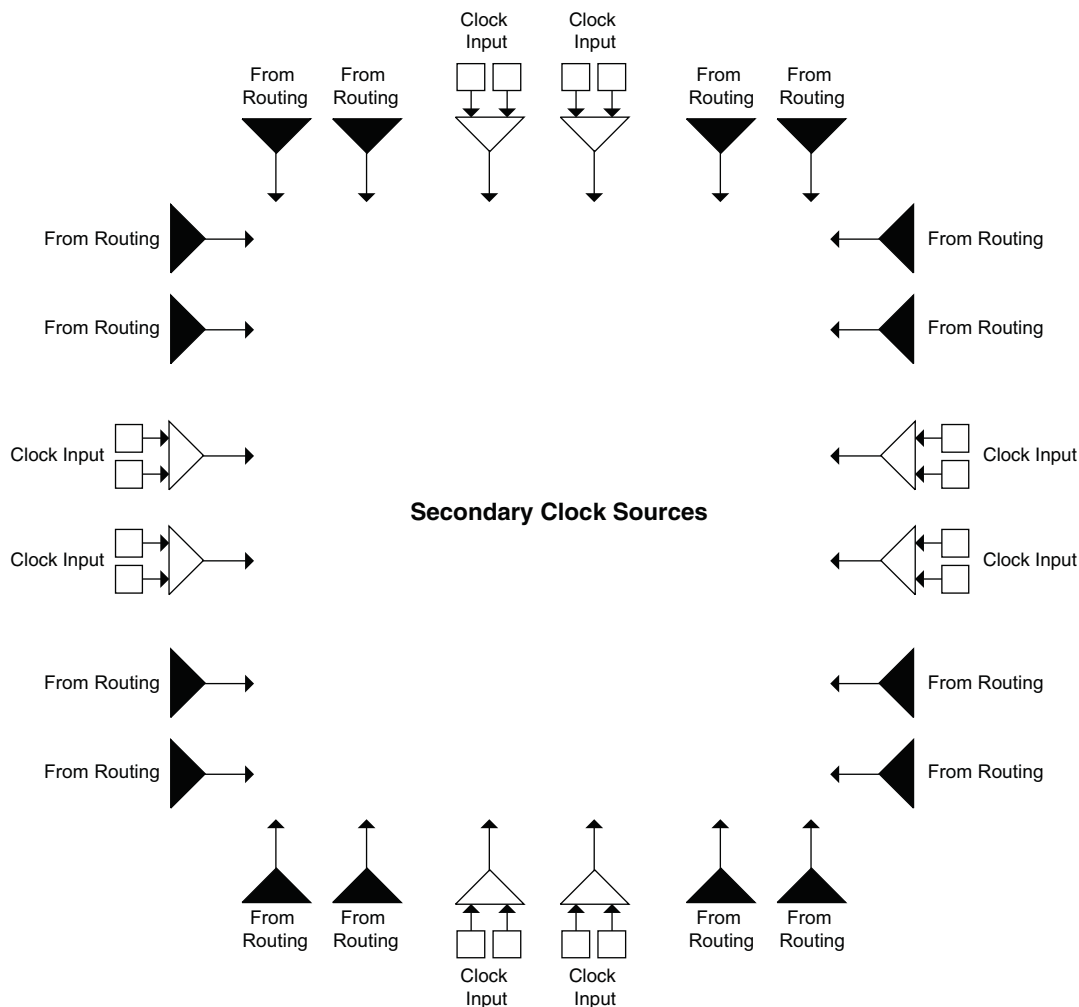
LatticeECP2/M devices have been designed to allow certain combinations of PLL (GPLL and SPLL) and DLL cascading. The allowable combinations are:

- PLL to PLL supported
- PLL to DLL supported

## Secondary Clock/Control Sources

LatticeECP2/M devices derive secondary clocks (SC0 through SC7) from eight dedicated clock input pads and the rest from routing. Figure 2-11 shows the secondary clock sources.

**Figure 2-11. Secondary Clock Sources**



**LatticeECP2 Pin Information Summary, LFE2-6 and LFE2-12**

| Pin Type                                                                          |                          | LFE2-6   |           | LFE2-12  |          |           |           |
|-----------------------------------------------------------------------------------|--------------------------|----------|-----------|----------|----------|-----------|-----------|
|                                                                                   |                          | 144 TQFP | 256 fpBGA | 144 TQFP | 208 PQFP | 256 fpBGA | 484 fpBGA |
| Single Ended User I/O                                                             |                          | 90       | 190       | 93       | 131      | 193       | 297       |
| Differential Pair User I/O                                                        |                          | 43       | 95        | 45       | 62       | 96        | 148       |
| Configuration                                                                     | TAP Pins                 | 5        | 5         | 5        | 5        | 5         | 5         |
|                                                                                   | Muxed Pins               | 14       | 14        | 14       | 14       | 14        | 14        |
|                                                                                   | Dedicated Pins (Non TAP) | 7        | 7         | 7        | 7        | 7         | 7         |
| Non Configuration                                                                 | Muxed Pins               | 34       | 54        | 33       | 40       | 54        | 57        |
|                                                                                   | Dedicated Pins           | 3        | 3         | 3        | 3        | 3         | 3         |
| VCC                                                                               |                          | 10       | 7         | 10       | 14       | 7         | 16        |
| VCCAUX                                                                            |                          | 4        | 4         | 4        | 8        | 4         | 16        |
| VCCPLL                                                                            |                          | 0        | 0         | 0        | 0        | 0         | 0         |
| VCCIO                                                                             | Bank0                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank1                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank2                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank3                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank4                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank5                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank6                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank7                    | 1        | 2         | 1        | 2        | 2         | 4         |
|                                                                                   | Bank8                    | 1        | 1         | 1        | 2        | 1         | 2         |
| GND, GND0 to GND7                                                                 |                          | 12       | 20        | 12       | 22       | 20        | 60        |
| NC                                                                                |                          | 4        | 3         | 1        | 0        | 0         | 44        |
| Single Ended/ Differential I/O Pairs per Bank (including emulated with resistors) | Bank0                    | 8/4      | 18/6      | 8/4      | 18/9     | 18/9      | 50/25     |
|                                                                                   | Bank1                    | 17/8     | 34/17     | 18/9     | 18/9     | 34/17     | 46/23     |
|                                                                                   | Bank2                    | 4/2      | 20/10     | 4/2      | 11/5     | 20/10     | 24/12     |
|                                                                                   | Bank3                    | 8/4      | 12/6      | 8/4      | 11/5     | 12/6      | 16/8      |
|                                                                                   | Bank4                    | 18/9     | 32/16     | 18/9     | 19/9     | 32/16     | 46/23     |
|                                                                                   | Bank5                    | 8/4      | 14/7      | 10/5     | 18/9     | 17/8      | 46/23     |
|                                                                                   | Bank6                    | 9/4      | 26/13     | 9/4      | 18/8     | 26/13     | 32/16     |
|                                                                                   | Bank7                    | 12/6     | 20/10     | 12/6     | 12/6     | 20/10     | 23/11     |
|                                                                                   | Bank8                    | 6/2      | 14/7      | 6/2      | 6/2      | 14/7      | 14/7      |
| True LVDS I/O Pairs per Bank                                                      | Bank0 (Top Edge)         | 0        | 0         | 0        | 0        | 0         | 0         |
|                                                                                   | Bank1 (Top Edge)         | 0        | 0         | 0        | 0        | 0         | 0         |
|                                                                                   | Bank2 (Right Edge)       | 1        | 5         | 1        | 4        | 5         | 6         |
|                                                                                   | Bank3 (Right Edge)       | 3        | 3         | 3        | 3        | 3         | 4         |
|                                                                                   | Bank4 (Bottom Edge)      | 0        | 0         | 0        | 0        | 0         | 0         |
|                                                                                   | Bank5 (Bottom Edge)      | 0        | 0         | 0        | 0        | 0         | 0         |
|                                                                                   | Bank6 (Left Edge)        | 2        | 7         | 2        | 6        | 7         | 8         |
|                                                                                   | Bank7 (Left Edge)        | 5        | 5         | 5        | 5        | 5         | 5         |
|                                                                                   | Bank8 (Right Edge)       | 0        | 0         | 0        | 0        | 0         | 0         |

**LFE2-20E/SE Logic Signal Connections: 256 fpBGA (Cont.)**

| LFE2-20E/SE |             |                   |      |               |              |
|-------------|-------------|-------------------|------|---------------|--------------|
| Ball Number | Ball Number | Ball/Pad Function | Bank | Dual Function | Differential |
| P5          | P5          | VCCIO5            | 5    |               |              |
| K5          | K5          | VCCIO6            | 6    |               |              |
| M3          | M3          | VCCIO6            | 6    |               |              |
| E3          | E3          | VCCIO7            | 7    |               |              |
| G5          | G5          | VCCIO7            | 7    |               |              |
| T15         | T15         | VCCIO8            | 8    |               |              |
| A1          | A1          | GND               | -    |               |              |
| A16         | A16         | GND               | -    |               |              |
| B12         | B12         | GND               | -    |               |              |
| B5          | B5          | GND               | -    |               |              |
| C8          | C8          | GND               | -    |               |              |
| E15         | E15         | GND               | -    |               |              |
| E2          | E2          | GND               | -    |               |              |
| H14         | H14         | GND               | -    |               |              |
| H8          | H8          | GND               | -    |               |              |
| H9          | H9          | GND               | -    |               |              |
| J3          | J3          | GND               | -    |               |              |
| J8          | J8          | GND               | -    |               |              |
| J9          | J9          | GND               | -    |               |              |
| M15         | M15         | GND               | -    |               |              |
| M2          | M2          | GND               | -    |               |              |
| P9          | P9          | GND               | -    |               |              |
| R12         | R12         | GND               | -    |               |              |
| R5          | R5          | GND               | -    |               |              |
| T1          | T1          | GND               | -    |               |              |
| T16         | T16         | GND               | -    |               |              |

\* Supports true LVDS. Other differential signals must be emulated with external resistors.

\*\* These dedicated input pins can be used for GPLLs or GDLLs within the respective quadrant.

Note: VCCIO and GND pads are used to determine the average DC current drawn by I/Os between GND/VCCIO connections, or between the last GND/VCCIO in an I/O bank and the end of an I/O bank. The substrate pads listed in the Pin Table do not necessarily have a one to one connection with a package ball or pin.

## LFE2-12E/SE and LFE2-20E/SE Logic Signal Connections: 484 fpBGA (Cont.)

| LFE2-12E/12SE |                   |      |               |              | LFE2-20E/20SE     |      |               |              |
|---------------|-------------------|------|---------------|--------------|-------------------|------|---------------|--------------|
| Ball Number   | Ball/Pad Function | Bank | Dual Function | Differential | Ball/Pad Function | Bank | Dual Function | Differential |
| B15           | PT40B             | 1    |               | C            | PT49B             | 1    |               | C            |
| GNDIO         | GNDIO1            | -    |               |              | GNDIO1            | -    |               |              |
| A15           | PT40A             | 1    |               | T            | PT49A             | 1    |               | T            |
| VCCIO         | VCCIO1            | 1    |               |              | VCCIO1            | 1    |               |              |
| A14           | PT39A             | 1    |               | T            | PT48A             | 1    |               | T            |
| B14           | PT39B             | 1    |               | C            | PT48B             | 1    |               | C            |
| D14           | PT37B             | 1    |               | C            | PT46B             | 1    |               | C            |
| E14           | PT36B             | 1    |               | C            | PT45B             | 1    |               | C            |
| GNDIO         | GNDIO1            | -    |               |              | GNDIO1            | -    |               |              |
| C13           | PT37A             | 1    |               | T            | PT46A             | 1    |               | T            |
| F14           | PT36A             | 1    |               | T            | PT45A             | 1    |               | T            |
| A13           | PT35B             | 1    |               | C            | PT44B             | 1    |               | C            |
| E13           | PT34B             | 1    |               | C            | PT43B             | 1    |               | C            |
| VCCIO         | VCCIO1            | 1    |               |              | VCCIO1            | 1    |               |              |
| B13           | PT35A             | 1    |               | T            | PT44A             | 1    |               | T            |
| D13           | PT34A             | 1    |               | T            | PT43A             | 1    |               | T            |
| E12           | PT33B             | 1    |               | C            | PT42B             | 1    |               | C            |
| GNDIO         | GNDIO1            | -    |               |              | GNDIO1            | -    |               |              |
| D12           | PT33A             | 1    |               | T            | PT42A             | 1    |               | T            |
| A12           | PT31B             | 1    |               | C            | PT40B             | 1    |               | C            |
| B12           | PT30B             | 1    | PCLKC1_0      | C            | PT39B             | 1    | PCLKC1_0      | C            |
| VCCIO         | VCCIO1            | 1    |               |              | VCCIO1            | 1    |               |              |
| A11           | PT31A             | 1    |               | T            | PT40A             | 1    |               | T            |
| C12           | PT30A             | 1    | PCLKT1_0      | T            | PT39A             | 1    | PCLKT1_0      | T            |
| F12           | XRES              | 1    |               |              | XRES              | 1    |               |              |
| B10           | PT28B             | 0    | PCLKC0_0      | C            | PT37B             | 0    | PCLKC0_0      | C            |
| GNDIO         | GNDIO0            | -    |               |              | GNDIO0            | -    |               |              |
| B11           | PT28A             | 0    | PCLKT0_0      | T            | PT37A             | 0    | PCLKT0_0      | T            |
| C11           | PT26B             | 0    |               | C            | PT35B             | 0    |               | C            |
| A10           | PT27B             | 0    |               | C            | PT36B             | 0    |               | C            |
| C10           | PT26A             | 0    |               | T            | PT35A             | 0    |               | T            |
| VCCIO         | VCCIO0            | 0    |               |              | VCCIO0            | 0    |               |              |
| A9            | PT27A             | 0    |               | T            | PT36A             | 0    |               | T            |
| A8            | PT24B             | 0    |               | C            | PT33B             | 0    |               | C            |
| E11           | PT25B             | 0    |               | C            | PT34B             | 0    |               | C            |
| A7            | PT24A             | 0    |               | T            | PT33A             | 0    |               | T            |
| F11           | PT25A             | 0    |               | T            | PT34A             | 0    |               | T            |
| GNDIO         | GNDIO0            | -    |               |              | GNDIO0            | -    |               |              |
| B8            | PT23B             | 0    |               | C            | PT32B             | 0    |               | C            |
| VCCIO         | VCCIO0            | 0    |               |              | VCCIO0            | 0    |               |              |
| B9            | PT23A             | 0    |               | T            | PT32A             | 0    |               | T            |
| C8            | PT20B             | 0    |               | C            | PT29B             | 0    |               | C            |
| B7            | PT21B             | 0    |               | C            | PT30B             | 0    |               | C            |
| D8            | PT20A             | 0    |               | T            | PT29A             | 0    |               | T            |

## LFE2-20E/SE and LFE2-35E/SE Logic Signal Connections: 672 fpBGA (Cont.)

| LFE2-20E/20SE |                   |      |                |              | LFE2-35E/35SE     |      |                |              |
|---------------|-------------------|------|----------------|--------------|-------------------|------|----------------|--------------|
| Ball Number   | Ball/Pad Function | Bank | Dual Function  | Differential | Ball/Pad Function | Bank | Dual Function  | Differential |
| L2            | NC                | -    |                |              | NC                | -    |                |              |
| L1            | NC                | -    |                |              | NC                | -    |                |              |
| VCCIO         | VCCIO7            | 7    |                |              | VCCIO7            | 7    |                |              |
| M2            | NC                | -    |                |              | NC                | -    |                |              |
| M1            | NC                | -    |                |              | NC                | -    |                |              |
| N2            | NC                | -    |                |              | NC                | -    |                |              |
| GND           | GNDIO7            | -    |                |              | GNDIO7            | -    |                |              |
| M8            | VCC               | -    |                |              | NC                | -    |                |              |
| VCCIO         | VCCIO7            | 7    |                |              | VCCIO7            | 7    |                |              |
| GND           | GNDIO7            | -    |                |              | GNDIO7            | -    |                |              |
| N1            | PL12A             | 7    | LDQ16          |              | PL18A             | 7    | LDQ22          |              |
| L8            | PL13A             | 7    | LDQ16          | T            | PL19A             | 7    | LDQ22          | T            |
| K8            | PL13B             | 7    | LDQ16          | C            | PL19B             | 7    | LDQ22          | C            |
| VCCIO         | VCCIO7            | 7    |                |              | VCCIO7            | 7    |                |              |
| L6            | PL14A             | 7    | LDQ16          | T (LVDS)*    | PL20A             | 7    | LDQ22          | T (LVDS)*    |
| K5            | PL14B             | 7    | LDQ16          | C (LVDS)*    | PL20B             | 7    | LDQ22          | C (LVDS)*    |
| L7            | PL15A             | 7    | LDQ16          | T            | PL21A             | 7    | LDQ22          | T            |
| L5            | PL15B             | 7    | LDQ16          | C            | PL21B             | 7    | LDQ22          | C            |
| GND           | GNDIO7            | -    |                |              | GNDIO7            | -    |                |              |
| P1            | PL16A             | 7    | LDQS16         | T (LVDS)*    | PL22A             | 7    | LDQS22         | T (LVDS)*    |
| P2            | PL16B             | 7    | LDQ16          | C (LVDS)*    | PL22B             | 7    | LDQ22          | C (LVDS)*    |
| M6            | PL17A             | 7    | LDQ16          | T            | PL23A             | 7    | LDQ22          | T            |
| VCCIO         | VCCIO7            | 7    |                |              | VCCIO7            | 7    |                |              |
| N8            | PL17B             | 7    | LDQ16          | C            | PL23B             | 7    | LDQ22          | C            |
| R1            | PL18A             | 7    | LDQ16          | T (LVDS)*    | PL24A             | 7    | LDQ22          | T (LVDS)*    |
| R2            | PL18B             | 7    | LDQ16          | C (LVDS)*    | PL24B             | 7    | LDQ22          | C (LVDS)*    |
| M7            | PL19A             | 7    | PCLKT7_0/LDQ16 | T            | PL25A             | 7    | PCLKT7_0/LDQ22 | T            |
| GND           | GNDIO7            | -    |                |              | GNDIO7            | -    |                |              |
| N9            | PL19B             | 7    | PCLKC7_0/LDQ16 | C            | PL25B             | 7    | PCLKC7_0/LDQ22 | C            |
| M4            | PL21A             | 6    | PCLKT6_0/LDQ25 | T (LVDS)*    | PL27A             | 6    | PCLKT6_0/LDQ31 | T (LVDS)*    |
| M5            | PL21B             | 6    | PCLKC6_0/LDQ25 | C (LVDS)*    | PL27B             | 6    | PCLKC6_0/LDQ31 | C (LVDS)*    |
| N7            | PL22A             | 6    | VREF2_6/LDQ25  | T            | PL28A             | 6    | VREF2_6/LDQ31  | T            |
| P9            | PL22B             | 6    | VREF1_6/LDQ25  | C            | PL28B             | 6    | VREF1_6/LDQ31  | C            |
| N3            | PL23A             | 6    | LDQ25          | T (LVDS)*    | PL29A             | 6    | LDQ31          | T (LVDS)*    |
| VCCIO         | VCCIO6            | 6    |                |              | VCCIO6            | 6    |                |              |
| N4            | PL23B             | 6    | LDQ25          | C (LVDS)*    | PL29B             | 6    | LDQ31          | C (LVDS)*    |
| N5            | PL24A             | 6    | LDQ25          | T            | PL30A             | 6    | LDQ31          | T            |
| P7            | PL24B             | 6    | LDQ25          | C            | PL30B             | 6    | LDQ31          | C            |
| T1            | NC                | -    |                |              | PL31A             | 6    | LDQS31         | T (LVDS)*    |
| GND           | GNDIO6            | -    |                |              | GNDIO6            | -    |                |              |
| T2            | NC                | -    |                |              | PL31B             | 6    | LDQ31          | C (LVDS)*    |
| P8            | NC                | -    |                |              | PL32A             | 6    | LDQ31          | T            |
| P6            | NC                | -    |                |              | PL32B             | 6    | LDQ31          | C            |
| VCCIO         | VCCIO6            | 6    |                |              | VCCIO6            | 6    |                |              |
| P5            | NC                | -    |                |              | PL33A             | 6    | LDQ31          | T (LVDS)*    |
| P4            | NC                | -    |                |              | PL33B             | 6    | LDQ31          | C (LVDS)*    |

## LFE2-20E/SE and LFE2-35E/SE Logic Signal Connections: 672 fpBGA (Cont.)

| LFE2-20E/20SE |                   |      |               |              | LFE2-35E/35SE     |      |               |              |
|---------------|-------------------|------|---------------|--------------|-------------------|------|---------------|--------------|
| Ball Number   | Ball/Pad Function | Bank | Dual Function | Differential | Ball/Pad Function | Bank | Dual Function | Differential |
| N15           | GND               | -    |               |              | GND               | -    |               |              |
| N17           | GND               | -    |               |              | GND               | -    |               |              |
| P10           | GND               | -    |               |              | GND               | -    |               |              |
| P12           | GND               | -    |               |              | GND               | -    |               |              |
| P13           | GND               | -    |               |              | GND               | -    |               |              |
| P14           | GND               | -    |               |              | GND               | -    |               |              |
| P15           | GND               | -    |               |              | GND               | -    |               |              |
| P17           | GND               | -    |               |              | GND               | -    |               |              |
| R13           | GND               | -    |               |              | GND               | -    |               |              |
| R14           | GND               | -    |               |              | GND               | -    |               |              |
| T10           | GND               | -    |               |              | GND               | -    |               |              |
| T11           | GND               | -    |               |              | GND               | -    |               |              |
| T16           | GND               | -    |               |              | GND               | -    |               |              |
| T17           | GND               | -    |               |              | GND               | -    |               |              |
| T24           | GND               | -    |               |              | GND               | -    |               |              |
| T3            | GND               | -    |               |              | GND               | -    |               |              |
| U10           | GND               | -    |               |              | GND               | -    |               |              |
| U11           | GND               | -    |               |              | GND               | -    |               |              |
| U13           | GND               | -    |               |              | GND               | -    |               |              |
| U14           | GND               | -    |               |              | GND               | -    |               |              |
| U16           | GND               | -    |               |              | GND               | -    |               |              |
| U17           | GND               | -    |               |              | GND               | -    |               |              |
| V13           | GND               | -    |               |              | GND               | -    |               |              |
| V14           | GND               | -    |               |              | GND               | -    |               |              |
| V21           | GND               | -    |               |              | GND               | -    |               |              |
| V6            | GND               | -    |               |              | GND               | -    |               |              |
| M3            | NC                | -    |               |              | NC                | -    |               |              |
| N6            | NC                | -    |               |              | NC                | -    |               |              |
| P24           | NC                | -    |               |              | NC                | -    |               |              |

\* Supports true LVDS. Other differential signals must be emulated with external resistors.

\*\* These dedicated input pins can be used for GPLLs or GDLLs within the respective quadrant.

\*\*\*Due to packaging bond out option, this DQS does not have all the necessary DQ pins bonded out for a full 8-bit data width.

Note: VCCIO and GND pads are used to determine the average DC current drawn by I/Os between GND/VCCIO connections, or between the last GND/VCCIO in an I/O bank and the end of an I/O bank. The substrate pads listed in the Pin Table do not necessarily have a one to one connection with a package ball or pin.

**LFE2-70E/SE Logic Signal Connections: 900 fpBGA (Cont.)**

| LFE2-70E/SE |                   |      |               |              |
|-------------|-------------------|------|---------------|--------------|
| Ball Number | Ball/Pad Function | Bank | Dual Function | Differential |
| AD2         | PL90B             | 6    | LDQ88         | C (LVDS)*    |
| AD7         | PL91A             | 6    | LDQ88         | T            |
| GND         | GNDIO6            | -    |               |              |
| AB9         | PL91B             | 6    | LDQ88         | C            |
| AD5         | TCK               | -    |               |              |
| AE7         | TDI               | -    |               |              |
| AD4         | TMS               | -    |               |              |
| AA9         | TDO               | -    |               |              |
| AD3         | VCCJ              | -    |               |              |
| AC8         | PB2A              | 5    | VREF2_5/BDQ6  | T            |
| AE8         | PB2B              | 5    | VREF1_5/BDQ6  | C            |
| AD8         | PB3A              | 5    | BDQ6          | T            |
| AF8         | PB3B              | 5    | BDQ6          | C            |
| AG7         | PB4A              | 5    | BDQ6          | T            |
| VCCIO       | VCCIO5            | 5    |               |              |
| AH7         | PB4B              | 5    | BDQ6          | C            |
| AC9         | PB5A              | 5    | BDQ6          | T            |
| AE9         | PB5B              | 5    | BDQ6          | C            |
| AD9         | PB6A              | 5    | BDQS6         | T            |
| GND         | GNDIO5            | -    |               |              |
| AF9         | PB6B              | 5    | BDQ6          | C            |
| AB10        | PB7A              | 5    | BDQ6          | T            |
| AA10        | PB7B              | 5    | BDQ6          | C            |
| AJ7         | PB8A              | 5    | BDQ6          | T            |
| VCCIO       | VCCIO5            | 5    |               |              |
| AK7         | PB8B              | 5    | BDQ6          | C            |
| AC10        | PB9A              | 5    | BDQ6          | T            |
| AE10        | PB9B              | 5    | BDQ6          | C            |
| AJ8         | PB10A             | 5    | BDQ6          | T            |
| GND         | GNDIO5            | -    |               |              |
| AK8         | PB10B             | 5    | BDQ6          | C            |
| AF6         | PB11A             | 5    | BDQ15         | T            |
| AF7         | PB11B             | 5    | BDQ15         | C            |
| AG5         | PB12A             | 5    | BDQ15         | T            |
| AH5         | PB12B             | 5    | BDQ15         | C            |
| AG6         | PB13A             | 5    | BDQ15         | T            |
| AH6         | PB13B             | 5    | BDQ15         | C            |
| VCCIO       | VCCIO5            | 5    |               |              |
| AJ4         | PB14A             | 5    | BDQ15         | T            |
| AK4         | PB14B             | 5    | BDQ15         | C            |
| GND         | GNDIO5            | -    |               |              |
| AJ5         | PB15A             | 5    | BDQS15        | T            |
| AK5         | PB15B             | 5    | BDQ15         | C            |

## LFE2M20E/SE and LFE2M35E/SE Logic Signal Connections: 484 fpBGA (Cont.)

| LFE2M20E/SE |                   |      |                     |              | LFE2M35E/SE       |      |                            |              |  |
|-------------|-------------------|------|---------------------|--------------|-------------------|------|----------------------------|--------------|--|
| Ball Number | Ball/Pad Function | Bank | Dual Function       | Differential | Ball/Pad Function | Bank | Dual Function              | Differential |  |
| T17         | PR51A             | 8    | D2***               | T            | PR66A             | 8    | D2***                      | T            |  |
| T22         | PR50B             | 8    | D3***               | C            | PR65B             | 8    | D3***                      | C            |  |
| GNDIO       | GNDIO8            | -    |                     |              | GNDIO8            | -    |                            |              |  |
| R22         | PR50A             | 8    | D4***               | T            | PR65A             | 8    | D4***                      | T            |  |
| T15         | PR49B             | 8    | D5***               | C            | PR64B             | 8    | D5***                      | C            |  |
| R17         | PR49A             | 8    | D6***               | T            | PR64A             | 8    | D6***                      | T            |  |
| T20         | PR48B             | 8    | D7/SPID0***         | C            | PR63B             | 8    | D7/SPID0***                | C            |  |
| VCCIO       | VCCIO8            | 8    |                     |              | VCCIO8            | 8    |                            |              |  |
| T21         | PR48A             | 8    | DI/CSSPI0N***       | T            | PR63A             | 8    | DI/CSSPI0N***              | T            |  |
| R21         | PR47B             | 8    | DOU/CSON/CSSPI1N*** | C            | PR62B             | 8    | DOU/CSON/CSSPI1N***        | C            |  |
| R20         | PR47A             | 8    | BUSY/SISPI***       | T            | PR62A             | 8    | BUSY/SISPI***              | T            |  |
| R16         | RLM0_PLLCAP       | 3    |                     |              | RLM0_PLLCAP       | 3    |                            |              |  |
| R18         | PR45B             | 3    | RLM0_GDLLC_FB_A     | C            | PR60B             | 3    | RLM0_GDLLC_FB_A/RDQ57      | C            |  |
| GNDIO       | GNDIO3            | -    |                     |              | GNDIO3            | -    |                            |              |  |
| R19         | PR45A             | 3    | RLM0_GDLLT_FB_A     | T            | PR60A             | 3    | RLM0_GDLLT_FB_A/RDQ57      | T            |  |
| P22         | PR44B             | 3    | RLM0_GDLLC_IN_A**   | C (LVDS)*    | PR59B             | 3    | RLM0_GDLLC_IN_A**/RDQ57    | C (LVDS)*    |  |
| P21         | PR44A             | 3    | RLM0_GDLLT_IN_A**   | T (LVDS)*    | PR59A             | 3    | RLM0_GDLLT_IN_A**/RDQ57    | T (LVDS)*    |  |
| P16         | PR43B             | 3    | RLM0_GPLLC_IN_A**   | C            | PR58B             | 3    | RLM0_GPLLC_IN_A**/RDQ57    | C            |  |
| VCCIO       | VCCIO3            | 3    |                     |              | VCCIO3            | 3    |                            |              |  |
| P17         | PR43A             | 3    | RLM0_GPLLT_IN_A**   | T            | PR58A             | 3    | RLM0_GPLLT_IN_A**/RDQ57    | T            |  |
| P20         | PR42B             | 3    | RLM0_GPLLC_FB_A     | C (LVDS)*    | PR57B             | 3    | RLM0_GPLLC_FB_A/RDQ57      | C (LVDS)*    |  |
| P19         | PR42A             | 3    | RLM0_GPLLT_FB_A     | T (LVDS)*    | PR57A             | 3    | RLM0_GPLLT_FB_A/RDQS57**** | T (LVDS)*    |  |
| GNDIO       | GNDIO3            | -    |                     |              | GNDIO3            | -    |                            |              |  |
| -           | -                 | -    |                     |              | VCCIO3            | 3    |                            |              |  |
| P18         | PR41B             | 3    | RDQ38               | C            | PR51B             | 3    | RDQ48                      | C            |  |
| N16         | PR41A             | 3    | RDQ38               | T            | PR51A             | 3    | RDQ48                      | T            |  |
| GNDIO       | GNDIO3            | -    |                     |              | GNDIO3            | -    |                            |              |  |
| N22         | PR40B             | 3    | RDQ38               | C (LVDS)*    | PR50B             | 3    | RDQ48                      | C (LVDS)*    |  |
| N21         | PR40A             | 3    | RDQ38               | T (LVDS)*    | PR50A             | 3    | RDQ48                      | T (LVDS)*    |  |
| N17         | PR39B             | 3    | RDQ38               | C            | PR49B             | 3    | RDQ48                      | C            |  |
| N18         | PR39A             | 3    | RDQ38               | T            | PR49A             | 3    | RDQ48                      | T            |  |
| VCCIO       | VCCIO3            | 3    |                     |              | VCCIO3            | 3    |                            |              |  |
| M22         | PR38B             | 3    | RDQ38               | C (LVDS)*    | PR48B             | 3    | RDQ48                      | C (LVDS)*    |  |
| M21         | PR38A             | 3    | RDQS38              | T (LVDS)*    | PR48A             | 3    | RDQS48                     | T (LVDS)*    |  |
| M16         | PR37B             | 3    | RDQ38               | C            | PR47B             | 3    | RDQ48                      | C            |  |
| GNDIO       | GNDIO3            | -    |                     |              | GNDIO3            | -    |                            |              |  |
| M17         | PR37A             | 3    | RDQ38               | T            | PR47A             | 3    | RDQ48                      | T            |  |
| M20         | PR36B             | 3    | RDQ38               | C (LVDS)*    | PR46B             | 3    | RDQ48                      | C (LVDS)*    |  |
| M19         | PR36A             | 3    | RDQ38               | T (LVDS)*    | PR46A             | 3    | RDQ48                      | T (LVDS)*    |  |
| M18         | PR35B             | 3    | RDQ38               | C            | PR45B             | 3    | RDQ48                      | C            |  |
| VCCIO       | VCCIO3            | 3    |                     |              | VCCIO3            | 3    |                            |              |  |
| L16         | PR35A             | 3    | RDQ38               | T            | PR45A             | 3    | RDQ48                      | T            |  |
| L22         | PR34B             | 3    | RDQ38               | C (LVDS)*    | PR44B             | 3    | RDQ48                      | C (LVDS)*    |  |
| L21         | PR34A             | 3    | RDQ38               | T (LVDS)*    | PR44A             | 3    | RDQ48                      | T (LVDS)*    |  |
| K22         | PR32B             | 3    | RLM1_SPLLC_FB_A     | C            | PR42B             | 3    | RLM2_SPLLC_FB_A            | C            |  |
| VCCIO       | VCCIO3            | 3    |                     |              | VCCIO3            | 3    |                            |              |  |
| K21         | PR32A             | 3    | RLM1_SPLLT_FB_A     | T            | PR42A             | 3    | RLM2_SPLLT_FB_A            | T            |  |
| L17         | PR31B             | 3    | RLM1_SPLLC_IN_A     | C (LVDS)*    | PR41B             | 3    | RLM2_SPLLC_IN_A            | C (LVDS)*    |  |

## LFE2M35E/SE and LFE2M50E/SE Logic Signal Connections: 672 fpBGA (Cont.)

| LFE2M35E/SE |                   |      |               |              | LFE2M50E/SE       |      |               |              |  |
|-------------|-------------------|------|---------------|--------------|-------------------|------|---------------|--------------|--|
| Ball Number | Ball/Pad Function | Bank | Dual Function | Differential | Ball/Pad Function | Bank | Dual Function | Differential |  |
| AA14        | PB42B             | 4    | BDQ42         | C            | PB51B             | 4    | BDQ51         | C            |  |
| VCCIO       | VCCIO4            | 4    |               |              | VCCIO4            | 4    |               |              |  |
| GNDIO       | GNDIO4            | -    |               |              | GNDIO4            | -    |               |              |  |
| W17         | PB65A             | 4    | BDQ69         | T            | PB56A             | 4    | BDQ60         | T            |  |
| AA19        | PB65B             | 4    | BDQ69         | C            | PB56B             | 4    | BDQ60         | C            |  |
| AC15        | PB48A             | 4    | BDQ51         | T            | PB57A             | 4    | BDQ60         | T            |  |
| Y18         | PB68B             | 4    | BDQ69         | C            | PB57B             | 4    | BDQ60         | C            |  |
| AB15        | PB49A             | 4    | BDQ51         | T            | PB58A             | 4    | BDQ60         | T            |  |
| AC16        | PB49B             | 4    | BDQ51         | C            | PB58B             | 4    | BDQ60         | C            |  |
| VCCIO       | VCCIO4            | 4    |               |              | VCCIO4            | 4    |               |              |  |
| AA17        | PB60A             | 4    | BDQS60****    | T            | PB59A             | 4    | BDQ60         | T            |  |
| AB16        | PB50B             | 4    | BDQ51         | C            | PB59B             | 4    | BDQ60         | C            |  |
| GNDIO       | GNDIO4            | -    |               |              | GNDIO4            | -    |               |              |  |
| AA15        | PB51A             | 4    | BDQS51****    | T            | PB60A             | 4    | BDQS60        | T            |  |
| W16         | PB59B             | 4    | BDQ60         | C            | PB60B             | 4    | BDQ60         | C            |  |
| Y15         | PB52A             | 4    | BDQ51         | T            | PB61A             | 4    | BDQ60         | T            |  |
| AC17        | PB52B             | 4    | BDQ51         | C            | PB61B             | 4    | BDQ60         | C            |  |
| AA18        | PB61A             | 4    | BDQ60         | T            | PB62A             | 4    | BDQ60         | T            |  |
| Y17         | PB61B             | 4    | BDQ60         | C            | PB62B             | 4    | BDQ60         | C            |  |
| -           | -                 | -    |               |              | VCCIO4            | 4    |               |              |  |
| GNDIO       | GNDIO4            | -    |               |              | -                 | -    |               |              |  |
| W15         | PB54A             | 4    | BDQ51         | T            | PB63A             | 4    | BDQ60         | T            |  |
| AB17        | PB54B             | 4    | BDQ51         | C            | PB63B             | 4    | BDQ60         | C            |  |
| GNDIO       | GNDIO4            | -    |               |              | GNDIO4            | -    |               |              |  |
| VCCIO       | VCCIO4            | 4    |               |              | VCCIO4            | 4    |               |              |  |
| V17         | PB73A             | 4    | BDQ69         | T            | PB72A             | 4    | BDQ69         | T            |  |
| AA20        | PB73B             | 4    | BDQ69         | C            | PB72B             | 4    | BDQ69         | C            |  |
| GNDIO       | GNDIO4            | -    |               |              | GNDIO4            | -    |               |              |  |
| AD13        | VCC               | -    |               |              | LRC_SQ_VCCR3      | 13   |               |              |  |
| AF14        | PB47A             | 4    | BDQ51         | T            | LRC_SQ_HDINP3     | 13   |               | T            |  |
| AE13        | NC                | -    |               |              | LRC_SQ_VCCIB3     | 13   |               |              |  |
| AE14        | PB41A             | 4    | VREF2_4/BDQ42 | T            | LRC_SQ_HDINN3     | 13   |               | C            |  |
| AD16        | VCC               | -    |               |              | LRC_SQ_VCCTX3     | 13   |               |              |  |
| AF17        | PB51B             | 4    | BDQ51         | C            | LRC_SQ_HDOUPT3    | 13   |               | T            |  |
| AF16        | NC                | -    |               |              | LRC_SQ_VCCOB3     | 13   |               |              |  |
| AE17        | PB50A             | 4    | BDQ51         | T            | LRC_SQ_HDOUPTN3   | 13   |               | C            |  |
| AD17        | VCC               | -    |               |              | LRC_SQ_VCCTX2     | 13   |               |              |  |
| AE18        | PB53B             | 4    | BDQ51         | C            | LRC_SQ_HDOUPTN2   | 13   |               | C            |  |
| AD18        | NC                | -    |               |              | LRC_SQ_VCCOB2     | 13   |               |              |  |
| AF18        | PB53A             | 4    | BDQ51         | T            | LRC_SQ_HDOUPT2    | 13   |               | T            |  |
| AD14        | VCC               | -    |               |              | LRC_SQ_VCCR2      | 13   |               |              |  |
| AE15        | PB48B             | 4    | BDQ51         | C            | LRC_SQ_HDINN2     | 13   |               | C            |  |
| AD15        | NC                | -    |               |              | LRC_SQ_VCCIB2     | 13   |               |              |  |
| AF15        | PB47B             | 4    | BDQ51         | C            | LRC_SQ_HDINP2     | 13   |               | T            |  |
| AD19        | VCC               | -    |               |              | LRC_SQ_VCCP       | 13   |               |              |  |
| AC19        | PB57B             | 4    | BDQ60         | C            | LRC_SQ_REFCLKP    | 13   |               | T            |  |
| AB19        | PB59A             | 4    | BDQ60         | T            | LRC_SQ_REFCLKN    | 13   |               | C            |  |
| AE19        | VCCAUX            | -    |               |              | LRC_SQ_VCCAUX33   | 13   |               |              |  |

## LFE2M50E/SE and LFE2M70E/SE Logic Signal Connections: 900 fpBGA (Cont.)

| LFE2M50E/SE |                   |      |               |              | LFE2M70E/SE       |      |               |              |  |
|-------------|-------------------|------|---------------|--------------|-------------------|------|---------------|--------------|--|
| Ball Number | Ball/Pad Function | Bank | Dual Function | Differential | Ball/Pad Function | Bank | Dual Function | Differential |  |
| AH12        | VCC               | -    |               |              | LLC_SQ_VCCR1      | 14   |               |              |  |
| AK8         | PB16A             | 5    | BDQ15         | T            | LLC_SQ_HDOUTP1    | 14   |               | T            |  |
| AH8         | NC                | -    |               |              | LLC_SQ_VCCOB1     | 14   |               |              |  |
| AJ8         | PB16B             | 5    | BDQ15         | C            | LLC_SQ_HDOUTN1    | 14   |               | C            |  |
| AH9         | VCC               | -    |               |              | LLC_SQ_VCCTX1     | 14   |               |              |  |
| AJ9         | PB17B             | 5    | BDQ15         | C            | LLC_SQ_HDOUTN0    | 14   |               | C            |  |
| AK10        | NC                | -    |               |              | LLC_SQ_VCCOB0     | 14   |               |              |  |
| AK9         | PB17A             | 5    | BDQ15         | T            | LLC_SQ_HDOUTP0    | 14   |               | T            |  |
| AH10        | VCC               | -    |               |              | LLC_SQ_VCCTX0     | 14   |               |              |  |
| AJ12        | PB19B             | 5    | BDQ15         | C            | LLC_SQ_HDINN0     | 14   |               | C            |  |
| AJ13        | NC                | -    |               |              | LLC_SQ_VCCIB0     | 14   |               |              |  |
| AK12        | PB19A             | 5    | BDQ15         | T            | LLC_SQ_HDINP0     | 14   |               | T            |  |
| AH13        | VCC               | -    |               |              | LLC_SQ_VCCR0      | 14   |               |              |  |
| AF10        | PB3A              | 5    | BDQ6          | T            | PB30A             | 5    | BDQ33         | T            |  |
| AE8         | PB3B              | 5    | BDQ6          | C            | PB30B             | 5    | BDQ33         | C            |  |
| AE11        | PB4A              | 5    | BDQ6          | T            | PB31A             | 5    | BDQ33         | T            |  |
| VCCIO       | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |
| AD9         | PB4B              | 5    | BDQ6          | C            | PB31B             | 5    | BDQ33         | C            |  |
| AE10        | PB5A              | 5    | BDQ6          | T            | PB32A             | 5    | BDQ33         | T            |  |
| AD10        | PB5B              | 5    | BDQ6          | C            | PB32B             | 5    | BDQ33         | C            |  |
| AE13        | PB6A              | 5    | BDQS6         | T            | PB33A             | 5    | BDQS33        | T            |  |
| GNDIO       | GNDIO5            | -    |               |              | GNDIO5            | -    |               |              |  |
| AC12        | PB6B              | 5    | BDQ6          | C            | PB33B             | 5    | BDQ33         | C            |  |
| AG2         | PB7A              | 5    | BDQ6          | T            | PB34A             | 5    | BDQ33         | T            |  |
| AG3         | PB7B              | 5    | BDQ6          | C            | PB34B             | 5    | BDQ33         | C            |  |
| AD13        | PB8A              | 5    | BDQ6          | T            | PB35A             | 5    | BDQ33         | T            |  |
| VCCIO       | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |
| AC13        | PB8B              | 5    | BDQ6          | C            | PB35B             | 5    | BDQ33         | C            |  |
| AE14        | PB9A              | 5    | BDQ6          | T            | PB36A             | 5    | BDQ33         | T            |  |
| AC14        | PB9B              | 5    | BDQ6          | C            | PB36B             | 5    | BDQ33         | C            |  |
| AF3         | PB10A             | 5    | BDQ6          | T            | PB37A             | 5    | BDQ33         | T            |  |
| GNDIO       | GNDIO5            | -    |               |              | GNDIO5            | -    |               |              |  |
| AF4         | PB10B             | 5    | BDQ6          | C            | PB37B             | 5    | BDQ33         | C            |  |
| VCCIO       | VCCIO5            | 5    |               |              | -                 | -    |               |              |  |
| AG4         | PB20A             | 5    | BDQ24         | T            | PB38A             | 5    | BDQ42         | T            |  |
| AG5         | PB20B             | 5    | BDQ24         | C            | PB38B             | 5    | BDQ42         | C            |  |
| GNDIO       | GNDIO5            | -    |               |              | -                 | -    |               |              |  |
| VCCIO       | VCCIO5            | 5    |               |              | -                 | -    |               |              |  |
| AD11        | PB24A             | 5    | BDQS24****    | T            | PB39A             | 5    | BDQ42         | T            |  |
| AF13        | PB24B             | 5    | BDQ24         | C            | PB39B             | 5    | BDQ42         | C            |  |
| AF12        | PB25A             | 5    | BDQ24         | T            | PB40A             | 5    | BDQ42         | T            |  |
| -           | -                 | -    |               |              | VCCIO5            | 5    |               |              |  |
| AD14        | PB25B             | 5    | BDQ24         | C            | PB40B             | 5    | BDQ42         | C            |  |
| AG8         | PB26A             | 5    | BDQ24         | T            | PB41A             | 5    | BDQ42         | T            |  |
| AF8         | PB26B             | 5    | BDQ24         | C            | PB41B             | 5    | BDQ42         | C            |  |
| AE15        | PB27A             | 5    | BDQ24         | T            | PB42A             | 5    | BDQS42****    | T            |  |
| -           | -                 | -    |               |              | GNDIO5            | -    |               |              |  |
| VCCIO       | VCCIO5            | 5    |               |              | -                 | -    |               |              |  |

## LFE2M50E/SE and LFE2M70E/SE Logic Signal Connections: 900 fpBGA (Cont.)

| LFE2M50E/SE |                   |      |               |              | LFE2M70E/SE       |      |               |              |  |
|-------------|-------------------|------|---------------|--------------|-------------------|------|---------------|--------------|--|
| Ball Number | Ball/Pad Function | Bank | Dual Function | Differential | Ball/Pad Function | Bank | Dual Function | Differential |  |
| AF17        | GND               | -    |               |              | GND               | -    |               |              |  |
| AF25        | GND               | -    |               |              | GND               | -    |               |              |  |
| AF6         | GND               | -    |               |              | GND               | -    |               |              |  |
| AJ10        | GND               | -    |               |              | GND               | -    |               |              |  |
| AJ21        | GND               | -    |               |              | GND               | -    |               |              |  |
| AJ27        | GND               | -    |               |              | GND               | -    |               |              |  |
| AJ4         | GND               | -    |               |              | GND               | -    |               |              |  |
| AK1         | GND               | -    |               |              | GND               | -    |               |              |  |
| AK13        | GND               | -    |               |              | GND               | -    |               |              |  |
| AK18        | GND               | -    |               |              | GND               | -    |               |              |  |
| AK24        | GND               | -    |               |              | GND               | -    |               |              |  |
| AK30        | GND               | -    |               |              | GND               | -    |               |              |  |
| AK7         | GND               | -    |               |              | GND               | -    |               |              |  |
| B10         | GND               | -    |               |              | GND               | -    |               |              |  |
| B21         | GND               | -    |               |              | GND               | -    |               |              |  |
| B27         | GND               | -    |               |              | GND               | -    |               |              |  |
| B4          | GND               | -    |               |              | GND               | -    |               |              |  |
| D25         | GND               | -    |               |              | GND               | -    |               |              |  |
| D6          | GND               | -    |               |              | GND               | -    |               |              |  |
| E14         | GND               | -    |               |              | GND               | -    |               |              |  |
| E17         | GND               | -    |               |              | GND               | -    |               |              |  |
| F22         | GND               | -    |               |              | GND               | -    |               |              |  |
| F27         | GND               | -    |               |              | GND               | -    |               |              |  |
| F4          | GND               | -    |               |              | GND               | -    |               |              |  |
| F9          | GND               | -    |               |              | GND               | -    |               |              |  |
| G12         | GND               | -    |               |              | GND               | -    |               |              |  |
| G19         | GND               | -    |               |              | GND               | -    |               |              |  |
| J24         | GND               | -    |               |              | GND               | -    |               |              |  |
| J7          | GND               | -    |               |              | GND               | -    |               |              |  |
| K14         | GND               | -    |               |              | GND               | -    |               |              |  |
| K15         | GND               | -    |               |              | GND               | -    |               |              |  |
| K16         | GND               | -    |               |              | GND               | -    |               |              |  |
| K17         | GND               | -    |               |              | GND               | -    |               |              |  |
| K27         | GND               | -    |               |              | GND               | -    |               |              |  |
| K4          | GND               | -    |               |              | GND               | -    |               |              |  |
| L14         | GND               | -    |               |              | GND               | -    |               |              |  |
| L15         | GND               | -    |               |              | GND               | -    |               |              |  |
| L16         | GND               | -    |               |              | GND               | -    |               |              |  |
| L17         | GND               | -    |               |              | GND               | -    |               |              |  |
| M23         | GND               | -    |               |              | GND               | -    |               |              |  |
| M8          | GND               | -    |               |              | GND               | -    |               |              |  |
| N14         | GND               | -    |               |              | GND               | -    |               |              |  |
| N15         | GND               | -    |               |              | GND               | -    |               |              |  |
| N16         | GND               | -    |               |              | GND               | -    |               |              |  |
| N17         | GND               | -    |               |              | GND               | -    |               |              |  |
| N27         | GND               | -    |               |              | GND               | -    |               |              |  |
| N4          | GND               | -    |               |              | GND               | -    |               |              |  |
| P11         | GND               | -    |               |              | GND               | -    |               |              |  |

**LFE2M100E/SE Logic Signal Connections: 900 fpBGA (Cont.)**

| LFE2M100E/SE |                   |      |               |              |
|--------------|-------------------|------|---------------|--------------|
| Ball Number  | Ball/Pad Function | Bank | Dual Function | Differential |
| AB27         | PR97A             | 3    | RDQ99         | T (LVDS)*    |
| VCCIO        | VCCIO3            | 3    |               |              |
| Y24          | PR96B             | 3    | RDQ99         | C            |
| Y25          | PR96A             | 3    | RDQ99         | T            |
| AA29         | PR95B             | 3    | RDQ99         | C (LVDS)*    |
| Y28          | PR95A             | 3    | RDQ99         | T (LVDS)*    |
| Y30          | PR93B             | 3    | RDQ90         | C            |
| Y29          | PR93A             | 3    | RDQ90         | T            |
| GNDIO        | GNDIO3            | -    |               |              |
| VCCIO        | VCCIO3            | 3    |               |              |
| W22          | PR83B             | 3    | RDQ81         | C (LVDS)*    |
| V22          | PR83A             | 3    | RDQ81         | T (LVDS)*    |
| Y27          | PR82B             | 3    | RDQ81         | C            |
| VCCIO        | VCCIO3            | 3    |               |              |
| Y26          | PR82A             | 3    | RDQ81         | T            |
| W30          | PR81B             | 3    | RDQ81         | C (LVDS)*    |
| W29          | PR81A             | 3    | RDQS81        | T (LVDS)*    |
| GNDIO        | GNDIO3            | -    |               |              |
| W25          | PR80B             | 3    | RDQ81         | C            |
| W26          | PR80A             | 3    | RDQ81         | T            |
| U29          | PR79B             | 3    | RDQ81         | C (LVDS)*    |
| V29          | PR79A             | 3    | RDQ81         | T (LVDS)*    |
| VCCIO        | VCCIO3            | 3    |               |              |
| V30          | PR78B             | 3    | RDQ81         | C            |
| U30          | PR78A             | 3    | RDQ81         | T            |
| W27          | PR77B             | 3    | RDQ81         | C (LVDS)*    |
| W28          | PR77A             | 3    | RDQ81         | T (LVDS)*    |
| V24          | PR75B             | 3    | RDQ72         | C            |
| V25          | PR75A             | 3    | RDQ72         | T            |
| GNDIO        | GNDIO3            | -    |               |              |
| U28          | PR74B             | 3    | RDQ72         | C (LVDS)*    |
| U27          | PR74A             | 3    | RDQ72         | T (LVDS)*    |
| U23          | PR73B             | 3    | RDQ72         | C            |
| V23          | PR73A             | 3    | RDQ72         | T            |
| VCCIO        | VCCIO3            | 3    |               |              |
| V26          | PR72B             | 3    | RDQ72         | C (LVDS)*    |
| U26          | PR72A             | 3    | RDQS72        | T (LVDS)*    |
| U25          | PR71B             | 3    | RDQ72         | C            |
| GNDIO        | GNDIO3            | -    |               |              |
| U24          | PR71A             | 3    | RDQ72         | T            |
| T30          | PR70B             | 3    | RDQ72         | C (LVDS)*    |
| R30          | PR70A             | 3    | RDQ72         | T (LVDS)*    |
| T23          | PR69B             | 3    | RDQ72         | C            |

**LFE2M100E/SE Logic Signal Connections: 900 fpBGA (Cont.)**

| LFE2M100E/SE |                   |      |               |              |
|--------------|-------------------|------|---------------|--------------|
| Ball Number  | Ball/Pad Function | Bank | Dual Function | Differential |
| GNDIO        | GNDIO2            | -    |               |              |
| M27          | PR47B             | 2    | RDQ45         | C (LVDS)*    |
| M28          | PR47A             | 2    | RDQ45         | T (LVDS)*    |
| H30          | PR46B             | 2    | RDQ45         | C            |
| G30          | PR46A             | 2    | RDQ45         | T            |
| VCCIO        | VCCIO2            | 2    |               |              |
| M25          | PR45B             | 2    | RDQ45         | C (LVDS)*    |
| M26          | PR45A             | 2    | RDQS45        | T (LVDS)*    |
| L30          | PR44B             | 2    | RDQ45         | C            |
| GNDIO        | GNDIO2            | -    |               |              |
| L29          | PR44A             | 2    | RDQ45         | T            |
| L28          | PR43B             | 2    | RDQ45         | C (LVDS)*    |
| L27          | PR43A             | 2    | RDQ45         | T (LVDS)*    |
| H29          | PR42B             | 2    | RDQ45         | C            |
| VCCIO        | VCCIO2            | 2    |               |              |
| G29          | PR42A             | 2    | RDQ45         | T            |
| L22          | PR41B             | 2    | RDQ45         | C (LVDS)*    |
| M22          | PR41A             | 2    | RDQ45         | T (LVDS)*    |
| F30          | PR40B             | 2    |               | C            |
| GNDIO        | GNDIO2            | -    |               |              |
| F29          | PR40A             | 2    |               | T            |
| VCCIO        | VCCIO2            | 2    |               |              |
| GNDIO        | GNDIO2            | -    |               |              |
| E30          | PR34B             | 2    | RDQ32         | C (LVDS)*    |
| E29          | PR34A             | 2    | RDQ32         | T (LVDS)*    |
| -            | -                 | -    |               |              |
| L25          | PR33B             | 2    | RDQ32         | C            |
| L26          | PR33A             | 2    | RDQ32         | T            |
| VCCIO        | VCCIO2            | 2    |               |              |
| H28          | PR32B             | 2    | RDQ32         | C (LVDS)*    |
| J28          | PR32A             | 2    | RDQS32        | T (LVDS)*    |
| G28          | PR31B             | 2    | RDQ32         | C            |
| GNDIO        | GNDIO2            | -    |               |              |
| G27          | PR31A             | 2    | RDQ32         | T            |
| L24          | PR30B             | 2    | RDQ32         | C (LVDS)*    |
| L23          | PR30A             | 2    | RDQ32         | T (LVDS)*    |
| D30          | PR29B             | 2    | RDQ32         | C            |
| VCCIO        | VCCIO2            | 2    |               |              |
| D29          | PR29A             | 2    | RDQ32         | T            |
| K24          | PR28B             | 2    | RDQ32         | C (LVDS)*    |
| K25          | PR28A             | 2    | RDQ32         | T (LVDS)*    |
| J27          | PR26B             | 2    | RDQ23         | C            |
| GNDIO        | GNDIO2            | -    |               |              |

**LFE2M100E/SE Logic Signal Connections: 900 fpBGA (Cont.)**

| LFE2M100E/SE |                   |      |               |              |
|--------------|-------------------|------|---------------|--------------|
| Ball Number  | Ball/Pad Function | Bank | Dual Function | Differential |
| AE23         | NC                | -    |               |              |
| AE5          | NC                | -    |               |              |
| AE6          | NC                | -    |               |              |
| AE7          | NC                | -    |               |              |
| AF20         | NC                | -    |               |              |
| AF23         | NC                | -    |               |              |
| AF5          | NC                | -    |               |              |
| AG23         | NC                | -    |               |              |
| AG26         | NC                | -    |               |              |
| D10          | NC                | -    |               |              |
| E10          | NC                | -    |               |              |
| E11          | NC                | -    |               |              |
| F10          | NC                | -    |               |              |
| F20          | NC                | -    |               |              |
| F23          | NC                | -    |               |              |
| F8           | NC                | -    |               |              |
| G10          | NC                | -    |               |              |
| G20          | NC                | -    |               |              |
| G21          | NC                | -    |               |              |
| G7           | NC                | -    |               |              |
| G8           | NC                | -    |               |              |
| G9           | NC                | -    |               |              |
| H19          | NC                | -    |               |              |
| H20          | NC                | -    |               |              |
| H21          | NC                | -    |               |              |
| H22          | NC                | -    |               |              |
| H6           | NC                | -    |               |              |
| H8           | NC                | -    |               |              |
| H9           | NC                | -    |               |              |
| J10          | NC                | -    |               |              |
| J20          | NC                | -    |               |              |
| J21          | NC                | -    |               |              |
| J9           | NC                | -    |               |              |
| K9           | NC                | -    |               |              |
| R9           | NC                | -    |               |              |
| U22          | NC                | -    |               |              |
| W9           | NC                | -    |               |              |
| N13          | VCCPLL            | -    |               |              |
| N18          | VCCPLL            | -    |               |              |
| V13          | VCCPLL            | -    |               |              |

## LFE2M100E/SE Logic Signal Connections: 900 fpBGA (Cont.)

| LFE2M100E/SE |                   |      |               |              |
|--------------|-------------------|------|---------------|--------------|
| Ball Number  | Ball/Pad Function | Bank | Dual Function | Differential |
| V18          | VCCPLL            | -    |               |              |

\* Supports true LVDS. Other differential signals must be emulated with external resistors.

\*\* These dedicated input pins can be used for GPLLs or GDLLs within the respective quadrant.

\*\*\* These sysCONFIG pins are dedicated I/O pins for configuration. The outputs are actively driven during normal device operation.

\*\*\*\*Due to packaging bond out option, this DQS does not have all the necessary DQ pins bonded out for a full 8-bit data width.

Note: VCCIO and GND pads are used to determine the average DC current drawn by I/Os between GND/VCCIO connections, or between the last GND/VCCIO in an I/O bank and the end of an I/O bank. The substrate pads listed in the Pin Table do not necessarily have a one to one connection with a package ball or pin.

## LFE2M70E/SE and LFE2M100E/SE Logic Signal Connections: 1152 fpBGA (Cont.)

| LFE2M70E/SE |                   |      |                       | LFE2M100E/SE |                   |      |                       |              |
|-------------|-------------------|------|-----------------------|--------------|-------------------|------|-----------------------|--------------|
| Ball Number | Ball/Pad Function | Bank | Dual Function         | Differential | Ball/Pad Function | Bank | Dual Function         | Differential |
| M2          | PL26A             | 7    | LDQ28                 | T (LVDS)*    | PL30A             | 7    | LDQ32                 | T (LVDS)*    |
| M1          | PL26B             | 7    | LDQ28                 | C (LVDS)*    | PL30B             | 7    | LDQ32                 | C (LVDS)*    |
| L6          | PL27A             | 7    | LDQ28                 | T            | PL31A             | 7    | LDQ32                 | T            |
| L5          | PL27B             | 7    | LDQ28                 | C            | PL31B             | 7    | LDQ32                 | C            |
| GNDIO       | GNDIO7            | -    |                       |              | GNDIO7            | -    |                       |              |
| L3          | PL28A             | 7    | LDQS28                | T (LVDS)*    | PL32A             | 7    | LDQS32                | T (LVDS)*    |
| L4          | PL28B             | 7    | LDQ28                 | C (LVDS)*    | PL32B             | 7    | LDQ32                 | C (LVDS)*    |
| M3          | PL29A             | 7    | LDQ28                 | T            | PL33A             | 7    | LDQ32                 | T            |
| VCCIO       | VCCIO7            | 7    |                       |              | VCCIO7            | 7    |                       |              |
| M4          | PL29B             | 7    | LDQ28                 | C            | PL33B             | 7    | LDQ32                 | C            |
| N1          | PL30A             | 7    | LDQ28                 | T (LVDS)*    | PL34A             | 7    | LDQ32                 | T (LVDS)*    |
| N2          | PL30B             | 7    | LDQ28                 | C (LVDS)*    | PL34B             | 7    | LDQ32                 | C (LVDS)*    |
| M5          | PL31A             | 7    | LDQ28                 | T            | PL35A             | 7    | LDQ32                 | T            |
| GNDIO       | GNDIO7            | -    |                       |              | GNDIO7            | -    |                       |              |
| N6          | PL31B             | 7    | LDQ28                 | C            | PL35B             | 7    | LDQ32                 | C            |
| P3          | NC                | -    |                       |              | PL37A             | 7    |                       | T (LVDS)*    |
| -           | -                 | -    |                       |              | GNDIO7            | -    |                       |              |
| P4          | NC                | -    |                       |              | PL37B             | 7    |                       | C (LVDS)*    |
| P9          | NC                | -    |                       |              | PL38A             | 7    |                       | T            |
| M7          | NC                | -    |                       |              | PL38B             | 7    |                       | C            |
| -           | -                 | -    |                       |              | VCCIO7            | 7    |                       |              |
| P1          | NC                | -    |                       |              | PL39A             | 7    |                       | T (LVDS)*    |
| P2          | NC                | -    |                       |              | PL39B             | 7    |                       | C (LVDS)*    |
| N7          | NC                | -    |                       |              | PL40A             | 7    |                       | T            |
| P7          | NC                | -    |                       |              | PL40B             | 7    |                       | C            |
| -           | -                 | -    |                       |              | GNDIO7            | -    |                       |              |
| P5          | PL33A             | 7    | LDQ37                 | T (LVDS)*    | PL41A             | 7    | LDQ45                 | T (LVDS)*    |
| N5          | PL33B             | 7    | LDQ37                 | C (LVDS)*    | PL41B             | 7    | LDQ45                 | C (LVDS)*    |
| P8          | PL34A             | 7    | LDQ37                 | T            | PL42A             | 7    | LDQ45                 | T            |
| P6          | PL34B             | 7    | LDQ37                 | C            | PL42B             | 7    | LDQ45                 | C            |
| VCCIO       | VCCIO7            | 7    |                       |              | VCCIO7            | 7    |                       |              |
| R3          | PL35A             | 7    | LDQ37                 | T (LVDS)*    | PL43A             | 7    | LDQ45                 | T (LVDS)*    |
| R4          | PL35B             | 7    | LDQ37                 | C (LVDS)*    | PL43B             | 7    | LDQ45                 | C (LVDS)*    |
| R10         | PL36A             | 7    | LDQ37                 | T            | PL44A             | 7    | LDQ45                 | T            |
| P11         | PL36B             | 7    | LDQ37                 | C            | PL44B             | 7    | LDQ45                 | C            |
| GNDIO       | GNDIO7            | -    |                       |              | GNDIO7            | -    |                       |              |
| R7          | PL37A             | 7    | LDQS37                | T (LVDS)*    | PL45A             | 7    | LDQS45                | T (LVDS)*    |
| R8          | PL37B             | 7    | LDQ37                 | C (LVDS)*    | PL45B             | 7    | LDQ45                 | C (LVDS)*    |
| R5          | PL38A             | 7    | LDQ37                 | T            | PL46A             | 7    | LDQ45                 | T            |
| VCCIO       | VCCIO7            | 7    |                       |              | VCCIO7            | 7    |                       |              |
| T5          | PL38B             | 7    | LDQ37                 | C            | PL46B             | 7    | LDQ45                 | C            |
| R1          | PL39A             | 7    | LDQ37                 | T (LVDS)*    | PL47A             | 7    | LDQ45                 | T (LVDS)*    |
| R2          | PL39B             | 7    | LDQ37                 | C (LVDS)*    | PL47B             | 7    | LDQ45                 | C (LVDS)*    |
| R11         | PL40A             | 7    | LDQ37                 | T            | PL48A             | 7    | LDQ45                 | T            |
| GNDIO       | GNDIO7            | -    |                       |              | GNDIO7            | -    |                       |              |
| T10         | PL40B             | 7    | LDQ37                 | C            | PL48B             | 7    | LDQ45                 | C            |
| T1          | PL42A             | 7    | LUM3_SPLLT_IN_A/LDQ46 | T (LVDS)*    | PL50A             | 7    | LUM3_SPLLT_IN_A/LDQ54 | T (LVDS)*    |
| T2          | PL42B             | 7    | LUM3_SPLLC_IN_A/LDQ46 | C (LVDS)*    | PL50B             | 7    | LUM3_SPLLC_IN_A/LDQ54 | C (LVDS)*    |
| U10         | PL43A             | 7    | LUM3_SPLLT_FB_A/LDQ46 | T            | PL51A             | 7    | LUM3_SPLLT_FB_A/LDQ54 | T            |

## LFE2M70E/SE and LFE2M100E/SE Logic Signal Connections: 1152 fpBGA (Cont.)

| LFE2M70E/SE |                   |      |                            | LFE2M100E/SE |                   |      |                             |              |
|-------------|-------------------|------|----------------------------|--------------|-------------------|------|-----------------------------|--------------|
| Ball Number | Ball/Pad Function | Bank | Dual Function              | Differential | Ball/Pad Function | Bank | Dual Function               | Differential |
| AF27        | RLM0_PLLCAP       | 3    |                            |              | RLM0_PLLCAP       | 3    |                             |              |
| AF28        | PR85B             | 3    | RLM0_GDLLC_FB_A            | C            | PR102B            | 3    | RLM0_GDLLC_FB_A/RDQ99       | C            |
| GNDIO       | GNDIO3            | -    |                            |              | GNDIO3            | -    |                             |              |
| AD26        | PR85A             | 3    | RLM0_GDLLT_FB_A            | T            | PR102A            | 3    | RLM0_GDLLT_FB_A/RDQ99       | T            |
| AJ32        | PR84B             | 3    | RLM0_GDLLC_IN_A**          | C (LVDS)*    | PR101B            | 3    | RLM0_GDLLC_IN_A**/<br>RDQ99 | C (LVDS)*    |
| AJ33        | PR84A             | 3    | RLM0_GDLLT_IN_A**          | T (LVDS)*    | PR101A            | 3    | RLM0_GDLLT_IN_A**/<br>RDQ99 | T (LVDS)*    |
| AJ34        | PR83B             | 3    | RLM0_GPLLC_IN_A**          | C            | PR100B            | 3    | RLM0_GPLLC_IN_A**/<br>RDQ99 | C            |
| VCCIO       | VCCIO3            | 3    |                            |              | VCCIO3            | 3    |                             |              |
| AK34        | PR83A             | 3    | RLM0_GPLLT_IN_A**          | T            | PR100A            | 3    | RLM0_GPLLT_IN_A**/<br>RDQ99 | T            |
| AH33        | PR82B             | 3    | RLM0_GPLLC_FB_A            | C (LVDS)*    | PR99B             | 3    | RLM0_GPLLC_FB_A/RDQ99       | C (LVDS)*    |
| AH34        | PR82A             | 3    | RLM0_GPLLT_FB_A/RDQS82**** | T (LVDS)*    | PR99A             | 3    | RLM0_GPLLT_FB_A/<br>RDQS99  | T (LVDS)*    |
| GNDIO       | GNDIO3            | -    |                            |              | GNDIO3            | -    |                             |              |
| AF29        | PR81B             | 3    | RDQ82                      | C            | PR98B             | 3    | RDQ99                       | C            |
| AF31        | PR81A             | 3    | RDQ82                      | T            | PR98A             | 3    | RDQ99                       | T            |
| AG33        | PR80B             | 3    | RDQ82                      | C (LVDS)*    | PR97B             | 3    | RDQ99                       | C (LVDS)*    |
| AG34        | PR80A             | 3    | RDQ82                      | T (LVDS)*    | PR97A             | 3    | RDQ99                       | T (LVDS)*    |
| VCCIO       | VCCIO3            | 3    |                            |              | VCCIO3            | 3    |                             |              |
| AF30        | PR79B             | 3    | RDQ82                      | C            | PR96B             | 3    | RDQ99                       | C            |
| AF32        | PR79A             | 3    | RDQ82                      | T            | PR96A             | 3    | RDQ99                       | T            |
| AE29        | PR78B             | 3    | RDQ82                      | C (LVDS)*    | PR95B             | 3    | RDQ99                       | C (LVDS)*    |
| AE30        | PR78A             | 3    | RDQ82                      | T (LVDS)*    | PR95A             | 3    | RDQ99                       | T (LVDS)*    |
| AF33        | NC                | -    |                            |              | PR93B             | 3    | RDQ90                       | C            |
| AF34        | NC                | -    |                            |              | PR93A             | 3    | RDQ90                       | T            |
| -           | -                 | -    |                            |              | GNDIO3            | -    |                             |              |
| AC27        | NC                | -    |                            |              | PR92B             | 3    | RDQ90                       | C (LVDS)*    |
| AC28        | NC                | -    |                            |              | PR92A             | 3    | RDQ90                       | T (LVDS)*    |
| AD29        | NC                | -    |                            |              | PR91B             | 3    | RDQ90                       | C            |
| AD30        | NC                | -    |                            |              | PR91A             | 3    | RDQ90                       | T            |
| -           | -                 | -    |                            |              | VCCIO3            | 3    |                             |              |
| AE33        | NC                | -    |                            |              | PR90B             | 3    | RDQ90                       | C (LVDS)*    |
| AE34        | NC                | -    |                            |              | PR90A             | 3    | RDQS90                      | T (LVDS)*    |
| AD32        | NC                | -    |                            |              | PR89B             | 3    | RDQ90                       | C            |
| -           | -                 | -    |                            |              | GNDIO3            | -    |                             |              |
| AD31        | NC                | -    |                            |              | PR89A             | 3    | RDQ90                       | T            |
| AB25        | NC                | -    |                            |              | PR88B             | 3    | RDQ90                       | C (LVDS)*    |
| AC25        | NC                | -    |                            |              | PR88A             | 3    | RDQ90                       | T (LVDS)*    |
| AB28        | NC                | -    |                            |              | PR87B             | 3    | RDQ90                       | C            |
| -           | -                 | -    |                            |              | VCCIO3            | 3    |                             |              |
| AA26        | NC                | -    |                            |              | PR87A             | 3    | RDQ90                       | T            |
| AD33        | NC                | -    |                            |              | PR86B             | 3    | RDQ90                       | C (LVDS)*    |
| AD34        | NC                | -    |                            |              | PR86A             | 3    | RDQ90                       | T (LVDS)*    |
| AC29        | PR76B             | 3    | RDQ73                      | C            | PR84B             | 3    | RDQ81                       | C            |
| GNDIO       | GNDIO3            | -    |                            |              | GNDIO3            | -    |                             |              |
| AA27        | PR76A             | 3    | RDQ73                      | T            | PR84A             | 3    | RDQ81                       | T            |
| AC32        | PR75B             | 3    | RDQ73                      | C (LVDS)*    | PR83B             | 3    | RDQ81                       | C (LVDS)*    |
| AC31        | PR75A             | 3    | RDQ73                      | T (LVDS)*    | PR83A             | 3    | RDQ81                       | T (LVDS)*    |

| Part Number      | I/Os | Voltage | Grade | Package | Pins | Temp. | LUTs (K) |
|------------------|------|---------|-------|---------|------|-------|----------|
| LFE2-35SE-5F484C | 331  | 1.2V    | -5    | fpBGA   | 484  | Com   | 35       |
| LFE2-35SE-6F484C | 331  | 1.2V    | -6    | fpBGA   | 484  | Com   | 35       |
| LFE2-35SE-7F484C | 331  | 1.2V    | -7    | fpBGA   | 484  | Com   | 35       |
| LFE2-35SE-5F672C | 450  | 1.2V    | -5    | fpBGA   | 672  | Com   | 35       |
| LFE2-35SE-6F672C | 450  | 1.2V    | -6    | fpBGA   | 672  | Com   | 35       |
| LFE2-35SE-7F672C | 450  | 1.2V    | -7    | fpBGA   | 672  | Com   | 35       |

| Part Number      | I/Os | Voltage | Grade | Package | Pins | Temp. | LUTs (K) |
|------------------|------|---------|-------|---------|------|-------|----------|
| LFE2-50SE-5F484C | 339  | 1.2V    | -5    | fpBGA   | 484  | Com   | 50       |
| LFE2-50SE-6F484C | 339  | 1.2V    | -6    | fpBGA   | 484  | Com   | 50       |
| LFE2-50SE-7F484C | 339  | 1.2V    | -7    | fpBGA   | 484  | Com   | 50       |
| LFE2-50SE-5F672C | 500  | 1.2V    | -5    | fpBGA   | 672  | Com   | 50       |
| LFE2-50SE-6F672C | 500  | 1.2V    | -6    | fpBGA   | 672  | Com   | 50       |
| LFE2-50SE-7F672C | 500  | 1.2V    | -7    | fpBGA   | 672  | Com   | 50       |

| Part Number      | I/Os | Voltage | Grade | Package | Pins | Temp. | LUTs (K) |
|------------------|------|---------|-------|---------|------|-------|----------|
| LFE2-70SE-5F672C | 500  | 1.2V    | -5    | fpBGA   | 672  | Com   | 70       |
| LFE2-70SE-6F672C | 500  | 1.2V    | -6    | fpBGA   | 672  | Com   | 70       |
| LFE2-70SE-7F672C | 500  | 1.2V    | -7    | fpBGA   | 672  | Com   | 70       |
| LFE2-70SE-5F900C | 583  | 1.2V    | -5    | fpBGA   | 900  | Com   | 70       |
| LFE2-70SE-6F900C | 583  | 1.2V    | -6    | fpBGA   | 900  | Com   | 70       |
| LFE2-70SE-7F900C | 583  | 1.2V    | -7    | fpBGA   | 900  | Com   | 70       |

### Industrial

| Part Number     | I/Os | Voltage | Grade | Package | Pins | Temp. | LUTs (K) |
|-----------------|------|---------|-------|---------|------|-------|----------|
| LFE2-6SE-5T144I | 90   | 1.2V    | -5    | TQFP    | 144  | Ind   | 6        |
| LFE2-6SE-6T144I | 90   | 1.2V    | -6    | TQFP    | 144  | Ind   | 6        |
| LFE2-6SE-5F256I | 190  | 1.2V    | -5    | fpBGA   | 256  | Ind   | 6        |
| LFE2-6SE-6F256I | 190  | 1.2V    | -6    | fpBGA   | 256  | Ind   | 6        |

| Part Number      | I/Os | Voltage | Grade | Package | Pins | Temp. | LUTs (K) |
|------------------|------|---------|-------|---------|------|-------|----------|
| LFE2-12SE-5T144I | 93   | 1.2V    | -5    | TQFP    | 144  | Ind   | 12       |
| LFE2-12SE-6T144I | 93   | 1.2V    | -6    | TQFP    | 144  | Ind   | 12       |
| LFE2-12SE-5Q208I | 131  | 1.2V    | -5    | PQFP    | 208  | Ind   | 12       |
| LFE2-12SE-6Q208I | 131  | 1.2V    | -6    | PQFP    | 208  | Ind   | 12       |
| LFE2-12SE-5F256I | 193  | 1.2V    | -5    | fpBGA   | 256  | Ind   | 12       |
| LFE2-12SE-6F256I | 193  | 1.2V    | -6    | fpBGA   | 256  | Ind   | 12       |
| LFE2-12SE-5F484I | 297  | 1.2V    | -5    | fpBGA   | 484  | Ind   | 12       |
| LFE2-12SE-6F484I | 297  | 1.2V    | -6    | fpBGA   | 484  | Ind   | 12       |

| Date                   | Version         | Section                                                        | Change Summary                                                                                                                                                                                                                                                                     |
|------------------------|-----------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| August 2007<br>(cont.) | 02.8<br>(cont.) | DC and Switching<br>(cont.)                                    | sysCLOCK GPLL timing has been updated.                                                                                                                                                                                                                                             |
|                        |                 | Pinout Information                                             | Added ECP2M50 (484/672/900-fpBGA), ECP2M70 (900-fpBGA) and ECP2M100 (900-fpBGA) pinout information.                                                                                                                                                                                |
|                        |                 | Ordering Information                                           | 1156-fpBGA package option has been removed from the LatticeECP2M family.                                                                                                                                                                                                           |
| September 2007         | 02.9            | Pinout Information                                             | Added Thermal Management text section.                                                                                                                                                                                                                                             |
| February 2008          | 03.0            | Architecture                                                   | Added LVC MOS33D description.                                                                                                                                                                                                                                                      |
|                        |                 | DC and Switching                                               | LatticeECP2M Supply Current has been updated.                                                                                                                                                                                                                                      |
|                        |                 |                                                                | Typical Building Block Function Performance, External Switching Characteristics, Internal Switching Characteristics, Family Timing Adders, sysCLOCK GPLL Timing, sysCLOCK SPLL Timing, DLL Timing and sysCONFIG Port Timing Specifications have been updated (timing rev. A 0.11). |
|                        |                 |                                                                | Figure 3-9. Read/Write Mode (Normal) and Figure 3-10. Read/Write Mode with Input and Output Registers have been updated.                                                                                                                                                           |
|                        |                 |                                                                | Table 3-8. Channel output Jitter (Max) has been updated.                                                                                                                                                                                                                           |
|                        |                 | Pinout Information                                             | Signal description has been updated.                                                                                                                                                                                                                                               |
| April 2008             | 03.1            | Pinout Information                                             | Added 1152-fpBGA pinouts for the ECP2M70 and ECP2M100.                                                                                                                                                                                                                             |
| June 2008              | 03.2            | Pinout Information                                             | Available DDR Interfaces per I/O Bank for the LFE2M35 (484/672-fpBGA) have been updated.                                                                                                                                                                                           |
|                        |                 | Introduction                                                   | Family Selection Guide table - Updated number of EBR SRAM Blocks for the ECP2-70 device.                                                                                                                                                                                           |
|                        |                 | Architecture                                                   | Removed Read-Before-Write sysMEM EBR mode.                                                                                                                                                                                                                                         |
|                        |                 | Clarification of the operation of the secondary clock regions. |                                                                                                                                                                                                                                                                                    |
| August 2008            | 03.3            | DC and Switching<br>Characteristics                            | Removed Read-Before-Write sysMEM EBR mode.                                                                                                                                                                                                                                         |
|                        |                 | Architecture                                                   | Clarification of the operation of the secondary clock regions.                                                                                                                                                                                                                     |
|                        |                 | Pinout Information                                             | Added information for [LOC]DQ[num] to Signal Descriptions table.                                                                                                                                                                                                                   |
| January 2009           | 03.4            | DC and Switching<br>Characteristics                            | Updated typical and max. jitter numbers in Channel Output Jitter table for x10 mode.                                                                                                                                                                                               |
|                        |                 |                                                                | Added Channel Output Jitter table for x20 mode.                                                                                                                                                                                                                                    |
| November 2009          | 03.5            | DC and Switching<br>Characteristics                            | Updated SPI/SPI <sub>m</sub> Configuration Waveforms diagram.                                                                                                                                                                                                                      |
|                        |                 |                                                                | Updated footnotes in LatticeECP2 Initialization Supply Current table.                                                                                                                                                                                                              |
|                        |                 |                                                                | Updated footnotes in LatticeECP2M Initialization Supply Current table.                                                                                                                                                                                                             |
|                        |                 |                                                                | Updated footnotes in SERDES High Speed Data Receiver (LatticeECP2M Family Only) table.                                                                                                                                                                                             |
|                        |                 |                                                                | Updated max. value for t <sub>DINIT</sub> parameter in LatticeECP2/M sysCONFIG Port Timing Specifications table.                                                                                                                                                                   |
|                        |                 |                                                                | Updated Serial Output Timing and Levels table.                                                                                                                                                                                                                                     |
|                        |                 |                                                                | Updated Figure 3-5 MLVDS                                                                                                                                                                                                                                                           |
|                        |                 |                                                                | Updated Table 3-7 Serial Output Timing and Levels                                                                                                                                                                                                                                  |
|                        |                 |                                                                | Updated Table 3-15 Power Down/Power Up Specification                                                                                                                                                                                                                               |
|                        |                 | Pinout Information                                             | Signal Descriptions table - corrected references to ULM, URM, LRM (changed to LUM, RUM and RLM), added footnote 5.                                                                                                                                                                 |