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

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

## Applications of Embedded - FPGAs

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

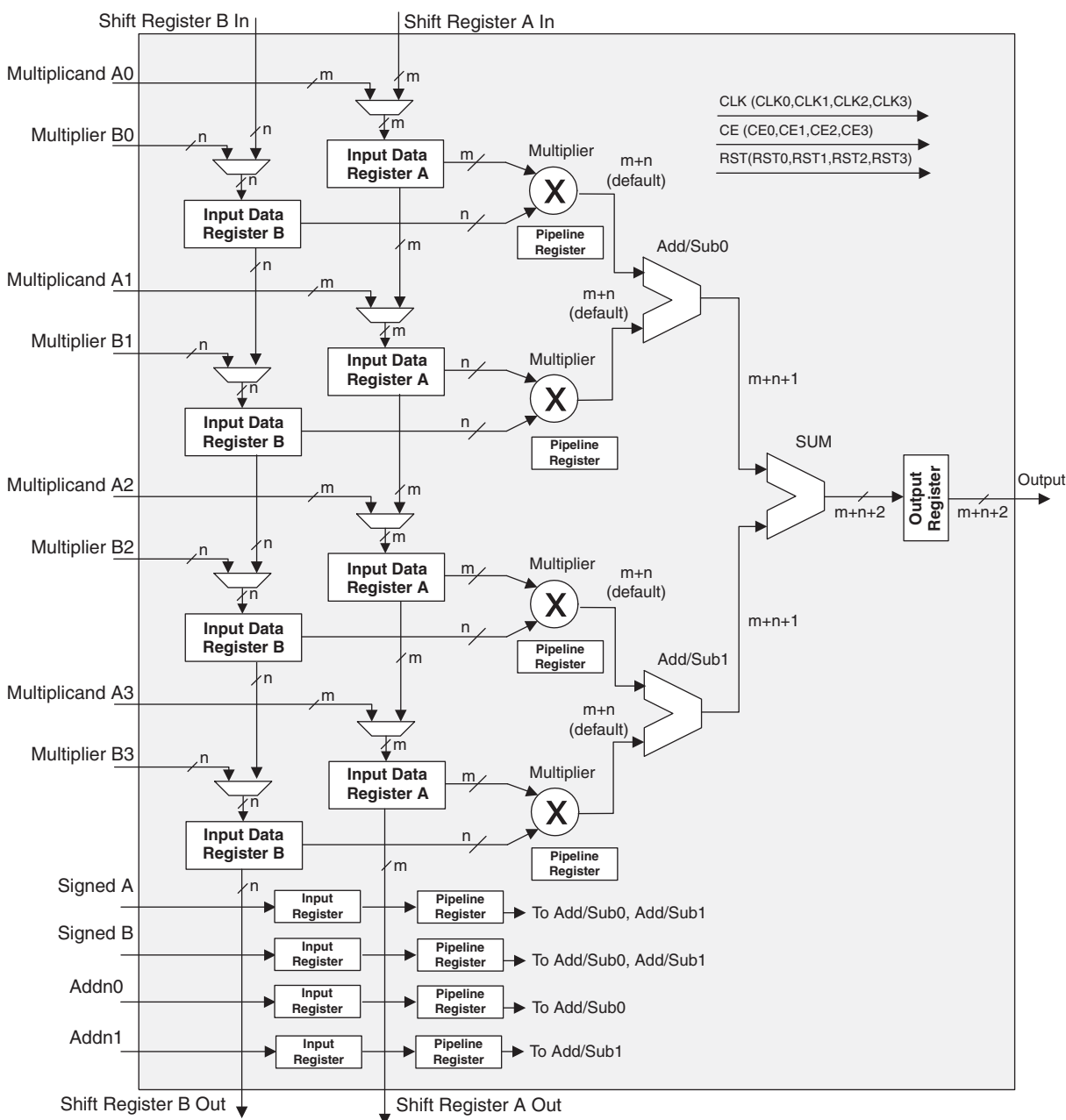
### Details

|                                |                                                                                                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Status                 | Active                                                                                                                                                                |
| Number of LABs/CLBs            | 1500                                                                                                                                                                  |
| Number of Logic Elements/Cells | 12000                                                                                                                                                                 |
| Total RAM Bits                 | 226304                                                                                                                                                                |
| Number of I/O                  | 93                                                                                                                                                                    |
| Number of Gates                | -                                                                                                                                                                     |
| Voltage - Supply               | 1.14V ~ 1.26V                                                                                                                                                         |
| Mounting Type                  | Surface Mount                                                                                                                                                         |
| Operating Temperature          | 0°C ~ 85°C (TJ)                                                                                                                                                       |
| Package / Case                 | 144-LQFP                                                                                                                                                              |
| Supplier Device Package        | 144-TQFP (20x20)                                                                                                                                                      |
| Purchase URL                   | <a href="https://www.e-xfl.com/product-detail/lattice-semiconductor/lfe2-12e-7tn144c">https://www.e-xfl.com/product-detail/lattice-semiconductor/lfe2-12e-7tn144c</a> |

## MULTADDSUBSUM sysDSP Element

In this case, the operands A0 and B0 are multiplied and the result is added/subtracted with the result of the multiplier operation of operands A1 and B1. Additionally the operands A2 and B2 are multiplied and the result is added/subtracted with the result of the multiplier operation of operands A3 and B3. The result of both addition/subtraction are added in a summation block. The user can enable the input, output and pipeline registers. Figure 2-26 shows the MULTADDSUBSUM sysDSP element.

**Figure 2-26. MULTADDSUBSUM**



## Clock, Clock Enable and Reset Resources

Global Clock, Clock Enable and Reset signals from routing are available to every DSP block. Four Clock, Reset and Clock Enable signals are selected for the sysDSP block. From four clock sources (CLK0, CLK1, CLK2, CLK3)

## DC Electrical Characteristics

### Over Recommended Operating Conditions

| Symbol                 | Parameter                        | Condition                                                                                          | Min.           | Typ. | Max.           | Units   |
|------------------------|----------------------------------|----------------------------------------------------------------------------------------------------|----------------|------|----------------|---------|
| $I_{IL}, I_{IH}^{1,2}$ | Input or I/O Low Leakage         | $0 \leq V_{IN} \leq (V_{CCIO} - 0.2V)$                                                             | —              | —    | 10             | $\mu A$ |
| $I_{IH}^{1,3}$         | Input or I/O High Leakage        | $(V_{CCIO} - 0.2V) < V_{IN} \leq 3.6V$                                                             | —              | —    | 150            | $\mu A$ |
| $I_{PU}$               | I/O Active Pull-up Current       | $0 \leq V_{IN} \leq 0.7 V_{CCIO}$                                                                  | -30            | —    | -210           | $\mu A$ |
| $I_{PD}$               | I/O Active Pull-down Current     | $V_{IL} (MAX) \leq V_{IN} \leq V_{IH} (MAX)$                                                       | 30             | —    | 210            | $\mu A$ |
| $I_{BHLS}$             | Bus Hold Low Sustaining Current  | $V_{IN} = V_{IL} (MAX)$                                                                            | 30             | —    | —              | $\mu A$ |
| $I_{BHHS}$             | Bus Hold High Sustaining Current | $V_{IN} = 0.7 V_{CCIO}$                                                                            | -30            | —    | —              | $\mu A$ |
| $I_{BHLO}$             | Bus Hold Low Overdrive Current   | $0 \leq V_{IN} \leq V_{CCIO}$                                                                      | —              | —    | 210            | $\mu A$ |
| $I_{BHHO}$             | Bus Hold High Overdrive Current  | $0 \leq V_{IN} \leq V_{CCIO}$                                                                      | —              | —    | -210           | $\mu A$ |
| $V_{BHT}$              | Bus Hold Trip Points             | $0 \leq V_{IN} \leq V_{IH} (MAX)$                                                                  | $V_{IL} (MAX)$ | —    | $V_{IH} (MIN)$ | V       |
| $C1^4$                 | I/O Capacitance                  | $V_{CCIO} = 3.3V, 2.5V, 1.8V, 1.5V, 1.2V,$<br>$V_{CC} = 1.2V, V_{IO} = 0 \text{ to } V_{IH} (MAX)$ | —              | 5    | 8              | pf      |
| $C2^4$                 | Dedicated Input Capacitance      | $V_{CCIO} = 3.3V, 2.5V, 1.8V, 1.5V, 1.2V,$<br>$V_{CC} = 1.2V, V_{IO} = 0 \text{ to } V_{IH} (MAX)$ | —              | 5    | 6              | pf      |

1. Input or I/O leakage current is measured with the pin configured as an input or as an I/O with the output driver tri-stated. It is not measured with the output driver active. Bus maintenance circuits are disabled.
2. When used as  $V_{REF}$  maximum leakage = 25 $\mu A$
3. Applicable to general purpose I/Os in top and bottom banks.
4.  $T_A$  25°C,  $f = 1.0MHz$ .

## sys/I/O Recommended Operating Conditions

| Standard                                 | V <sub>CCIO</sub> |      |       | V <sub>REF</sub> (V) |      |       |
|------------------------------------------|-------------------|------|-------|----------------------|------|-------|
|                                          | Min.              | Typ. | Max.  | Min.                 | Typ. | Max.  |
| LVC MOS 3.3 <sup>2</sup>                 | 3.135             | 3.3  | 3.465 | —                    | —    | —     |
| LVC MOS 2.5 <sup>2</sup>                 | 2.375             | 2.5  | 2.625 | —                    | —    | —     |
| LVC MOS 1.8                              | 1.71              | 1.8  | 1.89  | —                    | —    | —     |
| LVC MOS 1.5                              | 1.425             | 1.5  | 1.575 | —                    | —    | —     |
| LVC MOS 1.2 <sup>2</sup>                 | 1.14              | 1.2  | 1.26  | —                    | —    | —     |
| LVTTL <sup>2</sup>                       | 3.135             | 3.3  | 3.465 | —                    | —    | —     |
| PCI                                      | 3.135             | 3.3  | 3.465 | —                    | —    | —     |
| SSTL18 <sup>2</sup> Class I, II          | 1.71              | 1.8  | 1.89  | 0.833                | 0.9  | 0.969 |
| SSTL2 <sup>2</sup> Class I, II           | 2.375             | 2.5  | 2.625 | 1.15                 | 1.25 | 1.35  |
| SSTL3 <sup>2</sup> Class I, II           | 3.135             | 3.3  | 3.465 | 1.3                  | 1.5  | 1.7   |
| HSTL <sup>2</sup> 15 Class I             | 1.425             | 1.5  | 1.575 | 0.68                 | 0.75 | 0.9   |
| HSTL <sup>2</sup> 18 Class I, II         | 1.71              | 1.8  | 1.89  | 0.816                | 0.9  | 1.08  |
| LVDS <sup>2</sup>                        | 2.375             | 2.5  | 2.625 | —                    | —    | —     |
| MLVDS25 <sup>1</sup>                     | 2.375             | 2.5  | 2.625 | —                    | —    | —     |
| LVPECL33 <sup>1,2</sup>                  | 3.135             | 3.3  | 3.465 | —                    | —    | —     |
| BLVDS25 <sup>1,2</sup>                   | 2.375             | 2.5  | 2.625 | —                    | —    | —     |
| RSDS <sup>1,2</sup>                      | 2.375             | 2.5  | 2.625 | —                    | —    | —     |
| SSTL18D_I <sup>2</sup> , II <sup>2</sup> | 1.71              | 1.8  | 1.89  | —                    | —    | —     |
| SSTL25D_I <sup>2</sup> , II <sup>2</sup> | 2.375             | 2.5  | 2.625 | —                    | —    | —     |
| SSTL33D_I <sup>2</sup> , II <sup>2</sup> | 3.135             | 3.3  | 3.465 | —                    | —    | —     |
| HSTL15D_I <sup>2</sup>                   | 1.425             | 1.5  | 1.575 | —                    | —    | —     |
| HSTL18D_I <sup>2</sup> , II <sup>2</sup> | 1.71              | 1.8  | 1.89  | —                    | —    | —     |

1. Inputs on chip. Outputs are implemented with the addition of external resistors.

2. Input on this standard does not depend on the value of V<sub>CCIO</sub>.

## LatticeECP2M Pin Information Summary, LFE2M50, LFE2M70 and LFE2M100

| Pin Type                                                                          |                          | LFE2M50   |           |           | LFE2M70   |            | LFE2M100  |            |
|-----------------------------------------------------------------------------------|--------------------------|-----------|-----------|-----------|-----------|------------|-----------|------------|
|                                                                                   |                          | 484 fpBGA | 672 fpBGA | 900 fpBGA | 900 fpBGA | 1152 fpBGA | 900 fpBGA | 1152 fpBGA |
| Single Ended User I/O                                                             |                          | 270       | 372       | 410       | 416       | 436        | 416       | 520        |
| Differential Pair User I/O                                                        |                          | 135       | 185       | 205       | 208       | 218        | 207       | 260        |
| Configuration                                                                     | TAP Pins                 | 5         | 5         | 5         | 5         | 5          | 5         | 5          |
|                                                                                   | Muxed Pins               | 14        | 14        | 14        | 14        | 14         | 14        | 14         |
|                                                                                   | Dedicated Pins (Non TAP) | 7         | 7         | 7         | 7         | 7          | 7         | 7          |
| Non Configuration                                                                 | Muxed Pins               | 69        | 72        | 72        | 75        | 76         | 74        | 78         |
|                                                                                   | Dedicated Pins           | 3         | 3         | 3         | 3         | 3          | 3         | 3          |
| VCC                                                                               |                          | 16        | 20        | 62        | 44        | 44         | 44        | 44         |
| VCCAUX                                                                            |                          | 8         | 26        | 18        | 16        | 12         | 16        | 12         |
| VCCPLL                                                                            |                          | 4         | 8         | 4         | 4         | 4          | 4         | 4          |
| VCCIO                                                                             | Bank0                    | 4         | 5         | 6         | 6         | 7          | 6         | 7          |
|                                                                                   | Bank1                    | 3         | 4         | 6         | 6         | 7          | 6         | 7          |
|                                                                                   | Bank2                    | 4         | 5         | 9         | 9         | 9          | 9         | 9          |
|                                                                                   | Bank3                    | 4         | 5         | 9         | 9         | 9          | 9         | 9          |
|                                                                                   | Bank4                    | 4         | 4         | 6         | 6         | 7          | 6         | 7          |
|                                                                                   | Bank5                    | 4         | 5         | 6         | 6         | 7          | 6         | 7          |
|                                                                                   | Bank6                    | 4         | 5         | 9         | 9         | 9          | 9         | 9          |
|                                                                                   | Bank7                    | 4         | 5         | 9         | 9         | 9          | 9         | 9          |
|                                                                                   | Bank8                    | 2         | 2         | 2         | 2         | 2          | 2         | 2          |
| GND, GND0 to GND7                                                                 |                          | 57        | 80        | 122       | 122       | 134        | 122       | 134        |
| NC                                                                                |                          | 31        | 35        | 121       | 63        | 283        | 63        | 199        |
| Single Ended/ Differential I/O Pairs per Bank (including emulated with resistors) | Bank0                    | 36/18     | 63/31     | 56/28     | 34/17     | 46/23      | 34/17     | 54/27      |
|                                                                                   | Bank1                    | 18/9      | 18/9      | 36/18     | 42/21     | 34/17      | 42/21     | 44/22      |
|                                                                                   | Bank2                    | 30/15     | 50/25     | 54/27     | 70/35     | 72/36      | 70/35     | 80/40      |
|                                                                                   | Bank3                    | 36/18     | 43/21     | 44/22     | 60/30     | 64/32      | 60/30     | 80/40      |
|                                                                                   | Bank4                    | 42/21     | 24/12     | 38/19     | 38/19     | 40/20      | 38/19     | 44/22      |
|                                                                                   | Bank5                    | 28/14     | 60/30     | 58/29     | 40/20     | 40/20      | 40/20     | 46/23      |
|                                                                                   | Bank6                    | 40/20     | 54/27     | 60/30     | 62/31     | 66/33      | 62/31     | 82/41      |
|                                                                                   | Bank7                    | 40/20     | 60/30     | 64/32     | 70/35     | 74/37      | 70/35     | 90/45      |
|                                                                                   | Bank8                    | 0/0       | 0/0       | 0/0       | 0/0       | 0/0        | 0/0       | 0/0        |
| True LVDS I/O Pairs per Bank                                                      | Bank0 (Top Edge)         | 0         | 0         | 0         | 0         | 0          | 0         | 0          |
|                                                                                   | Bank1 (Top Edge)         | 0         | 0         | 0         | 0         | 0          | 0         | 0          |
|                                                                                   | Bank2 (Right Edge)       | 7         | 12        | 13        | 17        | 18         | 17        | 20         |
|                                                                                   | Bank3 (Right Edge)       | 9         | 11        | 11        | 15        | 16         | 15        | 20         |
|                                                                                   | Bank4 (Bottom Edge)      | 0         | 0         | 0         | 0         | 0          | 0         | 0          |
|                                                                                   | Bank5 (Bottom Edge)      | 0         | 0         | 0         | 0         | 0          | 0         | 0          |
|                                                                                   | Bank6 (Left Edge)        | 10        | 14        | 15        | 15        | 16         | 15        | 20         |
|                                                                                   | Bank7 (Left Edge)        | 10        | 15        | 17        | 17        | 18         | 17        | 22         |
|                                                                                   | Bank8 (Right Edge)       | 0         | 0         | 0         | 0         | 0          | 0         | 0          |

**LFE2-6E/SE and LFE2-12E/SE Logic Signal Connections: 256 fpBGA (Cont.)**

| LFE2-6E/SE  |                   |      |                |              | LFE2-12E/SE       |      |                |              |
|-------------|-------------------|------|----------------|--------------|-------------------|------|----------------|--------------|
| Ball Number | Ball/Pad Function | Bank | Dual Function  | Differential | Ball/Pad Function | Bank | Dual Function  | Differential |
| M8          | PB8B              | 5    | PCLKC5_0/BDQ6  | C            | PB26B             | 5    | PCLKC5_0/BDQ24 | C            |
| GND         | GNDIO5            | -    |                |              | GNDIO5            | -    |                |              |
| P7          | PB13A             | 4    | PCLKT4_0/BDQ15 | T            | PB31A             | 4    | PCLKT4_0/BDQ33 | T            |
| R8          | PB13B             | 4    | PCLKC4_0/BDQ15 | C            | PB31B             | 4    | PCLKC4_0/BDQ33 | C            |
| VCCIO       | VCCIO4            | 4    |                |              | VCCIO4            | 4    |                |              |
| T5          | PB14A             | 4    | BDQ15          | T            | PB32A             | 4    | BDQ33          | T            |
| T6          | PB14B             | 4    | BDQ15          | C            | PB32B             | 4    | BDQ33          | C            |
| T8          | PB15A             | 4    | BDQS15         | T            | PB33A             | 4    | BDQS33         | T            |
| GND         | GNDIO4            | -    |                |              | GNDIO4            | -    |                |              |
| R7          | PB16A             | 4    | BDQ15          | T            | PB34A             | 4    | BDQ33          | T            |
| T9          | PB15B             | 4    | BDQ15          | C            | PB33B             | 4    | BDQ33          | C            |
| T7          | PB16B             | 4    | BDQ15          | C            | PB34B             | 4    | BDQ33          | C            |
| L8          | PB17A             | 4    | BDQ15          | T            | PB35A             | 4    | BDQ33          | T            |
| VCCIO       | VCCIO4            | 4    |                |              | VCCIO4            | 4    |                |              |
| P8          | PB18A             | 4    | BDQ15          | T            | PB36A             | 4    | BDQ33          | T            |
| L9          | PB17B             | 4    | BDQ15          | C            | PB35B             | 4    | BDQ33          | C            |
| N8          | PB18B             | 4    | BDQ15          | C            | PB36B             | 4    | BDQ33          | C            |
| R9          | PB19A             | 4    | BDQ15          | T            | PB37A             | 4    | BDQ33          | T            |
| GND         | GNDIO4            | -    |                |              | GNDIO4            | -    |                |              |
| R10         | PB19B             | 4    | BDQ15          | C            | PB37B             | 4    | BDQ33          | C            |
| -           | -                 | -    |                |              | VCCIO             | 4    |                |              |
| -           | -                 | -    |                |              | GNDIO4            | 4    |                |              |
| N9          | PB20A             | 4    | BDQ24          | T            | PB47A             | 4    | BDQ51          | T            |
| T10         | PB21A             | 4    | BDQ24          | T            | PB48A             | 4    | BDQ51          | T            |
| M9          | PB20B             | 4    | BDQ24          | C            | PB47B             | 4    | BDQ51          | C            |
| R11         | PB21B             | 4    | BDQ24          | C            | PB48B             | 4    | BDQ51          | C            |
| P10         | PB22A             | 4    | BDQ24          | T            | PB49A             | 4    | BDQ51          | T            |
| N11         | PB23A             | 4    | BDQ24          | T            | PB50A             | 4    | BDQ51          | T            |
| VCCIO       | VCCIO4            | 4    |                |              | VCCIO4            | 4    |                |              |
| N10         | PB22B             | 4    | BDQ24          | C            | PB49B             | 4    | BDQ51          | C            |
| P11         | PB23B             | 4    | BDQ24          | C            | PB50B             | 4    | BDQ51          | C            |
| T11         | PB24A             | 4    | BDQS24         | T            | PB51A             | 4    | BDQS51         | T            |
| GND         | GNDIO4            | -    |                |              | GNDIO4            | -    |                |              |
| M11         | PB25A             | 4    | BDQ24          | T            | PB52A             | 4    | BDQ51          | T            |
| T12         | PB24B             | 4    | BDQ24          | C            | PB51B             | 4    | BDQ51          | C            |
| L11         | PB25B             | 4    | BDQ24          | C            | PB52B             | 4    | BDQ51          | C            |
| T13         | PB26A             | 4    | BDQ24          | T            | PB53A             | 4    | BDQ51          | T            |
| R13         | PB27A             | 4    | BDQ24          | T            | PB54A             | 4    | BDQ51          | T            |
| VCCIO       | VCCIO4            | 4    |                |              | VCCIO4            | 4    |                |              |
| T14         | PB26B             | 4    | BDQ24          | C            | PB53B             | 4    | BDQ51          | C            |
| P13         | PB27B             | 4    | BDQ24          | C            | PB54B             | 4    | BDQ51          | C            |
| GND         | GNDIO4            | -    |                |              | GNDIO4            | -    |                |              |
| N12         | PB28A             | 4    | VREF2_4/BDQ24  | T            | PB55A             | 4    | VREF2_4/BDQ51  | T            |
| M12         | PB28B             | 4    | VREF1_4/BDQ24  | C            | PB55B             | 4    | VREF1_4/BDQ51  | C            |
| R15         | CFG2              | 8    |                |              | CFG2              | 8    |                |              |

**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 |
| M6            | PL15B             | 6    | PCLKC6_0          | C (LVDS)*    | PL21B             | 6    | PCLKC6_0/LDQ25          | C (LVDS)*    |
| M3            | PL16A             | 6    | VREF2_6           | T            | PL22A             | 6    | VREF2_6/LDQ25           | T            |
| GNDIO         | GNDIO6            | -    |                   |              | -                 | -    |                         |              |
| M4            | PL16B             | 6    | VREF1_6           | C            | PL22B             | 6    | VREF1_6/LDQ25           | C            |
| -             | -                 | -    |                   |              | VCCIO6            | 6    |                         |              |
| N1            | NC                | -    |                   |              | PL24A             | 6    | LDQ25                   | T            |
| M2            | NC                | -    |                   |              | PL23A             | 6    | LDQ25                   | T (LVDS)*    |
| N2            | NC                | -    |                   |              | PL24B             | 6    | LDQ25                   | C            |
| M1            | NC                | -    |                   |              | PL23B             | 6    | LDQ25                   | C (LVDS)*    |
| -             | -                 | -    |                   |              | GNDIO             | -    |                         |              |
| N3            | NC                | -    |                   |              | PL25A             | 6    | LDQS25                  | T (LVDS)*    |
| N5            | NC                | -    |                   |              | PL26A             | 6    | LDQ25                   | T            |
| N4            | NC                | -    |                   |              | PL25B             | 6    | LDQ25                   | C (LVDS)*    |
| -             | -                 | -    |                   |              | VCCIO6            | 6    |                         |              |
| P5            | NC                | -    |                   |              | PL26B             | 6    | LDQ25                   | C            |
| P1            | PL17A             | 6    | LLM0_GDLLT_IN_A** | T (LVDS)*    | PL27A             | 6    | LLM0_GDLLT_IN_A**/LDQ25 | T (LVDS)*    |
| P2            | PL17B             | 6    | LLM0_GDLLC_IN_A** | C (LVDS)*    | PL27B             | 6    | LLM0_GDLLC_IN_A**/LDQ25 | C (LVDS)*    |
| P4            | PL18A             | 6    | LLM0_GDLLT_FB_A   | T            | PL28A             | 6    | LLM0_GDLLT_FB_A/LDQ25   | T            |
| -             | -                 | -    |                   |              | GNDIO             | -    |                         |              |
| R4            | PL18B             | 6    | LLM0_GDLLC_FB_A   | C            | PL28B             | 6    | LLM0_GDLLC_FB_A/LDQ25   | C            |
| P6            | LLM0_PLLCAP       | 6    |                   |              | LLM0_PLLCAP       | 6    |                         |              |
| R1            | PL20A             | 6    | LLM0_GPLLT_IN_A** | T (LVDS)*    | PL30A             | 6    | LLM0_GPLLT_IN_A**/LDQ34 | T (LVDS)*    |
| GNDIO         | GNDIO6            | -    |                   |              | -                 | -    |                         |              |
| R3            | PL21A             | 6    | LLM0_GPLLT_FB_A   | T            | PL31A             | 6    | LLM0_GPLLT_FB_A/LDQ34   | T            |
| R2            | PL20B             | 6    | LLM0_GPLLC_IN_A** | C (LVDS)*    | PL30B             | 6    | LLM0_GPLLC_IN_A/LDQ34   | C (LVDS)*    |
| T4            | PL21B             | 6    | LLM0_GPLLC_FB_A   | C            | PL31B             | 6    | LLM0_GPLLC_FB_A/LDQ34   | C            |
| T5            | PL23A             | 6    |                   | T            | PL33A             | 6    | LDQ34                   | T            |
| VCCIO         | VCCIO6            | 6    |                   |              | VCCIO6            | 6    |                         |              |
| T1            | PL22A             | 6    |                   | T (LVDS)*    | PL32A             | 6    | LDQ34                   | T (LVDS)*    |
| T3            | PL23B             | 6    |                   | C            | PL33B             | 6    | LDQ34                   | C            |
| T2            | PL22B             | 6    |                   | C (LVDS)*    | PL32B             | 6    | LDQ34                   | C (LVDS)*    |
| GNDIO         | GNDIO6            | -    |                   |              | GNDIO6            | -    |                         |              |
| -             | -                 | -    |                   |              | VCCIO6            | 6    |                         |              |
| V1            | PL25A             | 6    | LDQ28             | T            | PL39A             | 6    | LDQ42                   | T            |
| -             | -                 | -    |                   |              | GNDIO             | -    |                         |              |
| V2            | PL25B             | 6    | LDQ28             | C            | PL39B             | 6    | LDQ42                   | C            |
| U1            | PL24A             | 6    | LDQ28             | T (LVDS)*    | PL38A             | 6    | LDQ42                   | T (LVDS)*    |
| U3            | PL27A             | 6    | LDQ28             | T            | PL41A             | 6    | LDQ42                   | T            |
| VCCIO         | VCCIO6            | 6    |                   |              | VCCIO6            | 6    |                         |              |
| U2            | PL24B             | 6    | LDQ28             | C (LVDS)*    | PL38B             | 6    | LDQ42                   | C (LVDS)*    |
| U4            | PL27B             | 6    | LDQ28             | C            | PL41B             | 6    | LDQ42                   | C            |
| R6            | PL26A             | 6    | LDQ28             | T (LVDS)*    | PL40A             | 6    | LDQ42                   | T (LVDS)*    |
| R7            | PL29A             | 6    | LDQ28             | T            | PL43A             | 6    | LDQ42                   | T            |
| GNDIO         | GNDIO6            | -    |                   |              | GNDIO             | -    |                         |              |

## 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 |  |
| T7            | PL29B             | 6    | LDQ28         | C            | PL43B             | 6    | LDQ42         | C            |  |
| T6            | PL26B             | 6    | LDQ28         | C (LVDS)*    | PL40B             | 6    | LDQ42         | C (LVDS)*    |  |
| AA2           | PL31A             | 6    | LDQ28         | T            | PL45A             | 6    | LDQ42         | T            |  |
| VCCIO         | VCCIO6            | 6    |               |              | VCCIO6            | 6    |               |              |  |
| Y1            | PL28A             | 6    | LDQS28        | T (LVDS)*    | PL42A             | 6    | LDQS42        | T (LVDS)*    |  |
| AA1           | PL31B             | 6    | LDQ28         | C            | PL45B             | 6    | LDQ42         | C            |  |
| W1            | PL28B             | 6    | LDQ28         | C (LVDS)*    | PL42B             | 6    | LDQ42         | C (LVDS)*    |  |
| V3            | PL30B             | 6    | LDQ28         | C (LVDS)*    | PL44B             | 6    | LDQ42         | C (LVDS)*    |  |
| GNDIO         | GNDIO6            | -    |               |              | GNDIO             | -    |               |              |  |
| V4            | PL30A             | 6    | LDQ28         | T (LVDS)*    | PL44A             | 6    | LDQ42         | T (LVDS)*    |  |
| U5            | TDI               | -    |               |              | TDI               | -    |               |              |  |
| U7            | TCK               | -    |               |              | TCK               | -    |               |              |  |
| V6            | TDO               | -    |               |              | TDO               | -    |               |              |  |
| V5            | TMS               | -    |               |              | TMS               | -    |               |              |  |
| T8            | VCCJ              | -    |               |              | VCCJ              | -    |               |              |  |
| W4            | PB3A              | 5    | BDQ6          | T            | PB3A              | 5    | BDQ6          | T            |  |
| Y3            | PB2A              | 5    | VREF2_5/BDQ6  | T            | PB2A              | 5    | VREF2_5/BDQ6  | T            |  |
| W3            | PB3B              | 5    | BDQ6          | C            | PB3B              | 5    | BDQ6          | C            |  |
| Y2            | PB2B              | 5    | VREF1_5/BDQ6  | C            | PB2B              | 5    | VREF1_5/BDQ6  | C            |  |
| AB3           | PB5A              | 5    | BDQ6          | T            | PB5A              | 5    | BDQ6          | T            |  |
| VCCIO         | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |
| W5            | PB4A              | 5    | BDQ6          | T            | PB4A              | 5    | BDQ6          | T            |  |
| AB2           | PB5B              | 5    | BDQ6          | C            | PB5B              | 5    | BDQ6          | C            |  |
| W6            | PB4B              | 5    | BDQ6          | C            | PB4B              | 5    | BDQ6          | C            |  |
| AB5           | PB7A              | 5    | BDQ6          | T            | PB7A              | 5    | BDQ6          | T            |  |
| GNDIO         | GNDIO5            | -    |               |              | GNDIO             | -    |               |              |  |
| Y4            | PB6A              | 5    | BDQS6         | T            | PB6A              | 5    | BDQS6         | T            |  |
| AB4           | PB7B              | 5    | BDQ6          | C            | PB7B              | 5    | BDQ6          | C            |  |
| AA3           | PB6B              | 5    | BDQ6          | C            | PB6B              | 5    | BDQ6          | C            |  |
| AB6           | PB9A              | 5    | BDQ6          | T            | PB9A              | 5    | BDQ6          | T            |  |
| VCCIO         | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |
| AA5           | PB8A              | 5    | BDQ6          | T            | PB8A              | 5    | BDQ6          | T            |  |
| AA6           | PB9B              | 5    | BDQ6          | C            | PB9B              | 5    | BDQ6          | C            |  |
| Y5            | PB8B              | 5    | BDQ6          | C            | PB8B              | 5    | BDQ6          | C            |  |
| GNDIO         | GNDIO5            | -    |               |              | GNDIO             | -    |               |              |  |
| -             | -                 | -    |               |              | VCCIO5            | 5    |               |              |  |
| Y6            | PB12A             | 5    | BDQ15         | T            | PB21A             | 5    | BDQ24         | T            |  |
| W7            | PB11A             | 5    | BDQ15         | T            | PB20A             | 5    | BDQ24         | T            |  |
| Y7            | PB12B             | 5    | BDQ15         | C            | PB21B             | 5    | BDQ24         | C            |  |
| W8            | PB11B             | 5    | BDQ15         | C            | PB20B             | 5    | BDQ24         | C            |  |
| U8            | PB14A             | 5    | BDQ15         | T            | PB23A             | 5    | BDQ24         | T            |  |
| VCCIO         | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |
| AA7           | PB13A             | 5    | BDQ15         | T            | PB22A             | 5    | BDQ24         | T            |  |
| U9            | PB14B             | 5    | BDQ15         | C            | PB23B             | 5    | BDQ24         | C            |  |

## 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 |
| U1            | NC                | -    |                         |              | PL34A             | 6    | LDQ31                   | T            |
| V1            | NC                | -    |                         |              | PL34B             | 6    | LDQ31                   | C            |
| GND           | GNDIO6            | -    |                         |              | GNDIO6            | -    |                         |              |
| P3            | NC                | -    |                         |              | NC                | -    |                         |              |
| R3            | NC                | -    |                         |              | NC                | -    |                         |              |
| R4            | NC                | -    |                         |              | NC                | -    |                         |              |
| U2            | NC                | -    |                         |              | NC                | -    |                         |              |
| VCCIO         | VCCIO6            | 6    |                         |              | VCCIO6            | 6    |                         |              |
| V2            | NC                | -    |                         |              | NC                | -    |                         |              |
| W2            | NC                | -    |                         |              | NC                | -    |                         |              |
| T6            | NC                | -    |                         |              | PL38A             | 6    | LDQ39                   | T            |
| R5            | NC                | -    |                         |              | PL38B             | 6    | LDQ39                   | C            |
| GND           | GNDIO6            | -    |                         |              | GNDIO6            | -    |                         |              |
| R6            | PL25A             | 6    | LDQS25***               | T (LVDS)*    | PL39A             | 6    | LDQS39***               | T (LVDS)*    |
| R7            | PL25B             | 6    | LDQ25                   | C (LVDS)*    | PL39B             | 6    | LDQ39                   | C (LVDS)*    |
| W1            | PL26A             | 6    | LDQ25                   | T            | PL40A             | 6    | LDQ39                   | T            |
| VCCIO         | VCCIO6            | 6    |                         |              | VCCIO6            | 6    |                         |              |
| Y2            | PL26B             | 6    | LDQ25                   | C            | PL40B             | 6    | LDQ39                   | C            |
| Y1            | PL27A             | 6    | LLM0_GDLLT_IN_A**/LDQ25 | T (LVDS)*    | PL41A             | 6    | LLM0_GDLLT_IN_A**/LDQ39 | T (LVDS)*    |
| AA2           | PL27B             | 6    | LLM0_GDLLC_IN_A**/LDQ25 | C (LVDS)*    | PL41B             | 6    | LLM0_GDLLC_IN_A**/LDQ39 | C (LVDS)*    |
| T5            | PL28A             | 6    | LLM0_GDLLT_FB_A/LDQ25   | T            | PL42A             | 6    | LLM0_GDLLT_FB_A/LDQ39   | T            |
| GND           | GNDIO6            | -    |                         |              | GNDIO6            | -    |                         |              |
| T7            | PL28B             | 6    | LLM0_GDLLC_FB_A/LDQ25   | C            | PL42B             | 6    | LLM0_GDLLC_FB_A/LDQ39   | C            |
| R8            | VCC               | 6    |                         |              | VCCPLL            | 6    |                         |              |
| T8            | LLM0_PLLCAP       | 6    |                         |              | LLM0_PLLCAP       | 6    |                         |              |
| U3            | PL30A             | 6    | LLM0_GPLLT_IN_A**/LDQ34 | T (LVDS)*    | PL44A             | 6    | LLM0_GPLLT_IN_A**/LDQ48 | T (LVDS)*    |
| U4            | PL30B             | 6    | LLM0_GPLLC_IN_A**/LDQ34 | C (LVDS)*    | PL44B             | 6    | LLM0_GPLLC_IN_A**/LDQ48 | C (LVDS)*    |
| V3            | PL31A             | 6    | LLM0_GPLLT_FB_A/LDQ34   | T            | PL45A             | 6    | LLM0_GPLLT_FB_A/LDQ48   | T            |
| U5            | PL31B             | 6    | LLM0_GPLLC_FB_A/LDQ34   | C            | PL45B             | 6    | LLM0_GPLLC_FB_A/LDQ48   | C            |
| V4            | PL32A             | 6    | LDQ34                   | T (LVDS)*    | PL46A             | 6    | LDQ48                   | T (LVDS)*    |
| VCCIO         | VCCIO6            | 6    |                         |              | VCCIO6            | 6    |                         |              |
| V5            | PL32B             | 6    | LDQ34                   | C (LVDS)*    | PL46B             | 6    | LDQ48                   | C (LVDS)*    |
| Y3            | PL33A             | 6    | LDQ34                   | T            | PL47A             | 6    | LDQ48                   | T            |
| Y4            | PL33B             | 6    | LDQ34                   | C            | PL47B             | 6    | LDQ48                   | C            |
| W3            | PL34A             | 6    | LDQS34                  | T (LVDS)*    | PL48A             | 6    | LDQS48                  | T (LVDS)*    |
| GND           | GNDIO6            | -    |                         |              | GNDIO6            | -    |                         |              |
| W4            | PL34B             | 6    | LDQ34                   | C (LVDS)*    | PL48B             | 6    | LDQ48                   | C (LVDS)*    |
| AA1           | PL35A             | 6    | LDQ34                   | T            | PL49A             | 6    | LDQ48                   | T            |
| AB1           | PL35B             | 6    | LDQ34                   | C            | PL49B             | 6    | LDQ48                   | C            |
| VCCIO         | VCCIO6            | 6    |                         |              | VCCIO6            | 6    |                         |              |
| U8            | PL36A             | 6    | LDQ34                   | T (LVDS)*    | PL50A             | 6    | LDQ48                   | T (LVDS)*    |
| U7            | PL36B             | 6    | LDQ34                   | C (LVDS)*    | PL50B             | 6    | LDQ48                   | C (LVDS)*    |
| V8            | PL37A             | 6    | LDQ34                   | T            | PL51A             | 6    | LDQ48                   | T            |
| U6            | PL37B             | 6    | LDQ34                   | C            | PL51B             | 6    | LDQ48                   | C            |
| GND           | GNDIO6            | -    |                         |              | GNDIO6            | -    |                         |              |
| W6            | PL38A             | 6    | LDQ42                   | T (LVDS)*    | PL52A             | 6    | LDQ56                   | T (LVDS)*    |

## LFE2-50E/SE and LFE2-70E/SE Logic Signal Connections: 672 fpBGA (Cont.)

| LFE2-50E/SE |                   |      |               |              | LFE2-70E/SE       |      |               |              |  |
|-------------|-------------------|------|---------------|--------------|-------------------|------|---------------|--------------|--|
| Ball Number | Ball/Pad Function | Bank | Dual Function | Differential | Ball/Pad Function | Bank | Dual Function | Differential |  |
| W5          | PL71B             | 6    | LDQ75         | C (LVDS)*    | PL84B             | 6    | LDQ88         | C (LVDS)*    |  |
| AC1         | PL72A             | 6    | LDQ75         | T            | PL85A             | 6    | LDQ88         | T            |  |
| AD1         | PL72B             | 6    | LDQ75         | C            | PL85B             | 6    | LDQ88         | C            |  |
| VCCIO       | VCCIO6            | 6    |               |              | VCCIO6            | 6    |               |              |  |
| Y6          | PL73A             | 6    | LDQ75         | T (LVDS)*    | PL86A             | 6    | LDQ88         | T (LVDS)*    |  |
| Y5          | PL73B             | 6    | LDQ75         | C (LVDS)*    | PL86B             | 6    | LDQ88         | C (LVDS)*    |  |
| AE2         | PL74A             | 6    | LDQ75         | T            | PL87A             | 6    | LDQ88         | T            |  |
| AD2         | PL74B             | 6    | LDQ75         | C            | PL87B             | 6    | LDQ88         | C            |  |
| GND         | GNDIO6            | -    |               |              | GNDIO6            | -    |               |              |  |
| AB3         | PL75A             | 6    | LDQS75        | T (LVDS)*    | PL88A             | 6    | LDQS88        | T (LVDS)*    |  |
| AB2         | PL75B             | 6    | LDQ75         | C (LVDS)*    | PL88B             | 6    | LDQ88         | C (LVDS)*    |  |
| W7          | PL76A             | 6    | LDQ75         | T            | PL89A             | 6    | LDQ88         | T            |  |
| VCCIO       | VCCIO6            | 6    |               |              | VCCIO6            | 6    |               |              |  |
| W8          | PL76B             | 6    | LDQ75         | C            | PL89B             | 6    | LDQ88         | C            |  |
| Y7          | PL77A             | 6    | LDQ75         | T (LVDS)*    | PL90A             | 6    | LDQ88         | T (LVDS)*    |  |
| Y8          | PL77B             | 6    | LDQ75         | C (LVDS)*    | PL90B             | 6    | LDQ88         | C (LVDS)*    |  |
| AC2         | PL78A             | 6    | LDQ75         | T            | PL91A             | 6    | LDQ88         | T            |  |
| GND         | GNDIO6            | -    |               |              | GNDIO6            | -    |               |              |  |
| AD3         | PL78B             | 6    | LDQ75         | C            | PL91B             | 6    | LDQ88         | C            |  |
| AC3         | TCK               | -    |               |              | TCK               | -    |               |              |  |
| AA8         | TDI               | -    |               |              | TDI               | -    |               |              |  |
| AB4         | TMS               | -    |               |              | TMS               | -    |               |              |  |
| AA5         | TDO               | -    |               |              | TDO               | -    |               |              |  |
| AB5         | VCCJ              | -    |               |              | VCCJ              | -    |               |              |  |
| AE3         | PB2A              | 5    | VREF2_5/BDQ6  | T            | PB2A              | 5    | VREF2_5/BDQ6  | T            |  |
| AF3         | PB2B              | 5    | VREF1_5/BDQ6  | C            | PB2B              | 5    | VREF1_5/BDQ6  | C            |  |
| AC4         | PB3A              | 5    | BDQ6          | T            | PB3A              | 5    | BDQ6          | T            |  |
| AD4         | PB3B              | 5    | BDQ6          | C            | PB3B              | 5    | BDQ6          | C            |  |
| AE4         | PB4A              | 5    | BDQ6          | T            | PB4A              | 5    | BDQ6          | T            |  |
| AF4         | PB4B              | 5    | BDQ6          | C            | PB4B              | 5    | BDQ6          | C            |  |
| VCCIO       | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |
| V9          | PB5A              | 5    | BDQ6          | T            | PB5A              | 5    | BDQ6          | T            |  |
| W9          | PB5B              | 5    | BDQ6          | C            | PB5B              | 5    | BDQ6          | C            |  |
| GND         | GNDIO5            | -    |               |              | GNDIO5            | -    |               |              |  |
| AA6         | PB6A              | 5    | BDQS6         | T            | PB6A              | 5    | BDQS6         | T            |  |
| AB6         | PB6B              | 5    | BDQ6          | C            | PB6B              | 5    | BDQ6          | C            |  |
| AC5         | PB7A              | 5    | BDQ6          | T            | PB7A              | 5    | BDQ6          | T            |  |
| AD5         | PB7B              | 5    | BDQ6          | C            | PB7B              | 5    | BDQ6          | C            |  |
| AA7         | PB8A              | 5    | BDQ6          | T            | PB8A              | 5    | BDQ6          | T            |  |
| AB7         | PB8B              | 5    | BDQ6          | C            | PB8B              | 5    | BDQ6          | C            |  |
| VCCIO       | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |
| AE5         | PB9A              | 5    | BDQ6          | T            | PB9A              | 5    | BDQ6          | T            |  |
| AF5         | PB9B              | 5    | BDQ6          | C            | PB9B              | 5    | BDQ6          | C            |  |
| AC7         | PB10A             | 5    | BDQ6          | T            | PB10A             | 5    | BDQ6          | T            |  |
| AD7         | PB10B             | 5    | BDQ6          | C            | PB10B             | 5    | BDQ6          | C            |  |
| VCCIO       | VCCIO5            | 5    |               |              | VCCIO5            | 5    |               |              |  |

## LFE2M-20E/SE and LFE2M-35E/SE Logic Signal Connections: 256 fpBGA (Cont.)

| LFE2M20E/SE |                   |      |                 |              | LFE2M35E/SE       |      |                             |              |
|-------------|-------------------|------|-----------------|--------------|-------------------|------|-----------------------------|--------------|
| Ball Number | Ball/Pad Function | Bank | Dual Function   | Differential | Ball/Pad Function | Bank | Dual Function               | Differential |
| GNDIO       | GNDIO6            | -    |                 |              | GNDIO6            | -    |                             |              |
| L1          | PL42A             | 6    | LLM0_GPLLT_IN_A | T (LVDS)*    | PL57A             | 6    | LLM0_GPLLT_IN_A**/LDQS57*** | T (LVDS)*    |
| GNDIO       | GNDIO6            | -    |                 |              | GNDIO6            | -    |                             |              |
| L2          | PL42B             | 6    | LLM0_GPLLC_IN_A | C (LVDS)*    | PL57B             | 6    | LLM0_GPLLC_IN_A**/LDQ57     | C (LVDS)*    |
| L3          | PL43A             | 6    | LLM0_GPLLT_FB_A | T            | PL58A             | 6    | LLM0_GPLLT_FB_A/LDQ57       | T            |
| L4          | PL43B             | 6    | LLM0_GPLLC_FB_A | C            | PL58B             | 6    | LLM0_GPLLC_FB_A/LDQ57       | C            |
| VCCIO       | VCCIO6            | 6    |                 |              | VCCIO6            | 6    |                             |              |
| M1          | PL44A             | 6    | LLM0_GDLLT_IN_A | T (LVDS)*    | PL59A             | 6    | LLM0_GDLLT_IN_A**/LDQ57     | T (LVDS)*    |
| N1          | PL44B             | 6    | LLM0_GDLLC_IN_A | C (LVDS)*    | PL59B             | 6    | LLM0_GDLLC_IN_A**/LDQ57     | C (LVDS)*    |
| N2          | PL45A             | 6    | LLM0_GDLLT_FB_A | T            | PL60A             | 6    | LLM0_GDLLT_FB_A/LDQ57       | T            |
| N3          | PL45B             | 6    | LLM0_GDLLC_FB_A | C            | PL60B             | 6    | LLM0_GDLLC_FB_A/LDQ57       | C            |
| GNDIO       | GNDIO6            | -    |                 |              | GNDIO6            | -    |                             |              |
| M4          | LLM0_PLLCAP       | 6    |                 |              | LLM0_PLLCAP       | 6    |                             |              |
| VCCIO       | VCCIO6            | 6    |                 |              | VCCIO6            | 6    |                             |              |
| GNDIO       | GNDIO6            | -    |                 |              | GNDIO6            | -    |                             |              |
| K6          | TCK               | -    |                 |              | TCK               | -    |                             |              |
| L5          | TDI               | -    |                 |              | TDI               | -    |                             |              |
| N4          | TMS               | -    |                 |              | TMS               | -    |                             |              |
| N6          | TDO               | -    |                 |              | TDO               | -    |                             |              |
| K7          | VCCJ              | -    |                 |              | VCCJ              | -    |                             |              |
| M5          | PB2A              | 5    | BDQ6            | T            | PB2A              | 5    | BDQ6                        | T            |
| N5          | PB2B              | 5    | BDQ6            | C            | PB2B              | 5    | BDQ6                        | C            |
| L6          | PB3A              | 5    | BDQ6            | T            | PB3A              | 5    | BDQ6                        | T            |
| M6          | PB3B              | 5    | BDQ6            | C            | PB3B              | 5    | BDQ6                        | C            |
| P3          | PB4A              | 5    | BDQ6            | T            | PB4A              | 5    | BDQ6                        | T            |
| VCCIO       | VCCIO5            | 5    |                 |              | VCCIO5            | 5    |                             |              |
| P4          | PB4B              | 5    | BDQ6            | C            | PB4B              | 5    | BDQ6                        | C            |
| P2          | PB5A              | 5    | BDQ6            | T            | PB5A              | 5    | BDQ6                        | T            |
| P1          | PB5B              | 5    | BDQ6            | C            | PB5B              | 5    | BDQ6                        | C            |
| R1          | PB6A              | 5    | BDQS6           | T            | PB6A              | 5    | BDQS6                       | T            |
| GNDIO       | GNDIO5            | -    |                 |              | GNDIO5            | -    |                             |              |
| R2          | PB6B              | 5    | BDQ6            | C            | PB6B              | 5    | BDQ6                        | C            |
| R3          | PB7A              | 5    | BDQ6            | T            | PB7A              | 5    | BDQ6                        | T            |
| T2          | PB7B              | 5    | BDQ6            | C            | PB7B              | 5    | BDQ6                        | C            |
| R4          | PB8A              | 5    | BDQ6            | T            | PB8A              | 5    | BDQ6                        | T            |
| VCCIO       | VCCIO5            | 5    |                 |              | VCCIO5            | 5    |                             |              |
| T3          | PB8B              | 5    | BDQ6            | C            | PB8B              | 5    | BDQ6                        | C            |
| T4          | PB10A             | 5    | BDQ6            | T            | PB10A             | 5    | BDQ6                        | T            |
| GNDIO       | GNDIO5            | -    |                 |              | GNDIO5            | -    |                             |              |
| T5          | PB10B             | 5    | BDQ6            | C            | PB10B             | 5    | BDQ6                        | C            |
| VCCIO       | VCCIO5            | 5    |                 |              | VCCIO5            | 5    |                             |              |
| GNDIO       | GNDIO5            | -    |                 |              | GNDIO5            | -    |                             |              |
| T6          | PB16A             | 5    | VREF2_5/BDQ15   | T            | PB34A             | 5    | VREF2_5/BDQ33               | T            |
| R6          | PB16B             | 5    | VREF1_5/BDQ15   | C            | PB34B             | 5    | VREF1_5/BDQ33               | C            |
| P6          | PB17A             | 5    | PCLKT5_0/BDQ15  | T            | PB35A             | 5    | PCLKT5_0/BDQ33              | T            |
| P7          | PB17B             | 5    | PCLKC5_0/BDQ15  | C            | PB35B             | 5    | PCLKC5_0/BDQ33              | C            |
| VCCIO       | VCCIO5            | 5    |                 |              | VCCIO5            | 5    |                             |              |
| GNDIO       | GNDIO5            | -    |                 |              | GNDIO5            | -    |                             |              |

## 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 |  |
| G19         | GND               | -    |               |              | GND               | -    |               |              |  |
| G4          | GND               | -    |               |              | GND               | -    |               |              |  |
| H10         | GND               | -    |               |              | GND               | -    |               |              |  |
| H13         | GND               | -    |               |              | GND               | -    |               |              |  |
| J14         | GND               | -    |               |              | GND               | -    |               |              |  |
| J9          | GND               | -    |               |              | GND               | -    |               |              |  |
| K10         | GND               | -    |               |              | GND               | -    |               |              |  |
| K11         | GND               | -    |               |              | GND               | -    |               |              |  |
| K12         | GND               | -    |               |              | GND               | -    |               |              |  |
| K13         | GND               | -    |               |              | GND               | -    |               |              |  |
| K15         | GND               | -    |               |              | GND               | -    |               |              |  |
| K20         | GND               | -    |               |              | GND               | -    |               |              |  |
| K3          | GND               | -    |               |              | GND               | -    |               |              |  |
| K8          | GND               | -    |               |              | GND               | -    |               |              |  |
| L10         | GND               | -    |               |              | GND               | -    |               |              |  |
| L11         | GND               | -    |               |              | GND               | -    |               |              |  |
| L12         | GND               | -    |               |              | GND               | -    |               |              |  |
| L13         | GND               | -    |               |              | GND               | -    |               |              |  |
| M10         | GND               | -    |               |              | GND               | -    |               |              |  |
| M11         | GND               | -    |               |              | GND               | -    |               |              |  |
| M12         | GND               | -    |               |              | GND               | -    |               |              |  |
| M13         | GND               | -    |               |              | GND               | -    |               |              |  |
| N10         | GND               | -    |               |              | GND               | -    |               |              |  |
| N11         | GND               | -    |               |              | GND               | -    |               |              |  |
| N12         | GND               | -    |               |              | GND               | -    |               |              |  |
| N13         | GND               | -    |               |              | GND               | -    |               |              |  |
| N15         | GND               | -    |               |              | GND               | -    |               |              |  |
| N20         | GND               | -    |               |              | GND               | -    |               |              |  |
| N3          | GND               | -    |               |              | GND               | -    |               |              |  |
| N8          | GND               | -    |               |              | GND               | -    |               |              |  |
| P14         | GND               | -    |               |              | GND               | -    |               |              |  |
| P9          | GND               | -    |               |              | GND               | -    |               |              |  |
| R10         | GND               | -    |               |              | GND               | -    |               |              |  |
| R13         | GND               | -    |               |              | GND               | -    |               |              |  |
| T19         | GND               | -    |               |              | GND               | -    |               |              |  |
| T4          | GND               | -    |               |              | GND               | -    |               |              |  |
| W16         | GND               | -    |               |              | GND               | -    |               |              |  |
| W2          | GND               | -    |               |              | GND               | -    |               |              |  |
| W21         | GND               | -    |               |              | GND               | -    |               |              |  |
| W7          | GND               | -    |               |              | GND               | -    |               |              |  |
| Y10         | GND               | -    |               |              | GND               | -    |               |              |  |
| Y13         | GND               | -    |               |              | GND               | -    |               |              |  |
| D15         | NC                | -    |               |              | NC                | -    |               |              |  |
| G14         | NC                | -    |               |              | NC                | -    |               |              |  |
| G15         | NC                | -    |               |              | NC                | -    |               |              |  |
| D14         | NC                | -    |               |              | NC                | -    |               |              |  |
| E15         | NC                | -    |               |              | NC                | -    |               |              |  |
| E14         | NC                | -    |               |              | NC                | -    |               |              |  |

## 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 |  |
| E13         | PT28A             | 0    |               | T            | PT37A             | 0    |               | T            |  |
| VCCIO       | VCCIO0            | 0    |               |              | VCCIO0            | 0    |               |              |  |
| GNDIO       | GNDIO0            | -    |               |              | GNDIO0            | -    |               |              |  |
| J12         | PT5B              | 0    |               | C            | PT31B             | 0    |               | C            |  |
| GNDIO       | GNDIO0            | -    |               |              | -                 | -    |               |              |  |
| VCCIO       | VCCIO0            | 0    |               |              | VCCIO0            | 0    |               |              |  |
| H10         | PT5A              | 0    |               | T            | PT31A             | 0    |               | T            |  |
| E12         | PT4B              | 0    |               | C            | PT30B             | 0    |               | C            |  |
| D11         | PT4A              | 0    |               | T            | PT30A             | 0    |               | T            |  |
| H11         | PT3B              | 0    |               | C            | PT29B             | 0    |               | C            |  |
| F11         | PT3A              | 0    |               | T            | PT29A             | 0    |               | T            |  |
| C13         | VCC               | -    |               |              | ULC_SQ_VCCR0      | 11   |               |              |  |
| A12         | PT19A             | 0    |               | T            | ULC_SQ_HDINP0     | 11   |               | T            |  |
| B13         | NC                | -    |               |              | ULC_SQ_VCCIB0     | 11   |               |              |  |
| B12         | PT19B             | 0    |               | C            | ULC_SQ_HDINN0     | 11   |               | C            |  |
| C10         | VCC               | -    |               |              | ULC_SQ_VCCTX0     | 11   |               |              |  |
| A9          | PT17A             | 0    |               | T            | ULC_SQ_HDOUTP0    | 11   |               | T            |  |
| A10         | NC                | -    |               |              | ULC_SQ_VCCOB0     | 11   |               |              |  |
| B9          | PT17B             | 0    |               | C            | ULC_SQ_HDOUTN0    | 11   |               | C            |  |
| C9          | VCC               | -    |               |              | ULC_SQ_VCCTX1     | 11   |               |              |  |
| B8          | PT18B             | 0    |               | C            | ULC_SQ_HDOUTN1    | 11   |               | C            |  |
| C8          | NC                | -    |               |              | ULC_SQ_VCCOB1     | 11   |               |              |  |
| A8          | PT18A             | 0    |               | T            | ULC_SQ_HDOUTP1    | 11   |               | T            |  |
| C12         | VCC               | -    |               |              | ULC_SQ_VCCR1      | 11   |               |              |  |
| B11         | PT16B             | 0    |               | C            | ULC_SQ_HDINN1     | 11   |               | C            |  |
| C11         | NC                | -    |               |              | ULC_SQ_VCCIB1     | 11   |               |              |  |
| A11         | PT16A             | 0    |               | T            | ULC_SQ_HDINP1     | 11   |               | T            |  |
| B7          | VCCAUX            | -    |               |              | ULC_SQ_VCCAUX33   | 11   |               |              |  |
| E7          | PT15B             | 0    |               | C            | ULC_SQ_REFCLKN    | 11   |               | C            |  |
| D7          | PT15A             | 0    |               | T            | ULC_SQ_REFCLKP    | 11   |               | T            |  |
| C7          | VCC               | -    |               |              | ULC_SQ_VCCP       | 11   |               |              |  |
| A3          | PT12A             | 0    |               | T            | ULC_SQ_HDINP2     | 11   |               | T            |  |
| C3          | NC                | -    |               |              | ULC_SQ_VCCIB2     | 11   |               |              |  |
| B3          | PT12B             | 0    |               | C            | ULC_SQ_HDINN2     | 11   |               | C            |  |
| C2          | VCC               | -    |               |              | ULC_SQ_VCCR2      | 11   |               |              |  |
| A6          | PT14A             | 0    |               | T            | ULC_SQ_HDOUTP2    | 11   |               | T            |  |
| C6          | NC                | -    |               |              | ULC_SQ_VCCOB2     | 11   |               |              |  |
| B6          | PT14B             | 0    |               | C            | ULC_SQ_HDOUTN2    | 11   |               | C            |  |
| C5          | VCC               | -    |               |              | ULC_SQ_VCCTX2     | 11   |               |              |  |
| B5          | PT13B             | 0    |               | C            | ULC_SQ_HDOUTN3    | 11   |               | C            |  |
| A4          | NC                | -    |               |              | ULC_SQ_VCCOB3     | 11   |               |              |  |
| A5          | PT13A             | 0    |               | T            | ULC_SQ_HDOUTP3    | 11   |               | T            |  |
| C4          | VCC               | -    |               |              | ULC_SQ_VCCTX3     | 11   |               |              |  |
| B2          | PT11B             | 0    |               | C            | ULC_SQ_HDINN3     | 11   |               | C            |  |
| B1          | NC                | -    |               |              | ULC_SQ_VCCIB3     | 11   |               |              |  |
| A2          | PT11A             | 0    |               | T            | ULC_SQ_HDINP3     | 11   |               | T            |  |
| C1          | VCC               | -    |               |              | ULC_SQ_VCCR3      | 11   |               |              |  |
| L12         | VCC               | -    |               |              | VCC               | -    |               |              |  |

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

| LFE2M100E/SE |                   |      |               |              |
|--------------|-------------------|------|---------------|--------------|
| Ball Number  | Ball/Pad Function | Bank | Dual Function | Differential |
| AJ2          | LLC_SQ_HDINN3     | 14   |               | C            |
| AH4          | LLC_SQ_VCCTX3     | 14   |               |              |
| AK5          | LLC_SQ_HDOUTP3    | 14   |               | T            |
| AK4          | LLC_SQ_VCCOB3     | 14   |               |              |
| AJ5          | LLC_SQ_HDOUTN3    | 14   |               | C            |
| AH5          | LLC_SQ_VCCTX2     | 14   |               |              |
| AJ6          | LLC_SQ_HDOUTN2    | 14   |               | C            |
| AH6          | LLC_SQ_VCCOB2     | 14   |               |              |
| AK6          | LLC_SQ_HDOUTP2    | 14   |               | T            |
| AH2          | LLC_SQ_VCCR2      | 14   |               |              |
| AJ3          | LLC_SQ_HDINN2     | 14   |               | C            |
| AH3          | LLC_SQ_VCCIB2     | 14   |               |              |
| AK3          | LLC_SQ_HDINP2     | 14   |               | T            |
| AH7          | LLC_SQ_VCCP       | 14   |               |              |
| AG7          | LLC_SQ_REFCLKP    | 14   |               | T            |
| AF7          | LLC_SQ_REFCLKN    | 14   |               | C            |
| AJ7          | LLC_SQ_VCCAUX33   | 14   |               |              |
| AK11         | LLC_SQ_HDINP1     | 14   |               | T            |
| AH11         | LLC_SQ_VCCIB1     | 14   |               |              |
| AJ11         | LLC_SQ_HDINN1     | 14   |               | C            |
| AH12         | LLC_SQ_VCCR1      | 14   |               |              |
| AK8          | LLC_SQ_HDOUTP1    | 14   |               | T            |
| AH8          | LLC_SQ_VCCOB1     | 14   |               |              |
| AJ8          | LLC_SQ_HDOUTN1    | 14   |               | C            |
| AH9          | LLC_SQ_VCCTX1     | 14   |               |              |
| AJ9          | LLC_SQ_HDOUTN0    | 14   |               | C            |
| AK10         | LLC_SQ_VCCOB0     | 14   |               |              |
| AK9          | LLC_SQ_HDOUTP0    | 14   |               | T            |
| AH10         | LLC_SQ_VCCTX0     | 14   |               |              |
| AJ12         | LLC_SQ_HDINN0     | 14   |               | C            |
| AJ13         | LLC_SQ_VCCIB0     | 14   |               |              |
| AK12         | LLC_SQ_HDINP0     | 14   |               | T            |
| AH13         | LLC_SQ_VCCR0      | 14   |               |              |
| AF10         | PB30A             | 5    | BDQ33         | T            |
| AE8          | PB30B             | 5    | BDQ33         | C            |
| AE11         | PB31A             | 5    | BDQ33         | T            |
| VCCIO        | VCCIO5            | 5    |               |              |
| AD9          | PB31B             | 5    | BDQ33         | C            |
| AE10         | PB32A             | 5    | BDQ33         | T            |
| AD10         | PB32B             | 5    | BDQ33         | C            |
| AE13         | PB33A             | 5    | BDQS33        | T            |
| GNDIO        | GNDIO5            | -    |               |              |
| AC12         | PB33B             | 5    | BDQ33         | C            |

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

| LFE2M100E/SE |                   |      |               |              |
|--------------|-------------------|------|---------------|--------------|
| Ball Number  | Ball/Pad Function | Bank | Dual Function | Differential |
| M23          | GND               | -    |               |              |
| M8           | GND               | -    |               |              |
| N14          | GND               | -    |               |              |
| N15          | GND               | -    |               |              |
| N16          | GND               | -    |               |              |
| N17          | GND               | -    |               |              |
| N27          | GND               | -    |               |              |
| N4           | GND               | -    |               |              |
| P11          | GND               | -    |               |              |
| P13          | GND               | -    |               |              |
| P14          | GND               | -    |               |              |
| P15          | GND               | -    |               |              |
| P16          | GND               | -    |               |              |
| P17          | GND               | -    |               |              |
| P18          | GND               | -    |               |              |
| P20          | GND               | -    |               |              |
| R10          | GND               | -    |               |              |
| R11          | GND               | -    |               |              |
| R13          | GND               | -    |               |              |
| R14          | GND               | -    |               |              |
| R15          | GND               | -    |               |              |
| R16          | GND               | -    |               |              |
| R17          | GND               | -    |               |              |
| R18          | GND               | -    |               |              |
| R20          | GND               | -    |               |              |
| R21          | GND               | -    |               |              |
| R24          | GND               | -    |               |              |
| R7           | GND               | -    |               |              |
| T10          | GND               | -    |               |              |
| T11          | GND               | -    |               |              |
| T13          | GND               | -    |               |              |
| T14          | GND               | -    |               |              |
| T15          | GND               | -    |               |              |
| T16          | GND               | -    |               |              |
| T17          | GND               | -    |               |              |
| T18          | GND               | -    |               |              |
| T20          | GND               | -    |               |              |
| T21          | GND               | -    |               |              |
| T24          | GND               | -    |               |              |
| T7           | GND               | -    |               |              |
| U11          | GND               | -    |               |              |
| U13          | GND               | -    |               |              |
| U14          | GND               | -    |               |              |

## 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 |
| AK12        | NC                | -    |               |              | NC                | -    |               |              |
| AK24        | NC                | -    |               |              | NC                | -    |               |              |
| AK25        | NC                | -    |               |              | NC                | -    |               |              |
| AK26        | NC                | -    |               |              | NC                | -    |               |              |
| AK4         | NC                | -    |               |              | NC                | -    |               |              |
| AK9         | NC                | -    |               |              | NC                | -    |               |              |
| AL11        | NC                | -    |               |              | NC                | -    |               |              |
| AL12        | NC                | -    |               |              | NC                | -    |               |              |
| AL34        | NC                | -    |               |              | NC                | -    |               |              |
| AM10        | NC                | -    |               |              | NC                | -    |               |              |
| AM11        | NC                | -    |               |              | NC                | -    |               |              |
| AM13        | NC                | -    |               |              | NC                | -    |               |              |
| AM25        | NC                | -    |               |              | NC                | -    |               |              |
| AN10        | NC                | -    |               |              | NC                | -    |               |              |
| AN11        | NC                | -    |               |              | NC                | -    |               |              |
| AN12        | NC                | -    |               |              | NC                | -    |               |              |
| AN13        | NC                | -    |               |              | NC                | -    |               |              |
| AN24        | NC                | -    |               |              | NC                | -    |               |              |
| AN25        | NC                | -    |               |              | NC                | -    |               |              |
| AP11        | NC                | -    |               |              | NC                | -    |               |              |
| AP12        | NC                | -    |               |              | NC                | -    |               |              |
| AP24        | NC                | -    |               |              | NC                | -    |               |              |
| B10         | NC                | -    |               |              | NC                | -    |               |              |
| B11         | NC                | -    |               |              | NC                | -    |               |              |
| B12         | NC                | -    |               |              | NC                | -    |               |              |
| B13         | NC                | -    |               |              | NC                | -    |               |              |
| B22         | NC                | -    |               |              | NC                | -    |               |              |
| B23         | NC                | -    |               |              | NC                | -    |               |              |
| B24         | NC                | -    |               |              | NC                | -    |               |              |
| B25         | NC                | -    |               |              | NC                | -    |               |              |
| C10         | NC                | -    |               |              | NC                | -    |               |              |
| C11         | NC                | -    |               |              | NC                | -    |               |              |
| C13         | NC                | -    |               |              | NC                | -    |               |              |
| C22         | NC                | -    |               |              | NC                | -    |               |              |
| C24         | NC                | -    |               |              | NC                | -    |               |              |
| C25         | NC                | -    |               |              | NC                | -    |               |              |
| D1          | NC                | -    |               |              | NC                | -    |               |              |
| D15         | NC                | -    |               |              | NC                | -    |               |              |
| D24         | NC                | -    |               |              | NC                | -    |               |              |
| D34         | NC                | -    |               |              | NC                | -    |               |              |
| E10         | NC                | -    |               |              | NC                | -    |               |              |
| E24         | NC                | -    |               |              | NC                | -    |               |              |
| E25         | NC                | -    |               |              | NC                | -    |               |              |
| E26         | NC                | -    |               |              | NC                | -    |               |              |
| E3          | NC                | -    |               |              | NC                | -    |               |              |
| E31         | NC                | -    |               |              | NC                | -    |               |              |
| E32         | NC                | -    |               |              | NC                | -    |               |              |
| E33         | NC                | -    |               |              | NC                | -    |               |              |
| E34         | NC                | -    |               |              | NC                | -    |               |              |

| 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       |

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| Part Number       | I/Os | Voltage | Grade | Package | Pins | Temp. | LUTs (K) |
|-------------------|------|---------|-------|---------|------|-------|----------|
| LFE2M100E-5F1152C | 520  | 1.2V    | -5    | fpBGA   | 1152 | COM   | 100      |
| LFE2M100E-6F1152C | 520  | 1.2V    | -6    | fpBGA   | 1152 | COM   | 100      |
| LFE2M100E-7F1152C | 520  | 1.2V    | -7    | fpBGA   | 1152 | COM   | 100      |
| LFE2M100E-5F900C  | 416  | 1.2V    | -5    | fpBGA   | 900  | COM   | 100      |
| LFE2M100E-6F900C  | 416  | 1.2V    | -6    | fpBGA   | 900  | COM   | 100      |
| LFE2M100E-7F900C  | 416  | 1.2V    | -7    | fpBGA   | 900  | COM   | 100      |

**LatticeECP2M Standard Series Devices, Lead-Free Packaging**
**Commercial**

| Part Number      | I/Os | Voltage | Grade | Package         | Pins | Temp. | LUTs (K) |
|------------------|------|---------|-------|-----------------|------|-------|----------|
| LFE2M20E-5FN484C | 304  | 1.2V    | -5    | Lead-Free fpBGA | 484  | COM   | 20       |
| LFE2M20E-6FN484C | 304  | 1.2V    | -6    | Lead-Free fpBGA | 484  | COM   | 20       |
| LFE2M20E-7FN484C | 304  | 1.2V    | -7    | Lead-Free fpBGA | 484  | COM   | 20       |
| LFE2M20E-5FN256C | 140  | 1.2V    | -5    | Lead-Free fpBGA | 256  | COM   | 20       |
| LFE2M20E-6FN256C | 140  | 1.2V    | -6    | Lead-Free fpBGA | 256  | COM   | 20       |
| LFE2M20E-7FN256C | 140  | 1.2V    | -7    | Lead-Free fpBGA | 256  | COM   | 20       |

| Part Number      | I/Os | Voltage | Grade | Package         | Pins | Temp. | LUTs (K) |
|------------------|------|---------|-------|-----------------|------|-------|----------|
| LFE2M35E-5FN672C | 410  | 1.2V    | -5    | Lead-Free fpBGA | 672  | COM   | 35       |
| LFE2M35E-6FN672C | 410  | 1.2V    | -6    | Lead-Free fpBGA | 672  | COM   | 35       |
| LFE2M35E-7FN672C | 410  | 1.2V    | -7    | Lead-Free fpBGA | 672  | COM   | 35       |
| LFE2M35E-5FN484C | 303  | 1.2V    | -5    | Lead-Free fpBGA | 484  | COM   | 35       |
| LFE2M35E-6FN484C | 303  | 1.2V    | -6    | Lead-Free fpBGA | 484  | COM   | 35       |
| LFE2M35E-7FN484C | 303  | 1.2V    | -7    | Lead-Free fpBGA | 484  | COM   | 35       |
| LFE2M35E-5FN256C | 140  | 1.2V    | -5    | Lead-Free fpBGA | 256  | COM   | 35       |
| LFE2M35E-6FN256C | 140  | 1.2V    | -6    | Lead-Free fpBGA | 256  | COM   | 35       |
| LFE2M35E-7FN256C | 140  | 1.2V    | -7    | Lead-Free fpBGA | 256  | COM   | 35       |

| Part Number      | I/Os | Voltage | Grade | Package         | Pins | Temp. | LUTs (K) |
|------------------|------|---------|-------|-----------------|------|-------|----------|
| LFE2M50E-5FN900C | 410  | 1.2V    | -5    | Lead-Free fpBGA | 900  | COM   | 50       |
| LFE2M50E-6FN900C | 410  | 1.2V    | -6    | Lead-Free fpBGA | 900  | COM   | 50       |
| LFE2M50E-7FN900C | 410  | 1.2V    | -7    | Lead-Free fpBGA | 900  | COM   | 50       |
| LFE2M50E-5FN672C | 372  | 1.2V    | -5    | Lead-Free fpBGA | 672  | COM   | 50       |
| LFE2M50E-6FN672C | 372  | 1.2V    | -6    | Lead-Free fpBGA | 672  | COM   | 50       |
| LFE2M50E-7FN672C | 372  | 1.2V    | -7    | Lead-Free fpBGA | 672  | COM   | 50       |
| LFE2M50E-5FN484C | 270  | 1.2V    | -5    | Lead-Free fpBGA | 484  | COM   | 50       |
| LFE2M50E-6FN484C | 270  | 1.2V    | -6    | Lead-Free fpBGA | 484  | COM   | 50       |
| LFE2M50E-7FN484C | 270  | 1.2V    | -7    | Lead-Free fpBGA | 484  | COM   | 50       |

| Part Number       | I/Os | Voltage | Grade | Package         | Pins | Temp. | LUTs (K) |
|-------------------|------|---------|-------|-----------------|------|-------|----------|
| LFE2M70E-5FN1152C | 436  | 1.2V    | -5    | Lead-Free fpBGA | 1152 | COM   | 70       |
| LFE2M70E-6FN1152C | 436  | 1.2V    | -6    | Lead-Free fpBGA | 1152 | COM   | 70       |
| LFE2M70E-7FN1152C | 436  | 1.2V    | -7    | Lead-Free fpBGA | 1152 | COM   | 70       |
| LFE2M70E-5FN900C  | 416  | 1.2V    | -5    | Lead-Free fpBGA | 900  | COM   | 70       |
| LFE2M70E-6FN900C  | 416  | 1.2V    | -6    | Lead-Free fpBGA | 900  | COM   | 70       |
| LFE2M70E-7FN900C  | 416  | 1.2V    | -7    | Lead-Free fpBGA | 900  | COM   | 70       |