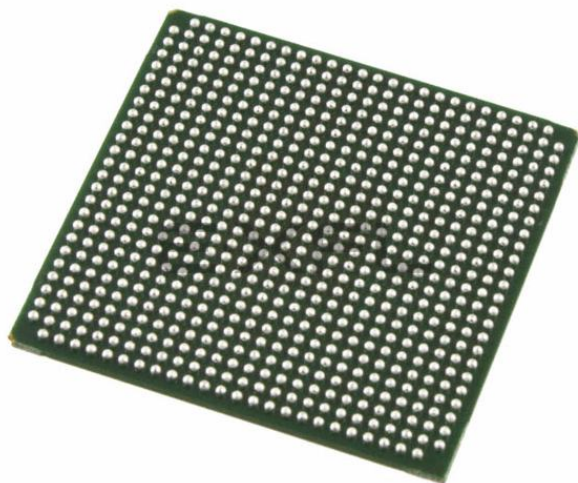




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Understanding [Embedded - FPGAs \(Field Programmable Gate Array\)](#)

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

Applications of Embedded - FPGAs

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

Details

Product Status	Obsolete
Number of LABs/CLBs	6000
Number of Logic Elements/Cells	48000
Total RAM Bits	396288
Number of I/O	500
Number of Gates	-
Voltage - Supply	1.14V ~ 1.26V
Mounting Type	Surface Mount
Operating Temperature	-40°C ~ 100°C (TJ)
Package / Case	672-BBGA
Supplier Device Package	672-FPBGA (27x27)
Purchase URL	https://www.e-xfl.com/product-detail/lattice-semiconductor/lfe2-50e-6f672i

Figure 2-1. Simplified Block Diagram, ECP2-6 Device (Top Level)

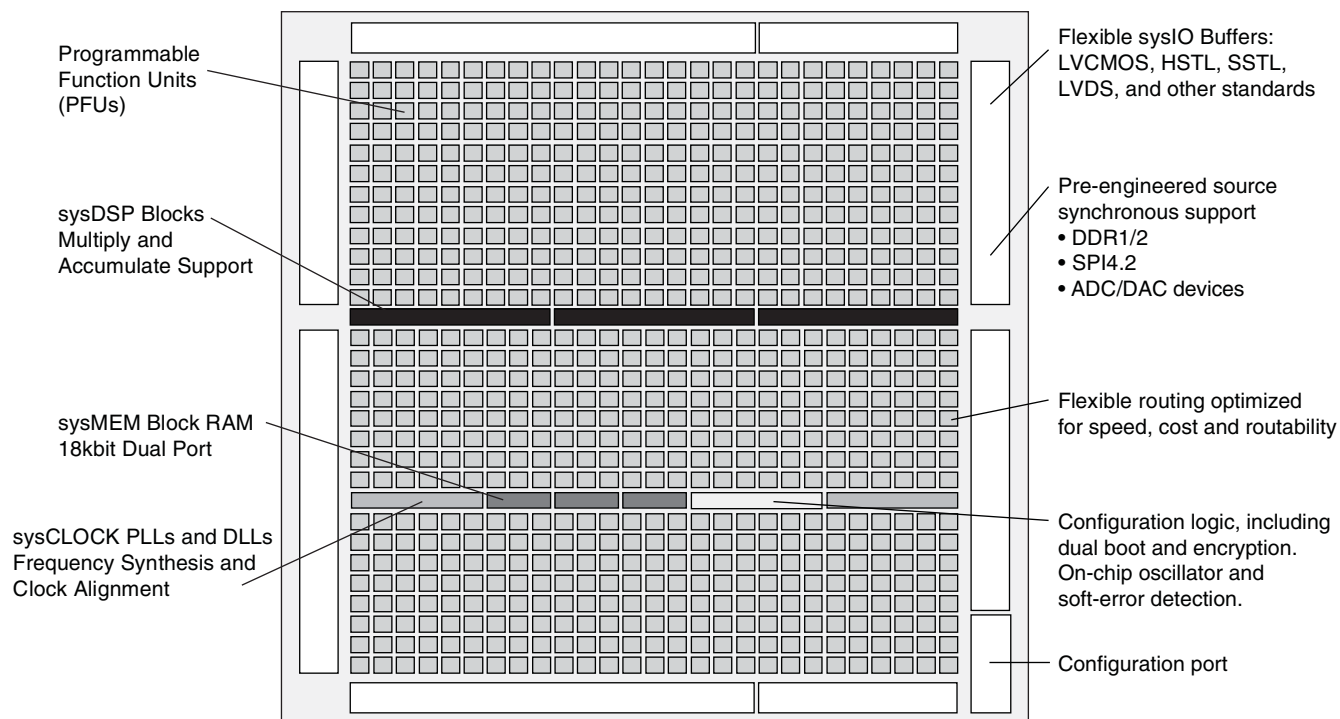
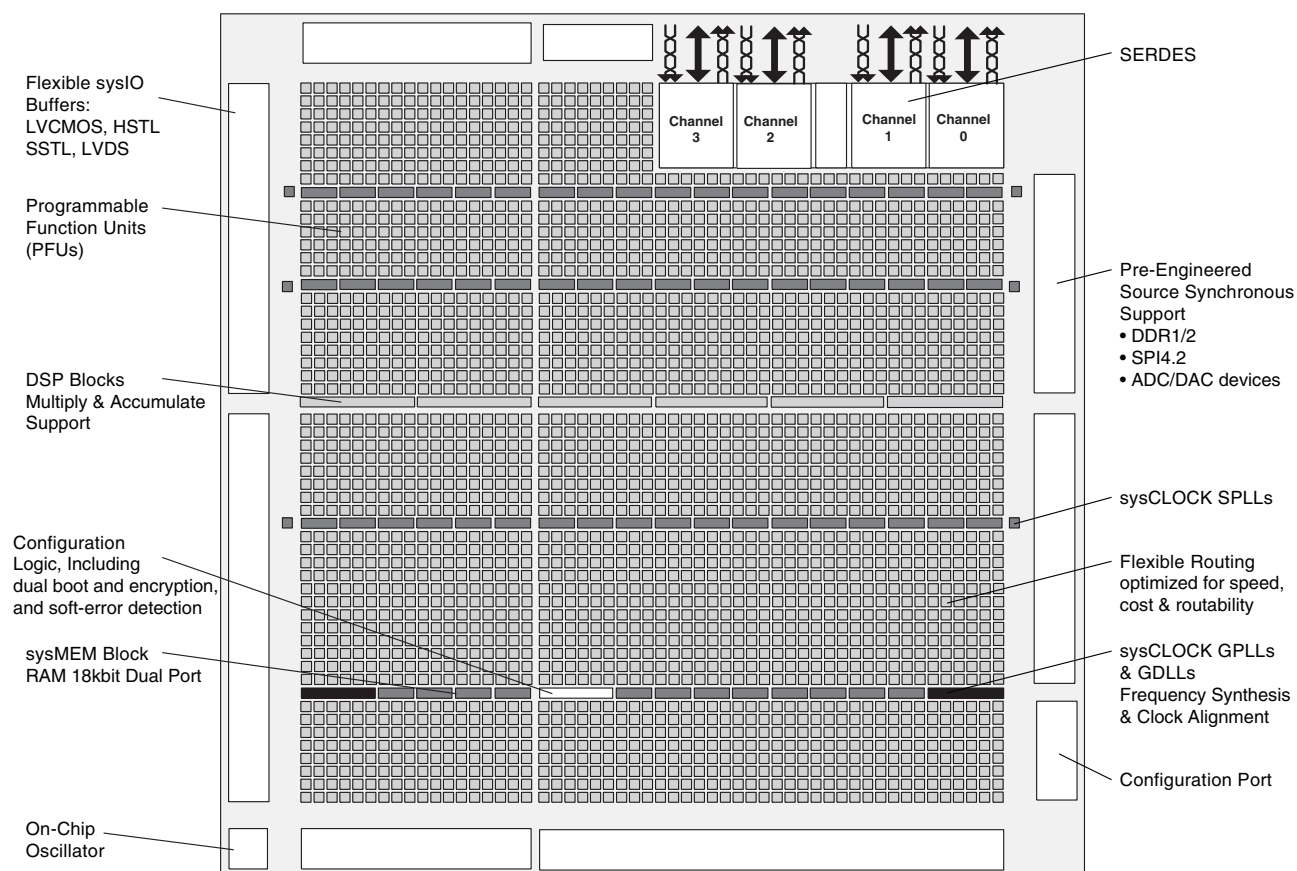


Figure 2-2. Simplified Block Diagram, ECP2M20 Device (Top Level)



If an EBR is pre-loaded during configuration, the GSR input must be disabled or the release of the GSR during device Wake Up must occur before the release of the device I/Os becomes active.

These instructions apply to all EBR RAM and ROM implementations.

Note that there are no reset restrictions if the EBR synchronous reset is used and the EBR GSR input is disabled.

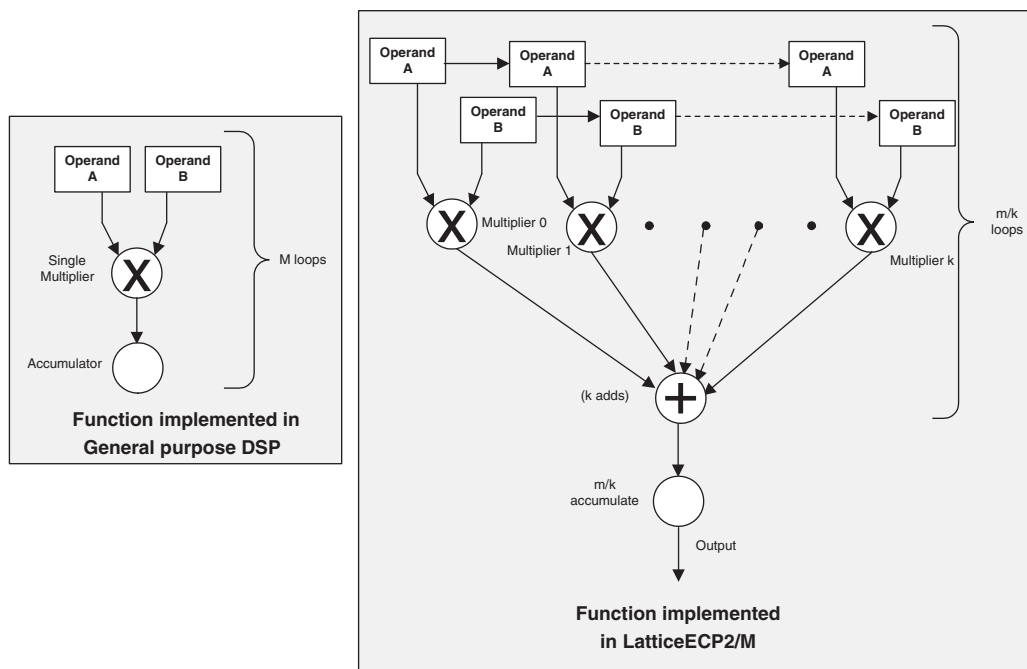
sysDSP™ Block

The LatticeECP2/M family provides a sysDSP block, making it ideally suited for low cost, high performance Digital Signal Processing (DSP) applications. Typical functions used in these applications are Finite Impulse Response (FIR) filters, Fast Fourier Transforms (FFT) functions, Correlators, Reed-Solomon/Turbo/Convolution encoders and decoders. These complex signal processing functions use similar building blocks such as multiply-adders and multiply-accumulators.

sysDSP Block Approach Compared to General DSP

Conventional general-purpose DSP chips typically contain one to four (Multiply and Accumulate) MAC units with fixed data-width multipliers; this leads to limited parallelism and limited throughput. Their throughput is increased by higher clock speeds. The LatticeECP2/M, on the other hand, has many DSP blocks that support different data-widths. This allows the designer to use highly parallel implementations of DSP functions. The designer can optimize the DSP performance vs. area by choosing an appropriate level of parallelism. Figure 2-22 compares the fully serial and the mixed parallel and serial implementations.

Figure 2-22. Comparison of General DSP and LatticeECP2/M Approaches



sysDSP Block Capabilities

The sysDSP block in the LatticeECP2/M family supports four functional elements in three 9, 18 and 36 data path widths. The user selects a function element for a DSP block and then selects the width and type (signed/unsigned) of its operands. The operands in the LatticeECP2/M family sysDSP Blocks can be either signed or unsigned but not mixed within a function element. Similarly, the operand widths cannot be mixed within a block. In the LatticeECP2/M family the DSP elements can be concatenated.

The resources in each sysDSP block can be configured to support the following elements:

LVDS25E

The top and bottom sides of LatticeECP2/M devices support LVDS outputs via emulated complementary LVCMOS outputs in conjunction with a parallel resistor across the driver outputs. The scheme shown in Figure 3-1 is one possible solution for point-to-point signals.

Figure 3-1. LVDS25E Output Termination Example

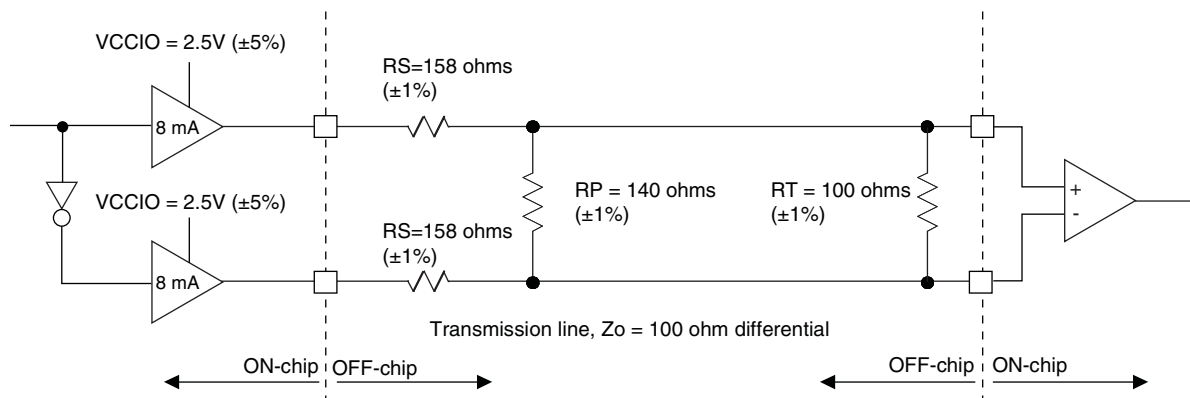


Table 3-2. LVDS25E DC Conditions

Parameter	Description	Typical	Units
V _{CCIO}	Output Driver Supply (+/-5%)	2.50	V
Z _{OUT}	Driver Impedance	20	Ω
R _S	Driver Series Resistor (+/-1%)	158	Ω
R _P	Driver Parallel Resistor (+/-1%)	140	Ω
R _T	Receiver Termination (+/-1%)	100	Ω
V _{OH}	Output High Voltage	1.43	V
V _{OL}	Output Low Voltage	1.07	V
V _{OD}	Output Differential Voltage	0.35	V
V _{CM}	Output Common Mode Voltage	1.25	V
Z _{BACK}	Back Impedance	100.5	Ω
I _{DC}	DC Output Current	6.03	mA

LVCMOS33D

All I/O banks support emulated differential I/O using the LVCMOS33D I/O type. This option, along with the external resistor network, provides the system designer the flexibility to place differential outputs on an I/O bank with 3.3V VCCIO. The default drive current for LVCMOS33D output is 12mA with the option to change the device strength to 4mA, 8mA, 16mA or 20mA. Follow the LVCMOS33 specifications for the DC characteristics of the LVCMOS33D.

BLVDS

The LatticeECP2/M devices support the BLVDS standard. This standard is emulated using complementary LVC-MOS outputs in conjunction with a parallel external resistor across the driver outputs. BLVDS is intended for use when multi-drop and bi-directional multi-point differential signaling is required. The scheme shown in Figure 3-2 is one possible solution for bi-directional multi-point differential signals.

Figure 3-2. BLVDS Multi-point Output Example

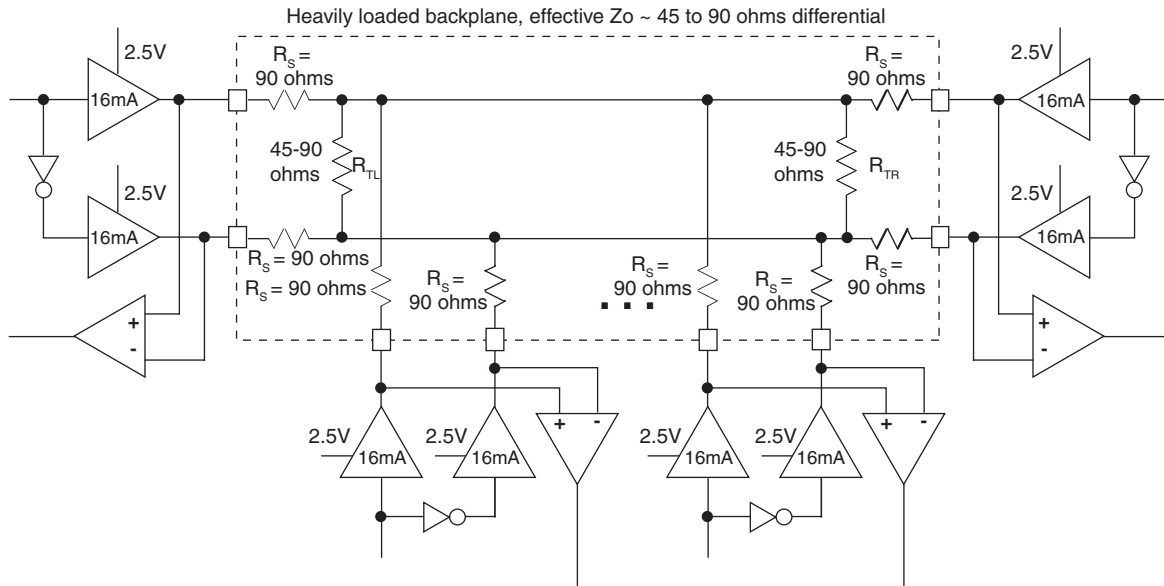


Table 3-3. BLVDS DC Conditions¹

Over Recommended Operating Conditions

Parameter	Description	Typical		Units
		Zo = 45Ω	Zo = 90Ω	
VCCIO	Output Driver Supply (+/- 5%)	2.50	2.50	V
ZOUT	Driver Impedance	10.00	10.00	Ω
RS	Driver Series Resistor (+/- 1%)	90.00	90.00	Ω
RTL	Driver Parallel Resistor (+/- 1%)	45.00	90.00	Ω
RTR	Receiver Termination (+/- 1%)	45.00	90.00	Ω
VOH	Output High Voltage	1.38	1.48	V
VOL	Output Low Voltage	1.12	1.02	V
VOD	Output Differential Voltage	0.25	0.46	V
VCM	Output Common Mode Voltage	1.25	1.25	V
IDC	DC Output Current	11.24	10.20	mA

1. For input buffer, see LVDS table.

LFE2-6E/SE and LFE2-12E/SE Logic Signal Connections: 256 fpBGA

LFE2-6E/SE					LFE2-12E/SE				
Ball Number	Ball/Pad Function	Bank	Dual Function	Differential	Ball/Pad Function	Bank	Dual Function	Differential	
C3	PL2A	7	VREF2_7	T (LVDS)*	PL2A	7	VREF2_7	T (LVDS)*	
C2	PL2B	7	VREF1_7	C (LVDS)*	PL2B	7	VREF1_7	C (LVDS)*	
VCCIO	VCCIO7	7			VCCIO7	7			
-	-	-			-	-			
D3	PL5A	7		T	PL5A	7		T	
D4	PL4A	7		T (LVDS)*	PL4A	7		T (LVDS)*	
D2	PL5B	7		C	PL5B	7		C	
GND	GNDIO7	-			GNDIO7	-			
E4	PL4B	7		C (LVDS)*	PL4B	7		C (LVDS)*	
B1	PL7A	7	LDQ10	T	PL7A	7	LDQ10	T	
C1	PL7B	7	LDQ10	C	PL7B	7	LDQ10	C	
F5	PL9A	7	LDQ10	T	PL9A	7	LDQ10	T	
VCCIO	VCCIO7	7			VCCIO7	7			
F4	PL8A	7	LDQ10	T (LVDS)*	PL8A	7	LDQ10	T (LVDS)*	
G6	PL9B	7	LDQ10	C	PL9B	7	LDQ10	C	
G4	PL8B	7	LDQ10	C (LVDS)*	PL8B	7	LDQ10	C (LVDS)*	
D1	PL10A	7	LDQS10	T (LVDS)*	PL10A	7	LDQS10	T (LVDS)*	
GND	GNDIO7	-			GNDIO7	-			
E1	PL10B	7	LDQ10	C (LVDS)*	PL10B	7	LDQ10	C (LVDS)*	
F3	PL11A	7	LDQ10	T	PL11A	7	LDQ10	T	
G3	PL11B	7	LDQ10	C	PL11B	7	LDQ10	C	
VCCIO	VCCIO7	7			VCCIO7	7			
F2	PL12A	7	LDQ10	T (LVDS)*	PL12A	7	LDQ10	T (LVDS)*	
F1	PL12B	7	LDQ10	C (LVDS)*	PL12B	7	LDQ10	C (LVDS)*	
GND	GNDIO7	-			GNDIO7	-			
G2	PL13A	7	PCLKT7_0/LDQ10	T	PL13A	7	PCLKT7_0/LDQ10	T	
G1	PL13B	7	PCLKC7_0/LDQ10	C	PL13B	7	PCLKC7_0/LDQ10	C	
H6	PL15A	6	PCLKT6_0	T (LVDS)*	PL15A	6	PCLKT6_0	T (LVDS)*	
VCCIO	VCCIO6	6			VCCIO6	6			
H5	PL15B	6	PCLKC6_0	C (LVDS)*	PL15B	6	PCLKC6_0	C (LVDS)*	
H4	PL16A	6	VREF2_6	T	PL16A	6	VREF2_6	T	
GND	GNDIO6	-			GNDIO6	-			
H3	PL16B	6	VREF1_6	C	PL16B	6	VREF1_6	C	
H2	PL17A	6	LLM0_GDLLT_IN_A**	T (LVDS)*	PL17A	6	LLM0_GDLLT_IN_A**	T (LVDS)*	
H1	PL17B	6	LLM0_GDLLC_IN_A**	C (LVDS)*	PL17B	6	LLM0_GDLLC_IN_A**	C (LVDS)*	
G10	VCC	-			VCC	-			
J4	PL18A	6	LLM0_GDLLT_FB_A	T	PL18A	6	LLM0_GDLLT_FB_A	T	
J5	PL18B	6	LLM0_GDLLC_FB_A	C	PL18B	6	LLM0_GDLLC_FB_A	C	
J6	LLM0_PLLCAP	6			LLM0_PLLCAP	6			
K4	PL20A	6	LLM0_GPLLT_IN_A**	T (LVDS)*	PL20A	6	LLM0_GPLLT_IN_A**	T (LVDS)*	
GND	GNDIO6	-			GNDIO6	-			
J1	PL21A	6	LLM0_GPLLT_FB_A	T	PL21A	6	LLM0_GPLLT_FB_A	T	
K3	PL20B	6	LLM0_GPLLC_IN_A**	C (LVDS)*	PL20B	6	LLM0_GPLLC_IN_A**	C (LVDS)*	
VCCIO	VCCIO6	6			VCCIO6	6			
J2	PL21B	6	LLM0_GPLLC_FB_A	C	PL21B	6	LLM0_GPLLC_FB_A	C	

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
F19	PR5A	2		T	PR7A	2	RDQ8	T
D20	PR4A	2		T (LVDS)*	PR6A	2	RDQ8	T (LVDS)*
F18	PR3B	2		C	PR5B	2	RDQ8	C
VCCIO	VCCIO2	2			VCCIO2	2		
C21	NC	-			PR4B	2	RDQ8	C (LVDS)*
F16	PR3A	2		T	PR5A	2	RDQ8	T
C22	NC	-			PR4A	2	RDQ8	T (LVDS)*
-	-	-			GNDIO	-		
D19	PR2B	2	VREF2_2	C (LVDS)*	PR2B	2	VREF2_2	C (LVDS)*
E19	PR2A	2	VREF1_2	T (LVDS)*	PR2A	2	VREF1_2	T (LVDS)*
B21	PT55B	1	VREF2_1	C	PT64B	1	VREF2_1	C
B22	PT55A	1	VREF1_1	T	PT64A	1	VREF1_1	T
GNDIO	GNDIO1	-			GNDIO1	-		
D18	PT53B	1		C	PT62B	1		C
C20	PT54B	1		C	PT63B	1		C
E18	PT53A	1		T	PT62A	1		T
C19	PT54A	1		T	PT63A	1		T
VCCIO	VCCIO1	1			VCCIO1	1		
D17	PT51B	1		C	PT60B	1		C
B20	PT52B	1		C	PT61B	1		C
C18	PT51A	1		T	PT60A	1		T
A19	PT52A	1		T	PT61A	1		T
GNDIO	GNDIO1	-			GNDIO1	-		
A18	PT49B	1		C	PT58B	1		C
A21	PT50B	1		C	PT59B	1		C
B18	PT49A	1		T	PT58A	1		T
A20	PT50A	1		T	PT59A	1		T
VCCIO	VCCIO1	1			VCCIO1	1		
D16	PT47B	1		C	PT56B	1		C
G16	PT48B	1		C	PT57B	1		C
E16	PT47A	1		T	PT56A	1		T
G15	PT48A	1		T	PT57A	1		T
C17	PT46B	1		C	PT55B	1		C
GNDIO	GNDIO1	-			GNDIO1	-		
C16	PT46A	1		T	PT55A	1		T
A17	PT44B	1		C	PT53B	1		C
B17	PT45B	1		C	PT54B	1		C
A16	PT44A	1		T	PT53A	1		T
VCCIO	VCCIO1	1			VCCIO1	1		
B16	PT45A	1		T	PT54A	1		T
E15	PT42B	1		C	PT51B	1		C
C15	PT43B	1		C	PT52B	1		C
F15	PT42A	1		T	PT51A	1		T
D15	PT43A	1		T	PT52A	1		T

LFE2-35E/SE and LFE2-50E/SE Logic Signal Connections: 484 fpBGA (Cont.)

LFE2-35E/SE					LFE2-50E/SE				
Ball Number	Ball/Pad Function	Bank	Dual Function	Differential	Ball/Pad Function	Bank	Dual Function	Differential	
K1	PL23B	7	LDQ22	C	PL42B	7	LDQ41	C	
L4	PL24A	7	LDQ22	T (LVDS)*	PL43A	7	LDQ41	T (LVDS)*	
L3	PL24B	7	LDQ22	C (LVDS)*	PL43B	7	LDQ41	C (LVDS)*	
L2	PL25A	7	PCLKT7_0/LDQ22	T	PL44A	7	PCLKT7_0/LDQ41	T	
GNDIO	GNDIO7	-			GNDIO7	-			
L1	PL25B	7	PCLKC7_0/LDQ22	C	PL44B	7	PCLKC7_0/LDQ41	C	
M5	PL27A	6	PCLKT6_0/LDQ31	T (LVDS)*	PL46A	6	PCLKT6_0/LDQ50	T (LVDS)*	
M6	PL27B	6	PCLKC6_0/LDQ31	C (LVDS)*	PL46B	6	PCLKC6_0/LDQ50	C (LVDS)*	
M3	PL28A	6	VREF2_6/LDQ31	T	PL47A	6	VREF2_6/LDQ50	T	
M4	PL28B	6	VREF1_6/LDQ31	C	PL47B	6	VREF1_6/LDQ50	C	
M2	PL29A	6	LDQ31	T (LVDS)*	PL48A	6	LDQ50	T (LVDS)*	
VCCIO	VCCIO6	6			VCCIO	6			
M1	PL29B	6	LDQ31	C (LVDS)*	PL48B	6	LDQ50	C (LVDS)*	
N1	PL30A	6	LDQ31	T	PL49A	6	LDQ50	T	
N2	PL30B	6	LDQ31	C	PL49B	6	LDQ50	C	
GNDIO	GNDIO6	-			GNDIO6	-			
VCCIO	VCCIO6	6			VCCIO	6			
N3	PL39A	6	LDQS39***	T (LVDS)*	PL58A	6	LDQS58***	T (LVDS)*	
N4	PL39B	6	LDQ39	C (LVDS)*	PL58B	6	LDQ58	C (LVDS)*	
N5	PL40A	6	LDQ39	T	PL59A	6	LDQ58	T	
VCCIO	VCCIO6	6			VCCIO	6			
P5	PL40B	6	LDQ39	C	PL59B	6	LDQ58	C	
P1	PL41A	6	LLM0_GDLLT_IN_A**/LDQ39	T (LVDS)*	PL60A	6	LLM0_GDLLT_IN_A**/LDQ58	T (LVDS)*	
P2	PL41B	6	LLM0_GDLLC_IN_A**/LDQ39	C (LVDS)*	PL60B	6	LLM0_GDLLC_IN_A**/LDQ58	C (LVDS)*	
P4	PL42A	6	LLM0_GDLLT_FB_A/LDQ39	T	PL61A	6	LLM0_GDLLT_FB_A/LDQ58	T	
GNDIO	GNDIO6	-			GNDIO6	-			
R4	PL42B	6	LLM0_GDLLC_FB_A/LDQ39	C	PL61B	6	LLM0_GDLLC_FB_D/LDQ58	C	
P6	LLM0_PLLCAP	6			LLM0_PLLCAP	6			
R1	PL44A	6	LLM0_GPLLT_IN_A**/LDQ48	T (LVDS)*	PL63A	6	LLM0_GPLLT_IN_A**/LDQ67	T (LVDS)*	
R2	PL44B	6	LLM0_GPLLC_IN_A**/LDQ48	C (LVDS)*	PL63B	6	LLM0_GPLLC_IN_A**/LDQ67	C (LVDS)*	
R3	PL45A	6	LLM0_GPLLT_FB_A/LDQ48	T	PL64A	6	LLM0_GPLLT_FB_A/LDQ67	T	
T4	PL45B	6	LLM0_GPLLC_FB_A/LDQ48	C	PL64B	6	LLM0_GPLLC_FB_A/LDQ67	C	
T1	PL46A	6	LDQ48	T (LVDS)*	PL65A	6	LDQ67	T (LVDS)*	
VCCIO	VCCIO6	6			VCCIO	6			
T2	PL46B	6	LDQ48	C (LVDS)*	PL65B	6	LDQ67	C (LVDS)*	
T5	PL47A	6	LDQ48	T	PL66A	6	LDQ67	T	
T3	PL47B	6	LDQ48	C	PL66B	6	LDQ67	C	
GNDIO	GNDIO6	-			VCCIO	6			
VCCIO	VCCIO6	-			GNDIO6	-			
U1	PL52A	6	LDQ56	T (LVDS)*	PL71A	6	LDQ75	T (LVDS)*	
U2	PL52B	6	LDQ56	C (LVDS)*	PL71B	6	LDQ75	C (LVDS)*	
V1	PL53A	6	LDQ56	T	PL72A	6	LDQ75	T	
V2	PL53B	6	LDQ56	C	PL72B	6	LDQ75	C	
VCCIO	VCCIO6	6			VCCIO	6			
R6	PL54A	6	LDQ56	T (LVDS)*	PL73A	6	LDQ75	T (LVDS)*	
T6	PL54B	6	LDQ56	C (LVDS)*	PL73B	6	LDQ75	C (LVDS)*	

LFE2-35E/SE and LFE2-50E/SE Logic Signal Connections: 484 fpBGA (Cont.)

LFE2-35E/SE					LFE2-50E/SE			
Ball Number	Ball/Pad Function	Bank	Dual Function	Differential	Ball/Pad Function	Bank	Dual Function	Differential
W20	CFG0	8			CFG0	8		
V20	PROGRAMN	8			PROGRAMN	8		
W22	CCLK	8			CCLK	8		
V22	INITN	8			INITN	8		
V21	DONE	8			DONE	8		
GNDIO	GNDIO8	-			GNDIO8	-		
R16	PR58B	8	WRITEN	C	PR77B	8	WRITEN	C
R17	PR58A	8	CS1N	T	PR77A	8	CS1N	T
U19	PR57B	8	CSN	C	PR76B	8	CSN	C
U20	PR57A	8	D0/SPIFASTN	T	PR76A	8	D0/SPIFASTN	T
VCCIO	VCCIO8	8			VCCIO	8		
U22	PR56B	8	D1	C	PR75B	8	D1	C
U21	PR56A	8	D2	T	PR75A	8	D2	T
T20	PR55B	8	D3	C	PR74B	8	D3	C
GNDIO	GNDIO8	-			GNDIO8	-		
T19	PR55A	8	D4	T	PR74A	8	D4	T
T17	PR54B	8	D5	C	PR73B	8	D5	C
T18	PR54A	8	D6	T	PR73A	8	D6	T
T21	PR53B	8	D7/SPID0	C	PR72B	8	D7/SPID0	C
VCCIO	VCCIO8	8			VCCIO	8		
T22	PR53A	8	DI/CSSPION	T	PR72A	8	DI/CSSPION	T
R18	PR52B	8	DOUT/CSON	C	PR71B	8	DOUT/CSON	C
R19	PR52A	8	BUSY/SISPI	T	PR71A	8	BUSY/SISPI	T
GNDIO	GNDIO3	-			GNDIO3	-		
VCCIO	VCCIO3	3			VCCIO	3		
R22	PR47B	3	RDQ48	C	PR66B	3	RDQ67	C
R21	PR47A	3	RDQ48	T	PR66A	3	RDQ67	T
P18	PR46B	3	RDQ48	C (LVDS)*	PR65B	3	RDQ67	C (LVDS)*
P19	PR46A	3	RDQ48	T (LVDS)*	PR65A	3	RDQ67	T (LVDS)*
VCCIO	VCCIO3	3			VCCIO	3		
R20	PR45B	3	RLM0_GPLL_C_FB_A/RDQ48	C	PR64B	3	RLM0_GPLL_C_FB_A/RDQ67	C
P22	PR45A	3	RLM0_GPLL_T_FB_A/RDQ48	T	PR64A	3	RLM0_GPLL_T_FB_A/RDQ67	T
P21	PR44B	3	RLM0_GPLL_C_IN_A**/RDQ48	C (LVDS)*	PR63B	3	RLM0_GPLL_C_IN_A**/RDQ67	C (LVDS)*
N21	PR44A	3	RLM0_GPLL_T_IN_A**/RDQ48	T (LVDS)*	PR63A	3	RLM0_GPLL_T_IN_A**/RDQ67	T (LVDS)*
N17	RLM0_PLLCAP	3			RLM0_PLLCAP	3		
N22	PR42B	3	RLM0_GDLL_C_FB_A/RDQ39	C	PR61B	3	RLM0_GDLL_C_FB_A/RDQ58	C
N20	PR42A	3	RLM0_GDLL_T_FB_A/RDQ39	T	PR61A	3	RLM0_GDLL_T_FB_A/RDQ58	T
GNDIO	GNDIO3	-			GNDIO3	-		
M22	PR41B	3	RLM0_GDLL_C_IN_A**/RDQ39	C (LVDS)*	PR60B	3	RLM0_GDLL_C_IN_A**/RDQ58	C (LVDS)*
M21	PR41A	3	RLM0_GDLL_T_IN_A**/RDQ39	T (LVDS)*	PR60A	3	RLM0_GDLL_T_IN_A**/RDQ58	T (LVDS)*
N19	PR40B	3	RDQ39	C	PR59B	3	RDQ58	C
M19	PR40A	3	RDQ39	T	PR59A	3	RDQ58	T
VCCIO	VCCIO3	3			VCCIO	3		
GNDIO	GNDIO3	-			GNDIO3	-		
L22	PR30B	3	RDQ31	C	PR49B	3	RDQ50	C
K22	PR30A	3	RDQ31	T	PR49A	3	RDQ50	T

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

LFE2-70E/SE				
Ball Number	Ball/Pad Function	Bank	Dual Function	Differential
AJ6	PB16A	5	BDQ15	T
AK6	PB16B	5	BDQ15	C
VCCIO	VCCIO5	5		
GND	GNDIO5	-		
AD10	PB29A	5	BDQ33	T
AF10	PB29B	5	BDQ33	C
AC11	PB30A	5	BDQ33	T
AD11	PB30B	5	BDQ33	C
AG9	PB31A	5	BDQ33	T
AH9	PB31B	5	BDQ33	C
VCCIO	VCCIO5	99		
AE11	PB32A	5	BDQ33	T
AG10	PB32B	5	BDQ33	C
GND	GNDIO5	-		
AJ9	PB33A	5	BDQS33	T
AK9	PB33B	5	BDQ33	C
AF11	PB34A	5	BDQ33	T
AH10	PB34B	5	BDQ33	C
AC12	PB35A	5	BDQ33	T
AE12	PB35B	5	BDQ33	C
VCCIO	VCCIO5	5		
AD12	PB36A	5	BDQ33	T
AF12	PB36B	5	BDQ33	C
AJ10	PB37A	5	BDQ33	T
AK10	PB37B	5	BDQ33	C
GND	GNDIO5	-		
AG11	PB38A	5	BDQ42	T
AH11	PB38B	5	BDQ42	C
AE13	PB39A	5	BDQ42	T
AC13	PB39B	5	BDQ42	C
AF13	PB40A	5	BDQ42	T
VCCIO	VCCIO5	5		
AD13	PB40B	5	BDQ42	C
AJ11	PB41A	5	BDQ42	T
AK11	PB41B	5	BDQ42	C
AD14	PB42A	5	BDQS42	T
GND	GNDIO5	-		
AC14	PB42B	5	BDQ42	C
AG12	PB43A	5	BDQ42	T
AE14	PB43B	5	BDQ42	C
AJ12	PB44A	5	BDQ42	T
VCCIO	VCCIO5	5		
AK12	PB44B	5	BDQ42	C

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

LFE2-70E/SE				
Ball Number	Ball/Pad Function	Bank	Dual Function	Differential
R14	GND	-		
R15	GND	-		
R16	GND	-		
R17	GND	-		
R18	GND	-		
R19	GND	-		
R20	GND	-		
T11	GND	-		
T12	GND	-		
T13	GND	-		
T14	GND	-		
T15	GND	-		
T16	GND	-		
T17	GND	-		
T18	GND	-		
T19	GND	-		
T20	GND	-		
U11	GND	-		
U12	GND	-		
U13	GND	-		
U14	GND	-		
U15	GND	-		
U16	GND	-		
U17	GND	-		
U18	GND	-		
U19	GND	-		
U20	GND	-		
V12	GND	-		
V13	GND	-		
V14	GND	-		
V15	GND	-		
V16	GND	-		
V17	GND	-		
V18	GND	-		
V19	GND	-		
V28	GND	-		
V3	GND	-		
W12	GND	-		
W13	GND	-		
W14	GND	-		
W15	GND	-		
W16	GND	-		
W17	GND	-		

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	
AB6	PB17A	5	PCLKT5_0/BDQ15	T	PB35A	5	PCLKT5_0/BDQ33	T	
AB7	PB17B	5	PCLKC5_0/BDQ15	C	PB35B	5	PCLKC5_0/BDQ33	C	
VCCIO	VCCIO5	5			VCCIO5	5			
GNDIO	GNDIO5	-			GNDIO5	-			
AA8	PB22A	4	PCLKT4_0/BDQ24	T	PB40A	4	PCLKT4_0/BDQ42	T	
VCCIO	VCCIO4	4			VCCIO4	4			
AB8	PB22B	4	PCLKC4_0/BDQ24	C	PB40B	4	PCLKC4_0/BDQ42	C	
AA9	PB23A	4	VREF2_4/BDQ24	T	PB41A	4	VREF2_4/BDQ42	T	
Y9	PB23B	4	VREF1_4/BDQ24	C	PB41B	4	VREF1_4/BDQ42	C	
AB9	PB24A	4	BDQS24****	T	PB42A	4	BDQS42****	T	
GNDIO	GNDIO4	-			GNDIO4	-			
AB10	PB24B	4	BDQ24	C	PB42B	4	BDQ42	C	
AA10	PB25A	4	BDQ24	T	PB43A	4	BDQ42	T	
Y11	PB25B	4	BDQ24	C	PB43B	4	BDQ42	C	
VCCIO	VCCIO4	4			VCCIO4	4			
GNDIO	GNDIO4	-			GNDIO4	-			
V10	PB29A	4	BDQ33	T	PB47A	4	BDQ51	T	
U11	PB29B	4	BDQ33	C	PB47B	4	BDQ51	C	
V11	PB30A	4	BDQ33	T	PB48A	4	BDQ51	T	
W11	PB30B	4	BDQ33	C	PB48B	4	BDQ51	C	
AA11	PB31A	4	BDQ33	T	PB49A	4	BDQ51	T	
AB11	PB31B	4	BDQ33	C	PB49B	4	BDQ51	C	
VCCIO	VCCIO4	4			VCCIO4	4			
T11	PB32A	4	BDQ33	T	PB50A	4	BDQ51	T	
U12	PB32B	4	BDQ33	C	PB50B	4	BDQ51	C	
GNDIO	GNDIO4	-			GNDIO4	-			
AA12	PB33A	4	BDQS33	T	PB51A	4	BDQS51	T	
Y12	PB33B	4	BDQ33	C	PB51B	4	BDQ51	C	
V12	PB34A	4	BDQ33	T	PB52A	4	BDQ51	T	
W12	PB34B	4	BDQ33	C	PB52B	4	BDQ51	C	
AB12	PB35A	4	BDQ33	T	PB53A	4	BDQ51	T	
AA13	PB35B	4	BDQ33	C	PB53B	4	BDQ51	C	
VCCIO	VCCIO4	4			VCCIO4	4			
T12	PB36A	4	BDQ33	T	PB54A	4	BDQ51	T	
U13	PB36B	4	BDQ33	C	PB54B	4	BDQ51	C	
V13	PB37A	4	BDQ33	T	PB55A	4	BDQ51	T	
T13	PB37B	4	BDQ33	C	PB55B	4	BDQ51	C	
GNDIO	GNDIO4	-			GNDIO4	-			
AB13	PB38A	4	BDQ42	T	PB56A	4	BDQ60	T	
AB14	PB38B	4	BDQ42	C	PB56B	4	BDQ60	C	
U14	PB39A	4	BDQ42	T	PB57A	4	BDQ60	T	
T14	PB39B	4	BDQ42	C	PB57B	4	BDQ60	C	
AA14	PB40A	4	BDQ42	T	PB58A	4	BDQ60	T	
VCCIO	VCCIO4	4			VCCIO4	4			
Y14	PB40B	4	BDQ42	C	PB58B	4	BDQ60	C	
W14	PB41A	4	BDQ42	T	PB59A	4	BDQ60	T	
V14	PB41B	4	BDQ42	C	PB59B	4	BDQ60	C	
AB15	PB42A	4	BDQS42	T	PB60A	4	BDQS60	T	

LFE2M50E/SE Logic Signal Connections: 484 fpBGA (Cont.)

LFE2M50E/SE				
Ball Number	Ball/Pad Function	Bank	Dual Function	Differential
T1	PL65A	6	LLM0_GDLLT_FB_A	T
T2	PL65B	6	LLM0_GDLLC_FB_A	C
GNDIO	GNDIO6	-		
R7	LLM0_PLLCAP	6		
T6	PL67A	6	LDQ71	T (LVDS)*
T7	PL67B	6	LDQ71	C (LVDS)*
U1	PL68A	6	LDQ71	T
U2	PL68B	6	LDQ71	C
VCCIO	VCCIO6	6		
T3	PL69A	6	LDQ71	T (LVDS)*
U3	PL69B	6	LDQ71	C (LVDS)*
U6	PL70A	6	LDQ71	T
U5	PL70B	6	LDQ71	C
GNDIO	GNDIO6	-		
V5	PL71A	6	LDQS71	T (LVDS)*
U4	PL71B	6	LDQ71	C (LVDS)*
V1	PL72A	6	LDQ71	T
VCCIO	VCCIO6	6		
V3	PL72B	6	LDQ71	C
W1	PL73A	6	LDQ71	T (LVDS)*
Y1	PL73B	6	LDQ71	C (LVDS)*
AA1	PL74A	6	LDQ71	T
GNDIO	GNDIO6	-		
AA2	PL74B	6	LDQ71	C
V4	TCK	-		
Y2	TDI	-		
Y3	TMS	-		
W3	TDO	-		
W4	VCCJ	-		
W5	PB2A	5	BDQ6	T
Y4	PB2B	5	BDQ6	C
W6	PB3A	5	BDQ6	T
V6	PB3B	5	BDQ6	C
AA3	PB4A	5	BDQ6	T
AB2	PB4B	5	BDQ6	C
VCCIO	VCCIO5	5		
T8	PB5A	5	BDQ6	T
U7	PB5B	5	BDQ6	C
GNDIO	GNDIO5	-		
U8	PB6A	5	BDQS6	T
T9	PB6B	5	BDQ6	C
V8	PB7A	5	BDQ6	T
W8	PB7B	5	BDQ6	C

LFE2M50E/SE Logic Signal Connections: 484 fpBGA (Cont.)

LFE2M50E/SE				
Ball Number	Ball/Pad Function	Bank	Dual Function	Differential
U21	CS1N***	8		
U17	CSN***	8		
U16	D0/SPIFASTN***	8		
VCCIO	VCCIO8	8		
T16	D1***	8		
T17	D2***	8		
T22	D3***	8		
GNDIO	GNDIO8	-		
R22	D4***	8		
T15	D5***	8		
R17	D6***	8		
T20	D7/SPID0***	8		
VCCIO	VCCIO8	8		
T21	DI/CSSPI0N***	8		
R21	DOUT/CSON/CSSPI1N***	8		
R20	BUSY/SISPI***	8		
R16	RLM0_PLLCAP	3		
R18	PR65B	3	RLM0_GDLLC_FB_A	C
GNDIO	GNDIO3	-		
R19	PR65A	3	RLM0_GDLLT_FB_A	T
P22	PR64B	3	RLM0_GDLLC_IN_A**	C (LVDS)*
P21	PR64A	3	RLM0_GDLLT_IN_A**	T (LVDS)*
P16	PR63B	3	RLM0_GPLL_C_IN_A**	C
VCCIO	VCCIO3	3		
P17	PR63A	3	RLM0_GPLLT_IN_A**	T
P20	PR62B	3	RLM0_GPLL_C_FB_A	C (LVDS)*
P19	PR62A	3	RLM0_GPLLT_FB_A	T (LVDS)*
GNDIO	GNDIO3	-		
VCCIO	VCCIO3	3		
P18	PR55B	3	RDQ52	C
N16	PR55A	3	RDQ52	T
GNDIO	GNDIO3	-		
N22	PR54B	3	RDQ52	C (LVDS)*
N21	PR54A	3	RDQ52	T (LVDS)*
N17	PR53B	3	RDQ52	C
N18	PR53A	3	RDQ52	T
VCCIO	VCCIO3	3		
M22	PR52B	3	RDQ52	C (LVDS)*
M21	PR52A	3	RDQS52	T (LVDS)*
M16	PR51B	3	RDQ52	C
GNDIO	GNDIO3	-		
M17	PR51A	3	RDQ52	T
M20	PR50B	3	RDQ52	C (LVDS)*

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
U8	PL43B	7	LUM3_SPLLC_FB_A/LDQ46	C	PL51B	7	LUM3_SPLLC_FB_A/LDQ54	C
VCCIO	VCCIO7	7			VCCIO7	7		
T6	PL44A	7	LDQ46	T (LVDS)*	PL52A	7	LDQ54	T (LVDS)*
R6	PL44B	7	LDQ46	C (LVDS)*	PL52B	7	LDQ54	C (LVDS)*
U9	PL45A	7	LDQ46	T	PL53A	7	LDQ54	T
T7	PL45B	7	LDQ46	C	PL53B	7	LDQ54	C
GNDIO	GNDIO7	-			GNDIO7	-		
U5	PL46A	7	LDQS46	T (LVDS)*	PL54A	7	LDQS54	T (LVDS)*
U6	PL46B	7	LDQ46	C (LVDS)*	PL54B	7	LDQ54	C (LVDS)*
U7	PL47A	7	LDQ46	T	PL55A	7	LDQ54	T
VCCIO	VCCIO7	7			VCCIO7	7		
V9	PL47B	7	LDQ46	C	PL55B	7	LDQ54	C
V11	PL48A	7	LDQ46	T (LVDS)*	PL56A	7	LDQ54	T (LVDS)*
V10	PL48B	7	LDQ46	C (LVDS)*	PL56B	7	LDQ54	C (LVDS)*
U4	PL49A	7	PCLKT7_0/LDQ46	T	PL57A	7	PCLKT7_0/LDQ54	T
GNDIO	GNDIO7	-			GNDIO7	-		
U3	PL49B	7	PCLKC7_0/LDQ46	C	PL57B	7	PCLKC7_0/LDQ54	C
U2	PL51A	6	PCLKT6_0/LDQ55	T (LVDS)*	PL59A	6	PCLKT6_0/LDQ63	T (LVDS)*
U1	PL51B	6	PCLKC6_0/LDQ55	C (LVDS)*	PL59B	6	PCLKC6_0/LDQ63	C (LVDS)*
V5	PL52A	6	VREF2_6/LDQ55	T	PL60A	6	VREF2_6/LDQ63	T
V6	PL52B	6	VREF1_6/LDQ55	C	PL60B	6	VREF1_6/LDQ63	C
V7	PL53A	6	LDQ55	T (LVDS)*	PL61A	6	LDQ63	T (LVDS)*
VCCIO	VCCIO6	6			VCCIO6	6		
V8	PL53B	6	LDQ55	C (LVDS)*	PL61B	6	LDQ63	C (LVDS)*
V4	PL54A	6	LDQ55	T	PL62A	6	LDQ63	T
V3	PL54B	6	LDQ55	C	PL62B	6	LDQ63	C
V2	PL55A	6	LDQS55	T (LVDS)*	PL63A	6	LDQS63	T (LVDS)*
GNDIO	GNDIO6	-			GNDIO6	-		
V1	PL55B	6	LDQ55	C (LVDS)*	PL63B	6	LDQ63	C (LVDS)*
W7	PL56A	6	LDQ55	T	PL64A	6	LDQ63	T
W5	PL56B	6	LDQ55	C	PL64B	6	LDQ63	C
VCCIO	VCCIO6	6			VCCIO6	6		
W2	PL57A	6	LLM3_SPLLT_IN_A/LDQ55	T (LVDS)*	PL65A	6	LLM4_SPLLT_IN_A/LDQ63	T (LVDS)*
W1	PL57B	6	LLM3_SPLLC_IN_A/LDQ55	C (LVDS)*	PL65B	6	LLM4_SPLLC_IN_A/LDQ63	C (LVDS)*
Y6	PL58A	6	LLM3_SPLLT_FB_A/LDQ55	T	PL66A	6	LLM4_SPLLT_FB_A/LDQ63	T
W6	PL58B	6	LLM3_SPLLC_FB_A/LDQ55	C	PL66B	6	LLM4_SPLLC_FB_A/LDQ63	C
GNDIO	GNDIO6	-			GNDIO6	-		
Y1	PL60A	6	LDQ64	T (LVDS)*	PL68A	6	LDQ72	T (LVDS)*
Y2	PL60B	6	LDQ64	C (LVDS)*	PL68B	6	LDQ72	C (LVDS)*
Y7	PL61A	6	LDQ64	T	PL69A	6	LDQ72	T
Y5	PL61B	6	LDQ64	C	PL69B	6	LDQ72	C
VCCIO	VCCIO6	6			VCCIO6	6		
W10	PL62A	6	LDQ64	T (LVDS)*	PL70A	6	LDQ72	T (LVDS)*
Y8	PL62B	6	LDQ64	C (LVDS)*	PL70B	6	LDQ72	C (LVDS)*
Y4	PL63A	6	LDQ64	T	PL71A	6	LDQ72	T
Y3	PL63B	6	LDQ64	C	PL71B	6	LDQ72	C
GNDIO	GNDIO6	-			GNDIO6	-		
AA1	PL64A	6	LDQS64	T (LVDS)*	PL72A	6	LDQS72	T (LVDS)*
AA2	PL64B	6	LDQ64	C (LVDS)*	PL72B	6	LDQ72	C (LVDS)*

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
AA8	PL65A	6	LDQ64	T	PL73A	6	LDQ72	T
VCCIO	VCCIO6	6			VCCIO6	6		
Y9	PL65B	6	LDQ64	C	PL73B	6	LDQ72	C
AA6	PL66A	6	LDQ64	T (LVDS)*	PL74A	6	LDQ72	T (LVDS)*
AA7	PL66B	6	LDQ64	C (LVDS)*	PL74B	6	LDQ72	C (LVDS)*
AA4	PL67A	6	LDQ64	T	PL75A	6	LDQ72	T
GNDIO	GNDIO6	-			GNDIO6	-		
AA3	PL67B	6	LDQ64	C	PL75B	6	LDQ72	C
AA9	PL69A	6	LDQ73	T (LVDS)*	PL77A	6	LDQ81	T (LVDS)*
AA10	PL69B	6	LDQ73	C (LVDS)*	PL77B	6	LDQ81	C (LVDS)*
AA5	PL70A	6	LDQ73	T	PL78A	6	LDQ81	T
AB6	PL70B	6	LDQ73	C	PL78B	6	LDQ81	C
AB1	PL71A	6	LDQ73	T (LVDS)*	PL79A	6	LDQ81	T (LVDS)*
VCCIO	VCCIO6	6			VCCIO6	6		
AB2	PL71B	6	LDQ73	C (LVDS)*	PL79B	6	LDQ81	C (LVDS)*
AC8	PL72A	6	LDQ73	T	PL80A	6	LDQ81	T
AB10	PL72B	6	LDQ73	C	PL80B	6	LDQ81	C
AC1	PL73A	6	LDQS73	T (LVDS)*	PL81A	6	LDQS81	T (LVDS)*
GNDIO	GNDIO6	-			GNDIO6	-		
AC2	PL73B	6	LDQ73	C (LVDS)*	PL81B	6	LDQ81	C (LVDS)*
AB7	PL74A	6	LDQ73	T	PL82A	6	LDQ81	T
AB5	PL74B	6	LDQ73	C	PL82B	6	LDQ81	C
VCCIO	VCCIO6	6			VCCIO6	6		
AC3	PL75A	6	LDQ73	T (LVDS)*	PL83A	6	LDQ81	T (LVDS)*
AC4	PL75B	6	LDQ73	C (LVDS)*	PL83B	6	LDQ81	C (LVDS)*
AC10	PL76A	6	LDQ73	T	PL84A	6	LDQ81	T
AC9	PL76B	6	LDQ73	C	PL84B	6	LDQ81	C
GNDIO	GNDIO6	-			GNDIO6	-		
AC7	NC	-			PL86A	6	LDQ90	T (LVDS)*
AC5	NC	-			PL86B	6	LDQ90	C (LVDS)*
AC6	NC	-			PL87A	6	LDQ90	T
AD5	NC	-			PL87B	6	LDQ90	C
-	-	-			VCCIO6	6		
AD4	NC	-			PL88A	6	LDQ90	T (LVDS)*
AD3	NC	-			PL88B	6	LDQ90	C (LVDS)*
AD10	NC	-			PL89A	6	LDQ90	T
AD8	NC	-			PL89B	6	LDQ90	C
-	-	-			GNDIO6	-		
AD2	NC	-			PL90A	6	LDQS90	T (LVDS)*
AD1	NC	-			PL90B	6	LDQ90	C (LVDS)*
AD9	NC	-			PL91A	6	LDQ90	T
-	-	-			VCCIO6	6		
AC11	NC	-			PL91B	6	LDQ90	C
AD6	NC	-			PL92A	6	LDQ90	T (LVDS)*
AD7	NC	-			PL92B	6	LDQ90	C (LVDS)*
AE1	NC	-			PL93A	6	LDQ90	T
-	-	-			GNDIO6	-		
AE2	NC	-			PL93B	6	LDQ90	C
AF2	PL78A	6	LDQ82	T (LVDS)*	PL95A	6	LDQ99	T (LVDS)*

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

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

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
R21	VCC	-			VCC	-		
R22	VCC	-			VCC	-		
T14	VCC	-			VCC	-		
T21	VCC	-			VCC	-		
U14	VCC	-			VCC	-		
U21	VCC	-			VCC	-		
V14	VCC	-			VCC	-		
V21	VCC	-			VCC	-		
W14	VCC	-			VCC	-		
W21	VCC	-			VCC	-		
Y13	VCC	-			VCC	-		
Y14	VCC	-			VCC	-		
Y21	VCC	-			VCC	-		
Y22	VCC	-			VCC	-		
C12	VCCIO0	0			VCCIO0	0		
C16	VCCIO0	0			VCCIO0	0		
E14	VCCIO0	0			VCCIO0	0		
H12	VCCIO0	0			VCCIO0	0		
H16	VCCIO0	0			VCCIO0	0		
M14	VCCIO0	0			VCCIO0	0		
M15	VCCIO0	0			VCCIO0	0		
C19	VCCIO1	1			VCCIO1	1		
C23	VCCIO1	1			VCCIO1	1		
E21	VCCIO1	1			VCCIO1	1		
H19	VCCIO1	1			VCCIO1	1		
H23	VCCIO1	1			VCCIO1	1		
M20	VCCIO1	1			VCCIO1	1		
M21	VCCIO1	1			VCCIO1	1		
G32	VCCIO2	2			VCCIO2	2		
K28	VCCIO2	2			VCCIO2	2		
K32	VCCIO2	2			VCCIO2	2		
N27	VCCIO2	2			VCCIO2	2		
N32	VCCIO2	2			VCCIO2	2		
P23	VCCIO2	2			VCCIO2	2		
R23	VCCIO2	2			VCCIO2	2		
T27	VCCIO2	2			VCCIO2	2		
T32	VCCIO2	2			VCCIO2	2		
AA23	VCCIO3	3			VCCIO3	3		
AB27	VCCIO3	3			VCCIO3	3		
AB32	VCCIO3	3			VCCIO3	3		
AE28	VCCIO3	3			VCCIO3	3		
AE32	VCCIO3	3			VCCIO3	3		
AH32	VCCIO3	3			VCCIO3	3		
W27	VCCIO3	3			VCCIO3	3		
W32	VCCIO3	3			VCCIO3	3		
Y23	VCCIO3	3			VCCIO3	3		
AC20	VCCIO4	4			VCCIO4	4		
AC21	VCCIO4	4			VCCIO4	4		
AG19	VCCIO4	4			VCCIO4	4		

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
F21	GND	-			GND	-		
G31	GND	-			GND	-		
G4	GND	-			GND	-		
J12	GND	-			GND	-		
J16	GND	-			GND	-		
J19	GND	-			GND	-		
J23	GND	-			GND	-		
K27	GND	-			GND	-		
K31	GND	-			GND	-		
K4	GND	-			GND	-		
K8	GND	-			GND	-		
M16	GND	-			GND	-		
M17	GND	-			GND	-		
M18	GND	-			GND	-		
M19	GND	-			GND	-		
N16	GND	-			GND	-		
N17	GND	-			GND	-		
N18	GND	-			GND	-		
N19	GND	-			GND	-		
N26	GND	-			GND	-		
N31	GND	-			GND	-		
N4	GND	-			GND	-		
N9	GND	-			GND	-		
R16	GND	-			GND	-		
R17	GND	-			GND	-		
R18	GND	-			GND	-		
R19	GND	-			GND	-		
T12	GND	-			GND	-		
T13	GND	-			GND	-		
T15	GND	-			GND	-		
T16	GND	-			GND	-		
T17	GND	-			GND	-		
T18	GND	-			GND	-		
T19	GND	-			GND	-		
T20	GND	-			GND	-		
T22	GND	-			GND	-		
T23	GND	-			GND	-		
T26	GND	-			GND	-		
T31	GND	-			GND	-		
T4	GND	-			GND	-		
T9	GND	-			GND	-		
U12	GND	-			GND	-		
U13	GND	-			GND	-		
U15	GND	-			GND	-		
U16	GND	-			GND	-		
U17	GND	-			GND	-		
U18	GND	-			GND	-		
U19	GND	-			GND	-		
U20	GND	-			GND	-		

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2-20SE-5Q208I	131	1.2V	-5	PQFP	208	Ind	20
LFE2-20SE-6Q208I	131	1.2V	-6	PQFP	208	Ind	20
LFE2-20SE-5F256I	193	1.2V	-5	fpBGA	256	Ind	20
LFE2-20SE-6F256I	193	1.2V	-6	fpBGA	256	Ind	20
LFE2-20SE-5F484I	331	1.2V	-5	fpBGA	484	Ind	20
LFE2-20SE-6F484I	331	1.2V	-6	fpBGA	484	Ind	20
LFE2-20SE-5F672I	402	1.2V	-5	fpBGA	672	Ind	20
LFE2-20SE-6F672I	402	1.2V	-6	fpBGA	672	Ind	20

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2-35SE-5F484I	331	1.2V	-5	fpBGA	484	Ind	35
LFE2-35SE-6F484I	331	1.2V	-6	fpBGA	484	Ind	35
LFE2-35SE-5F672I	450	1.2V	-5	fpBGA	672	Ind	35
LFE2-35SE-6F672I	450	1.2V	-6	fpBGA	672	Ind	35

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2-50SE-5F484I	339	1.2V	-5	fpBGA	484	Ind	50
LFE2-50SE-6F484I	339	1.2V	-6	fpBGA	484	Ind	50
LFE2-50SE-5F672I	500	1.2V	-5	fpBGA	672	Ind	50
LFE2-50SE-6F672I	500	1.2V	-6	fpBGA	672	Ind	50

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2-70SE-5F672I	500	1.2V	-5	fpBGA	672	Ind	70
LFE2-70SE-6F672I	500	1.2V	-6	fpBGA	672	Ind	70
LFE2-70SE-5F900I	583	1.2V	-5	fpBGA	900	Ind	70
LFE2-70SE-6F900I	583	1.2V	-6	fpBGA	900	Ind	70

Industrial

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2M20E-5F484I	304	1.2V	-5	fpBGA	484	IND	20
LFE2M20E-6F484I	304	1.2V	-6	fpBGA	484	IND	20
LFE2M20E-5F256I	140	1.2V	-5	fpBGA	256	IND	20
LFE2M20E-6F256I	140	1.2V	-6	fpBGA	256	IND	20

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2M35E-5F672I	410	1.2V	-5	fpBGA	672	IND	35
LFE2M35E-6F672I	410	1.2V	-6	fpBGA	672	IND	35
LFE2M35E-5F484I	303	1.2V	-5	fpBGA	484	IND	35
LFE2M35E-6F484I	303	1.2V	-6	fpBGA	484	IND	35
LFE2M35E-5F256I	140	1.2V	-5	fpBGA	256	IND	35
LFE2M35E-6F256I	140	1.2V	-6	fpBGA	256	IND	35

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2M50E-5F900I	410	1.2V	-5	fpBGA	900	IND	50
LFE2M50E-6F900I	410	1.2V	-6	fpBGA	900	IND	50
LFE2M50E-5F672I	372	1.2V	-5	fpBGA	672	IND	50
LFE2M50E-6F672I	372	1.2V	-6	fpBGA	672	IND	50
LFE2M50E-5F484I	270	1.2V	-5	fpBGA	484	IND	50
LFE2M50E-6F484I	270	1.2V	-6	fpBGA	484	IND	50

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2M70E-5F1152I	436	1.2V	-5	fpBGA	1152	IND	70
LFE2M70E-6F1152I	436	1.2V	-6	fpBGA	1152	IND	70
LFE2M70E-5F900I	416	1.2V	-5	fpBGA	900	IND	70
LFE2M70E-6F900I	416	1.2V	-6	fpBGA	900	IND	70

Part Number	I/Os	Voltage	Grade	Package	Pins	Temp.	LUTs (K)
LFE2M100E-5F1152I	520	1.2V	-5	fpBGA	1152	IND	100
LFE2M100E-6F1152I	520	1.2V	-6	fpBGA	1152	IND	100
LFE2M100E-5F900I	416	1.2V	-5	fpBGA	900	IND	100
LFE2M100E-6F900I	416	1.2V	-6	fpBGA	900	IND	100