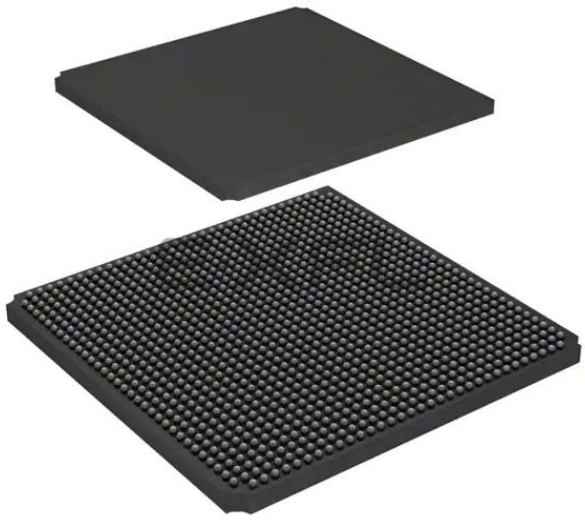
Lattice Semiconductor Corporation - LFSCM3GA80EP1-6FC1152C Datasheet



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Understanding Embedded - FPGAs (Field Programmable Gate Array)

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

Applications of Embedded - FPGAs

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

Details	
Product Status	Obsolete
Number of LABs/CLBs	20000
Number of Logic Elements/Cells	80000
Total RAM Bits	5816320
Number of I/O	660
Number of Gates	-
Voltage - Supply	0.95V ~ 1.26V
Mounting Type	Surface Mount
Operating Temperature	0°C ~ 85°C (TJ)
Package / Case	1152-BCBGA, FCBGA
Supplier Device Package	1152-CFCBGA (35x35)
Purchase URL	https://www.e-xfl.com/product-detail/lattice-semiconductor/lfscm3ga80ep1-6fc1152c

Figure 2-13. DLL to PLL

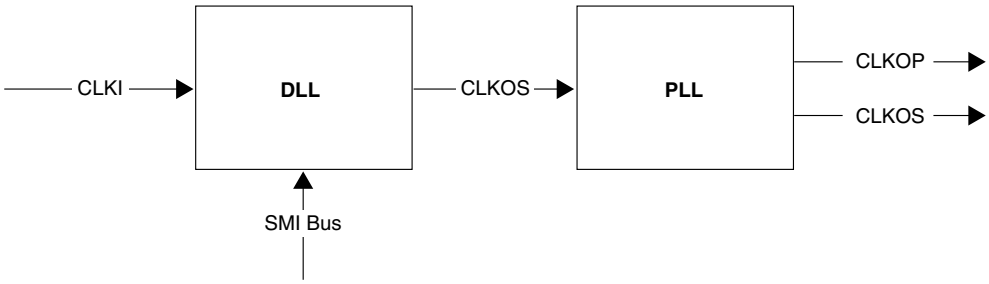


Figure 2-14 shows a shift of only CLKOP out in time.

Figure 2-14. PLL to DLL

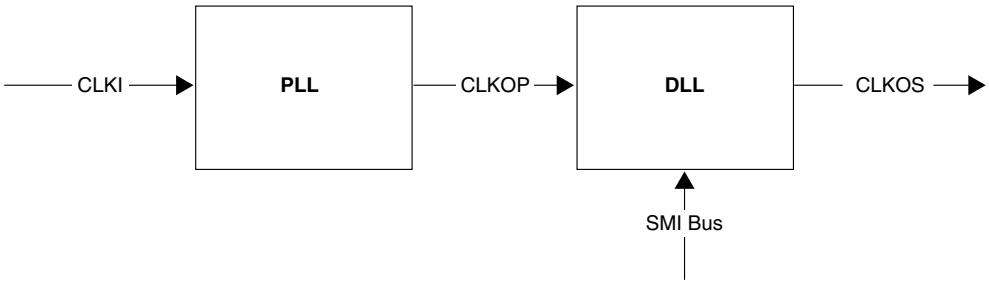
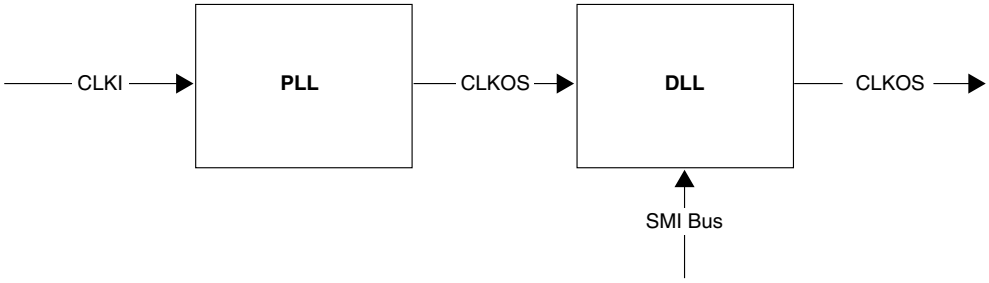


Figure 2-15 shows a shift of only CLKOS out in time.

Figure 2-15. PLL to DLL



For further information on the DLL, please see details of additional technical documentation at the end of this data sheet.

sysMEM Memory Block

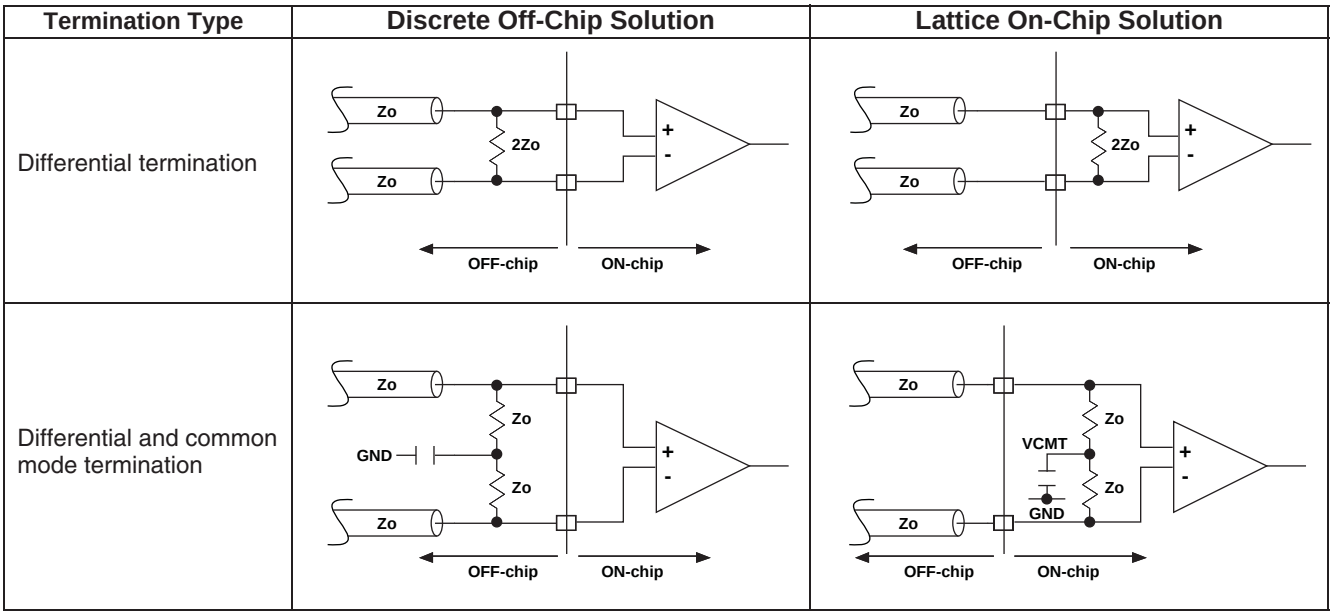
The sysMEM block can implement single port, true dual port, pseudo dual port or FIFO memories. Dedicated FIFO support logic allows the LatticeSC devices to efficiently implement FIFOs without consuming LUTs or routing resources for flag generation. Each block can be used in a variety of depths and widths as shown in Table 2-5. Memory with ranges from x1 to x18 in all modes: single port, pseudo-dual port and FIFO also providing x36.

Differential Input Termination

The LatticeSC device allows two types of differential termination. The first is a single resistor across the differential inputs. The second is a center-tapped system where each input is terminated to the on-chip termination bus V_{CMT}. The V_{CMT} bus is DC-coupled through an internal capacitor to ground.

Figure 2-29 shows the differential termination schemes and Table 2-9 shows the nominal values of the termination resistors.

Figure 2-29. Differential Termination Scheme



Calibration

There are two calibration sources that are associated with the termination scheme used in the LatticeSC devices:

- DIFFR – This pin occurs in each bank that supports differential drivers and must be connected through a 1K+/-1% resistor to ground if differential outputs are used. Note that differential drivers are not supported in banks 1, 4 and 5.
- XRES – There is one of these pins per device. It is used for several functions including calibrating on-chip termination. This pin should always be connected through a 1K+/-1% resistor to ground.

The LatticeSC devices support two modes of calibration:

- Continuous – In this mode the SC devices continually calibrate the termination resistances. Calibration happens several times a second. Using this mode ensures that termination resistances remain calibrated as the silicon junction temperature changes.
- User Request – In this mode the calibration circuit operates continuously. However, the termination resistor values are only updated on the assertion of the calibration_update signal available to the core logic.

For more information on calibration, refer to the details of additional technical documentation at the end of this data sheet.

Hot Socketing

The LatticeSC devices have been carefully designed to ensure predictable behavior during power-up and power-down. To ensure proper power sequencing, care must be taken during power-up and power-down as described below. During power-up and power-down sequences, the I/Os remain in tristate until the power supply voltage is high enough to ensure reliable operation. In addition, leakage into I/O pins is controlled to within specified limits,

LatticeSC/M Family Timing Adders (Continued)

Over Recommended Operating Conditions at VCC = 1.2V +/- 5%

Buffer Type	Description	-7		-6		-5		Units
		Min.	Max.	Min.	Max.	Min.	Max.	
LVCMOS18_12mA	LVCMOS 1.8 12mA drive	0.024	-0.106	0.019	-0.004	0.016	0.099	ns
LVCMOS18_16mA	LVCMOS 1.8 16mA drive	0.074	-0.134	0.08	-0.022	0.088	0.089	ns
LVCMOS18_OD	LVCMOS 1.8 open drain	0.002	-0.206	0	-0.196	-0.002	-0.221	ns
LVCMOS15_4mA	LVCMOS 1.5 4mA drive	-0.344	-0.164	-0.379	-0.186	-0.412	-0.209	ns
LVCMOS15_8mA	LVCMOS 1.5 8mA drive	-0.125	-0.137	-0.145	-0.157	-0.164	-0.176	ns
LVCMOS15_12mA	LVCMOS 1.5 12mA drive	-0.027	-0.166	-0.043	-0.07	-0.059	0.026	ns
LVCMOS15_16mA	LVCMOS 1.5 16mA drive	0.025	-0.195	0.013	-0.089	0.003	0.017	ns
LVCMOS15_OD	LVCMOS 1.5 open drain	-0.047	-0.267	-0.067	-0.267	-0.087	-0.299	ns
LVCMOS12_2mA	LVCMOS 1.2 2mA drive	-0.473	-0.293	-0.505	-0.317	-0.537	-0.34	ns
LVCMOS12_4mA	LVCMOS 1.2 4mA drive	-0.218	-0.239	-0.25	-0.271	-0.28	-0.303	ns
LVCMOS12_8mA	LVCMOS 1.2 8mA drive	-0.109	-0.269	-0.143	-0.181	-0.176	-0.093	ns
LVCMOS12_12mA	LVCMOS 1.2 12mA drive	-0.054	-0.3	-0.085	-0.203	-0.114	-0.106	ns
LVCMOS12_OD	LVCMOS 1.2 open drain	-0.126	-0.371	-0.166	-0.398	-0.204	-0.43	ns
PCI33	PCI	-0.216	-0.791	-0.417	-1.263	-0.618	-1.735	ns
PCIX33	PCI-X 3.3	-0.216	-0.791	-0.417	-1.263	-0.618	-1.735	ns
PCIX15	PCI-X 1.5	0.208	0.227	0.233	0.312	0.259	0.398	ns
AGP1X33	AGP-1X 3.3	-0.216	-0.791	-0.417	-1.263	-0.618	-1.735	ns
AGP2X33	AGP-2X	-0.216	-0.791	-0.417	-1.263	-0.618	-1.735	ns

LFSC/M15 Logic Signal Connections: 256 fpBGA[1,2] (Cont.)

Ball Number	LFSC/M15		
	Ball Function	VCCIO Bank	Dual Function
M4	PL43B	6	
P1	PL45A	6	LLC_DLLT_IN_F/LLC_DLLT_FB_E
R1	PL45B	6	LLC_DLLC_IN_F/LLC_DLLC_FB_E
R2	XRES	-	
P3	TEMP	6	
R3	PB3A	5	LLC_PLLT_IN_A/LLC_PLLT_FB_B
N4	PB3B	5	LLC_PLLC_IN_A/LLC_PLLC_FB_B
T3	PB3C	5	LLC_DLLT_IN_C/LLC_DLLT_FB_D
T2	PB3D	5	LLC_DLLC_IN_C/LLC_DLLC_FB_D
N5	PB5D	5	VREF1_5
P5	PB8A	5	
R5	PB8B	5	
T4	PB9A	5	
T5	PB9B	5	
R6	PB12A	5	PCLKT5_3
T6	PB12B	5	PCLKC5_3
L5	PB13C	5	
P6	PB15A	5	PCLKT5_0
T7	PB15B	5	PCLKC5_0
M7	PB15D	5	VREF2_5
R8	PB16A	5	PCLKT5_1
T8	PB16B	5	PCLKC5_1
N7	PB17A	5	PCLKT5_2
N8	PB17B	5	PCLKC5_2
R9	PB20A	5	
T9	PB20B	5	
M8	PB21A	5	
M9	PB21B	5	
P8	PB24A	5	
P9	PB24B	5	
T10	PB28A	4	
R11	PB28B	4	
N9	PB31A	4	
N10	PB31B	4	
T11	PB32A	4	
R12	PB32B	4	
P11	PB35A	4	PCLKT4_2
M10	PB35B	4	PCLKC4_2
T12	PB36A	4	PCLKT4_1
P12	PB36B	4	PCLKC4_1
T13	PB37A	4	PCLKT4_0
T14	PB37B	4	PCLKC4_0
R15	PB37C	4	VREF2_4

LFSC/M15 Logic Signal Connections: 256 fpBGA[1,2] (Cont.)

Ball Number	LFSC/M15		
	Ball Function	VCCIO Bank	Dual Function
C5	A_VDDIB1_L	-	
A5	A_HDINP1_L	-	PCS 360 CH 1 IN P
B5	A_HDINN1_L	-	PCS 360 CH 1 IN N
A4	A_HDOUTP1_L	-	PCS 360 CH 1 OUT P
B4	A_HDOUTN1_L	-	PCS 360 CH 1 OUT N
C4	A_VDDOB1_L	-	
B3	A_HDOUTN0_L	-	PCS 360 CH 0 OUT N
C3	A_VDDOB0_L	-	
A3	A_HDOUTP0_L	-	PCS 360 CH 0 OUT P
B2	A_HDINN0_L	-	PCS 360 CH 0 IN N
A2	A_HDINP0_L	-	PCS 360 CH 0 IN P
C2	A_VDDIB0_L	-	
A1	GND	-	
A16	GND	-	
B10	GND	-	
C13	GND	-	
D15	GND	-	
D3	GND	-	
E11	GND	-	
F13	GND	-	
G14	GND	-	
G2	GND	-	
G8	GND	-	
H10	GND	-	
J7	GND	-	
K15	GND	-	
K3	GND	-	
K9	GND	-	
M6	GND	-	
N11	GND	-	
N14	GND	-	
N2	GND	-	
P10	GND	-	
P4	GND	-	
R13	GND	-	
R7	GND	-	
G10	VCC	-	
G7	VCC	-	
G9	VCC	-	
H7	VCC	-	
H8	VCC	-	
H9	VCC	-	
J10	VCC	-	
J8	VCC	-	

LFSC/M15, LFSC/M25 Logic Signal Connections: 900 fpBGA[1, 2] (Cont.)

Ball Number	LFSC/M15			LFSC/M25		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
AF4	PB3C	5	LLC_DLLT_IN_C/LLC_DLLT_FB_D	PB3C	5	LLC_DLLT_IN_C/LLC_DLLT_FB_D
AE5	PB3D	5	LLC_DLLC_IN_C/LLC_DLLC_FB_D	PB3D	5	LLC_DLLC_IN_C/LLC_DLLC_FB_D
AG3	PB4A	5	LLC_DLLT_IN_D/LLC_DLLT_FB_C	PB4A	5	LLC_DLLT_IN_D/LLC_DLLT_FB_C
AH2	PB4B	5	LLC_DLLC_IN_D/LLC_DLLC_FB_C	PB4B	5	LLC_DLLC_IN_D/LLC_DLLC_FB_C
AD6	PB4C	5		PB4C	5	
AJ2	PB5A	5		PB5A	5	
AK2	PB5B	5		PB5B	5	
AD7	PB5C	5		PB5C	5	
AD8	PB5D	5	VREF1_5	PB5D	5	VREF1_5
AH3	PB7A	5		PB11A	5	
AJ3	PB7B	5		PB11B	5	
AF9	PB7C	5		PB11C	5	
AE10	PB7D	5		PB11D	5	
AK3	PB8A	5		PB12A	5	
AJ4	PB8B	5		PB12B	5	
AE11	PB9A	5		PB13A	5	
AF10	PB9B	5		PB13B	5	
AK4	PB11A	5		PB16A	5	
AK5	PB11B	5		PB16B	5	
AH10	PB12A	5	PCLKT5_3	PB20A	5	PCLKT5_3
AH11	PB12B	5	PCLKC5_3	PB20B	5	PCLKC5_3
AF13	PB12C	5	PCLKT5_4	PB20C	5	PCLKT5_4
AE14	PB12D	5	PCLKC5_4	PB20D	5	PCLKC5_4
AK6	PB13A	5	PCLKT5_5	PB21A	5	PCLKT5_5
AK7	PB13B	5	PCLKC5_5	PB21B	5	PCLKC5_5
AF14	PB13C	5		PB21C	5	
AJ11	PB15A	5	PCLKT5_0	PB23A	5	PCLKT5_0
AJ12	PB15B	5	PCLKC5_0	PB23B	5	PCLKC5_0
AH13	PB15D	5	VREF2_5	PB23D	5	VREF2_5
AK8	PB16A	5	PCLKT5_1	PB24A	5	PCLKT5_1
AK9	PB16B	5	PCLKC5_1	PB24B	5	PCLKC5_1
AH14	PB17A	5	PCLKT5_2	PB25A	5	PCLKT5_2
AG14	PB17B	5	PCLKC5_2	PB25B	5	PCLKC5_2
AK10	PB19A	5		PB28A	5	
AK11	PB19B	5		PB28B	5	
AH15	PB20A	5		PB29A	5	
AG15	PB20B	5		PB29B	5	
AH12	PB21A	5		PB31A	5	
AJ13	PB21B	5		PB31B	5	
AD15	PB21C	5		PB31C	5	
AE15	PB21D	5		PB31D	5	
AK12	PB23A	5		PB32A	5	
AK13	PB23B	5		PB32B	5	
AJ14	PB24A	5		PB33A	5	
AJ15	PB24B	5		PB33B	5	

LFSC/M15, LFSC/M25 Logic Signal Connections: 900 fpBGA[1, 2] (Cont.)

Ball Number	LFSC/M15			LFSC/M25		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
E19	NC	-		NC	-	
G21	NC	-		NC	-	
G20	NC	-		NC	-	
G19	NC	-		NC	-	
F9	NC	-		NC	-	
A11	NC	-		NC	-	
G7	NC	-		NC	-	
AH9	NC	-		NC	-	
H8	VCC12	-		VCC12	-	
T8	VCC12	-		VCC12	-	
AB9	VCC12	-		VCC12	-	
AC8	VCC12	-		VCC12	-	
AB22	VCC12	-		VCC12	-	
AC23	VCC12	-		VCC12	-	
R23	VCC12	-		VCC12	-	
H23	VCC12	-		VCC12	-	
H15	VCC12	-		VCC12	-	
L24	VTT_2	2		VTT_2	2	
T23	VTT_2	2		VTT_2	2	
AC24	VTT_3	3		VTT_3	3	
T25	VTT_3	3		VTT_3	3	
W25	VTT_3	3		VTT_3	3	
AD24	VTT_4	4		VTT_4	4	
AE17	VTT_4	4		VTT_4	4	
AE18	VTT_4	4		VTT_4	4	
AC15	VTT_5	5		VTT_5	5	
AD16	VTT_5	5		VTT_5	5	
AE9	VTT_5	5		VTT_5	5	
AA6	VTT_6	6		VTT_6	6	
T7	VTT_6	6		VTT_6	6	
W6	VTT_6	6		VTT_6	6	
L7	VTT_7	7		VTT_7	7	
P7	VTT_7	7		VTT_7	7	
AA10	VCC	-		VCC	-	
AA11	VCC	-		VCC	-	
AA12	VCC	-		VCC	-	
AA13	VCC	-		VCC	-	
AA14	VCC	-		VCC	-	
AA17	VCC	-		VCC	-	
AA18	VCC	-		VCC	-	
AA19	VCC	-		VCC	-	
AA20	VCC	-		VCC	-	
AA21	VCC	-		VCC	-	
AA22	VCC	-		VCC	-	
AA9	VCC	-		VCC	-	

LFSC/M25, LFSC/M40 Logic Signal Connections: 1020 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M25			LFSC/M40		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
E16	PT45C	1	D3/MPI_DATA3	PT54C	1	D3/MPI_DATA3
C13	PT45B	1	D2/MPI_DATA2	PT53B	1	D2/MPI_DATA2
C14	PT45A	1	D1/MPI_DATA1	PT53A	1	D1/MPI_DATA1
B14	PT43B	1	D0/MPI_DATA0	PT51B	1	D0/MPI_DATA0
B13	PT43A	1	QOUT/CEON	PT51A	1	QOUT/CEON
L13	PT42D	1	VREF2_1	PT50D	1	VREF2_1
C15	PT42B	1	DOUT	PT50B	1	DOUT
D15	PT42A	1	MCA_DONE_IN	PT50A	1	MCA_DONE_IN
J16	PT41B	1	MCA_CLK_P1_OUT	PT49B	1	MCA_CLK_P1_OUT
K16	PT41A	1	MCA_CLK_P1_IN	PT49A	1	MCA_CLK_P1_IN
H15	PT39D	1	D21/PCLKC1_1/MPI_DATA21	PT47D	1	D21/PCLKC1_1/MPI_DATA21
H16	PT39C	1	D22/PCLKT1_1/MPI_DATA22	PT47C	1	D22/PCLKT1_1/MPI_DATA22
A14	PT39B	1	MCA_CLK_P2_OUT	PT47B	1	MCA_CLK_P2_OUT
A13	PT39A	1	MCA_CLK_P2_IN	PT47A	1	MCA_CLK_P2_IN
G16	PT38D	1	MCA_DONE_OUT	PT46D	1	MCA_DONE_OUT
F16	PT38C	1	BUSYN/RCLK/SCK	PT46C	1	BUSYN/RCLK/SCK
B16	PT38B	1	DP0/MPI_PAR0	PT46B	1	DP0/MPI_PAR0
B15	PT38A	1	MPI_TA	PT46A	1	MPI_TA
L16	PT37C	1	DP2/MPI_PAR2	PT45C	1	DP2/MPI_PAR2
A16	PT37B	1	PCLKC1_0	PT45B	1	PCLKC1_0
A15	PT37A	1	PCLKT1_0/MPI_CLK	PT45A	1	PCLKT1_0/MPI_CLK
L17	PT35C	1	D24/PCLKT1_4/MPI_DATA24	PT43C	1	D24/PCLKT1_4/MPI_DATA24
A17	PT35B	1	MPI_RETRY	PT43B	1	MPI_RETRY
A18	PT35A	1	A0/MPI_ADDR14	PT43A	1	A0/MPI_ADDR14
F17	PT33D	1	A1/MPI_ADDR15	PT42D	1	A1/MPI_ADDR15
G17	PT33C	1	A2/MPI_ADDR16	PT42C	1	A2/MPI_ADDR16
B17	PT33B	1	A3/MPI_ADDR17	PT42B	1	A3/MPI_ADDR17
B18	PT33A	1	A4/MPI_ADDR18	PT42A	1	A4/MPI_ADDR18
H17	PT32D	1	D25/PCLKC1_5/MPI_DATA25	PT41D	1	D25/PCLKC1_5/MPI_DATA25
H18	PT32C	1	D26/PCLKT1_5/MPI_DATA26	PT41C	1	D26/PCLKT1_5/MPI_DATA26
A19	PT32B	1	A5/MPI_ADDR19	PT41B	1	A5/MPI_ADDR19
A20	PT32A	1	A6/MPI_ADDR20	PT41A	1	A6/MPI_ADDR20
L20	PT31C	1	VREF1_1	PT39C	1	VREF1_1
J17	PT31B	1	A7/MPI_ADDR21	PT39B	1	A7/MPI_ADDR21
K17	PT31A	1	A8/MPI_ADDR22	PT39A	1	A8/MPI_ADDR22
C18	PT29B	1	A9/MPI_ADDR23	PT38B	1	A9/MPI_ADDR23
D18	PT29A	1	A10/MPI_ADDR24	PT38A	1	A10/MPI_ADDR24
B19	PT28B	1	A11/MPI_ADDR25	PT37B	1	A11/MPI_ADDR25
B20	PT28A	1	A12/MPI_ADDR26	PT37A	1	A12/MPI_ADDR26
E17	PT27D	1	D11/MPI_DATA11	PT35D	1	D11/MPI_DATA11
E18	PT27C	1	D12/MPI_DATA12	PT35C	1	D12/MPI_DATA12
C20	PT27B	1	A13/MPI_ADDR27	PT35B	1	A13/MPI_ADDR27
C19	PT27A	1	A14/MPI_ADDR28	PT35A	1	A14/MPI_ADDR28
H19	PT25D	1	A16/MPI_ADDR30	PT33D	1	A16/MPI_ADDR30
G19	PT25C	1	D13/MPI_DATA13	PT33C	1	D13/MPI_DATA13
D20	PT25B	1	A15/MPI_ADDR29	PT33B	1	A15/MPI_ADDR29
D19	PT25A	1	A17/MPI_ADDR31	PT33A	1	A17/MPI_ADDR31
H20	PT24D	1	A19/MPI_TSIZ1	PT30D	1	A19/MPI_TSIZ1
G20	PT24C	1	A20/MPI_BDIP	PT30C	1	A20/MPI_BDIP
E19	PT24B	1	A18/MPI_TSIZ0	PT30B	1	A18/MPI_TSIZ0

LFSC/M25, LFSC/M40 Logic Signal Connections: 1020 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M25			LFSC/M40		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
B30	A_HDOUTN0_L	-	PCS 360 CH 0 OUT N	A_HDOUTN0_L	-	PCS 360 CH 0 OUT N
D30	A_VDDOB0_L	-		A_VDDOB0_L	-	
A30	A_HDOUTP0_L	-	PCS 360 CH 0 OUT P	A_HDOUTP0_L	-	PCS 360 CH 0 OUT P
C31	A_HDINN0_L	-	PCS 360 CH 0 IN N	A_HDINN0_L	-	PCS 360 CH 0 IN N
C32	A_HDINP0_L	-	PCS 360 CH 0 IN P	A_HDINP0_L	-	PCS 360 CH 0 IN P
B31	A_VDDIB0_L	-		A_VDDIB0_L	-	
AL25	NC	-		PB26A	5	
AL24	NC	-		PB26B	5	
AG27	NC	-		PB26C	5	
AH27	NC	-		PB26D	5	
AM25	NC	-		PB27A	5	
AM24	NC	-		PB27B	5	
AL9	NC	-		PB62A	4	
AL8	NC	-		PB62B	4	
AK9	NC	-		PB63A	4	
AJ9	NC	-		PB63B	4	
AG10	NC	-		PB63C	4	
AG11	NC	-		PB63D	4	
J30	NC	-		PL26A	7	
H30	NC	-		PL26B	7	
M28	NC	-		PL26C	7	
N28	NC	-		PL26D	7	
J32	NC	-		PL27A	7	
J31	NC	-		PL27B	7	
N26	NC	-		PL27C	7	
N27	NC	-		PL27D	7	
K31	NC	-		PL29A	7	
K32	NC	-		PL29B	7	
P25	NC	-		PL29C	7	
P26	NC	-		PL29D	7	
L27	NC	-		PL22C	7	
L28	NC	-		PL22D	7	
M29	NC	-		PL30A	7	
L29	NC	-		PL30B	7	
M30	NC	-		PL31A	7	
L30	NC	-		PL31B	7	
L31	NC	-		PL34A	7	
M31	NC	-		PL34B	7	
AA29	NC	-		PL56A	6	
AA30	NC	-		PL56B	6	
AB31	NC	-		PL57A	6	
AA31	NC	-		PL57B	6	
AG30	NC	-		PL57C	6	
AG29	NC	-		PL57D	6	
AB29	NC	-		PL58A	6	
AB30	NC	-		PL58B	6	
Y25	NC	-		PL58C	6	
AA25	NC	-		PL58D	6	
AA8	NC	-		PR58D	3	
Y8	NC	-		PR58C	3	

LFSC/M40, LFSC/M80 Logic Signal Connections: 1152 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M40			LFSC/M80		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
L33	PL27B	7		PL35B	7	
M30	PL27C	7		PL35C	7	
N30	PL27D	7		PL35D	7	
M31	PL29A	7		PL37A	7	
N31	PL29B	7		PL37B	7	
P24	PL29C	7		PL37C	7	
R24	PL29D	7		PL37D	7	
M33	PL30A	7		PL42A	7	
N33	PL30B	7		PL42B	7	
U25	PL30C	7		PL42C	7	
T25	PL30D	7		PL42D	7	
L34	PL31A	7		PL43A	7	
M34	PL31B	7		PL43B	7	
P29	PL31C	7		PL43C	7	
R29	PL31D	7		PL43D	7	
N34	PL34A	7		PL46A	7	
P34	PL34B	7		PL46B	7	
R27	PL34C	7		PL46C	7	
T27	PL34D	7		PL46D	7	
R32	PL35A	7	PCLKT7_1	PL47A	7	PCLKT7_1
R31	PL35B	7	PCLKC7_1	PL47B	7	PCLKC7_1
U24	PL35C	7	PCLKT7_3	PL47C	7	PCLKT7_3
T24	PL35D	7	PCLKC7_3	PL47D	7	PCLKC7_3
P33	PL36A	7	PCLKT7_0	PL48A	7	PCLKT7_0
R33	PL36B	7	PCLKC7_0	PL48B	7	PCLKC7_0
T26	PL36C	7	PCLKT7_2	PL48C	7	PCLKT7_2
U26	PL36D	7	PCLKC7_2	PL48D	7	PCLKC7_2
T32	PL38A	6	PCLKT6_0	PL50A	6	PCLKT6_0
T31	PL38B	6	PCLKC6_0	PL50B	6	PCLKC6_0
U29	PL38C	6	PCLKT6_1	PL50C	6	PCLKT6_1
V29	PL38D	6	PCLKC6_1	PL50D	6	PCLKC6_1
T30	PL39A	6		PL51A	6	
U30	PL39B	6		PL51B	6	
U27	PL39C	6	PCLKT6_3	PL51C	6	PCLKT6_3
V27	PL39D	6	PCLKC6_3	PL51D	6	PCLKC6_3
R34	PL40A	6		PL52A	6	
T34	PL40B	6		PL52B	6	
U28	PL40C	6	PCLKT6_2	PL52C	6	PCLKT6_2
V28	PL40D	6	PCLKC6_2	PL52D	6	PCLKC6_2
V30	PL43A	6		PL55A	6	
W30	PL43B	6		PL55B	6	
W27	PL43C	6	VREF1_6	PL55C	6	VREF1_6
Y27	PL43D	6		PL55D	6	
T33	PL44A	6		PL56A	6	
U33	PL44B	6		PL56B	6	

LFSC/M40, LFSC/M80 Logic Signal Connections: 1152 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M40			LFSC/M80		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
AH27	PB5C	5		PB5C	5	
AH26	PB5D	5	VREF1_5	PB5D	5	VREF1_5
AN32	PB7A	5		PB7A	5	
AP32	PB7B	5		PB7B	5	
AF25	PB7C	5		PB7C	5	
AE25	PB7D	5		PB7D	5	
AN31	PB8A	5		PB9A	5	
AN30	PB8B	5		PB9B	5	
AK29	PB8C	5		PB9C	5	
AK28	PB8D	5		PB9D	5	
AP31	PB9A	5		PB11A	5	
AP30	PB9B	5		PB11B	5	
AD24	PB9C	5		PB11C	5	
AE24	PB9D	5		PB11D	5	
AM29	PB11A	5		PB13A	5	
AM28	PB11B	5		PB13B	5	
AJ27	PB11C	5		PB13C	5	
AJ26	PB11D	5		PB13D	5	
AP29	PB13A	5		PB15A	5	
AP28	PB13B	5		PB15B	5	
AK27	PB13C	5		PB15C	5	
AK26	PB13D	5		PB15D	5	
AN29	PB15A	5		PB17A	5	
AN28	PB15B	5		PB17B	5	
AG25	PB15C	5		PB17C	5	
AG24	PB15D	5		PB17D	5	
AL26	PB17A	5		PB19A	5	
AL25	PB17B	5		PB19B	5	
AG23	PB17C	5		PB19C	5	
AG22	PB17D	5		PB19D	5	
AN27	PB19A	5		PB21A	5	
AN26	PB19B	5		PB21B	5	
AF24	PB19C	5		PB21C	5	
AF23	PB19D	5		PB21D	5	
AP27	PB22A	5		PB24A	5	
AP26	PB22B	5		PB24B	5	
AK25	PB22C	5		PB24C	5	
AK24	PB22D	5		PB24D	5	
AN25	PB25A	5		PB27A	5	
AN24	PB25B	5		PB27B	5	
AE22	PB25C	5		PB27C	5	
AE21	PB25D	5		PB27D	5	
AM26	PB26A	5		PB29A	5	
AM25	PB26B	5		PB29B	5	
AF22	PB26C	5		PB29C	5	

LFSC/M40, LFSC/M80 Logic Signal Connections: 1152 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M40			LFSC/M80		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
AF21	PB26D	5		PB29D	5	
AN23	PB27A	5		PB45A	5	
AN22	PB27B	5		PB45B	5	
AP23	PB29A	5		PB55A	5	
AP22	PB29B	5		PB55B	5	
AG21	PB29C	5		PB55C	5	
AG20	PB29D	5		PB55D	5	
AP25	PB30A	5	PCLKT5_3	PB48A	5	PCLKT5_3
AP24	PB30B	5	PCLKC5_3	PB48B	5	PCLKC5_3
AD21	PB30C	5	PCLKT5_4	PB48C	5	PCLKT5_4
AD20	PB30D	5	PCLKC5_4	PB48D	5	PCLKC5_4
AL23	PB31A	5	PCLKT5_5	PB49A	5	PCLKT5_5
AL22	PB31B	5	PCLKC5_5	PB49B	5	PCLKC5_5
AH24	PB31C	5		PB49C	5	
AH23	PB31D	5		PB49D	5	
AM23	PB33A	5	PCLKT5_0	PB51A	5	PCLKT5_0
AM22	PB33B	5	PCLKC5_0	PB51B	5	PCLKC5_0
AJ24	PB33C	5		PB51C	5	
AJ23	PB33D	5	VREF2_5	PB51D	5	VREF2_5
AN21	PB34A	5	PCLKT5_1	PB52A	5	PCLKT5_1
AN20	PB34B	5	PCLKC5_1	PB52B	5	PCLKC5_1
AE19	PB34C	5	PCLKT5_6	PB52C	5	PCLKT5_6
AD19	PB34D	5	PCLKC5_6	PB52D	5	PCLKC5_6
AK21	PB35A	5	PCLKT5_2	PB53A	5	PCLKT5_2
AK20	PB35B	5	PCLKC5_2	PB53B	5	PCLKC5_2
AK23	PB35C	5	PCLKT5_7	PB53C	5	PCLKT5_7
AK22	PB35D	5	PCLKC5_7	PB53D	5	PCLKC5_7
AL20	PB37A	5		PB56A	5	
AL19	PB37B	5		PB56B	5	
AG19	PB37C	5		PB56C	5	
AF19	PB37D	5		PB56D	5	
AP21	PB38A	5		PB57A	5	
AP20	PB38B	5		PB57B	5	
AH21	PB38C	5		PB57C	5	
AH20	PB38D	5		PB57D	5	
AM20	PB39A	5		PB59A	5	
AM19	PB39B	5		PB59B	5	
AJ21	PB39C	5		PB59C	5	
AJ20	PB39D	5		PB59D	5	
AK19	PB41A	5		PB60A	5	
AK18	PB41B	5		PB60B	5	
AE18	PB41C	5		PB60C	5	
AD18	PB41D	5		PB60D	5	
AN19	PB42A	5		PB61A	5	
AN18	PB42B	5		PB61B	5	

LFSC/M40, LFSC/M80 Logic Signal Connections: 1152 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M40			LFSC/M80		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
L1	PR31A	2		PR43A	2	
T10	PR30D	2		PR42D	2	
U10	PR30C	2		PR42C	2	
N2	PR30B	2		PR42B	2	
M2	PR30A	2		PR42A	2	
R11	PR29D	2		PR37D	2	
P11	PR29C	2		PR37C	2	
N4	PR29B	2		PR37B	2	
M4	PR29A	2		PR37A	2	
N5	PR27D	2		PR35D	2	
M5	PR27C	2		PR35C	2	
L2	PR27B	2		PR35B	2	
K2	PR27A	2		PR35A	2	
P8	PR26D	2		PR33D	2	
N8	PR26C	2		PR33C	2	
J2	PR26B	2		PR33B	2	
H2	PR26A	2		PR33A	2	
M6	PR25D	2		PR31D	2	
L6	PR25C	2		PR31C	2	
K3	PR25B	2		PR31B	2	
J3	PR25A	2		PR31A	2	
M8	PR23D	2	DIFFR_2	PR29D	2	DIFFR_2
L8	PR23C	2	VREF1_2	PR29C	2	VREF1_2
K4	PR23B	2		PR29B	2	
J4	PR23A	2		PR29A	2	
M7	PR22D	2		PR21D	2	
L7	PR22C	2		PR21C	2	
J5	PR22B	2		PR21B	2	
H5	PR22A	2		PR21A	2	
N9	PR21D	2		PR20D	2	
P9	PR21C	2		PR20C	2	
G3	PR21B	2		PR20B	2	
F3	PR21A	2		PR20A	2	
J6	PR18D	2	VREF2_2	PR18D	2	VREF2_2
H6	PR18C	2		PR18C	2	
E2	PR18B	2	URC_DLLC_IN_D/URC_DLLC_FB_C	PR18B	2	URC_DLLC_IN_D/URC_DLLC_FB_C
D2	PR18A	2	URC_DLLT_IN_D/URC_DLLT_FB_C	PR18A	2	URC_DLLT_IN_D/URC_DLLT_FB_C
P10	PR17D	2	URC_PLLC_IN_B/URC_PLLC_FB_A	PR17D	2	URC_PLLC_IN_B/URC_PLLC_FB_A
N10	PR17C	2	URC_PLLT_IN_B/URC_PLLT_FB_A	PR17C	2	URC_PLLT_IN_B/URC_PLLT_FB_A
G4	PR17B	2	URC_DLLC_IN_C/URC_DLLC_FB_D	PR17B	2	URC_DLLC_IN_C/URC_DLLC_FB_D
F4	PR17A	2	URC_DLLT_IN_C/URC_DLLT_FB_D	PR17A	2	URC_DLLT_IN_C/URC_DLLT_FB_D
J7	PR16D	2		PR16D	2	
H7	PR16C	2		PR16C	2	
G5	PR16B	2	URC_PLLC_IN_A/URC_PLLC_FB_B	PR16B	2	URC_PLLC_IN_A/URC_PLLC_FB_B
F5	PR16A	2	URC_PLLT_IN_A/URC_PLLT_FB_B	PR16A	2	URC_PLLT_IN_A/URC_PLLT_FB_B

LFSC/M115 Logic Signal Connections: 1152 fcBGA[1, 2]

Ball Number	LFSC/M115		
	Ball Function	VCCIO Bank	Dual Function
U22	VCCAUX	-	
V13	VCCAUX	-	
V22	VCCAUX	-	
V23	VCCAUX	-	
W13	VCCAUX	-	
W22	VCCAUX	-	
Y21	GND	-	
Y25	GND	-	
C18	VCCIO1	-	
D17	VCCIO1	-	
F16	VCCIO1	-	
G19	VCCIO1	-	
J20	VCCIO1	-	
K12	VCCIO1	-	
K15	VCCIO1	-	
L23	VCCIO1	-	
Y9	GND	-	
J9	VCCIO1	-	
E3	VCCIO2	-	
G6	VCCIO2	-	
H4	VCCIO2	-	
K7	VCCIO2	-	
L3	VCCIO2	-	
M11	VCCIO2	-	
N6	VCCIO2	-	
P4	VCCIO2	-	
R9	VCCIO2	-	
AA3	VCCIO3	-	
AB7	VCCIO3	-	
AC10	VCCIO3	-	
AD4	VCCIO3	-	
AE6	VCCIO3	-	
AG3	VCCIO3	-	
AK4	VCCIO3	-	
T7	VCCIO3	-	
U3	VCCIO3	-	
V4	VCCIO3	-	
W6	VCCIO3	-	
Y10	VCCIO3	-	
AD12	VCCIO4	-	
AF15	VCCIO4	-	
AF9	VCCIO4	-	
AH10	VCCIO4	-	

LFSC/M80, LFSC/M115 Logic Signal Connections: 1704 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M80			LFSC/M115		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
AP8	PB117D	4		PB131D	4	
AY3	PB119A	4		PB133A	4	
AW3	PB119B	4		PB133B	4	
AR6	PB119C	4		PB133C	4	
AR5	PB119D	4		PB133D	4	
AU5	PB120A	4		PB134A	4	
AV5	PB120B	4		PB134B	4	
AL12	PB120C	4		PB134C	4	
AL11	PB120D	4		PB134D	4	
AV3	PB121A	4		PB135A	4	
AV4	PB121B	4		PB135B	4	
AN9	PB121C	4		PB135C	4	
AN8	PB121D	4		PB135D	4	
AW1	PB123A	4		PB138A	4	
AY1	PB123B	4		PB138B	4	
AK14	PB123C	4	VREF1_4	PB138C	4	VREF1_4
AK13	PB123D	4		PB138D	4	
AV2	PB124A	4	LRC_DLLT_IN_C/LRC_DLLT_FB_D	PB139A	4	LRC_DLLT_IN_C/LRC_DLLT_FB_D
AW2	PB124B	4	LRC_DLLC_IN_C/LRC_DLLC_FB_D	PB139B	4	LRC_DLLC_IN_C/LRC_DLLC_FB_D
AM10	PB124C	4		PB139C	4	
AM9	PB124D	4		PB139D	4	
AV1	PB125A	4	LRC_PLLT_IN_A/LRC_PLLT_FB_B	PB141A	4	LRC_PLLT_IN_A/LRC_PLLT_FB_B
AU1	PB125B	4	LRC_PLLC_IN_A/LRC_PLLC_FB_B	PB141B	4	LRC_PLLC_IN_A/LRC_PLLC_FB_B
AL10	PB125C	4	LRC_DLLT_IN_D/LRC_DLLT_FB_C	PB141C	4	LRC_DLLT_IN_D/LRC_DLLT_FB_C
AL9	PB125D	4	LRC_DLLC_IN_D/LRC_DLLC_FB_C	PB141D	4	LRC_DLLC_IN_D/LRC_DLLC_FB_C
AT3	PROBE_VCC	-		PROBE_VCC	-	
AU2	PROBE_GND	-		PROBE_GND	-	
AP7	PR95D	3	LRC_PLLC_IN_B/LRC_PLLC_FB_A	PR117D	3	LRC_PLLC_IN_B/LRC_PLLC_FB_A
AN7	PR95C	3	LRC_PLLT_IN_B/LRC_PLLT_FB_A	PR117C	3	LRC_PLLT_IN_B/LRC_PLLT_FB_A
AR3	PR95B	3	LRC_DLLC_IN_F/LRC_DLLC_FB_E	PR117B	3	LRC_DLLC_IN_F/LRC_DLLC_FB_E
AR4	PR95A	3	LRC_DLLT_IN_F/LRC_DLLT_FB_E	PR117A	3	LRC_DLLT_IN_F/LRC_DLLT_FB_E
AP6	PR94D	3		PR116D	3	
AN6	PR94C	3		PR116C	3	
AT2	PR94B	3		PR116B	3	
AR2	PR94A	3		PR116A	3	
AM6	PR93D	3	LRC_DLLC_IN_E/LRC_DLLC_FB_F	PR115D	3	LRC_DLLC_IN_E/LRC_DLLC_FB_F
AL6	PR93C	3	LRC_DLLT_IN_E/LRC_DLLT_FB_F	PR115C	3	LRC_DLLT_IN_E/LRC_DLLT_FB_F
AP5	PR93B	3		PR115B	3	
AN5	PR93A	3		PR115A	3	
AL8	PR91D	3		PR112D	3	
AK8	PR91C	3		PR112C	3	
AP2	PR91B	3		PR112B	3	
AN2	PR91A	3		PR112A	3	
AJ12	PR90D	3		PR109D	3	
AH12	PR90C	3		PR109C	3	

LFSC/M80, LFSC/M115 Logic Signal Connections: 1704 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M80			LFSC/M115		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
D32	C_HDINP1_L	-	PCS 362 CH 1 IN P	C_HDINP1_L	-	PCS 362 CH 1 IN P
E32	C_HDINN1_L	-	PCS 362 CH 1 IN N	C_HDINN1_L	-	PCS 362 CH 1 IN N
B31	C_HDOUTP1_L	-	PCS 362 CH 1 OUT P	C_HDOUTP1_L	-	PCS 362 CH 1 OUT P
K32	VCC12	-		VCC12	-	
A31	C_HDOUTN1_L	-	PCS 362 CH 1 OUT N	C_HDOUTN1_L	-	PCS 362 CH 1 OUT N
L32	C_VDDOB1_L	-		C_VDDOB1_L	-	
A32	C_HDOUTN0_L	-	PCS 362 CH 0 OUT N	C_HDOUTN0_L	-	PCS 362 CH 0 OUT N
M31	C_VDDOB0_L	-		C_VDDOB0_L	-	
B32	C_HDOUTP0_L	-	PCS 362 CH 0 OUT P	C_HDOUTP0_L	-	PCS 362 CH 0 OUT P
H37	VCC12	-		VCC12	-	
E33	C_HDINN0_L	-	PCS 362 CH 0 IN N	C_HDINN0_L	-	PCS 362 CH 0 IN N
D33	C_HDINP0_L	-	PCS 362 CH 0 IN P	C_HDINP0_L	-	PCS 362 CH 0 IN P
G31	C_VDDIB0_L	-		C_VDDIB0_L	-	
J29	VCC12	-		VCC12	-	
L29	B_REFCLKP_L	-		B_REFCLKP_L	-	
M29	B_REFCLKN_L	-		B_REFCLKN_L	-	
J31	VCC12	-		VCC12	-	
H31	B_VDDIB3_L	-		B_VDDIB3_L	-	
J30	VCC12	-		VCC12	-	
D34	B_HDINP3_L	-	PCS 361 CH 3 IN P	B_HDINP3_L	-	PCS 361 CH 3 IN P
E34	B_HDINN3_L	-	PCS 361 CH 3 IN N	B_HDINN3_L	-	PCS 361 CH 3 IN N
B33	B_HDOUTP3_L	-	PCS 361 CH 3 OUT P	B_HDOUTP3_L	-	PCS 361 CH 3 OUT P
H38	VCC12	-		VCC12	-	
A33	B_HDOUTN3_L	-	PCS 361 CH 3 OUT N	B_HDOUTN3_L	-	PCS 361 CH 3 OUT N
C38	B_VDDOB3_L	-		B_VDDOB3_L	-	
A34	B_HDOUTN2_L	-	PCS 361 CH 2 OUT N	B_HDOUTN2_L	-	PCS 361 CH 2 OUT N
L31	B_VDDOB2_L	-		B_VDDOB2_L	-	
B34	B_HDOUTP2_L	-	PCS 361 CH 2 OUT P	B_HDOUTP2_L	-	PCS 361 CH 2 OUT P
G38	VCC12	-		VCC12	-	
E35	B_HDINN2_L	-	PCS 361 CH 2 IN N	B_HDINN2_L	-	PCS 361 CH 2 IN N
D35	B_HDINP2_L	-	PCS 361 CH 2 IN P	B_HDINP2_L	-	PCS 361 CH 2 IN P
H32	B_VDDIB2_L	-		B_VDDIB2_L	-	
K29	VCC12	-		VCC12	-	
K30	B_VDDIB1_L	-		B_VDDIB1_L	-	
F33	VCC12	-		VCC12	-	
D36	B_HDINP1_L	-	PCS 361 CH 1 IN P	B_HDINP1_L	-	PCS 361 CH 1 IN P
E36	B_HDINN1_L	-	PCS 361 CH 1 IN N	B_HDINN1_L	-	PCS 361 CH 1 IN N
B35	B_HDOUTP1_L	-	PCS 361 CH 1 OUT P	B_HDOUTP1_L	-	PCS 361 CH 1 OUT P
L34	VCC12	-		VCC12	-	
A35	B_HDOUTN1_L	-	PCS 361 CH 1 OUT N	B_HDOUTN1_L	-	PCS 361 CH 1 OUT N
K35	B_VDDOB1_L	-		B_VDDOB1_L	-	
A36	B_HDOUTN0_L	-	PCS 361 CH 0 OUT N	B_HDOUTN0_L	-	PCS 361 CH 0 OUT N
G39	B_VDDOB0_L	-		B_VDDOB0_L	-	
B36	B_HDOUTP0_L	-	PCS 361 CH 0 OUT P	B_HDOUTP0_L	-	PCS 361 CH 0 OUT P
J35	VCC12	-		VCC12	-	

LFSC/M80, LFSC/M115 Logic Signal Connections: 1704 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M80			LFSC/M115		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
AC24	GND	-		GND	-	
AC26	GND	-		GND	-	
AC35	GND	-		GND	-	
AC8	GND	-		GND	-	
AD12	GND	-		GND	-	
AD16	GND	-		GND	-	
AD18	GND	-		GND	-	
AD20	GND	-		GND	-	
AD23	GND	-		GND	-	
AD25	GND	-		GND	-	
AD27	GND	-		GND	-	
AD31	GND	-		GND	-	
AE17	GND	-		GND	-	
AE19	GND	-		GND	-	
AE24	GND	-		GND	-	
AE26	GND	-		GND	-	
AE3	GND	-		GND	-	
AE39	GND	-		GND	-	
AF18	GND	-		GND	-	
AF20	GND	-		GND	-	
AF23	GND	-		GND	-	
AF25	GND	-		GND	-	
AF36	GND	-		GND	-	
AF7	GND	-		GND	-	
AG11	GND	-		GND	-	
AG16	GND	-		GND	-	
AG19	GND	-		GND	-	
AG24	GND	-		GND	-	
AG27	GND	-		GND	-	
AG32	GND	-		GND	-	
AH15	GND	-		GND	-	
AH28	GND	-		GND	-	
AH4	GND	-		GND	-	
AH40	GND	-		GND	-	
AJ35	GND	-		GND	-	
AJ8	GND	-		GND	-	
AK12	GND	-		GND	-	
AK31	GND	-		GND	-	
AL13	GND	-		GND	-	
AL19	GND	-		GND	-	
AL24	GND	-		GND	-	
AL3	GND	-		GND	-	
AL30	GND	-		GND	-	
AL39	GND	-		GND	-	
AM16	GND	-		GND	-	

LFSC/M80, LFSC/M115 Logic Signal Connections: 1704 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M80			LFSC/M115		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
AB25	VCC	-		VCC	-	
AB26	VCC	-		VCC	-	
AC16	VCC	-		VCC	-	
AC18	VCC	-		VCC	-	
AC20	VCC	-		VCC	-	
AC23	VCC	-		VCC	-	
AC25	VCC	-		VCC	-	
AC27	VCC	-		VCC	-	
AD17	VCC	-		VCC	-	
AD19	VCC	-		VCC	-	
AD21	VCC	-		VCC	-	
AD22	VCC	-		VCC	-	
AD24	VCC	-		VCC	-	
AD26	VCC	-		VCC	-	
AE16	VCC	-		VCC	-	
AE18	VCC	-		VCC	-	
AE20	VCC	-		VCC	-	
AE21	VCC	-		VCC	-	
AE22	VCC	-		VCC	-	
AE23	VCC	-		VCC	-	
AE25	VCC	-		VCC	-	
AE27	VCC	-		VCC	-	
AF17	VCC	-		VCC	-	
AF19	VCC	-		VCC	-	
AF21	VCC	-		VCC	-	
AF22	VCC	-		VCC	-	
AF24	VCC	-		VCC	-	
AF26	VCC	-		VCC	-	
AG18	VCC	-		VCC	-	
AG20	VCC	-		VCC	-	
AG23	VCC	-		VCC	-	
AG25	VCC	-		VCC	-	
T18	VCC	-		VCC	-	
T20	VCC	-		VCC	-	
T23	VCC	-		VCC	-	
T25	VCC	-		VCC	-	
U17	VCC	-		VCC	-	
U19	VCC	-		VCC	-	
U21	VCC	-		VCC	-	
U22	VCC	-		VCC	-	
U24	VCC	-		VCC	-	
U26	VCC	-		VCC	-	
V16	VCC	-		VCC	-	
V18	VCC	-		VCC	-	
V20	VCC	-		VCC	-	

LFSC/M80, LFSC/M115 Logic Signal Connections: 1704 fcBGA[1, 2] (Cont.)

Ball Number	LFSC/M80			LFSC/M115		
	Ball Function	VCCIO Bank	Dual Function	Ball Function	VCCIO Bank	Dual Function
V21	VCC	-		VCC	-	
V22	VCC	-		VCC	-	
V23	VCC	-		VCC	-	
V25	VCC	-		VCC	-	
V27	VCC	-		VCC	-	
W17	VCC	-		VCC	-	
W19	VCC	-		VCC	-	
W21	VCC	-		VCC	-	
W22	VCC	-		VCC	-	
W24	VCC	-		VCC	-	
W26	VCC	-		VCC	-	
Y16	VCC	-		VCC	-	
Y18	VCC	-		VCC	-	
Y20	VCC	-		VCC	-	
Y23	VCC	-		VCC	-	
Y25	VCC	-		VCC	-	
Y27	VCC	-		VCC	-	
AG22	VCC12	-		VCC12	-	
AG26	VCC12	-		VCC12	-	
T17	VCC12	-		VCC12	-	
T21	VCC12	-		VCC12	-	
T22	VCC12	-		VCC12	-	
T26	VCC12	-		VCC12	-	
U16	VCC12	-		VCC12	-	
U27	VCC12	-		VCC12	-	
AC15	VCCAUX	-		VCCAUX	-	
AC28	VCCAUX	-		VCCAUX	-	
AD15	VCCAUX	-		VCCAUX	-	
AD28	VCCAUX	-		VCCAUX	-	
AE15	VCCAUX	-		VCCAUX	-	
AE28	VCCAUX	-		VCCAUX	-	
AF15	VCCAUX	-		VCCAUX	-	
AF28	VCCAUX	-		VCCAUX	-	
AG15	VCCAUX	-		VCCAUX	-	
AG28	VCCAUX	-		VCCAUX	-	
AH14	VCCAUX	-		VCCAUX	-	
AH16	VCCAUX	-		VCCAUX	-	
AH17	VCCAUX	-		VCCAUX	-	
AH18	VCCAUX	-		VCCAUX	-	
AH19	VCCAUX	-		VCCAUX	-	
AH20	VCCAUX	-		VCCAUX	-	
AH23	VCCAUX	-		VCCAUX	-	
AH24	VCCAUX	-		VCCAUX	-	
AH25	VCCAUX	-		VCCAUX	-	
AH26	VCCAUX	-		VCCAUX	-	

Industrial, Cont.

Part Number	Grade	Package	Balls	Temp.	LUTs (K)
LFSC3GA115E-6FCN1152I[1]	-6	Lead-Free Ceramic fcBGA	1152	IND	115.2
LFSC3GA115E-5FCN1152I[1]	-5	Lead-Free Ceramic fcBGA	1152	IND	115.2
LFSC3GA115E-6FFN1152I	-6	Lead-Free Organic fcBGA	1152	IND	115.2
LFSC3GA115E-5FFN1152I	-5	Lead-Free Organic fcBGA	1152	IND	115.2
LFSC3GA115E-6FCN1704I[1]	-6	Lead-Free Ceramic fcBGA	1704	IND	115.2
LFSC3GA115E-5FCN1704I[1]	-5	Lead-Free Ceramic fcBGA	1704	IND	115.2
LFSC3GA115E-6FFN1704I	-6	Lead-Free Organic fcBGA	1704	IND	115.2
LFSC3GA115E-5FFN1704I	-5	Lead-Free Organic fcBGA	1704	IND	115.2

1. Converted to organic flip-chip BGA package per PCN #01A-10.

Part Number	Grade	Package	Balls	Temp.	LUTs (K)
LFSCM3GA115EP1-6FCN1152I[1]	-6	Lead-Free Ceramic fcBGA	1152	IND	115.2
LFSCM3GA115EP1-5FCN1152I[1]	-5	Lead-Free Ceramic fcBGA	1152	IND	115.2
LFSCM3GA115EP1-6FFN1152I	-6	Lead-Free Organic fcBGA	1152	IND	115.2
LFSCM3GA115EP1-5FFN1152I	-5	Lead-Free Organic fcBGA	1152	IND	115.2
LFSCM3GA115EP1-6FCN1704I[1]	-6	Lead-Free Ceramic fcBGA	1704	IND	115.2
LFSCM3GA115EP1-5FCN1704I[1]	-5	Lead-Free Ceramic fcBGA	1704	IND	115.2
LFSCM3GA115EP1-6FFN1704I	-6	Lead-Free Organic fcBGA	1704	IND	115.2
LFSCM3GA115EP1-5FFN1704I	-5	Lead-Free Organic fcBGA	1704	IND	115.2

1. Converted to organic flip-chip BGA package per PCN #01A-10.