UC Davis ECE MSEE Thesis

DDR2 SDRAM SODIMM INTERPOSER BOARD

Micron
DDR2 SDRAM
SODIMM
Top Side of Board
MT16HTF25664H – 2GB

333MHz DDR
64-bit Data, 16-bit Address

Micron
DDR2 SDRAM
SODIMM
Bottom Side of Board
MT16HTF25664H – 2GB

Blue = Top-Side (Correct Decal)
Red = Bottom-Side (Wrong Decal)

VLSI Computation LAB

Title:	BLOCK DIAGRAM				
File:	SODIMM_INTERPOSER				
Created by:	JEREMY W. WEBB			Date:	9-21-2009_8:29
Modified by:				Date:	
PCB NO:	389	Size:	B	Sheet 1 of 4	REV: 3

A INDEX

SHEET/BLOCK	DESCRIPTION
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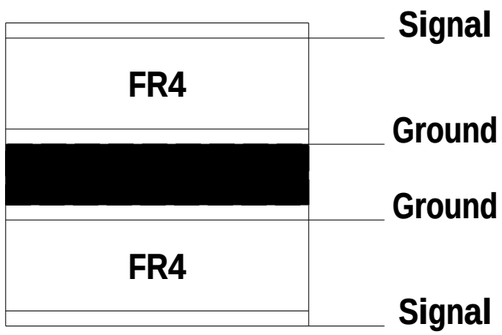
2	SCHEMATIC DESIGN SHEET INDEX
3	DDR2 SDRAM SODIMM - MT16HTF25664H – 2GB (TOP - SIDE)
4	DDR2 SDRAM SODIMM - MT16HTF25664H – 2GB (BOTTOM - SIDE)

B Board Stack-Up



VLSI Computation LAB

Title:	SCHEMATIC INDEX				
File:	SODIMM_INTERPOSER				
Created by:	JEREMY W. WEBB		Date:	9-21-2009_8:29	
Modified by:			Date:		
PCB NO:	389	Size: B	Sheet	2 of 4	REV: 3

DDR2 SDRAM SODIMM - MT16HTF25664H – 2GB (TOP - SIDE)

256 Meg x 64-bits

Provides between 1.024 GS and 1.280 GS storage of sampled data.

**** INPUTS ****

SDRAM Signals

3-C1,3-C2,3-C3,3-C4,3-D1 3-D2,3-D3,3-D4,3-E1 3-E4,4-C1,4-C2,4-C3 4-C4,4-D1,4-D2,4-D3 4-D4,4-E1,4-E4	FPGA_DDR2_SDRAM_DQ[63:0]
3-C2,3-D3,3-E1,3-E3,4-C2 4-D3,4-E1,4-E3	FPGA_DDR2_SDRAM_A[15:0]
3-C2,3-D3,3-E1,4-C2,4-D3 4-E1	FPGA_DDR2_SDRAM_BA[2:0]
3-D3,3-E1,4-D3,4-E1	FPGA_DDR2_SDRAM_RASN
3-D3,3-E1,4-D3,4-E1	FPGA_DDR2_SDRAM_CASN
3-D3,3-E1,4-D3,4-E1	FPGA_DDR2_SDRAM_WEN
3-C2,3-E1,4-C2,4-E1	FPGA_DDR2_SDRAM_CKE[1:0]
3-C1,3-C3,3-C4,3-D1,3-D2 3-D4,3-E1,3-E2,4-C1 4-C3,4-C4,4-D1,4-D2 4-D4,4-E1,4-E2	FPGA_DDR2_SDRAM_DQS[7:0]
3-C1,3-C3,3-C4,3-D1,3-D2 3-D4,3-E1,4-C1,4-C3 4-C4,4-D1,4-D2,4-D4 4-E1	FPGA_DDR2_SDRAM_DQSN_NC[7:0]
3-C1,3-D4,3-E1,4-C1,4-D4 4-E1	FPGA_DDR2_SDRAM_CK_P[1:0]
3-C1,3-D4,3-E1,4-C1,4-D4 4-E1	FPGA_DDR2_SDRAM_CK_N[1:0]
3-C1,3-C3,3-C4,3-D1,3-D2 3-D4,3-E1,3-E2,4-C1 4-C3,4-C4,4-D1,4-D2 4-D4,4-E1,4-E2	FPGA_DDR2_SDRAM_DM[7:0]
3-D1,3-D3,4-D1,4-D3	FPGA_DDR2_SDRAM_SN[1:0]
3-D1,3-D3,4-D1,4-D3	FPGA_DDR2_SDRAM_ODT[1:0]
3-C4,3-D1,4-C4,4-D1	FPGA_DDR2_SDRAM_SDA
3-C4,3-D1,4-C4,4-D1	FPGA_DDR2_SDRAM_SCL

U1 — MT16HTF12864H SODIMM Connector (1 of 9)

	P0V9D_SDRAM_VREF	1	VREF
		2	VSS_D0
		3	VSS_D1
FPGA_DDR2_SDRAM_DQ4		4	DQ4
FPGA_DDR2_SDRAM_DQ0		5	DQ0
FPGA_DDR2_SDRAM_DQ5		6	DQ5
FPGA_DDR2_SDRAM_DQ1		7	DQ1
		8	VSS_D2
		9	VSS_D3
FPGA_DDR2_SDRAM_DM0		10	DM0
FPGA_DDR2_SDRAM_DQSN_NC0		11	DQS0#
		12	VSS_D4
FPGA_DDR2_SDRAM_DQS0		13	DQS0
FPGA_DDR2_SDRAM_DQ6		14	DQ6
		15	VSS_D5
FPGA_DDR2_SDRAM_DQ7		16	DQ7
FPGA_DDR2_SDRAM_DQ2		17	DQ2
		18	VSS_D6
FPGA_DDR2_SDRAM_DQ3		19	DQ3
FPGA_DDR2_SDRAM_DQ12		20	DQ12
		21	VSS_D7
FPGA_DDR2_SDRAM_DQ13		22	DQ13
FPGA_DDR2_SDRAM_DQ8		23	DQ8
		24	VSS_D8
FPGA_DDR2_SDRAM_DQ9		25	DQ9

U1 — MT16HTF12864H SODIMM Connector (3 of 9)

FPGA_DDR2_SDRAM_DQS2		51	DQS2
FPGA_DDR2_SDRAM_DM2		52	DM2
		53	VSS_D0
		54	VSS_D1
FPGA_DDR2_SDRAM_DQ18		55	DQ18
FPGA_DDR2_SDRAM_DQ22		56	DQ22
FPGA_DDR2_SDRAM_DQ19		57	DQ19
FPGA_DDR2_SDRAM_DQ23		58	DQ23
		59	VSS_D2
		60	VSS_D3
FPGA_DDR2_SDRAM_DQ24		61	DQ24
FPGA_DDR2_SDRAM_DQ28		62	DQ28
FPGA_DDR2_SDRAM_DQ25		63	DQ25
FPGA_DDR2_SDRAM_DQ29		64	DQ29
		65	VSS_D4
		66	VSS_D5
FPGA_DDR2_SDRAM_DM3		67	DM3
FPGA_DDR2_SDRAM_DQSN_NC3		68	DQS3#
NC		69	NC_D0
FPGA_DDR2_SDRAM_DQS3		70	DQS3
		71	VSS_D6
		72	VSS_D7
FPGA_DDR2_SDRAM_DQ26		73	DQ26
FPGA_DDR2_SDRAM_DQ30		74	DQ30
FPGA_DDR2_SDRAM_DQ27		75	DQ27

U1 — MT16HTF12864H SODIMM Connector (5 of 9)

	P1V8D_SDRAM	101	A1
FPGA_DDR2_SDRAM_A0		102	A0
FPGA_DDR2_SDRAM_A1		103	VDD_D0
		104	VDD_D1
FPGA_DDR2_SDRAM_A10		105	A10/AP
FPGA_DDR2_SDRAM_BA1		106	BA1
FPGA_DDR2_SDRAM_BA0		107	BA0
FPGA_DDR2_SDRAM_RASN		108	RAS#
FPGA_DDR2_SDRAM_WEN		109	WE#
FPGA_DDR2_SDRAM_SN0		110	S0#
		111	VDD_D2
		112	VDD_D3
FPGA_DDR2_SDRAM_CASN		113	CAS#
FPGA_DDR2_SDRAM_ODT0		114	ODT0
FPGA_DDR2_SDRAM_SN1		115	S1#
FPGA_DDR2_SDRAM_A13		116	NC/A13
		117	VDD_D4
		118	VDD_D5
FPGA_DDR2_SDRAM_ODT1		119	ODT1
NC		120	NC_D0
		121	VSS_D0
		122	VSS_D1
FPGA_DDR2_SDRAM_DQ32		123	DQ32
FPGA_DDR2_SDRAM_DQ36		124	DQ36
FPGA_DDR2_SDRAM_DQ33		125	DQ33

U1 — MT16HTF12864H SODIMM Connector (7 of 9)

FPGA_DDR2_SDRAM_DQ42		151	DQ42
FPGA_DDR2_SDRAM_DQ46		152	DQ46
FPGA_DDR2_SDRAM_DQ43		153	DQ43
FPGA_DDR2_SDRAM_DQ47		154	DQ47
		155	VSS_D0
		156	VSS_D1
FPGA_DDR2_SDRAM_DQ48		157	DQ48
FPGA_DDR2_SDRAM_DQ52		158	DQ52
FPGA_DDR2_SDRAM_DQ49		159	DQ49
FPGA_DDR2_SDRAM_DQ53		160	DQ53
		161	VSS_D2
		162	VSS_D3
NC		163	NC_D0
FPGA_DDR2_SDRAM_CK_P1		164	CK1
		165	VSS_D4
FPGA_DDR2_SDRAM_CK_N1		166	CK1#
FPGA_DDR2_SDRAM_DQSN_NC6		167	DQS6#
		168	VSS_D5
FPGA_DDR2_SDRAM_DQS6		169	DQS6
FPGA_DDR2_SDRAM_DM6		170	DM6
		171	VSS_D6
		172	VSS_D7
FPGA_DDR2_SDRAM_DQ50		173	DQ50
FPGA_DDR2_SDRAM_DQ54		174	DQ54
FPGA_DDR2_SDRAM_DQ51		175	DQ51

U1 — MT16HTF12864H SODIMM Connector (9 of 9)

		201	PIN1
		202	PIN2
		203	PAD1
		204	PAD2

U1 — MT16HTF12864H SODIMM Connector (2 of 9)

FPGA_DDR2_SDRAM_DM1		26	DM1
		27	VSS_D0
		28	VSS_D1
FPGA_DDR2_SDRAM_DQSN_NC1		29	DQS1#
FPGA_DDR2_SDRAM_CK_P0		30	CK0
FPGA_DDR2_SDRAM_DQS1		31	DQS1
FPGA_DDR2_SDRAM_CK_N0		32	CK0#
		33	VSS_D2
		34	VSS_D3
FPGA_DDR2_SDRAM_DQ10		35	DQ10
FPGA_DDR2_SDRAM_DQ14		36	DQ14
FPGA_DDR2_SDRAM_DQ11		37	DQ11
FPGA_DDR2_SDRAM_DQ15		38	DQ15
		39	VSS_D4
		40	VSS_D5
		41	VSS_D6
		42	VSS_D7
FPGA_DDR2_SDRAM_DQ16		43	DQ16
FPGA_DDR2_SDRAM_DQ20		44	DQ20
FPGA_DDR2_SDRAM_DQ17		45	DQ17
FPGA_DDR2_SDRAM_DQ21		46	DQ21
		47	VSS_D8
		48	VSS_D9
FPGA_DDR2_SDRAM_DQSN_NC2		49	DQS2#
NC		50	NC_D0

U1 — MT16HTF12864H SODIMM Connector (4 of 9)

	P1V8D_SDRAM	76	DQ31
FPGA_DDR2_SDRAM_DQ31		77	VSS_D0
		78	VSS_D1
FPGA_DDR2_SDRAM_CKE0		79	CKE0
FPGA_DDR2_SDRAM_CKE1		80	CKE1
		81	VDD_D0
		82	VDD_D1
NC		83	NC_D0
FPGA_DDR2_SDRAM_A15		84	NC_D1
FPGA_DDR2_SDRAM_BA2		85	NC/BA2
FPGA_DDR2_SDRAM_A14		86	NC_D2
		87	VDD_D2
		88	VDD_D3
FPGA_DDR2_SDRAM_A12		89	A12
FPGA_DDR2_SDRAM_A11		90	A11
FPGA_DDR2_SDRAM_A9		91	A9
FPGA_DDR2_SDRAM_A7		92	A7
FPGA_DDR2_SDRAM_A8		93	A8
FPGA_DDR2_SDRAM_A6		94	A6
		95	VDD_D4
		96	VDD_D5
FPGA_DDR2_SDRAM_A5		97	A5
FPGA_DDR2_SDRAM_A4		98	A4
FPGA_DDR2_SDRAM_A3		99	A3
FPGA_DDR2_SDRAM_A2		100	A2

U1 — MT16HTF12864H SODIMM Connector (6 of 9)

FPGA_DDR2_SDRAM_DQ37		126	DQ37
		127	VSS_D0
		128	VSS_D1
FPGA_DDR2_SDRAM_DQSN_NC4		129	DQS4#
FPGA_DDR2_SDRAM_DM4		130	DM4
FPGA_DDR2_SDRAM_DQS4		131	DQS4
		132	VSS_D2
		133	VSS_D3
FPGA_DDR2_SDRAM_DQ38		134	DQ38
FPGA_DDR2_SDRAM_DQ34		135	DQ34
FPGA_DDR2_SDRAM_DQ39		136	DQ39
FPGA_DDR2_SDRAM_DQ35		137	DQ35
		138	VSS_D4
		139	VSS_D5
FPGA_DDR2_SDRAM_DQ44		140	DQ44
FPGA_DDR2_SDRAM_DQ40		141	DQ40
FPGA_DDR2_SDRAM_DQ45		142	DQ45
FPGA_DDR2_SDRAM_DQ41		143	DQ41
		144	VSS_D6
		145	VSS_D7
FPGA_DDR2_SDRAM_DQSN_NC5		146	DQS5#
FPGA_DDR2_SDRAM_DM5		147	DM5
FPGA_DDR2_SDRAM_DQS5		148	DQS5
		149	VSS_D8
		150	VSS_D9

U1 — MT16HTF12864H SODIMM Connector (8 of 9)

	P3V3D_SDRAM	176	DQ55
FPGA_DDR2_SDRAM_DQS5		177	VSS_D0
		178	VSS_D1
FPGA_DDR2_SDRAM_DQ56		179	DQ56
FPGA_DDR2_SDRAM_DQ60		180	DQ60
FPGA_DDR2_SDRAM_DQ57		181	DQ57
FPGA_DDR2_SDRAM_DQ61		182	DQ61
		183	VSS_D2
		184	VSS_D3
FPGA_DDR2_SDRAM_DM7		185	DM7
FPGA_DDR2_SDRAM_DQSN_NC7		186	DQS7#
		187	VSS_D4
FPGA_DDR2_SDRAM_DQS7		188	DQS7
FPGA_DDR2_SDRAM_DQS8		189	DQS8
		190	VSS_D5
FPGA_DDR2_SDRAM_DQ59		191	DQ59
FPGA_DDR2_SDRAM_DQ62		192	DQ62
		193	VSS_D6
FPGA_DDR2_SDRAM_DQ63		194	DQ63
FPGA_DDR2_SDRAM_SDA		195	SDA
		196	VSS_D7
FPGA_DDR2_SDRAM_SCL		197	SCL
		198	SA0
		199	VDDSPD
		200	SA1

VLSI Computation LAB

Title:	DDR2 SDRAM SODIMM - MT16HTF25664H – 2GB (TOP - SIDE)		
File:	SODIMM_INTERPOSER		
Created by:	JEREMY W. WEBB	Date:	9-21-2009_8:29
Modified by:		Date:	
PCB NO: 389	Size: E	Sheet 3 of 4	REV: 3

DDR2 SDRAM SODIMM - MT16HTF25664H – 2GB (BOTTOM - SIDE)

256 Meg x 64-bits

Provides between 1.024 GS and 1.280 GS storage of sampled data.

**** INPUTS ****

SDRAM Signals

- 3-C1,3-C2,3-C3,3-C4,3-D1 3-D2,3-D3,3-D4,3-E1 3-E4,4-C1,4-C2,4-C3 4-C4,4-D1,4-D2,4-D3 4-D4,4-E1,4-E4 — FPGA_DDR2_SDRAM_D0[63:0]
- 3-C2,3-D3,3-E1,3-E3,4-C2 4-D3,4-E1,4-E3 — FPGA_DDR2_SDRAM_A[15:0]
- 3-C2,3-D3,3-E1,4-C2,4-D3 4-E1 — FPGA_DDR2_SDRAM_BA[2:0]
- 3-D3,3-E1,4-D3,4-E1 — FPGA_DDR2_SDRAM_RASN
- 3-D3,3-E1,4-D3,4-E1 — FPGA_DDR2_SDRAM_CASN
- 3-D3,3-E1,4-D3,4-E1 — FPGA_DDR2_SDRAM_WEN
- 3-C2,3-E1,4-C2,4-E1 — FPGA_DDR2_SDRAM_CKE[1:0]
- 3-C1,3-C3,3-C4,3-D1,3-D2 3-D4,3-E1,3-E2,4-C1 4-C3,4-C4,4-D1,4-D2 4-D4,4-E1 — FPGA_DDR2_SDRAM_DQS[7:0]
- 3-C1,3-C3,3-C4,3-D1,3-D2 3-D4,3-E1,4-C1,4-C3 4-C4,4-D1,4-D2,4-D4 4-E1 — FPGA_DDR2_SDRAM_DQSN_NC[7:0]
- 3-C1,3-D4,3-E1,4-C1,4-D4 4-E1 — FPGA_DDR2_SDRAM_CK_P[1:0]
- 3-C1,3-D4,3-E1,4-C1,4-D4 4-E1 — FPGA_DDR2_SDRAM_CK_N[1:0]
- 3-C1,3-C3,3-C4,3-D1,3-D2 3-D4,3-E1,3-E2,4-C1 4-C3,4-C4,4-D1,4-D2 4-D4,4-E1,4-E2 — FPGA_DDR2_SDRAM_DM[7:0]
- 3-D1,3-D3,4-D1,4-D3 — FPGA_DDR2_SDRAM_SN1[1:0]
- 3-D1,3-D3,4-D1,4-D3 — FPGA_DDR2_SDRAM_ODT1[1:0]
- 3-C4,3-D1,4-C4,4-D1 — FPGA_DDR2_SDRAM_SDA
- 3-C4,3-D1,4-C4,4-D1 — FPGA_DDR2_SDRAM_SCL

U2 — MT16HTF12864H SODIMM Connector (1 of 9)

P0V9D_SDRAM_VREF

	1	VREF	
	2	VSS_D0	
	3	VSS_D1	
FPGA_DDR2_SDRAM_DQ4	4	DQ4	
FPGA_DDR2_SDRAM_DQ0	5	DQ0	
FPGA_DDR2_SDRAM_DQ5	6	DQ5	
FPGA_DDR2_SDRAM_DQ1	7	DQ1	
	8	VSS_D2	
	9	VSS_D3	
FPGA_DDR2_SDRAM_DM0	10	DM0	
FPGA_DDR2_SDRAM_DQSN_NC0	11	DQS0#	
	12	VSS_D4	
FPGA_DDR2_SDRAM_DQS0	13	DQS0	
FPGA_DDR2_SDRAM_DQ6	14	DQ6	
	15	VSS_D5	
FPGA_DDR2_SDRAM_DQ7	16	DQ7	
FPGA_DDR2_SDRAM_DQ2	17	DQ2	
	18	VSS_D6	
FPGA_DDR2_SDRAM_DQ3	19	DQ3	
FPGA_DDR2_SDRAM_DQ12	20	DQ12	
	21	VSS_D7	
FPGA_DDR2_SDRAM_DQ13	22	DQ13	
FPGA_DDR2_SDRAM_DQ8	23	DQ8	
	24	VSS_D8	
FPGA_DDR2_SDRAM_DQ9	25	DQ9	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (3 of 9)

FPGA_DDR2_SDRAM_DQS2	51	DQS2	
FPGA_DDR2_SDRAM_DM2	52	DM2	
	53	VSS_D0	
	54	VSS_D1	
FPGA_DDR2_SDRAM_DQ18	55	DQ18	
FPGA_DDR2_SDRAM_DQ22	56	DQ22	
FPGA_DDR2_SDRAM_DQ19	57	DQ19	
FPGA_DDR2_SDRAM_DQ23	58	DQ23	
	59	VSS_D2	
	60	VSS_D3	
FPGA_DDR2_SDRAM_DQ24	61	DQ24	
FPGA_DDR2_SDRAM_DQ28	62	DQ28	
FPGA_DDR2_SDRAM_DQ25	63	DQ25	
FPGA_DDR2_SDRAM_DQ29	64	DQ29	
	65	VSS_D4	
	66	VSS_D5	
FPGA_DDR2_SDRAM_DM3	67	DM3	
FPGA_DDR2_SDRAM_DQSN_NC3	68	DQS3#	
NC	69	NC_D0	
FPGA_DDR2_SDRAM_DQS3	70	DQS3	
	71	VSS_D6	
	72	VSS_D7	
FPGA_DDR2_SDRAM_DQ26	73	DQ26	
FPGA_DDR2_SDRAM_DQ30	74	DQ30	
FPGA_DDR2_SDRAM_DQ27	75	DQ27	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (5 of 9)

P1V8D_SDRAM

FPGA_DDR2_SDRAM_A0	101	A1	
FPGA_DDR2_SDRAM_A1	102	A0	
	103	VDD_D0	
	104	VDD_D1	
FPGA_DDR2_SDRAM_A10	105	A10/AP	
FPGA_DDR2_SDRAM_BA1	106	BA1	
FPGA_DDR2_SDRAM_BA0	107	BA0	
FPGA_DDR2_SDRAM_RASN	108	RAS#	
FPGA_DDR2_SDRAM_WEN	109	WE#	
FPGA_DDR2_SDRAM_SN0	110	S0#	
	111	VDD_D2	
	112	VDD_D3	
FPGA_DDR2_SDRAM_CASN	113	CAS#	
FPGA_DDR2_SDRAM_ODT0	114	ODT0	
FPGA_DDR2_SDRAM_SN1	115	S1#	
FPGA_DDR2_SDRAM_A13	116	NC/A13	
	117	VDD_D4	
	118	VDD_D5	
FPGA_DDR2_SDRAM_ODT1	119	ODT1	
NC	120	NC_D0	
	121	VSS_D0	
	122	VSS_D1	
FPGA_DDR2_SDRAM_DQ32	123	DQ32	
FPGA_DDR2_SDRAM_DQ36	124	DQ36	
FPGA_DDR2_SDRAM_DQ33	125	DQ33	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (7 of 9)

FPGA_DDR2_SDRAM_DQ42	151	DQ42	
FPGA_DDR2_SDRAM_DQ46	152	DQ46	
FPGA_DDR2_SDRAM_DQ43	153	DQ43	
FPGA_DDR2_SDRAM_DQ47	154	DQ47	
	155	VSS_D0	
	156	VSS_D1	
FPGA_DDR2_SDRAM_DQ48	157	DQ48	
FPGA_DDR2_SDRAM_DQ52	158	DQ52	
FPGA_DDR2_SDRAM_DQ49	159	DQ49	
FPGA_DDR2_SDRAM_DQ53	160	DQ53	
	161	VSS_D2	
	162	VSS_D3	
NC	163	NC_D0	
FPGA_DDR2_SDRAM_CK_P1	164	CK1	
	165	VSS_D4	
FPGA_DDR2_SDRAM_CK_N1	166	CK1#	
FPGA_DDR2_SDRAM_DQSN_NC6	167	DQS6#	
	168	VSS_D5	
FPGA_DDR2_SDRAM_DQS6	169	DQS6	
FPGA_DDR2_SDRAM_DM6	170	DM6	
	171	VSS_D6	
	172	VSS_D7	
FPGA_DDR2_SDRAM_DQ50	173	DQ50	
FPGA_DDR2_SDRAM_DQ54	174	DQ54	
FPGA_DDR2_SDRAM_DQ51	175	DQ51	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (9 of 9)

201	PIN1	
202	PIN2	
203	PAD1	
204	PAD2	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (2 of 9)

FPGA_DDR2_SDRAM_DM1	26	DM1	
	27	VSS_D0	
	28	VSS_D1	
FPGA_DDR2_SDRAM_DQSN_NC1	29	DQS1#	
FPGA_DDR2_SDRAM_CK_P0	30	CK0	
FPGA_DDR2_SDRAM_DQS1	31	DQS1	
FPGA_DDR2_SDRAM_CK_N0	32	CK0#	
	33	VSS_D2	
	34	VSS_D3	
FPGA_DDR2_SDRAM_DQ10	35	DQ10	
FPGA_DDR2_SDRAM_DQ14	36	DQ14	
FPGA_DDR2_SDRAM_DQ11	37	DQ11	
FPGA_DDR2_SDRAM_DQ15	38	DQ15	
	39	VSS_D4	
	40	VSS_D5	
	41	VSS_D6	
	42	VSS_D7	
FPGA_DDR2_SDRAM_DQ16	43	DQ16	
FPGA_DDR2_SDRAM_DQ20	44	DQ20	
FPGA_DDR2_SDRAM_DQ17	45	DQ17	
FPGA_DDR2_SDRAM_DQ21	46	DQ21	
	47	VSS_D8	
	48	VSS_D9	
FPGA_DDR2_SDRAM_DQSN_NC2	49	DQS2#	
NC	50	NC_D0	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (4 of 9)

P1V8D_SDRAM

FPGA_DDR2_SDRAM_DQ31	76	DQ31	
	77	VSS_D0	
	78	VSS_D1	
FPGA_DDR2_SDRAM_CKE0	79	CKE0	
FPGA_DDR2_SDRAM_CKE1	80	CKE1	
	81	VDD_D0	
	82	VDD_D1	
NC	83	NC_D0	
FPGA_DDR2_SDRAM_A15	84	NC_D1	
FPGA_DDR2_SDRAM_BA2	85	NC/BA2	
FPGA_DDR2_SDRAM_A14	86	NC_D2	
	87	VDD_D2	
	88	VDD_D3	
FPGA_DDR2_SDRAM_A12	89	A12	
FPGA_DDR2_SDRAM_A11	90	A11	
FPGA_DDR2_SDRAM_A9	91	A9	
FPGA_DDR2_SDRAM_A7	92	A7	
FPGA_DDR2_SDRAM_A8	93	A8	
FPGA_DDR2_SDRAM_A6	94	A6	
	95	VDD_D4	
	96	VDD_D5	
FPGA_DDR2_SDRAM_A5	97	A5	
FPGA_DDR2_SDRAM_A4	98	A4	
FPGA_DDR2_SDRAM_A3	99	A3	
FPGA_DDR2_SDRAM_A2	100	A2	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (6 of 9)

FPGA_DDR2_SDRAM_DQ37	126	DQ37	
	127	VSS_D0	
	128	VSS_D1	
FPGA_DDR2_SDRAM_DQSN_NC4	129	DQS4#	
FPGA_DDR2_SDRAM_DM4	130	DM4	
FPGA_DDR2_SDRAM_DQS4	131	DQS4	
	132	VSS_D2	
	133	VSS_D3	
FPGA_DDR2_SDRAM_DQ38	134	DQ38	
FPGA_DDR2_SDRAM_DQ34	135	DQ34	
FPGA_DDR2_SDRAM_DQ39	136	DQ39	
FPGA_DDR2_SDRAM_DQ35	137	DQ35	
	138	VSS_D4	
	139	VSS_D5	
FPGA_DDR2_SDRAM_DQ44	140	DQ44	
FPGA_DDR2_SDRAM_DQ40	141	DQ40	
FPGA_DDR2_SDRAM_DQ45	142	DQ45	
FPGA_DDR2_SDRAM_DQ41	143	DQ41	
	144	VSS_D6	
	145	VSS_D7	
FPGA_DDR2_SDRAM_DQSN_NC5	146	DQS5#	
FPGA_DDR2_SDRAM_DM5	147	DM5	
FPGA_DDR2_SDRAM_DQS5	148	DQS5	
	149	VSS_D8	
	150	VSS_D9	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

U2 — MT16HTF12864H SODIMM Connector (8 of 9)

P3V3D_SDRAM

FPGA_DDR2_SDRAM_DQ55	176	DQ55	
	177	VSS_D0	
	178	VSS_D1	
FPGA_DDR2_SDRAM_DQ56	179	DQ56	
FPGA_DDR2_SDRAM_DQ60	180	DQ60	
FPGA_DDR2_SDRAM_DQ57	181	DQ57	
FPGA_DDR2_SDRAM_DQ61	182	DQ61	
	183	VSS_D2	
	184	VSS_D3	
FPGA_DDR2_SDRAM_DM7	185	DM7	
FPGA_DDR2_SDRAM_DQSN_NC7	186	DQS7#	
	187	VSS_D4	
FPGA_DDR2_SDRAM_DQS7	188	DQS7	
FPGA_DDR2_SDRAM_DQS8	189	DQS8	
	190	VSS_D5	
FPGA_DDR2_SDRAM_DQ59	191	DQ59	
FPGA_DDR2_SDRAM_DQ62	192	DQ62	
	193	VSS_D6	
FPGA_DDR2_SDRAM_DQ63	194	DQ63	
FPGA_DDR2_SDRAM_SDA	195	SDA	
	196	VSS_D7	
FPGA_DDR2_SDRAM_SCL	197	SCL	
	198	SA0	
	199	VDDSPD	
	200	SA1	

FOOTPRINT=MM50-200_MISSING_OFFSET_MIRRORED

VLSI Computation LAB

Title:	DDR2 SDRAM SODIMM - MT16HTF25664H – 2GB (BOTTOM - SIDE)				
File:	SODIMM_INTERPOSER				
Created by:	JEREMY W. WEBB		Date:	9-21-2009_8:29	
Modified by:			Date:		
PCB NO:	389	Size: E	Sheet	4 of 4	REV: 3