

LX21EVK01

Channel Link III Ser/Des

Evaluation Kit

Rev 1.0
Oct, 2010

General Description

The LX21EVK01 is designed to allow for easy evaluation of the DS92LX2121 and DS92LX2122 Channel Link III Ser/Des. This kit allows for 2 basic methods of evaluation:

- 1) Users may apply parallel clock, data and I2C commands, and evaluate the power, jitter and cable performance of the Ser/Des. Or,
- 2) Apply only a parallel clock and enable BIST mode. This allows the user to easily evaluate the serial link and check device feature functionality such as receive equalization, SSCG, etc.

The LX16EVK01 boards uses USB connectors as the serial Channel Link III inputs/outputs. SMA connectors can also be attached and configured for serial input/output if other types of the cable are desired.

Features

- 20 – 50 MHz support for up to 800 Mbps (default configuration)
- LVCMOS parallel interface: 21-bit data (default) + clock + 2 upstream GPIO
- High speed forward channel + bi-directional control channel + back channel GPIO serialized to 1 pair
- AC Coupled STP Interconnect up to 10 meters in length
- Selectable receive equalization, SSCG, and deserializer output slew rate
- Integrated serial terminations
- @ Speed link BIST Mode and reporting pin
- I2C compatible Serial Control Bus
- Power down mode minimizes power dissipation
- Randomized, DC-balanced and Scrambled data stream with CRC
- >8 kV HBM

Applications

- Industrial Displays
- Machine Vision
- Medical Imaging

Ordering Information

PART: LX21EVK01

Demo boards:

Tx: DS92LX2121-EVK

Rx: DS92LX2122-EVK

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Quick Start Guide:

DS92LX2121 Tx Board:

1. Connect 3.3V DC power and ground of the board to JP12 from the power supply (3.3V on left pin, ground on right pin). Connect 1.8V DC power and ground of the board to the J5 and J6 from the power supply respectively.
2. Attach the USB cable to the TX board (DS92LX2121) output and to an RX board (DS92LX2122) input.
3. Attach parallel data and clock to the TX board at connector J1. This is typically done with a flat ribbon cable (not supplied).

DS92LX2122 Rx Board

4. Connect 3.3V DC power and ground of the board to JP13 from the power supply (3.3V on left pin, ground on right pin). Connect 1.8V DC power and ground of the board to the J8 and J9 from the power supply respectively.
5. Attach the USB cable to the RX board (DS92LX2122) input from a TX board (DS92LX2121) output.
6. Attach parallel data and clock output to the RX board at connector J7. This is typically done with a flat ribbon cable (not supplied).

Jumpers and switches on both the TX and RX boards have been configured at the factory; they should not require any changes for immediate operation. See the datasheet for more details.

Tx Board Configuration Settings

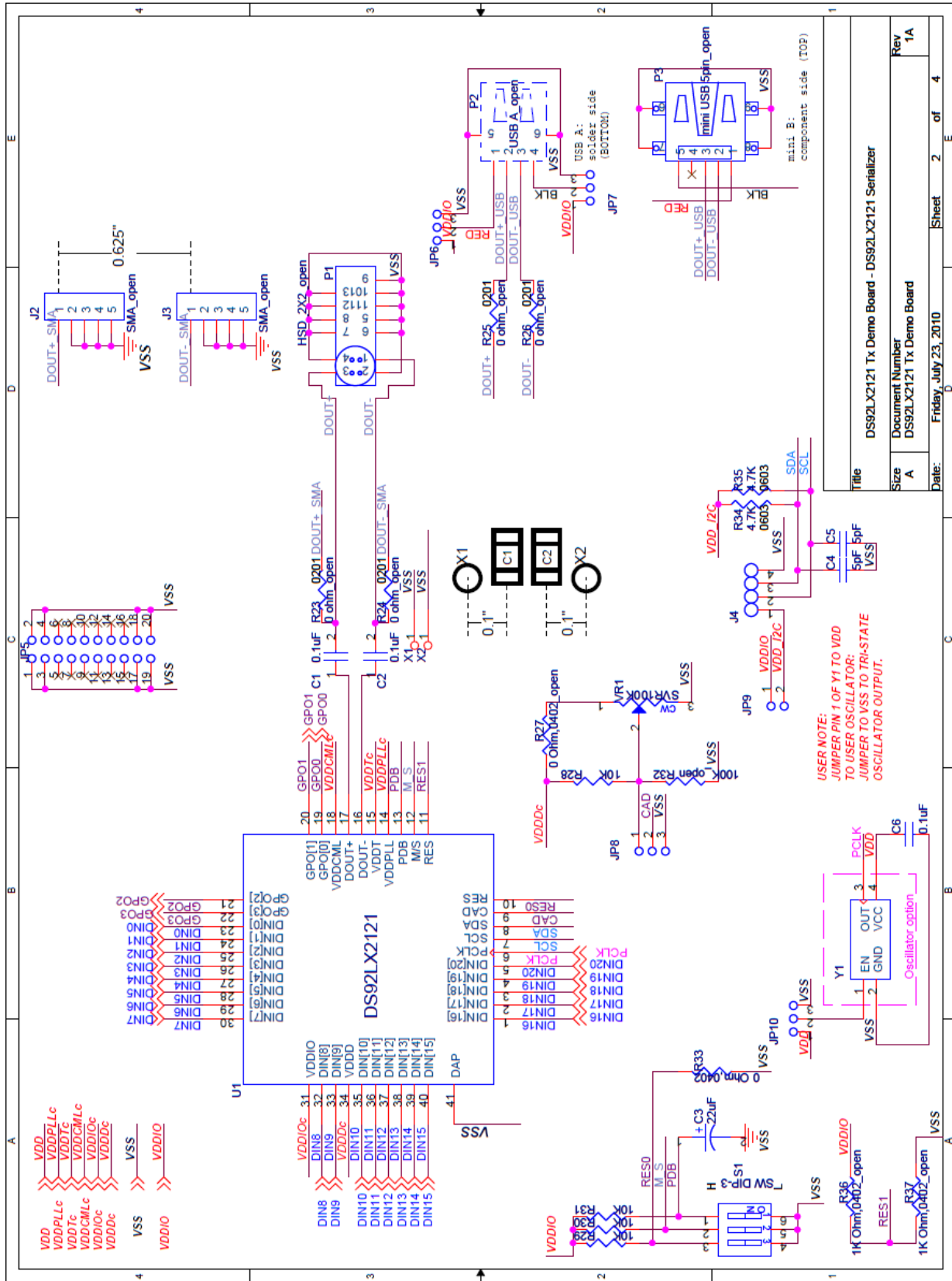
Component	Name	Function
Power Connections		
J8	5V DC	Optional 5V DC Power Jack. Note: unpopulated by default
J5	1.8V DC	1.8V VDD Power.
J6	VSS	Ground.
JP12	3.3V DC	3.3V VDD Power (left header pin), Ground (right header pin)
JP11	VDDIO	Input voltage select. Jumper set to 3.3V by default.
Input and Output Connections		
J1	44 position wall header (DIN0 – DIN20, PCLK)	Connect to data input.
JP1 - JP4	GPO0 - GPO3	Optional general purpose back channel data output
P2	USB Connector (Type-A Female)	Connect to Channel Link II output (default).
J2 and J3	SMA Connectors	Connect to Channel Link II output. Note: unpopulated by default
Control Connections		
S1:1	PDB	Power down mode input. PDB = H, Serializer is enabled (default) PDB = L, Serializer is in power-down mode
S1:2	M_S	I2C Mode Select. M_S = H, Slave Mode – device receives clock and data from local master M_S = L, Master Mode – device generates and drives the clock line
S1:3	RESO	Reserved. Keep set to LOW (default)
JP8 and VR1	CAD	Connect CAD pin to VSS to have the default device PHY address (default setting). Connect CAD pin to VR1 pin; then adjust VR4 value to select desired device PHY address. See datasheet for detailed information.
JP9 and J4	I2C Interface	Leave JP8 unconnected if I2C VDD is provided by an external source. (default).
Others		
JP6, JP7	Other options	Do not connect

Tx Board Bill of Materials

		HEADER			
13	1 J1	22X2	AMP/TYCO Johnson	3-87215-0	A26588-ND
14	2 J3,J2	SMA_open	Components Molex/Waldom Electronics	142-0701-851_open	J658-ND_open
15	1 J4	IDC1X4	Corp	22-11-2042	WM2702-ND
16	2 J5,J6	BANANA 2x4 pin	Johnson	108-0740-001	J147-ND
17	1 J7	Jumper_open CONN JACK	Molex	10-89-7082_open	WM26808-ND
18	1 J8	PWR_open HSD_2X2_op	CPU Inc	PJ-002A_open D4S20B-40ML5-	CP-002A-ND_open
19	1 P1	en	Rosenberger	Y_open	
20	1 P2	USB A mini USB	AMP/Tyco	292303-1	A31726-ND
21	1 P3 R1,R2,R3,R4,R5,R6,R7,R8, R9,R10,R11,R12,R13,R14, R15,R16,R17,R18,R19,R20	5pin_open	Hirose	UX60-MB-5ST_open	H2959CT-ND
22	21 ,R21	49.9ohm_open	Venkel	CR0201-20W-49R9FT_open	
23	1 R22	49.9ohm_open	Panasonic	ERJ-6ENF49R9V_open	P49.9CCT-ND
24	2 R23,R24	0 ohm_open		RES/CAP-AM0201	
24a	2 R25,R26	0 ohm		RES/CAP-AM0201	
		0 Ohm,0402_op			
25	1 R27	en	Panasonic	ERJ-2GEJ0R00X_open	P0.0JTR-ND_open
26	4 R28,R29,R30,R31	10K	Panasonic	ERJ-3EKF1002V	P10.0KHCT-ND P100KHCT-
27	1 R32	100K_open	Panasonic	ERJ-3EKF1003V_open	ND_open
28	5 R38,R40,R41,R43,R45	Ferrite Bead	Murata	BLM15AX102SN1D	490-5442-1-ND
28a	1 R33	0 Ohm,0402	Panasonic	ERJ-2GEJ0R00X	P0.0JTR-ND
29	2 R34,R35	1.0K	Panasonic	ERJ-3GEYJ102V	P1.0KGCT-ND

30	2	R36,R37	1K Ohm,0402_ope n	Panasonic	ERJ-2GEJ102X_open	P1.0KJCT-ND_open
31	2	R42,R39	82.5ohm_open	Panasonic	ERJ-3EKF82R5V_open	P82.5HCT-ND
32	1	R44	100ohm_open	Panasonic	ERJ-3EKF1000V_open	P100HCT-ND
33	1	S1	SW DIP-3	Grayhill	78B03ST	GH7182-ND
34	1	U1	DS92LX2121	National	DS92LX2121	
			LM1117IMP- ADJ/SOT223_o pen	National	LM1117IMP- ADJ/NOPB_open	LM1117IMP- ADJ/NOPB
35	2	U2,U3				
36	1	VR1	SVR100K	Bourns	3224W-1-104E	3224W-1-104ECT-ND
37	2	VR3,VR2	SVR100_open	Bourns	3214W-1-101E_open	3214W-101ETR-ND
38	2	X2,X1	TP_0402		TP_0402	
					ASFLM-BLANK- LC_open	
39	1	Y1	OSC4/SM			535-10059-5-ND_open

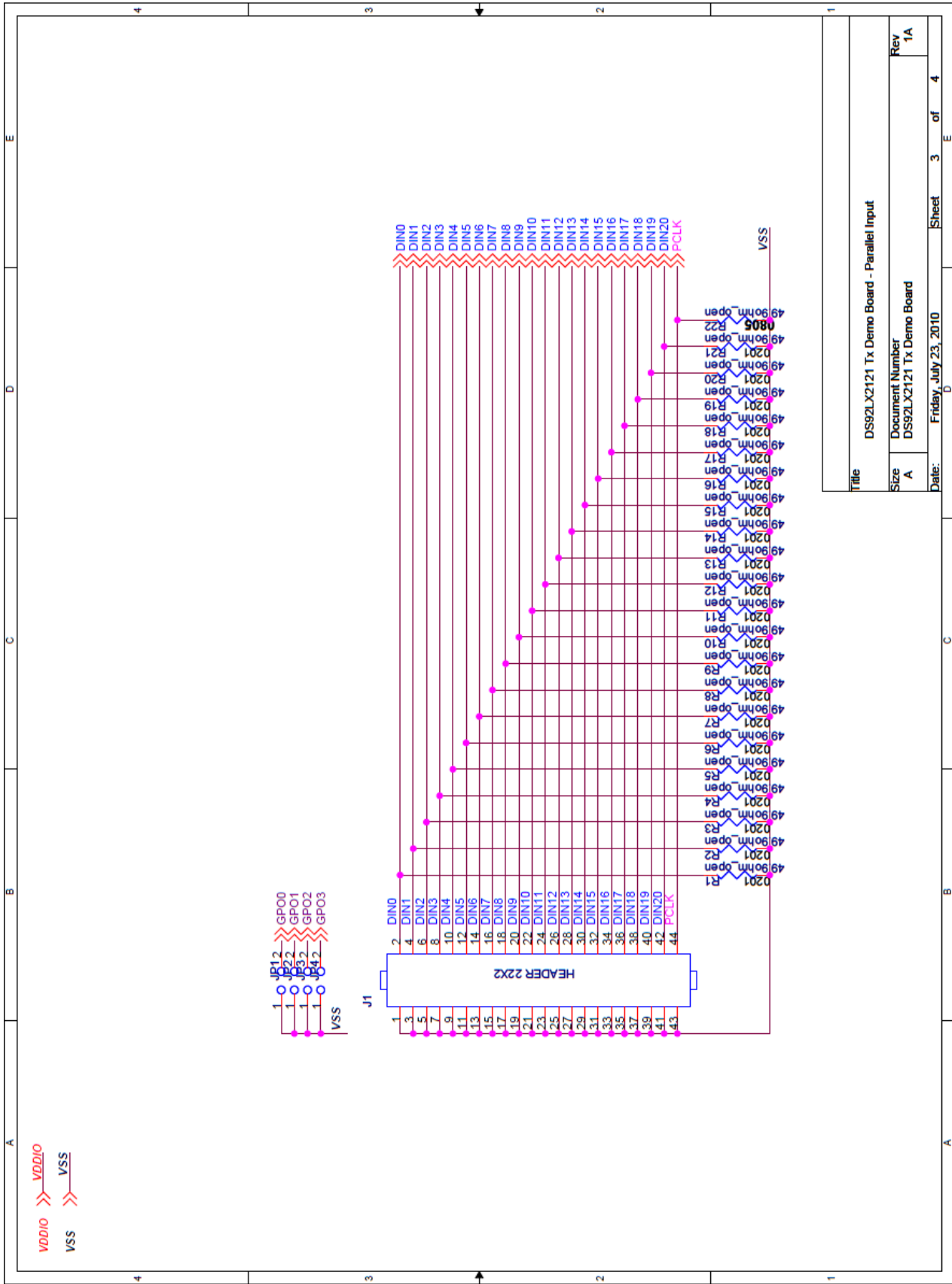
Tx Board Schematics



Title		DS92LX2121 Tx Demo Board - DS92LX2121 Serializer	
Size	A	Document Number	DS92LX2121 Tx Demo Board
Date:	Friday, July 23, 2010	Sheet	2 of 4
Rev	1A	component side (TOP)	

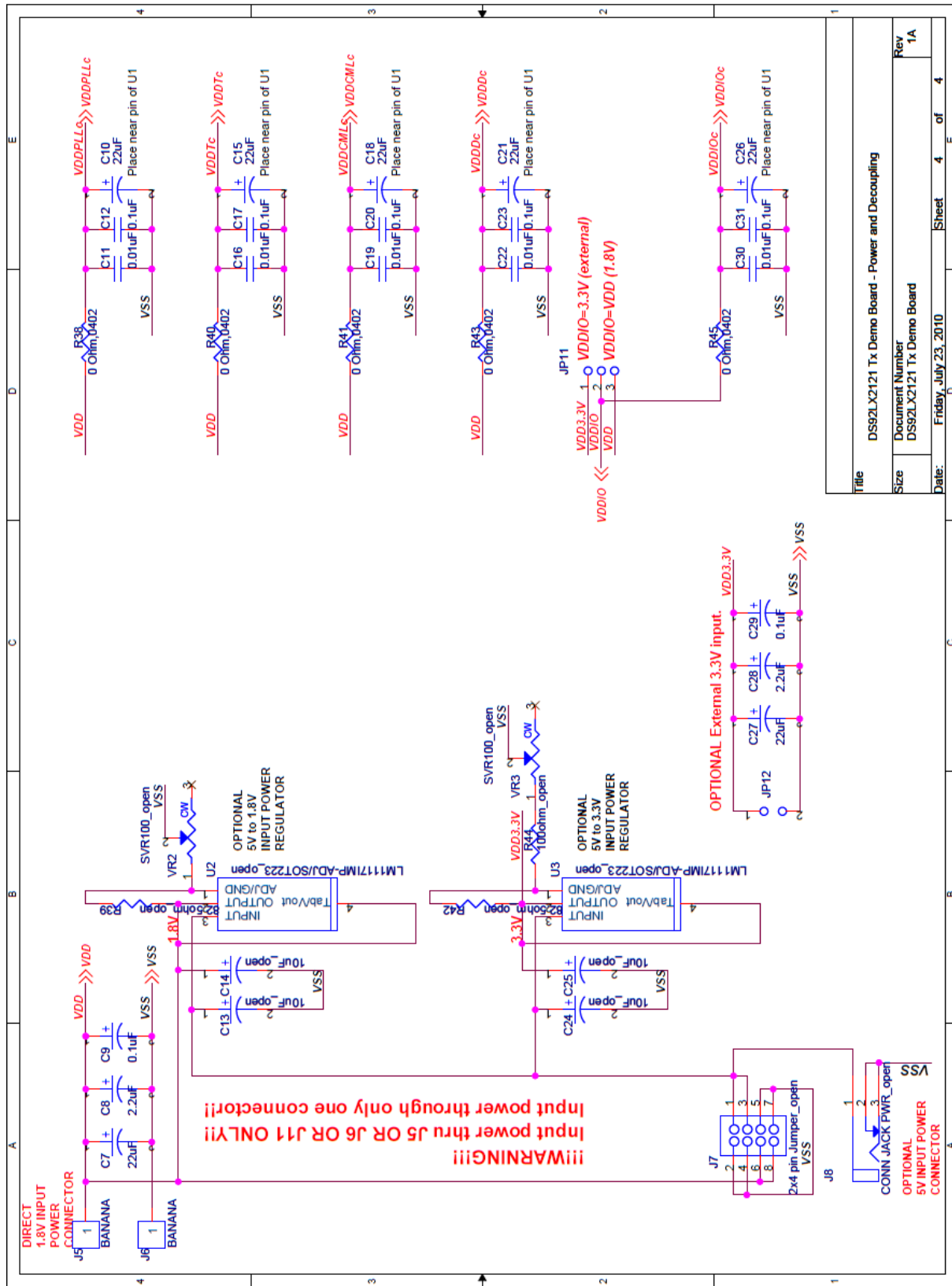
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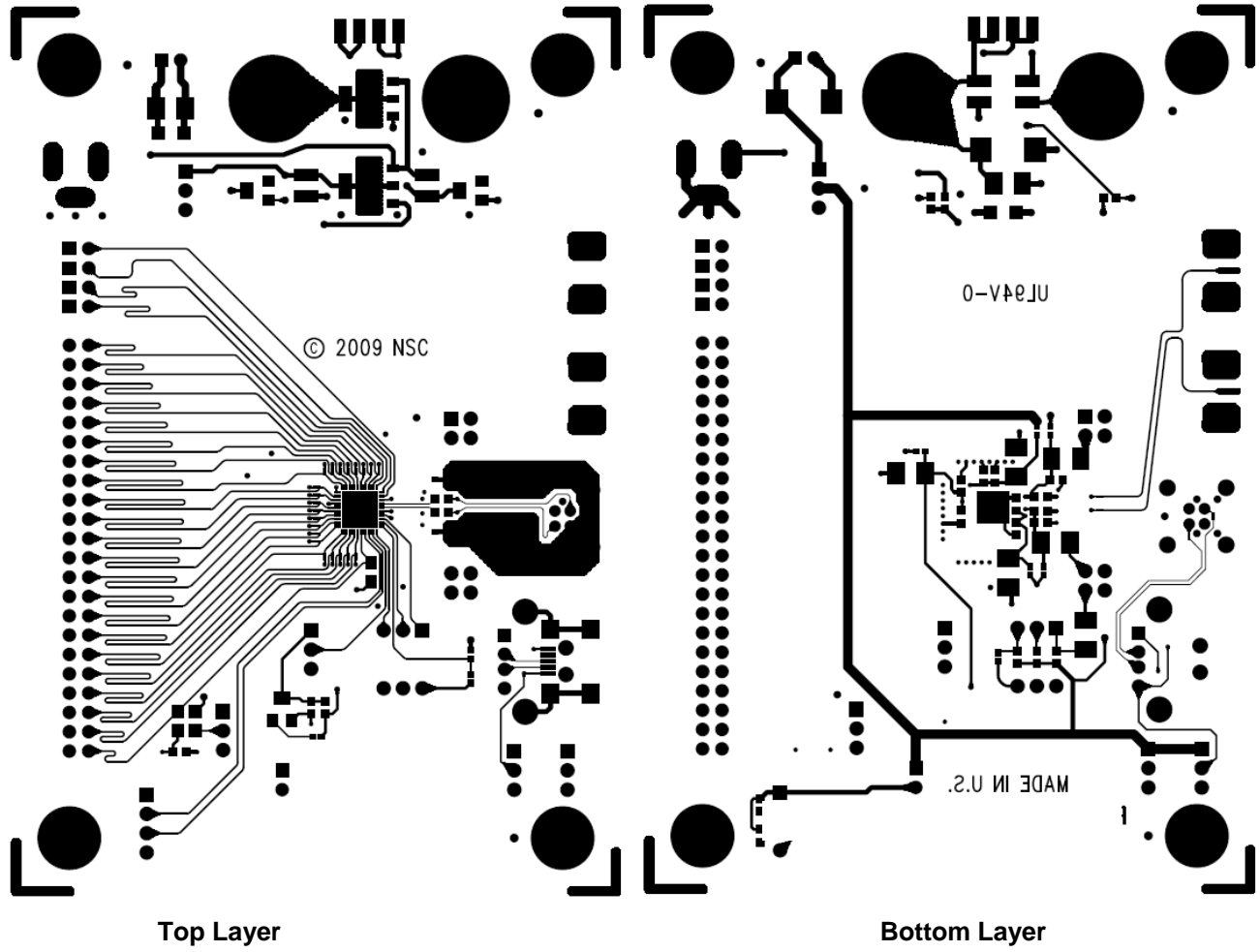
Title		DS92LX2121 Tx Demo Board - Parallel Input	
Size	A	Document Number	DS92LX2121 Tx Demo Board
Rev	1A	Date:	Friday, July 23, 2010
		Sheet	3 of 4





File	DSS92LX2121 Tx Demo Board - Power and Decoupling
Size	Document Number DSS92LX2121 Tx Demo Board
Date:	Friday, July 23, 2010
Sheet	4 of 4
Rev	1A

Tx Board Reference Layout



Rx Board Configuration Settings

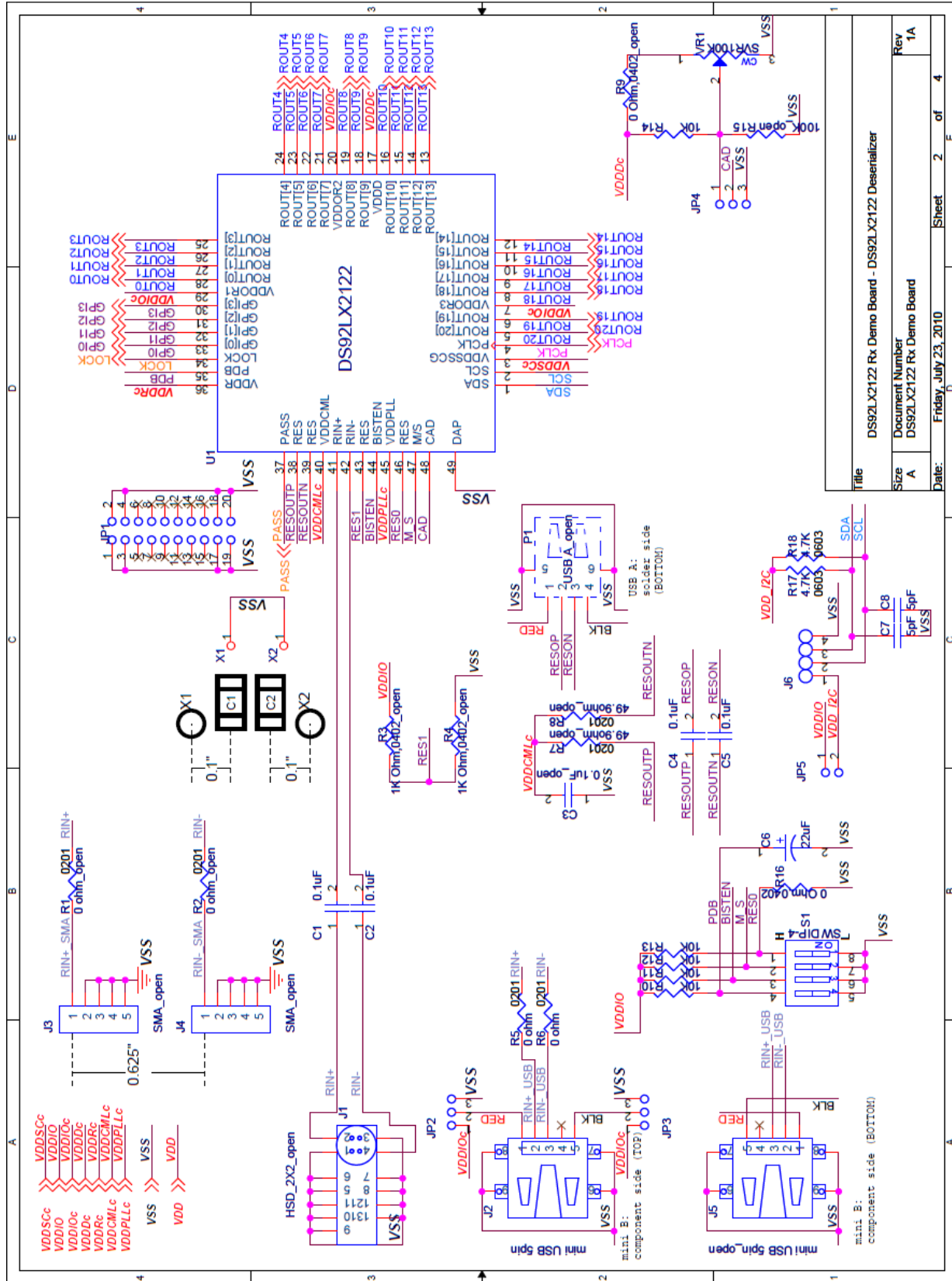
Component	Name	Function
Power Connections		
J11	5V DC	Optional 5V DC Power Jack. Note: unpopulated by default
J8	1.8V DC	1.8V VDD Power.
JP13	3.3V DC	3.3V VDD Power (left header pin), ground (right header pin)
J9	VSS	Ground.
JP12	VDDIO	Output voltage select. Jumper set to 3.3V by default.
Input and Output Connections		
J7	44 position wall header (ROUT0 – ROUT20, PCLK)	Connect to data output.
JP6 – JP9	GPI0 – GPI3	Optional general purpose back channel data input
J3 and J4	SMA Connector	Connect to Channel Link II input. Note: unpopulated by default.
J2	USB Connector (micro-B, female)	Connect to Channel Link II input.
Control Connections		
S1:1	RESO	Reserved. Keep set to LOW.
S1:2	M_S	I2C Mode Select. M_S = H, Slave mode – device will accept a clock from a local master M_S = L, Master mode – device will generate a clock and drive a slave device
S1:3	BISTEN	BIST Enable BISTEN = H, BIST mode enabled BISTEN = L, BIST mode disabled (default)
S1:4	PDB	Power down mode input. PDB = H, Deserializer is enabled (default) PDB = L, Deserializer is in power-down mode
JP4 and VR1	CAD	Connect CAD pin to VSS to have the default device PHY address (default setting). Connect CAD pin to VR1 pin; then adjust VR4 value to select desired device PHY address. See datasheet for detailed information.
J6 and JP5	I2C Interface	Leave JP9 unconnected if I2C VDD is provided by an external source. (default).
Others		
LED1	PASS	PASS output. "ON" when PASS is "H"
LED2	LOCK	LOCK output. "ON" when LOCK is "H"
JP3, JP2	Other options	Do not connect

Rx Board Bill of Materials

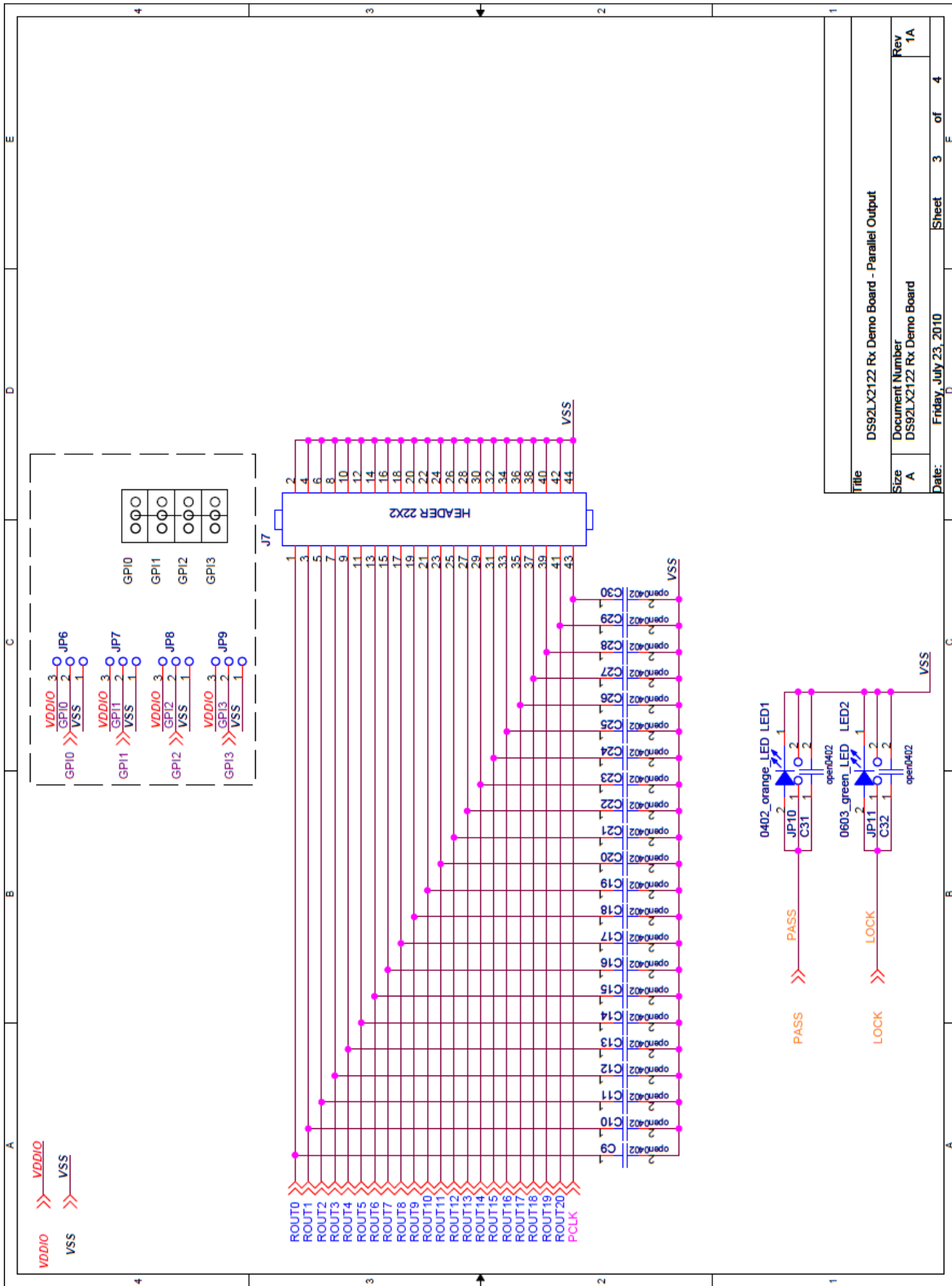
Item	Qty	Reference	Part	MFR	MFR Part#
1	4	C1,C2,C4,C5	0.1uF	Panasonic	ECJ-1VB1H104K
2	1	C3	0.1uF_open	Panasonic	ECJ-0EF1C104Z_open
3	7	C6,C33,C39,C44,C47,C C55	22uF	Kemet	T494B226M016AT
4	2	C8,C7	100pF	TDK Corporation	C0603C0G1H101J
5	24	C9,C10,C11,C12,C13,C 14,C15,C16,C17,C18,C 19,C20,C21,C22,C23,C 24,C25,C26,C27,C28,C 29,C30,C31,C32	open0402		CAPopen0402SMD
6	6	C34,C40,C45,C48,C51,	0.01uF	KEMET	C0603C103K1RACTU
7	6	C35,C41,C46,C49,C52,	0.1uF	Panasonic	ECJ-1VB1E104K
8	2	C56,C36	22uF	nichicon	F931E226MNC
9	2	C57,C37	2.2uF	KEMET	T491B225K020AT
10	2	C38,C58	0.1uF	KEMET	C1206C104K5RACTU
11	4	C42,C43,C53,C54	10uF_open	nichicon	F931C106MBA_open
12	1	JP1	2X10-Pin Header, open	AMP/TYCO	87215-7_open
13	4	JP2,JP3,JP4,JP12	3-Pin Header	AMP/Tyco	87224-3
14	2	JP13,JP5	2-Pin Header	AMP/Tyco	87220-2
15	4	JP6,JP7,JP8,JP9	3-Pin Header	AMP/Tyco	87224-3
16	2	JP11,JP10	2-Pin Header_open	AMP/Tyco	87220-2_open
17	1	J1	HSD_2X2_open	Rosenberger	D4S20B-40ML5-Y_open
18	1	J2	mini USB 5pin	Hirose	UX60-MB-5ST
19	2	J4,J3	SMA_open	Johnson Components	142-0701-851_open
20	1	J5	mini USB 5pin_open	Hirose	UX60-MB-5ST
21	1	J6	IDC1X4	Molex/Waldom Electronics Corp	22-11-2042
22	1	J7	HEADER 22X2	AMP/TYCO	3-87215-0
23	2	J8,J9	BANANA	Johnson	108-0740-001
24	1	J10	2x4 pin Jumper_open	Molex	10-89-7082_open
25	1	J11	CONN JACK PWR_open	CPU Inc	PJ-002A_open
26	1	LED1	0402_orange_LED	Lumex Opto/Components Inc	SML-LX0402SOC-TR
27	1	LED2	0603_green_LED	LITE-ON INC	LTST-C191KGKT
28	1	P1	USB A_open	AMP/Tyco	292303-1_open
29	2	R1,R2	0 ohm_open		RES/CAP-AM0201
30	2	R3,R4	1K Ohm,0402_open	Panasonic	ERJ-2GEJ102X_open
31	2	R5,R6	0 ohm	any	RES/CAP-AM0201

Item	Qty	Reference	Part	Comments	MFR Part#
32	2	R7,R8	49.9ohm_open	Venkel	CR0201-20W-49R9FT_open
33	1	R9	0 Ohm,0402_open	Panasonic	ERJ-2GEJ0R00X_open
34	5	R10,R11,R12,R13,R14	10K	Panasonic	ERJ-3EKF1002V
35	1	R15	100K_open	Panasonic	ERJ-3EKF1003V_open
36	6	R19,R21,R22,R23,R25, R27	Ferrite Bead	Murata	BLM15AX102SN1D
36a	1	R16	0 Ohm,0402	Panasonic	ERJ-2GEJ0R00X
37	2	R17,R18	1.0K	Panasonic	ERJ-3GEYJ102V
38	2	R20,R24	82.5ohm	Panasonic	ERJ-3EKF82R5V
39	1	R26	100ohm_open	Panasonic	ERJ-3EKF1000V_open
40	1	S1	SW DIP-4	Grayhill	78B04ST
41	1	U1	DS92LX2122	National	DS92LX2122
42	2	U2,U3	LM1117IMP-ADJ/SOT223_open	National	LM1117IMP-ADJ/NOPB_open
43	1	VR1	SVR100K	Bourns	3224W-1-104E
44	2	VR2,VR3	SVR100_open	Bourns	3214W-1-101E_open
45	2	X2,X1	TP_0402		TP_0402

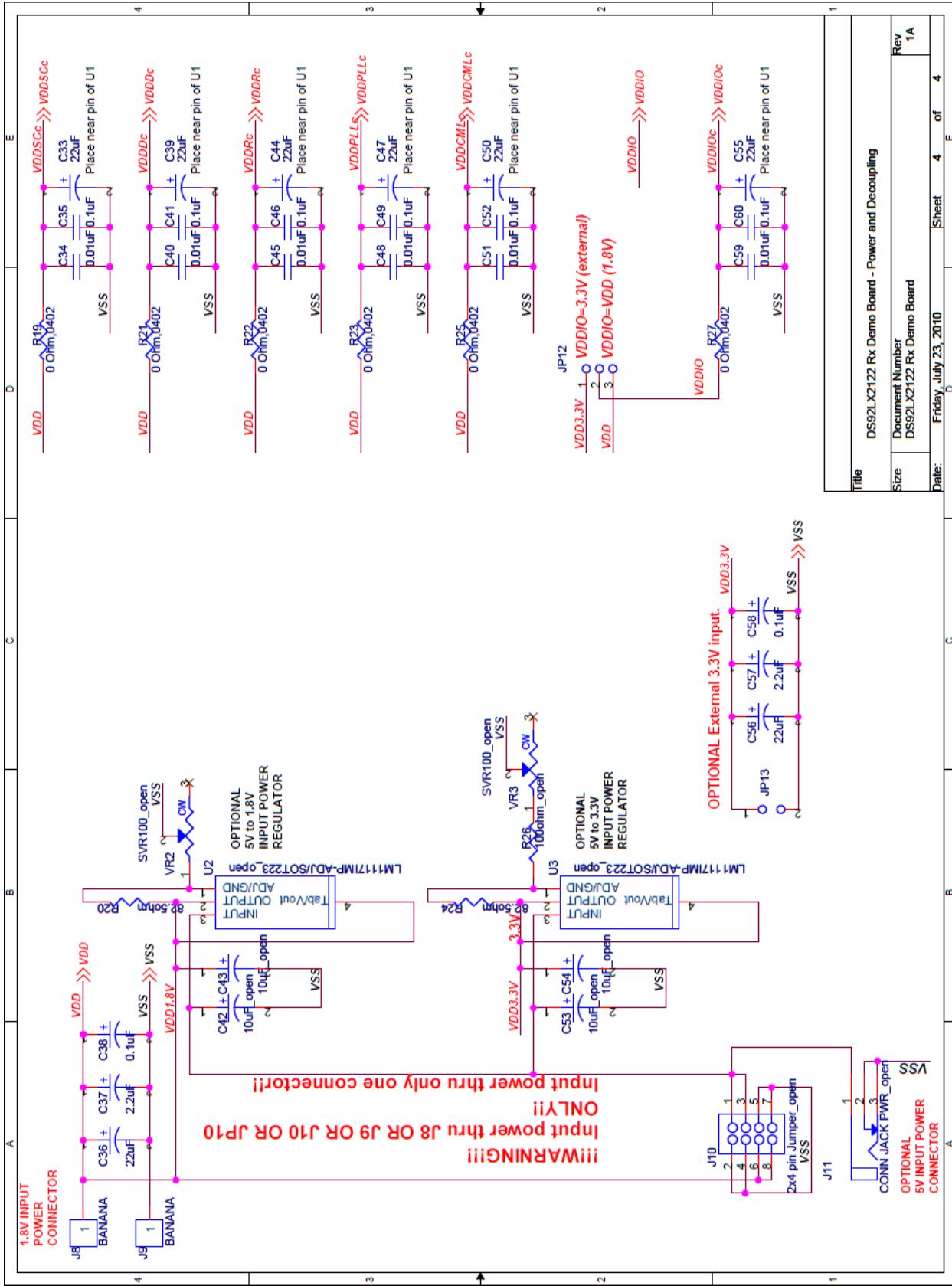
Rx Board Schematics



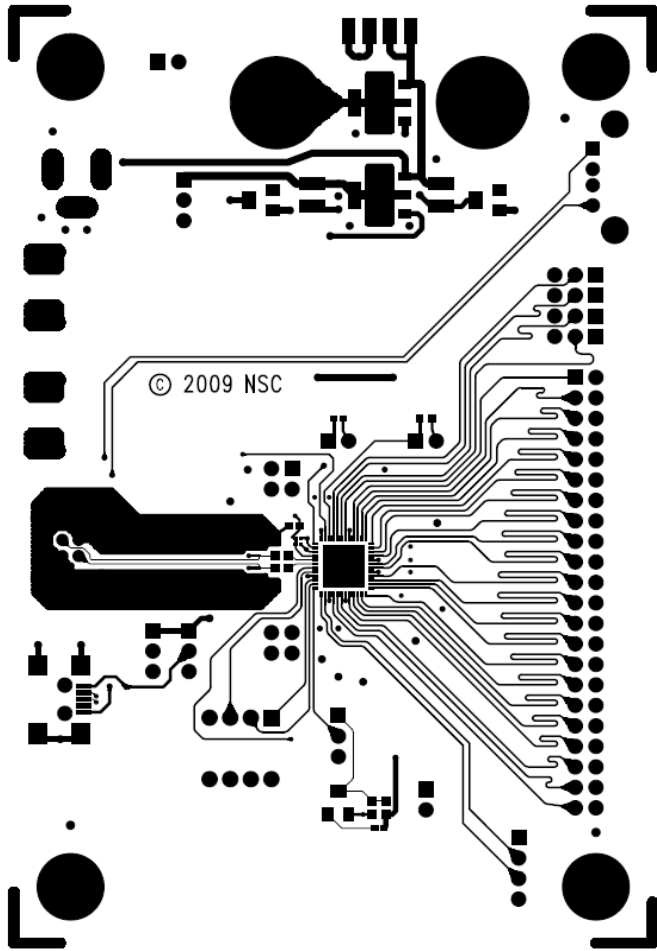
Title		DS92LX2122 Rx Demo Board - DS92LX2122 Deserializer	
Size	A	Document Number	DS92LX2122 Rx Demo Board
Date:	Friday, July 23, 2010	Sheet	2 of 4
Rev	1A		



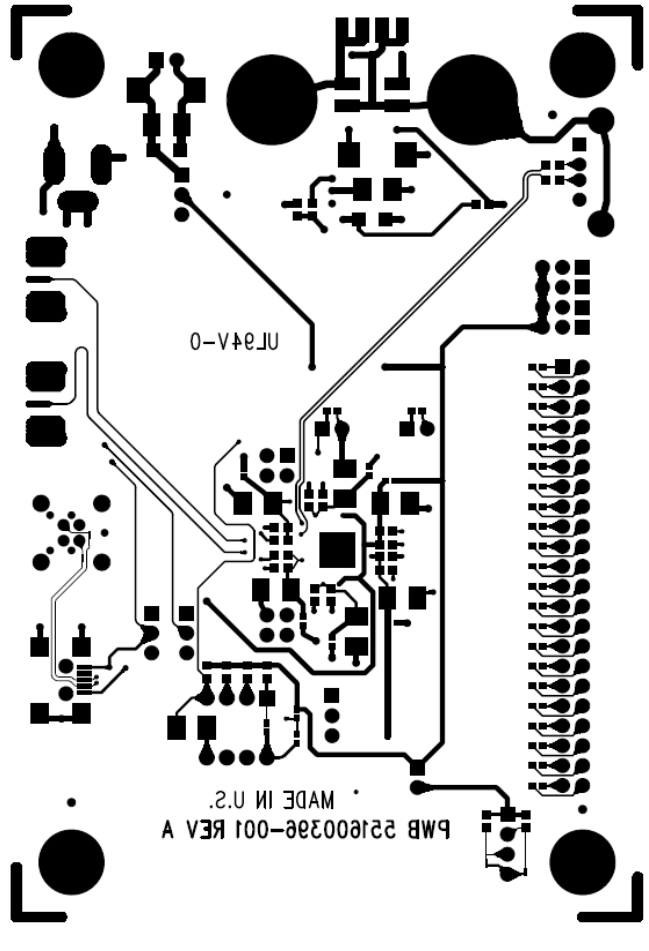
Title		DS92LX2122 Rx Demo Board - Parallel Output	
Size	A	Document Number	DS92LX2122 Rx Demo Board
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Rx Board Reference Layout



Top Layer



Bottom Layer

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