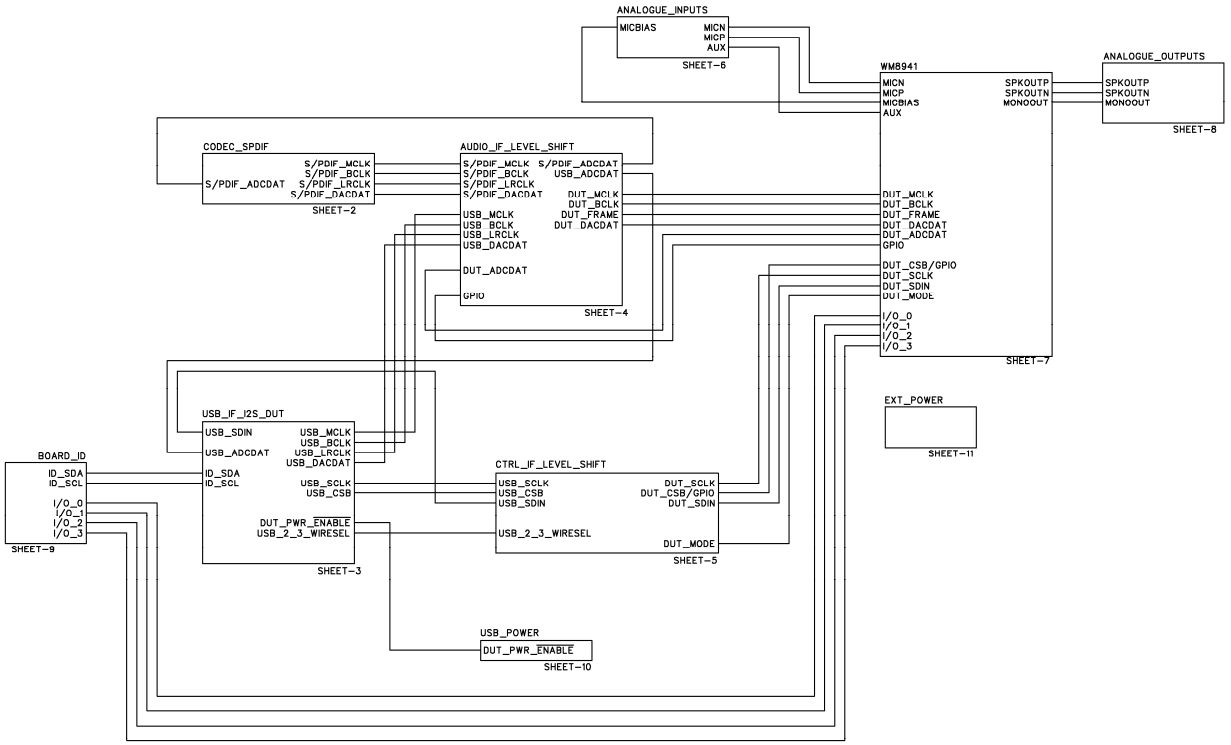
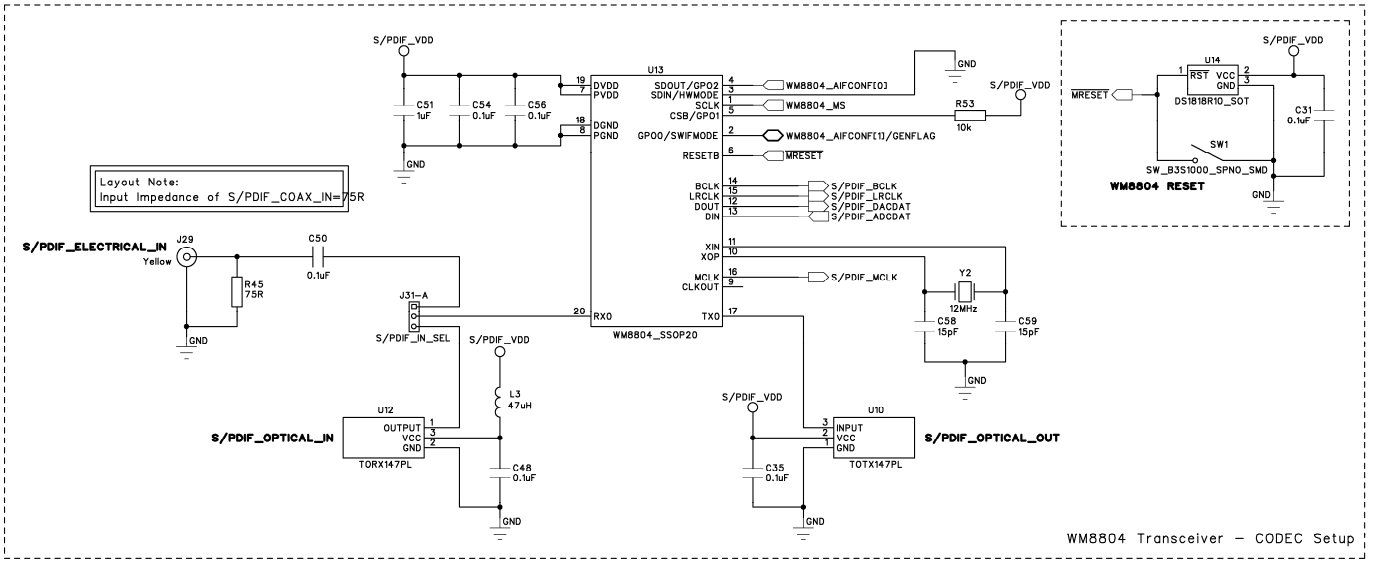
DOC TYPE:	Schematic and Layout
BOARD REFERENCE:	6162-EV1-REV2
BOARD TYPE:	Customer Main
WOLFSON DEVICE(S):	WM8940, WM8941, WM8952
DATE:	April 2008
DOC REVISION:	Rev 1.0

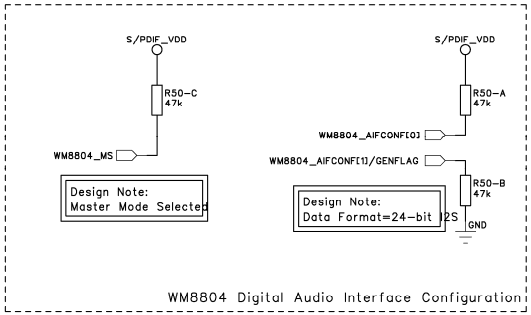
Schematic

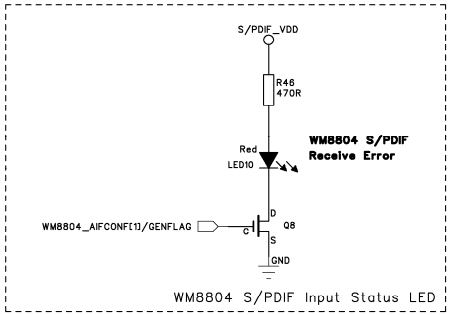
Sheet 1: Functional Diagram

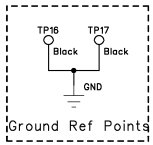


Sheet 2: S/PDIF Interface

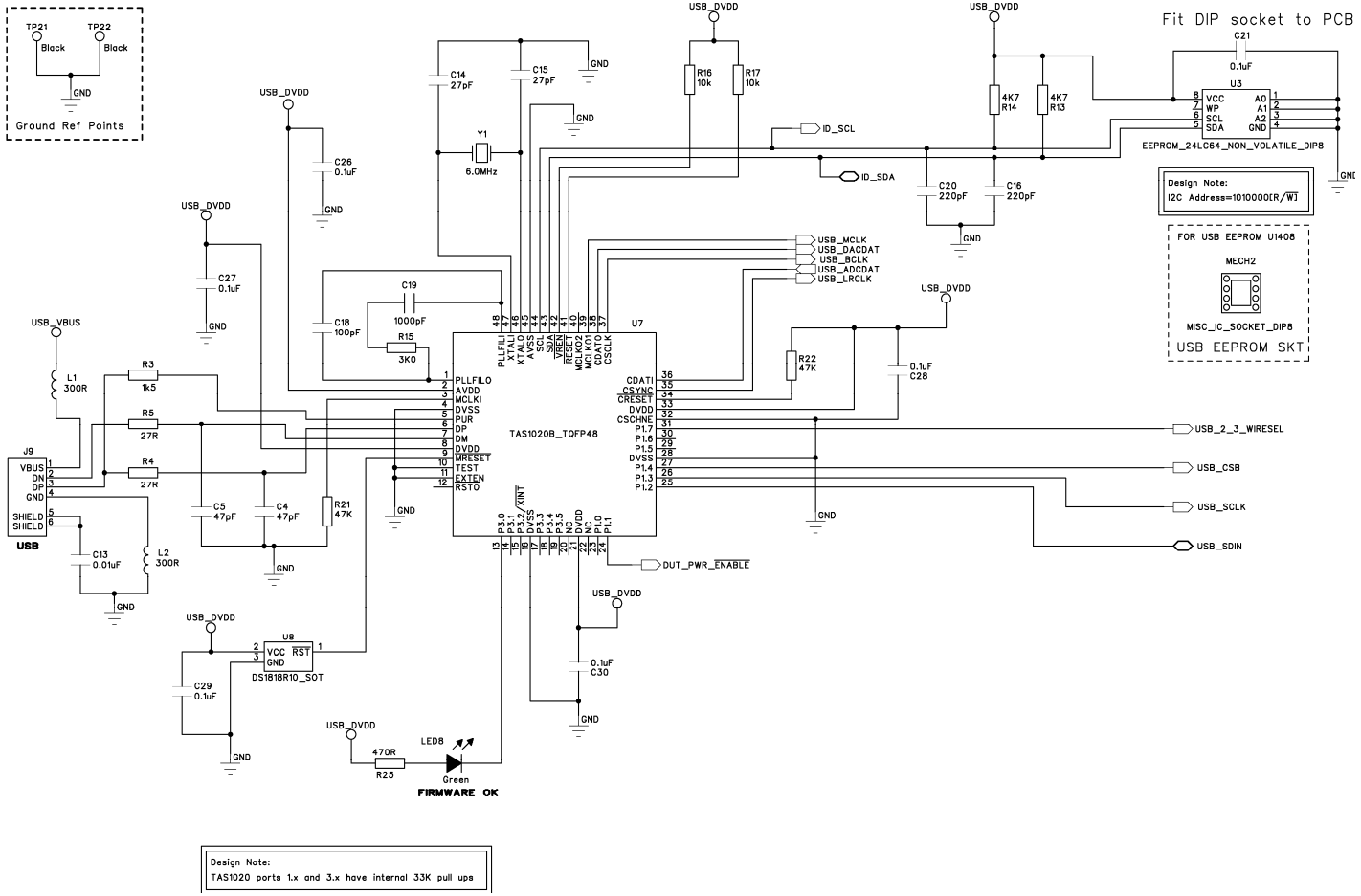




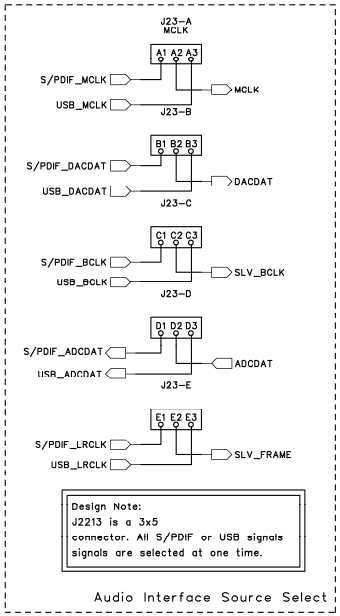


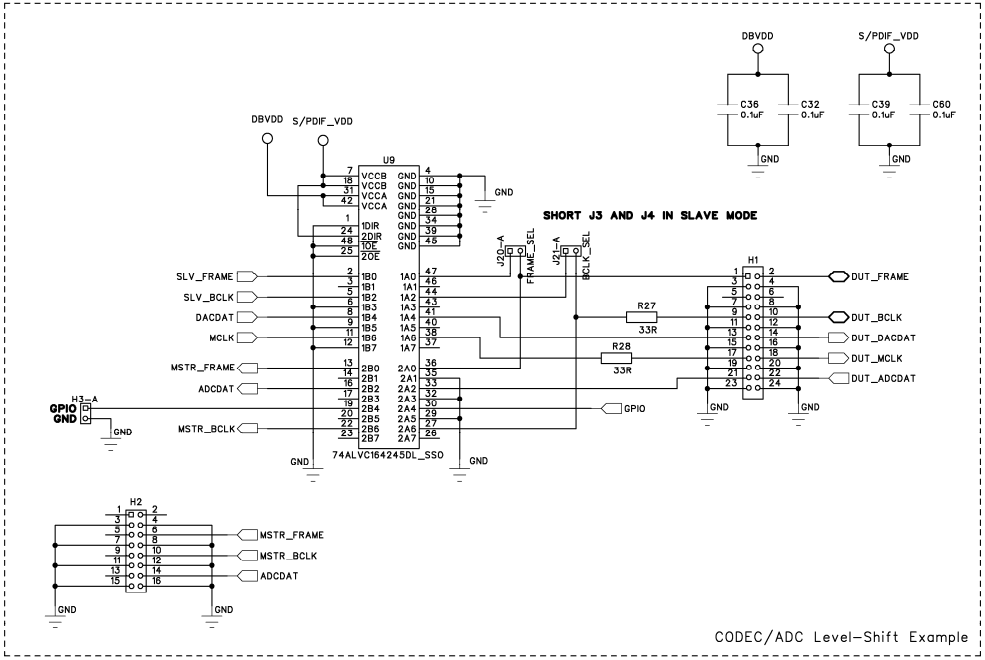


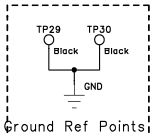
Sheet 3: USB Interface

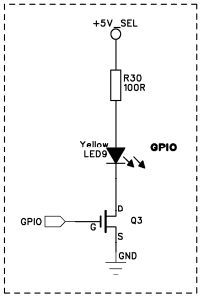


Sheet 4: Audio Level Shift

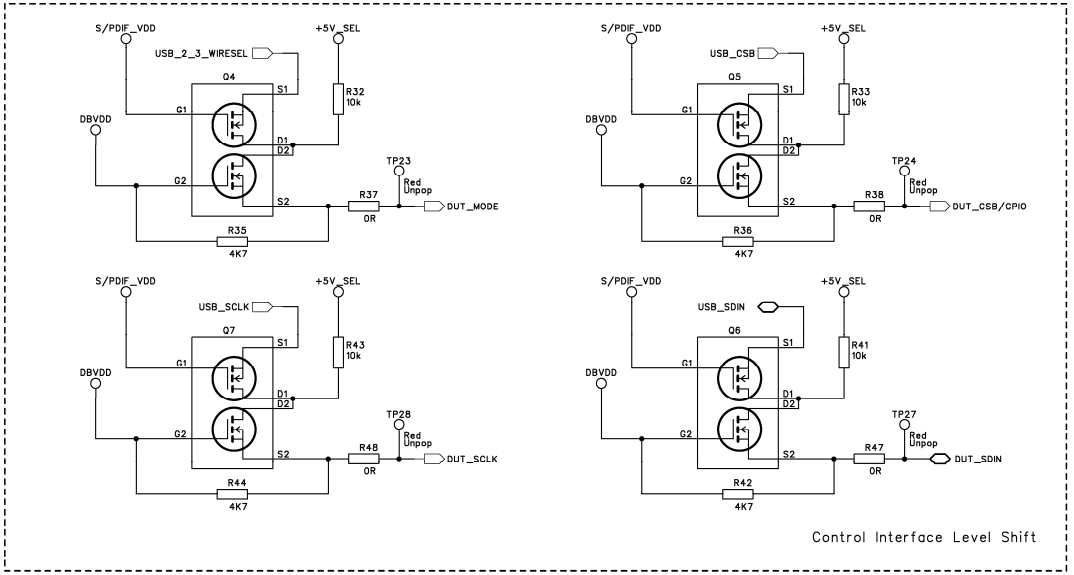


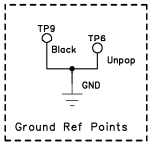




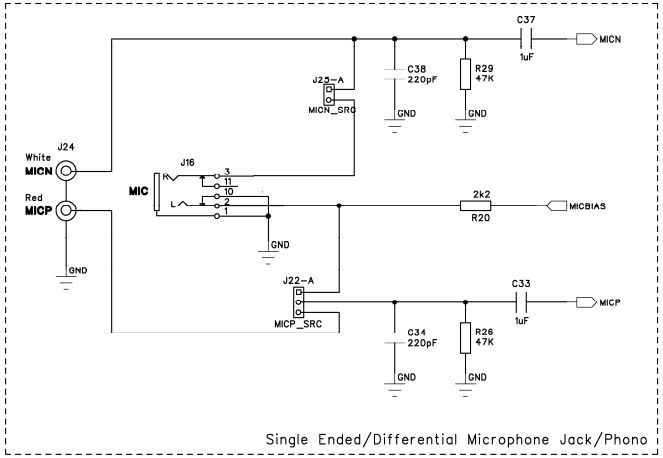


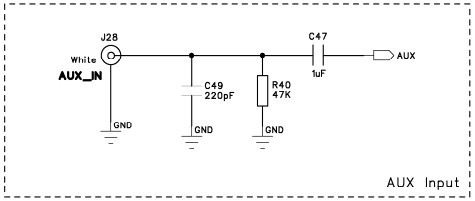
Sheet 5: Control Level Shift

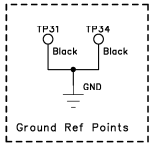




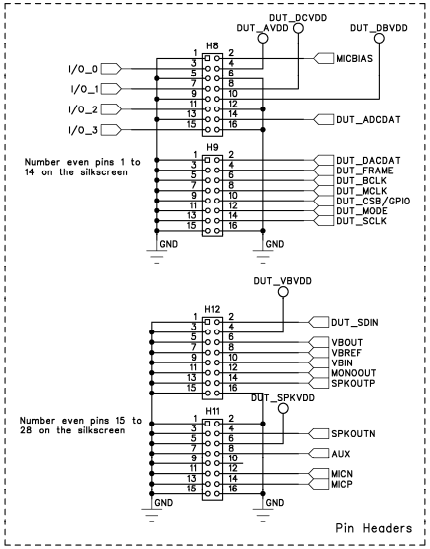
Sheet 6: Analogue Inputs

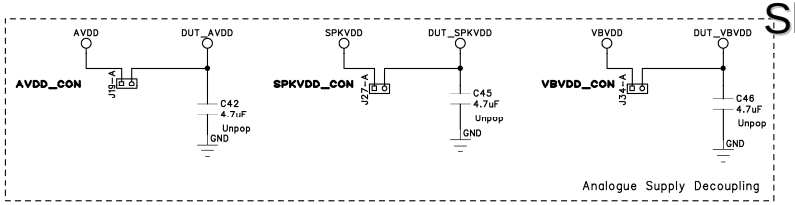


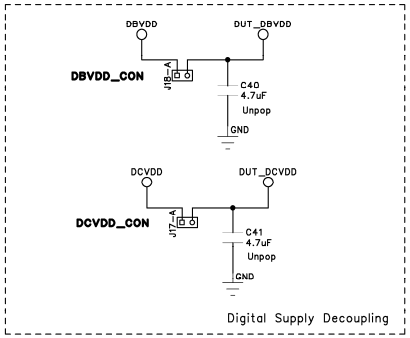


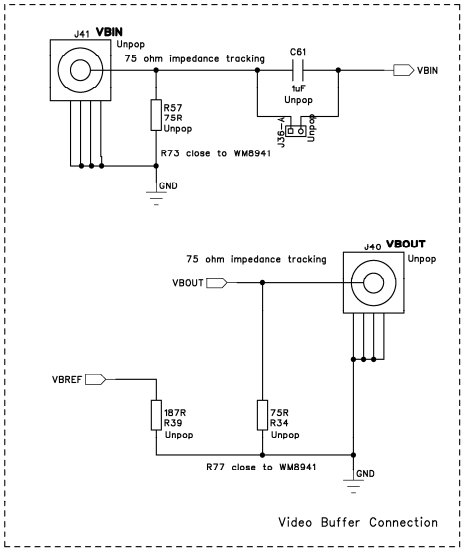


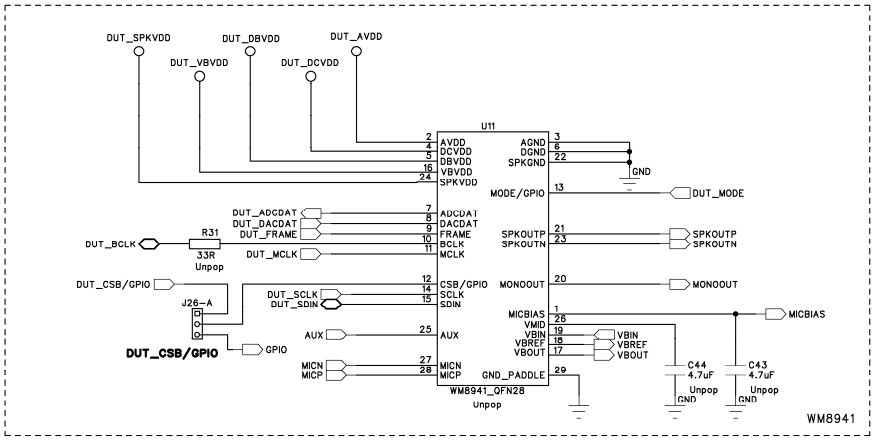
Sheet 7: WM8941







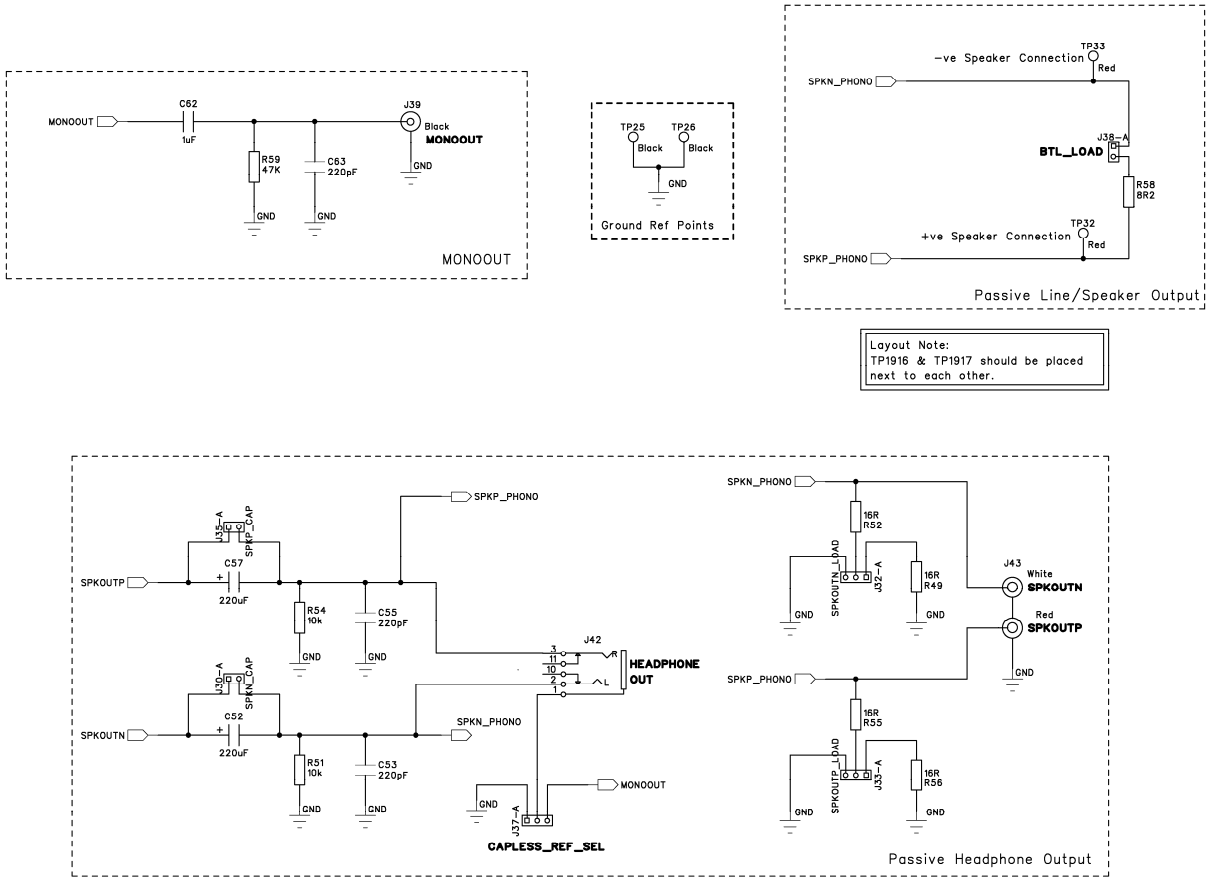




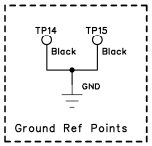
LAYOUT NOTE:
Provision of a mini board will need to be made when laying out header pins
No jumpers, headers or test points should go under the mini board as they will be unreachable

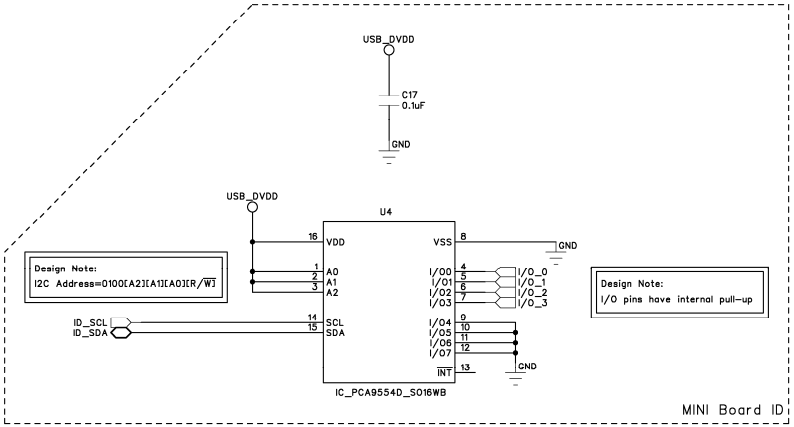
MAIN Board to MINI Board interface pin spacing should be wide enough to allow a DUT or socket to be placed on the mini board.

Sheet 8: Analogue Outputs

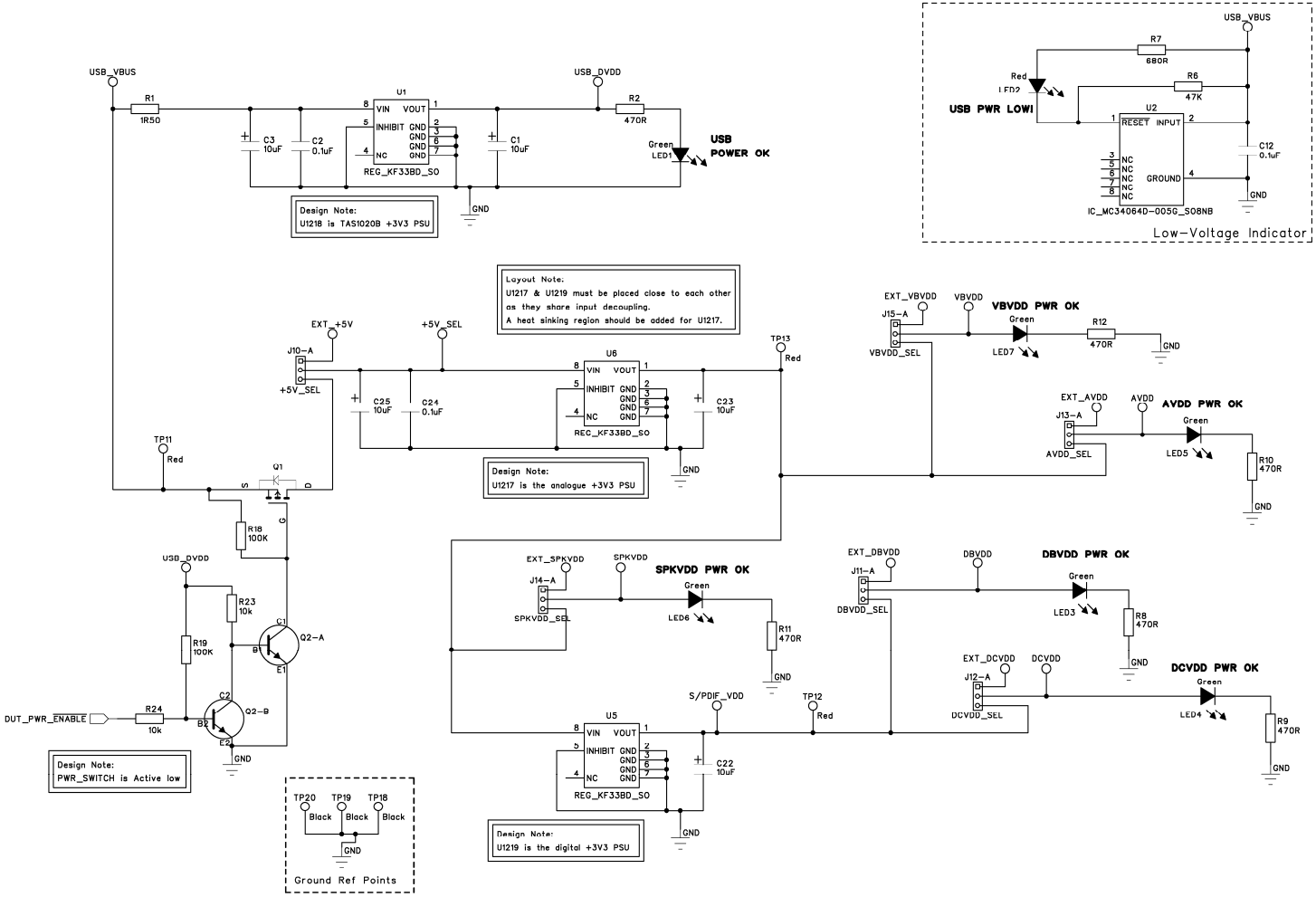


Sheet 9: Device ID

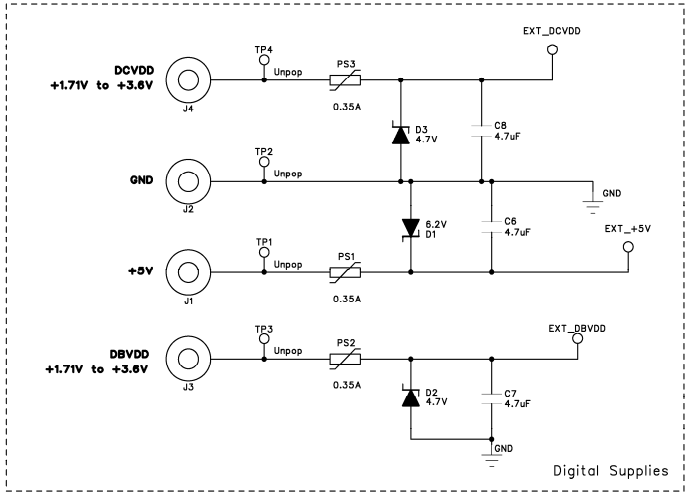


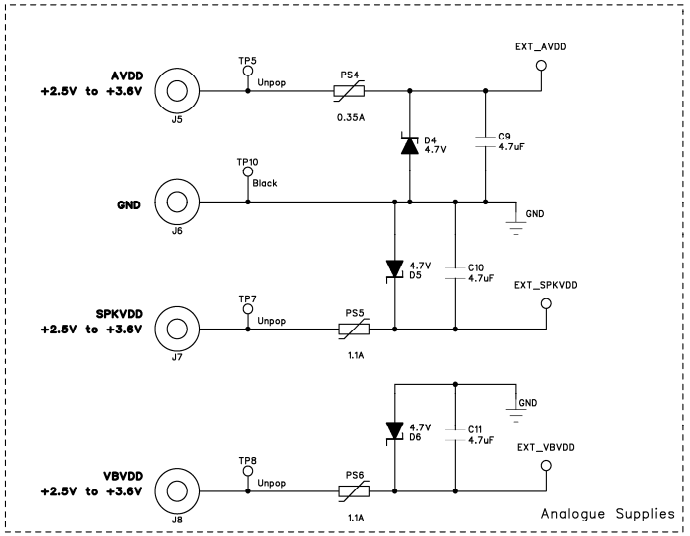


Sheet 10: USB Power



Sheet 11: External Power





Sheet 12: Reference Tables (Jumpers)

	Short 1–2	Short 2–3	
J13–B	EXT AVDD	USB AVDD	LNK13 YELLOW
PCB Ref: AVDD_SEL			2–3

	Short 1–2	Short 2–3	
J10–B	EXT_+5V	USB_+5V	LNK10 YELLOW
PCB Ref: +5V_SEL			2–3

	Short 1–2	Short 2–3	
J11–B	EXT DBVDD	USB DBVDD	LNK11 YELLOW
PCB Ref: DBVDD_SEL			2–3

	Short 1–2	Short 2–3	
J12–B	EXT DCVDD	USB DCVDD	LNK12 YELLOW
PCB Ref: DCVDD_SEL			2–3

	Short 1–2	Short 2–3	
J14–B	EXT SPKVDD	USB SPKVDD	LNK14 YELLOW
PCB Ref: SPKVDD_SEL			2–3

	Short	Open	
J30–B	Capless Mode	Cap in circuit	
PCB Ref: SPKN_CAP			Open

	Short	Open	
J35–B	Capless Mode	Cap in circuit	
PCB Ref: SPKP_CAP			Open

	Short 1–2	Short 2–3	
J31–B	Electrical Input	Optical Input	LNK31 YELLOW
PCB Ref: S/PDIF_IN_SEL			1–2

J23–F	Short 1–2	Short 2–3	PCB Ref:	
Row A:	S/PDIF_MCLK	USB_MCLK	MCLK	1–2
Row B:	S/PDIF_DACDAT	USB_DACDAT	DACDAT	1–2
Row C:	S/PDIF_BCLK	USB_BCLK	SLV_BCLK	1–2
Row D:	S/PDIF_ADCDAT	USB_ADCDAT	ADCDAT	1–2
Row E:	S/PDIF_LRCLK	USB_LRCLK	SLV_DACLRC	1–2

LNK23 BLACK

	Short	Open	
J25–B	Diff N from jack	No diff N from jack	
PCB Ref: MICN_SRC			Open

	Short 1–2	Short 2–3	
J22–B	MICP jack select	MICP phono select	LNK22 YELLOW
PCB Ref: MICP_SRC			1–2

	Short 1–2	Short 2–3	
J26–B	DUT_CSB	GPIO	LNK26 YELLOW
PCB Ref: DUT_CSB/GPIO			1–2

	Short 1–2	Short 2–3	
J37–B	GND selected	MONOOUT selected	LNK37 YELLOW
PCB Ref: CAPLESS_REF_SEL			1–2

	Short 1–2	Short 2–3	
J32–B	32R Load	16R Load	
PCB Ref: SPKOUTN_LOAD			No Link

	Short 1–2	Short 2–3	
J33–B	32R Load	16R Load	
PCB Ref: SPKOUTP_LOAD			No Link

	Short	Open	
J38–B	8R BTL load	No BTL load	
PCB Ref: BTL_LOADM			Open

	Short	Open	
J21–B	Slave BCLK	Master BCLK	LNK21 YELLOW
PCB Ref: BCLK_SEL			Short

	Short	Open	
J20–B	Slave FRAME	Master FRAME	LNK20 YELLOW
PCB Ref: FRAME_SEL			Short

	Short	Open	
J19–B	No Current Monitor	Current Monitor	LNK19 RED
PCB Ref: AVDD_CON			Short

	Short	Open	
J27–B	No Current Monitor	Current Monitor	LNK27 RED
PCB Ref: SPKVDD_CON			Short

	Short	Open	
J18–B	No Current Monitor	Current Monitor	LNK18 RED
PCB Ref: DBVDD_CON			Short

	Short	Open	
J17–B	No Current Monitor	Current Monitor	LNK17 RED
PCB Ref: DCVDD_CON			Short

	Short	Open	
J34–B	VBVDD to DUT	No VBVDD to DUT	LNK34 RED
PCB Ref: VBVDD_CON			Short

Bag of Links
LNK30 YELLOW
LNK35 YELLOW
LNK38 YELLOW
LNK25 YELLOW
LNK32 YELLOW
LNK33 YELLOW

Bill Of Materials (BOM)

Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
1	MSC1	Grip Seal Bag, 90x115mm	CPC	PA123
2	J16 J42	3.5mm Jack Socket 6.5mm Centre Height	Technik Industrial	TSH-3565-PBT-TIC-T
3	U9	74ALVC164245 16 Bit Dual Supply Bus Transceiver SSO	Philips	74ALVC164245DL
4	U7	USB Streaming Controller	Texas Instruments	TAS1020BPFB
5	C51	1uF 0603 SMD Ceramic Capacitor 6.3V X5R	Murata	GRM188R60J105KA01D
6	C14 C15	27pF 0603 SMD Ceramic Capacitor 50V NPO	Panasonic	ECJ-1VC1H270J
7	J39	Phono Socket PCB mount BLACK	Dragon City	RS109 - Black
8	J29	Phono Socket PCB mount YELLOW	Dragon City	RS109 - Yellow
9	J28	Phono Socket PCB mount WHITE	Dragon City	RS-109 White
10	U12	TORX147PL Digital Audio Fiber Optic Receiver	Toshiba	TORX147PL
11	U10	Fiber Optic Transmitting Module for Digital Audio Interface	Toshiba	TOTX147PL
12	U2	MC34064 Undervoltage Sense Circuit, SOIC8	On Semiconductor	MC34064D-005G
13	MISC11	Lead-free label, 15mm round	Brady	Y436425
14	H2 H8 H9 H11 H12	2x8 2.54mm pitch PCB Pin Header VERTICAL	Harwin	M20-9980845
15	H3 J17 J18 J19 J20 J21 J25 J30 J34 J35 J38	1x2 PCB Pin Header 0.1" VERTICAL	Harwin	M20-9990245
16	J10 J11 J12 J13 J14 J15 J22 J26 J31 J32 J33 J37	1x3 2.54mm Header Vertical	Harwin	M20-9990345

Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
17	Q2	BC847BS NPN Dual Bipolar Transistor SOT363	Philips	BC847BS
18	J9	USB receptacle Type B	FCI	61729-0010BLF
19	MECH2	IC Socket DIL 8 WAY	Multicomp	2227MC-08-03-F1
20	Q4 Q5 Q6 Q7	Si1902DL N- Channel Dual MOSFET SC-70	Vishay Siliconix	SI1902DL-T1-E3
21	C1 C3 C22 C23 C25	10uF 10V SMD Tantalum Capacitor case A	Kemet	T491A106K010AT
22	PS1 PS2 PS3 PS4	0.35A Poly Switch 1210	Tyco	MICROSMD035F-2
23	L1 L2	300R 0805 BMB2A Ferrite Bead	Meggitt	BMB2A0300AN1
24	L3	47uH 1210 Surface Mount Inductor 'PA series'	Panasonic	ELJPA470KF
25	PS5 PS6	1.1A Poly Switch 1210	Raychem	MICROSMD110F-2
26	SW1	B3S1000 SPNO SMT PCB mount switch	Omron	B3S-1000
27	C52 C57	Tantalum Capacitor SMD-D 220uF - 10V - AVX	AVX	TAJD227K010R
28	R1	1R50 1206 SMD chip resistor 5% 0.25W	Vishay BC	2312 1551 1508
29	C2 C12 C17 C21 C24 C26 C27 C28 C29 C30 C31 C32 C35 C36 C39 C48 C50 C54 C56 C60	0.1uF 0603 SMD Ceramic Capacitor 16V X7R	Phycomp	06032R104K7B2
30	C4 C5	47pF 0603 SMD Ceramic Capacitor 50V NPO	AVX	06035A470JAT2A
31	C16 C20 C34 C38 C49 C53 C55 C63	220pF 0603 SMD Ceramic Capacitor 50V NPO	AVX	06035A221JAT2A
32	P100 P101 P102 P103 P104 P105	Hexagonal brass M3 size spacer 20mm length	Harwin	R6379-02

Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
33	C58 C59	15pF 0603 SMD Ceramic Capacitor 50V X7R	Phycomp	2238 867 15159
34	C13	0.01uF 0603 SMD Ceramic Capacitor 50V X7R	Phycomp	2238 586 15636
35	TP9 TP10 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP25 TP26 TP29 TP30 TP31 TP34	1.32mm PCB Test Terminal BLACK	VERO	20-2136
36	TP11 TP12 TP13 TP32 TP33	1.32mm PCB Test Terminal RED	Vero	20-313141
37	SC100 SC101 SC102 SC103 SC104 SC105	Slotted Panhead Screw - M3 thread; 12mm long	Roebuck	PFP527
38	W100 W101 W102 W103 W104 W105	Plain M3 size washer	Roebuck	PFP2497
39	C6 C7 C8 C9 C10 C11	4.7uF 0805 SMD Ceramic Capacitor 16V X5R	Kemet	C0805C475K4PAC
40	R50	47k 1206 SMD chip 4 resistor array 5% 0.063W	Phycomp	2350 035 10473
41	R58	8R2 1218 SMD chip resistor 1% 1W	Phycomp	2322 7357 8208
42	R30	100R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 100R
43	R16 R17 R23 R24 R32 R33 R41 R43 R51 R53 R54	10k 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 10K
44	R18 R19	100K 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 100K
45	R3	1k5 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 1K5

Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
46	R49 R52 R55 R56	16R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 16R
47	R20	2k2 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 2K2
48	R4 R5	27R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 27R
49	R15	3K0 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 3K
50	R27 R28	33R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 33R
51	R13 R14 R35 R36 R42 R44	4K7 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 4K7
52	R6 R21 R22 R26 R29 R40 R59	47K 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 47K
53	R7	680R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 680R
54	R45	75R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 75R
55	R37 R38 R47 R48	0R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 0R
56	C18	100pF 0603 SMD Ceramic Capacitor 50V NPO	Multicomp	U0603C101JCT
57	C19	1000pF 0603 SMD Ceramic Capacitor 50V NPO	Multicomp	U0603C102JCT
58	C33 C37 C47 C62	1uF 0805 SMD Ceramic Capacitor 10V X7R	Multicomp	N0805R105KCT
59	Q1	P-Channel MOSFET 60v, Rds(on) = 0.17R SOT23	Vishay	SI2309DS
60	D2 D3 D4 D5 D6	1N5337B 4.7V 5W Zener Diode PTH	ON Semiconductor	1N5337BG
61	D1	1N5341B 6.2V 5W Zener Diode PTH	ON Semiconductor	1N5341BG

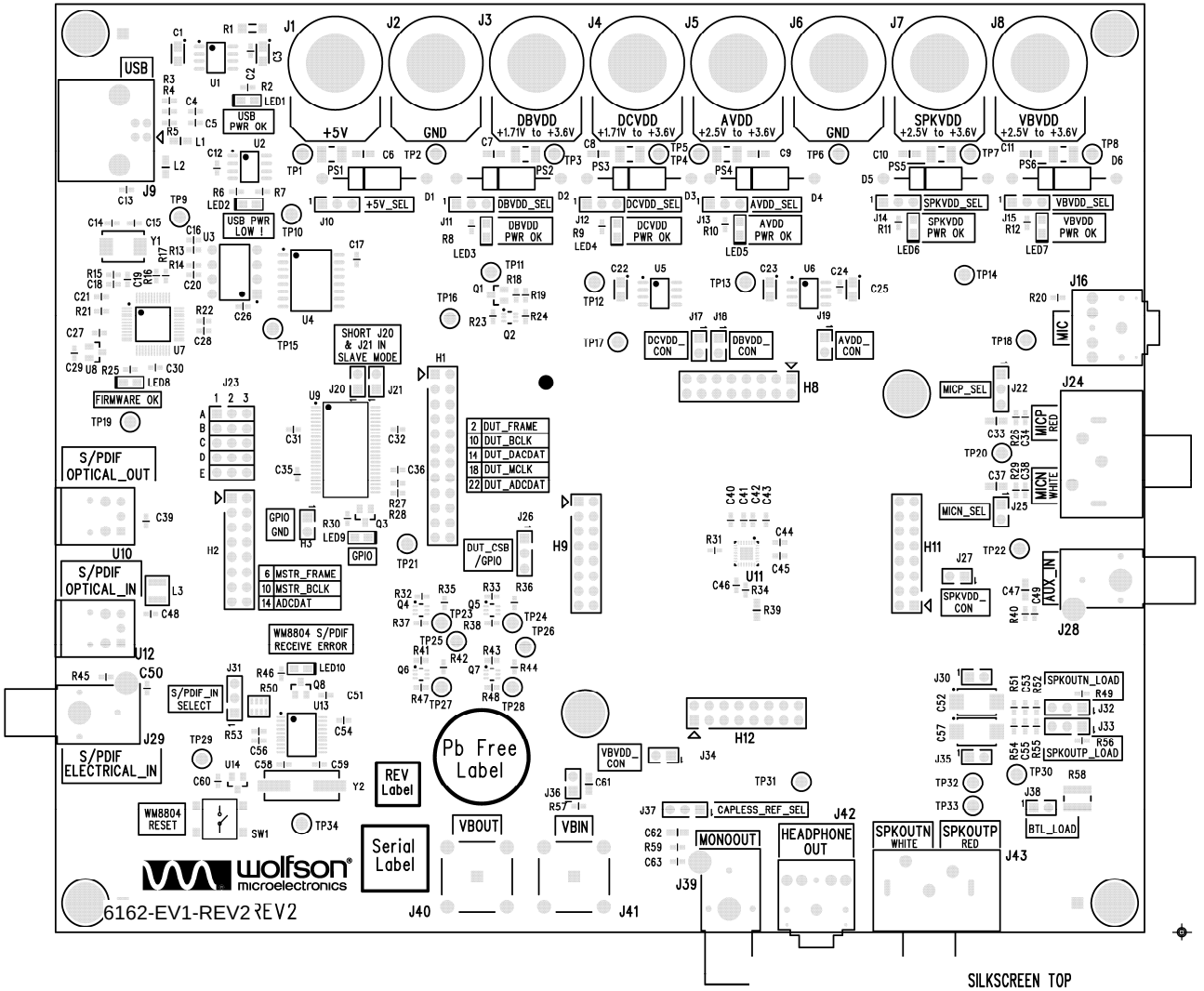
Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
62	U8 U14	DS1818 3.3V active-low Power-On-Reset chip SOT	Dallas Semiconductor	DS1818R-10+
63	U1 U5 U6	KF33BD Very Low Drop +3.3V Voltage Regulator SO	SGS Thomson Microelectronics	KF33BD
64	U3	EEPROM 8x8 i2c interface	Microchip Technology	24LC64-I/P
65	Q3 Q8	BSS138 N-Channel enhancement Mode FET	Fairchild Semiconductor	BSS138
66	Y2	12.0MHz GSX49-4/351BF SM Crystal 12pF	Golledge	GSX49-4/351BF 12.0MHz
67	Y1	6.0MHz GSX-752A/351JF SM Crystal 30pF	Golledge	GSX-752A/351JF 6.0MHz
68	J1 J2 J3 J4 J5 J6 J7 J8	4mm Non-Insulated Panel Socket 16A	PJP	3110I
69	J24 J43	Phono Socket PCB mount Pair Red/White	Rapid	20-1290
70	LNK17 LNK18 LNK19 LNK27 LNK34	0.1" OPEN JUMPER LINK RED	Protech	22-3565
71	LNK10 LNK11 LNK12 LNK13 LNK14 LNK20 LNK21 LNK22 LNK25 LNK26 LNK30 LNK31 LNK32 LNK33 LNK35 LNK37 LNK38 LNK_H1-4 LNK_H1-5 LNK_H1_1 LNK_H1_2 LNK_H1_3 LNK_H2_1 LNK_H2_2 LNK_H2_3	0.1" OPEN JUMPER LINK YELLOW	Protech	22-3570

Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
72	R2 R8 R9 R10 R11 R12 R25 R46	470R 0603 SMD chip resistor 1% 0.063W	Tyco	01622949-1
73	LED1 LED3 LED4 LED5 LED6 LED7 LED8	KP-2012MGC 0805 SMD Chip LED GREEN	Kingbright	KP-2012MGC
74	LED2 LED10	KP-2012SRC-PRV 0805 SMD Chip LED RED	Kingbright	KP-2012SRC-PRV
75	LED9	KP-2012SYC 0805 SMD Chip LED YELLOW	Kingbright	KP-2012SYC
76	U4	PCA9554D I2C I/O Expander	Philips	PCA9554D
77	LNK23	5way 2.54mm Pitch Jumper Link Block - Black	Toby	C33-GAG1-2x5-G
78	H1	2x12 2.54mm pitch PCB Pin Header VERTICAL	Toby	THD-12-R
79	J23	3x5 2.54mm Header Vertical	Toby	THT-5-R
80	PCB1	PCB	Wolfson Microelectronics	6162-EV1-REV1
81	U13	WM8804 1:1 Digital Interface Transceiver with PLL	Wolfson Microelectronics	WM8804GEDS
Unpop				
82	C40 C41 C42 C43 C44 C45 C46	4.7uF 0603 SMD Ceramic Capacitor 6.3V X5R	Murata	GRM188R60J475KE19D
83	R39	187R 0805 SMD chip resistor 1% 0.125W	TYCO ELECTRONICS / HOLSWORTHY	RN73C2A187RBTG
84	J27 J36	1x2 PCB Pin Header 0.1" VERTICAL	Harwin	M20-9990245

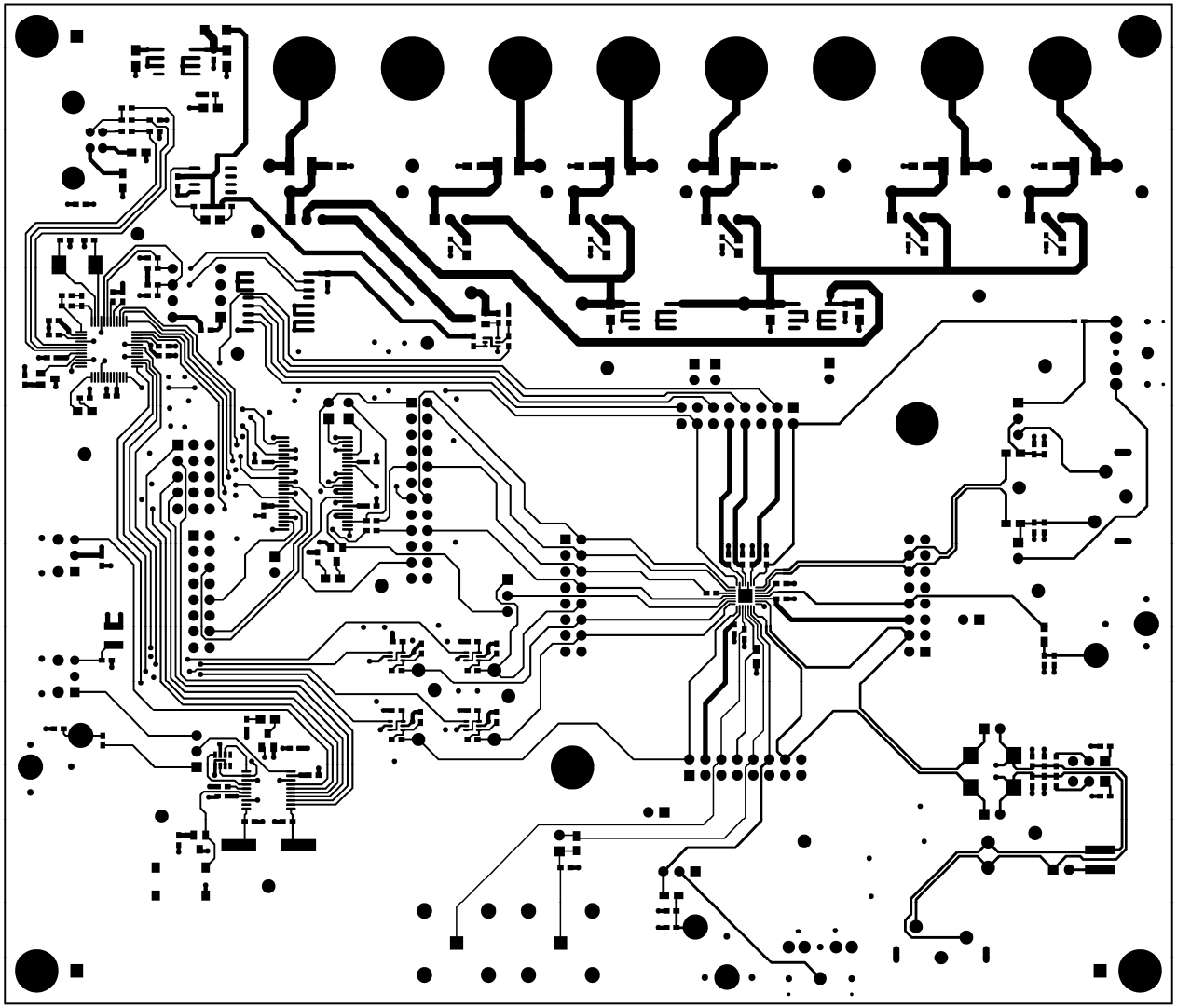
Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
85	J40 J41	BNC Panel Socket PCB Mount 75R	Amphenol	B6251F1-NT3G-75
86	TP23 TP24 TP27 TP28	1.32mm PCB Test Terminal RED	Vero	20-313141
87	R31	33R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 33R
88	R34 R57	75R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 75R
89	C61	1uF 0805 SMD Ceramic Capacitor 10V X7R	Multicomp	N0805R105KCT
90	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8	1.32mm off-board connection point	N/A	N/A
91	U11	WM8941 Mono CODEC with Speaker Driver and Video Buffer	Wolfson Microelectronics	WM8941GEFL/V

Layout

Top Silkscreen



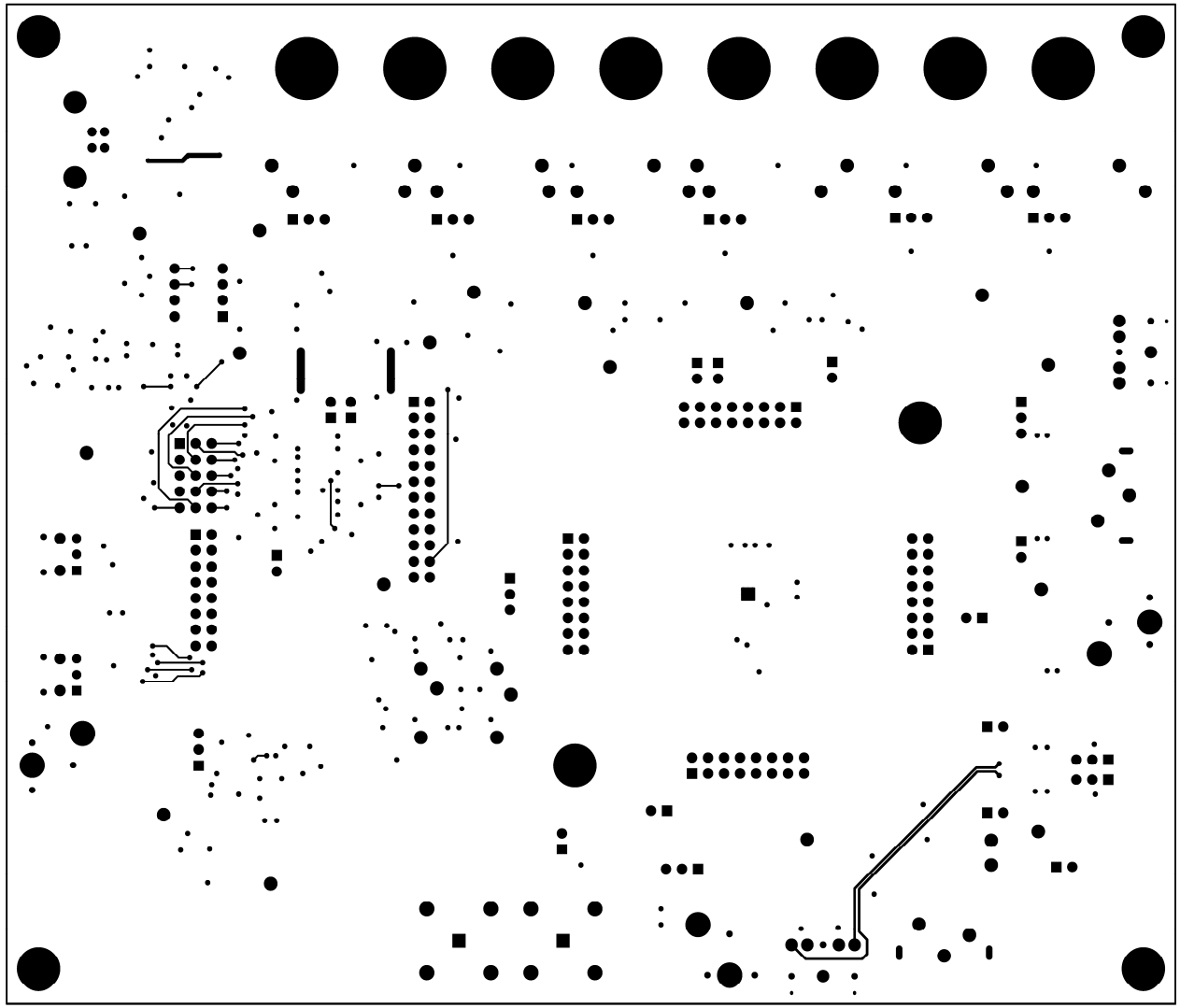
Top Layer



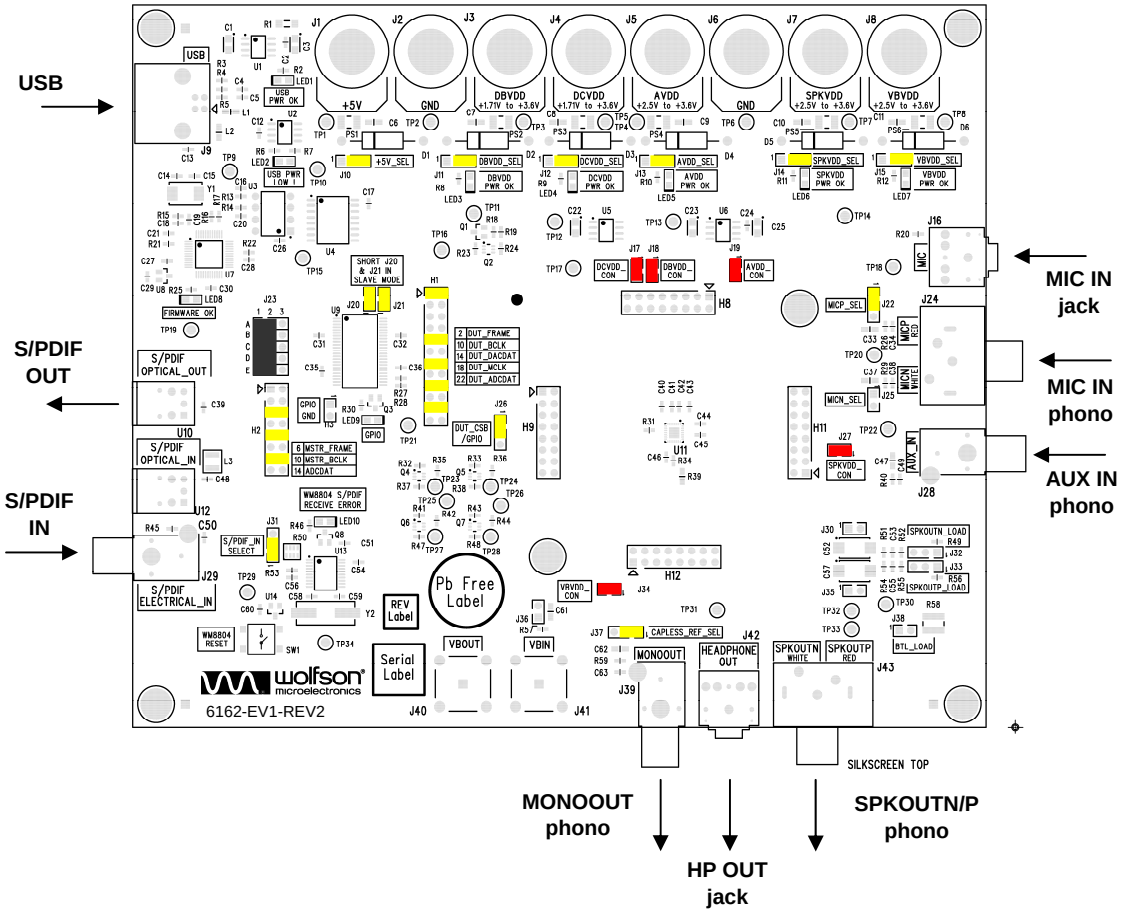
Layer 2
GND Plane

Layer3
GND/POWER
Plane

Bottom Layer



Generic Board Configuration



Board Setup

- Generic ADC, DAC, Bypass
- USB power supply
- S/PDIF audio interface
  - phono electrical input
  - optical output
- Slave Mode
- Outputs
  - AC coupled
  - GND referenced
  - No load
  - Phono or jack
- Inputs
  - phono

Application Support

If you require more information or require technical support, please contact the Wolfson Microelectronics Applications group through the following channels:

Email: apps@wolfsonmicro.com
Telephone Apps: +44 (0) 131 272 7070
Fax: +44 (0) 131 272 7001
Mail: Applications Engineering at the address on the last page

or contact your local Wolfson representative.

Additional information may be made available on our web site at: http://www.wolfsonmicro.com

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