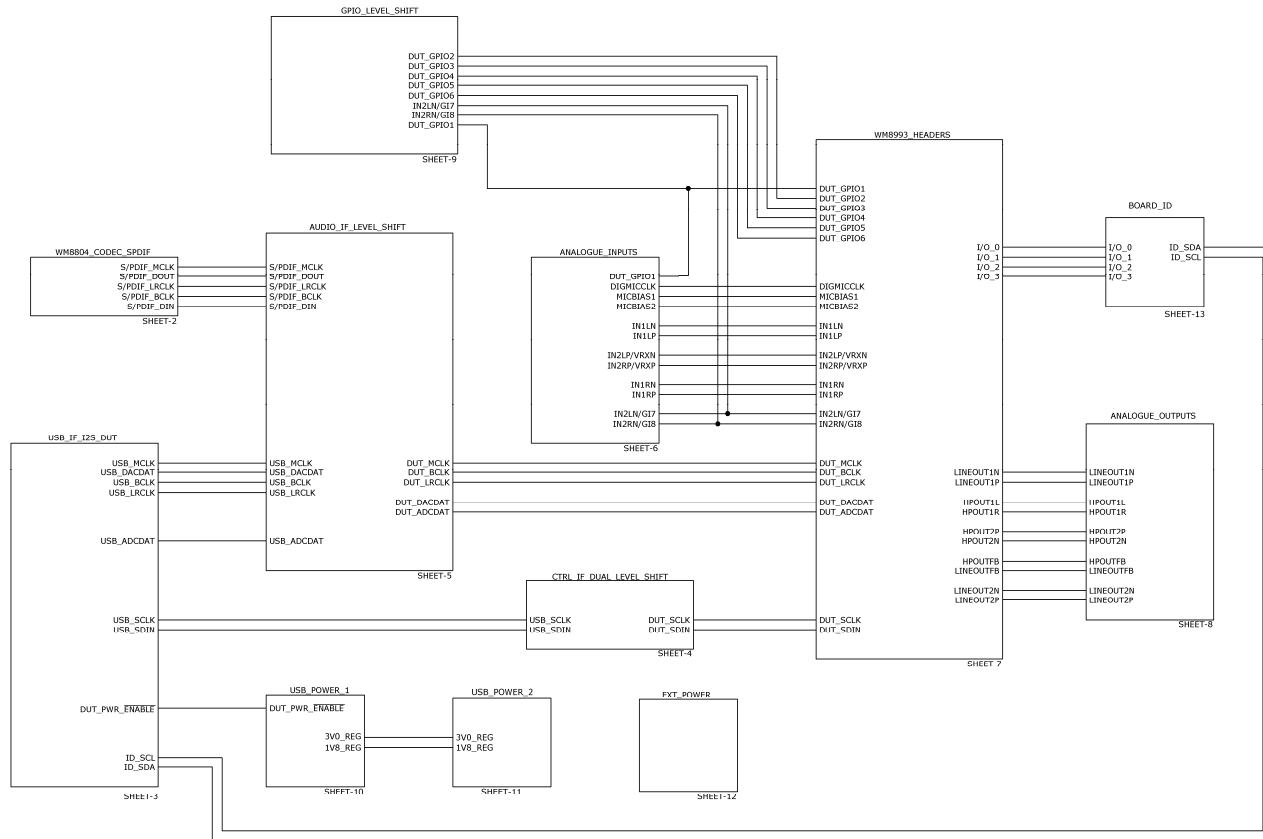


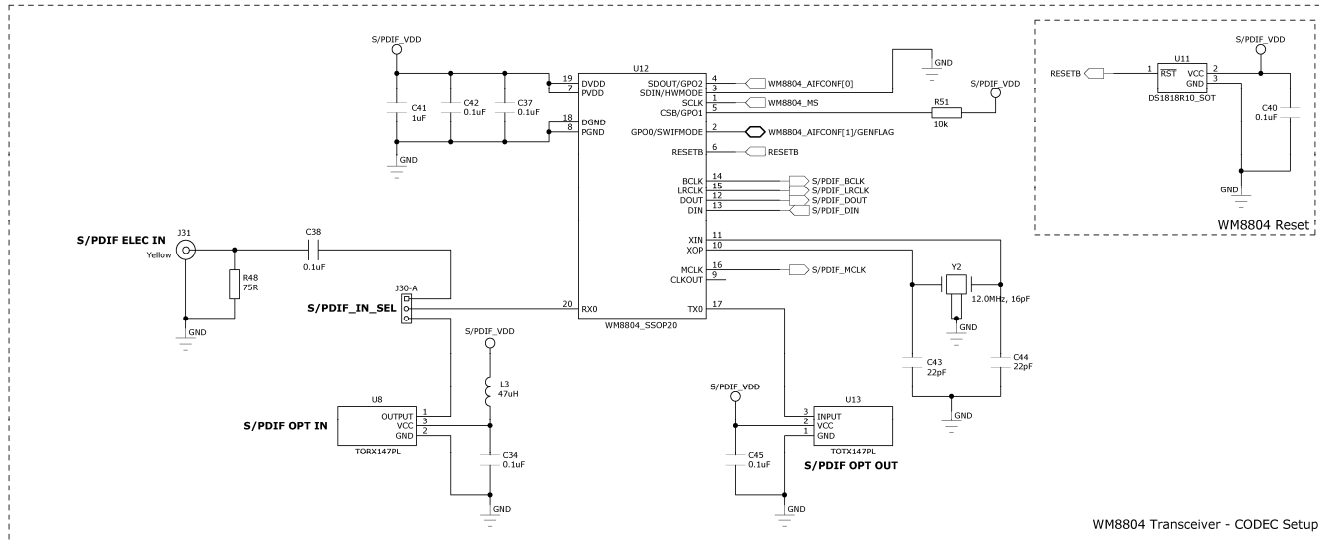
DOC TYPE:	SCHEMATIC AND LAYOUT
BOARD REFERENCE:	6220-EV1-REV1
BOARD TYPE:	Customer Main
WOLFSON DEVICE(S):	WM8993
DATE:	May 2009
DOC REVISION:	Rev 1.0

SCHEMATIC

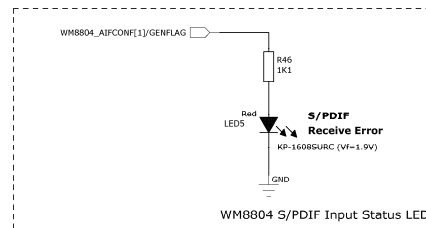
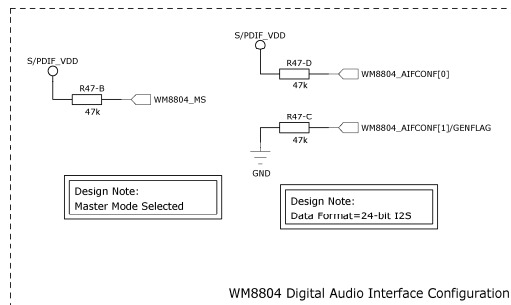
Sheet 1: Functional Diagram



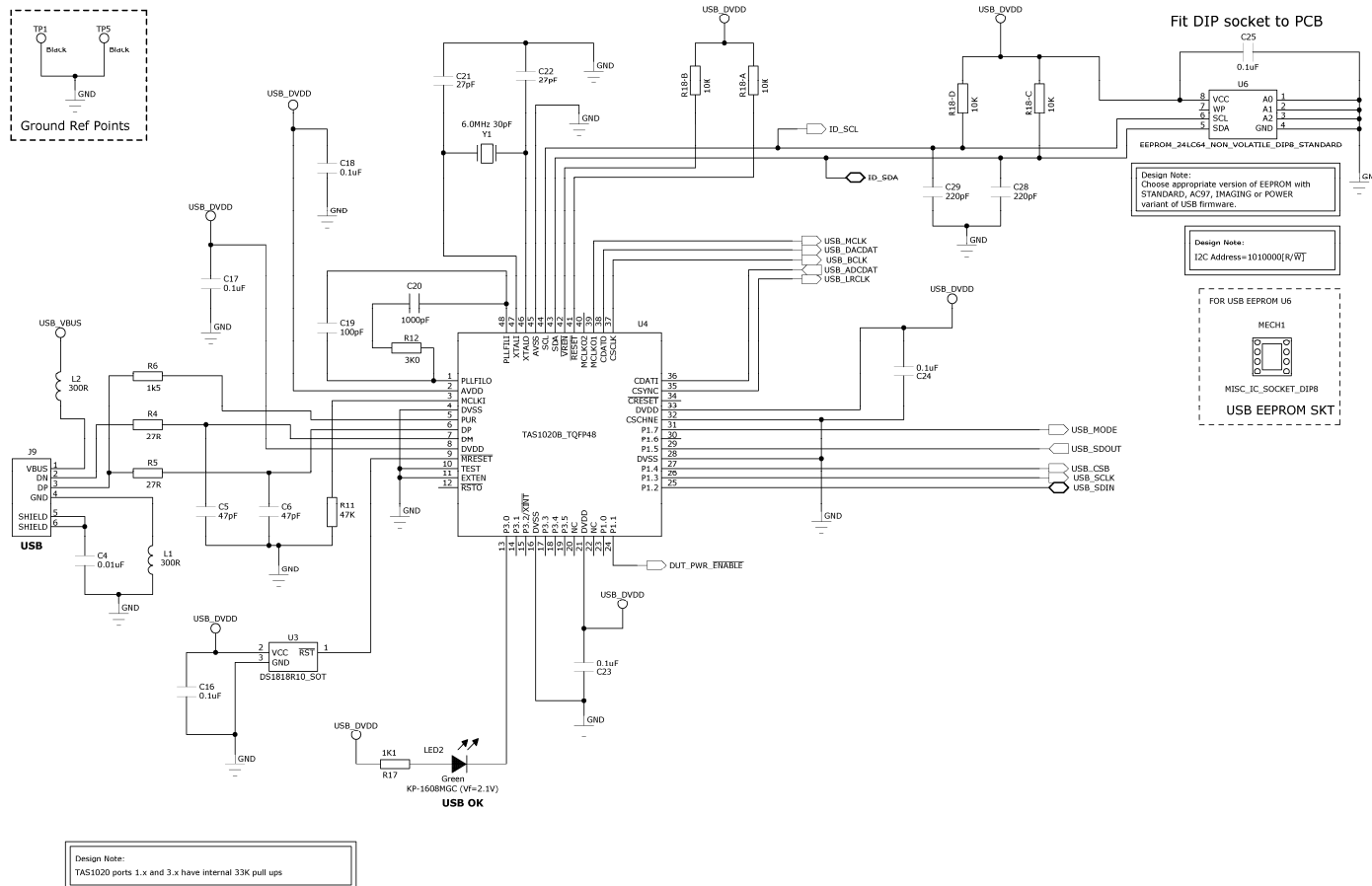
Sheet 2: S/PDIF Interface



WM8804 Transceiver - CODEC Setup

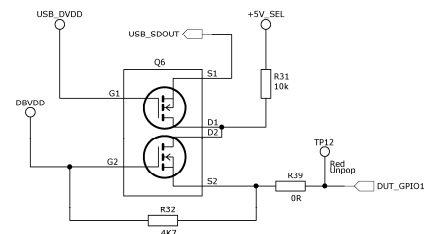
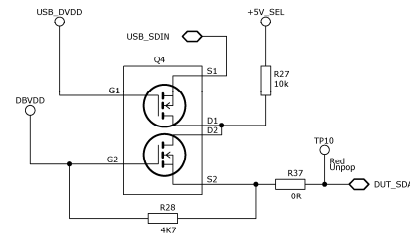
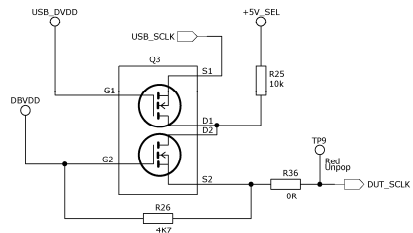
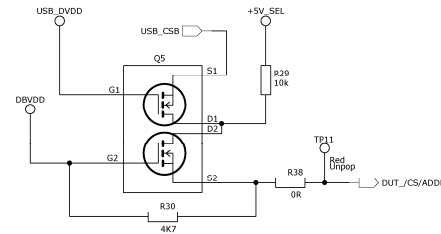
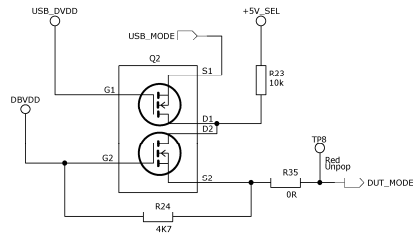


Sheet 3: USB Interface

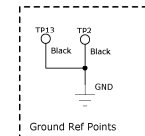




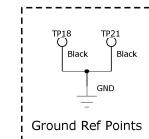
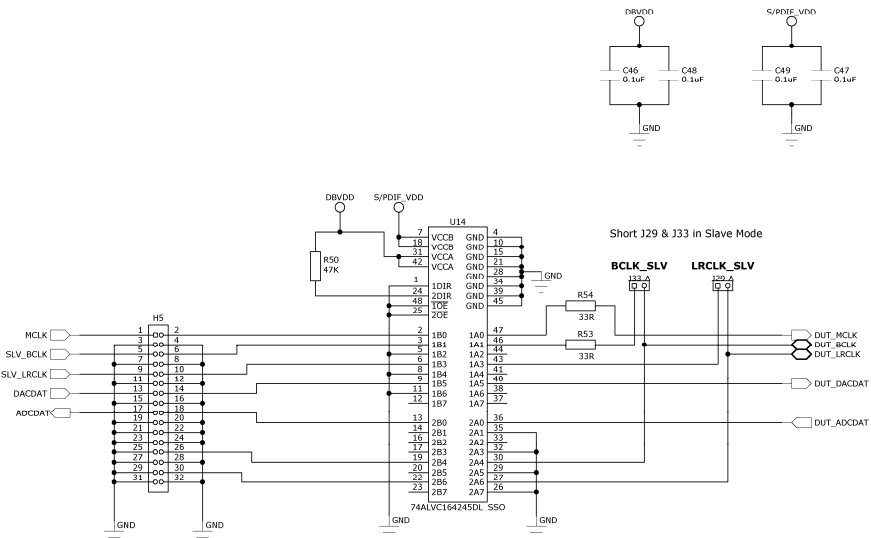
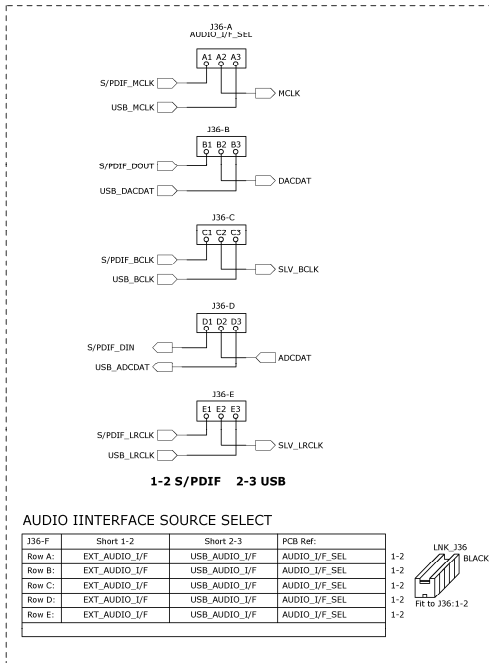
Sheet 4: Control I/F Level Shift



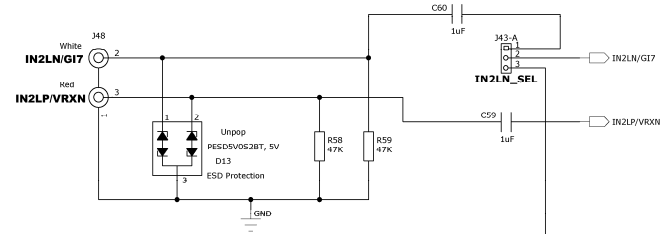
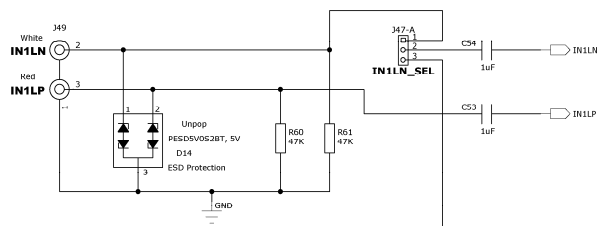
DESIGN NOTE
In 4-wire mode SDOUT from the DUT should be configured on GPI01.



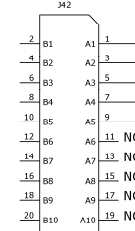
Sheet 5: Audio I/F Level Shift



Sheet 6: Audio Inputs



WOLFSON MIC CONNECTOR

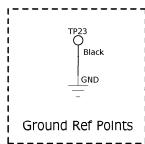
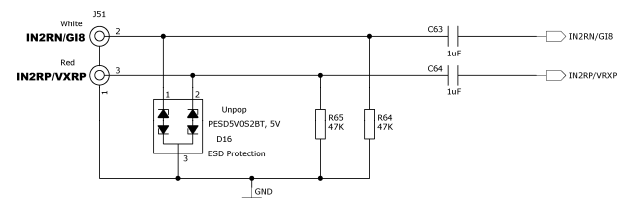
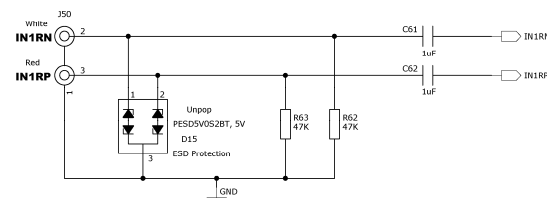


MICBIAS_SEL



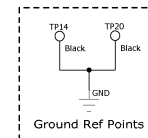
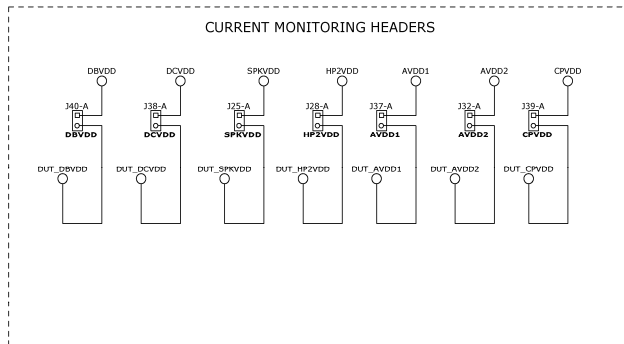
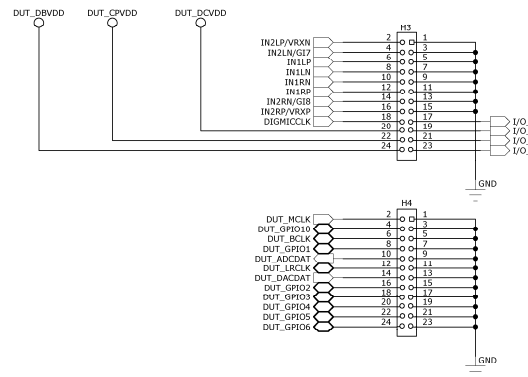
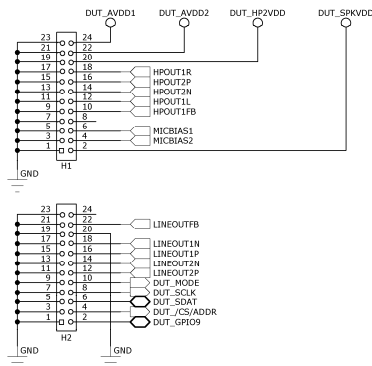
User Note:
When MIC is not in use MICBIAS should be disabled in the register settings

CON_ZX10_SH_SAMTEC_MEC8-110-02-L-0V

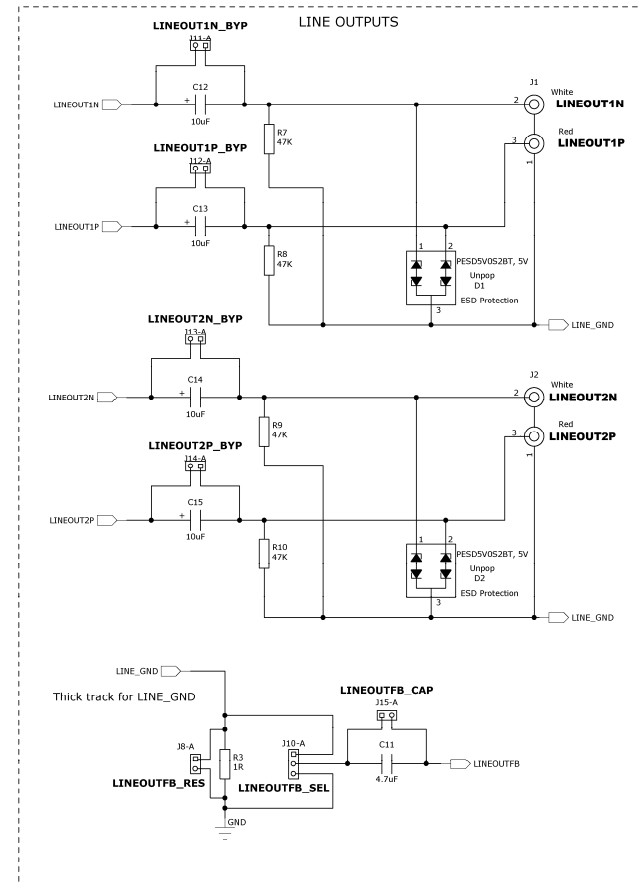
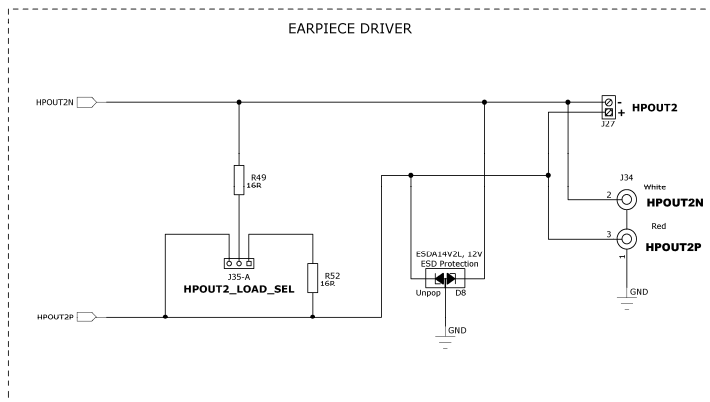
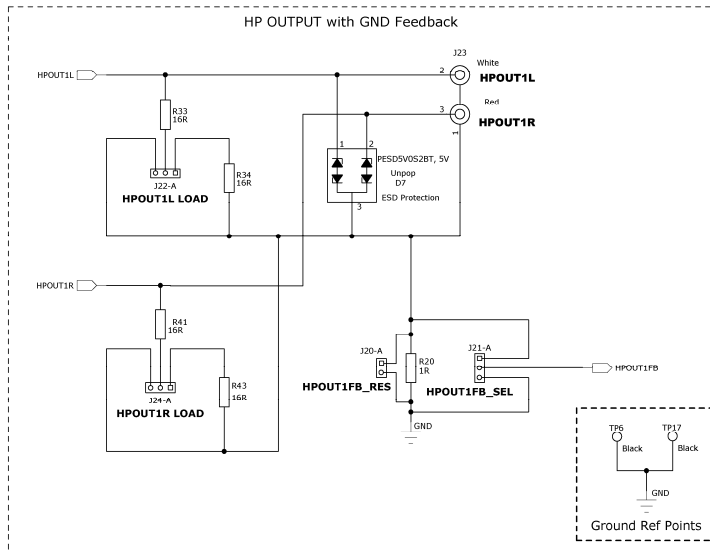




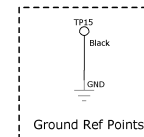
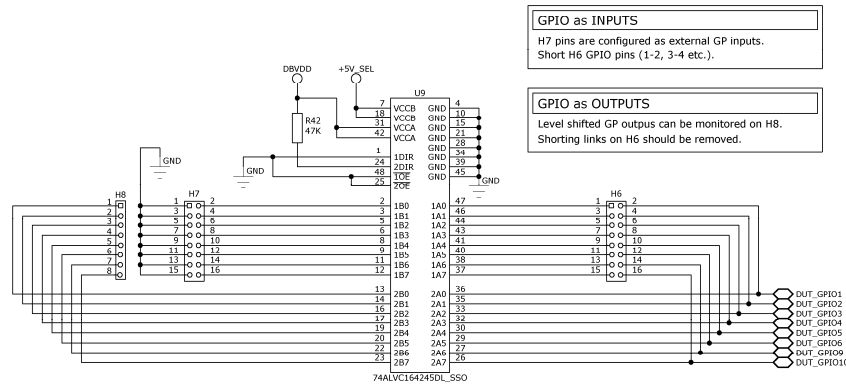
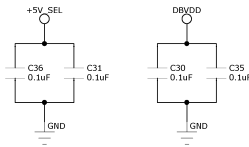
Sheet 7: DUT Headers



Sheet 8: Audio Outputs

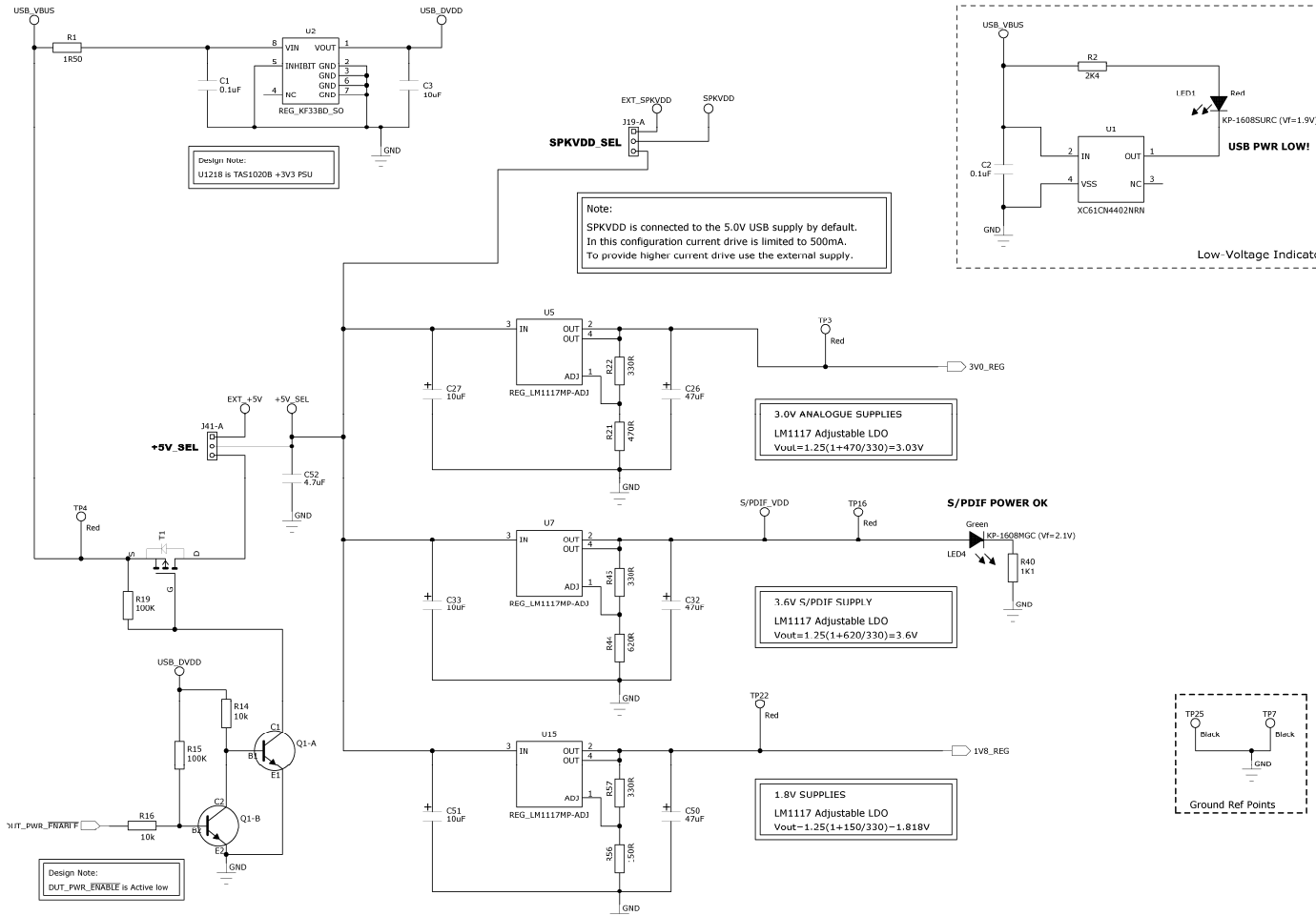


Sheet 9: GPIO Interface

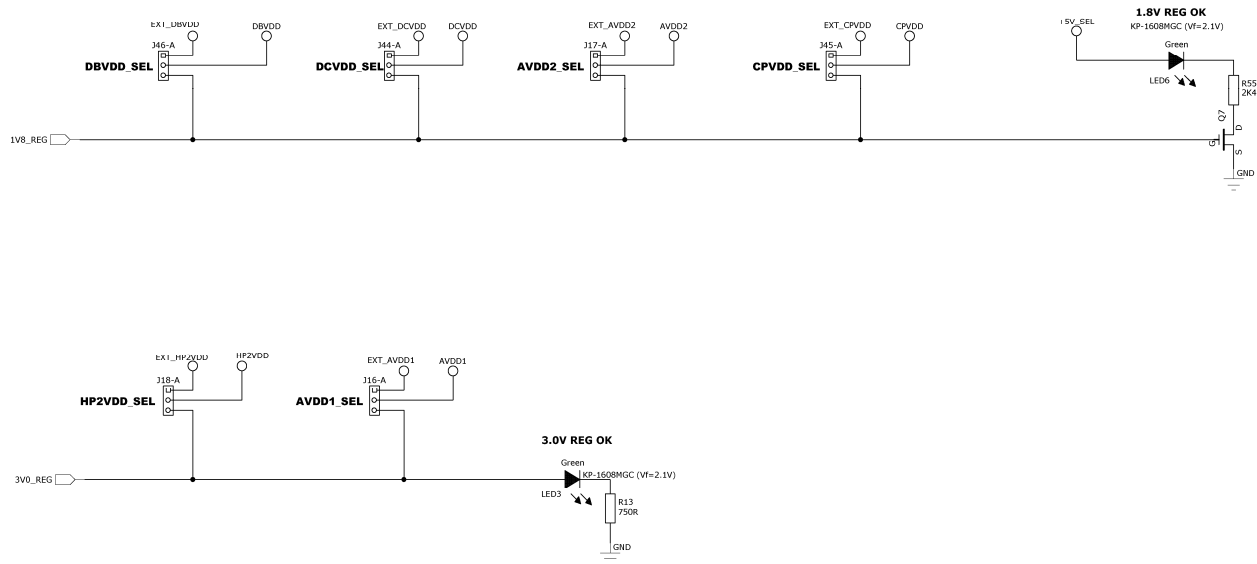




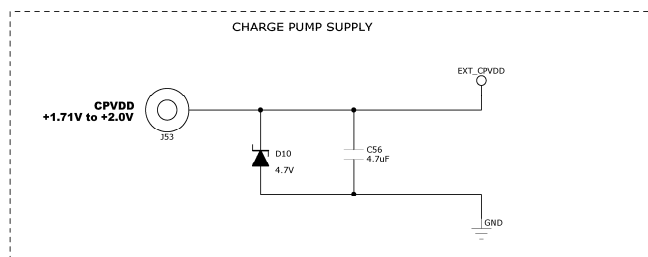
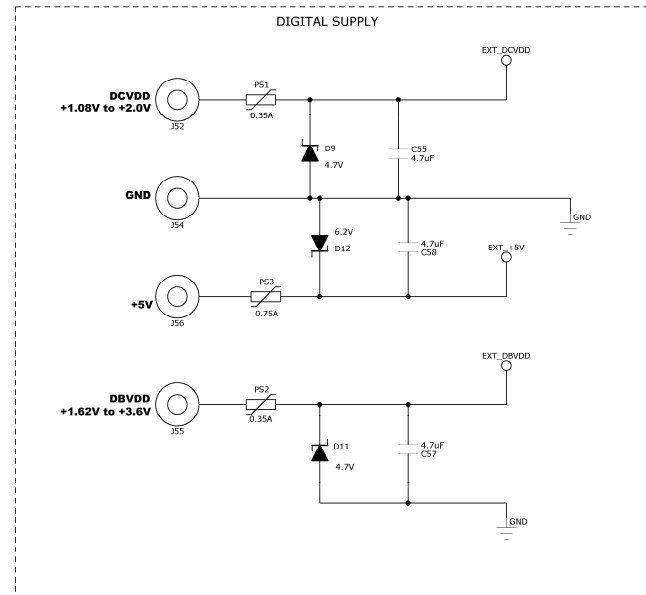
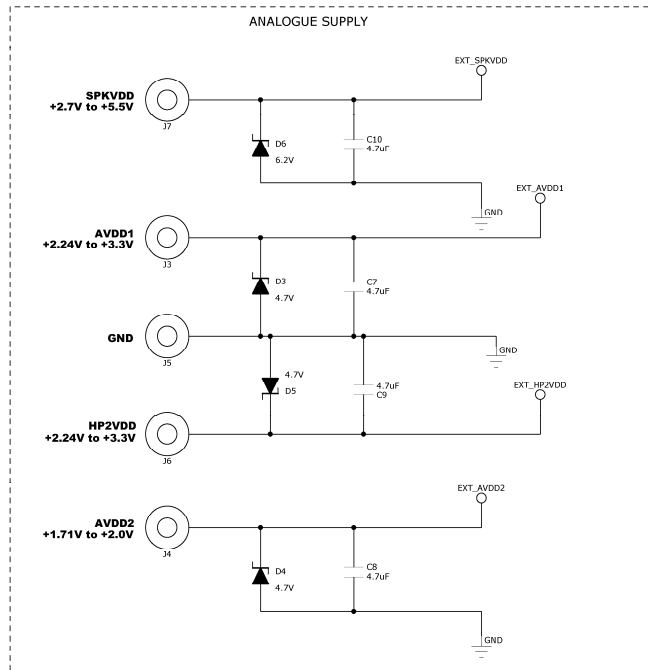
Sheet 10: USB Power 1



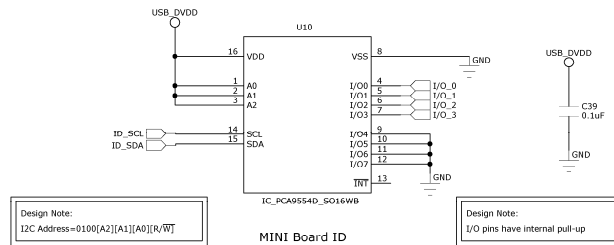
Sheet 11: USB Power 2



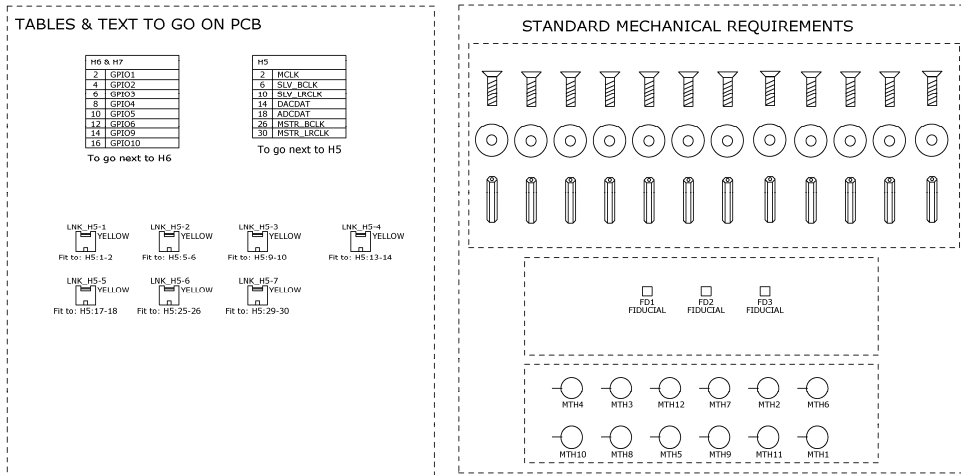
Sheet 12: External Power



Note:
 PS = Poly Switch for over-current protection
 D = Diodes for reverse polarity protection



Sheet 14: Mechanical Information



Sheet 15: Reference Tables

TABLES FOR REFERENCE

AUDIO_IF_LEVEL_SHIFT

UNK_333	Short	Open	UNK_333 VFI1 ROW Short
J33-B	Slave	Master	
PCB Ref:	BCLK_SLV		
UNK_329	Short	Open	UNK_329 YELLOW Short
J29-B	Slave	Master	
PCB Ref:	LNCLK_SLV		

Note:
1. Short J25 & J28 in Slave Mode

WM8804 S/PDIF

UNK_330	Short 1-2	Short 2-3	UNK_330 YELLOW 1-2
J30-B	Electrical Input	Optical Input	
PCB Ref:	S/PDIF_IN_SEL		

ANALOGUE OUTPUTS: HPOUT1

UNK_322	Short 1-2	Short 2-3	UNK_322 YELLOW 2-3
J22-B	32K load	16R load	
PCB Ref:	HPOUT1L_LOAD		
UNK_324	Short 1-2	Short 2-3	UNK_324 YELLOW 2-3
J24-B	32K load	16R load	
PCB Ref:	HPOUT1R_LOAD		
UNK_320	Short	Open	UNK_320 YELLOW Short
J20-B	No resistor in circuit	Resistor in circuit	
PCB Ref:	HPOUT1FB_RES		
UNK_321	Short 1-2	Short 2-3	UNK_321 YELLOW 2-3
J21-B	Pre Resistor	Post Resistor	
PCB Ref:	HPOUT1FB_SEL		

ANALOGUE OUTPUTS: HPOUT2

UNK_335	Short 1-2	Short 2-3	UNK_335 YELLOW 2-3
J35-B	32K load	16R load	
PCB Ref:	HPOUT2_LOAD_SEL		

ANALOGUE_INPUTS

UNK_347	Short 1-2	Short 2-3	UNK_347 YELLOW 1-2
J47-B	IN1LN Phono	ANA MIC	
PCB Ref:	IN1LN_SEL		
UNK_343	Short 1-2	Short 2-3	UNK_343 YELLOW 1-2
J43-B	IN2LN Phono	DIG MIC	
PCB Ref:	IN2LN_SEL		
UNK_326	Short 1-2	Short 2-3	UNK_326 YELLOW 1-2
J26-B	MICBIAS1	MICBIAS2	
PCB Ref:	MICBIAS_SEL		

ANALOGUE OUTPUTS: LINEOUT

	Short	Open	
J11-B	Capacitor Bypass	AC Coupled	Open
PCB Ref:	LINEOUT1N_BYP		
	Short	Open	
J12-B	Capacitor Bypass	AC Coupled	Open
PCB Ref:	LINEOUT1P_BYP		
	Short	Open	
J13-B	Capacitor Bypass	AC Coupled	Open
PCB Ref:	LINEOUT2N_BYP		
	Short	Open	
J14-B	Capacitor Bypass	AC Coupled	Open
PCB Ref:	LINEOUT2P_BYP		
	Short	Open	UNK_38
J8-B	No resistor in circuit	Resistor in circuit	Short
PCB Ref:	LINEOUTFB_RES		
	Short 1-2	Short 2-3	UNK_310
J10-B	Pre Resistor	Post Resistor	Short
PCB Ref:	LINEOUTFB_SEL		
	Short	Open	
J15-B	Cap bypassed	Cap in circuit	Open
PCB Ref:	LINEOUTFB_CAP		

USB_POWER

UNK_341	Short 1-2	Short 2-3	UNK_341 RED 2-3
J41-B	DXT_+5V	USD_+5V	
PCB Ref:	+5V_SEL		
UNK_318	Short 1-2	Short 2-3	UNK_318 RED 2-3
J18-B	EXT_HP2VDD	USB_HP2VDD	
PCB Ref:	HP2VDD_SEL		
UNK_316	Short 1-2	Short 2-3	UNK_316 RED 2-3
J16-B	EXT_AVDD1	USB_AVDD1	
PCB Ref:	AVDD1_SEL		
UNK_346	Short 1-2	Short 2-3	UNK_346 RED 2-3
J46-B	EXT_DBVDD	USB_DBVDD	
PCB Ref:	DBVDD_SEL		
UNK_344	Short 1-2	Short 2-3	UNK_344 RED 2-3
J44-B	EXT_DCVDD	USB_DCVDD	
PCB Ref:	DCVDD_SEL		
UNK_319	Short 1-2	Short 2-3	UNK_319 RED 2-3
J19-B	EXT_SPKVDD	USB_SPKVDD	
PCB Ref:	SPKVDD_SEL		
UNK_317	Short 1-2	Short 2-3	UNK_317 RED 2-3
J17-B	EXT_AVDD2	USB_AVDD2	
PCB Ref:	AVDD2_SEL		
UNK_345	Short 1-2	Short 2-3	UNK_345 RED 2-3
J45-B	EXT_CPVDD	USB_CPVDD	
PCB Ref:	CPVDD_SEL		

POWER SUPPLY CONNECTORS

UNK_340	Short	Open	UNK_340 RED Short
J40-B	DUT_DBVDD	Current measurement	
PCB Ref:	DBVDD		
UNK_338	Short	Open	UNK_338 RED Short
J38-B	DUT_DCVDD	Current measurement	
PCB Ref:	DCVDD		
UNK_325	Short	Open	UNK_325 RED Short
J25-B	DUT_SPKVDD	Current measurement	
PCB Ref:	SPKVDD		
UNK_328	Short	Open	UNK_328 RED Short
J28-B	DUT_HP2VDD	Current measurement	
PCB Ref:	HP2VDD		
UNK_337	Short	Open	UNK_337 RED Short
J37-B	DUT_AVDD1	Current measurement	
PCB Ref:	AVDD1		
UNK_332	Short	Open	UNK_332 RED Short
J32-B	DUT_AVDD2	Current measurement	
PCB Ref:	AVDD2		
UNK_339	Short	Open	UNK_339 RED Short
J39-B	DUT_CPVDD	Current measurement	
PCB Ref:	CPVDD		

BILL OF MATERIALS (BOM)

<i>Item</i>	<i>RefDes</i>	<i>Description</i>	<i>Manufacturer</i>	<i>Manufacturer's Part Number</i>
1	MSC3	Grip Seal Bag, 90x115mm	CPC	PA123
2	U9 U14	74ALVC164245 16 Bit Dual Supply Bus Transceiver SSO	Philips	74ALVC164245DL
3	U4	USB Streaming Controller	Texas Instruments	TAS1020BPFB
4	C3	10uF 0805 SMD Ceramic Capacitor 6.3V X5R	MuRata	GRM21BR60J106KE19L
5	C7 C8 C9 C10 C11 C52 C55 C56 C57 C58	4.7uF 0603 SMD Ceramic Capacitor 6.3V X5R	MuRata	GRM188R60J475KE19D
6	C21 C22	27pF 0603 SMD Ceramic Capacitor 50V NPO	Panasonic	ECJ-1VC1H270J
7	J31	Phono Socket PCB mount YELLOW	Dragon City	RS109 - Yellow
8	MSC2	Lead-free label, 15mm round	Brady	805794
9	H6 H7	2x8 2.54mm pitch PCB Pin Header VERTICAL	Harwin	M20-9980845
10	J8 J11 J12 J13 J14 J15 J20 J25 J28 J29 J32 J33 J37 J38 J39 J40	1x2 PCB Pin Header 0.1" VERTICAL	Harwin	M20-9990245
11	J10 J16 J17 J18 J19 J21 J22 J24 J26 J30 J35 J41 J43 J44 J45 J46 J47	1x3 2.54mm Header Vertical	Harwin	M20-9990345
12	H8	1x8 2.54mm pitch PCB Pin Header VERTICAL	Harwin	M20-9990845
13	Q1	BC847BS NPN Dual Bipolar Transistor SOT363	Philips	BC847BS
14	J9	USB receptacle Type B	FCI	61729-0010BLF
15	R49 R52	16R 1206 SMD chip resistor 2% 0.25W	Welwyn	WCR 1206 16R 2%
16	MECH1	IC Socket DIL 8 WAY	Multicomp	2227MC-08-03-F1
17	C12 C13 C14 C15 C27 C33 C51	10uF 10V SMD Tantalum Capacitor case A	Kemet	T491A106K010AT
18	R3 R20	1R 0805 SMD chip resistor 2% 0.1W	Meggitt	CRL1220 1R0
19	PS1 PS2	0.35A Poly Switch 1210	Tyco	MICROSMD035F-2
20	J27	PCB mount 1X2 terminal block for 2.5mm wire guage	LUMBERG	KRM 02
21	L1 L2	300R 0805 BMB2A Ferrite Bead	Meggitt	BMB2A0300AN1
22	L3	47uH 1210 Surface Mount Inductor 'PA series'	Panasonic	ELJPA470KF
23	U8	TORX147PL Digital Audio Fiber Optic Receiver	Toshiba	TORX147PL
24	U13	Fiber Optic Transmitting Module for Digital Audio Interface	Toshiba	TOTX147PL
25	PS3	0.75A Poly Switch 1210	Raychem	MICROSMD075F-2
26	SC1 SC2 SC3 SC4 SC5 SC6 SC7 SC8 SC9 SC10 SC11 SC12	Slotted Panhead Screw - M3 thread; 12mm long	TR Fasteners	M312 PSSTM CZ100-
27	W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12	Plain M3 size washer	TR Fasteners	M3-FABRWAN100-
28	Q2 Q3 Q4 Q5 Q6	Si1902DL N- Channel Dual MOSFET SC-70	Vishay	SI1902DL-T1-E3
29	C26 C32 C50	47uF 10V SMD Tantalum Capacitor case C	AVX	TAJC476K010R
30	R1	1R50 1206 SMD chip resistor 5% 0.25W	Vishay	2312 1551 1508

<i>Item</i>	<i>RefDes</i>	<i>Description</i>	<i>Manufacturer</i>	<i>Manufacturer's Part Number</i>
31	C1 C2 C16 C17 C18 C23 C24 C25 C30 C31 C34 C35 C36 C37 C38 C39 C40 C42 C45 C46 C47 C48 C49	0.1uF 0603 SMD Ceramic Capacitor 16V X7R	Phycomp	2238 786 15649
32	C5 C6	47pF 0603 SMD Ceramic Capacitor 50V NPO	AVX	06035A470JAT2A
33	C28 C29	220pF 0603 SMD Ceramic Capacitor 50V NPO	AVX	06035A221JAT2A
34	P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12	Hexagonal brass M3 size spacer 20mm length	Harwin	R6379-02
35	C43 C44	22pF 0603 SMD Ceramic Capacitor 50V NPO	Phycomp	2238 867 15229
36	C4	0.01uF 0603 SMD Ceramic Capacitor 50V X7R	Phycomp	2238 586 15636
37	LED2 LED3 LED4 LED6	KP-1608MGC 0603 SMD Chip LED GREEN	Kingbright	KP-1608MGC
38	LED1 LED5	KP-1608SURC 0603 SMD Chip LED RED	Kingbright	KP-1608SURC
39	TP1 TP2 TP5 TP6 TP7 TP13 TP14 TP15 TP17 TP18 TP19 TP20 TP21 TP23 TP24 TP25	1.32mm PCB Test Terminal BLACK	Vero	20-2136
40	TP3 TP4 TP16 TP22	1.32mm PCB Test Terminal RED	Vero	20-313141
41	R18	10K 1206 SMD chip 4 resistor array 5% 0.063W	Phycomp	2350 03510 103
42	R47	47k 1206 SMD chip 4 resistor array 5% 0.063W	Phycomp	2350 035 10473
43	R14 R16 R23 R25 R27 R29 R31 R51	10k 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 10K
44	R15 R19	100K 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 100K
45	R17 R40 R46	1K1 0603 SMD chip resistor 1% 0.1W	Multicomp	MC 0.063W 0603 1% 1K1
46	R56	150R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 150R
47	R6	1k5 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 1K5
48	R33 R34 R41 R43	16R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 16R
49	R2 R55	2K4 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 2K4
50	R4 R5	27R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 27R
51	R12	3K0 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 3K
52	R22 R45 R57	330R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 330R
53	R53 R54	33R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 33R
54	R24 R26 R28 R30 R32	4K7 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 4K7
55	R7 R8 R9 R10 R11 R42 R50 R58 R59 R60 R61 R62 R63 R64 R65	47K 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 47K
56	R44	620R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 620R
57	R13	750R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 750R
58	R48	75R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 75R
59	R35 R36 R37 R38 R39 R66	0R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 0R
60	C19	100pF 0603 SMD Ceramic Capacitor 50V NPO	Multicomp	U0603C101JCT
61	C20	1000pF 0603 SMD Ceramic Capacitor 50V NPO	Multicomp	U0603C102JCT

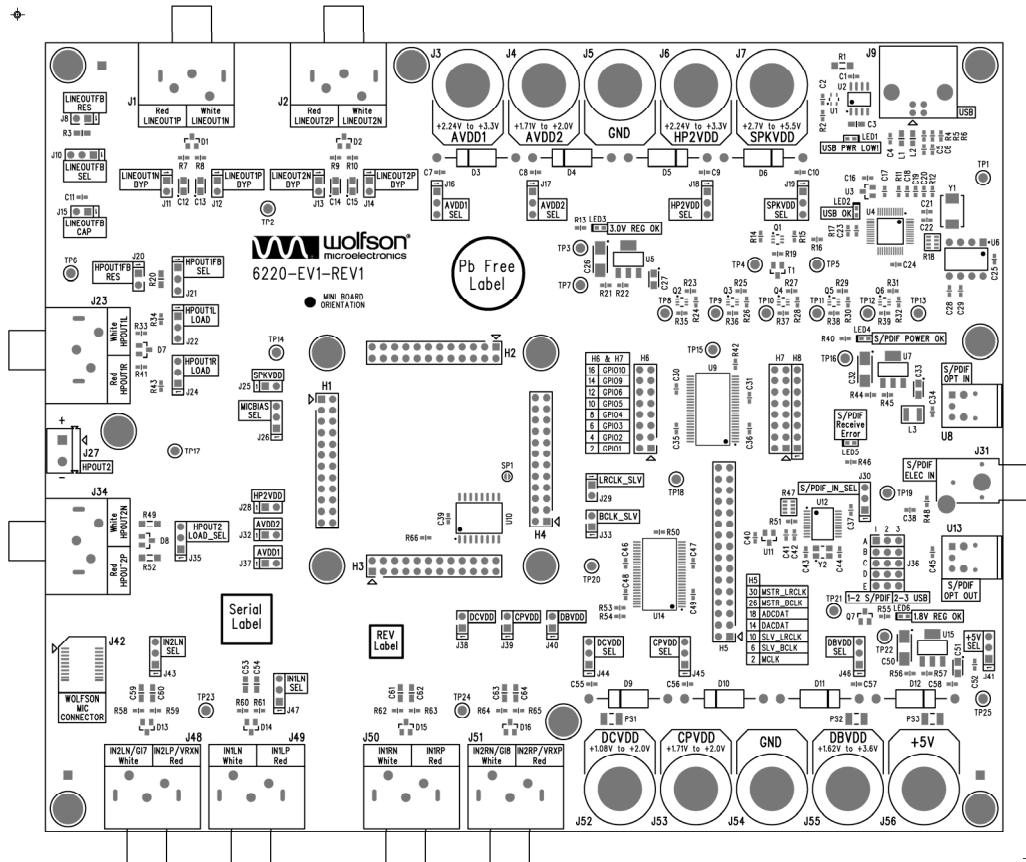
Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
62	C53 C54 C59 C60 C61 C62 C63 C64	1uF 0805 SMD Ceramic Capacitor 10V X7R	Multicomp	N0805R105KCT
63	T1	P-Channel MOSFET 60v, R _{ds(on)} = 0.17R - SOT23	Vishay	SI2309DS
64	D3 D4 D5 D9 D10 D11	1N5337B 4.7V 5W Zener Diode PTH	ON Semiconductor	1N5337BG
65	D6 D12	1N5341B 6.2V 5W Zener Diode PTH	ON Semiconductor	1N5341BG
66	U3 U11	DS1818 3.3V active-low Power-On-Reset chip SOT	Dallas Semiconductor	DS1818R-10+
67	U2	KF33BD Very Low Drop +3.3V Voltage Regulator SO	ST Microelectronics	KF33BD
68	U6	EEPROM 8x8 i2c interface - with Wolfson "Standard" code	Microchip Technology	24LC64-I/P
69	Q7	BSS138 N-Channel enhancement Mode FET	Fairchild Semiconductor	BSS138
70	Y2	XTAL 12MHz 16pF SM GSX-433 Series	Golledge	GSX-433/111DF 12MHz
71	Y1	6.0MHz GSX-752A/351JF SM Crystal 30pF	Golledge	GSX-752A/351JF 6.0MHz
72	J3 J4 J5 J6 J7 J52 J53 J54 J55 J56	4mm Non-Insulated Panel Socket 16A	PJP	3110I
73	J1 J2 J23 J34 J48 J49 J50 J51	Phono Socket PCB mount Pair Red/White	Rapid	20-1290
74	LNK_J16 LNK_J17 LNK_J18 LNK_J19 LNK_J25 LNK_J28 LNK_J32 LNK_J37 LNK_J38 LNK_J39 LNK_J40 LNK_J41 LNK_J44 LNK_J45 LNK_J46	0.1" OPEN JUMPER LINK RED	Protech	22-3565
75	LNK_H5-7 LNK_H5-6 LNK_H5-5 LNK_H5-4 LNK_H5-3 LNK_H5-2 LNK_H5-1 LNK_J8 LNK_J10 LNK_J20 LNK_J21 LNK_J22 LNK_J24 LNK_J26 LNK_J29 LNK_J30 LNK_J33 LNK_J35 LNK_J43 LNK_J47	0.1" OPEN JUMPER LINK YELLOW	Protech	22-3570
76	R21	470R 0603 SMD chip resistor 1% 0.063W	Tyco	01622949-1
77	U10	PCA9554D I2C I/O Expander	Philips	PCA9554D
78	U5 U7 U15	REG LM1117 1.25 - 13.8V 0.8A ADJUSTABLE	National Semiconductor	LM1117MP-ADJ
79	C41	1uF 0603 SMD Ceramic Capacitor 6.3V X5R	MuRata	GRM188R60J105KA01D
80	LNK J36	5way, 0.1" Pitch, Open, Black, Jumper Link - Block	Toby	C33-GAG1-2x5-G
81	J42	2x10 way socket, mates with edge connector on 0.062" thick PCB	Samtec	MEC8-110-02-L-DV
82	H1 H2 H3 H4	2x12 2.54mm pitch PCB Pin Header VERTICAL	Toby	THD-12-R
83	H5	2x16 2.54mm pitch PCB Pin Header VERTICAL	Toby	THD-16-R
84	J36	3x5 2.54mm Header Vertical	Toby	THT-5-R
85	U1	XC61C Low Power Consumption Voltage Detector	Torex	XC61CN4402NRN
86	PCB1	PCB	Kelan Circuits Ltd	6220-EV1-REV1
87	U12	WM8804 1:1 Digital Interface Transceiver with PLL	Wolfson Microelectronics	WM8804GEDS



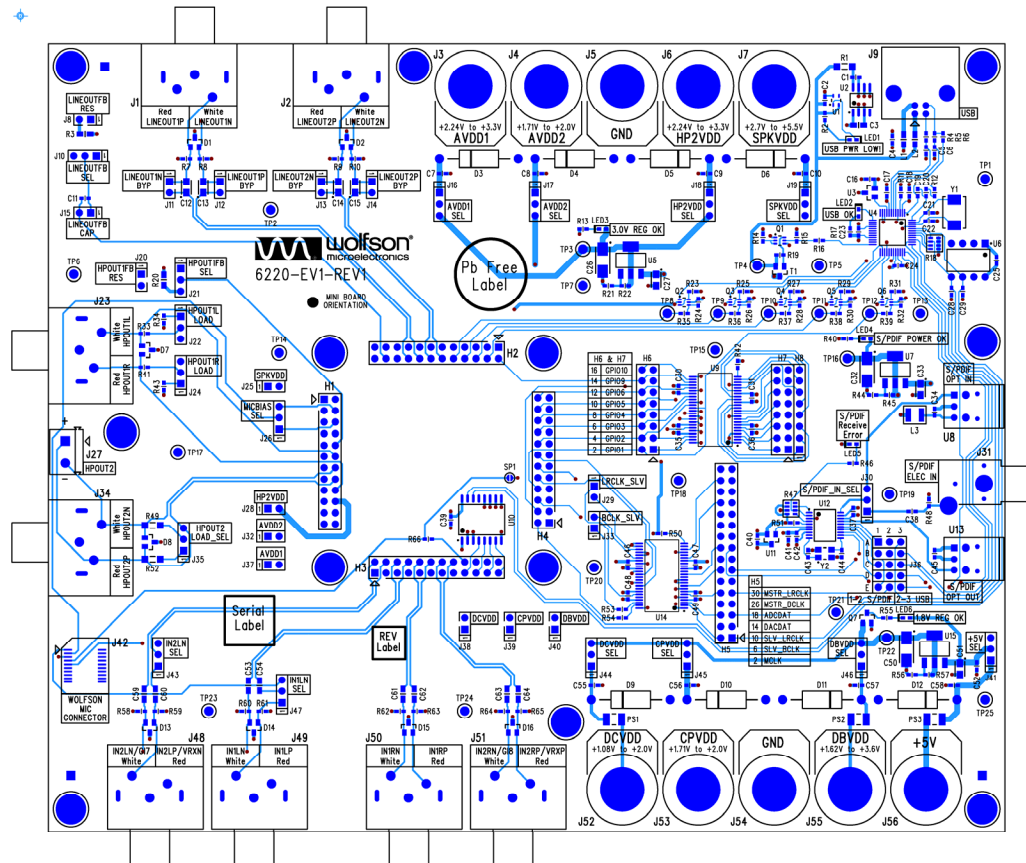
<i>Item</i>	<i>RefDes</i>	<i>Description</i>	<i>Manufacturer</i>	<i>Manufacturer's Part Number</i>
Unpop				
88	TP8 TP9 TP10 TP11 TP12	1.32mm PCB Test Terminal RED	Vero	20-313141
89	D1 D2 D7 D13 D14 D15 D16	TVS Diode PESD5V0S2BT V _{rw} m=5V dual ESD Protection SOT23	Philips	PESD5V0S2BT
90	D8	TVS Diode ESDA14V2L V _{rw} m=12V dual ESD Protection SOT23	ST Microelectronics	ESDA14V2L
91	SP1	Surface mount shorting point	N/A	N/A

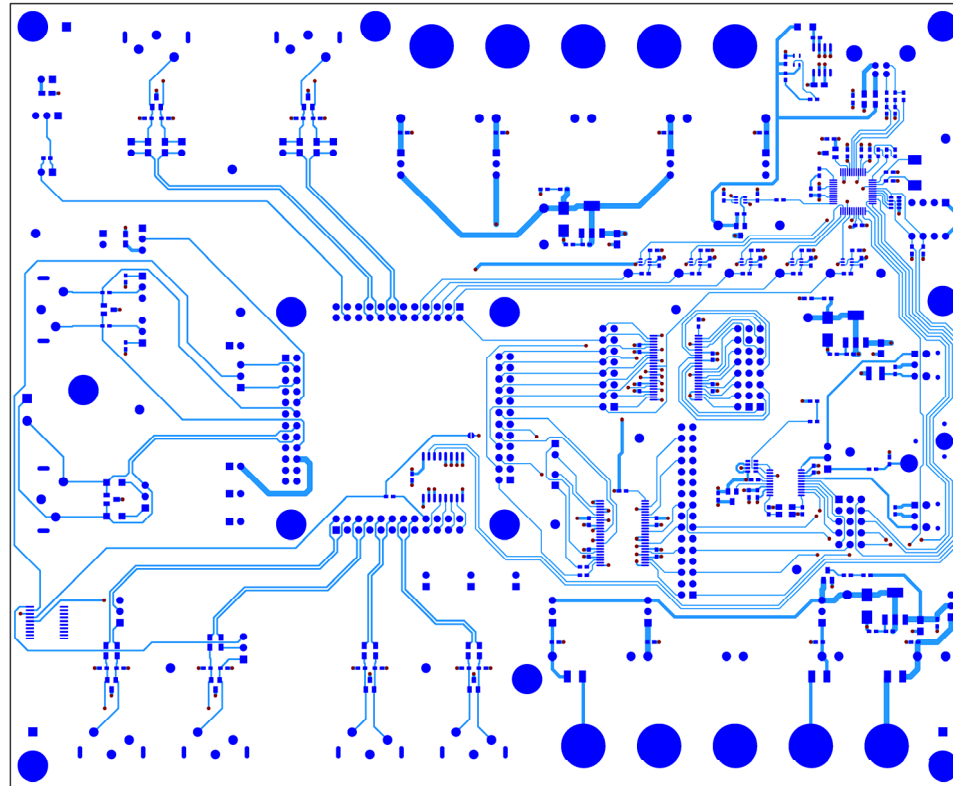


PCB LAYOUT

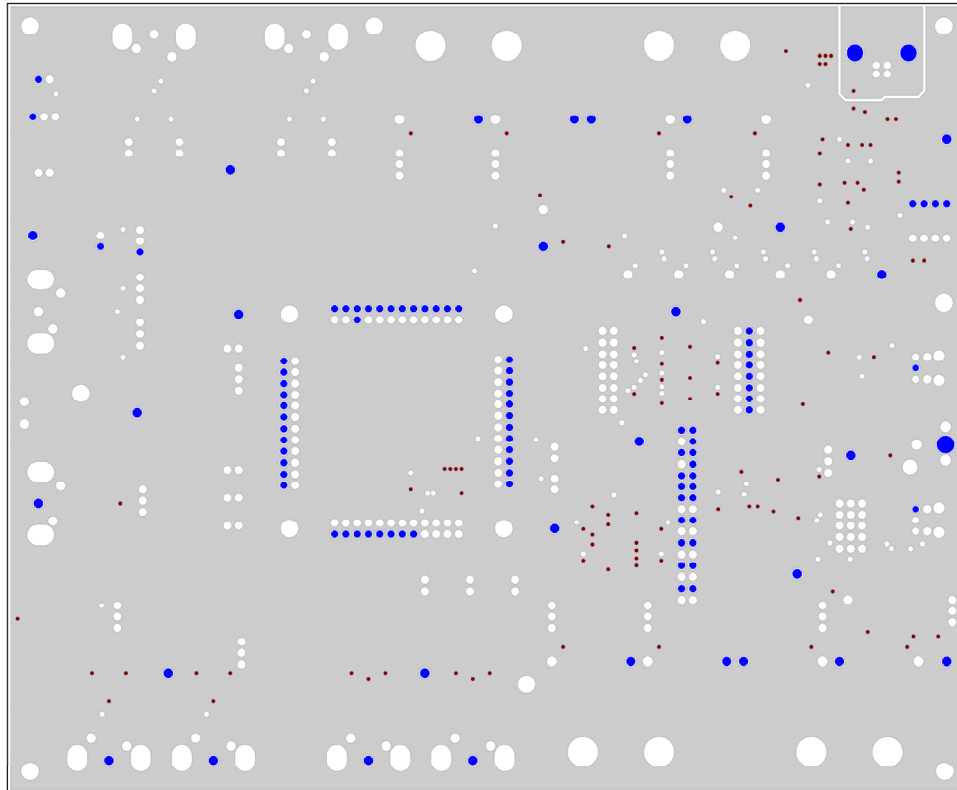


Top Layer: Overview

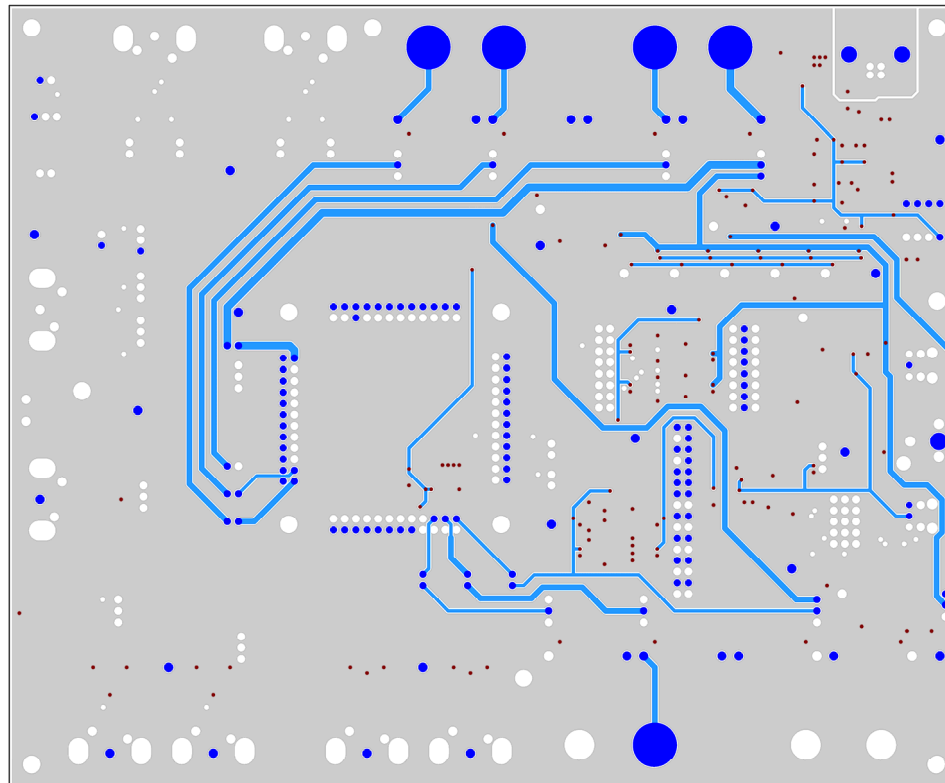




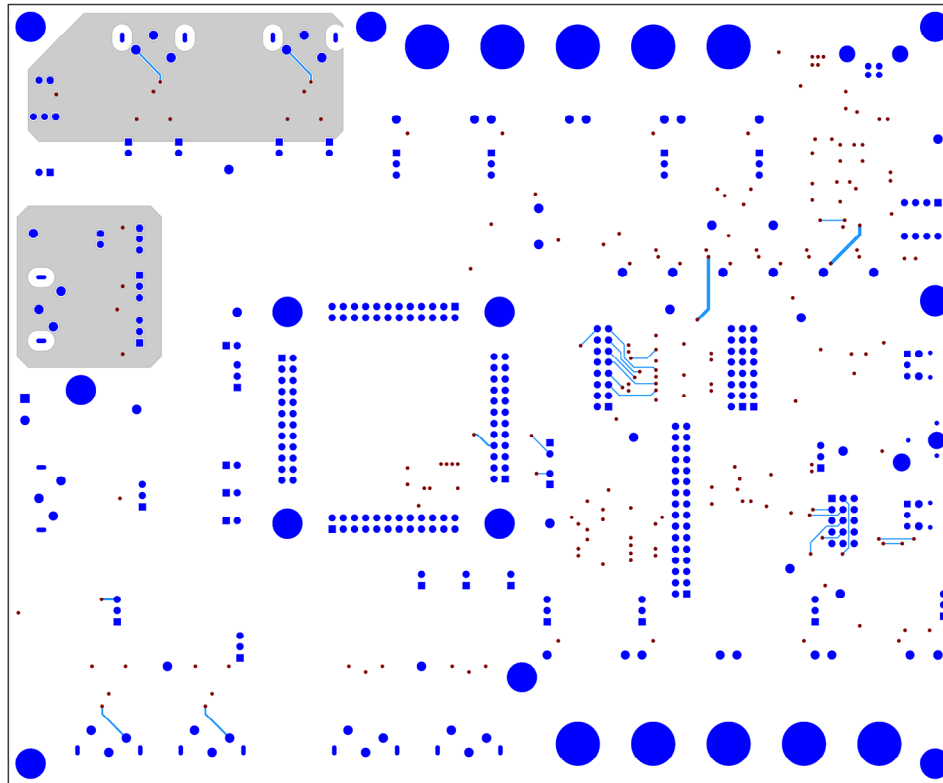
Top Layer: Copper



Layer 2: Copper



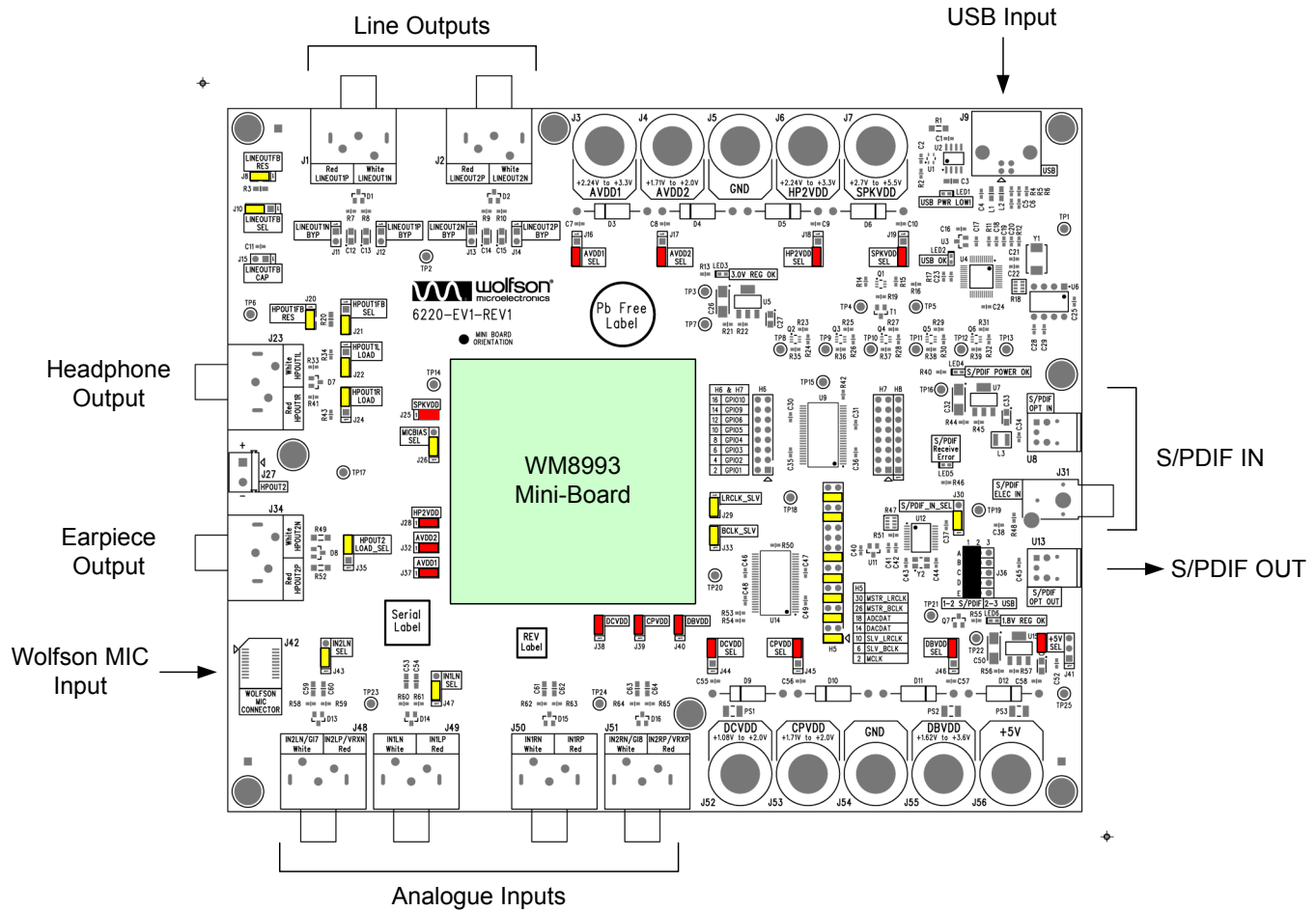
Layer 3: Copper



Bottom Layer: Copper



GENERIC BOARD CONFIGURATION



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
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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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