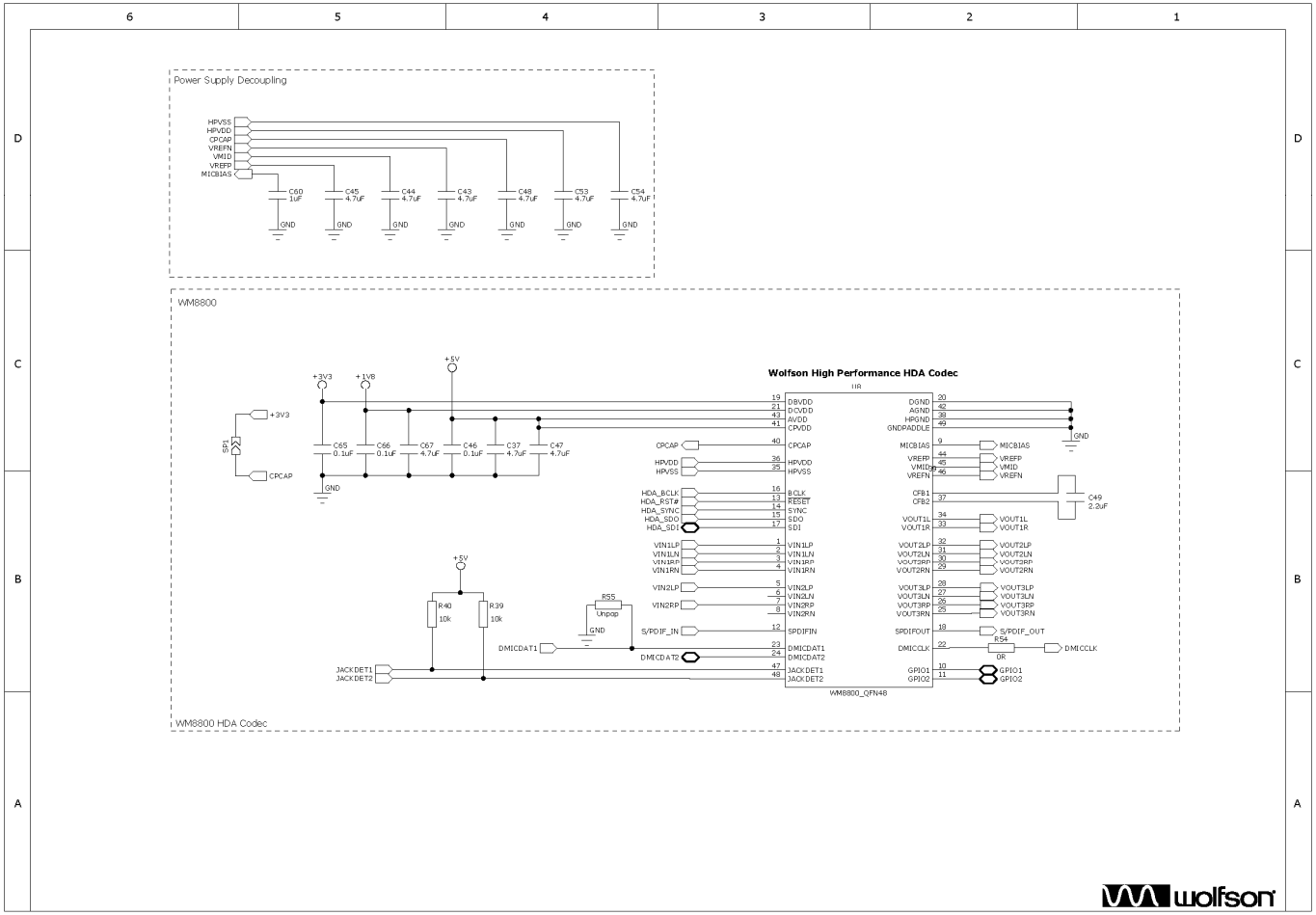
WM8800-6200-FL48-EV1-REV1
Schematic and Layout

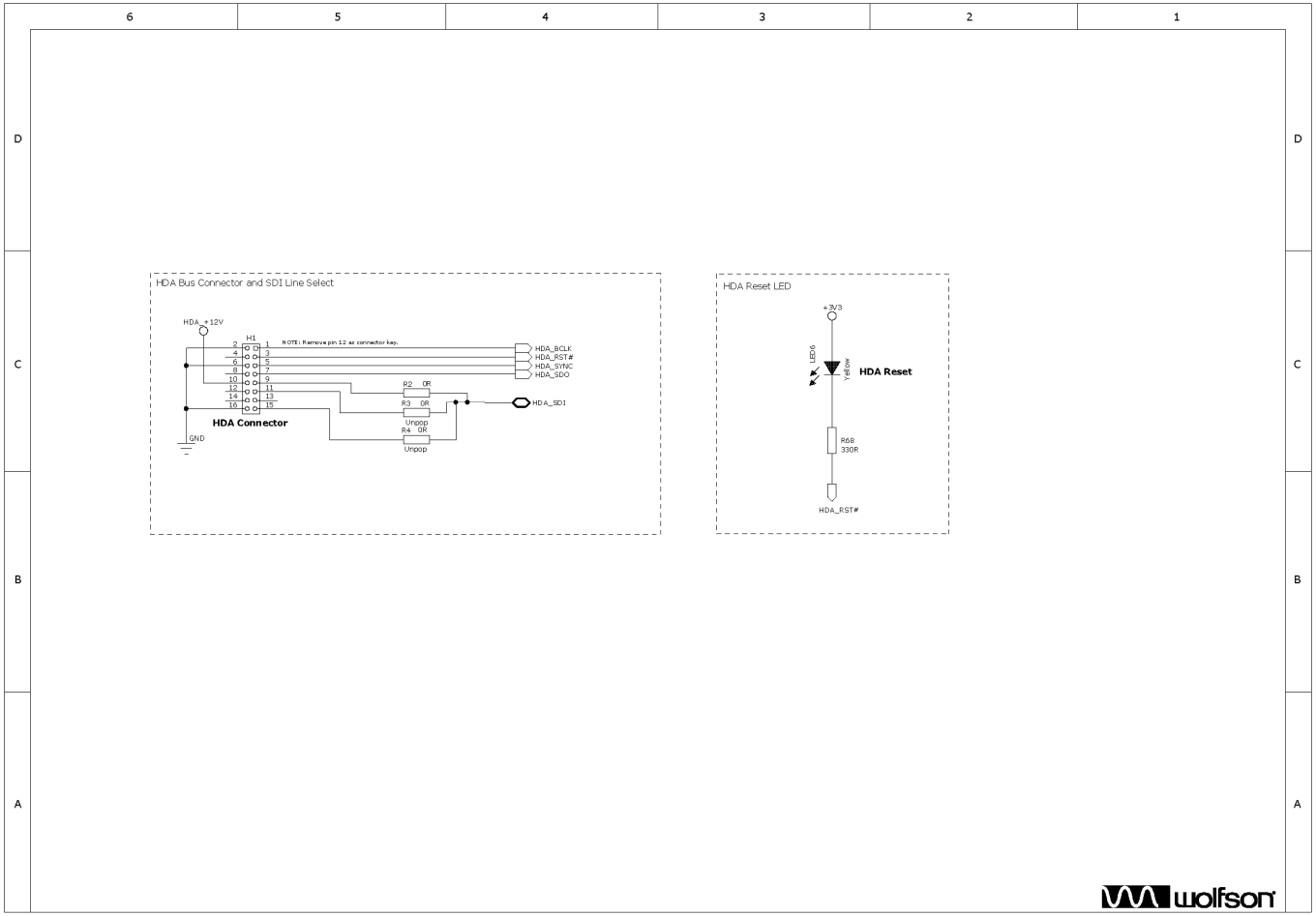
DOC TYPE:	Schematic and Layout
BOARD REFERENCE:	WM88XX-6200-FL48-EV1-REV1
BOARD TYPE:	Customer Standalone
WOLFSON DEVICE(S):	WM8800
DATE:	August 2010
DOC REVISION:	Rev 1.0

SCHEMATIC

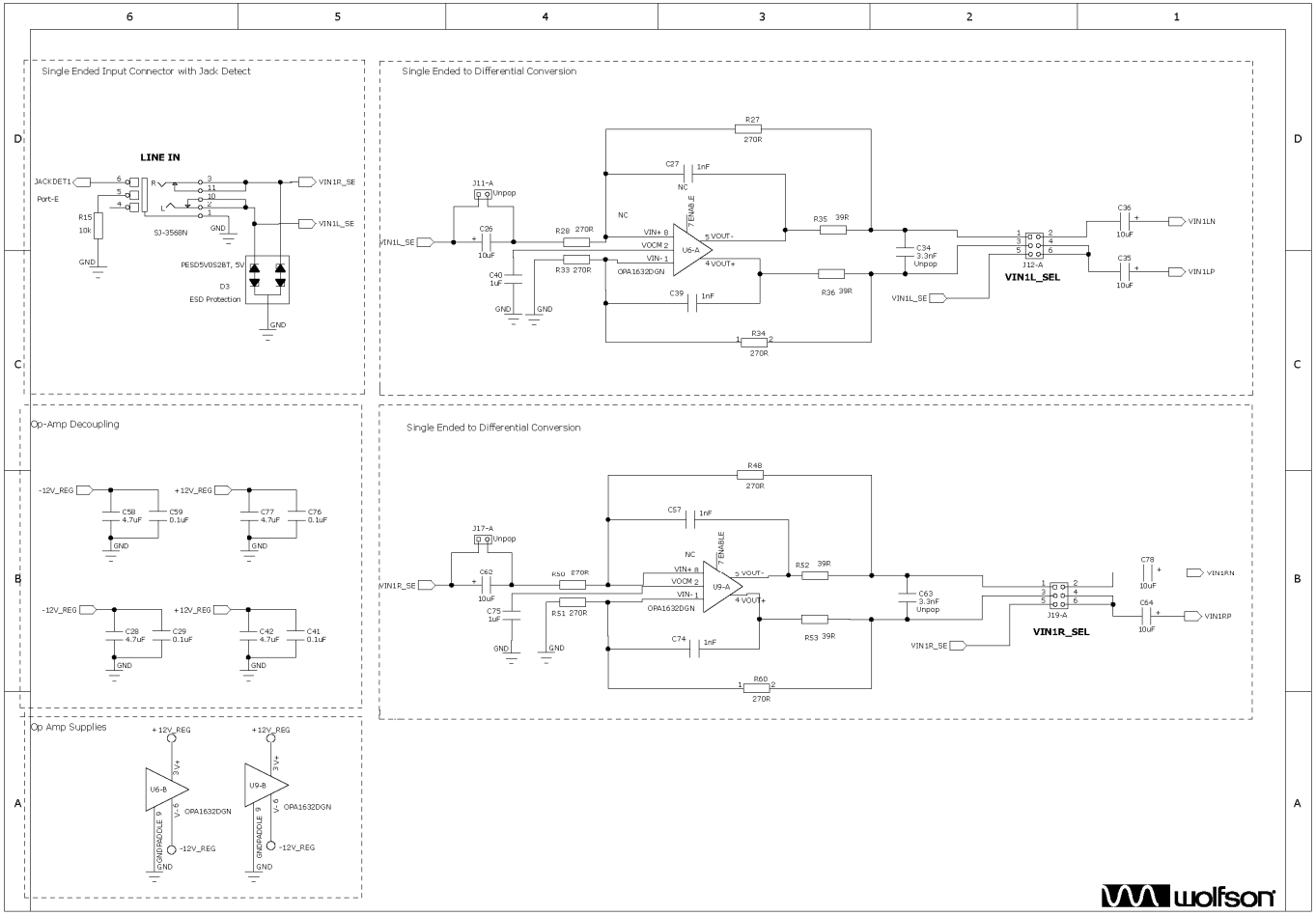
Sheet 1:



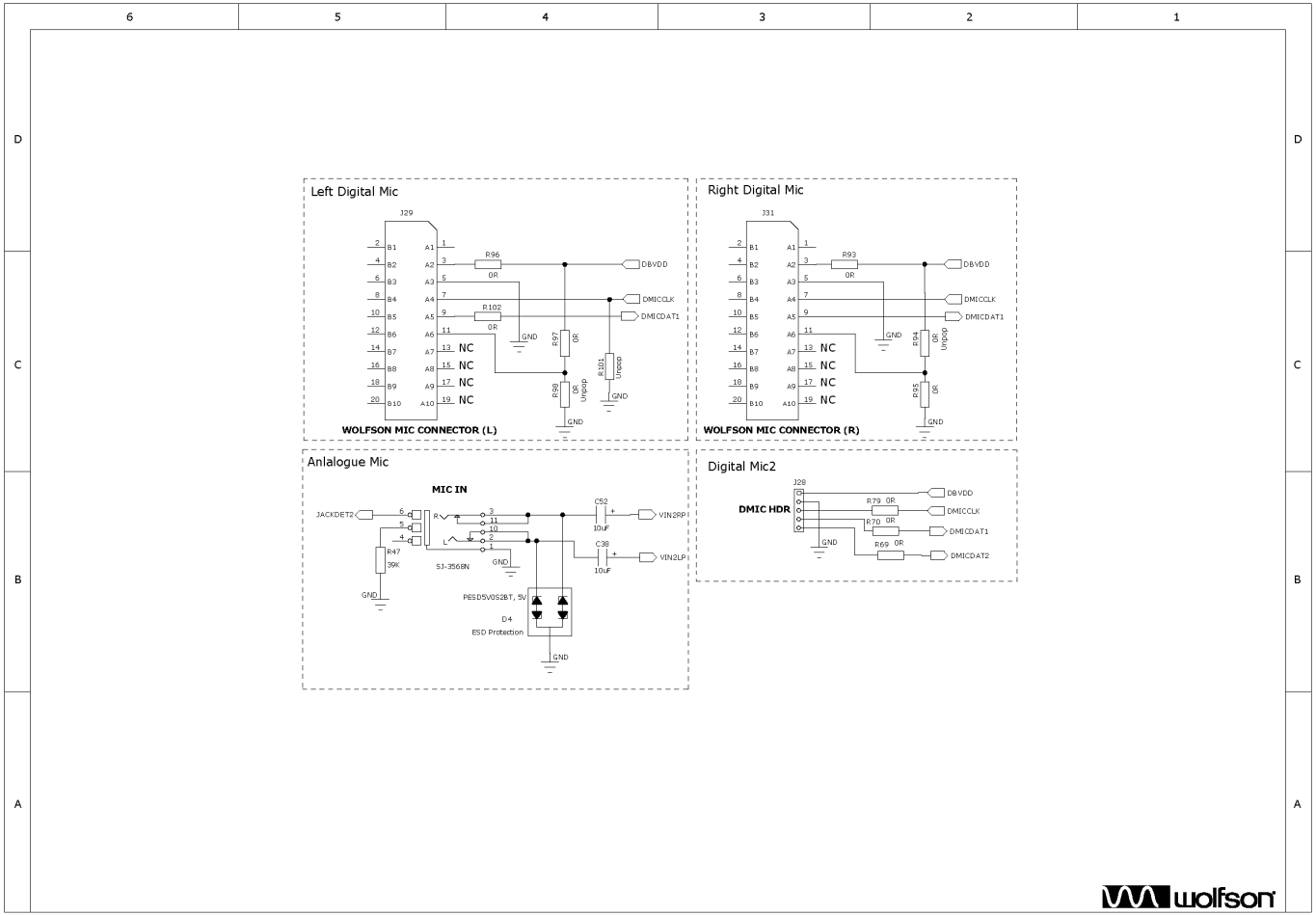
Sheet 2:


6
5
4
3
2
1
D
C
B
A
HDA Bus Connector and SDI Line Select
HDA_+12V
H1
NOTE: Remove pin 12 as connector key.
HDA_BCLK
HDA_RST#
HDA_SYNC
HDA_SDO
R2 0R
R3 0R
HDA_SDI
Unpop
R4 0R
Unpop
HDA Connector
GND
HDA Reset LED
+3V3
LED6
Yellow
HDA Reset
R68
330R
HDA_RST#

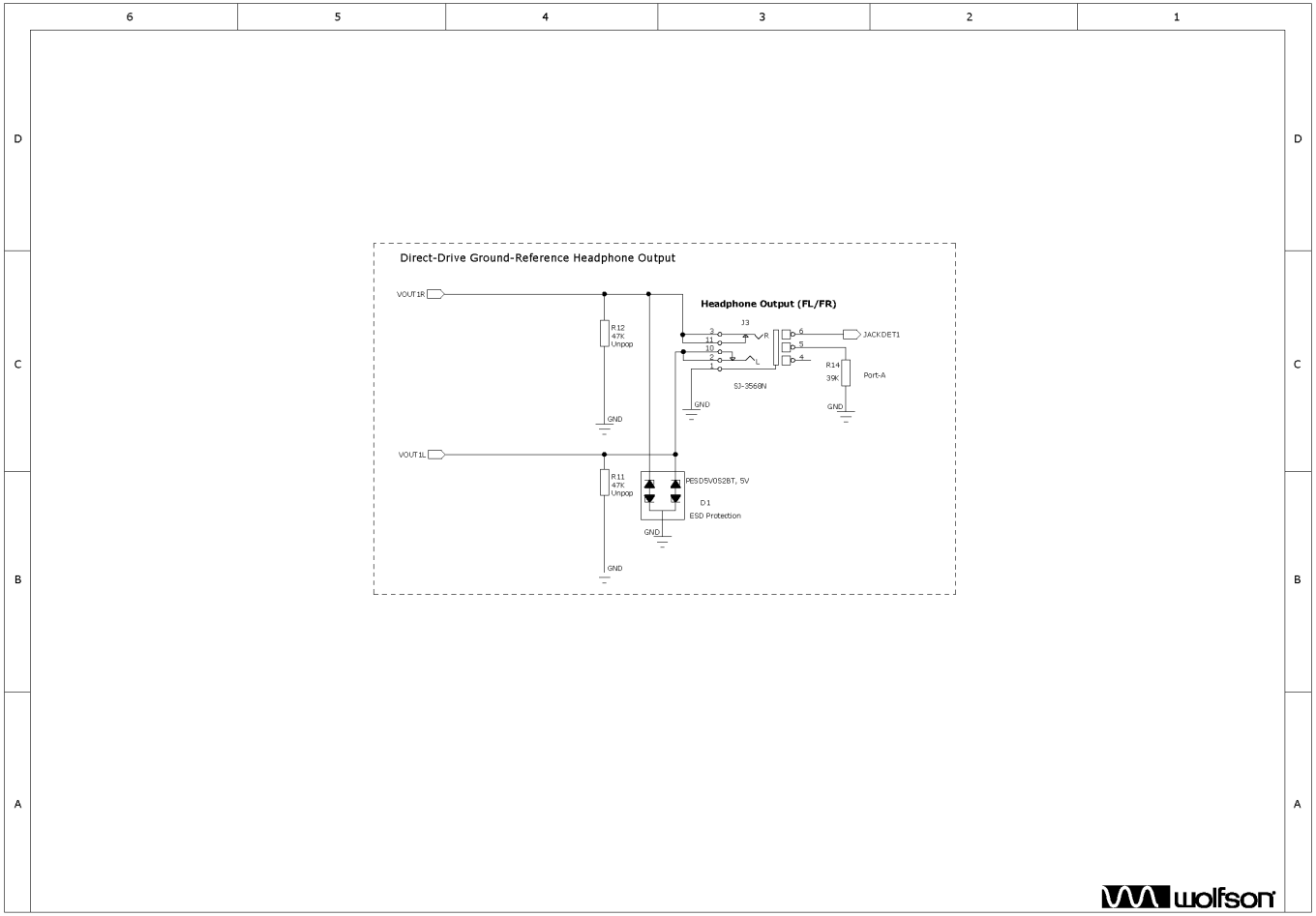
Sheet 3:


Single Ended Input Connector with Jack Detect
LINE IN
JACKDET1
Port-E
R15
10k
SJ-3568N
PESD5V0S2BT, 5V
D3
ESD Protection
VIN1R_SE
VIN1L_SE
GND
Single Ended to Differential Conversion
R27
270R
C27
1nF
NC
J11-A
Unpop
C26
10uF
R28 270R
R33 270R
C40
1uF
U6-A
OPA1632DGN
R35 39R
R36 39R
R34
270R
C39
1nF
C34
3.3nF
Unpop
J12-A
VIN1L_SEL
C36
10uF
C35
10uF
VIN1LN
VIN1LP
Op-Amp Decoupling
-12V_REG
+12V_REG
C58
4.7uF
C59
0.1uF
C77
4.7uF
C76
0.1uF
C28
4.7uF
C29
0.1uF
C42
4.7uF
C41
0.1uF
Op Amp Supplies
U6-B
U9-B
OPA1632DGN
GNDPADDLE
Single Ended to Differential Conversion
R48
270R
C57
1nF
J17-A
C62
10uF
R50 270R
R51 270R
C75
1uF
U9-A
R52 39R
R53 39R
C74
1nF
R60
270R
C63
3.3nF
Unpop
J19-A
VIN1R_SEL
C78
10uF
C64
10uF
VIN1RN
VIN1RP

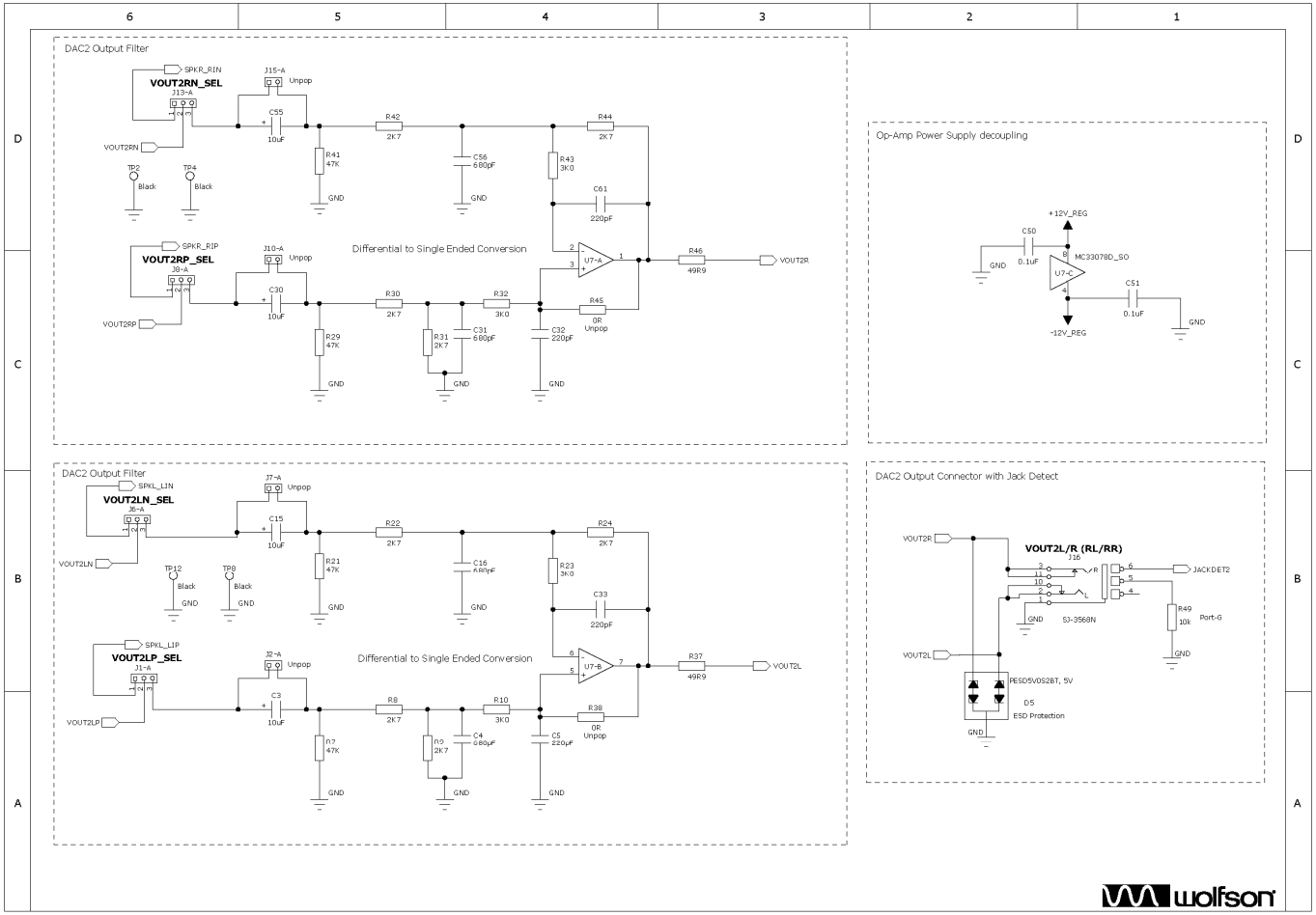
Sheet 4:


Left Digital Mic
J29
R96
0R
R102
0R
R97
0R
R98
0R
Unpop
R101
Unpop
DBVDD
DMICCLK
DMICDAT1
NC
NC
NC
NC
GND
WOLFSON MIC CONNECTOR (L)
Right Digital Mic
J31
R93
0R
R94
0R
Unpop
R95
0R
DBVDD
DMICCLK
DMICDAT1
NC
NC
NC
NC
GND
WOLFSON MIC CONNECTOR (R)
Anlalogue Mic
MIC IN
JACKDET2
R
L
R47
39K
SJ-3568N
C52
10uF
C38
10uF
VIN2RP
VIN2LP
GND
PESD5V0S2BT, 5V
D4
ESD Protection
Digital Mic2
J28
DMIC HDR
R79 0R
R70 0R
R69 0R
DBVDD
DMICCLK
DMICDAT1
DMICDAT2
GND

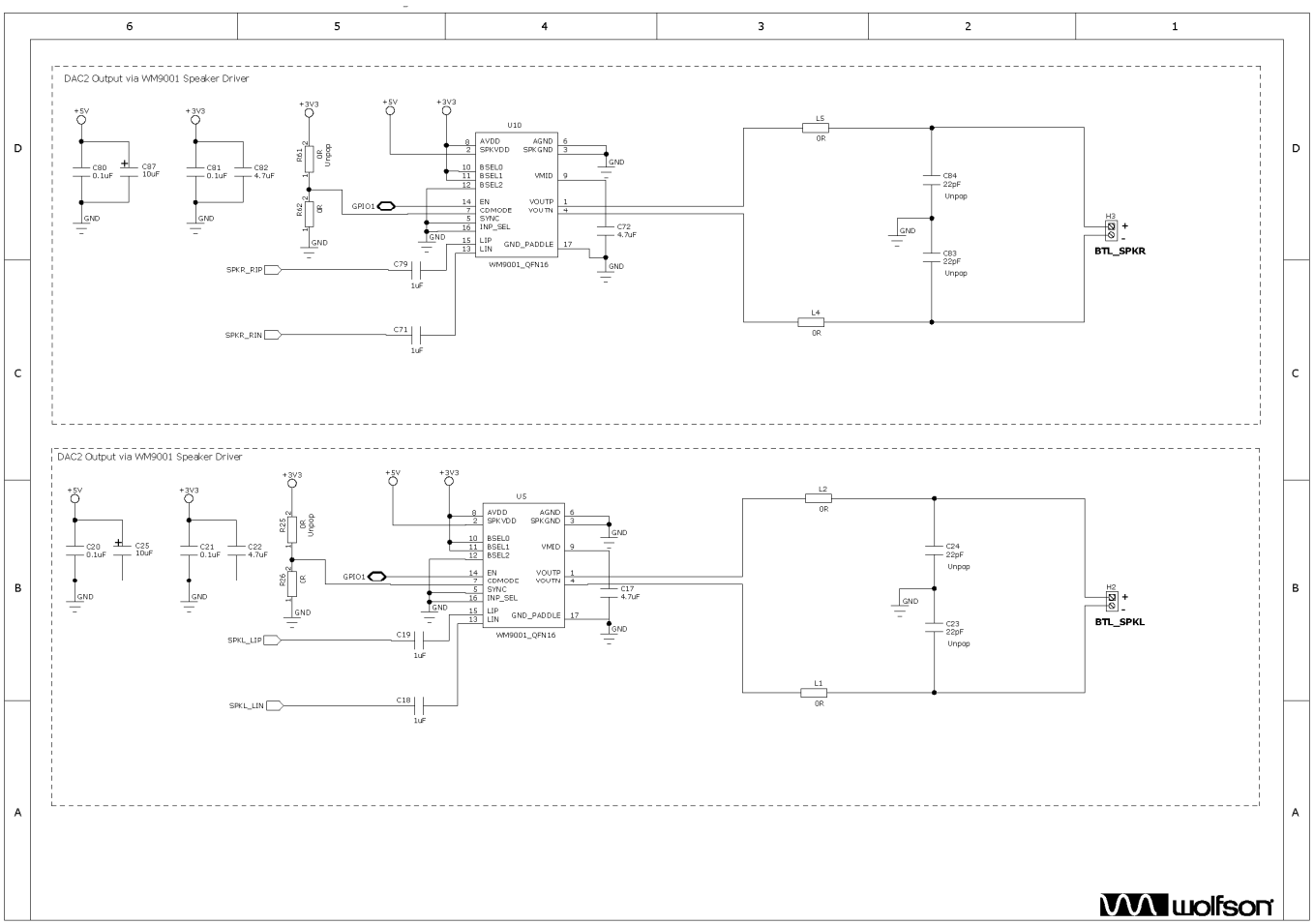
Sheet 5:


Direct-Drive Ground-Reference Headphone Output
VOUT1R
VOUT1L
R12
47K
Unpop
R11
47K
Unpop
GND
Headphone Output (FL/FR)
J3
SJ-3560N
JACKDET1
R14
39K
Port-A
PESD5V0S2BT, SV
D1
ESD Protection

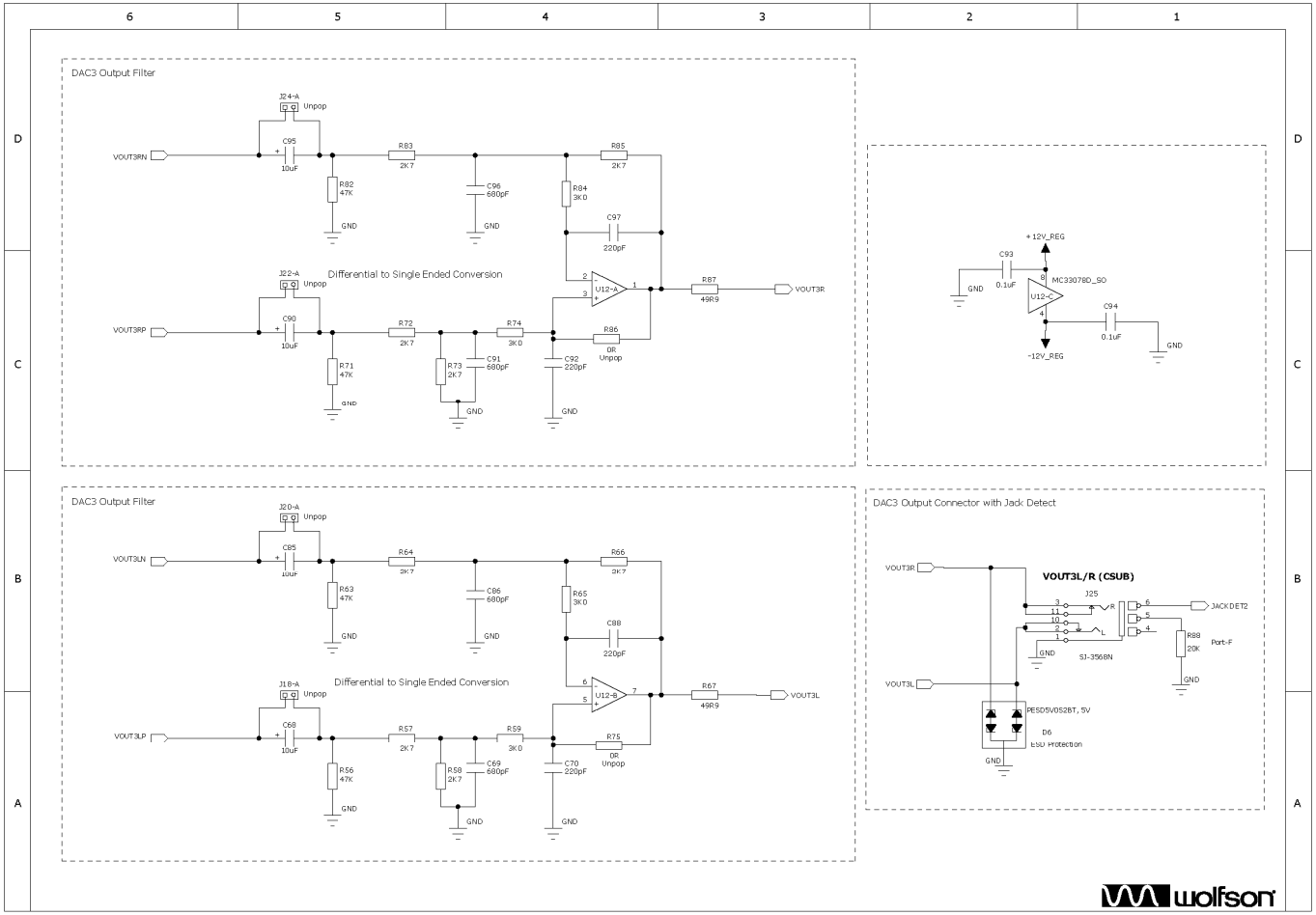
Sheet 6:


DAC2 Output Filter
VOUT2RN_SEL
VOUT2RP_SEL
Differential to Single Ended Conversion
VOUT2R
Op-Amp Power Supply decoupling
+12V_REG
-12V_REG
MC33078D_SO
DAC2 Output Filter
VOUT2LN_SEL
VOUT2LP_SEL
Differential to Single Ended Conversion
VOUT2L
DAC2 Output Connector with Jack Detect
VOUT2L/R (RL/RR)
JACKDET2
SJ-3568N
PESD5V052BT, 5V
ESD Protection

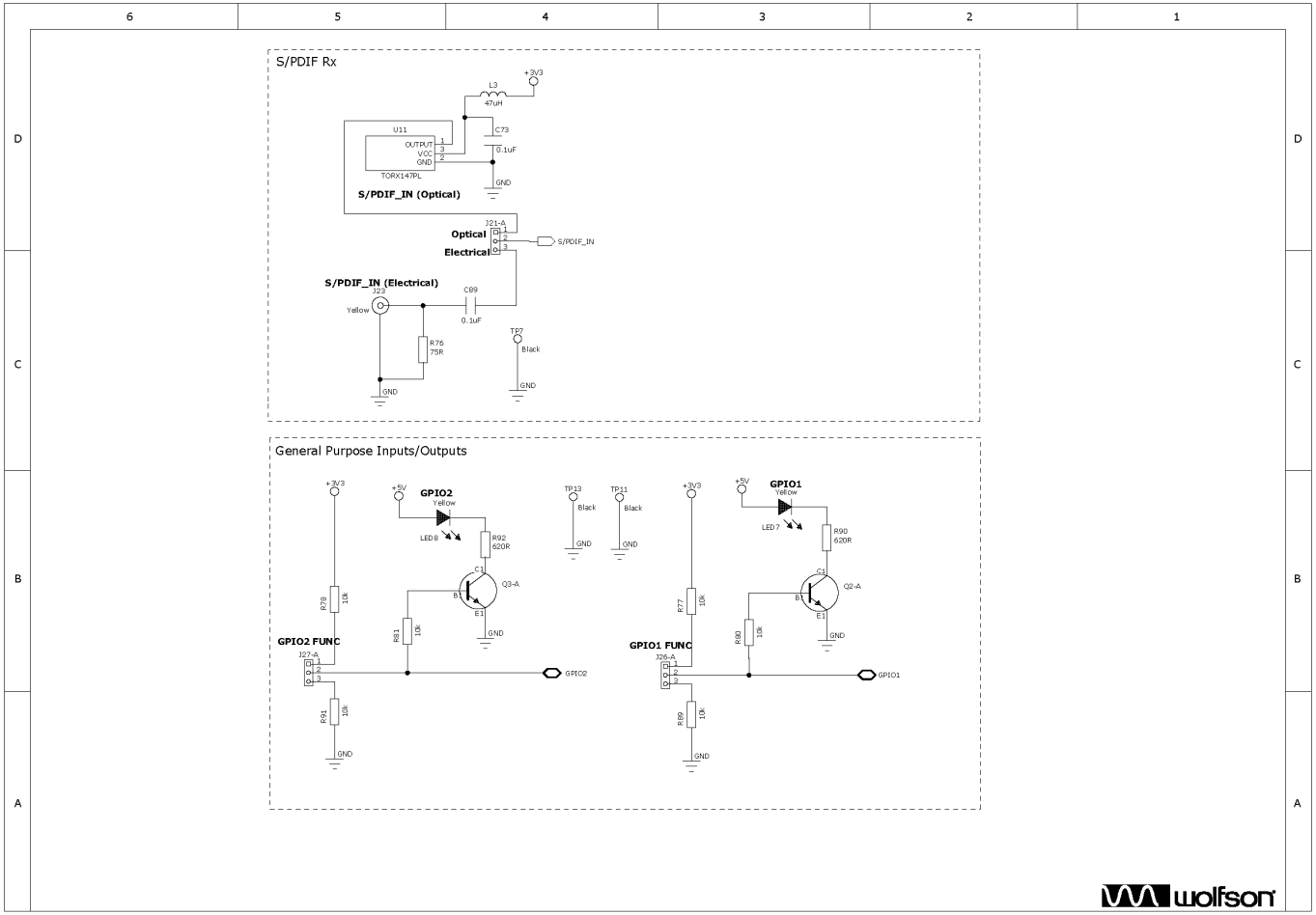
Sheet 7:


DAC2 Output via WM9001 Speaker Driver
U10
WM9001_QFN16
BTL_SPKR
DAC2 Output via WM9001 Speaker Driver
U5
WM9001_QFN16
BTL_SPKL

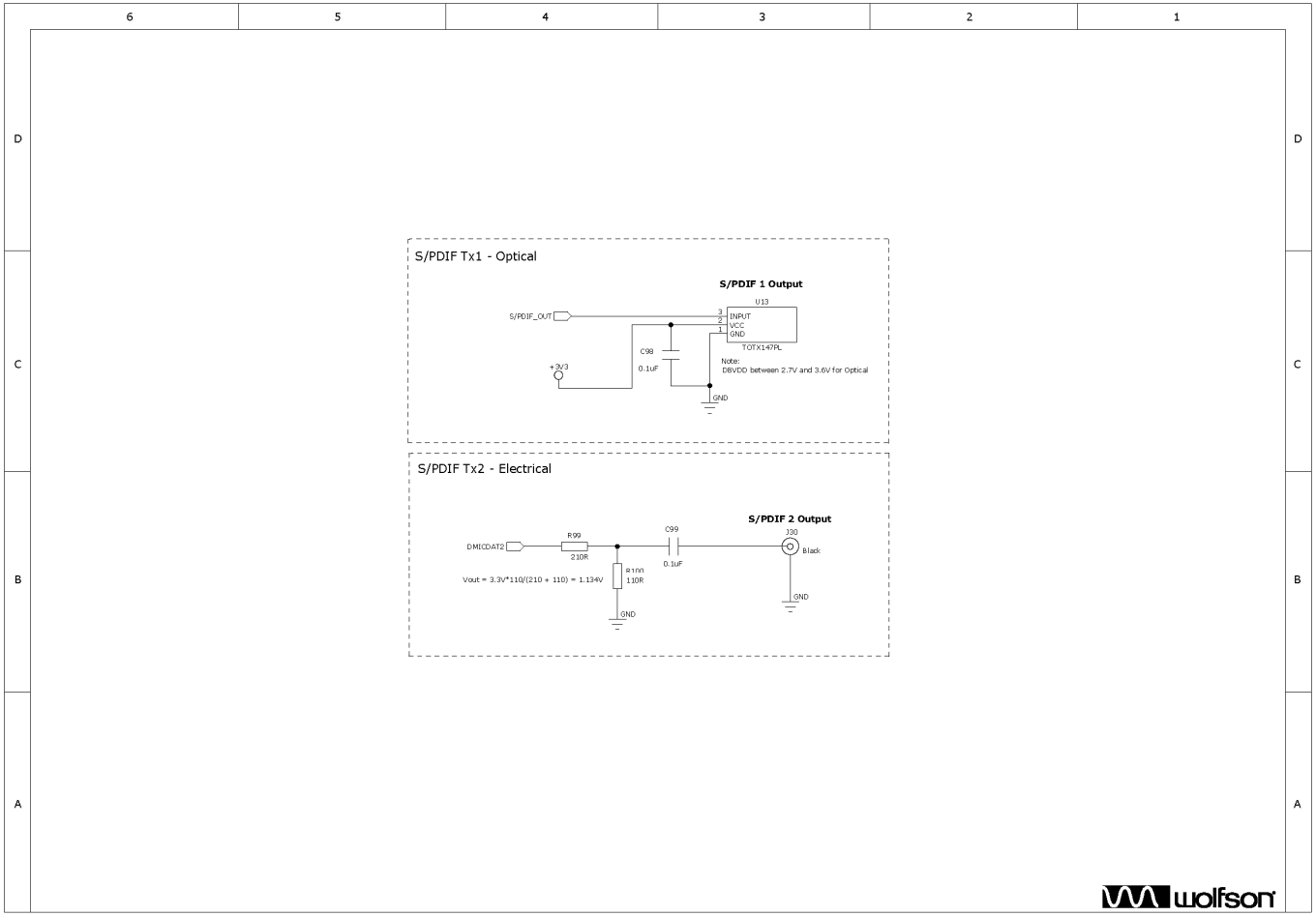
Sheet 8:


DAC3 Output Filter
Differential to Single Ended Conversion
DAC3 Output Filter
Differential to Single Ended Conversion
DAC3 Output Connector with Jack Detect
VOUT3L/R (CSUB)
+12V_REG
-12V_REG
MC33078D_SO
SJ-3568N
PESD5V0S2BT, 5V
ESD Protection

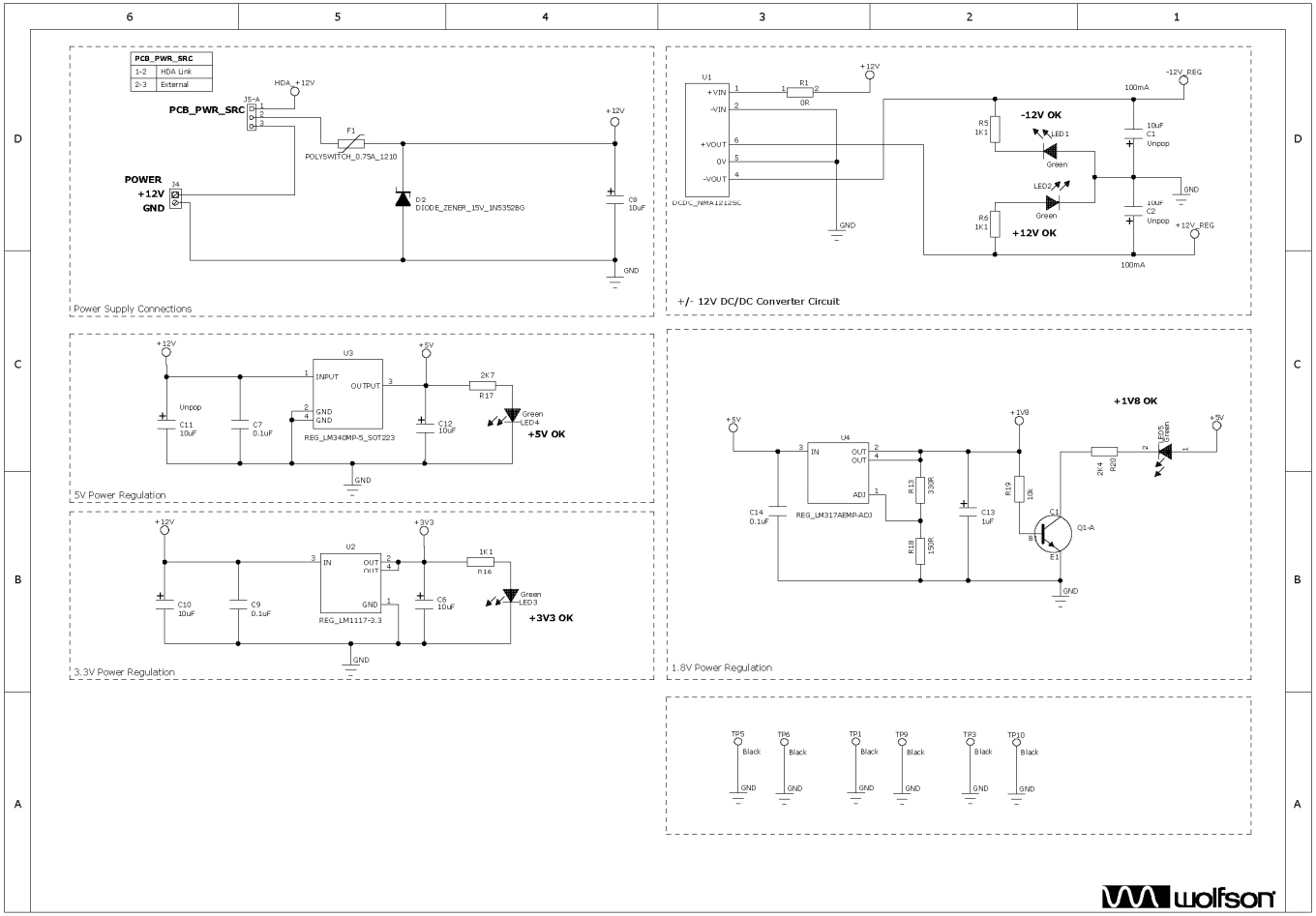
Sheet 9:


S/PDIF Rx
L3
47uH
+3V3
U11
OUTPUT
VCC
GND
TORX147PL
C73
0.1uF
GND
S/PDIF_IN (Optical)
J21-A
Optical
Electrical
S/PDIF_IN
S/PDIF_IN (Electrical)
J23
Yellow
C89
0.1uF
R76
75R
TP7
Black
GND
General Purpose Inputs/Outputs
GPIO2
Yellow
LED8
R92
620R
Q3-A
R78
10k
R81
10k
GPIO2 FUNC
J27-A
R91
10k
GPIO2
TP13
TP11
Black
GPIO1
LED7
R90
620R
Q2-A
R77
10k
R80
10k
GPIO1 FUNC
J26-A
R89
10k
GPIO1
6
5
4
3
2
1
D
C
B
A

Sheet 10:


6
5
4
3
2
1
D
C
B
A
S/PDIF Tx1 - Optical
S/PDIF 1 Output
U13
S/PDIF_OUT
3
2
1
INPUT
VCC
GND
TOTX147PL
C98
0.1uF
+3/3
Note:
DBVDD between 2.7V and 3.6V for Optical
GND
S/PDIF Tx2 - Electrical
S/PDIF 2 Output
DMICDAT2
R99
210R
C99
0.1uF
J30
Black
R100
110R
Vout = 3.3V*110/(210 + 110) = 1.134V
GND
GND

Sheet 11:


PCB_PWR_SRC
1-2 HDA Link
2-3 External
HDA +12V
PCB_PWR_SRC
POWER
+12V
GND
F1
POLYSWITCH_0.75A_1210
D2
DIODE_ZENER_15V_1N5352BG
C9
10uF
Power Supply Connections
U1
+VIN
-VIN
+VOUT
0V
-VOUT
R1
0R
R5
1K1
R6
1K1
-12V OK
+12V OK
LED1
LED2
Green
10uF
C1
Unpop
C2
100mA
-12V_REG
+12V_REG
+/- 12V DC/DC Converter Circuit
U3
INPUT
OUTPUT
GND
REG_LM340MP-5_SOT223
C11
10uF
C7
0.1uF
C10
10uF
2K7
R17
LED4
+5V OK
5V Power Regulation
U2
REG_LM1117-3.3
C10
10uF
C9
0.1uF
C6
10uF
1K1
R16
LED3
+3V3 OK
3.3V Power Regulation
U4
REG_LM317AEMP-ADJ
C14
0.1uF
C13
1uF
R13
330R
R18
150R
R19
13k
2K4
R20
Q1-A
+1V8 OK
1.8V Power Regulation
TP5
TP6
TP1
TP9
TP3
TP10
Black
GND
wolfson

BILL OF MATERIALS (BOM)

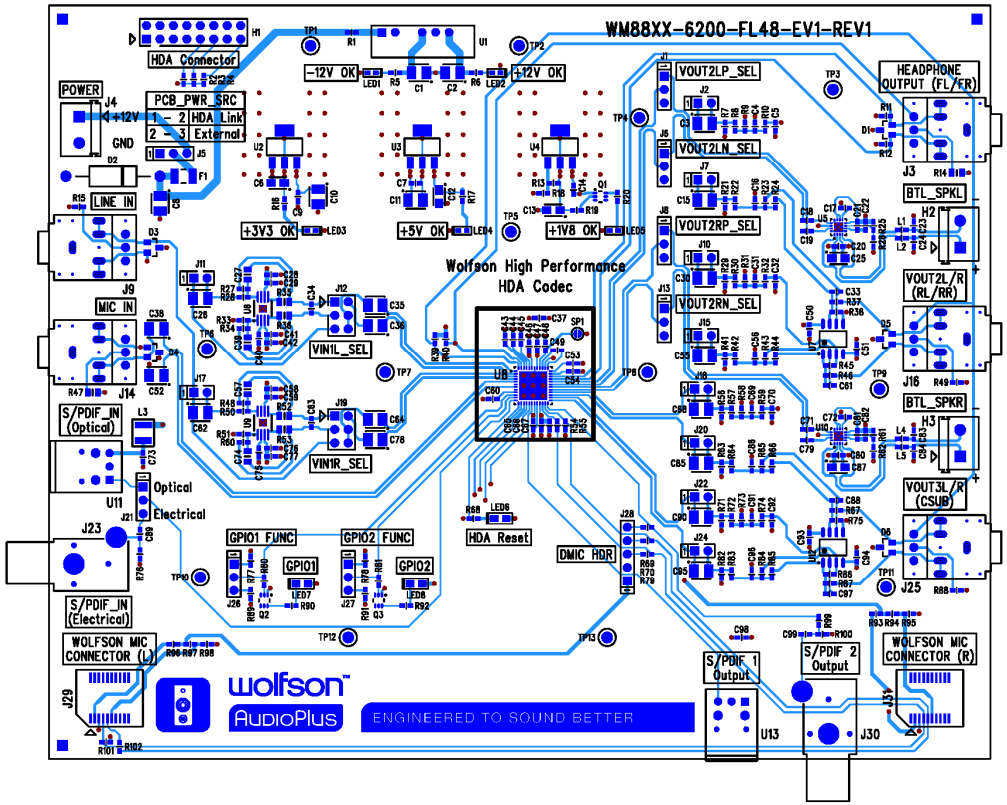
Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
1	C49	2.2uF 0603 SMD Ceramic Capacitor 6.3V X5R	MuRata	GRM185R60J225KE26D
2	C17 C22 C28 C37 C42 C43 C44 C45 C47 C48 C53 C54 C58 C67 C72 C77 C82	4.7uF 0603 SMD Ceramic Capacitor 6.3V X5R	MuRata	GRM188R60J475KE19D
3	J3 J9 J14 J16 J25	3.5mm Jack Socket CUI Right Angle	CUI INC	SJ-3568N
4	J30	Phono Socket PCB mount BLACK	Dragon City	RS109 - Black
5	J23	Phono Socket PCB mount YELLOW	Dragon City	RS109 - Yellow
6	U1	NMA +12v in +/-12V out Isolated 1W DC/DC Converter	C&D Technologies	NMA1212SC
7	J12 J19	2X3 2.54mm pitch PCB Pin Header VERTICAL	Harwin	M20-9980345
8	H1	2x8 2.54mm pitch PCB Pin Header VERTICAL	Harwin	M20-9980845
9	J1 J5 J6 J8 J13 J21 J26 J27	1x3 2.54mm Header Vertical	Harwin	M20-9990345
10	J28	1x5 2.54mm Header Vertical	Harwin	M20-9990545
11	Q1 Q2 Q3	BC847BS NPN Dual Bipolar Transistor SOT363	Philips	BC847BS
12	MECH1	Feet black 12.7sq self-adhesive 40 pack - qty 4	3M	SJ5018BLACK
13	R37 R46 R67 R87	49R9 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 49R9
14	R99	210R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 210R
15	H2 H3 J4	PCB mount 1X2 terminal block for 2.5mm wire guage	LUMBERG	KRM 02
16	L3	47uH 1210 Surface Mount Inductor 'PA series'	Panasonic	ELJPA470KF
17	U11	TORX147PL Digital Audio Fiber Optic Receiver	Toshiba	TORX147PL
18	U13	Fiber Optic Transmitting Module for Digital Audio Interface	Toshiba	TOTX147PL
19	F1	0.75A Poly Switch 1210	Raychem	MICROSMD075F-2
20	C6 C12 C25 C87	10uF 10V SMD Tantalum Capacitor case A	Kemet	T491A106K010AT
21	MISC2	Lead-free label, 15mm round	Pro Power	7827260
22	C4 C16 C31 C56 C69 C86 C91 C96	680pF 0603 SMD Ceramic Capacitor 50V NPO	Multicomp	2238 867 15681
23	C7 C9 C14 C20 C21 C29 C41 C46 C50 C51 C59 C65 C66 C73 C76 C80 C81 C89 C93 C94 C98 C99	0.1uF 0603 SMD Ceramic Capacitor 16V X7R	Phycomp	2238 786 15649
24	C5 C32 C33 C61 C70 C88 C92 C97	220pF 0603 SMD Ceramic Capacitor 50V NPO	AVX	06035A221JAT2A

Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
25	C3 C8 C10 C15 C26 C30 C35 C36 C38 C52 C55 C62 C64 C68 C78 C85 C90 C95	Tantalum Capacitor SMD-B 10uF - 16V - AVX	AVX	TAJB106K016R
26	C27 C39 C57 C74	1nF 0805 SMD Ceramic Capacitor 50V NPO	Phycomp	2238 861 15102
27	U6 U9	OPA1632 High-Performance, Fully-Differential AUDIO OP AMP	Texas Instruments	OPA1632DGN
28	LED1 LED2 LED3 LED4 LED5	KP-1608MGC 0603 SMD Chip LED GREEN	Kingbright	KP-1608MGC
29	TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13	1.32mm PCB Test Terminal BLACK	Vero	20-2136
30	D1 D3 D4 D5 D6	TVS Diode PESD5V0S2BT Vrwm=5V dual ESD Protection SOT23	Philips	PESD5V0S2BT
31	R15 R19 R39 R40 R49 R77 R78 R80 R81 R89 R91	10k 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 10K
32	R100	110R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 110R
33	R5 R6 R16	1K1 0603 SMD chip resistor 1% 0.1W	Multicomp	MC 0.063W 0603 1% 1K1
34	R18	150R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 150R
35	R88	20K 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 20K
36	R20	2K4 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 2K4
37	R27 R28 R33 R34 R48 R50 R51 R60	270R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 270R
38	R8 R9 R17 R22 R24 R30 R31 R42 R44 R57 R58 R64 R66 R72 R73 R83 R85	2K7 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 2K7
39	R10 R23 R32 R43 R59 R65 R74 R84	3K0 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 3K
40	R13 R68	330R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 330R
41	R7 R21 R29 R41 R56 R63 R71 R82	47K 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 47K
42	R90 R92	620R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 620R
43	R76	75R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 75R
44	L1 L2 L4 L5	0R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 0R
45	R1 R2 R26 R54 R62 R69 R70 R79 R93 R95 R96 R97 R102	0R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 0R

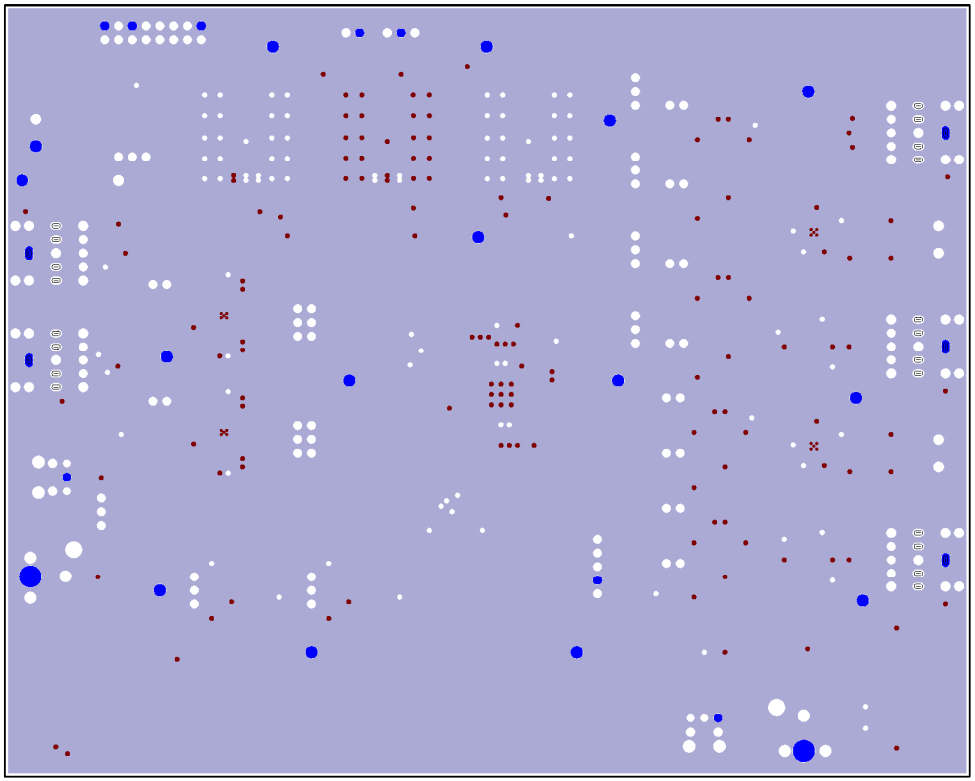
Item	RefDes	Description	Manufacturer	Manufacturer's Part Number
46	R14 R47	39K 0805 SMD chip resistor 1% 0.1W	Multicomp	MC 0.1W 0805 1% 39K
47	R35 R36 R52 R53	39R 0805 SMD chip resistor 1% 0.1W	Multicomp	MC 0.1W 0805 1% 39R
48	D2	1N5352BG 15V 5W Zener Diode	ON Semiconductor	1N5352BG
49	U7 U12	MC33078 Low Noise Dual Op-Amp SO	Motorola	MC33078DG
50	U3	LM340 Series 3 -Terminal Positive Regulators	National Semiconductor	LM340MP-5.0
51	U4	REG LM317A 1.2 - 25V 1A ADJUSTABLE	National Semiconductor	LM317AEMP
52	LNK_J5	0.1" OPEN JUMPER LINK RED	Protech	22-3565
53	LNK_J12-2 LNK_J19-2 LNK_J19-1 LNK_J12-1 LNK_J21	0.1" OPEN JUMPER LINK YELLOW	Protech	22-3570
54	C13	Tantalum Capacitor SMD-A 1uF - 25V - AVX	AVX	THJA105K025RJN
55	LED6 LED7 LED8	KP-2012SYC 0805 SMD Chip LED YELLOW	Kingbright	KP-2012SYC
56	U2	REG LM1117 3.3V 0.8A LINEAR	National Semiconductor	LM1117MP-3.3
57	C18 C19 C40 C60 C71 C75 C79	1uF 0603 SMD Ceramic Capacitor 6.3V X5R	MuRata	GRM188R60J105KA01D
58	J29 J31	2x10 way socket, mates with edge connector on 0.062" thick PCB	Samtec	MEC8-110-02-L-DV
59	U8	Multi-channel high-definition audio codec	Wolfson Microelectronics	WM8800GEFL
60	PCB1	PCB	Kelan Circuits Ltd	WM88XX-6200-FL48-EV1-REV1
61	U5 U10	WM9001 16-pin QFN Speaker Driver	Wolfson Microelectronics	WM9001GEFL
Unpop				
62	J2 J7 J10 J11 J15 J17 J18 J20 J22 J24	1x2 PCB Pin Header 0.1" VERTICAL	Harwin	M20-9990245
63	C1 C2 C11	Tantalum Capacitor SMD-B 10uF - 16V - AVX	AVX	TAJB106K016R
64	C23 C24 C83 C84	22pF 0603 SMD Ceramic Capacitor 50V NPO	Phycomp	2238 867 15229
65	C34 C63	3.3nF 0603 SMD Ceramic Capacitor 50V X7R	Phycomp	2238 586 15629
66	R11 R12	47K 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 1% 47K
67	R3 R4 R25 R38 R45 R55 R61 R75 R86 R94 R98 R101	0R 0603 SMD chip resistor 1% 0.063W	Multicomp	MC 0.063W 0603 0R
68	SP1	Surface mount shorting point	N/A	N/A

PCB LAYOUT

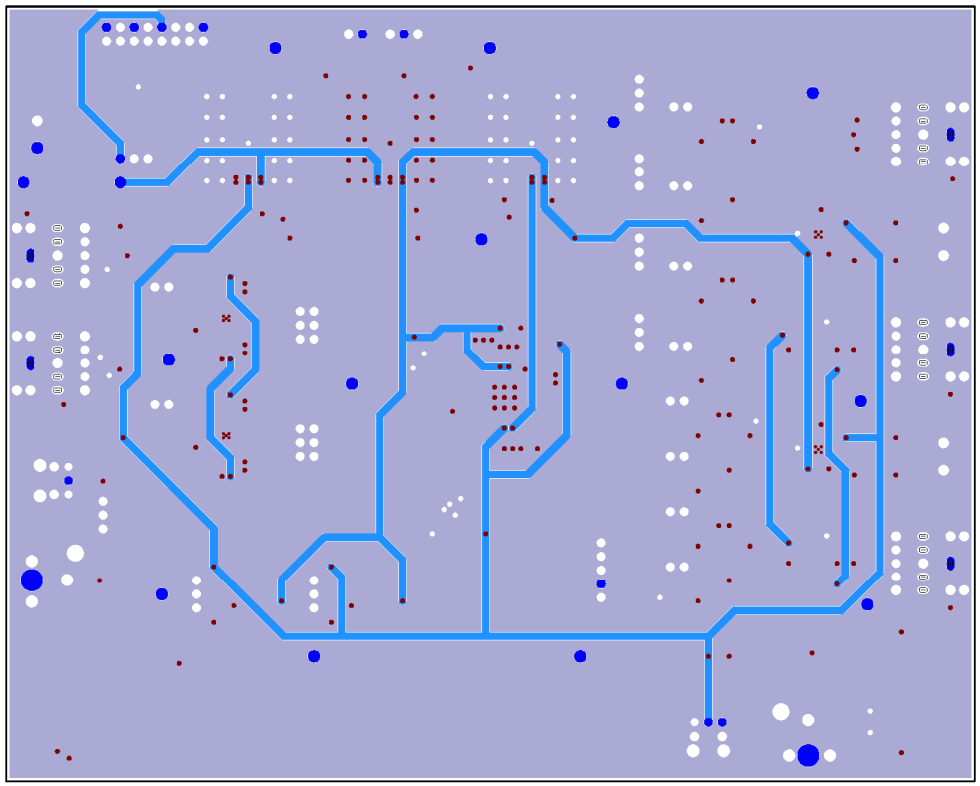
Top Layer 1: Silkscreen and Copper



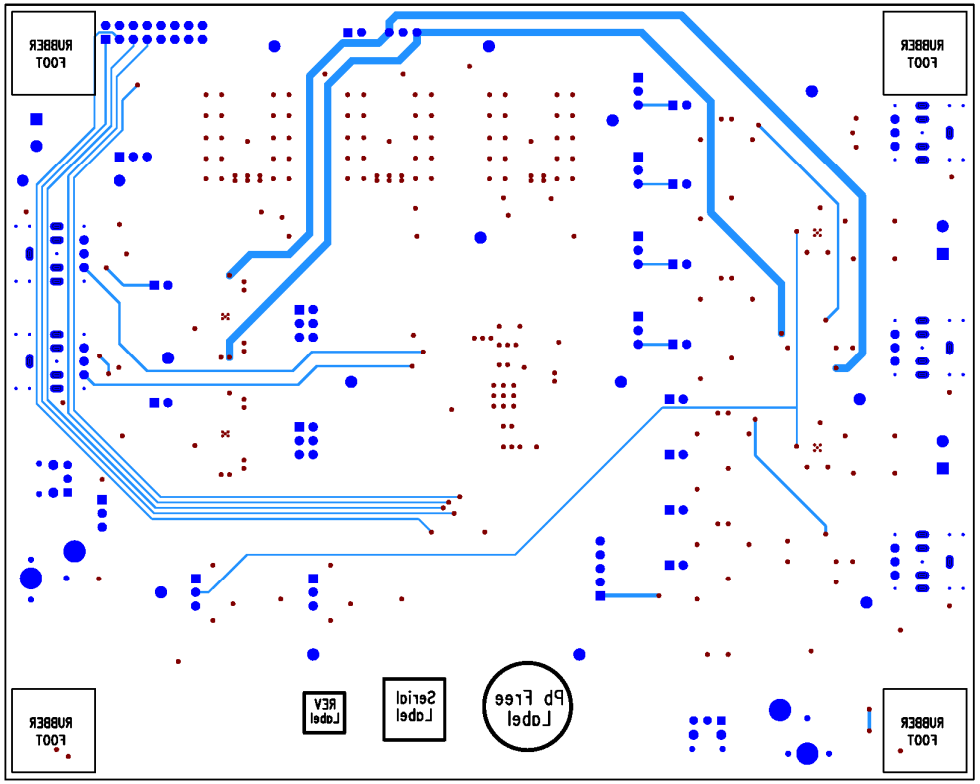
Inner Layer 2: Ground



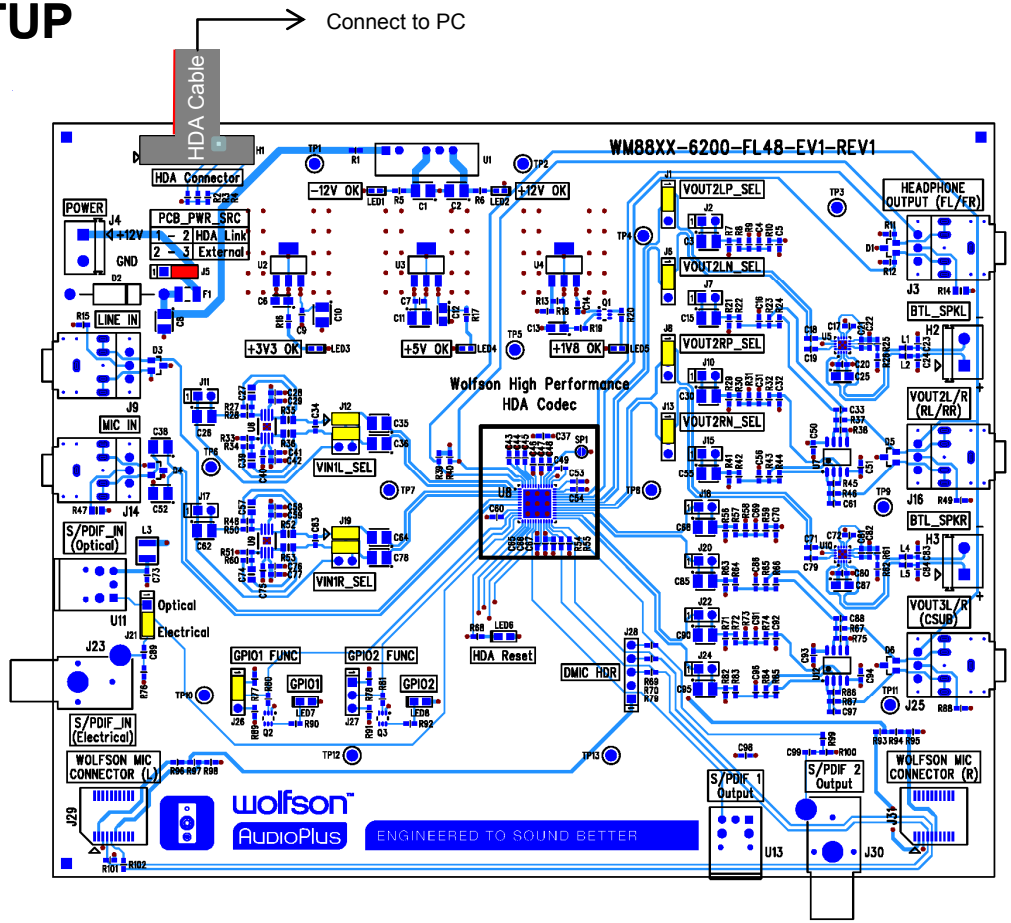
Inner Layer 3: Power



Bottom Layer 4 - Copper



DEFAULT SETUP



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http://www.wolfsonmicro.com/distribution

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