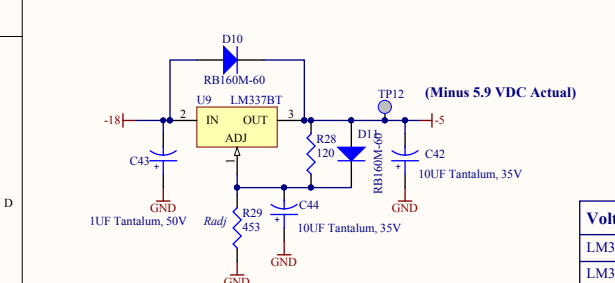
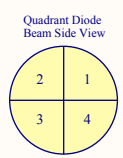
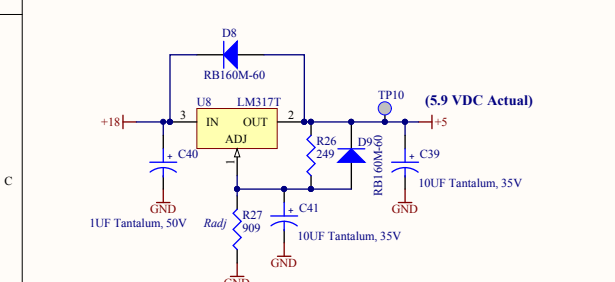
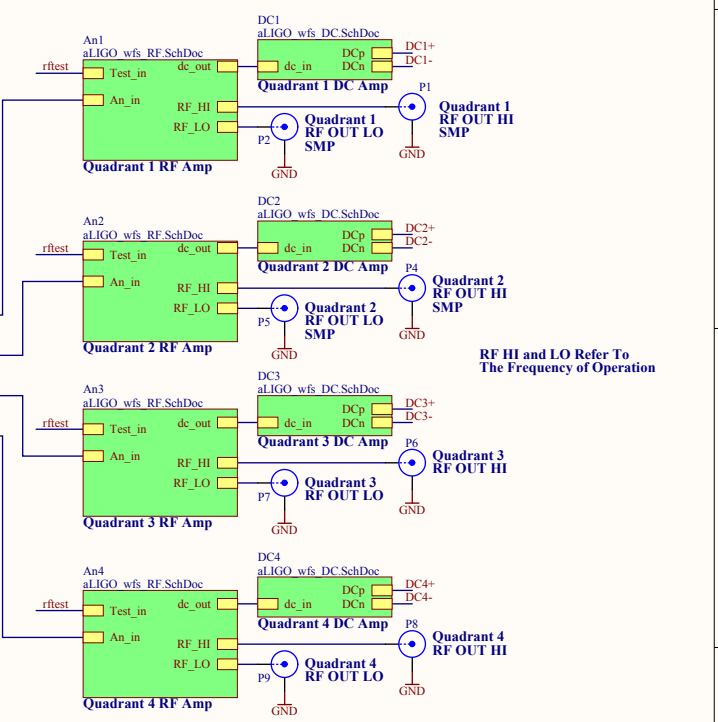
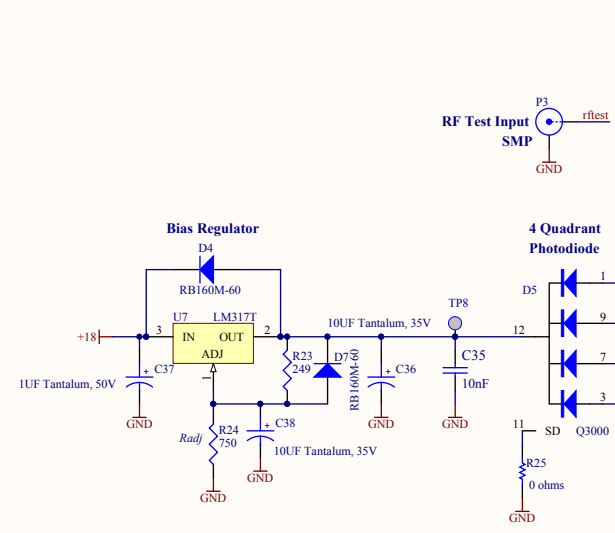
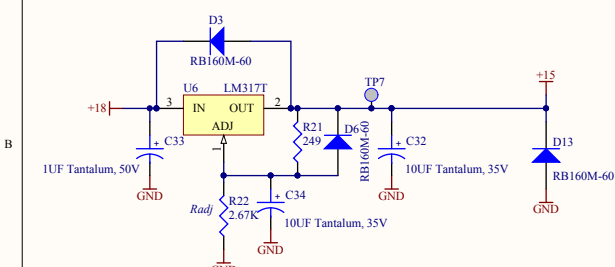
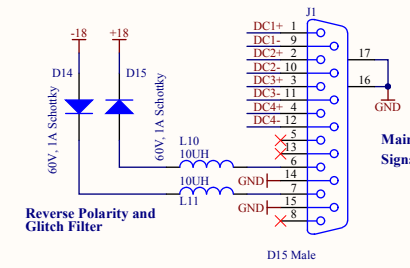
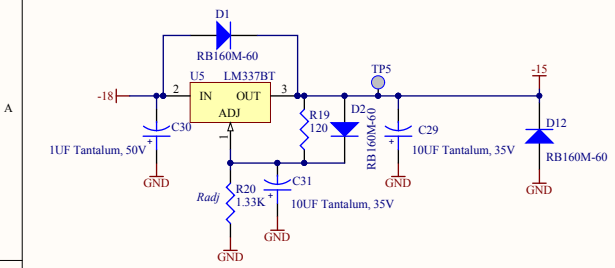


Revision History:  
 Rev1 - Initial release  
 Rev2 - In response to single supply sensitivity, changed U2 from AD8597 to LT1128, changed U1 from AD8599 to AD8672, removed C28 to stabilize LT1128. Bypassed C29 and C32 with reverse biased 1N4001 diode to clamp the +/-15V regulated supplies.  
 Rev3 - PCB updated to include single supply sensitivity fixes. All new orders of this board should use revision 3 schematic and PCB

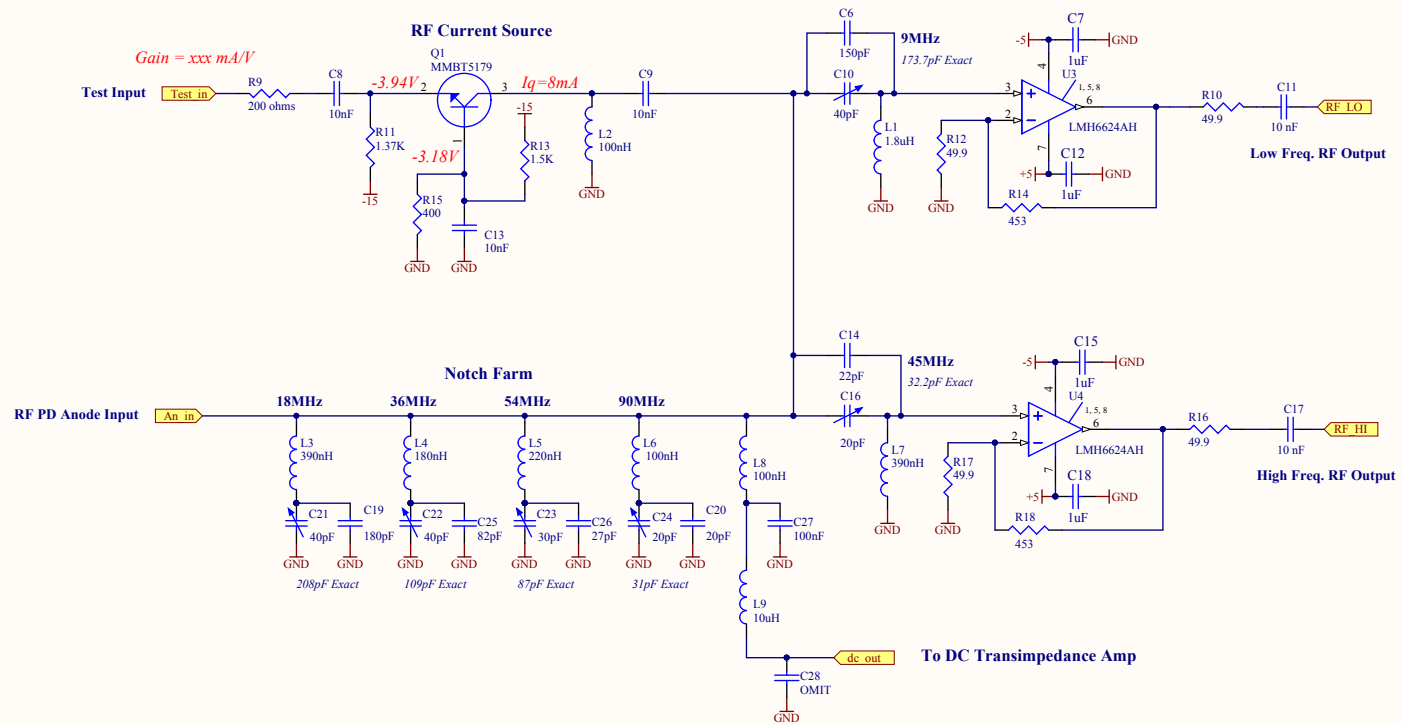


**Voltage Regulator Equations**  
 $LM337 V_o = -1.25(1 + Radj/120) + (50\mu A * Radj)$   
 $LM317 V_o = 1.25(1 + Radj/249) + (100\mu A * Radj)$



Title <b>aLIGO ASC RF Photodetector</b>		LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology		Last Edited: 7 August 2013	
Size: B	DCC Number: D1101614	Revision: v3	Engineer: R. Abbott	Date: 8/28/2013	
File: C:\Rich's Files\Mycadfiles\ISC\AdL_RFPPD\2011 aLIGO WFS\alIGO WFS v3\alIGO wfs top.SchDoc				Time: 10:32:47 AM	
				Sheet 1 of 3	

For component variations at different operating frequencies, see T1300199

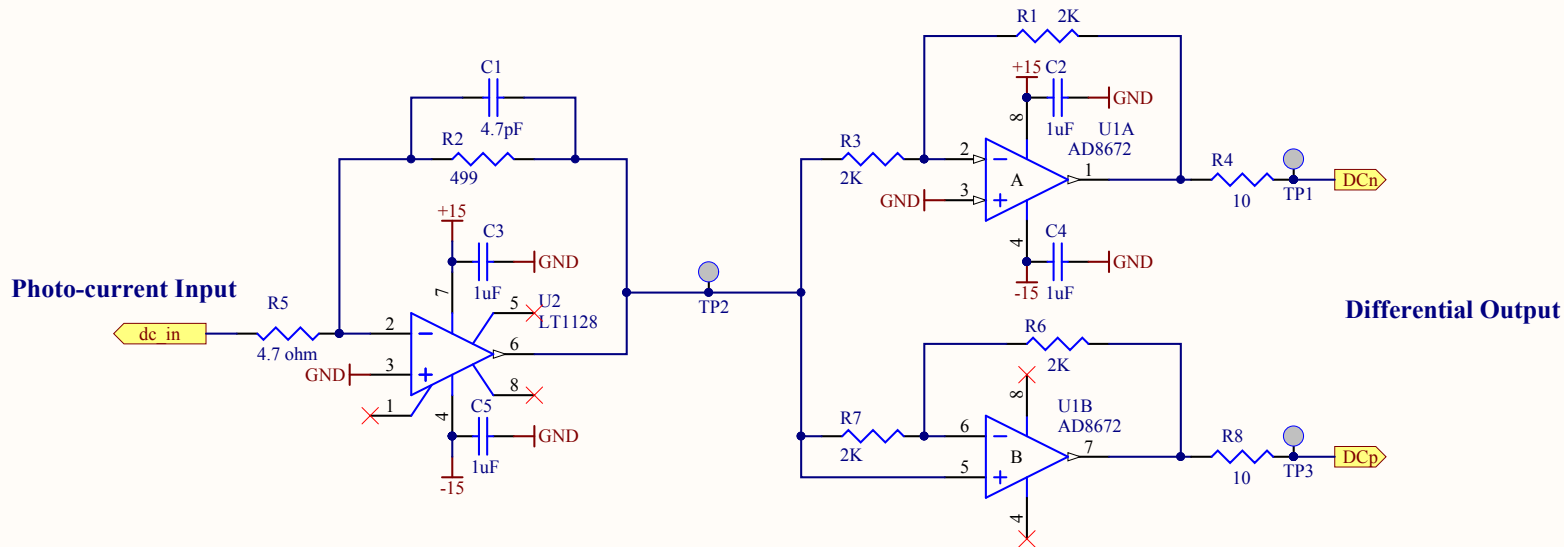


9/45 Design Corresponds to: C:\Rich's Files\LT Spice\PhotodiodeAnalysis\lsc\_rfpd\alIGO\_ASC\_2011\9\_45\_ASC\_v3.asc

Last Edited: 7 August 2013

Title <b>RF Section</b>		LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology		LIGO	
Size: B	DCC Number: D1101614	Revision: v3	Engineer: R. Abbott	Date: 8/28/2013	Time: 10:32:47 AM
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					Sheet 2 of 3

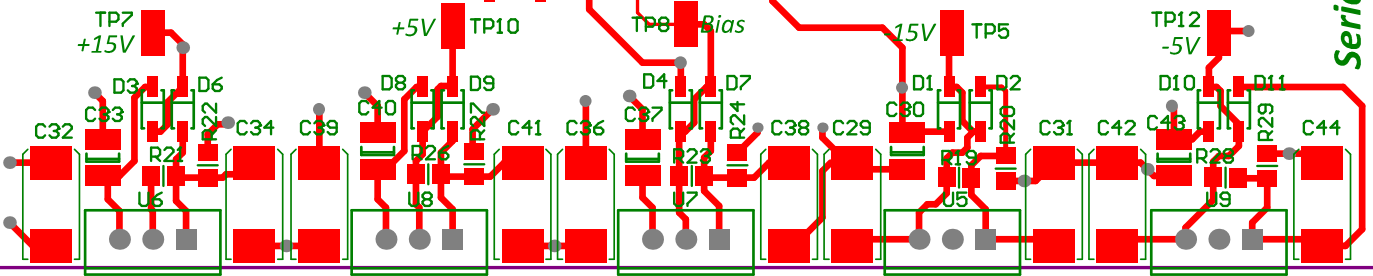
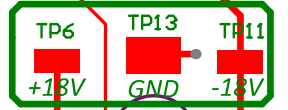
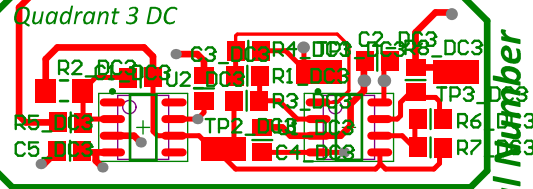
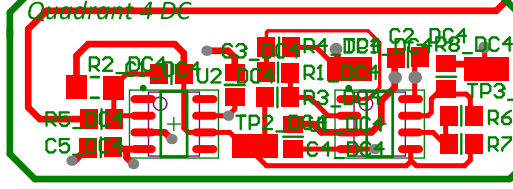
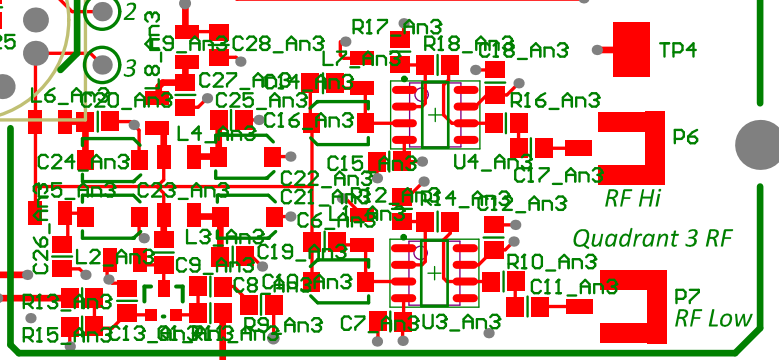
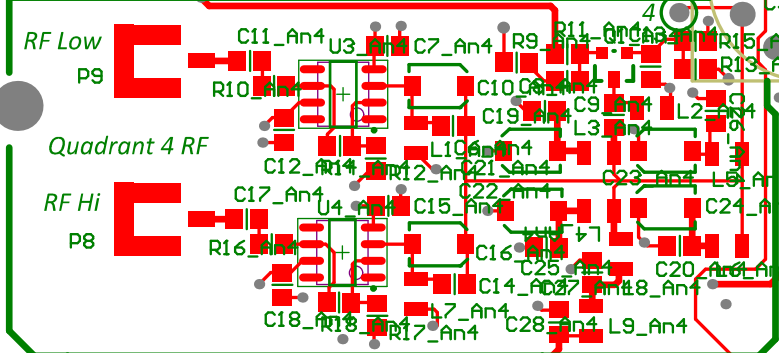
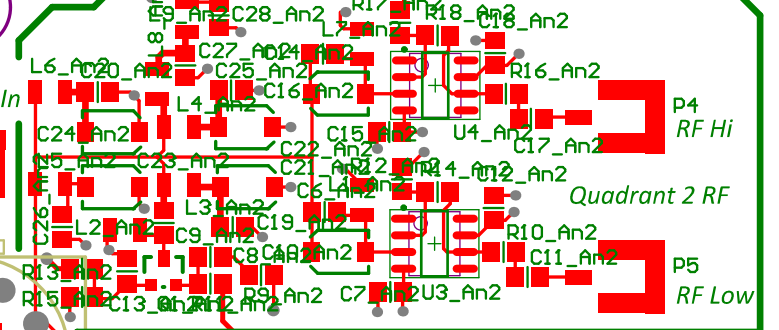
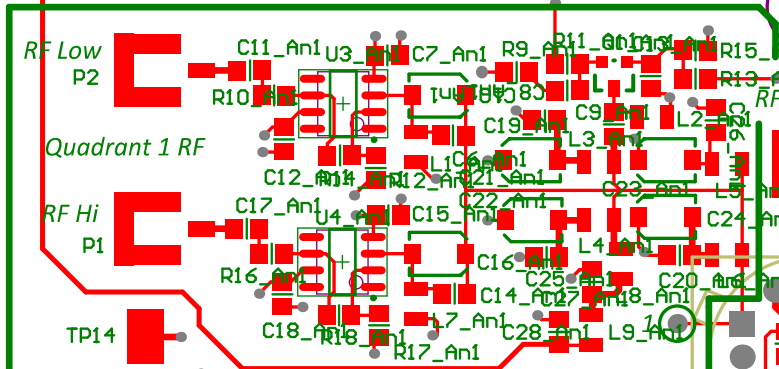
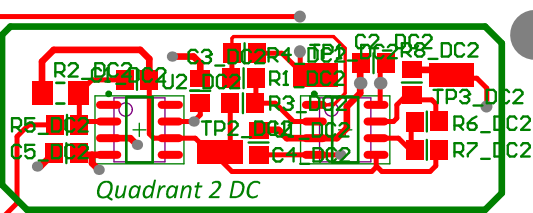
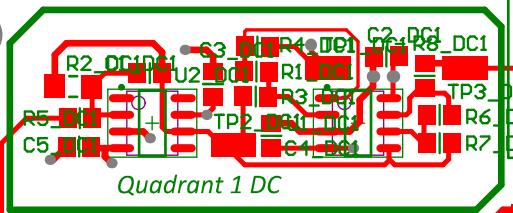
### DC Transimpedance Amp (15mA Maximum Photo-current)



Last Edited: 7 August 2013

Title <b>DC Section</b>		LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology		<b>LIGO</b>	
Size: A	DCC Number: D1101614	Revision: v3	Engineer: R. Abbott	Date: 8/28/2013	
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				Sheet 3 of 3	

aLIGO D1101614-v3  
WFS Head



Designator	Comment	Display Part Number	Manufacturer Part Number	Quantity
C1_DC3, C1_DC4, C1_DC3, C1_DC4	4.7pF	478-1300-1-ND		4
C2_DC3, C2_DC4, C3_DC3, C3_DC4, C3_DC3, C3_DC4, C4_DC1, C4_DC2, C4_DC3, C4_DC4, C5_DC1, C5_DC2, C5_DC3, C5_DC4, C7_A01, C7_A02, C7_A03, C7_A04, C12_A01, C12_A02, C12_A03, C12_A04, C15_A01, C15_A02, C15_A03, C15_A04, C18_A01, C18_A02, C18_A03, C18_A04	1uF	478-1580-1-ND		32
C6_A03, C6_A04	150pF	399-1125-1-ND		4
C8_A01, C8_A02, C8_A03, C8_A04, C9_A01, C9_A02, C9_A03, C9_A04, C11_A01, C11_A02, C11_A03, C11_A04, C13_A01, C13_A02, C13_A03, C13_A04, C17_A01, C17_A02, C17_A03, C17_A04, C18	10 nF, 100pF	399-1158-1-ND		21
C10_A03, C10_A04, C21_A01, C21_A02, C21_A03, C21_A04, C22_A01, C22_A02, C22_A03, C22_A04	40 pF		Voltronics JZ400	12
C14_A03, C14_A04, C16_A01, C16_A02, C16_A03, C16_A04, C24_A01, C24_A02, C24_A03, C24_A04	22pF	490-3028-1-ND		4
C19_A03, C19_A04	20 pF, 200pF		Voltronics JZ200	8
C19_A03, C19_A04	180pF	445-1336-1-ND		4
C20_A03, C20_A04	20pF	490-3007-1-ND		4
C23_A03, C23_A04, C25_A03, C25_A04, C26_A03, C26_A04	30pF		Voltronics JZ300	4
C25_A03, C25_A04	85pF	490-3815-1-ND		4
C26_A03, C26_A04	27pF	490-3009-1-ND		4
C27_A03, C27_A04	1000pF	478-1316-1-ND		4
C28_A03, C28_A04	2MΩ	2MΩ		4
C30_C01, C30_C02, C30_C03, C30_C04, C30_C08, C30_C09, C41, C42, C44	10uF Tantalum, 35V	478-1701-1-ND		10
C30_L03, C30_L04, C30	10uF Tantalum, 50V	478-3075-1-ND		3
D7, D8, D9, D10, D11, D12, D13, D14, D15	80V, 1A Schottky, RB160M60	RB160M 60CT-ND		14
D5	2S200	2S200		1
D15	010 Male	86170-010P-AJ121-ND		1
L1_A03, L1_A04, L1_A03, L1_A04	1.8uH		Coilcraft 1080CS-182XJLB	4
L2_A03, L2_A04, L3_A01, L3_A02, L3_A03, L3_A04, L3_A01, L3_A02, L3_A03, L3_A04	100nH		Coilcraft 1080CS-101XGLB	12
L3_A03, L3_A04, L7_A01, L7_A02, L7_A03, L7_A04	800nH		Coilcraft 1080CS-801XGLB	8
L4_A03, L4_A04	180nH		Coilcraft 1080CS-181XGLB	4
L5_A03, L5_A04	220nH		Coilcraft 1080CS-221XGLB	4
L3_A03, L3_A04	10uH		Coilcraft 1098S-102XJLB	4
L10, L11	100uH	499-1754-1-ND		2
P1, P2, P3, P4, P5, P6, P7, P8, P9	SMP Surface Mount RF Connector	ARF1584-ND		3
Q1_A01, Q1_A02, Q1_A03, Q1_A04	MMBT3179	MMBT3179CT-ND		4
R1_DC3, R1_DC4, R3_DC1, R3_DC2, R3_DC3, R3_DC4, R6_DC1, R6_DC2, R6_DC3, R6_DC4, R7_DC1, R7_DC2, R7_DC3, R7_DC4	2K	P2,00KCT-ND		16
R2_DC1, R2_DC2, R2_DC3, R2_DC4	499	RNCP0805FD499RCT-ND		4
R4_DC3, R4_DC4, R8_DC1, R8_DC2, R8_DC3, R8_DC4	10	RNCP0805FD10R0CT-ND		8
R5_DC3, R5_DC4	4.7 ohm	RNCP0805FD4R70CT-ND		4
R9_A03, R9_A04, R12_A01, R12_A02, R12_A03, R12_A04, R17_A01, R17_A02, R17_A03, R17_A04	49.9 ohms	RNCP0805FD499RCT-ND		12
R10_A03, R10_A04, R16_A01, R16_A02, R16_A03, R16_A04	30 ohms	311-30BCT-ND		8
R11_A01, R11_A02, R11_A03, R11_A04	1.37K	P1,37KDACT-ND		4
R13_A03, R13_A04	1.5K	RNCP0805FD1500CT-ND		4
R14_A03, R14_A04, R18_A01, R18_A02, R18_A03, R18_A04	453, 453 ohms	RQ20P453BCT-ND		3
R15_A03, R15_A04	802 ohms	805-1294-1-ND		4
R19, R20	50	P1200KCT-ND		2
R20	1.33K	RQ20P1.33KCT-ND		1
R21, R23, R26	250	RNCP0805FD250RCT-ND		3
R22	2.67K	P2,67KDACT-ND		1
R24	750	RNCP0805FD750RCT-ND		1
R25	0 ohms	RS000CT-ND		1
R27	50	RNCP0805FD500RCT-ND		1
TP1_DC1, TP1_DC2, TP1_DC3, TP1_DC4, TP2_DC1, TP2_DC2, TP2_DC3, TP2_DC4, TP3_DC1, TP3_DC2, TP3_DC3, TP3_DC4, TP4_TP3, TP6, TP7, TP8, TP10, TP11, TP12, TP13, TP14	TESTPNT	5016KCT-ND		22
U1_DC3, U1_DC4	AD8672	AD8672ARZ-REEL7CT-ND		4
U2_DC3, U2_DC4	LT1128	LT1128CS88PBF-ND		4
U3_A03, U3_A04, U4_A01, U4_A02, U4_A03, U4_A04	LM85624AH	296-3E334-1-ND		8
U5, U6	LM3378T	LM3378TGS-ND		3
U6, U7, U8	LM317T	LM3178TGS-ND		3