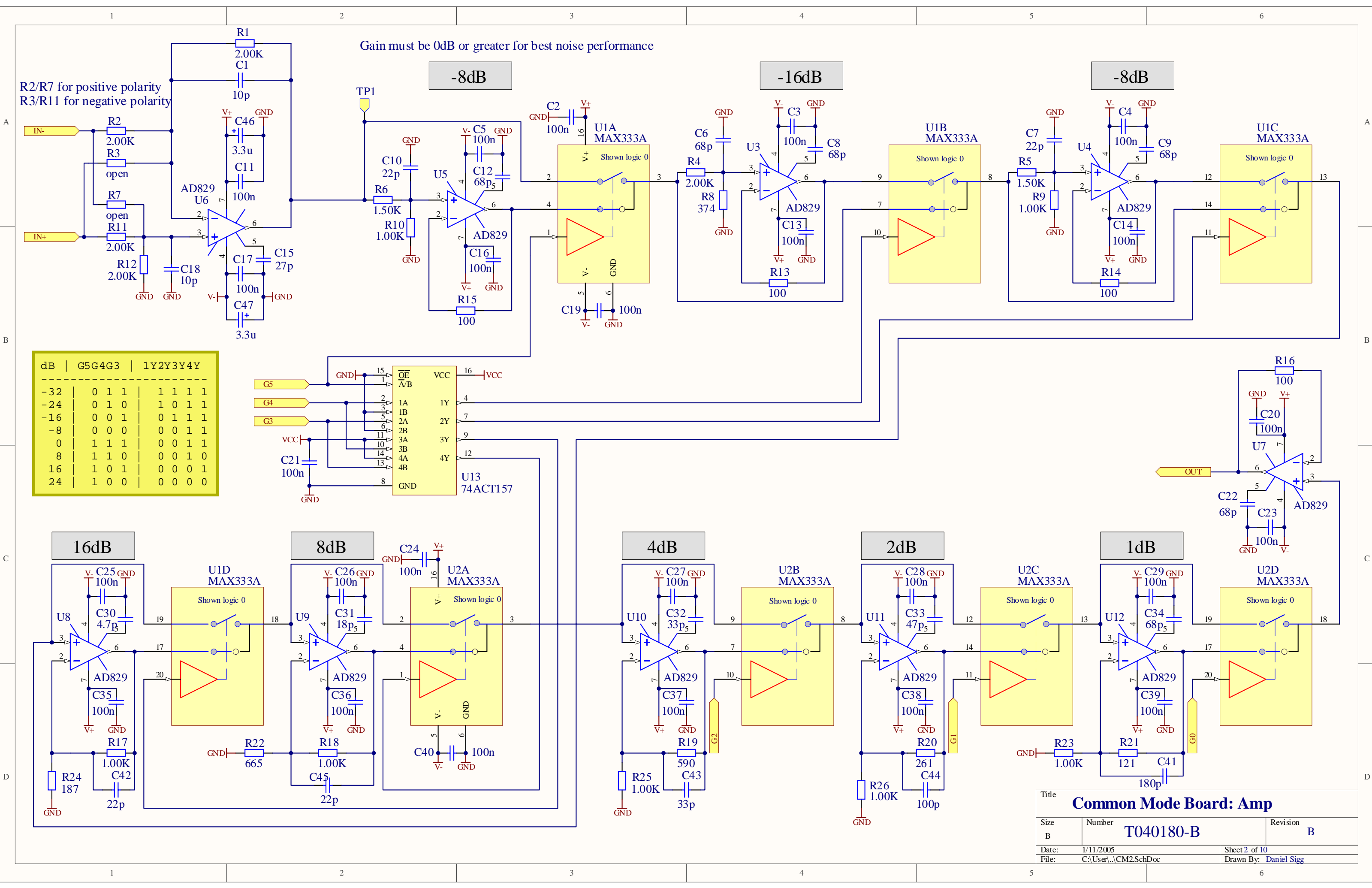
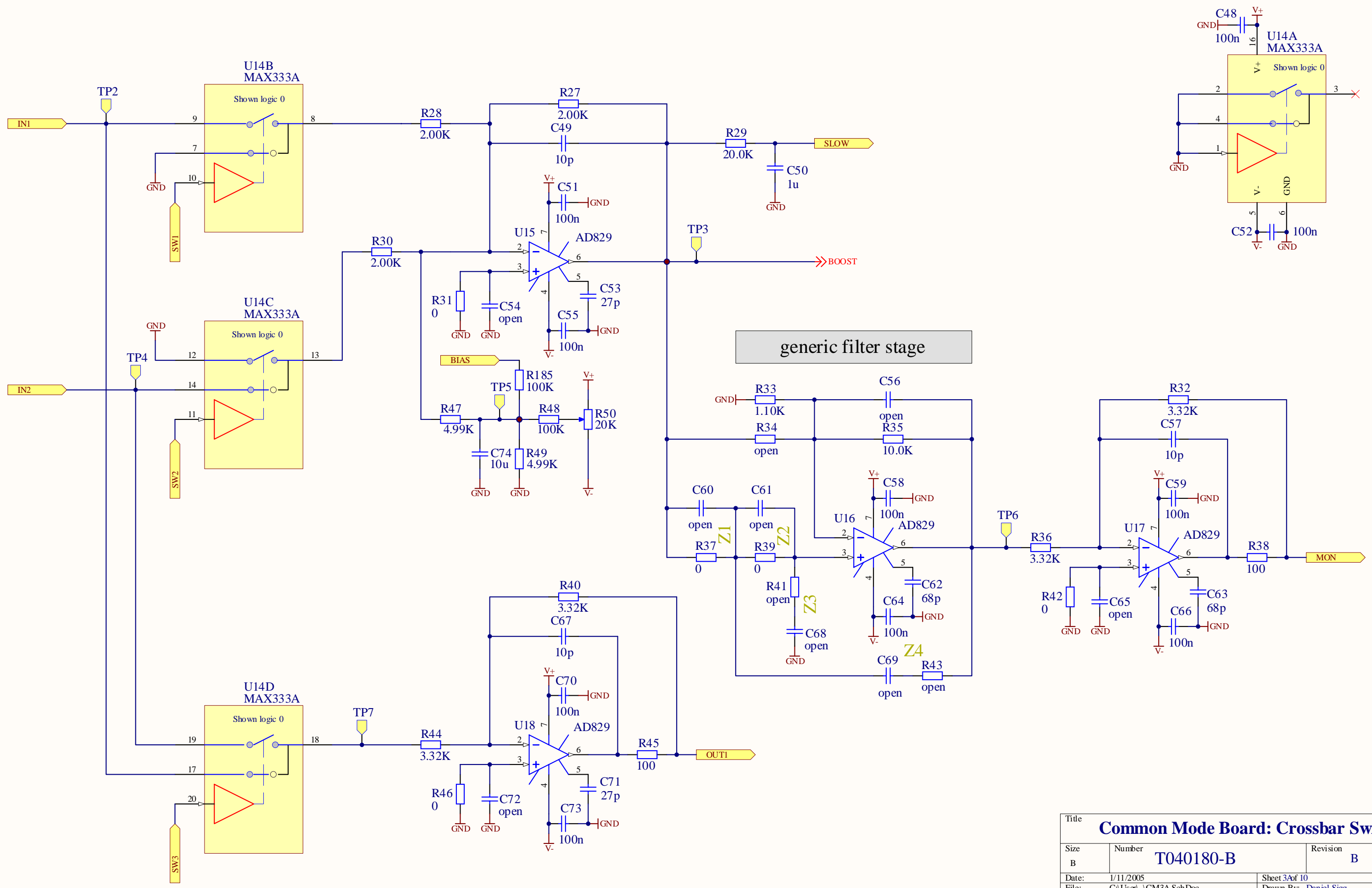


Title		
Common Mode Board		
Size	Number	Revision
B	D040180-B	B
Date:	1/11/2005	Sheet 1 of 10
File:	C:\User\...\CM1.SchDoc	Drawn By: Daniel Sigg



dB	G5	G4	G3	1Y	2Y	3Y	4Y
-32	0	1	1	1	1	1	1
-24	0	1	0	1	0	1	1
-16	0	0	1	0	1	1	1
-8	0	0	0	0	0	1	1
0	1	1	1	0	0	1	1
8	1	1	0	0	0	1	0
16	1	0	1	0	0	0	1
24	1	0	0	0	0	0	0

Title Common Mode Board: Amp		
Size B	Number T040180-B	Revision B
Date: 1/11/2005	Sheet 2 of 10	
File: C:\User\...\CM2.SchDoc	Drawn By: Daniel Sigg	



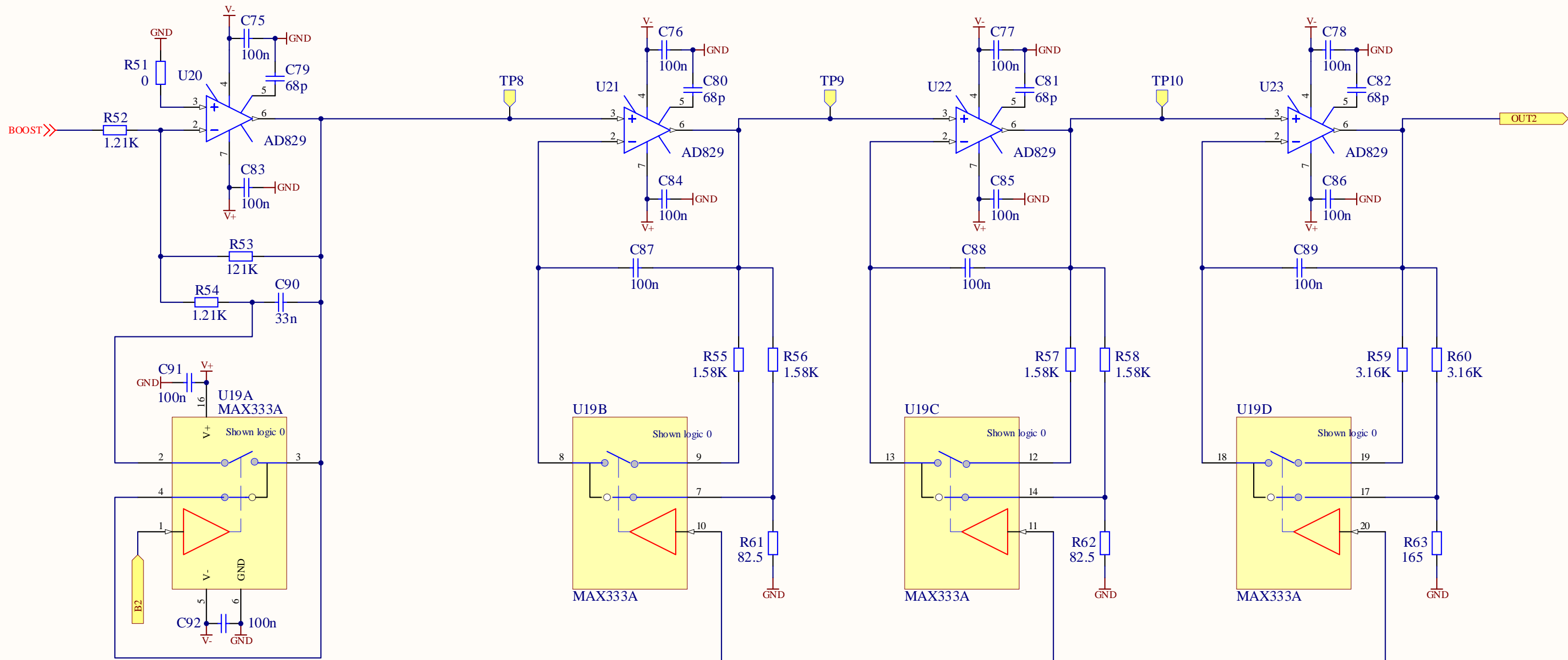
Title		
Common Mode Board: Crossbar Switch		
Size	Number	Revision
B	T040180-B	B
Date:	1/11/2005	Sheet 3 of 10
File:	C:\User\d...CM3A.Sch Doc	Drawn By: Daniel Sigg

40Hz/4kHz pole/zero pair

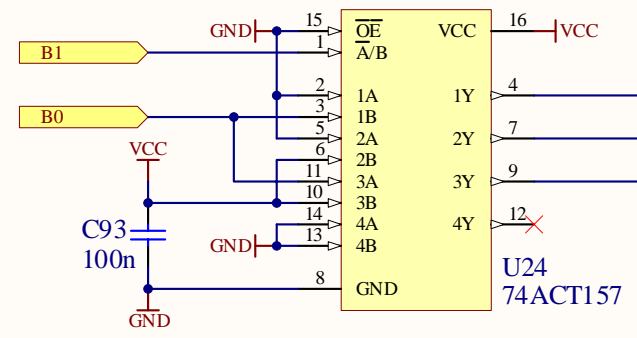
1kHz/20kHz pole/zero pair

1kHz/20kHz pole/zero pair

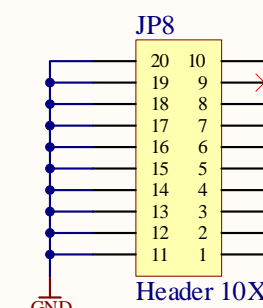
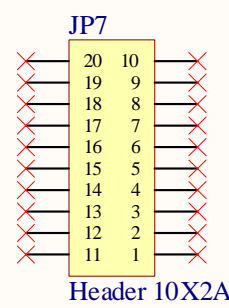
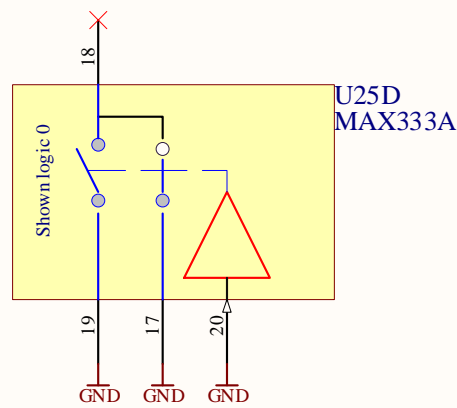
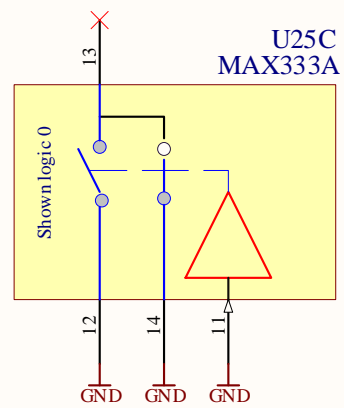
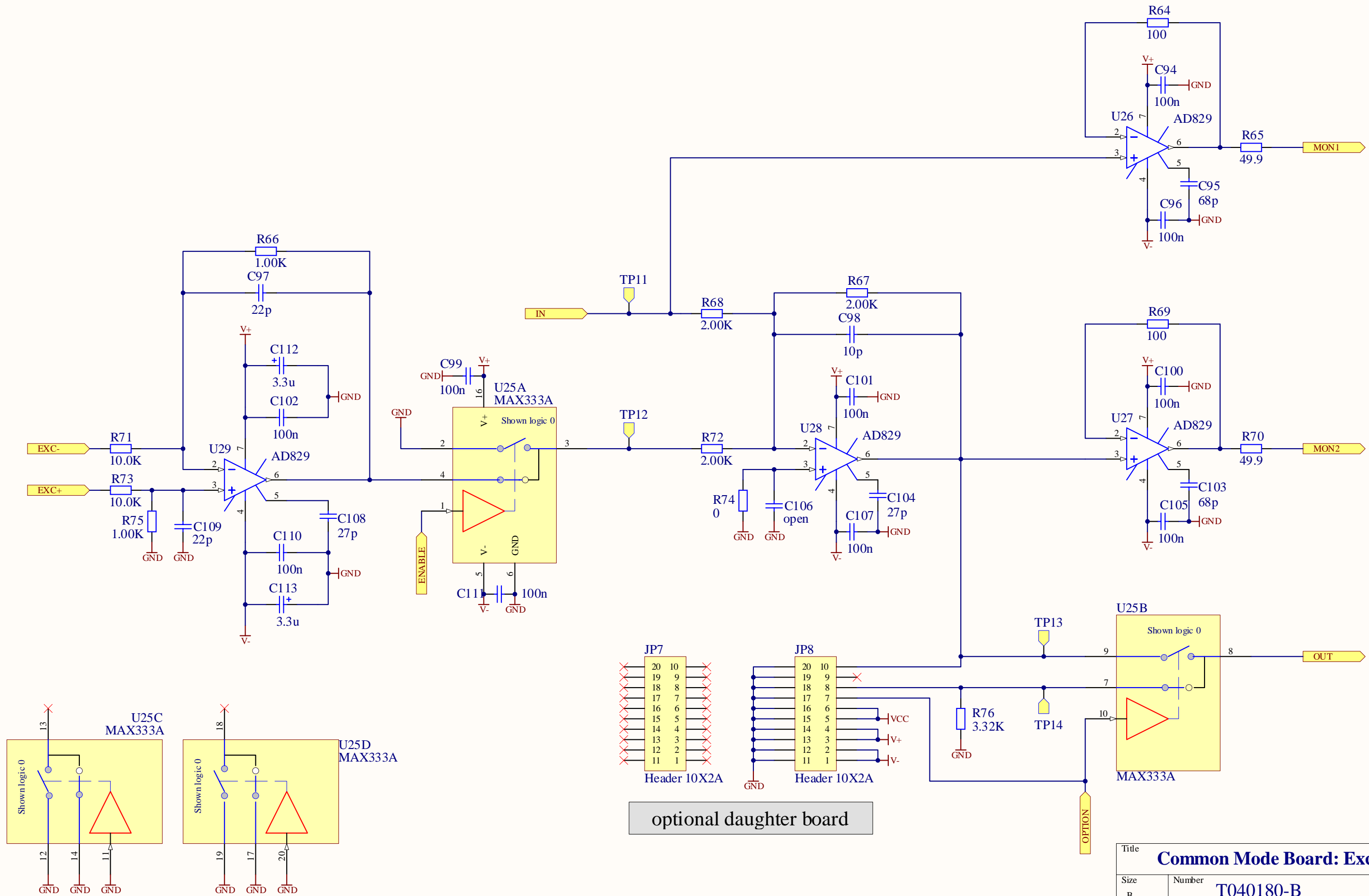
500Hz/10kHz pole/zero pair



Boosts	B1B0	1Y2Y3Y
0	1 1	1 1 1
1	1 0	0 1 1
2	0 1	0 0 1
3	0 0	0 0 0

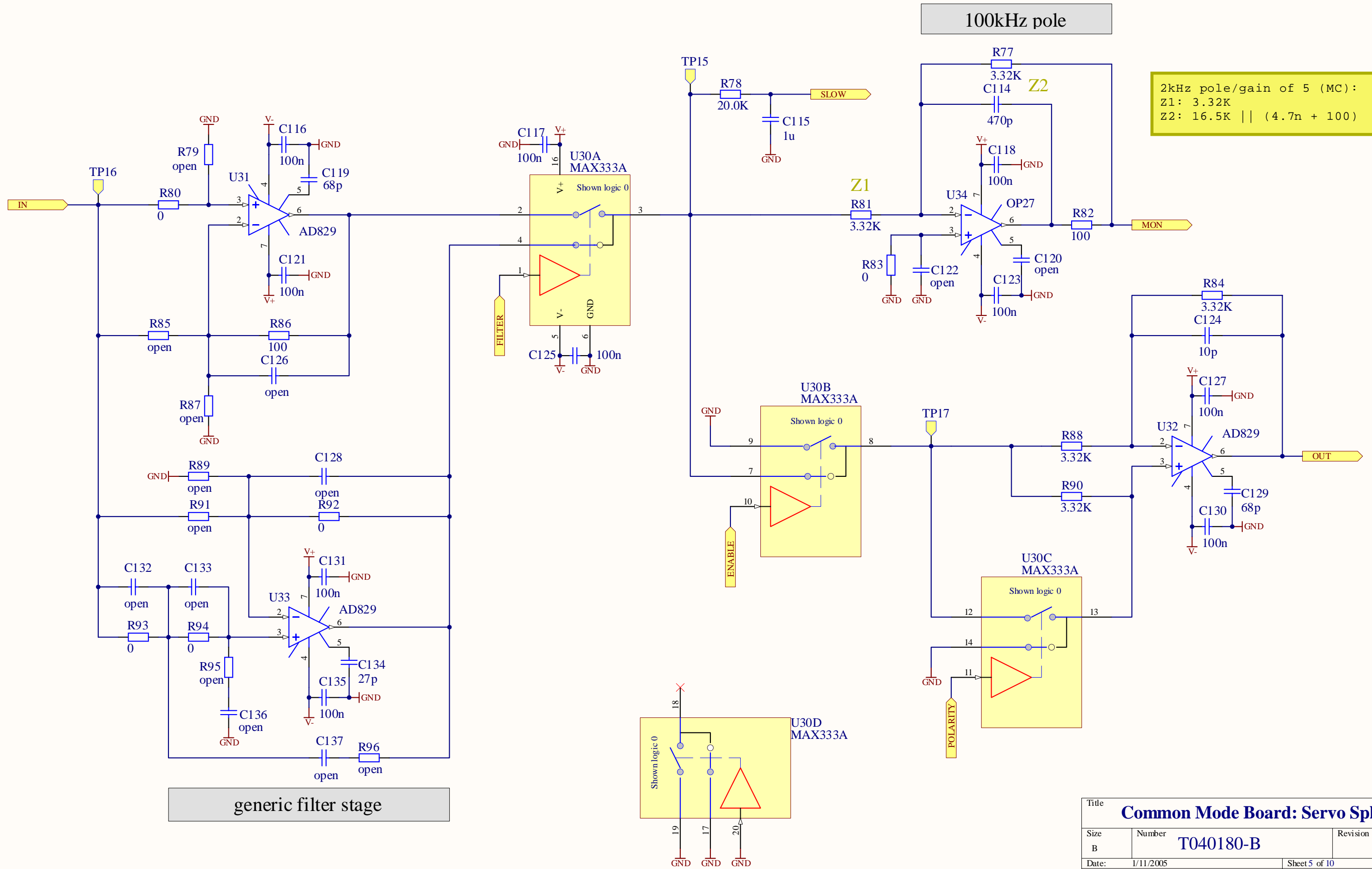


Title Common Mode Board: Boost		
Size B	Number T040180-B	Revision B
Date: 1/11/2005	Sheet 3Bof 10	
File: C:\User\...\CM3B.SchDoc	Drawn By: Daniel Sigg	



optional daughter board

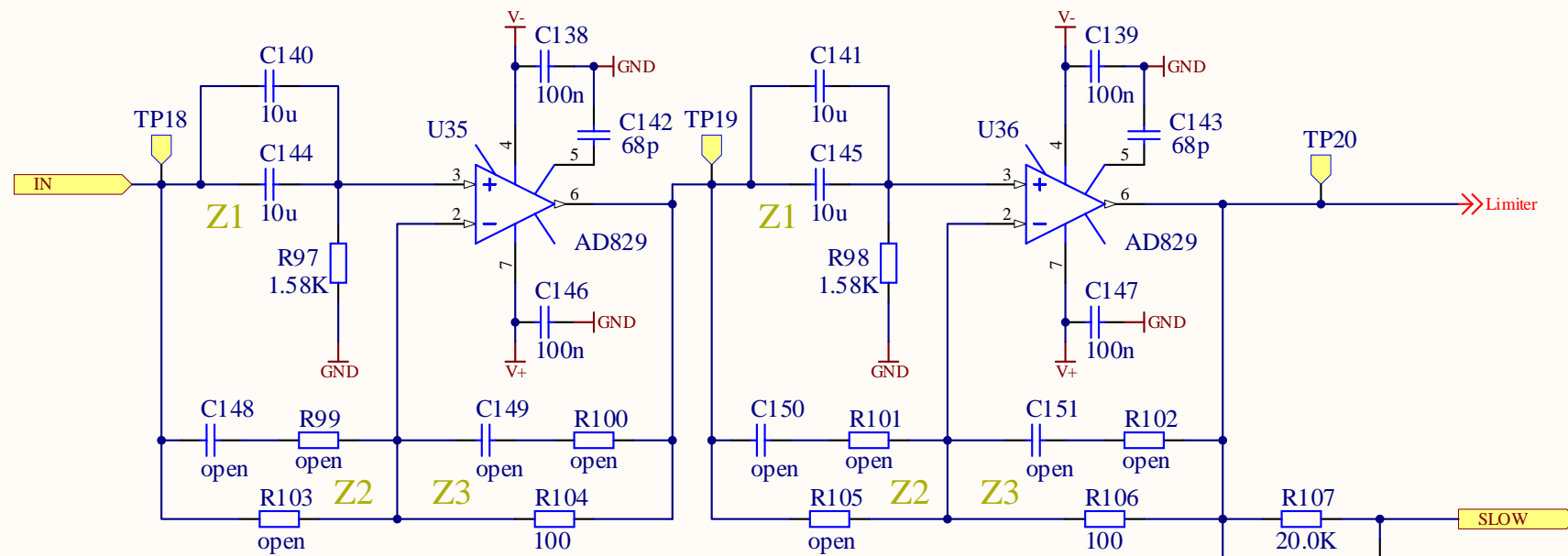
Title Common Mode Board: Excitation Point		
Size B	Number T040180-B	Revision B
Date: 1/11/2005	Sheet 4 of 10	
File: C:\User\...\CM4.SchDoc	Drawn By: Daniel Sigg	



Title		
Common Mode Board: Servo Split		
Size	Number	Revision
B	T040180-B	B
Date:	1/11/2005	Sheet 5 of 10
File:	C:\User\...\CM5.SchDoc	Drawn By: Daniel Sigg

5Hz high pass

5Hz high pass



70kHz zero/140kHz pole (MC):
 Z1: 0 Ohm to ground
 Z2: $(1n + 1.13K) \parallel 1.13K$
 Z3: $1.13K \parallel 10p$

voltage follower for MC:
 Z1: 0 Ohm
 Z2: open
 Z3: 100 Ohm

Filter Design Examples:

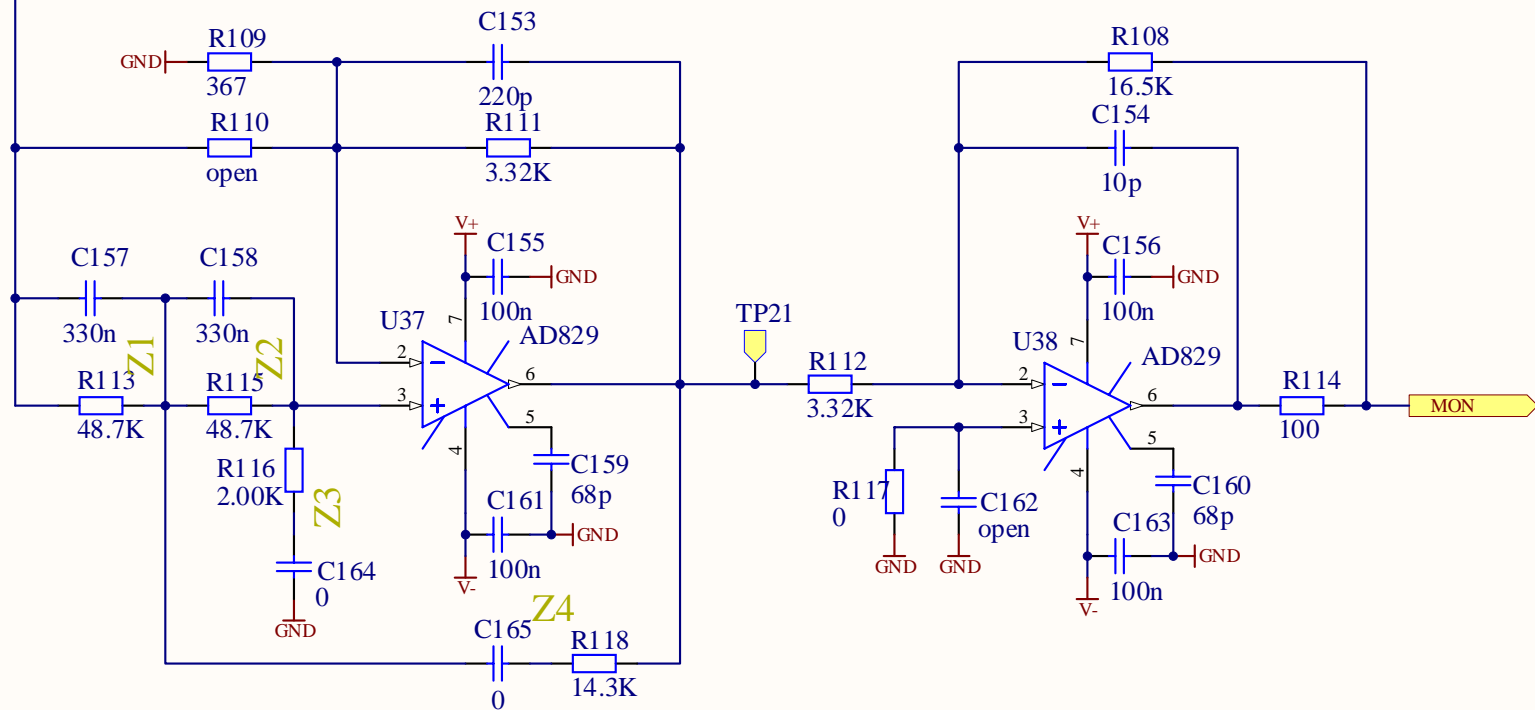
Butterworth high pass: $G = 1.586$, $Z1 = Z2 = 1/sC$, $Z3 = Z4 = R$
 two zeros at 0Hz, two complex poles at $f = 1/(2 \pi R C)$

Butterworth low pass: $G = 1.586$, $Z1 = Z2 = R$, $Z3 = Z4 = 1/sC$
 two complex poles at $f = 1/(2 \pi R C)$

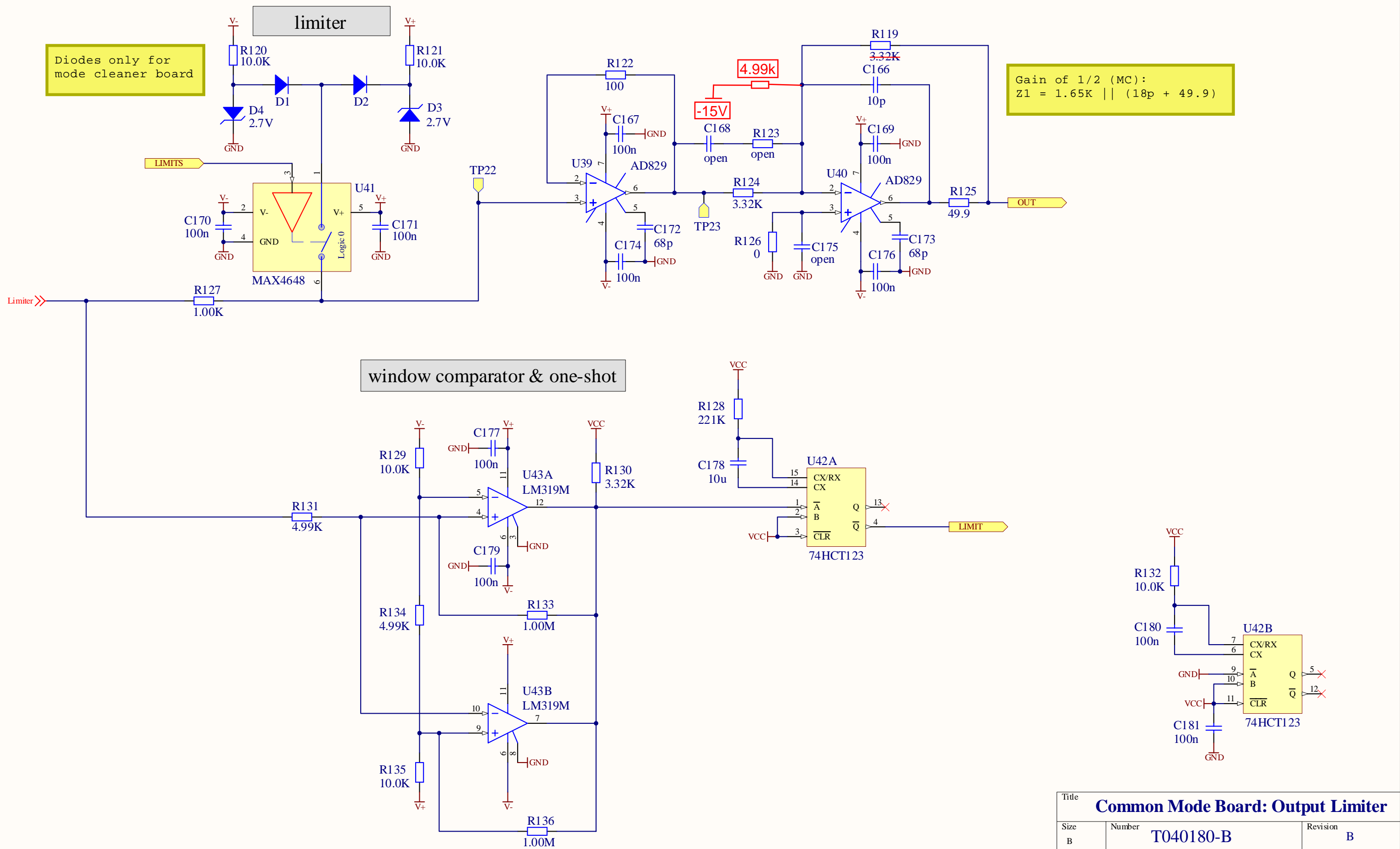
Whitening: $G = 1$, $Z1 = Z2 = (1/sC) \parallel R2$, $Z3 = Z4 = R1$
 two real zeros at $f = 1/(2 \pi R2 C)$, two real poles at $f = 1/(2 \pi (R1 \parallel R2) C)$

Dewhitening: $G = 1$, $Z1 = Z2 = R1$, $Z3 = Z4 = 1/sC + R2$
 two real poles at $f = 1/(2 \pi (R1 + R2) C)$, two real zeros at $f = 1/(2 \pi R2 C)$

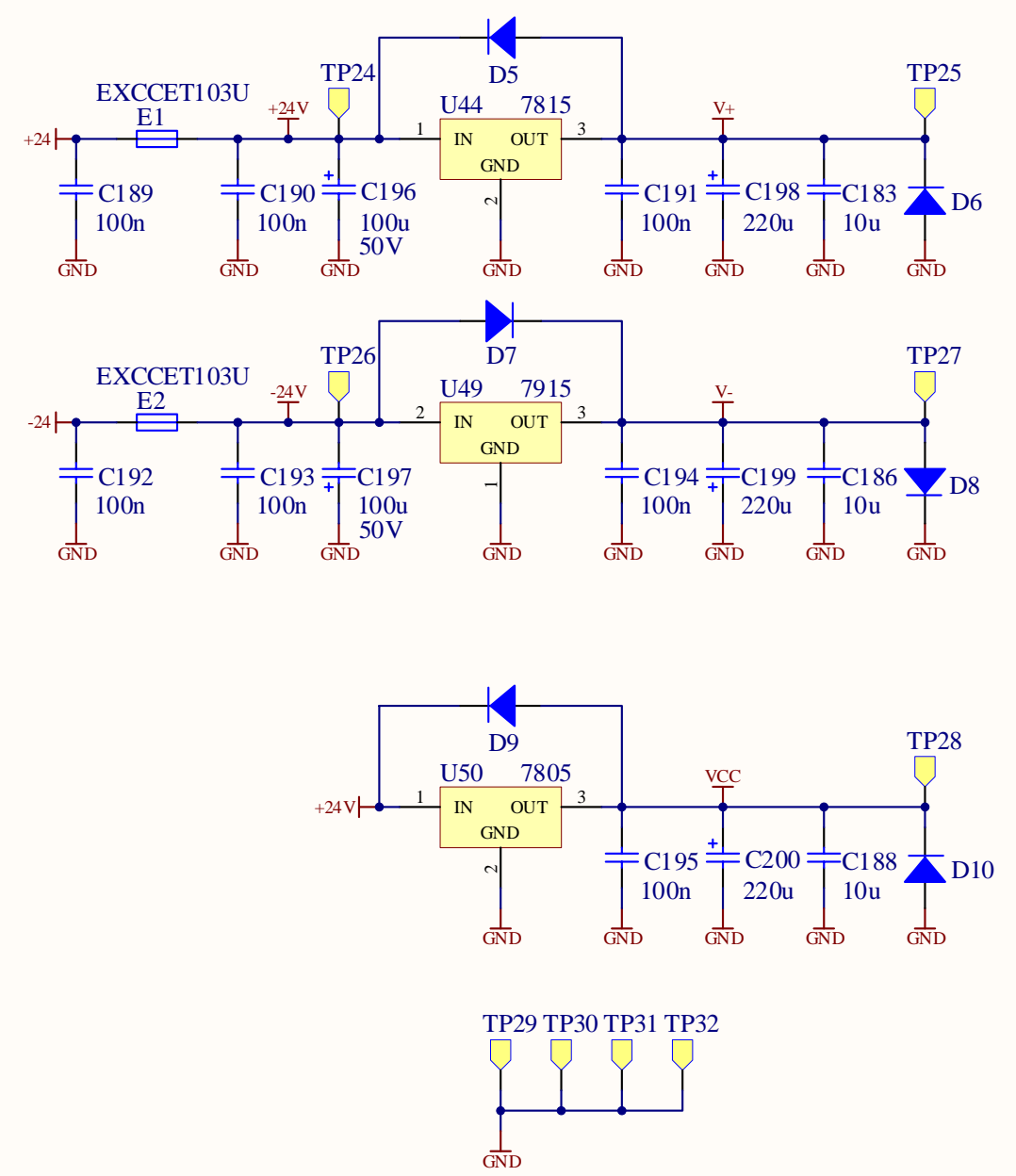
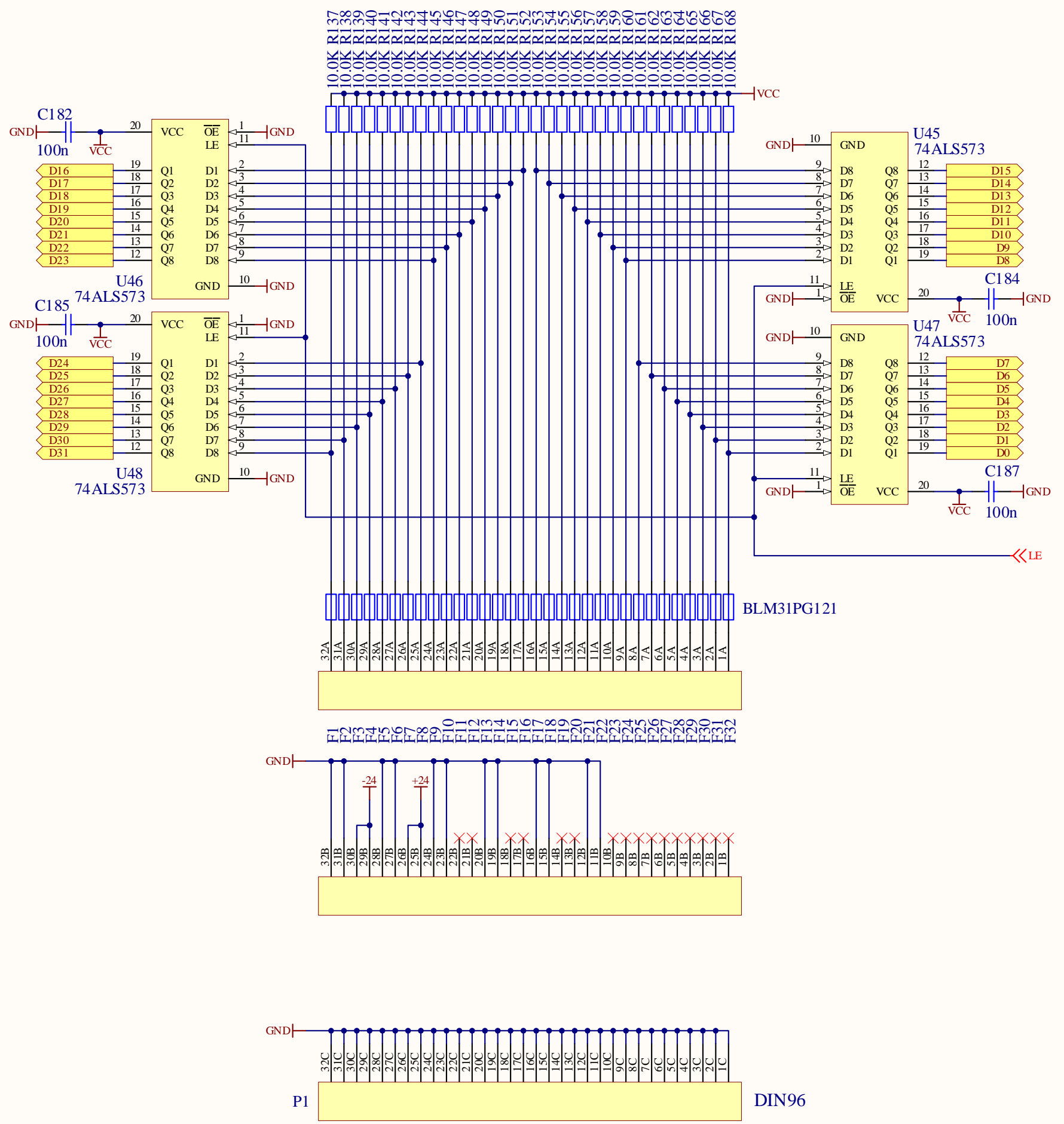
generic filter stage
 2 real zeros at 10Hz
 2 real poles at 100Hz
 dc gain of 0.1



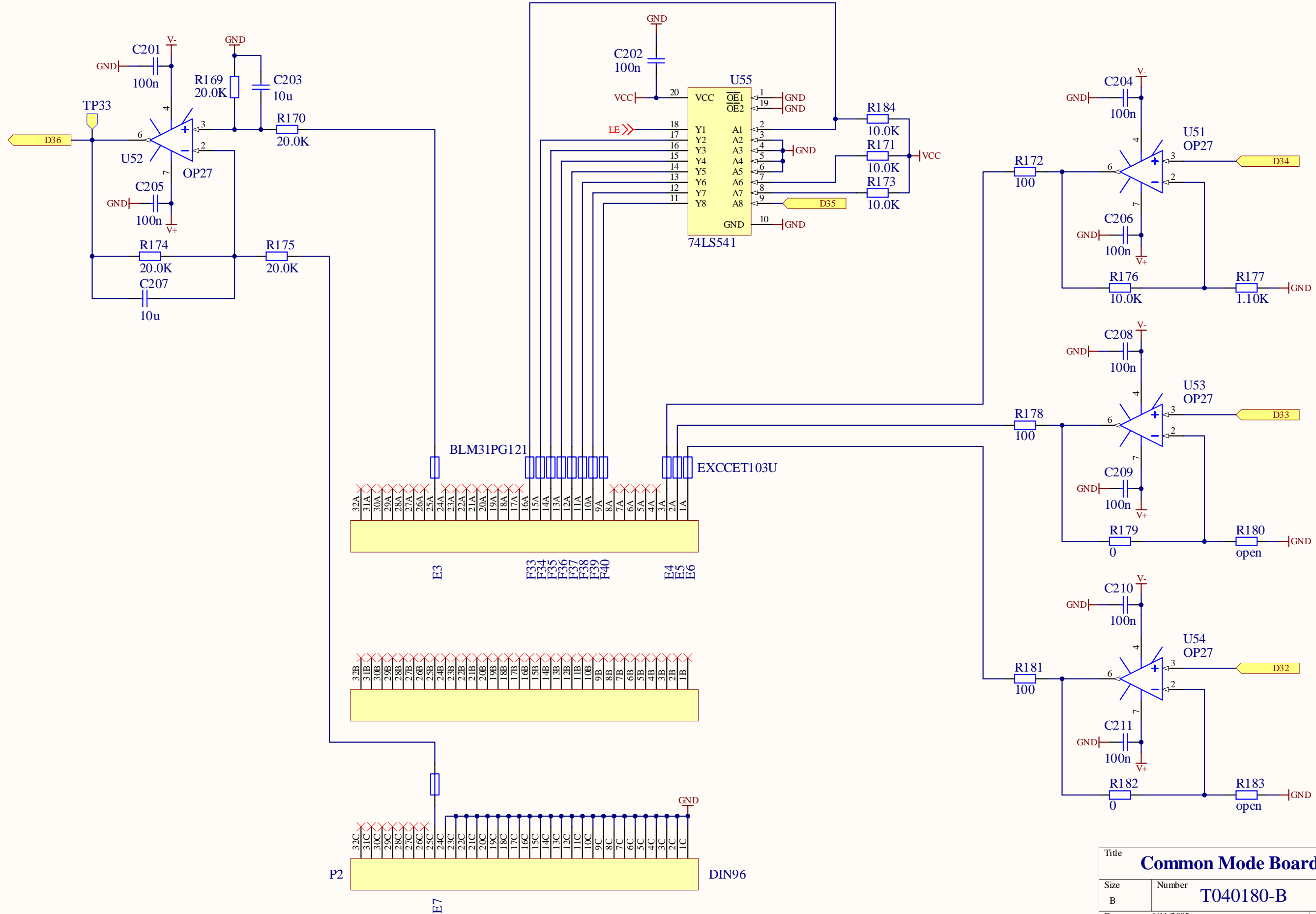
Title		
Common Mode Board: Fast Path		
Size	Number	Revision
B	T040180-B	B
Date:	1/11/2005	Sheet 6 of 10
File:	C:\User\...\CM6A.Sch.Doc	Drawn By: Daniel Sigg



Title		
Common Mode Board: Output Limiter		
Size	Number	Revision
B	T040180-B	B
Date:	1/11/2005	Sheet 6Bof 10
File:	C:\User\...\CM6B.SchDoc	Drawn By: Daniel Sigg



Title Common Mode Board: Backplane(P1)		
Size B	Number T040180-B	Revision B
Date: 1/11/2005	Sheet 7 of 10	
File: C:\User\...\CM7A.Sch.Doc	Drawn By: Daniel Sigg	



Title		
Common Mode Board: Backplane(P2)		
Size	Number	Revision
B	T040180-B	B
Date:	1/11/2005	Sheet 7Bof 10
File:	C:\User\...\CM7B.SchDoc	Drawn By: Daniel Sigg