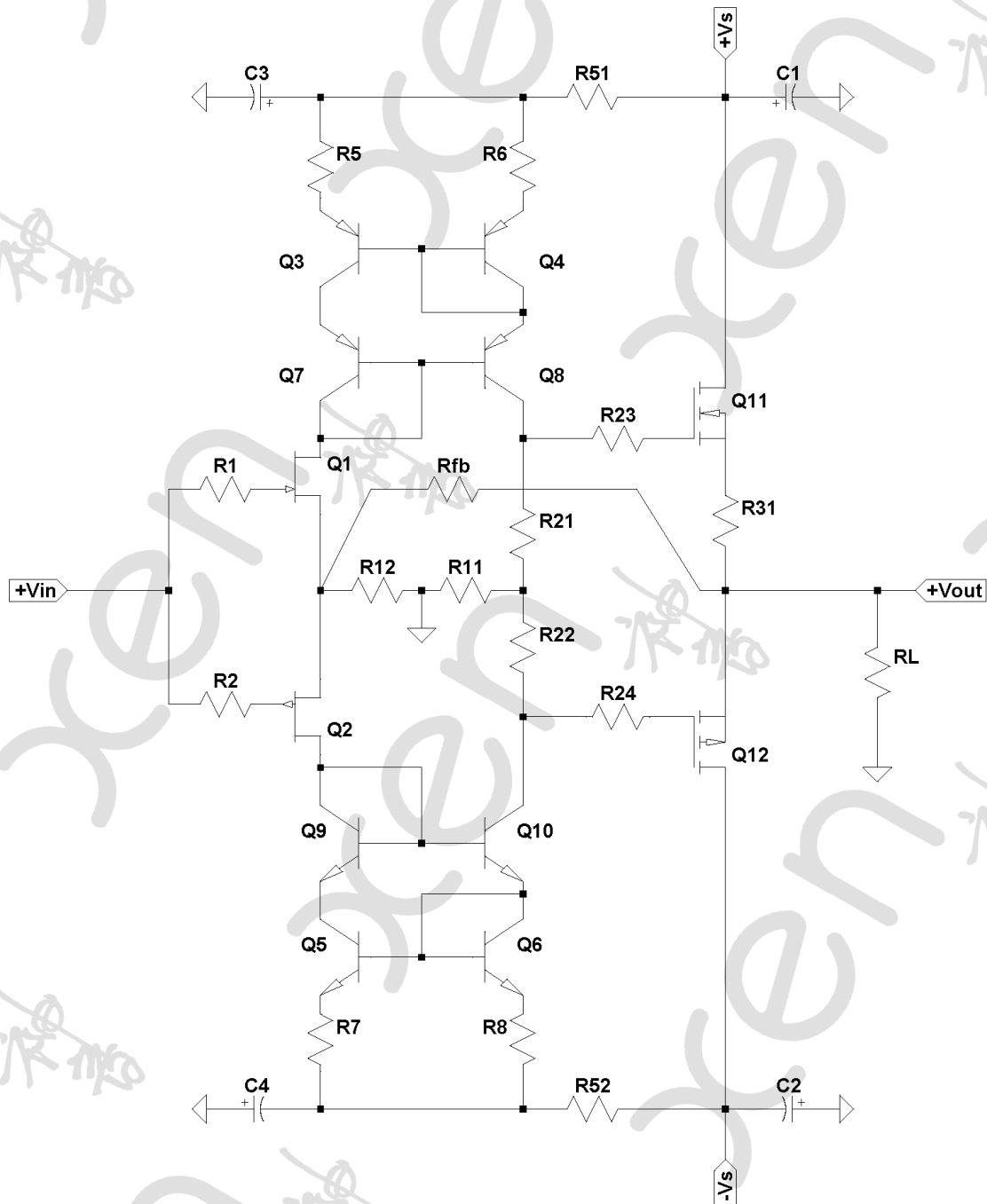


Appendix 1a UTHAiM Basic Schematics (4-BJT current mirrors)

Note that connections between G & D of Q4,6 requires hard wire jumpers at the back of the PCB.



Appendix 2 Bill of Materials

(Per Channel)

A) All FET, ZGF

Designation	Type	Remark
R1,2	Susumu 0805 100R 0.5%	
Rs1,2	Panasonic 0805 0R	
R5,6,7,8	Dale RN55 499R 1%	Trim R6, R8 for DC offset
R11	Dale RN55 5.1k 0.1%	
R12a,b	Beyschlag MMA 0204 910R 0.1%	
R21	Dale RN55 124R 1%	Trim Q1 bias to 150mA
R22	Dale RN55 75R 1%	Trim Q2 bias to 150mA
R23,24	Beyschlag MMA 0204 220R 1%	
R31a,b,c	Beyschlag MMB 0207 1R 1%	
R31d	Beyschlag MMB 0207 5.6R 1%	
R51,52	Dale RN55 10R 1%	Skip if using dual rail voltages
Rfb	Not used	
C1,2	Nichicon KA 470 μ 35V	
C3,4	Nichicon KA 100 μ 35V	
Q1	2SK170BL	Idss ~ 8mA
Q2	2SJ74	Idss matched to Q1
Q3,4,7,8	ZVP3306	Vgs matched at 8mA
Q5,6,9,10	ZVN3306	Vgs matched at 8mA
Q11	2SK1058	
Q12	2SJ162	Vgs ~ Q11
J3,5, J31	apply	
J4,6, J32	leave open	
Recommended Rail Voltage +/- 24V, 300mA		
Optional Output Stage Rail Voltage +/-15V, 300mA		

B) All FET, 30dB NFB

Designation	Type	Remark
R1,2	Susumu 0805 100R 0.5%	
Rs1,2	Panasonic 0805 0R	
R5,6,7,8	Dale RN55 499R 1%	Trim R6, R8 for DC offset
R11	Dale RN55 20k 1%	
R12a,b	Beyschlag MMA 0204 560R 0.1%	
R21	Dale RN55 124R 1%	Trim Q1 bias to 150mA
R22	Dale RN55 75R 1%	Trim Q2 bias to 150mA
R23,24	Beyschlag MMA 0204 220R 1%	
R31a,b,c	Beyschlag MMB 0207 1R 1%	
R31d	Beyschlag MMB 0207 5.6R 1%	

R51,52	Dale RN55 10R 1%	Skip if using dual rail voltages
Rfb	Dale RN65 3k 0.1%	
C1,2	Nichicon KA 470 μ 35V	
C3,4	Nichicon KA 100 μ 35V	
Q1	2SK170BL	Idss ~ 8mA
Q2	2SJ74	Idss matched to Q1
Q3,4,7,8	ZVP3306	Vgs matched at 8mA
Q5,6,9,10	ZVN3306	Vgs matched at 8mA
Q11	2SK1058	
Q12	2SJ162	Vgs ~ Q11
J3,5, J31	apply	
J4,6, J32	leave open	
Recommended Rail Voltage +/- 24V, 300mA		
Optional Output Stage Rail Voltage +/-15V, 300mA		

C) BJT CM, ZGF

Designation	Type	Remark
R1,2	Susumu 0805 100R 0.5%	
Rs1,2	Panasonic 0805 0R	
R5,6,7,8	Dale RN55 390R 1%	Trim R6, R8 for DC offset
R11	Dale RN55 5.1k 0.1%	
R12a,b	Beyschlag MMA 0204 910R 0.1%	
R21	Dale RN55 124R 1%	Trim Q1 bias to 150mA
R22	Dale RN55 75R 1%	Trim Q2 bias to 150mA
R23,24	Beyschlag MMA 0204 220R 1%	
R31a,b,c	Beyschlag MMB 0207 1R 1%	
R31d	Beyschlag MMB 0207 5.6R 1%	
R51,52	Dale RN55 10R 1%	
Rfb	Not used	
C1,2	Nichicon KA 470 μ 35V	
C3,4	Nichicon KA 100 μ 35V	
Q1	2SK170BL	Idss ~ 8mA
Q2	2SJ74	Idss matched to Q1
Q3,4,7,8	ZTX951	hfe matched
Q5,6,9,10	ZTX851	hfe matched
Q11	2SK1058	
Q12	2SJ162	Vgs ~ Q11
J4,6, J31	apply	
J3,5, J32	leave open	
Recommended Rail Voltage +/- 18V, 300mA		