

[AI2 MAX: BFX-UA300]

Amp Audio Output Performance Analysis

Organization
R&D Lab. 2

Issued Date
2020.12.15

Version
1.0

Revision History

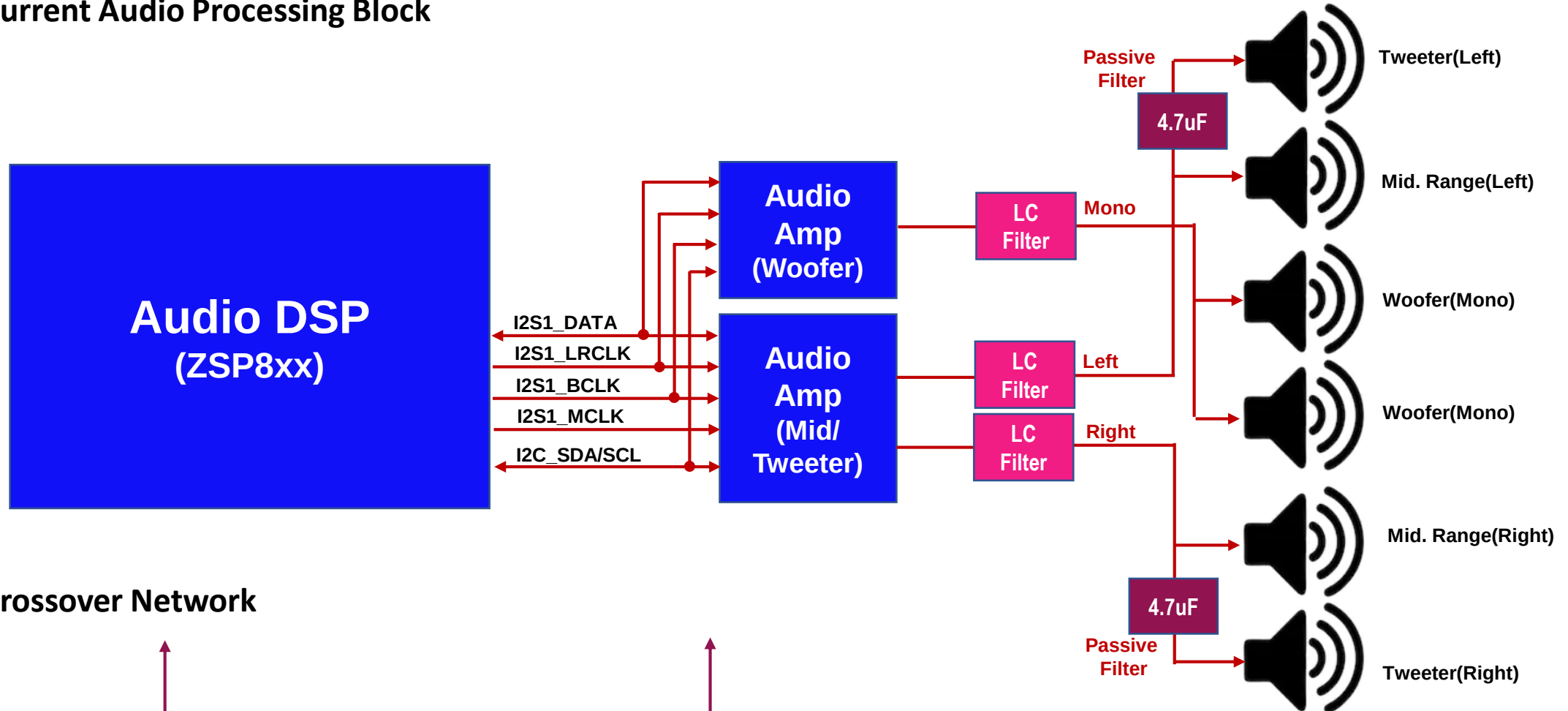
Version	Date	Description	Owner
1.0	2020/12/15	1 st Draft version	Lonnie Kim

Measurement Setup



Current Audio Processing

● Current Audio Processing Block



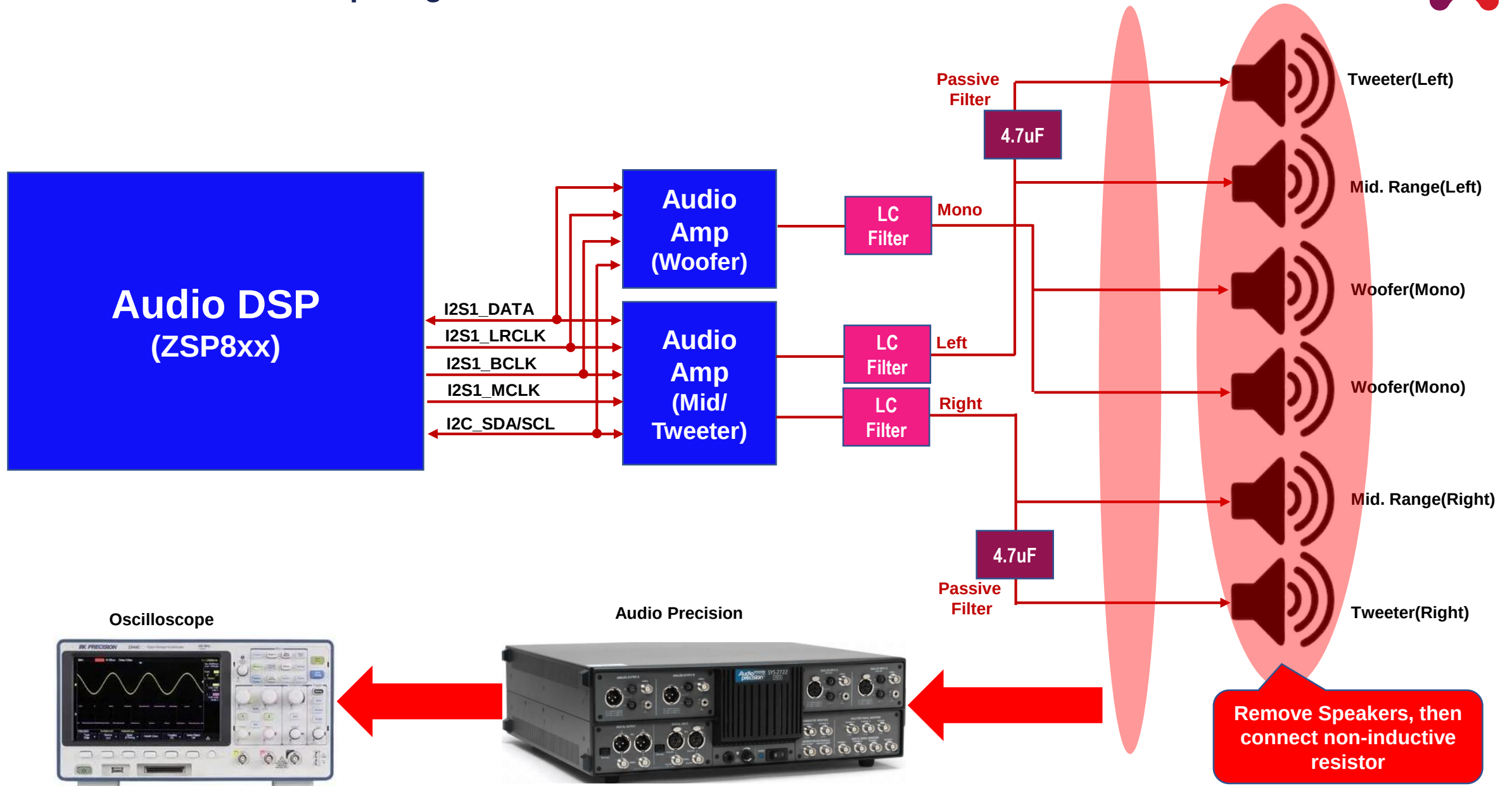
● Crossover Network



- Speaker Impedance
- Tweeter Speaker : 4 ohm
- Mid. Range Speaker : 4 ohm
- Woofer Speaker : 8 ohm



Test Measurement Setup Diagram





Amp Board Connection

Audio Precision

AD82584F
Test

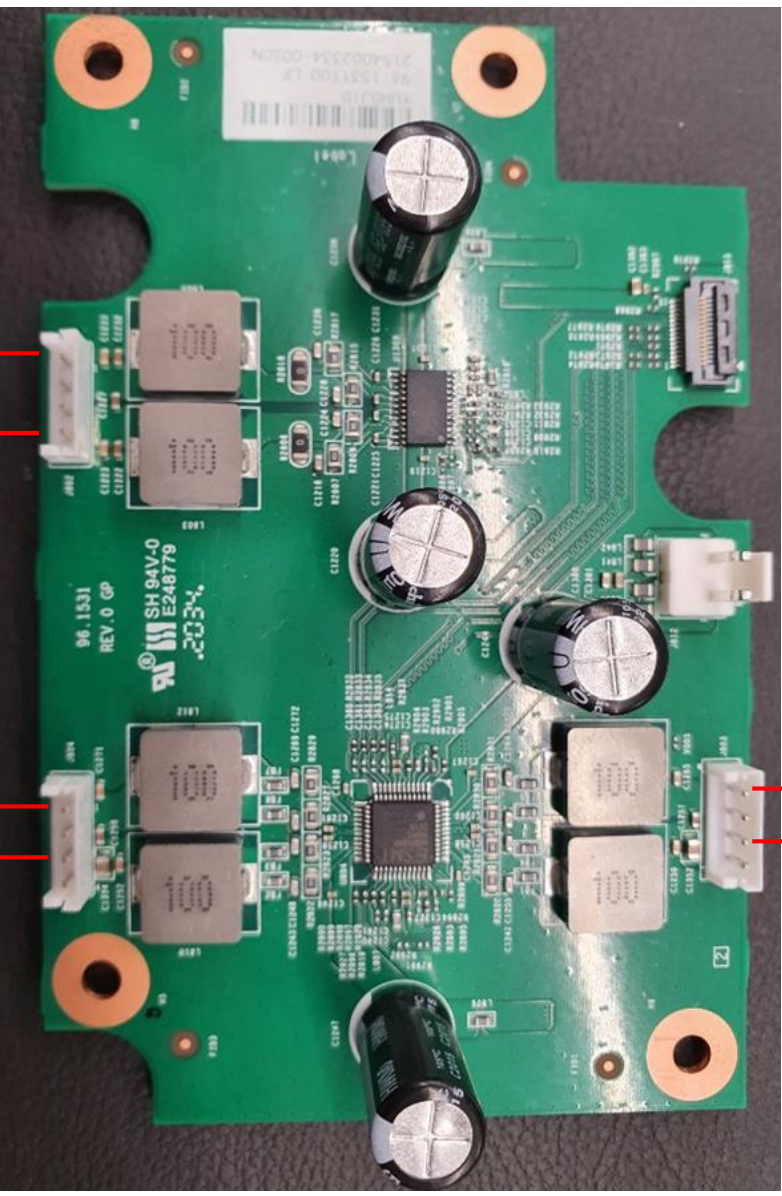
Non-inductive resistor
(4 ohm, 1%, 50W)



Audio Precision

AD83586B
Test

Non-inductive resistor
(4 ohm, 1%, 50W)



AD83586B
Test

Audio Precision

Non-inductive resistor
(4 ohm, 1%, 50W)



Measurement Process



Amp Setting

1. Set “EQ bypass mode”
2. Set Amp Gain
 - 0dB
 - Woofer: 30W
 - Midrange/Tweeter: 15W(per channel)
3. Test audio performance

[Volume Table]

GUI	dB	Mid/Tweeter	Woofer
		Power(W)	Power(W)
1	-31	0.469	0.938
2	-30.0000	0.938	1.875
3	-29.0000	1.406	2.813
4	-28.0000	1.875	3.750
5	-27.0000	2.344	4.688
6	-26.0000	2.813	5.625
7	-25.0000	3.281	6.563
8	-24.0000	3.750	7.500
9	-23.0000	4.219	8.438
10	-22.0000	4.688	9.375
11	-21.0000	5.156	10.313
12	-20.0000	5.625	11.250
13	-19.0000	6.094	12.188
14	-18.0000	6.563	13.125
15	-17.0000	7.031	14.063
16	-16.0000	7.500	15.000
17	-15.0000	7.969	15.938
18	-14.0000	8.438	16.875
19	-13.0000	8.906	17.813
20	-12.0000	9.375	18.750
21	-11.0000	9.844	19.688
22	-10.0000	10.313	20.625
23	-9.0000	10.781	21.563
24	-8.0000	11.250	22.500
25	-7.0000	11.719	23.438
26	-6.0000	12.188	24.375
27	-5.0000	12.656	25.313
28	-4.0000	13.125	26.250
29	-3.0000	13.594	27.188
30	-2.0000	14.063	28.125
31	-1.0000	14.531	29.063
32	0	15.000	30.000



Amp Performance Table

1. AD83586B Performance Table

Symbol	Parameter	Condition	Input Level	Min	Typ	Max	Units
P _O (Note1)	RMS Output Power (THD+N=0.22%)				40		W
	RMS Output Power (THD+N=0.17%)				25		W
THD+N	Total Harmonic Distortion + Noise	P _O =15W			0.15		%
SNR	Signal to Noise Ratio(Note 2)		-1dB		98		dB
DR	Dynamic Range(Note 2)		-60dB		106		dB
V _n	Output Noise (Note 2)	20Hz to 20kHz			150		uV
PSRR	Power Supply Rejection Ratio	VRIPPLE=1VRMS at 1kHz			-80		dB
	Channel Separation	P=1W@1kHz			-84		dB

- Stereo output (PBTL)

- Condition: T_A=25 °C, DVDD =3.3V, PVDD=24V, FS=48kHz, Load=4Ω with passive LC lowpass filter (L=10μH with RDC=27mΩ, C=470nF); Input is 1kHz sinewave. Volume is 0dB unless otherwise specified.
 - Note 1: Thermal dissipation is limited by package type and PCB design. The external heat-sink or system cooling method should be adopted for maximum power output.
 - Note 2: Measured with A-weighting filter.
- Measurement points(frequency)
20Hz/50Hz/100Hz/200Hz/500Hz/700Hz/1KHz/2KHz/5KHz/7KHz/10KHz/15KHz/20KHz

Amp Performance Table



1. AD82584F Performance Table

Symbol	Parameter	Condition	Input Level	Min	Typ	Max	Units
Po (Note3)	RMS Output Power (THD+N=0.4%)				50		W
	RMS Output Power (THD+N=0.31%)				30		W
	RMS Output Power (THD+N=0.26%)				20		W
THD+N	Total Harmonic Distortion + Noise	Po=15W			0.22		%
SNR	Signal to Noise Ratio(Note 4)	Maximum power at THD < 1% @1kHz			102		dB
DR	Dynamic Range(Note 4)		-60dB		106		dB
Vn	Output Noise (Note 4)	20Hz to 20kHz			130		uV
PSRR	Power Supply Rejection Ratio	VRIPPLE=1VRMS at 1kHz			-78		dB

- Stereo output (PBTL)

- Condition: TA=25 oC, DVDD =3.3V, PVDD=24V, FS=48kHz, Load=4Ω with passive LC lowpass filter (L=10μH with RDC=27mΩ, C=470nF); Input is 1kHz sinewave.

Note 3: Thermal dissipation is limited by package type and PCB design. The external heat-sink or system cooling method should be adopted for maximum power output.

Note 4: Measured with A-weighting filter.

- Measurement points(frequency)

20Hz/50Hz/100Hz/200Hz/500Hz/700Hz/1KHz/2KHz/5KHz/7KHz/10KHz/15KHz/20KHz

To be Done & Improvement Points

Volume Setting

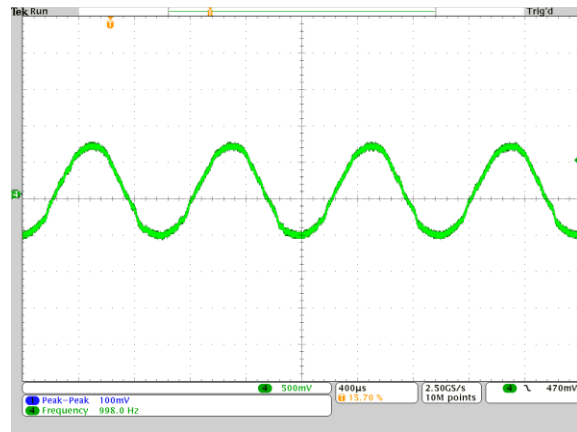
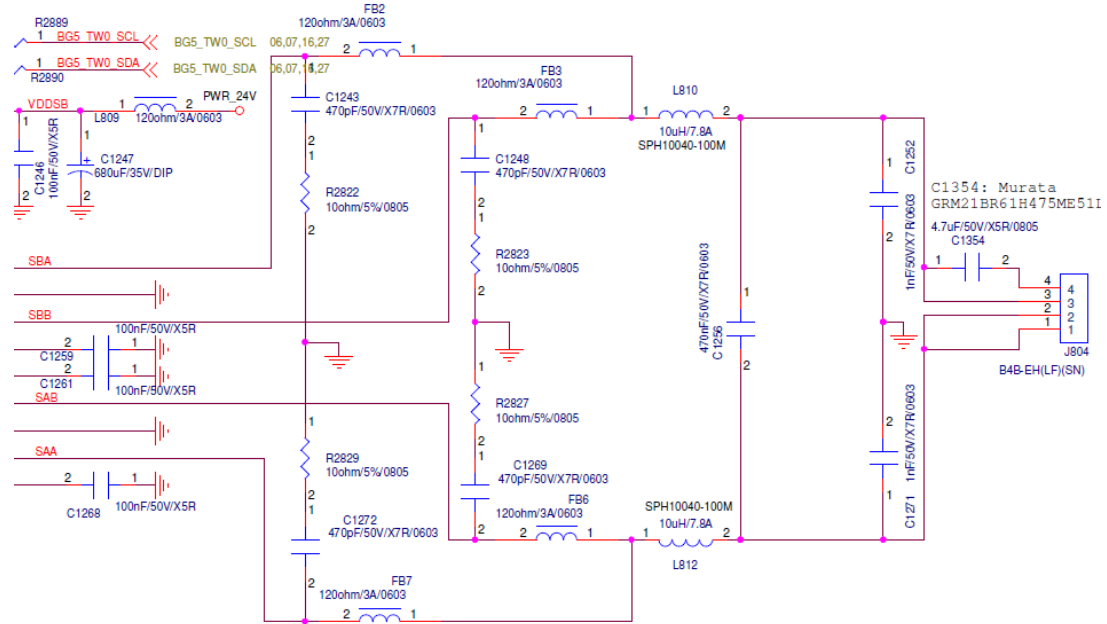


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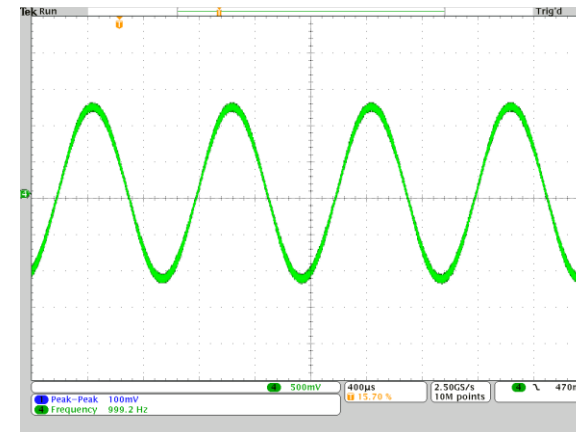
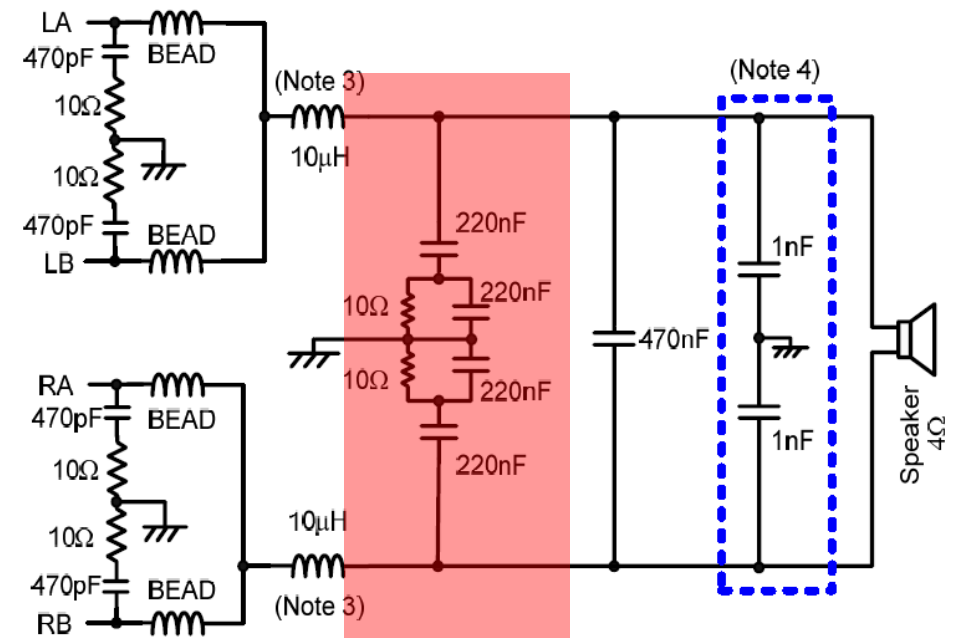


LC Filter(Improvement Waveform distortion and THD)

1. Current Filter



2. Modified Filter



Thank you.