

BFX-UA300

Hardware Unit Test Report

4 *MIC Test

Hardware version	FW version	Sample No.
V015	TBD	PCB S/N: YUH0FYF

1.1 Audio Test Setup & Environment





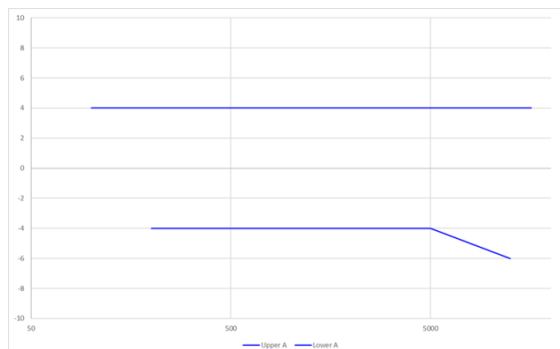
- (1) Play 1KHz Tone
- (2) DUT(4*Mic)
- (3) Microphone(Use for AP analysis)

1.2 Test Condition

Use Audio precision send 1 KHz signal and the sample rate is 48 KHz.

2.1 Test Criteria for unit microphone

Item 1: Frequency Response: Measurement of microphone frequency characteristics at 94dB SPL in front of 1m measuring speaker.



	Upper A	Lower A
100	4	
200	4	-4
5000	4	-4
12500	4	-6
16000	4	

Item 2: Harmonic Distortion: check distortion at 94dB SPL in front of 1m measuring speaker.

Item 3: Total harmonic distortion is within 1% at 1 kHz of 94dB SPL.

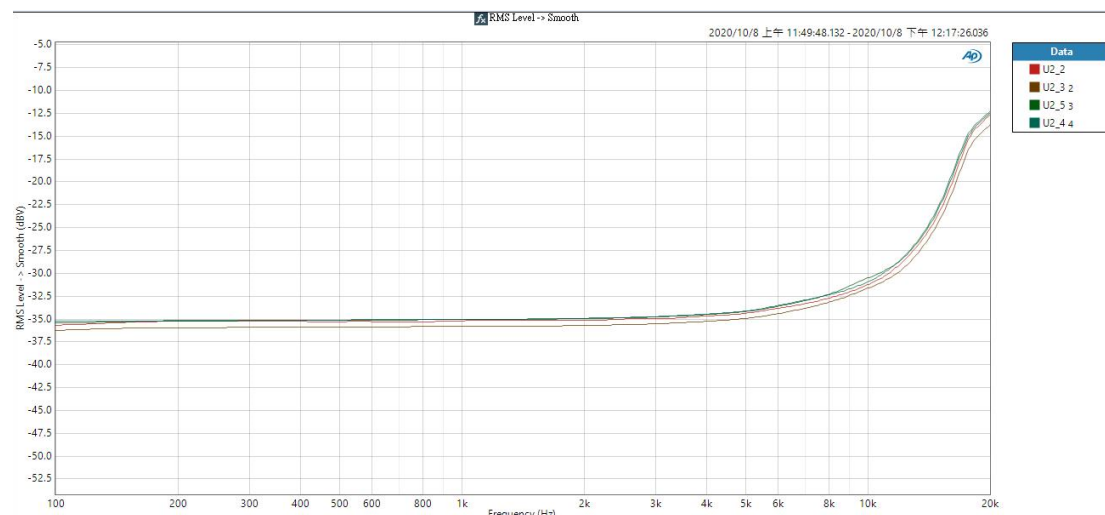
Item 4: Sensitivity: Over -35 dBV (analog mic.) at 1kHz of 94dB SPL.

Item 5: Signal-Noise-Ratio (SNR): Over 64 dB .

2.2 Result and Picture

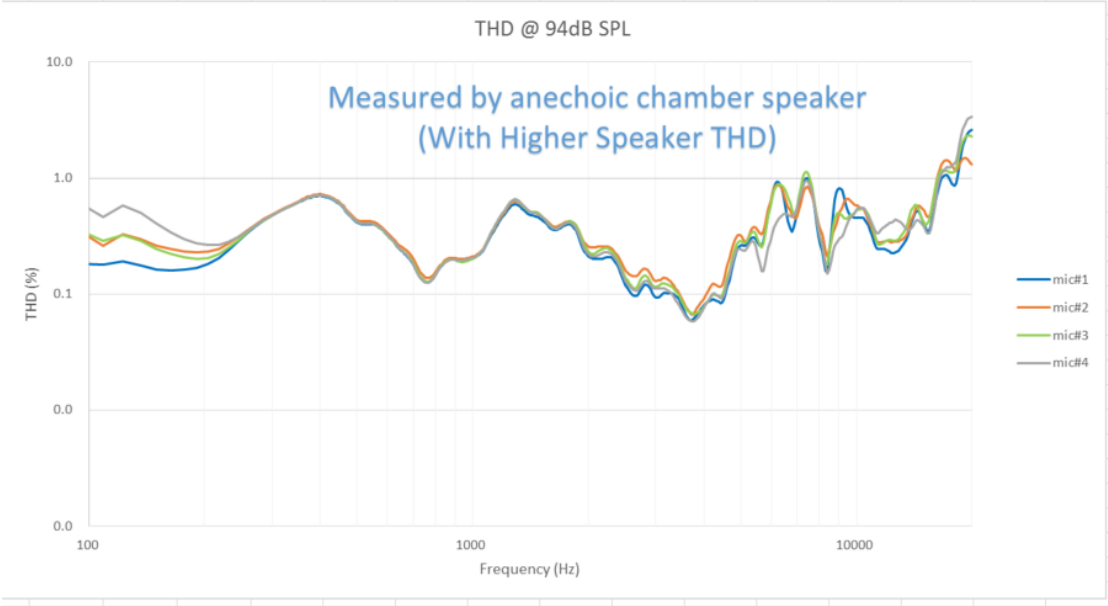
item 1: Frequency Response =====> **PASS**

	SPEC	MIC#1	MIC#2	MIC#3	MIC#4
Frequency Response	See 2.1(item1)	PASS	PASS	PASS	PASS

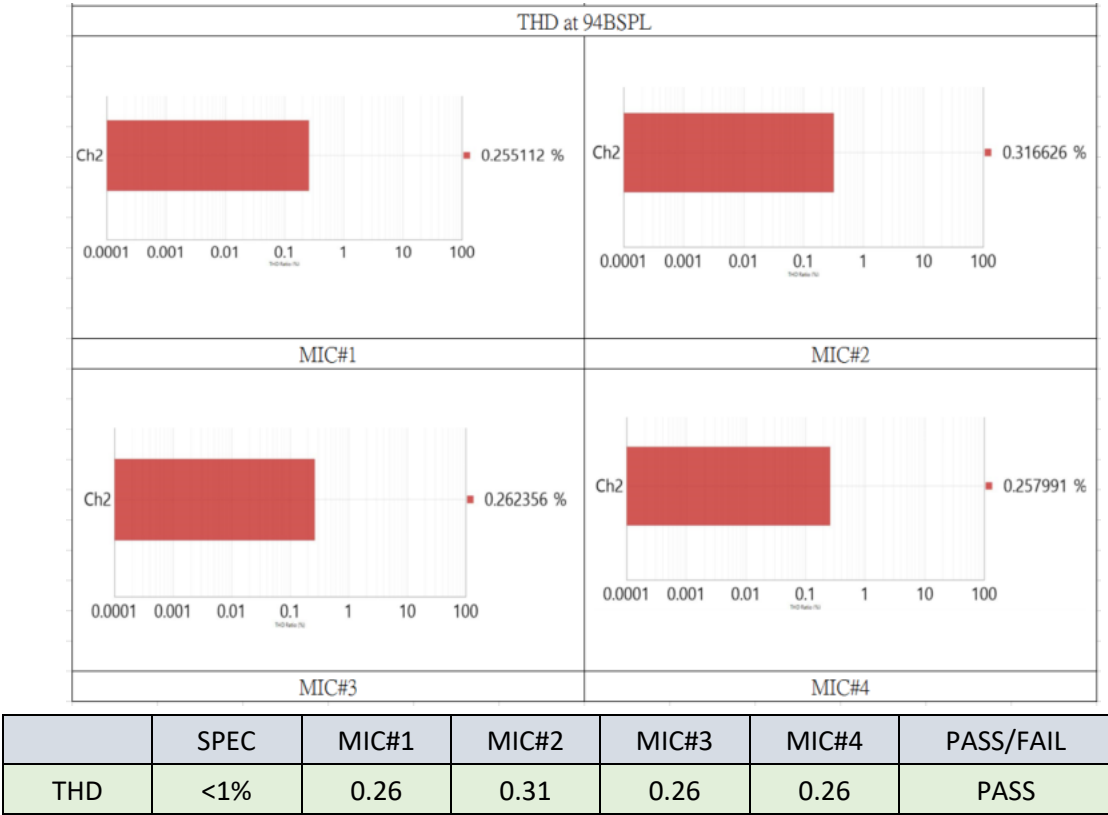


Picture (1)

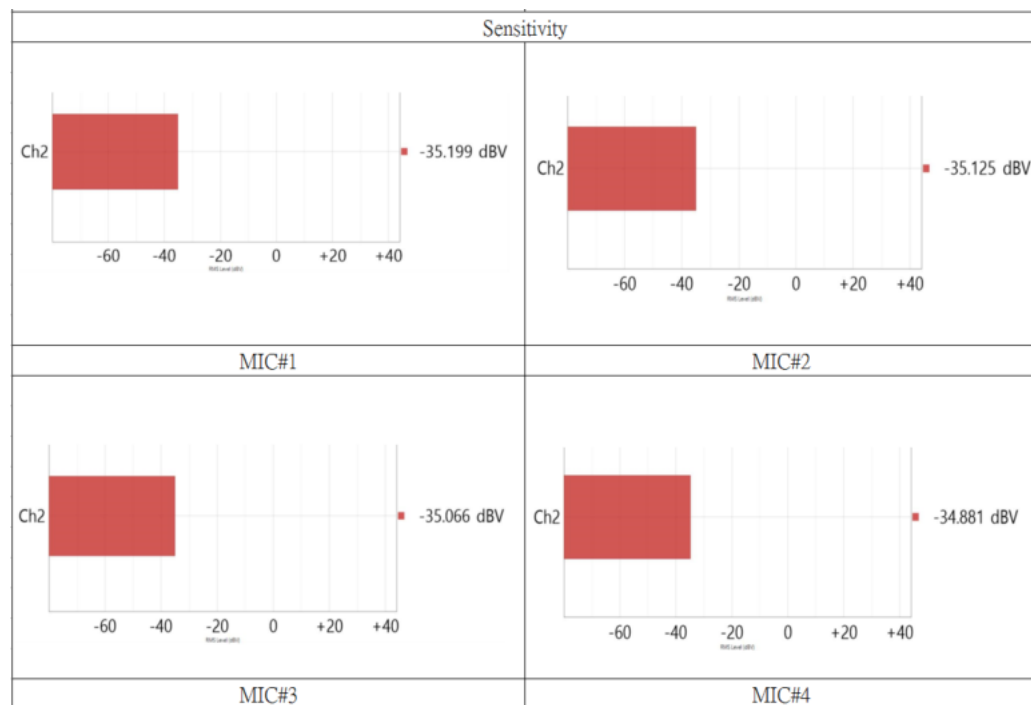
Item 2: Harmonic Distortion =====> **PASS**



Item 3: Harmonic Distortion(Mic1~Mic4) =====> **PASS**



Item 4: Sensitivity =====> **PASS**



2.5V	MIC#1	MIC#2	MIC#3	MIC#4	PASS/FAIL
Sensitivity (dBV)	-35.20	-35.12	-35.00	-34.88	PASS

Item 5: Signal-Noise-Ratio (SNR) =====> **PASS**

2.5V	Spec	MIC#1	MIC#2	MIC#3	MIC#4	PASS/FAIL
Sensitivity @ 1KHz	>-35dBV	-35.2	-35.12	-35	-34.88	PASS
Noise Floor(A-weight)		-101.39	-100.67	-100.44	-100.43	PASS
SNR	>64	66.19	65.55	65.44	65.55	PASS

3.1 Test Criteria for Microphone

Item 1: Frequency response: Deviation range is within ± 4 dB at 100 Hz to 8000 Hz of 94dB SPL.

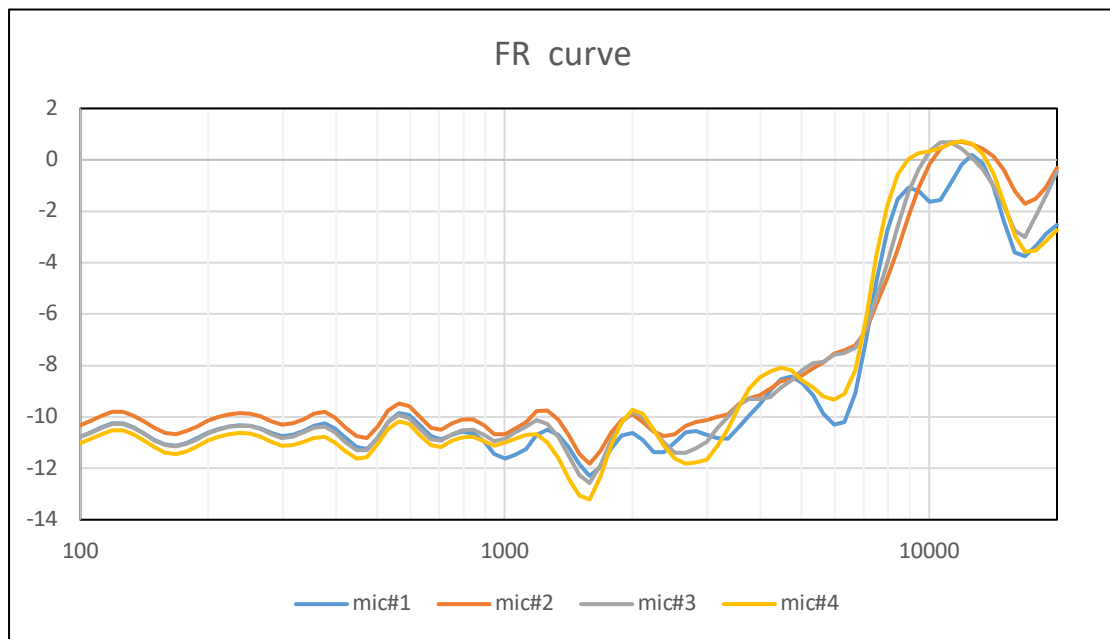
Item 2: THD: Total harmonic distortion is within 1% at 1 kHz of 94dB SPL.

Item 3: Sealing: Difference of Average RMS Should be over 25dB between Mic hole open and close at 100Hz~10KHz.

3.2 Result& Picture

Item 1 : Frequency Response ==> Please see below comment in details.

	SPEC	MIC#1	MIC#2	MIC#3	MIC#4	Comment
Frequency Response(at 94dB SPL)	(+/-)4dB	PASS	PASS	PASS	PASS	See Note(1).

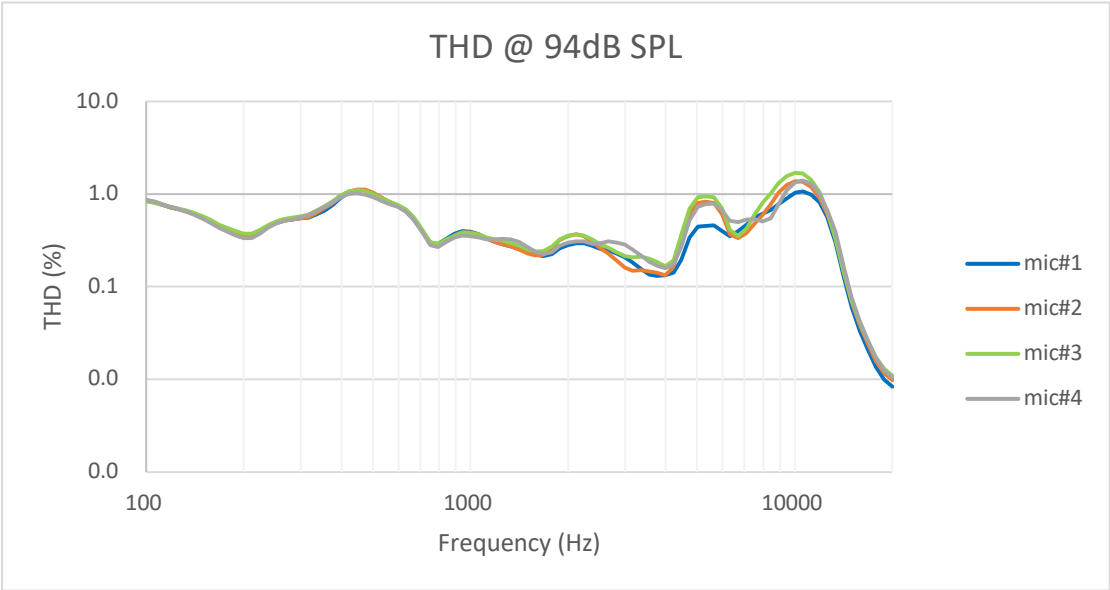


Picture (1)

Note(1): By using clay for MIC sealing, the FR gets better test.

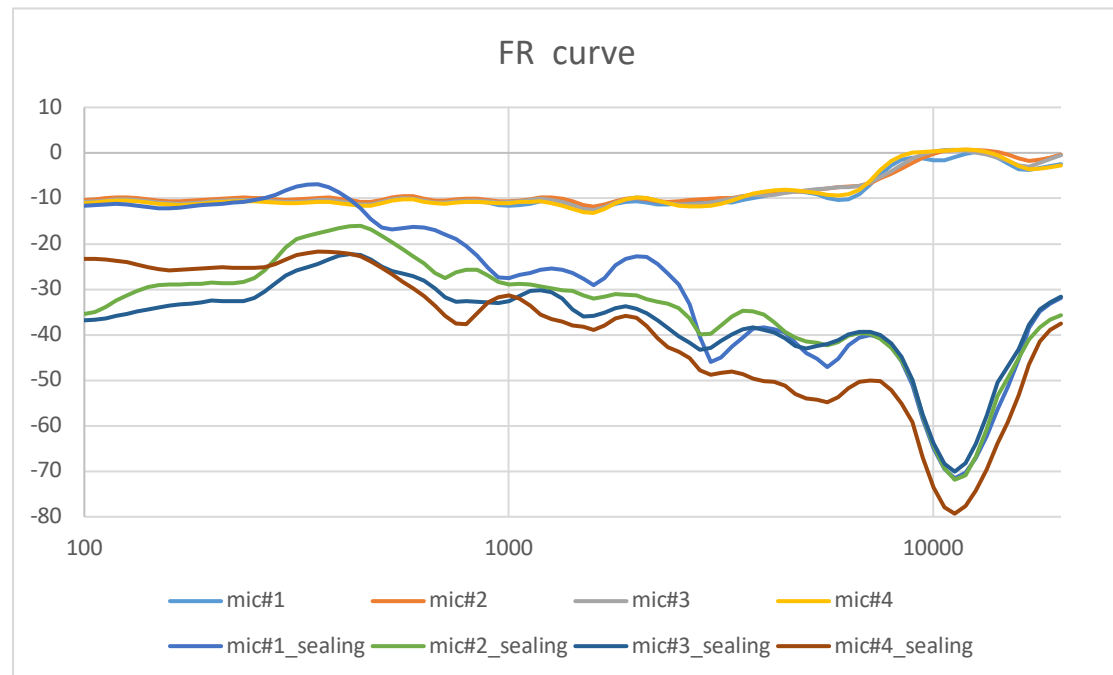
Item 2: Harmonic Distortion(Mic1~Mic4) =====> **PASS**

	SPEC	MIC#1	MIC#2	MIC#3	MIC#4	PASS/FAIL
THD at 94dbSPL(%)	<1%	0.39577	0.38483	0.38108	0.35274	PASS



Item 3: Sealing =====> Please see below comment in details.

	SPEC	MIC#1	MIC#2	MIC#3	MIC#4	Comment
Sealing 100~10KHz	>25dB	Margin	PASS	PASS	PASS	See Note(1).



Note (1): According to the above result, Mic#1 of sealing is not good than the other 3 Mic at lower frequency. But from 1KHz, the sealing of all MIC is good. Suspect the mockup sample at the bottom side of top cover is a little deformation and the flatness is not good. MIC vendor suggests that next test can use tooling sample for test and do the fine tune with pink noise for better sealing.

Additional test:

SPONGE_MIC_SILICON_140X24X0D5T rubber

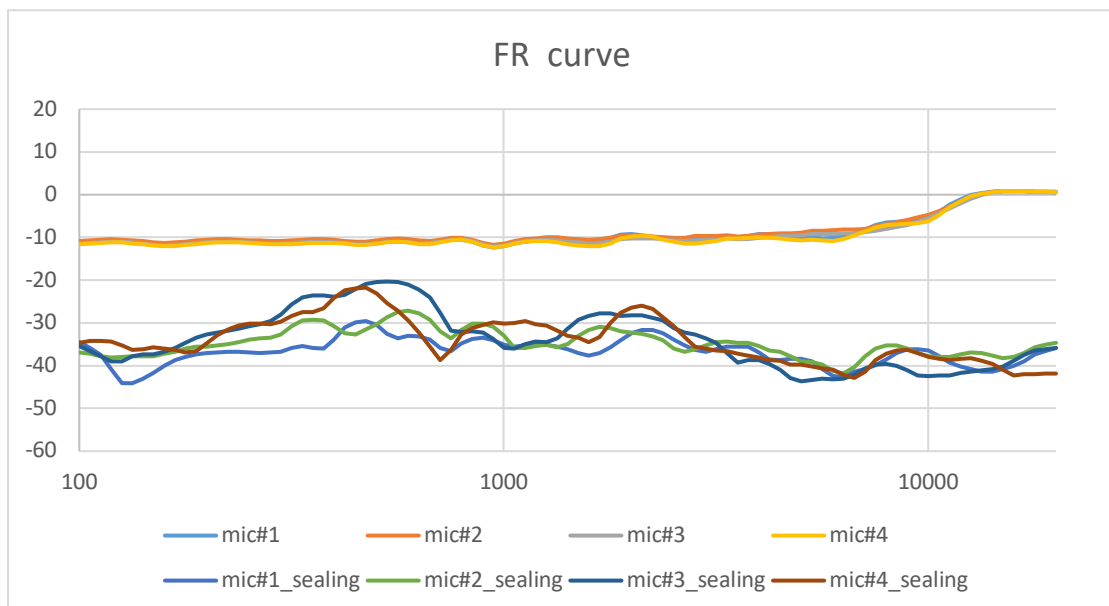
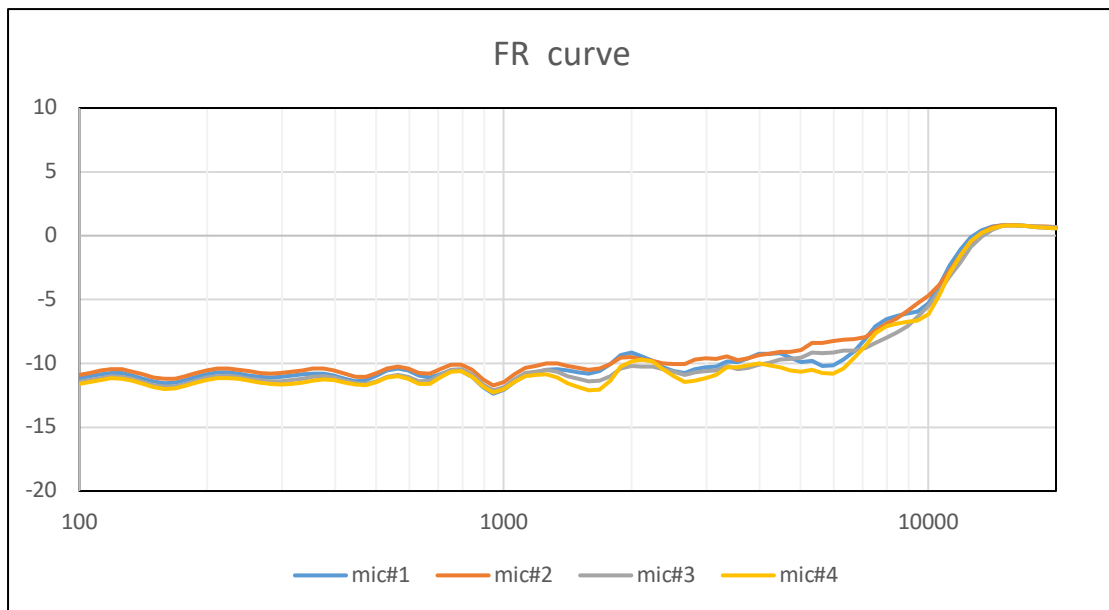
--0.7mm / 0.9mm / 1.1mm

SILICON_MIC_UA300 rubber

--New rubber is for fit MIC board.

For *PONGE_MIC_SILICON_140X24X0D5T* rubber, vendor suggests us to add adhesive at top and bottom side to test. But the MIC board is broken and no further bottom side adhesive test result. But vendor suggests to add adhesive at bottom side will be better than top side. The results will verify on DVT build.

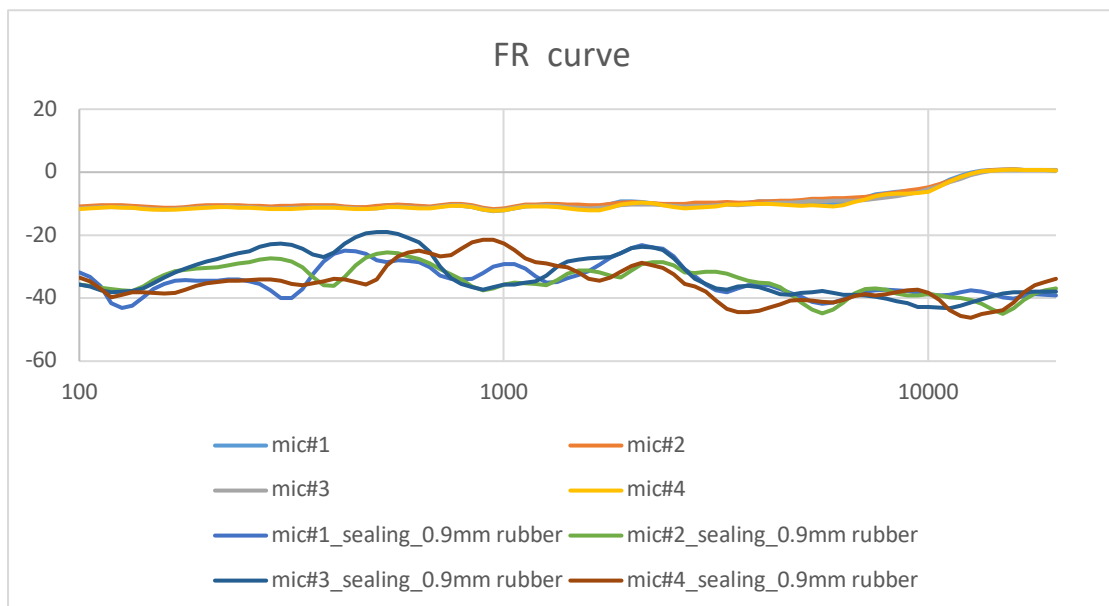
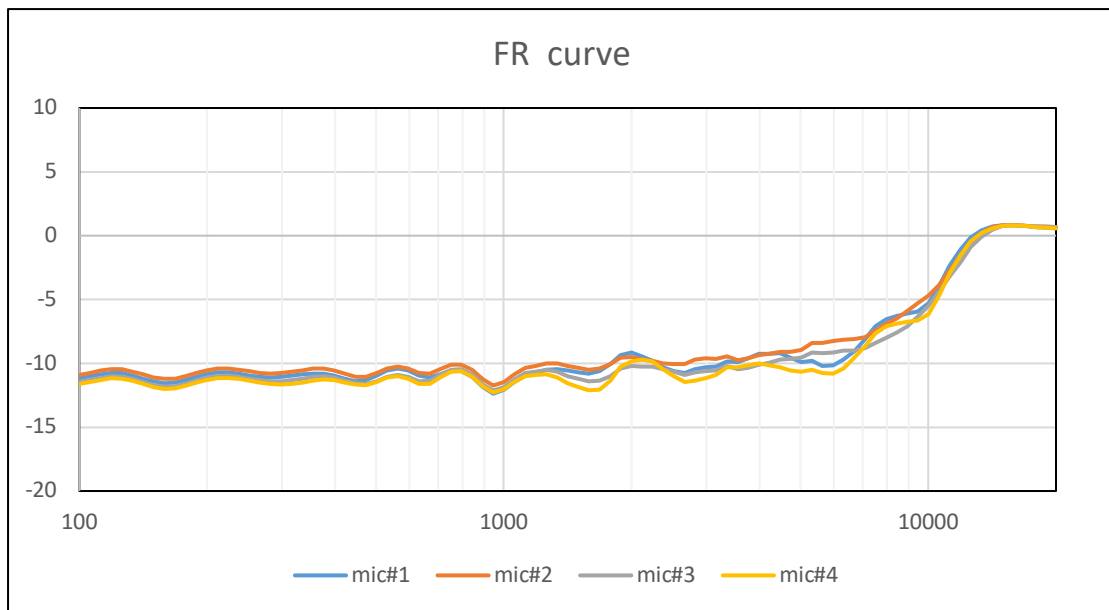
0.7 mm rubber w/o adhesive:



Note:

Mic#3 and MIC#4 maybe not assemble well or mockup sample has some deformation to cause not sealing well.

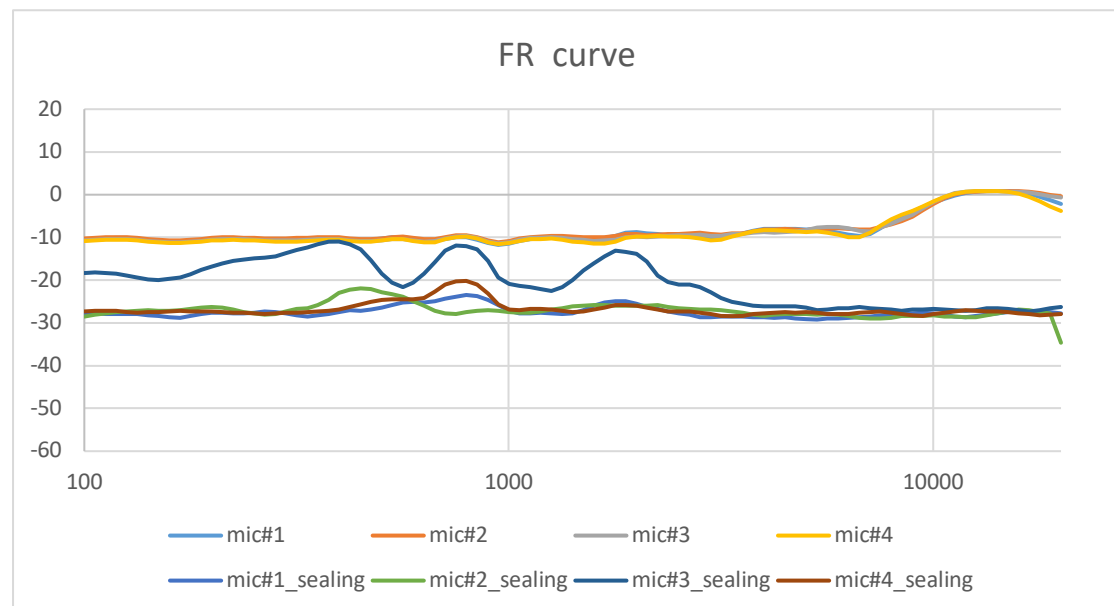
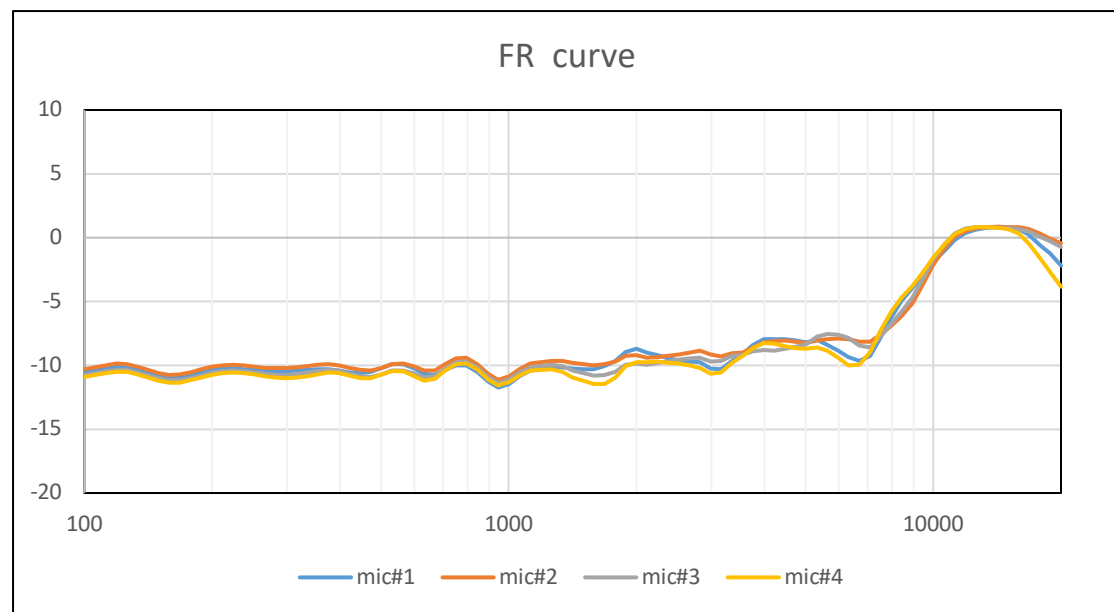
0.9 mm rubber w/o adhesive:



Note:

0.9mm rubber is not better than 0.7mm rubber.

0.7 mm rubber w/ adhesive at top side:



Note:

Mic#3 maybe not assemble well or mockup sample has some deformation to cause not sealing well..

The adhesive at top side of rubber seems better than w/o adhesive. But bottom side test result is not completed due to MIC board broken. But vendor suggests to test with hard tooling on DVT build and also can test gasket if that can help to seal the mic board.

Summary:

1. *SPONGE_MIC_SILICON_140X24X0D5T* rubber 0.7mm is good to use on DVT build, but we would like to try 0.5mm rubber which is respect to be better than 0.7mm.
2. The DVT build can use *SPONGE_MIC_SILICON_140X24X0D5T* rubber 0.7mm+ *SILICON_MIC_UA300* rubber w/o adhesive. But we can verify more other solutions such as adhesive at bottom side of 0.7mm and 0.5mm, and add O-Ring at mic hole with 0.3mm thickness to have better sealing.

