FCC PART 15B

TEST REPORT

For

StarLink LLC

1030 E. El Camino Real, #158 Sunnyvale, CA 94087 Sunnyvale, CA 94087

Tested Model: ST-7000

Report Type:	**Product Name:**
Original Report	Single Channel High-Definition Modulator

Report Number:	2407X41163E-EM-01
Report Date:	2024-10-09
Reviewed By:	Stein Peng
Approved By:	Miles Chen
Prepared By:	Bay Area Compliance Laboratories Corp. (Xiamen) Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone, Xiamen Tel: +86-592-3200111 www.baclcorp.com.cn

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	2407X41163E-EM-01	R1V1	2024-10-09	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:		StarLink LLC
Product Name:		Single Channel High-Definition Modulator
Tested Model:		ST-7000
Series Model(s):		ST-7005
Trade Mark:		SATLINK
Adapter Information	Model:	YS03A-120150U
	Input:	100-240VAC
	Output:	12VDC 1.5A
Power Supply:		DC 12V from Adapter
Firmware Version:		N/A
Software Version:		N/A
★Highest Operating Frequency:		860 MHz
EUT Received Status:		Good

Note:
1. The highest operating frequency is provided by the applicant.
2. The difference between tested model and series model was explained in the attached declaration letter.
3. All measurement and test data in this report was gathered from production sample serial number: 2RWW-1 (Assigned by the BACL (Xiamen). The EUT supplied by the applicant was received on 2024-09-19).

Objective

This report is prepared for *StarLink LLC* in accordance with Part 2-Subpart J, and Part 15-Subparts A and B of the Federal Communication Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15, Class B device.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Xiamen) to collect test data is located on the Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen.

Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the product as specified in CISPR 16-4-2. This uncertainty represents expanded uncertainty expressed at 95% confidence level using a coverage factor of k=2.

$$u_c(y) = \sqrt{\sum_i c_i^2 \; u^2(x_i)}$$

Item	Frequency Range	*U*lab= 2 uc (y) (Confidence of 95%)
Conducted Emissions	150kHz-30MHz	2.33 dB
Radiated Emissions	30MHz~200MHz	4.38 dB
	200MHz~1GHz	4.50 dB
	1GHz~6GHz	4.58 dB

SYSTEM TEST CONFIGURATION

Test Mode and Voltage

The system was configured for testing in a typical mode (as normally used by a typical user).	
Test mode:	Test Mode1: Signal transmission
Test voltage:	DC 12V from Adapter (AC 120V/60Hz)
Remark:	During all emission tests, the EUT was configured to measure its highest possible emission level and the worst case's test data was presented in this test report.

EUT Exercise Software

No exercise software was used to test.

Special Accessories

No special accessory was used.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	DVD	/	/
Lenovo	Laptop	T480	PF1P5K4F

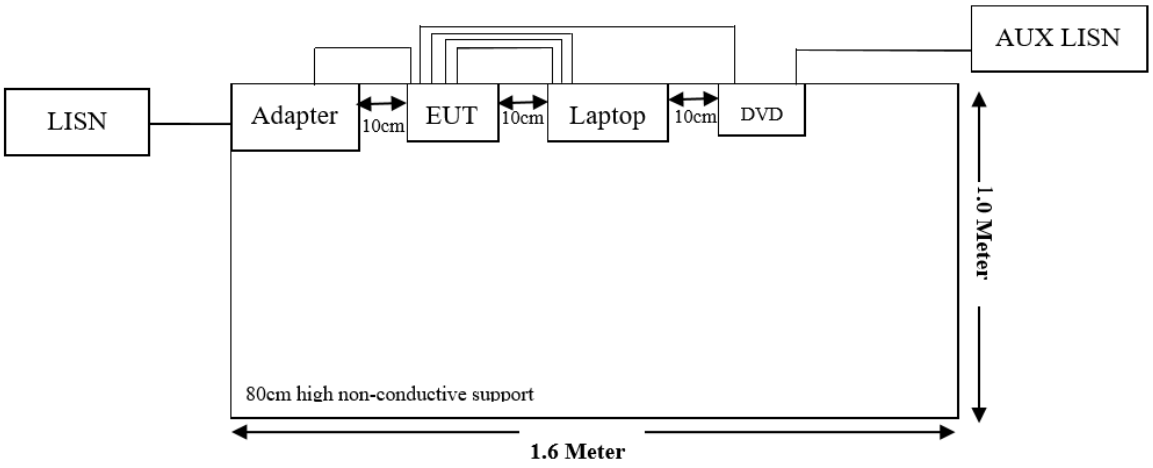
External I/O Cable

Cable Description	Length (m)	From Port	To Port
TPY-C Cable	0.65	EUT	Laptop
RJ45 Cable	1.1	EUT	Laptop
HDMI Cable	1.1	EUT	Laptop
Audio Cable	1.1	EUT	DVD

Block Diagram of Test Setup

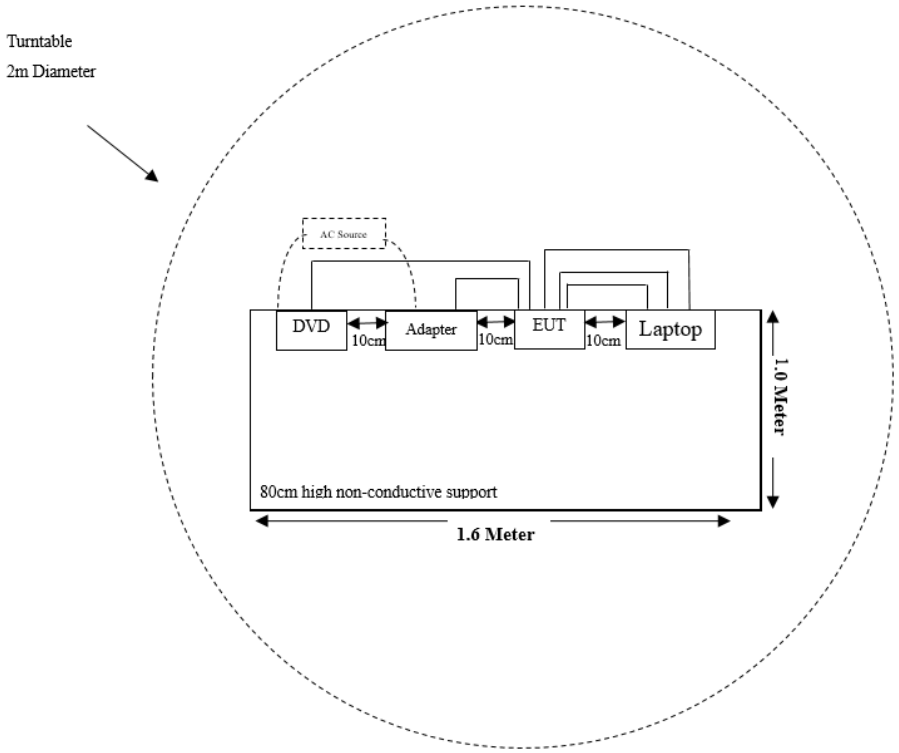
Conducted Emission:

Test Mode 1：



Radiated Emission:

Test Mode 1：



SUMMARY OF TEST RESULTS

FCC PART 15B		
Rule Part	**Description of Test**	**Results**
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions (30MHz-1000MHz)	Compliant
§15.109	Radiated Emissions (Above 1GHz)	Compliant

TEST EQUIPMENT LIST

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions					
EMI Test Receiver	Rohde & Schwarz	ESR	103105	2024/03/29	2025/03/28
LISN	Rohde & Schwarz	ENV216	100129	2024/03/29	2025/03/28
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	0357.8810.54	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC001	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Below 1 GHz					
Rohde & Schwarz	EMI Test Receiver	ESR	103103	2024/03/29	2025/03/28
Sunol Sciences	Hybrid Antenna	JB6	A122022-5	2023/07/27	2026/07/26
Sonoma	Amplifier	310B	120903	2024/03/29	2025/03/28
XINHANGWEIBO	Coaxial Cable	XH400T-N-4M	CC002	2024/03/29	2025/03/28
XINHANGWEIBO	Coaxial Cable	XH460B-N-2M	CC006	2024/03/29	2025/03/28
XINHANGWEIBO	Coaxial Cable	XH460B-N-12M	CC007	2024/03/29	2025/03/28
Audix	Test Software	E3	18621a	N/A	N/A
Radiated Emissions Above 1 GHz					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28
Double Ridge Guide Horn Antenna	A.H.Systems	SAS-571	1980	2023/07/28	2026/07/27
Preamplifier	A.H.Systems	PAM-0118P	489	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-6M	CC003	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-1M	CC005	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A

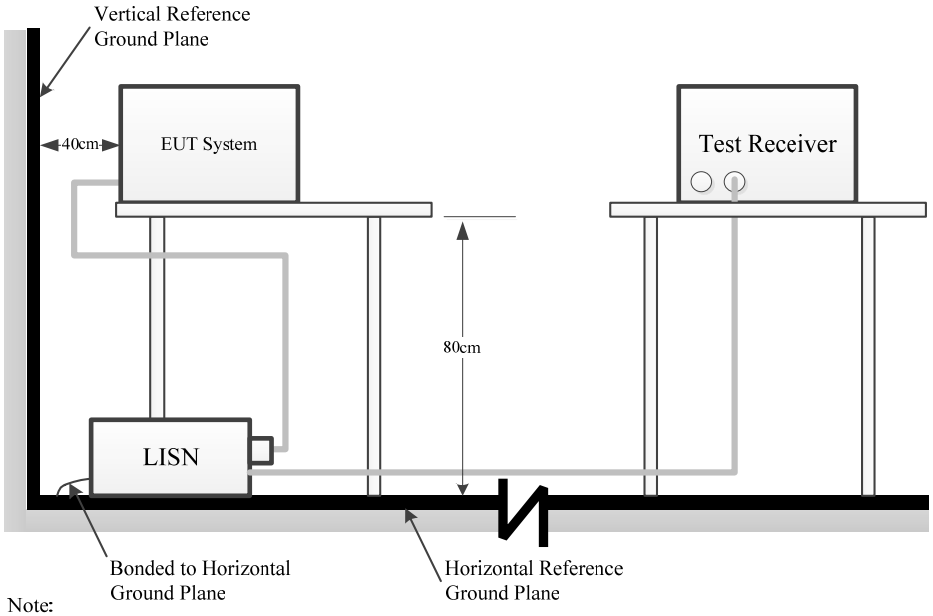
Statement of Traceability: Bay Area Compliance Laboratories Corp. (Xiamen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.107 - CONDUCTED EMISSIONS

Applicable Standard

FCC §15.107

Test System Setup



Note:
1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at least 80 cm from other units and oter metal planes support units.

The measurement procedure of test setup is according with ANSI C63.4-2014. The related limit was specified in FCC Part 15.107 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW
150 kHz – 30 MHz	9 kHz	30 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Level &Margin Calculation

The Level is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
Level (dBμV) = Reading (dBμV) + Factor (dB)

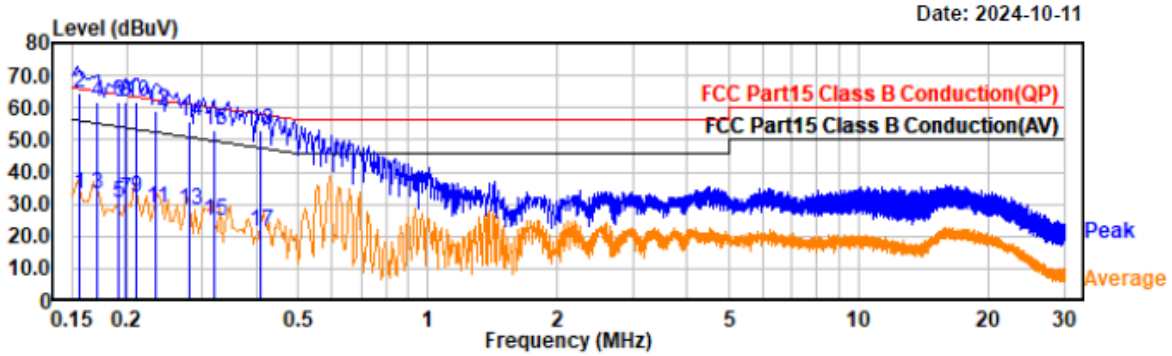
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dBμV) – Level (dBμV)

Test Data

Project No.: 2407X41163E-EM
Test Mode: MODE1
EUT Model: ST-7000

Temp/Humi/ATM: 24.1℃/56%/100.1kPa
Tested by: Spike Gao
Power Source: AC 120V/60Hz

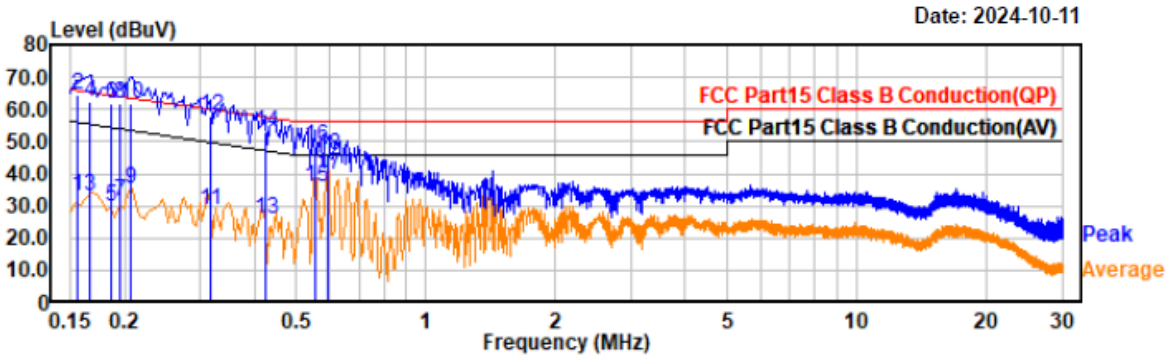


Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.16	12.25	20.89	33.14	55.69	22.55	Line	Average
0.16	43.67	20.89	64.56	65.69	1.13	Line	QP
0.17	12.10	20.77	32.87	54.90	22.03	Line	Average
0.17	40.98	20.77	61.75	64.90	3.15	Line	QP
0.19	9.64	20.60	30.24	53.94	23.70	Line	Average
0.19	41.14	20.60	61.74	63.94	2.20	Line	QP
0.20	10.69	20.57	31.26	53.62	22.36	Line	Average
0.20	41.36	20.57	61.93	63.62	1.69	Line	QP
0.21	11.43	20.55	31.98	53.17	21.19	Line	Average
0.21	40.97	20.55	61.52	63.17	1.65	Line	QP
0.23	8.00	20.52	28.52	52.28	23.76	Line	Average
0.23	38.36	20.52	58.88	62.28	3.40	Line	QP
0.28	7.63	20.47	28.10	50.80	22.70	Line	Average
0.28	35.26	20.47	55.73	60.80	5.07	Line	QP
0.32	4.24	20.43	24.67	49.68	25.01	Line	Average
0.32	32.69	20.43	53.12	59.68	6.56	Line	QP
0.41	1.24	20.35	21.59	47.63	26.04	Line	Average
0.41	32.63	20.35	52.98	57.63	4.65	Line	QP

Project No.: 2407X41163E-EM
Test Mode: MODE1
EUT Model: ST-7000

Temp/Humi/ATM: 24.1℃/56%/100.1kPa
Tested by: Spike Gao
Power Source: AC 120V/60Hz



Trace: 1

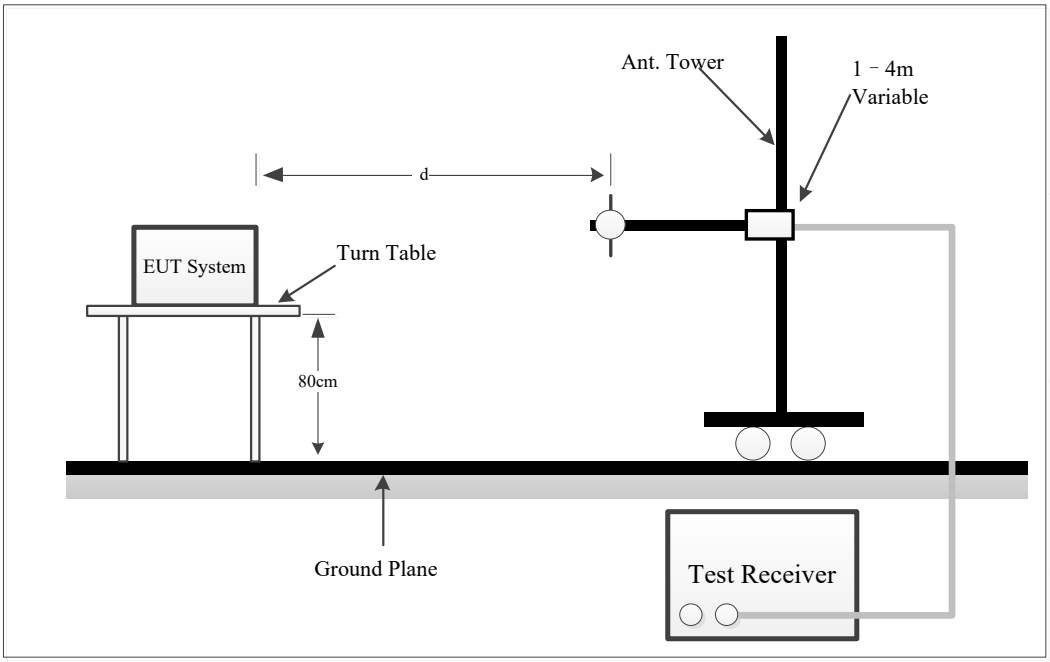
Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.16	12.40	20.73	33.13	55.68	22.55	Neutral	Average
0.16	43.66	20.73	64.39	65.68	1.29	Neutral	QP
0.17	12.49	20.71	33.20	55.11	21.91	Neutral	Average
0.17	41.57	20.71	62.28	65.11	2.83	Neutral	QP
0.19	9.36	20.67	30.03	54.18	24.15	Neutral	Average
0.19	40.87	20.67	61.54	64.18	2.64	Neutral	QP
0.20	10.79	20.67	31.46	53.80	22.34	Neutral	Average
0.20	41.23	20.67	61.90	63.80	1.90	Neutral	QP
0.21	14.59	20.66	35.25	53.33	18.08	Neutral	Average
0.21	41.11	20.66	61.77	63.33	1.56	Neutral	QP
0.32	8.15	20.53	28.68	49.80	21.12	Neutral	Average
0.32	37.36	20.53	57.89	59.80	1.91	Neutral	QP
0.42	5.64	20.44	26.08	47.36	21.28	Neutral	Average
0.42	32.64	20.44	53.08	57.36	4.28	Neutral	QP
0.55	15.36	20.36	35.72	46.00	10.28	Neutral	Average
0.55	28.36	20.36	48.72	56.00	7.28	Neutral	QP
0.60	19.63	20.34	39.97	46.00	6.03	Neutral	Average
0.60	25.34	20.34	45.68	56.00	10.32	Neutral	QP

FCC §15.109 - RADIATED EMISSIONS(30MHz-1GHz)

Applicable Standard

FCC §15.109

Test System Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW
30 MHz – 1000 MHz	120 kHz	300 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

If the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 10 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

Level &Margin Calculation

The Level is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Factor (dB) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)
Level (dBμV/m) = Reading (dBμV) + Factor (dB)

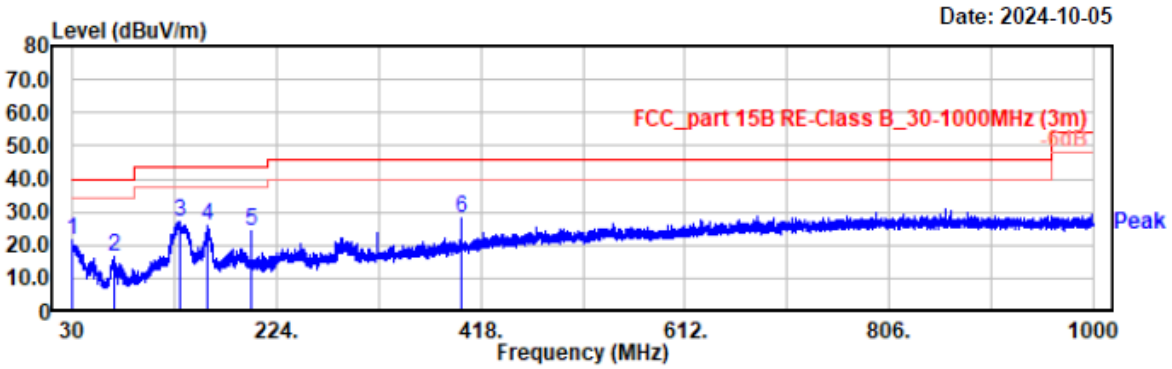
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dBμV/m) –Level (dBμV/m)

Test Data

Project No.: 2407X41163E-EM
Test Mode: MODE1
EUT Model: ST-7000
Test distance: 3m

Temp/Humi/ATM: 23.9℃/54%/100.1kPa
Tested by: Spike Gao
Power Source: AC 120V/60Hz



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
30.39	27.45	-5.70	21.75	40.00	18.25	Horizontal	Peak
69.29	33.68	-17.15	16.53	40.00	23.47	Horizontal	Peak
131.46	37.00	-10.14	26.86	43.50	16.64	Horizontal	Peak
158.23	37.19	-11.47	25.72	43.50	17.78	Horizontal	Peak
199.94	35.76	-11.70	24.06	43.50	19.44	Horizontal	Peak
399.96	34.38	-6.39	27.99	46.00	18.01	Horizontal	Peak

Project No.: 2407X41163E-EM
Test Mode: MODE1
EUT Model: ST-7000
Test distance: 3m

Temp/Humi/ATM: 23.9℃/54%/100.1kPa
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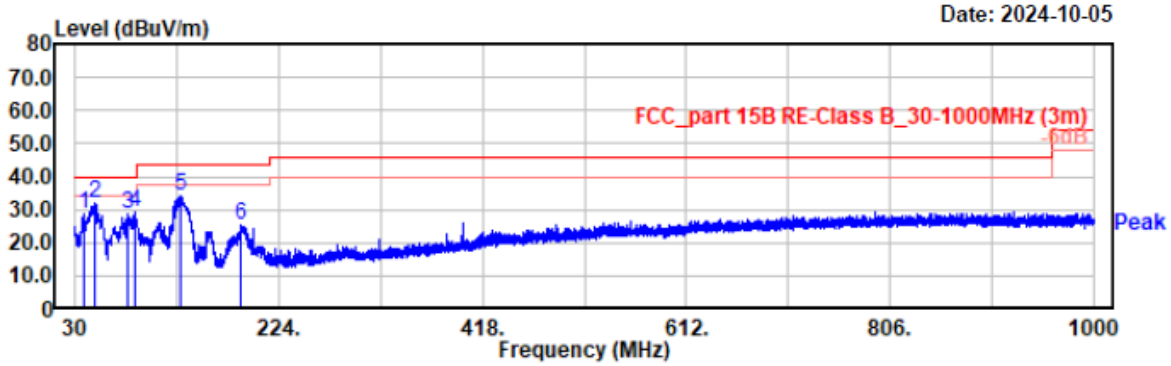


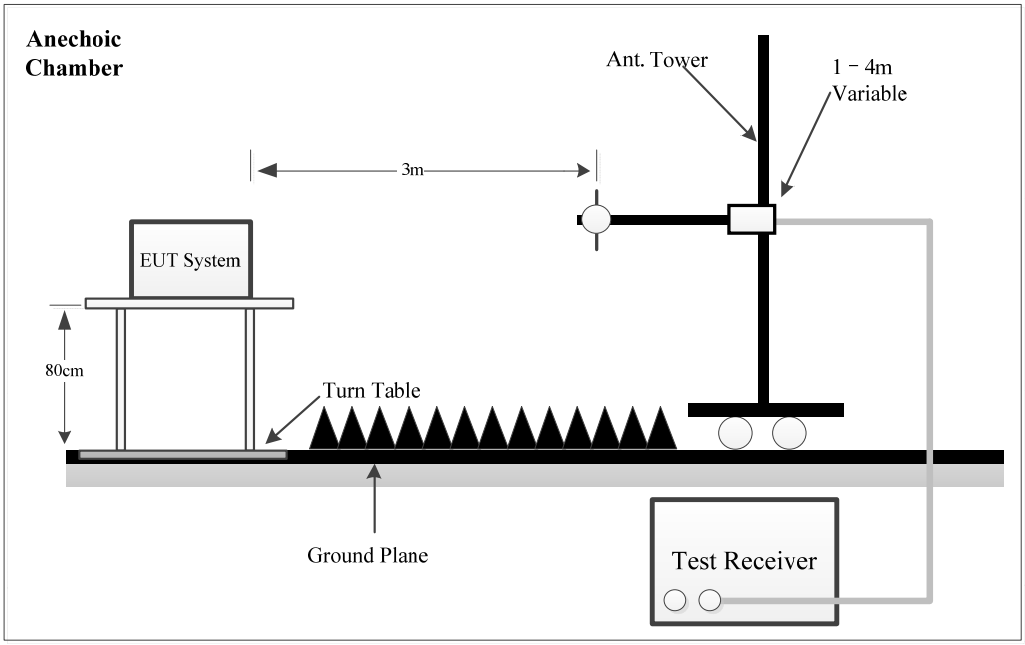
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
38.25	39.08	-10.42	28.66	40.00	11.34	Vertical	Peak
49.59	49.51	-17.29	32.22	40.00	7.78	Vertical	Peak
79.76	45.99	-17.06	28.93	40.00	11.07	Vertical	Peak
86.26	46.23	-17.16	29.07	40.00	10.93	Vertical	Peak
130.30	44.33	-10.14	34.19	43.50	9.31	Vertical	Peak
188.30	37.97	-12.41	25.56	43.50	17.94	Vertical	Peak

FCC §15.109 - RADIATED EMISSIONS IN FREQUENCY ABOVE 1GHz

Applicable Standard

FCC §15.109

Test System Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated above 1GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW	Detector
Above 1 GHz	1 MHz	3 MHz	PK
	1 MHz	10 Hz	AV

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

If the maximum peak value of the emissions is below the average limit, the average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Level & Margin Calculation

The Level is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)
Level (dBμV/m) = Reading (dBμV) + Factor (dB/m)

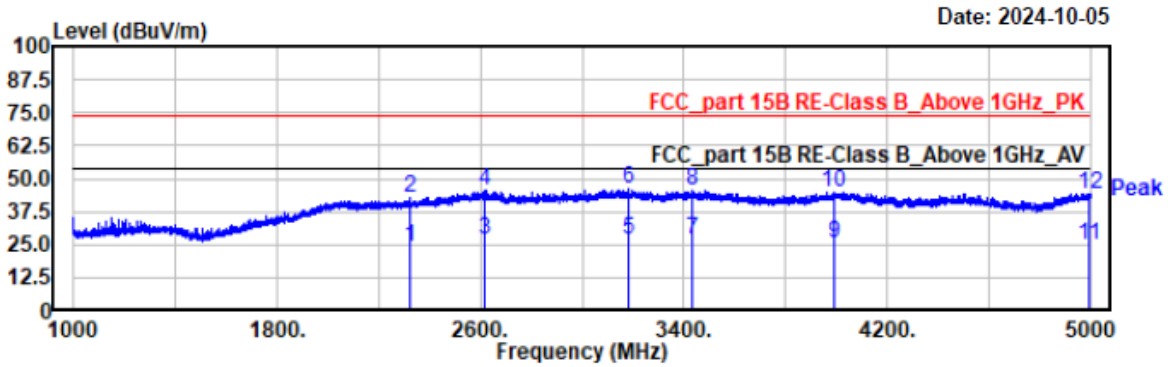
The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dBμV/m) –Level (dBμV/m)

Test Data

Project No.: 2407X41163E-EM
Test Mode: MODE1
EUT Model: ST-7000
Test distance: 3m

Temp/Humi/ATM: 23.9℃/54%/100.1kPa
Tested by: Spike Gao
Power Source: AC 120V/60Hz



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2323.00	28.99	-4.85	24.14	54.00	29.86	horizontal	Average
2323.00	47.78	-4.85	42.93	74.00	31.07	horizontal	Peak
2617.50	28.76	-1.98	26.78	54.00	27.22	horizontal	Average
2617.50	47.31	-1.98	45.33	74.00	28.67	horizontal	Peak
3181.00	28.37	-1.43	26.94	54.00	27.06	horizontal	Average
3181.00	47.58	-1.43	46.15	74.00	27.85	horizontal	Peak
3434.50	28.79	-2.07	26.72	54.00	27.28	horizontal	Average
3434.50	47.43	-2.07	45.36	74.00	28.64	horizontal	Peak
3988.50	28.47	-2.65	25.82	54.00	28.18	horizontal	Average
3988.50	47.54	-2.65	44.89	74.00	29.11	horizontal	Peak
4993.50	28.25	-3.27	24.98	54.00	29.02	horizontal	Average
4993.50	47.69	-3.27	44.42	74.00	29.58	horizontal	Peak

Project No.: 2407X41163E-EM
Test Mode: MODE1
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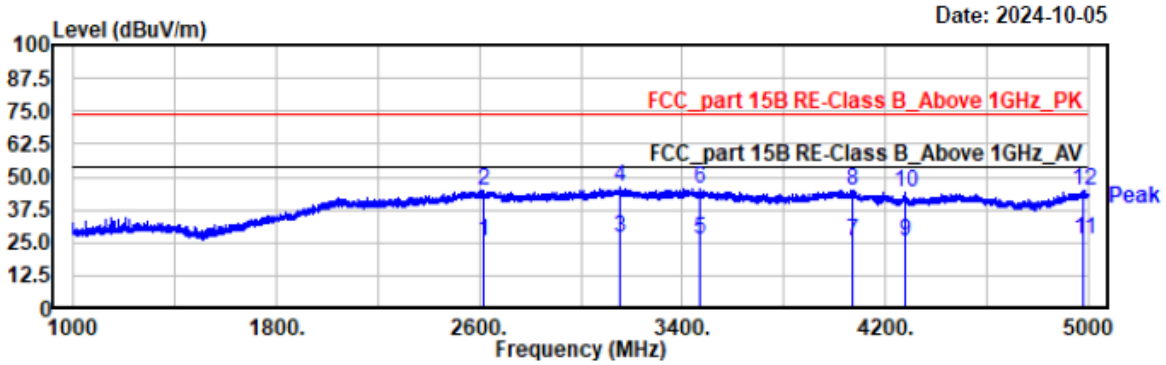
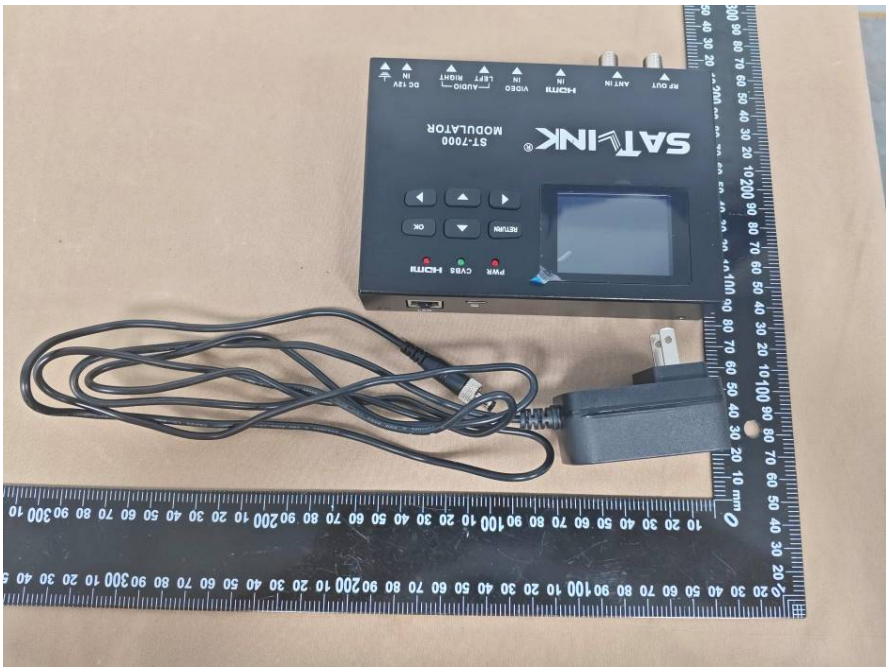
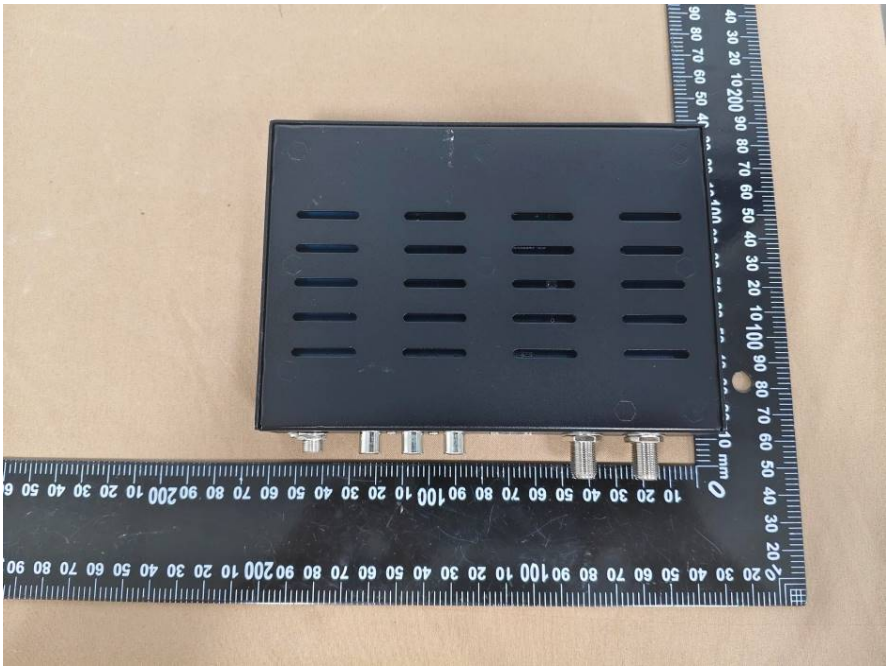


Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2620.50	27.44	-1.98	25.46	54.00	28.54	vertical	Average
2620.50	46.76	-1.98	44.78	74.00	29.22	vertical	Peak
3151.00	28.07	-1.44	26.63	54.00	27.37	vertical	Average
3151.00	47.99	-1.44	46.55	74.00	27.45	vertical	Peak
3466.50	28.36	-2.22	26.14	54.00	27.86	vertical	Average
3466.50	47.64	-2.22	45.42	74.00	28.58	vertical	Peak
4072.50	28.16	-2.41	25.75	54.00	28.25	vertical	Average
4072.50	47.31	-2.41	44.90	74.00	29.10	vertical	Peak
4275.50	28.98	-3.65	25.33	54.00	28.67	vertical	Average
4275.50	47.74	-3.65	44.09	74.00	29.91	vertical	Peak
4982.00	29.41	-3.34	26.07	54.00	27.93	vertical	Average
4982.00	48.06	-3.34	44.72	74.00	29.28	vertical	Peak

EXHIBIT A - EUT PHOTOGRAPHS

External Photos

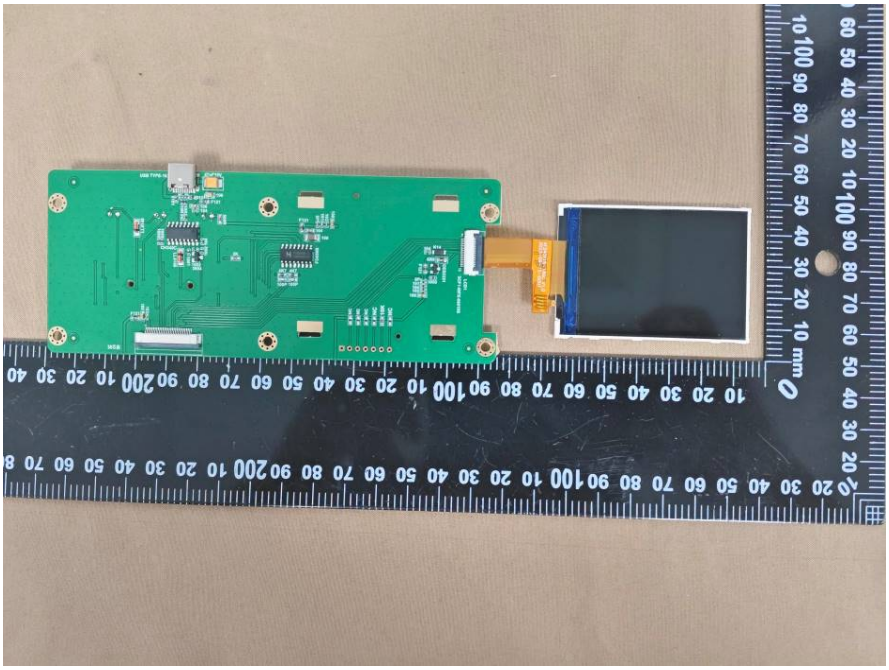


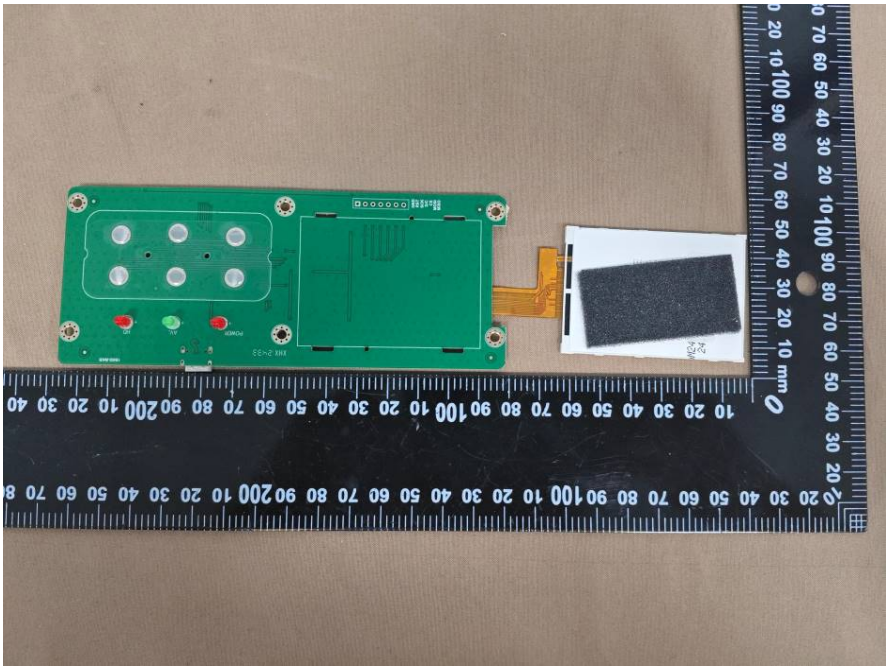


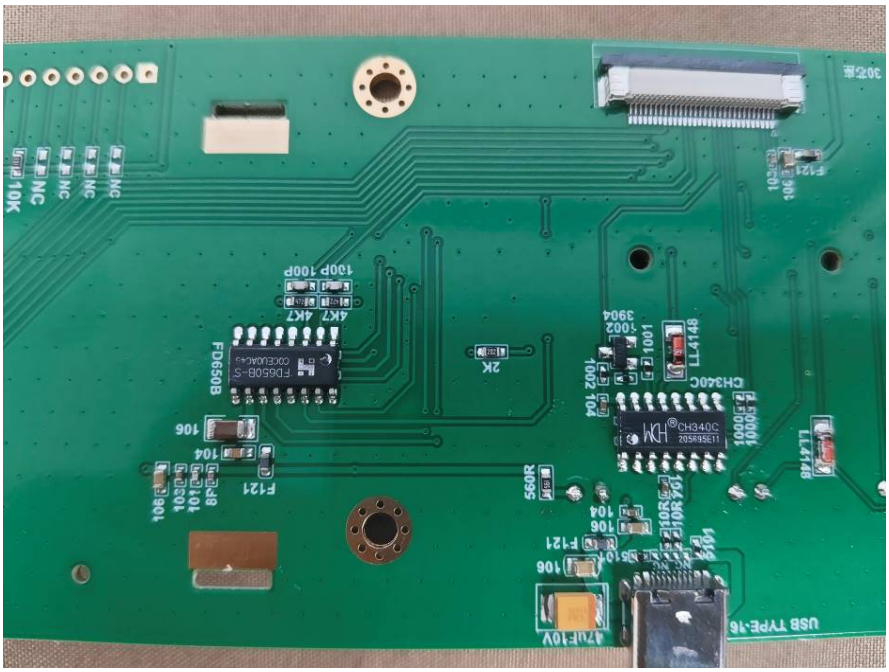

LAN

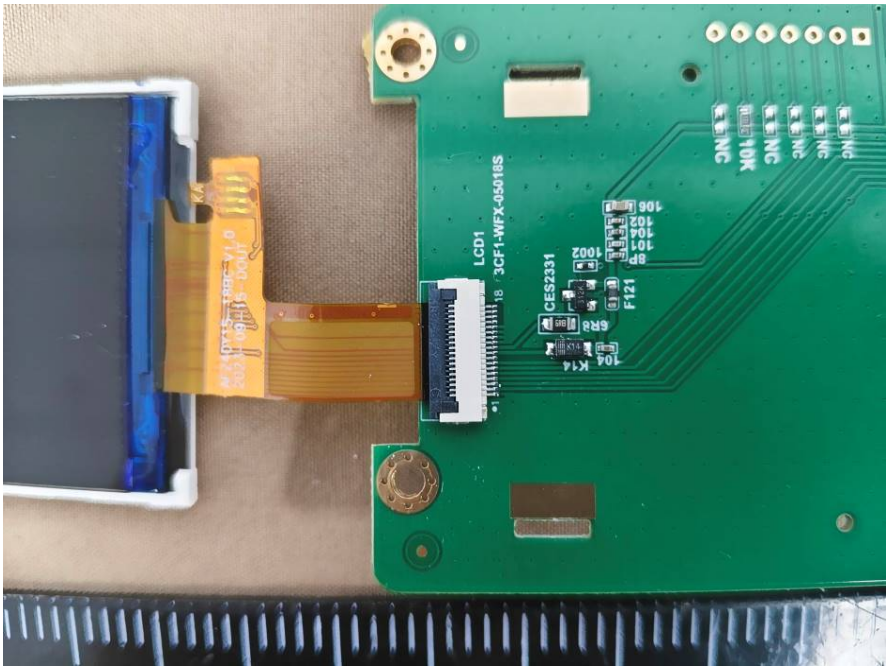

POWER SUPPLY
MODEL:YS03A-120150U
INPUT:100-240V~50/60Hz 0.75A MAX
OUTPUT: 12V 1500mA
Intertek
WARNING
INDOOR USE
RISK OF ELECTRIC SHOCK
DO NOT OPEN
Shenzhen Yunsheng High
Tech Electronics Co., Ltd
www.yunshengdz.com
2413 MADE IN CHINA

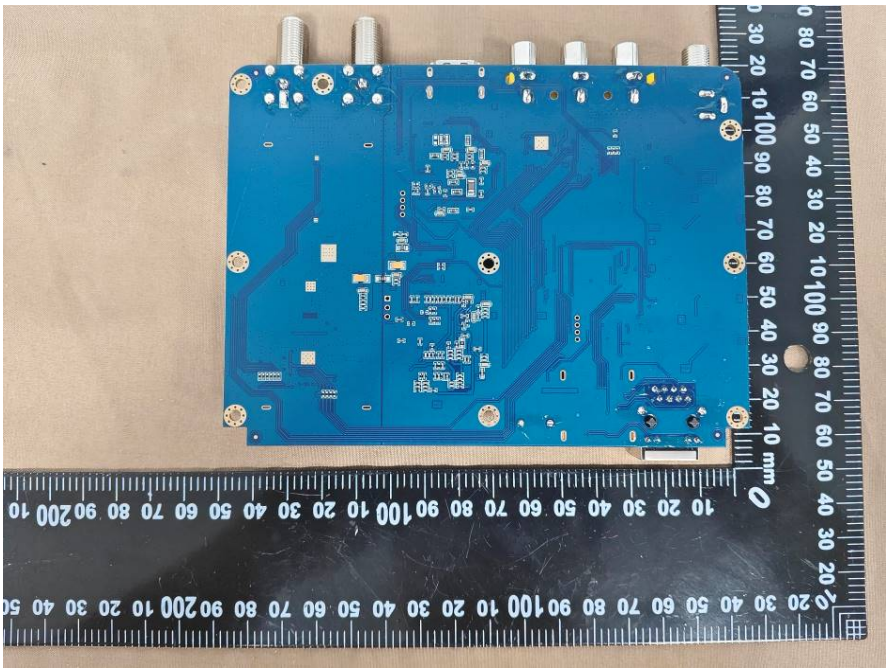
Internal Photos

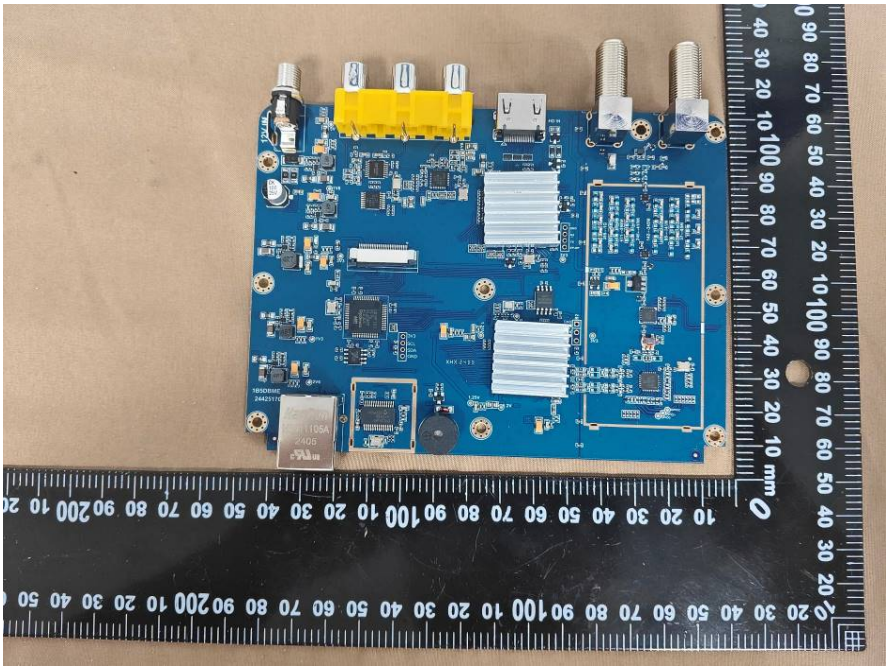


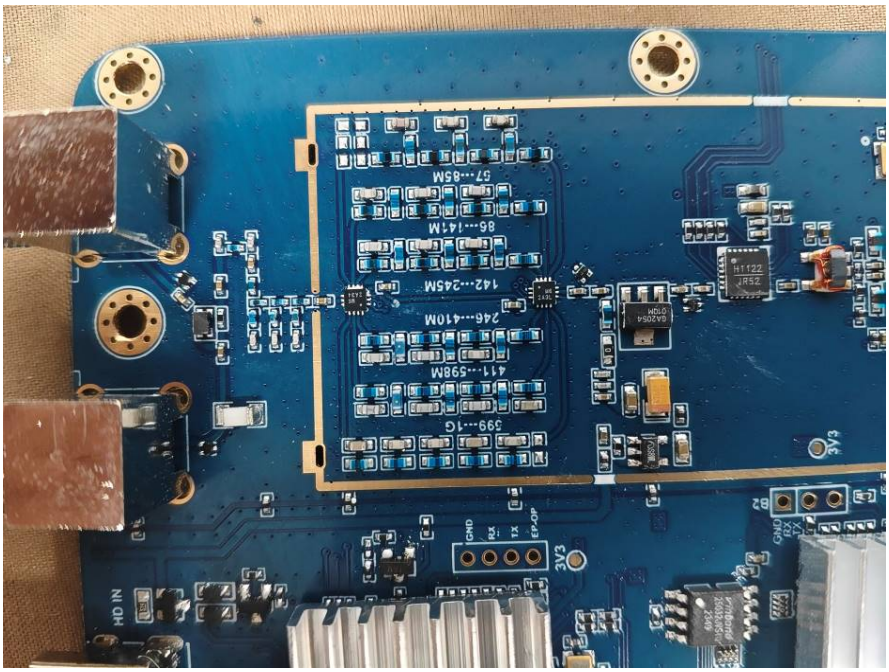


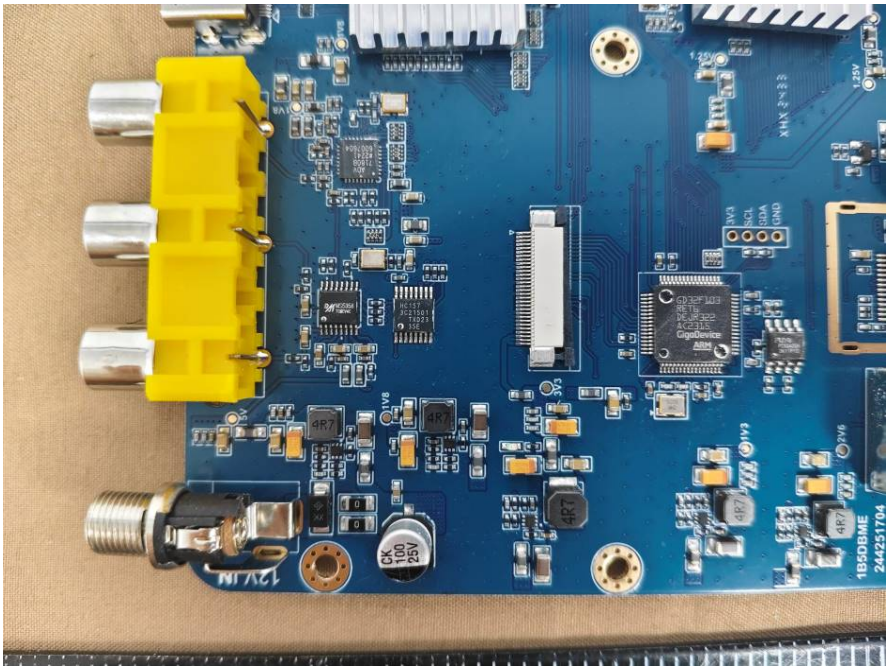

CH340C
USB TYPE-16

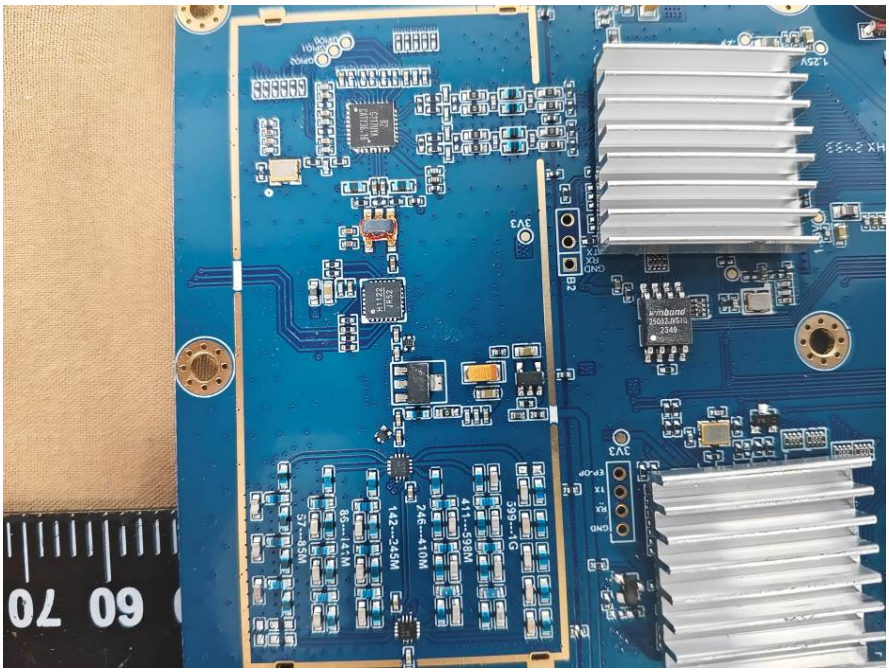

LCD1
3CF1-WFX-05018S
CES2331
NC
10K

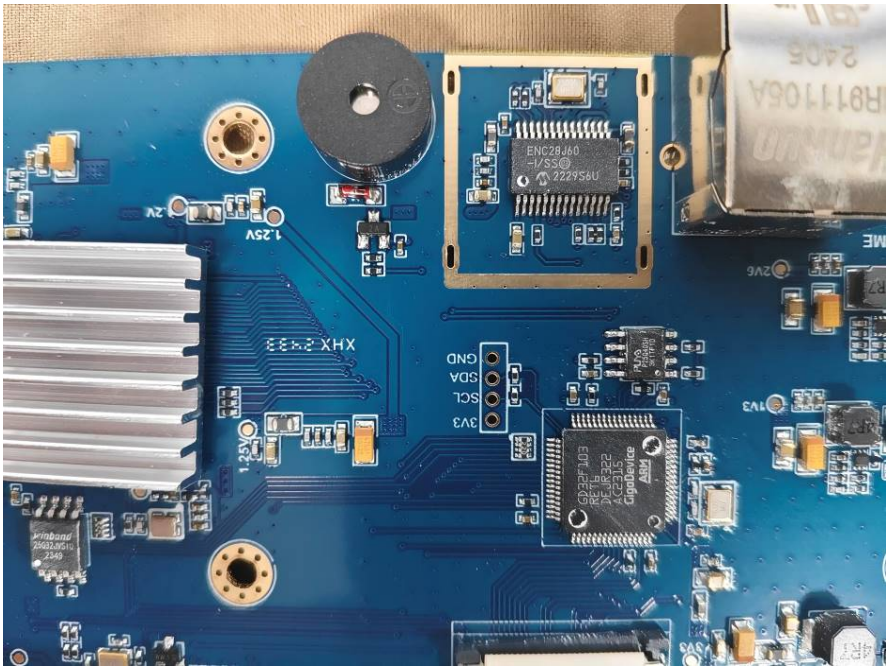











ENC28J60
1.25V
GND
SDA
SCL
3V3

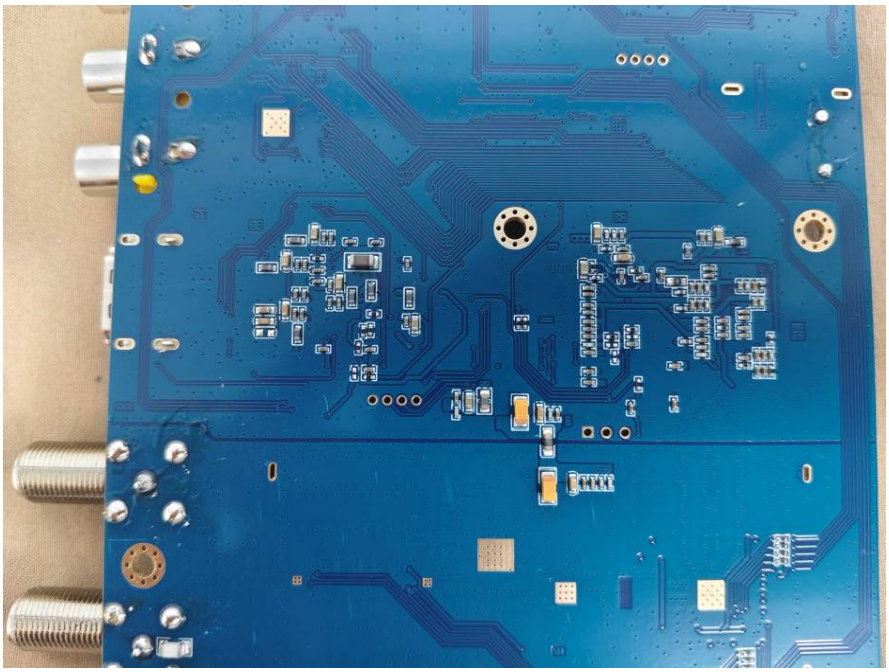
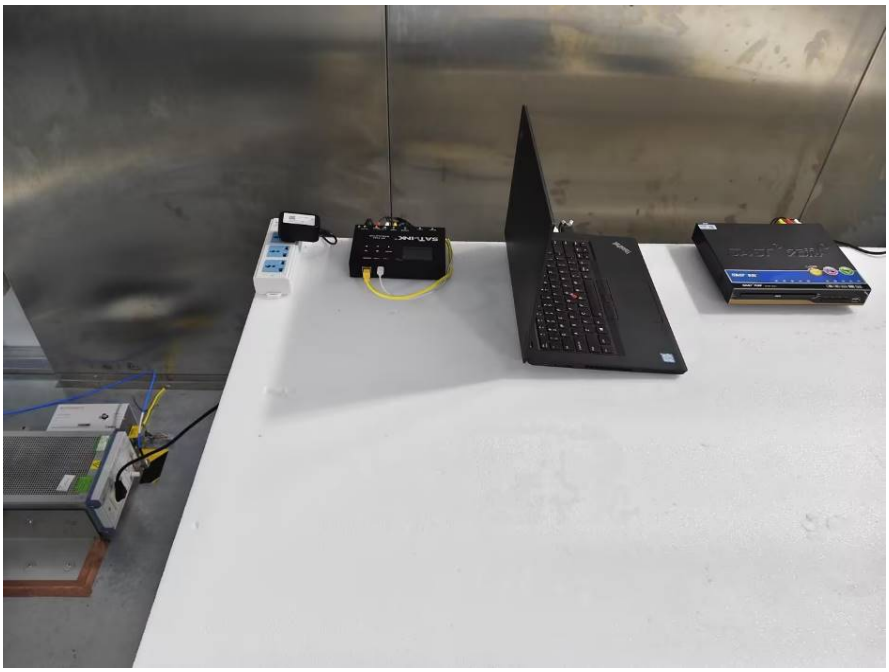
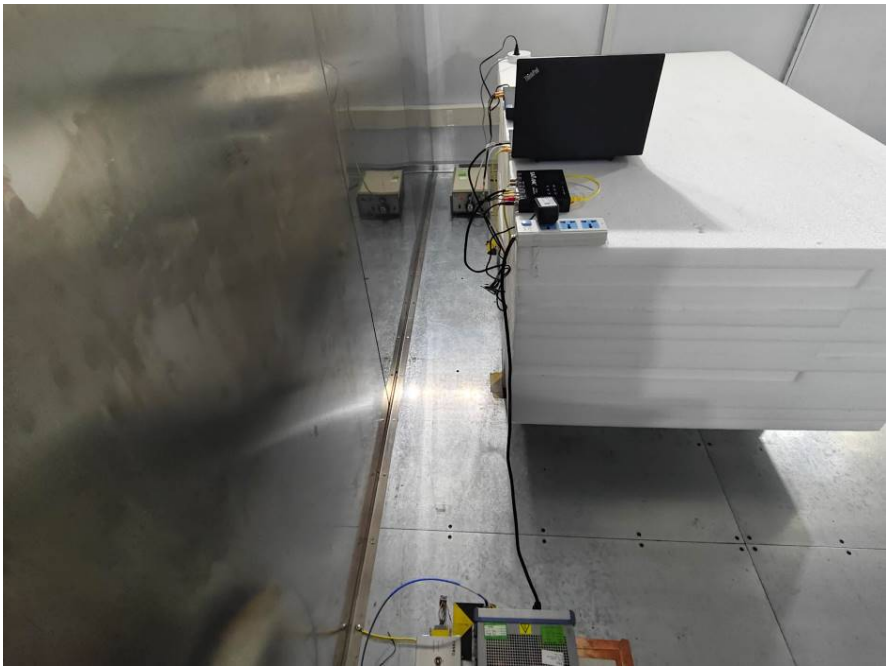


EXHIBIT B - TEST SETUP PHOTOGRAPHS

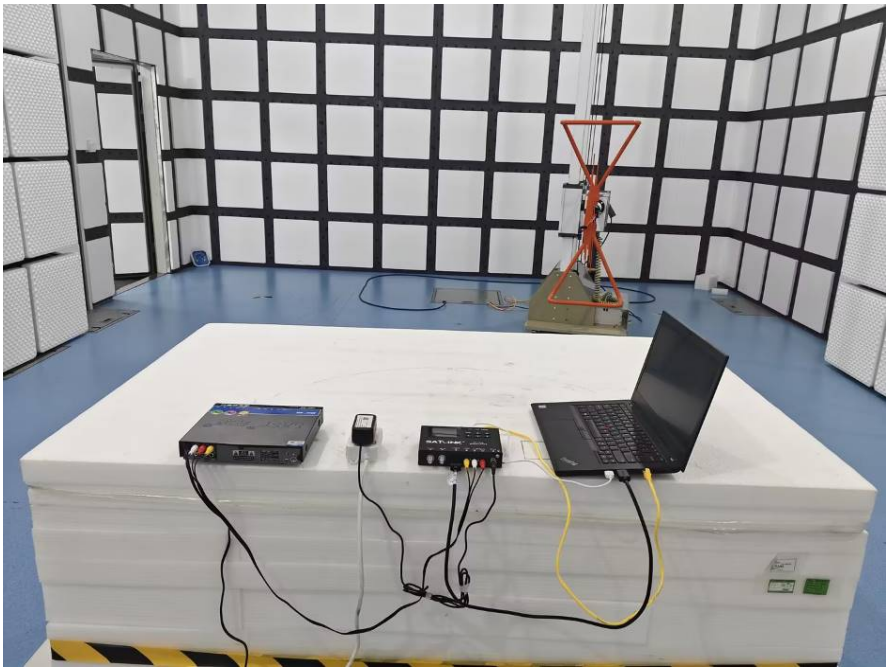
CE - Front View



CE - Left View

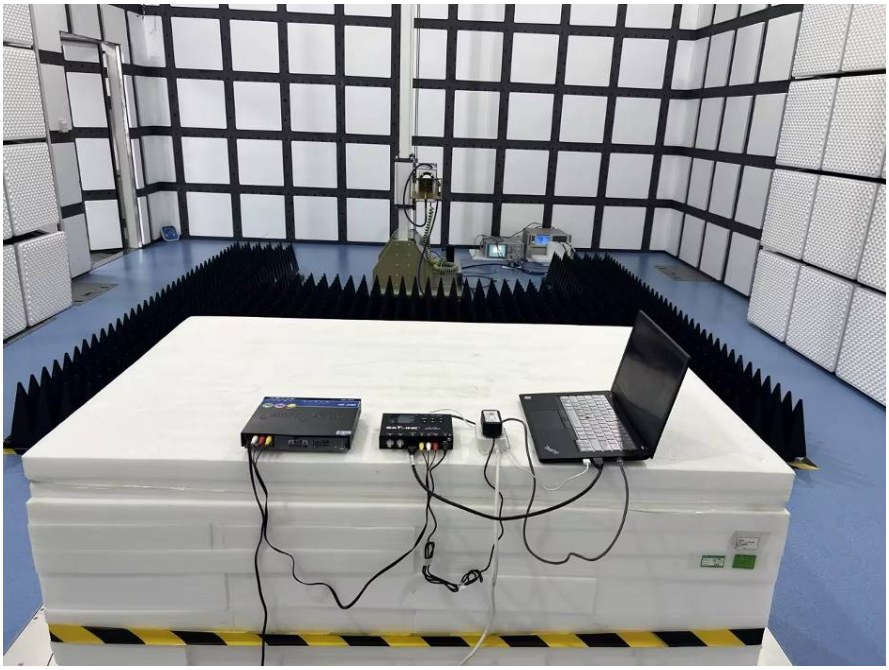


RE - Front View (Below 1GHz)

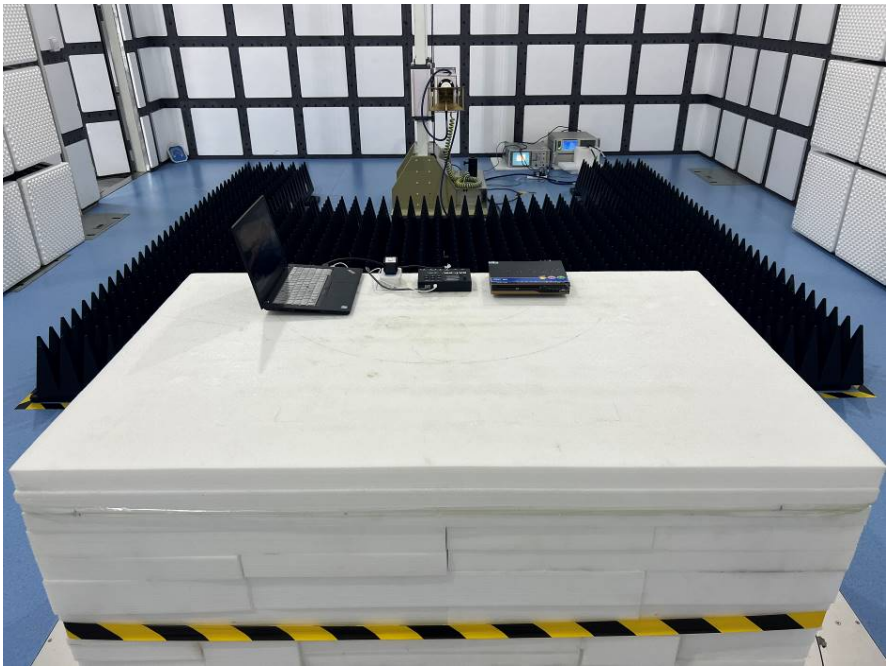


RE - Rear View (Below 1GHz)

RE - Front View (Above 1GHz)



RE - Rear View (Above 1GHz)



Declarations

1. Bay Area Compliance Laboratories Corp. (Xiamen) is not responsible for authenticity of any test data provided by the applicant. Test data from the applicant that may affect test results are marked with an asterisk "★". The model number, product name, address, trademark, etc. from the applicant are not considered as test data.

2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.

3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.

4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95% confidence interval.

5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Xiamen).

6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

PRODUCT SIMILARITY DECLARATION LETTER

StarLink LLC
1030 E. El Camino Real, #158 Sunnyvale, CA 94087 Sunnyvale, CA 94087

Declaration of Model Difference

To Whom It May Concern,

We StarLink LLC hereby declare that there are some differences between series models and tested model(s). Details are as below:

Products Description	Name:	Single Channel High-Definition Modulator
	Brand:	SATLINK
	Manufacturer:	FUJIAN SATLINK ELECTRONICS CO., LTD
	Project No.:	2407X41163E-EM

Differences Description			
Tested Model(s)	Series Models	Differences Items	Details
ST-7000	ST-7005	Model Name	All are the same except model name

Note: Tested Model(s) mean the models have been tested by Bay Area Compliance Laboratories Corp.(Xiamen).

Except for the differences in above table, we declare the products are identical in every other way. We guarantee all the information provided above is true, and notice that we'll bear all the consequences caused by any false information or concealing.

Best Regards,
Signature: CHENYEA ALEX LUO
Print Name: CHENYEA ALEX LUO
Title: PRODUCT MANAGER

*******END OF REPORT*******