

TEST REPORT

Report No. : CHTEW21070156 Report Verification: 

Project No..... : SHT2106125705EW

FCC ID..... : 2ADHNCOSECARGOFR1

Applicant's name : MATRIX COMSEC PVT. LTD.

Address..... : 394-GIDC, MAKARPURA, VADODARA-390010, GUJARAT, INDIA

Test item description : COSEC ARGO

Trade Mark : 

Model/Type reference..... : COSEC ARGO FACEE

Listed Model(s) : -

Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.209

Date of receipt of test sample..... : Jul.12, 2021

Date of testing..... : Jul.12, 2021- Jul.22, 2021

Date of issue..... : Jul.23, 2021

Result..... : PASS

Compiled by
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Echo Wei

Kiki Kong

Hans Hu

Testing Laboratory Name : Shenzhen Huatongwei International Inspection Co., Ltd.

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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The test report merely correspond to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.209](#): Radiated emission limits; general requirements

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version information

Revision No.	Date of issue	Description
N/A	2021-07-23	Original

2. TEST DESCRIPTION

Report clause	Test Item	Section in CFR 47	Result	Test Engineer
5.1	Antenna requirement	15.203	PASS	-
5.2	AC Power Line Conducted Emissions	15.207	PASS	Si Ding
5.3	20dB Occupied Bandwidth	2.1049	PASS	Hailey Chen
5.4	Radiated Spurious Emissions	15.209	PASS	Jian Quan Wu

Noted: The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	MATRIX COMSEC PVT. LTD.
Address:	394-GIDC, MAKARPURA, VADODARA-390010, GUJARAT, INDIA
Manufacturer:	MATRIX COMSEC PVT. LTD.
Address:	15 & 19-GIDC, WAGHODIA, DIST.VADODARA-391760, GUJARAT, INDIA
Factory:	MATRIX COMSEC PVT. LTD.
Address:	15 & 19-GIDC, WAGHODIA, DIST.VADODARA-391760, GUJARAT, INDIA

3.2. Product Description

Name of EUT:	COSEC ARGO
Trade Mark:	
Model No.:	COSEC ARGO FACEE
Listed Model(s):	-
Power supply:	DC12V for adapter DC 48V for POE
Adapter Information:	Model:ADS-25SGP-12 12024E Input: 100-240Va.c.,50/60Hz MAX 0.7A Output: 12.0Vd.c.,2.0A 24.0W
Hardware version:	V1R2
Software version:	V01R01.00

3.3. Radio Specification Description

Operation frequency:	125kHz
Channel number:	1
Modulation Type:	ASK
Antenna type:	Coil Antenna

3.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Connect information:	Phone: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC	762235

4. TEST CONFIGURATION

4.1. EUT operation mode

TEST MODE

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The engineering test program was provided and enabled to make EUT continuous transmit.

4.2. Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?			
✓ Yes			
Item	Equipement	Trade Name	Model No.
1	COSEC PATH RDCE	MATRIX	10003879
2	EM Magnetic lock	N/A	N/A

4.3. Testing environmental condition

Type	Requirement	Actual
Temperature:	15~35°C	25°C
Relative Humidity:	25~75%	50%
Air Pressure:	860~1060mbar	1000mbar

4.4. Measurement uncertainty

Test Items	Measurement Uncertainty
AC Power Conducted Emissions	± 3.02 dB
Radiated emissions below 1GHz	± 4.90 dB
Radiated emissions above 1GHz	± 4.96 dB
Occupied Bandwidth	15 Hz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4.5. Equipments Used during the Test

● Conducted Emission							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	HTWE0114	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2020/10/19	2021/10/18
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2020/10/15	2021/10/14
●	Pulse Limiter	R&S	HTWE0033	ESH3-Z2	100499	2020/10/15	2021/10/14
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLE X 142	EF-NM-BNCM-2M	2020/10/15	2021/10/14
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-6th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2018/09/30	2021/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2020/10/19	2021/10/18
●	Loop Antenna	R&S	HTWE0170	HFH2-Z2	100020	2021/04/06	2022/04/05
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0123	VULB9163	538	2021/04/06	2022/04/05
●	Pre-Amplifier	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2020/11/13	2021/11/12
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX104	501184/4	2021/02/26	2022/02/25
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-7th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	N/A	2018/09/27	2021/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2020/10/20	2021/10/19
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2020/04/01	2023/03/31
●	Broadband Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2018/10/11	2021/10/11
●	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2020/11/13	2021/11/12
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2021/03/05	2022/03/04
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0119-05	6m 3GHz RG Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0121-01	6m 18GHz S Serisa	N/A	2021/02/26	2022/02/25
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A

● RF Conducted Method						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	FSV40	100048	2020/10/19	2021/10/18
●	Spectrum Analyzer	Agilent	N9020A	MY50510187	2020/10/19	2021/10/18
●	Power Meter	Anritsu	ML249A	N/A	2020/10/19	2021/10/18
○	Radio communication tester	R&S	CMW500	137688-Lv	2020/10/19	2021/10/18

5. TEST CONDITIONS AND RESULTS

5.1. Antenna requirement

Requirement

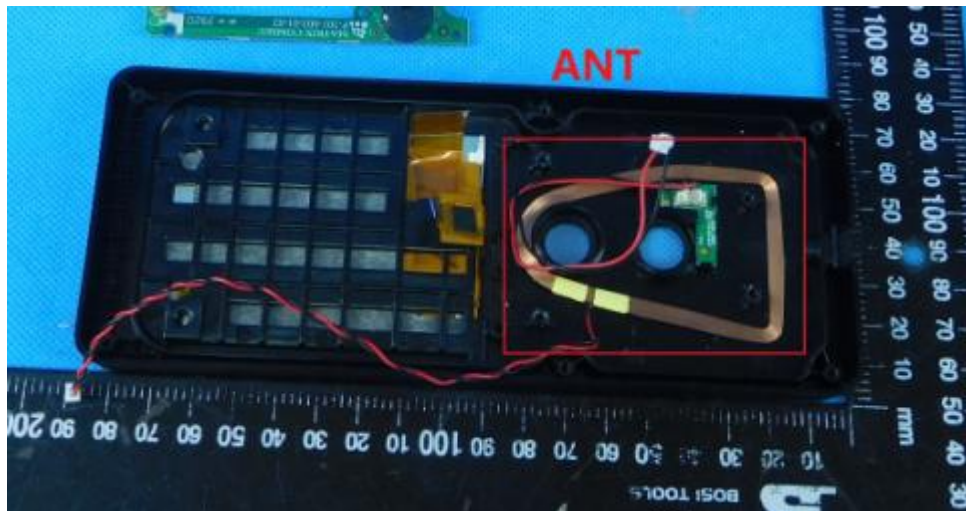
FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

TEST RESULTS

☒ Passed ☐ Not Applicable

The antenna type is a Coil antenna, please refer to the below antenna photo.



5.2. AC Power Conducted Emissions

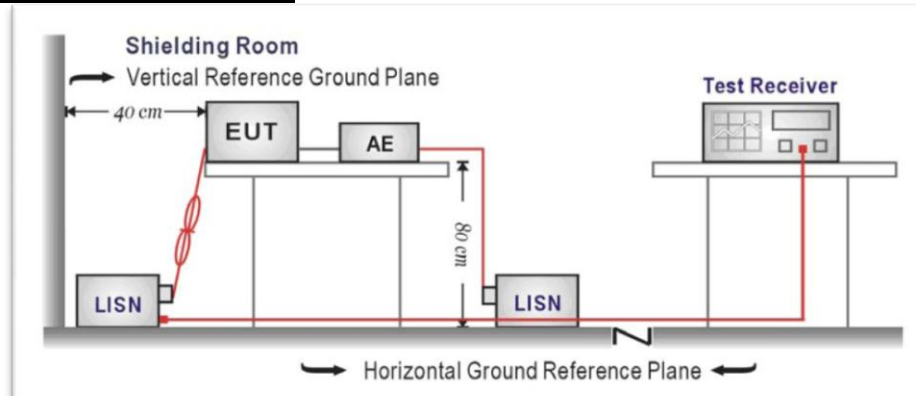
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

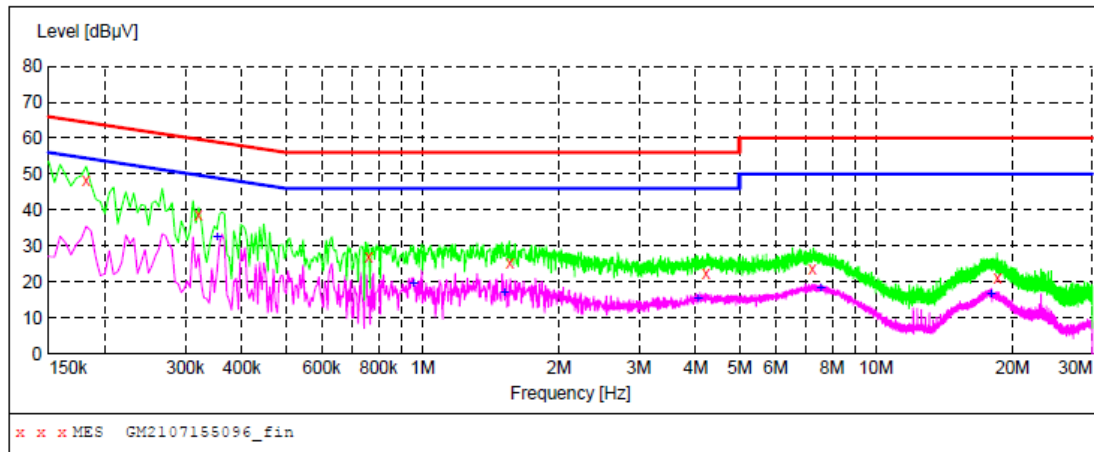
Please refer to the clause 4.1

TEST RESULTS

☒ Passed ☐ Not Applicable

Test Line:

L

**MEASUREMENT RESULT: "GM2107155096_fin"**

7/15/2021 9:20PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.181500	48.20	10.2	64	16.2	QP	L1	GND
0.321000	38.70	10.2	60	21.0	QP	L1	GND
0.762000	26.90	10.2	56	29.1	QP	L1	GND
1.558500	25.40	10.2	56	30.6	QP	L1	GND
4.227000	22.50	10.2	56	33.5	QP	L1	GND
7.251000	23.70	10.3	60	36.3	QP	L1	GND
18.537000	21.00	10.5	60	39.0	QP	L1	GND

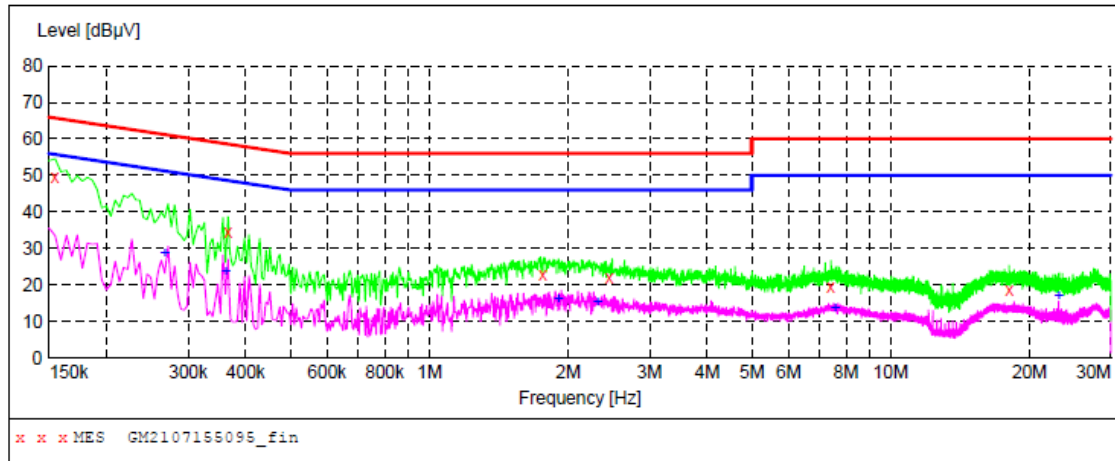
MEASUREMENT RESULT: "GM2107155096_fin2"

7/15/2021 9:20PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.352500	32.60	10.2	49	16.3	AV	L1	GND
0.955500	19.40	10.2	46	26.6	AV	L1	GND
1.513500	16.90	10.2	46	29.1	AV	L1	GND
4.051500	15.40	10.2	46	30.6	AV	L1	GND
7.552500	18.30	10.3	50	31.7	AV	L1	GND
17.920500	16.60	10.5	50	33.4	AV	L1	GND

Test Line:

N

**MEASUREMENT RESULT: "GM2107155095_fin"**

7/15/2021 9:16PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.154500	49.40	10.2	66	16.4	QP	N	GND
0.366000	34.30	10.2	59	24.3	QP	N	GND
1.761000	22.80	10.2	56	33.2	QP	N	GND
2.454000	21.80	10.2	56	34.2	QP	N	GND
7.417500	19.30	10.3	60	40.7	QP	N	GND
18.082500	18.50	10.5	60	41.5	QP	N	GND

MEASUREMENT RESULT: "GM2107155095_fin2"

7/15/2021 9:16PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.267000	28.80	10.2	51	22.4	AV	N	GND
0.361500	23.70	10.2	49	25.0	AV	N	GND
1.900500	15.90	10.2	46	30.1	AV	N	GND
2.310000	15.40	10.2	46	30.6	AV	N	GND
7.561500	13.70	10.3	50	36.3	AV	N	GND
23.127000	16.80	10.5	50	33.2	AV	N	GND

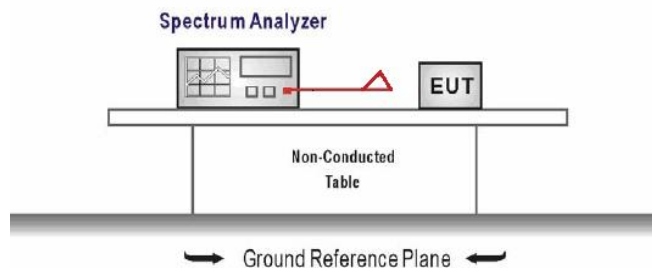
5.3. 20dB Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.215

Intentional radiators must be designed to ensure that the 20dB emission bandwidth in the specific band.

TEST CONFIGURATION



TEST PROCEDURE

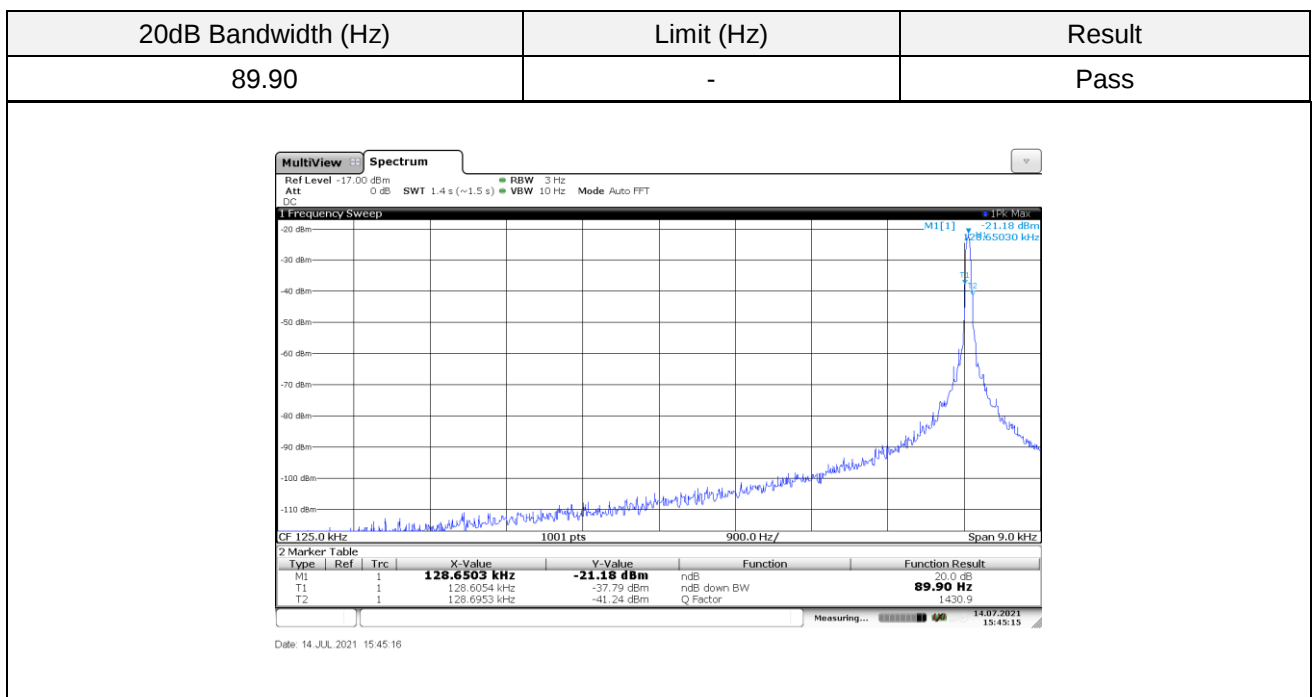
1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW $\geq$ 1% of the 20 dB bandwidth, VBW $\geq$ RBW
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

TEST MODE:

Please refer to the clause 4.1

TEST RESULTS

☒ Passed ☐ Not Applicable



5.4. Radiated Spurious Emissions

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

Limit for frequency below 30MHz:

Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009~0.490	2400/F(kHz)	300	Quasi-peak
0.490~1.705	24000/F(kHz)	30	Quasi-peak
1.705~30.0	30	30	Quasi-peak

Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 40*log(300/3)= Limit dBuV/m @300m +80,

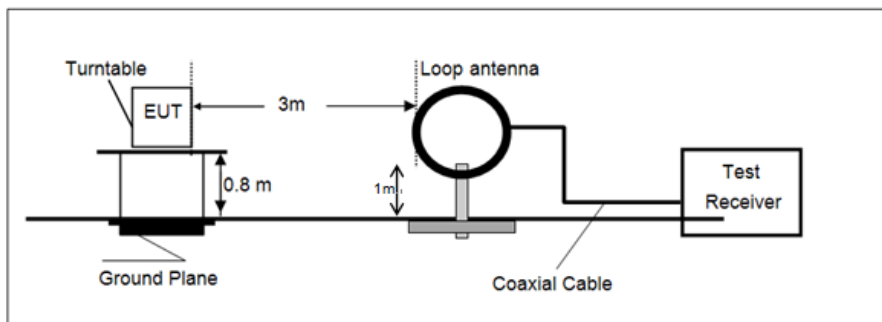
Limit dBuV/m @3m = Limit dBuV/m @30m +40*log(30/3)= Limit dBuV/m @30m + 40.

Limit for frequency above 30MHz:

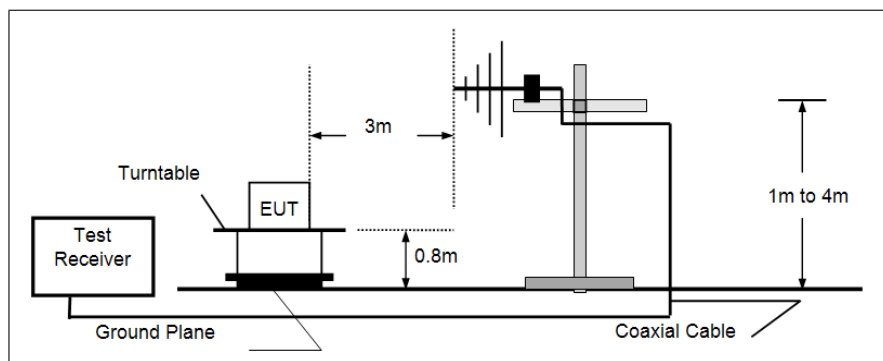
Frequency	Limit (dBuV/m@3m)	Remark
30MHz~88MHz	40.00	Quasi-peak
88MHz~216MHz	43.50	Quasi-peak
216MHz~960MHz	46.00	Quasi-peak
960MHz~1GHz	54.00	Quasi-peak

TEST CONFIGURATION

- 9 kHz ~ 30 MHz



- 30 MHz ~ 1 GHz



TEST PROCEDURE

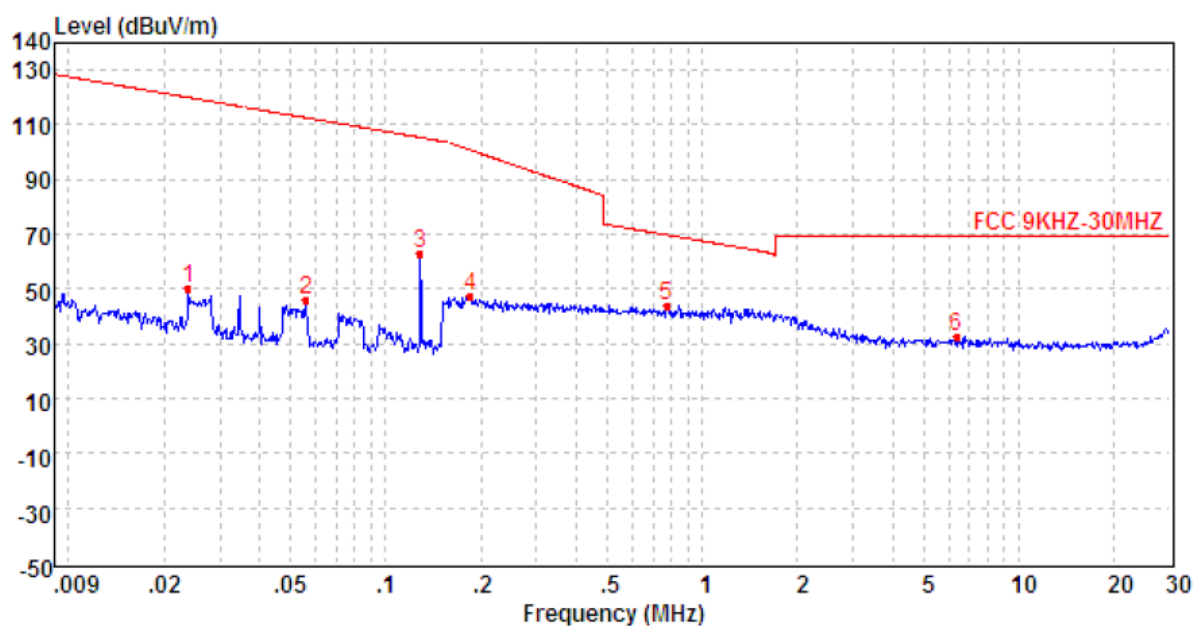
1. The EUT was setup and tested according to ANSI C63.10 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Below 30MHz:
RBW=10 kHz, VBW=30 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
 - (3) 30MHz to 1 GHz:
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
 - (4) From 1 GHz to 10th harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

Please refer to the clause 4.1

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

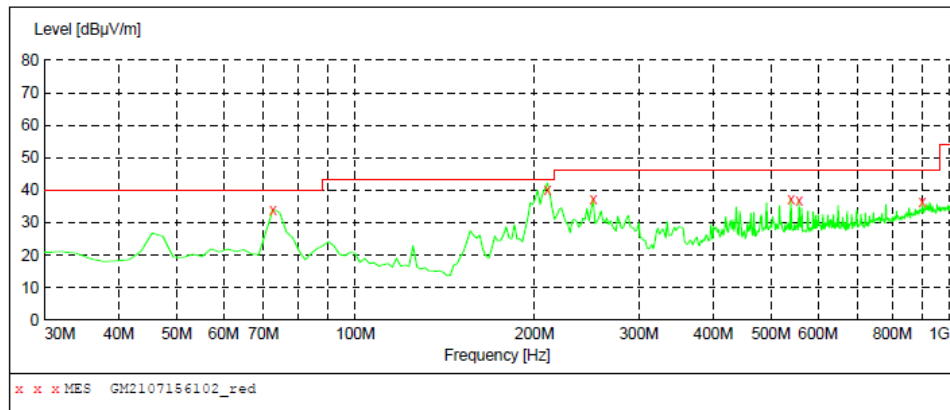
Below 30MHz:

Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamplifier dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	0.02	27.37	22.38	0.20	0.00	49.95	120.09	-70.14	Peak
2	0.06	23.37	22.30	0.21	0.00	45.88	112.64	-66.76	Peak
3	0.13	40.82	22.26	0.23	0.00	63.31	105.40	-42.09	Peak
4	0.19	24.73	22.21	0.24	0.00	47.18	100.92	-53.74	Peak
5	0.78	21.46	22.20	0.29	0.00	43.95	69.81	-25.86	Peak
6	6.39	10.00	22.02	0.41	0.00	32.43	69.54	-37.11	Peak

Above 30MHz:

Polarization:

Vertical

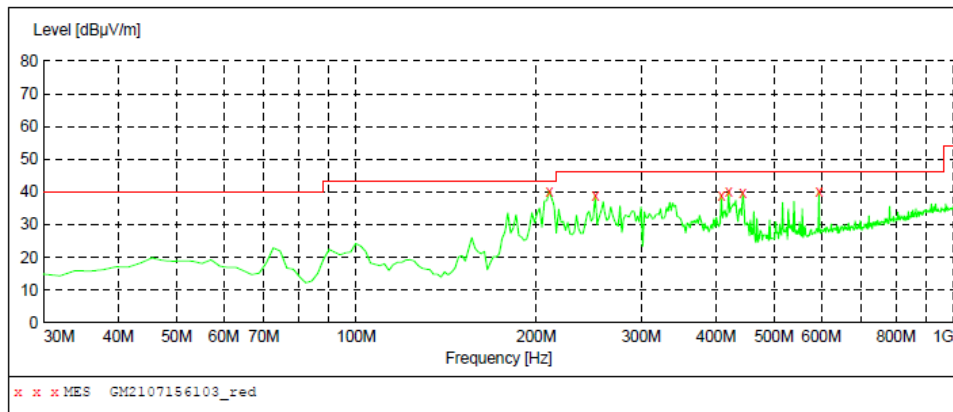
**MEASUREMENT RESULT: "GM2107156102_red"**

7/15/2021 11:08PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
72.680000	34.10	-14.0	40.0	5.9	QP	100.0	244.00	VERTICAL
210.420000	40.00	-10.6	43.5	3.5	QP	100.0	76.00	VERTICAL
251.160000	37.20	-8.6	46.0	8.8	QP	100.0	39.00	VERTICAL
540.220000	37.10	-0.9	46.0	8.9	QP	100.0	172.00	VERTICAL
557.680000	36.70	-0.4	46.0	9.3	QP	100.0	76.00	VERTICAL
899.120000	36.30	7.2	46.0	9.7	QP	100.0	303.00	VERTICAL

Polarization:

Horizontal

**MEASUREMENT RESULT: "GM2107156103_red"**

7/15/2021 11:14PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
210.420000	40.30	-10.6	43.5	3.2	QP	100.0	112.00	HORIZONTAL
251.160000	38.80	-8.6	46.0	7.2	QP	100.0	122.00	HORIZONTAL
408.300000	39.00	-3.8	46.0	7.0	QP	100.0	293.00	HORIZONTAL
419.940000	40.20	-3.3	46.0	5.8	QP	100.0	293.00	HORIZONTAL
443.220000	39.80	-3.0	46.0	6.2	QP	100.0	77.00	HORIZONTAL
594.540000	40.00	1.2	46.0	6.0	QP	100.0	220.00	HORIZONTAL

6. TEST SETUP PHOTOS

Conducted Emissions (AC Mains)



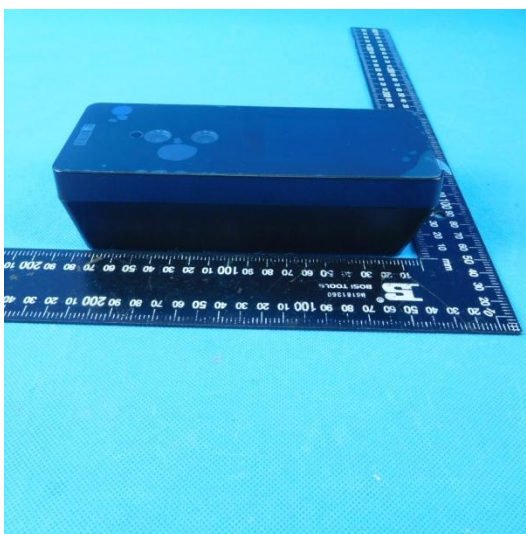
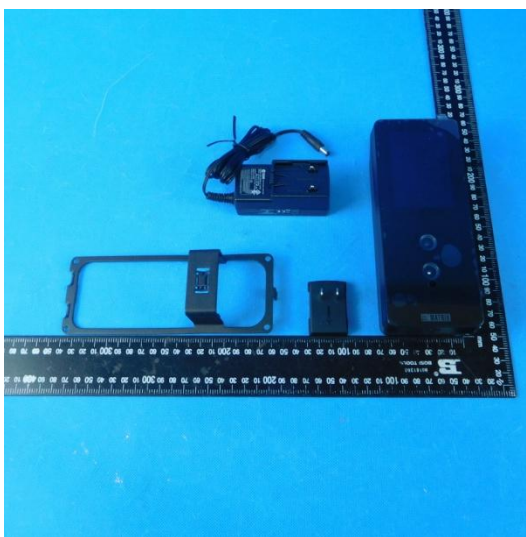
Radiated Emissions

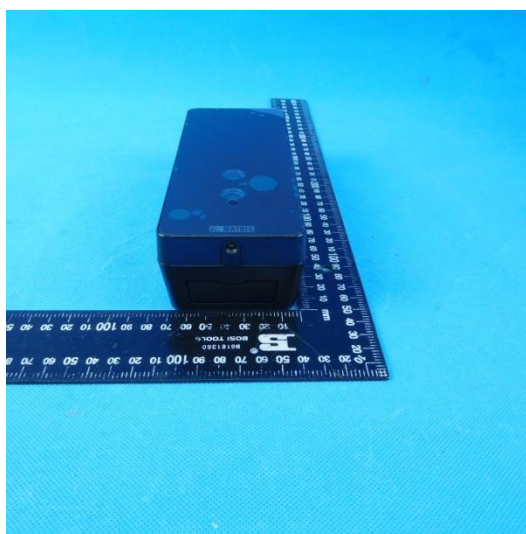
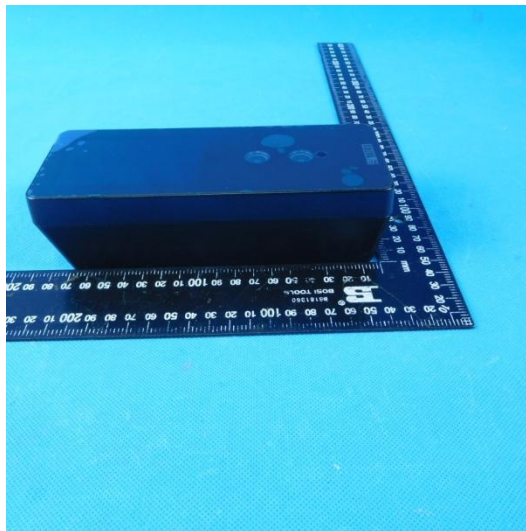
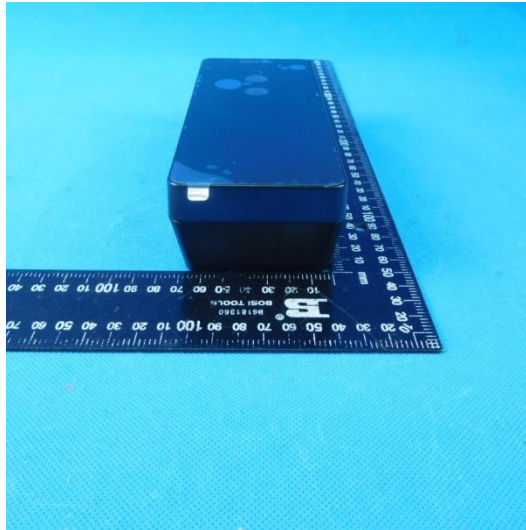


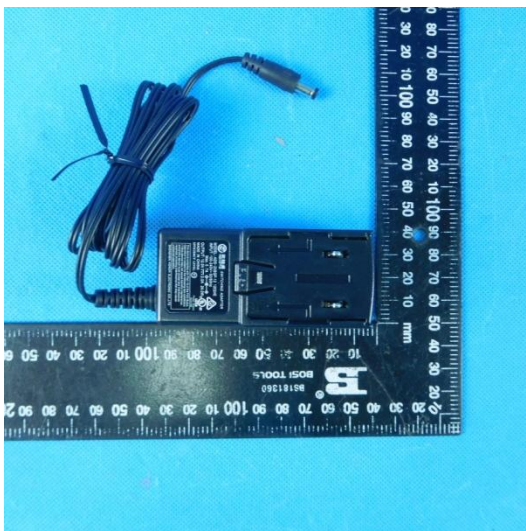
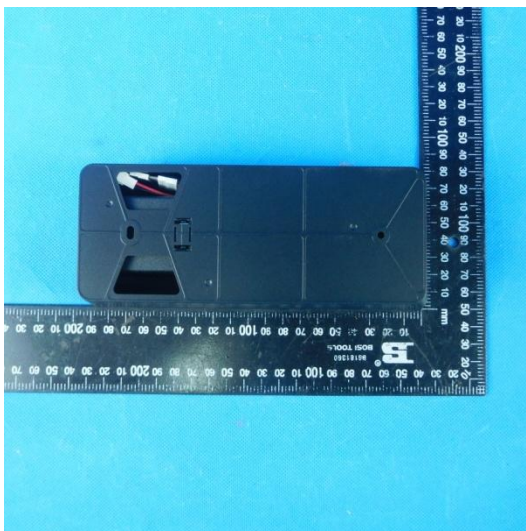


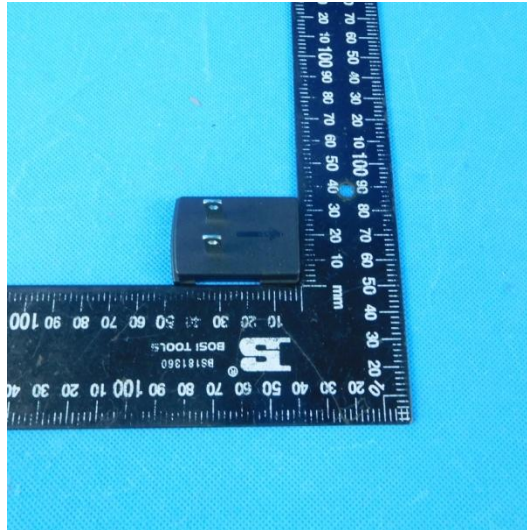
7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

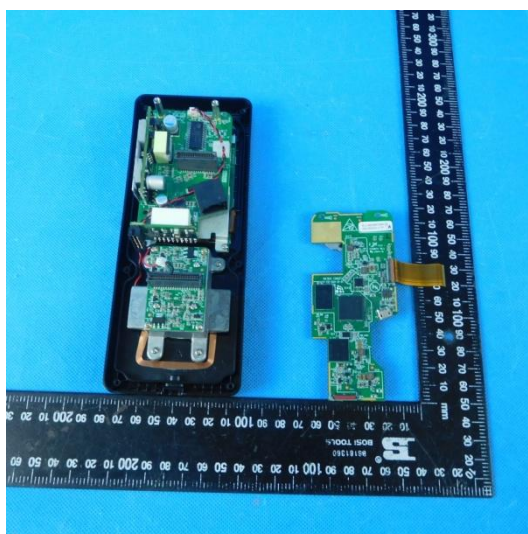
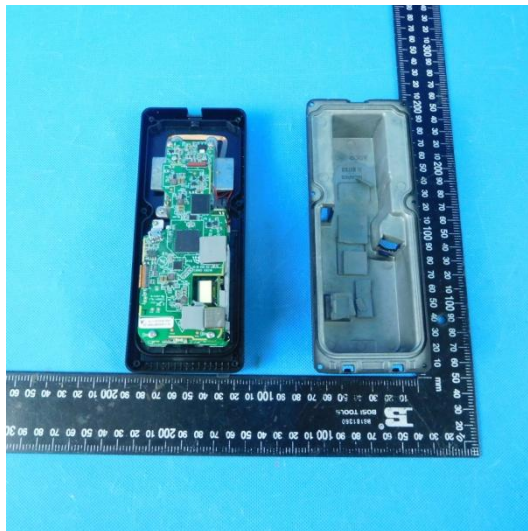
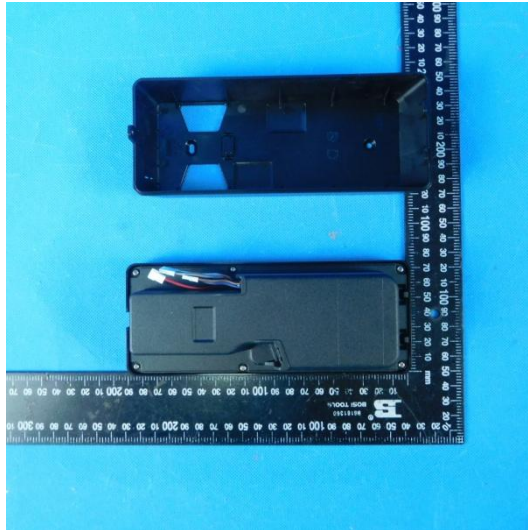
External Photos

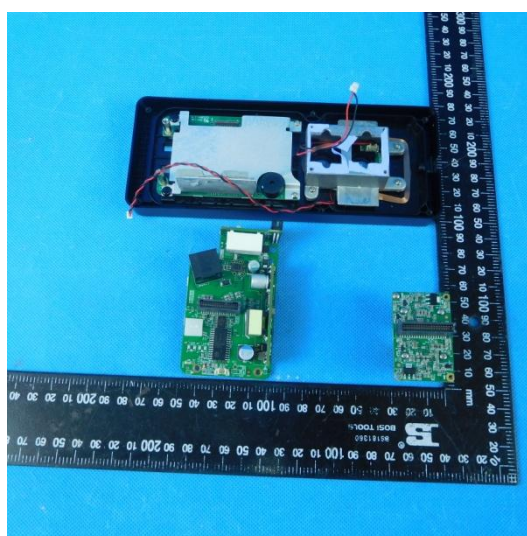
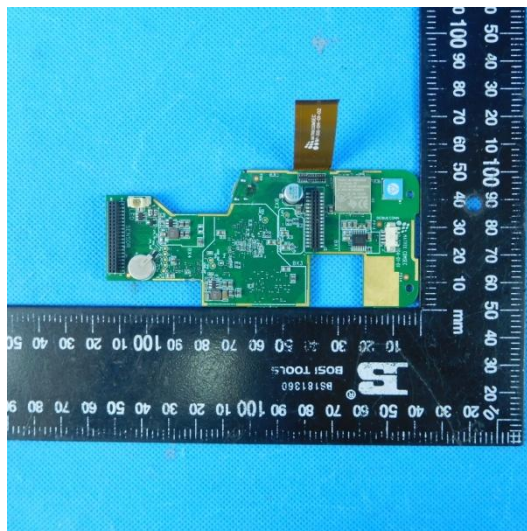
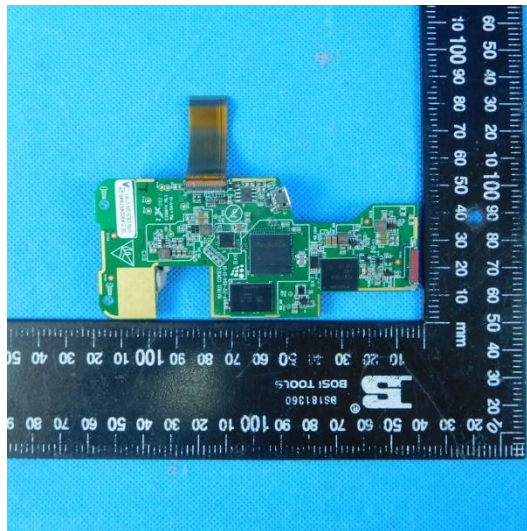


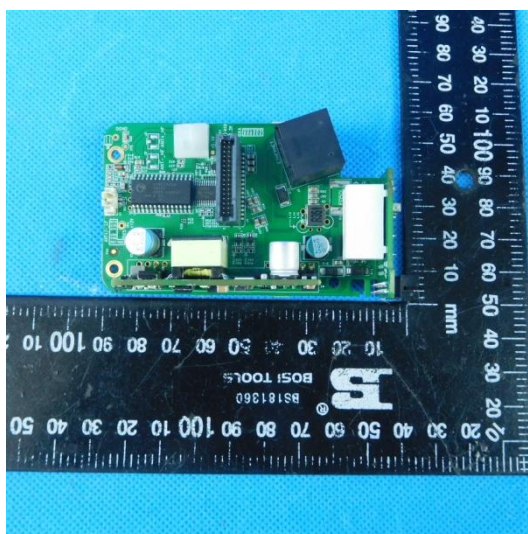
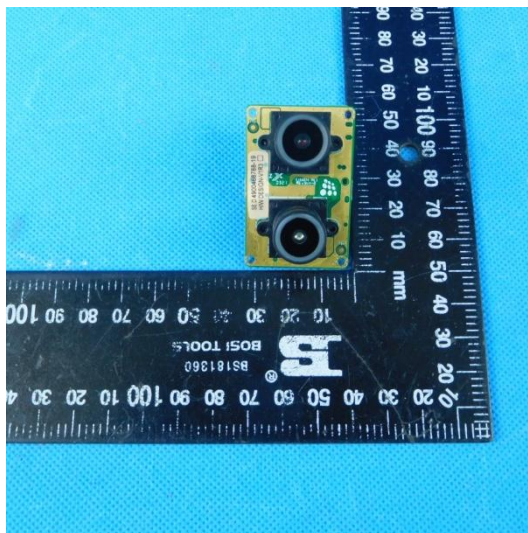
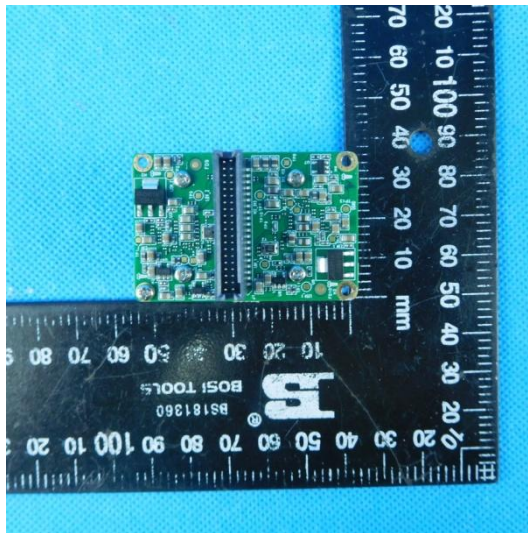


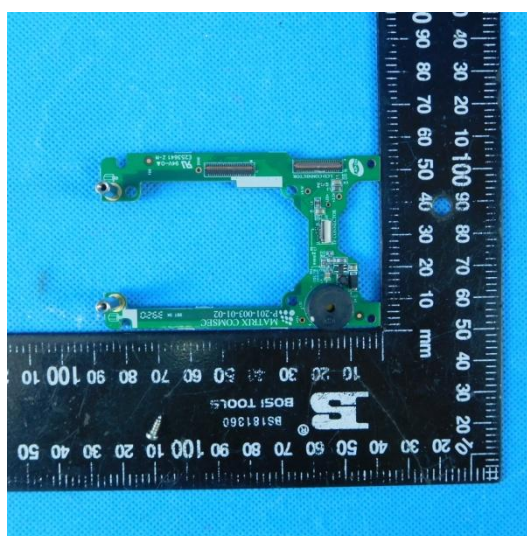
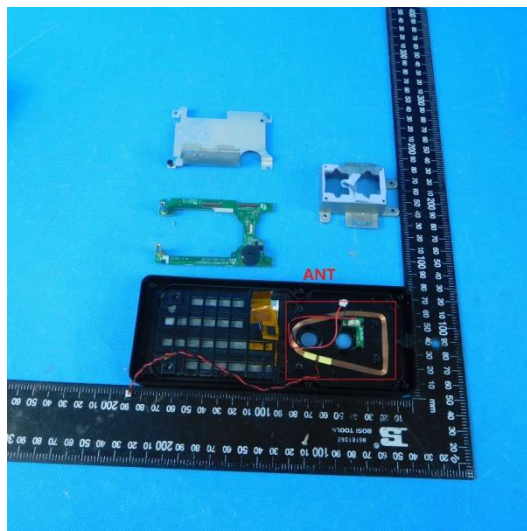
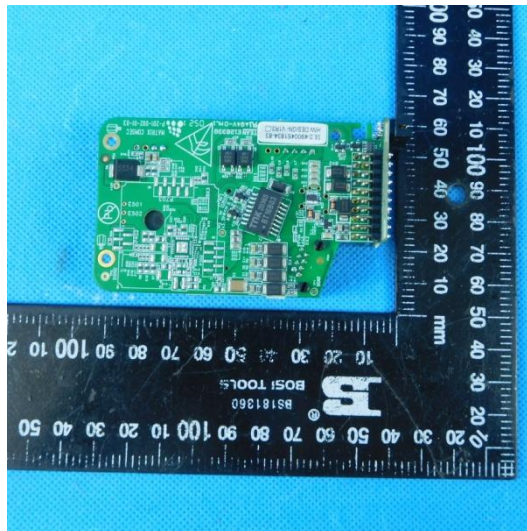


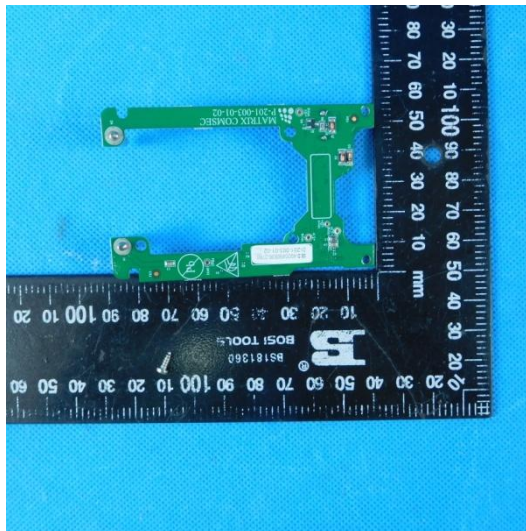


Internal Photos









-----End of Report-----