

FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Planet Computers Limited

COSMO

Model No.: COSMO COMMUNICATOR

FCC ID: 2A07Q-COSMO

Prepared for : Planet Computers Limited
Suite #9, 56 Sloane Square, London, SW1W 8AX, United
Kingdom

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
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Report Number : ACS-F19154
Date of Test : Sep.02~Dec.03, 2019
Date of Report : Dec.04, 2019

TABLE OF CONTENTS

Description	Page
1. SUMMARY OF STANDARDS AND RESULTS	4
1.1. Description of Standards and Results	4
2. GENERAL INFORMATION.....	5
2.1. Description of Equipment Under Test	5
2.2. Feature of Equipment Under Test	6
2.3. Tested Supporting System Details	8
2.4. Block diagram of connection between the EUT and simulators.....	8
2.5. Test Facility.....	8
2.6. Measurement Uncertainty (95% confidence levels, k=2).....	9
3. POWER LINE CONDUCTED EMISSION TEST	10
3.1. Test Equipments.....	10
3.2. Block Diagram of Test Setup	10
3.3. Power Line Conducted Emission Test Limits.....	10
3.4. Configuration of EUT on Test	11
3.5. Operating Condition of EUT.....	11
3.6. Test Procedure.....	11
3.7. Power Line Conducted Emission Test Results	11
4. RADIATED EMISSION TEST	14
4.1. Test Equipment	14
4.2. Block Diagram of Test Setup	15
4.3. Radiated Emission Limit.....	16
4.4. 15.205 Restricted bands of operation.....	16
4.5. EUT Configuration on Test.....	16
4.6. Operating Condition of EUT.....	17
4.7. Test Procedure.....	17
4.8. Radiated Emission Test Results.....	17
5. FREQUENCY STABILITY TEST.....	21
5.1. Test Equipment	21
5.2. Limits	21
5.3. Test Procedure.....	21
5.4. Test result	22
6. 20 DB BANDWIDTH TEST.....	23
6.1. Test Equipment	23
6.2. Limit.....	23
6.3. Test Results	23
7. DEVIATION TO TEST SPECIFICATIONS.....	24

Appendix A. Photograph of Test

Appendix B. Photo of the EUT

TEST REPORT CERTIFICATION

Applicant : Planet Computers Limited
Manufacture : Planet Computers Limited
EUT Description : COSMO
FCC ID : 2A07Q-COSMO
(A) Model No. : COSMO COMMUNICATOR
(B) Test Voltage : AC 120V/60Hz

Tested for comply with:
FCC CFR 47 Part 15 Subpart C

Test procedure used:
ANSI C63.10:2013

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements.

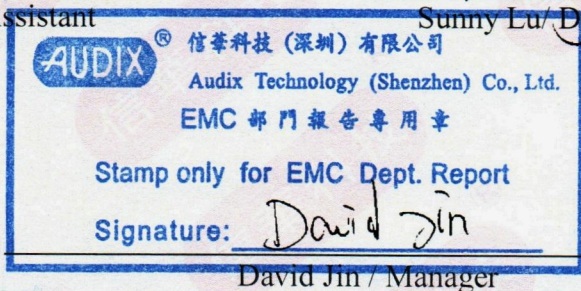
The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC and IC requirements.

This Report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

Date of Test : Sep.02~Dec.03, 2019 Report of date: Dec.04, 2019

Prepared by : Monica Liu Reviewer by : Sunny Lu
Monica Liu / Assistant Sunny Lu / Deputy Manager



Approved & Authorized Signer :

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	Standard	Results
Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.10: 2013	PASS
Radiated Emission Test	FCC Part 15: 15.205, 15.209 FCC Part 15: 15.225(a)(b)(c)(d) ANSI C63.10: 2013	PASS
Frequency Stability Test	FCC Part 15: 15.225(e)	PASS
20dB Bandwidth Test	FCC Part 15: 15.215	PASS

2. GENERAL INFORMATION

2.1. Description of Equipment Under Test

Applicant	Planet Computers Limited Suite #9, 56 Sloane Square, London, SW1W 8AX, United Kingdom
Manufacturer	Planet Computers Limited Suite #9, 56 Sloane Square, London, SW1W 8AX, United Kingdom
Factory	Shenzhen Eastaeon Technology Limited Company 4F, B block, Kingdee Software Park, 2 Keji South 12 Road, Nanshan District, Shenzhen
Product	COSMO
Model No.	COSMO COMMUNICATOR
FCC ID	2A07Q-COSMO
Power Adapter	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO., LTD. Model: TPA-10120125UU-MTK Input: 100-240V~, 50/60Hz, 0.6A Output: 5V, 2A / 7V, 1.67A / 9V, 1.67A / 12V, 1.25A
Rechargeable Li-ion Battery	Manufacturer: Shenzhen 3sun Electronics Co., Ltd.; M/N: Gemini Standard Battery; Rating Voltage: 3.85V; Capacity: 4220mAh; Charge Voltage: 4.4V.
USB Cable	Shielded, Detachable, 0.8m
Sample Type	Prototype production
Date of Receipt	Jul.12, 2019
Date of Test	Sep.02~Dec.03, 2019

2.2. Feature of Equipment Under Test

Product Feature & Specification		
Product	COSMO	
Model No.	2A07Q-COSMO	
Radio	IEEE802.11 a/b/g/n/ac; Bluetooth V3.0+EDR; Bluetooth V4.0; NFC	
Power Source	☒ Commercial Power	AC 100 ~ 240V, 0.6A
	☒ External Power Source	DC 5/7/9/12V, 2/1.67/1.67/1.25A
	☒ Lithium battery	DC 3.85V, 4220mAh
	☐ UM battery	DC V
NFC		
Frequency Range	13.56MHz	
Type of Modulation	ASK	
Bluetooth		
Bluetooth Version	V4.0 dual mode	
Frequency Range	2402-2480MHz	
Type of Modulation	GFSK, $\pi/4$ DQPSK, 8DPSK	
Data Rate	1Mbps, 2Mbps, 3Mbps	
Quantity of Channels	79/40	
Channel Separation	1MHz/2MHz	
2.4GHz Wi-Fi		
Support Modes	802.11b/g/n20/n40	
Frequency Range	2412-2462MHz	
Type of Modulation	802.11b(DSSS): CCK, QPSK, BPSK; 802.11g/n(OFDM): 64QAM,16QAM, QPSK, BPSK	
Data Rate	802.11b: 11/5.5/2/1 Mbps; 802.11g: 54/48/36/24/18/12/9/6 Mbps; 802.11n: up to 150Mbps	
Channel Separation	5MHz	
5GHz Wi-Fi		
Support Modes	802.11a/n20/n40/ac20/ac40/ac80	
Frequency Range	5180-5240MHz, 5260-5320MHz, 5500-5700MHz, 5745-5825MHz	
Type of Modulation	802.11a/ac/n (OFDM): QPSK, BPSK, 16QAM, 64QAM,256QAM	
Data Rate	802.11a: 54/48/36/24/18/12/9/6 Mbps; 802.11n up to 150 Mbps; 802.11ac: up to 400Mbps	
Channel Separation	5MHz	
Type of Product	Slave device without Radar detection	
Transmit Power Control	No Support	

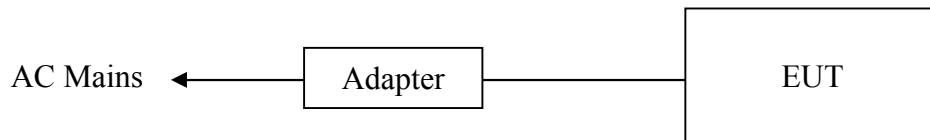
Antenna System

NFC	
Type of Antenna	FPC Antenna
Antenna number	1
Antenna Peak Gain	0dBi
Bluetooth	
Type of Antenna	MONOPOLE Antenna
Antenna number	1
Antenna Peak Gain	-0.1dBi
Wi-Fi	
Type of Antenna	MONOPOLE Antenna
Antenna number	1
Antenna Peak Gain	DTS Band (2400-2483.5MHz) Peak Gain: -0.1dBi U-NII-1 Band(5150-5250MHz) Peak Gain: 0.6dBi U-NII-2A Band(5250-5350MHz) Peak Gain: 0.6dBi U-NII-2C Band(5470-5725MHz) Peak Gain: 0.4dBi U-NII-3 Band (5725-5850MHz) Peak Gain: 0.3dBi

2.3. Tested Supporting System Details

[None]

2.4. Block diagram of connection between the EUT and simulators



(EUT: COSMO)

2.5. Test Facility

Site Description

Name of Firm : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Kefeng Road, Science & Technology
Park, Nanshan District, Shenzhen,
Guangdong, China

EMC Lab. : Certificated by Industry Canada
Registration Number: IC 5183A-1
Valid Date: May.07, 2020

: Certificated by DAkkS, Germany
Registration No: D-PL-12151-01-00
Valid Date: Dec.07, 2021

Accredited by NVLAP, USA
NVLAP Code: 200372-0
Valid Date: Mar.31, 2020

2.6. Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	2.6dB(150KHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	3.6dB(30~200MHz, Polarization: H)
	4.0dB(30~200MHz, Polarization: V)
	3.6dB(200M~1GHz, Polarization: H)
	3.8dB(200M~1GHz, Polarization: V)
Uncertainty for Frequency range test	7×10^{-8}
Uncertainty for Bandwidth test	83 kHz
Uncertainty for DC power test	0.1 %
Uncertainty for test site temperature and humidity	0.6°C
	3%

Note: EMI uncertainty is evaluated by CISPR16-4-2.

The value of measurement uncertainty of EMI is less than U_{CISPR} .

The value is not calculated in the test results.

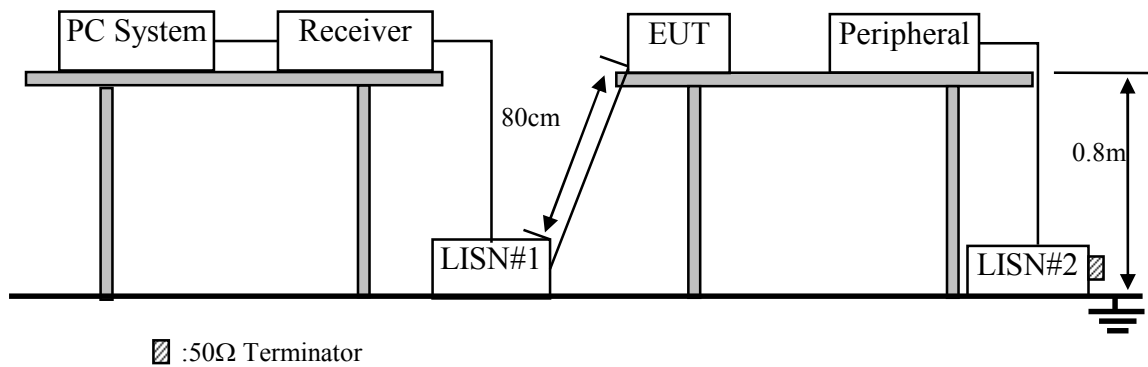
3. POWER LINE CONDUCTED EMISSION TEST

3.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	1# Shielding Room	AUDIX	N/A	N/A	May.17,18	3 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100842	Apr.14,19	1 Year
3.	L.I.S.N.#1	Rohde & Schwarz	ENV216	102160	Dec.01,18	1 Year
4.	L.I.S.N.#2	Kyoritsu	K NW-403D	8-1750-2	Apr.18,19	1 Year
5.	Terminator	Hubersuhner	50Ω	No.1	Apr.14,19	1 Year
6.	Terminator	Hubersuhner	50Ω	No.2	Apr.14,19	1 Year
7.	RF Cable	Fujikura	RG55/U	No.1	Apr.13,19	1 Year
8.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

Note: N/A means Not applicable.

3.2. Block Diagram of Test Setup



▨ :50Ω Terminator

3.3. Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.4. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4.1. COSMO (EUT)

Model No. : COSMO COMMUNICATOR

Serial No. : N/A

3.4.2. Support Equipment: As Tested Supporting System Details, in Section 2.2.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 3.2.

3.5.2. Turn on the power of all equipments.

3.5.3. PC run test software to control EUT work in Tx mode.

3.6. Test Procedure

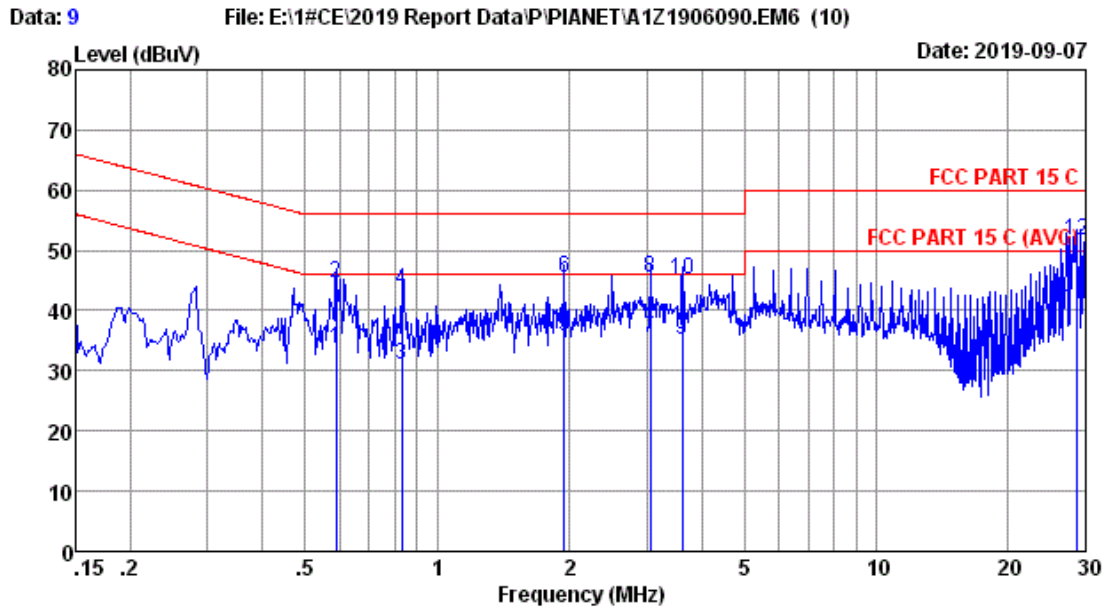
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power Via PC connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.7. Power Line Conducted Emission Test Results

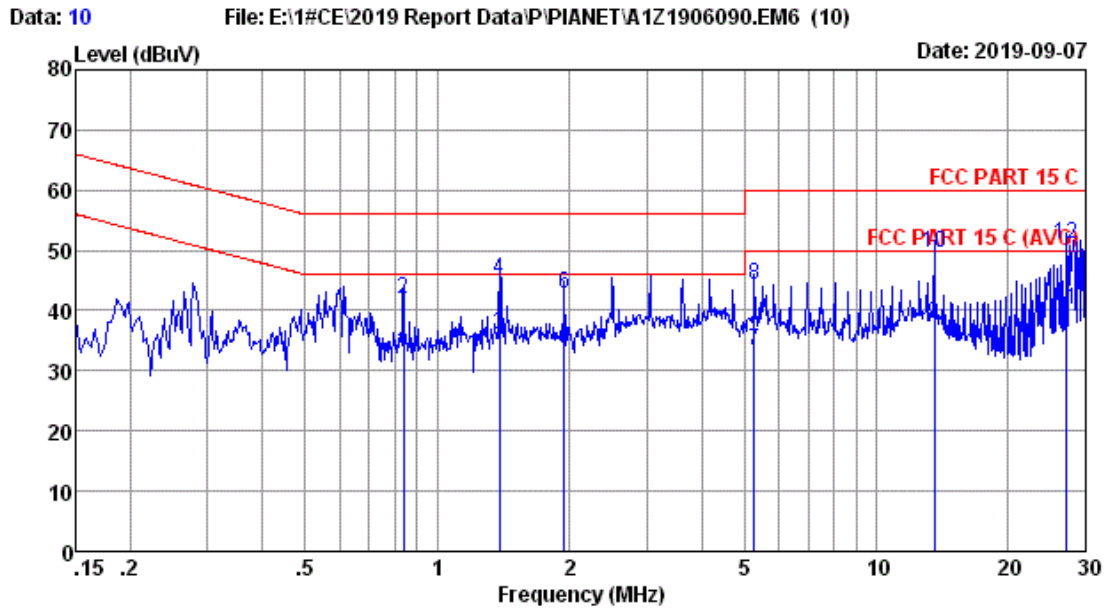
PASS. (All emissions not reported below are too low against the prescribed limits.)



Site no :1# Conduction Data No :9
 Dis./Lisn :2018 ENV216-N LISN phase:
 Limit :FCC PART 15 C
 Env./Ins. :Temp:23.8°C Humi:55% Engineer :Evan
 Power Rating :AC 120V/60Hz
 Test Mode :NFC Mode

No	Freq (MHz)	LISN Factor (dB)	Cable loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.589	9.40	0.02	24.13	33.55	46.00	12.45	Average
2	0.589	9.40	0.02	35.15	44.57	56.00	11.43	QP
3	0.830	9.40	0.03	21.58	31.01	46.00	14.99	Average
4	0.830	9.40	0.03	33.98	43.41	56.00	12.59	QP
5	1.949	9.40	0.04	26.37	35.81	46.00	10.19	Average
6	1.949	9.40	0.04	35.96	45.40	56.00	10.60	QP
7	3.058	9.45	0.05	25.84	35.34	46.00	10.66	Average
8	3.058	9.45	0.05	36.03	45.53	56.00	10.47	QP
9	3.623	9.48	0.06	25.47	35.01	46.00	10.99	Average
10	3.623	9.48	0.06	35.74	45.28	56.00	10.72	QP
11	28.603	9.79	0.17	30.56	40.52	50.00	9.48	Average
12	28.603	9.79	0.17	41.57	51.53	60.00	8.47	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.



Site no :1# Conduction Data No :10
 Dis./Lisn :2018 ENV216-L LISN phase:
 Limit :FCC PART 15 C
 Env./Ins. :Temp:23.8°C Humi:55% Engineer :Evan
 Power Rating :AC 120V/60Hz
 Test Mode :NFC Mode

No	Freq (MHz)	LISN Factor (dB)	Cable loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.839	9.40	0.03	23.63	33.06	46.00	12.94	Average
2	0.839	9.40	0.03	32.36	41.79	56.00	14.21	QP
3	1.388	9.44	0.03	26.59	36.06	46.00	9.94	Average
4	1.388	9.44	0.03	35.70	45.17	56.00	10.83	QP
5	1.949	9.49	0.04	24.16	33.69	46.00	12.31	Average
6	1.949	9.49	0.04	33.30	42.83	56.00	13.17	QP
7	5.277	9.50	0.07	23.69	33.26	50.00	16.74	Average
8	5.277	9.50	0.07	34.62	44.19	60.00	15.81	QP
9	13.551	9.57	0.12	28.17	37.86	50.00	12.14	Average
10	13.551	9.57	0.12	39.85	49.54	60.00	10.46	QP
11	27.127	9.60	0.16	30.28	40.04	50.00	9.96	Average
12	27.127	9.60	0.16	41.20	50.96	60.00	9.04	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

4. RADIATED EMISSION TEST

4.1. Test Equipment

Frequency Range: 30-1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber(NSA)	AUDIX	N/A	N/A	May.10,19	1 Year
2.	3#Chamber(SE)	AUDIX	N/A	N/A	May.17,18	3 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV30	104050	Apr.14,19	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR7	101547	Apr.14,19	1 Year
5.	Amplifier	HP	8447D	2648A04738	Apr.14,19	1 Year
6.	Bi log Antenna	TESEQ	CBL6112D	35375	Nov.21,18	1 Year
7.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3	Dec.01,18	1 Year
8.	Coaxial Switch	Anritsu	MP59B	6201397222	Apr.14,19	1 Year
9.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A

Note: N/A means Not applicable.

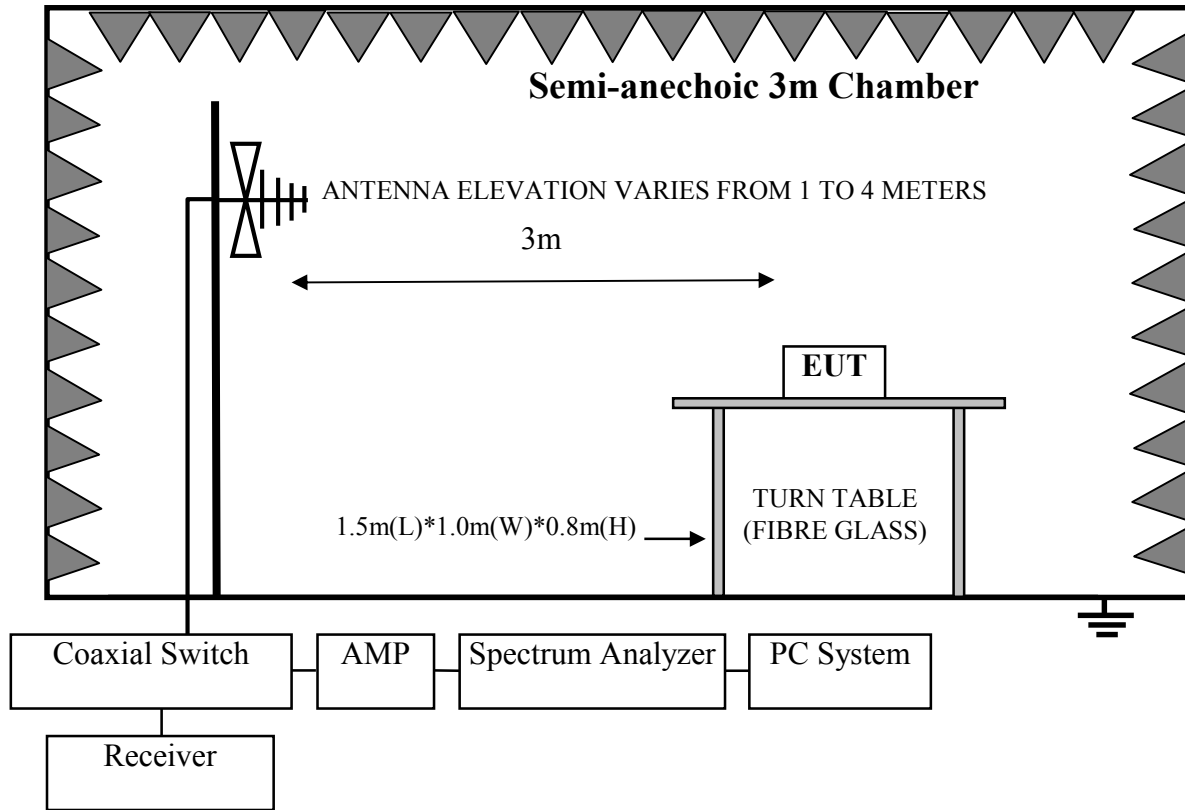
Frequency Range: 1.705-30MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	10m Chamber(NSA)	AUDIX	N/A	N/A	Apr.15,19	1 Year
2.	10m Chamber(SE)	AUDIX	N/A	N/A	Apr.15,18	3 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV30	103670	Oct.14,18	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR3	101931	Apr.14,19	1 Year
5.	Amplifier	EMCI	EMC9135	980347	Jun.30,19	1 Year
6.	Loop Antenna	Chase	HLA6120	1062	Apr.18,19	1 Year
7.	RF Cable	SPUMA	CFD400NL-LW	No.4	Jun.30,19	1 Year
8.	Coaxial Switch	Anritsu	MP59B	6201397221	Apr.14,19	1 Year
9.	Coaxial Switch	Anritsu	MP59B	6201397220	Apr.14,19	1 Year
10.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

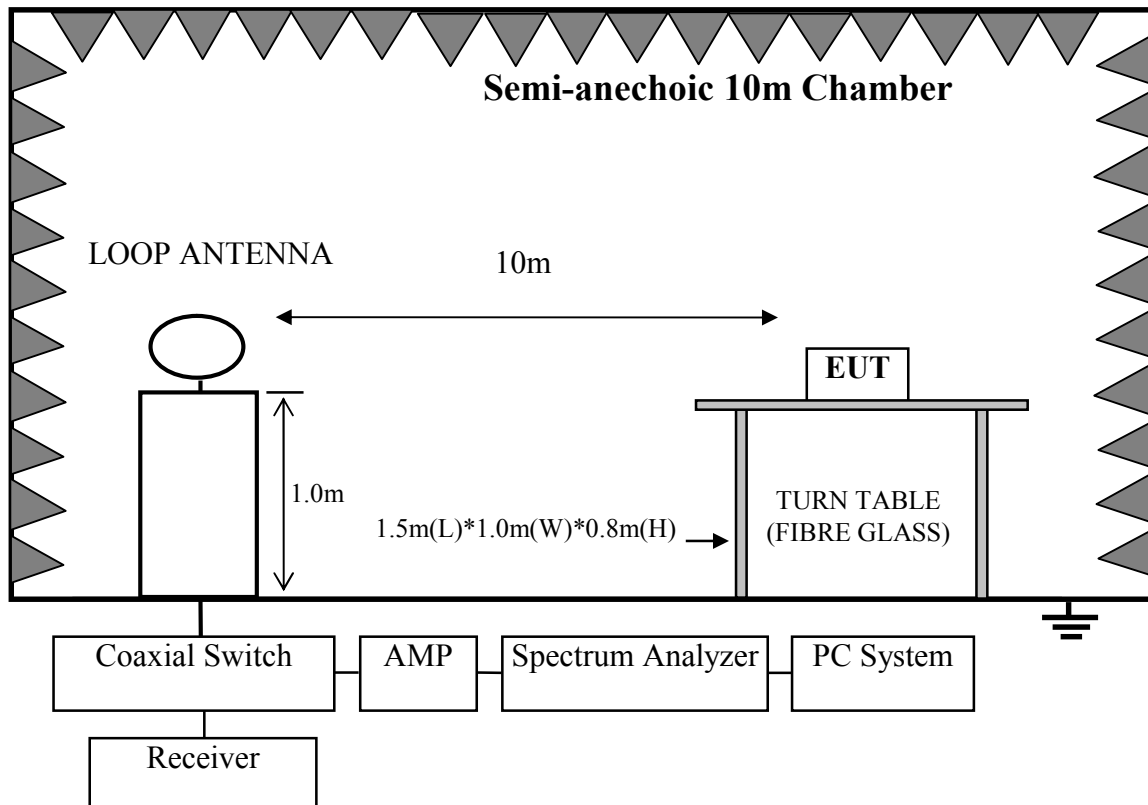
Note: N/A means Not applicable.

4.2. Block Diagram of Test Setup

Frequency Range: 30-1000MHz



Frequency Range: 1.705-30MHz



4.3. Radiated Emission Limit

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

- Remark : (1) Emission level dBμV = 20 log Emission level μV/m
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4.4. 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

4.5. EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.6. Operating Condition of EUT

4.6.1. Setup the EUT as shown in Section 4.2.

4.6.2. Turn on the power of all equipments.

4.6.3. Let the EUT work in test mode (Tx Mode) and test it.

4.7. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it work in test mode, then test it. EUT is set 10 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

For frequency range below 30MHz the Loop antenna was used at 10m measurement distance with antenna heights of 1m and antenna loop front and side faced to the EUT.

The axis of the antenna was rotated to maximize the emission. A CISPR quasi-peak detector is used for measurements below 30MHz and RBW/VBW is 9kHz/30kHz.

The limit 1.705MHz to 30MHz in clause 4.3 are specified at 30 meters, and measurements were made at 10 meters, the limit is translated to 10 meters by using a formula as follows:

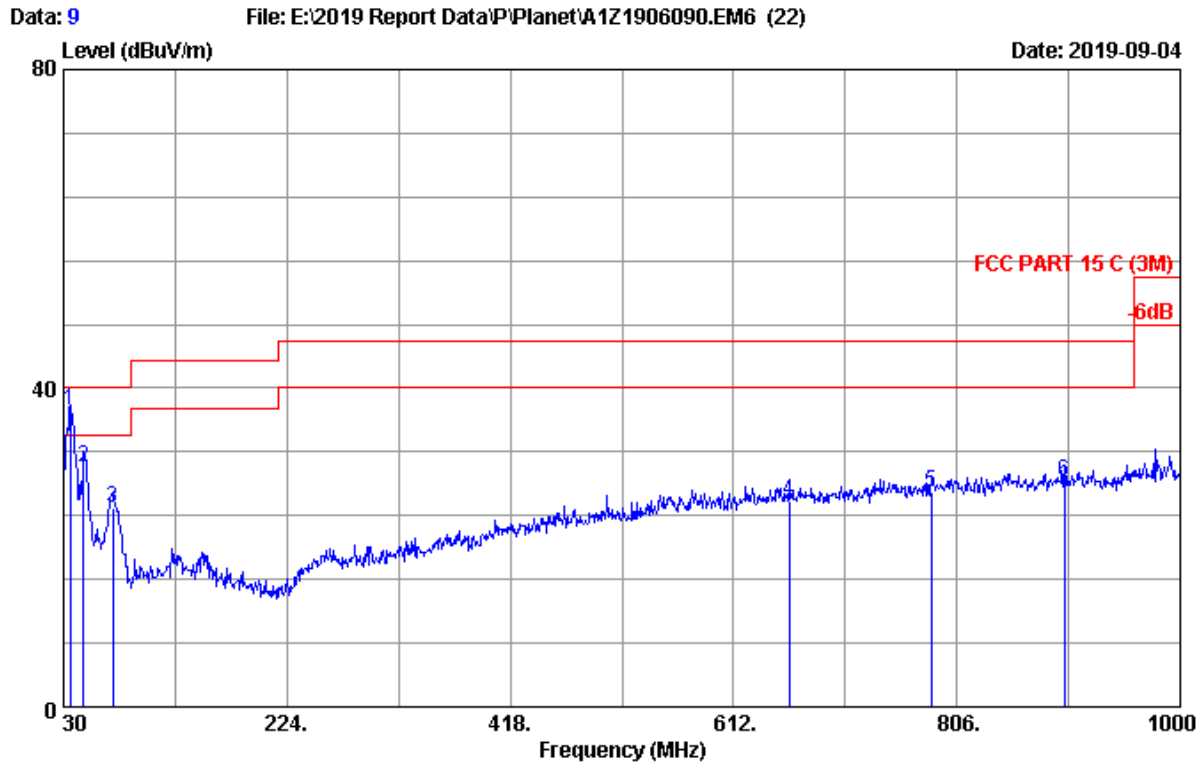
$$\text{Limit}_{30\text{m}} = \text{Limit}_{10\text{m}} + 40\log(30\text{m}/10)$$

4.8. Radiated Emission Test Results

PASS.

The frequency range from 30MHz to 1000MHz and 1.705MHz to 30MHz is investigated. Please see the following pages.

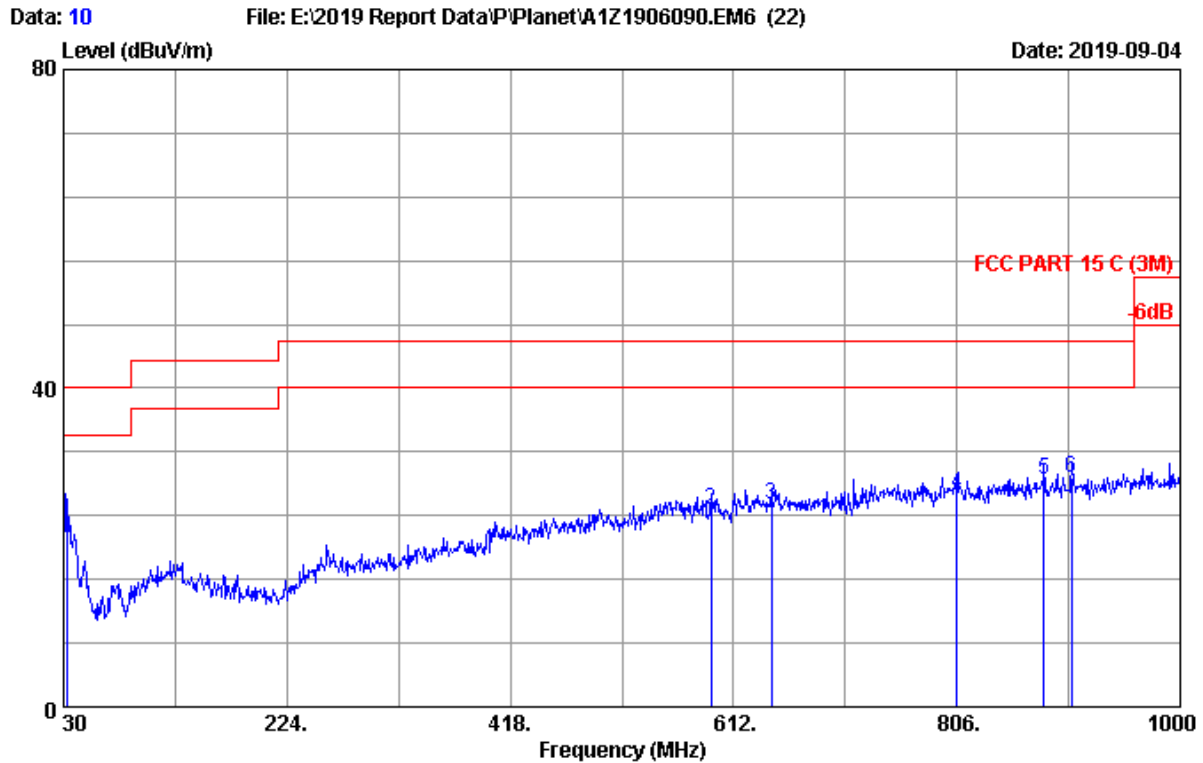
Note: According to exploratory test, 9kHz to 1.705MHz no obvious signal can be detected.



Site no. : 3m Chamber Data no. : 9
 Dis. / Ant. : 3m 2018 CBL6112D-35375 Ant. pol. : VERTICAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : 23.4°C/54% Engineer : Hogen
 EUT : COSMO M/N: COSMO COMMUNICATOR
 Power rating : AC 120V/60Hz
 Test Mode : NFC Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	35.820	21.30	0.57	15.37	37.24	40.00	2.76	QP
2	47.460	16.30	0.65	13.17	30.12	40.00	9.88	QP
3	72.680	13.10	0.83	11.04	24.97	40.00	15.03	QP
4	660.500	25.30	2.76	-2.12	25.94	46.00	20.06	QP
5	783.690	26.06	3.08	-2.17	26.97	46.00	19.03	QP
6	899.120	26.70	3.32	-1.67	28.35	46.00	17.65	QP

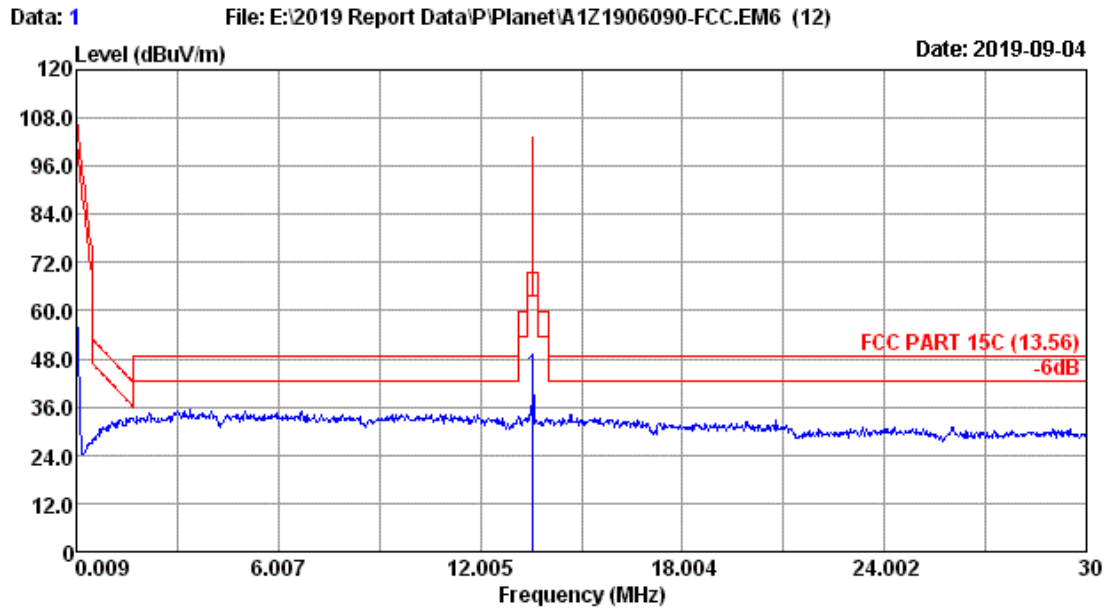
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 10
 Dis. / Ant. : 3m 2018 CBL6112D-35375 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : s Engineer : Hogen
 EUT : COSMO M/N: COSMO COMMUNICATOR
 Power rating : AC 120V/60Hz
 Test Mode : NFC Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission			
					Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	32.910	22.90	0.55	0.59	24.04	40.00	15.96	QP
2	592.600	24.84	2.59	-2.73	24.70	46.00	21.30	QP
3	644.980	25.20	2.72	-2.42	25.50	46.00	20.50	QP
4	806.000	26.36	3.13	-2.65	26.84	46.00	19.16	QP
5	881.660	26.60	3.28	-1.35	28.53	46.00	17.47	QP
6	905.910	26.72	3.34	-1.39	28.67	46.00	17.33	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 10m Chamber Data no. : 1
 Dis. / Ant. : 10m 2018 6120 LOOP 10M Ant. pol. : VERTICAL
 Limit : FCC PART 15C (13.56)
 Env. / Ins. : 23.2°C/55% Engineer : Garry
 EUT : COSMO M/N: COSMO COMMUNICATOR
 Power rating : AC 120V/60Hz
 Test Mode : NFC Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin Limits (dB)	Remark
1	13.56	20.23	0.84	22.83	43.90	103.08	59.18	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

5. FREQUENCY STABILITY TEST

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	Amplifier	HP	8449B	3008A00863	Apr.23,19	1 Year
3.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	May.13,19	1 Year

5.2. Limits

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.3. Test Procedure

The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.

5.4. Test result

EUT: COSMO		
M/N: COSMO COMMUNICATOR		
Test date: 2019-12-03	Pressure: 102.3±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Garry	Test site: RF site	Temperature: 25.5±0.6℃

Frequency stability VS Voltage (Temperature: 20℃)					
Test Voltage	Temperature	Frequency (MHz)	Max. Reading (MHz)	Result (%)	Limit (%)
DC 3.27V	20℃	13.56	13.56003	0.002	±0.01
DC 3.85V	20℃	13.56	13.56003	0.002	±0.01
DC 4.43V	20℃	13.56	13.56001	0.001	±0.01
Frequency stability VS Voltage (Supply voltage DC 3.85V)					
DC 3.85V	-20℃	13.56	13.56003	0.002	±0.01
DC 3.85V	-10℃	13.56	13.56003	0.002	±0.01
DC 3.85V	0℃	13.56	13.56001	0.001	±0.01
DC 3.85V	10℃	13.56	13.56002	0.001	±0.01
DC 3.85V	20℃	13.56	13.56002	0.001	±0.01
DC 3.85V	30℃	13.56	13.56001	0.001	±0.01
DC 3.85V	40℃	13.56	13.56002	0.001	±0.01
DC 3.85V	50℃	13.56	13.56001	0.001	±0.01
Conclusion: PASS					

6. 20 DB BANDWIDTH TEST

6.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	RF Cable	Mini-Circuits	CBL-1M-SMSM+	No.4	Oct.14,18	1 Year

6.2.Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

6.3. Test Results

EUT: COSMO		
M/N: COSMO COMMUNICATOR		
Test date: 2019-09-02	Pressure: 102.3±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Garry	Test site: RF site	Temperature: 25.5±0.6℃
Frequency	20dB bandwidth (kHz)	Limit (KHz)
13.56MHz	189.9	N/A
Conclusion : PASS		



7. DEVIATION TO TEST SPECIFICATIONS

[NONE]

..... End of Report