Shenzhen HTT Technology Co., Ltd.

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.231

Report Reference No.....:	**HTT202203154F01**	
FCC ID..... :	**2A536-SMART1**	
Compiled by (position+printed name+signature)..:	File administrators	Ervin Xu
Supervised by (position+printed name+signature)..:	Project Engineer	Bruce Zhu
Approved by (position+printed name+signature)..:	RF Manager	Kevin Yang
Date of issue.....:	Apr.14,2022	

Testing Laboratory Name .....:	**Shenzhen HTT Technology Co.,Ltd.**
Address .....:	1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name.....:	**Dongguan Meisen Electronics Co., Ltd.**
Address .....:	No. 82 Daling Road, Gaoying Village, Dalang Town, Dongguan City, Guangdong Province, China
Test specification .....**:**	
Standard .....:	**FCC Part 15.231**

Test item description .....:	Smart Door Bell
Trade Mark .....:	N/A
Manufacturer .....:	Dongguan Meisen Electronics Co., Ltd.
Model/Type reference.....:	SMART1
Listed Models .....:	SMART2, SMART8, SMART20, SMART21, SMART22, SMART23, SMART30, SMART31, SMART32, SMART10, T1, T1 PRO
Ratings .....:	DC 5V From External Circuit or DC3.7V by battery
Modulation .....:	ASK
Frequency.....	433.92MHz
Result.....:	**PASS**

TEST REPORT

Equipment under Test	:	Smart Door Bell
Model /Type	:	SMART1
Listed Models	:	SMART2, SMART8, SMART20, SMART21, SMART22, SMART23, SMART30, SMART31, SMART32, SMART10, T1, T1 PRO
Model Declaration	:	All the model are the same circuit and RF module, except the model name and colour.
Applicant	:	Dongguan Meisen Electronics Co., Ltd.
Address	:	No. 82 Daling Road, Gaoying Village, Dalang Town, Dongguan City, Guangdong Province, China
Manufacturer	:	Dongguan Meisen Electronics Co., Ltd.
Address	:	No. 82 Daling Road, Gaoying Village, Dalang Town, Dongguan City, Guangdong Province, China

Test Result:	**PASS**

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.231:Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.
ANSI C63.10:2013 : American National Standard for Testing Unlicensed Wireless Devices

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	Mar.07,2022
Testing commenced on	:	Mar.07,2022
Testing concluded on	:	Apr.14,2022

2.2 Product Description

Product Name:	Smart Door Bell
Model No.:	SMART1
Series model:	SMART2, SMART8, SMART20, SMART21, SMART22, SMART23, SMART30, SMART31, SMART32, SMART10, T1, T1 PRO
Model Difference	All the model are the same circuit and RF module, except the model name and colour.
Power supply:	DC 5V From External Circuit or DC3.7V by battery
Modulation:	ASK
Operation frequency:	433.92MHz
Channel number:	1
Antenna type:	Integral Antenna
Antenna gain:	1.0 dBi

2.3 Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

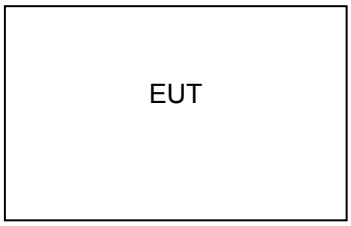
DC 3.7V From Battery

2.4 Short description of the Equipment under Test (EUT)

This is a Smart Door Bell.

For more details, refer to the user's manual of the EUT.

2.5 Block Diagram of Test Setup



2.6 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
Adapter	UGREEN	CD122	Input:AC100-240V,50/60Hz,500mA, Output: 5V3A,9V2A,12V1.5A	/	/
/	/	/	/	/	/

2.7 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for the device filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules.

2.8 Modifications

No modifications were implemented to meet testing criteria.

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen HTT Technology Co.,Ltd.
1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China

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3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 779513 Designation Number: CN1319
Shenzhen HTT Technology Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6435.01
Shenzhen HTT Technology Co.,Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Radiated Emission:

Temperature:	25 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

Conducted testing：

Temperature:	25 ° C
Humidity:	44 %
Atmospheric pressure:	950-1050mbar

3.4 Summary of measurement results

FCC and IC Requirements		
FCC Part 15.207	Conducted Emission	PASS
FCC Part 15.231(a)(2)	Automatically Deactivate	PASS
FCC Part 15.231(b)	Electric Field Strength of Fundamental Emission	PASS
FCC Part 15.205 &15.209& 15.231(b)	Electric Field Strength of Spurious Emission	PASS
FCC Part 15.231(c)	-20dB bandwidth	PASS

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

3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen HTT Technology Co.,Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Hereafter the best measurement capability for Shenzhen HTT Technology Co.,Ltd. :

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9k~30MHz	3.17 dB	(1)
Radiated Emission	30~1000MHz	3.45 dB	(1)
Radiated Emission	1~6GHz	3.54 dB	(1)
Radiated Emission	6~40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.66 dB	(1)
RF power, conducted	/	0.16 dB	(1)
Spurious emissions, conducted	/	0.21dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6 Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	Shenzhen C.R.T technology co., LTD	9*6*6	HTT-E028	Aug. 10 2020	Aug. 09 2024
2	Control Room	Shenzhen C.R.T technology co., LTD	4.8*3.5*3.0	HTT-E030	Aug. 10 2020	Aug. 09 2024
3	EMI Test Receiver	Rohde&Schwar	ESCI7	HTT-E022	May 21 2021	May 20 2022
4	Spectrum Analyzer	Rohde&Schwar	FSP	HTT-E037	May 21 2021	May 20 2022
5	Coaxial Cable	ZDecl	ZT26-NJ-NJ-0.6M	HTT-E018	May 21 2021	May 20 2022
6	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-2M	HTT-E019	May 21 2021	May 20 2022
7	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-0.6M	HTT-E020	May 21 2021	May 20 2022
8	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-8.5M	HTT-E021	May 21 2021	May 20 2022
9	Composite logarithmic antenna	Schwarzbeck	VULB 9168	HTT-E017	Aug. 22 2021	Aug. 21 2022
10	Horn Antenna	Schwarzbeck	BBHA9120D	HTT-E016	Aug. 22 2021	Aug. 21 2022
11	Loop Antenna	Zhinan	ZN30900C	HTT-E039	Aug. 22 2021	Aug. 21 2022
12	Horn Antenna	Beijing Hangwei Dayang	OBH100400	HTT-E040	Aug. 22 2021	Aug. 21 2022
13	low frequency Amplifier	Sonoma Instrument	310	HTT-E015	May 21 2021	May 20 2022
14	high-frequency Amplifier	HP	8449B	HTT-E014	May 21 2021	May 20 2022
15	Variable frequency power supply	Shenzhen Anbiao Instrument Co., Ltd	ANB-10VA	HTT-082	May 21 2021	May 20 2022
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	HTT-E004	May 21 2021	May 20 2022
17	Artificial Mains	Rohde & Schwarz	ESH3-Z5	HTT-E006	May 21 2021	May 20 2022
18	Artificial Mains	Rohde & Schwarz	ENV-216	HTT-E038	May 21 2021	May 20 2022
19	Cable Line	Robinson	Z302S-NJ-BNCJ-1.5M	HTT-E001	May 21 2021	May 20 2022
20	Attenuator	Robinson	6810.17A	HTT-E007	May 21 2021	May 20 2022
21	Variable frequency power supply	Shenzhen Yanghong Electric Co., Ltd	YF-650（5KVA）	HTT-E032	May 21 2021	May 20 2022
22	Control Room	Shenzhen C.R.T technology co., LTD	8*4*3.5	HTT-E029	May 21 2021	May 20 2022
23	DC power supply	Agilent	E3632A	HTT-E023	May 21 2021	May 20 2022
24	EMI Test Receiver	Agilent	N9020A	HTT-E024	May 21 2021	May 20 2022
25	Analog signal generator	Agilent	N5181A	HTT-E025	May 21 2021	May 20 2022
26	Vector signal generator	Agilent	N5182A	HTT-E026	May 21 2021	May 20 2022
27	Power sensor	Keysight	U2021XA	HTT-E027	May 21 2021	May 20 2022
28	Temperature and humidity meter	Shenzhen Anbiao Instrument Co., Ltd	TH10R	HTT-074	May 21 2021	May 20 2022
29	Radiated Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
30	Conducted Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
31	RF Test Software	panshanrf	TST	N/A	N/A	N/A
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	Shenzhen C.R.T technology co., LTD	9*6*6	HTT-E028	Aug. 10 2020	Aug. 09 2024
2	Control Room	Shenzhen C.R.T technology co., LTD	4.8*3.5*3.0	HTT-E030	Aug. 10 2020	Aug. 09 2024
3	EMI Test Receiver	Rohde&Schwar	ESCI7	HTT-E022	May 21 2021	May 20 2022

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12	Horn Antenna	Beijing Hangwei Dayang	OBH100400	HTT-E040	Aug. 22 2021	Aug. 21 2022
13	low frequency Amplifier	Sonoma Instrument	310	HTT-E015	May 21 2021	May 20 2022
14	high-frequency Amplifier	HP	8449B	HTT-E014	May 21 2021	May 20 2022
15	Variable frequency power supply	Shenzhen Anbiao Instrument Co., Ltd	ANB-10VA	HTT-082	May 21 2021	May 20 2022
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	HTT-E004	May 21 2021	May 20 2022
17	Artificial Mains	Rohde & Schwarz	ESH3-Z5	HTT-E006	May 21 2021	May 20 2022
18	Artificial Mains	Rohde & Schwarz	ENV-216	HTT-E038	May 21 2021	May 20 2022
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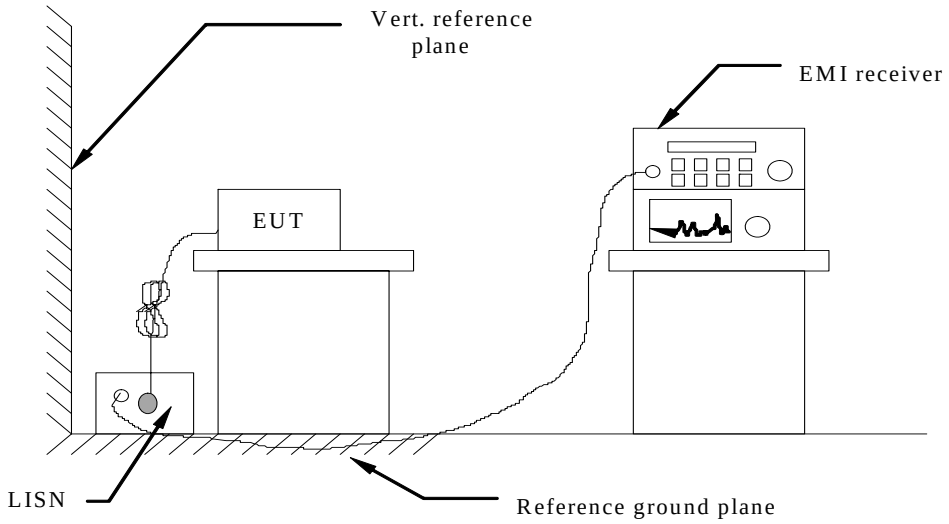
29	Radiated Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
30	Conducted Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
31	RF Test Software	panshanrf	TST	N/A	N/A	N/A

Note: The Cal.Interval was one year.

4 TEST CONDITIONS AND RESULTS

4.1 AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received DC 12V power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT.The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

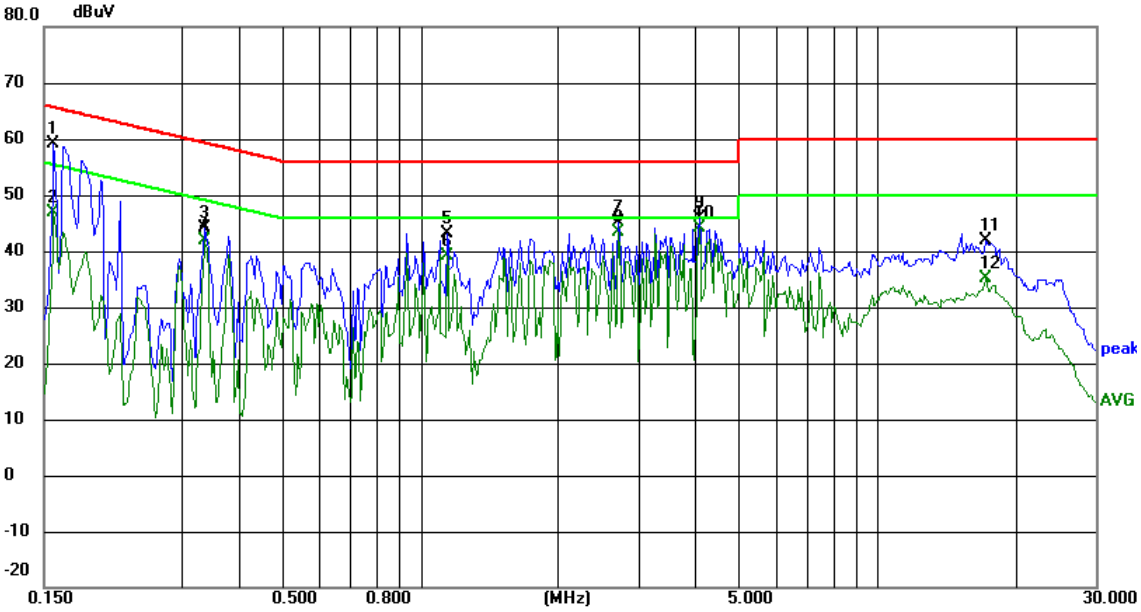
For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

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 RESULTS

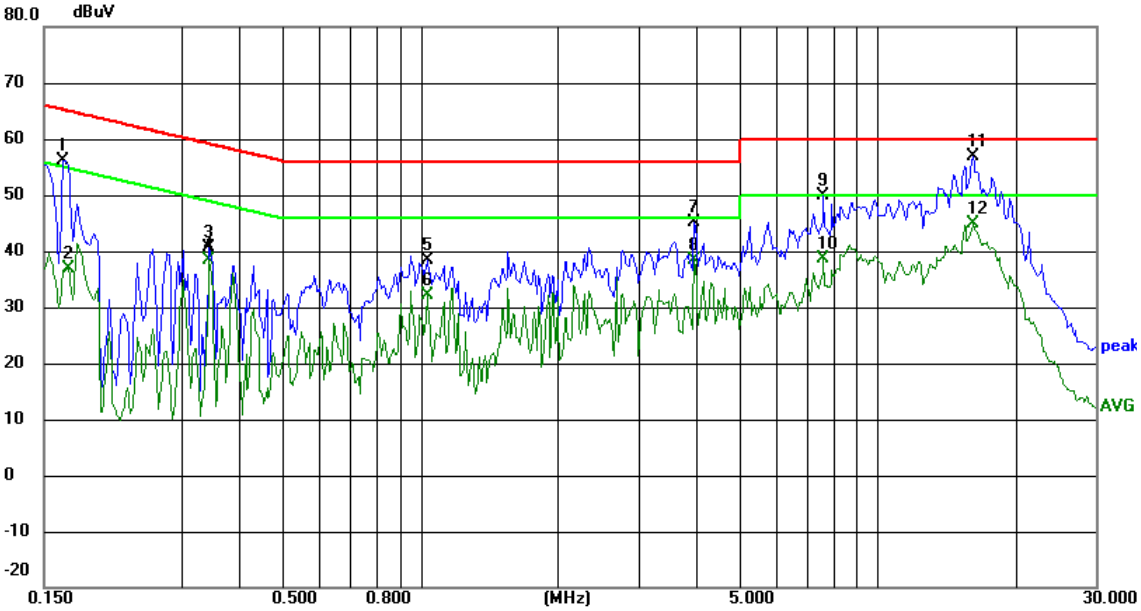
Pass

Measurement data:
Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1577	49.28	9.78	59.06	65.58	-6.52	peak	P
2	0.1577	36.99	9.78	46.77	55.58	-8.81	AVG	P
3	0.3371	34.45	9.76	44.21	59.27	-15.06	peak	P
4	0.3371	32.04	9.76	41.80	49.27	-7.47	AVG	P
5	1.1445	33.40	9.79	43.19	56.00	-12.81	peak	P
6	1.1445	29.46	9.79	39.25	46.00	-6.75	AVG	P
7	2.7122	35.24	9.83	45.07	56.00	-10.93	peak	P
8	2.7122	33.53	9.83	43.36	46.00	-2.64	AVG	P
9	4.0724	35.97	9.89	45.86	56.00	-10.14	peak	P
10 *	4.0724	34.18	9.89	44.07	46.00	-1.93	AVG	P
11	17.2584	13.99	27.78	41.77	60.00	-18.23	peak	P
12	17.2584	7.31	27.78	35.09	50.00	-14.91	AVG	P

Neutral:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1655	46.48	9.77	56.25	65.18	-8.93	peak	P
2	0.1695	27.15	9.77	36.92	54.98	-18.06	AVG	P
3	0.3447	30.81	9.76	40.57	59.09	-18.52	peak	P
4	0.3447	28.70	9.76	38.46	49.09	-10.63	AVG	P
5	1.0353	28.65	9.79	38.44	56.00	-17.56	peak	P
6	1.0353	22.33	9.79	32.12	46.00	-13.88	AVG	P
7	3.9788	35.22	9.89	45.11	56.00	-10.89	peak	P
8	3.9788	28.52	9.89	38.41	46.00	-7.59	AVG	P
9	7.6135	32.31	17.65	49.96	60.00	-10.04	peak	P
10	7.6135	20.92	17.65	38.57	50.00	-11.43	AVG	P
11 *	16.1585	30.39	26.61	57.00	60.00	-3.00	peak	P
12	16.1585	18.22	26.61	44.83	50.00	-5.17	AVG	P

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Los

4.2 Radiated Emission

Limit

For intentional device, according to 15.209(a) the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

In addition to the provisions of 15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

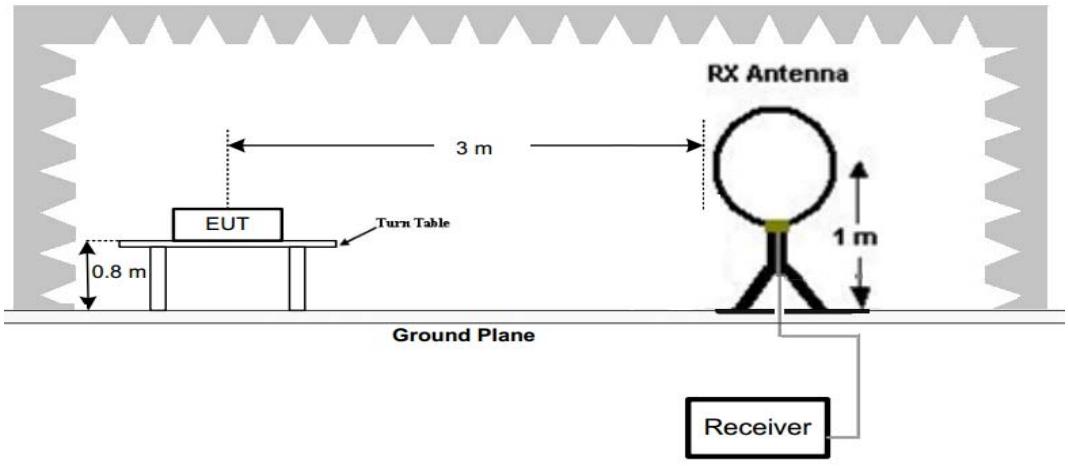
Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66–40.70.	2,250	225
70–130	1,250	125
130–174	[1] 1,250 to 3,750	[1] 125 to 375
174–260	3,750	375
260–470	[1] 3,750 to 12,500	[1] 375 to 1,250
Above 470	12,500	1,250

[1] Linear interpolations.

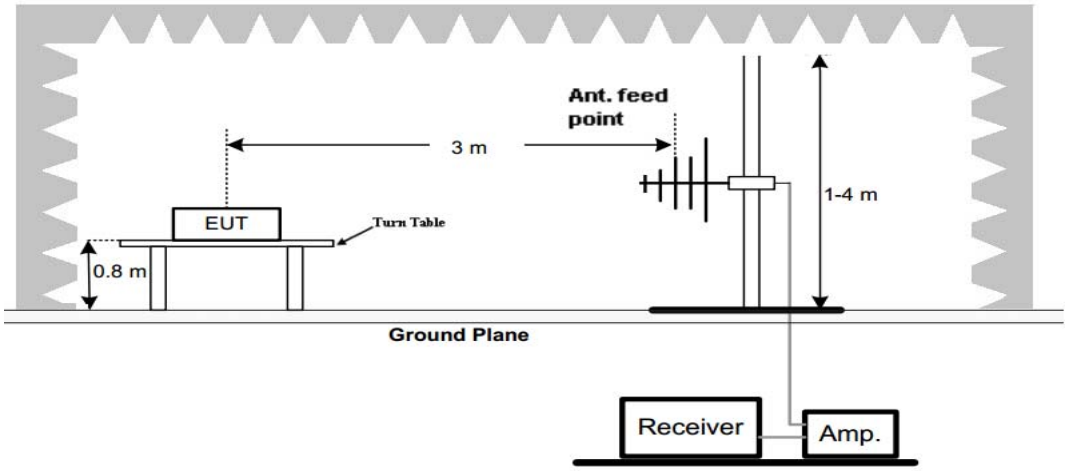
[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 260-470 MHz, 20*log(41.6667*433.890-7083.3333)=80.82dBuV/m The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

TEST CONFIGURATION

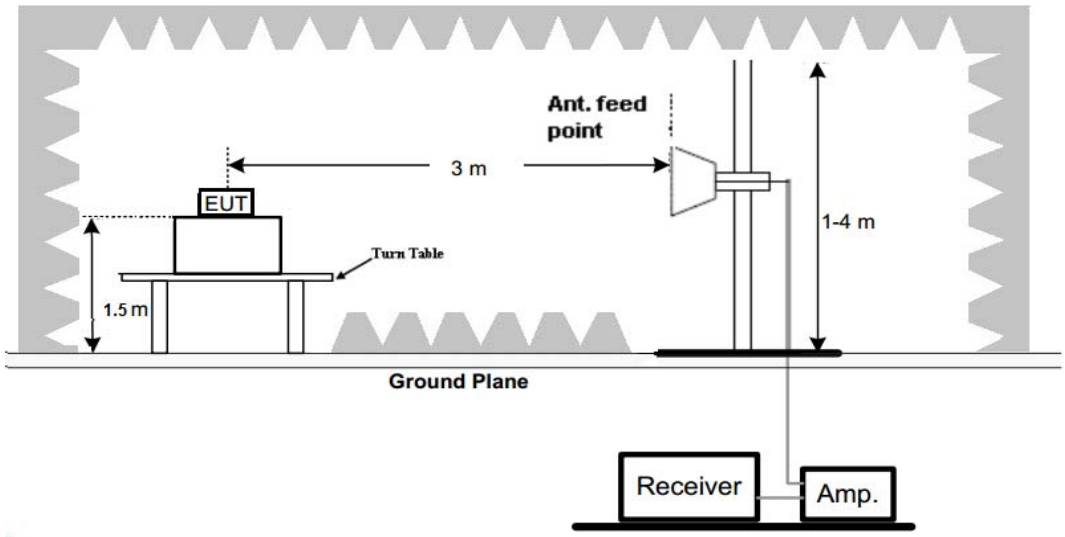
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

TEST RESULTS

PASS

Remark:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.

Below 30M

Temperature:	22℃	Relative Humidity:	48%
Test Date:	2022-03-24	Pressure:	1010hPa
Test Voltage:	DC3.7V from battery	Test Mode:	TX

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	P
--	--	--	--	P

Note:

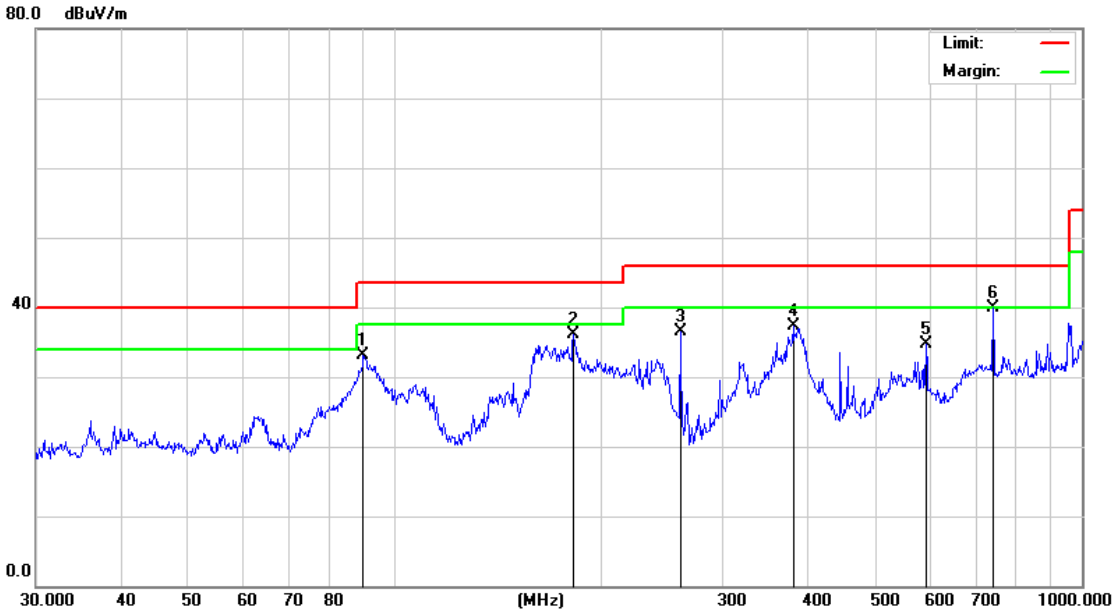
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =20 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor

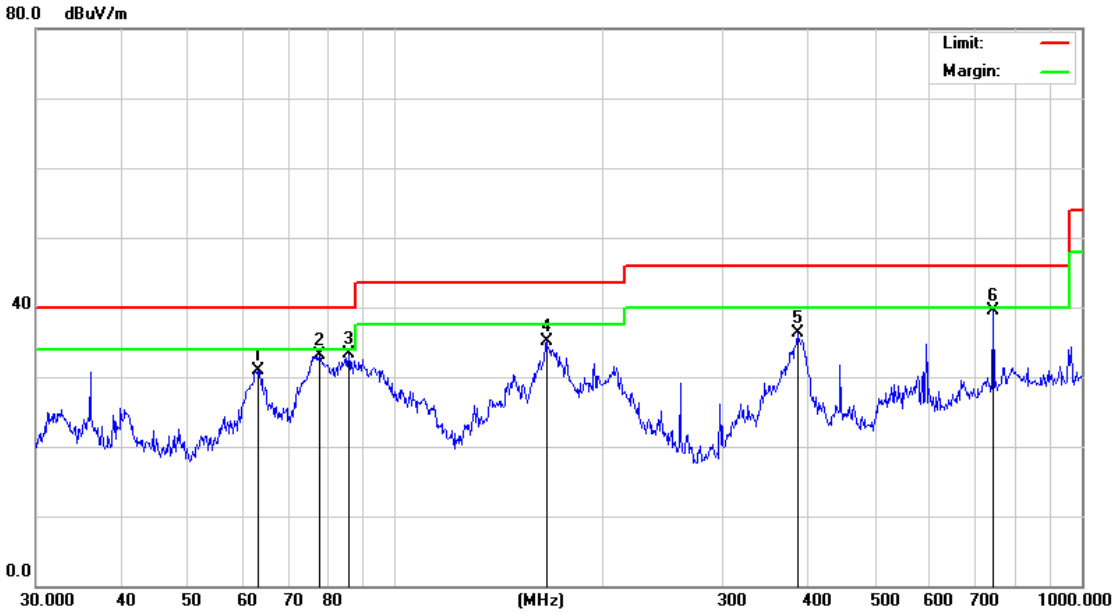
BETWEEN 30 – 1000 MHz Test Results:

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		89.9047	41.67	-8.64	33.03	43.50	-10.47	QP
2		181.9202	41.67	-5.62	36.05	43.50	-7.45	QP
3		260.1444	45.28	-8.87	36.41	46.00	-9.59	QP
4		379.9141	42.01	-4.62	37.39	46.00	-8.61	QP
5		593.0497	30.33	4.31	34.64	46.00	-11.36	QP
6	*	742.2587	32.86	7.00	39.86	46.00	-6.14	QP

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		63.0916	39.15	-8.30	30.85	40.00	-9.15	QP
2		77.5928	43.86	-10.77	33.09	40.00	-6.91	QP
3		85.5977	43.96	-10.63	33.33	40.00	-6.67	QP
4		166.0680	44.15	-8.97	35.18	43.50	-8.32	QP
5		385.2805	40.66	-4.26	36.40	46.00	-9.60	QP
6	*	742.2587	34.35	5.14	39.49	46.00	-6.51	QP

Radiated Emission test (1GHz-6GHz)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Remark
V	1248.794	52.73	-12.41	40.32	74.00	-33.68	peak
V	1996.946	52.34	-9.70	42.64	74.00	-31.36	peak
V	2137.648	49.93	-8.35	41.58	74.00	-32.42	peak
V	3136.610	44.09	-7.07	37.02	74.00	-36.98	peak
V	3966.416	43.46	-2.67	40.79	74.00	-33.21	peak
V	4917.863	42.10	0.04	42.14	74.00	-31.86	peak
H	1742.717	47.96	-11.13	36.83	74.00	-37.17	peak
H	1882.294	47.75	-10.46	37.29	74.00	-36.71	peak
H	2317.144	44.68	-9.22	35.46	74.00	-38.54	peak
H	3492.606	45.09	-5.32	39.77	74.00	-34.23	peak
H	3909.967	43.63	-3.03	40.60	74.00	-33.40	peak
H	4891.499	42.14	0.01	42.15	74.00	-31.85	peak

Remark:
1.Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level – Limit
2.If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

Temperature:	22℃	Relative Humidity:	48%
Test Voltage:	DC3.7V from battery	Pressure:	1010hPa
Test Mode:	TX	Polarization:	Horizontal

Frequency	Average Factor	Field Strength	Field Strength	Limit(PK)	Limit(AV)	State
MHz	dB	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
433.92	-6.20	83.77	77.57	100.83	80.83	pass
867.84	-6.20	42.51	36.31	80.83	60.83	pass
1301.76	-6.20	39.25	33.05	74.00	54.00	pass
1735.68	-6.20	37.05	30.85	80.83	60.83	pass

Temperature:	22℃	Relative Humidity:	48%
Test Voltage:	DC3.7V from battery	Pressure:	1010hPa
Test Mode:	TX	Polarization:	Vertical

Frequency	Average Factor	Field Strength	Field Strength	Limit(PK)	Limit(AV)	State
MHz	dB	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
433.92	-6.20	80.62	74.42	100.83	80.83	pass
867.84	-6.20	37.89	31.69	80.83	60.83	pass
1301.76	-6.20	37.02	30.82	74.00	54.00	pass
1735.68	-6.20	36.12	29.92	80.83	60.83	pass

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

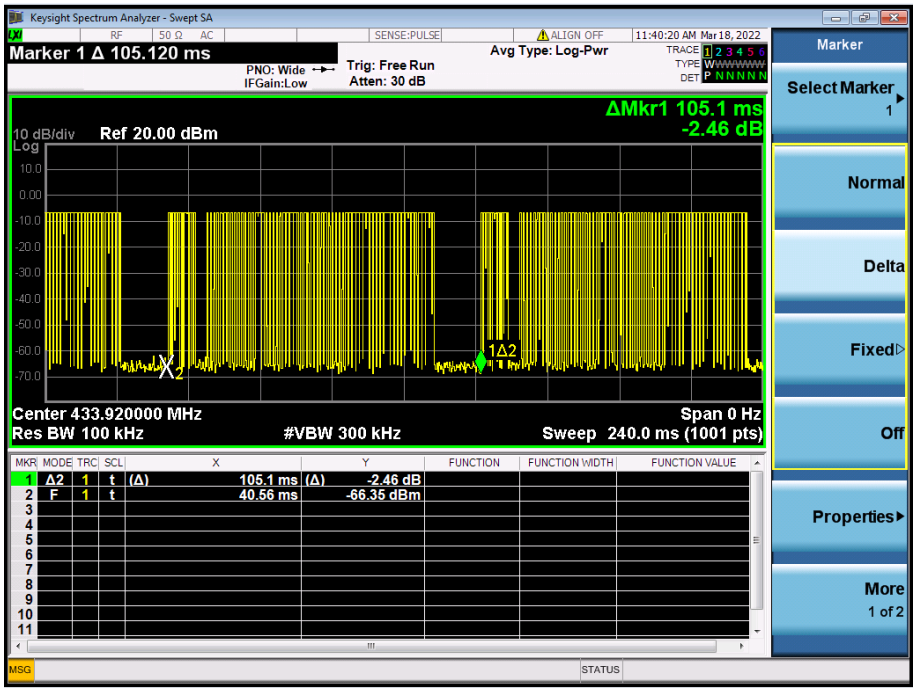
Note: 1. EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report(Z orientation).
2. *Calculate Average value based on Duty Cycle correction factor:
Duty Cycle=Ton/(Ton+Toff)= (0.395ms*39+0.840ms*40)/100ms =0.49=49%
Duty Cycle factor=20lg(Duty Cycle)=20lg(0.49)= -6.20dB
Average=Peak+ Duty Cycle factor
3. Pulse Desensitization Correction Factor
Pulse Width(PW)=49.005ms
2/PW=2/49.005ms=0.04kHz
RBW(100kHz)＞2/PW (0.04KHz)
Therefore PDCF is not needed

Duty Cycle:

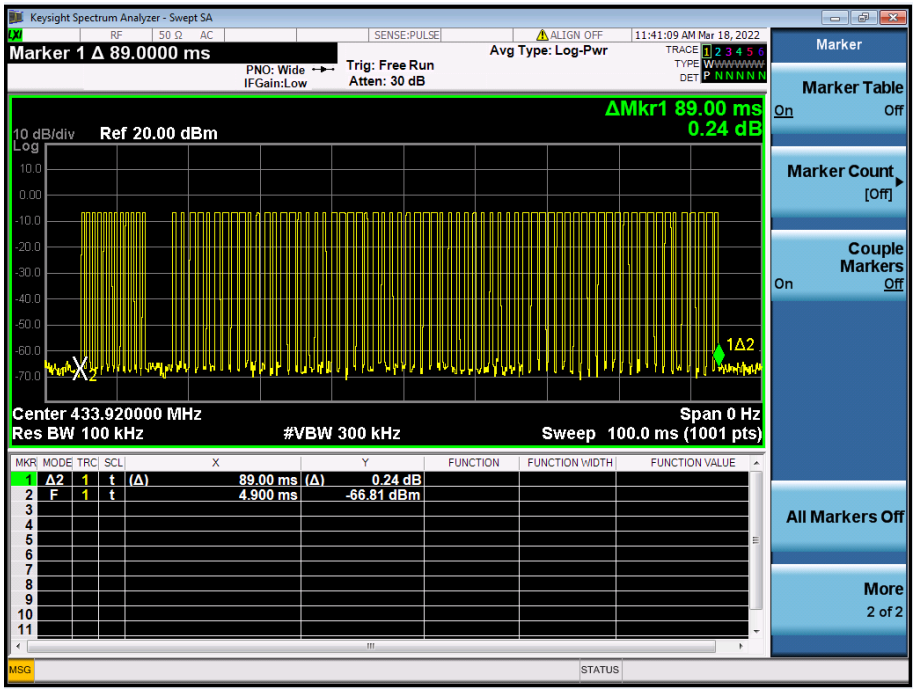
The duty cycle is simply the on time divided by the period:
The duration of one cycle = 105.1ms
Effective period of the cycle = 0.395ms*39+0.840ms*40=49.005ms

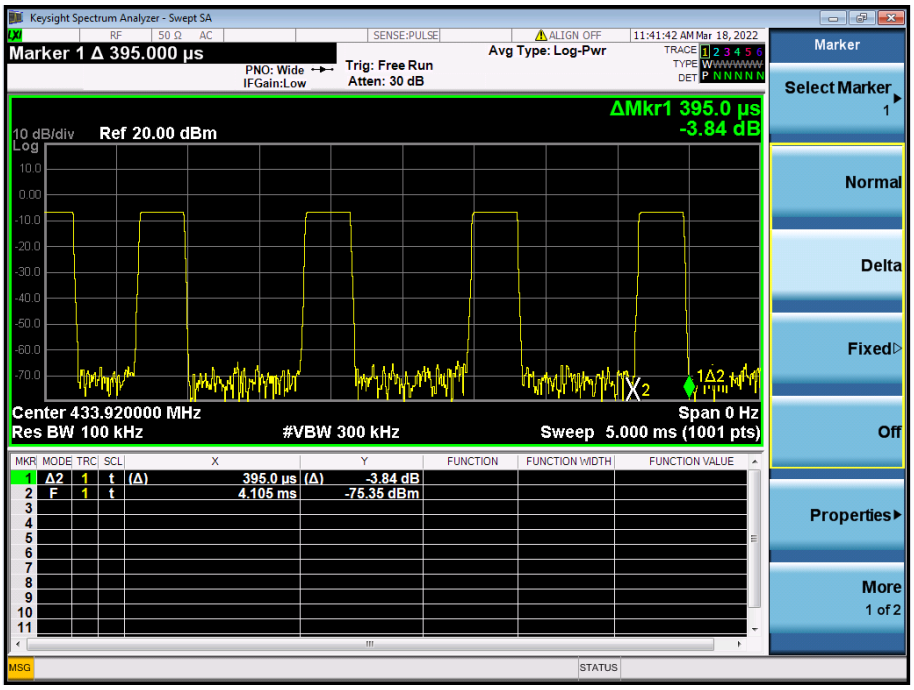
Duty Cycle = 49.005ms/100ms =0.49

(The plot of Duty Cycle See the follow page)

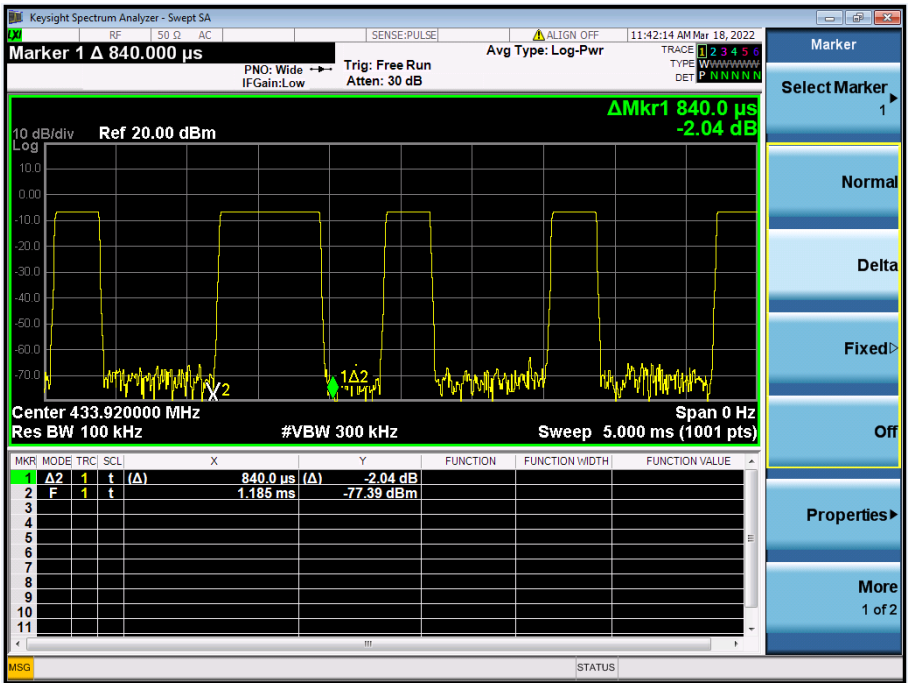


(Transmit cycle 105.1ms)





(Time per burst: 0.395ms*39pcs)



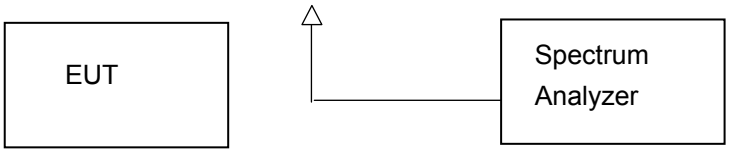
(Time per burst: 0.840ms*40pcs)

4.3 20dB Bandwidth

Limit

According to 47 CFR 15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the centre frequency for devices operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

Test Configuration



Test Procedure

The 20dB bandwidth and 99% bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Test Results

Modulation	Channel Frequency (MHz)	99% OBW (KHz)	20dB bandwidth (KHz)	Limit (KHz)	Result
ASK	433.9200	65.242	46.44	0.25%*433.9200=1084.8	Pass

Test plot as follows:

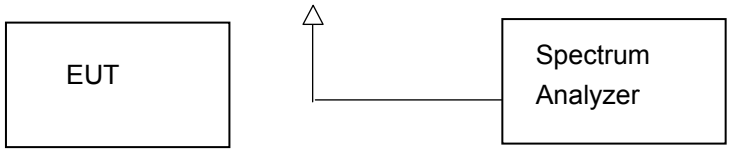
ASK Modulation

4.4 Deactivation Time

Limit

According to FCC §15.231(a)(2), A transmitter activated automatically shall cease transmission within 5 seconds after activation.

Test Configuration



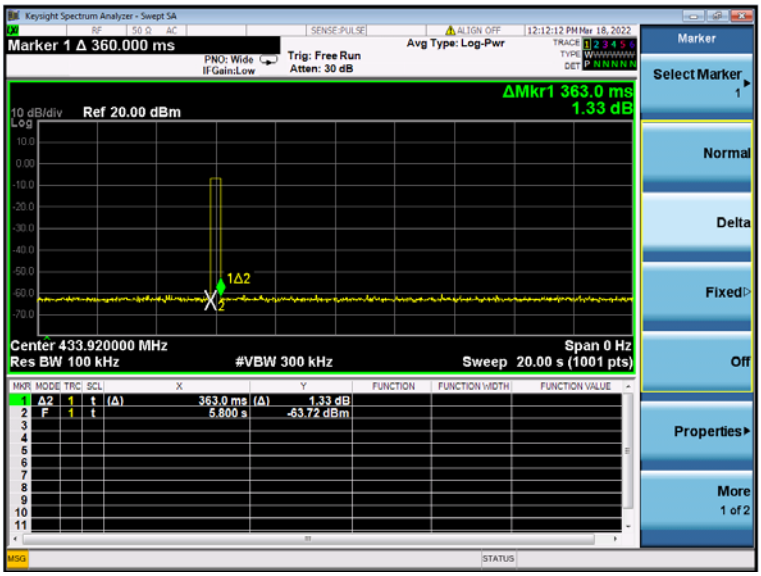
Test Procedure

1. The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
2. The spectrum analyzer resolution bandwidth was set to100 kHz and video bandwidth was set to 300kHz to encompass all significant spectral components during the test. The spectrum analyzer was operated in linear scale and zero span mode after tuning to the transmitter carrier frequency.

TEST RESULTS

Note: The transmitter was automatically activated:

Frequency (MHz)	One transmission time (S)	Limit(S)	Result
433.9200	0.363	5	Pass



4.5 Antenna Requirement

Standard Applicable

According to FCC Part 15C 15.203

a) An intentional radiator shall be de-signed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

b) 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.

Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is an Internal Antenna, The directional gains of antenna used for transmitting is 1.0 dBi.

Remark:The antenna gain is provided by the customer , if the data provided by the customer is not accurate, Shenzhen HTT Technology Co.,Ltd. does not assume any responsibility.

5 Test Setup Photos of the EUT

Reference to the **appendix I** for details

6 Photos of the EUT

Reference to the **appendix II** for details.

********** End of Report **********