



FCC Part 15C Test Report

FCC ID:2ATVVYTS-8110T

Product Name:	Wireless Tour Guide System
Trademark:	N/A
Model Name :	YTS-8110T
Prepared For :	Guangzhou Youxin Technology Co., Ltd.
Address :	Room 607, No.5 Building, Julong Industrial Zone, Xicha Road, Baiyun District, Guangzhou, Guangdong , China
Prepared By :	Shenzhen BCTC Testing Co., Ltd.
Address :	BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	May 08, 2019 to May 30, 2019
Date of Report :	May 30, 2019
Report No.:	BCTC-FY190502360E

VERIFICATION OF COMPLIANCE

Applicant's name Guangzhou Youxin Technology Co., Ltd.

Address Room 607, No.5 Building, Julong Industrial Zone, Xicha Road,
Baiyun District, Guangzhou, Guangdong, China

Manufacture's Name... Guangzhou Youxin Technology Co., Ltd.

Address Room 607, No.5 Building, Julong Industrial Zone, Xicha Road,
Baiyun District, Guangzhou, Guangdong, China

Product description

Product name..... Wireless Tour Guide System

Trademark: N/A

Model Name: YTS-8110T

Test Standards: FCC Part15.236
ANSI C63.10:2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Result..... **Pass**

Prepared by(Engineer): Leke Xie

Reviewer(Supervisor): Eric Yang

Approved(Manager): Zero Zhou

Leke Xie
Eric Yang
Zero Zhou



The seal is a blue circular stamp. The outer ring contains the text 'SHENZHEN BCTC TESTING CO., LTD.' and 'BCTC'. The inner part contains the text 'BCTC APPROVED' and 'SHENZHEN BCTC TESTING CO., LTD.'.

Table of Contents	Page
1 . SUMMARY OF TEST RESULTS	5
1.1 TEST FACILITY	6
1.2 MEASUREMENT UNCERTAINTY	6
2 . GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	8
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	9
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	9
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	10
3 . EMC EMISSION TEST	12
3.1 CONDUCTED EMISSION MEASUREMENT	12
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	12
3.1.2 TEST PROCEDURE	13
3.1.3 DEVIATION FROM TEST STANDARD	13
3.1.4 TEST SETUP	13
3.1.5 EUT OPERATING CONDITIONS	13
3.1.6 TEST RESULTS	14
3.2 RADIATED EMISSION MEASUREMENT	16
3.2.1 RADIATED EMISSION LIMITS	16
3.2.2 TEST PROCEDURE	17
3.2.3 TEST SETUP	19
3.2.4 TEST RESULTS	21
4 . PEAK OUTPUT POWER TEST	29
4.1 APPLIED PROCEDURES / LIMIT	29
4.1.1 TEST PROCEDURE	29
4.1.2 DEVIATION FROM STANDARD	29
4.1.3 TEST SETUP	29
4.1.4 EUT OPERATION CONDITIONS	29
4.1.5 TEST RESULTS	30
5 . BANDWIDTH TEST	31
5.1 APPLIED PROCEDURES / LIMIT	31
5.1.1 TEST PROCEDURE	31
5.1.2 DEVIATION FROM STANDARD	31
5.1.3 TEST SETUP	31
5.1.4 EUT OPERATION CONDITIONS	31
5.1.5 TEST RESULTS	32



Table of Contents	Page
6 . FREQUENCY STABILITY	34
6.1 APPLICABLE STANDARD	34
6.2 TEST PROCEDURE	34
6.3 DEVIATION FROM STANDARD	34
6.4 TEST SETUP	34
6.5 EUT OPERATION CONDITIONS	34
7 . ANTENNA REQUIREMENT	37
7.1 STANDARD REQUIREMENT	37
7.2 EUT ANTENNA	37
8 . EUT TEST PHOTO	38
9 . EUT PHOTO	40
APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.236) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207(a)	Conducted Emission	PASS	
15.236(g)	Transmitter Spurious Emissions & Emission mask	PASS	
15.236(d)	PEAK OUTPUT POWER	PASS	
15.236 (f)	Occupy Bandwidth	PASS	
15.236(f)(3)	Frequency stability	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report



1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.

Add.: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 712850

IC Registered No.: 23583

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
4	Conducted Adjacent channel power	U=1.38dB
5	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59℃



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Tour Guide System	
Trade Name	N/A	
Model Name	YTS-8110T	
Model Difference	N/A	
Product Description	Operation Frequency:	186.9-215.7MHz
	Modulation Type:	DQPSK
	Antenna Type:	External antenna
	Antenna Gain:	1dBi
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Ratings	DC 3.7V	
Connecting I/O Port(s)	Please refer to the User's Manual	
hardware version	H1.0	
Software version	V1.0	
Serial number	N/A	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.2 DESCRIPTION OF TEST MODES

For All Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH85
Mode 3	CH97
Mode 4	Link mode(conducted emission and Radiated emission)

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	215.7	27	207.9	53	200.1	79	192.3
02	215.4	28	207.6	54	199.8	80	192
03	215.1	29	207.3	55	199.5	81	191.7
04	214.8	30	207	56	199.2	82	191.4
05	214.5	31	206.7	57	198.9	83	191.1
06	214.2	32	206.4	58	198.6	84	190.8
07	213.9	33	206.1	59	198.3	85	190.5
08	213.6	34	205.8	60	198	86	190.2
09	213.3	35	205.5	61	197.7	87	189.9
10	213	36	205.2	62	197.4	88	189.6
11	212.7	37	204.9	63	197.1	89	189.3
12	212.4	38	204.6	64	196.8	90	189
13	212.1	39	204.3	65	196.5	91	188.7
14	211.8	40	204	66	196.2	92	188.4
15	211.5	41	203.7	67	195.9	93	188.1
16	211.2	42	203.4	68	195.6	94	187.8
17	210.9	43	203.1	69	195.3	95	187.5
18	210.6	44	202.8	70	195	96	187.2
19	210.3	45	202.5	71	194.7	97	186.9
20	210	46	202.2	72	194.4		
21	209.7	47	201.9	73	194.1		
22	209.4	48	201.6	74	193.8		
23	209.1	49	201.3	75	193.5		
24	208.8	50	201	76	193.2		
25	208.5	51	200.7	77	192.9		
26	208.2	52	200.4	78	192.6		

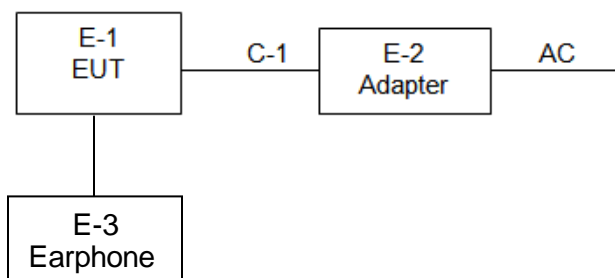
Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

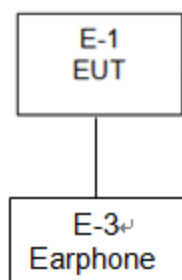


2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Spurious emissions



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Wireless Tour Guide System	N/A	YTS-8110T	N/A	EUT
E-2	Adapter	N/A	BCTC005	N/A	Auxiliary
E-3	Earphone	N/A	N/A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2M	DC cable unshielded

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45109572	2018.06.20	2019.06.20
2	Test Receiver (9kHz-7GHz)	R&S	ESR7	101154	2018.06.20	2019.06.20
3	Bilog Antenna (30MHz-3GHz)	SCHWARZBE CK	VULB9163	VULB9163-94 2	2018.06.23	2019.06.23
4	Horn Antenna (1GHz-18GHz)	SCHWARZBE CK	BBHA9120D	1541	2018.06.23	2021.06.22
5	Horn Antenna (18GHz-40GHz)	SCHWARZBE CK	BBHA9170	822	2018.08.06	2019.08.06
6	Amplifier (9KHz-6GHz)	SCHWARZBE CK	BBV9744	9744-0037	2018.06.20	2019.06.20
7	Amplifier (0.5GHz-18GHz)	SCHWARZBE CK	BBV9718	9718-309	2018.06.20	2019.06.20
8	Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35- HG	2034381	2018.08.06	2019.08.06
9	Loop Antenna (9KHz-30MHz)	SCHWARZBE CK	FMZB1519B	014	2018.06.23	2019.06.23
10	RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B17022108-00 08	2019.02.12	2020.02.12
11	RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	2019.03.27	2020.03.27
12	RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	2018.06.19	2019.06.19
13	Power Metter	Keysight	E4419	\	2018.06.15	2019.06.15
14	Power Sensor (AV)	Keysight	E9 300A	\	2018.06.15	2019.06.15
15	Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	2018.08.14	2019.08.13
16	Test Receiver 9kHz-40GHz	R&S	FSP40	100550	2018.06.13	2019.06.12
17	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
18	Software	Frad	EZ-EMC	FA-03A2 RE	\	\



Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESR3	102075	2018.06.20	2019.06.20
2	LISN	SCHWARZBECK	NSLK8127	8127739	2018.06.19	2019.06.19
3	LISN	R&S	ENV216	101375	2018.06.20	2019.06.20
4	RF cables	Huber+Suhnar	9kHz-30MHz	B17022108-0008	2019.02.12	2020.02.12
5	Software	Frad	EZ-EMC	EMC-CON 3A1	\	\



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

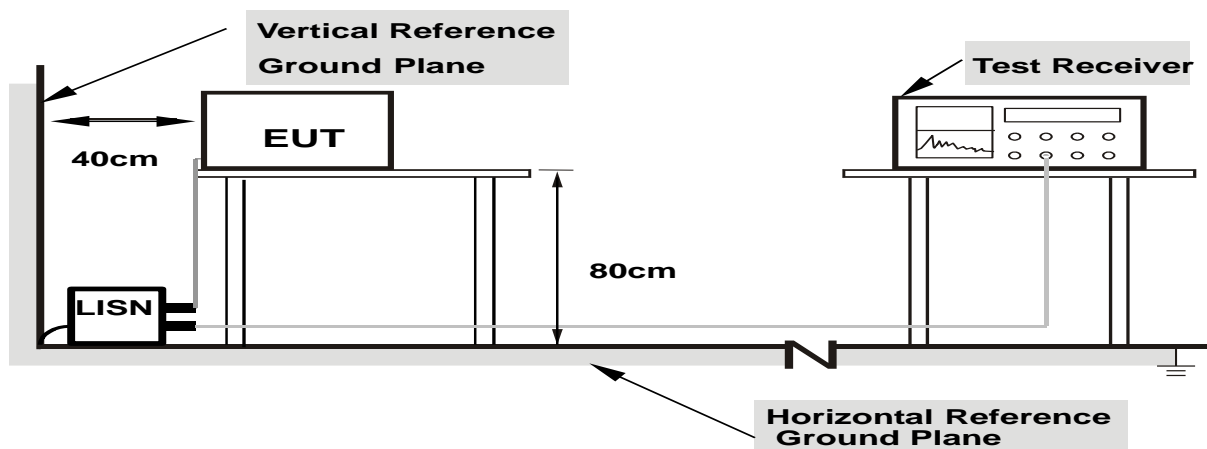
3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

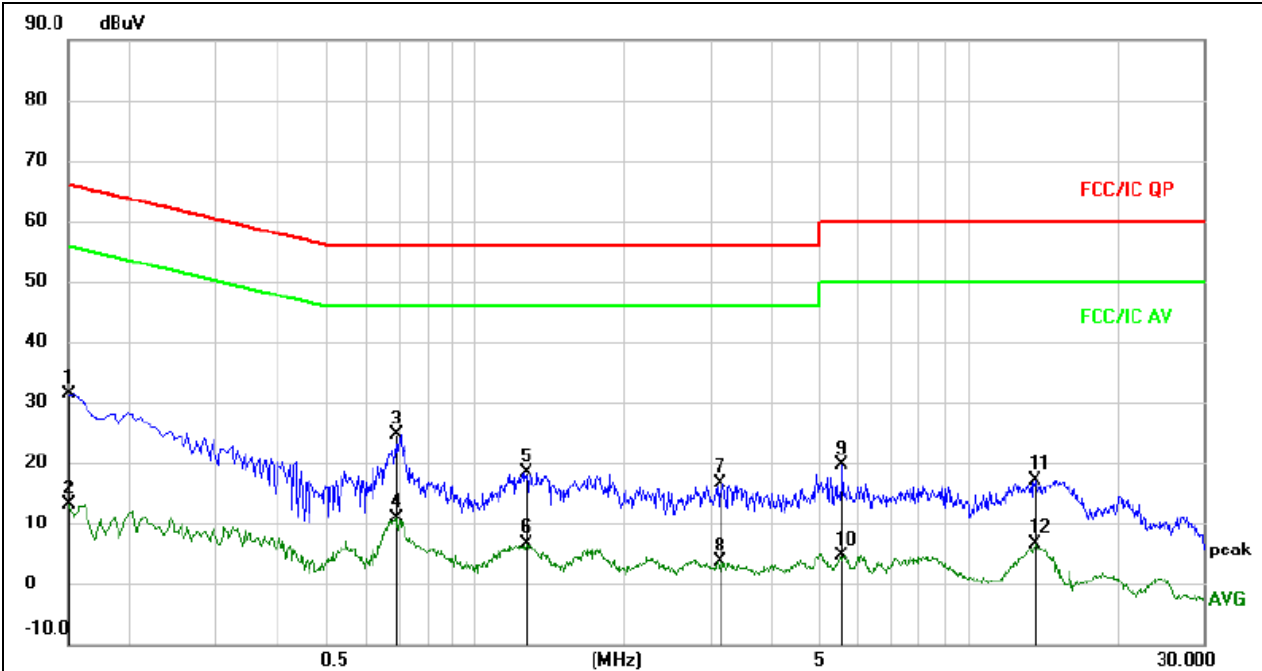
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.



3.1.6 TEST RESULTS

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 4



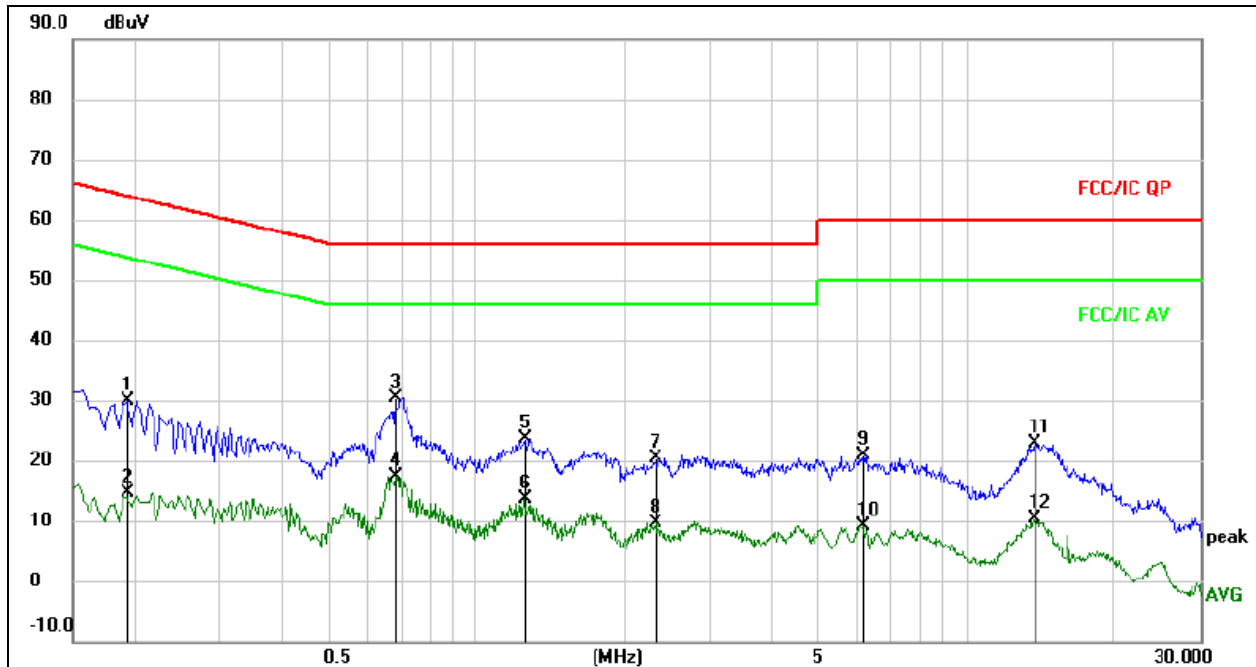
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	21.80	9.52	31.32	66.00	-34.68	QP	
2		0.1500	3.58	9.52	13.10	56.00	-42.90	AVG	
3	*	0.6900	14.87	9.68	24.55	56.00	-31.45	QP	
4		0.6900	1.10	9.68	10.78	46.00	-35.22	AVG	
5		1.2700	8.76	9.58	18.34	56.00	-37.66	QP	
6		1.2700	-2.92	9.58	6.66	46.00	-39.34	AVG	
7		3.1420	6.88	9.67	16.55	56.00	-39.45	QP	
8		3.1420	-6.00	9.67	3.67	46.00	-42.33	AVG	
9		5.5539	9.77	9.78	19.55	60.00	-40.45	QP	
10		5.5539	-5.11	9.78	4.67	50.00	-45.33	AVG	
11		13.6779	7.54	9.70	17.24	60.00	-42.76	QP	
12		13.6779	-3.13	9.70	6.57	50.00	-43.43	AVG	



Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 4



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1940	20.38	9.47	29.85	63.86	-34.01	QP	
2		0.1940	5.24	9.47	14.71	53.86	-39.15	AVG	
3	*	0.6860	20.73	9.70	30.43	56.00	-25.57	QP	
4		0.6860	7.73	9.70	17.43	46.00	-28.57	AVG	
5		1.2460	14.18	9.57	23.75	56.00	-32.25	QP	
6		1.2460	3.96	9.57	13.53	46.00	-32.47	AVG	
7		2.3140	10.70	9.61	20.31	56.00	-35.69	QP	
8		2.3140	0.04	9.61	9.65	46.00	-36.35	AVG	
9		6.1419	11.23	9.75	20.98	60.00	-39.02	QP	
10		6.1419	-0.53	9.75	9.22	50.00	-40.78	AVG	
11		13.7459	13.13	9.70	22.83	60.00	-37.17	QP	
12		13.7459	0.59	9.70	10.29	50.00	-39.71	AVG	

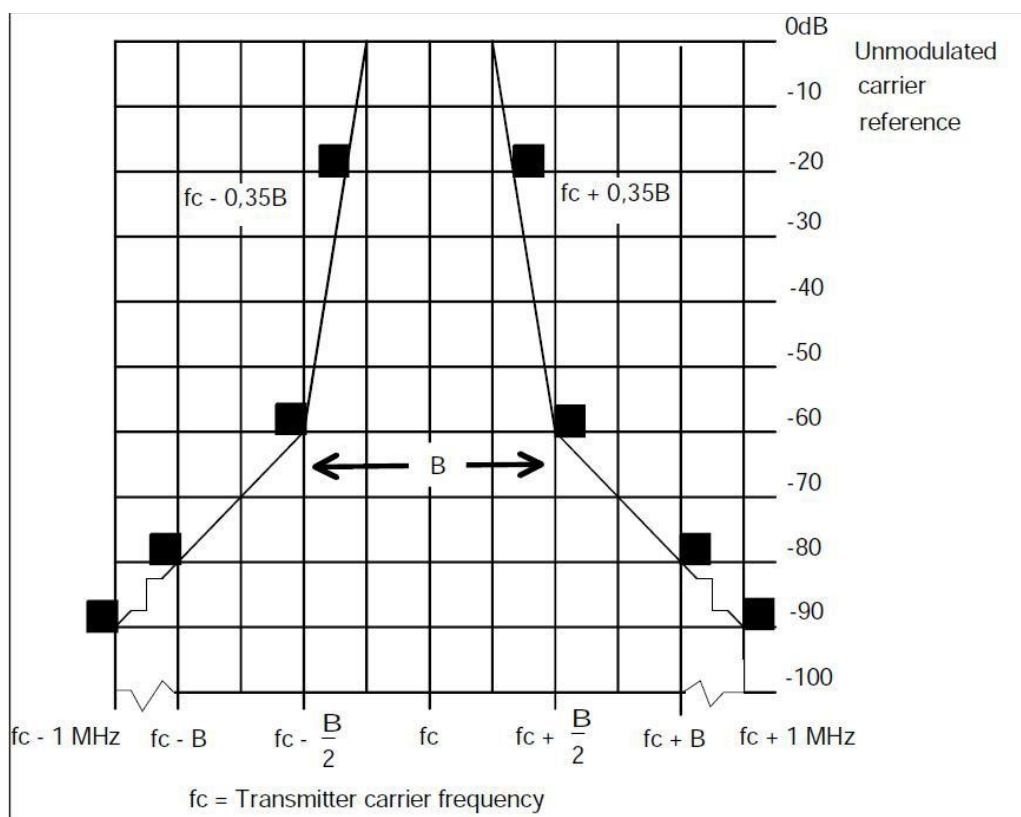
3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

According to FCC 15.236(g), Emission within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in Section 8.3 of ETSI EN 300422-1. Emissions outside this band shall comply with the limit specified at the edges of the ETSI mask.

State	Frequency		
	47MHz to 74MHz 87.5MHz to 137MHz 174MHz to 230MHz 470MHz to 862MHz	Other frequencies Below 1000MHz	Frequency above 1000MHz
Operation	4nW(-54dBm)	250nW(-36dBm)	1uW(-30dBm)
Standby	2nW(-57dBm)	2nW(-57dBm)	20nW(-57dBm)

Limits for Emission Mask





Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW setting	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case was X axis and the emissions were reported

Emission Mask test procedure



Necessary Bandwidth (BN) for Analogue Systems Method of Measurement

The arrangement of test equipment as shown in figure B.1 shall be used. Note that the noise meter conforms to (quasi peak) without weighting filter (flat).

With the Low Frequency (LF) audio signal generator set to 500 Hz, the audio input level to the EUT shall be adjusted to 8 dB below the limiting threshold (-8 dB (lim)) as declared by the manufacturer.

The corresponding audio output level from the demodulator shall be measured and recorded.

The input impedance of the noise meter shall be sufficiently high to avoid more than 0,1 dB change in input level when the meter is switched between input and output. The audio input level shall be increased by 20 dB, i.e. to +12 dB (lim), and the corresponding change in output level shall be measured.

It shall be checked that the audio output level has increased by ≤ 10 dB.

If this condition is not met, the initial audio input level shall be increased from -8 dB (lim) in 1 dB steps until the above condition is fulfilled, and the input level recorded in the test report. This level replaces the value derived from the manufacturer's declaration and is defined as -8 dB (lim).

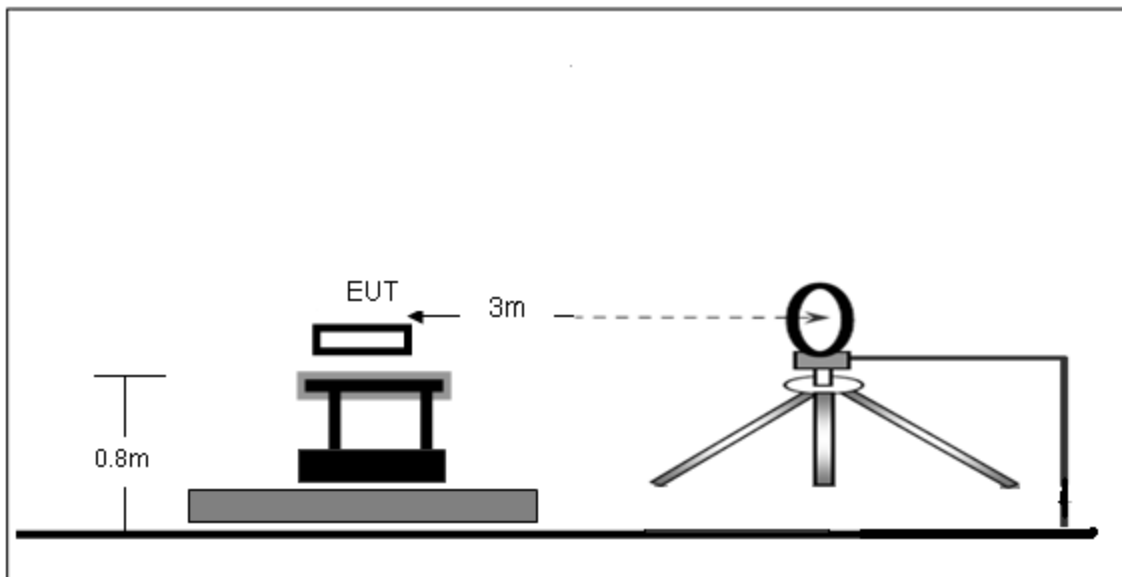
If the transmitter incorporates more than one audio input, e.g. stereo systems, the second and subsequent channels shall be simultaneously driven from the same noise source, attenuated to a level of -6 dB (lim).

The transmitter RF output spectrum shall be measured, using a spectrum analyser with the following settings:

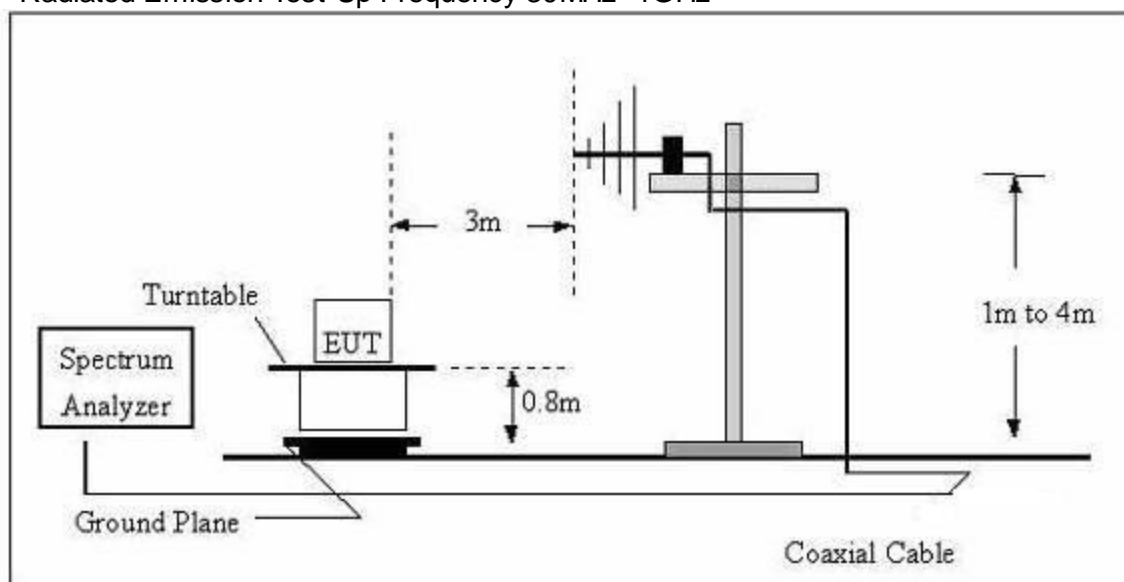
- centre frequency: f_c : Transmitter (Tx) nominal frequency;
- dispersion (Span): $f_c - 1$ MHz to $f_c + 1$ MHz;
- Resolution BandWidth (RBW): 1 kHz;
- Video BandWidth (VBW): 1 kHz; - detector: Peak hold.

3.2.3 TEST SETUP

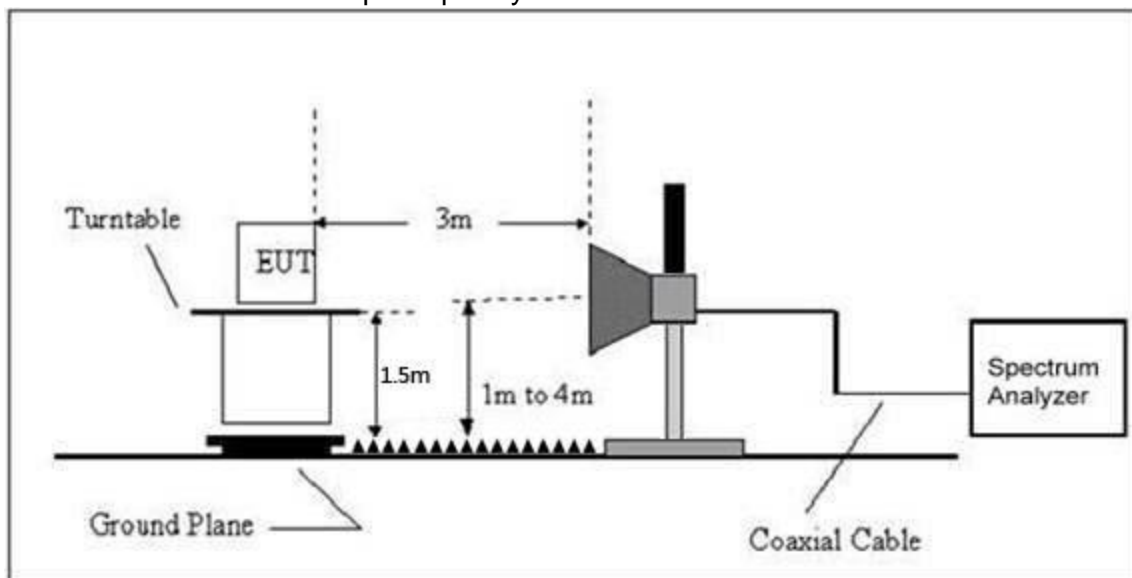
(A) Radiated Emission Test-Up Frequency Below 30MHz



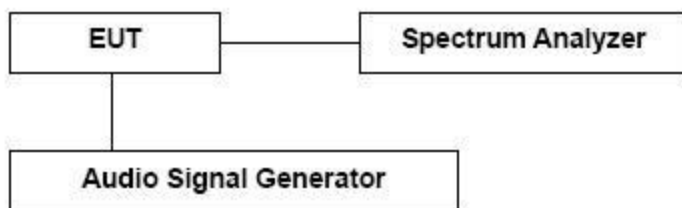
(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



Emission Mask Test set-up.





3.2.4 TEST RESULTS

Radiated Spurious Emission (Below 9KHz – 30MHz)

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101 kPa	Polarization :	---
Test Voltage :	DC 3.7V		
Test Mode :	TX Mode		

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

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 = $40 \log (\text{specific distance/test distance})$ (dB);

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



Radiated Spurious Emission (Between 30MHz – 1GHz)

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Phase :	H
Test Voltage :	DC 3.7V	Test Mode :	Mode 1

No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	34.5487	-62.35	-36.00	-26.35	0	100	peak
2	42.6224	-67.62	-54.00	-13.62	0	100	peak
3	61.6581	-70.51	-54.00	-16.51	0	100	peak
4	103.5120	-70.84	-54.00	-16.84	0	100	peak
5	401.5849	-65.95	-54.00	-11.95	0	100	peak
6	510.2345	-61.34	-54.00	-7.34	0	100	peak

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Phase :	V
Test Voltage :	DC 3.7V	Test Mode :	Mode 1

No.	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Degree ()	Height (cm)	Remark
1	59.1313	-62.35	-54.00	-8.35	150	150	peak
2	91.7622	-66.62	-54.00	-12.62	150	150	peak
3	172.8240	-67.51	-36.00	-31.51	150	150	peak
4	221.6904	-66.48	-54.00	-12.48	150	150	peak
5	362.4273	-58.95	-36.00	-22.95	150	150	peak
6	524.4034	-60.34	-54.00	-6.34	150	150	peak

Remark: Only Show the worst case.



3.2.5 TEST RESULTS (1GHZ~6GHZ)

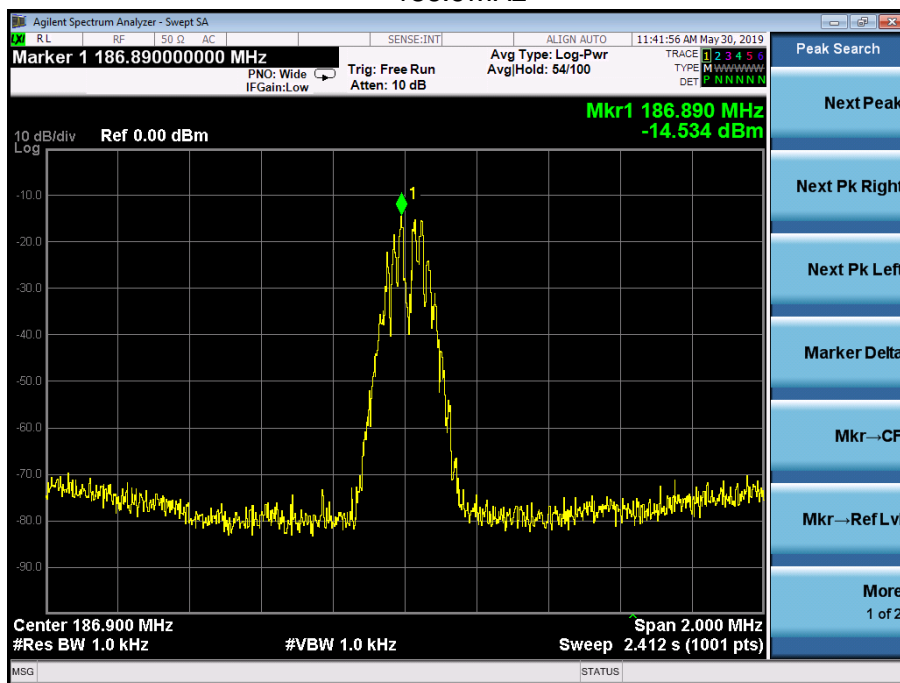
Frequency	SG Reading	Angle	Height	Polar	Result dBm	Limit dBm	Margin dB
MHz	dBm	Degree	Meter	H/V			
1075.00	-40.35	262	1.4	H	-38.62	-30	-8.62
1075.00	-42.24	335	1.4	V	-34.35	-30	-4.35
2741.72	-43.51	151	1.5	H	-36.24	-30	-6.24
2741.72	-45.68	124	1.6	V	-40.91	-30	-10.91
3655.63	-51.57	194	1.6	H	-45.75	-30	-15.75
3655.63	-52.91	158	1.6	V	-47.95	-30	-17.95

Standby mode does not cause any spurious emissions and no peak detected.

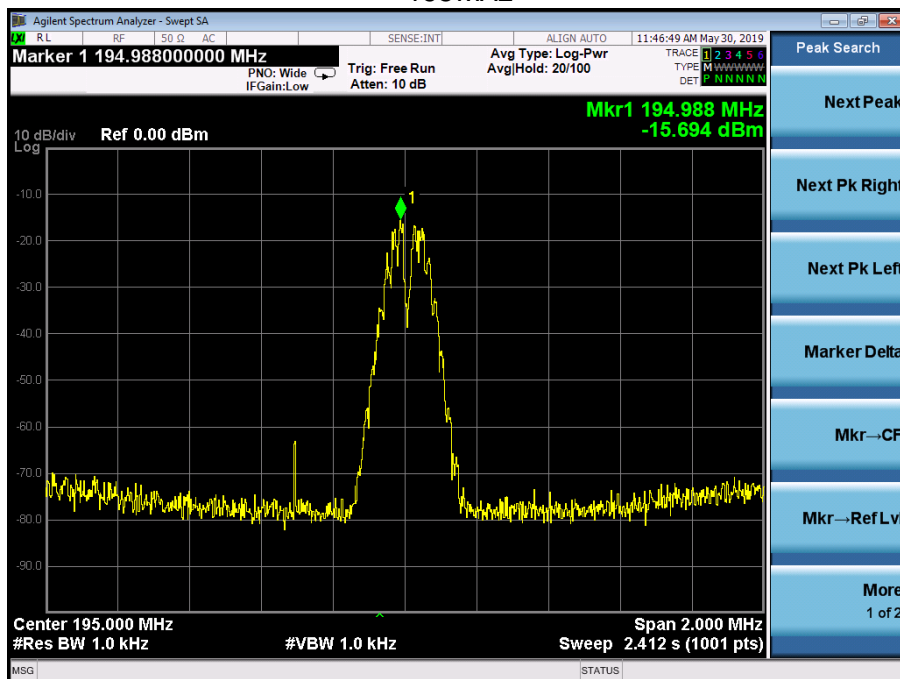
Remark: Only Show the worst case



Mask Emission 186.9MHz

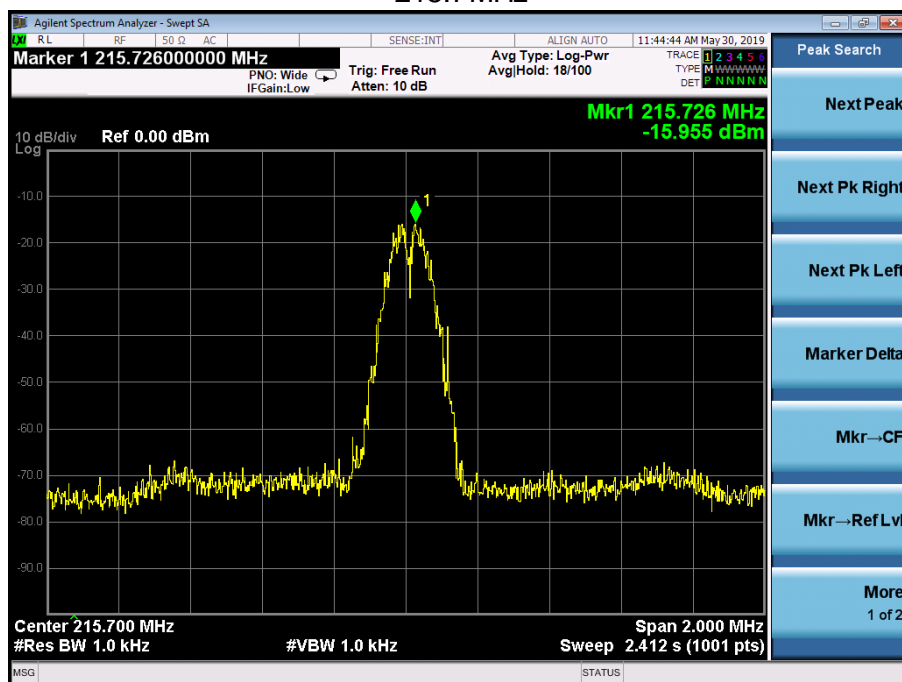


195MHz





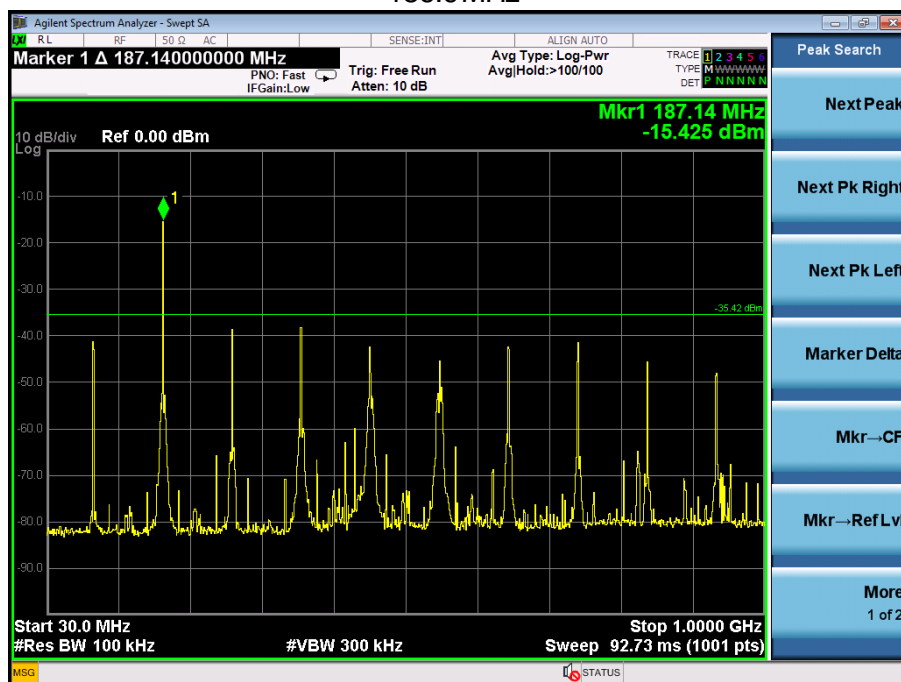
215.7MHz



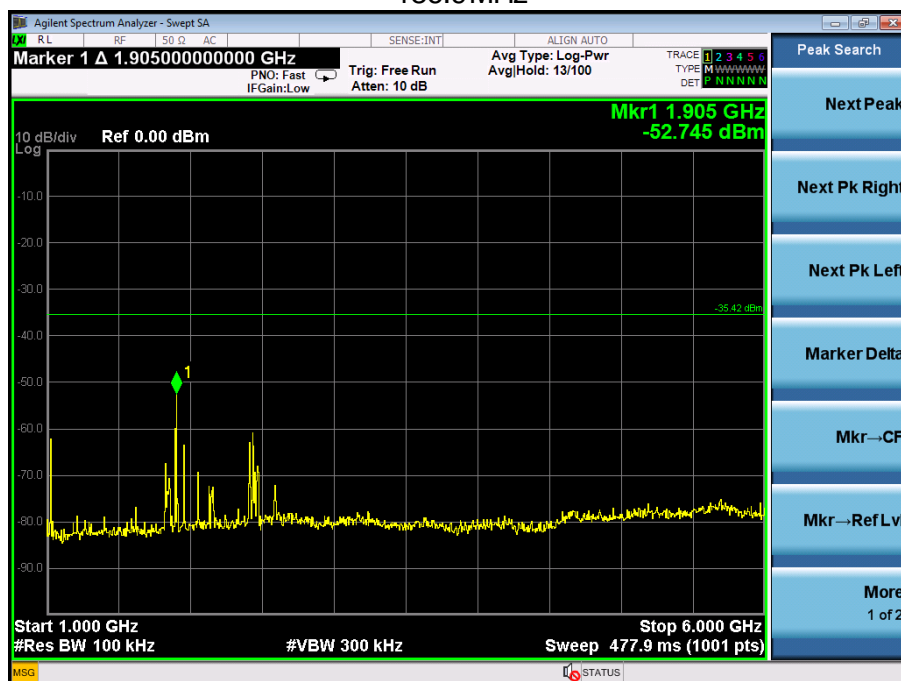


CONDUCTED EMISSION MEASUREMENT

186.9MHz

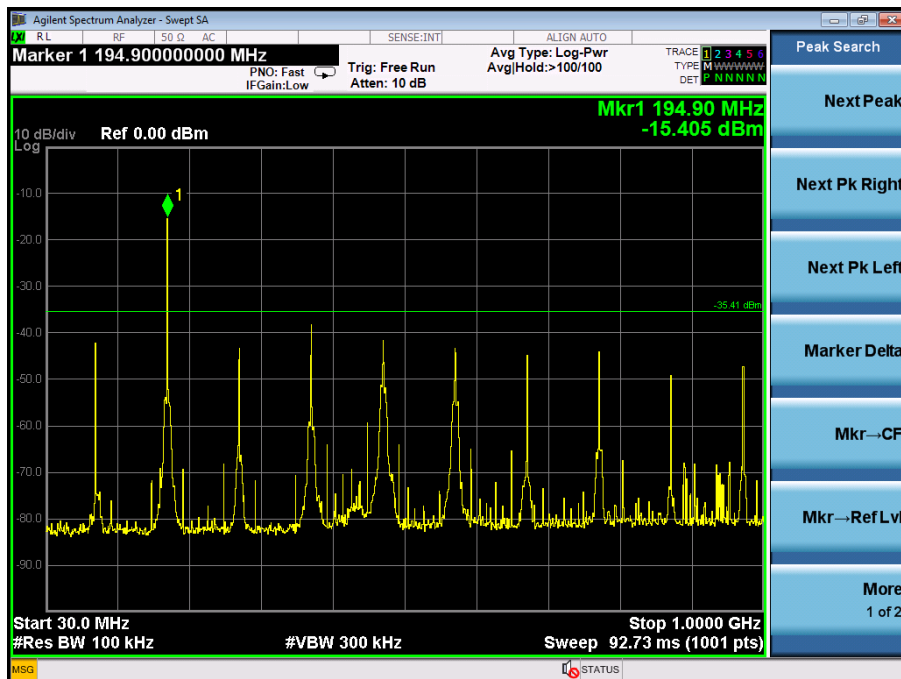


186.9MHz

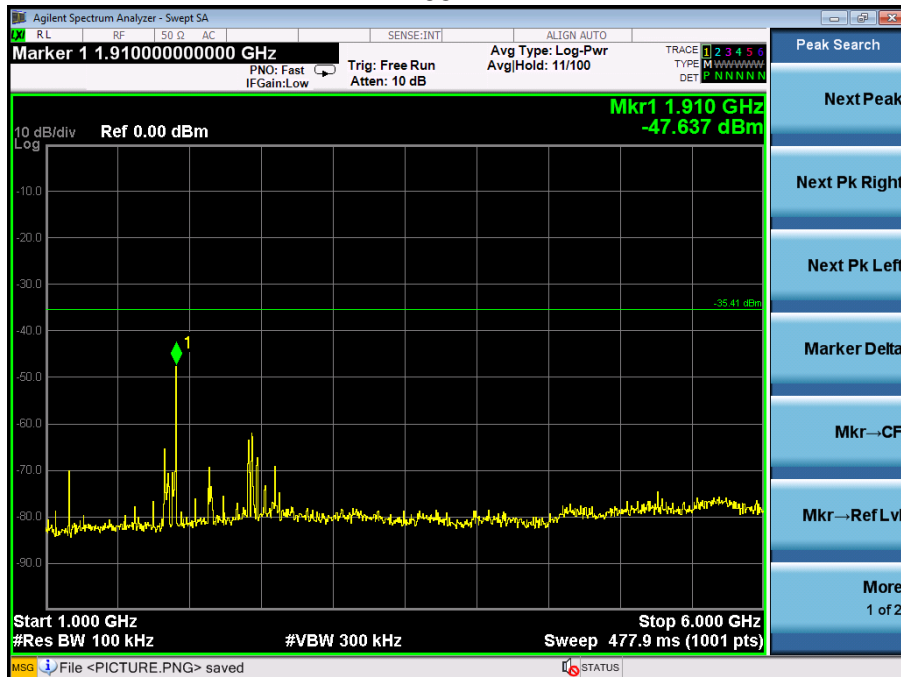




195MHz

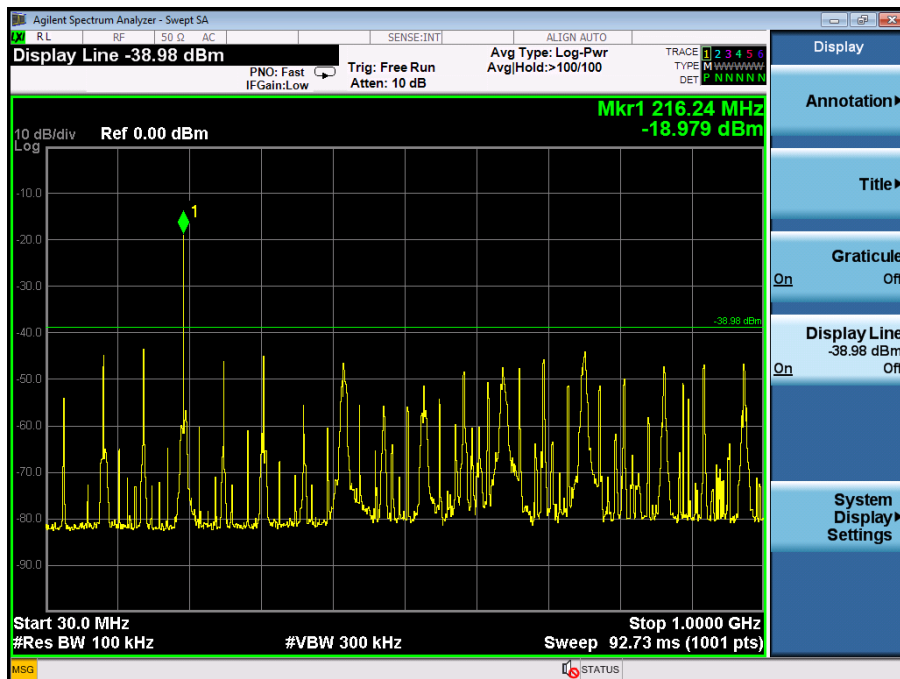


195MHz

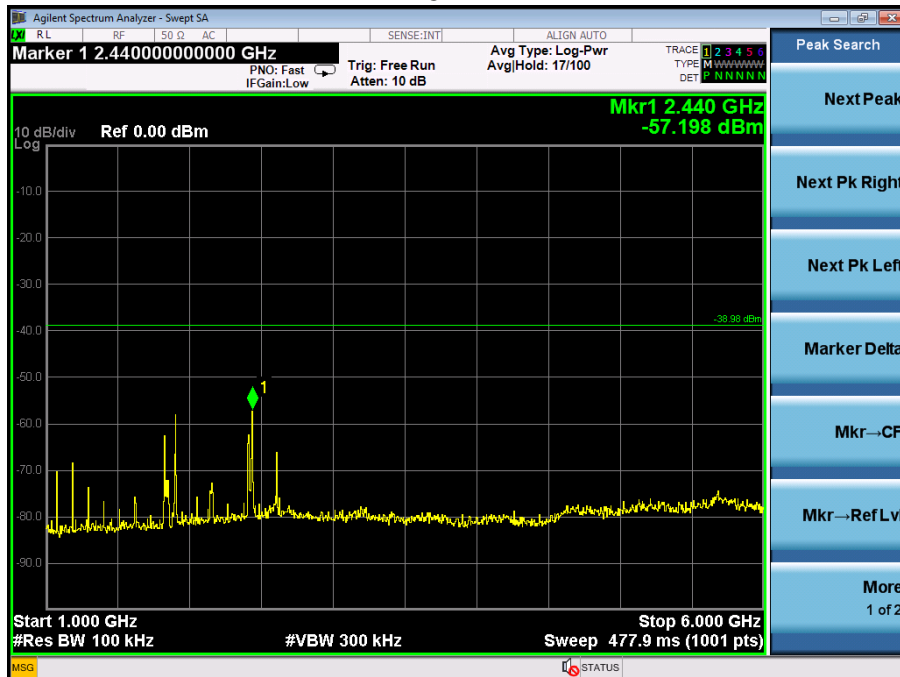




215.7MHz



215.7MHz



4. PEAK OUTPUT POWER TEST

4.1 APPLIED PROCEDURES / LIMIT

Maximum Conducted Output power at Antenna Terminals, FCC Rules 15.236(d):

- (1) In the bands allocated and assigned for broadcast television and in the 600MHz service band: 50mW EIRP.
- (2) In the 600MHz guard bands including the duplex gap: 20mW EIRP.

4.1.1 TEST PROCEDURE

1. The maximum peak output power was measured with a Spectrum analyzer connected to antenna terminal while EUT was operating in unmodulated situation.
2. Power was supplied to the battery input connector a power supply. The power supply was set for +3.0VDC. The spectrum analyzer was connected at antenna terminal to measure RF Power of carrier.
3. A Multimeter was connected in series with final RF stage to measure the current;
A multimeter was used to measure final RF stage supply voltage. Then the voltage v.s. current of the final RF stage can be showed.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



4.1.5 TEST RESULTS

Temperature :	26℃	Relative Humidity :	54%
Test Voltage :	DC 3.7V		

	Frequency	Maximum Conducted Output Power(PK)	Conducted Output Power Limit
	(MHz)	(dBm)	dBm
DQPSK	186.9	-6.81	17
	195	-9.43	17
	215.7	-9.05	17

5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC15.236 (f) The operating bandwidth shall not exceed 200 kHz.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	10kHz
VB	\geq RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.1.1 TEST PROCEDURE

According to FCC 15.236(f), The operating frequency within a permissible band of operation as defined in paragraph (c) must comply with the following requirements.

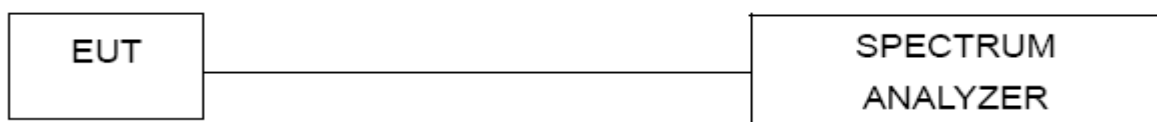
- The frequency selection shall be offset from the upper or lower band limits by 25KHz or an integral multiple thereof.
- One or more adjacent 25KHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200KHz. The operating bandwidth shall not exceed 200KHz.

According the ANSI C6.10-2013 section 6.9 for additional test set-up procedure, the occupied bandwidth of emission was measured with a spectrum analyzer connected to the antenna terminal while EUT was operating in 2.5KHz tone at an input level 16dB greater than necessary to produce 50 percent modulation. Then mark the -26dB Bandwidth and record it.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



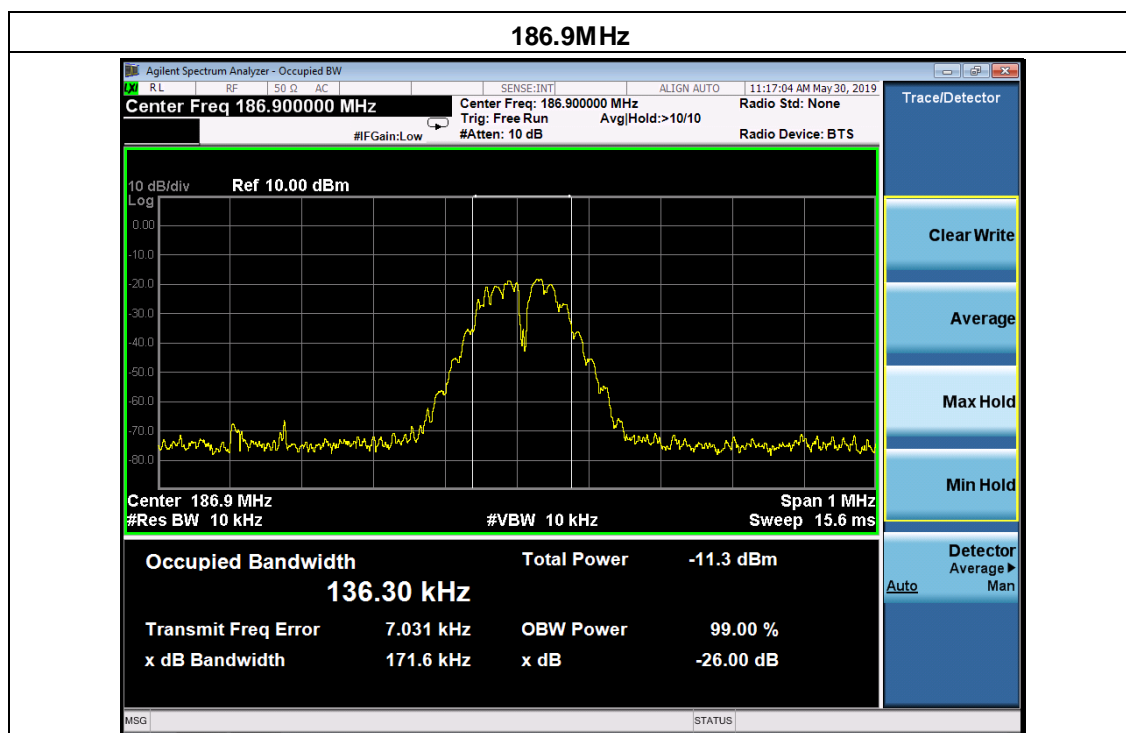
5.1.4 EUT OPERATION CONDITIONS

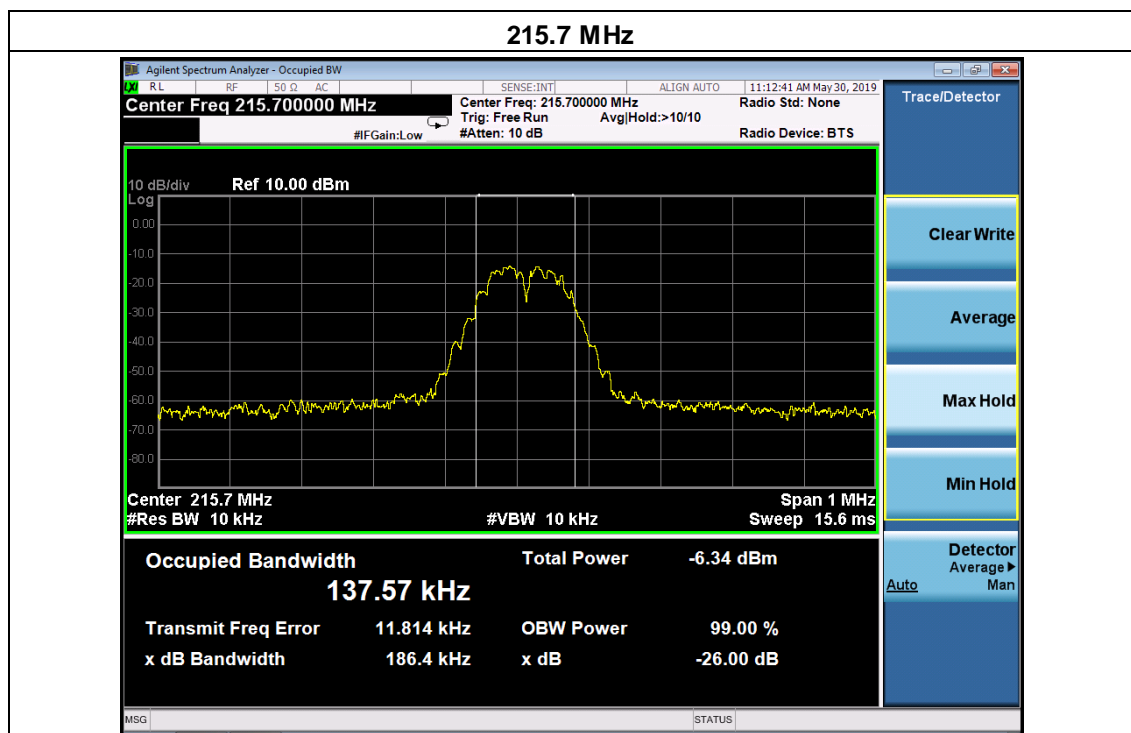
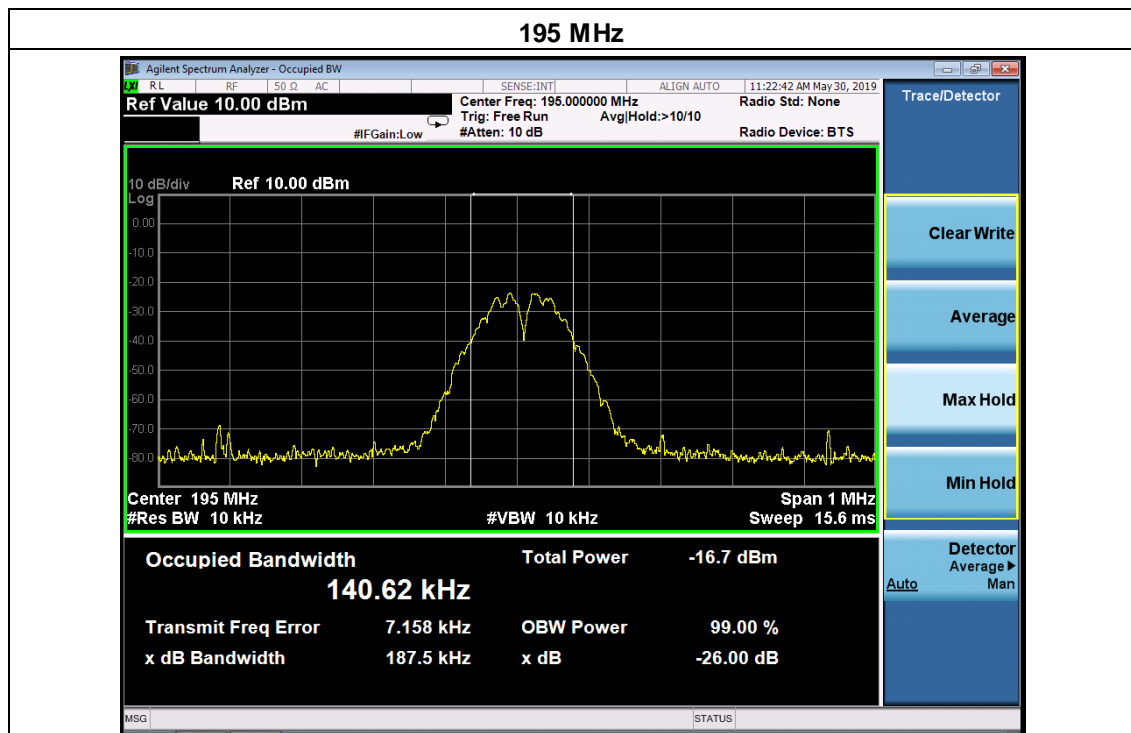
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode		

Frequency	99% Bandwidth kHz	-26dB Bandwidth kHz	Limit (MHz)	Result
186.9 MHz	136.30	171.6	200	PASS
195 MHz	140.62	187.5	200	PASS
215.7 MHz	137.57	186.4	200	PASS





6. FREQUENCY STABILITY

6.1 APPLICABLE STANDARD

According to 15.236(f)(3). The frequency tolerance of the transmitter shall be 0.005 percent.

6.2 TEST PROCEDURE

According to FCC 15.236(f)(3), The frequency tolerance of the carrier signal shall be maintained within 0.005% 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. Battery operated equipment shall be tested using a new battery.

- a) Setup the configuration of the ambient temperature from -20 degrees to 50 degrees with sufficient time. And measure the different power of the EUT with an artificial power from highest to end point voltage.
- b) Set frequency counter center frequency to the right frequency needs to be measured.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS



Test conditions		Frequency Error
Temperature (°C)	Voltage (V)	186.900MHz
25	3.7	186.909
	3.15	186.907
	4.37	186.902
-20	3.7	186.901
	3.15	186.908
	4.37	186.905
55	3.7	186.906
	3.15	186.903
	4.37	186.904
Max. frequency error (ppm)		48.15
Limit(ppm)		± 50

Test conditions		Frequency Error
Temperature (°C)	Voltage (V)	195.000MHz
25	3.7	194.999
	3.15	194.994
	4.37	194.997
-20	3.7	194.995
	3.15	194.996
	4.37	194.993
55	3.7	194.991
	3.15	194.992
	4.37	194.998
Max. frequency error (ppm)		-5.13
Limit(ppm)		± 50



Test conditions		Frequency Error
Temperature (°C)	Voltage (V)	215.700MHz
25	3.7	215.706
	3.15	215.704
	4.37	215.705
-20	3.7	215.699
	3.15	215.693
	4.37	215.695
55	3.7	215.691
	3.15	215.697
	4.37	215.701
Max. frequency error (ppm)		27.82
Limit(ppm)		±50



7. ANTENNA REQUIREMENT

7.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

7.2 EUT ANTENNA

The EUT antenna is the external antenna. It comply with the standard requirement.



8. EUT TEST PHOTO

Radiated Measurement Photos



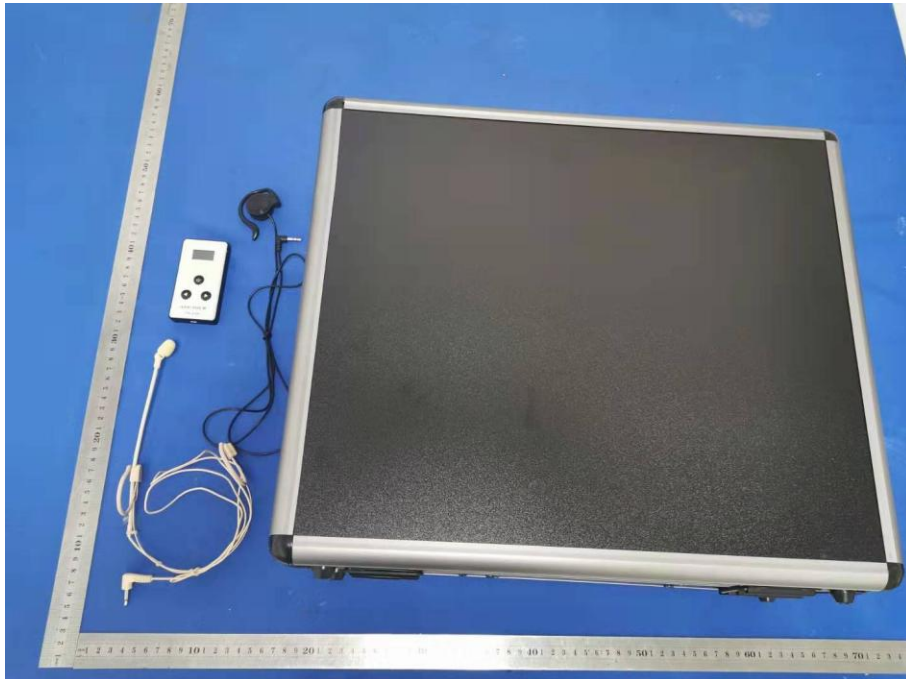


Conducted Measurement Photos





9. EUT PHOTO





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