



FCC 47 CFR PART 15 SUBPART C 15.249

TEST REPORT

FOR

MINI GRAMOPHONE BLUETOOTH SPEAKER

Model : VS0426, VS0425S, VS0425T, VS042XX ("X" can be 0-9, a-z, A-Z, For marketing purpose only)

Issued to

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Issued by
WH Technology Corp.



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1. GENERAL INFORMATION

Applicant : Vansong Technology (Hongkong) Limited
Address : Rooms 1318-19, Hollywood Plaza, 610 Nathan Road,
Mongkok, Kowloon, HK
**Manufacturer/
Factory** : Vansong Technology (Hongkong) Limited
Address : Rooms 1318-19, Hollywood Plaza, 610 Nathan Road,
Mongkok, Kowloon, HK
EUT : Mini Gramophone Bluetooth Speaker
Model Name : VS0426, VS0425S, VS0425T, VS042XX ("X" can be 0-9, a-z, A-Z,
For marketing purpose only)
Test Model : VS0426
Trade Name : HOFEINZ
**Model
Differences** : Only model name is different, the other exactly the same.

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.10-2013. The said equipment in the configuration described in this report shows the maximum emission levels emanating

FCC part 15 Subpart C

Receipt Date : 11/15/2020

Final Test Date :12/17/2020

Tested By:


Dec 15, 2020
(Date)


Bing Chang/ Engineer

Dec 17, 2020
(Date)



Reviewed by:


Bell Wei / Manager
Designation Number: TW2954



2. REPORT OF MEASUREMENTS AND EXAMINATIONS

2.1 LIST OF MEASUREMENTS AND EXAMINATIONS

FCC Rules	Description of test	Result
15.207(a)	AC Power Conducted Emission	PASS
15.249(a)/15.209	Radiated Emissions	PASS
15.249(d)/15.205	Band Edge Measurement	PASS
15.215(c)	20dB RF Bandwidth	PASS
15.203	Antenna Requirement	PASS



3. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

3.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name	:	Mini Gramophone Bluetooth Speaker
Model Number	:	VS0426
FCC ID	:	2AYCC-VS0426
Input Voltage	:	DC 5V/2A
Operate Frequency	:	2402MHz~2480MHz
Modulation Technique	:	GFSK, $\pi/4$ DQPSK,
Number of Channels	:	79 CH
Bluetooth Version	:	BT 5.0
Antenna Type	:	PCB Antenna
Channel Space	:	1MHz
Antenna gain	:	0dBi

3.2 CARRIER FREQUENCY OF CHANNELS

Channel List							
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2402	2	2403	3	2404	4	2405
5	2406	6	2407	7	2408	8	2409
9	2410	10	2411	11	2412	12	2413
13	2414	14	2415	15	2416	16	2417
17	2418	18	2419	19	2420	20	2421
21	2422	22	2423	23	2424	24	2425
25	2426	26	2427	27	2428	28	2429
29	2430	30	2431	31	2432	32	2433
33	2434	34	2435	35	2436	36	2437
37	2438	38	2439	39	2440	40	2441
41	2442	42	2443	43	2444	44	2445
45	2446	46	2447	47	2448	48	2449
49	2450	50	2451	51	2452	52	2453
53	2454	54	2455	55	2456	56	2457
57	2458	58	2459	59	2460	60	2461
61	2462	62	2463	63	2464	64	2465
65	2466	66	2467	67	2468	68	2469
69	2470	70	2471	71	2472	72	2473
73	2474	74	2475	75	2476	76	2477
77	2478	78	2479	79	2480	-	-



3.3 TEST MODE AND TEST SOFTWARE

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10-2013.
- b. The complete test system included Notebook and EUT for RF test.
- c. An executive “FCC_assist.exe” under Win 7 was executed to keep transmitting and receiving data via Wireless.
- d. The following test modes were performed for test:
CH01: 2402MHz, CH40: 2441MHz, CH79: 2480MHz
- e. only the worst case was recorded in this report



3.4 TEST METHODOLOGY & GENERAL TEST PROCEDURES

All testing as described bellowed were performed in accordance with ANSI C63.10:2013 and FCC CFR 47 Part 15 Subpart C .

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.10:2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

- 1)Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
- 2)Setting test channel described as “Channel setting and operating condition” , and testing channel by channel.
- 3)For the maximum output power measurement, we followed the method of measurement ANSI C63.10.
- 4)For the spurious emission test based on ANSI C63.10, at the frequency where below 1GHz used quasi-peak detector mode; where above 1GHz used the peak and average detector mode. IF the peak value may be under average limit, the average mode will not be performed.

3.5 MEASUREMENT UNCERTAINTY

Measurement Item	Uncertainty
Radiated emission	±4.11dB
Peak Output Power(conducted)	±1.38dB
Peak Output Power(Radiated)	±1.70dB
Power Spectral Density	±1.39dB
Radiated emission(3m)	±4.11dB
Radiated emission(10m)	±3.89dB



3.6 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

Support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID	Trade name	Date Cable	Power Cord
1.	Lap top	14q-by00 1AX	N/A	FCC DOC	HP	N/A	N/A
2.	AC adapter	QX6.5W7 5100FG	N/A	VOC	Stos	N/A	N/A
INSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID	Trade name	Date Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer' s requirement and conditions for the intended use.



4. TEST AND MEASUREMENT EQUIPMENT

4.1 CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards. Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

**TABLELIST OF TEST AND MEASUREMENT EQUIPMENT**

Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
EMI Receiver	R&S	ESHS10	830223/008	2021/06/06
LISN	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2021/06/11
ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158-0094	2021/09/21
RF Cable	N/A	N/A	EMI-3	2021/10/19
Bilog antenna(30M-1G)	ETC	MCTD2786 B	BLB16M040 04/JB-5-004	2021/05/18
Double Ridged Guide Horn antenna(1G-18G)	ETC	MCTD 1209	DRH15N020 09	2021/11/23
Horn antenna (18G-26G)	com-power	AH-826	81000	2021/08/16
LOOP Antenna (Below 30M)	com-power	AL-130	17117	2021/10/04
Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2021/05/03
Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC05184 5	980108&AT -18001	2021/10/23
Pre amplifier (18G~26G)	MITEQ	JS4-180026 00-30-5A	808329	2021/08/09
EMI Test Receiver	R&S	ESVS30 (20M-1000 MHz)	826006/002	2021/11/28
RF Cable (open site)	EMCI	N male on end of both sides (EMI4)	30m	2021/10/19
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(4 M+4M)	NA	2021/04/16
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(7 M)	NA	2021/08/09
Spectrum (9K--7GHz)	R&S	FSP7	830180/006	2021/04/13
Spectrum (9K--40GHz)	AGILENT	8564EC	4046A0032	2021/03/01
e3	AUDIX	N/A	N/A	N/A
SINGAL GENTERATOR (100k-1GHz)	HP	8648A	3619U0042 6	N/A
Power Meter	ANRITSU	ML2487	6K00001574	2021/08/09

***CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR**



5. ANTENNA REQUIREMENTS

5.1 STANDARD APPLICABLE

According to the FCC Part 15 Paragraph 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.

5.2 ANTENNA CONSTRUCTION AND DIRECTIONAL GAIN

Antenna		
Antenna Type	:	PCB Antenna
Antenna Gain	:	0 dBi



6. TEST OF CONDUCTED EMISSION

6.1 TEST LIMIT

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

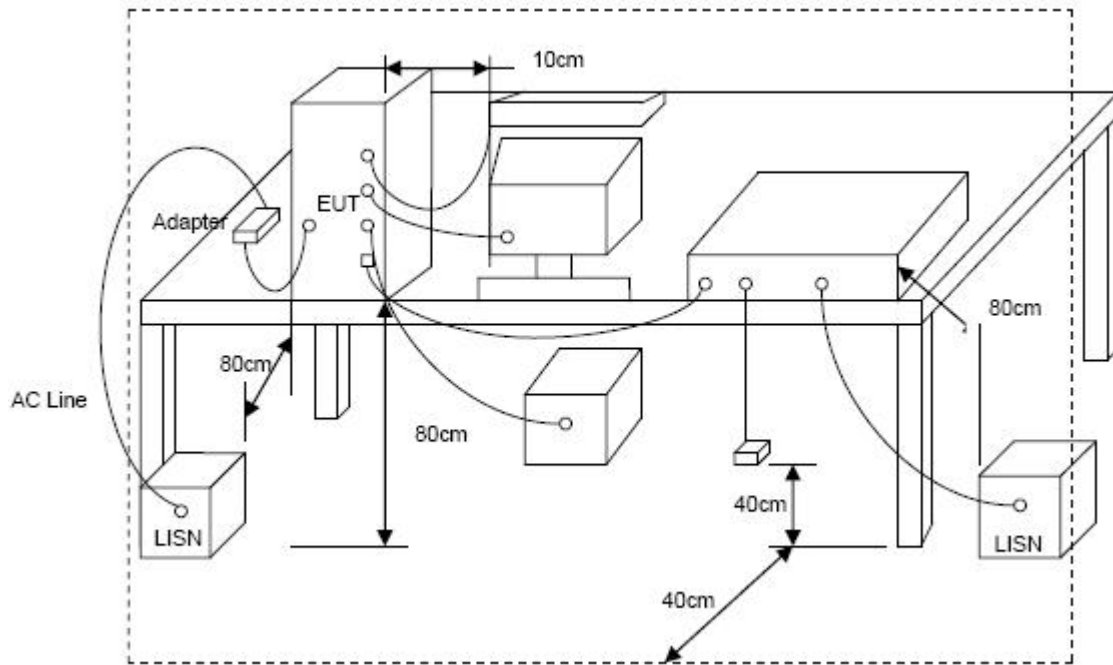
*Decreases with the logarithm of the frequency.

6.2 TEST PROCEDURES

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



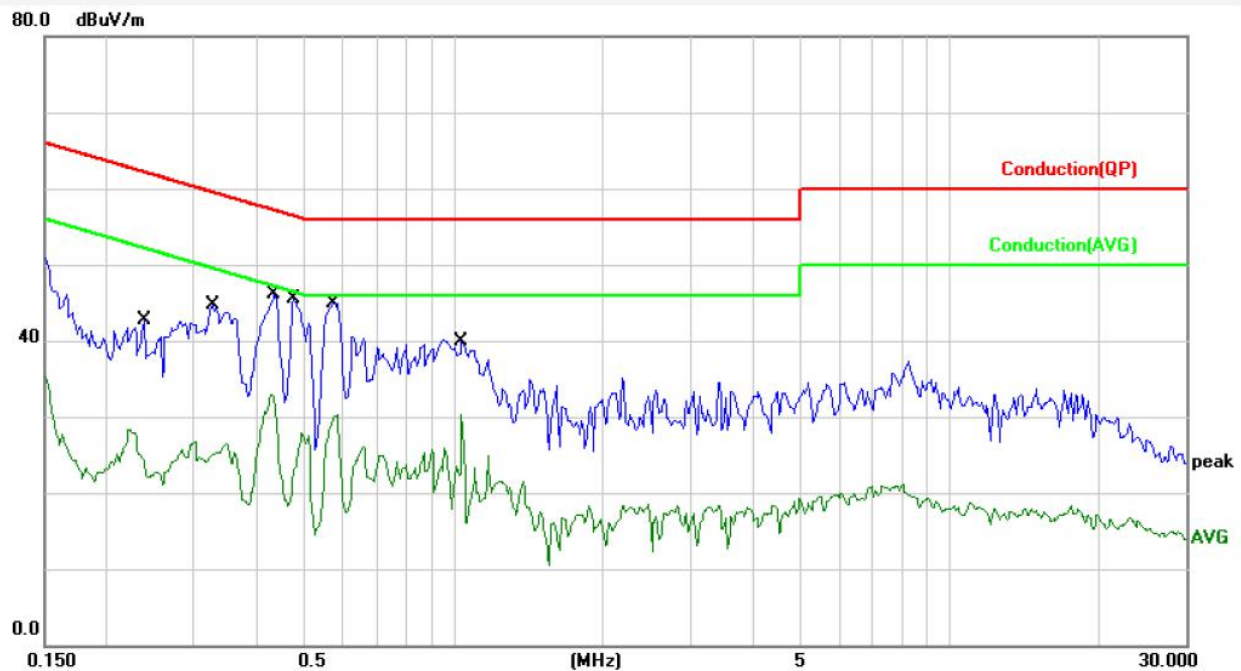
6.3 TYPICAL TEST SETUP





6.4 TEST RESULT AND DATA

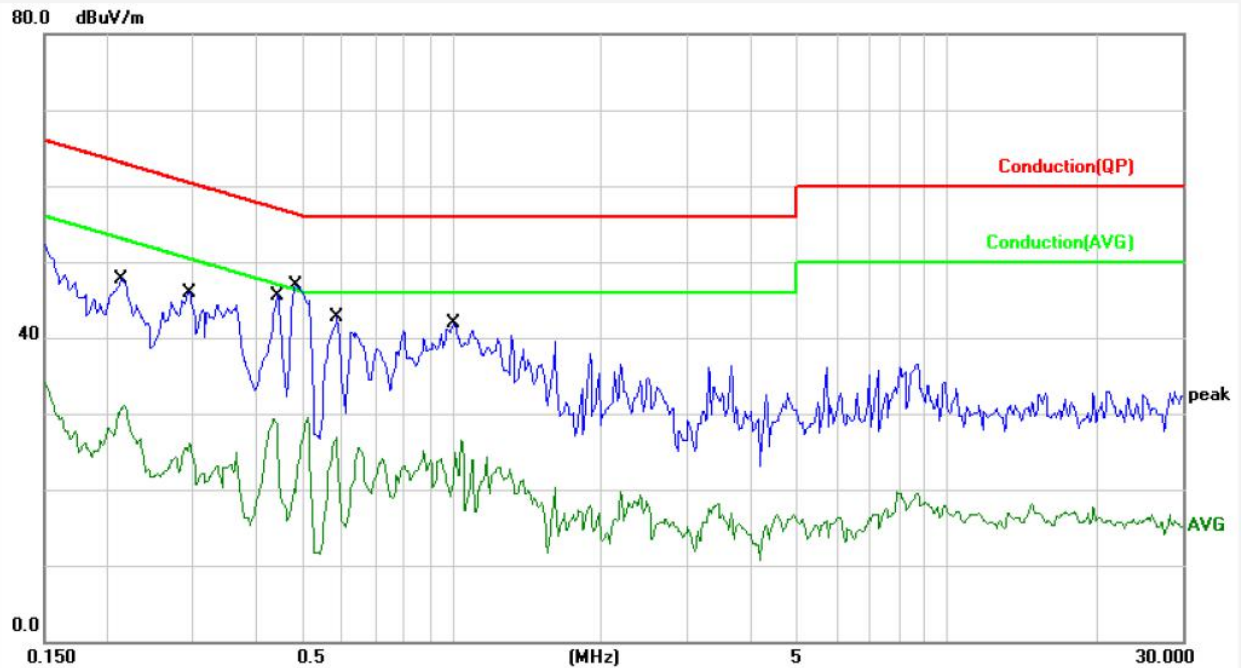
M/N :	VS0426	Test Voltage:	DC 5V From Adapter Input AC 120V/60Hz
Test Date :	2020.12.01	Phase:	L1
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	0.2381	10.71	29.09	39.80	62.16	-22.36	QP	P	
2	0.2381	10.71	17.67	28.38	52.16	-23.78	AVG	P	
3	0.3274	10.74	31.06	41.80	59.52	-17.72	QP	P	
4	0.3274	10.74	15.75	26.49	49.52	-23.03	AVG	P	
5	0.4363	10.79	32.31	43.10	57.13	-14.03	QP	P	
6	0.4363	10.79	22.11	32.90	47.13	-14.23	AVG	P	
7	0.4763	10.81	31.59	42.40	56.40	-14.00	QP	P	
8	0.4763	10.81	17.10	27.91	46.40	-18.49	AVG	P	
9	0.5721	10.84	31.16	42.00	56.00	-14.00	QP	P	
10	0.5721	10.84	19.49	30.33	46.00	-15.67	AVG	P	
11	1.0400	10.97	26.03	37.00	56.00	-19.00	QP	P	
12	1.0400	10.97	19.30	30.27	46.00	-15.73	AVG	P	



M/N :	VS0426	Test Voltage:	DC 5V From Adapter Input AC 120V/60Hz
Test Date :	2020.12.01	Phase:	Neutral
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	0.2146	10.56	34.14	44.70	63.03	-18.33	QP	P	
2	0.2146	10.56	20.47	31.03	53.03	-22.00	AVG	P	
3	0.2952	10.56	32.44	43.00	60.38	-17.38	QP	P	
4	0.2952	10.56	15.47	26.03	50.38	-24.35	AVG	P	
5	0.4433	10.58	32.02	42.60	57.00	-14.40	QP	P	
6	0.4433	10.58	18.75	29.33	47.00	-17.67	AVG	P	
7	0.4840	10.58	33.32	43.90	56.27	-12.37	QP	P	
8	0.4840	10.58	18.99	29.57	46.27	-16.70	AVG	P	
9	0.5860	10.58	29.12	39.70	56.00	-16.30	QP	P	
10	0.5860	10.58	16.25	26.83	46.00	-19.17	AVG	P	
11	1.0072	10.57	28.43	39.00	56.00	-17.00	QP	P	
12	1.0072	10.57	15.88	26.45	46.00	-19.55	AVG	P	



7. TEST OF RADIATED EMISSION

7.1 TEST LIMIT

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)	
		$\mu\text{V/m}$	
0.009 ~ 0.490	300	2400/F(kHz)	
0.490 ~ 1.705	30	24000/F(kHz)	
1.705 ~ 30	30	30	
30 ~ 88	3	100	
88 ~ 216	3	150	
216 ~ 960	3	200	
Above 960	3	500	
Frequency range MHz	Distance Meters	Field Strengths Limit (15.249)	
		mV/m (Field strength of fundamental)	$\mu\text{V/m}$ (Field strength of Harmonics)
902 ~ 928	3	50	500
2400 ~ 2483.5	3	50	500
5725 ~ 5875	3	50	500
24000 ~ 2425000	3	250	2500

- Remark: (1) Emission level (dB) μV = 20 log Emission level $\mu\text{V/m}$
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
(4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

7.2 TEST PROCEDURES

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength

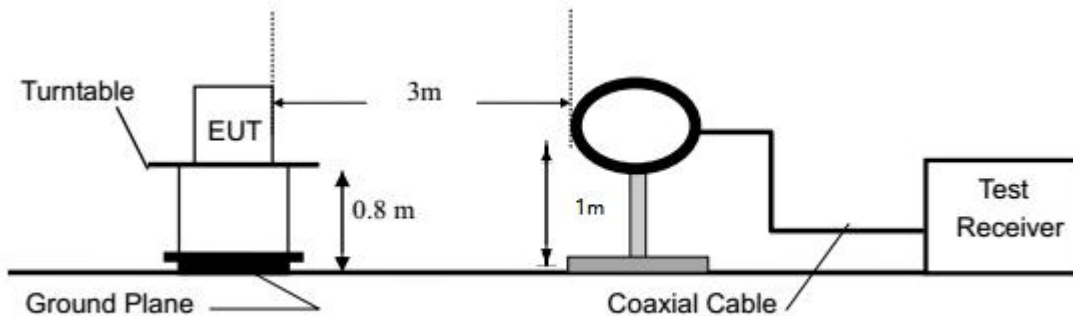


both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

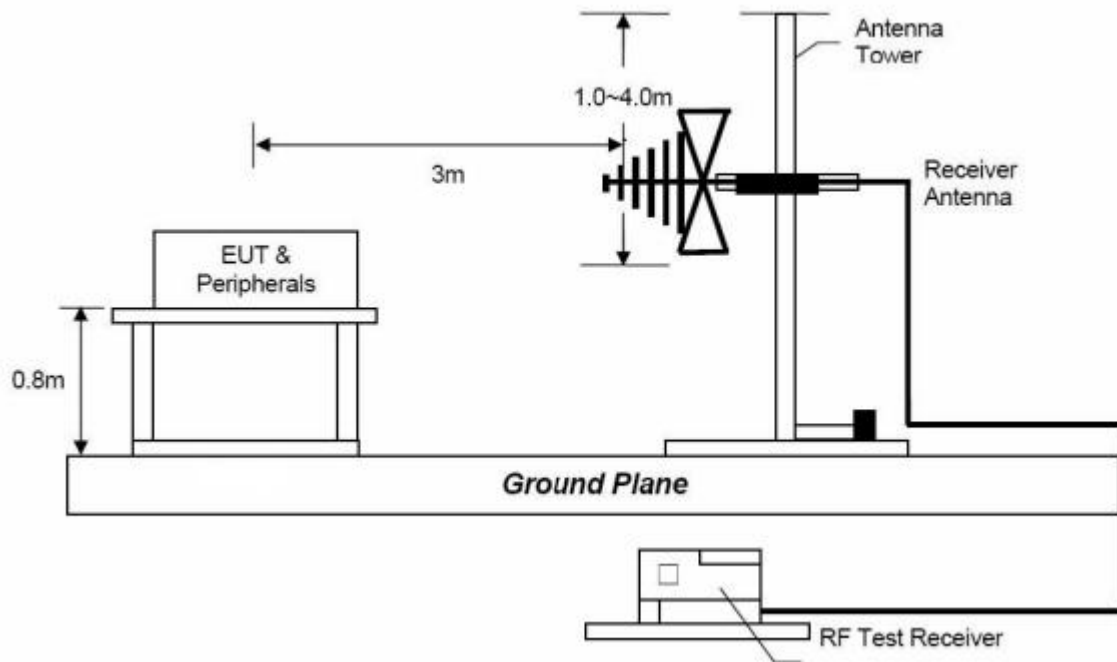
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- i. “Cone of radiation” has been considered to be 3dB bandwidth of the measurement antenna.

7.3 TYPICAL TEST SETUP

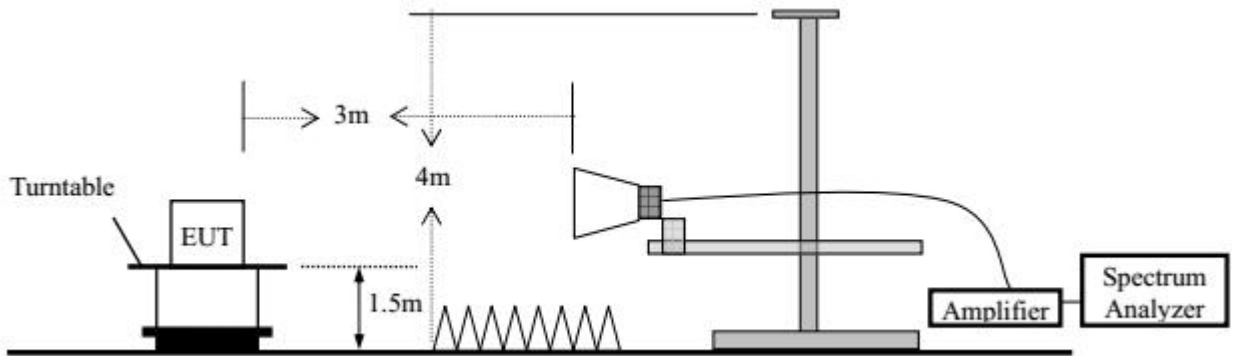
Radiated Emission Test Set-Up, Frequency Below 30MHz



Radiated Emission Test Set-Up, Frequency 30MHz-1000MHz



Radiated Emission Test Set-Up, Frequency above 1GHz



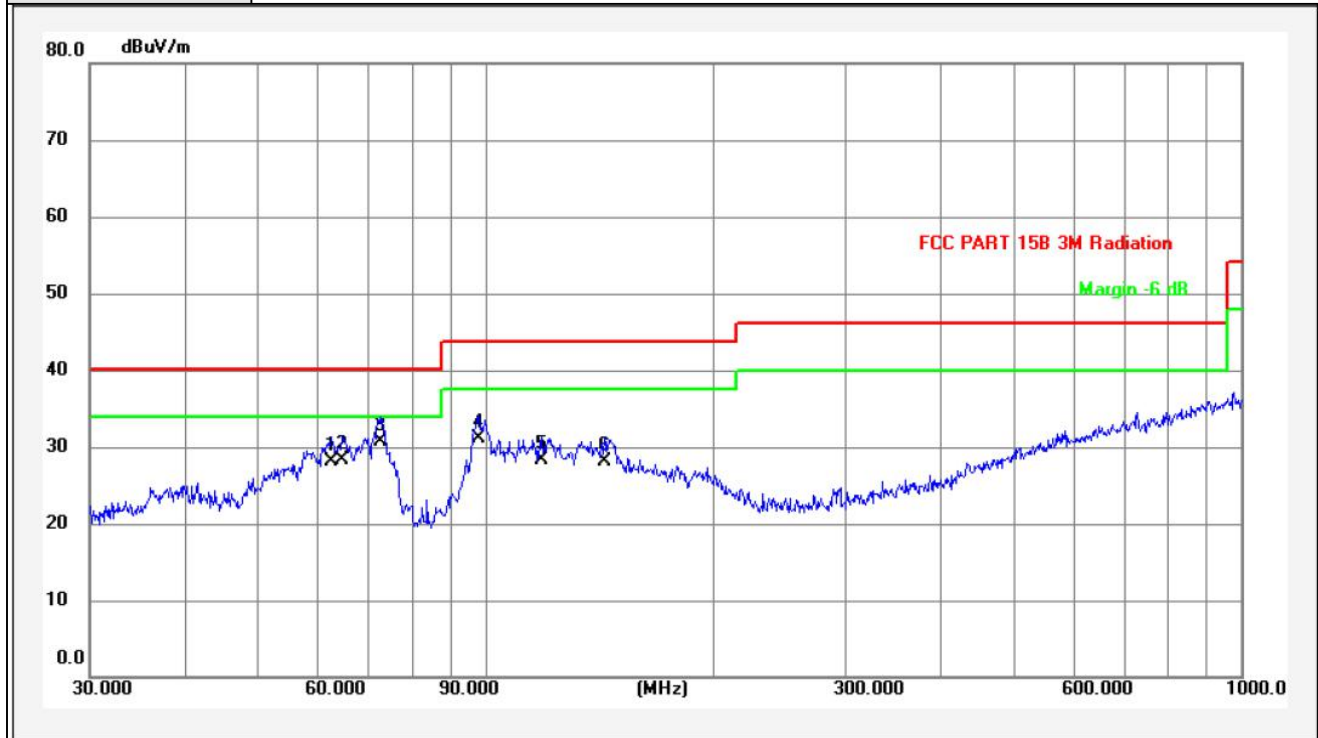
7.4 TEST RESULT AND DATA (9KHZ ~ 30MHZ)

The 9kHz - 30MHz spurious emission is under limit 20dB more.



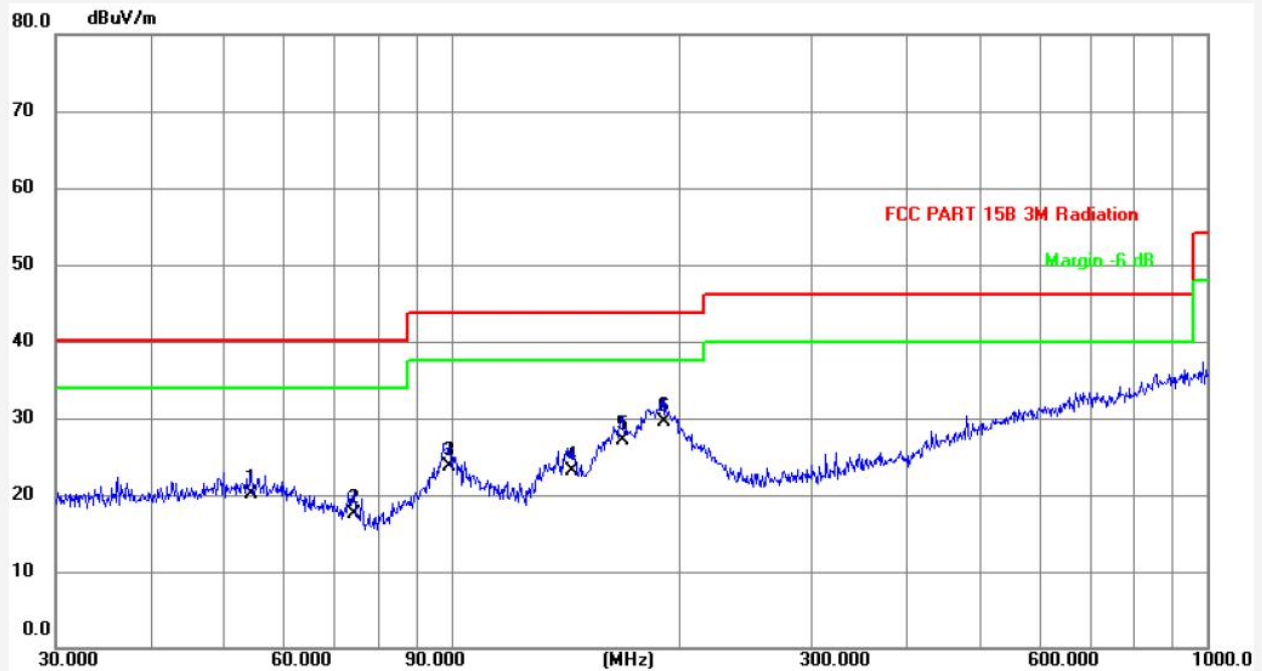
7.5 TEST RESULT AND DATA (30MHZ ~ 1GHZ, WORST EMISSIONS FOUND)

M/N :	VS0426	Test Voltage:	DC 3.7V From Battery
Test Date :	2020.12.01	Phase:	Vertical
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Low channel		





M/N :	VS0426	Test Voltage:	DC 3.7V From Battery
Test Date :	2020.12.01	Phase:	Horizontal
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Low channel		



No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	MK.	Remark
1	54.4515	13.17	6.93	20.10	40.00	-19.90	QP		
2	74.3953	8.98	8.52	17.50	40.00	-22.50	QP		
3	99.5279	13.09	10.61	23.70	43.50	-19.80	QP		
4	144.3343	9.31	13.89	23.20	43.50	-20.30	QP		
5	168.4137	9.61	17.59	27.20	43.50	-16.30	QP		
6	191.7450	10.61	18.89	29.50	43.50	-14.00	QP	*	



7.6 TEST RESULT AND DATA (ABOVE 1GHZ)

M/N :		VS0426			Test Voltage:		DC 3.7V From Battery			
Test Date :		2020.12.03			Phase:		Vertical/Horizontal			
Temperature:		20℃			Relative Humidity:		54%			
Pressure:		101.0KPa			Test by:		Bing			
Test Mode:		TX(The worst case GFSK)								
Operation Mode:Channel 1										
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4810.23	V	48.61	30.22	14.55	63.16	44.77	74.00	54.00	-10.84	-9.23
7215.35	V	39.46	26.11	15.23	54.69	41.34	74.00	54.00	-19.31	-12.66

4810.76	H	47.24	30.71	14.21	61.45	44.92	74.00	54.00	-12.55	-9.08
7215.29	H	41.56	25.97	14.55	56.11	40.52	74.00	54.00	-17.89	-13.48

Operation Mode:Channel 40										
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4880.52	V	46.40	31.05	14.21	60.61	45.26	74.00	54.00	-13.39	-8.74
7320.81	V	42.68	28.96	15.03	57.71	43.99	74.00	54.00	-16.29	-10.01

4880.76	H	45.26	30.28	14.20	59.46	44.48	74.00	54.00	-14.54	-9.52
7320.77	H	38.47	26.04	18.55	57.02	44.59	74.00	54.00	-16.98	-9.41

Operation Mode:Channel 79										
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4960.26	V	45.59	29.97	14.19	59.78	44.16	74.00	54.00	-14.22	-9.84
7440.81	V	41.66	26.89	15.03	56.69	41.92	74.00	54.00	-17.31	-12.08

4960.29	H	46.87	32.01	14.55	61.42	46.56	74.00	54.00	-12.58	-7.44
7440.45	H	38.77	26.56	18.05	56.82	44.61	74.00	54.00	-17.18	-9.39



FUNDAMENTAL FREQUENCY:

M/N :	VS0426	Test Voltage:	DC 3.7V From Battery
Test Date :	2020.12.03	Phase:	Vertical
Temperature:	20°C	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	TX		

Operation Mode: The worst case GFSK

Freq (MHz)	Ant. Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2402	V	75.09	54.74	13.75	88.84	68.49	114	94	-25.16	-25.51
2402	H	74.07	53.24	13.75	87.82	66.99	114	94	-26.18	-27.01

2441	V	66.52	48.05	14.01	80.53	62.06	114	94	-33.47	-31.94
2441	H	63.95	44.84	14.01	77.96	58.85	114	94	-36.04	-35.15

2480	V	69.45	51.61	14.32	83.77	65.93	114	94	-30.23	-28.07
2480	H	67.41	48.62	14.32	81.73	62.94	114	94	-32.27	-31.06

Operation Mode: $\pi/4$ DQPSK

Freq (MHz)	Ant. Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2402	V	71.02	52.36	13.75	84.77	66.11	114	94	-29.23	-27.89
2402	H	70.68	51.62	13.75	84.43	65.37	114	94	-29.57	-28.63

2441	V	63.11	45.93	14.01	77.12	59.94	114	94	-36.88	-34.06
2441	H	60.06	42.16	14.01	74.07	56.17	114	94	-39.93	-37.83

2480	V	66.75	48.27	14.32	81.07	62.59	114	94	-32.93	-31.41
2480	H	64.23	44.28	14.32	78.55	58.60	114	94	-35.45	-35.40

NOTE: $RBW > 20BW$; $VBW = 3 \cdot RBW$



7.7 RESTRICT BAND EMISSION MEASUREMENT DATA

M/N :		VS0426			Test Voltage:		DC 3.7V From Battery			
Test Date :		2020.12.03			Phase:		Vertical			
Temperature:		20℃			Relative Humidity:		54%			
Pressure:		101.0KPa			Test by:		Bing			
Test Mode:		The worst case GFSK								
Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2390.000	H	32.98	17.25	13.55	46.53	30.80	74	54	-27.47	-23.20
2390.000	V	37.44	20.15	13.55	50.99	33.70	74	54	-23.01	-20.30
2400.000	H	46.26	31.03	13.55	59.81	44.58	74	54	-14.19	-9.42
2400.000	V	49.52	35.18	13.55	63.07	48.73	74	54	-10.93	-5.27
2483.500	H	31.07	15.57	14.63	45.70	30.20	74	54	-28.30	-23.80
2483.500	V	36.68	21.57	14.63	51.31	36.20	74	54	-22.69	-17.80

Note:

1. Emission level = Reading level + Correction factor
2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting:1 MHz RBW with 1 MHz VBW (Peak Detector).
5. Measurements above 1000 MHz, Average detector setting:1 MHz RBW with 10Hz VBW (RMS Detector).
6. Peak detector measurement data will represent the worst case results.
7. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.



8. BANDWIDTH TEST

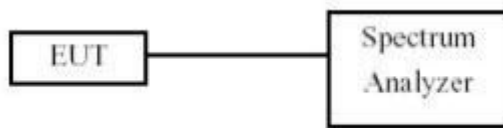
8.1 TEST LIMIT

No Limit.

8.2 TEST PROCEDURES

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 30KHz, VBW \cong RBW, Sweep time = Auto.

8.3 TEST SETUP LAYOUT



8.4 TEST RESULT AND DATA

PASS

Please refer to following table.



Temperature :	22 ℃	Humidity:	56%	Pressure:	101.45KPa
Test By:		Bing	Test Date :	2020.12.07	
Frequency MHz		20dB Bandwidth (MHz)			Limit
GFSK					
Low Channel: 2402		1.118			---
Middle Channel: 2441		1.112			---
High Channel: 2480		1.115			---
$\pi/4$ DQPSK					
Low Channel: 2402		1.175			---
Middle Channel: 2441		1.173			---
High Channel: 2480		1.177			---



GFSK Low Channel



GFSK Middle Channel





GFSK High Channel



$\pi/4$ DQPSK Low Channel





$\pi/4$ DQPSK Middle Channel



$\pi/4$ DQPSK High Channel





9. RESTRICTED BANDS OF OPERATION

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

9.1 LABELING REQUIREMENT

The device shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

--END---