

FCC AND ISED CERTIFICATION TEST REPORT

FOR

Applicant	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	Wireless Microphone
Model No.	:	OTGM100W
Trade Mark	:	JBL
FCC ID	:	APIM100W
IC	:	6132A-M100W
Manufacturer	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,

Dongguan City, Guangdong Province, China, 523808

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REPORT

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Test Report Declare

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Trade Mark	:	JBL
Manufacturer	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C, RSS-210 Issue 10 December 2019.

Test Procedure Used:

ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018. ETSI EN 300 422-1v1.4.2(2011-08)

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&ISED standards.

Report No.:	DDT-R20011711-1E3		
Date of Receipt:	Jan. 20, 2020	Date of Test:	Jan. 20, 2020 ~ Jun. 06, 2020

Prepared By:

Ella Gong

Ella Gong/Engineer

Approved By:



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Jun. 06, 2020	

1. Summary of Test Results

Description of Test Item	Standard	Results
Maximum Radiated Power	FCC Part 15: 15.236(d)(2) ANSI C63.10:2013 RSS-210 Issue 10	PASS
Modulation	RSS-210 Issue 10 ANSI/TIA-603-E-2016	PASS
Occupied Bandwidth	FCC Part 15: 15.236(f)(2) ANSI C63.10:2013 RSS-210 Issue 10	PASS
Frequency Tolerance	FCC Part 15: 15.236(f)(3) RSS-210 Issue 10	PASS
Emission Mask	FCC Part 15: 15.236(g) RSS-210 Issue 10 ETSI EN 300 422-1v1.4.2(2011-08)	PASS
Radiated Spurious Emission	FCC Part 15: 15.236(g) RSS-210 Issue 10 ETSI EN 300 422-1v1.4.2(2011-08)	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.10:2013 RSS-Gen Issue 5	N/A
Antenna Requirement	FCC Part 15: 15.203 RSS-Gen Issue 5	PASS
Note: N/A is an abbreviation for Not Applicable.		

2. General test information

2.1. Description of EUT

Eut* Name	: Wireless Microphone
Model Number	: OTGM100W
EUT Function Description	: Please reference user manual of this device
Power Supply	: DC 3V from battery
Operation Frequency	: 657.027MHz-661.427MHz
Modulation	: FM
Antenna Type	: Spring antenna, maximum PK gain: -4.15 dBi
Sample Type	: Series production

Note: EUT is the ab. of equipment under test.

Channel information:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	657.027	7	659.427
2	657.427	8	659.827
3	657.827	9	660.227
4	658.227	10	660.627
5	658.627	11	661.027
6	659.027	12	661.427

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
N/A	N/A	N/A	N/A	N/A

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	Serial No.	Other	Memo
Audio Generator	Good Will Instrument	EM862120	GAG-810	N/A	N/A

2.4. Block diagram of EUT configuration for test

EUT

Switch channels by button control, test channels as below table.

Channel	Frequency (MHz)
1	657.027
3	657.827
6	659.027
7	659.427

9	660.227
12	661.427

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

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

Temperature range:	21-25 °C
Humidity range:	40-75%
Pressure range:	86-106 kPa

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

Tel: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com

CNAS Accreditation No. L6451; A2LA Accreditation No. 3870.01

FCC Designation Number: CN1182; FCC Test Firm Registration Number: 540522

Industry Canada site registration number: 10288A-1

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum Analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz); 1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz); 1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7 × 10 ⁻⁸ (Antenna couple method) 5.5 × 10 ⁻⁸ (Conducted method)
Conducted Spurious Emissions	0.86 dB (10 MHz ≤ f < 3.6 GHz); 1.40 dB (3.6 GHz ≤ f < 8 GHz) 1.66 dB (8 GHz ≤ f < 22 GHz)
Uncertainty for Radio Frequency (RBW<20 kHz)	3×10 ⁻⁸
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission Test (30 MHz-1 GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission Test (1 GHz-40 GHz)	4.10 dB (1-6 GHz) 4.40 dB (6 GHz-18 GHz) 3.54 dB (18 GHz-26 GHz) 4.30 dB (26 GHz-40 GHz)
Uncertainty for Power Line Conduction Emission Test	3.32 dB (150 kHz-30 MHz)

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

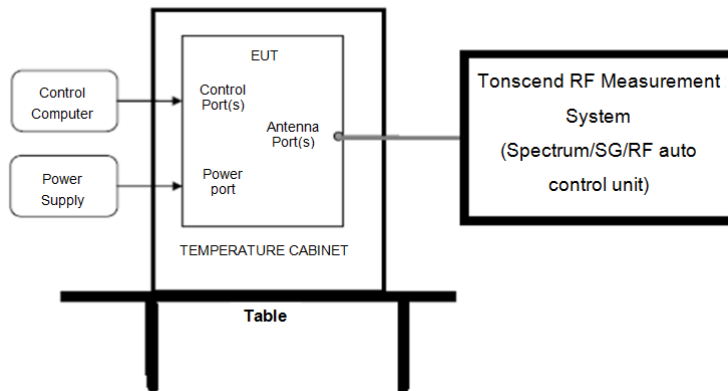
3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test (Tonscend RF Measurement System)					
Spectrum analyzer	R&S	FSU26	200071	Sep. 29, 2019	1 Year
Modulation Analyzer	HP	8901B	3226A04430	Sep. 29, 2019	1 Year
Wideband Radio Communication tester	R&S	CMW500	117491	Jun. 25, 2019	1 Year
Vector Signal Generator	Agilent	E8267D	US49060192	Sep. 29, 2019	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180737	Jun. 25, 2019	1 Year
Power Sensor	Agilent	U2021XA	MY55150010	Jun. 28, 2019	1 Year
Power Sensor	Agilent	U2021XA	MY55150011	Jun. 28, 2019	1 Year
DC Power Source	MATRIS	MPS-3005L-3	D813058W	Jun. 25, 2019	1 Year
RF Cable	Micable	C10-01-01-1	100309	Sep. 29, 2019	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	Oct. 21, 2019	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.2.7	N/A	N/A
Radiation 1#chamber					
EMI Test Receiver	R&S	ESU8	100316	Sep. 29, 2019	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	Jun. 25, 2019	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	Nov. 15, 2019	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2019	1 Year
Double Ridged Horn Antenna	R&S	HF907	100276	Nov. 15, 2019	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	Sep. 29, 2019	1 Year
Pre-amplifier	A.H.	PAM-0118	360	Sep. 29, 2019	1 Year
Pre-amplifier	TERA-MW	TRLA-0040 G35	101303	Sep. 29, 2019	1 Year
RF Cable	HUBSER	CP-X2+ CP-X1	W11.03+ W12.02	Sep. 29, 2019	1 Year
RF Cable	N/A	5m+6m+1m	06270619	Sep. 29, 2019	1 Year
MI Cable	HUBSER	C10-01-01-1 M	1091629	Sep. 29, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Radiation 2#chamber					
EMI Test Receiver	R&S	ESCI	101364	Sep. 29, 2019	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	Jun. 25, 2019	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	9163-994	Nov. 15, 2019	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2019	1 Year
Double Ridged Horn	Schwarzbeck	BBHA9120	02108	Jul. 21, 2019	1 Year

Antenna					
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	Sep. 29, 2019	1 Year
Pre-amplifier	TERA-MW	TRLA-0040 G35	101303	Sep. 29, 2019	1 Year
RF Cable	N/A	14+1.5m	06270619	Sep. 29, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Power Line Conducted Emissions Test					
EMI Test Receiver	R&S	ESU8	100316	Sep. 29, 2019	1 Year
LISN 1	R&S	ENV216	101109	Sep. 29, 2019	1 Year
LISN 2	R&S	ESH2-Z5	100309	Sep. 29, 2019	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Sep. 29, 2019	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Sep. 29, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A

4. Maximum Radiated Power

4.1. Block diagram of test setup



4.2. Limits

15.236(d) The maximum radiated power shall not exceed the following values:

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

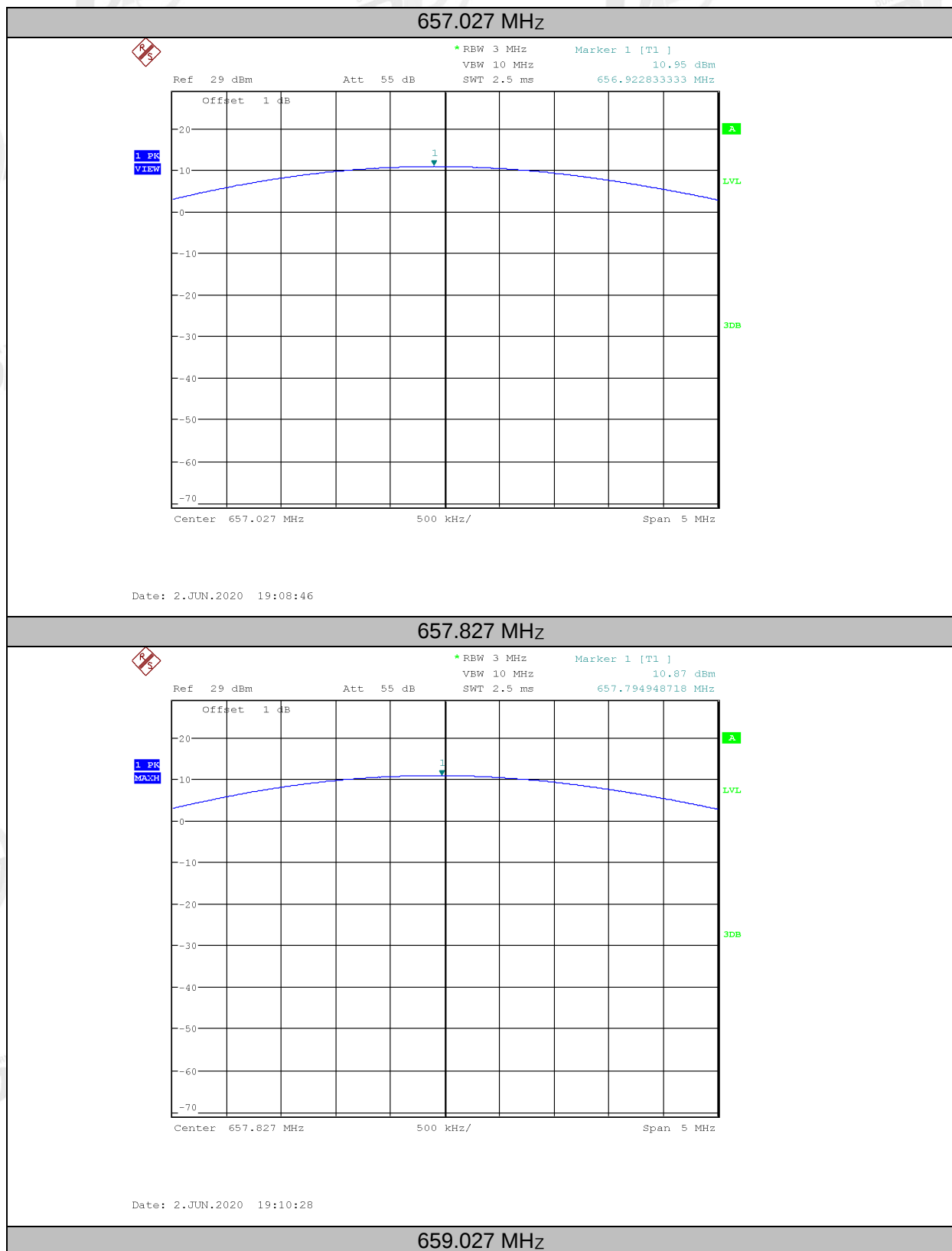
4.3. Test procedure

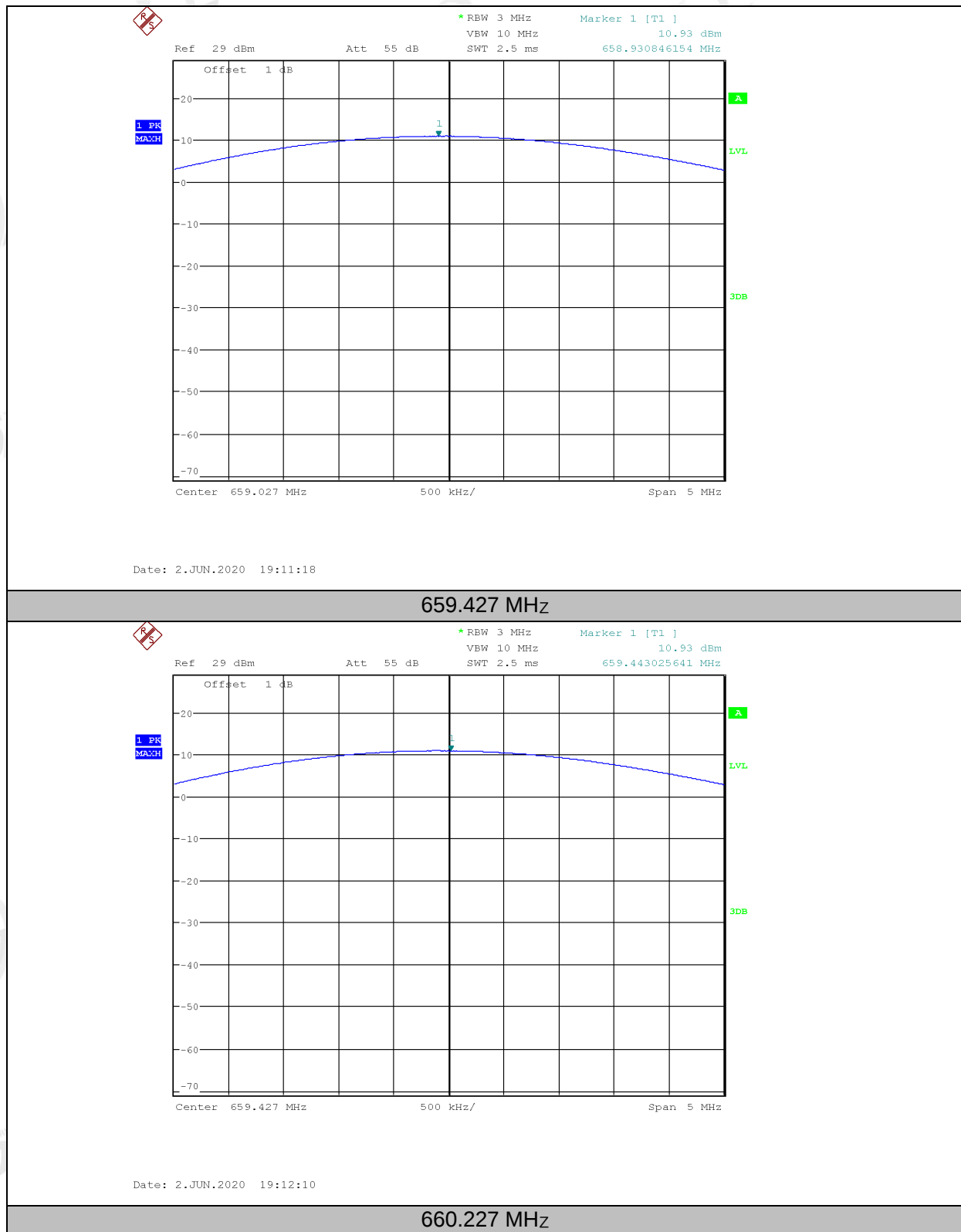
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
 - (2) Measure the maximum output power of EUT by spectrum analyzer with PK detector and set
 $RBW \geq \text{Bandwidth}$, $VBW \geq 3 \times RBW$, $\text{Span} \geq 3 \times RBW$, Sweep time=auto, Measurement points $\geq 2 \text{ span} / RBW$
 - (3) Radiated RF power= Conduction measurement Level + Ant. Gain
- Note: The attenuator loss was inputted into spectrum analyzer as amplitude offset.

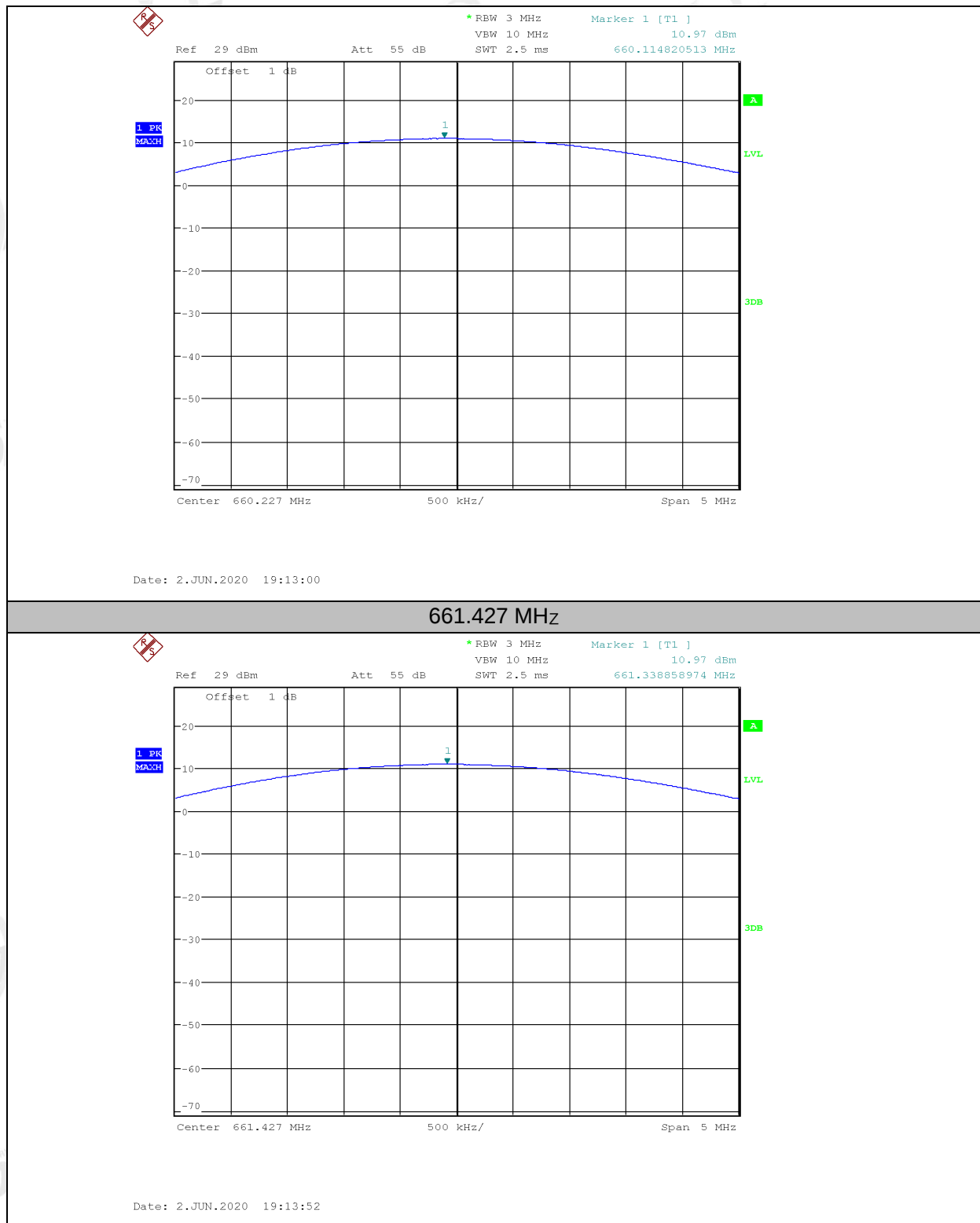
4.4. Test result

Frequency (MHz)	Conduction measurement level (dBm)	Ant. Gain(dBi)	Radiated RF power(dBm)	Limit (dBm)	Verdict
657.027	10.95	-4.15	6.80	13	Pass
657.827	10.67	-4.15	6.52	13	Pass
659.027	10.93	-4.15	6.78	13	Pass
659.427	10.93	-4.15	6.78	13	Pass
660.227	10.97	-4.15	6.82	13	Pass
661.427	10.97	-4.15	6.82	13	Pass

4.5. Original test data

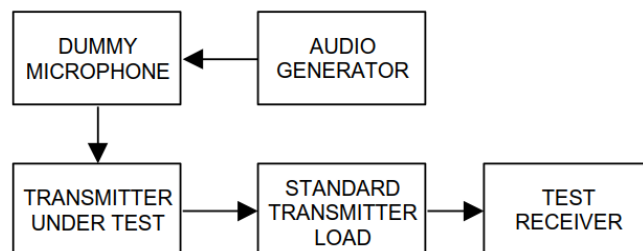






5. Modulation

5.1. Block diagram of test setup



5.2. Limits

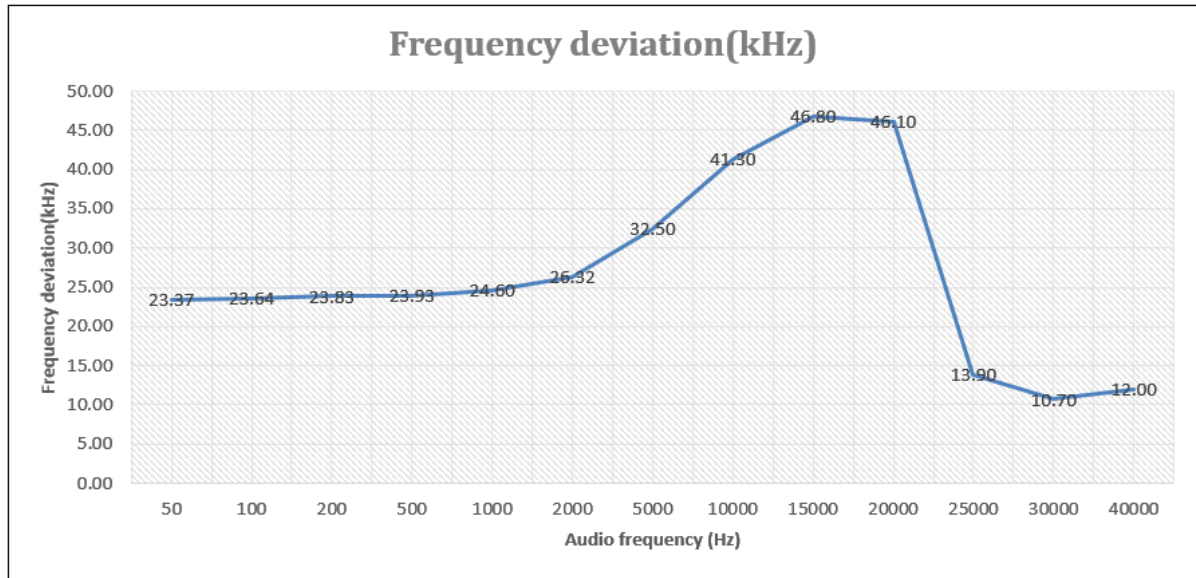
Equipment employing amplitude modulation (AM) or frequency modulation (FM) shall have a modulation index that does not exceed 100% or a frequency deviation that does not exceed ± 75 kHz, respectively.

5.3. Test procedure

- (1) Connect the equipment as illustrated.
- (2) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- (3) Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation.
- (4) Slowly vary the audio frequency and observe the steady-state deviation. Record the maximum deviation.
- (5) Set the test receiver to measure peak negative deviation.

5.4. Test Result

Audio frequency (Hz)	Frequency deviation(kHz)
50	23.37
100	23.64
200	23.83
500	23.93
1000	24.60
2000	26.32
5000	32.50
10000	41.30
15000	46.80
20000	46.10
25000	13.90
30000	10.70
40000	12.00



6. Occupied Bandwidth

6.1. Block diagram of test setup

Same as section 4.1

6.2. Limits

FCC Part 15.236(f)(2) One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.

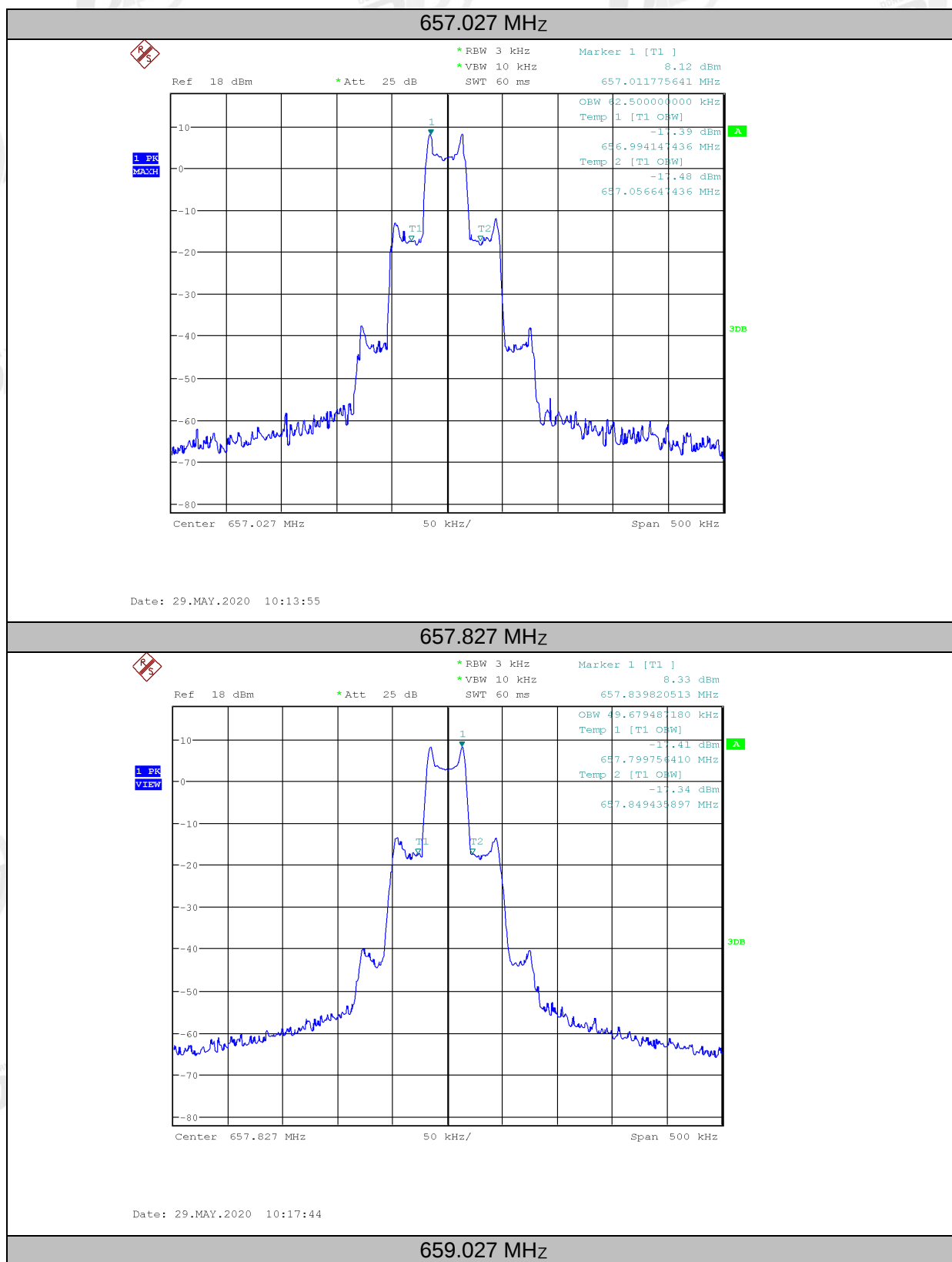
6.3. Test procedure

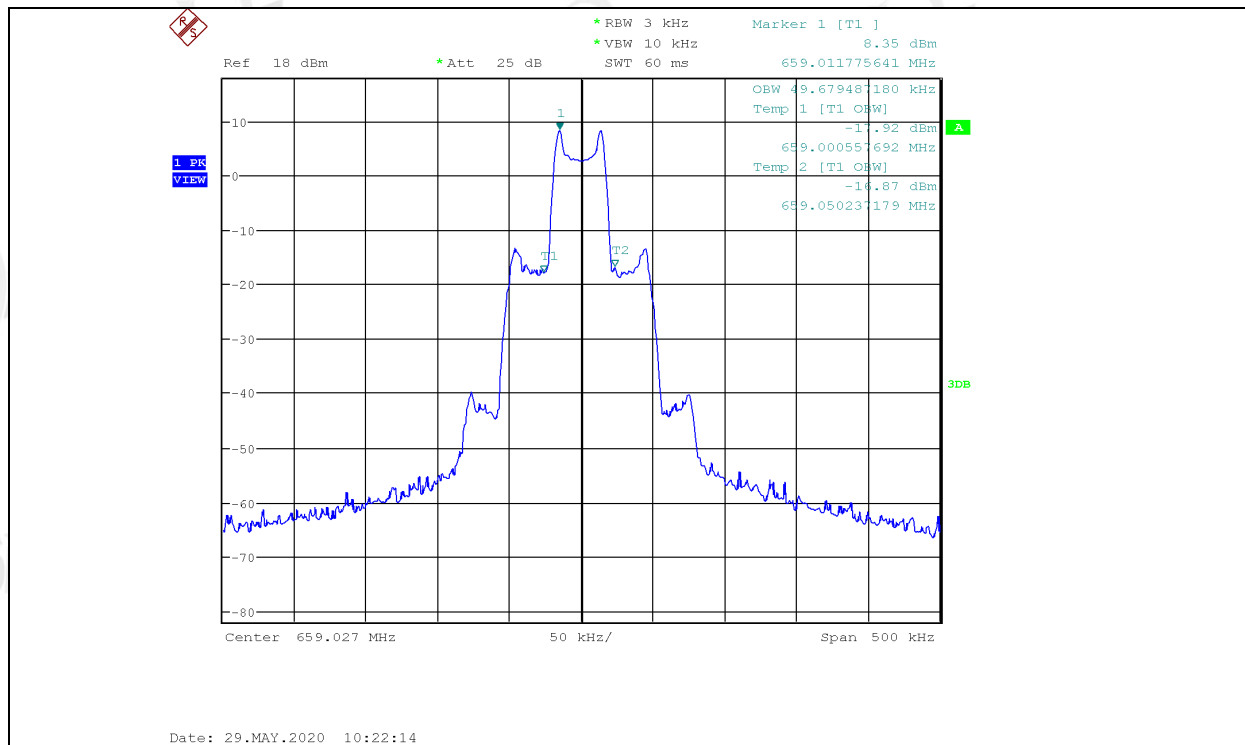
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable, apply a 500Hz 100 mV modulation signal to EUT.
- (2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 3 kHz RBW and 10 kHz VBW.
- (3) Using the 99% power OBW function of the spectrum analyzer. This is the occupied bandwidth specified.

6.4. Test result

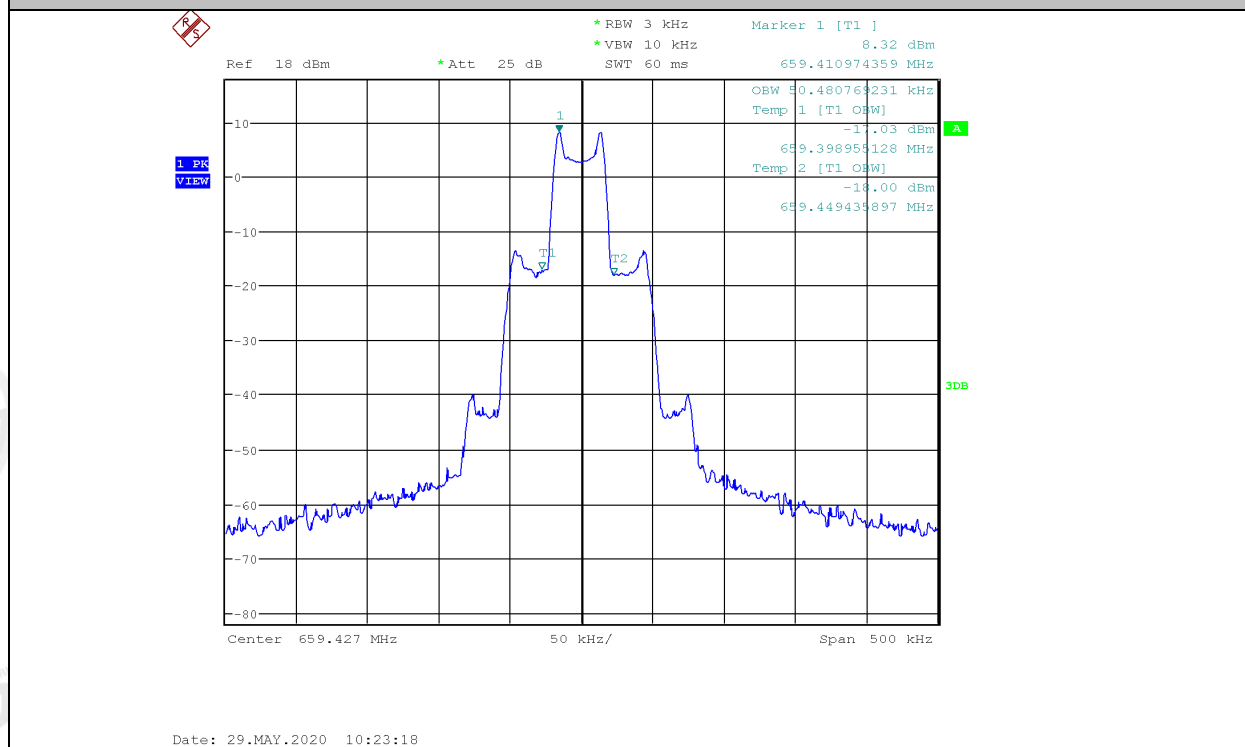
Frequency (MHz)	99% bandwidth Result (kHz)	Limit (kHz)	Verdict
657.027	62.50	200	Pass
657.827	49.68	200	Pass
659.027	49.68	200	Pass
659.427	50.48	200	Pass
660.227	49.68	200	Pass
661.427	48.08	200	Pass

6.5. Original test data

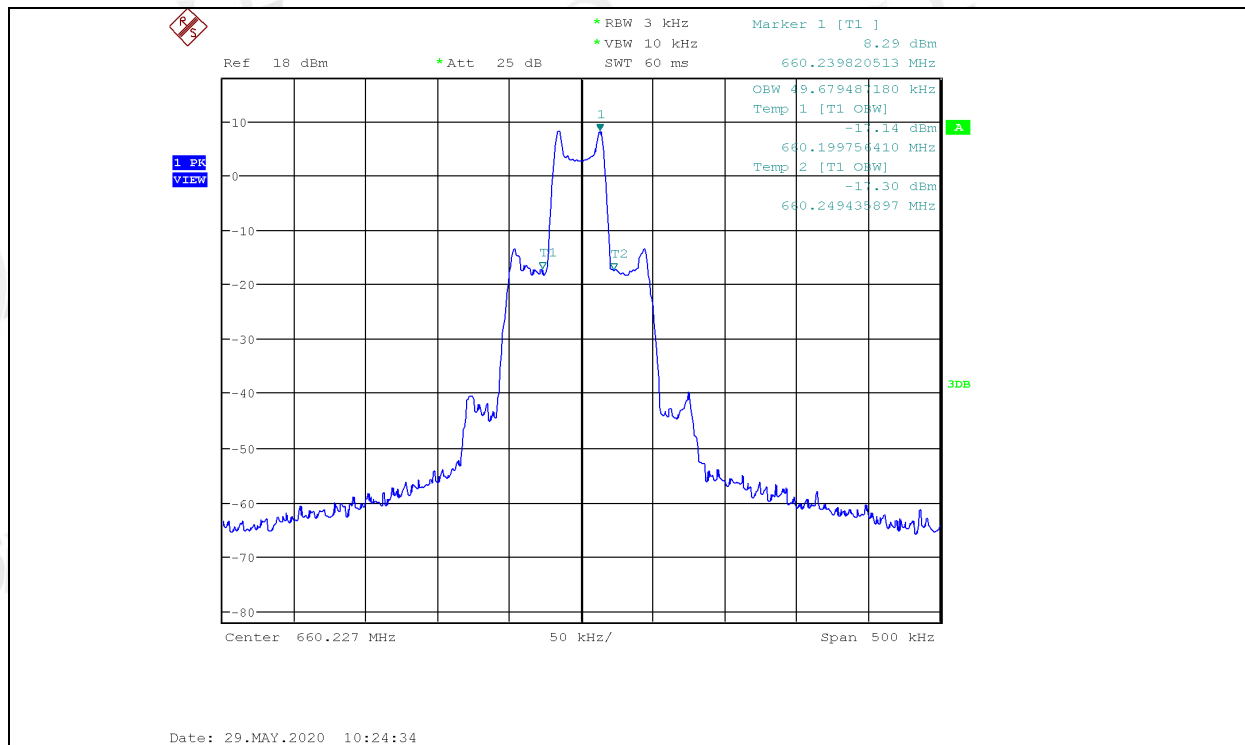




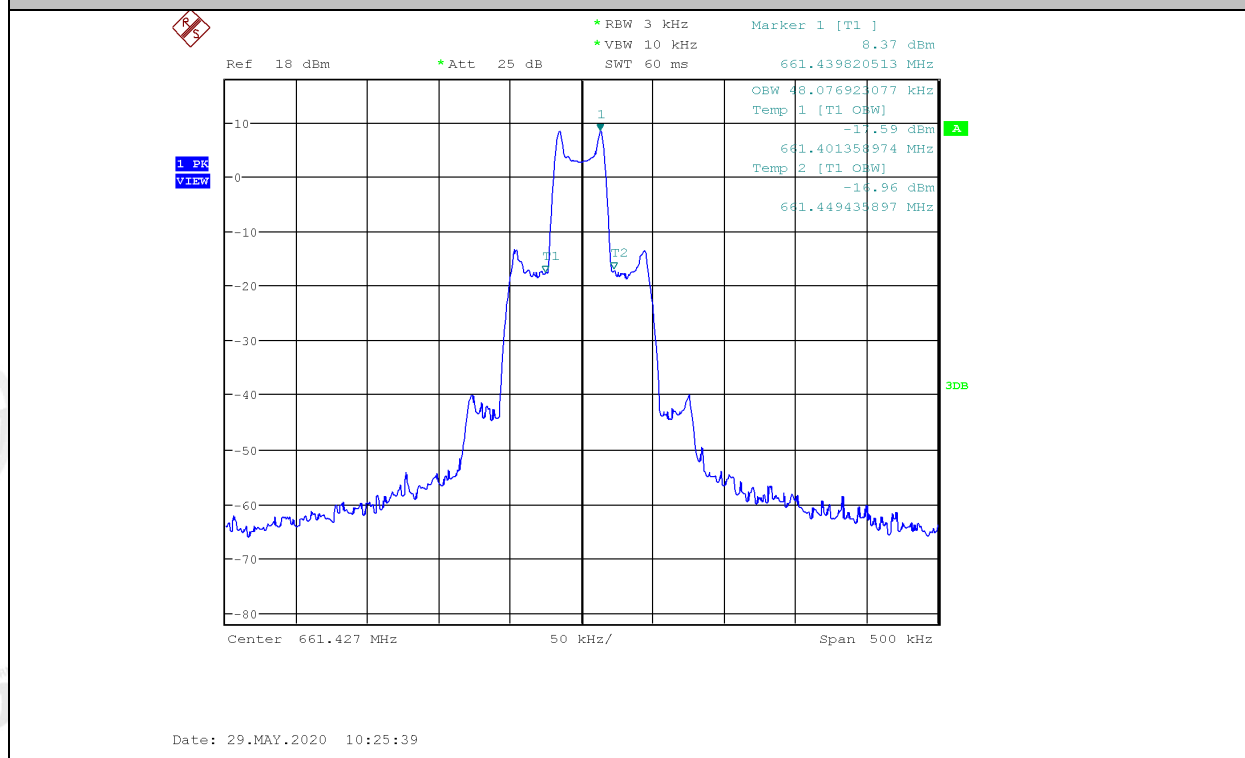
659.427 MHz



660.227 MHz



661.427 MHz



7. Frequency Tolerance

7.1. Block diagram of test setup

Same as section 4.1

7.2. Limits

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ 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.

7.3. Test Procedure

(1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 10 kHz.

Video BW: 10 kHz.

Span: 1 MHz.

Detector: Peak.

Trace Mode: Max Hold.

(2) When the trace is complete, find the peak value of the power envelope and record the frequency.

7.4. Test Result

CH	Temperature	Result			Limit
		Measured (MHz)	Tolerance (kHz)	Tolerance (ppm)	ppm
CH1: 657.027 MHz	-20	657.026	-1	-1.522	+/-50
	-10	657.026	-1	-1.522	+/-50
	0	657.026	-1	-1.522	+/-50
	10	657.026	-1	-1.522	+/-50
	20	657.026	-1	-1.522	+/-50
	30	657.026	-1	-1.522	+/-50
	40	657.026	-1	-1.522	+/-50
	50	657.026	-1	-1.522	+/-50
CH3: 657.827 MHz	-20	657.827	0	0	+/-50
	-10	657.827	0	0	+/-50
	0	657.827	0	0	+/-50
	10	657.827	0	0	+/-50
	20	657.827	0	0	+/-50

	30	657.827	0	0	+/-50
	40	657.826	-1	-1.522	+/-50
	50	657.826	-1	-1.522	+/-50
CH6: 659.027 MHz	-20	659.026	-1	-1.522	+/-50
	-10	659.026	-1	-1.522	+/-50
	0	659.026	-1	-1.522	+/-50
	10	659.026	-1	-1.522	+/-50
	20	659.026	-1	-1.522	+/-50
	30	659.026	-1	-1.522	+/-50
	40	659.026	-1	-1.522	+/-50
	50	659.026	-1	-1.522	+/-50
	-20	659.426	-1	-1.522	+/-50
	-10	659.426	-1	-1.522	+/-50
CH7: 659.427 MHz	0	659.427	0	0	+/-50
	10	659.426	-1	-1.522	+/-50
	20	659.426	-1	-1.522	+/-50
	30	659.426	-1	-1.522	+/-50
	40	659.427	0	0	+/-50
	50	659.427	0	0	+/-50
	-20	660.226	-1	-1.522	+/-50
	-10	660.226	-1	-1.522	+/-50
CH9: 660.227MHz	0	660.226	-1	-1.522	+/-50
	10	660.226	-1	-1.522	+/-50
	20	660.226	-1	-1.522	+/-50
	30	660.226	-1	-1.522	+/-50
	40	660.226	-1	-1.522	+/-50
	50	660.226	-1	-1.522	+/-50
	-20	661.427	0	0	+/-50
	-10	661.427	0	0	+/-50
CH12: 661.427 MHz	0	661.427	0	0	+/-50
	10	661.427	0	0	+/-50
	20	661.427	0	0	+/-50
	30	661.427	0	0	+/-50
	40	661.427	0	0	+/-50
	50	661.427	0	0	+/-50
	-20	661.427	0	0	+/-50
	-10	661.427	0	0	+/-50

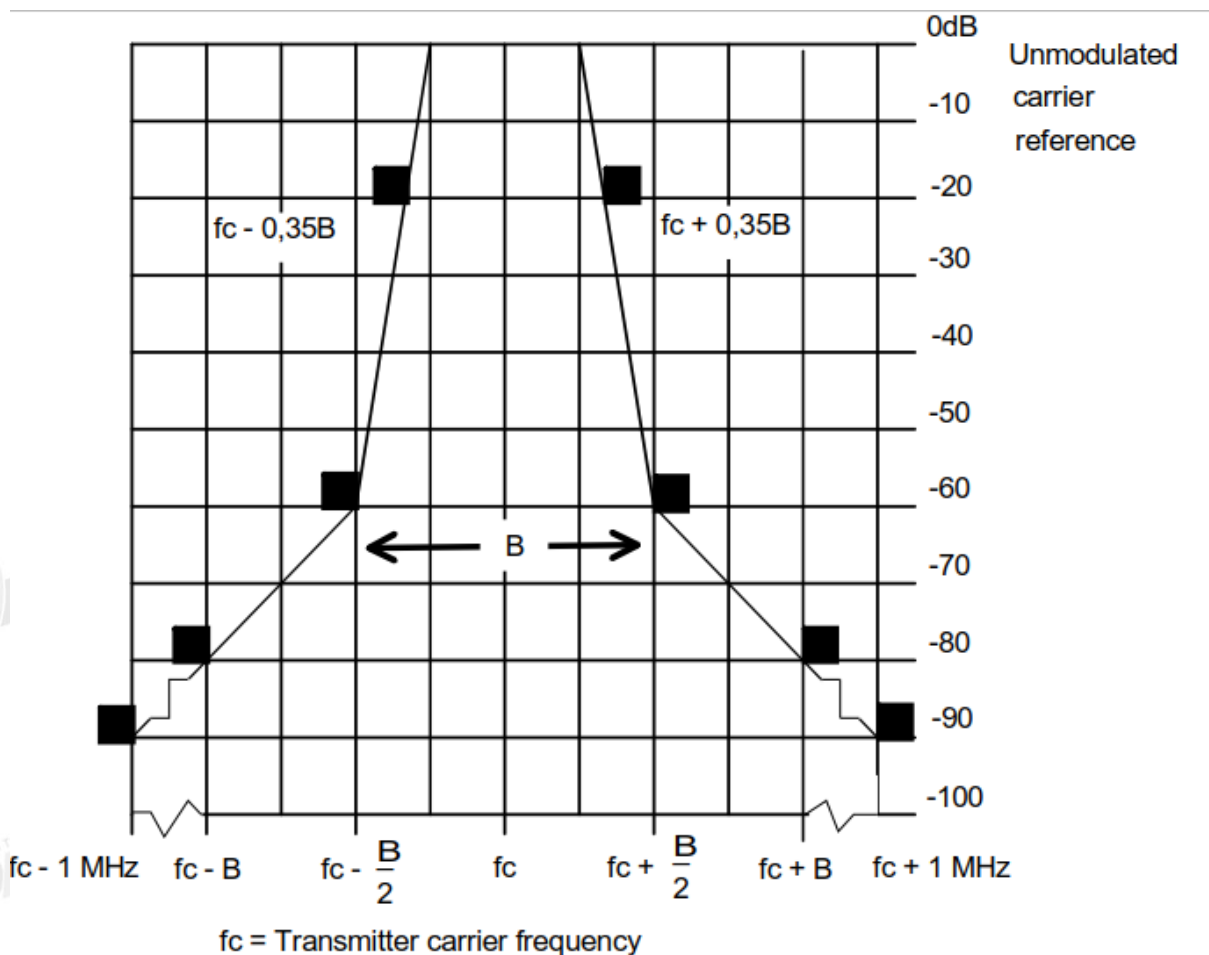
8. Emission Mask

8.1. Block diagram of test setup

Same as section 4.1

8.2. Limits

According to §15.236(g), Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).



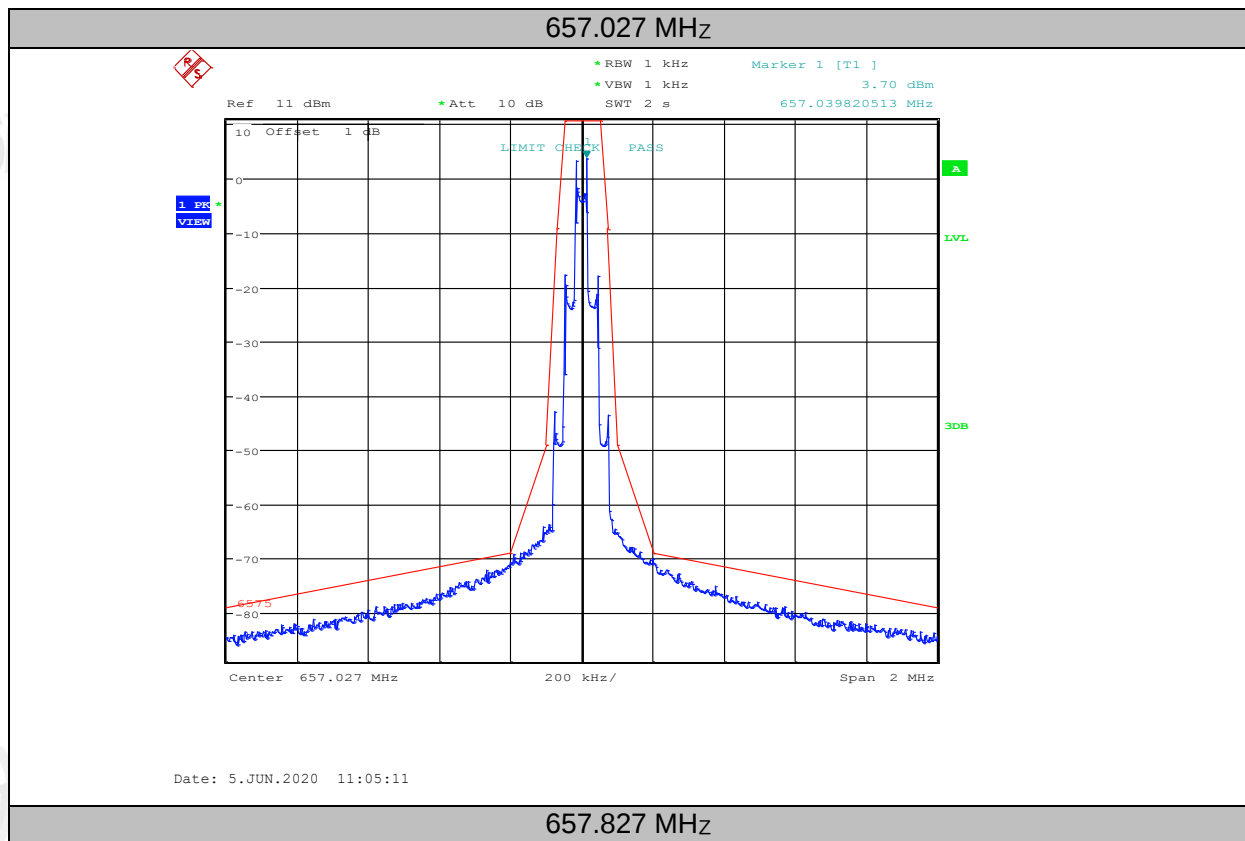
8.3. Test procedure

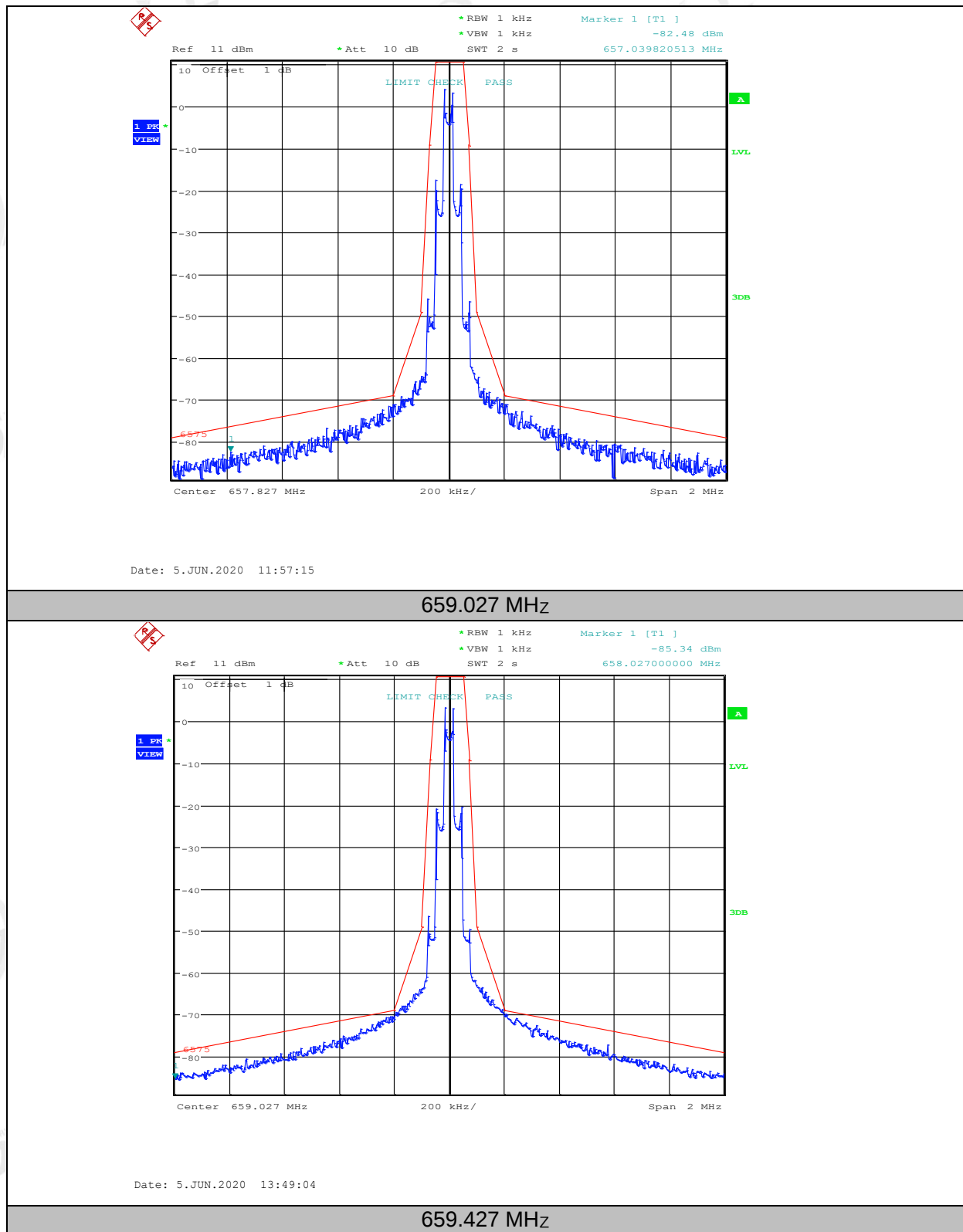
- (6) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (7) Apply a 500Hz modulation signal to EUT and measure the frequencies of the modulated signal from the EUT where it is the specified number of dB below the reference level.

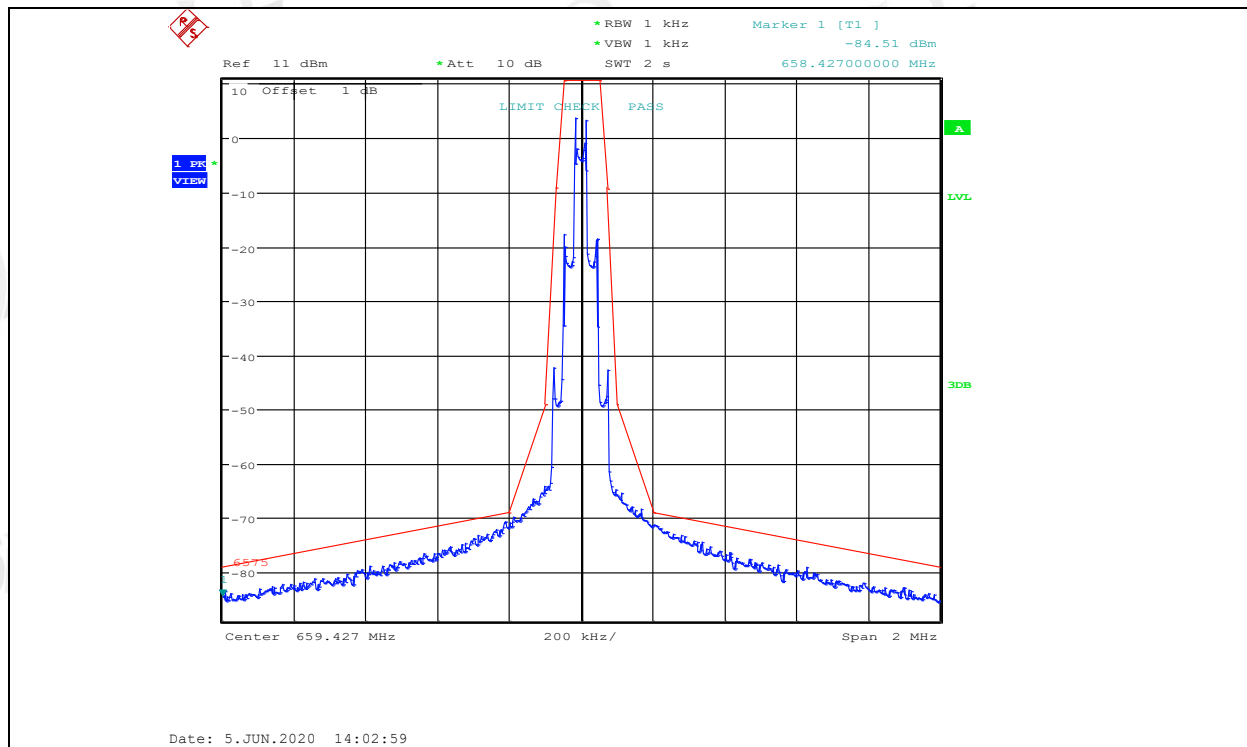
8.4. Test Result

Frequency (MHz)	Verdict
657.027	Pass
657.827	Pass
659.027	Pass
659.427	Pass
660.227	Pass
661.427	Pass

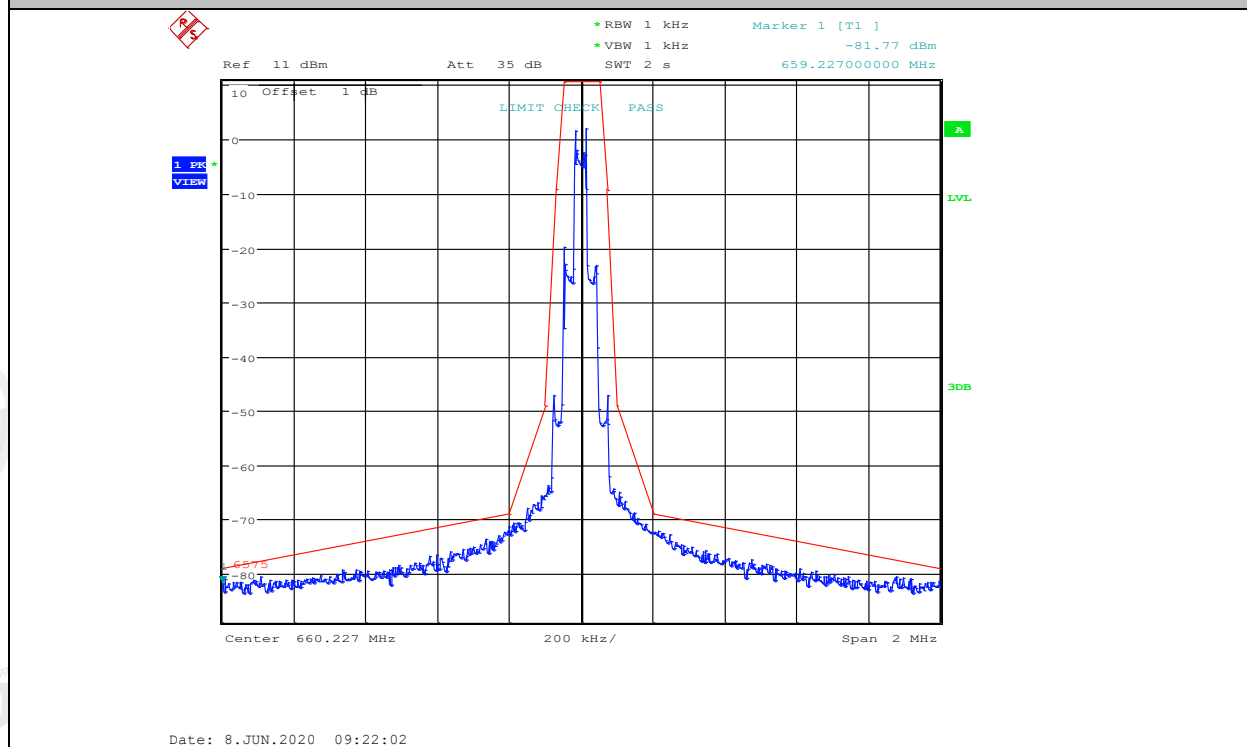
8.5. Original test data



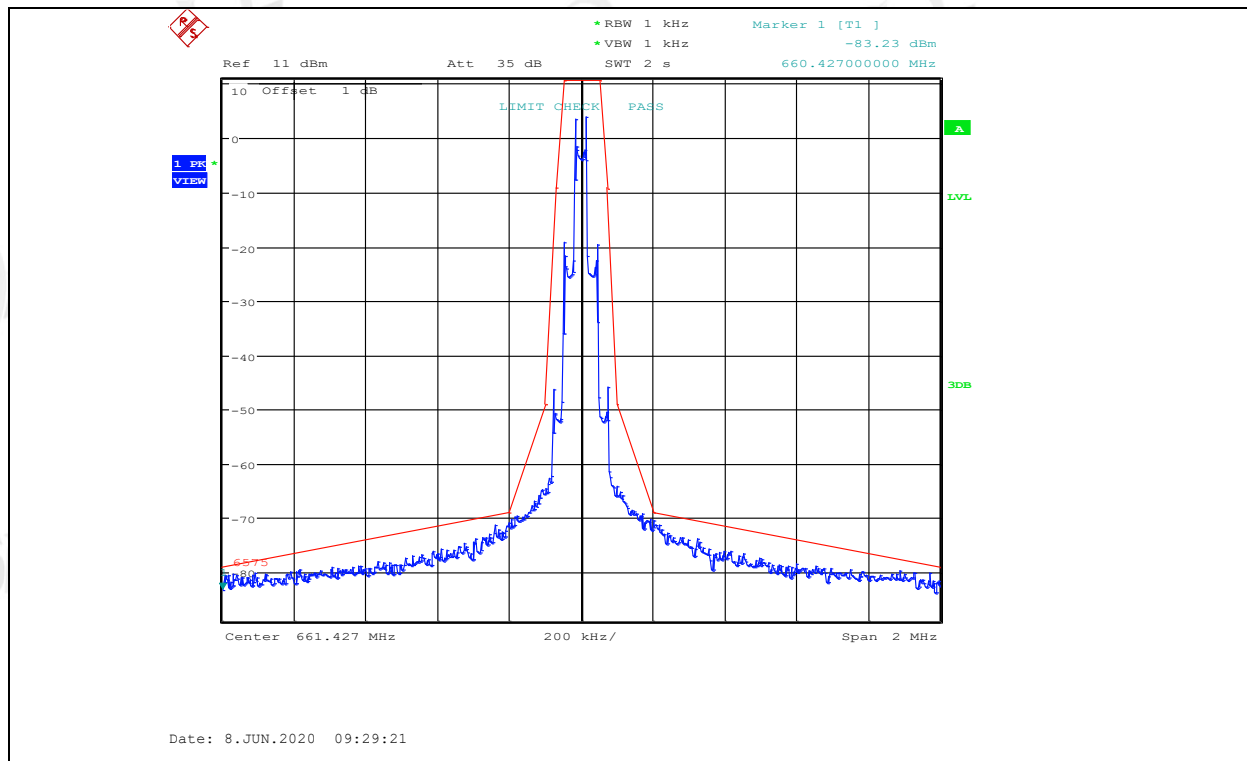




660.227 MHz



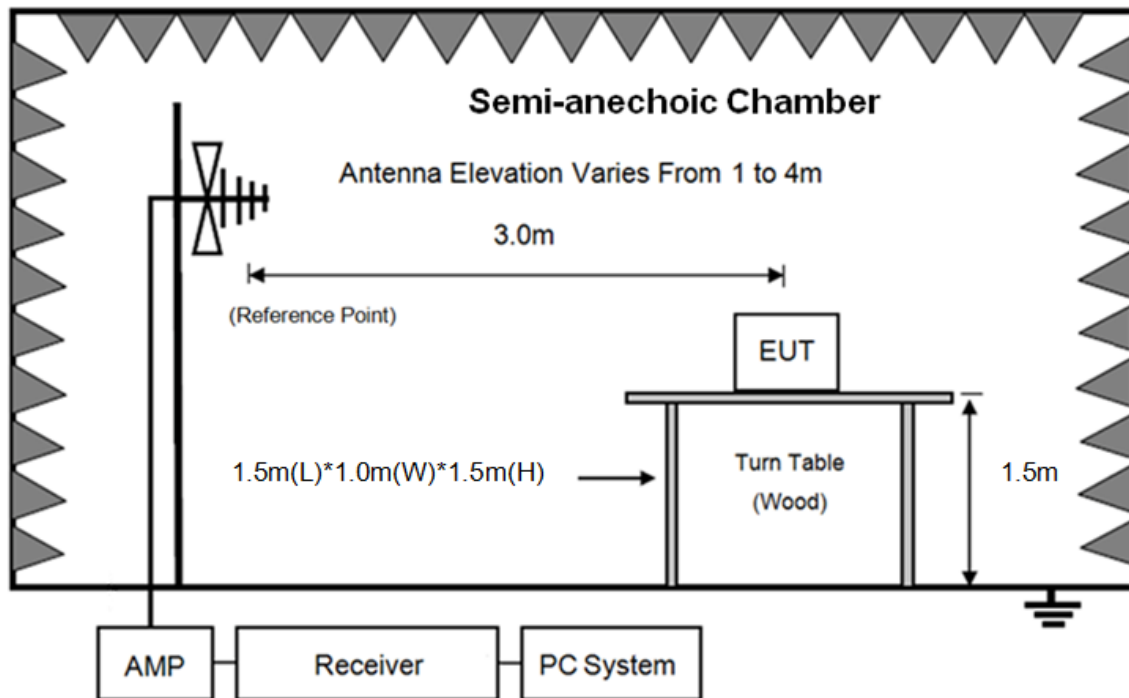
661.427 MHz



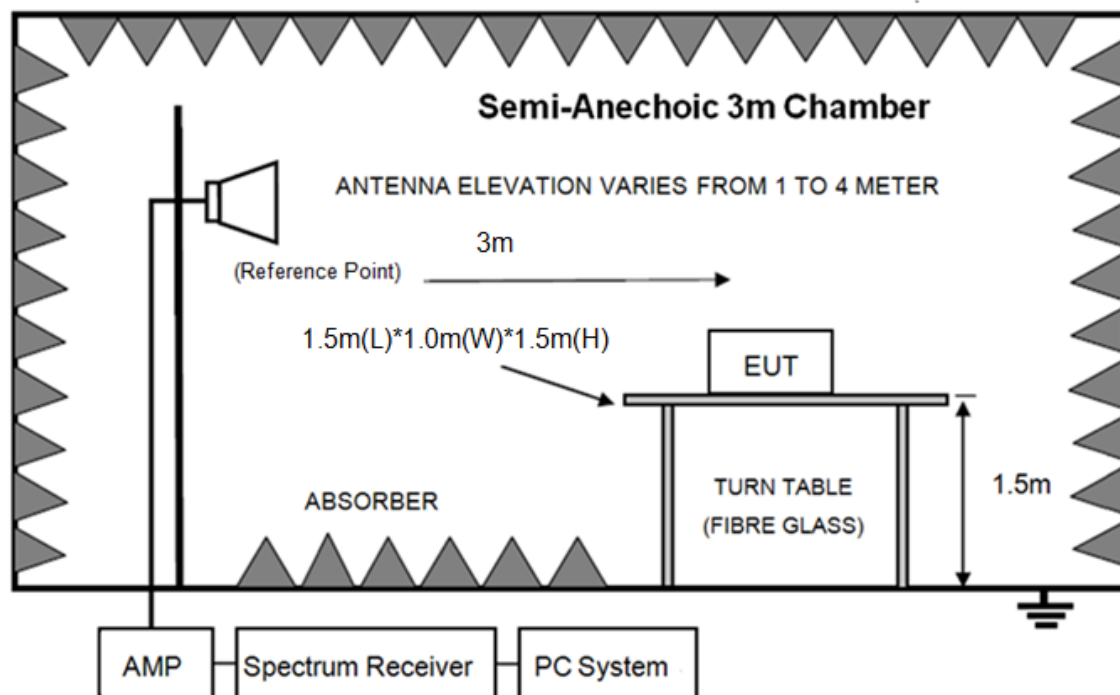
9. Radiated Spurious Emission

9.1. Block diagram of test setup

Below 1G:



Above 1G:



9.2. Limits

According to §15.236 (g), Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

Frequency Range	Maximum power e.r.p (≤1GHz) e.i.r.p (>1GHz)	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87.5 MHz	-36 dBm	100 kHz
87.5 MHz to 137 MHz	-54 dBm	100 kHz
137 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12.75 GHz	-30 dBm	1 MHz

9.3. Test Procedure

- (1) Scan from 25MHz to 12.75GHz, find the maximum radiation frequency to measure.
- (2) The technique used to find the Spurious Emissions of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP/EIRP emission levels of the EUT.
- (3) Refer to EN 300 422-3 V2.1.1 Clause 8.4.2 and Annex C

9.4. Test result

PASS. (See below detailed test result)

Radiated Emission test (below 1GHz)

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2#

E:\2020 RE2# Report Data\Q20011711-1E.EM6

Test Date : 2020-06-08

Tested By : Jacky

EUT : Wireless Microphone

Model Number : OTGM100W

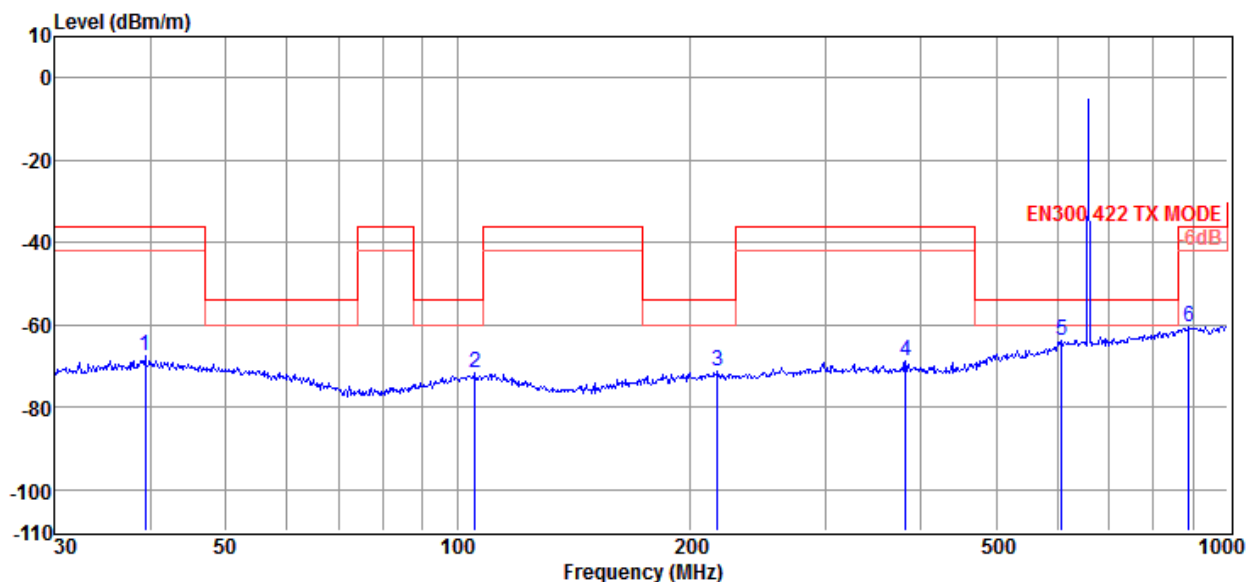
Power Supply : Battery

Test Mode : TX Mode

Condition : Temp:24.5°C,Humi:55%,Press:100.1kPa

Antenna/Distance : 2019 VULB 9163 2#/3m/VERTICAL

Memo : 657.027



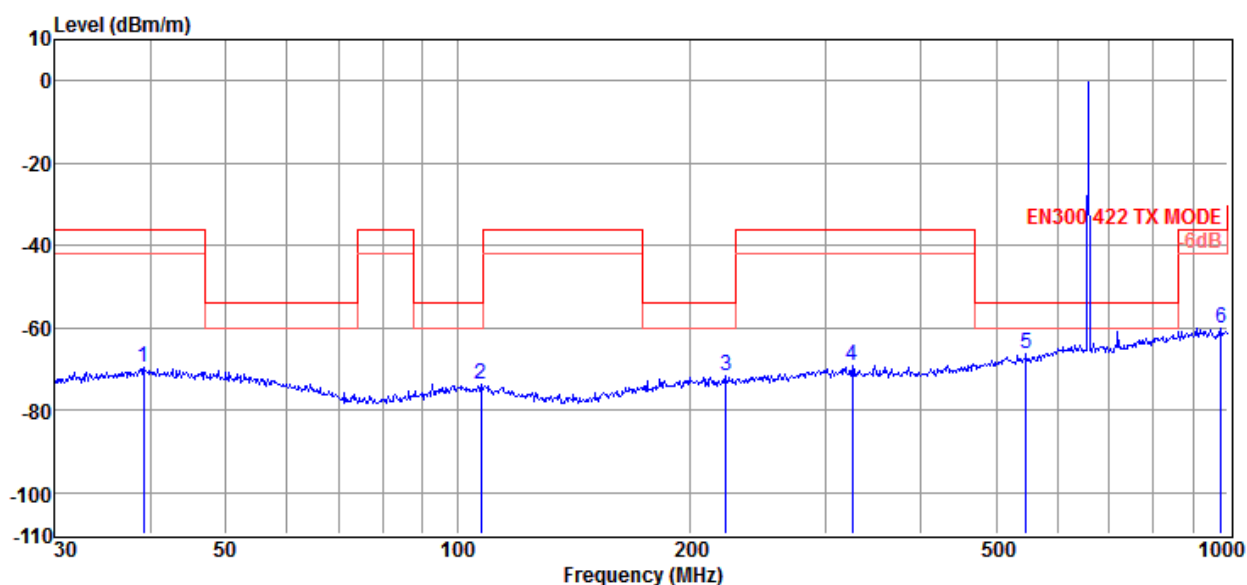
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2019 VULB 9163 2#/3m/HORIZONTAL
Memo : 657.027



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	39.16	-101.30	14.33	3.70	13.49	-69.78	-36.00	-33.78	EIRP
2	107.13	-101.36	11.63	4.26	11.63	-73.84	-54.00	-19.84	EIRP
3	222.95	-100.61	12.10	4.98	11.94	-71.59	-54.00	-17.59	EIRP
4	325.60	-100.85	14.43	5.50	11.81	-69.11	-36.00	-33.11	EIRP
5	547.10	-100.66	18.49	6.51	9.28	-66.38	-54.00	-12.38	EIRP
6	979.18	-99.86	22.66	8.19	8.85	-60.16	-36.00	-24.16	EIRP

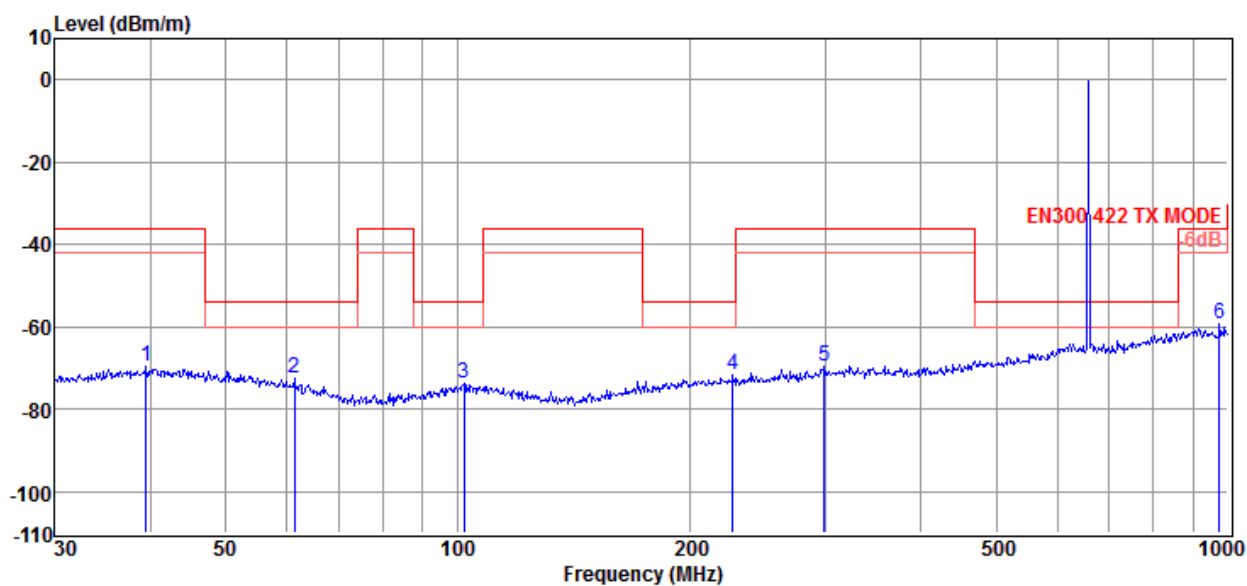
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2019 VULB 9163 2#/3m/HORIZONTAL
Memo : 657.827



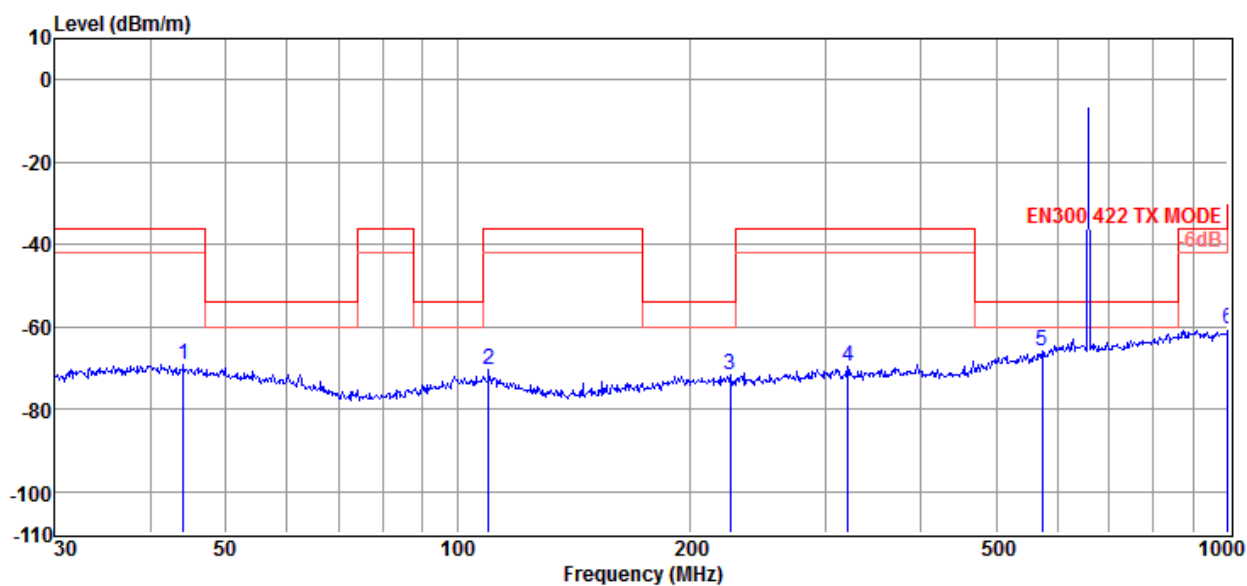
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kP **Antenna/Distance** : 2019 VULB 9163 2#/3m/VERTICAL
Memo : 657.827



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	44.12	-101.18	13.97	3.74	14.49	-68.98	-36.00	-32.98	EIRP
2	109.80	-99.28	11.60	4.28	12.89	-70.51	-36.00	-34.51	EIRP
3	226.10	-100.89	12.19	5.00	12.14	-71.56	-54.00	-17.56	EIRP
4	321.06	-100.91	14.35	5.48	11.60	-69.48	-36.00	-33.48	EIRP
5	574.63	-100.77	18.92	6.65	9.36	-65.84	-54.00	-11.84	EIRP
6	1000.00	-100.61	22.80	8.26	9.08	-60.47	-36.00	-24.47	EIRP

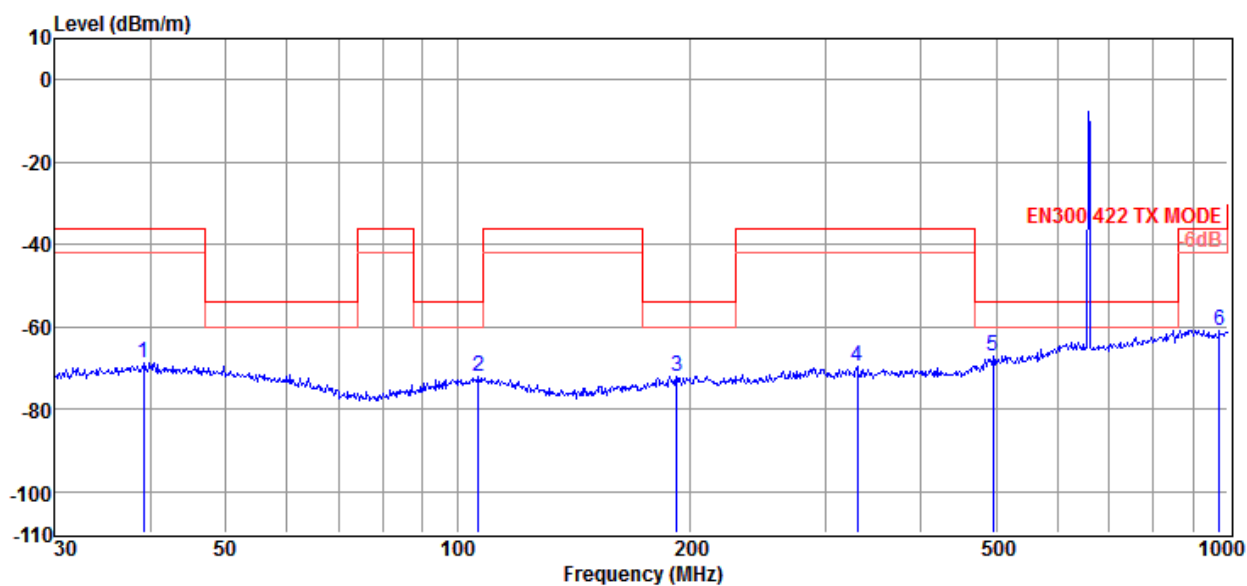
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kP **Antenna/Distance** : 2019 VULB 9163 2#/3m/VERTICAL
Memo : 659.027



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	39.16	-101.27	14.33	3.70	14.49	-68.75	-36.00	-32.75	EIRP
2	106.39	-100.76	11.64	4.25	12.89	-71.98	-54.00	-17.98	EIRP
3	192.42	-100.60	11.10	4.80	12.77	-71.93	-54.00	-17.93	EIRP
4	330.20	-101.14	14.50	5.52	11.60	-69.52	-36.00	-33.52	EIRP
5	495.93	-100.50	17.62	6.25	9.67	-66.96	-54.00	-12.96	EIRP
6	975.75	-100.45	22.64	8.18	8.90	-60.73	-36.00	-24.73	EIRP

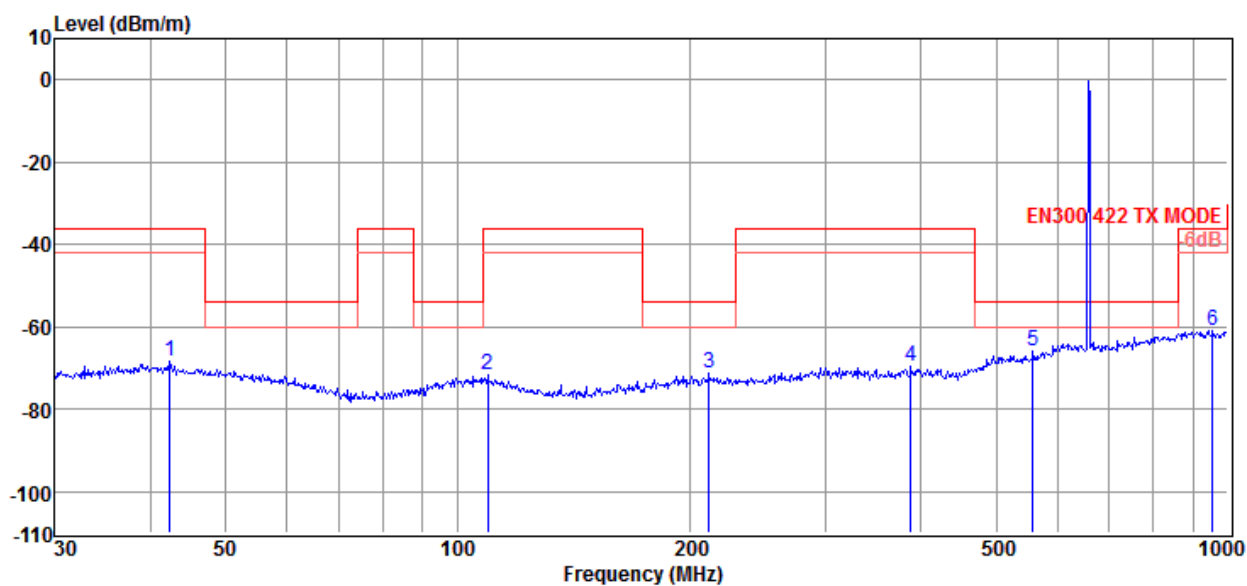
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2019 VULB 9163 2#/3m/HORIZONTAL
Memo : 659.027



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	42.30	-100.64	14.20	3.72	14.49	-68.23	-36.00	-32.23	EIRP
2	109.41	-100.56	11.61	4.28	12.89	-71.78	-36.00	-35.78	EIRP
3	212.27	-100.11	11.78	4.92	12.14	-71.27	-54.00	-17.27	EIRP
4	387.99	-101.07	15.34	5.78	10.46	-69.49	-36.00	-33.49	EIRP
5	558.73	-100.18	18.67	6.57	9.09	-65.85	-54.00	-11.85	EIRP
6	955.44	-100.37	22.50	8.11	8.78	-60.98	-36.00	-24.98	EIRP

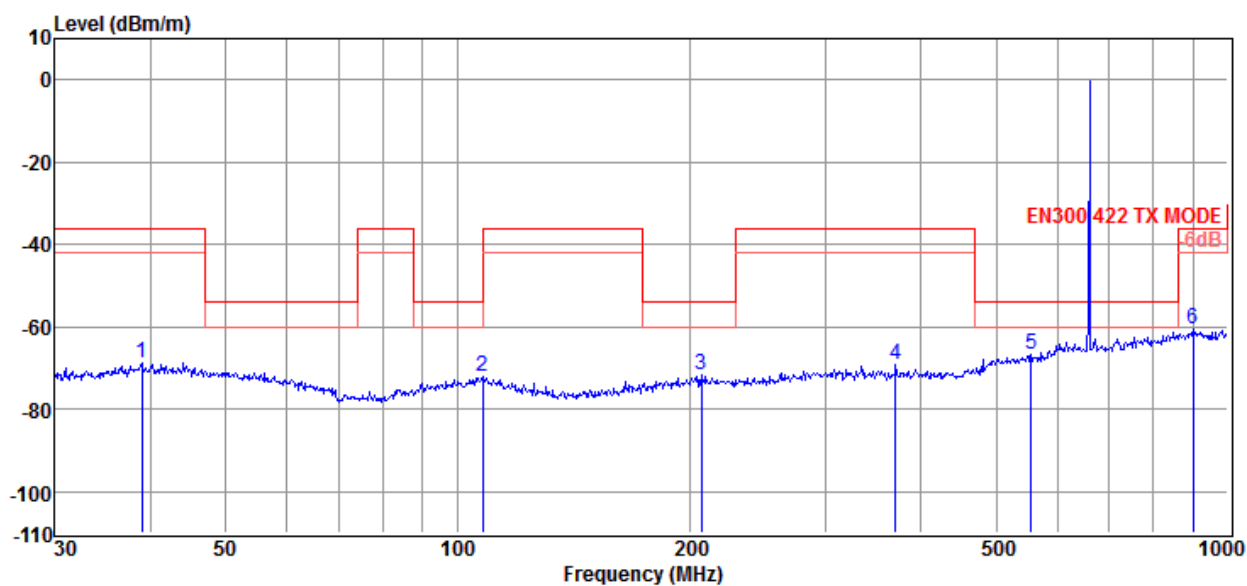
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2019 VULB 9163 2#/3m/HORIZONTAL
Memo : 659.427



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	38.89	-101.10	14.27	3.69	14.49	-68.65	-36.00	-32.65	EIRP
2	107.89	-100.96	11.62	4.27	12.89	-72.18	-54.00	-18.18	EIRP
3	207.12	-101.00	11.62	4.89	12.77	-71.72	-54.00	-17.72	EIRP
4	370.70	-100.70	15.10	5.71	10.66	-69.23	-36.00	-33.23	EIRP
5	554.83	-101.15	18.61	6.55	9.09	-66.90	-54.00	-12.90	EIRP
6	900.15	-100.61	22.10	7.92	9.96	-60.63	-36.00	-24.63	EIRP

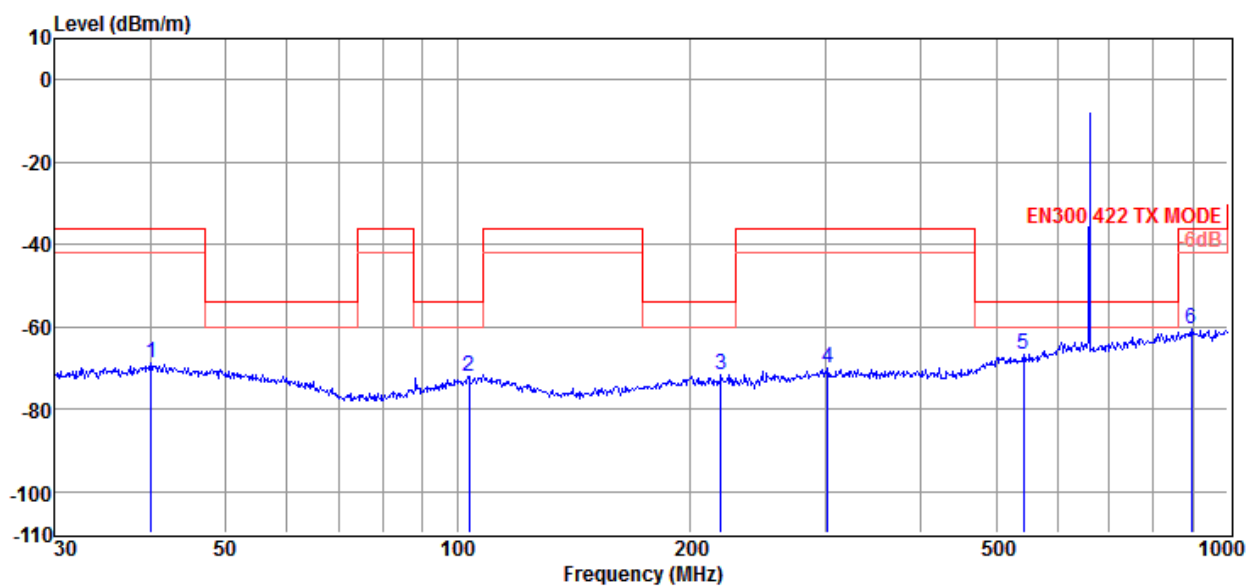
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2019 VULB 9163 2#/3m/VERTICAL
Memo : 659.427



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	39.99	-101.52	14.50	3.70	14.49	-68.83	-36.00	-32.83	EIRP
2	103.44	-100.80	11.66	4.23	12.89	-72.02	-54.00	-18.02	EIRP
3	219.85	-100.66	12.01	4.96	12.14	-71.55	-54.00	-17.55	EIRP
4	302.48	-101.06	14.04	5.38	11.58	-70.06	-36.00	-34.06	EIRP
5	543.27	-101.20	18.43	6.49	9.42	-66.86	-54.00	-12.86	EIRP
6	897.00	-100.47	22.07	7.91	9.96	-60.53	-36.00	-24.53	EIRP

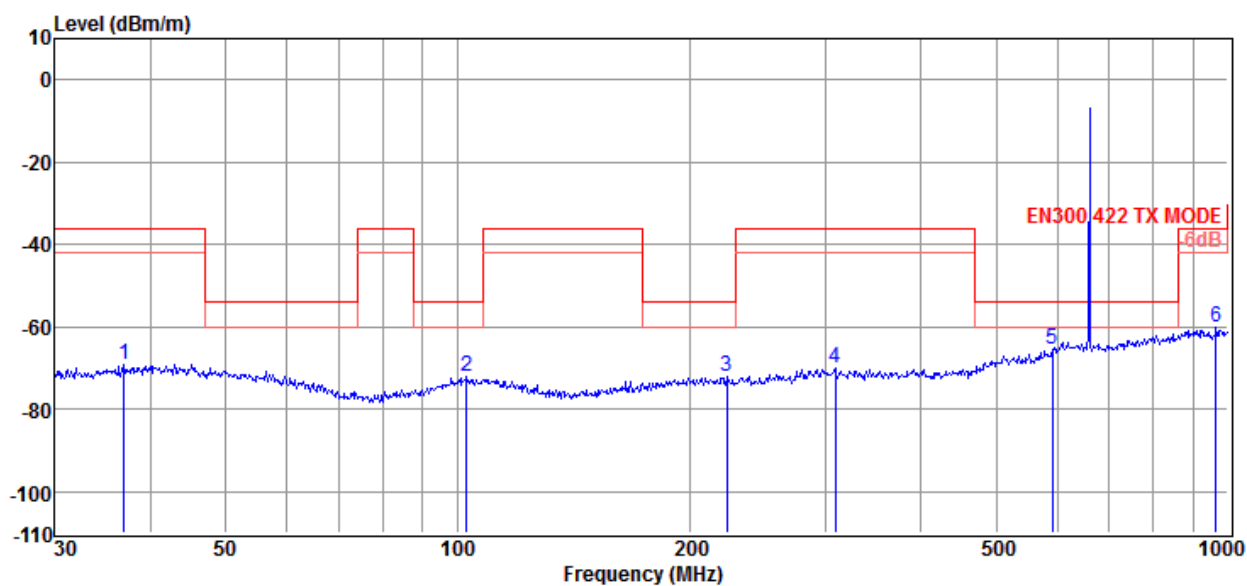
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kP **Antenna/Distance** : 2019 VULB 9163 2#/3m/VERTICAL
Memo : 660.227



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	36.90	-101.23	13.85	3.68	14.49	-69.21	-36.00	-33.21	EIRP
2	102.72	-100.76	11.67	4.22	12.89	-71.98	-54.00	-17.98	EIRP
3	223.73	-101.48	12.12	4.98	12.14	-72.24	-54.00	-18.24	EIRP
4	308.91	-101.26	14.15	5.42	11.58	-70.11	-36.00	-34.11	EIRP
5	590.97	-101.12	19.17	6.72	9.82	-65.41	-54.00	-11.41	EIRP
6	965.54	-99.69	22.57	8.15	8.78	-60.19	-36.00	-24.19	EIRP

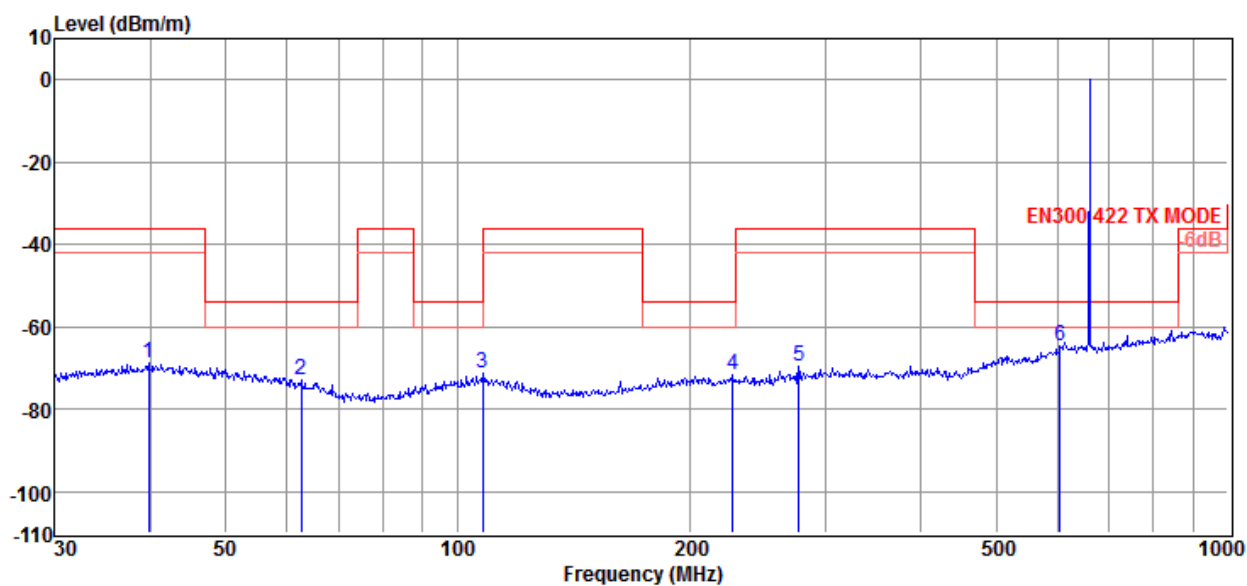
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kP **Antenna/Distance** : 2019 VULB 9163 2#/3m/HORIZONTAL
Memo : 660.227



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	39.72	-101.22	14.44	3.70	14.49	-68.59	-36.00	-32.59	EIRP
2	62.65	-101.48	10.97	3.90	13.77	-72.84	-54.00	-18.84	EIRP
3	107.89	-99.96	11.62	4.27	12.89	-71.18	-54.00	-17.18	EIRP
4	227.69	-101.00	12.23	5.01	12.14	-71.62	-54.00	-17.62	EIRP
5	277.09	-99.71	13.49	5.27	11.27	-69.68	-36.00	-33.68	EIRP
6	605.66	-100.53	19.34	6.79	9.82	-64.58	-54.00	-10.58	EIRP

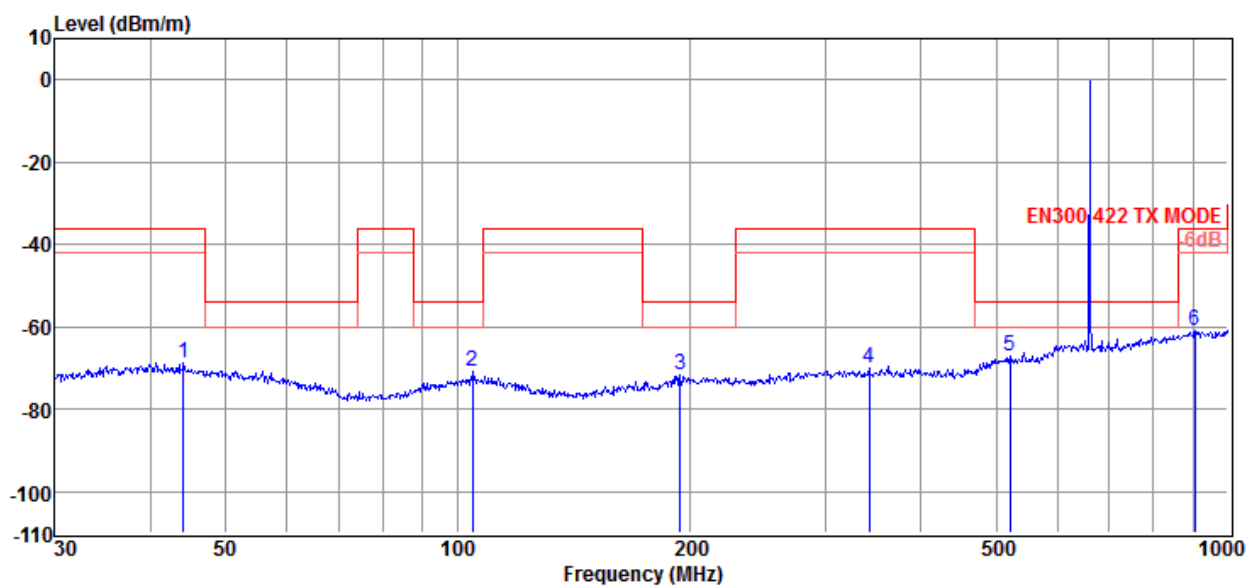
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2019 VULB 9163 2#/3m/HORIZONTAL
Memo : 661.427



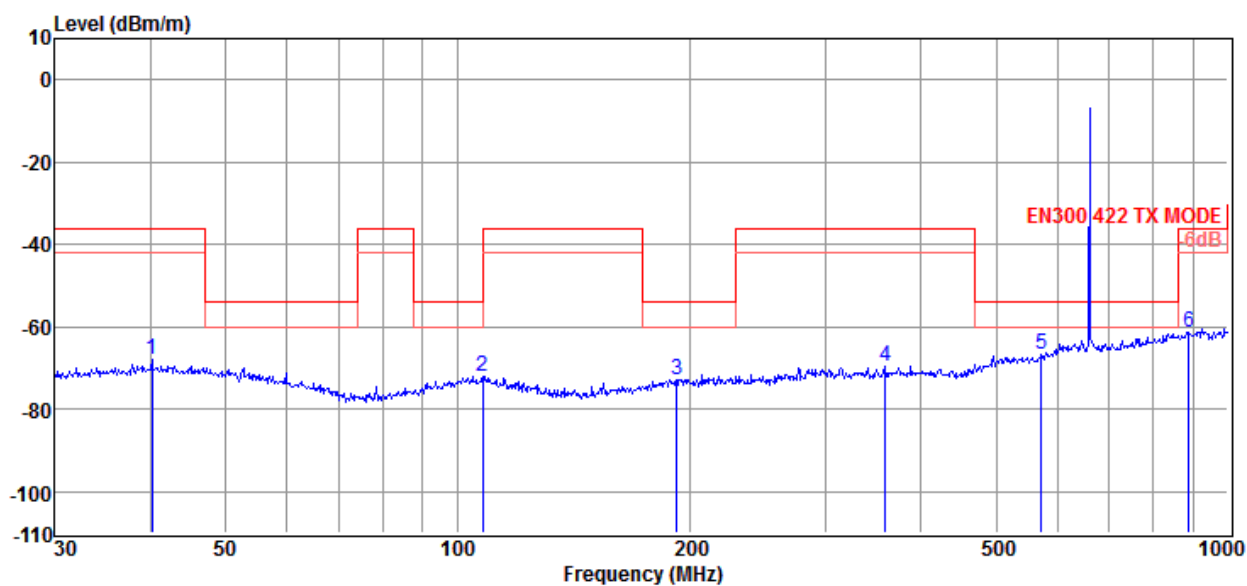
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Spurious Emission Test Result

Test Site : DDT 3m Chamber 2# **E:\2020 RE2# Report Data\Q20011711-1E.EM6**
Test Date : 2020-06-08 **Tested By** : Jacky
EUT : Wireless Microphone **Model Number** : OTGM100W
Power Supply : Battery **Test Mode** : TX Mode
Condition : Temp:24.5'C,Humi:55%,Press:100.1kP **Antenna/Distance** : 2019 VULB 9163 2#/3m/VERTICAL
Memo : 661.427



Item (Mark)	Freq. (MHz)	Read Level (dBm)	Antenna Factor (dB/m)	Cable Loss dB	Site Loss Factor dB	Result Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Type
1	40.14	-100.50	14.48	3.71	14.49	-67.82	-36.00	-31.82	EIRP
2	107.89	-100.89	11.62	4.27	12.89	-72.11	-54.00	-18.11	EIRP
3	192.42	-101.41	11.10	4.80	12.77	-72.74	-54.00	-18.74	EIRP
4	359.19	-100.99	14.94	5.66	10.66	-69.73	-36.00	-33.73	EIRP
5	572.61	-101.40	18.89	6.64	9.36	-66.51	-54.00	-12.51	EIRP
6	890.73	-100.87	22.02	7.89	9.76	-61.20	-36.00	-25.20	EIRP

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss + Site Loss Factor.

2. Below 1 GHz test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.

3. Above 1 GHz test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

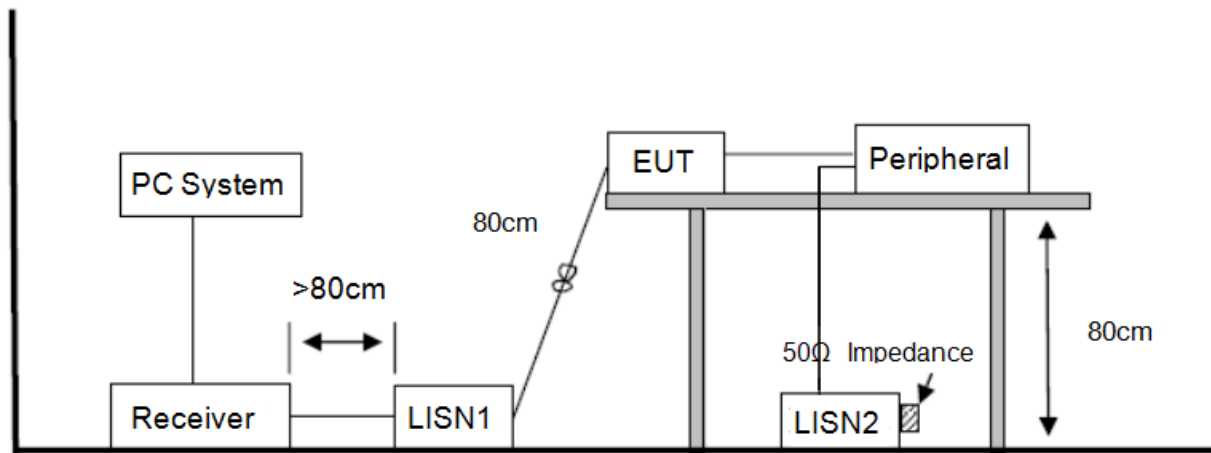
Radiated Emission Test (above 1GHz)

657.027 Mhz				
1314.05	-48.79	-30.00	H	PASS
1971.08	-35.85	-30.00	H	PASS
2628.11	-45.36	-30.00	H	PASS
3295.14	-49.38	-30.00	H	PASS
3954.16	-47.27	-30.00	H	PASS
6570.27	-46.64	-30.00	H	PASS
1971.08	-42.74	-30.00	V	PASS
2628.11	-46.02	-30.00	V	PASS
3295.14	-45.79	-30.00	V	PASS
3954.16	-45.21	-30.00	V	PASS
4599.19	-46.06	-30.00	V	PASS
6570.27	-46.06	-30.00	V	PASS
657.827 Mhz				
1315.65	-49.23	-30.00	H	PASS
1973.48	-35.86	-30.00	H	PASS
2631.31	-45.16	-30.00	H	PASS
3289.14	-47.66	-30.00	H	PASS
3946.96	-47.26	-30.00	H	PASS
6578.27	-45.80	-30.00	H	PASS
1973.48	-41.71	-30.00	V	PASS
2631.31	-46.94	-30.00	V	PASS
3289.14	-48.07	-30.00	V	PASS
3946.96	-45.47	-30.00	V	PASS
4607.79	-46.42	-30.00	V	PASS
6578.27	-46.70	-30.00	V	PASS
659.027 Mhz				
1318.05	-50.26	-30.00	H	PASS
1977.08	-35.96	-30.00	H	PASS
2636.11	-46.18	-30.00	H	PASS
3954.16	-47.88	-30.00	H	PASS
5272.21	-49.49	-30.00	H	PASS
6590.27	-45.36	-30.00	H	PASS
1977.08	-41.28	-30.00	V	PASS
2636.11	-46.02	-30.00	V	PASS
3295.14	-47.34	-30.00	V	PASS
3954.16	-46.32	-30.00	V	PASS
4613.19	-46.01	-30.00	V	PASS
6590.27	-45.81	-30.00	V	PASS

659.427 Mhz				
1318.85	-49.51	-30.00	H	PASS
1978.28	-36.05	-30.00	H	PASS
2637.71	-46.19	-30.00	H	PASS
3297.14	-50.85	-30.00	H	PASS
3956.56	-47.92	-30.00	H	PASS
5275.42	-48.61	-30.00	H	PASS
1978.28	-41.74	-30.00	V	PASS
2637.71	-46.09	-30.00	V	PASS
3297.14	-47.10	-30.00	V	PASS
3956.56	-44.76	-30.00	V	PASS
4615.99	-46.00	-30.00	V	PASS
5275.42	-48.28	-30.00	V	PASS
660.227 Mhz				
1320.45	-51.48	-30.00	H	PASS
1980.68	-35.54	-30.00	H	PASS
2640.91	-47.11	-30.00	H	PASS
3301.14	-48.97	-30.00	H	PASS
3961.36	-46.57	-30.00	H	PASS
4621.59	-48.76	-30.00	H	PASS
1980.68	-42.38	-30.00	V	PASS
2640.91	-47.17	-30.00	V	PASS
3301.14	-48.23	-30.00	V	PASS
3961.36	-47.87	-30.00	V	PASS
4621.59	-47.77	-30.00	V	PASS
5281.82	-47.64	-30.00	V	PASS
661.427 Mhz				
1322.85	-50.65	-30.00	H	PASS
1984.28	-35.62	-30.00	H	PASS
2645.71	-46.91	-30.00	H	PASS
3307.14	-50.14	-30.00	H	PASS
3968.56	-46.84	-30.00	H	PASS
6614.27	-46.59	-30.00	H	PASS
1984.28	-41.40	-30.00	V	PASS
2645.71	-46.92	-30.00	V	PASS
3307.14	-47.99	-30.00	V	PASS
3968.56	-47.49	-30.00	V	PASS
4629.99	-46.18	-30.00	V	PASS
6614.27	-47.96	-30.00	V	PASS

10. Power Line Conducted Emission

10.1. Block diagram of test setup



10.2. Power Line Conducted Emission Limits

Frequency	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

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

10.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

10.4. Test Result

Not Applicable

Remark: Conducted limits are not required for devices which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines according to 15.207(C).

11. Antenna Requirements

11.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2. Result

The antenna used for this product is Spring antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only -4.15 dBi.

END OF REPORT