

FCC TEST REPORT FCC ID: 2ATNS-PPHP1235WMU

Product Name	:	WIRELESS MICROPHONE	
Model Name	:	PPHP1235WMU/PPHP1535WMU	
Brand Name	:	PYLE	
Report No.	:	PTC19060314001E-FC01	

Prepared for

GUANGZHOU TEAMWORK IMP AND EXP CO., LTD

ROOM 901A, BUILDING 1, GUANGZHOU FRIENDSHIP COMMERCIAL BUILDING, NO.369
HUANSHI EAST ROAD, YUEXIU, GUANGZHOU

Prepared by

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1 TEST RESULT CERTIFICATION

Applicant's name : GUANGZHOU TEAMWORK IMP AND EXP CO., LTD

Address : ROOM 901A, BUILDING 1, GUANGZHOU FRIENDSHIP

COMMERCIAL BUILDING, NO.369 HUANSHI EAST ROAD, YUEXIU,

GUANGZHOU

Manufacture's name : GUANGZHOU TEAMWORK IMP AND EXP CO., LTD

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COMMERCIAL BUILDING, NO.369 HUANSHI EAST ROAD, YUEXIU.

GUANGZHOU

: ANSI C63.10:2013

Product name : WIRELESS MICROPHONE

Model name : PPHP1235WMU/PPHP1535WMU
Standards : FCC Part 15.236, KDB206256 D01

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Test Date : June 1, 2019, June 4, 2019

Date of Issue : June 5, 2019

Test Result : Pass

Test procedure

This device described above has been tested by PTC, 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 Engineer:

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2 Test Summary

FCC Rules Description Of Test		Result	
§15.207 (a)	AC Power Conducted Emission	Not Applicable	
§15.236(d)	RF Output Power	Compliant	
§15.236(f)	Occupied Bandwidth	Compliant	
§15.236(f)(3)	Frequency stability	Compliance	
§15.236(g)	Transmitter Spurious Emissions & Emission mask	Compliance	
§15.203	Antenna Requirement	Compliant	

Remark:

- 1. Due to this EUT is powered by battery only, the AC Power Conducted Emission is not applicable.
- 2. The EUT has been tested as an independent unit. And Continual transmitting in maximum power (The new battery be used during test)



3 TEST FACILITY

Dongguan Precise Testing & Certification Corp., Ltd.

Address: Building D, Baoding Technology Park, Guangming Road2, Dongcheng District, Dongguan,

Guangdong, China

FCC Registration Number: 790290 A2LA Certificate No.: 4408.01 IC Registration Number: 12191A-1



4 General Information

4.1 General Description of E.U.T.

Product Name		WIRELESS MICROPHONE	
Model Name	:	PPHP1235WMU/PPHP1535WMU (Note: The samples are the same except appearance and model number. PPHP1535WMU was selected for full tested.)	
Equipment Type	:	DWM: Part 15 WIRELESS MICROPHONE.	
Operating frequency		600.85/606.0MHz	
Antenna Type		Internal Antenna	
Antenna Gain		0 dBi	
Type of Modulation	: FM		
Power supply		DC 2*1.5V Battery (New batteries were used during testing)	

4.2 Test Mode

Channel List: 600.85MHz, 606.00MHz

Only test result of sample of in channels 600.85 and 606.0MHz.



5 Equipment During Test

5.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Apr 07, 2020
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Oct 09, 2020
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Aug. 26, 2020

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions(Test Frequency from 9KHz-18GHz)

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Sep. 03, 2020
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug 31, 2020
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug 31, 2020
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Sep. 03, 2020
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Sep. 03, 2020
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Oct. 13, 2020
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug. 31, 2020
Power Amplifier	LUNAR EM	LNA1G18-40	J10100000081	1GHz-26.5GHz	Aug. 31, 2020
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Sep. 03, 2020

5.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement L	Incertainty for a level of Confidence of 95%

5.3 Description of Support Units

Equipment	Model No.	Series No.
N/A	N/A	N/A

5.4 E.U.T. Operation Condition

Operating Environment:		
Temperature:	20.0 °C~25 °C	
Humidity:	50 ~70% RH	
Atmospheric Pressure:	980~1012 mbar	
EUT Operation:	Test the EUT in transmitting mode.	

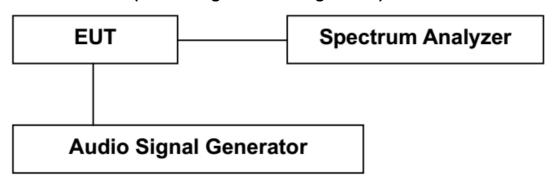


6 Max. RF Output Power

6.1 Test Requirement:

- 1. The maximum 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. In the bands allocated and assigned for broadcast television and in the 600MHz service band: 50mW (17dBm)

6.2 Test SET-UP (Block Diagram of Configuration):

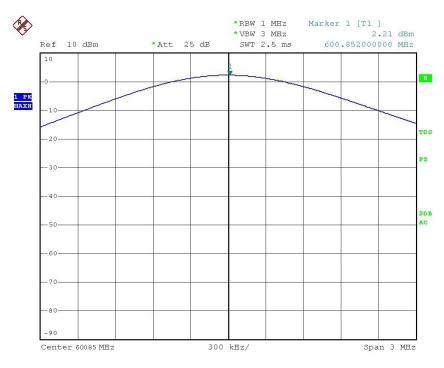


6.3 Test result:

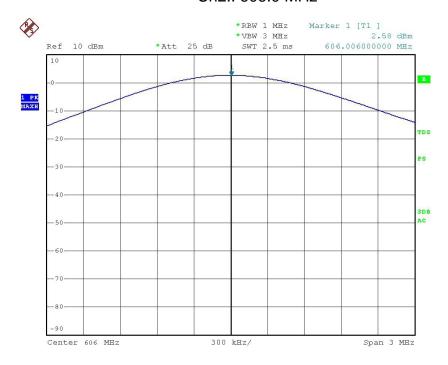
Frequency (MHz)	Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
Channel 1: 600.85	2.21	0	2.21	17
Channel 2: 606.00	2.58	0	2.58	17



Ch1.: 600.85 MHz



Ch2.: 606.0 MHz





7 Occupied Bandwidth

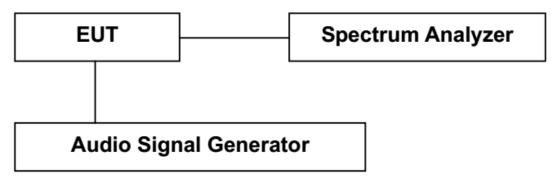
7.1 Test Requirement:

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.

- (1) The frequency selection shall be offset from the upper or lower band limits by 25kHz or an integral multiple thereof.
- (2) 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 grater than necessary to produce 50 percent modulation. Then mark the -26dB Bandwidth and record it.

7.2 Test SET-UP (Block Diagram of Configuration):

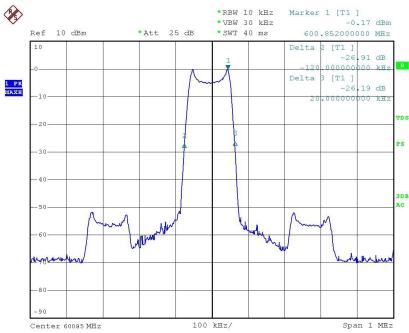


7.3 Test result:

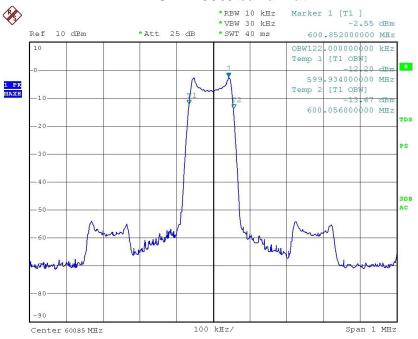
Frequency (MHz)	99% Bandwidth (kHz)	-26dB Bandwidth (kHz)	Limit
Channel 1: 600.85	122.0	140.0	<200KHz
Channel 2: 606.0	124.0	144.0	<200KHz



Ch1.: -26dB bandwidth

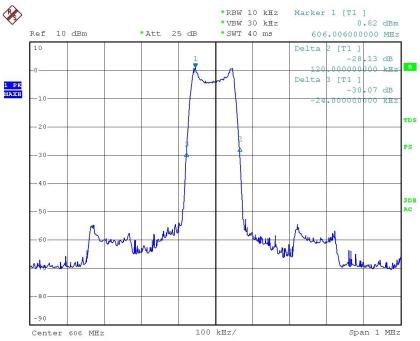


Ch1.: 99% bandwidth

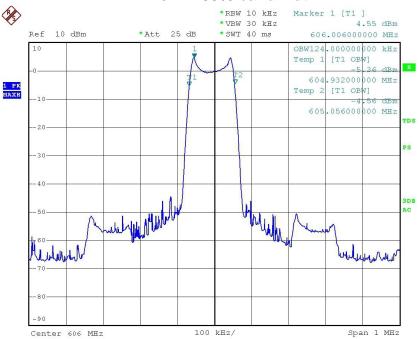




Ch2.: -26dB bandwidth



ch2.: 99% bandwidth





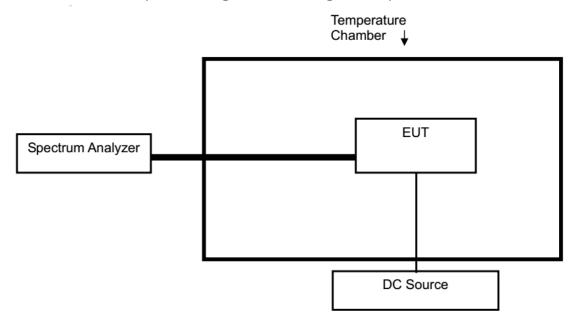
8 Frequency Stability

8.1 Test Requirement:

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.

- 1. 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.
- 2. Set frequency counter center frequency to the right frequency needs to be measured.

8.2 Test SET-UP (Block Diagram of Configuration):





8.3 Test Result:

Reference Frequency: 600.850MHz							
Voltage (V)	Temperature (°C)	Frequency Error (MHz)	Frequency Tolerance	Result			
			(%)				
	-20	600.851	0.000185				
	-10	600.863	0.000186				
	0	600.867	0.000173				
3.0	10	600.862	0.000067				
3.0	20	600.862	0.000015	Pass			
	30	600.862	0.000001				
	40	600.862	0.000067				
	50	600.862	0.000017				
3.45	25	600.860					
2.55	25	600.851					
Liı	mit(%)		± 0.005				





Reference Frequency: 606.000MHz							
Voltage (V)	Temperature (°C)	Frequency Error (MHz)	Frequency Tolerance (%)	Result			
	-20	606.2231	0.000368				
	-10	606.2181	0.000360				
	0	606.1448	0.0002390				
3.0	10	606.1272	0.0002100				
3.0	20	606.0853	0.0001410	Pass			
	30	606.2491	0.0004111				
	40	606.3488	0.0005756				
	50	606.3423	0.0005649				
3.45	25	606.1491	0.0002460				
2.55	25	606.2622	0.0004327				
Limit(%)			± 0.005				



9 Radiated Spurious Emissions & Emission Mask

9.1 Test Requirement:

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 300 422-1 V1.4.2(2011-08). Emissions outside this band shall comply with the limit specified at the edges of the ETSI mask.

9.2 Test Procedure:

Radiated spurious emission test procedure:

- a. Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- b. For the radiated emission test above 1GHz:
 - The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. Peak and /or AVG for above 1GHz emission test.



During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz or 3MHz

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: fc: Transmitter (Tx) nominal frequency;

- dispersion (Span): fc - 1 MHz to fc + 1 MHz;

- Resolution BandWidth (RBW): 1 kHz;

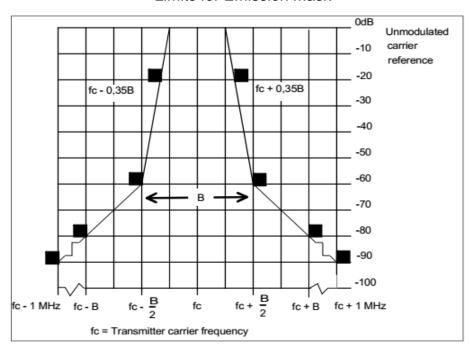
- Video BandWidth (VBW): 1 kHz; - detector: Peak hold

Limits for spurious emissions

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

Measured valued for equipment in each frequency band must fall below the values given in table above.

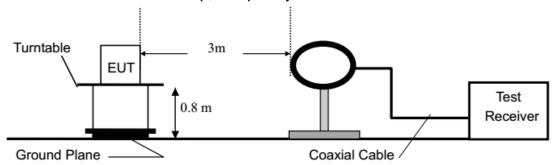
Limits for Emission Mask



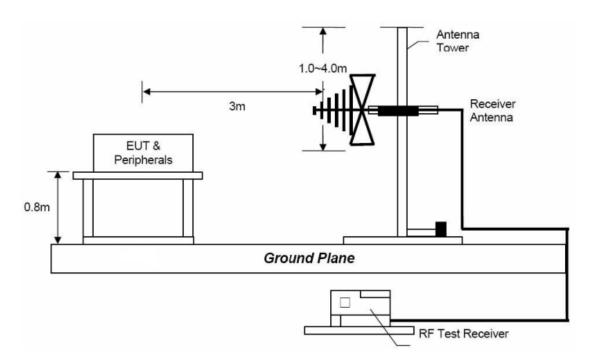


9.3 Test SET-UP (Block Diagram of Configuration):

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



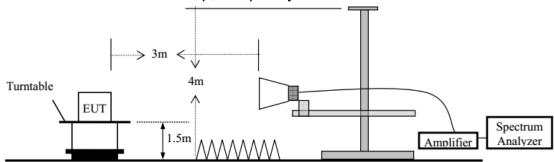
(B) Radiated Emission Test Set-Up, Frequency 30MHz to 1GHz



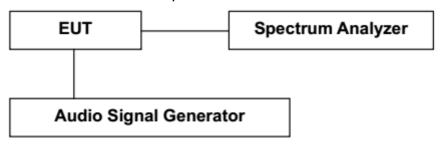




(C) Radiated Emission Test Set-Up, Frequency above 1GHz



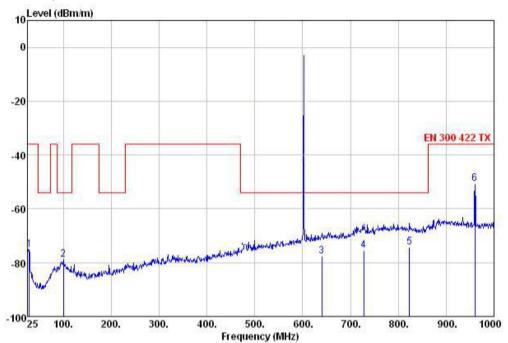
(D) Emission Mask Test set-up.



9.4 Test result:

Refer the following plot.

30MHz - 1GHz, Horizontal@ch 1.: 600.85MHz

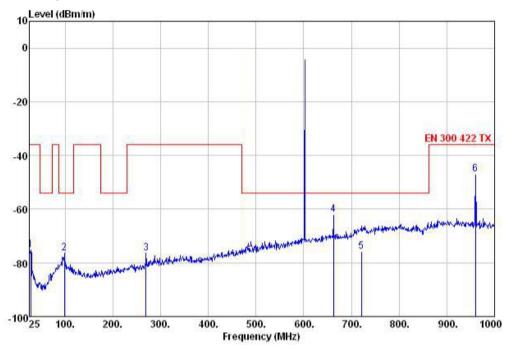


Spurious Emission Frequency (MHz)	PsigGen (dBm)	AUX factor (dB)	EIRP (QP value) (dBm)	ERP (QP value) (dBm)	Limit/ dBm	Margin(dB)
28.9	-103.5	28.3	-75.2	-77.35	-36	-41.35
100.1	-105.5	29.0	-76.5	-78.65	-54	-24.65
640.2	-104.6	28.2	-76.4	-78.55	-54	-24.55
728.0	-100.1	38.1	-62.0	-64.15	-54	-10.15
823.5	-115.0	39.3	-75.7	-77.85	-54	-23.85
960.0	-91.8	41.8	-50.0	-52.15	-36	-16.15

Note:

480.0MHz is the transmitter's fundamental frequency, and its limit need not be considered in this test.

30MHz - 1GHz, Vertical@ch 1.: 600.85MHz

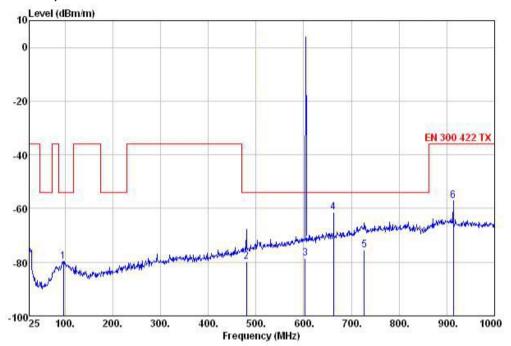


Spurious Emission Frequency (MHz)	P sigGen (dBm)	AUX factor (dB)	EIRP (QP value) (dBm)	ERP (QP value) (dBm)	Limit/ dBm	Margin(dB)
27.9	-103.5	28.3	-75.2	-77.35	-36	-41.35
98.1	-105.5	29.0	-76.5	-78.65	-54	-24.65
269.7	-104.6	28.2	-76.4	-78.55	-36	-42.55
662.7	-100.1	38.1	-62.0	-64.15	-54	-10.15
721.2	-115.0	39.3	-75.7	-77.85	-54	-23.85
960.0	-89.3	41.8	-47.5	-49.65	-36	-13.65

Note:

480.0MHz is the transmitter's fundamental frequency, and its limit need not be considered in this test.

30MHz - 1GHz, Horizontal@ch 2.: 606MHz



Spurious Emission Frequency (MHz)	P sigGen (dBm)	AUX factor (dB)	EIRP (QP value) (dBm)	ERP (QP value) (dBm)	Limit/ dBm	Margin(dB)
97.2	-108.5	28.9	-79.6	-81.75	-54	-27.75
480.3	-114.5	34.6	-79.9	-82.05	-54	-28.05
603.2	-115.4	37.0	-78.4	-80.55	-54	-26.55
662.7	-99.4	38.1	-61.3	-63.45	-54	-9.45
727.0	-115.1	39.6	-75.5	-77.65	-54	-23.65
913.2	-99.7	42.6	-57.1	-59.25	-36	-23.25

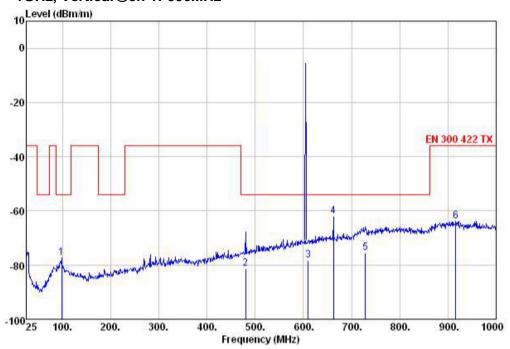
Note:

505.0MHz is the transmitter's fundamental frequency, and its limit need not be considered in this test.





30MHz - 1GHz, Vertical@ch 1: 606MHz



Spurious Emission Frequency (MHz)	P sigGen (dBm)	AUX factor (dB)	EIRP (QP value) (dBm)	ERP (QP value) (dBm)	Limit/ dBm	Margin(dB)
98.1	-106.3	29.0	-77.3	-79.45	-54	-25.45
480.3	-116.0	34.6	-81.4	-83.55	-54	-29.55
610.0	-115.5	37.2	-78.3	-80.45	-54	-26.45
662.7	-100.0	38.1	-61.9	-64.05	-54	-10.05
729.0	-115.2	39.7	-75.5	-77.65	-54	-23.65
916.2	-106.6	42.6	-64.0	-66.15	-36	-30.15

Note:

505.0MHz is the transmitter's fundamental frequency, and its limit need not be considered in this test.



Frequency Range: 1-5.3GHz

Spurious Emission Frequency (MHz)	PsigGen (dBm)	AUX factor (dB)	EIRP (AV value) (dBm)	Limit/ dBm	Margin(dB)	Ant.Pol. (H/V)
	Operation	n Mode: T	X Mode@L	ow ch.: 60	0.85MHz	
1440.0	-31.6	-6.6	-38.2	-30	-8.2	V
1920.0	-33.8	-5.8	-39.6	-30	-9.6	V
1440.0	-32.9	-6.6	-39.5	-30	-9.5	Н
1920.0	-34.1	-5.8	-39.9	-30	-9.9	Н
	Operation	Mode: TX	Mode@M	iddle ch.: (606.0MHz	
1010.0	-30.3	-7.2	-37.5	-30	-7.5	V
1515.0	-32.0	-6.6	-38.6	-30	-8.6	V
1010.0	-31.1	-7.2	-38.3	-30	-8.3	Н
1515.0	-32.7	-6.6	-39.3	-30	-9.3	Н

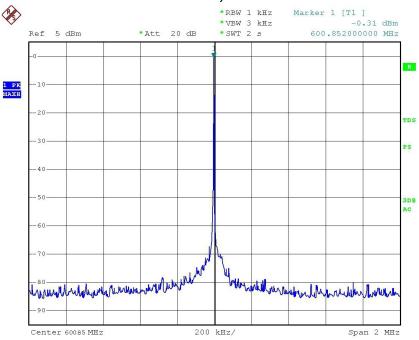
Other harmonics emissions are lower than 10dB below the allowable limit.

Note:

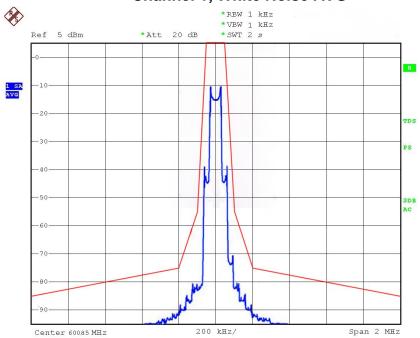
- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level + Factor
- (3) Factor= Antenna Gain + Cable Loss Amplifier Gain
- (4) Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
- (5) Measurement uncertainty: ±3.7dB.
- (6) Horn antenna used for the emission over 1000MHz.



Mask Emission Channel 1, Un-modulated

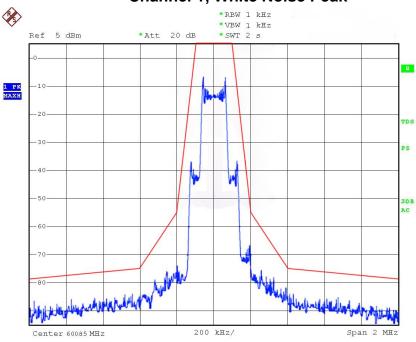


Channel 1, White Noise AVG

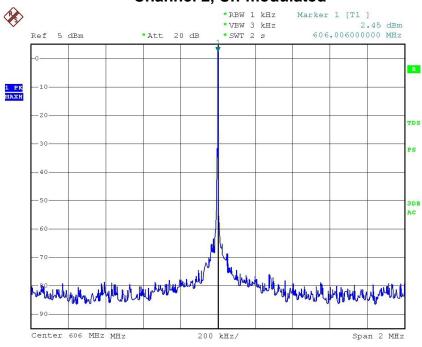






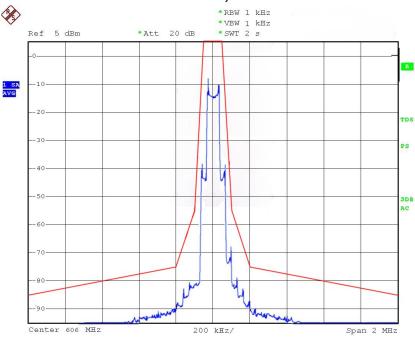


Channel 2, Un-modulated

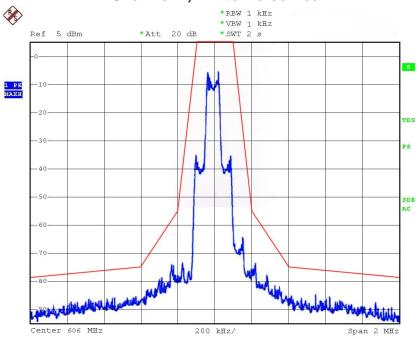




Channel 2, White Noise AVG



Channel 2, White Noise Peak





10 Antenna requirement

10.1Test Requirement:

From 206256 D01 WIRELESS MICROPHONE Certification v02: Compliance with Section 15.203 antenna requirements does not apply to devices operated under Section 15.236.

10.2Test Results

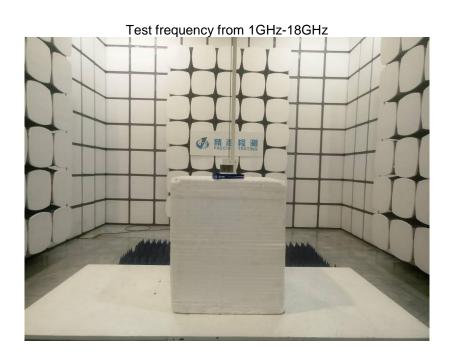
The antenna is integral antenna and no consideration of replacement, and the best case gain of the antenna is 0dBi. So, the antenna is consider meet the requirement.





11 TEST PHOTOS







12 EUT PHOTOS











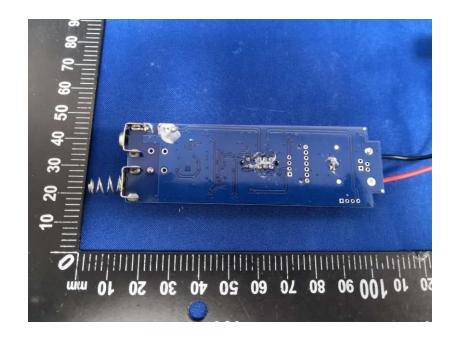












*****THE END REPORT*****