中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant: **Shanghai Loostone Information Technology Co., Ltd.**
Address: Room 601, Building 9, No. 351, Sizhuan Road, Sijing Town, Songjiang District, Shanghai, China

FCC ID: **2A7ZR-K3AMC3**

Product Name: **K3 Karaoke Microphone**

Standard(s): **47 CFR Part 15, Subpart C(15.236)**
ANSI C63.10-2013

The above device has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

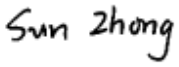
Report Number: **CR231060340-00B**

Date Of Issue: **2023/12/25**

Reviewed By: **Calvin Chen**

Title: RF Engineer

Approved By: **Sun Zhong**



Title: Manager

Test Laboratory: **China Certification ICT Co., Ltd (Dongguan)**
No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China
Tel: +86-769-82016888

Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR231060340-00B	Original Report	2023/12/25

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	K3 Karaoke Microphone
EUT Model:	Puremic K3
Multiple Models:	KaraFun Party Station(KPS1), Popsical Duet Pro, Popsical Rawr, Rawr, K-Stream, MagicStar--D'Maestro (MS-A15), Ivideoke VDK-8000
Operation Frequency:	657-662.5 MHz
Maximum Peak Output Power (EIRP):	-0.66 dBm
Modulation Type:	FM
Rated Input Voltage:	DC 5V charging from Karaoke Device Receiver or DC 3.7V from Battery
Serial Number:	2CAL-6(for Radiated Spurious Emission) 2CAL-1(for RF Conducted Test)
EUT Received Date:	2023/10/21
EUT Received Status:	Good
Note: The Multiple models are electrically identical with the test model. Please refer to the declaration letter for more detail, which was provided by manufacturer.	

Operation Frequency Detail:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	657	7	660
2	657.5	8	660.5
3	658	9	661
4	658.5	10	661.5
5	659	11	662
6	659.5	12	662.5

Per section 15.31(m), the below frequencies were performed the test as below:

Test Channel	Frequency (MHz)
Lowest	657
Highest	662.5

Antenna Information Detail▲:

Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
PCB	50	650~680MHz	-6.38 dBi

Accessory Information:

No Accessory.

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer. Audio input is 500Hz for Bandwidth Test and Emission Mask test
Equipment Modifications:	No
EUT Exercise Software:	No
The engineering mode was provided by manufacturer▲. The maximum power was configured default setting.	

1.2.2 Support Equipment List and Details

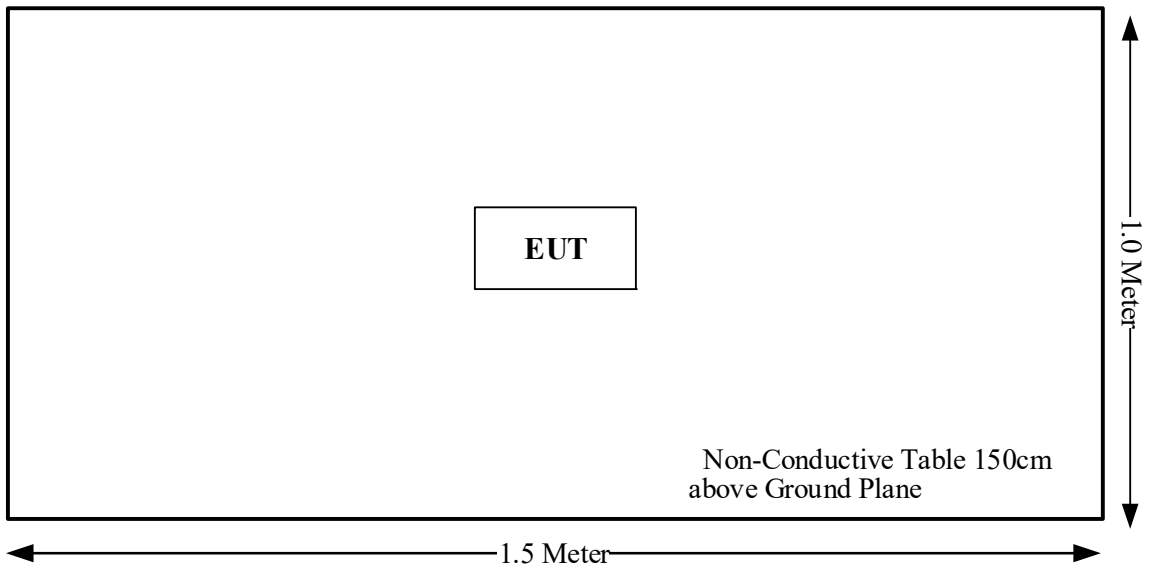
Manufacturer	Description	Model	Serial Number
/	/	/	/

1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
/	/	/	/	/	/

1.2.4 Block Diagram of Test Setup

Spurious emissions:



1.3 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
Unwanted Emissions, radiated	30M~200MHz: 4.15 dB,200M~1GHz: 5.61 dB,1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.26 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

2. SUMMARY OF TEST RESULTS

Standard(s)/Rule(s)	Description of Test	Result
FCC §15.207(a)	AC Line Conducted Emissions	Not Applicable
FCC §15.236(d)	RF Output Power	Compliant
FCC §15.236(f)(2)	Operating Bandwidth	Compliant
FCC §15.236(g)	Emission Mask	Compliant
FCC §15.236(f)(3)	Frequency Tolerance	Compliant
FCC §15.236(g)	Spurious Emission	Compliant
FCC §1.1310	RF Exposure Evaluation	Compliant

3. REQUIREMENTS AND TEST PROCEDURES

3.1 AC Line Conducted Emissions

3.1.1 Applicable Standard

FCC §15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

	Conducted limit (dBμV)	
Frequency of emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

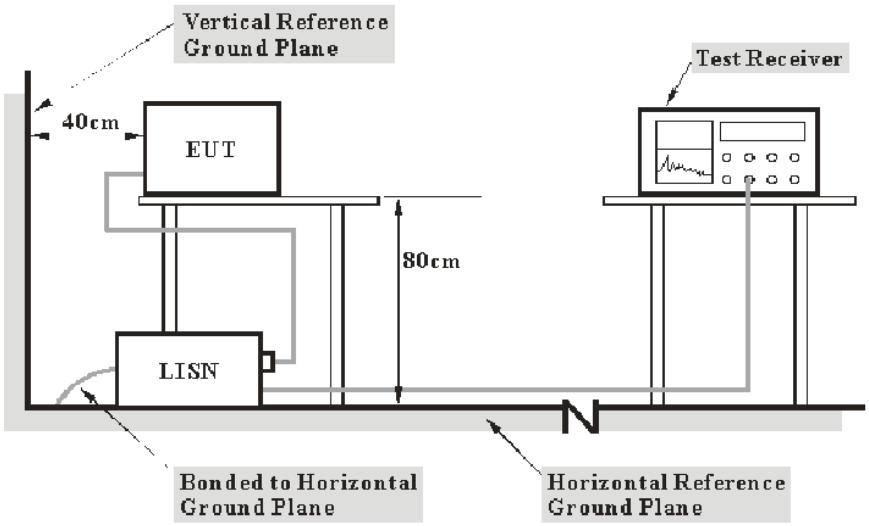
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μV within the frequency band 535-1705 kHz, as measured using a 50 μH/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtainig their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

3.1.2 EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

3.1.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

3.1.4 Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the first LISN.

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

3.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = attenuation caused by cable loss + voltage division factor of AMN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

3.2 RF Output Power

3.2.1 Applicable Standard

FCC§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.

3.2.2 EUT Setup Block Diagram

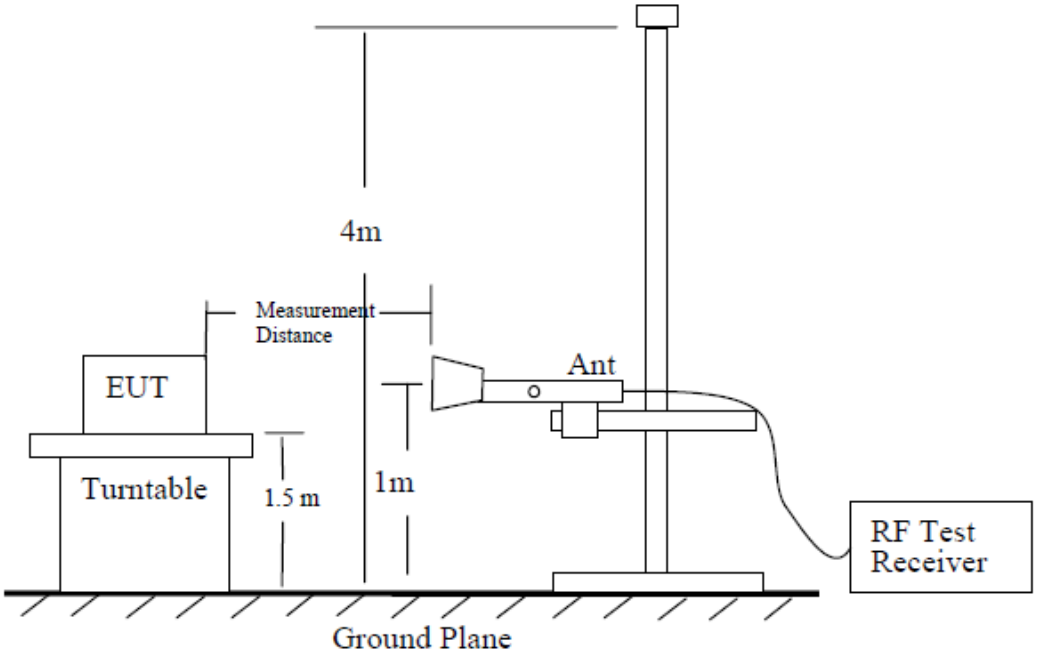


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

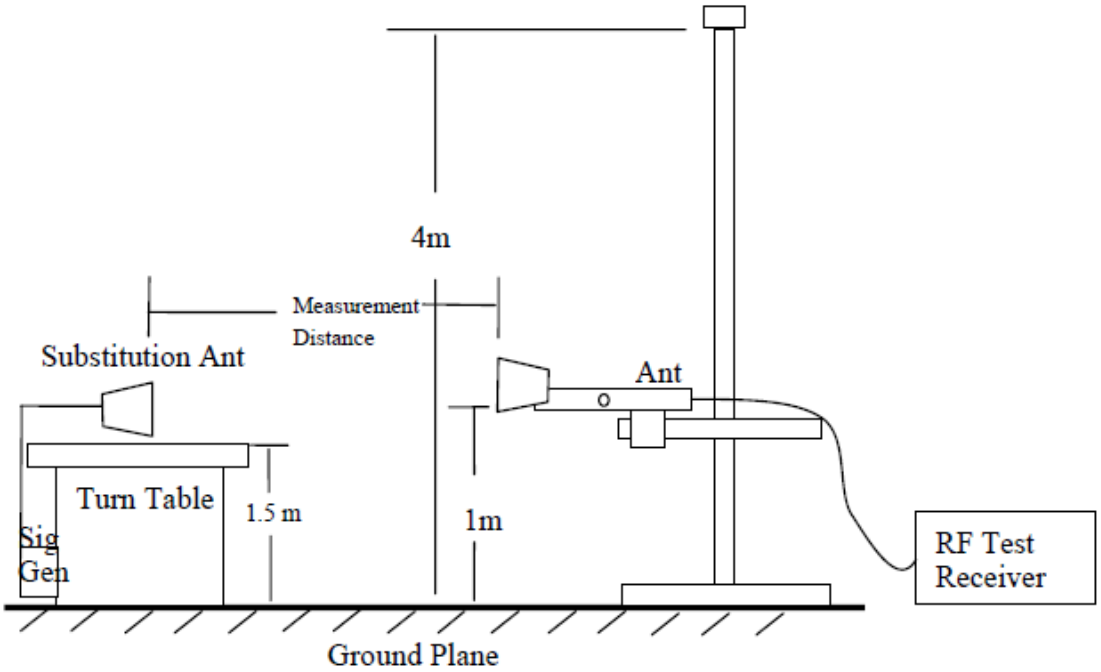


Figure 7—Substitution method set-up for radiated emission

3.2.3 Test Procedure

a) Place the EUT in the center of the turntable. The EUT shall be configured to transmit into the standard non-radiating load (for measuring radiated spurious emissions), connected with cables of minimal length unless specified otherwise. If the EUT uses an adjustable antenna, the antenna shall be positioned to the length that produces the worst case emission at the fundamental operating frequency.
b) Each emission under consideration shall be evaluated:
1) Raise and lower the measurement antenna in accordance 5.5.2, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.
2) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.
3) Return the turntable to the azimuth where the highest emission amplitude level was observed.
4) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.
5) Record the measured emission amplitude level and frequency using the appropriate RBW.
c) Repeat step b) for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.
d) Set-up the substitution measurement with the reference point of the substitution antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement.
e) Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.
f) Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.
g) For each emission that was detected and measured in the initial test [i.e., in step b) and step c)]:
1) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.
2) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step b) and step c).
3) Record the output power level of the signal generator when equivalence is achieved in step 2).
h) Repeat step e) through step g) with the measurement antenna oriented in the opposite polarization.
i) Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:
Pe = Ps(dBm) − cable loss (dB) + antenna gain (dBd)
where
Pe = equivalent emission power in dBm
Ps = source (signal generator) power in dBm
NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.

j) Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from: gain (dBd) = gain (dBi) − 2.15 dB. If necessary, the antenna gain can be calculated from calibrated antenna factor information
k) Provide the complete measurement results as a part of the test report.

3.3 Operating Bandwidth

3.3.1 Applicable Standard

FCC§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.

3.3.2 EUT Setup Block Diagram

3.3.3 Test Procedure

According to ANSI C63.10-2013 Section 6.9.2

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2
d) Steps a) through c) might require iteration to adjust within the specified tolerances.
e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
f) Set detection mode to peak and trace mode to max hold.
g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

h) Determine the "−xx dB down amplitude" using [(reference value) − xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.
i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).

j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "−xx dB down amplitude" determined in step h). If a marker is below this "−xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "−xx dB down

amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

According to ANSI C63.10-2013 Section 6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
The following procedure shall be used for measuring 99% power bandwidth:
a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
d) Step a) through step c) might require iteration to adjust within the specified range.
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

3.4 Emission Mask

3.4.1 Applicable Standard

FCC§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).

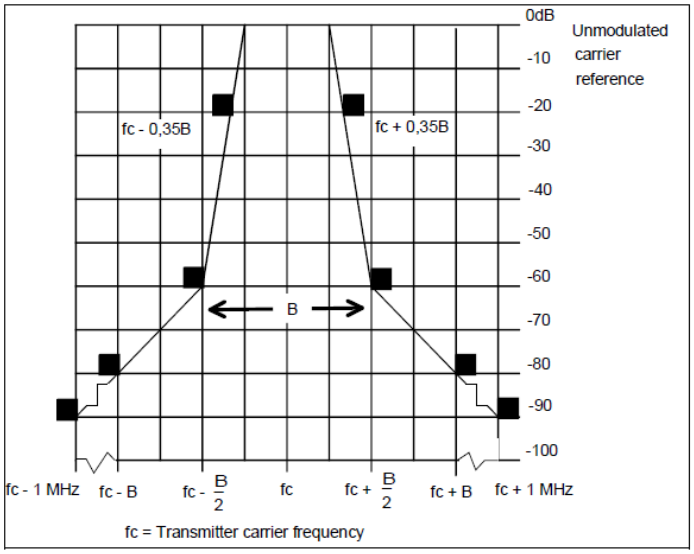


Figure 3: Spectrum mask for analogue systems in all bands

Figure 3 shows the spectrum mask for all analogue systems in the band. The -90 dBc point shall be ±1 MHz from fc measured with an average detector. To comply, a measured value must fall below the mask limit as shown in figure 3.

3.4.2 EUT Setup Block Diagram

3.4.3 Test Procedure

According to sections 8.3.1.1 of ETSI EN 300 422-1 V1.4.2 (2011-08)

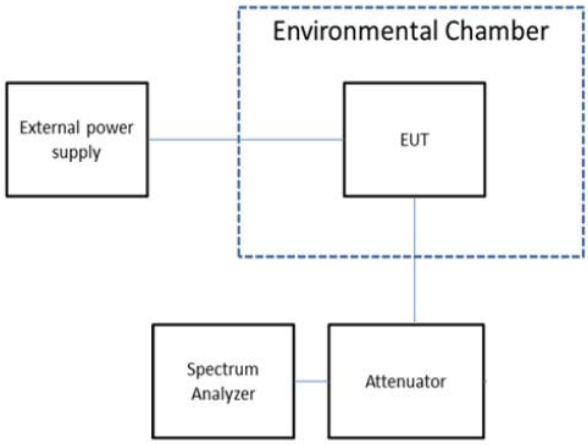
3.5 Frequency Tolerance

3.5.1 Applicable Standard

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.

3.5.2 EUT Setup Block Diagram



3.5.3 Test Procedure

According to ANSI C63.10-2013 Section 6.8

Frequency stability with respect to ambient temperature

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.

NOTE—An instrument that has an adequate level of accuracy as specified by the procuring or regulatory agency is the recommended measuring instrument.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have

oscillator heaters, energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies specified in 5.6.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more that 10 °C, and allow the temperature inside the chamber to stabilize.

j) Repeat step f) through step i) down to the lowest specified temperature.

Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15 °C to +25 °C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

a) Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency-measuring instrument.

NOTE—An instrument that has an adequate level of accuracy as specified by the procuring or regulatory agency is the recommended measuring instrument.

b) Tune the EUT to one of the number of frequencies required in 5.6. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

c) Measure the frequency at each of the frequencies specified in 5.6.

d) Repeat the above procedure at 85% and 115% of the nominal supply voltage as described in 5.13.

3.6 Spurious Emissions

3.6.1 Applicable Standard

FCC§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).

3.6.2 EUT Setup Block Diagram

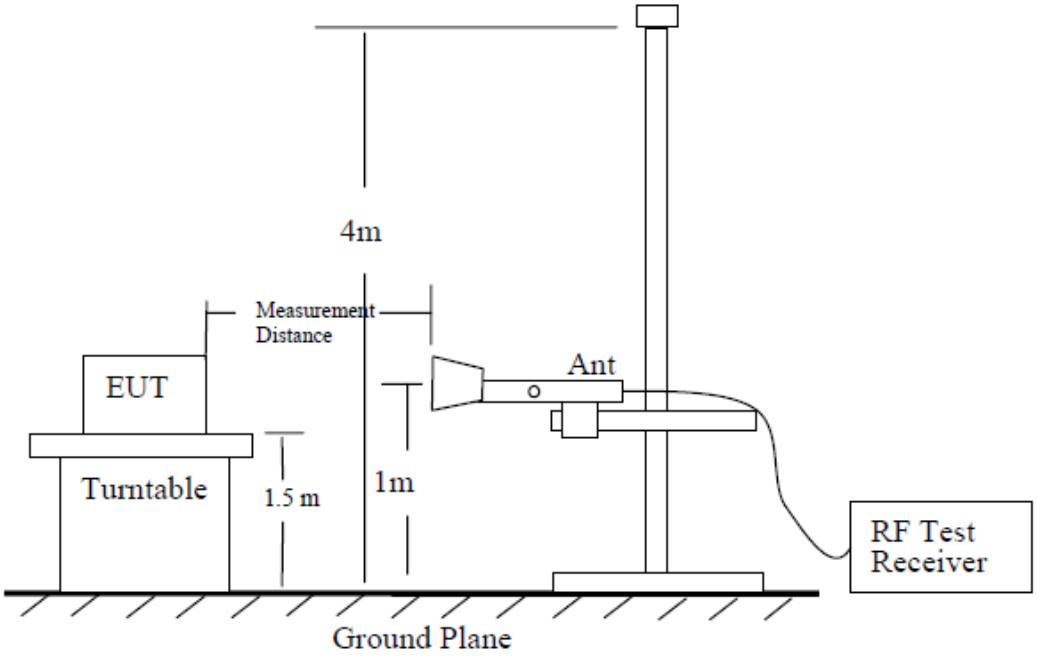


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

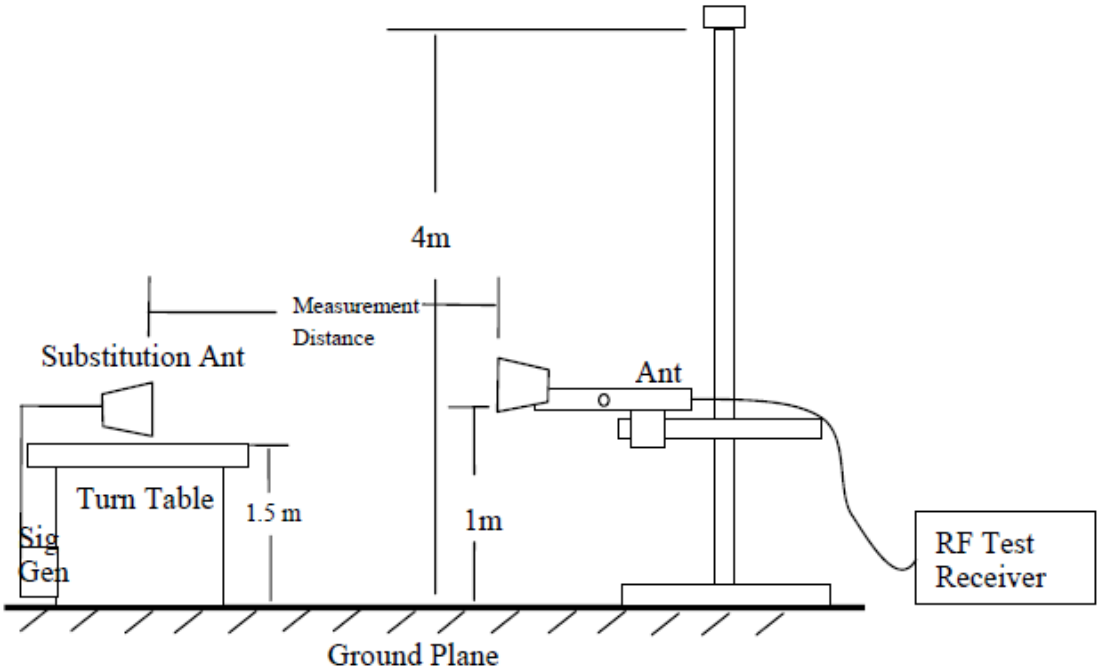


Figure 7—Substitution method set-up for radiated emission

3.6.3 Test Procedure

As Per section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08)
On a test site, the sample shall be placed at the specified height on a non-conducting support. The transmitter shall be operated at the power as specified under clause 8.2, delivered to the antenna (see clause 5.1.1).
Radiation of any spurious components shall be detected by the test antenna and receiver, over the frequency range specified below, excluding the 250 % (out of band region) band of frequencies centred on the channel on which the transmitter is intended to operate.
NOTE: The 250 % (out of band region) exclusion is covered by measurements carried out in clauses 8.3.1 and 8.3.2.
The measuring receiver, as defined in table 4, shall be tuned over the frequency range 25 MHz to 4 GHz for equipment operating on frequencies below 1 GHz or in the frequency range of 25 MHz to 12,75 GHz for equipment operating on frequencies above 1 GHz.
At each frequency at which a component is detected, the sample shall be rotated to obtain maximum response and the effective radiated power of that component determined by a substitution measurement.
The measurement shall be repeated with the test antenna in the orthogonal polarization plane.
If the transmitter allows for standby operation, the tests shall be repeated with the transmitter in standby mode.

4. Test DATA AND RESULTS

4.1 AC Line Conducted Emissions

Not Applicable, the device was only powered by battery when operating.

4.2 RF Output Power

Serial Number:	2CAL-6	Test Date:	2023/11/10
Test Site:	966-2	Test Mode:	Transmitting
Tester:	Carl Xue	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	26.1	Relative Humidity: (%)	59	ATM Pressure: (kPa)	101.1

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-6	2023/09/18	2026/09/17
R&S	EMI Test Receiver	ESR3	102724	2023/03/31	2024/03/30
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2023/07/16	2024/07/15
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2023/07/16	2024/07/15
Sonoma	Amplifier	310N	186165	2023/07/16	2024/07/15

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Frequency (MHz)	**Polar (H/V)**	**Receiver Reading (dBμV)**	**Substituted Method**			**Absolute Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
			Substituted Level (dBm)	**Antenna Gain (dBd/dBi)**	**Cable Loss (dB)**			
Test Frequency: 657 MHz								
657.00	H	97.99	-6.71	0.00	0.52	-7.23	13.00	20.23
657.00	V	102.18	-0.14	0.00	0.52	-0.66	13.00	13.66
Test Frequency: 662.5 MHz								
662.50	H	98.12	-6.57	0.00	0.51	-7.08	13.00	20.08
662.50	V	100.66	-1.53	0.00	0.51	-2.04	13.00	15.04

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.
Note 2:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

4.3 Operating Bandwidth:

Serial Number:	2CAL-1	Test Date:	2023/11/2
Test Site:	RF	Test Mode:	Transmitting
Tester:	Arthur Su	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.3	Relative Humidity: (%)	56	ATM Pressure: (kPa)	100.9

Test Equipment List and Details:

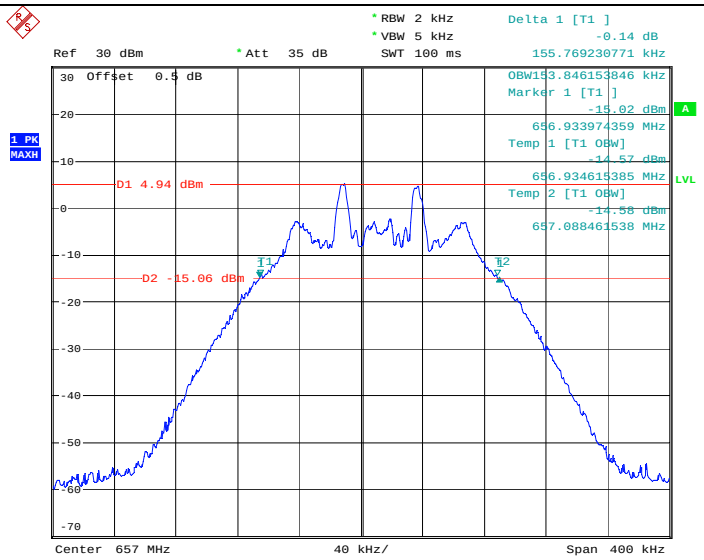
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	100147	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
HP	RF Communications Test Set	8920A	3438A05209	2023/3/31	2024/3/30

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

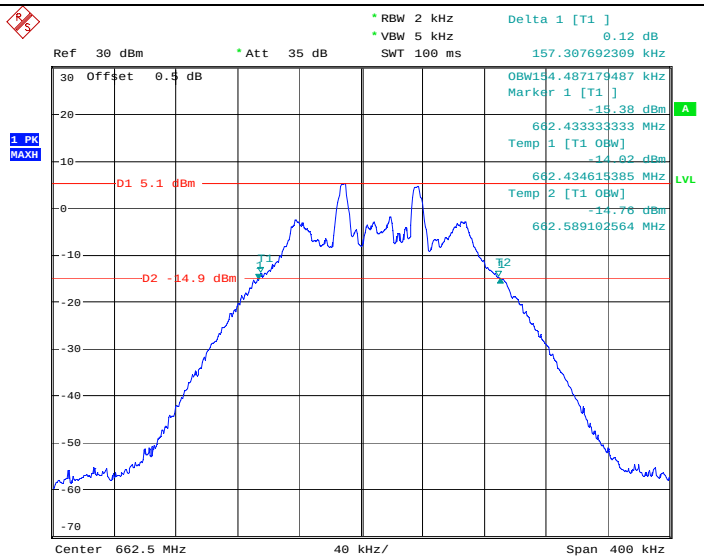
Test Frequency (MHz)	99% Occupied Bandwidth (kHz)	20 dB Bandwidth (kHz)	Limit (kHz)
657	153.846	155.769	200
662.5	154.487	157.308	200

Low Channel



Comment: ProjectNo.:CR231060340 Tester:Arthur Su
Date: 2.NOV.2023 19:15:36

High Channel



Comment: ProjectNo.:CR231060340 Tester:Arthur Su
Date: 2.NOV.2023 19:20:33

4.4 Emission Mask:

Serial Number:	2CAL-1	Test Date:	2023/10/31-2023/12/22
Test Site:	RF	Test Mode:	Transmitting
Tester:	Arthur Su	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	24.3-25.5	Relative Humidity: (%)	42-51	ATM Pressure: (kPa)	101.6-102.6

Test Equipment List and Details:

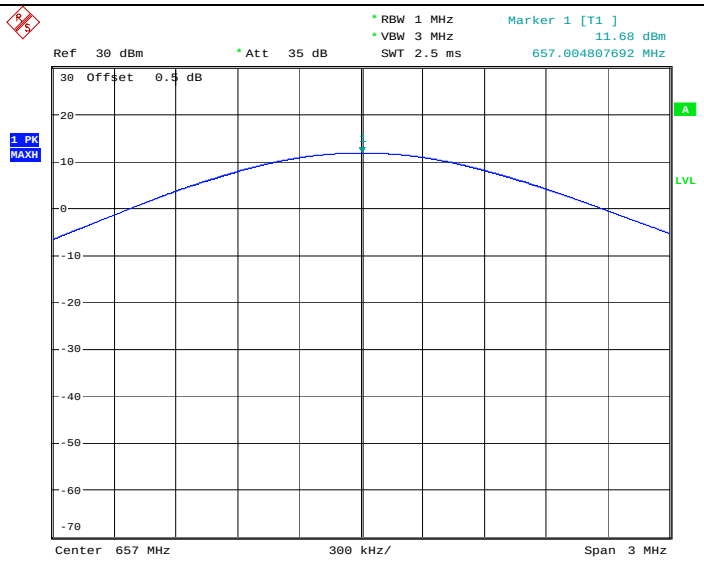
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	100147	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
HP	RF Communications Test Set	8920A	3438A05209	2023/3/31	2024/3/30

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

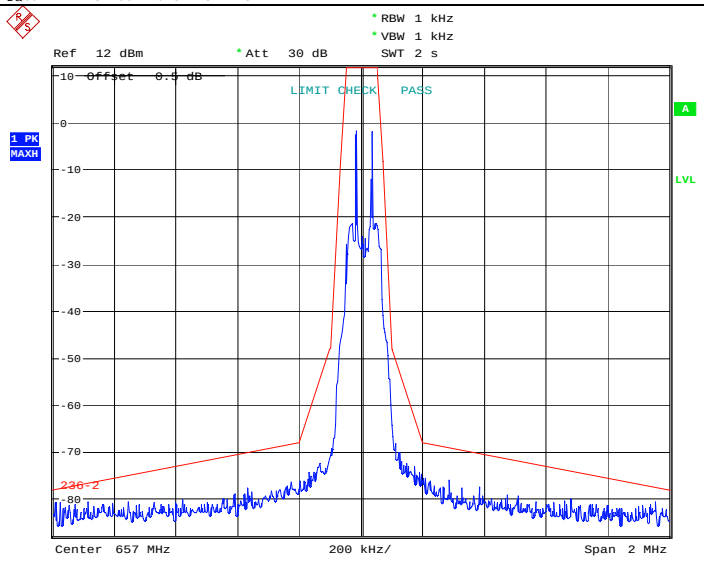
Test Data:

Test Frequency (MHz)	Declared Bandwidth (kHz)
657	200
662.5	200

Low Channel

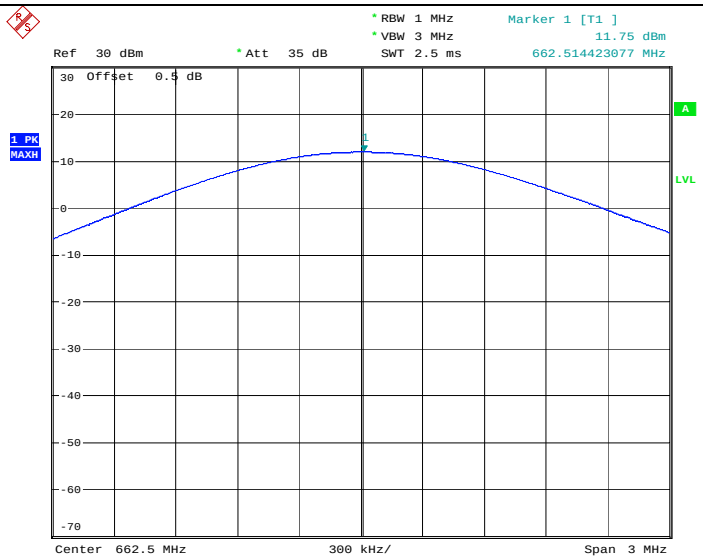


Comment: ProjectNo.:CR231060340 Tester:Arthur Su
Date: 31.OCT.2023 18:44:32

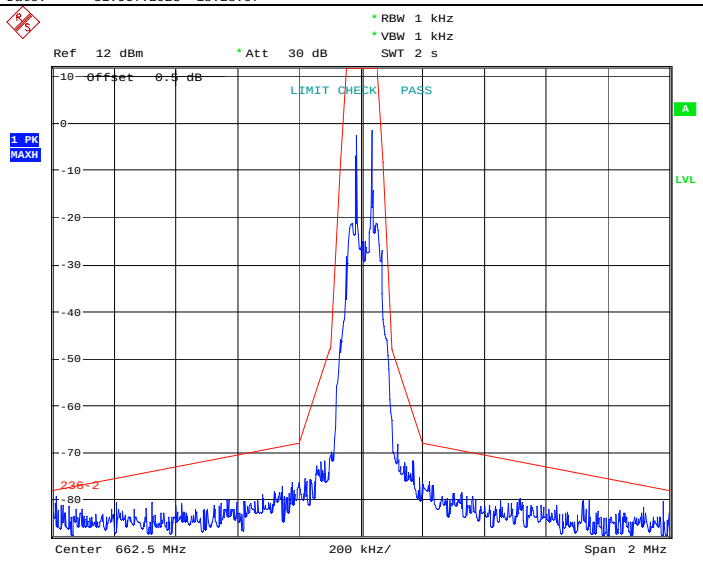


Comment: ProjectNo.:CR231060340 Tester:Arthur Su
Date: 13.DEC.2023 15:50:52

High Channel



Comment: ProjectNo.:CR231060340 Tester:Arthur Su
Date: 31.OCT.2023 18:28:07



Comment: ProjectNo.:CR231060340 Tester:Arthur Su
Date: 22.DEC.2023 22:54:29

4.5 Frequency Tolerance:

Serial Number:	2CAL-1	Test Date:	2023/10/31
Test Site:	RF	Test Mode:	Transmitting
Tester:	Arthur Su	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.1	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	100147	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/28	2024/9/27
YINSAIGE	Coaxial Cable	SS402	SJ0100004	Each time	N/A

Test Data:

		fc =	657	MHz
Temperature	**Voltage**	**Reading**	**Frequency Error**	**Limit**
℃	**Vdc**	**MHz**	**%**	**%**
-20	3.7	657.0135897	0.0021	±0.005
-10		657.0135828	0.0021	
0		657.0135890	0.0021	
10		657.0135957	0.0021	
20		657.0136218	0.0021	
30		657.0136767	0.0021	
40		657.0136662	0.0021	
50		657.0136514	0.0021	
20	3.3	657.0136823	0.0021	
20	4.2	657.0136458	0.0021	

		fc =	662.5	MHz
Temperature	**Voltage**	**Reading**	**Frequency Error**	**Limit**
℃	**Vdc**	**MHz**	**%**	**%**
-20	3.7	662.5127832	0.0019	±0.005
-10		662.5127872	0.0019	
0		662.5127264	0.0019	
10		662.5127919	0.0019	
20		662.5128205	0.0019	
30		662.5128519	0.0019	
40		662.5129002	0.0019	
50		662.5128647	0.0019	
20	3.3	662.5128771	0.0019	
20	4.2	662.5128498	0.0019	

4.6 Spurious Emissions:

Serial Number:	2CAL-6	Test Date:	2023/11/10~2023/11/29
Test Site:	966-2,966-1	Test Mode:	Transmitting
Tester:	Carl Xue, Mack Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.2~26.1	Relative Humidity: (%)	55~59	ATM Pressure: (kPa)	101.1~101.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-6	2023/9/18	2026/9/17
R&S	EMI Test Receiver	ESR3	102724	2023/3/31	2024/3/30
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2023/7/16	2024/7/15
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2023/7/16	2024/7/15
Sonoma	Amplifier	310N	186165	2023/7/16	2024/7/15
EMCO	Adjustable Dipole Antenna	3121C	9109-756	N/A	N/A
MICRO-COAX	Coaxial Cable	UFA210B-0-0720-300300	99G1448	2023/7/16	2024/7/15
Agilent	Signal Generator	E8247C	MY43321352	2022/11/18	2023/11/17
Agilent	Signal Generator	E8247C	MY43321352	2023/11/17	2024/11/16
AH	Double Ridge Guide Horn Antenna	SAS-571	1394	2023/2/22	2026/2/21
R&S	Spectrum Analyzer	FSV40	101591	2023/3/31	2024/3/30
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2023/8/6	2024/8/5
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2023/8/6	2024/8/5
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2023/11/8	2024/11/7
AH	Double Ridge Guide Horn Antenna	SAS-571	1396	2021/10/18	2024/10/17
MICRO-COAX	Coaxial Cable	UFA210B-0-0720-300300	99G1448	2023/7/16	2024/7/15

**** Statement of Traceability:*** *China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

After pre-scan in the X, Y and Z axes of orientation, the worst case is below:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
			Frequency:	657	MHz			
332.74	H	28.92	-81.31	0.00	0.35	-81.66	-36.00	45.66
44.73	V	37.64	-58.31	-20.16	0.12	-78.59	-36.00	42.59
381.45	H	28.53	-80.96	0.00	0.38	-81.34	-36.00	45.34
38.21	V	37.43	-50.64	-25.54	0.11	-76.29	-36.00	40.29
1314.000	H	40.11	-62.76	7.98	0.73	-55.51	-30.00	25.51
1314.000	V	47.97	-55.30	7.98	0.73	-48.05	-30.00	18.05
1971.000	H	40.73	-61.64	9.07	0.86	-53.43	-30.00	23.43
1971.000	V	43.18	-58.65	9.07	0.86	-50.44	-30.00	20.44
2628.000	H	40.16	-59.78	9.60	1.05	-51.23	-30.00	21.23
2628.000	V	39.08	-60.75	9.60	1.05	-52.20	-30.00	22.20
3285.000	H	37.84	-58.90	10.31	1.16	-49.75	-30.00	19.75
3285.000	V	45.48	-51.02	10.31	1.16	-41.87	-30.00	11.87
3942.000	H	45.55	-50.45	10.84	1.30	-40.91	-30.00	10.91
3942.000	V	55.89	-40.02	10.84	1.30	-30.48	-30.00	0.48
4599.000	H	38.60	-56.85	10.72	1.40	-47.53	-30.00	17.53
4599.000	V	46.77	-48.51	10.72	1.40	-39.19	-30.00	9.19
5256.000	H	40.09	-53.66	11.35	1.47	-43.78	-30.00	13.78
5256.000	V	42.86	-50.67	11.35	1.47	-40.79	-30.00	10.79
5913.000	H	37.81	-55.72	11.00	1.67	-46.39	-30.00	16.39
5913.000	V	38.42	-55.15	11.00	1.67	-45.82	-30.00	15.82
6570.000	H	35.75	-56.03	11.29	1.88	-46.62	-30.00	16.62
6570.000	V	40.35	-51.45	11.29	1.88	-42.04	-30.00	12.04
			Frequency:	662.5	MHz			
211.02	H	29.09	-83.58	0.00	0.26	-83.84	-54.00	29.84
43.81	V	37.89	-56.87	-21.37	0.12	-78.36	-36.00	42.36
162.83	H	28.96	-82.77	0.00	0.24	-83.01	-36.00	47.01
38.48	V	37.34	-51.00	-25.67	0.11	-76.78	-36.00	40.78
1325.000	H	43.17	-59.81	8.01	0.75	-52.55	-30.00	22.55
1325.000	V	49.87	-53.46	8.01	0.75	-46.20	-30.00	16.20
1987.500	H	41.15	-61.09	9.09	0.88	-52.88	-30.00	22.88
1987.500	V	43.01	-58.63	9.09	0.88	-50.42	-30.00	20.42
2650.000	H	35.66	-64.30	9.64	1.07	-55.73	-30.00	25.73
2650.000	V	37.38	-62.49	9.64	1.07	-53.92	-30.00	23.92
3312.500	H	38.46	-58.34	10.33	1.15	-49.16	-30.00	19.16
3312.500	V	44.74	-51.85	10.33	1.15	-42.67	-30.00	12.67
3975.000	H	48.55	-47.31	10.88	1.30	-37.73	-30.00	7.73
3975.000	V	55.62	-40.09	10.88	1.30	-30.51	-30.00	0.51
4637.500	H	39.10	-56.11	10.77	1.42	-46.76	-30.00	16.76
4637.500	V	44.57	-50.55	10.77	1.42	-41.20	-30.00	11.20
5300.000	H	41.57	-51.86	11.38	1.46	-41.94	-30.00	11.94
5300.000	V	41.62	-51.54	11.38	1.46	-41.62	-30.00	11.62
5962.500	H	34.68	-58.52	10.95	1.64	-49.21	-30.00	19.21
5962.500	V	34.06	-59.06	10.95	1.64	-49.75	-30.00	19.75
6625.000	H	35.44	-56.23	11.28	1.91	-46.86	-30.00	16.86
6625.000	V	39.90	-51.71	11.28	1.91	-42.34	-30.00	12.34

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.
Note 2:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

5. RF EXPOSURE EVALUATION

5.1 Applicable Standard

According to §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v06:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

5.2 Measurement Result

The device is handheld device.
The max power including tune-up tolerance is 12 dBm (15.85 mW).
[(max. power of channel, mW)/(min. test separation distance, mm)][√f(GHz)]
=1/5*(√0.6625) = 5< 7.5

Result: Compliant. The stand-alone SAR test is not necessary.

6. EUT PHOTOGRAPHS

Please refer to the attachment CR231060340-EXP EUT External Photographs and CR231060340-INP EUT Internal Photographs

7. TEST SETUP PHOTOGRAPHS

Please refer to the attachment CR231060340-00B-TSP Test Setup Photographs.

===== END OF REPORT ====