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Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.

TEST REPORT

SCOPE OF WORK
FCC TESTING – YJCB023

REPORT NUMBER
240913010SZN-001

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TEST REPORT

Intertek Report No.: 240913010SZN-001

Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.

Application
For
Certification

FCC ID: 2A942YJCB023

Automatic Cleaning&Charging Station

Model: YJCB023

2.4GHz Transceiver

Report No.: 240913010SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-23]

Prepared and Checked by:

Karot Huang
Assistant Engineer

Approved by:

Johnny Wang
Project Engineer
Date: 28 October 2024

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MEASUREMENT/TECHNICAL REPORT

This report concerns (check one) Original Grant ___X___ Class II Change _____

Equipment Type: DTS - Part 15 Digital Transmission System

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No ___X___

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No ___X___

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-23] Edition] provision.

Report prepared by:

Karot Huang
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1.0 Summary of Test results

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Applicant Address: Room A2901, Yunzhongcheng, Building 1, Vanke Yuncheng VI, Dashi 2nd Road, Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, China
Manufacturer: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Manufacturer Address: Room A2901, Yunzhongcheng, Building 1, Vanke Yuncheng VI, Dashi 2nd Road, Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, China

Model: YJCB023

FCC ID: 2A942YJCB023

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d), 15.209, FCC 15.205	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

2.0 General Description

2.1 Product Description

The equipment under test (EUT) is a Automatic Cleaning&Charging Station with Bluetooth 5.0 function operating in 2402-2480MHz. The EUT is powered by 100-240V~ 50/60Hz 60W. For more detail information pls. refer to the user manual.

Bluetooth Version: BLE 5.0
Antenna Type: PIFA antenna
Antenna Gain: 2 dBi (This information is provided by applicant, and the applicant is responsible for the authenticity of the provided information.)
Modulation Type: GFSK

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of transceiver for the Automatic Cleaning&Charging Station which has Bluetooth function. Other digital functions were reported in the verification report: 240913010SZN-007.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst-case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.4 Test Facility

The Semi-anechoic chamber and shielded room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by Input: 100-240V~ 50/60Hz 60W, Output: DC 20V 2.25A during the test.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.1m. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The rear of unit shall be flushed with the rear of the table.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst-case configuration is used in all specified testing.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

Test software: EMI_Test_Tool, Version: 2.0

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

3.5 Equipment Modification

Any modifications installed previous to testing by Yunjing Intelligence Innovation (Shenzhen) Co., Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

Description	Manufacturer	Remark
Laptop (Provided by Intertek)	DELL	Latitude 3480

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September 2024 Model: YJCB023

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter has a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2402	6.62	4.592
Middle Channel: 2440	6.27	4.236
High Channel: 2480	5.71	3.724

Cable loss:0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function.

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September 2024 Model: YJCB023

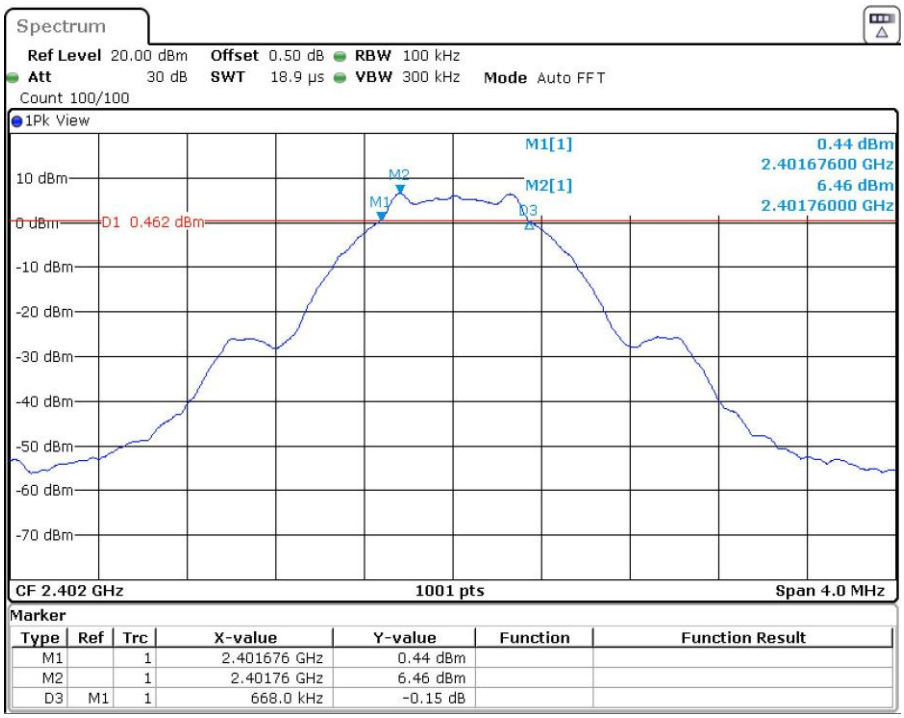
4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

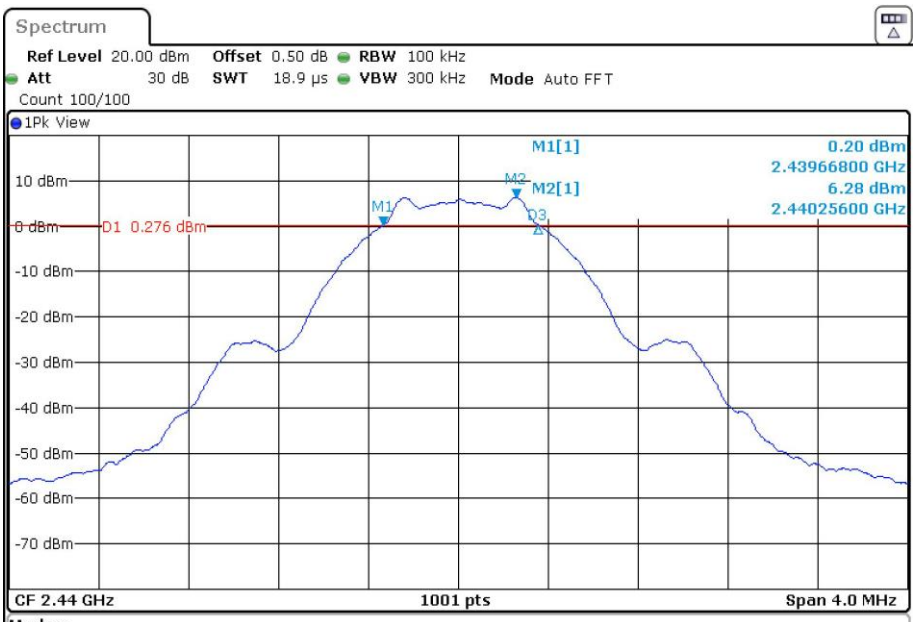
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

Frequency (MHz)	6 dB Bandwidth (kHz)
2402	668.0
2440	668.0
2480	668.0

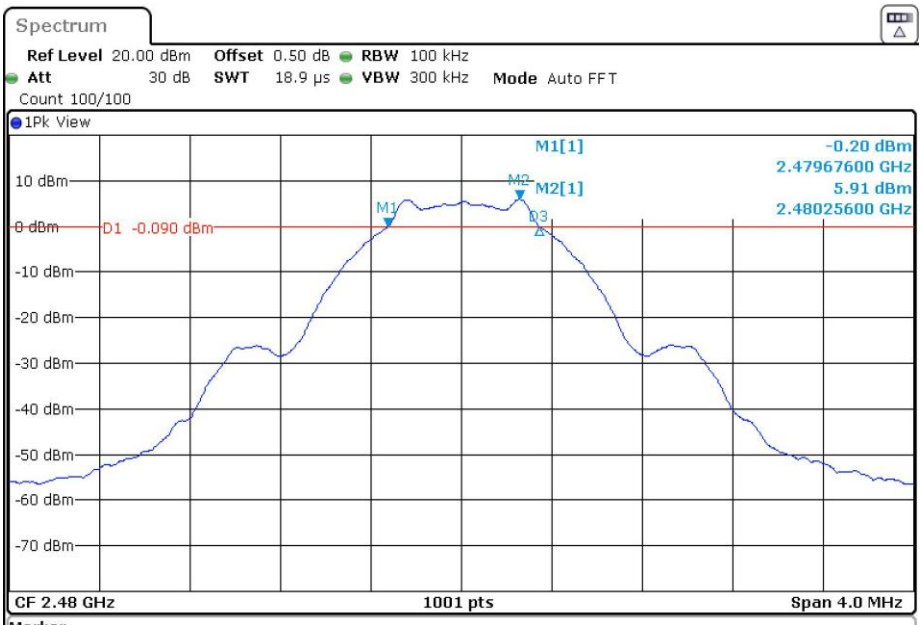
The test plots are attached as below.





Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.439668 GHz	0.20 dBm		
M2		1	2.440256 GHz	6.28 dBm		
D3	M1	1	688.0 kHz	0.01 dB		



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479676 GHz	-0.20 dBm		
M2		1	2.480256 GHz	5.91 dBm		
D3	M1	1	668.0 kHz	0.10 dB		

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September 2024 Model: YJCB023

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

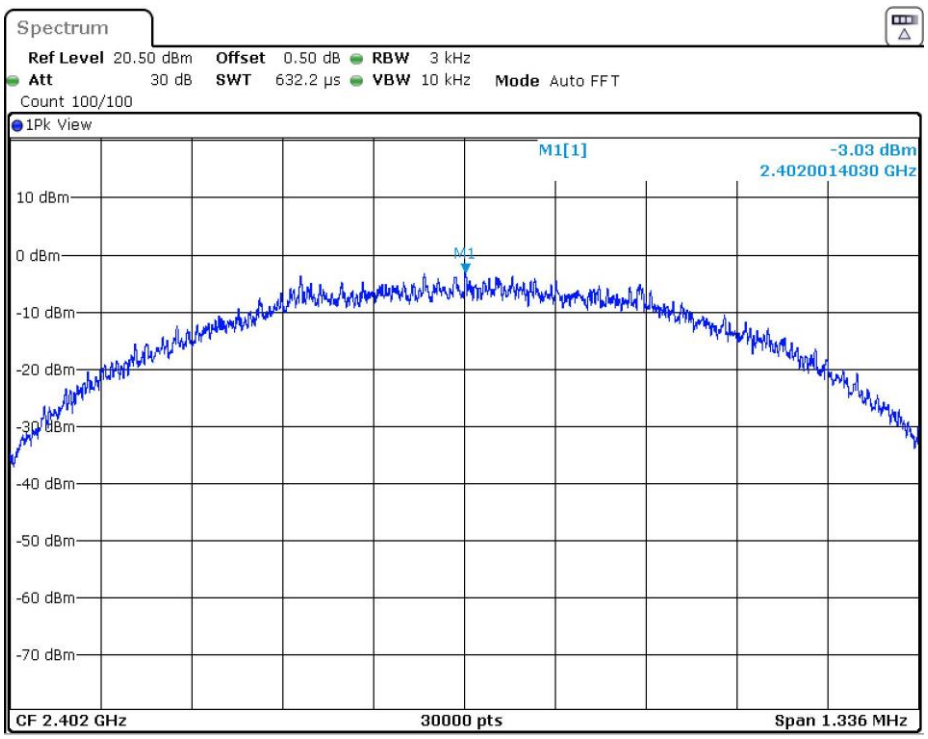
The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

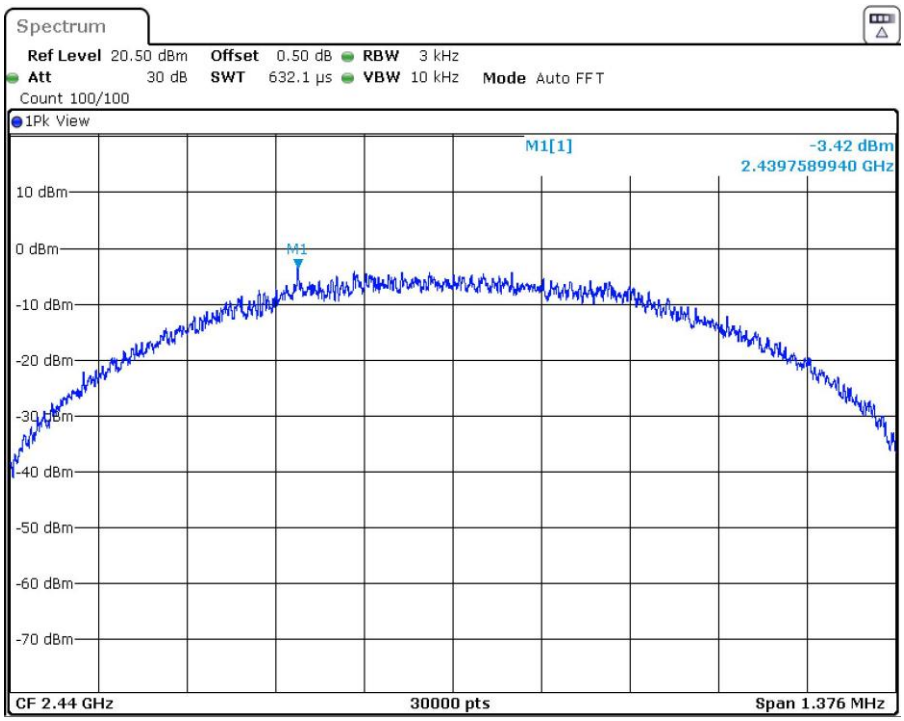
Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

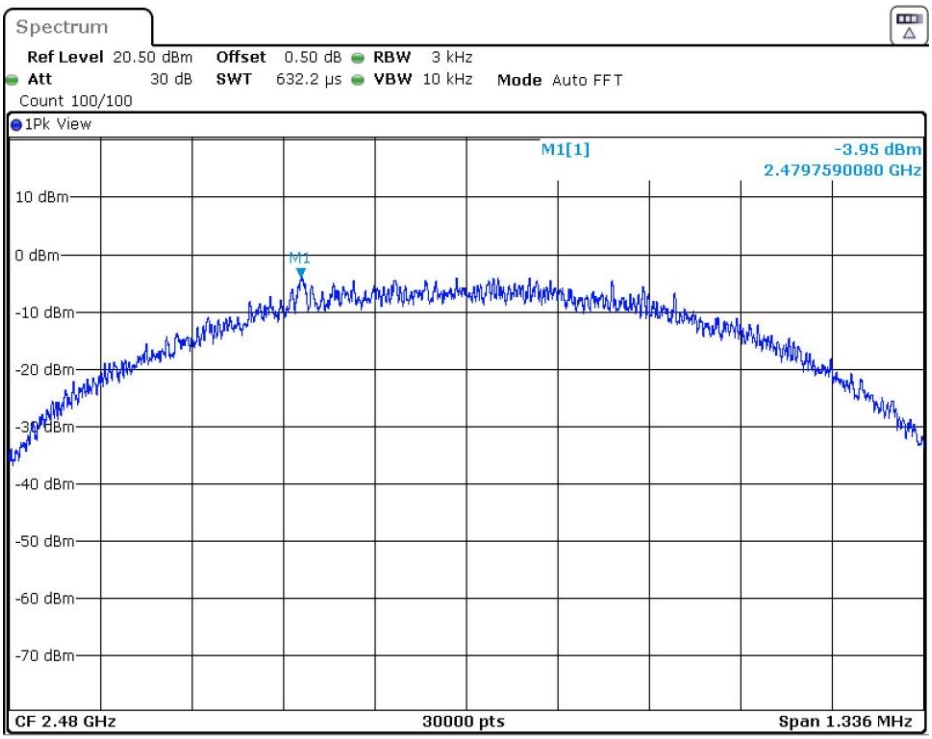
Limit: The Power Density does not exceed 8dBm/3 kHz.

Frequency (MHz)	Power Density with RBW 3kHz(dBm)
2402	-3.03
2440	-3.42
2480	-3.95

The test plots are attached as below.




Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz
Att 30 dB SWT 632.1 µs VBW 10 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -3.42 dBm
2.4397589940 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.44 GHz
30000 pts
Span 1.376 MHz


Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 3 kHz
Att 30 dB SWT 632.2 µs VBW 10 kHz Mode Auto FFT
Count 100/100
1Pk View
M1[1] -3.95 dBm
2.4797590080 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.48 GHz
30000 pts
Span 1.336 MHz

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September 2024 Model: YJCB023

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

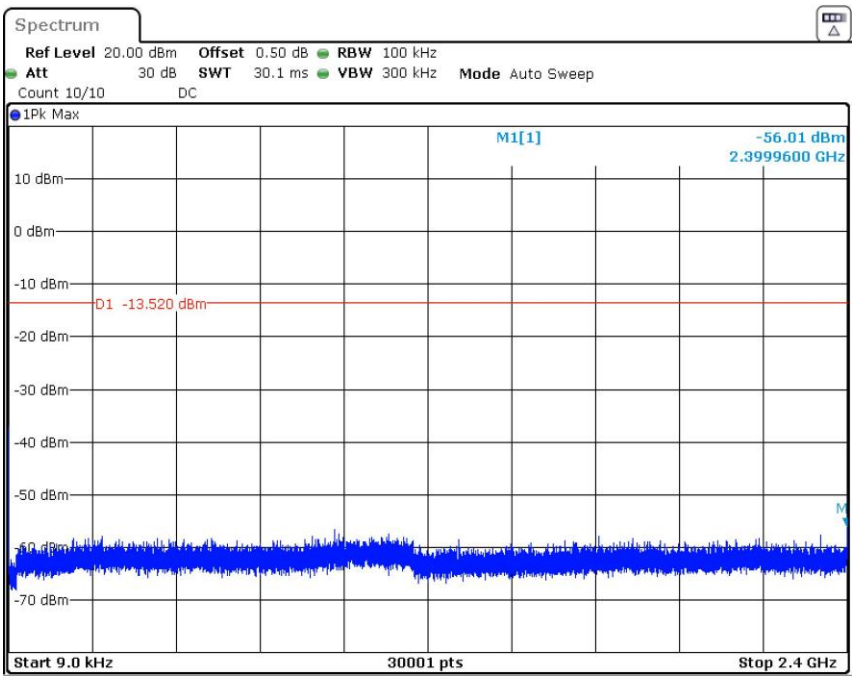
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

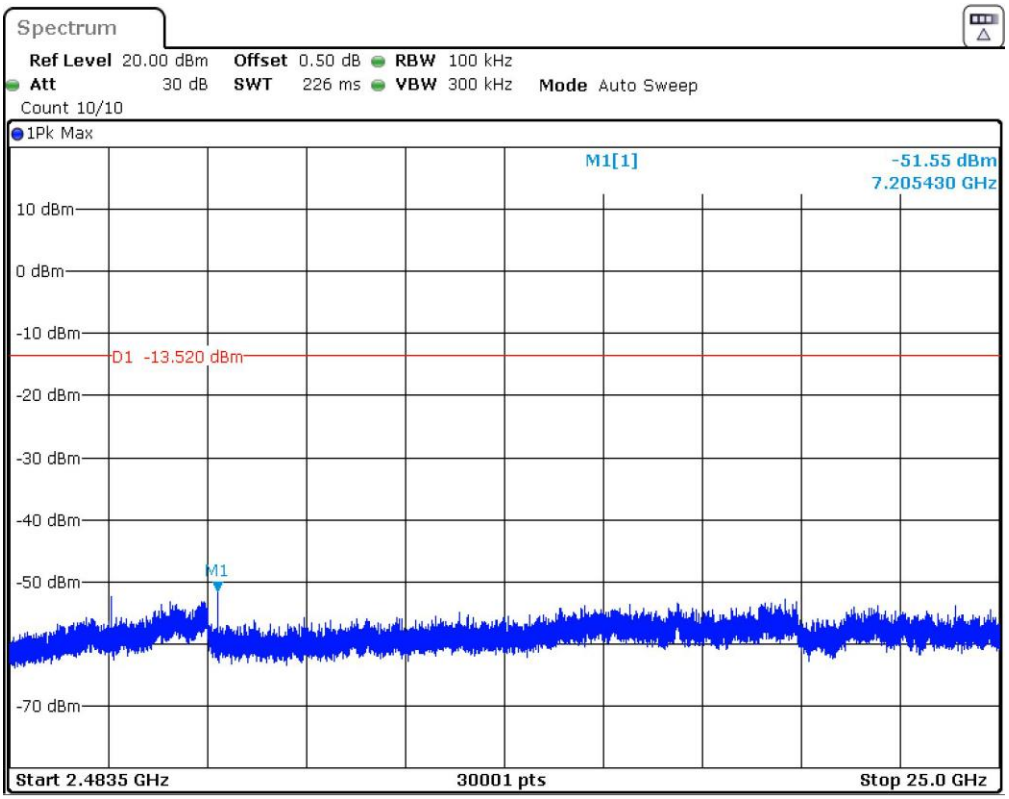
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for BLE.

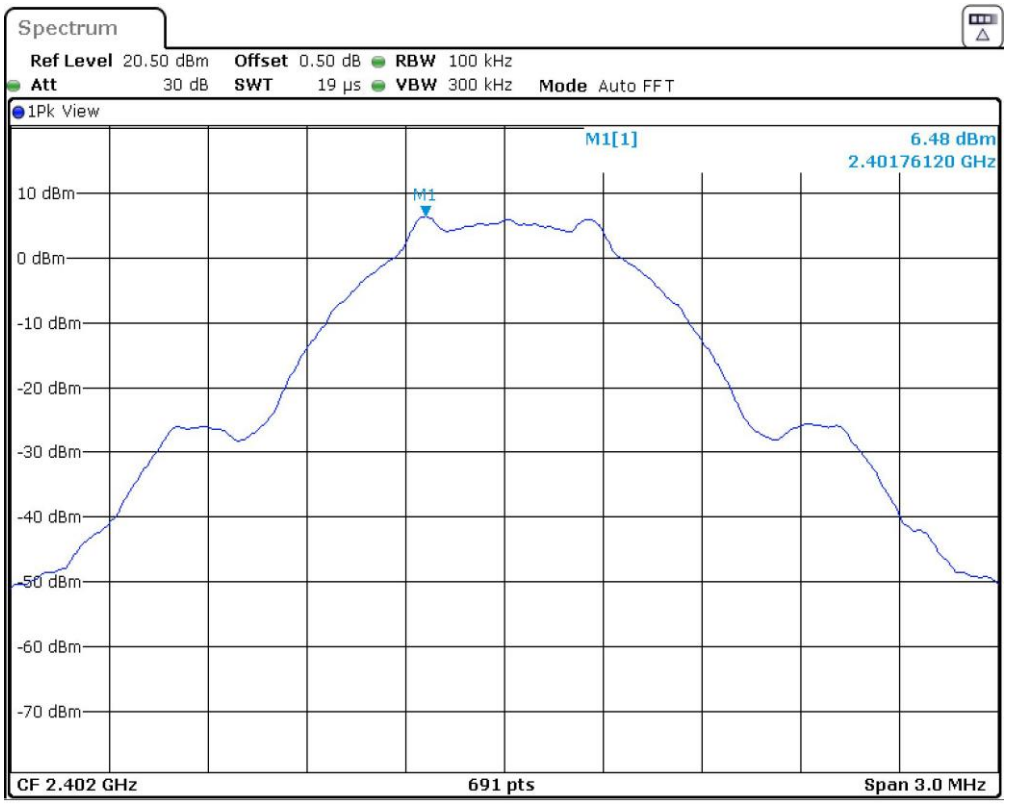
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

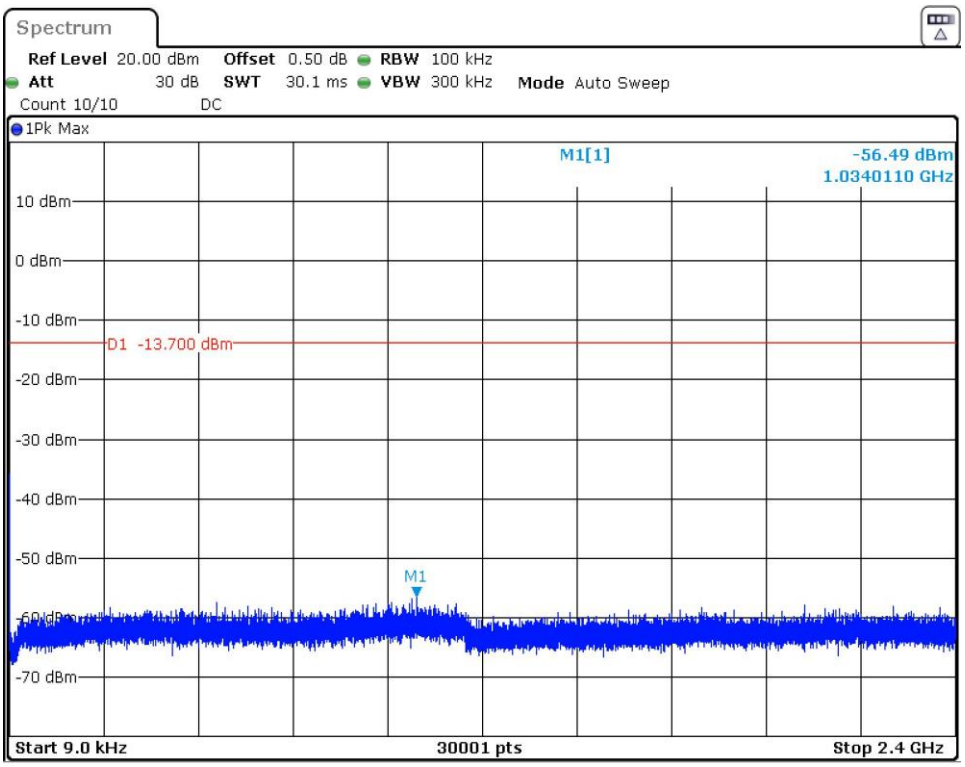
Channel 00 (2402MHz) Reference Level: 6.48dBm

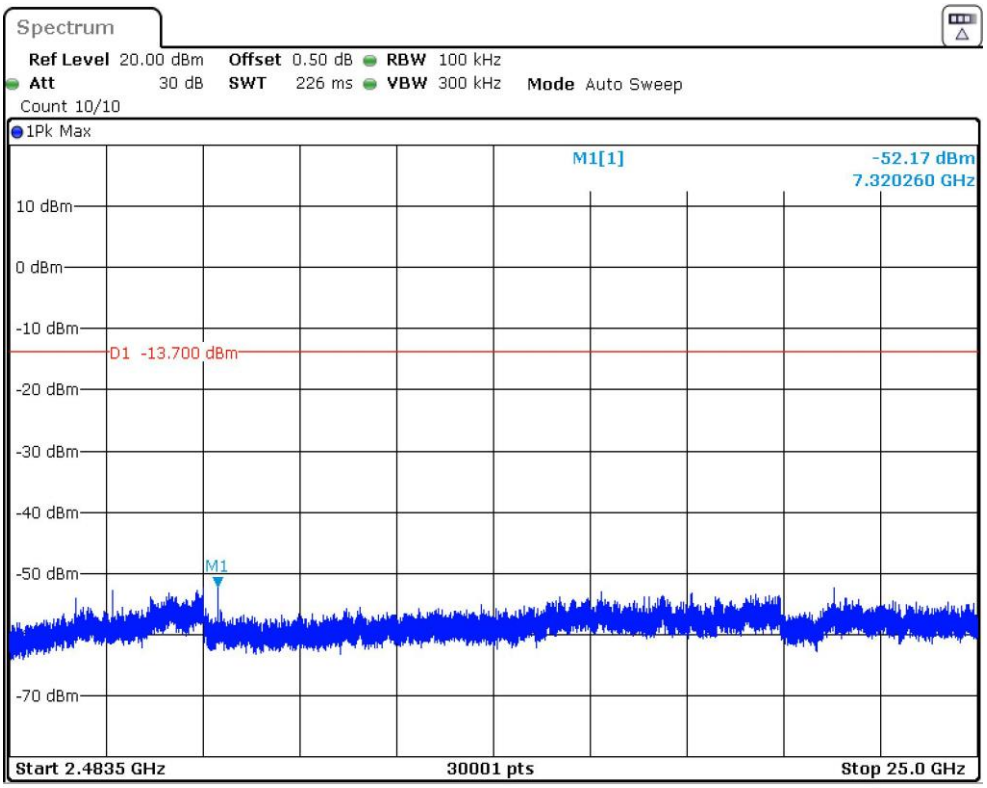


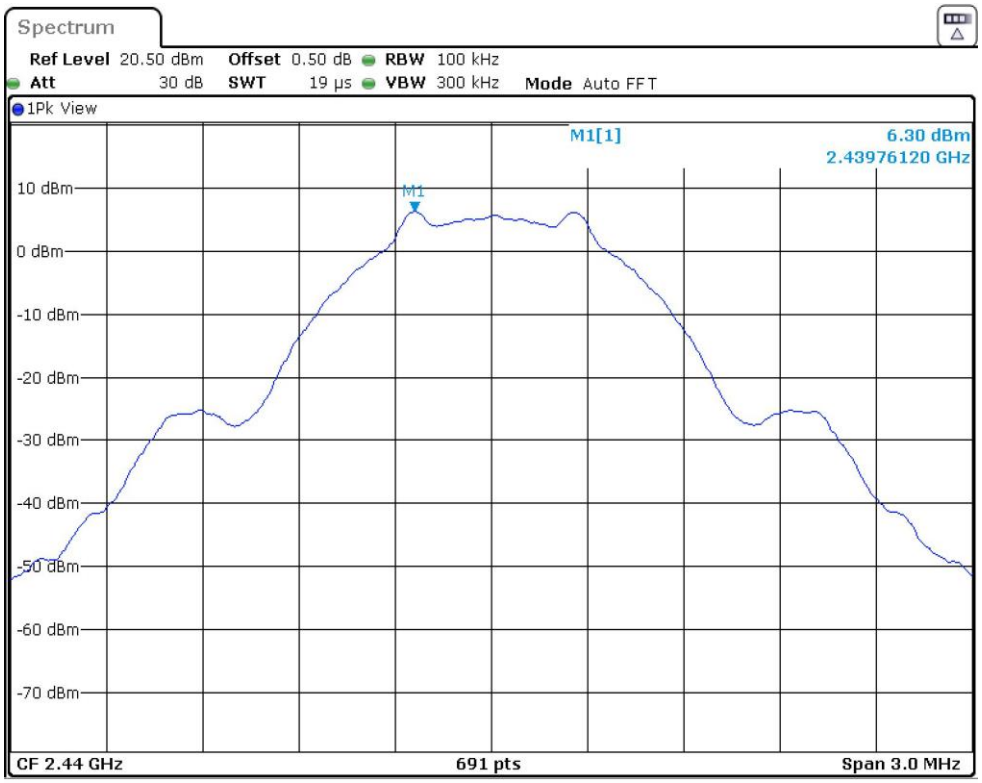

Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -51.55 dBm
7.205430 GHz
10 dBm
0 dBm
-10 dBm
D1 -13.520 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
M1
-70 dBm
Start 2.4835 GHz
30001 pts
Stop 25.0 GHz


Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] 6.48 dBm
2.40176120 GHz
10 dBm
M1
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.402 GHz
691 pts
Span 3.0 MHz

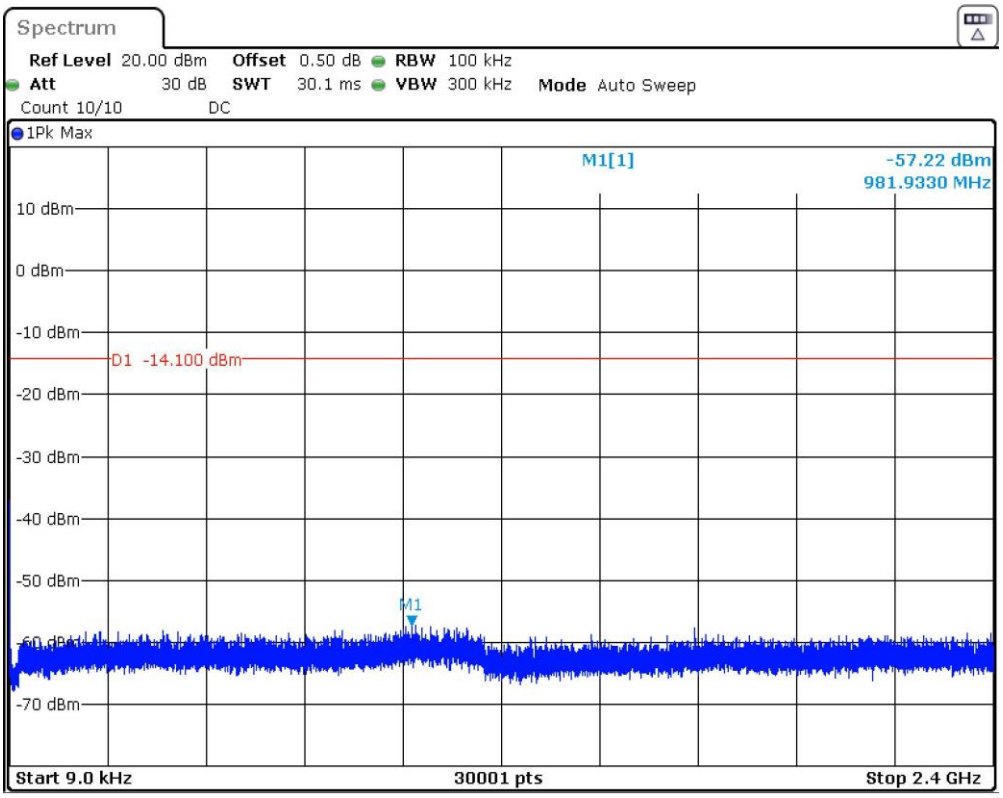
Channel 19 (2440MHz) Reference Level: 6.30dBm

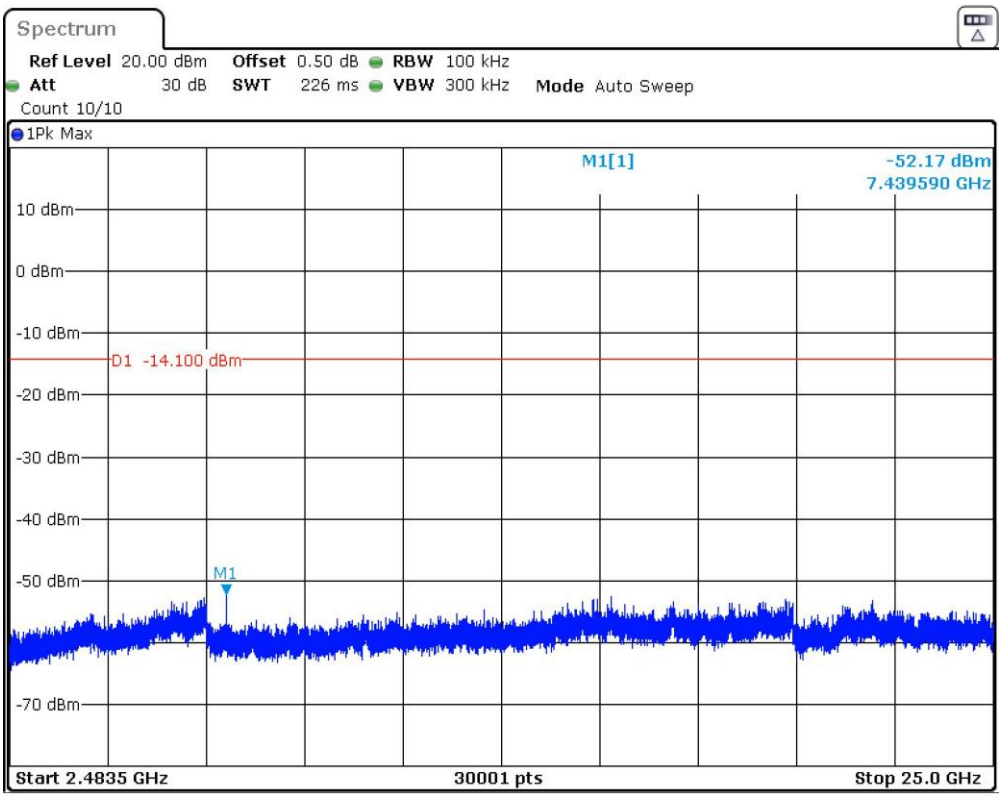


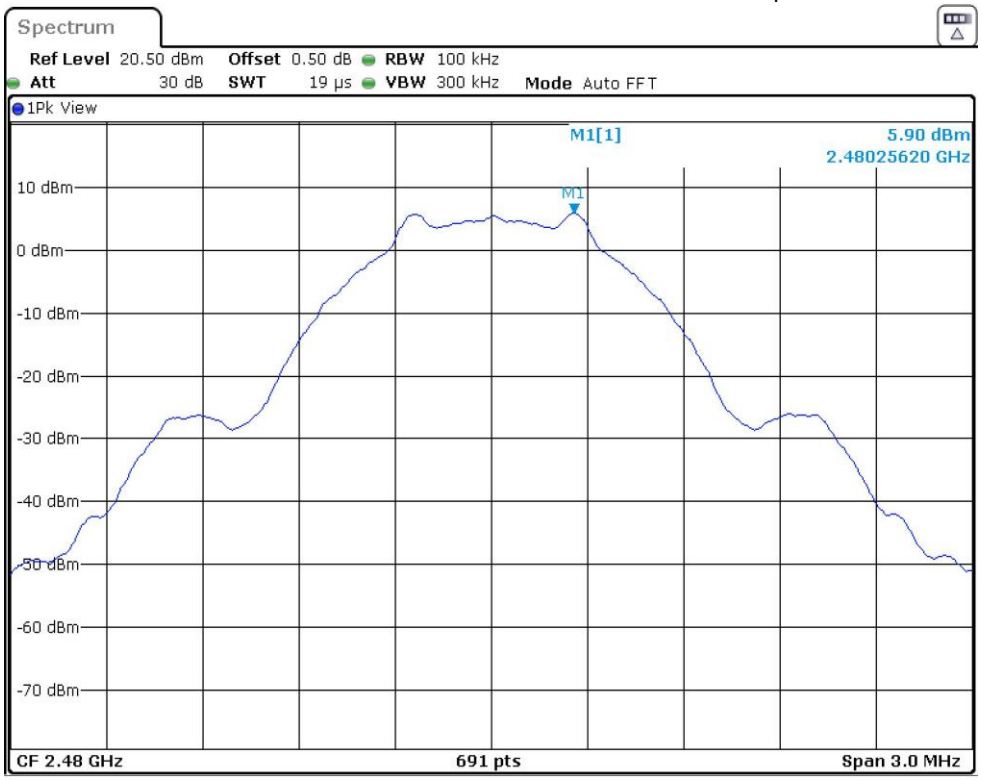



Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] 6.30 dBm
2.43976120 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.44 GHz
691 pts
Span 3.0 MHz

Channel 39 (2480MHz) Reference Level: 5.90dBm






Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] 5.90 dBm
2.48025620 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.48 GHz
691 pts
Span 3.0 MHz

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required, since all emissions are more than 20dB below fundamental.
[ ] See attached data sheet.

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst-case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024 Model: YJCB023

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB/m
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

<u>Example</u>
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024 Model: YJCB023

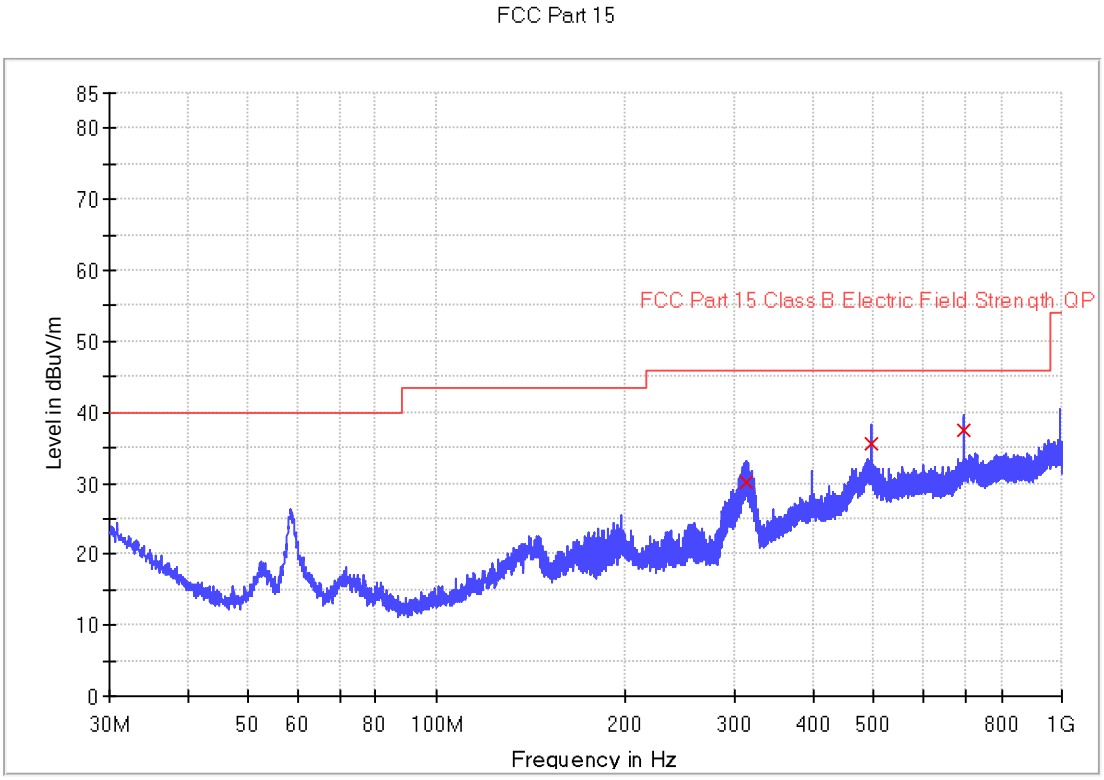
4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission
at 2390.000MHz
is passed by 5.5dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024 Model: YJCB023
Worst Case Operating Mode: BT Link

ANT Polarity: Horizontal

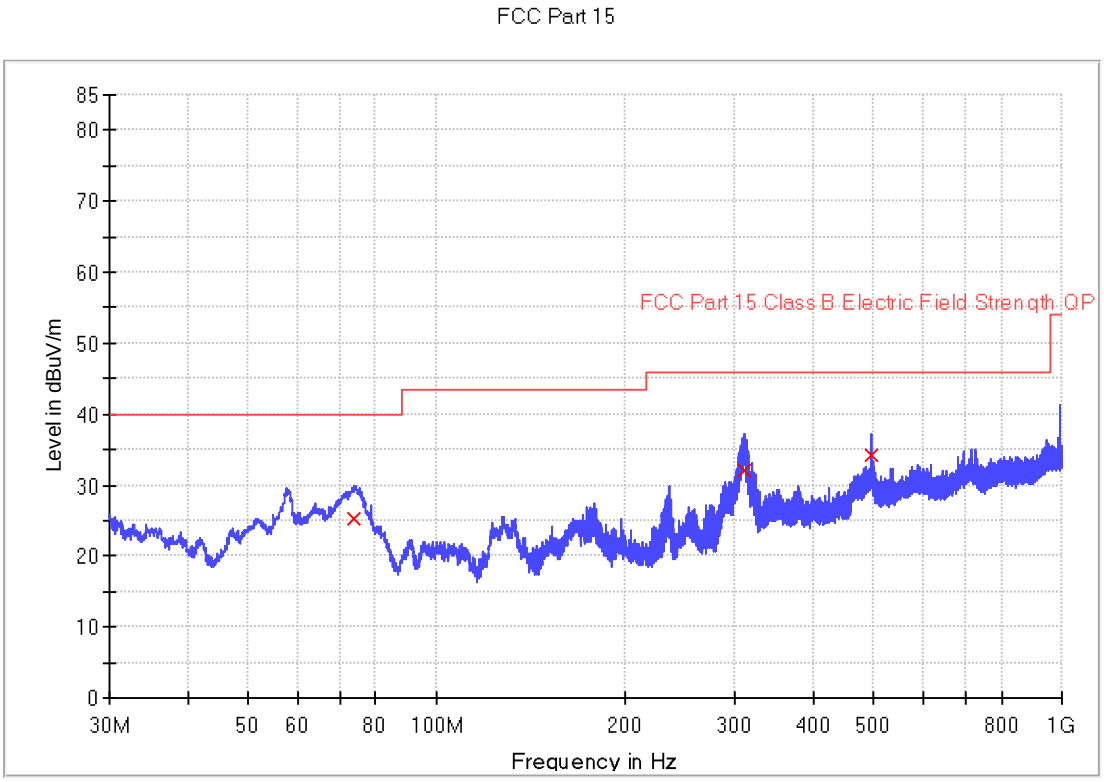


Frequency (MHz)	Quasi Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK dBµV/m)
312.367000	30.1	1000.0	120.000	H	20.8	15.9	46.0
496.537667	35.6	1000.0	120.000	H	26.4	10.4	46.0
695.161333	37.5	1000.0	120.000	H	30.8	8.5	46.0

Remark:
1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit Line (dBµV/m) – Level (dBµV/m)

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024 Model: YJCB023
Worst Case Operating Mode: BT Link

ANT Polarity: Vertical



Frequency (MHz)	Quasi Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK (dBµV/m)
73.908667	25.3	1000.0	120.000	V	13.9	14.7	40.0
309.942000	32.1	1000.0	120.000	V	20.7	13.9	46.0
496.440667	34.2	1000.0	120.000	V	26.4	11.8	46.0

Remark:
1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit Line (dBµV/m) – Level (dBµV/m)

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024 Model: YJCB023
Worst Case Operating Mode: Transmitting (Channel 0)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*2390.000	65.7	33.1	27.4	60.0	74.0	-14.0
Vertical	*4804.000	39.8	30.6	32.7	41.9	74.0	-32.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*2390.000	54.2	33.1	27.4	48.5	54.0	-5.5
Vertical	*4804.000	28.2	30.6	32.7	30.3	54.0	-23.7

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024 Model: YJCB023
Worst Case Operating Mode: Transmitting (Channel 19)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4880.000	46.2	33.1	27.8	40.9	74.0	-33.1
Vertical	*7320.000	42.4	30.5	32.9	44.8	74.0	-29.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4880.000	35.0	33.1	27.8	29.7	54.0	-24.3
Vertical	*7320.000	33.3	30.5	32.9	35.7	54.0	-18.3

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024 Model: YJCB023
Worst Case Operating Mode: Transmitting (Channel 39)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*2483.500	65.7	33.1	27.8	60.4	74.0	-13.6
Vertical	*4960.000	39.2	30.5	32.9	41.6	74.0	-32.4
Vertical	*7440.000	42.3	30.9	37.3	48.7	74.0	-25.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*2483.500	53.7	33.1	27.8	48.4	54.0	-5.6
Vertical	*4960.000	30.1	30.5	32.9	32.5	54.0	-21.5
Vertical	*7440.000	30.2	30.9	37.3	36.6	54.0	-17.4

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024
Model: YJCB023

4.9 Conducted Emission

Worst Case Conducted Emission
at 0.154000MHz
is passed by 10.6dB margin.

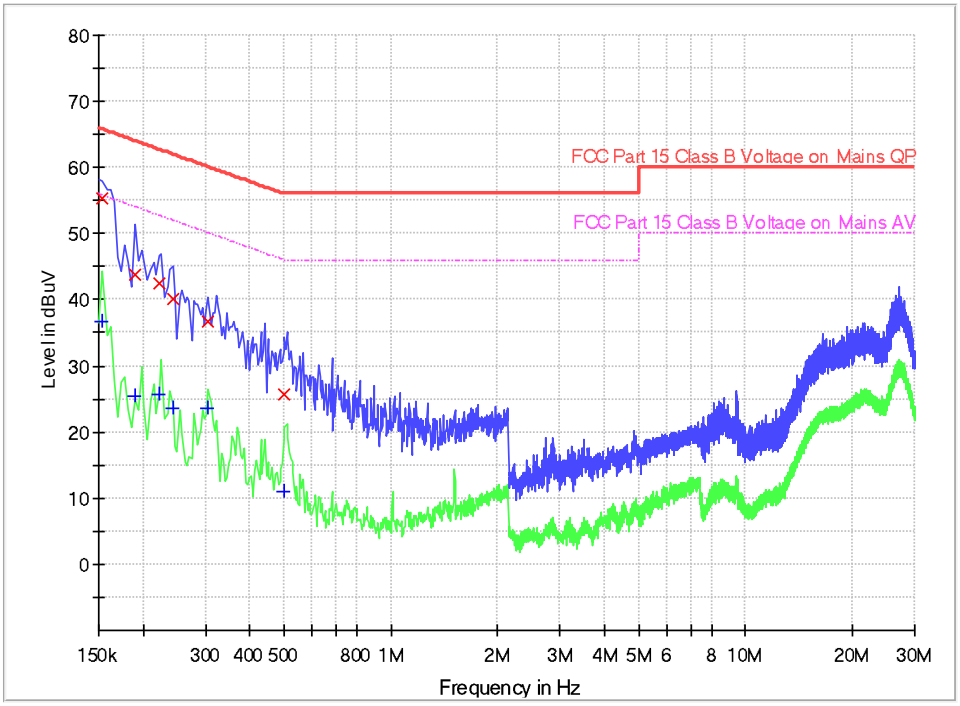
For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024
Model: YJCB023
Worst Case Operating Mode: BT Link
Phase: Live

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement

Conducted Emission Test FCC Part 15



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154000	55.2	9.000	L1	9.6	10.6	65.8
0.190000	43.9	9.000	L1	9.6	20.1	64.0
0.222000	42.6	9.000	L1	9.6	20.1	62.7
0.242000	40.1	9.000	L1	9.6	21.9	62.0
0.306000	36.6	9.000	L1	9.6	23.5	60.1
0.502000	25.7	9.000	L1	9.6	30.3	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154000	36.8	9.000	L1	9.6	19.0	55.8
0.190000	25.5	9.000	L1	9.6	28.5	54.0
0.222000	25.7	9.000	L1	9.6	27.0	52.7
0.242000	23.6	9.000	L1	9.6	28.4	52.0
0.306000	23.7	9.000	L1	9.6	26.4	50.1
0.502000	11.0	9.000	L1	9.6	35.0	46.0

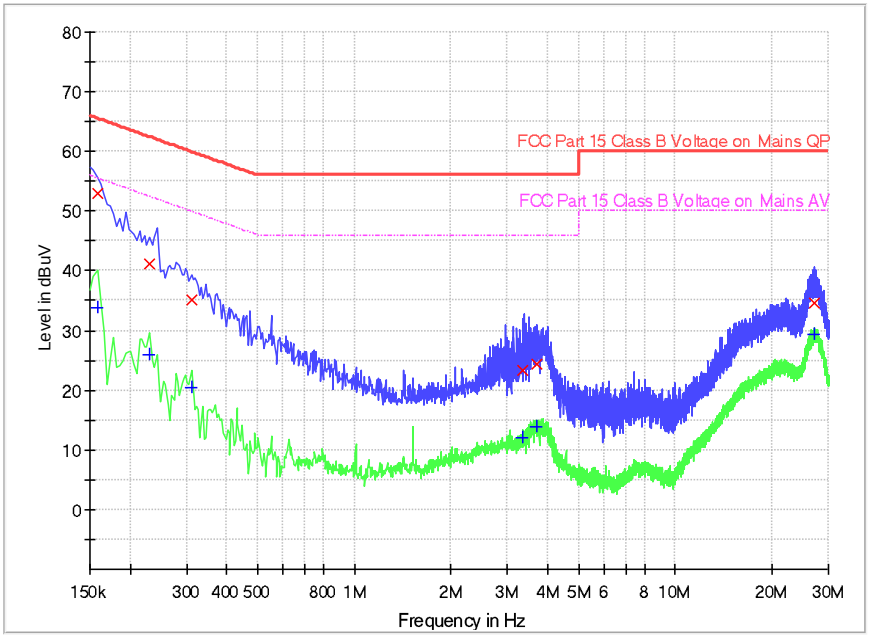
Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBµV) – Level (dBµV)

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September2024
Model: YJCB023
Worst Case Operating Mode: BT Link
Phase: Neutral

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement

Conducted Emission Test FCC Part 15



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	53.0	9.000	N	9.6	12.6	65.6
0.230000	41.1	9.000	N	9.6	21.3	62.4
0.310000	35.1	9.000	N	9.6	24.9	60.0
3.358000	23.3	9.000	N	9.7	32.7	56.0
3.722000	24.5	9.000	N	9.7	31.5	56.0
27.066000	34.6	9.000	N	11.0	25.4	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	33.8	9.000	N	9.6	21.8	55.6
0.230000	25.9	9.000	N	9.6	26.5	52.4
0.310000	20.4	9.000	N	9.6	29.6	50.0
3.358000	12.0	9.000	N	9.7	34.0	46.0
3.722000	14.0	9.000	N	9.7	32.0	46.0
27.066000	29.3	9.000	N	11.0	20.7	50.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBµV) – Level (dBµV)

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September 2024
Model: YJCB023

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

[ ] Not required - No digital part.

[ ] Test results are attached.

[x] Included in the separated report.

Applicant: Yunjing Intelligence Innovation (Shenzhen) Co., Ltd.
Date of Test: 25 September 2024
Model: YJCB023

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	2024-04-22	2025-04-22
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	2024-04-22	2025-04-22
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	2023-12-13	2024-12-13
SZ062-10	RF Cable	Bedea	RG 58	--	2023-11-15	2024-11-15
SZ056-08	Signal Analyzer	R&S	FSV 40	101430	2023-12-13	2024-12-13
SZ185-03	EMI Receiver	R&S	ESR7	101975	2024-04-23	2025-04-23
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2024-05-05	2027-05-05
SZ061-13	BiConiLog Antenna	ETS	3142E	00217919	2022-07-13	2025-07-13
SZ061-09	Double-Ridged Waveguide Horn Antenna	ETS	3115	00092347	2022-10-14	2025-10-14
SZ181-08	Microwave System Amplifier	Agilent	83017A	MY57280108	2024-07-29	2025-07-29
SZ188-05	Anechoic Chamber	ETS	FACT 3-2.0	CT001880-Q1391	2021-05-25	2026-05-25
SZ062-35	RF Cable	RADIALL	A50-3.5M 3.5M-8M	-	2023-11-14	2024-11-14
SZ062-30	RF Cable	RADIALL	A50-3.5M 3.5M-4.5M	-	2023-11-14	2024-11-14
SZ062-31	RF Cable	RADIALL	A50-3.5M 3.5M-1M	-	2023-11-14	2024-11-14
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	015	2024-04-23	2025-04-23
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2024-07-09	2025-07-09
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	2023-10-18	2024-10-18
SZ188-03	Shielding Room	ETS	RFD-100	4100	2022-12-20	2025-12-20

********** End of Report**********