FCC TEST REPORT

Test report
On Behalf of
Flat River Group LLC
For
ELECTRIC KIDS BUMPER CAR
Model No.: FR2005
FCC ID: 2AX5B-FR2005

Prepared for :	**Flat River Group LLC** **306 Reed St. , Belding, MI 48809**
Prepared By :	**Shenzhen Tongzhou Testing Co.,Ltd** **1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China**
Date of Test:	**2020/11/2 – 2020/11/14**
Date of Report:	**2020/11/16**
Report Number:	**TZ201101789-EW1**

TEST RESULT CERTIFICATION

Applicant's name	:	**Flat River Group LLC**
Address	:	306 Reed St. , Belding, MI 48809
Manufacture's Name	:	**Flat River Group LLC**
Address	:	306 Reed St. , Belding, MI 48809

Product description

Trade Mark	:	N/A
Product name	:	ELECTRIC KIDS BUMPER CAR
Model and/or type reference	:	FR2005
Standards	:	FCC Rules and Regulations Part 15 Subpart C Section 15.249 ANSI C63.10: 2013

Date of Test	:	
Date (s) of performance of tests	:	2020/11/2 – 2020/11/14
Date of Issue	:	2020/11/16
Test Result	:	**Pass**

Testing Engineer : Nancy Li

(Nancy Li)

Technical Manager : Hugo Chen

(Hugo Chen)

Authorized Signatory : Andy Zhang

(Andy Zhang)

Revision History

Revision	Issue Date	Revisions	Revised By
000	2020/11/16	Initial Issue	Andy Zhang

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	ELECTRIC KIDS BUMPER CAR
Model Number	:	FR2005
Model Difference Declaration	:	N/A
Test Model	:	FR2005
Power Supply	:	(AAA 1.5V)*2
Hardware version	:	N/A
Software version	:	N/A
Sample ID	:	TZ201101789–1# / TZ201101789–2# TZ201101789–3# / TZ201101789–4#
Channel Number	:	79 Channels
Modulation Technology	:	GFSK
Antenna Type And Gain	:	PCB Antenna / 0dBi

Note1: Antenna position refer to EUT Photos.

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate

1.3 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

☐ supplied by the lab ☐supplied by the manufacturer

Manufacturer	Description	Model	Serial Number	Certificate

1.4. External I/O Cable

I/O Port Description	Quantity	Cable
/	/	/

1.5. Description of Test Facility

FCC

Designation Number: CN1275

Test Firm Registration Number: 167722

Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA

Certificate Number: 5463.01

Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

IC

ISED#: 22033

CAB identifier: CN0099

Shenzhen Tongzhou Testing Co.,Ltd has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010

1.6. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.7. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.08dB	(1)
		30MHz~1000MHz	±4.42dB	(1)
		1GHz~40GHz	±4.06dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±2.23dB	(1)

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

1.8. Description of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power.

Worst-Case data rates were utilized from preliminary testing of the Chipset.

1.9. Frequency of Channels

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

Test Mode List		
Test Mode	Description	Remark
TM1	Low Channel	2402MHz
TM2	Middle Channel	2440MHz
TM3	High Channel	2480MHz
TM4	Normal working	N/A

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen Tongzhou Testing Co.,Ltd

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

2.3. General Test Procedures

2.3.1 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013

2.4. Test Sample

The application provides 1 sample to meet requirement;

Sample ID	Description
TZ201101789–1#	Engineer sample –Fixed frequency transmission(2402MHz)
TZ201101789–2#	Engineer sample –Fixed frequency transmission(2440MHz)
TZ201101789–3#	Engineer sample –Fixed frequency transmission(2480MHz)
TZ200801536–4#	Normal sample – Intermittent transmit

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by Engineer samples provided by application.

3.3. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
1	PC	ASUS	X454L	15105-0038A100	/	/	/

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen Tongzhou Testing Co.,Ltd has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C			
FCC Rules	Description of Test	Test Sample(s)	Result
§15.207(a)	Conducted Emissions	TZ201101789–4#	N/A
15.209(a),15.249(a),15.249(c),15.205(a)	Fundamental &Radiated Spurious Emission Measurement	TZ201101789-4# TZ200801536-1#/2#/3#	Compliant
15.215(c)	Bandwidth	TZ201101789-1#/2#/3#	Compliant
15.249(d)	Band Edge Emission	TZ200801536-4#	Compliant
§15.203	Antenna Requirements	TZ200801536-4#	Compliant

5. TEST RESULT

5.1. Radiated Emissions Measurement

5.1.1. Standard Applicable

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed:

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz):

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m)

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

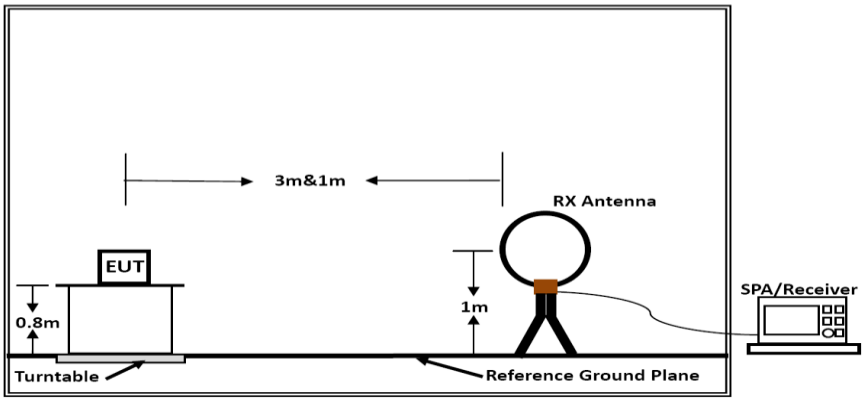
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

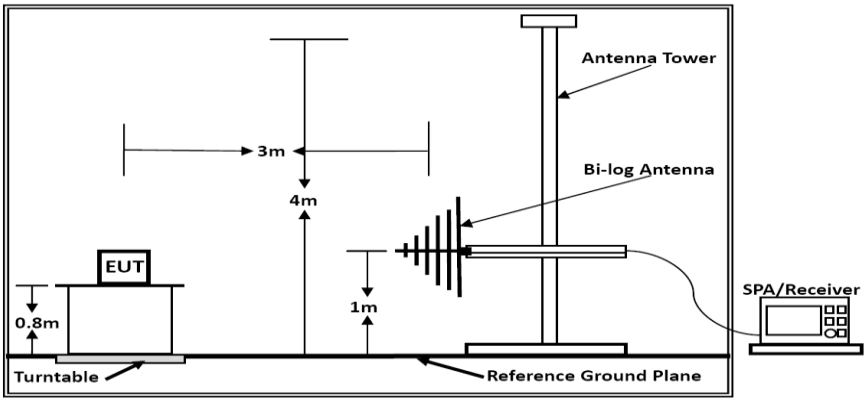
5.1.2. Test Procedures

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 and 1.5 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
g. For the radiated emission test above 1GHz:
   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.
   Note:
   Both horizontal and vertical antenna polarities were tested
   and performed pretest to three orthogonal axis. The worst case emissions were reported

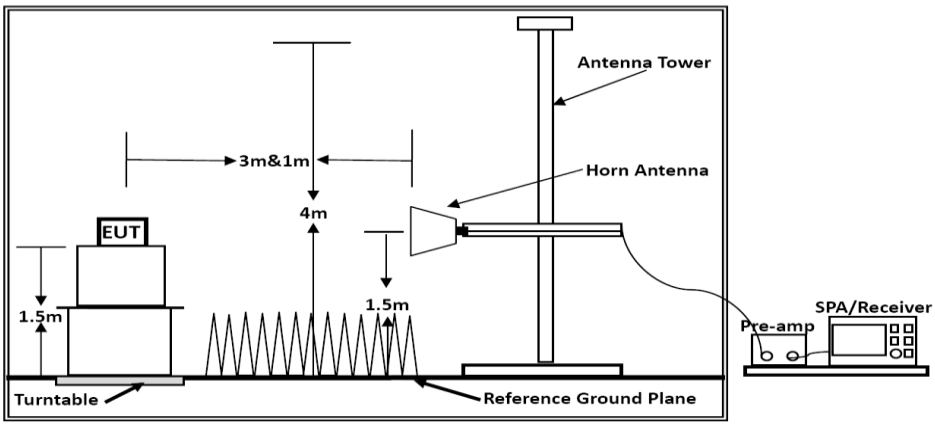
5.1.3. Test Setup Layout



Below 30MHz



Below 1GHz



Above 1GHz

Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1.5m]) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.1.4. EUT Operation during Test

The EUT was programmed to be Normal Working in mode.

5.1.5.Field Strength of Fundamental

Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
2402	93.98	-8.67	85.31	114	-28.69	H	PK
2402	92.38	-8.67	83.71	94	-10.29	H	AV
2440	92.48	-8.4	84.08	114	-29.92	H	PK
2440	89.24	-8.4	80.84	94	-13.16	H	AV
2480	92.99	-8.25	84.74	114	-29.26	H	PK
2480	90.48	-8.25	82.23	94	-11.77	H	AV
2402	94.38	-8.67	85.71	114	-28.29	V	PK
2402	92.20	-8.67	83.53	94	-10.47	V	AV
2440	92.31	-8.4	83.91	114	-30.09	V	PK
2440	92.16	-8.4	83.76	94	-10.24	V	AV
2480	93.68	-8.25	85.43	114	-28.57	V	PK
2480	89.82	-8.25	81.57	94	-12.43	V	AV

5.1.6. Results of Radiated Emissions (9 kHz~30MHz)

Temperature	22.6℃	Humidity	56%
Test Engineer	Nancy Li	Configurations	Normal Working

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

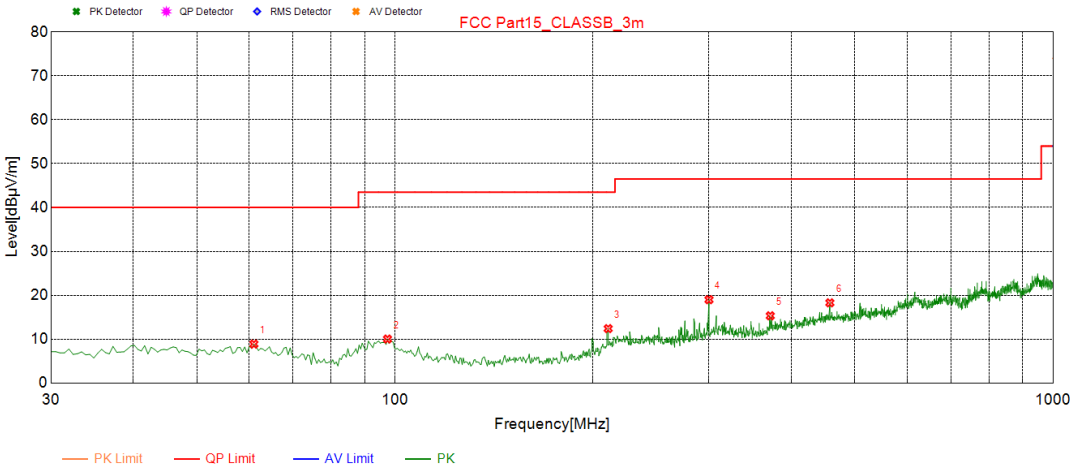
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor.

5.1.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	22.6℃	Humidty	56%
Test Engineer	Nancy Li	Configurations	Normal Working

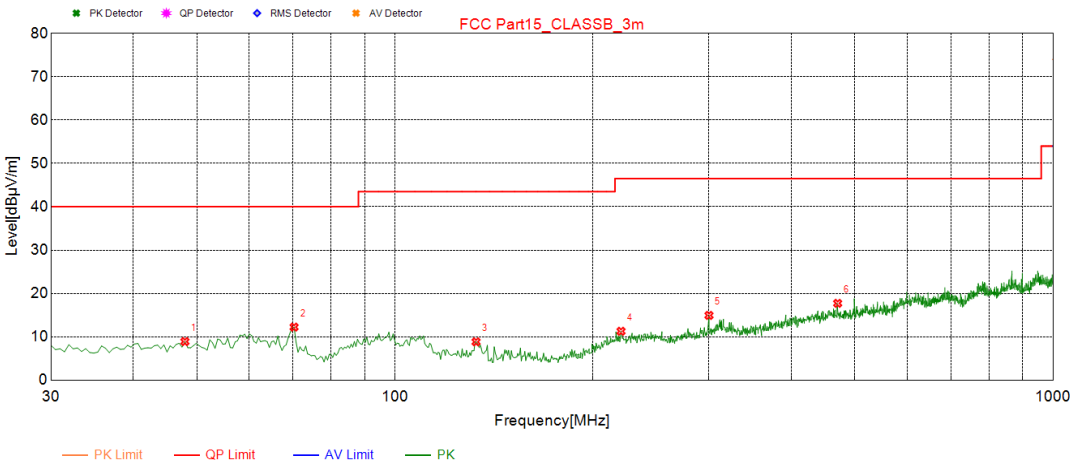
Test result for Normal Working:

Horizontal:



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	61.040	8.86	-15.92	40.00	31.14	100	227	Horizontal
2	97.415	10.01	-16.42	43.50	33.49	100	202	Horizontal
3	210.905	12.39	-15.10	43.50	31.11	100	44	Horizontal
4	300.145	18.98	-12.81	46.50	27.52	100	196	Horizontal
5	371.925	15.31	-10.81	46.50	31.19	100	224	Horizontal
6	458.255	18.27	-8.89	46.50	28.23	100	211	Horizontal

Vertical:



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	47.945	8.88	-14.07	40	31.12	100	50	Vertical
2	70.255	12.22	-18.26	40	27.78	100	122	Vertical
3	132.820	8.82	-19.19	43.5	34.68	100	8	Vertical
4	220.605	11.26	-14.79	46.5	35.24	100	62	Vertical
5	300.145	14.92	-12.81	46.5	31.58	100	209	Vertical
6	470.865	17.71	-8.64	46.5	28.79	100	122	Vertical

Note:

1). Margin(dB) = Limit(dBµV/m) – Result Level(dBµV/m)

5.1.8. Results for Radiated Emissions (Above 1GHz)

Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2402MHz							
4804	58.13	-1.29	56.84	74	-17.16	H	PK
4804	42.49	-1.29	41.20	54	-12.80	H	AV
7206	47.50	6.51	54.01	74	-19.99	H	PK
7206	33.32	6.51	39.83	54	-14.17	H	AV
4804	58.95	-1.29	57.66	74	-16.34	V	PK
4804	43.96	-1.29	42.67	54	-11.33	V	AV
7206	43.36	6.51	49.87	74	-24.13	V	PK
7206	31.08	6.51	37.59	54	-16.41	V	AV
Middle Channel-2440MHz							
4880	58.93	-0.98	57.95	74	-16.05	H	PK
4880	46.57	-0.98	45.59	54	-8.41	H	AV
7320	44.18	6.83	51.01	74	-22.99	H	PK
7320	29.44	6.83	36.27	54	-17.73	H	AV
4880	56.87	-0.98	55.89	74	-18.11	V	PK
4880	41.54	-0.98	40.56	54	-13.44	V	AV
7320	46.71	6.83	53.54	74	-20.46	V	PK
7320	33.95	6.83	40.78	54	-13.22	V	AV
High Channel-2480MHz							
4960	59.13	-0.8	58.33	74	-15.67	H	PK
4960	43.97	-0.8	43.17	54	-10.83	H	AV
7440	42.50	6.94	49.44	74	-24.56	H	PK
7440	30.43	6.94	37.37	54	-16.63	H	AV
4960	59.45	-0.8	58.65	74	-15.35	V	PK
4960	40.97	-0.8	40.17	54	-13.83	V	AV
7440	45.27	6.94	52.21	74	-21.79	V	PK
7440	31.08	6.94	38.02	54	-15.98	V	AV

Notes:

1.Correction Factor= Antenna Factor + Cable loss–Pre-amplifier; Emission Level=Peak Reading + Correction Factor; Margin=Emission Level–Limit.

2.The emission levels of other frequencies are very lower than the limit and not show in test report.

3. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

5.2. Antenna Requirements

5.2.1 Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

5.8.2 Antenna Connected Construction

5.8.2.1. Standard Applicable

According to § 15.203, an intentional radiatorshall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

5.8.2.2. Antenna Connector Construction

The directional gains of antenna refer to section 1.1, and the antenna is an Internal antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.8.2.3. Results: Compliance.

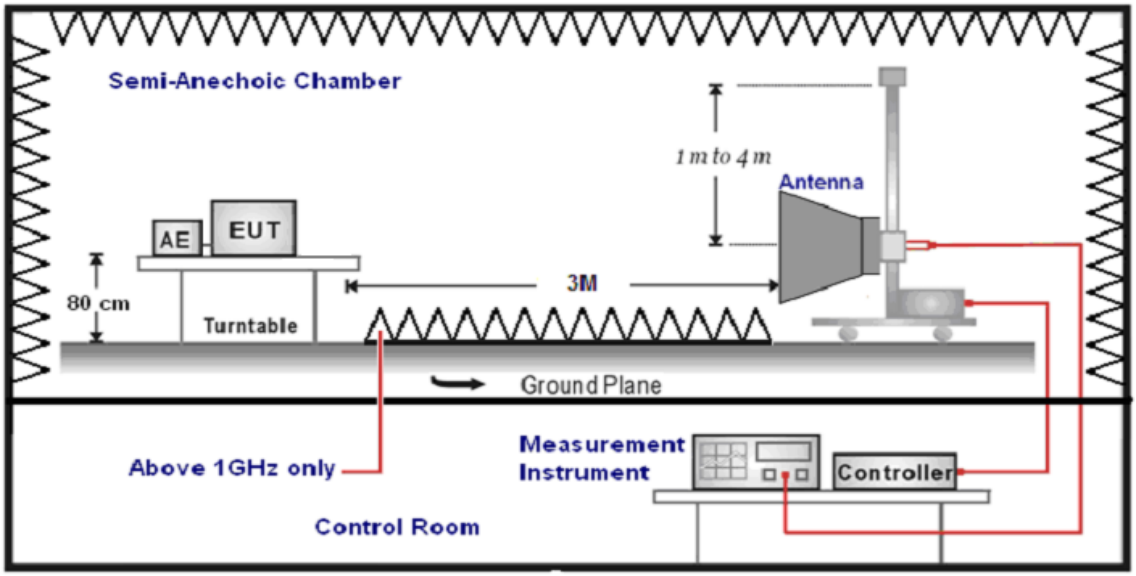
5.3. Band-edge measurements for radiated emissions

5.3.1 Standard Applicable

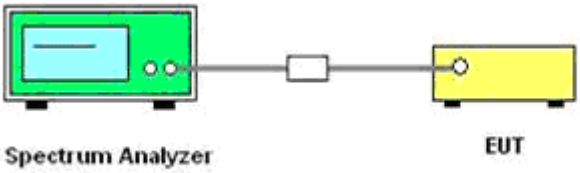
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

5.3.2 Test Setup Layout

☒**For Radiated**



☐**For Conducted**



5.3.3. Measuring Instruments and Setting

Please refer to equipment list in this report. the detail setting of instrument shows in test procedure..

5.3.4. Test Procedures

☒**Radiated Method:**

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed..
5. The distance between test antenna and EUT was 3 meter:
6. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

☐**Conducted Method:**

According to KDB 558074 D01 v05r02 and C63.10 for Antenna-port conducted measurement.
Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=1/B for Peak detector.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency (see 11.12.2.3 through 11.12.2.5 of C63.10 for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level ((see 11.12.2.6 of C63.10 for guidance on determining the applicable antenna gain)
8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:
    $E = EIRP - 20\log D + 104.8 = EIRP + 95.23$

    Where:
    E = electric field strength in dBμV/m,
    EIRP = equivalent isotropic radiated power in dBm
    D = specified measurement distance in meters.
11. Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.
12. Per KDB662911 D01 section b) In cases where a combination of conducted measurements and cabinet radiated measurements are permitted to demonstrate compliance with absolute radiated out-of-band and spurious limits (e.g., KDB Publications 558074 for DTS and 789033 for U-NII), the conducted measurements must be combined with directional gain to compute the radiated levels of the out-of-band and spurious emissions as described in this section.
13. Compare the resultant electric field strength level to the applicable regulatory limit.
14. Perform radiated spurious emission test duress until all measured frequencies were complete.

5.3.5 Test Results

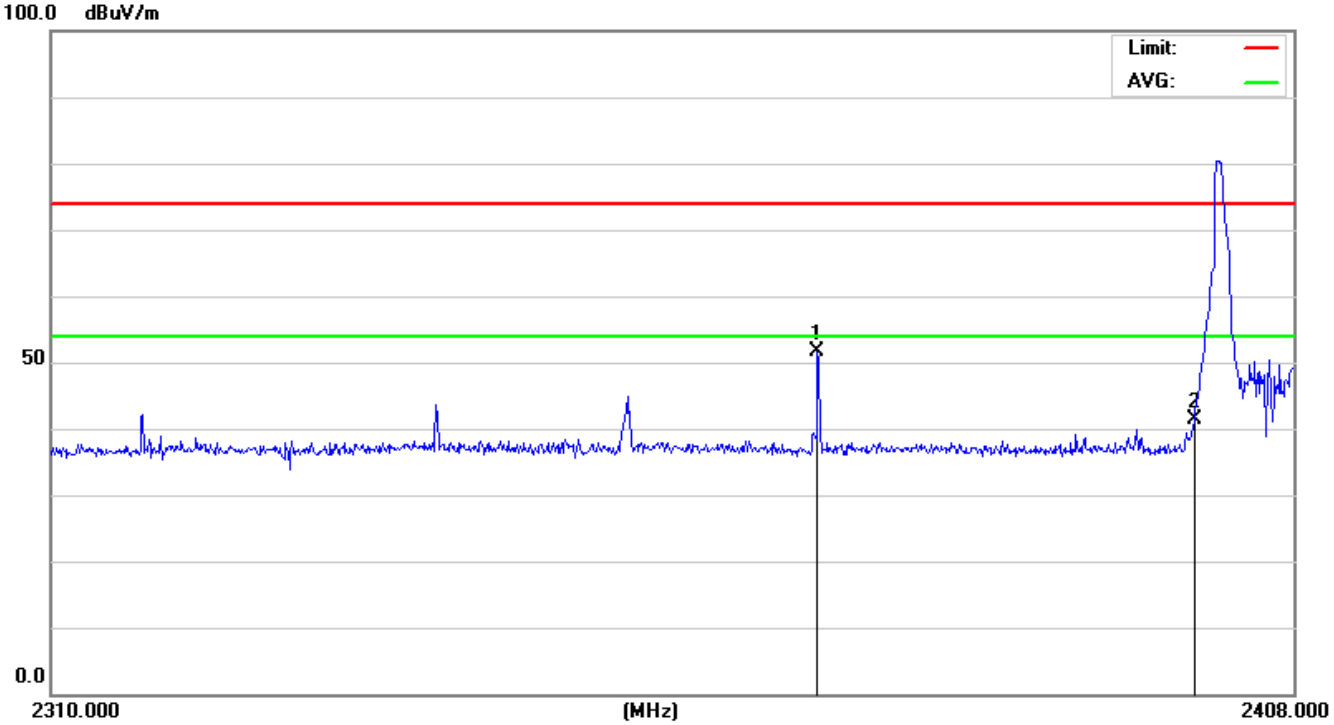
Temperature	22.8℃	Humidity	56%
Test Engineer	Nancy Li		

Radiated measurement:

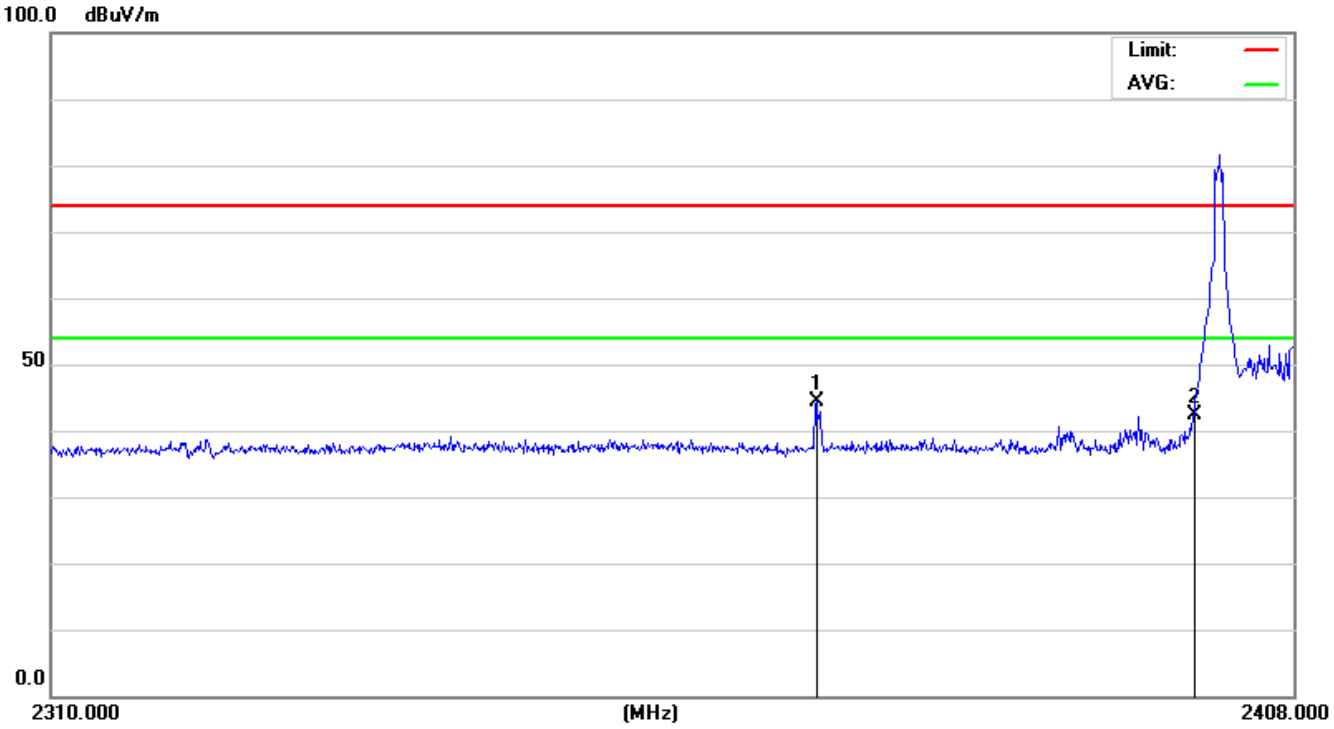
Polar (H/V)	Frequency (MHz)	Reading Level	Correct Factor	Emission evel	Limits (dBuV/m)		Result
					PK	AV	
Low Channel 2402MHz							
H	2370.074	43.60	8.09	51.69	74.00	54.00	PASS
H	2390.000	33.34	8.10	41.44	74.00	54.00	PASS
V	2369.886	36.40	8.09	44.49	74.00	54.00	PASS
V	2390.000	34.28	8.10	42.38	74.00	54.00	PASS
High Channel 2480MHz							
H	2483.500	29.92	8.13	38.05	74.00	54.00	PASS
H	2491.024	34.54	8.13	42.67	74.00	54.00	PASS
V	2483.500	36.40	8.09	44.49	74.00	54.00	PASS
V	2491.024	34.54	8.13	42.67	74.00	54.00	PASS

Note1：All Mode has been tested, list the worst case in this item.

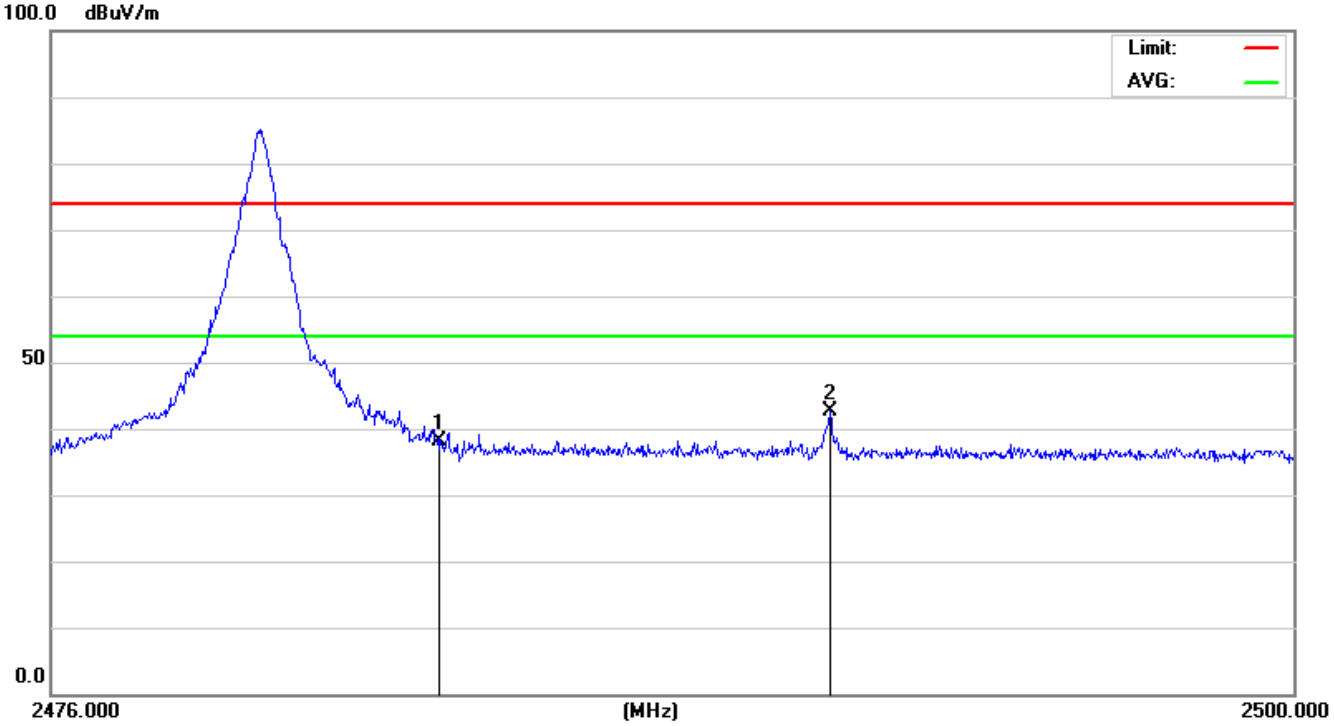
Low Channel (2402MHz) Horizontal:



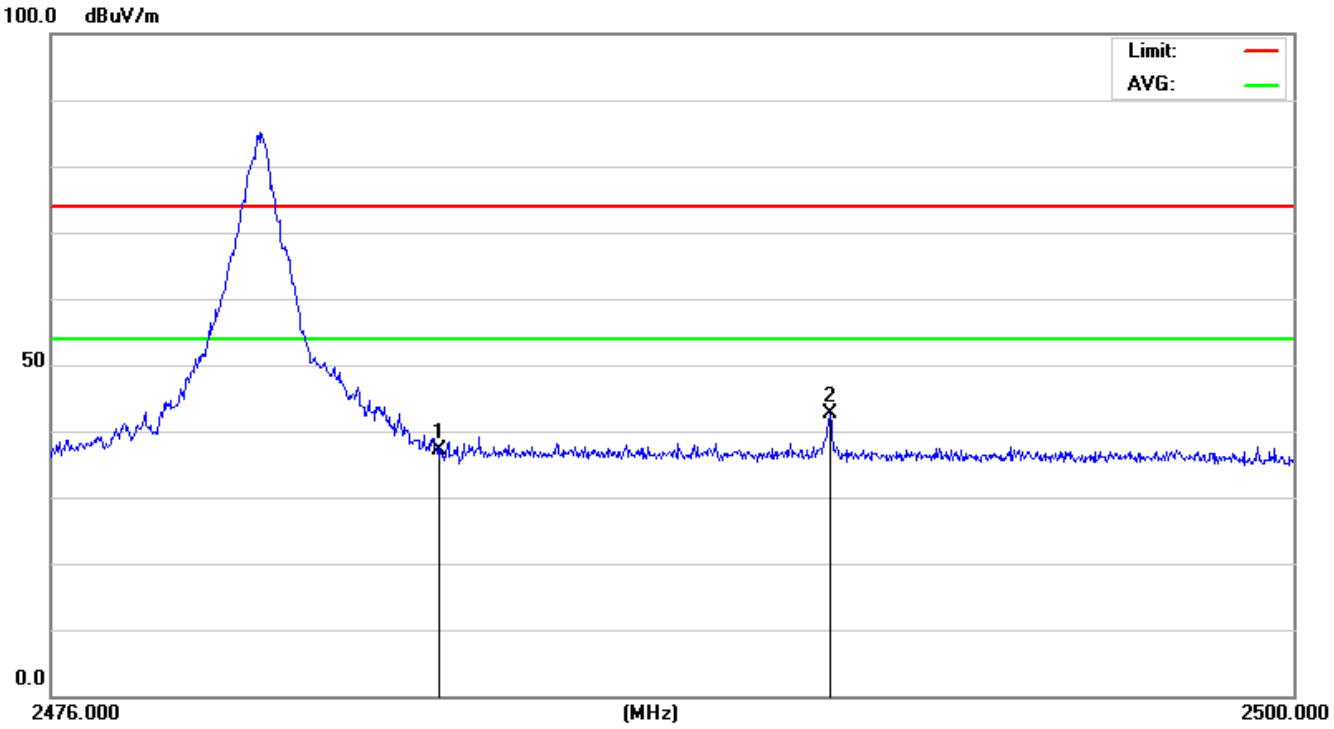
Vertical:



High Channel (2480MHz) Horizontal:



Vertical:



5.4. Bandwidth Test

5.4.1 Standard Applicable

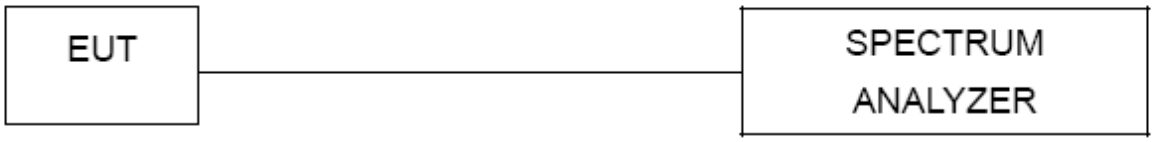
FCC Part15 (15.249) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.249	Bandwidth	(20dB bandwidth)	2402-2480	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100KHz
VB	≥ RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.4.2 Test Setup procedure

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW≥RBW, Sweep time = Auto.

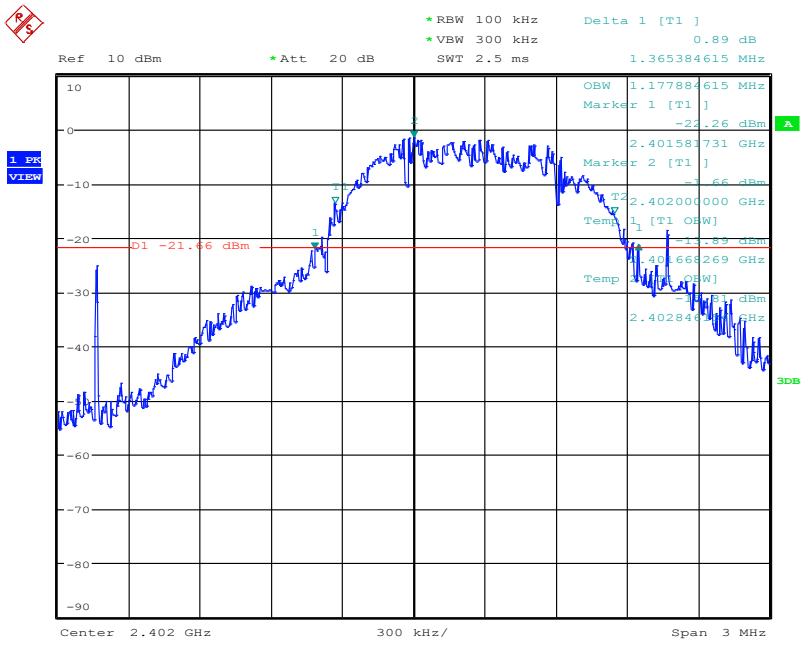
5.4.2 Block Diagram of Test Setup



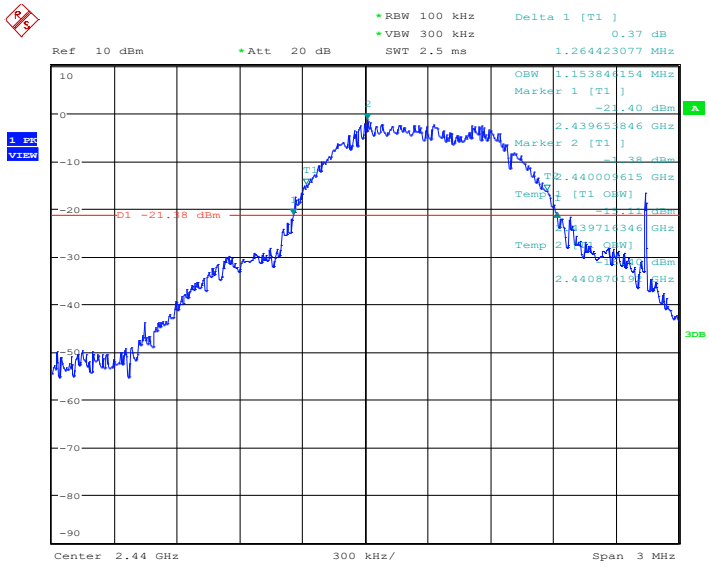
5.4.3 Test Results

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	1179	PASS
2440MHz	1154	PASS
2480 MHz	1149	PASS

Lowest channel-2402MHz



Middle channel-2440MHz



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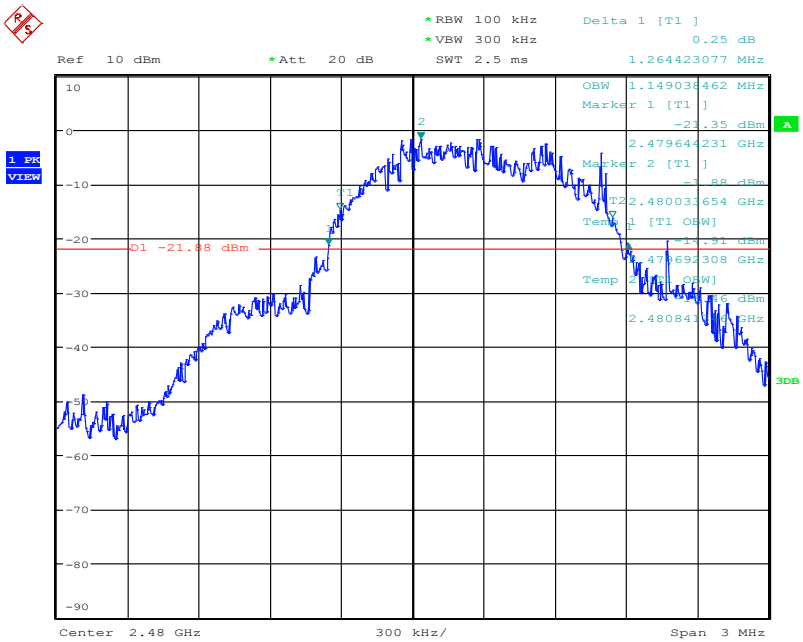
Lowest channel-2480MHz



Date: 10.NOV.2020 14:59:44

6. LIST OF MEASURING EQUIPMENTS

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	MXASignal Analyzer	Keysight	N9020A	MY52091623	2020/1/2	2021/1/1
2	Power Sensor	Agilent	U2021XA	MY5365004	2020/1/2	2021/1/1
3	Power Meter	Agilent	U2531A	TW53323507	2020/1/2	2021/1/1
4	Wideband Antenna	schwarzbeck	VULB 9163	958	2019/11/16	2022/11/15
5	Horn Antenna	schwarzbeck	9120D-1141	1574	2019/11/16	2022/11/15
6	EMI Test Receiver	R&S	ESCI	100849/003	2020/1/2	2021/1/1
7	Controller	MF	MF7802	N/A	N/A	N/A
8	Amplifier	schwarzbeck	BBV 9743	209	2020/1/2	2021/1/1
9	Amplifier	Tonscend	TSAMP-0518 SE	--	2020/1/2	2021/1/1
10	RF Cable(below 1GHz)	HUBER+SUHNE R	RG214	N/A	2020/1/2	2021/1/1
11	RF Cable(above 1GHz)	HUBER+SUHNE R	RG214	N/A	2020/1/2	2021/1/1
12	Artificial Mains	ROHDE & SCHWARZ	ENV 216	101333-IP	2020/1/2	2021/1/1
12	EMI Test Software	ROHDE & SCHWARZ	ESK1	V1.71	N/A	N/A
14	RE test software	Tonscend	JS32-RE	V2.0.2.0	N/A	N/A
15	Test Software	Tonscend	JS1120-3	V2.5.77.0418	N/A	N/A
16	Horn Antenna	A-INFO	LB-180400-K F	J211020657	2019/11/16	2022/11/15
17	Pre-amplifier	CDSI	PAP-1840	17021	2020/03/24	2021/03/23

7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

8. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

9. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

----------THE END OF REPORT----------