RF TEST REPORT

Product Name: Smart-hopping 1.4GHz USB AP

Model Name: RTX3300

FCC ID: T7HRTX3300

Issued For : RTX HONG KONG LTD

8TH FL CORPORATION SQUARE, 8 LAM LOK ST., KOWLOON BAY, HK.

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Chen Hsong Industrial Park, No.177 Renmin West Road, Jinsha Community, Kengzi Street, Pingshan New District, Shenzhen, China

Report Number:	LGT23B032RF01
Sample Received Date:	Feb. 16, 2023
Date of Tested:	Feb. 16, 2023 – Mar. 01, 2023
Date of Issue:	May. 16, 2023

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TEST REPORT CERTIFICATION

Applicant	RTX HONG KONG LTD
Address	8TH FL CORPORATION SQUARE, 8 LAM LOK ST., KOWLOON BAY, HK.
Manufacturer	RTX HONG KONG LTD
Address	8TH FL CORPORATION SQUARE, 8 LAM LOK ST., KOWLOON BAY, HK.
Product Name	Smart-hopping 1.4GHz USB AP
Trademark	PHILIPS
Model Name	RTX3300
Sample Status:	Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
47 CFR FCC Part 95H ANSI C63.26:2015	PASS

Prepared by:

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Vita Li
Technical Director

SHENZHEN LGT TEST SERVICE CO., LTD. LGT 领冠检测

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Revision History

Rev.	Issue Date	Revisions
00	May. 16, 2023	Initial Issue

1. SUMMARY OF TEST

47 CFR FCC Part 95H			
Range Of Measurements	Specification Reference	Judgment	Remark
Transmitter Fundamental Fieldstrength	Part 95.2369(b)	PASS	--
Occupied Bandwidth	Part 2.1049	PASS	--
Radiated Emission & field strength	Part 95.2369 & 95.2379	PASS	--
Frequency Stability	Part 95.2565	PASS	--

1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Chen Hsong Industrial Park, No.177 Renmin West Road, Jinsha Community, Kengzi Street, Pingshan New District, Shenzhen, China
Accreditation Certificate	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Parameter	Uncertainty
Occupied Channel Bandwidth	±3.2 %
RF Output Power, Conducted	±0.71dB
Power Spectral Density, Conducted	±1.57 dB
Unwanted Emission, Conducted	±0.63dB
Conducted emission	±2.80dB
All Emissions, Radiated (0.009-30MHz)	±2.16dB
All Emissions, Radiated (30MHz-1GHz)	±4.40dB
All Emissions, Radiated (1GHz-18GHz)	±5.49dB
Temperature	±0.5°C
Humidity	±2%
Duty Cycle	±2.3%

2. GENERAL INFORMATION

2.1 TECHNICAL SPECIFICATIONS AND REGULATIONS

2.1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Name	Smart-hopping 1.4GHz USB AP
Trademark	PHILIPS
Model Name	RTX3300
Series Model	N/A
Model Difference	N/A
Assigned frequency range	1395-1400 MHz 1427-1432 MHz
Antenna Type	F PCB
Antenna gain	ANT 1: 1 dBi ANT 2: 1 dBi
Power Input	USB DC 5V
Extreme Vol. Limits	DC 4.25V to DC 5.75V (Nominal 5V)
Operation temperature	0℃ to +55℃
Test extreme Temp. Tolerance	-30℃ to +50℃
Hardware version number	N/A
Software version number	N/A

Note:

1. The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.
2. Antenna 1 and Antenna 2 do not support simultaneous transmission.

2.1.2 Channel list

Mode	Channel Number	Part 95 1395-1400 1427-1432	Modulation type
SH 1.0 WMTS	1	1395.8977	GFSK
	2	1397.4970	
	3	1399.0963	
	4	1427.8979	
	5	1429.4972	
	6	1431.0965	
	7	1430.2410	
SH 2.0 WMTS	14	1396.636	DBPSK DQPSK D8PSK
	15	1398.364	
	16	1428.513	
	17	1430.241	

2.1.3 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for filing to comply with the 47 CFR Part 2, 95.

2.1.4 SPECIAL ACCESSORIES

The charger, antenna supplied by the applicant were used as accessories and being tested with eut intended for fcc grant together.

2.1.5 EUT CONFIGURATION

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

2.1.6 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.1.7 DESCRIPTION OF THE TEST MODES

SH 1.0 WMTS		SH 2.0 WMTS		/	
Channel	Frequency	Channel	Frequency	/	/
1	1395.8977	14	1396.636	/	/
4	1427.8979	16	1428.513	/	/
6	1431.0965	17	1430.241	/	/
/	/	/	/	/	/

Note: Only the worst modulation GFSK, DBPSK, D8PSK was tested and recorded in this report.

2.1.8 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test software Version	Test program: 1.4GHz	
CMD	SH 1.0 WMTS	Default
	SH 2.0 WMTS	Default

2.1.9 DESCRIPTION OF necessary accessories AND support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop	HUAWEI	HKF-16	N/A	N/A
USB extension cable	N/A	N/A	N/A	0.5m

Note:

(1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

(2) “YES” is means “with core”; “NO” is means “without core”.

2.1.11 MEASUREMENT INSTRUMENTS

RF Radiated Test equipment					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Until**
EMI Test Receiver	R&S	ESU8	100372	2022.04.12	2023.04.11
Active loop Antenna	R&S	HFH2-Z2	POS871398181	2022.06.02	2024.06.01
Spectrum Analyzer	Kesight	N9010B	MY60242508	2022.04.29	2023.04.28
Bilog Antenna	SCHAFFNER	CBL6112B	2705	2022.06.05	2024.06.04
Bilog Antenna	SCHAFFNER	VULB 9168	01447	2022.12.12	2023.12.11
Horn Antenna	Schwarzbeck	3115	10SL0060	2022.06.02	2024.06.01
Pre-amplifier(0.1 M-3GHz)	HP	8447D	2727A05655	2022.04.11	2023.04.10
Pre-amplifier(1-2 6.5G)	Agilent	8449B	3008A4722	2022.04.13	2023.04.12
RE Cable (9K-1G)	N.A	R01	N.A	2022.05.05	2023.05.04
RE Cable (1-26G)	N.A	R02	N.A	2022.05.05	2023.05.04
Wireless Communications Test Set	R&S	CMW 500	137737	2022.04.29	2023.04.28
Temperature & Humidity	KTJ	TA218B	N.A	2022.05.05	2023.05.04
Testing Software	EMC-I_V1.4.0.3_SKET				

RF Conducted Test equipment					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Until**
Signal Analyzer	Keysight	N9010B	MY60242508	2022.04.29	2023.04.28
Signal Analyzer	Keysight	N9020A	MY50530994	2022.12.09	2023.12.08
RF Automatic Test system	MW	MW200-RFCB	MW220322LG	2022.04.29	2023.04.28
MXG Vector Signal Generator	Keysight	N5182B	MY59100717	2022.06.02	2023.06.01
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2022.05.10	2023.05.09
Attenuator	eastsheep	90db	N.A	2022.04.29	2023.04.28
Router	TP-LINK(FCC ID:Q87-WRT3 200ACM)	TL-WR885N	1125074010735	N.C.R	N.C.R
Temperature & Humidity	KTJ	TA218B	N.A	2022.05.05	2023.05.04
Testing Software	MTS8310_V2.0.0.0_MW				

4. OCCUPIED BANDWIDTH

4.1 LIMIT

Reported only, no limit applied.

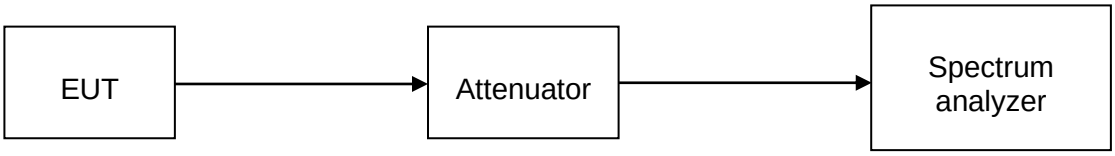
4.2 MEASUREMENT METHOD

1. The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

2. The 26 db emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 db below the maximum in-band spectral density of the modulated signal. spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

Configuration follows C63.26:2015 Section 5.4.

4.3 TEST SETUP



4.4 TEST PROCEDURES

1. The testing follows C63.26:2015 Section 5.4.

2. The EUT transmitter output port was connected to spectrum analyzer through an attenuator.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Set the test probe and measure the Occupied Bandwidth of the spectrum analyzer.

5. Measure and record the Occupied Bandwidth from the Spectrum Analyzer.

4.5 TEST RESULTS

For the measurement records, refer to the appendix I.

7. RADIATED SPURIOUS EMISSION AND FIELDSTRENGTH

7.1 LIMIT

RADIATED SPURIOUS EMISSION

Below 1GHz

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

Above 1GHz

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

Fundamental Fieldstrength

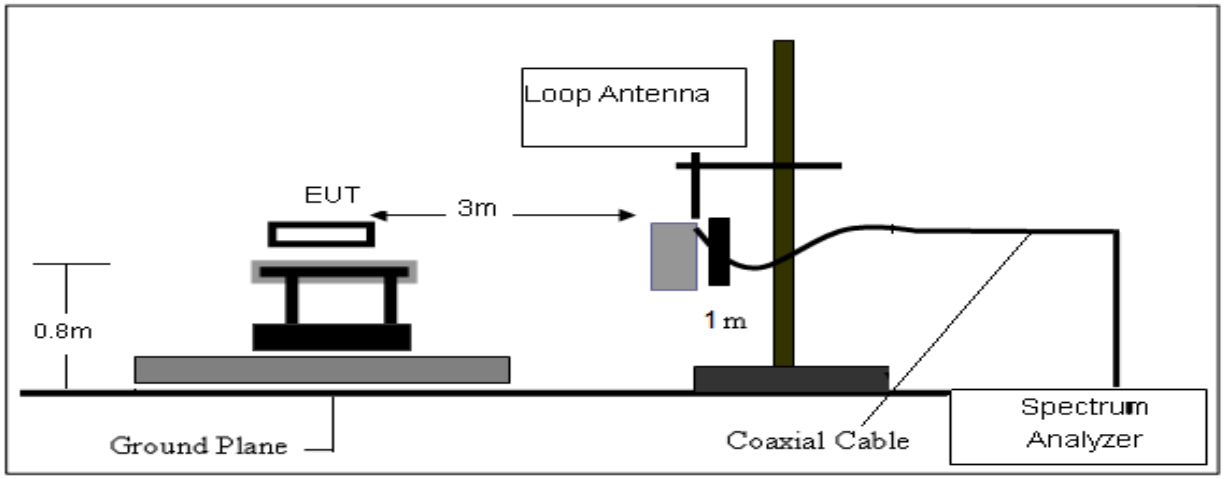
Frequency Band (MHz)	dBuv/m
1395.0 – 1400	117.4
1427.0 – 1432	117.4

Note: According to Part 95.369 the radiated field strenath limit is 740 mV/m (117.4 dBuV/m) at 3 metres. Toconvert from fieldstrength to an equivalent conducted power in dBm, subtract 95.2 dB. (117.4 -95.2 = 22.2). The figure of 95.2 dB is arrived at using the formula P = (V/m x d) /30.

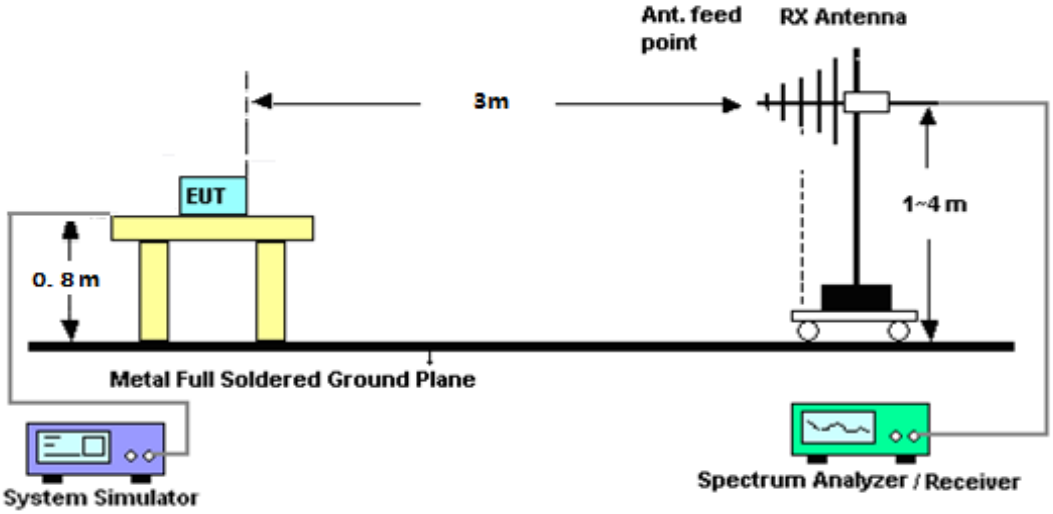
7.2 Test Setup

The procedure of radiated spurious emissions is as follows:

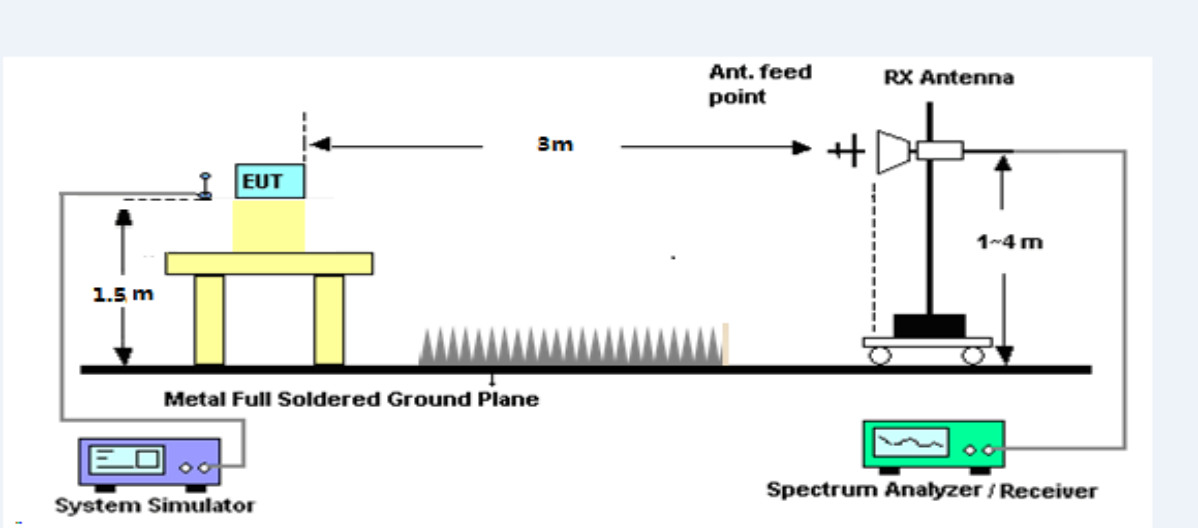
For radiated test from below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz



7.3 TEST PROCEDURES

a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization 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 QuasiPeak detector mode will be re-measured.
e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

7.4 TEST RESULTS

For the measurement records, refer to the appendix I.

Note:
1. 9KHz-30MHz amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Test is divided into three directions, X/Y/Z. X pattern is the worst.
3. Pre-test with remote antenna and without remote antenna modes, find the worst case is with remote antenna mode and recorded in this report.

8. FREQUENCY STABILITY

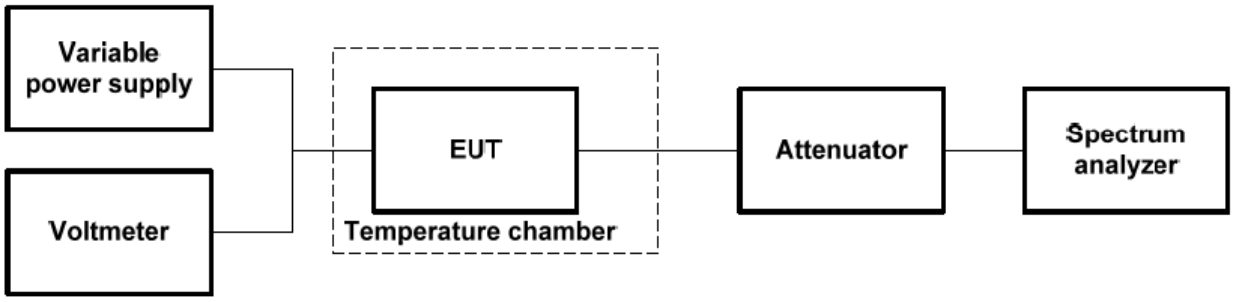
8.1 LIMIT

Assigned frequency: 1395 – 1400 MHz; 1427 – 1432 MHz
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

8.2 MEASUREMENT METHOD

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency band.
Configuration follows C63.26:2015 Section 5.6.

8.3 TEST SETUP



8.4 TEST PROCEDURES FOR TEMPERATURE VARIATION

1. The EUT was set up in the thermal chamber and connected to spectrum analyzer through an attenuator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

8.5 TEST PROCEDURES FOR VOLTAGE VARIATION

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simlator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

8.6 TEST RESULTS

For the measurement records, refer to the appendix I.

APPENDIX I - TEST RESULTS

OCCUPIED BANDWIDTH

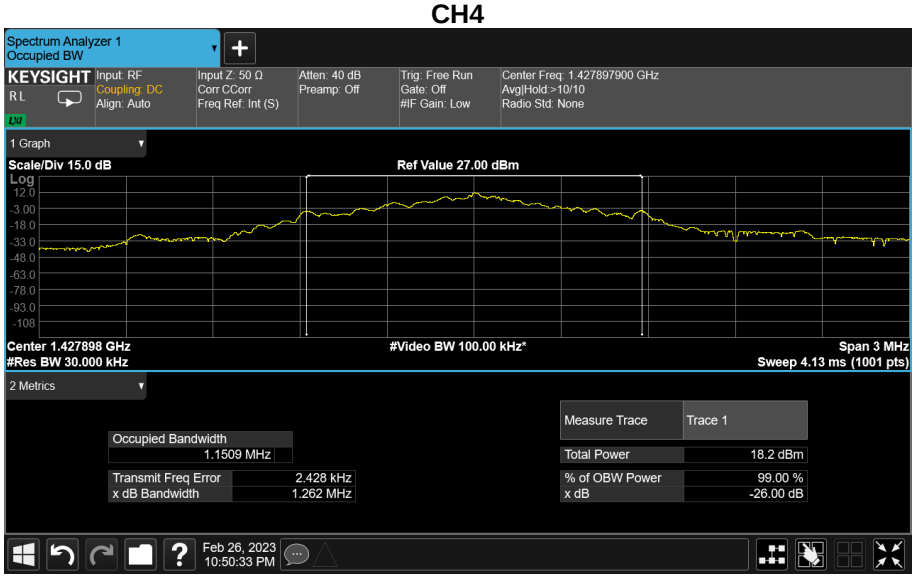
SH 1.0 WMTS

Test Frequency (MHz)	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
1395.898	1.1495	1.267
1427.898	1.1509	1.262
1431.097	1.1517	1.315

CH1

Spectrum Analyzer 1
Occupied BW
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
Atten: 40 dB
Preamp: Off
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 1.395897700 GHz
Avg|Hold:>10/10
Radio Std: None
1 Graph
Scale/Div 15.0 dB
Ref Value 27.00 dBm
Center 1.395898 GHz
#Res BW 30.000 kHz
#Video BW 100.00 kHz*
Span 3 MHz
Sweep 4.13 ms (1001 pts)
2 Metrics
Occupied Bandwidth
1.1495 MHz
Transmit Freq Error 1.423 kHz
x dB Bandwidth 1.267 MHz
Measure Trace Trace 1
Total Power 18.6 dBm
% of OBW Power 99.00 %
x dB -26.00 dB
Feb 26, 2023
10:49:48 PM

CH4


Spectrum Analyzer 1
Occupied BW
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
Atten: 40 dB
Preamp: Off
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 1.427897900 GHz
Avg|Hold:>10/10
Radio Std: None
1 Graph
Scale/Div 15.0 dB
Ref Value 27.00 dBm
Center 1.427898 GHz
#Res BW 30.000 kHz
#Video BW 100.00 kHz*
Span 3 MHz
Sweep 4.13 ms (1001 pts)
2 Metrics
Occupied Bandwidth
1.1509 MHz
Transmit Freq Error 2.428 kHz
x dB Bandwidth 1.262 MHz
Measure Trace Trace 1
Total Power 18.2 dBm
% of OBW Power 99.00 %
x dB -26.00 dB
Feb 26, 2023
10:50:33 PM

CH6

Spectrum Analyzer 1
Occupied BW
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
Atten: 40 dB
Preamp: Off
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 1.431096500 GHz
Avg|Hold:>10/10
Radio Std: None
1 Graph
Scale/Div 15.0 dB
Ref Value 27.00 dBm
Center 1.431097 GHz
#Res BW 30.000 kHz
#Video BW 100.00 kHz*
Span 3 MHz
Sweep 4.13 ms (1001 pts)
2 Metrics
Occupied Bandwidth
1.1517 MHz
Transmit Freq Error 506 Hz
x dB Bandwidth 1.315 MHz
Measure Trace Trace 1
Total Power 18.0 dBm
% of OBW Power 99.00 %
x dB -26.00 dB
Feb 26, 2023
10:51:17 PM

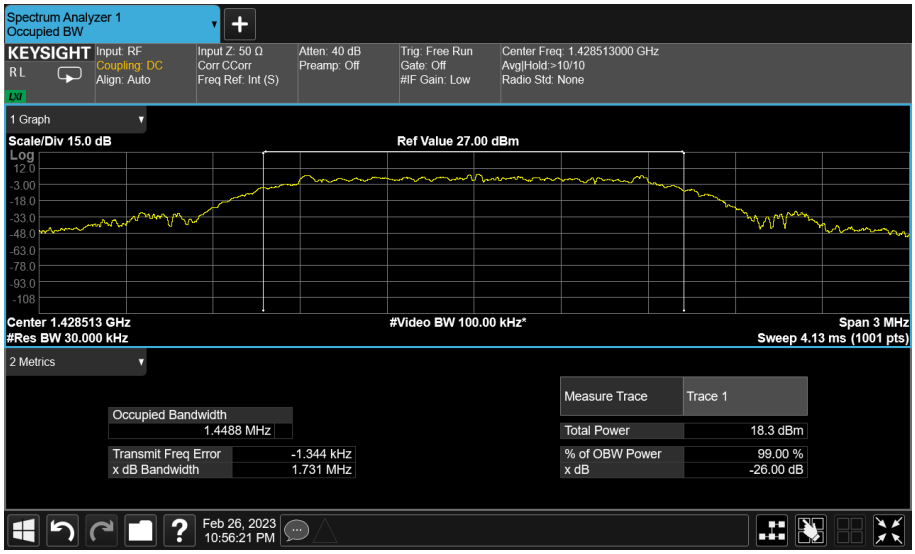
SH 2.0 WMTS

Modulation Type	Test Frequency (MHz)	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
DBPSK	1396.636	1.4369	1.691
	1428.513	1.4488	1.731
	1430.241	1.4386	1.697
D8PSK	1396.636	1.4211	1.690
	1428.513	1.4175	1.695
	1430.241	1.4216	1.692

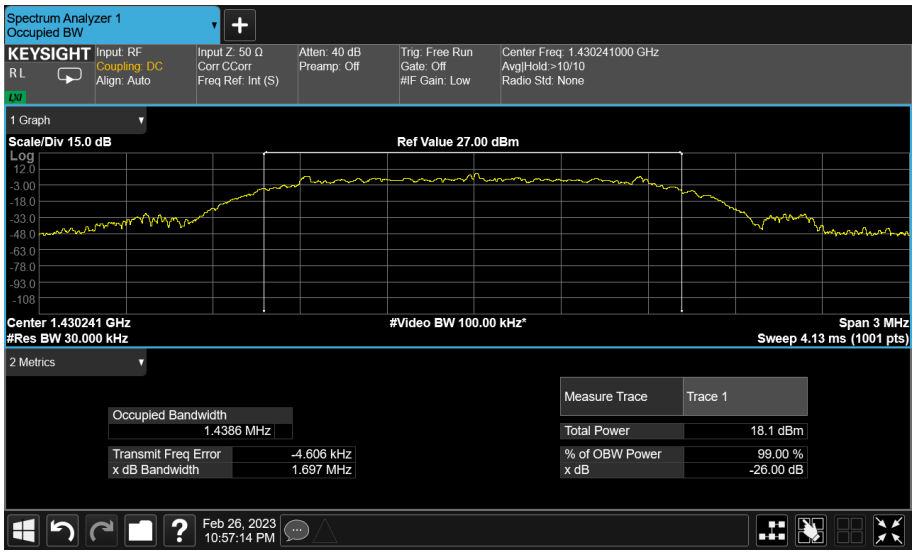
DBPSK

CH14

CH16

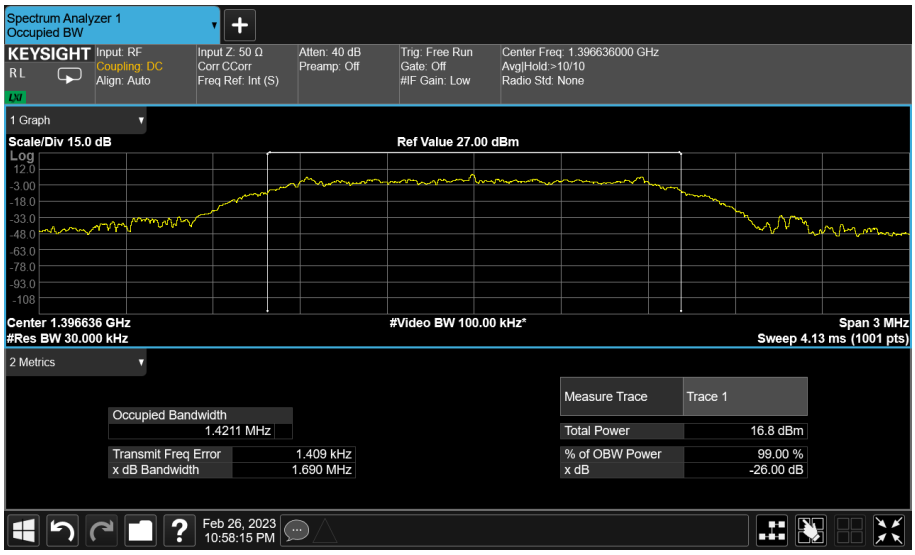


CH17

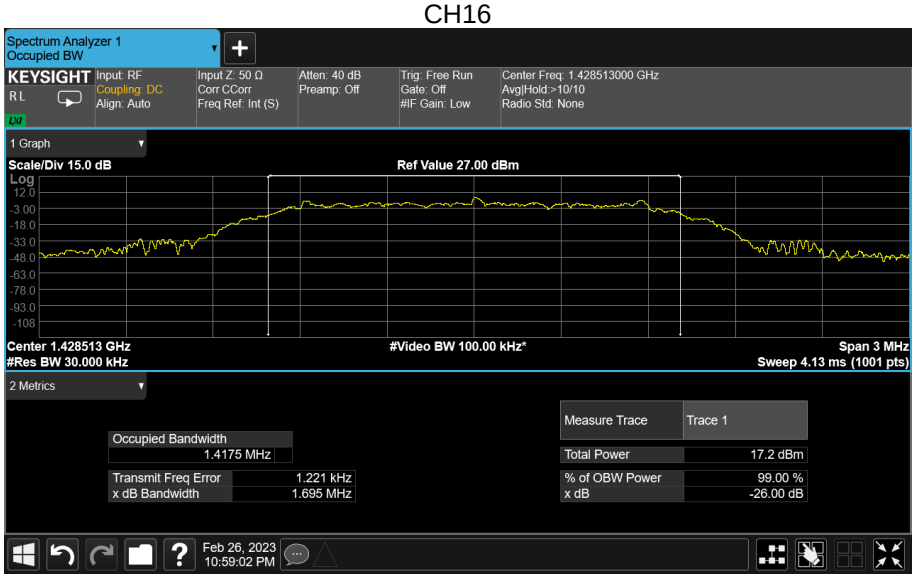


D8PSK

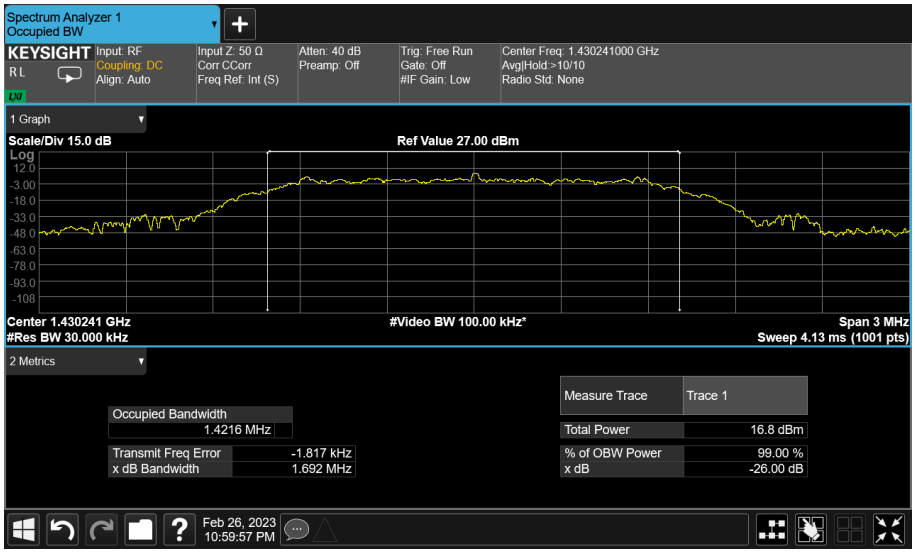
CH14



CH16



CH17



RADIATED SPURIOUS EMISSION AND FIELDSTRENGTH

Fundamental Field strength

SH 1.0 WMTS

No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
CH1	1395.8977MHz	84.00	29.97	113.97	117.40	-3.43	AV	Hor
CH1	1395.8977MHz	77.48	29.97	107.45	117.40	-9.95	AV	Ver
CH4	1427.8979MHz	79.60	30.04	109.64	117.40	-7.76	AV	Hor
CH4	1427.8979MHz	71.62	30.04	101.66	117.40	-15.74	AV	Ver
CH6	1431.0965MHz	79.82	30.05	109.87	117.40	-7.53	AV	Hor
CH6	1431.0965MHz	71.71	30.05	101.76	117.40	-15.64	AV	Ver

SH 2.0 WMTS

D8PSK

No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
CH14	1396.636MHz	79.51	29.97	109.48	117.40	-7.92	AV	Hor
CH14	1396.636MHz	70.81	29.97	100.78	117.40	-16.62	AV	Ver
CH16	1428.513MHz	78.90	30.04	108.94	117.40	-8.46	AV	Hor
CH16	1428.513MHz	70.46	30.04	100.50	117.40	-16.90	AV	Ver
CH17	1430.241MHz	78.50	30.05	108.55	117.40	-8.85	AV	Hor
CH17	1430.241MHz	70.84	30.05	100.89	117.40	-16.51	AV	Ver

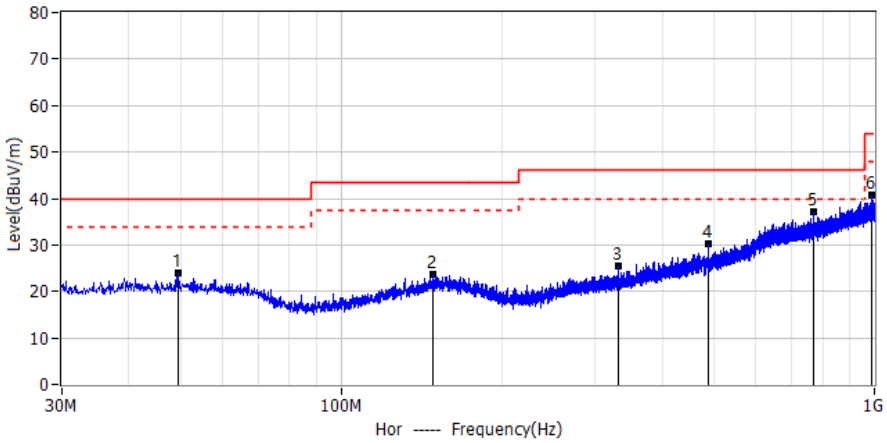
DBPSK

No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
CH14	1396.636MHz	80.82	29.97	110.79	117.40	-6.61	AV	Hor
CH14	1396.636MHz	72.01	29.97	101.98	117.40	-15.42	AV	Ver
CH16	1428.513MHz	79.80	30.04	109.84	117.40	-7.56	AV	Hor
CH16	1428.513MHz	71.74	30.04	101.78	117.40	-15.62	AV	Ver
CH17	1428.513MHz	79.75	30.05	109.80	117.40	-7.60	AV	Hor
CH17	1428.513MHz	71.54	30.05	101.59	117.40	-15.81	AV	Ver

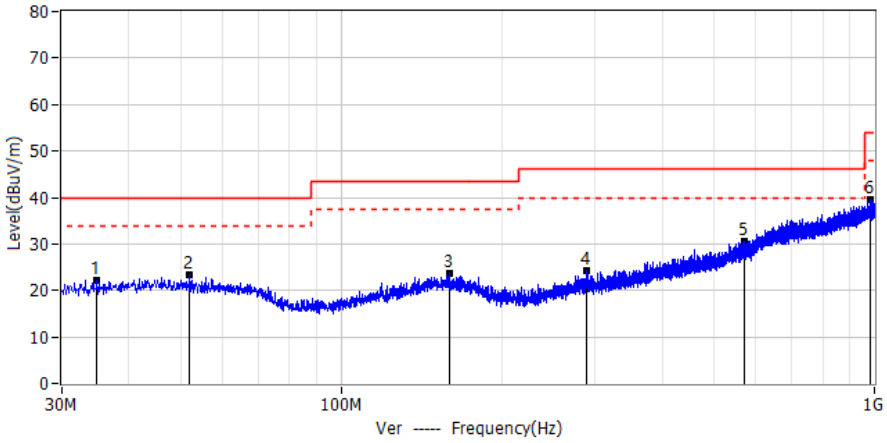
Radiated Spurious Emission

Below 1GHz

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 23.5℃
M/N: RTX3300	Humidity: 59%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 1.0 WMTS_GFSK_CH1_1395.8977	
Note: worst case	



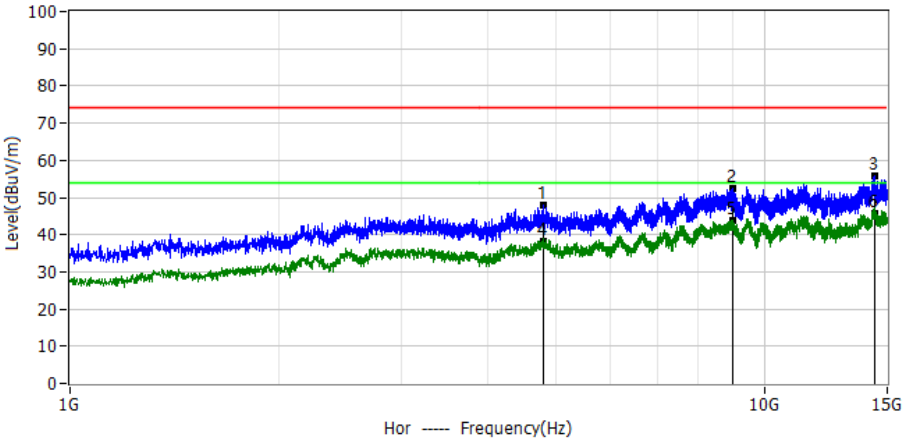
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	49.521MHz	4.74	19.35	24.09	40.00	-15.91	PK	Hor
2*	148.583MHz	3.71	19.86	23.57	43.50	-19.93	PK	Hor
3*	331.791MHz	4.66	20.83	25.49	46.00	-20.51	PK	Hor
4*	487.598MHz	5.51	24.66	30.17	46.00	-15.83	PK	Hor
5*	767.321MHz	6.51	30.75	37.26	46.00	-8.74	PK	Hor
6*	987.511MHz	6.33	34.51	40.84	54.00	-13.16	PK	Hor



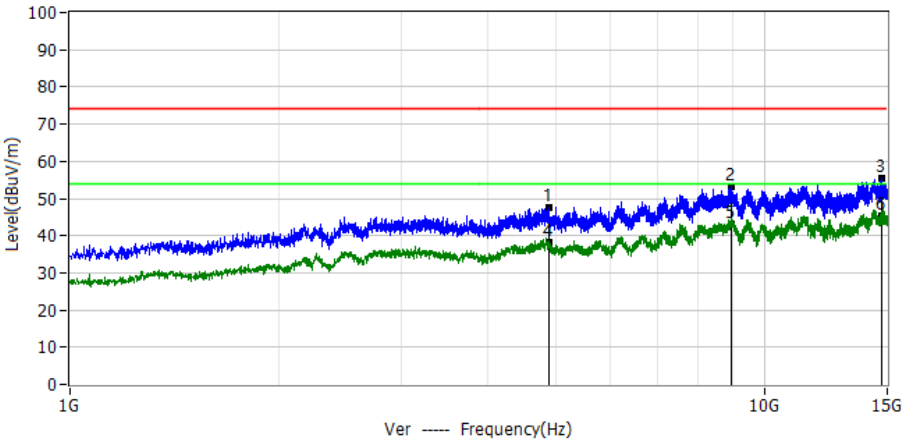
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	34.850MHz	3.60	18.53	22.13	40.00	-17.87	PK	Ver
2*	52.068MHz	4.20	19.21	23.41	40.00	-16.59	PK	Ver
3*	159.374MHz	3.92	19.85	23.77	43.50	-19.73	PK	Ver
4*	289.475MHz	4.44	19.71	24.15	46.00	-21.85	PK	Ver
5*	570.533MHz	3.83	26.65	30.48	46.00	-15.52	PK	Ver
6*	983.268MHz	5.10	34.49	39.59	54.00	-14.41	PK	Ver

Above 1GHz

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 1.0 WMTS_GFSK_CH1_1395.8977	
Note:	

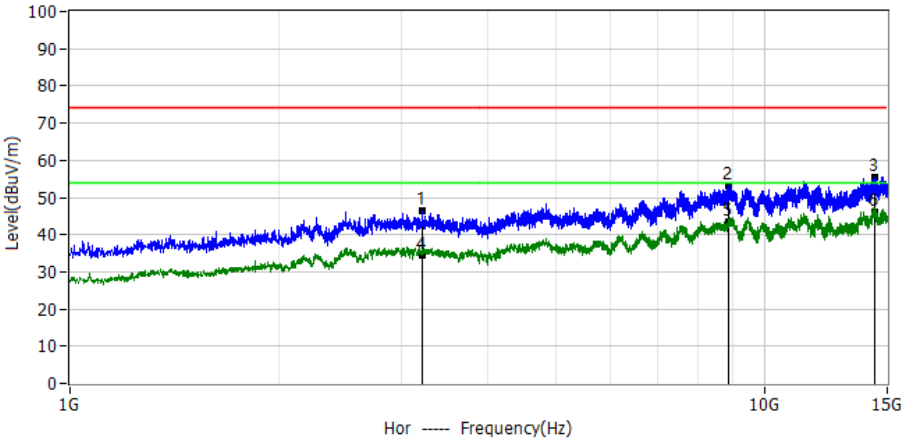


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.789GHz	54.07	-5.98	48.09	74.00	-25.91	PK	Hor
2*	8.982GHz	53.63	-1.22	52.41	74.00	-21.59	PK	Hor
3*	14.403GHz	49.81	5.91	55.72	74.00	-18.28	PK	Hor
4*	4.789GHz	44.18	-5.98	38.20	54.00	-15.80	AV	Hor
5*	8.982GHz	44.92	-1.22	43.70	54.00	-10.30	AV	Hor
6*	14.403GHz	39.89	5.91	45.80	54.00	-8.20	AV	Hor

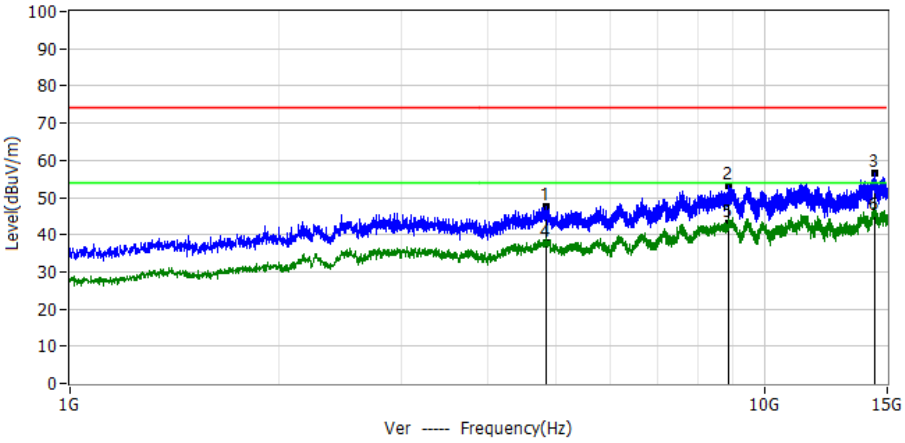


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.883GHz	53.80	-6.05	47.75	74.00	-26.25	PK	Ver
2*	8.936GHz	54.41	-1.35	53.06	74.00	-20.94	PK	Ver
3*	14.715GHz	49.34	5.93	55.27	74.00	-18.73	PK	Ver
4*	4.883GHz	44.25	-6.05	38.20	54.00	-15.80	AV	Ver
5*	8.936GHz	44.35	-1.35	43.00	54.00	-11.00	AV	Ver
6*	14.715GHz	39.47	5.93	45.40	54.00	-8.60	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 1.0 WMTS_GFSK_CH4_1427.8979	
Note:	

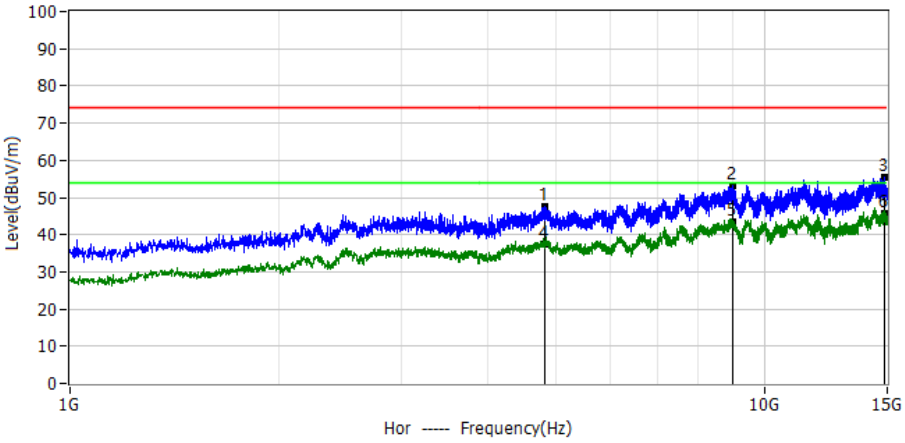


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	3.212GHz	54.84	-8.41	46.43	74.00	-27.57	PK	Hor
2*	8.880GHz	54.77	-1.51	53.26	74.00	-20.74	PK	Hor
3*	14.412GHz	49.68	5.91	55.59	74.00	-18.41	PK	Hor
4*	3.212GHz	43.01	-8.41	34.60	54.00	-19.40	AV	Hor
5*	8.880GHz	45.01	-1.51	43.50	54.00	-10.50	AV	Hor
6*	14.412GHz	40.09	5.91	46.00	54.00	-8.00	AV	Hor

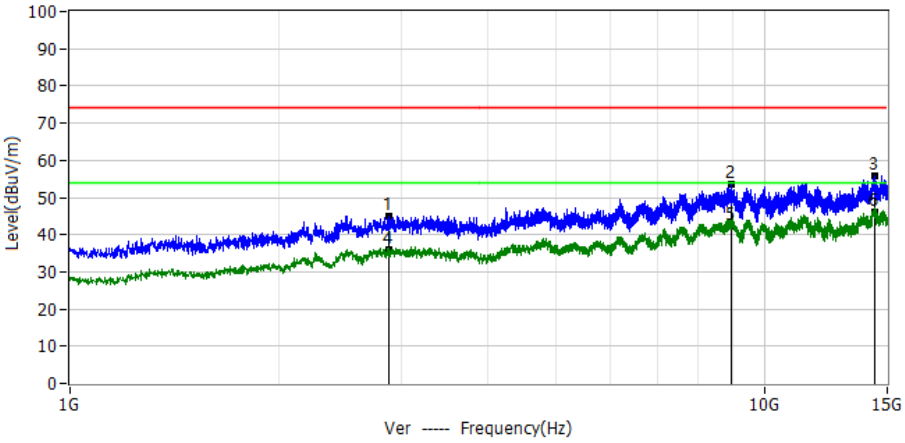


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.836GHz	53.49	-6.01	47.48	74.00	-26.52	PK	Ver
2*	8.872GHz	54.58	-1.53	53.05	74.00	-20.95	PK	Ver
3*	14.405GHz	50.53	5.91	56.44	74.00	-17.56	PK	Ver
4*	4.836GHz	43.71	-6.01	37.70	54.00	-16.30	AV	Ver
5*	8.872GHz	44.43	-1.53	42.90	54.00	-11.10	AV	Ver
6*	14.405GHz	39.09	5.91	45.00	54.00	-9.00	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 1.0 WMTS_GFSK_CH6_1431.0965	
Note:	

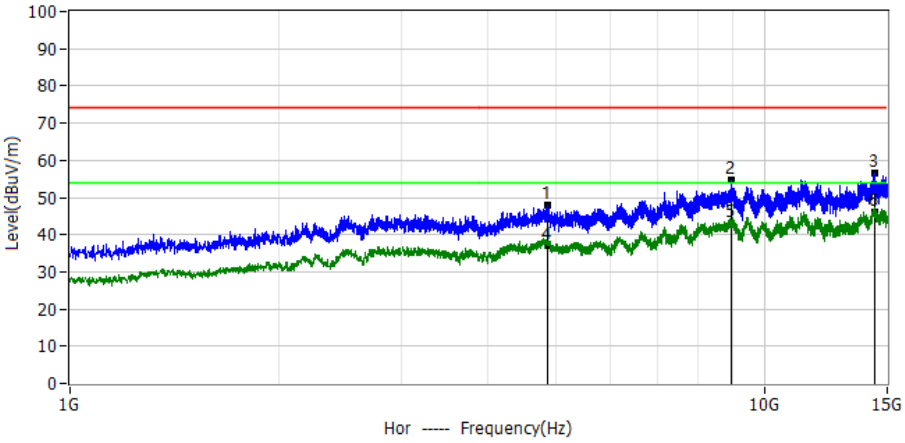


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.815GHz	53.38	-6.00	47.38	74.00	-26.62	PK	Hor
2*	8.996GHz	54.51	-1.18	53.33	74.00	-20.67	PK	Hor
3*	14.839GHz	49.62	5.95	55.57	74.00	-18.43	PK	Hor
4*	4.815GHz	43.60	-6.00	37.60	54.00	-16.40	AV	Hor
5*	8.996GHz	44.78	-1.18	43.60	54.00	-10.40	AV	Hor
6*	14.839GHz	39.85	5.95	45.80	54.00	-8.20	AV	Hor

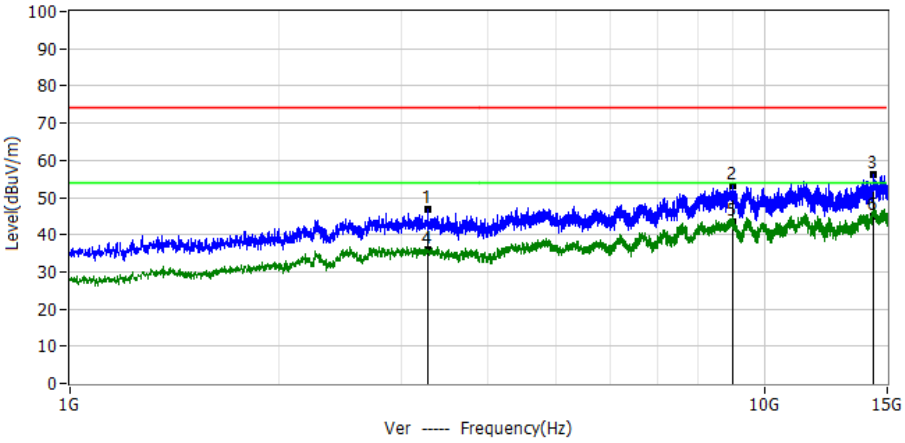


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2.871GHz	54.09	-9.02	45.07	74.00	-28.93	PK	Ver
2*	8.959GHz	54.78	-1.29	53.49	74.00	-20.51	PK	Ver
3*	14.416GHz	49.98	5.91	55.89	74.00	-18.11	PK	Ver
4*	2.871GHz	45.02	-9.02	36.00	54.00	-18.00	AV	Ver
5*	8.959GHz	43.49	-1.29	42.20	54.00	-11.80	AV	Ver
6*	14.416GHz	40.29	5.91	46.20	54.00	-7.80	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 2.0 WMTS_DBPSK_CH14_1396.636	
Note:	

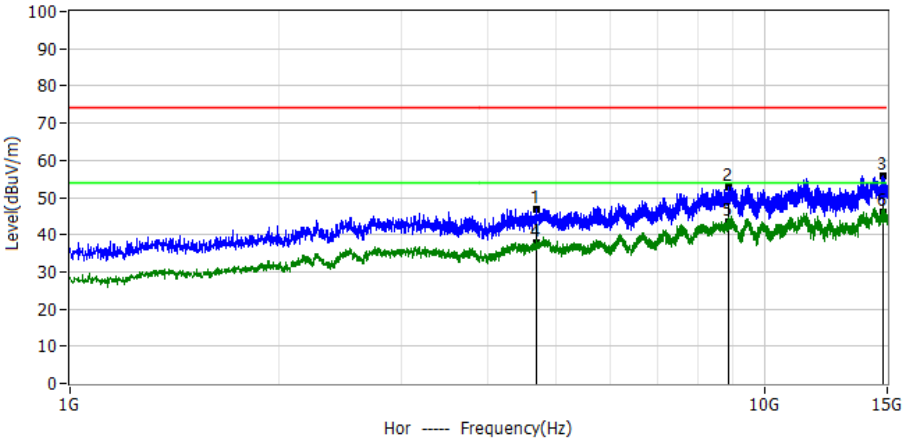


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.866GHz	54.08	-6.04	48.04	74.00	-25.96	PK	Hor
2*	8.956GHz	55.90	-1.30	54.60	74.00	-19.40	PK	Hor
3*	14.407GHz	50.57	5.91	56.48	74.00	-17.52	PK	Hor
4*	4.866GHz	43.24	-6.04	37.20	54.00	-16.80	AV	Hor
5*	8.956GHz	44.20	-1.30	42.90	54.00	-11.10	AV	Hor
6*	14.407GHz	39.99	5.91	45.90	54.00	-8.10	AV	Hor

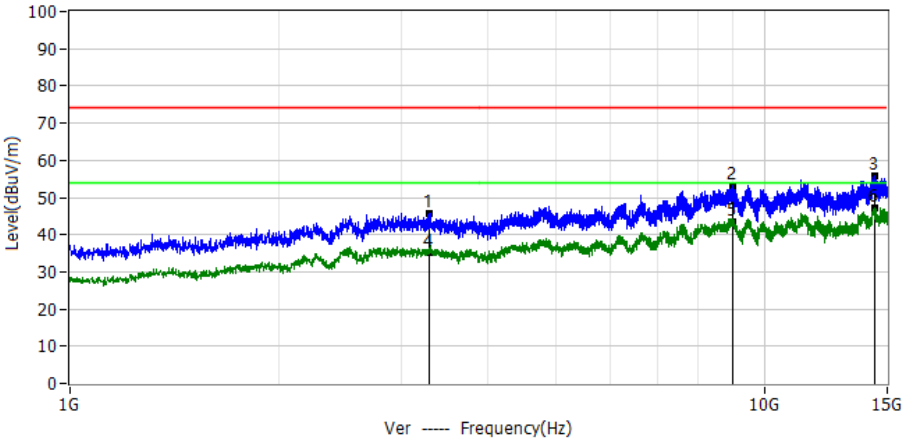


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	3.279GHz	55.20	-8.43	46.77	74.00	-27.23	PK	Ver
2*	8.985GHz	54.42	-1.21	53.21	74.00	-20.79	PK	Ver
3*	14.307GHz	50.32	5.90	56.22	74.00	-17.78	PK	Ver
4*	3.279GHz	44.23	-8.43	35.80	54.00	-18.20	AV	Ver
5*	8.985GHz	44.51	-1.21	43.30	54.00	-10.70	AV	Ver
6*	14.307GHz	39.20	5.90	45.10	54.00	-8.90	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 2.0 WMTS_DBPSK_CH16_1428.513	
Note:	

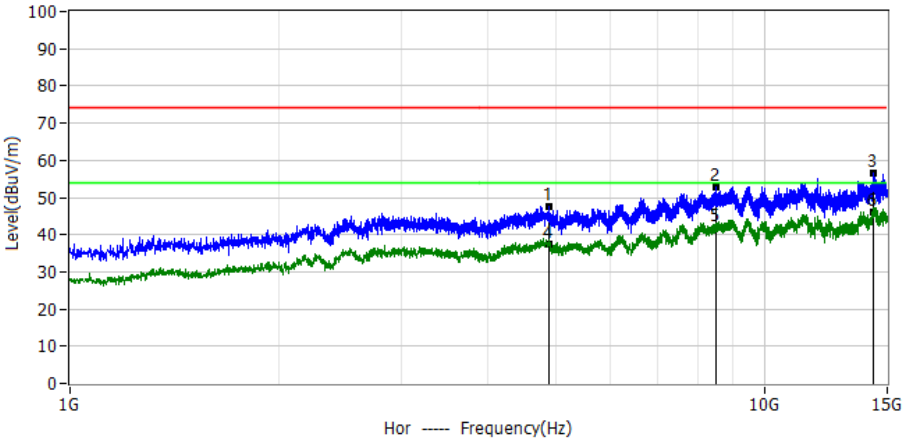


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.698GHz	52.91	-5.91	47.00	74.00	-27.00	PK	Hor
2*	8.870GHz	54.27	-1.54	52.73	74.00	-21.27	PK	Hor
3*	14.773GHz	49.73	5.94	55.67	74.00	-18.33	PK	Hor
4*	4.698GHz	43.71	-5.91	37.80	54.00	-16.20	AV	Hor
5*	8.870GHz	44.84	-1.54	43.30	54.00	-10.70	AV	Hor
6*	14.773GHz	40.16	5.94	46.10	54.00	-7.90	AV	Hor

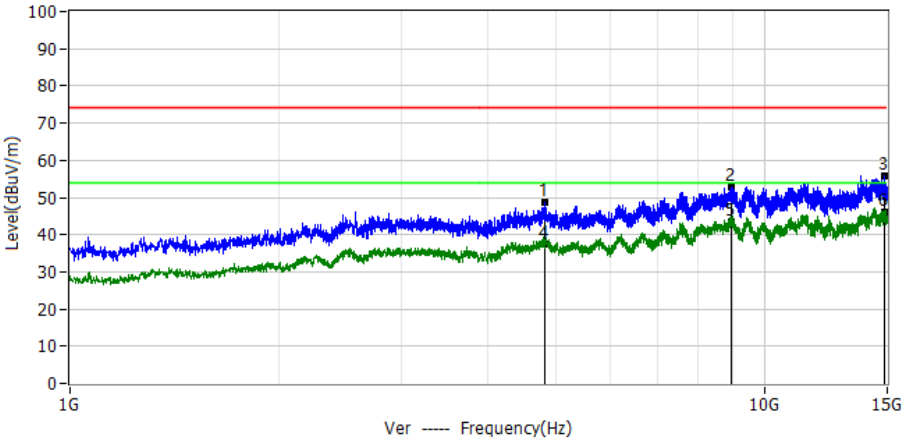


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	3.286GHz	54.13	-8.43	45.70	74.00	-28.30	PK	Ver
2*	9.003GHz	54.45	-1.17	53.28	74.00	-20.72	PK	Ver
3*	14.414GHz	50.01	5.91	55.92	74.00	-18.08	PK	Ver
4*	3.286GHz	43.53	-8.43	35.10	54.00	-18.90	AV	Ver
5*	9.003GHz	44.67	-1.17	43.50	54.00	-10.50	AV	Ver
6*	14.414GHz	41.29	5.91	47.20	54.00	-6.80	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 2.0 WMTS_DBPSK_CH17_1430.241	
Note:	

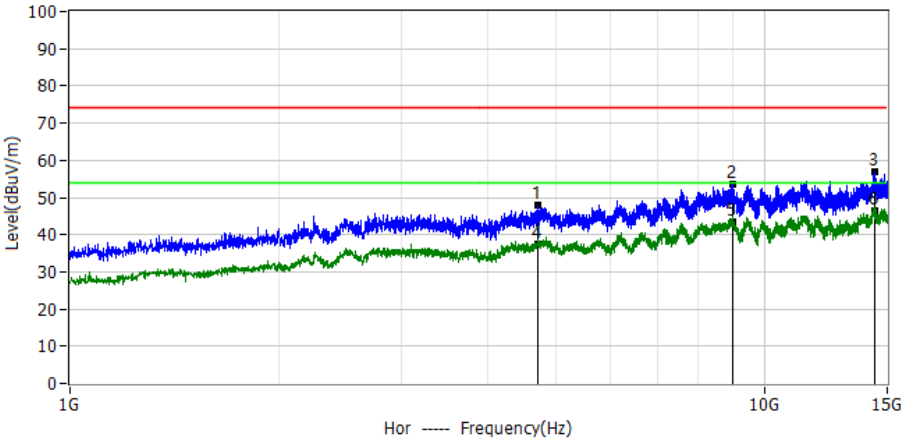


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.894GHz	53.58	-6.06	47.52	74.00	-26.48	PK	Hor
2*	8.499GHz	55.47	-2.59	52.88	74.00	-21.12	PK	Hor
3*	14.316GHz	50.62	5.90	56.52	74.00	-17.48	PK	Hor
4*	4.894GHz	43.56	-6.06	37.50	54.00	-16.50	AV	Hor
5*	8.499GHz	44.59	-2.59	42.00	54.00	-12.00	AV	Hor
6*	14.316GHz	40.20	5.90	46.10	54.00	-7.90	AV	Hor

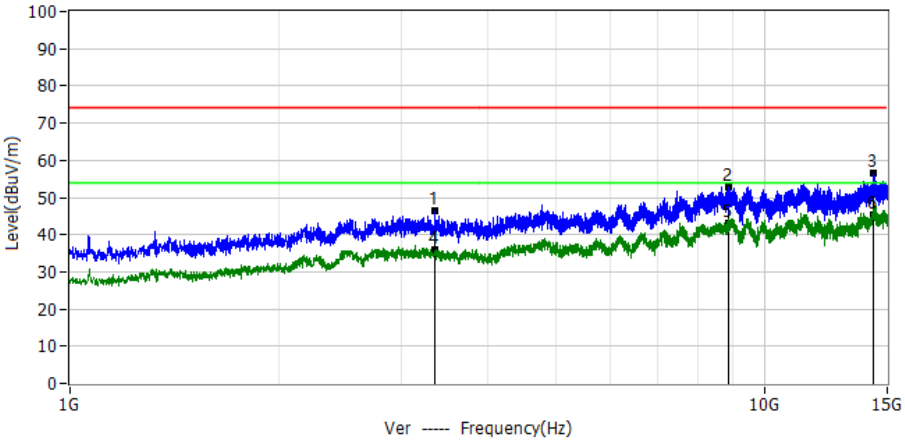


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.824GHz	54.72	-6.00	48.72	74.00	-25.28	PK	Ver
2*	8.949GHz	54.26	-1.32	52.94	74.00	-21.06	PK	Ver
3*	14.836GHz	49.85	5.95	55.80	74.00	-18.20	PK	Ver
4*	4.824GHz	43.40	-6.00	37.40	54.00	-16.60	AV	Ver
5*	8.949GHz	44.62	-1.32	43.30	54.00	-10.70	AV	Ver
6*	14.836GHz	40.25	5.95	46.20	54.00	-7.80	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 2.0 WMTS_D8PSK_CH14_1396.636	
Note:	

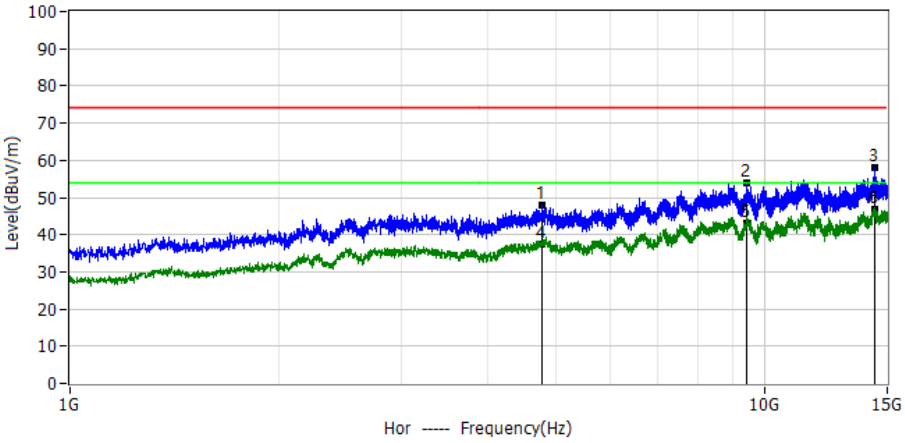


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.707GHz	53.67	-5.91	47.76	74.00	-26.24	PK	Hor
2*	8.998GHz	54.80	-1.18	53.62	74.00	-20.38	PK	Hor
3*	14.409GHz	50.86	5.91	56.77	74.00	-17.23	PK	Hor
4*	4.707GHz	43.51	-5.91	37.60	54.00	-16.40	AV	Hor
5*	8.998GHz	44.58	-1.18	43.40	54.00	-10.60	AV	Hor
6*	14.409GHz	40.69	5.91	46.60	54.00	-7.40	AV	Hor

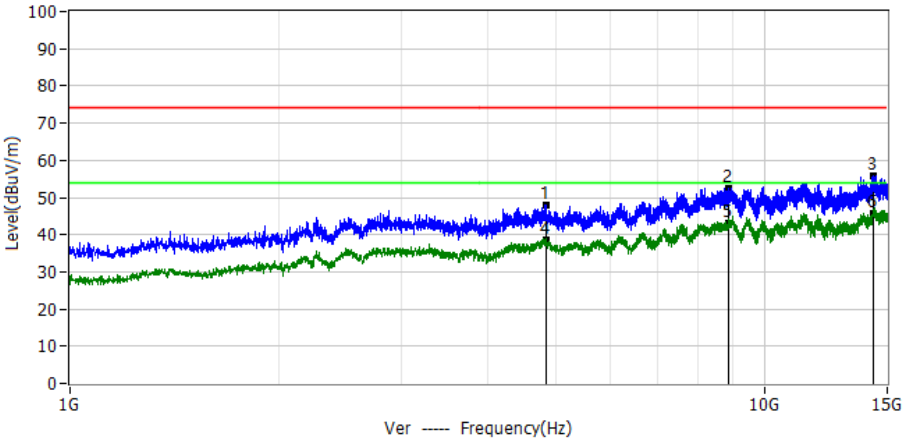


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	3.356GHz	54.93	-8.46	46.47	74.00	-27.53	PK	Ver
2*	8.882GHz	54.35	-1.50	52.85	74.00	-21.15	PK	Ver
3*	14.295GHz	50.57	5.90	56.47	74.00	-17.53	PK	Ver
4*	3.356GHz	44.26	-8.46	35.80	54.00	-18.20	AV	Ver
5*	8.882GHz	44.60	-1.50	43.10	54.00	-10.90	AV	Ver
6*	14.295GHz	39.60	5.90	45.50	54.00	-8.50	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 2.0 WMTS_D8PSK_CH16_1428.513	
Note:	

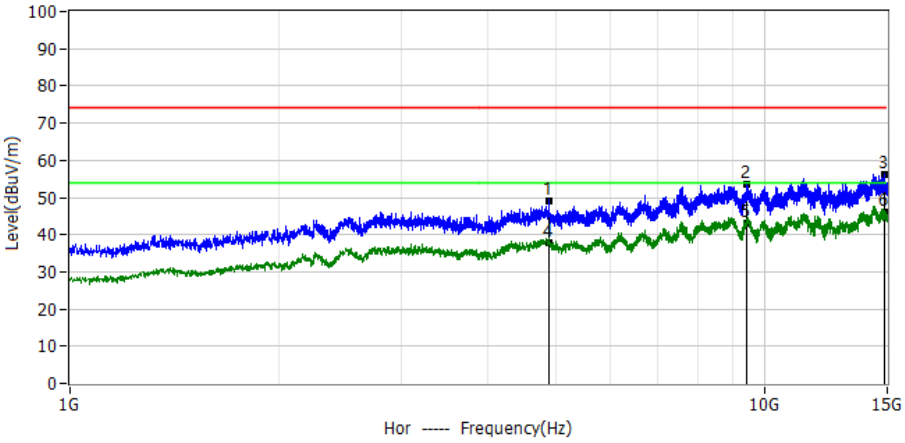


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.768GHz	53.97	-5.96	48.01	74.00	-25.99	PK	Hor
2*	9.412GHz	54.93	-1.17	53.76	74.00	-20.24	PK	Hor
3*	14.405GHz	52.01	5.91	57.92	74.00	-16.08	PK	Hor
4*	4.768GHz	43.26	-5.96	37.30	54.00	-16.70	AV	Hor
5*	9.412GHz	44.37	-1.17	43.20	54.00	-10.80	AV	Hor
6*	14.405GHz	40.89	5.91	46.80	54.00	-7.20	AV	Hor

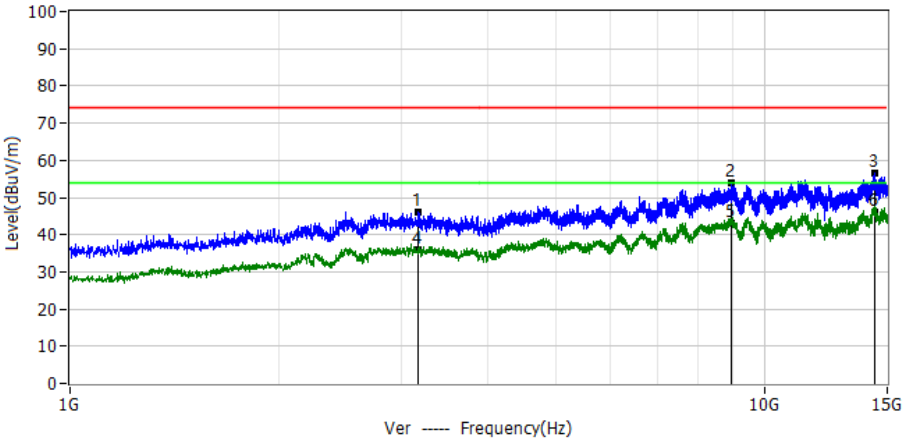


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.843GHz	53.81	-6.02	47.79	74.00	-26.21	PK	Ver
2*	8.877GHz	53.91	-1.52	52.39	74.00	-21.61	PK	Ver
3*	14.312GHz	50.09	5.90	55.99	74.00	-18.01	PK	Ver
4*	4.843GHz	44.62	-6.02	38.60	54.00	-15.40	AV	Ver
5*	8.877GHz	44.72	-1.52	43.20	54.00	-10.80	AV	Ver
6*	14.312GHz	39.70	5.90	45.60	54.00	-8.40	AV	Ver

Project: LGT23B032	Test Engineer: Dylan.shi
EUT: Smart-hopping 1.4GHz USB AP	Temperature: 27.1℃
M/N: RTX3300	Humidity: 52%RH
Test Voltage: USB 5V	Test Data: 2023-02-19
Test Mode: SH 2.0 WMTS_D8PSK_CH17_1430.241	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.892GHz	55.31	-6.06	49.25	74.00	-24.75	PK	Hor
2*	9.407GHz	54.76	-1.17	53.59	74.00	-20.41	PK	Hor
3*	14.836GHz	50.38	5.95	56.33	74.00	-17.67	PK	Hor
4*	4.892GHz	44.06	-6.06	38.00	54.00	-16.00	AV	Hor
5*	9.407GHz	44.27	-1.17	43.10	54.00	-10.90	AV	Hor
6*	14.836GHz	40.15	5.95	46.10	54.00	-7.90	AV	Hor



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	3.175GHz	54.44	-8.40	46.04	74.00	-27.96	PK	Ver
2*	8.957GHz	55.36	-1.29	54.07	74.00	-19.93	PK	Ver
3*	14.395GHz	50.74	5.91	56.65	74.00	-17.35	PK	Ver
4*	3.175GHz	44.20	-8.40	35.80	54.00	-18.20	AV	Ver
5*	8.957GHz	44.19	-1.29	42.90	54.00	-11.10	AV	Ver
6*	14.395GHz	39.99	5.91	45.90	54.00	-8.10	AV	Ver

FREQUENCY STABILITY

SH 1.0 WMTS_GFSK

CH1

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1395.8977	50	Normal Voltage	1395.3230	1396.4741	1395.89854	839	0.601	PASS
	40		1395.3239	1396.4736	1395.89875	1046	0.749	PASS
	30		1395.3242	1396.4743	1395.89923	1532	1.097	PASS
	20		1395.3241	1396.4725	1395.89830	602	0.431	PASS
	10		1395.3237	1396.4728	1395.89825	550	0.394	PASS
	0		1395.3243	1396.4725	1395.89841	707	0.507	PASS
	-10		1395.3235	1396.4728	1395.89820	497	0.356	PASS
	-20		1395.3240	1396.4731	1395.89853	831	0.595	PASS
	-30		1395.3246	1396.4724	1395.89850	803	0.575	PASS
	20	15%	1395.3240	1396.4725	1395.89827	568	0.407	PASS
	20	-15%	1395.3236	1396.4726	1395.89811	408	0.292	PASS

CH4

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1427.8979	50	Normal Voltage	1427.3231	1428.4734	1427.89826	364	0.255	PASS
	40		1427.3237	1428.4733	1427.89852	625	0.438	PASS
	30		1427.3228	1428.4736	1427.89817	270	0.189	PASS
	20		1427.3233	1428.4747	1427.89902	1119	0.783	PASS
	10		1427.3231	1428.4748	1427.89898	1084	0.759	PASS
	0		1427.3227	1428.4750	1427.89885	952	0.667	PASS
	-10		1427.3237	1428.4741	1427.89891	1005	0.704	PASS
	-20		1427.3228	1428.4742	1427.89852	619	0.433	PASS
	-30		1427.3240	1428.4746	1427.89928	1377	0.964	PASS
	20	15%	1427.3227	1428.4746	1427.89865	747	0.523	PASS
	20	-15%	1427.3231	1428.4752	1427.89914	1242	0.870	PASS

CH7

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1430.2410	50	Normal Voltage	1429.6661	1430.8178	1430.24197	968	0.677	PASS
	40		1429.6658	1430.8172	1430.24151	510	0.356	PASS
	30		1429.6655	1430.8172	1430.24135	345	0.241	PASS
	20		1429.6655	1430.8173	1430.24137	371	0.259	PASS
	10		1429.6669	1430.8176	1430.24228	1283	0.897	PASS
	0		1429.6667	1430.8178	1430.24222	1223	0.855	PASS
	-10		1429.6657	1430.8167	1430.24117	169	0.118	PASS
	-20		1429.6668	1430.8185	1430.24264	1643	1.149	PASS
	-30		1429.6663	1430.8181	1430.24217	1170	0.818	PASS
	20	15%	1429.6669	1430.8172	1430.24206	1062	0.743	PASS
	20	-15%	1429.6661	1430.8176	1430.24182	819	0.573	PASS

SH 2.0 WMTS_ DBPSK

CH14

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1396.636	50	Normal Voltage	1395.9178	1397.3552	1396.63650	500	0.358	PASS
	40		1395.9195	1397.3546	1396.63705	1045	0.748	PASS
	30		1395.9176	1397.3563	1396.63691	912	0.653	PASS
	20		1395.9192	1397.3554	1396.63728	1285	0.920	PASS
	10		1395.9183	1397.3551	1396.63673	728	0.522	PASS
	0		1395.9190	1397.3558	1396.63742	1420	1.017	PASS
	-10		1395.9176	1397.3550	1396.63628	279	0.200	PASS
	-20		1395.9192	1397.3556	1396.63742	1417	1.015	PASS
	-30		1395.9193	1397.3559	1396.63762	1623	1.162	PASS
	20	15%	1395.9185	1397.3551	1396.63681	812	0.581	PASS
	20	-15%	1395.9188	1397.3563	1396.63756	1559	1.116	PASS

CH16

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1428.513	50	Normal Voltage	1427.7900	1429.2383	1428.51418	1177	0.824	PASS
	40		1427.7895	1429.2380	1428.51376	762	0.533	PASS
	30		1427.7889	1429.2374	1428.51314	136	0.095	PASS
	20		1427.7902	1429.2373	1428.51376	757	0.530	PASS
	10		1427.7904	1429.2390	1428.51472	1719	1.204	PASS
	0		1427.7897	1429.2375	1428.51362	617	0.432	PASS
	-10		1427.7899	1429.2391	1428.51446	1461	1.023	PASS
	-20		1427.7893	1429.2392	1428.51422	1224	0.857	PASS
	-30		1427.7886	1429.2392	1428.51391	912	0.638	PASS
	20	15%	1427.7904	1429.2388	1428.51460	1596	1.117	PASS
	20	-15%	1427.7892	1429.2386	1428.51392	919	0.643	PASS

CH17

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1430.241	50	Normal Voltage	1429.5221	1430.9603	1430.24118	178	0.125	PASS
	40		1429.5223	1430.9615	1430.24187	872	0.610	PASS
	30		1429.5218	1430.9619	1430.24186	859	0.601	PASS
	20		1429.5220	1430.9609	1430.24146	458	0.320	PASS
	10		1429.5221	1430.9608	1430.24143	431	0.301	PASS
	0		1429.5230	1430.9611	1430.24205	1048	0.733	PASS
	-10		1429.5233	1430.9604	1430.24183	829	0.579	PASS
	-20		1429.5235	1430.9606	1430.24204	1037	0.725	PASS
	-30		1429.5223	1430.9620	1430.24218	1183	0.827	PASS
	20	15%	1429.5224	1430.9615	1430.24193	935	0.653	PASS
	20	-15%	1429.5224	1430.9614	1430.24190	901	0.630	PASS

SH 2.0 WMTS_D8PSK

CH14

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1396.636	50	Normal Voltage	1395.9257	1397.3473	1396.63652	516	0.370	PASS
	40		1395.9265	1397.3483	1396.63740	1400	1.003	PASS
	30		1395.9254	1397.3475	1396.63649	491	0.351	PASS
	20		1395.9260	1397.3477	1396.63687	872	0.624	PASS
	10		1395.9267	1397.3470	1396.63686	857	0.614	PASS
	0		1395.9260	1397.3475	1396.63677	770	0.551	PASS
	-10		1395.9272	1397.3476	1396.63743	1427	1.022	PASS
	-20		1395.9271	1397.3476	1396.63735	1353	0.969	PASS
	-30		1395.9263	1397.3473	1396.63682	817	0.585	PASS
	20	15%	1395.9271	1397.3478	1396.63743	1425	1.021	PASS
	20	-15%	1395.9268	1397.3474	1396.63712	1117	0.800	PASS

CH16

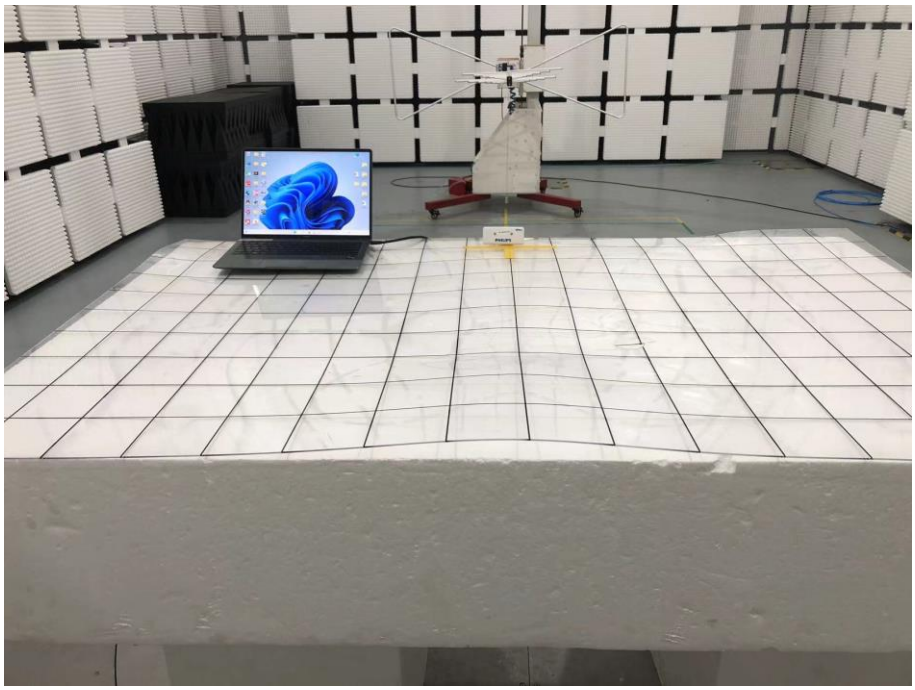
Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1428.513	50	Normal Voltage	1427.8058	1429.2227	1428.51426	1262	0.884	PASS
	40		1427.8055	1429.2221	1428.51379	795	0.556	PASS
	30		1427.8057	1429.2221	1428.51389	893	0.625	PASS
	20		1427.8044	1429.2216	1428.51304	45	0.031	PASS
	10		1427.8043	1429.2230	1428.51365	646	0.452	PASS
	0		1427.8042	1429.2222	1428.51320	197	0.138	PASS
	-10		1427.8053	1429.2218	1428.51355	550	0.385	PASS
	-20		1427.8049	1429.2221	1428.51353	533	0.373	PASS
	-30		1427.8047	1429.2226	1428.51364	637	0.446	PASS
	20	15%	1427.8061	1429.2235	1428.51479	1787	1.251	PASS
	20	-15%	1427.8046	1429.2229	1428.51378	779	0.546	PASS

CH17

Test Frequency (MHz)	Temperature (°C)	Voltage (V)	FL	FH	FC	Tolerance (Hz)	Tolerance (ppm)	Verdict
1430.241	50	Normal Voltage	1429.5314	1430.9528	1430.24208	1082	0.757	PASS
	40		1429.5305	1430.9526	1430.24155	548	0.383	PASS
	30		1429.5313	1430.9536	1430.24246	1459	1.020	PASS
	20		1429.5319	1430.9531	1430.24250	1501	1.050	PASS
	10		1429.5317	1430.9519	1430.24179	792	0.554	PASS
	0		1429.5315	1430.9529	1430.24219	1188	0.831	PASS
	-10		1429.5306	1430.9533	1430.24195	951	0.665	PASS
	-20		1429.5309	1430.9523	1430.24161	605	0.423	PASS
	-30		1429.5302	1430.9533	1430.24178	778	0.544	PASS
	20	15%	1429.5318	1430.9520	1430.24192	920	0.644	PASS
	20	-15%	1429.5320	1430.9531	1430.24253	1526	1.067	PASS

APPENDIX II - PHOTOS OF TEST SETUP

Radiated Spurious Emission Test Setup Photo - Below 1GHz



Radiated Spurious Emission Test Setup Photo - Above 1GHz

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