

Prüfbericht-Nr.: <i>Test report No.:</i>	50054803 001	Auftrags-Nr.: <i>Order No.:</i>	164070177	Seite 1 von 29 <i>Page 1 of 29</i>
Kunden-Referenz-Nr.: <i>Client reference No.:</i>	N/A	Auftragsdatum: <i>Order date.:</i>	28.07.2016	
Auftraggeber: <i>Client:</i>	Cyber Acoustics (HK) Ltd. Unit A-B, 8/F, Yue Hing Building, 101-105 Hennessy Road, Wanchai, Hong Kong			
Prüfgegenstand: <i>Test item:</i>	2.1 wireless speaker system			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	NS-PSB4721			
Auftrags-Inhalt: <i>Order content:</i>	FCC and IC approval			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15.247 CFR47 FCC Part 15.207 CFR47 FCC Part 15.209 CFR47 FCC Part 2.1091		RSS-247 Issue 1 RSS-Gen Issue 4 RSS-102 Issue 5	
Wareneingangsdatum: <i>Date of receipt:</i>	08.08.2016	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000405894-002 A000405894-003			
Prüfzeitraum: <i>Testing period:</i>	15.08.2016 - 29.08.2016			
Ort der Prüfung: <i>Place of testing:</i>	Emtek (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
 27.09.2016 Andy Yan / Project Manager		 27.09.2016 Owen Tian / Technical Certifier		
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>
				Unterschrift <i>Signature</i>
Sonstiges / Other:				
FCC ID: ODLPSB4721				
IC: 10509A-PSB4721 HVIN: NS-PSB4721				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>		
1 = sehr gut 2 = gut 3 = befriedigend P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n)		4 = ausreichend 5 = mangelhaft N/A = nicht anwendbar N/T = nicht getestet		
Legend: 1 = very good 2 = good 3 = satisfactory P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s)		4 = sufficient 5 = poor N/A = not applicable N/T = not tested		
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

RESULT: Pass

5.1.3 CONDUCTED POWER SPECTRAL DENSITY

RESULT: Pass

5.1.4 6dB BANDWIDTH

RESULT: Pass

5.1.5 99% BANDWIDTH

RESULT: Pass

5.1.6 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH

RESULT: Pass

5.1.7 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.8 20dB BANDWIDTH

RESULT: Pass

5.1.9 CARRIER FREQUENCY SEPARATION

RESULT: Pass

5.1.10 NUMBER OF HOPPING FREQUENCY

RESULT: Pass

5.1.11 TIME OF OCCUPANCY

RESULT: Pass

5.1.12 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results of Bluetooth 4.2 (Dual mode) of Conducted Testing

Appendix B: Test Results of Bluetooth 4.2 (Dual mode) of Radiated Emission and AC Conducted Emission

2 Test Sites

2.1 Test Facilities

Emtek (Shenzhen) Co., Ltd.

Bldg. 69, Majialong Industry Zone, Nanshan District, Shenzhen Guangdong, China

FCC Registration No.: 406365

Test site Industry Canada No.: 4480A-2

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Emtek (Shenzhen) Co., Ltd.

Radio Spectrum Test				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Spectrum Analyzer	Rohde & Schwarz	FSV40	132.1-3008K39-100967-AP	28.05.2017
Spurious Emission				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	Rohde & Schwarz	ESCI	101414	28.05.2017
Spectrum Analyzer	Rohde & Schwarz	FSV40	132.1-3008K39-100967-AP	28.05.2017
Bilog Antenna	Schwarzbeck	VULB9163	660	29.05.2017
Loop Antenna	Schwarzbeck	FMZB 1519	1519-012	28.05.2017
Horn Antenna	Schwarzbeck	BBHA 9120	1178	29.05.2017
Horn Antenna	Schwarzbeck	BBHA 9170	RS1307229170547	29.05.2017
Pre-Amplifier	Lunar EM	LNA1G18-48	J1011131010001	28.05.2017
Pre-Amplifier	LUNAR-EM	LNA30M3G-25	J10100000071	28.05.2017
RF Coaxial Cable	H+B	NmNm-7-C15702		29.05.2017
RF Coaxial Cable	H+B	NmSm-05-C15052		29.05.2017
RF Coaxial Cable	H+B	NmSm-2-C15201		29.05.2017
RF Coaxial Cable	H+B	NmNm-7-C15702		29.05.2017
RF Coaxial Cable	H+B	SAC-40G-1	6200283933	29.05.2017
RF Coaxial Cable	H+B	SUCOFLEX104		29.05.2017
RF Coaxial Cable	H+B	BLU18A-NmSm-6500		29.05.2017
Conducted Emission on AC Mains				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Test Receiver	R&S	ESCI	26115-010-0027	28.05.2017
L.I.S.N.	R&S	ENV216	101161	28.05.2017
50Ω Coaxial Switch	Anritsu	MP59B	6100175589	29.05.2017

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table

Item		Extended Uncertainty
Conducted Emission		± 2.96 dB
Radiated Emission (9kHz-30MHz)	Field strength (dBµV/m)	U=3.78dB, k=2, σ=95%
Radiated Emission (30-1000MHz)	Field strength (dBµV/m)	U=4.27dB, k=2, σ=95%
Radiated Emission (above 1000MHz)	Field strength (dBµV/m)	U=4.96dB, k=2, σ=95%
Occupied Channel Bandwidth		±5.0 %
RF Output Power, Conducted		±1.5 dB
Power Spectral Density, Conducted		±3.0 dB
Unwanted Emission, Conducted		±3.0 dB
Duty Cycle		±5.0 %

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The Emtek (Shenzhen) Co., Ltd. Test facility located at Bldg. 69, Majialong Industry Zone, Nanshan District, Shenzhen Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a 2.1 wireless speaker system which supports Bluetooth 4.2 (dual mode) and AUX IN functions. This report is for Bluetooth function of DTS and DSS.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

Technical Specification	Value
Kind of Equipment	2.1 wireless speaker system
Type Designation	NS-PSB4721
FCC ID	ODLPSB4721
IC	10509A-PSB4721
HVIN	NS-PSB4721
Operating Frequency	2402 - 2480 MHz
Operating Voltage	AC 120V, 60Hz
Testing Voltage	AC 120V, 60Hz
Type of Modulation	GFSK, $\pi/4$ DQPSK, 8DPSK
Channel Number	BDR & EDR mode:79 channels; Low Energy mode:40 channels
Channel Separation	BDR & EDR mode:1MHz; Low Energy mode:2MHz
Wireless Technology	Bluetooth 4.2 (Dual mode)
Antenna Type	Integral Antenna
Max. Antenna Gain	-0.68 dBi

Table 3: RF Channel and Frequency of Bluetooth

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
00	2402.00	20	2422.00	40	2442.00	60	2462.00
01	2403.00	21	2423.00	41	2443.00	61	2463.00
02	2404.00	22	2424.00	42	2444.00	62	2464.00
03	2405.00	23	2425.00	43	2445.00	63	2465.00
04	2406.00	24	2426.00	44	2446.00	64	2466.00
05	2407.00	25	2427.00	45	2447.00	65	2467.00
06	2408.00	26	2428.00	46	2448.00	66	2468.00
07	2409.00	27	2429.00	47	2449.00	67	2469.00
08	2410.00	28	2430.00	48	2450.00	68	2470.00
09	2411.00	29	2431.00	49	2451.00	69	2471.00
10	2412.00	30	2432.00	50	2452.00	70	2472.00
11	2413.00	31	2433.00	51	2453.00	71	2473.00
12	2414.00	32	2434.00	52	2454.00	72	2474.00
13	2415.00	33	2435.00	53	2455.00	73	2475.00
14	2416.00	34	2436.00	54	2456.00	74	2476.00
15	2417.00	35	2437.00	55	2457.00	75	2477.00
16	2418.00	36	2438.00	56	2458.00	76	2478.00
17	2419.00	37	2439.00	57	2459.00	77	2479.00
18	2420.00	38	2440.00	58	2460.00	78	2480.00
19	2421.00	39	2441.00	59	2461.00	--	--

Table 4: RF Channel and Frequency of Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
00	2402.00	10	2422.00	20	2442.00	30	2462.00
01	2404.00	11	2424.00	21	2444.00	31	2464.00
02	2406.00	12	2426.00	22	2446.00	32	2466.00
03	2408.00	13	2428.00	23	2448.00	33	2468.00
04	2410.00	14	2430.00	24	2450.00	34	2470.00
05	2412.00	15	2432.00	25	2452.00	35	2472.00
06	2414.00	16	2434.00	26	2454.00	36	2474.00
07	2416.00	17	2436.00	27	2456.00	37	2476.00
08	2418.00	18	2438.00	28	2458.00	38	2478.00
09	2420.00	19	2440.00	29	2460.00	39	2480.00

Table 5: Frequency Hopping Information

Technical Specification	Description
Hopping Range	Hereby we declare that the frequency range of this device is 2402-2480MHz. This is according the Bluetooth Core Specification V2.1 + EDR for devices which will be operated in the USA. This was checked during the Bluetooth Qualification tests.
Hopping Sequence	Example of a 79 hopping sequence in data mode: 33,04,21,44,23,42,53,46,55,48,40,59,72,29,76,31,08,73,07,75,09,45,60,39,58,13,47,11,77,52,35,50,65,54,67,56,69,62,71,64, 7,25,27,66,57,70,74,61,78,63,10,41,05,43,15,44,64,68,02,70,06,01,51,03,55,05,03,66,53,49,36,47..
Receiver input bandwidth	The input bandwidth of the receiver is 1MHz. In every connection one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings. Repeating of a packer has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

3.3 Independent Operation Modes

The basic operation modes are:

- A. On
 - 1. Bluetooth transmitting mode (BDR & EDR mode)
 - a) Low Channel
 - b) Middle Channel
 - c) High Channel
 - 2. Bluetooth transmitting mode (Low Energy mode)
 - a) Low Channel
 - b) Middle Channel
 - c) High Channel
- B. On, Transmitting on Hopping channel
- C. On, Bluetooth connecting mode

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|-------------------------|----------------------------------|
| - Application Form | - FCC/IC Label and Location Info |
| - Block Diagram | - Photo Document |
| - Schematics | - User Manual |
| - Technical Description | |

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.

4.3 Special Accessories and Auxiliary Equipment

Table 6: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
iPhone 5C	Apple	A1526	--	--
AUX IN Cable	N/A	N/A	--	Unshielded, Length 100cm

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

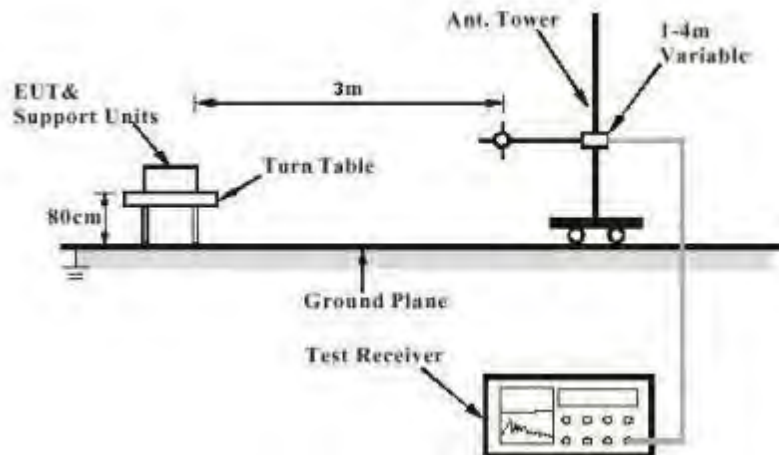


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

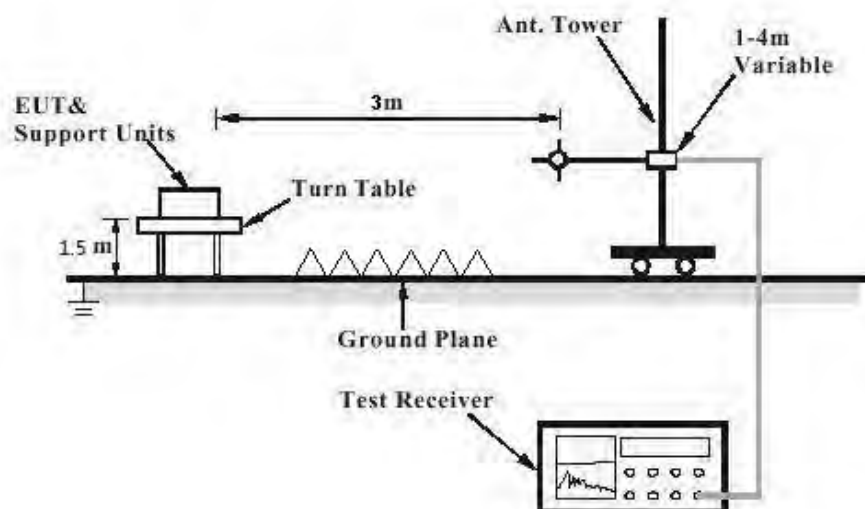


Diagram of Measurement Configuration for Mains Conduction Measurement

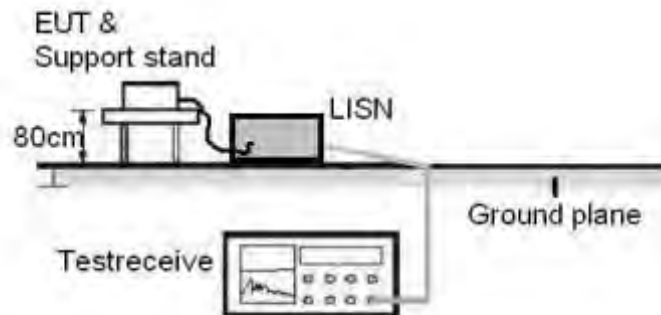
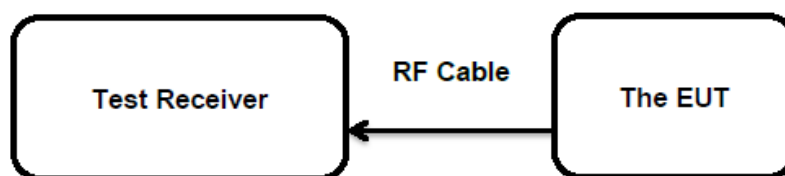


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.247(b)(4) and Part 15.203
RSS-Gen Clause 8.3

According to the manufacturer declared, the EUT has an integral antenna, the directional gain of antenna is -0.68 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Maximum Peak Conducted Output Power

RESULT:
Pass
Test Specification

Test standard	: FCC Part 15.247(b)(1)&(3) RSS-247 Clause 5.4(2)&(4)
Basic standard	: ANSI C63.10: 2013
Limits	: FHSS < 0.125 Watts, DSSS < 1.0 Watts
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 15.08.2016
Input voltage	: AC 120V/60Hz
Operation mode	: A.1, A.2
Test channel	: Low / Middle / High
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Table 7: Test Result of Maximum Peak Conducted Output Power

Test Mode	Channel Frequency (MHz)	Measured Peak Output Power		Limit (W)
		(dBm)	(W)	
BDR	2402	5.91	0.00390	< 0.125
	2441	7.39	0.00548	
	2480	8.04	0.00637	
EDR	2402	7.45	0.00556	< 0.125
	2441	8.56	0.00718	
	2480	9.00	0.00794	
Low Energy	2402	6.19	0.00416	< 1.0
	2440	7.65	0.00582	
	2480	8.44	0.00698	
Maximum Measured Value		9.00	0.00794	/

Note: The cable loss 1.0 dB is taken into account in results.

This testing was carried out on all operation modes, but only the worst case was presented in this report.

For the measurement records, refer to the appendix A.

5.1.3 Conducted Power Spectral Density

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.247(e) RSS-247 Clause 5.2(2)
Basic standard	: ANSI C63.10: 2013
Limits	: 8 dBm/3kHz
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 15.08.2016
Input voltage	: AC 120V/60Hz
Operation mode	: A.2
Test channel	: Low / Middle / High
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Table 8: Test Result of Power Spectral Density, Low Energy

Test Mode	Test Channel (MHz)	Power Spectrum Density(dBm/100kHz)	Limit (dBm/3kHz)
Low Energy	2402	5.22	< 8.0
	2440	6.93	
	2480	7.53	
Maximum Measured Value		7.53	

Note: The cable loss 1.0 dB is taken into account in results.

This testing was carried out on all operation modes, but only the worst case was presented in this report.

For the measurement records, refer to the appendix A.

5.1.4 6dB Bandwidth

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.247(a)(2)
RSS-247 Clause 5.2(1)
Basic standard : ANSI C63.10: 2013
Limits : More than 500 KHz
Kind of test site : Shielded Room

Test Setup

Date of testing : 15.08.2016
Input voltage : AC 120V/60Hz
Operation mode : A.2
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 9: Test Result of 6dB Bandwidth, Low Energy

Test Mode	Test Channel (MHz)	-6dB Bandwidth (kHz)	Limit (kHz)
Low Energy	2402	740.3	> 500
	2440	743.3	
	2480	752.2	
Minimum Measured Value		740.3	

For the measurement records, refer to the appendix A.

5.1.5 99% Bandwidth

RESULT:
Pass
Test Specification

Test standard : RSS-Gen Clause 6.6
 Basic standard : ANSI C63.10: 2013
 Kind of test site : Shielded Room

Test Setup

Date of testing : 15.08.2016
 Input voltage : AC 120V/60Hz
 Operation mode : A.1, A.2
 Test channel : Low / Middle / High
 Ambient temperature : 25 °C
 Relative humidity : 56 %
 Atmospheric pressure : 101 kPa

Table 10: Test Result of 99% Bandwidth

Test Mode	Channel Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)
BDR	2402	923.08	/
	2441	923.08	
	2480	920.08	
EDR	2402	1183.82	/
	2441	1189.81	
	2480	1198.80	
Low Energy	2402	1036.96	/
	2440	1045.95	
	2480	1048.95	
Maximum Measured Value		1198.80	/

For the measurement records, refer to the appendix A.

5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth**RESULT:****Pass****Test Specification**

Test standard	: FCC Part 15.247(d) RSS-247 Clause 5.5
Basic standard	: ANSI C63.10: 2013
Limits	: 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power);
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 15.08.2016
Input voltage	: AC 120V/60Hz
Operation mode	: A.1, A.2
Test channel	: Low / Middle / High
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to following test plot, and compliance is achieved as well.

For the measurement records, refer to the appendix A.

5.1.7 Radiated Spurious Emission

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.247(d) & FCC Part 15.205 RSS-247 Clause 3.3
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to 15.209(a) of FCC part 15.247(d) RSS-Gen Table 4 & Table 5
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 16.08.2016 - 29.08.2016
Input voltage	: AC 120V/60Hz
Operation mode	: A.1, A.2
Test channel	: Low / Middle / High
Ambient temperature	: 24 °C
Relative humidity	: 53 %
Atmospheric pressure	: 101 kPa

Remark:

During the pretest the EUT was rotated through three orthogonal axes to determine the attitude that maximizes the emissions. After that the EUT was manually handled to find the orientation that has the maximum emission, which is the orientation shown in the test set-up photos.

Pre-test the EUT in continuous transmitting with different data packet. Compliance test in continuous transmitting mode with BDR and BLE mode as the worst case was found.

Testing was carried out within frequency range 9kHz to the tenth harmonics.

For the measurement records, refer to the appendix B.

5.1.8 20dB Bandwidth

RESULT:
Pass
Test Specification

Test standard : FCC Part 15.247(a)(1)
RSS-247 Clause 5.1(1)
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 15.08.2016
Input voltage : AC 120V/60Hz
Operation mode : A.1
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 11: Test Result of 20dB Bandwidth

Test Mode	Channel Frequency (MHz)	20dB Bandwidth (kHz)	2/3 of 20dB Bandwidth (kHz)	Limit (MHz)
BDR	2402	1040.0	693.3	Within the Frequency band 2400~2483.5MHz
	2441	1040.0	693.3	
	2480	1043.0	695.3	
EDR	2402	1300.7	867.1	
	2441	1300.7	867.1	
	2480	1327.7	885.1	
Maximum Measured Value		1327.7	885.1	

For the measurement records, refer to the appendix A.

5.1.9 Carrier Frequency Separation

RESULT:
Pass
Test Specification

Test standard : FCC Part 15.247(a)(1)
RSS-247 Clause 5.1(2)

Basic standard : ANSI C63.10: 2013

Limits : $\geq 25\text{kHz}$ or $2/3$ of 20dB bandwidth, whichever is greater

Kind of test site : Shielded Room

Test Setup

Date of testing : 15.08.2016

Input voltage : AC 120V/60Hz

Operation mode : B

Test channel : Low / Middle / High

Ambient temperature : 25 °C

Relative humidity : 56 %

Atmospheric pressure : 101 kPa

Table 12: Test Result of Carrier Frequency Separation

Channel	Channel Frequency (MHz)	Measured Channel Separation (KHz)	Limit (kHz)	Result
Low Channel	2402	998	≥ 25kHz or 2/3 of 20dB bandwidth	Pass
Adjacency Channel	2403			
Middle Channel	2441	998		Pass
Adjacency Channel	2442			
High Channel	2480	998		Pass
Adjacency Channel	2479			

Note:

The limit is maximum $2/3$ of the 20 dB bandwidth: 885.1 KHz.

For the measurement records, refer to the appendix A.

5.1.10 Number of Hopping Frequency**RESULT:****Pass****Test Specification**

Test standard : FCC part 15.247(a)(1)(iii)
RSS-247 Clause 5.1(4)
Basic standard : ANSI C63.10: 2013
Limits : ≥ 15 non-overlapping channels
Kind of test site : Shielded Room

Test Setup

Date of testing : 15.08.2016
Input voltage : AC 120V/60Hz
Operation mode : B
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 13: Test Result of Number of Hopping Frequency

Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
2402 to 2480 MHz	79	≥ 15	Pass

For the measurement records, refer to the appendix A.

5.1.11 Time of Occupancy**RESULT:****Pass****Test Specification**

Test standard : FCC part 15.247(a)(1)(iii)
RSS-247 Clause 5.1(4)
Basic standard : ANSI C63.10: 2013
Limits : < 0.4s
Kind of test site : Shielded Room

Test Setup

Date of testing : 15.08.2016
Input voltage : AC 120V/60Hz
Operation mode : B
Test channel : Low / Middle / High
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 14: Test Result of Time of Occupancy

Test Mode	Test Channel	Data Packet	Pulse width (ms)	Measured Dwell time(s)	Limit (s)
BDR mode	2402	DH1	0.364	0.116	< 0.4s
		DH3	1.617	0.259	
		DH5	2.874	0.307	
	2441	DH1	0.364	0.116	
		DH3	1.617	0.259	
		DH5	2.864	0.306	
	2480	DH1	0.364	0.116	
		DH3	1.624	0.260	
		DH5	2.864	0.306	
EDR mode	2402	3DH1	0.387	0.124	
		3DH3	1.636	0.262	
		3DH5	2.889	0.308	
	2441	3DH1	0.383	0.123	
		3DH3	1.629	0.261	
		3DH5	2.889	0.308	
	2480	3DH1	0.383	0.123	
		3DH3	1.629	0.261	
		3DH5	2.889	0.308	
Maximum Measured Value			2.889	0.308	

Note:

Dwell time = Pulse width x (Hopping rate / Number of channels) x Period

Period = 0.4 x 79 (channel) = 31.6 seconds

This testing was carried out on all operation modes, but only the worst case was presented in this report.

For the measurement records, refer to the appendix A.

5.1.12 Conducted Emission on AC Mains**RESULT:****Pass****Test Specification**

Test standard	: FCC Part 15.207(a) RSS-Gen Clause 8.8
Basic standard	: ANSI C63.10: 2013
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15.207(a) RSS-Gen Table 3
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 18.08.2016
Input voltage	: AC 120V/60Hz
Operation mode	: C
Earthing	: Not connected
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Pass****Test Specification**

Test standard : CFR47 FCC Part 2.1091
RSS-102 Issue 5

Limit : CFR47 FCC Part 1.1310

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

MPE Calculation Method according to OET Bulletin 65

Power Density: $S_{(mW/cm^2)} = PG/4\pi R^2$ or $EIRP/4\pi R^2$

Where:

S = power density (mW/cm²)

P = power input to the antenna (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm)

The maximum conducted output power specified: 10dBm

From the peak RF output power, the minimum mobile separation distance, d=20 cm, as well as the antenna gain (Max. -0.68 dBi), the RF power density can be calculated as below:

$$S_{(mW/cm^2)} = PG/4\pi R^2 = 0.002 mW/cm^2$$

Limits for Maximum Permissible Exposure (MPE) according to FCC Part 1.1310: 1.0 mW/cm²

IC requirements: The EUT shall comply with the requirement of RSS-102 section 2.5.2.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

- RF exposure evaluation exempted power for Bluetooth: 2.676 W

The maximum conducted output power and e.i.r.p. are far below the exempted power level, so the RF exposure evaluation is not required.

“RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”

7 Photographs of the Test Set-Up

Photograph 1: Set-up for Radiated Spurious Emission up to 1GHz

Please refer to the attached setup photos.

Photograph 2: Set-up for Radiated Spurious Emission above 1GHz

Please refer to the attached setup photos.

Photograph 3: Set-up for Conducted Emission on AC Mains

Please refer to the attached setup photos.

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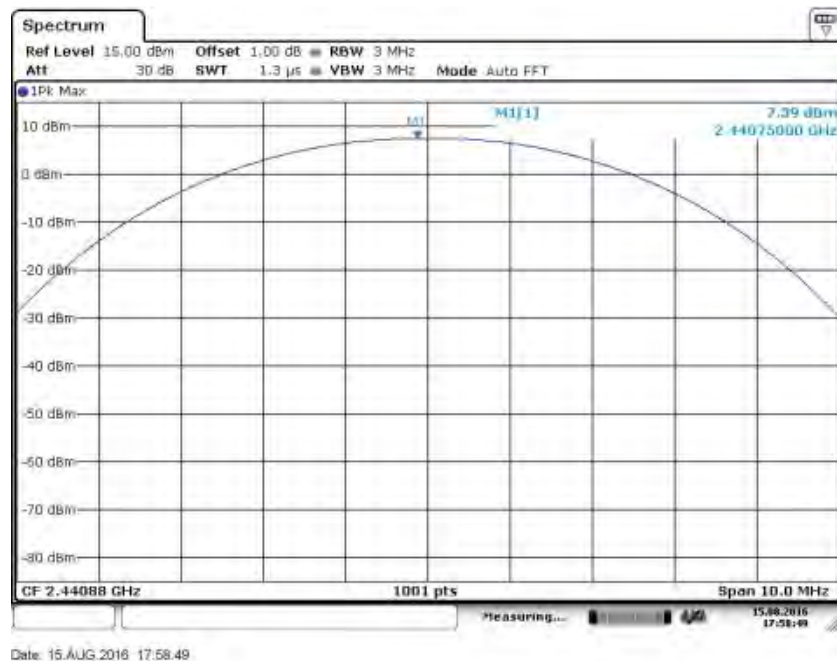
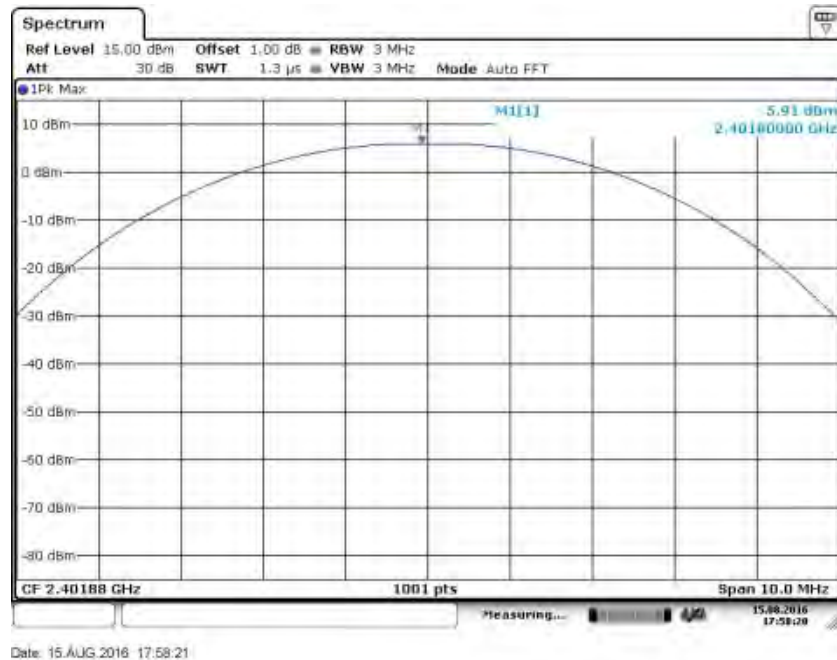
Appendix A

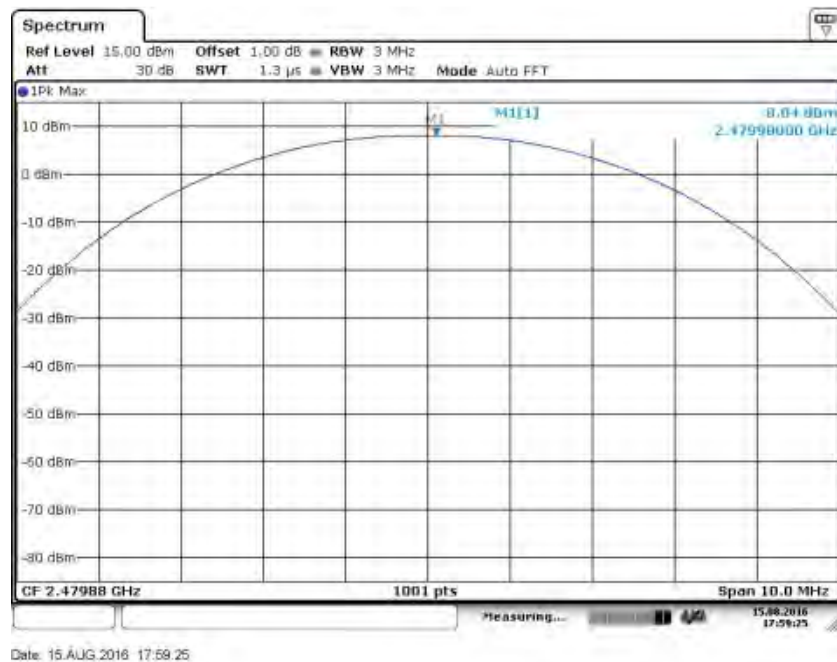
Test Results of Bluetooth 4.2 (Dual mode) of Conducted Testing

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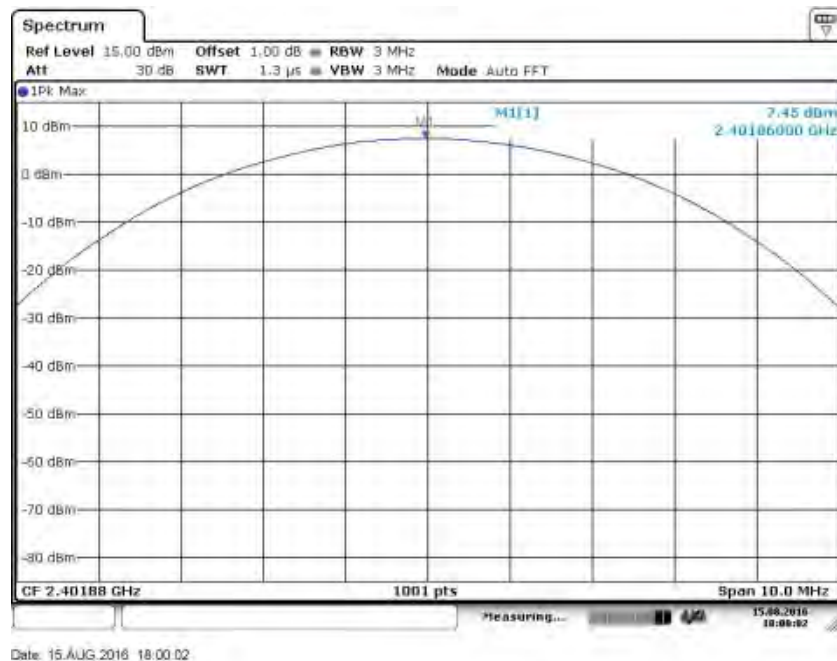
Appendix A.1: Test Plots of Maximum Peak Conducted Output Power

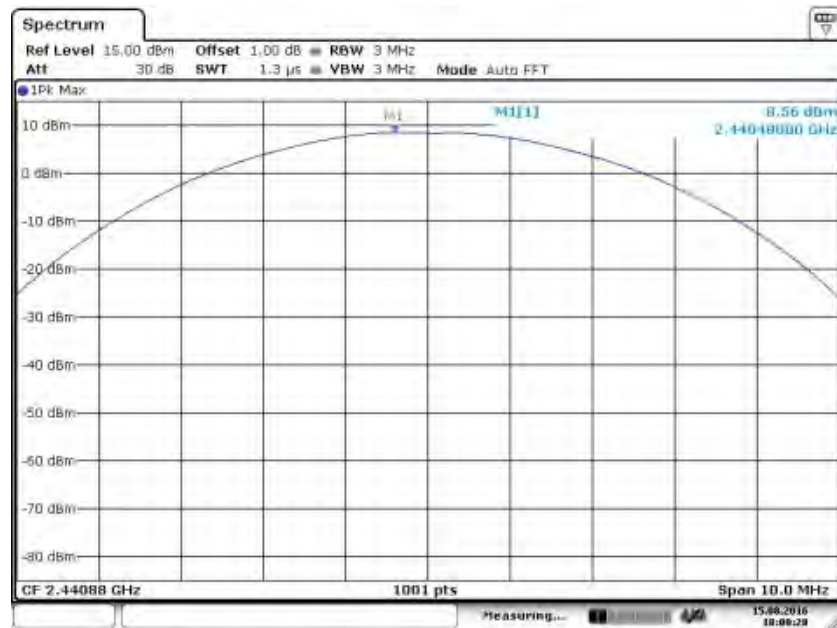
BDR Mode, DH1



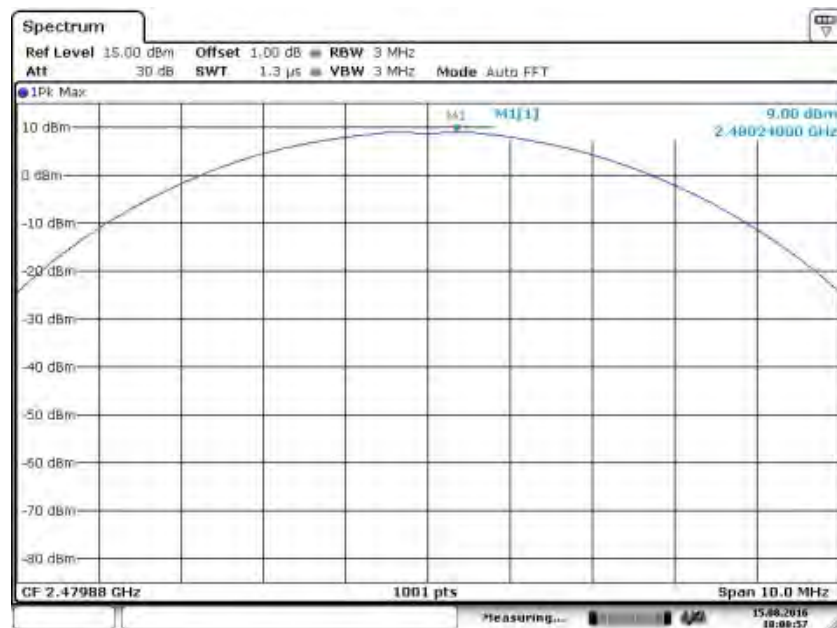


EDR Mode, 3DH1



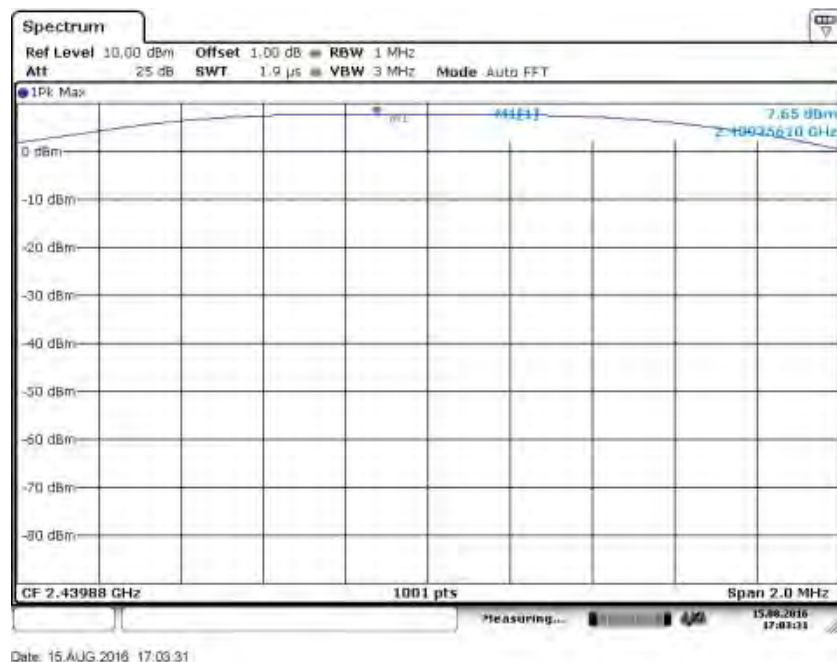
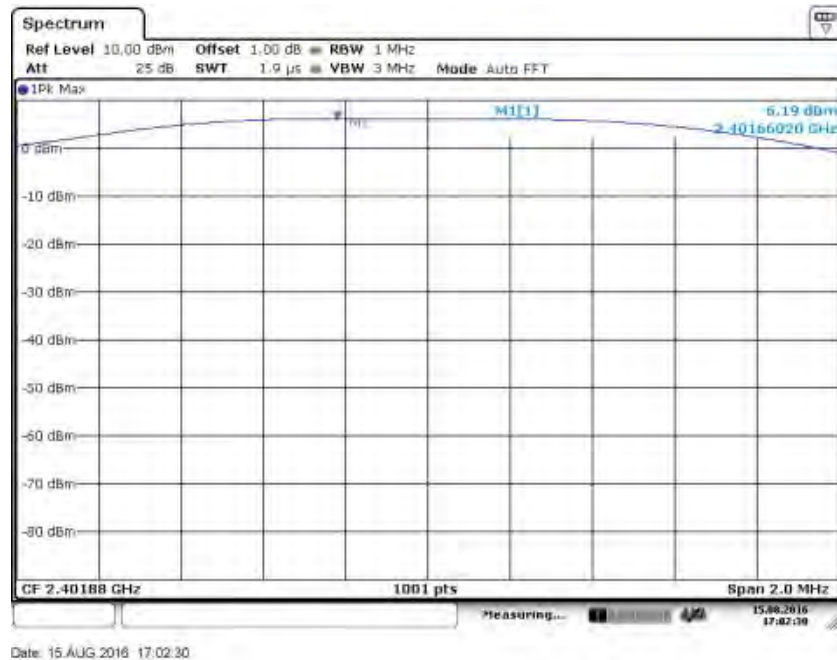


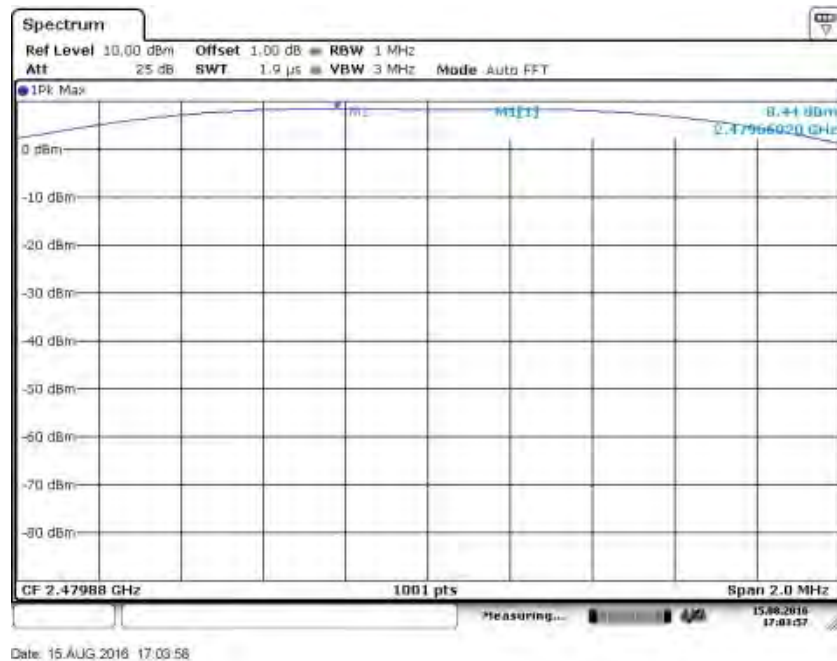
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Low Energy Mode





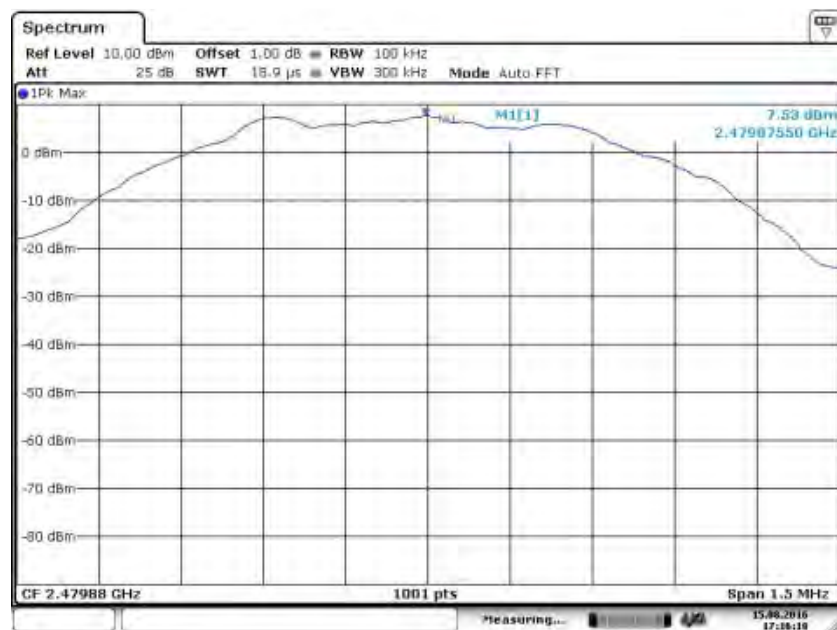
Appendix A.2: Test Plots of Conducted Power Spectral Density

Low Energy Mode





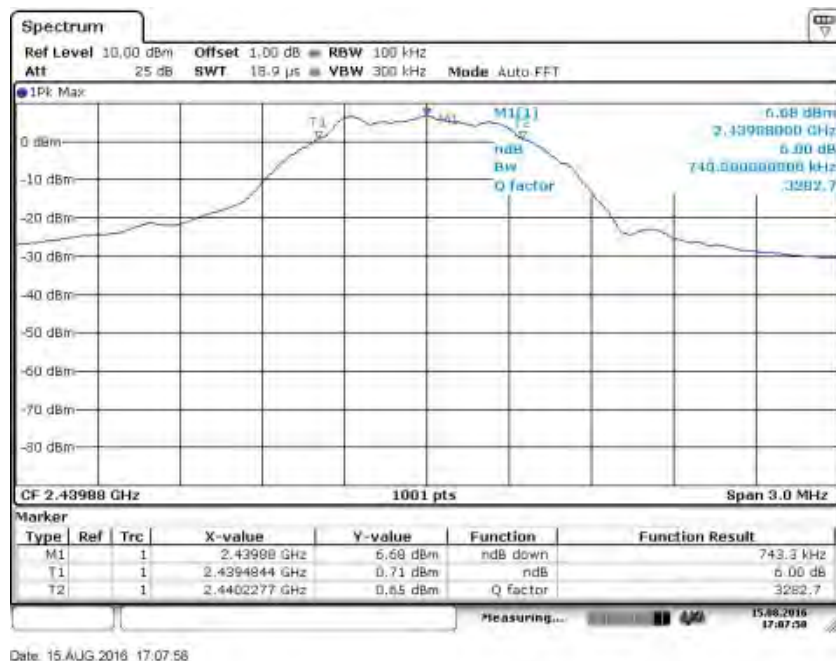
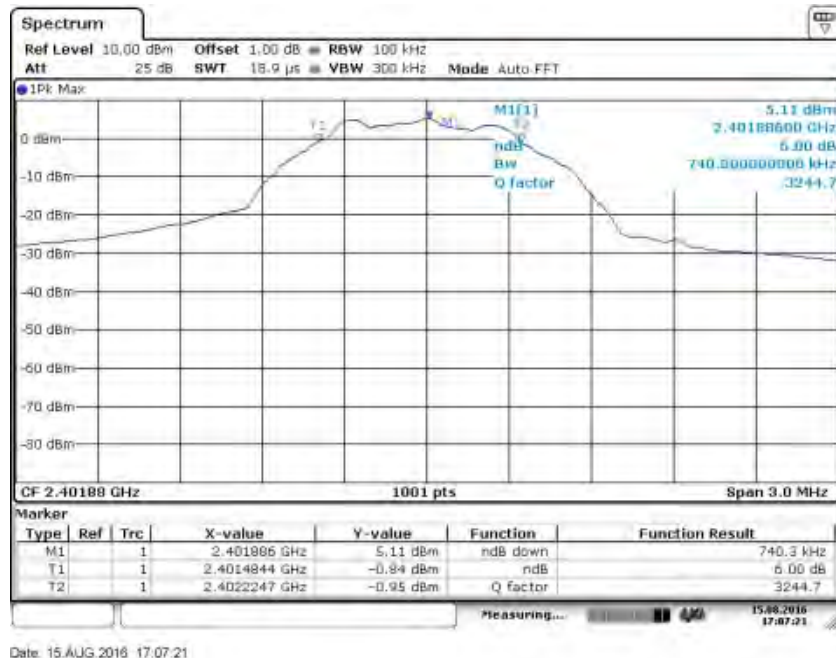
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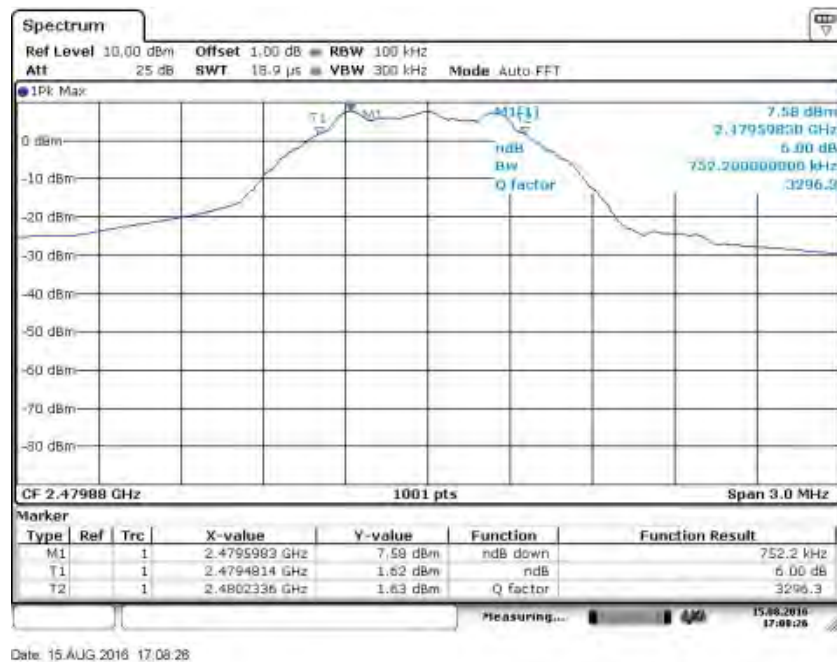


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Appendix A.3: Test Plots of 6dB Bandwidth

Low Energy Mode





Appendix A.4: Test Plots of 99% Bandwidth

BDR Mode, DH1





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EDR Mode, 3DH1





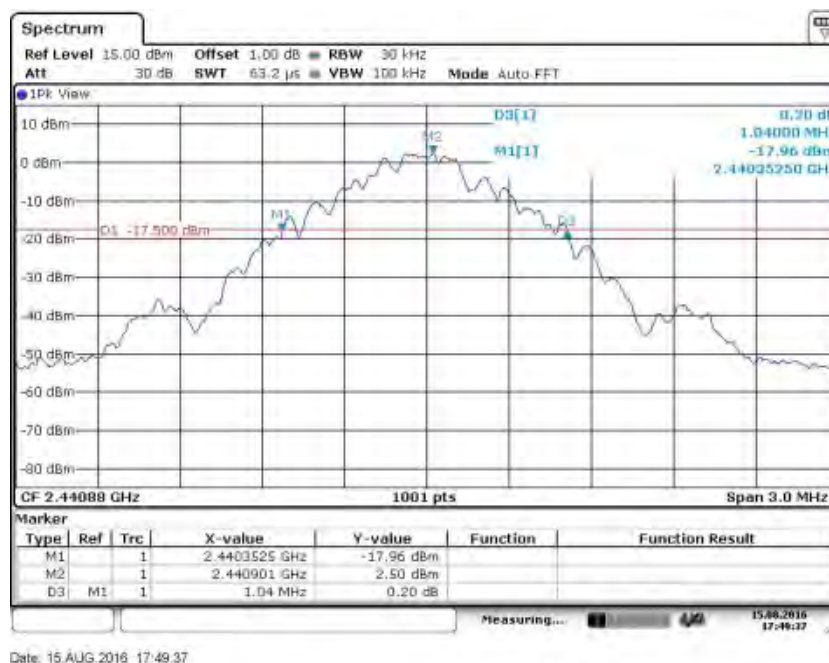
Low Energy Mode





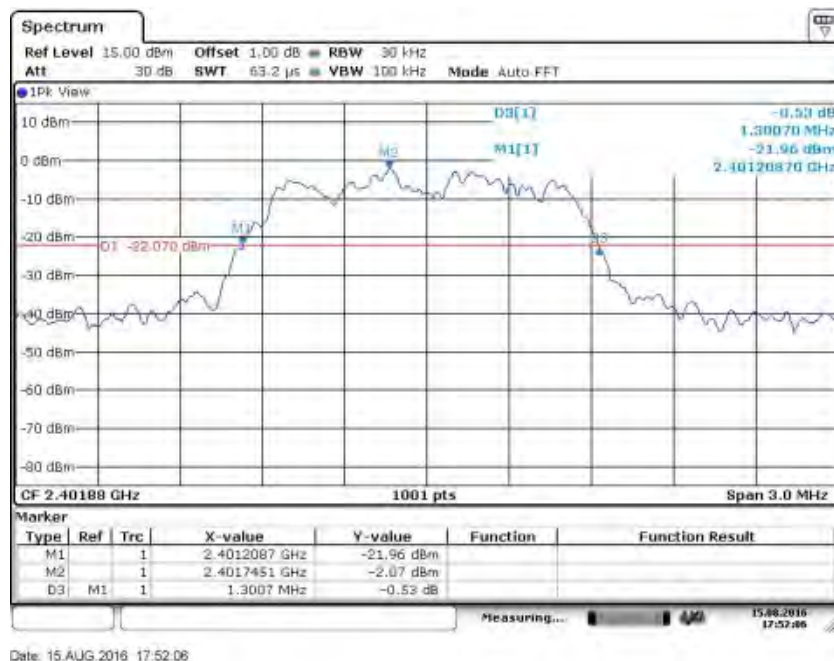
Appendix A.5: Test Plots of 20dB Bandwidth

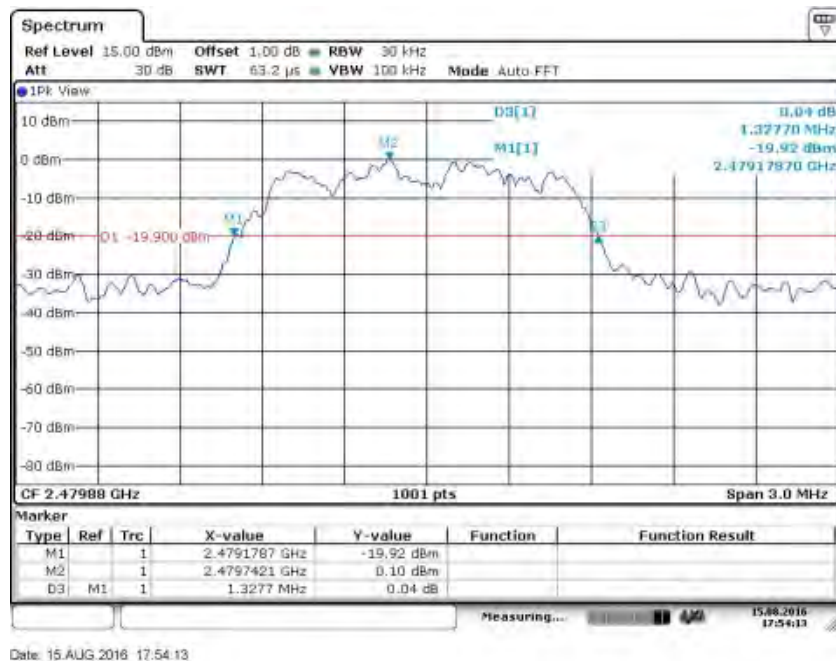
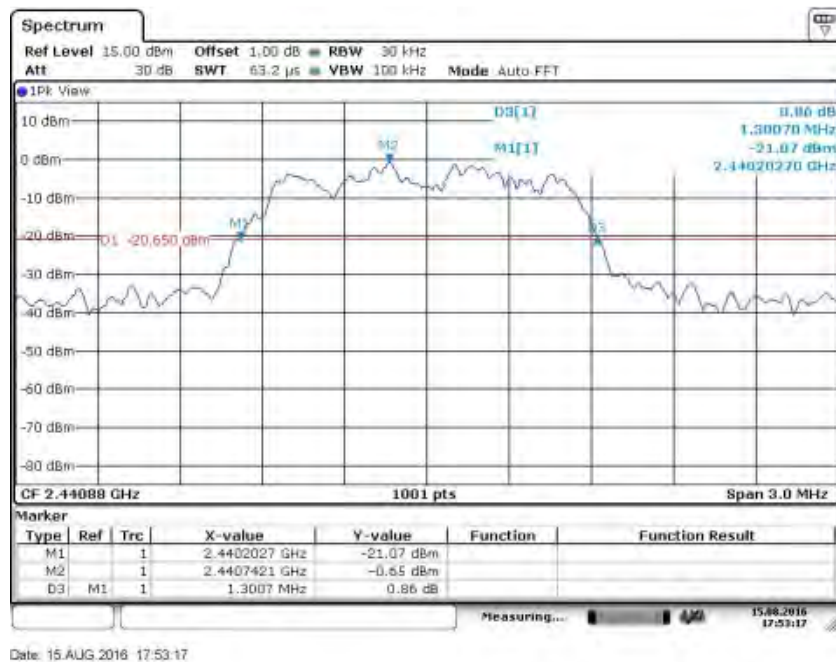
BDR Mode, DH1





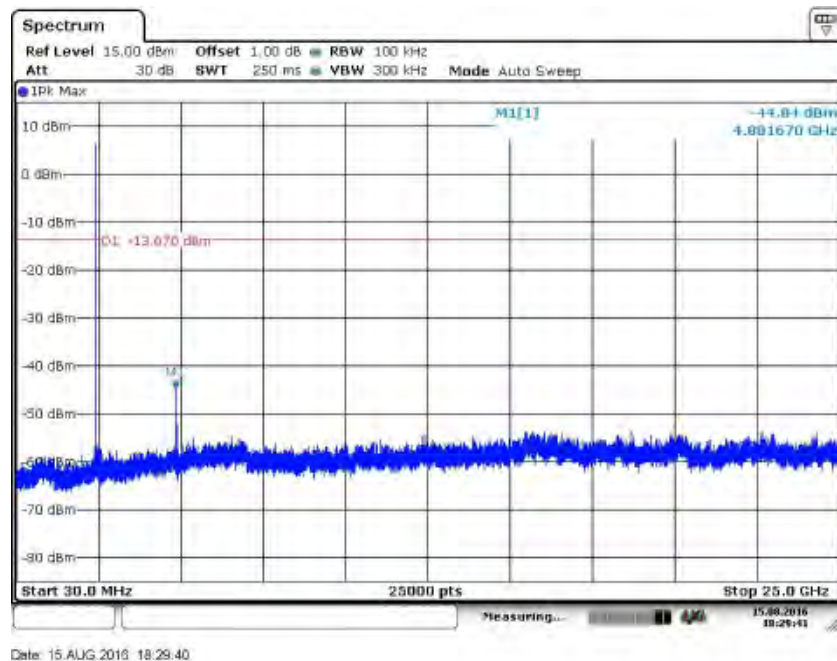
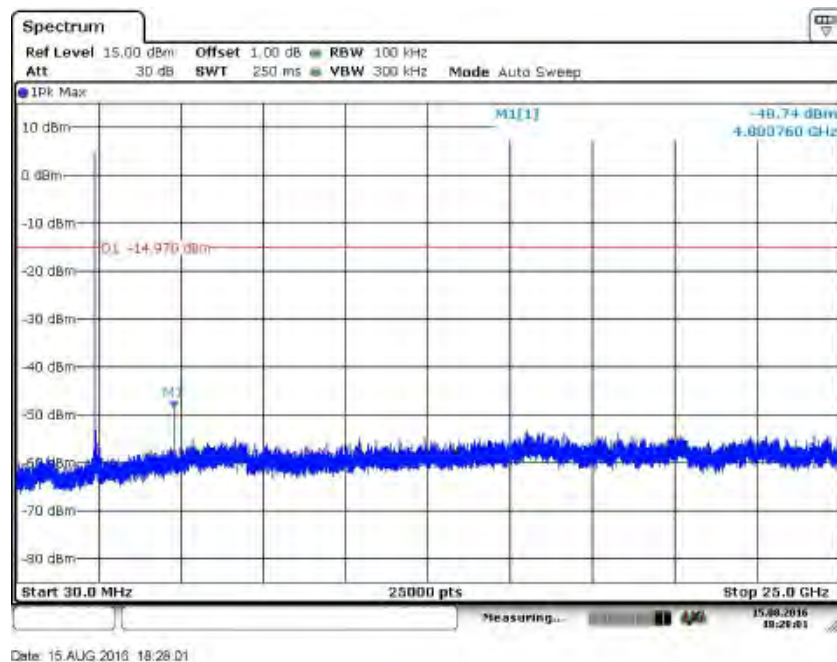
EDR Mode, 3DH1

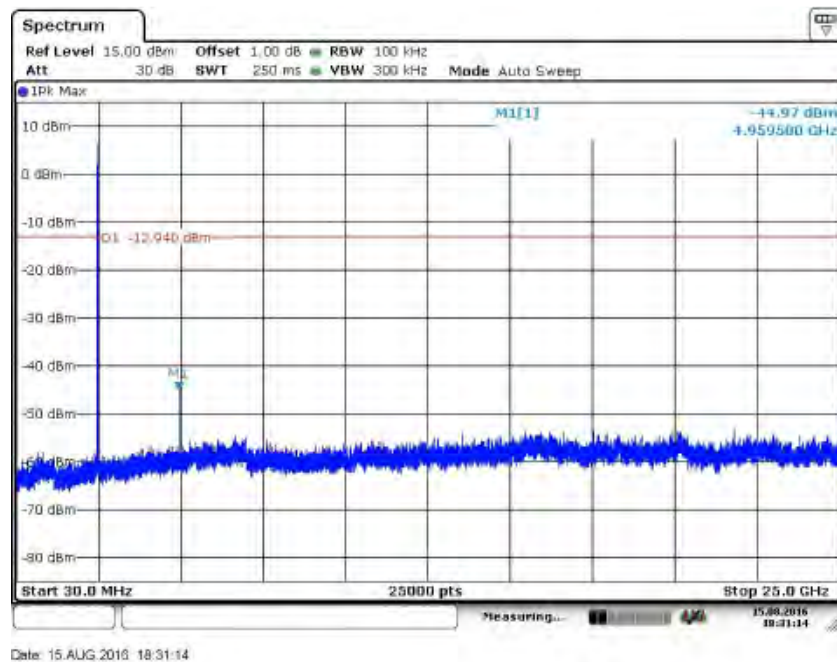




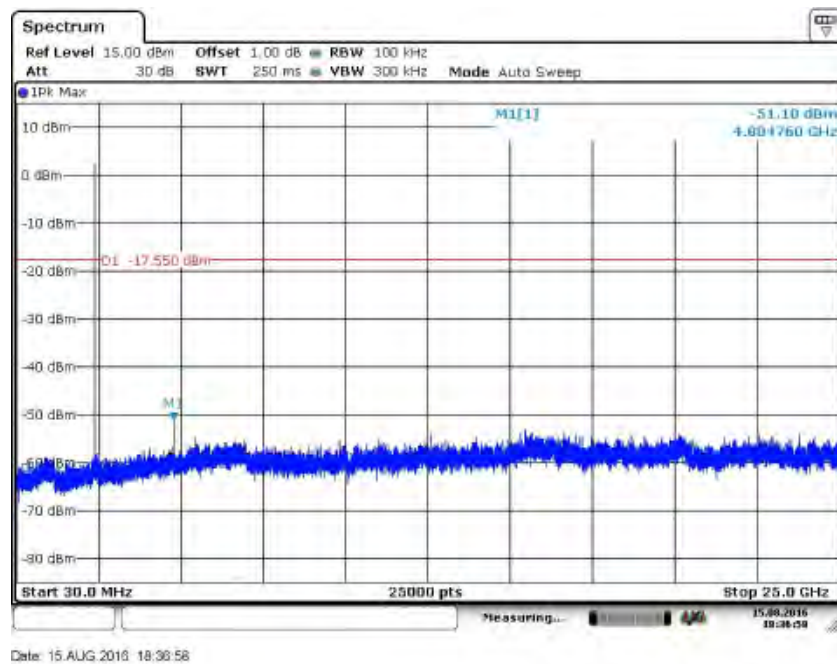
Appendix A.6: Test Plots of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

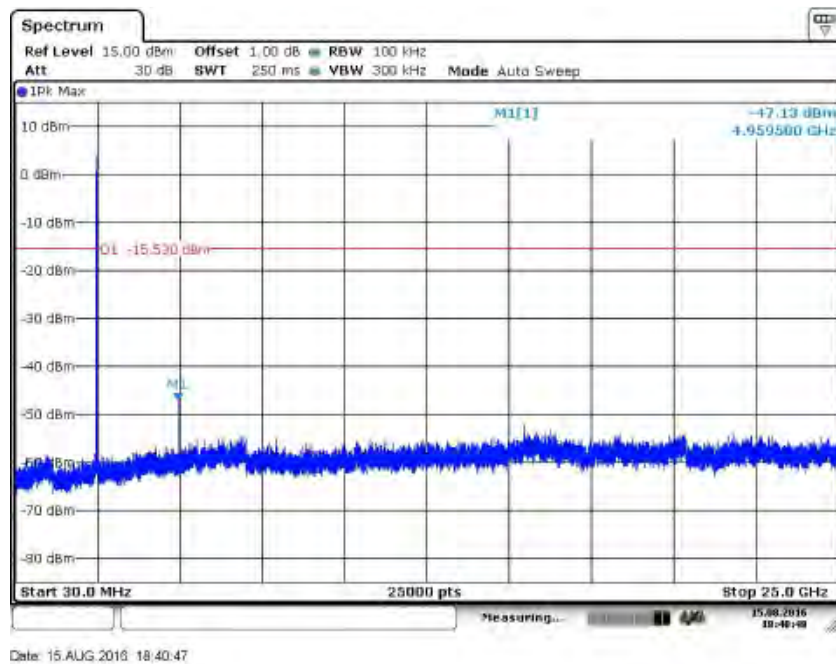
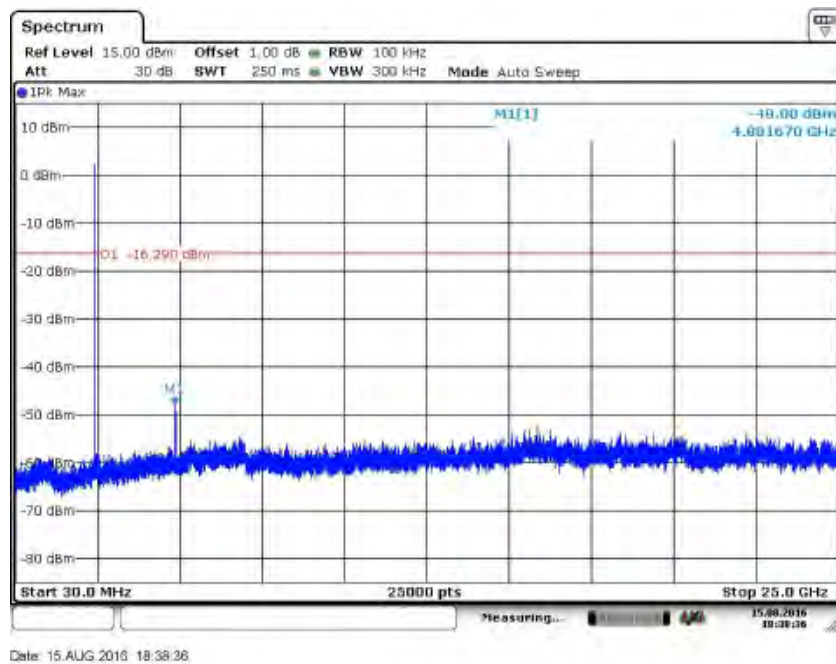
BDR Mode, DH1



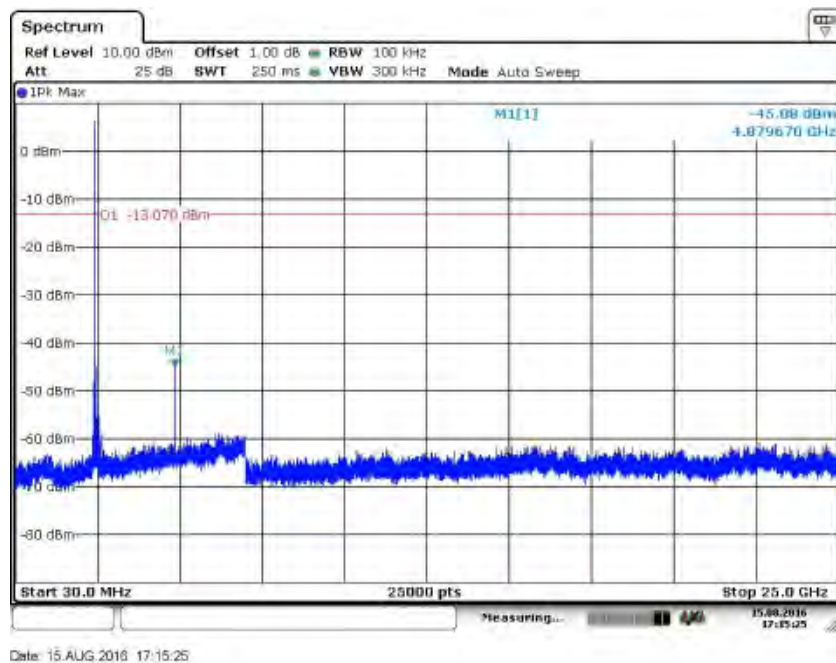
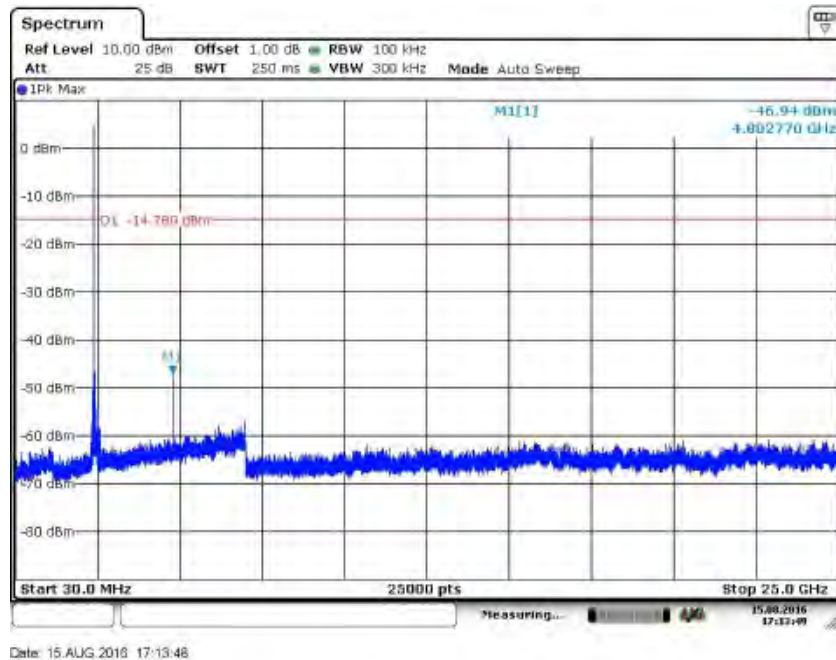


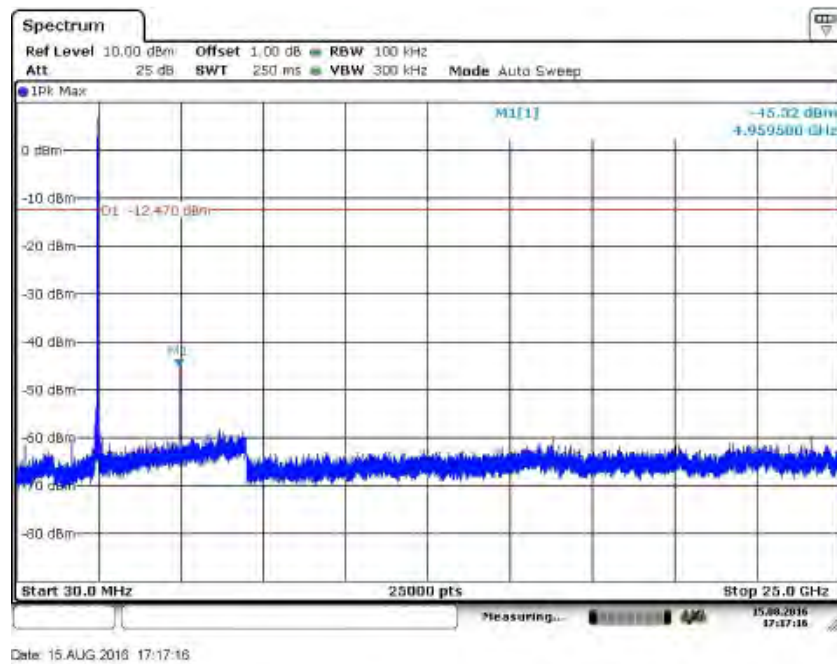
EDR Mode, 3DH1



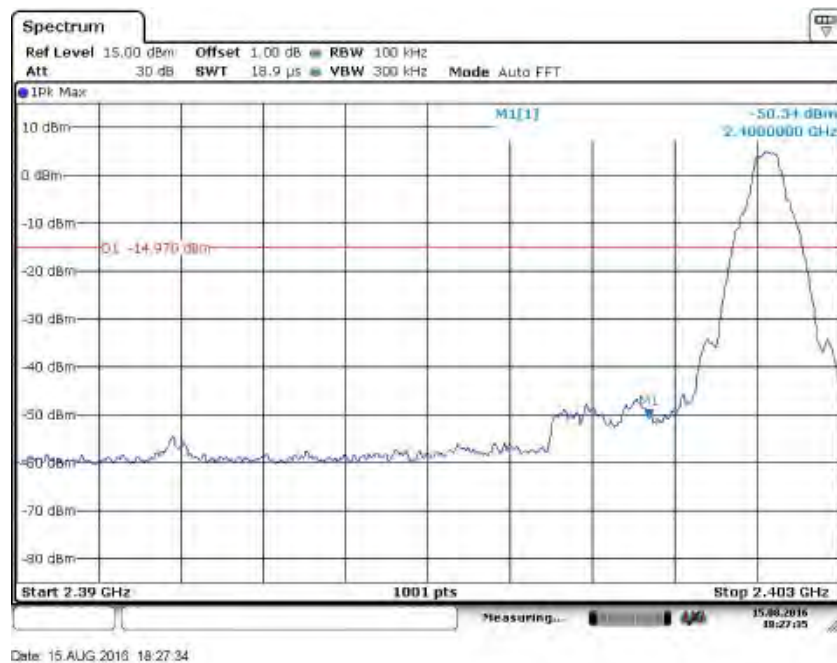


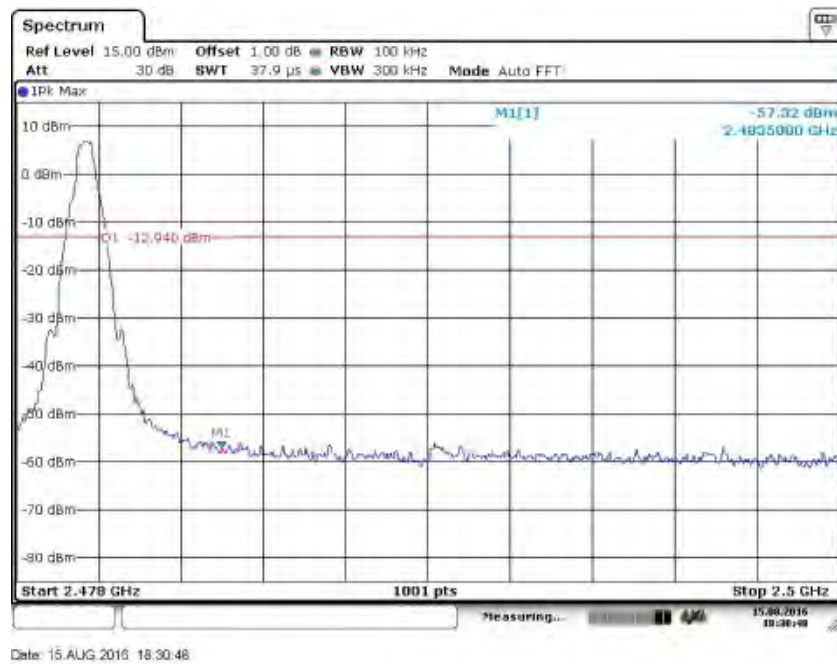
Low Energy Mode



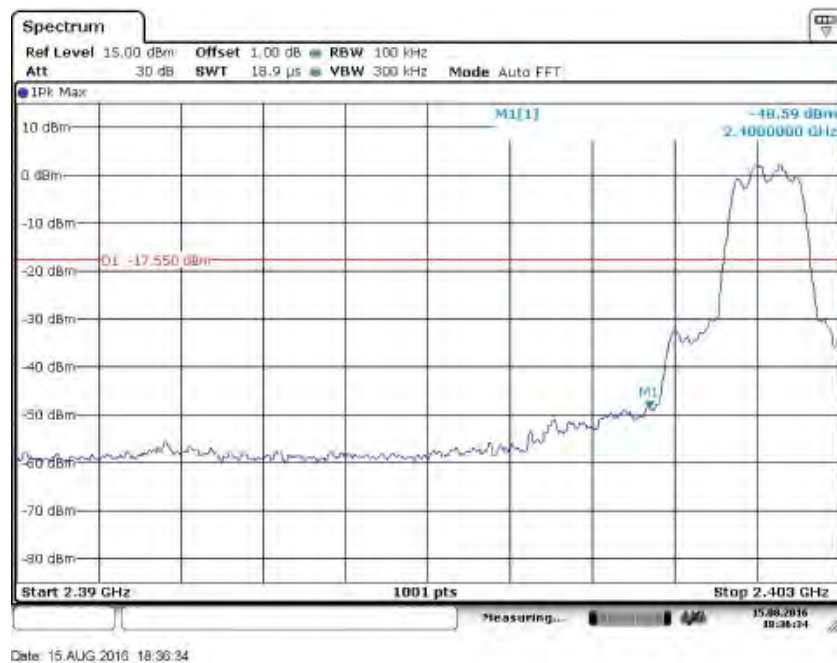


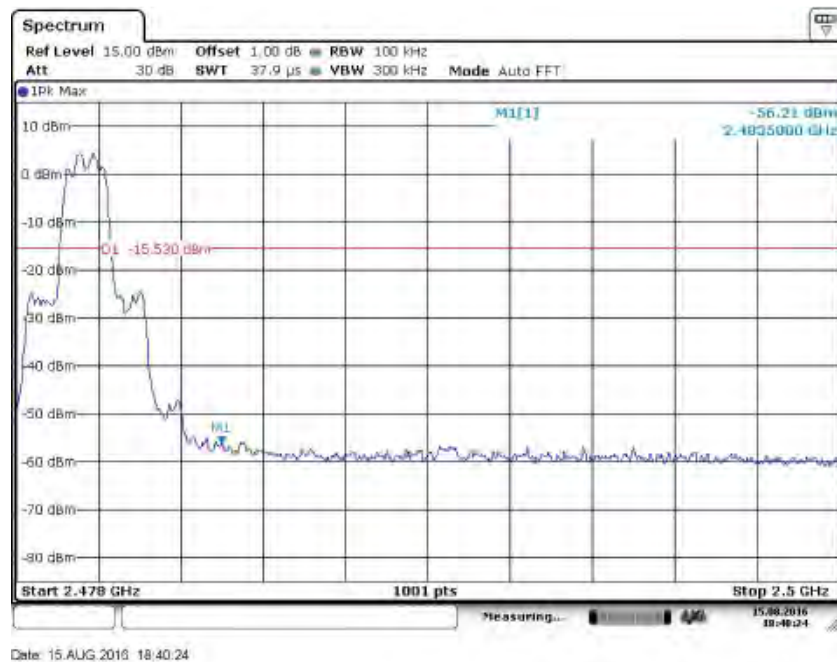
BDR Mode, Band Edge



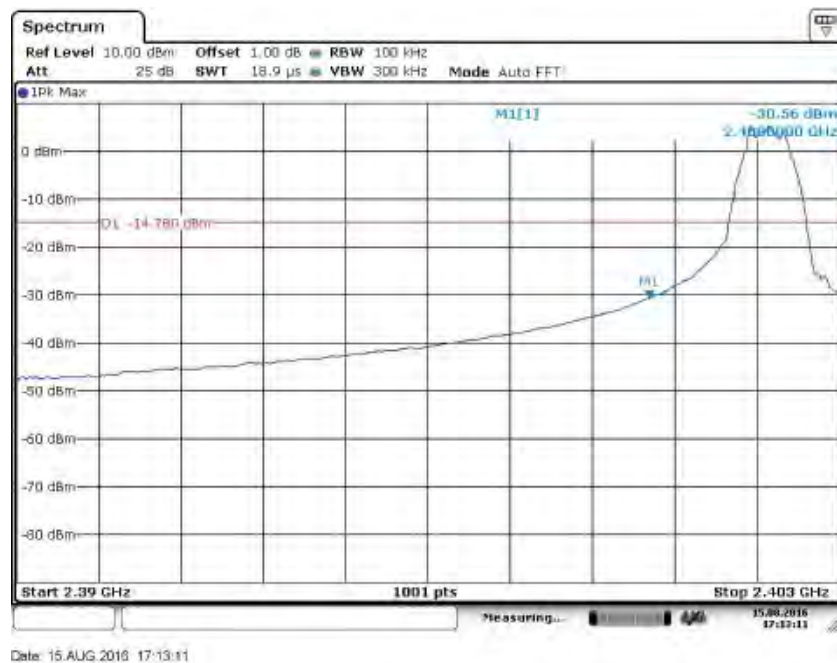


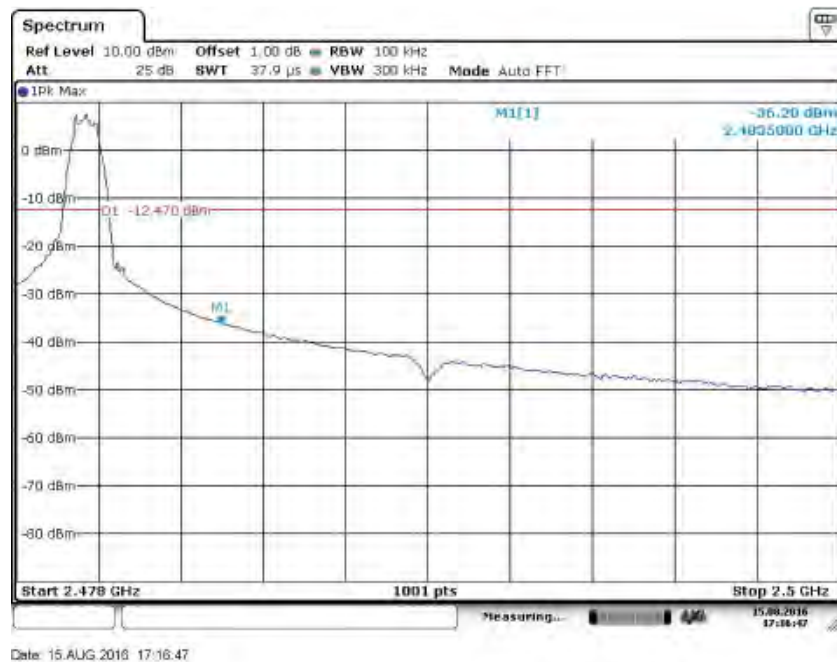
EDR Mode, Band Edge





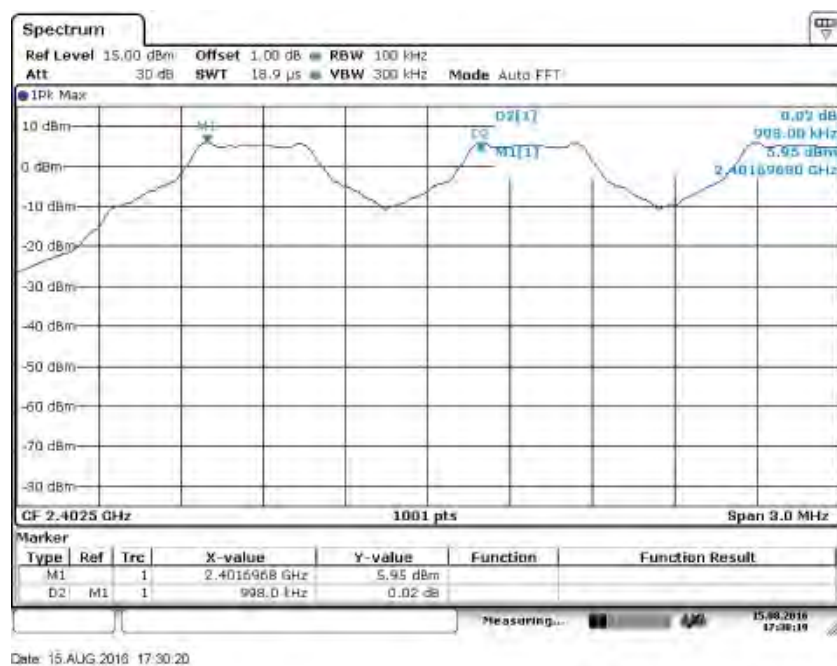
Low Energy Mode, Band Edge

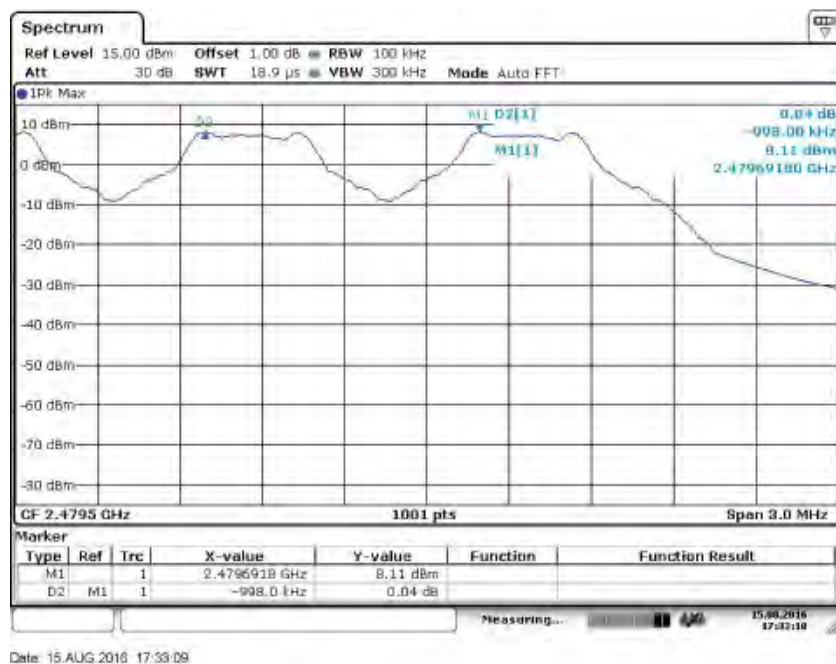
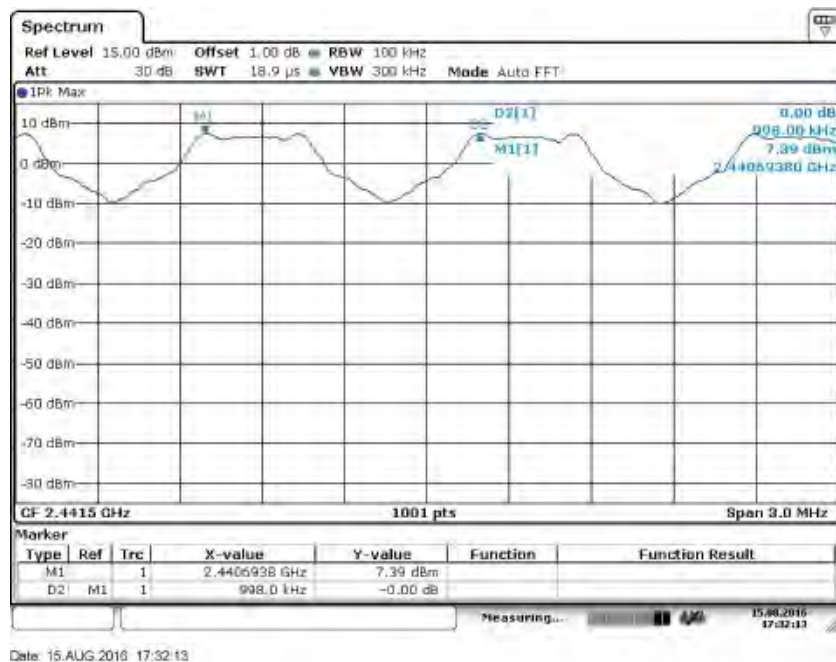




Appendix A.7: Test Plots of Carrier Frequency Separation

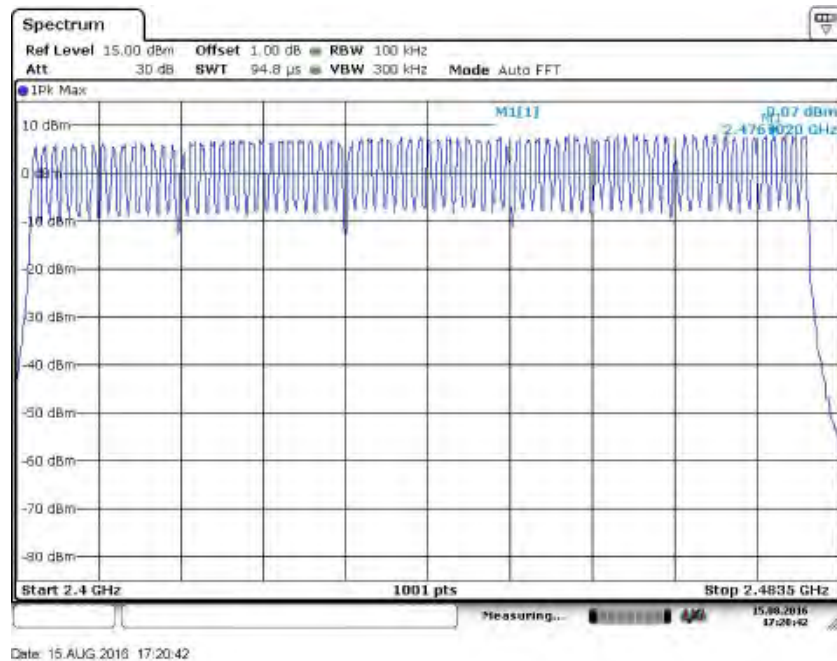
Hopping Mode





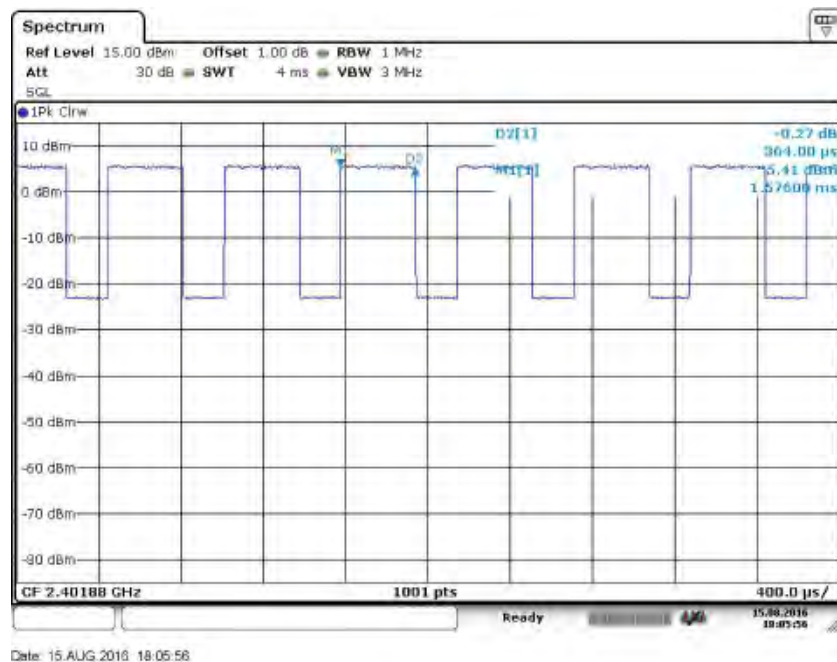
Appendix A.8: Test Plots of Number of Hopping Frequency

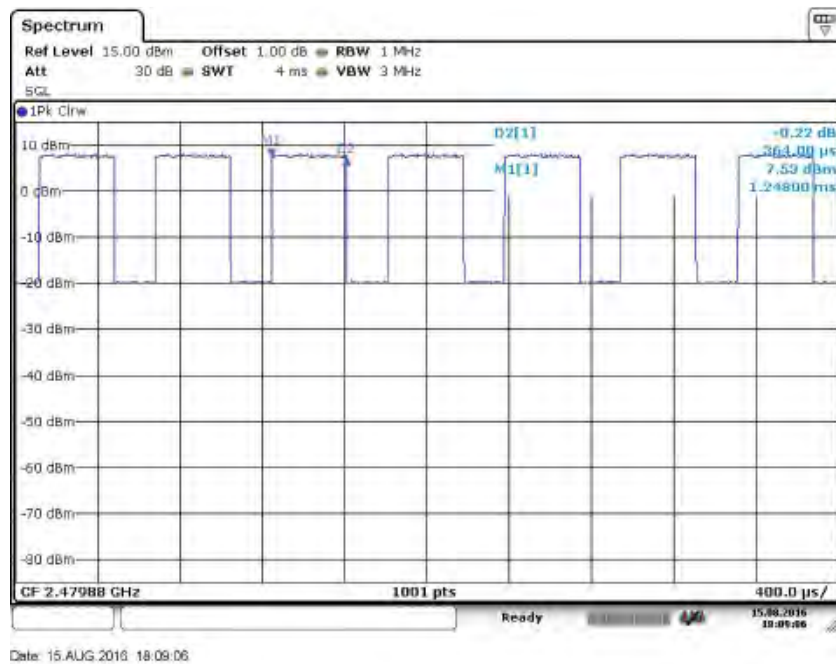
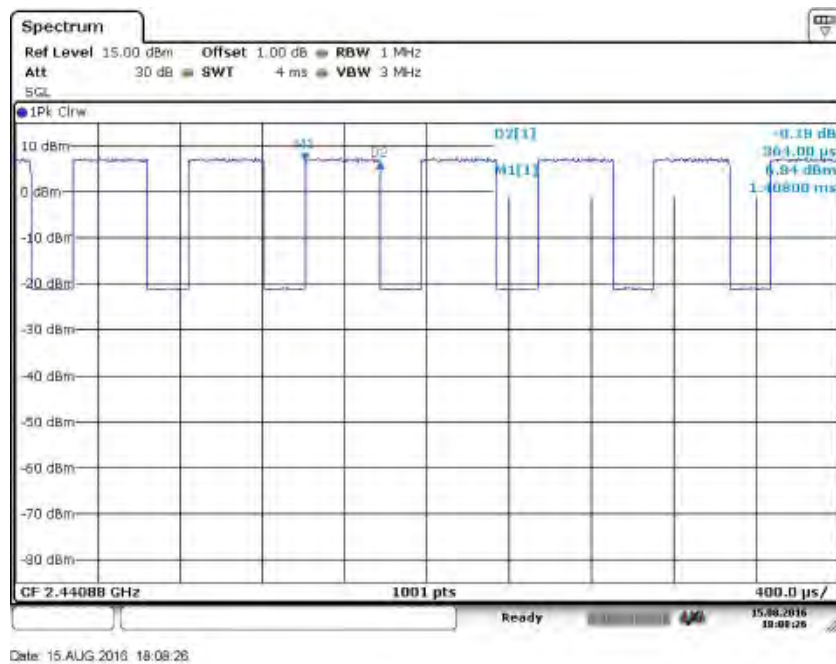
Hopping Mode



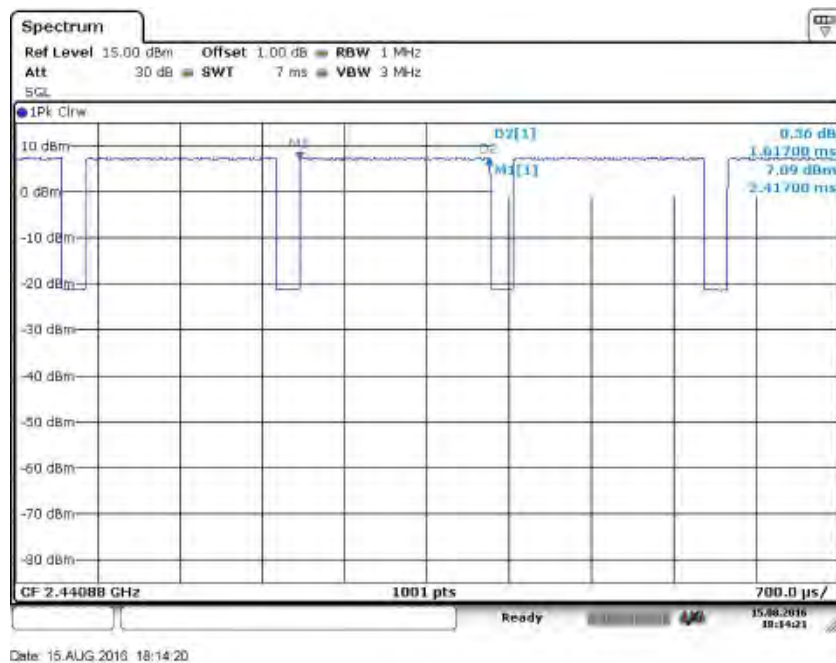
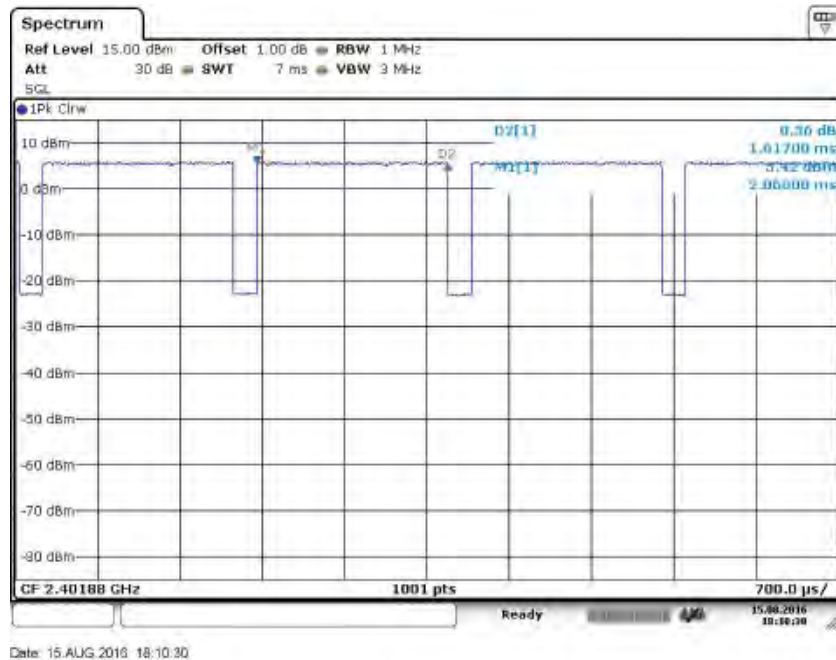
Appendix A.9: Test Plots of Time of Occupancy

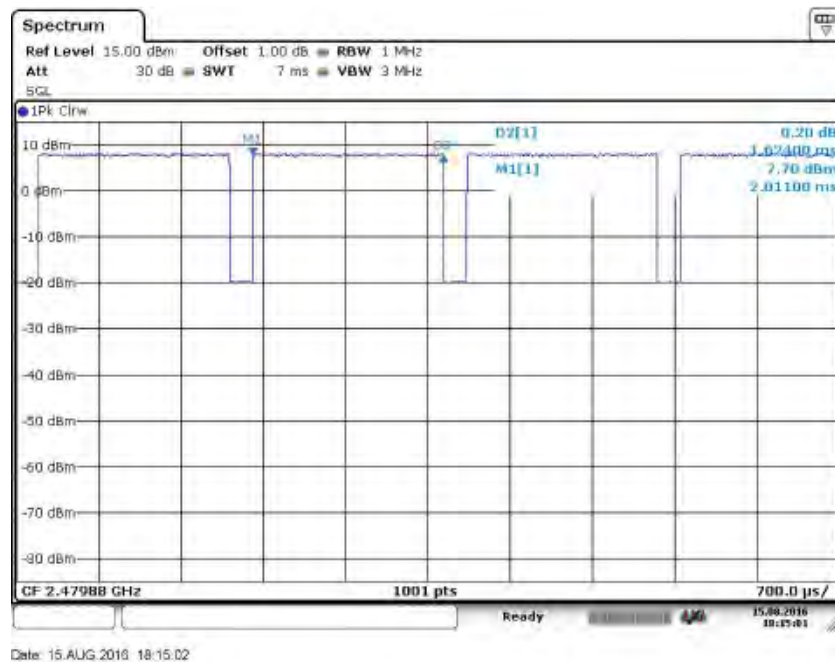
BDR Mode, DH1



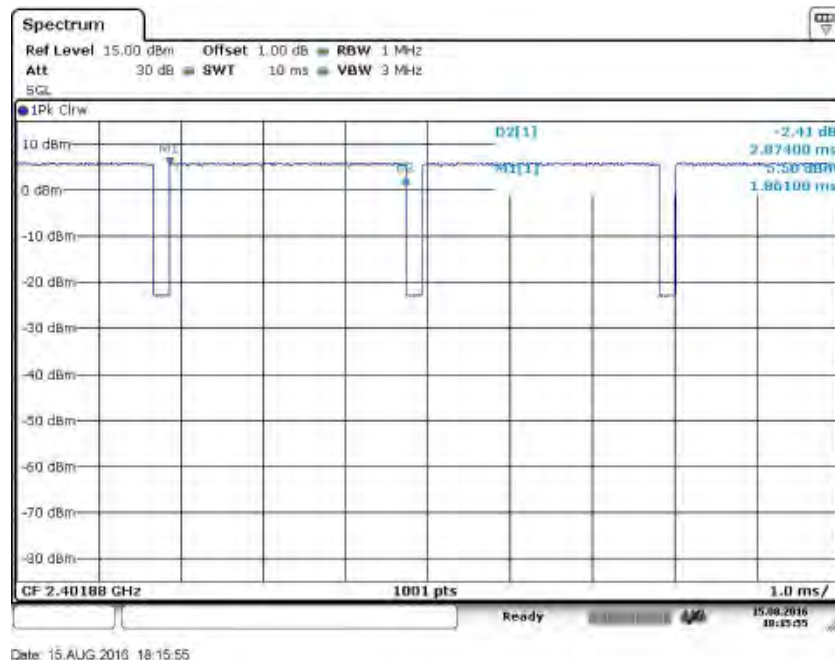


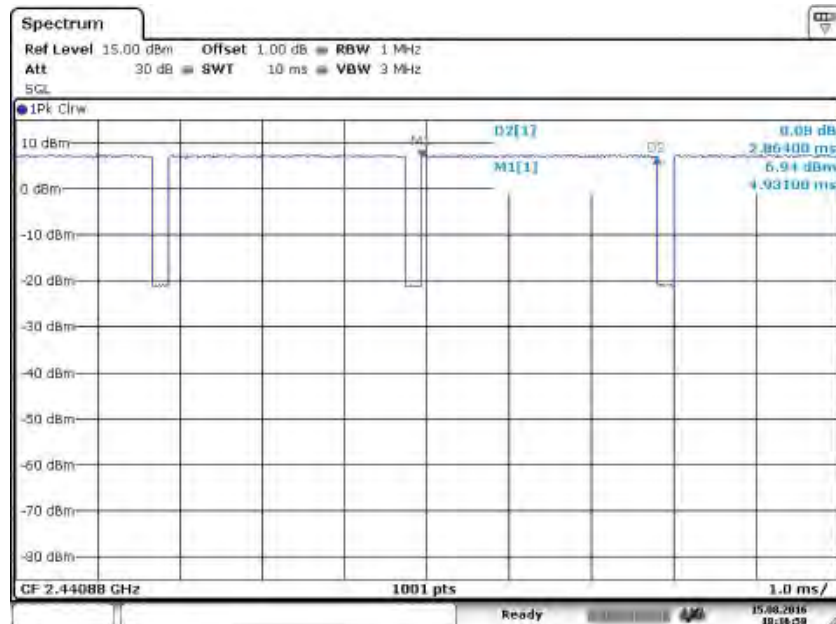
BDR Mode, DH3



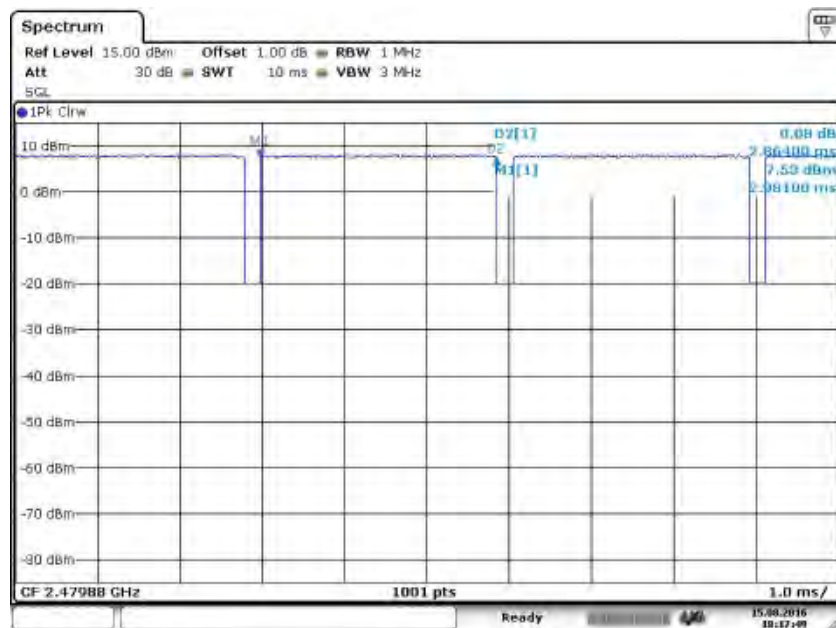


BDR Mode, DH5



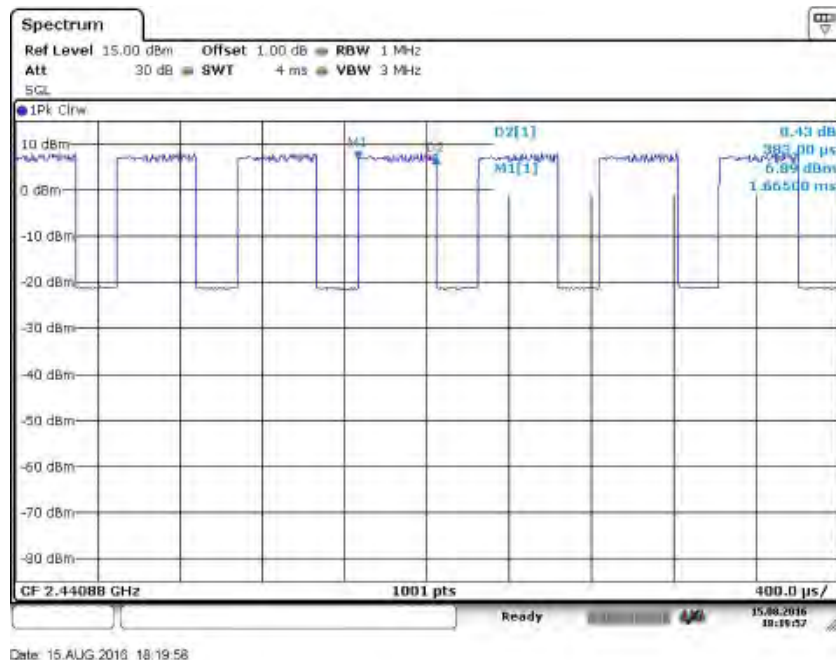
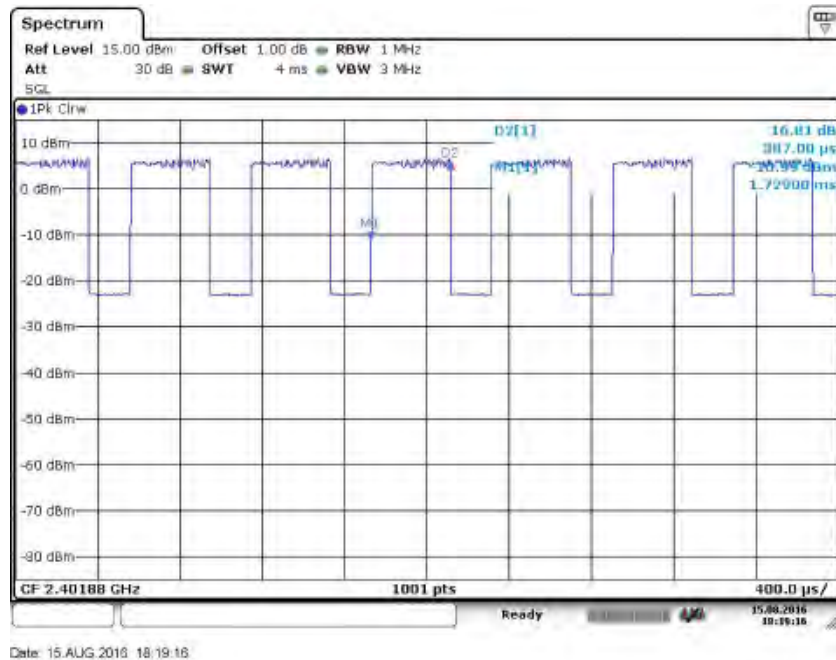


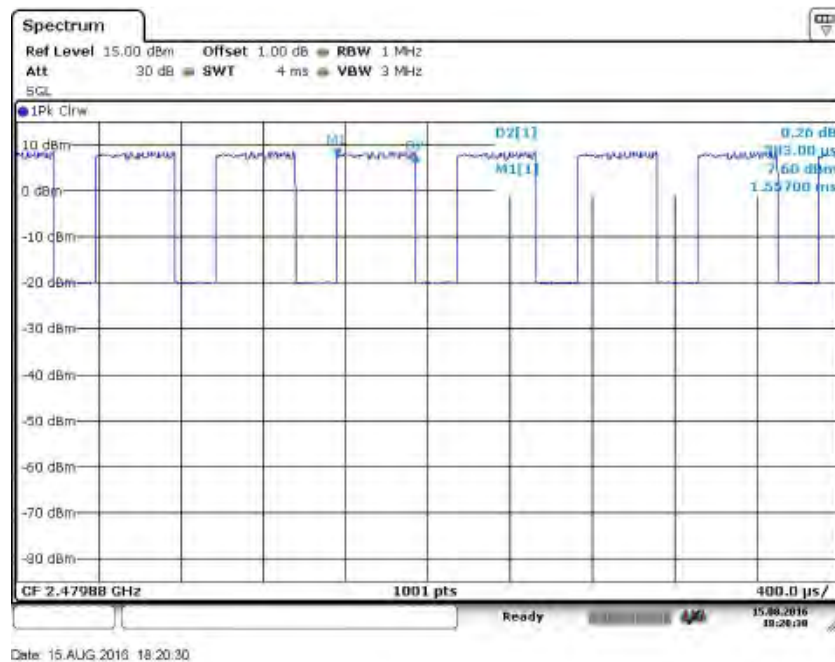
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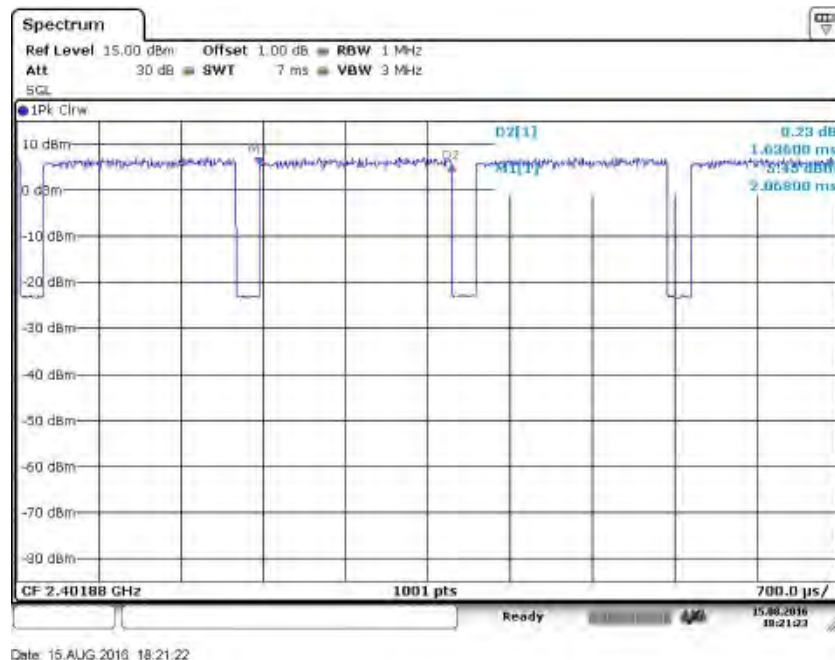
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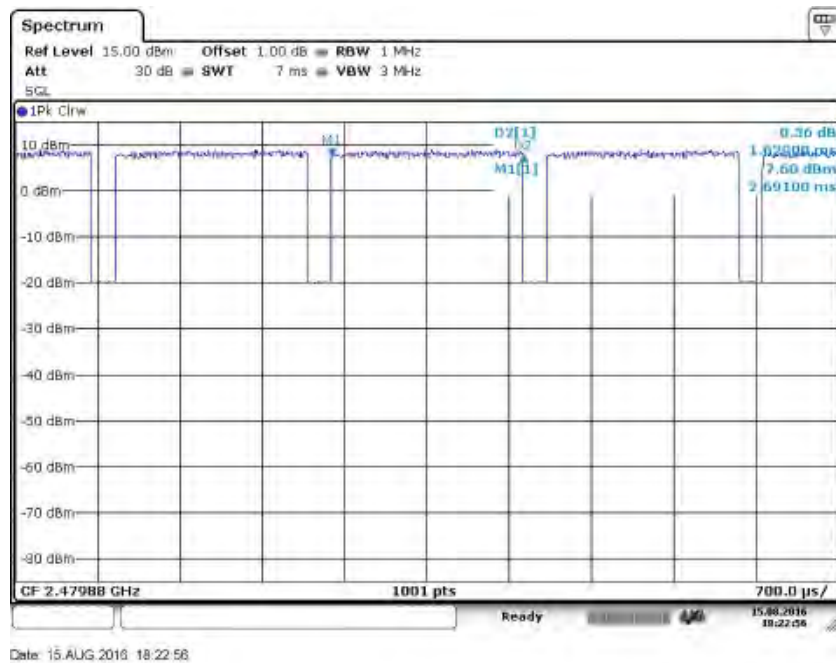
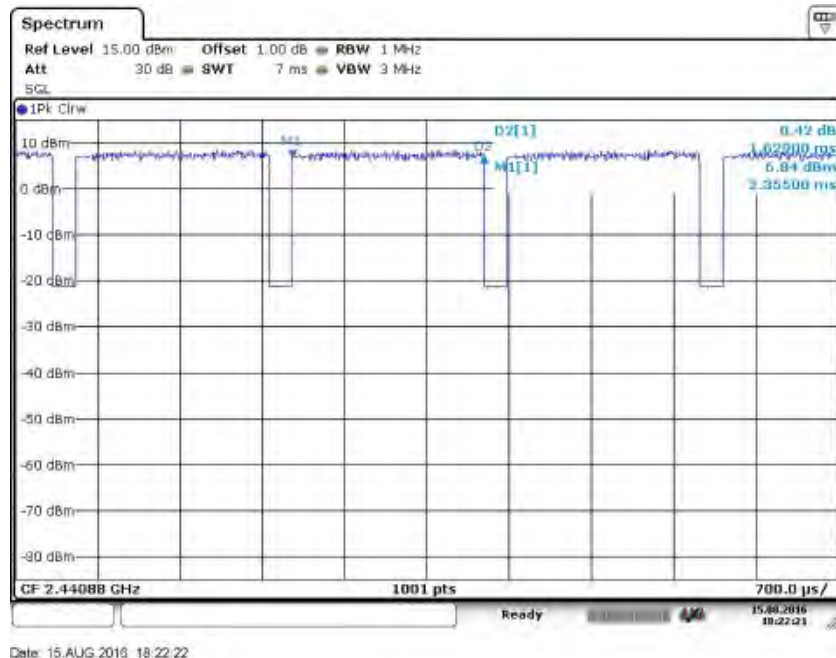
EDR Mode, 3DH1



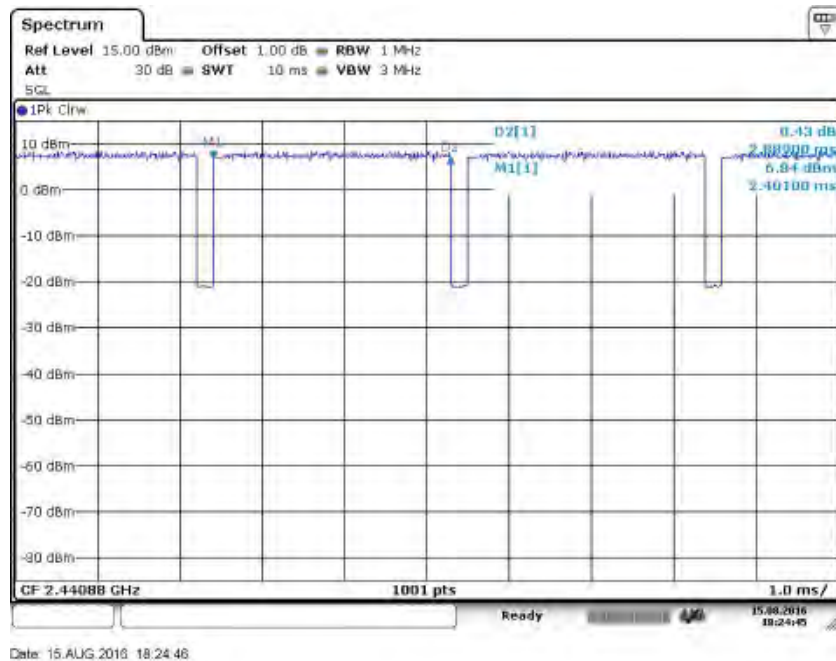
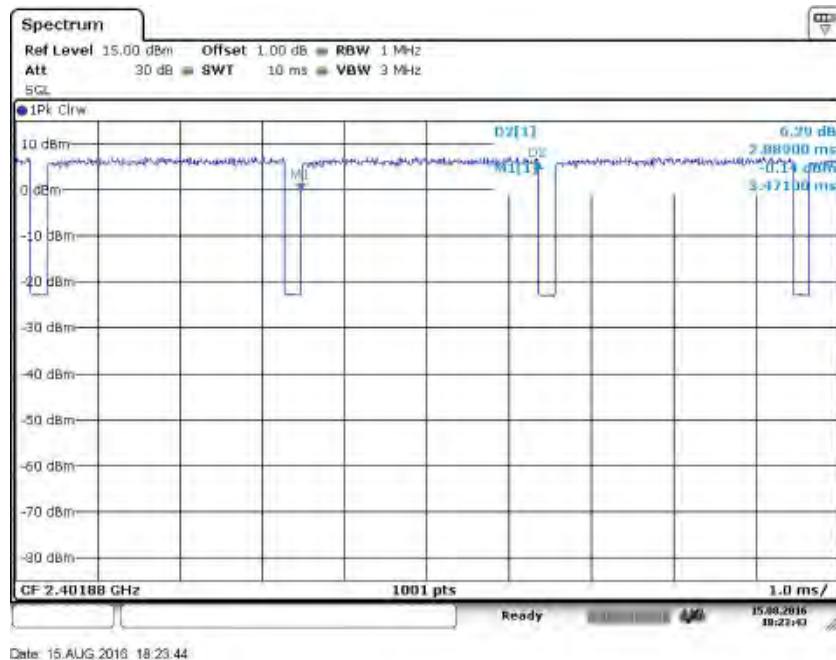


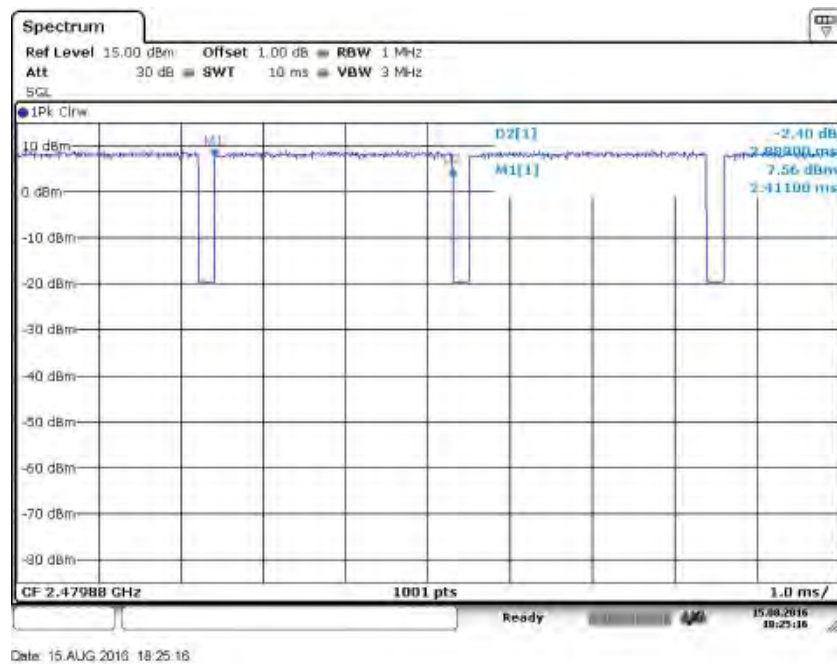
EDR Mode, 3DH3





EDR Mode, 3DH5





Appendix B

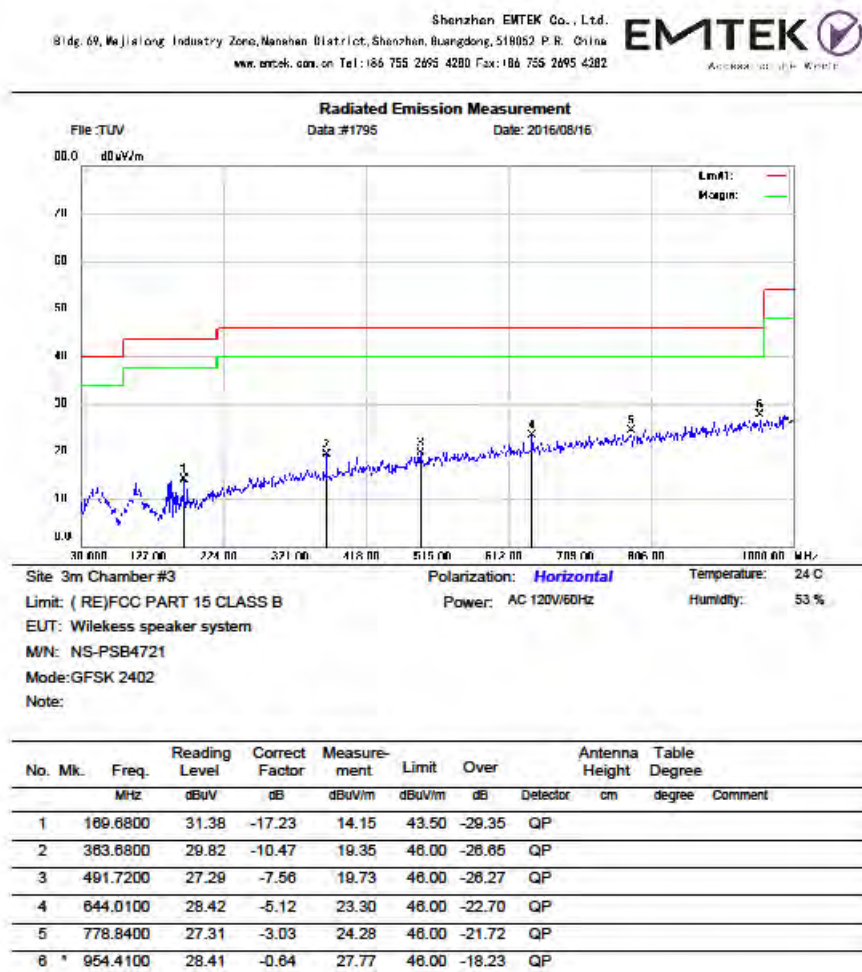
Test Results of Bluetooth 4.2 (Dual mode) of Radiated Emission and AC Conducted Emission

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Note: The radiated spurious emission were measured from 9KHz to 26.5GHz, the measurements from 9KHz-30MHz with active loop antenna were greater than 20dB below the limit, so the radiated Spurious Emissions (9kHz – 30MHz) tests were recorded but not showed in the appendix B.

Appendix B.1: Test Plots of Radiated Spurious Emission

BDR mode, 30MHz - 1GHz



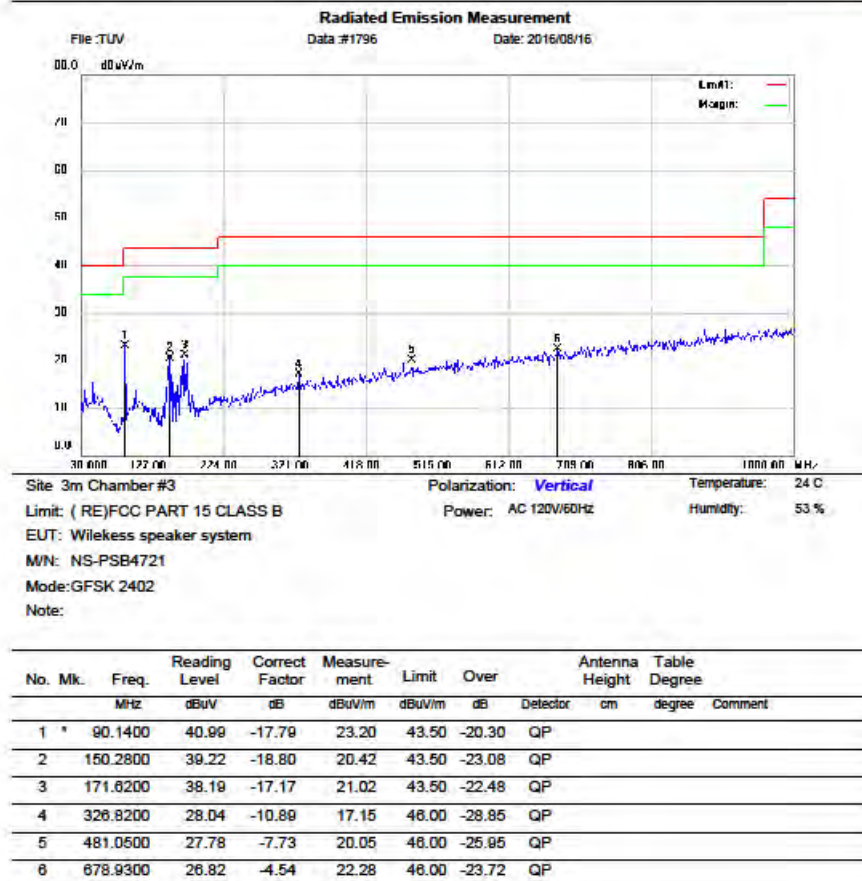
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1795

Page: 1

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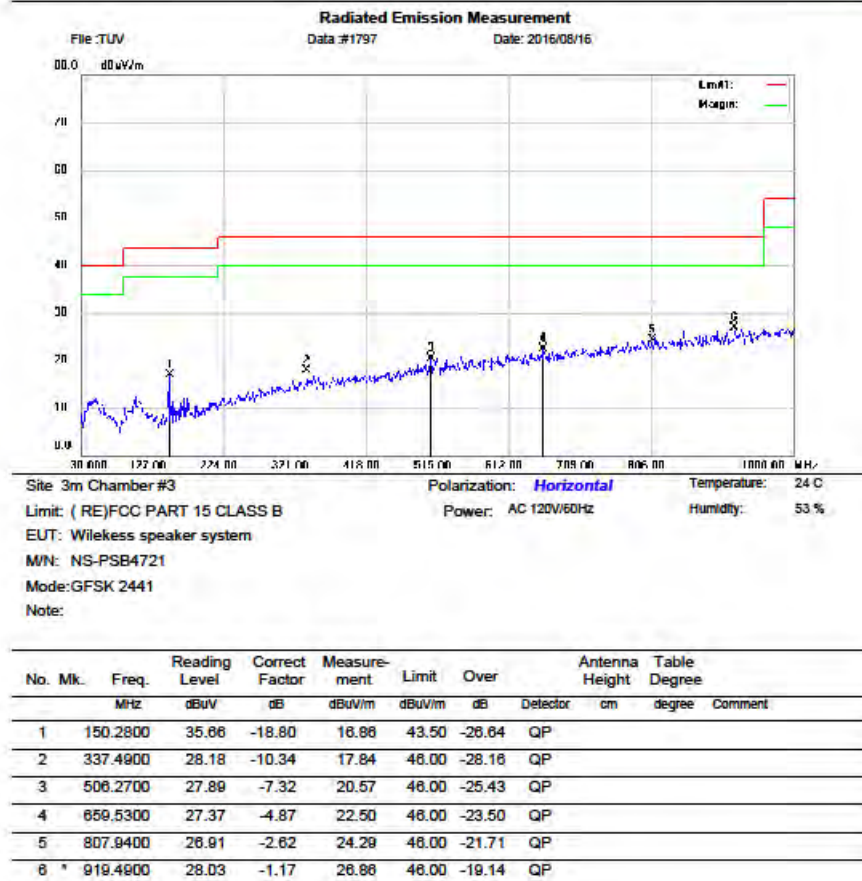
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUV\Data #1796

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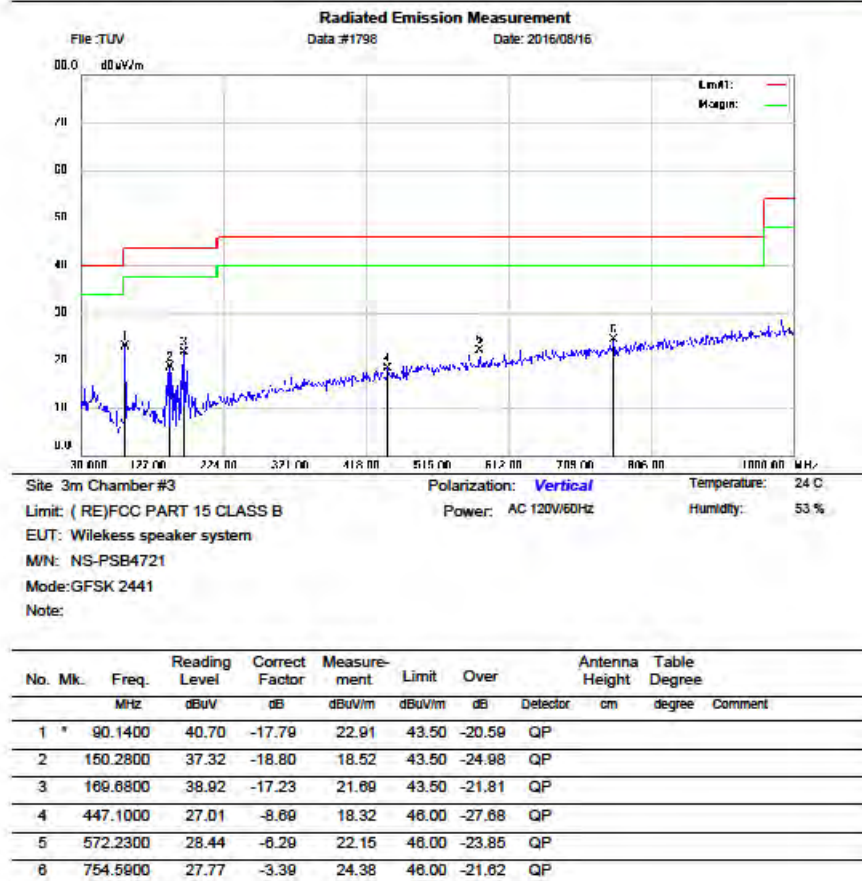
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1797

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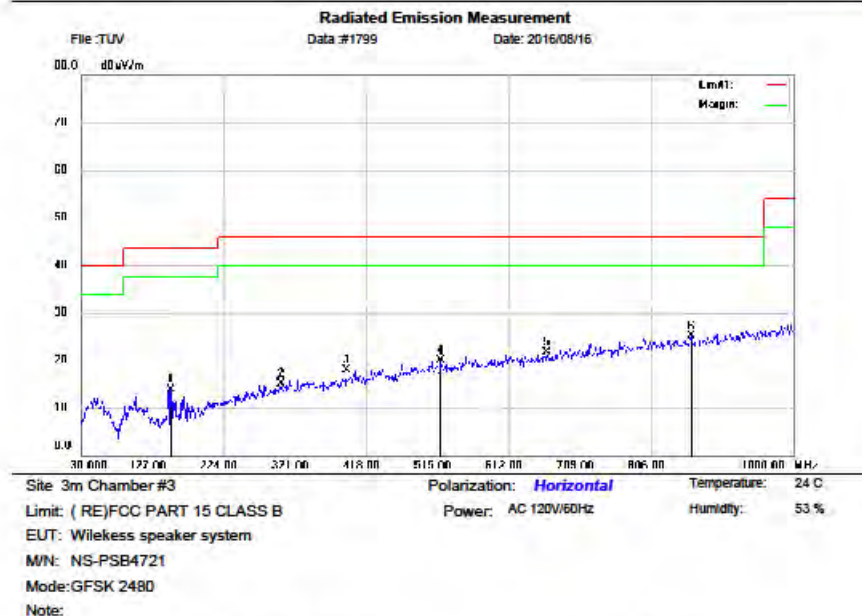
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1798

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		152.2200	32.71	-18.71	14.00	43.50	-29.50	QP		
2		301.8000	26.58	-11.48	15.10	48.00	-30.90	QP		
3		390.8400	27.55	-9.69	17.86	48.00	-28.14	QP		
4		519.8500	26.94	-7.11	19.83	48.00	-26.17	QP		
5		864.3800	26.52	-4.78	21.74	48.00	-24.26	QP		
6	*	880.3200	27.09	-1.96	25.13	48.00	-20.87	QP		

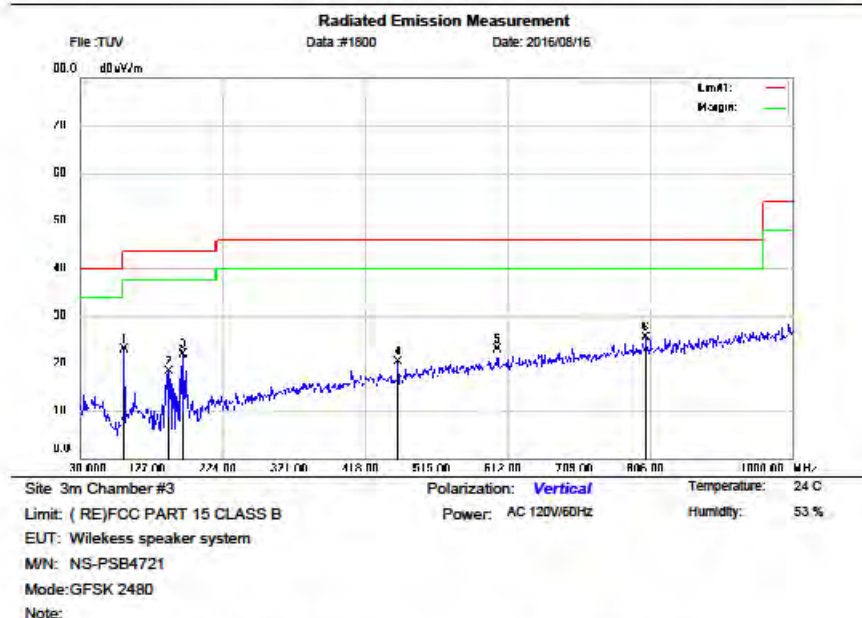
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1799

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		90.1400	40.70	-17.79	22.91	43.50	-20.59	QP		
2		150.2800	37.01	-18.80	18.21	43.50	-25.29	QP		
3		169.6800	39.23	-17.23	22.00	43.50	-21.50	QP		
4		402.6200	29.11	-8.73	20.38	46.00	-25.62	QP		
5		508.4200	28.71	-5.87	22.84	46.00	-23.16	QP		
6 *		800.1800	28.15	-2.72	25.43	46.00	-20.57	QP		

*:Maximum data x:Over limit f:over margin

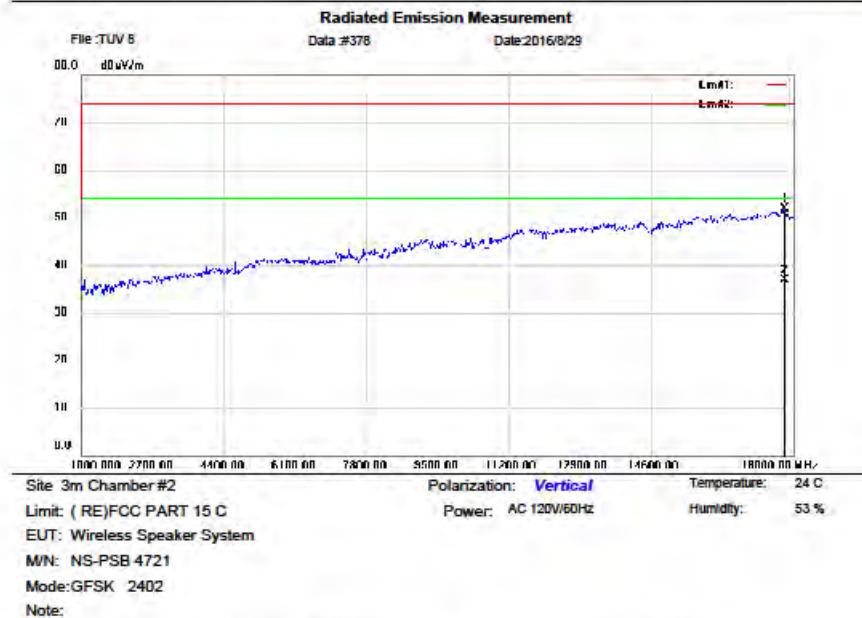
Operator: KK

File: TUV\Data #1800

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BDR mode, 1GHz - 18GHz

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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		17779.00	51.88	0.23	51.91	74.00	-22.09	peak	0	
2	*	17779.00	38.67	0.23	38.90	54.00	-17.10	AVG	0	

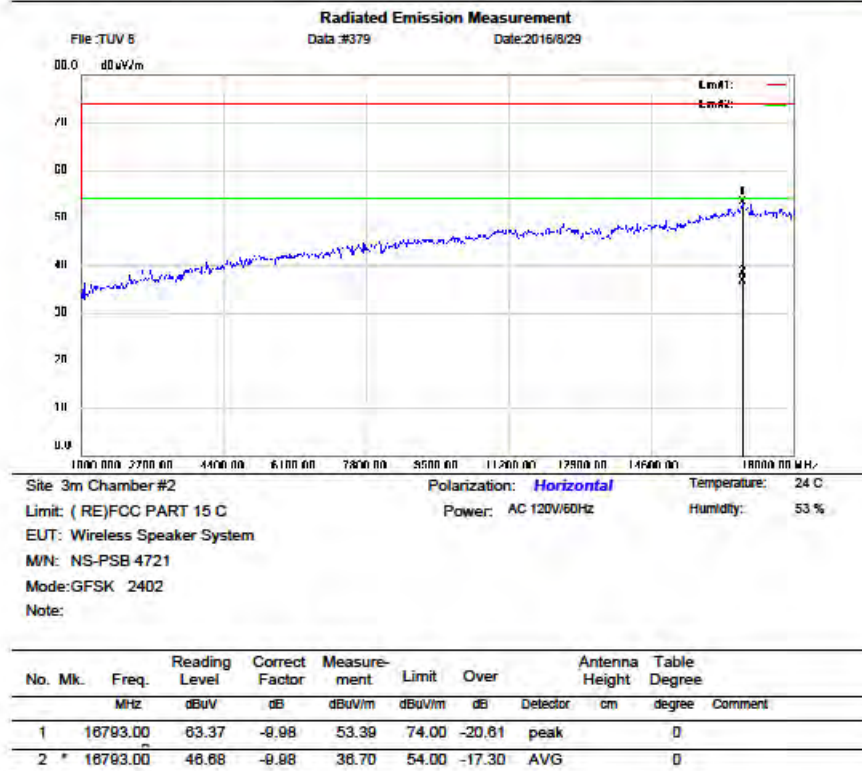
*: Maximum data x: Over limit f: over margin

Operator:

File: TUV 8 Data: #378

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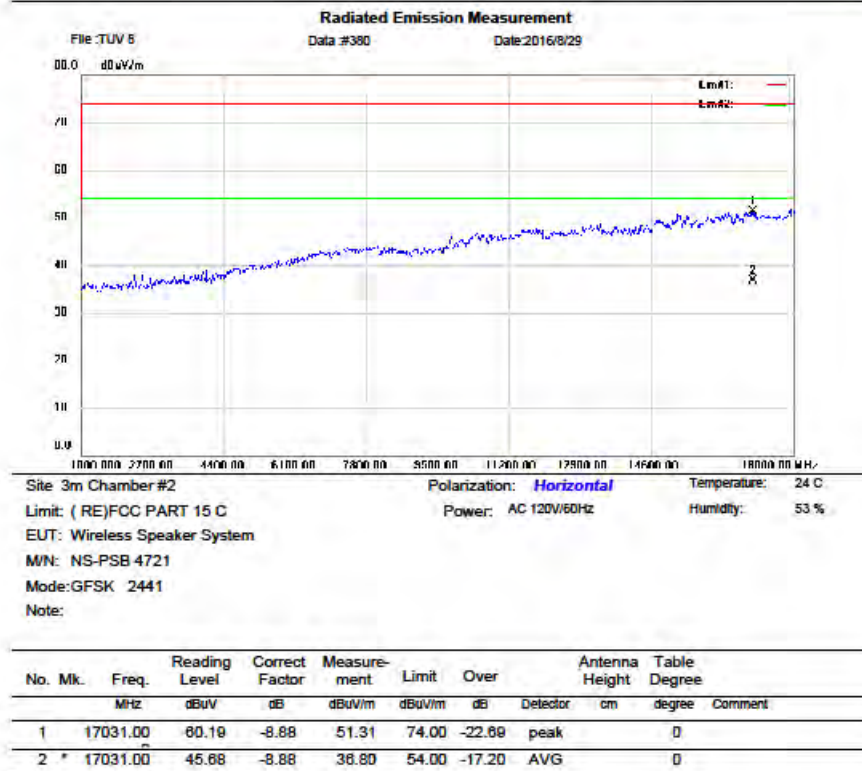
*:Maximum data x:Over limit f:over margin

Operator:

File: TUV 5 \Data: #379

Page: 1

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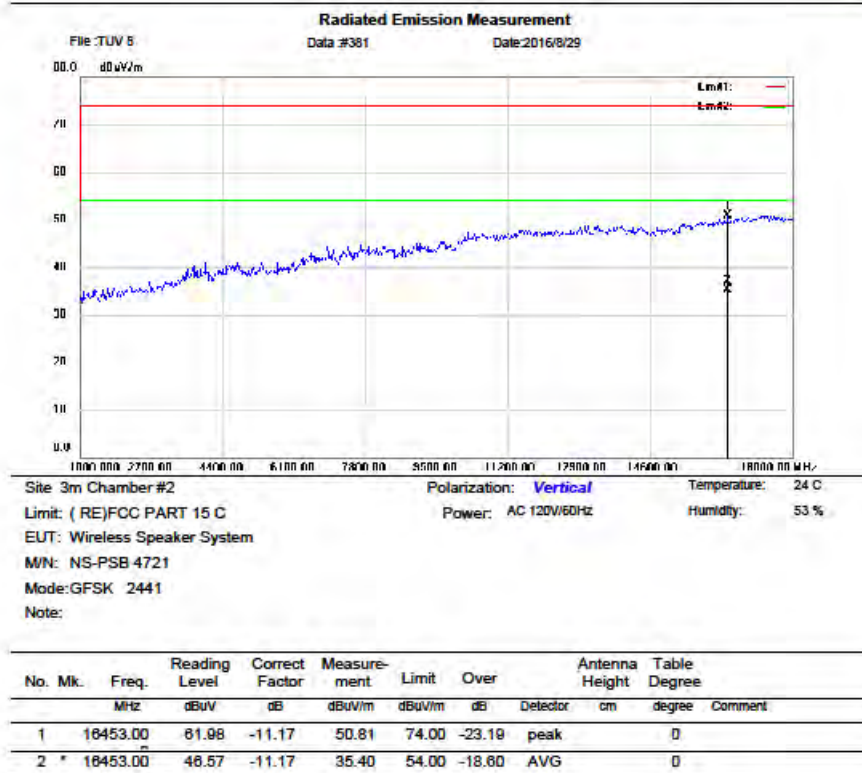
*: Maximum data x: Over limit l: over margin

Operator:

File: TUV 5/Data: #380

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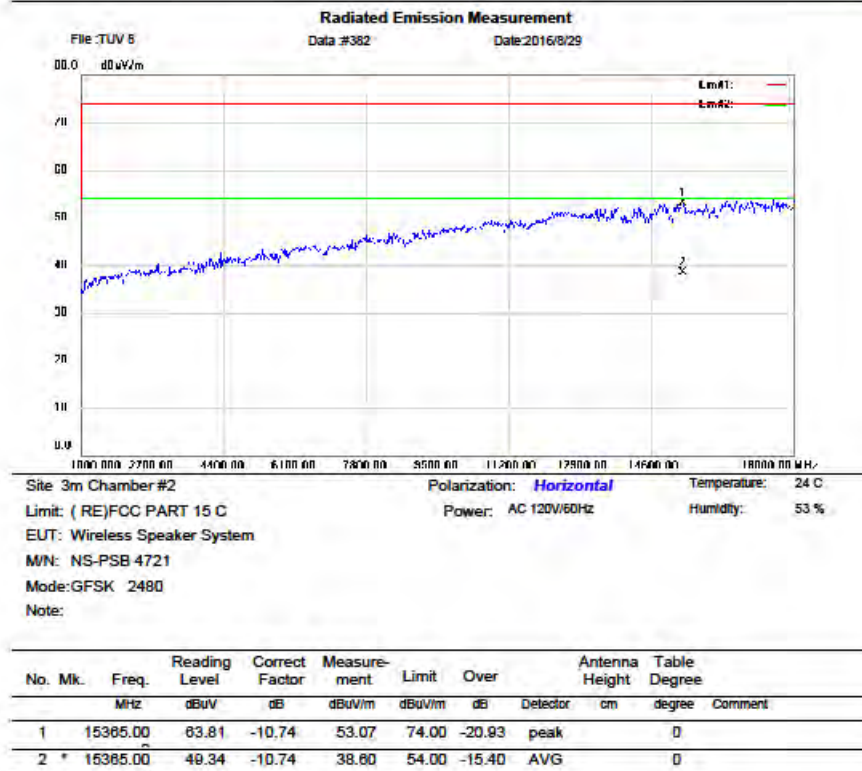
*:Maximum data x:Over limit f:over margin

Operator:

File: TUV 5/Data #381

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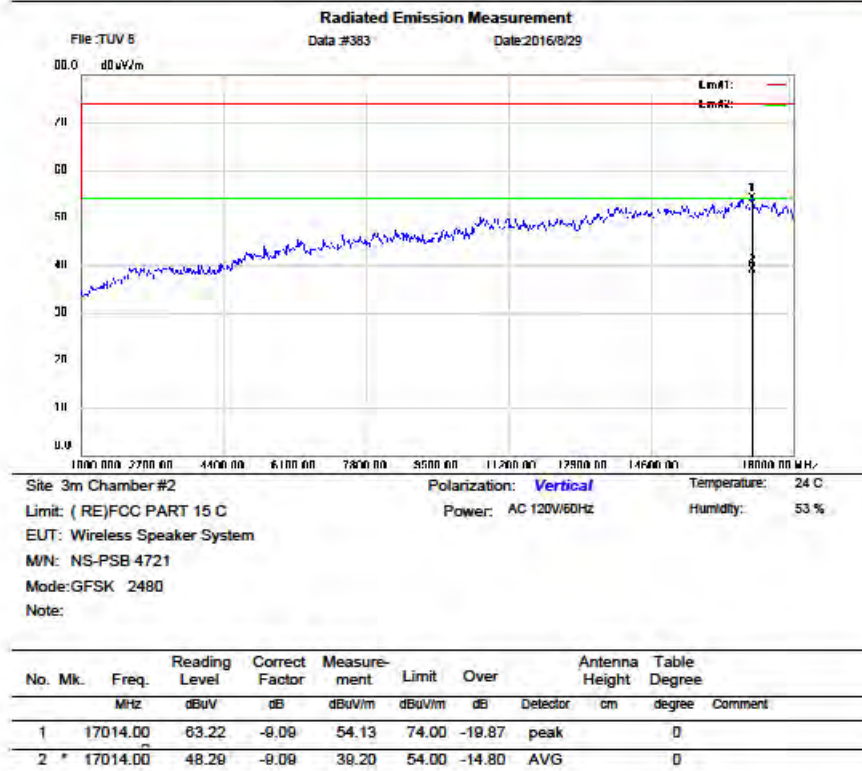
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5 Data #382

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*: Maximum data x: Over limit f: over margin

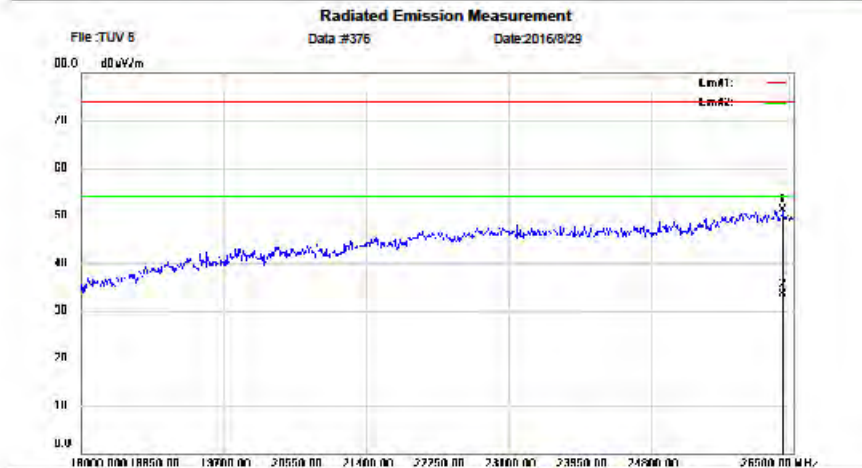
Operator: KK

File: TUV 5 Data #383

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BDR mode, 18GHz - 26.5GHz

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Site: 3m Chamber #2 Polarization: **Horizontal** Temperature: 24 C
Limit: (RE) FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: GFSK 2402
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		26372.50	86.82	-35.34	51.28	74.00	-22.72	peak	0	
2	*	26372.50	88.84	-35.34	33.50	54.00	-20.50	AVG	0	

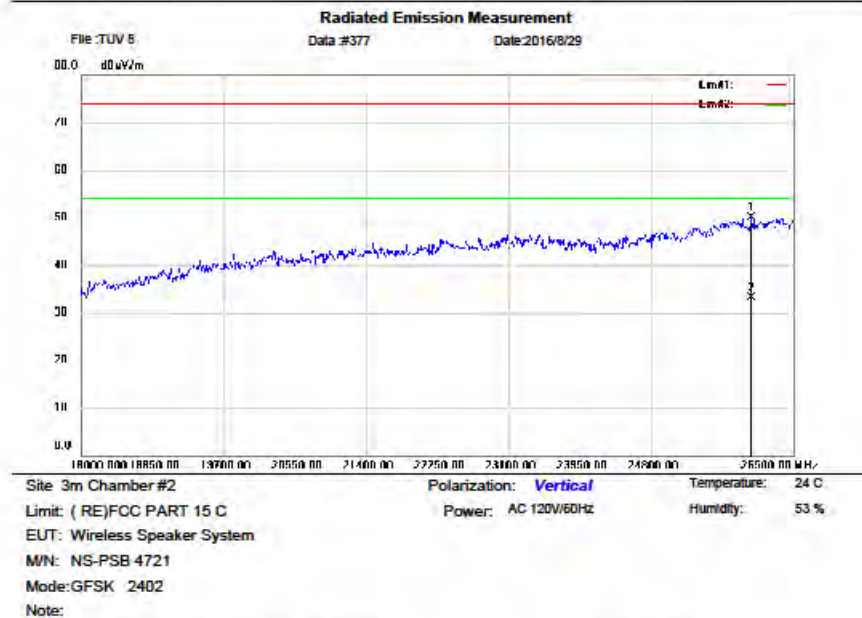
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 8/Data: #376

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		25000.50	85.87	-35.79	50.08	74.00	-23.92	peak	0
2	*	25000.50	88.89	-35.79	33.10	54.00	-20.90	AVG	0

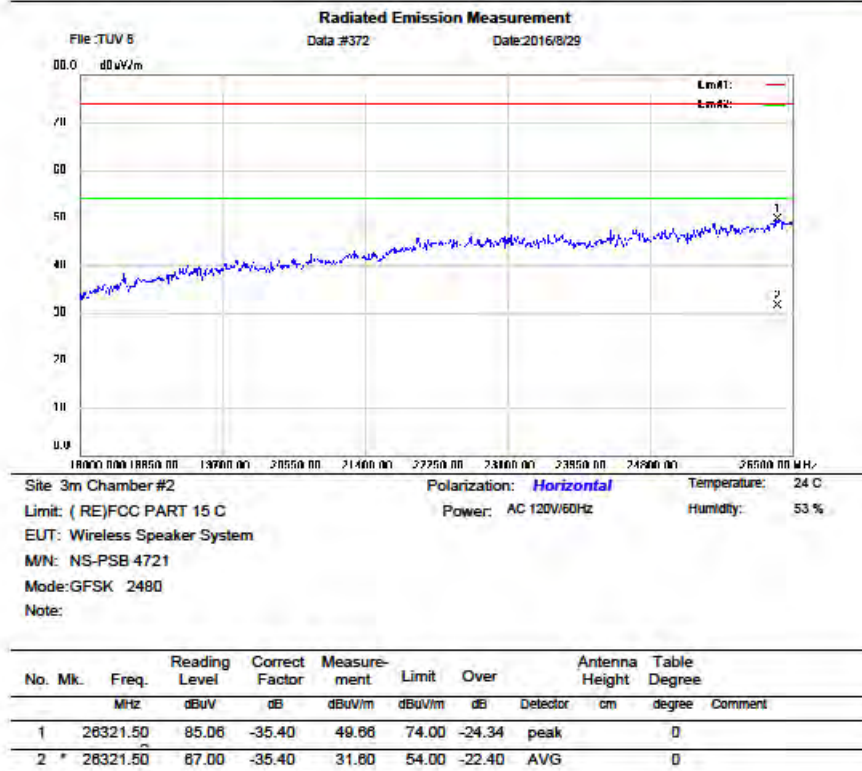
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5/Data: #377

Page: 1

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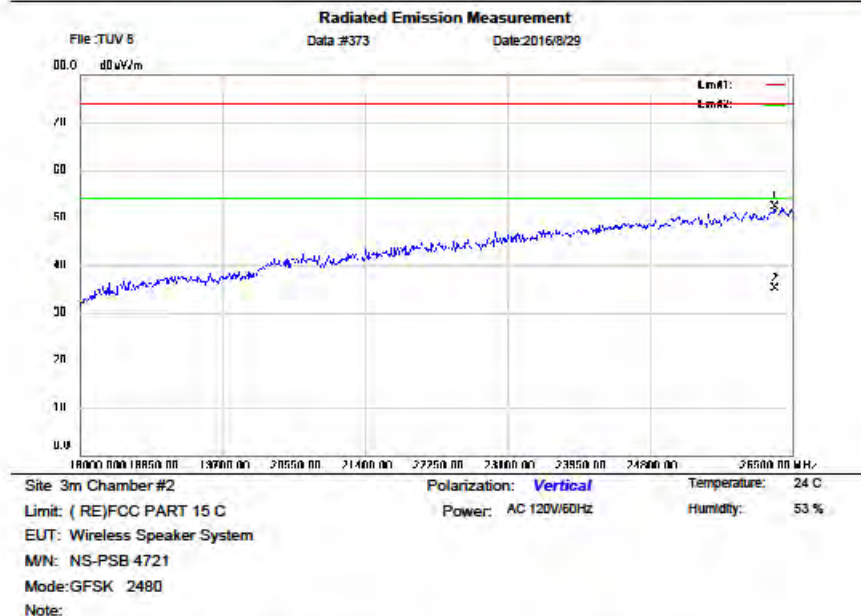
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5 Data: #372

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		26287.50	87.86	-35.44	52.22	74.00	-21.78	peak	0
2	*	26287.50	70.64	-35.44	35.20	54.00	-18.80	AVG	0

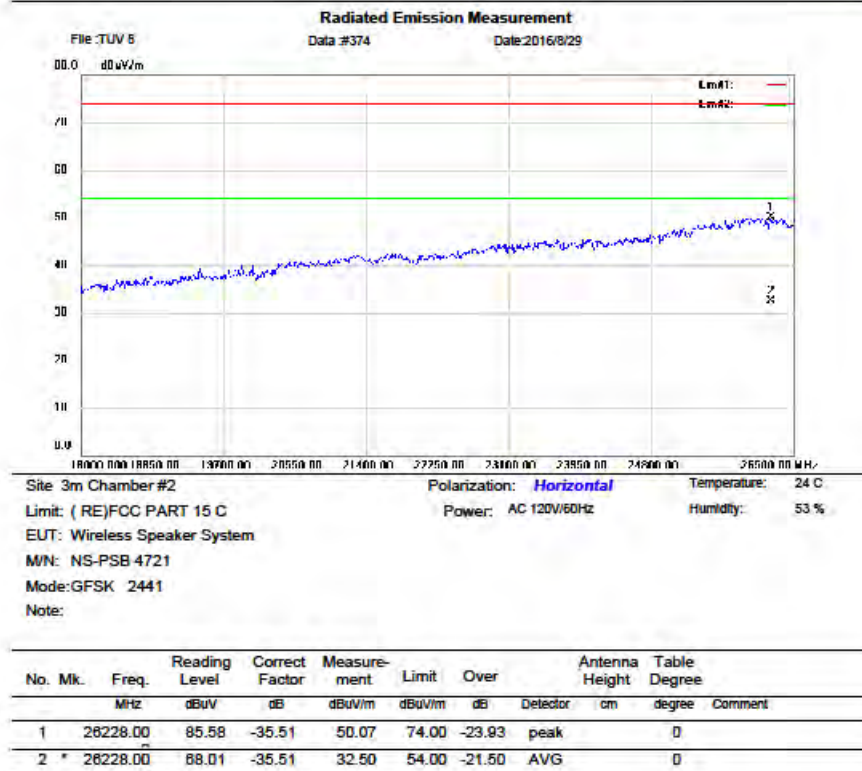
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5 Data: #373

Page: 1

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*: Maximum data x: Over limit f: over margin

Operator: KK

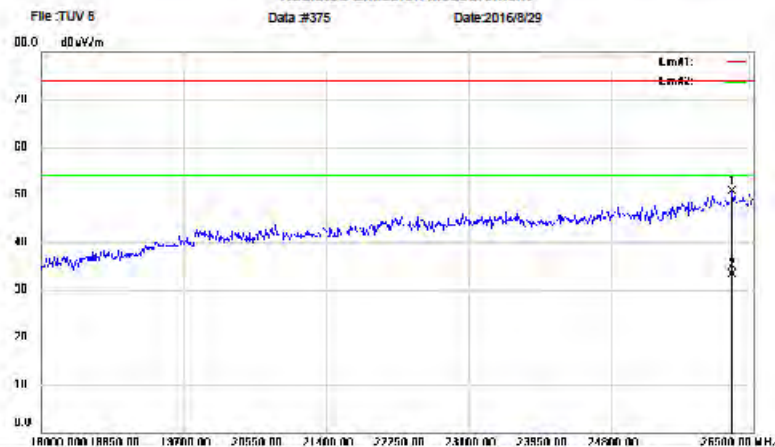
File: TUV 5/Data: #374

Page: 1

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Radiated Emission Measurement



Site: 3m Chamber #2 Polarization: **Vertical** Temperature: 24 C
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: GFSK 2441
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm
1		26245.00	86.26	-35.49	50.77	74.00	-23.23	peak	0
2	*	26245.00	88.89	-35.49	33.40	54.00	-20.60	AVG	0

*: Maximum data x: Over limit f: over margin

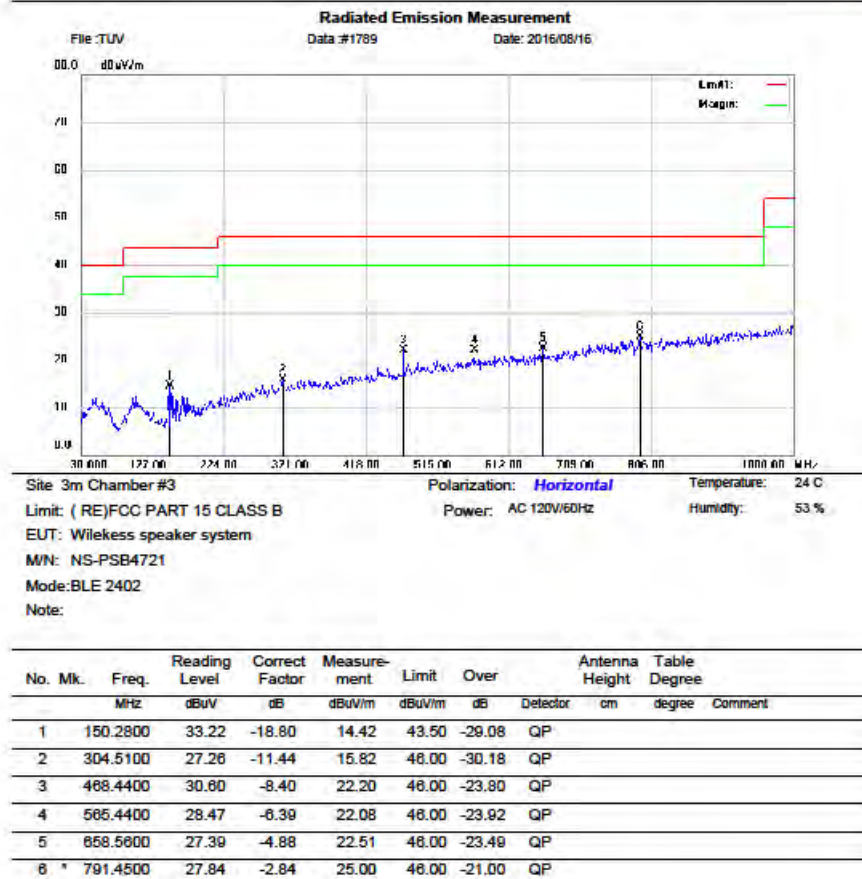
Operator: KK

File: TUV 5 \Data #375

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Low Energy mode, 30MHz - 1GHz

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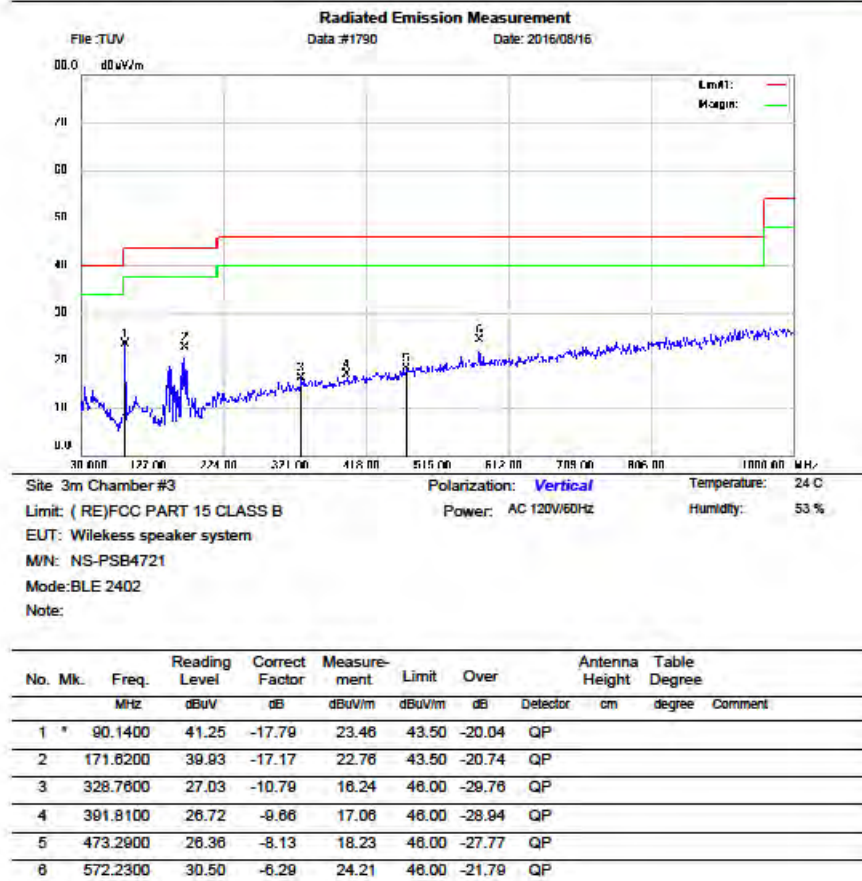
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUVData #1789

Page: 1

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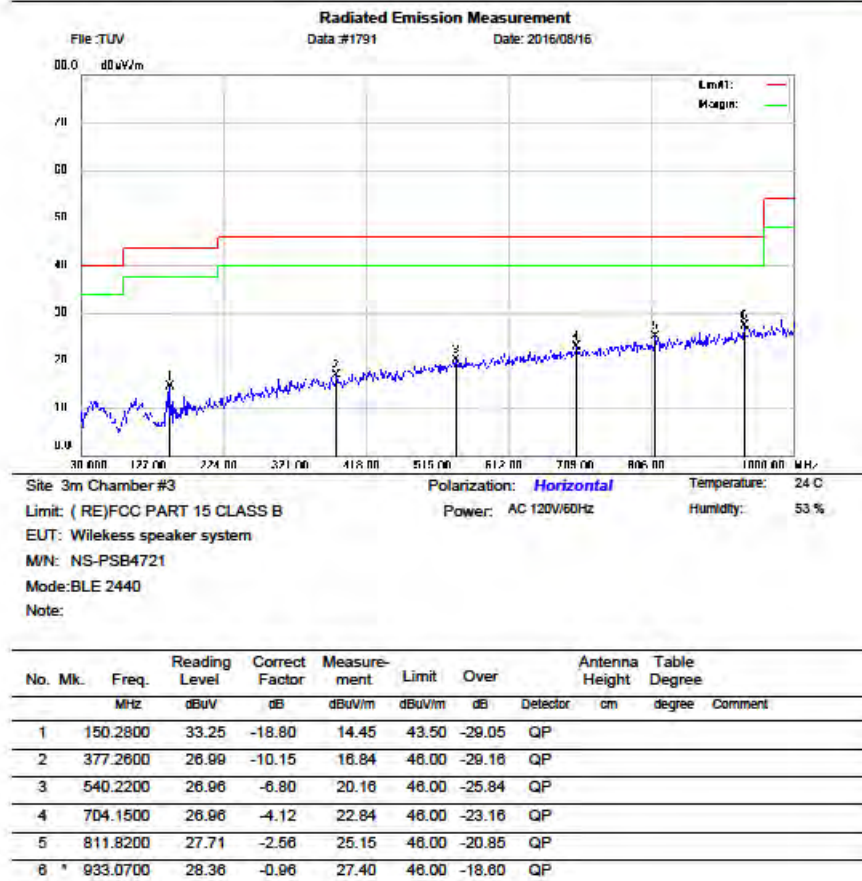
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1790

Page: 1

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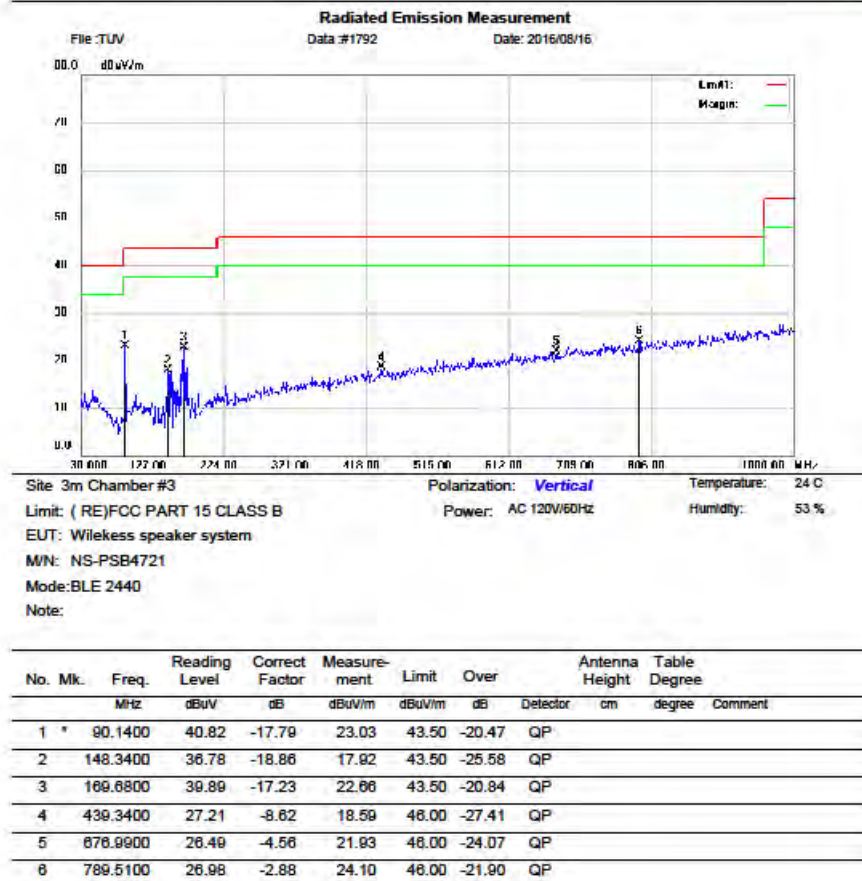
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1791

Page: 1

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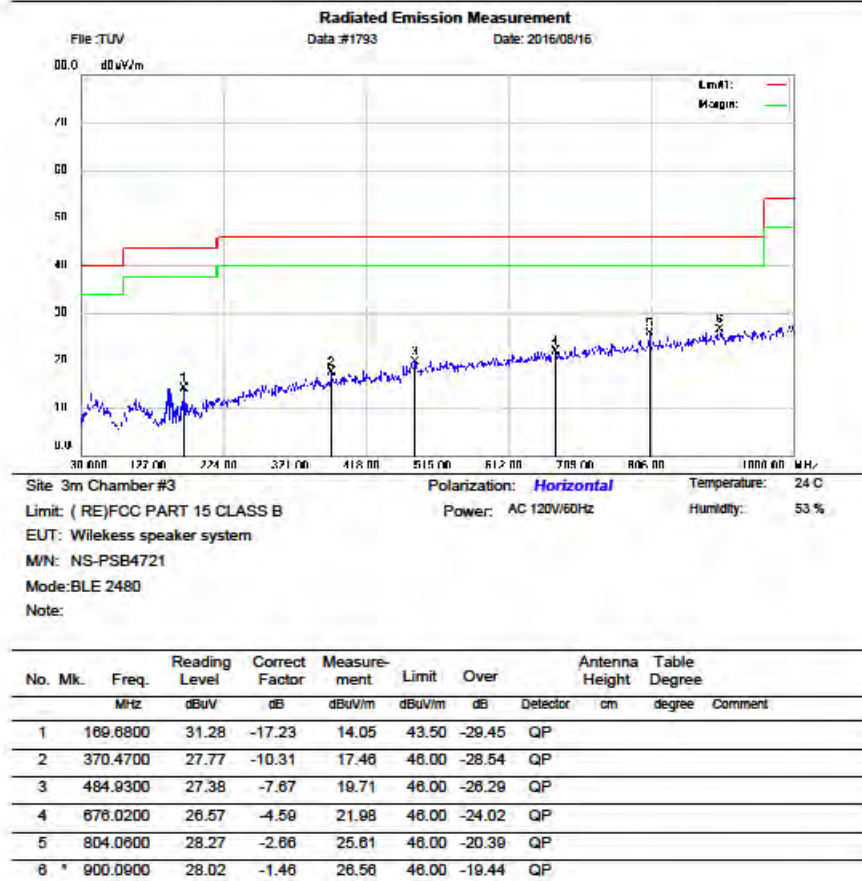
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1792

Page: 1

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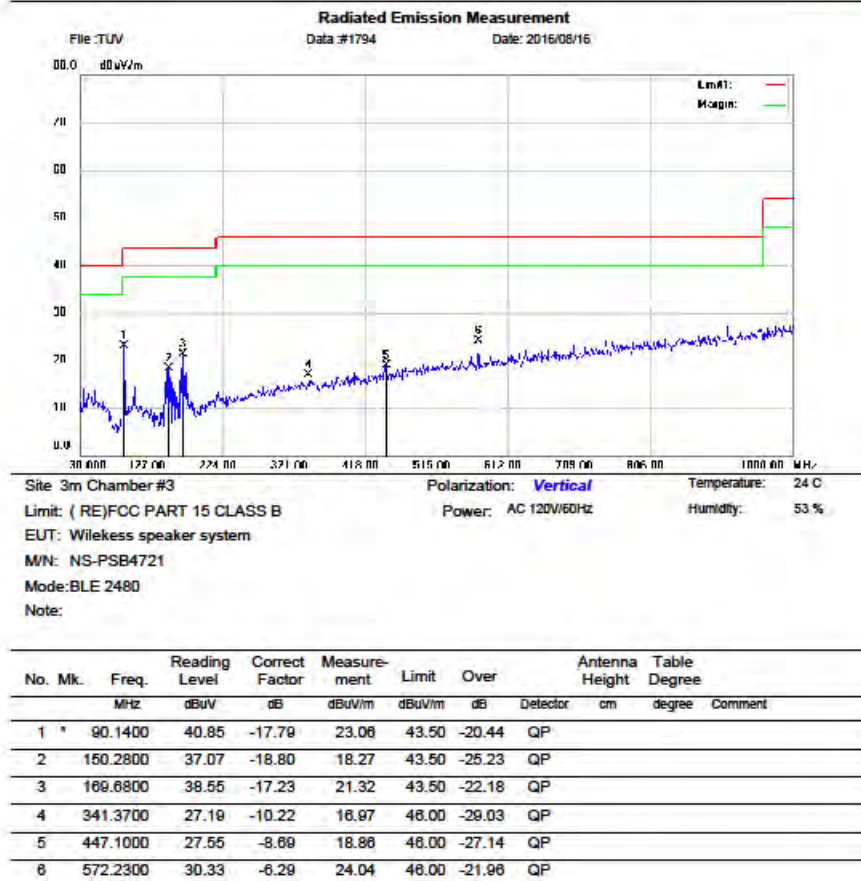
*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1793

Page: 1

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*:Maximum data x:Over limit f:over margin

Operator: KK

File: TUVData #1794

Page: 1

Low Energy mode, 1GHz - 18GHz

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Radiated Emission Measurement

File: TUV 8

Data #392

Date: 2016/8/29



Site: 3m Chamber #2

Polarization: **Horizontal**

Temperature: 24 C

Limit: (RE) FCC PART 15 C

Power: AC 120V/60Hz

Humidity: 53 %

EUT: Wireless Speaker System

M/N: NS-PSB 4721

Mode: BLE 2440

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		16436.00	64.43	-11.23	53.20	74.00	-20.80	peak	0	
2	*	16436.00	49.83	-11.23	38.40	54.00	-15.60	AVG	0	

*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 8/Data #392

Page: 1

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Radiated Emission Measurement

File: TUV 5

Data #393

Date: 2016/8/29



Site: 3m Chamber #2

Polarization: Vertical

Temperature: 24 C

Limit: (RE) FCC PART 15 C

Power: AC 120V/60Hz

Humidity: 53 %

EUT: Wireless Speaker System

M/N: NS-PSB 4721

Mode: BLE 2440

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		16742.00	64.26	-10.16	54.10	74.00	-19.90	peak	0
2 *		16742.00	49.26	-10.16	39.10	54.00	-14.90	AVG	0

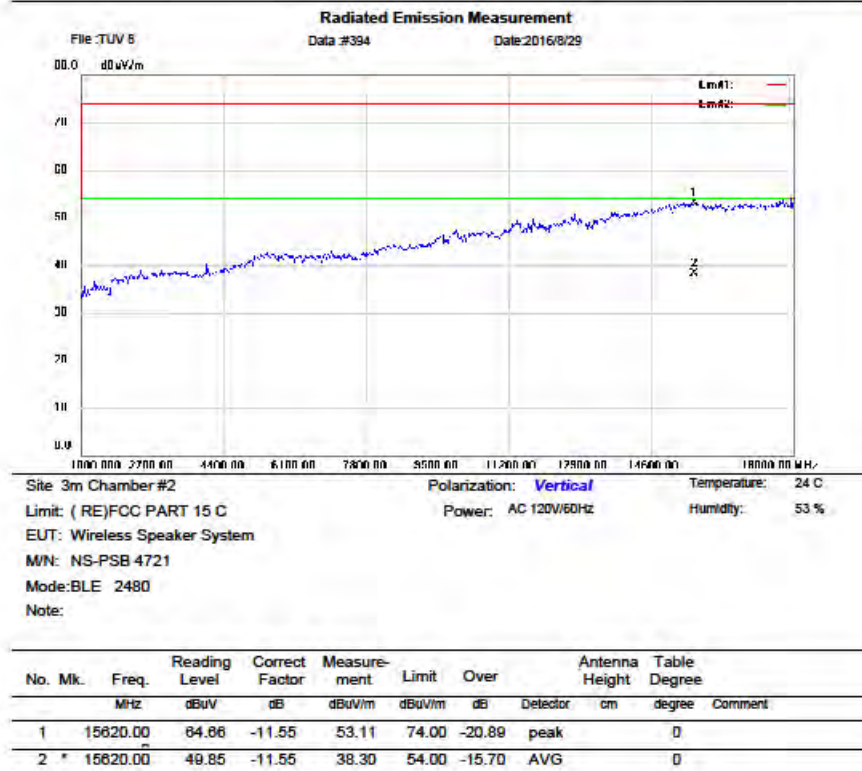
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5/Data #393

Page: 1

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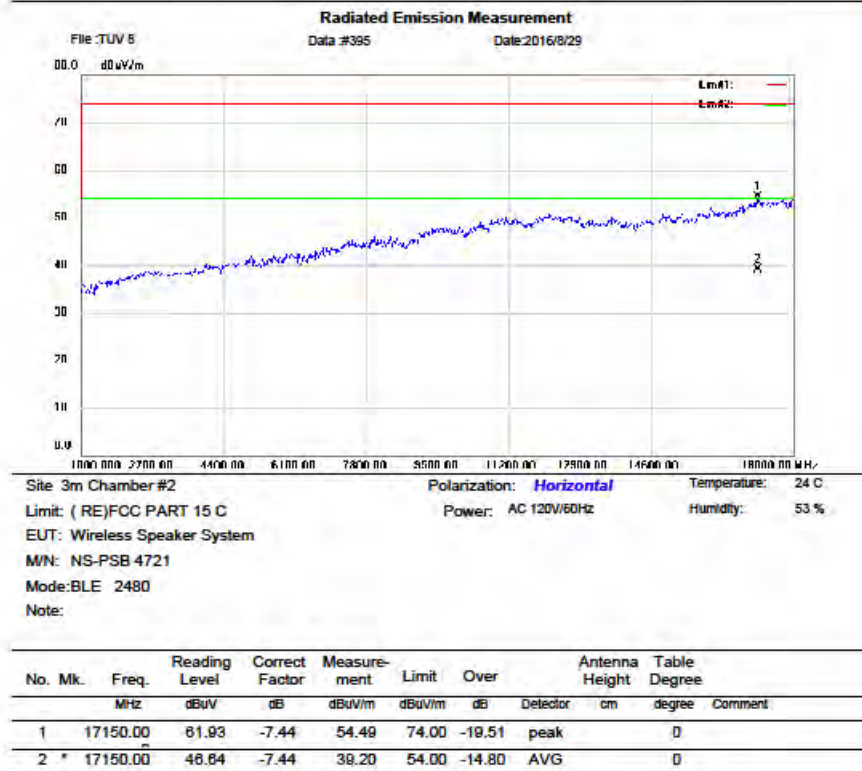
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5/Data #394

Page: 1

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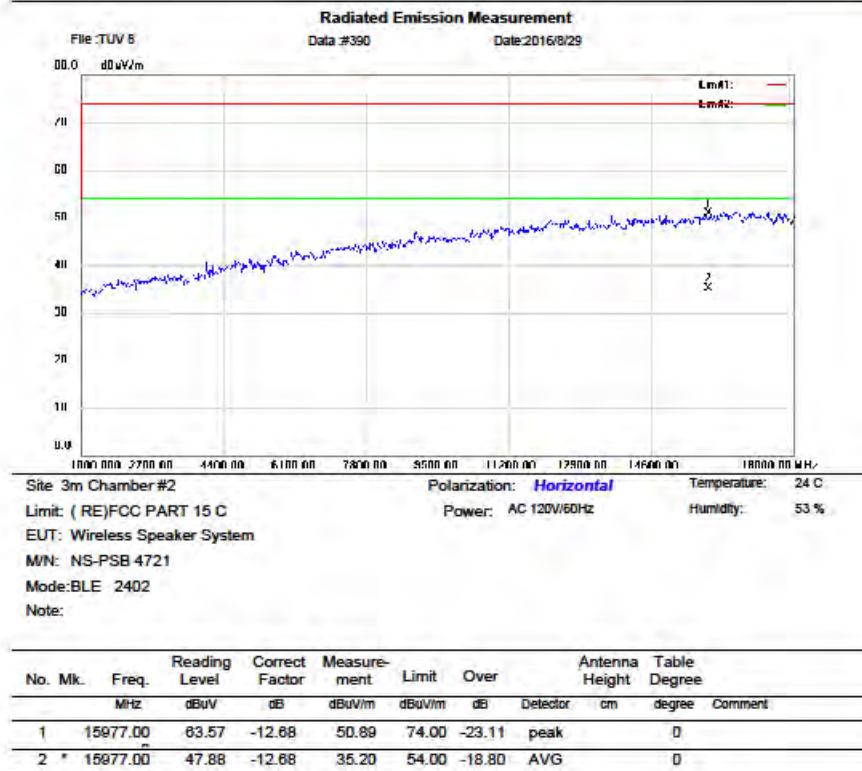
*:Maximum data x:Over limit l:over margin

Operator: KK

File: TUV 5/Data #395

Page: 1

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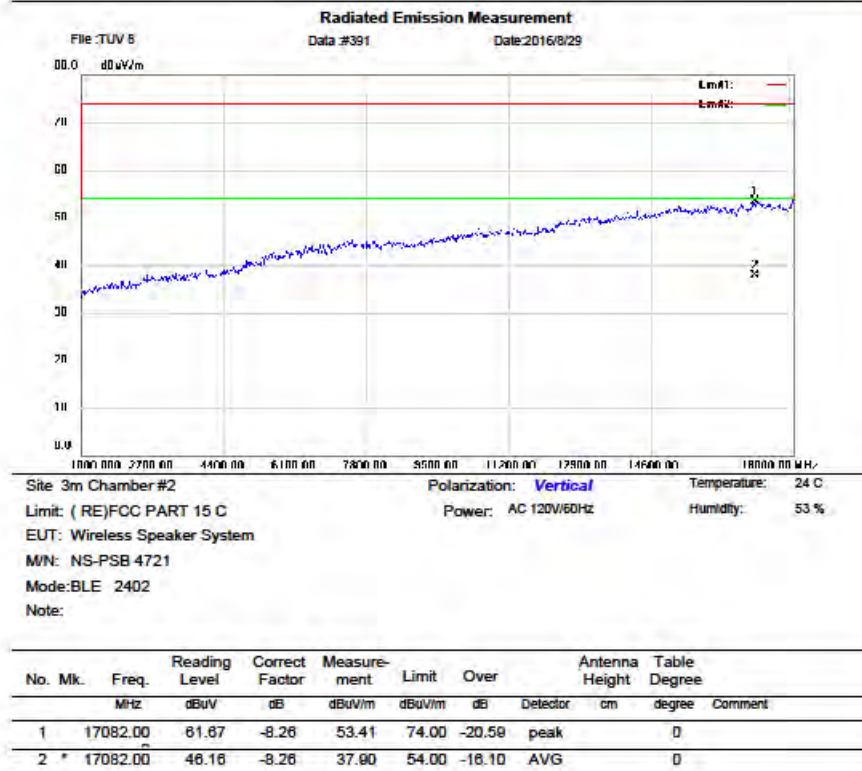
*: Maximum data x: Over limit l: over margin

Operator: KK

File: TUV 5 Data #390

Page: 1

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*: Maximum data x: Over limit f: over margin

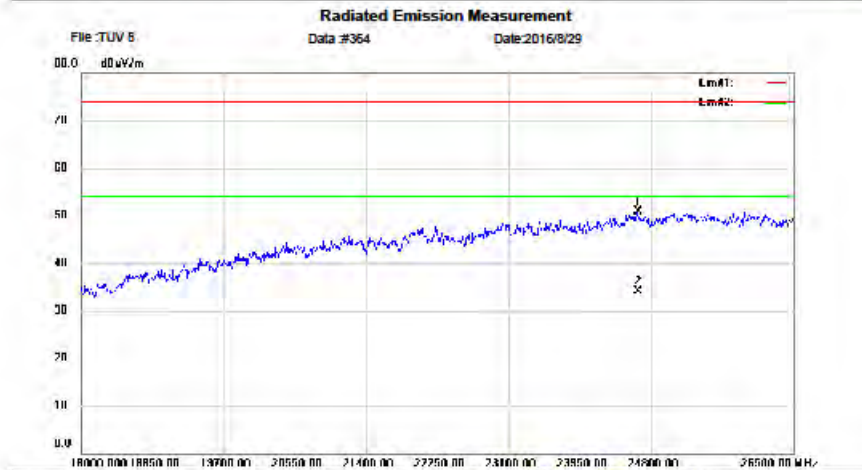
Operator: KK

File: TUV 5 Data #391

Page: 1

Low Energy mode, 18GHz - 26.5GHz

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Site: 3m Chamber #2 Polarization: **Horizontal** Temperature: 24 C
Limit: (RE) FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: BLE 2402
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		24847.00	88.05	-37.05	51.00	74.00	-23.00	peak		0
2	*	24847.00	71.25	-37.05	34.20	54.00	-19.80	AVG		0

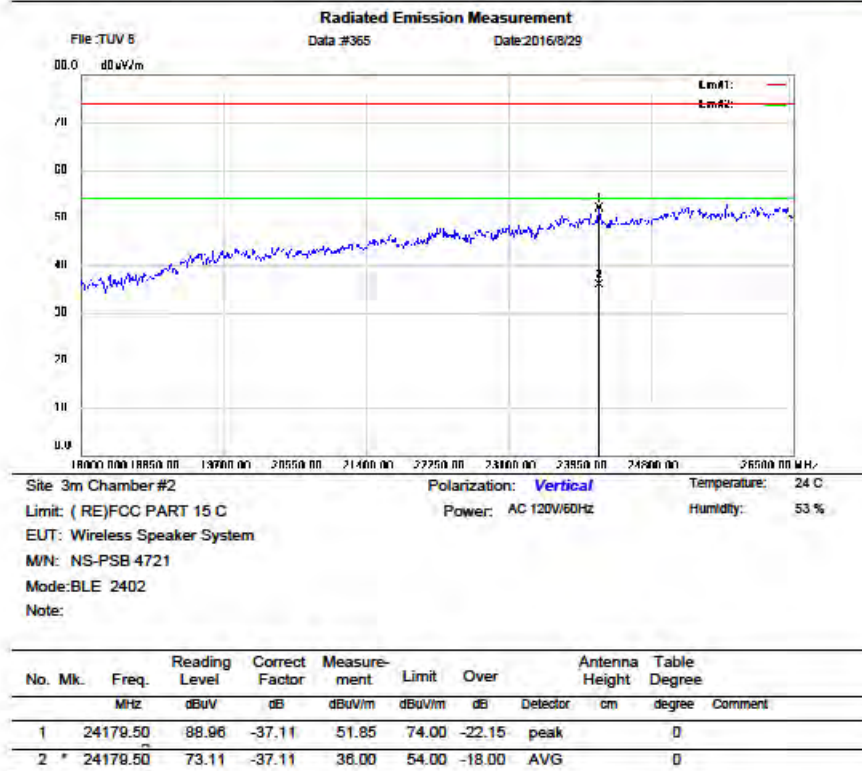
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 8/Data #364

Page: 1

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*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5 Data #365

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Radiated Emission Measurement

File: TUV 5

Data #360

Date: 2016/8/29



Site: 3m Chamber #2

Polarization: **Horizontal**

Temperature: 24 C

Limit: (RE) FCC PART 15 C

Power: AC 120V/60Hz

Humidity: 53 %

EUT: Wireless Speaker System

M/N: NS-PSB 4721

Mode: BLE 2480

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		26500.00	69.57	-39.34	50.23	74.00	-23.77	peak	0
2	*	26500.00	72.34	-39.34	33.00	54.00	-21.00	AVG	0

*: Maximum data x: Over limit f: over margin

Operator: KK

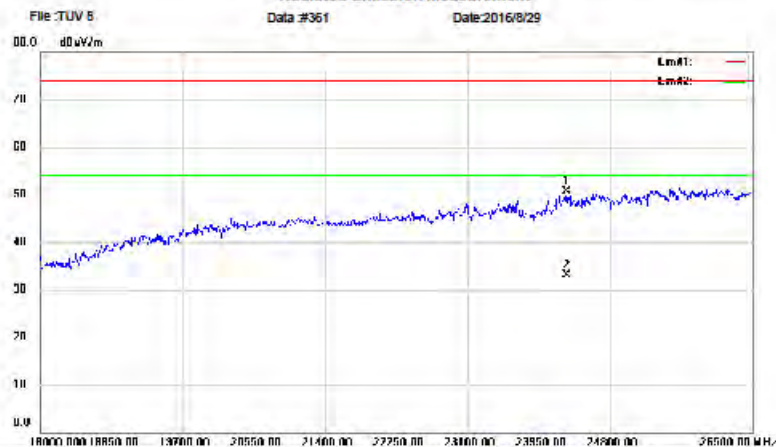
File: TUV 5/Data #360

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Radiated Emission Measurement



Site: 3m Chamber #2 Polarization: **Vertical** Temperature: 24 C
Limit: (RE) FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: BLE 2480
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm
1		24281.50	87.82	-37.10	50.72	74.00	-23.28	peak	0
2	*	24281.50	70.20	-37.10	33.10	54.00	-20.90	AVG	0

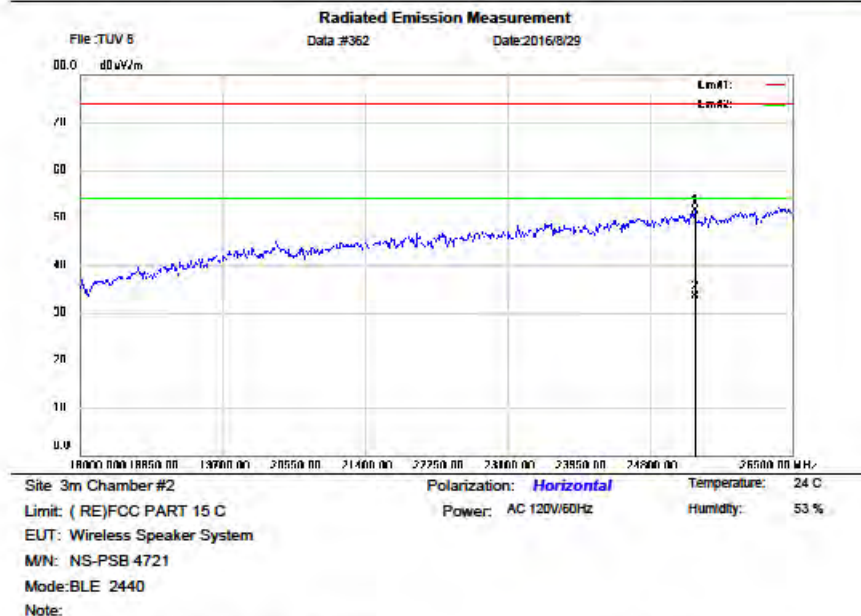
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5 Data #361

Page: 1

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		25335.50	88.20	-36.60	51.60	74.00	-22.40	peak	0
2	*	25335.50	70.10	-36.60	33.50	54.00	-20.50	AVG	0

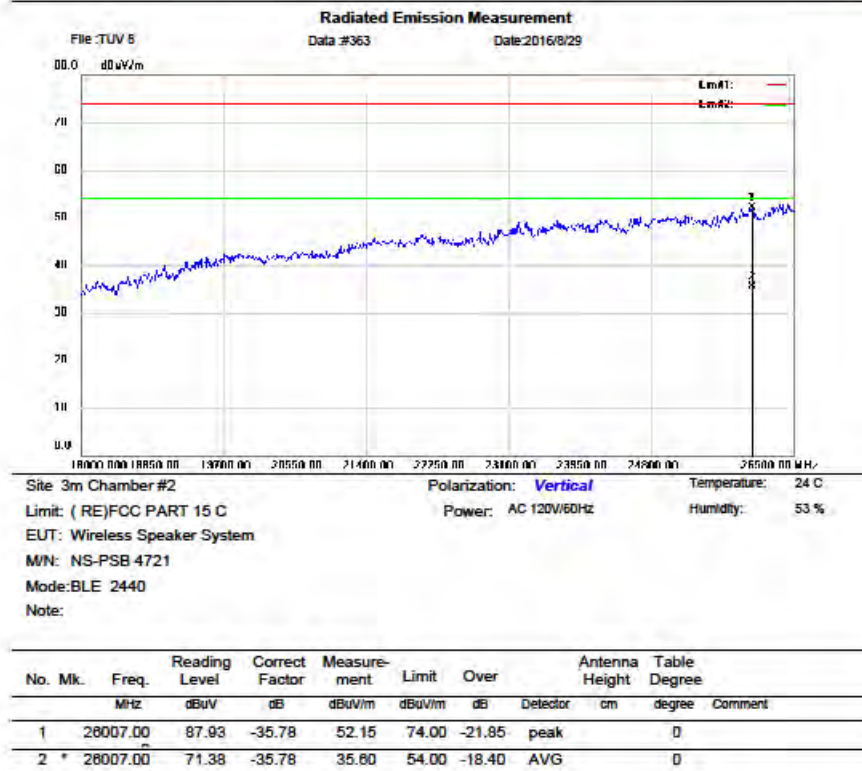
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 5 Data #362

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*: Maximum data x: Over limit l: over margin

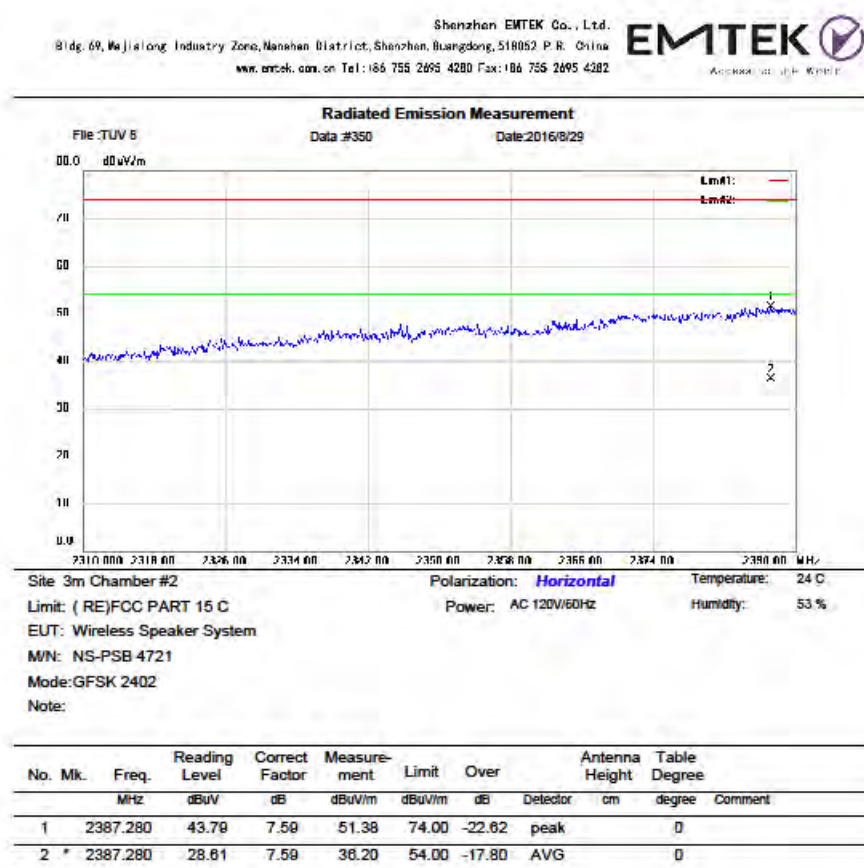
Operator: KK

File: TUV 5 Data: #363

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Appendix B.2: Test Plots of Band Edge (Radiated)

BDR mode, Low Channel



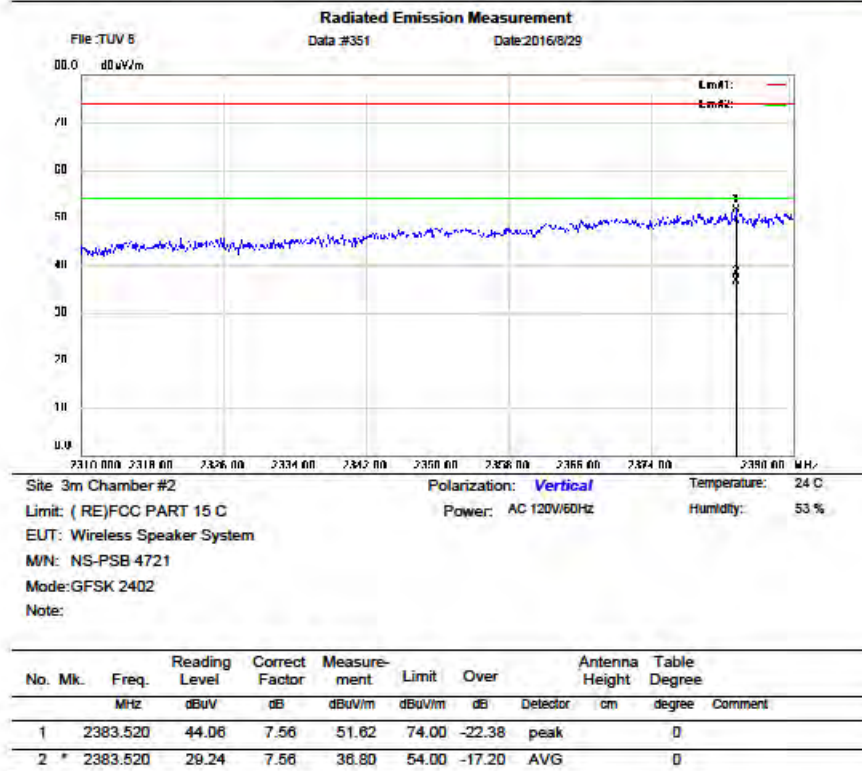
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 8/Data: #350

Page: 1

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*: Maximum data x: Over limit f: over margin

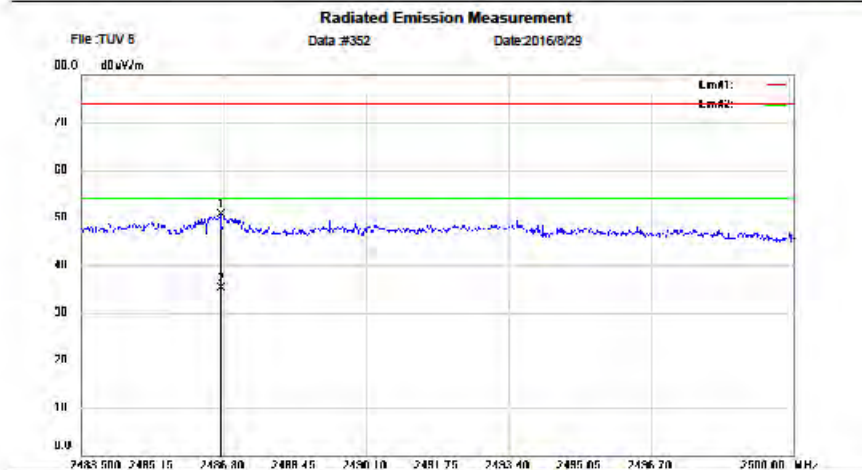
Operator: KK

File: TUV 8/Data #351

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BDR mode, High Channel

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Site: 3m Chamber #2 Polarization: **Horizontal** Temperature: 24 C
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: GFSK 2480
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		2486.734	42.36	8.31	50.67	74.00	-23.33	peak	0	
2	*	2486.734	26.89	8.31	35.20	54.00	-18.80	AVG	0	

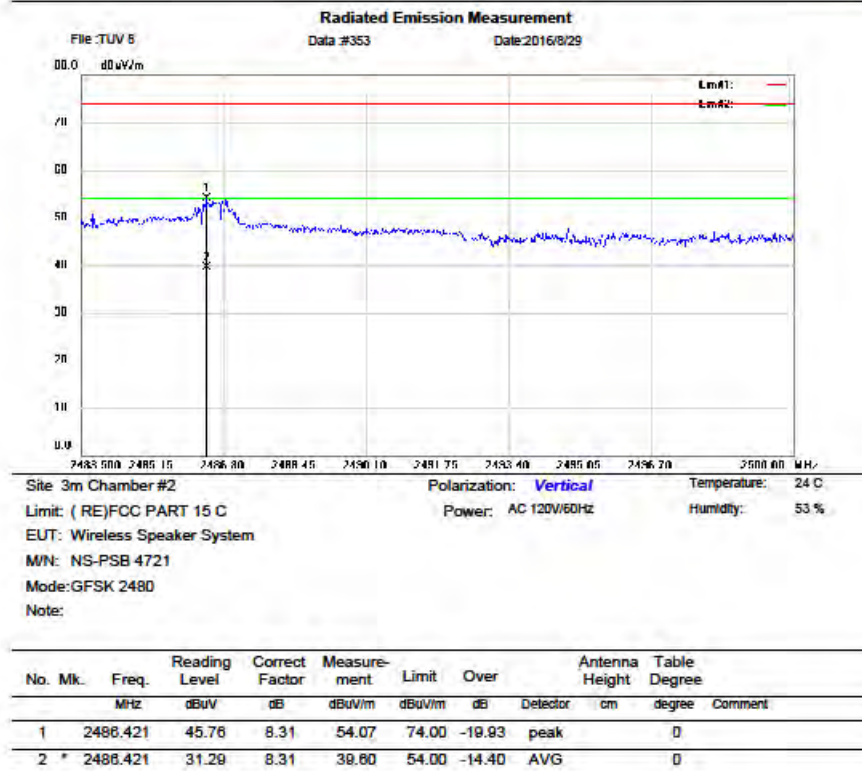
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 8/Data: #352

Page: 1

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*: Maximum data x: Over limit f: over margin

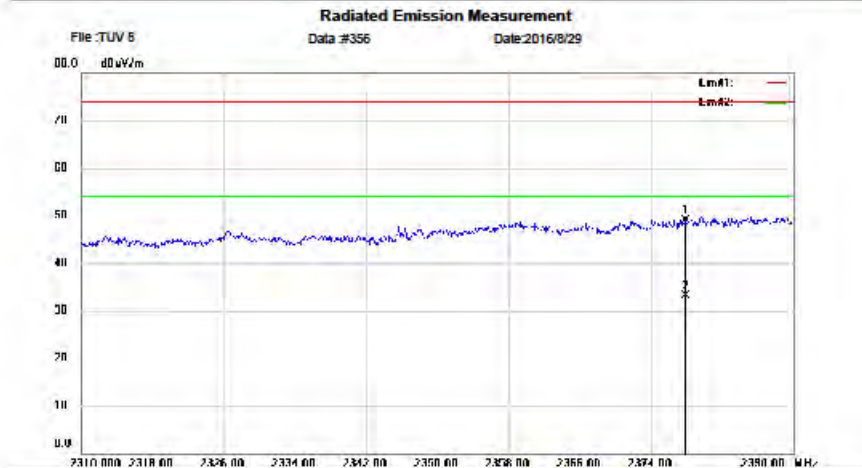
Operator: KK

File: TUV 8/Data #353

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Low Energy mode, Low Channel

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Site: 3m Chamber #2 Polarization: **Horizontal** Temperature: 24 C
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: BLE 2402
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		2377.840	41.86	7.52	49.18	74.00	-24.82	peak	0	
2	*	2377.840	25.58	7.52	33.10	54.00	-20.90	AVG	0	

*: Maximum data x: Over limit f: over margin

Operator: KK

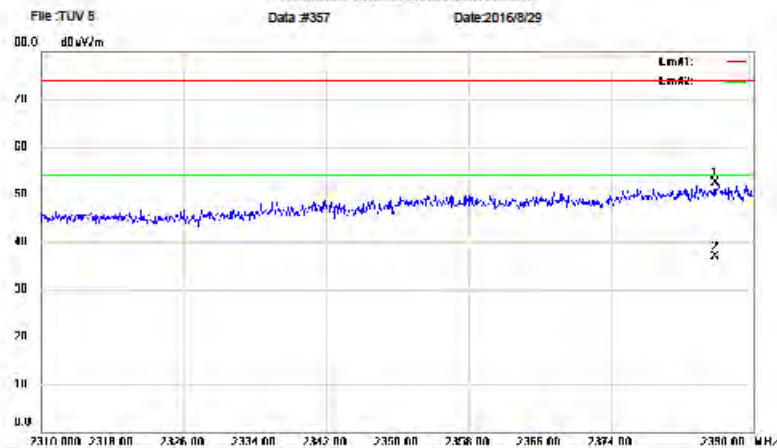
File: TUV 8/Data: #356

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Radiated Emission Measurement



Site: 3m Chamber #2 Polarization: **Vertical** Temperature: 24 °C
Limit: (RE) FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: BLE 2402
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		2385.680	44.94	7.58	52.52	74.00	-21.48	peak	0	
2	*	2385.680	29.32	7.58	36.90	54.00	-17.10	AVG	0	

*: Maximum data x: Over limit f: over margin

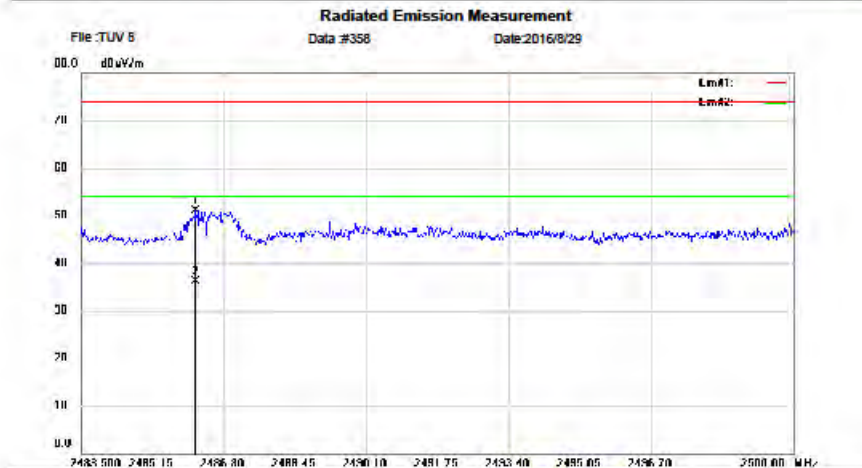
Operator: KK

File: TUV 8/Data #357

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Low Energy mode, High Channel

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Site: 3m Chamber #2 Polarization: **Horizontal** Temperature: 24 C
Limit: (RE) FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
EUT: Wireless Speaker System
M/N: NS-PSB 4721
Mode: BLE 2480
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		2486.157	42.85	8.30	51.15	74.00	-22.85	peak		0
2	*	2486.157	27.80	8.30	36.10	54.00	-17.90	AVG		0

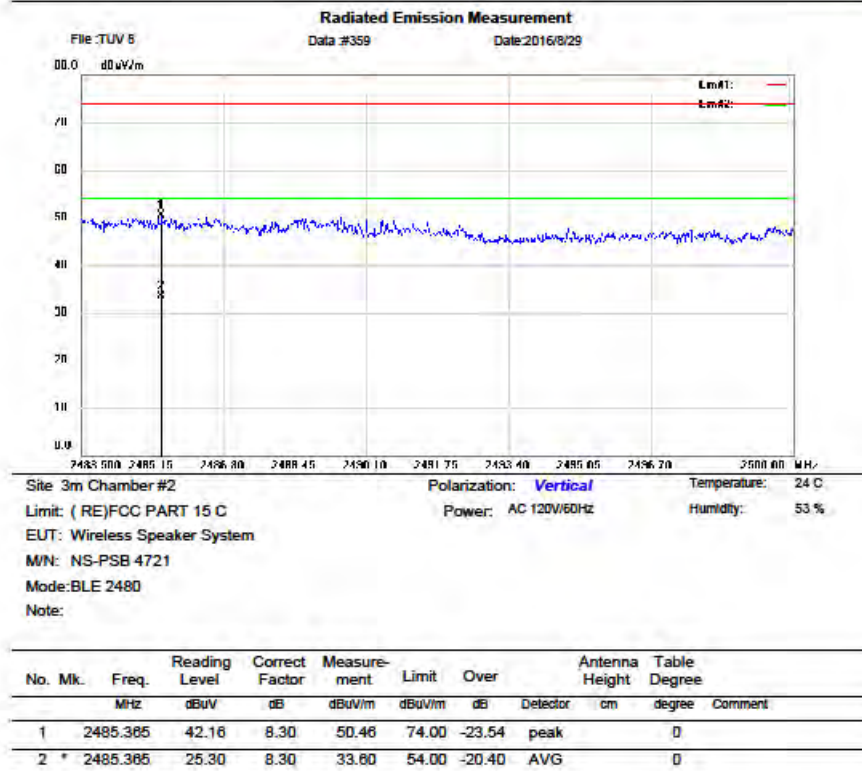
*: Maximum data x: Over limit f: over margin

Operator: KK

File: TUV 8/Data: #358

Page: 1

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*: Maximum data x: Over limit f: over margin

Operator: KK

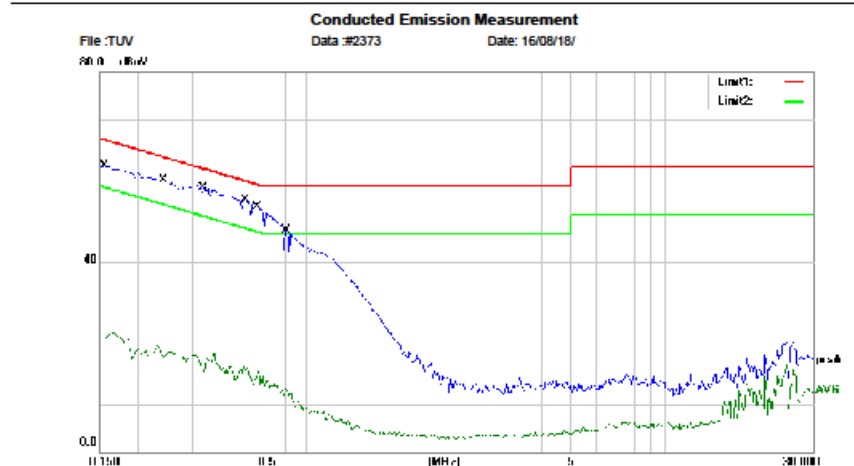
File: TUV 8 \Data #359

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Appendix B.3: Test Plots of Conducted Emission

C Mode

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Site: Conduction #1 Phase: L1 Temperature: 22
Limit: (CE)FCC PART 15 class B_QP Power: AC 120V/60Hz Humidity: 55 %
EUT: WICELESS SPEAKER SYSTEM
M/N: NS-PSB4721
Mode: BT3.0
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBμV	dB	dBμV	dBμV	dB		
1		0.1550	53.10	0.00	53.10	65.73	-12.63	QP	
2		0.1550	25.11	0.00	25.11	55.73	-30.62	AVG	
3		0.2400	51.80	0.00	51.80	62.10	-10.30	QP	
4		0.2400	22.49	0.00	22.49	52.10	-29.61	AVG	
5		0.3250	50.20	0.00	50.20	59.58	-9.38	QP	
6		0.3250	20.81	0.00	20.81	49.58	-28.77	AVG	
7		0.4400	47.10	0.00	47.10	57.06	-9.96	QP	
8		0.4400	18.25	0.00	18.25	47.06	-28.81	AVG	
9		0.4863	45.50	0.00	45.50	56.23	-10.73	QP	
10		0.4863	17.05	0.00	17.05	46.23	-29.18	AVG	
11	*	0.5950	46.80	0.00	46.80	56.00	-9.20	QP	
12		0.5950	14.41	0.00	14.41	46.00	-31.59	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: WQG

File: TUVData :#2373

Page: 1

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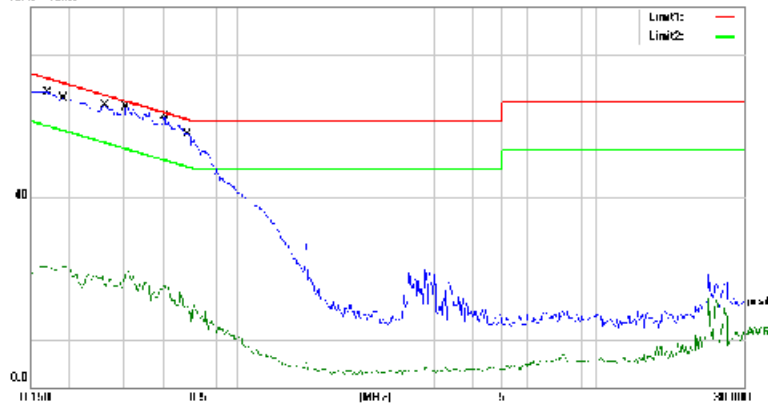
Conducted Emission Measurement

File: TUV

Data: #2374

Date: 16/08/18

50.0 dBuV



Site: Conduction #1

Phase: N

Temperature: 22

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

Humidity: 55 %

EUT: WICELESS SPEAKER SYSTEM

M/N: NS-PSB4721

Mode: BT3.0

Note:

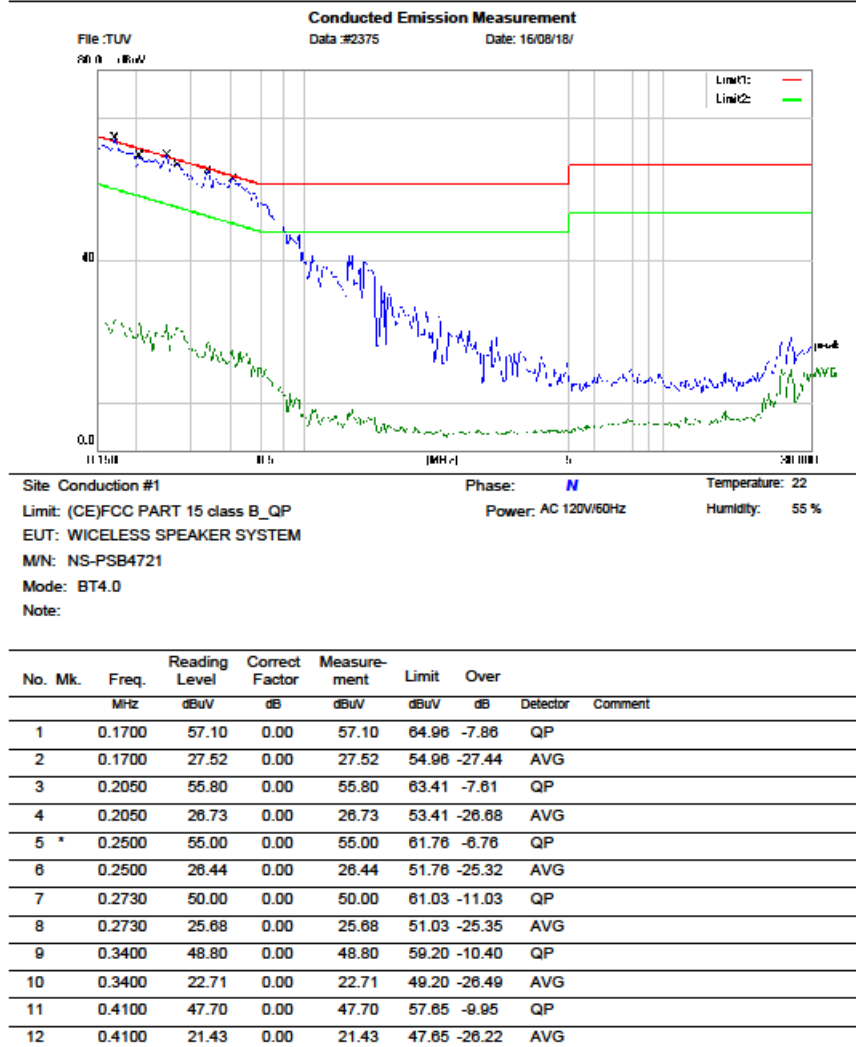
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1700	56.00	0.00	56.00	64.96	-8.96	QP	
2		0.1700	25.46	0.00	25.46	64.96	-29.50	AVG	
3		0.1900	55.00	0.00	55.00	64.04	-9.04	QP	
4		0.1900	24.90	0.00	24.90	64.04	-29.14	AVG	
5		0.2600	52.50	0.00	52.50	61.43	-8.93	QP	
6		0.2600	23.33	0.00	23.33	61.43	-28.10	AVG	
7	*	0.3050	51.40	0.00	51.40	60.11	-8.71	QP	
8		0.3050	24.58	0.00	24.58	60.11	-25.53	AVG	
9		0.4050	48.90	0.00	48.90	57.75	-8.85	QP	
10		0.4050	21.43	0.00	21.43	47.75	-26.32	AVG	
11		0.4800	45.60	0.00	45.60	56.34	-10.74	QP	
12		0.4800	17.75	0.00	17.75	46.34	-28.59	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: WQG

File: TUVData: #2374

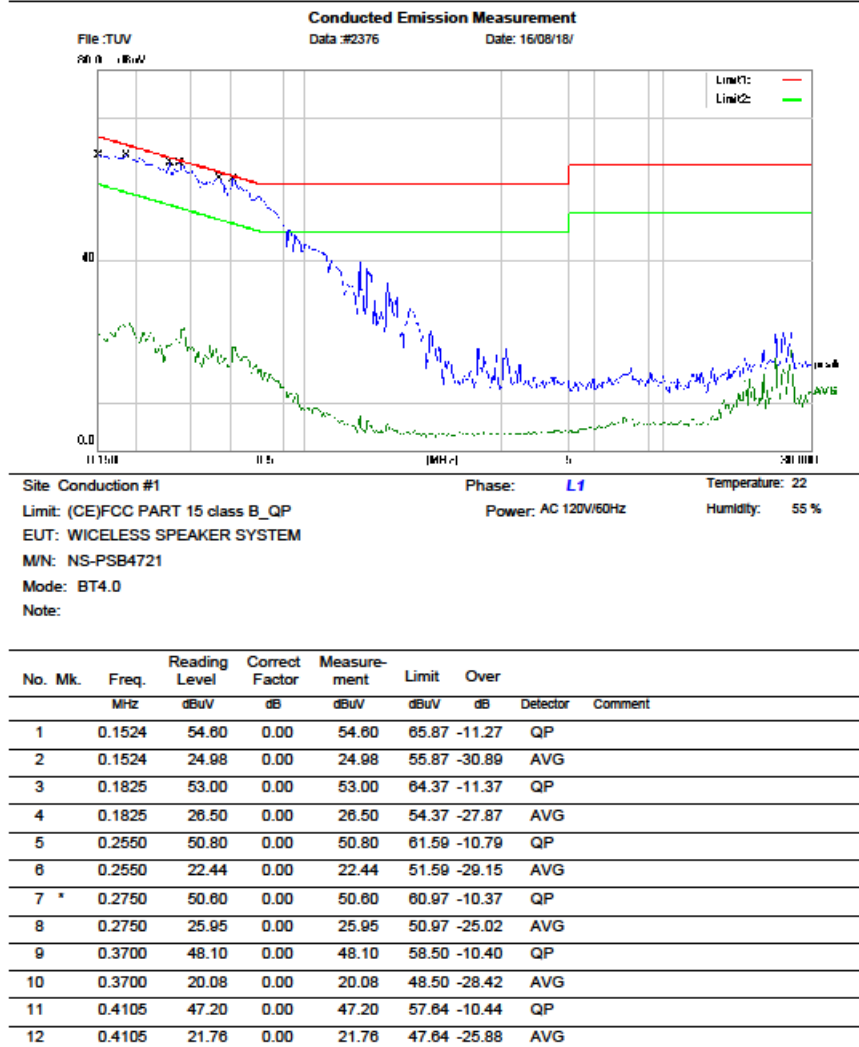
Page: 1

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*:Maximum data x:Over limit :over margin Comment: Factor build in receiver. Operator: WQG
File :TUVData :#2375 Page: 1

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*:Maximum data x:Over limit :over margin Comment: Factor build in receiver. Operator: WQG
File :TUVData :#2376 Page: 1