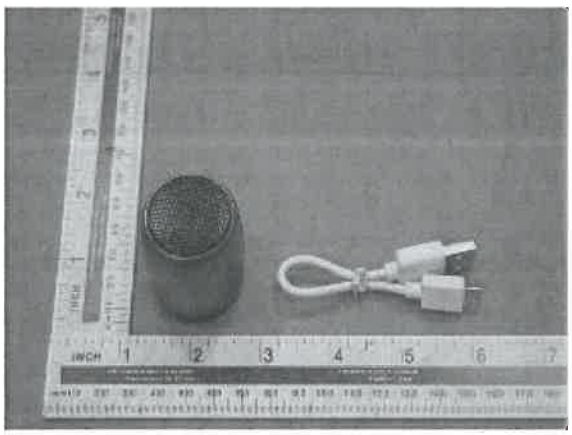
Prüfbericht-Nr.: *Test report No.:*	**50041915 001**	**Auftrags-Nr.:** *Order No.:*	164060145	Seite 1 von 30 *Page 1 of 30*
Kunden-Referenz-Nr.: *Client reference No.:*	N/A	**Auftragsdatum:** *Order date.:*	08.04.2016	
Auftraggeber: *Client:*	**THUMBS UP(UK) LTD** Unit L, Braintree Industrial Estate, Braintree Road, HA4 0EJ, Ruislip, London, United Kindom			
Prüfgegenstand: *Test item:*	Mini Metal Bluetooth Speaker			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	MMBTSPKPKPRM, MMBTSPKBLPRM, MMBTSPKBZPRM, MMBTSPKGMPRM (PRIMARK)			
Auftrags-Inhalt: *Order content:*	FCC approval			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 FCC KDB Publication 447498 v06 CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109			
Wareneingangsdatum: *Date of receipt:*	22.03.2016			
Prüfmuster-Nr.: *Test sample No.:*	A000341368-040			
Prüfzeitraum: *Testing period:*	22.03.2016 - 14.04.2016			
Ort der Prüfung: *Place of testing:*	Accurate Technology Co., Ltd.			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			



geprüft von / *tested by:*			**kontrolliert von** / *reviewed by:*		
10.05.2016	Ryan Yang / Senior Project Engineer		10.05.2016	Owen Tian / Technical Certifier	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges / *Other:*

FCC ID: 2AHHEBTMETSPEAKERS

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:* Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged:*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhalt
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	1 = very good	2 = good	3 = satisfactory	4 = sufficient	5 = poor
	P(ass) = passed a.m. test specifications(s)		F(ail) = failed a.m. test specifications(s)	N/A = not applicable	N/T = not tested

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER
RESULT: Pass

5.1.3 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH
RESULT: Pass

5.1.4 RADIATED SPURIOUS EMISSION
RESULT: Pass

5.1.5 20DB BANDWIDTH
RESULT: Pass

5.1.6 CARRIER FREQUENCY SEPARATION
RESULT: Pass

5.1.7 NUMBER OF HOPPING FREQUENCY
RESULT: Pass

5.1.8 TIME OF OCCUPANCY
RESULT: Pass

5.1.9 CONDUCTED EMISSION
RESULT: Pass

5.1.10 RADIATED EMISSION
RESULT: Pass

6.1.1 ELECTROMAGNETIC FIELDS
RESULT: Pass

Contents

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 2.1+ EDR of Conducted Testing

Appendix B: Test Results of Bluetooth 2.1+ EDR of Radiated Testing

2 Test Sites

2.1 Test Facilities

Accurate Technology Co., Ltd.
F1, Bldg. A, Changyuan New Material Port Keyuan Rd., Science & Industry Park, Nanshan Shenzhen, 518057, P.R. China

FCC Registration No.: 752051

Test site Industry Canada No.: 5077A-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

Accurate Technology Co., Ltd.

Radio Spectrum Test				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Spectrum Analyzer	R&S	ESPI3	100396/003	09.01.2017
Spectrum Analyzer	Agilent	E7405A	MY45115511	09.01.2017
Temp. & Humid. Chamber	Gongwen	HSD-500	0109	09.01.2017
Conducted Emission				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Test Receiver	R&S	ESCS30	100307	09.01.2017
L.I.S.N.	Schwarzbeck	NLSK8126	8126431	09.01.2017
Pulse Limiter	R&S	ESH3-Z2	100815	09.01.2017
50_ Coaxial Switch	Anritsu Corp	MP59B	6200283933	09.01.2017
Radiated Emission & Spurious Emission				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Spectrum Analyzer	R&S	FSV40	101495	01.01.2017
Test Receiver	R&S	ESCS30	100307	01.01.2017
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	01.01.2017
Loop Antenna	Schwarzbeck	FMZB1516	1516131	01.01.2017
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	01.01.2017
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	01.01.2017
RF Switching Unit+PreAMP	Compliance Direction	RSU-M2	38322	01.01.2017
Pre-Amplifier	R&S	CBLU11835 40-01	3791	01.01.2017
50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	01.01.2017
RF Coaxial Cable	SUHNER	N-3m	No.8	01.01.2017
RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	01.01.2017
RF Coaxial Cable	SUHNER	N-6m	No.10	01.01.2017
RF Coaxial Cable	RESENBERGER	N-12m	No.11	01.01.2017
50_ Coaxial Switch	Anritsu Corp	MP59B	6200283933	01.01.2017

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 basics 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	Disturbance Voltage (dBμV)	U=1.94dB, k=2, σ=95%
Radiated Emission (9kHz-30MHz)	Field strength (dBμV/m)	U=3.08dB, k=2, σ=95%
Radiated Emission (30-1000MHz)	Field strength (dBμV/m)	U=4.42dB, k=2, σ=95%
Radiated Emission (above 1000MHz)	Field strength (dBμV/m)	U=4.06dB, k=2, σ=95%
Radio Spectrum		± 0.60 dB
Ambient Temperature		25 ℃
Relative Humidity		56 %
Atmospheric Pressure		101 kPa

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 Accurate Technology Co., Ltd. Test facility located at F1, Bldg. A, Changyuan New Material Port Keyuan Rd., Science & Industry Park, Nanshan Shenzhen, 518057, P.R. 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 “Mini Metal Bluetooth Speaker” device. It supports Bluetooth 2.1+EDR wireless technology.

According to the declaration of the applicant, the electrical circuit design, PCB layout and components used are identical for all models, only the model No. and appearance are different.

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	Mini Metal Bluetooth Speaker
Type Designation	MMBTSPKPKPRM, MMBTSPKBLPRM, MMBTSPKBZPRM, MMBTSPKGMPRM
Trade Mark	PRIMARK
FCC ID	2AHHEBTMETSPEAKERS
Operating Frequency	2402-2480 MHz
Operating Temperature Range	-10 °C ~ +55 °C
Operating Voltage	DC 3.7V via internal rechargeable lithium battery
Testing Voltage	DC 3.7V via internal rechargeable lithium battery DC 5.0V via USB port for charging
Type of Modulation	GFSK, π/4DQPSK, 8DPSK
Channel Number	79 channels
Channel Separation	1MHz
Wireless Technology	Bluetooth 2.1 + EDR
Antenna Type	PCB Antenna
Antenna Gain	0.00 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: Frequency Hopping Information

Technical Specification	Description
Hopping Range	Hereby we declare that the maximum frequency 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 (Test Case: TRM/CA/04-E).
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, Bluetooth transmitting mode (BDR & EDR mode)
    1. Transmitting
        a. Low Channel
        b. Middle Channel
        c. High Channel
    2. Receiving
B. On, Transmitting on Hopping channel
C. On, Bluetooth connecting mode
D. On, Charging mode via USB port
E. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- ID Label and Location Info
- Operation Description
- Photo Document
- User Manual
- Block Diagram
- Model Difference Letter
- Parts List
- Schematics

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 and ANSI C63.4: 2014

According to clause 3.1, all tests were performed on model PANSPKPRM in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
iPhone 6	Apple	MG4J2 CH/A	F17NTK2QG5MV	N/A
Notebook PC	Lenovo	ThinkPad X240	N/A	N/A
Printer	HP	HP laserjet 1015	CNFG030424	N/A

4.4 Countermeasures to Achieve EMC Compliance

Additional countermeasures to the submitted test sample(s) for Radiated Spurious Emission were employed to achieve compliance.

4.5 Test Setup Diagram

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

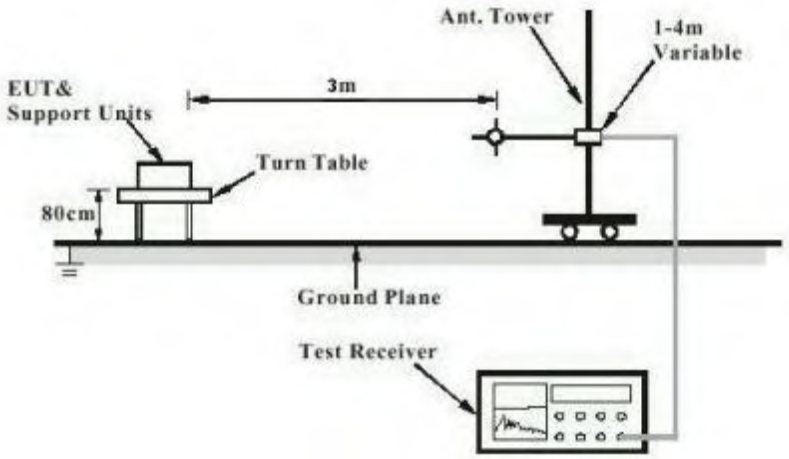


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

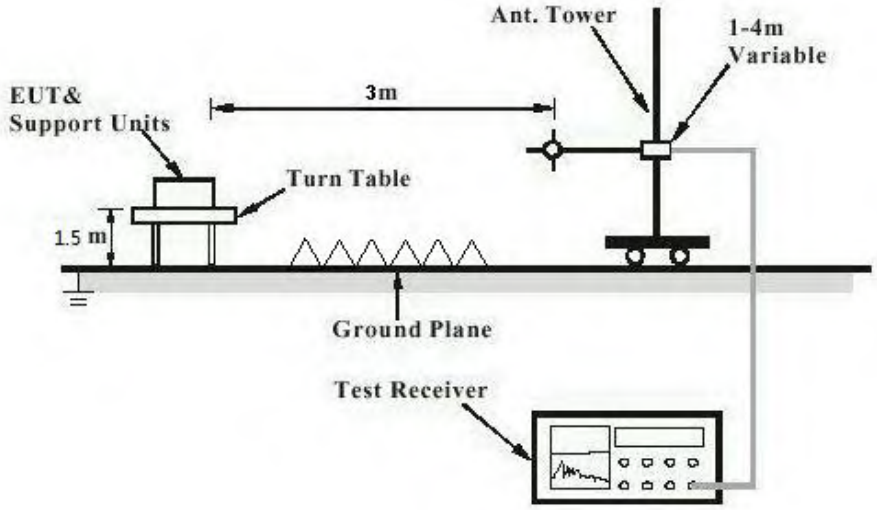


Diagram of Measurement Configuration for Mains Conduction Measurement

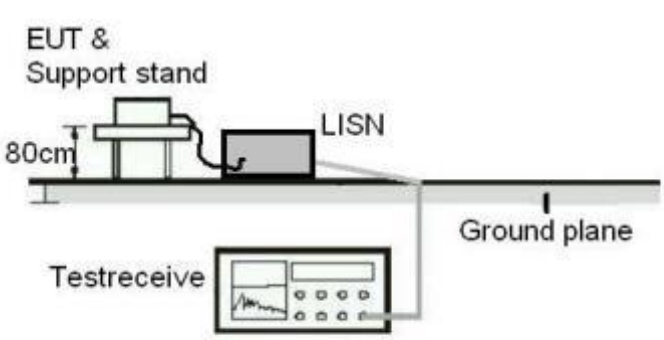
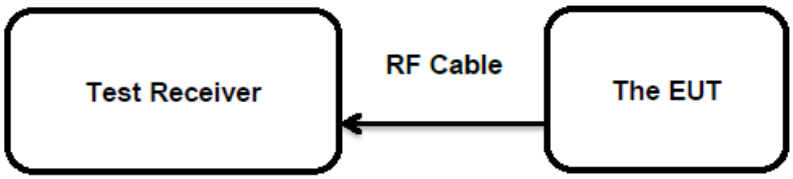


Diagram of Measurement Configuration for Conducted Transmitter Measurement



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

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 0.00 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)
Basic standard	:	ANSI C63.10: 2013
Limits	:	< 0.125 Watts
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	22.03.2016
Input voltage	:	DC 3.7V via internal rechargeable lithium battery
Operation mode	:	A.1
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Table 6: Test Result of Maximum Peak Conducted Output Power

Test Mode	Channel Frequency (MHz)	Measured Peak Output Power		Limit (W)
		(dBm)	(W)	
BDR	2402	-2.18	0.00061	< 0.125
	2441	-3.69	0.00043	
	2480	-5.05	0.00031	
EDR	2402	-1.96	0.00064	< 0.125
	2441	-3.46	0.00045	
	2480	-4.93	0.00032	
Maximum Measured Value		-1.96	0.00064	/

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

For the measurement records, refer to the appendix A.

5.1.3 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d)
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); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	22.03.2016
Input voltage	:	DC 3.7V via internal rechargeable lithium battery
Operation mode	:	A.1
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
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.

5.1.4 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) & FCC Part 15.205
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) of FCC part 15.247(d)
Kind of test site	:	3m Semi-anechoic Chamber & 3m Full-anechoic Chamber

Test Setup

Date of testing	:	12.03.2016 & 22.03.2016
Input voltage	:	DC 3.7V via internal rechargeable lithium battery
Operation mode	:	A.1
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
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 mode at the low (2402 MHz), middle (2441 MHz) and high (2480 MHz) channel with different data packet. Compliance test in continuous transmitting mode with BDR mode (DH5) 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.

5.1.5 20dB Bandwidth

RESULT: **Pass**

Test Specification

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

Test Setup

Date of testing	:	22.03.2016
Input voltage	:	DC 3.7V via internal rechargeable lithium battery
Operation mode	:	A.1
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Table 7: Test Result of 20dB Bandwidth

Test Mode	Channel Frequency (MHz)	20dB Bandwidth (kHz)	2/3 of 20dB Bandwidth (kHz)	Limit (MHz)
BDR	2402	672.90	448.600	/
	2441	651.30	434.200	
	2480	668.60	445.733	
EDR	2402	1189.60	793.067	/
	2441	1189.60	793.067	
	2480	1211.30	807.533	
Maximum Measured Value		1211.30	807.533	/

For the measurement records, refer to the appendix A.

5.1.6 Carrier Frequency Separation

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)(1)
Basic standard	:	ANSI C63.10: 2013
Limits	:	≥ 25kHz or 2/3 of 20dB bandwidth, whichever is greater
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	22.03.2016
Input voltage	:	DC 3.7V via internal rechargeable lithium battery
Operation mode	:	B
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Table 8: Test Result of Carrier Frequency Separation

Channel	Channel Frequency (MHz)	Measured Channel Separation (KHz)	Limit (kHz)	Result
Low Channel	2402	1002.9	≥ 25kHz or 2/3 of 20dB bandwidth	Pass
Adjacency Channel	2403			
Middle Channel	2441	1002.9		Pass
Adjacency Channel	2442			
High Channel	2480	1002.9		Pass
Adjacency Channel	2479			

Note:
The limit is maximum 2/3 of the 20 dB bandwidth: 807.533 KHz.

For the measurement records, refer to the appendix A.

5.1.7 Number of Hopping Frequency

RESULT: **Pass**

Test Specification

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

Test Setup

Date of testing	:	22.03.2016
Input voltage	:	DC 3.7V via internal rechargeable lithium battery
Operation mode	:	B
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Table 9: 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.

5.1.8 Time of Occupancy

RESULT: **Pass**

Test Specification

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

Test Setup

Date of testing	:	22.03.2016
Input voltage	:	DC 3.7V via internal rechargeable lithium battery
Operation mode	:	B
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Table 10: Test Result of Time of Occupancy

Test Mode	Data Packet	Pulse width (ms)	Measured Dwell time(s)	Limit (s)	Result
BDR mode	DH1	0.393	0.126	< 0.4s	Pass
	DH3	1.647	0.264		
	DH5	2.893	0.309		
EDR mode	2DH1	0.393	0.126		
	2DH3	1.647	0.264		
	2DH5	2.887	0.308		

Note:

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

Period = 0.4 (seconds/ channel) x 79 (channel) = 31.6 seconds

For the measurement records, refer to the appendix A.

5.1.9 Conducted Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.207(a) & FCC Part 15.107(a)
Basic standard	:	ANSI C63.10: 2013 & ANSI C63.4: 2014
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207(a) & FCC Part 15.107(a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	26.03.2016
Input voltage	:	DC 5.0V via USB port for charging
Operation mode	:	C, D
Earthing	:	Not connected
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.10 Radiated Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.109(a)
Basic standard	:	ANSI C63.4: 2014
Frequency range	:	30 - 6000MHz
Classification	:	Class B
Limits	:	FCC Part 15.109(a)
Kind of test site	:	3m Semi-anechoic Chamber & 3m Full-anechoic Chamber

Test Setup

Date of testing	:	14.04.2016
Input voltage	:	DC 5.0V via USB port for charging
Operation mode	:	D
Earthing	:	Not connected
Ambient temperature	:	23 ℃
Relative humidity	:	48 %
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 : FCC KDB Publication 447498 v06

Measurement Record:

The minimum distance for the EUT is less than 5mm.

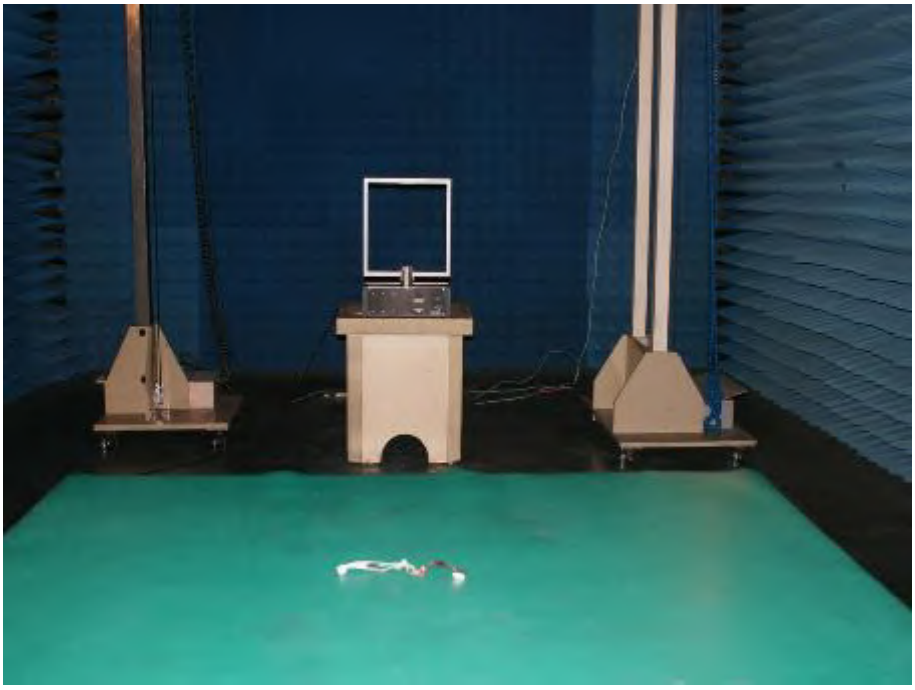
Since maximum peak output power of the transmitter is -1.96 dBm ≈ 0.64 mW <10 mW.

Hence the EUT is excluded from SAR evaluation according to FCC KDB Publication 447498 D01 General RF Exposure Guidance v06.

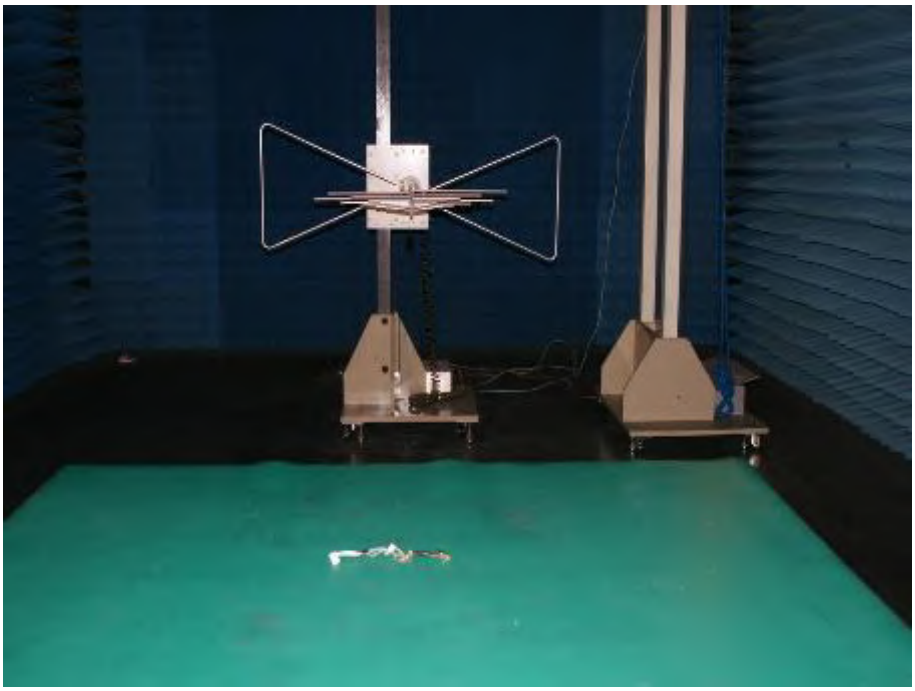
7 Photographs of the Test Set-Up

Photograph 1: Set-up for Conducted Testing

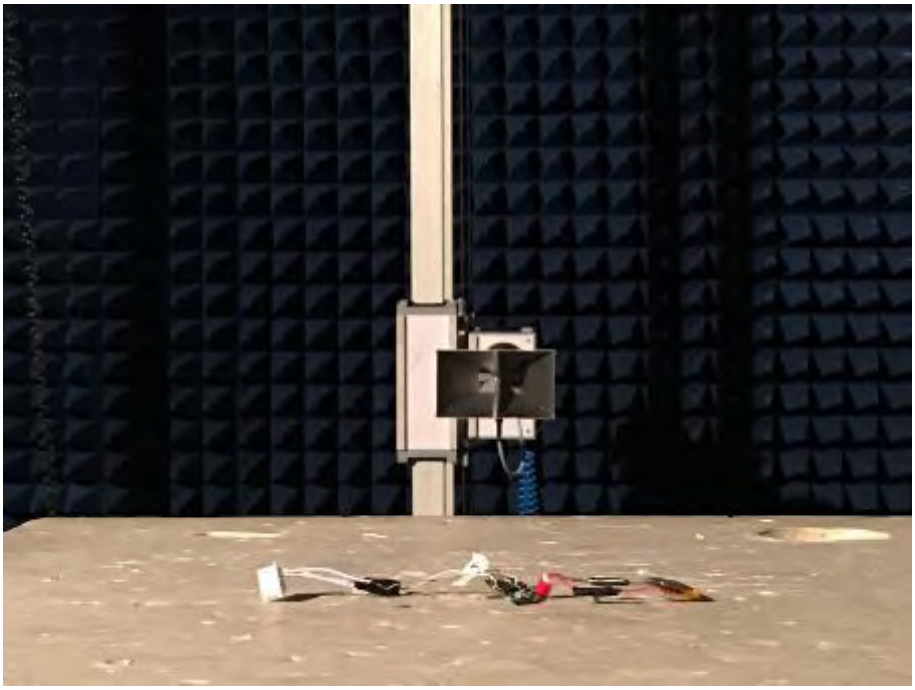
Photograph 2: Set-up for Radiated Spurious Emission (9kHz ~ 30MHz)



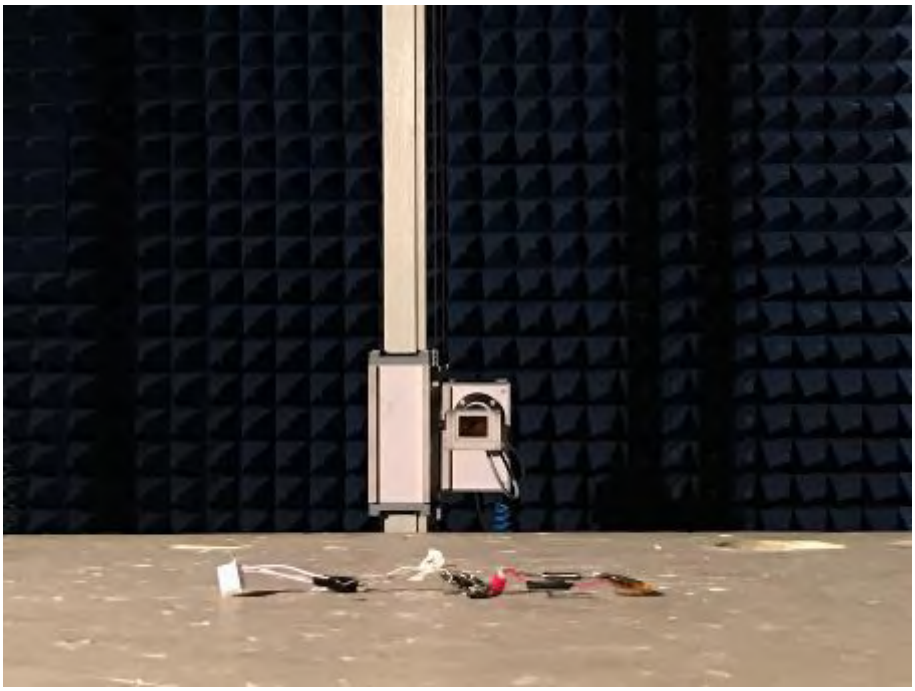
Photograph 3: Set-up for Radiated Spurious Emission (30MHz~1GHz)



Photograph 4: Set-up for Radiated Spurious Emission (1GHz ~ 18GHz)

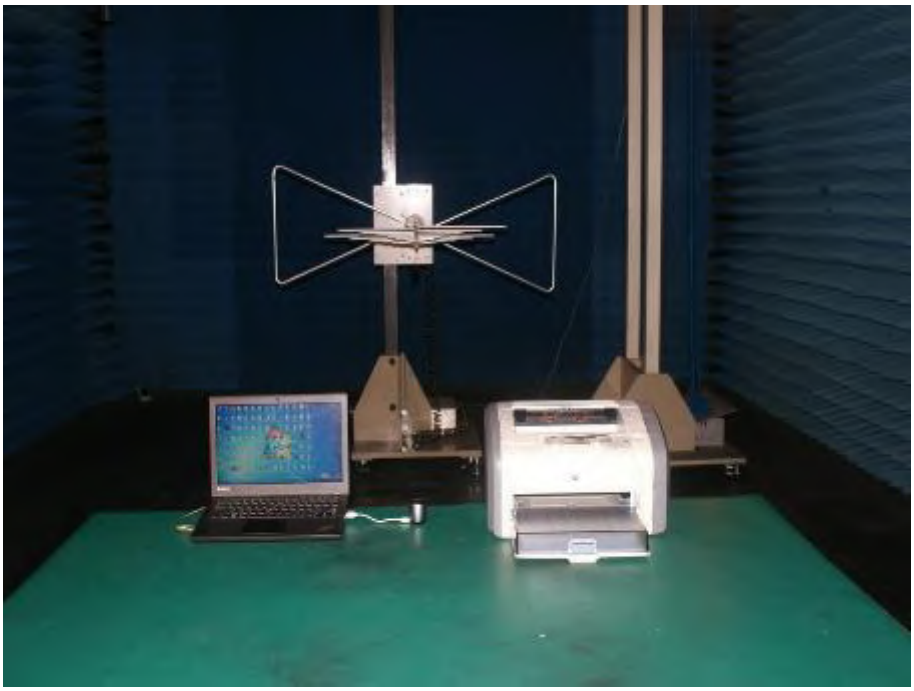


Photograph 5: Set-up for Radiated Spurious Emission (18GHz ~ 26GHz)

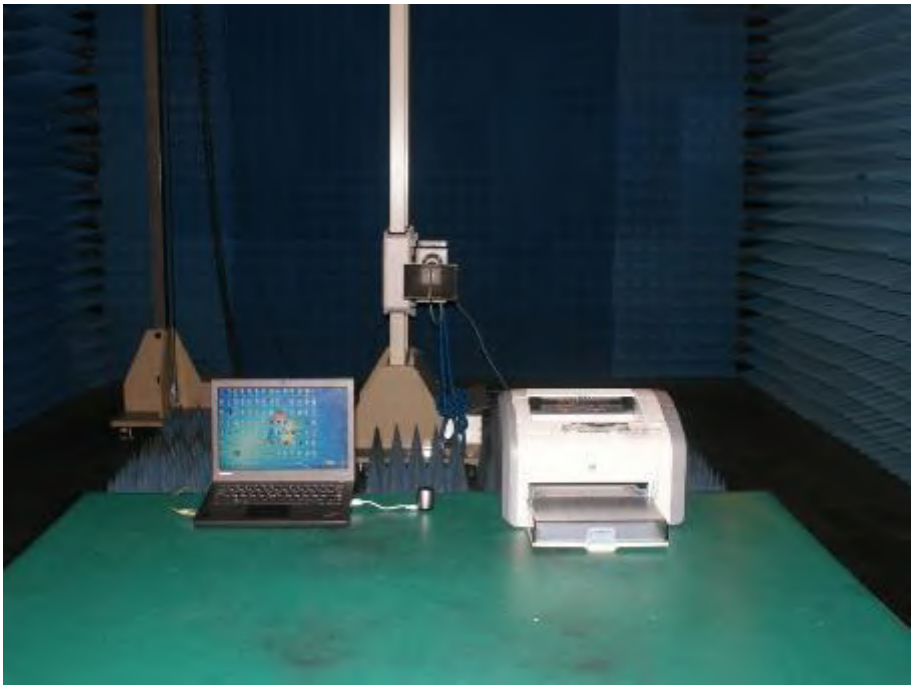


Photograph 6: Set-up for Conducted Emission

Photograph 7: Set-up for Radiated Emission (30MHz ~ 1GHz)



Photograph 8: Set-up for Radiated Emission (1GHz ~ 6GHz)



8 List of Tables

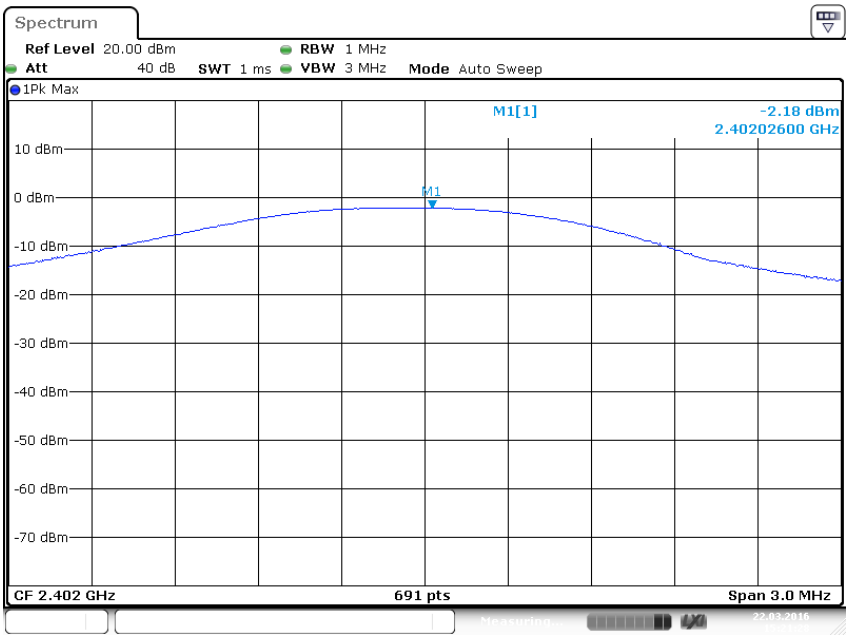
9 List of Photographs

Appendix A

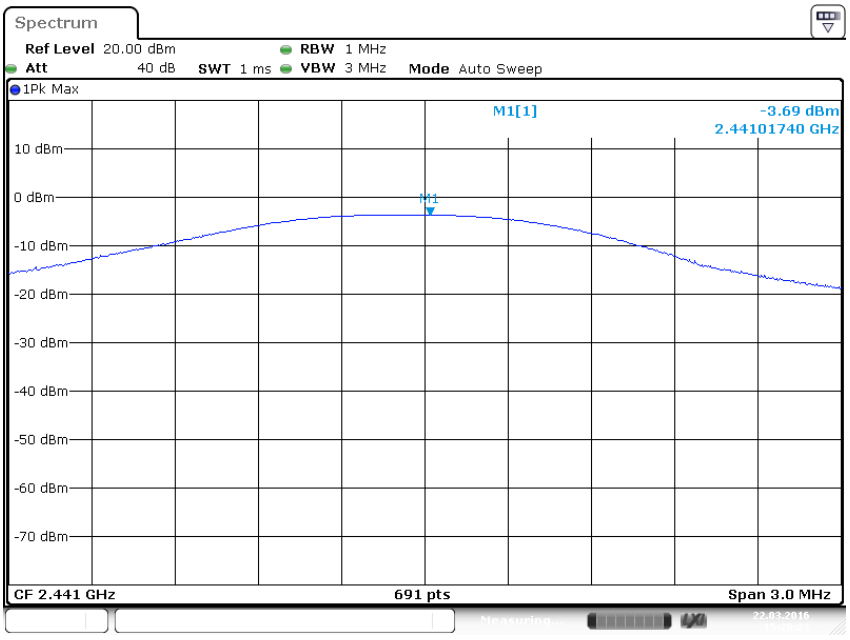
Test Results of Bluetooth 2.1+ EDR of Conducted Testing

Appendix A.1: Maximum Peak Conducted Output Power

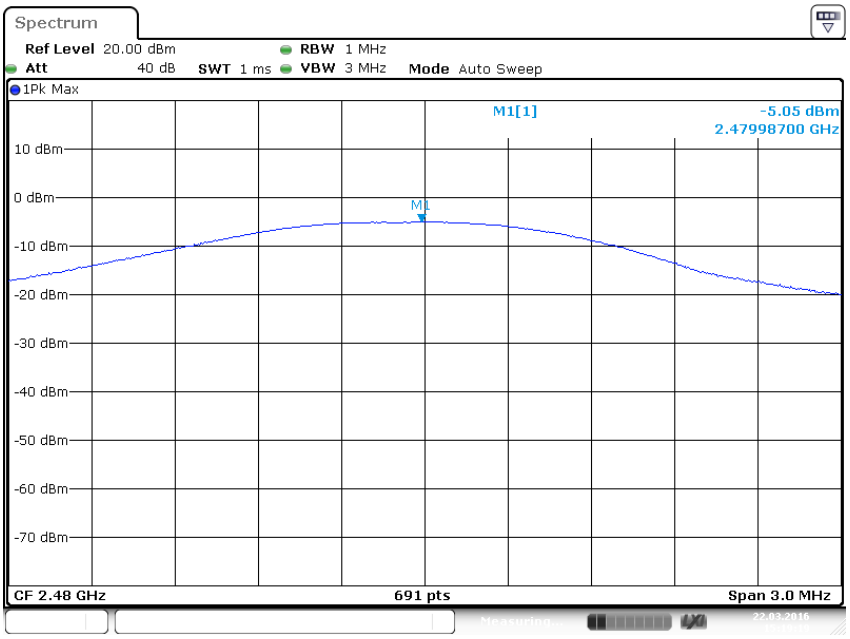
BDR Mode, DH1



Date: 22.MAR.2016 15:21:28

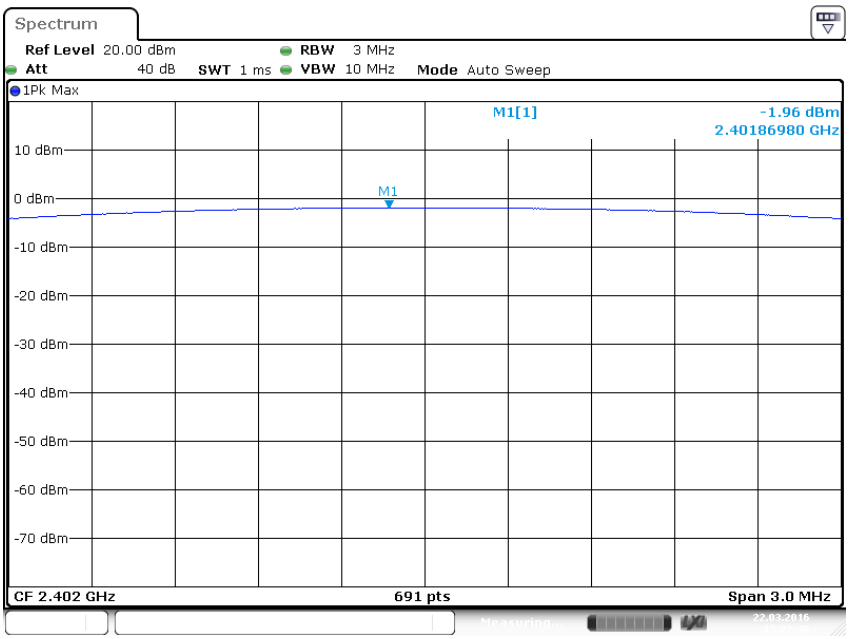


Date: 22.MAR.2016 15:20:23

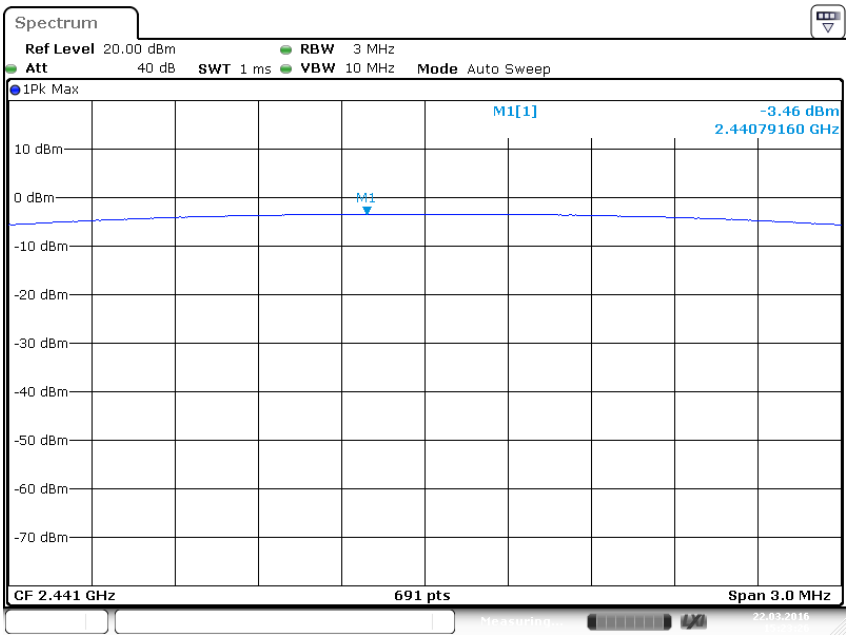


Date: 22.MAR.2016 15:19:19

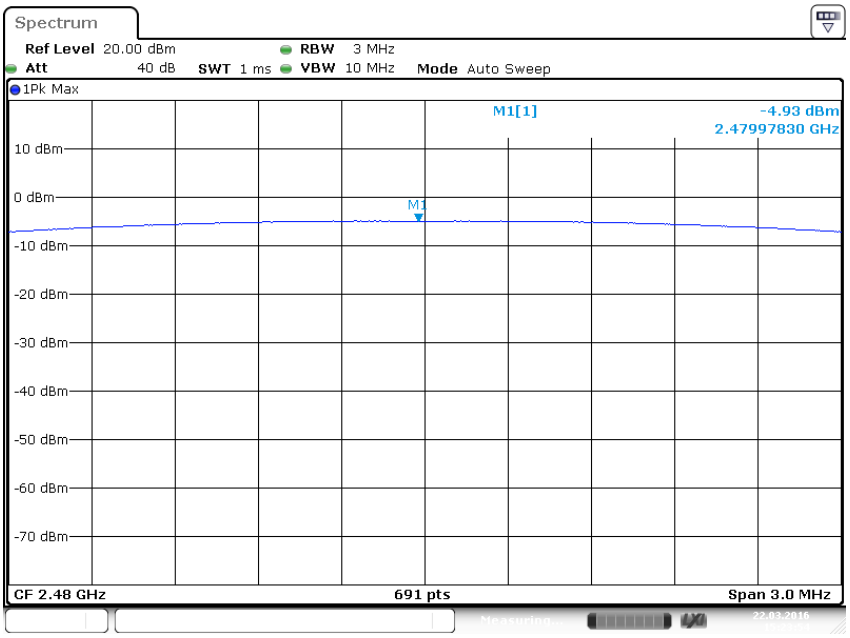
EDR Mode, 3DH1



Date: 22.MAR.2016 15:22:46



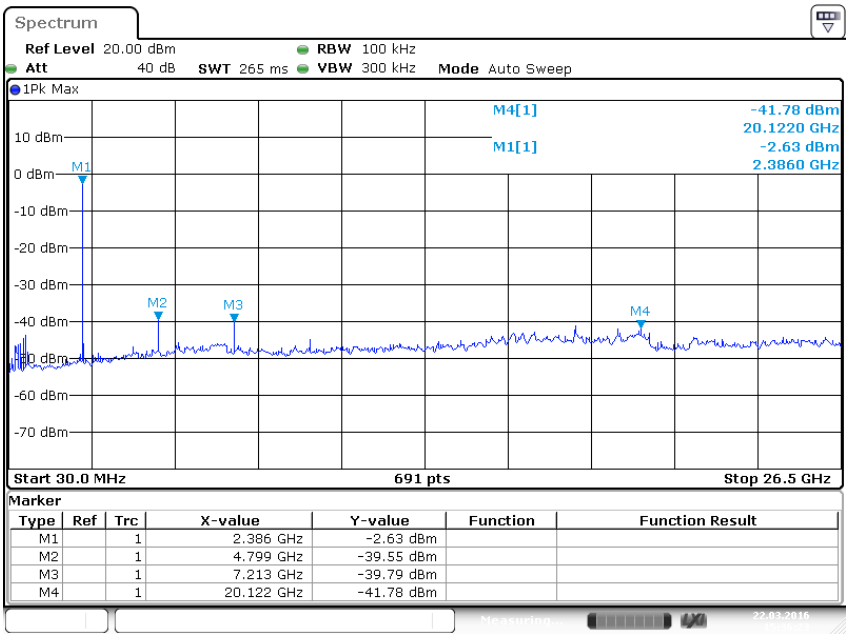
Date: 22.MAR.2016 15:23:26



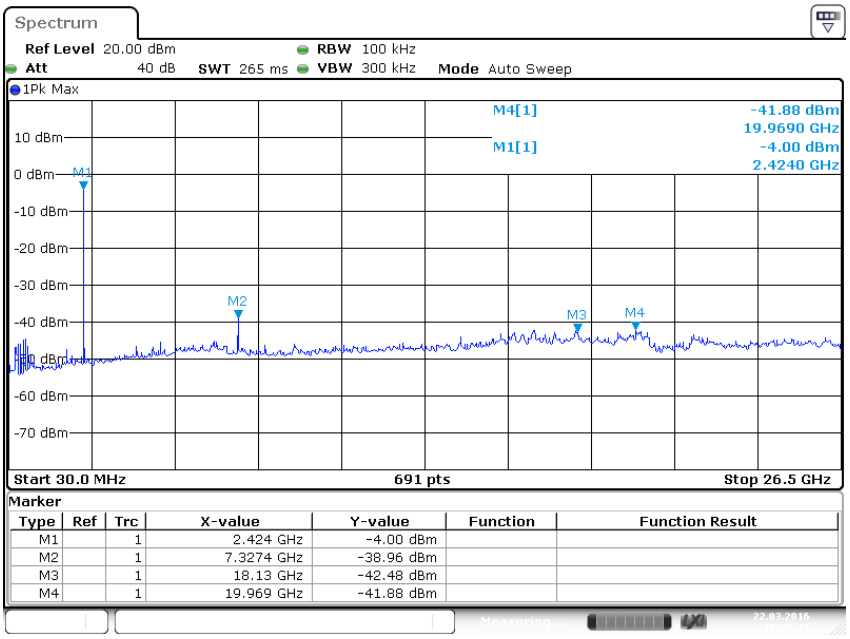
Date: 22.MAR.2016 15:23:54

Appendix A.2: Conducted Spurious Emissions Measured in 100 kHz Bandwidth

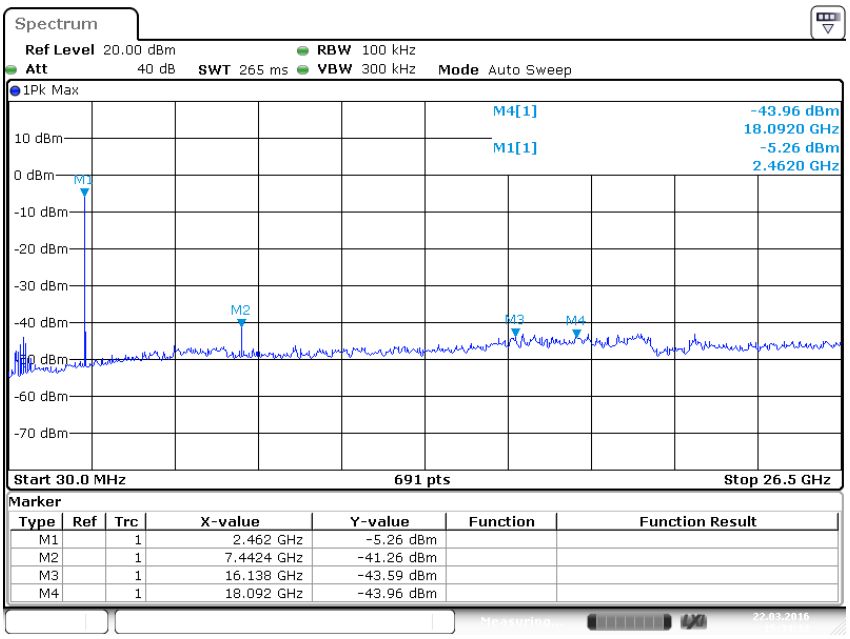
BDR Mode, DH1



Date: 22.MAR.2016 15:36:23

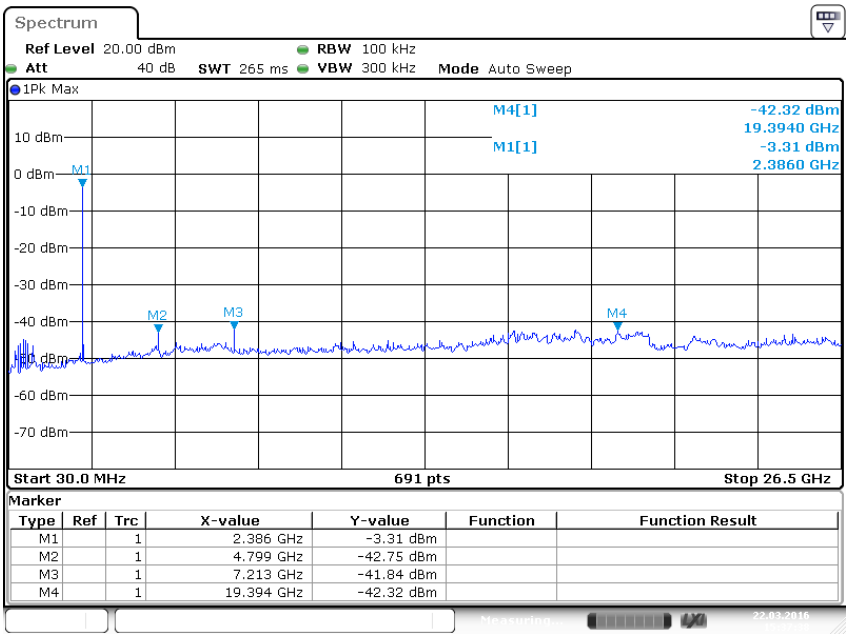


Date: 22.MAR.2016 15:35:38

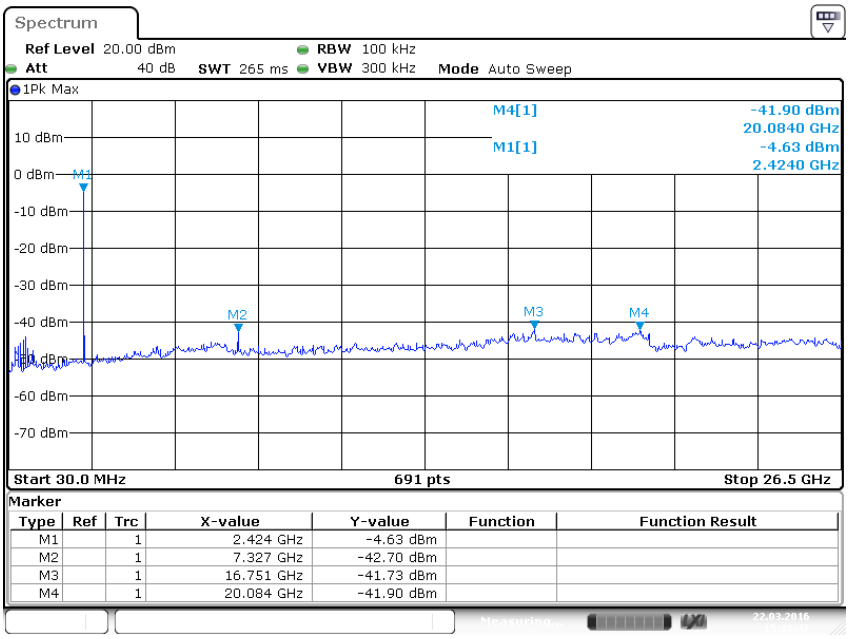


Date: 22.MAR.2016 15:34:31

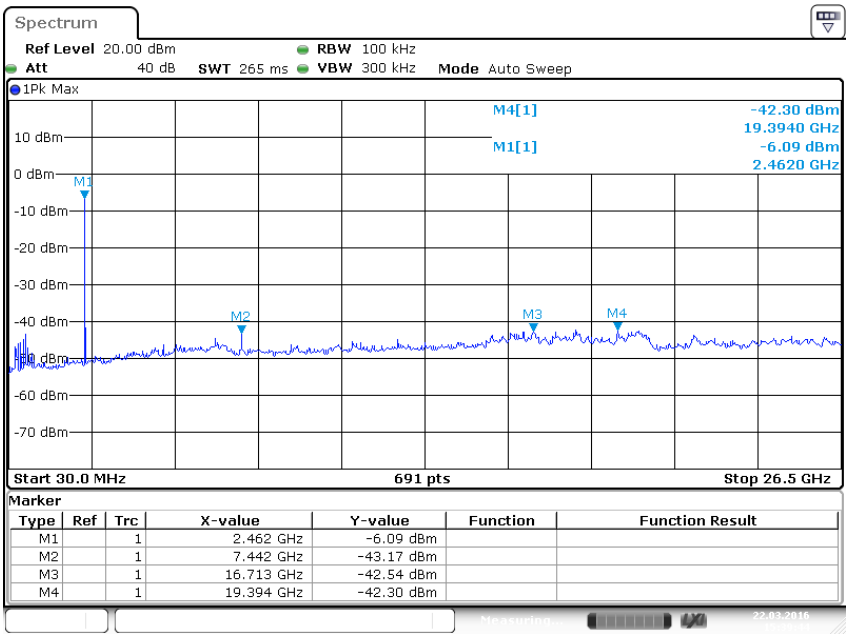
EDR Mode, 3DH1



Date: 22.MAR.2016 15:37:38

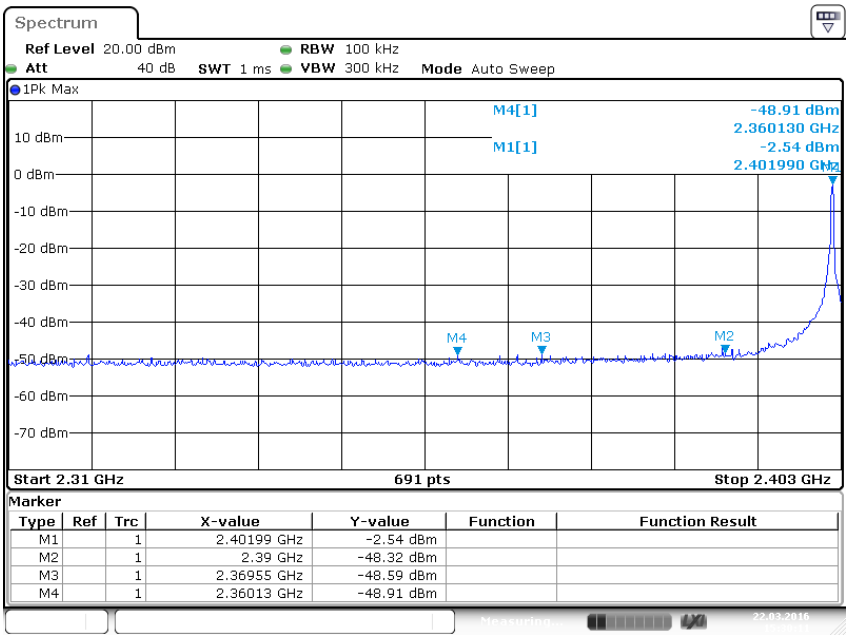


Date: 22.MAR.2016 15:38:47

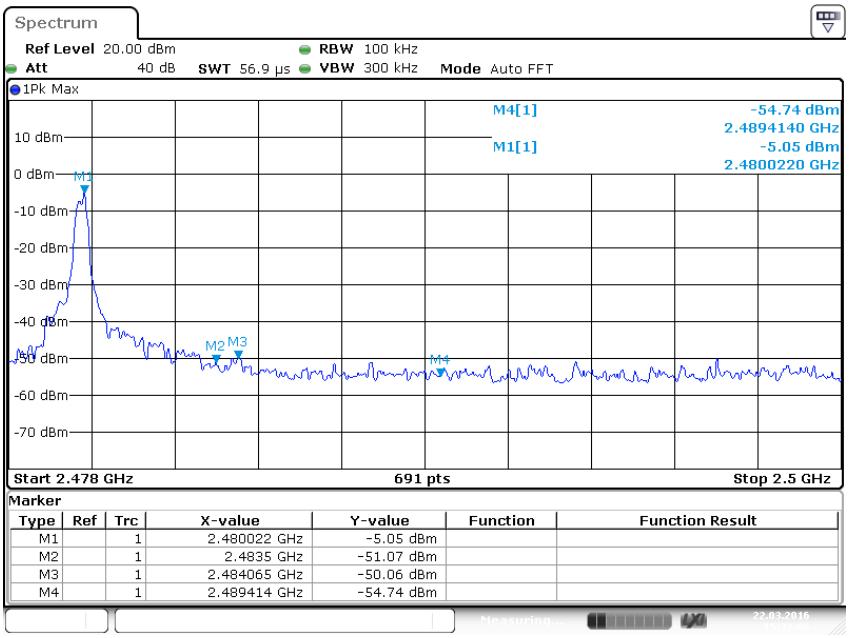


Date: 22.MAR.2016 15:39:43

BDR Mode, Band Edge

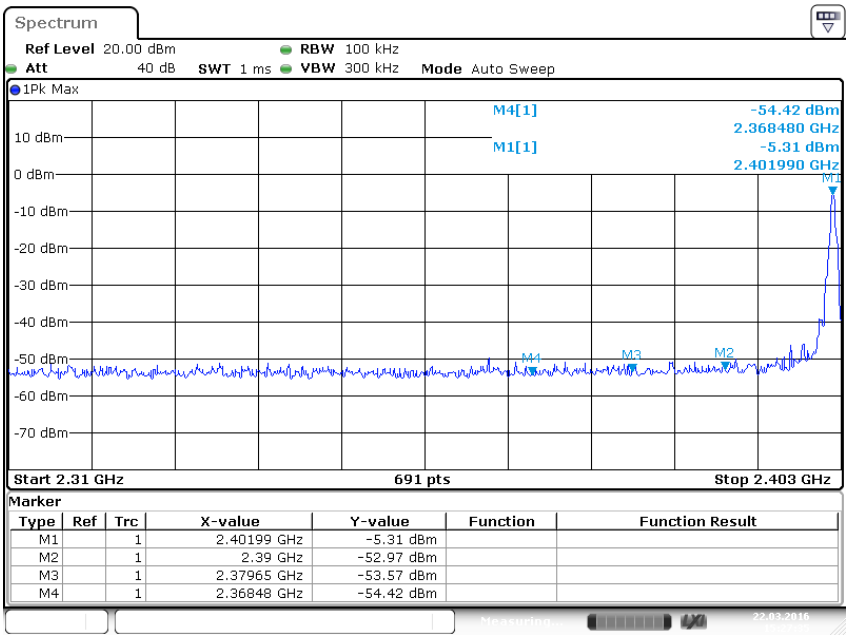


Date: 22.MAR.2016 15:30:11

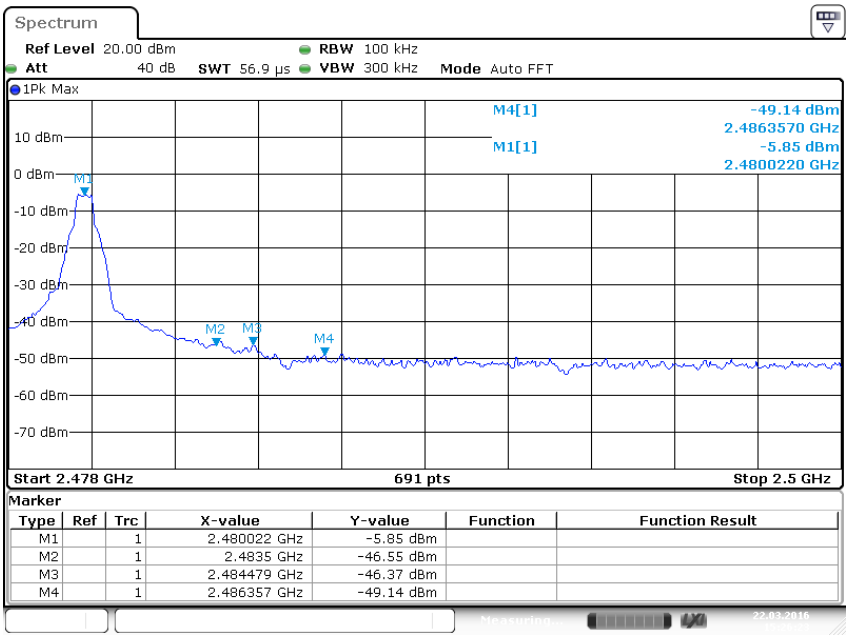


Date: 22.MAR.2016 15:32:06

EDR Mode, Band Edge



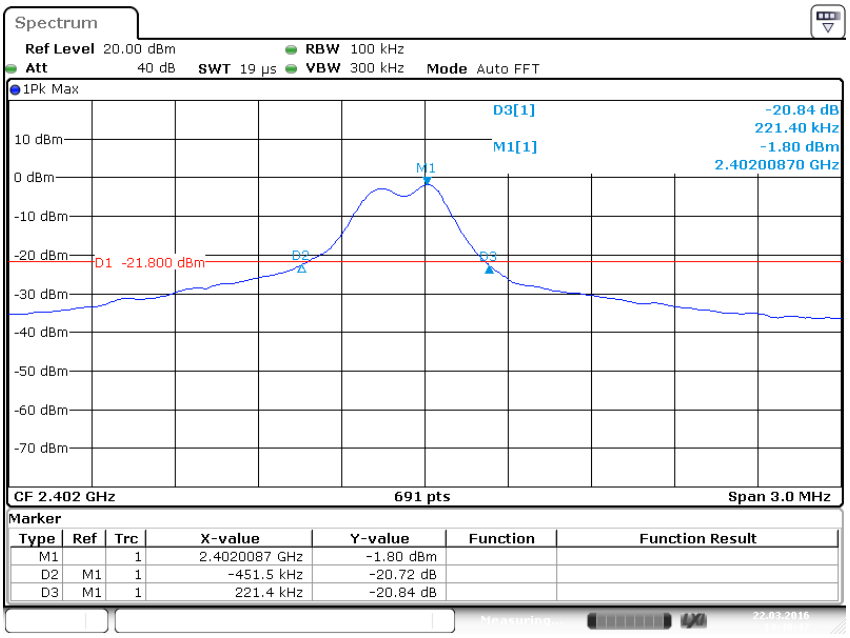
Date: 22.MAR.2016 15:27:35



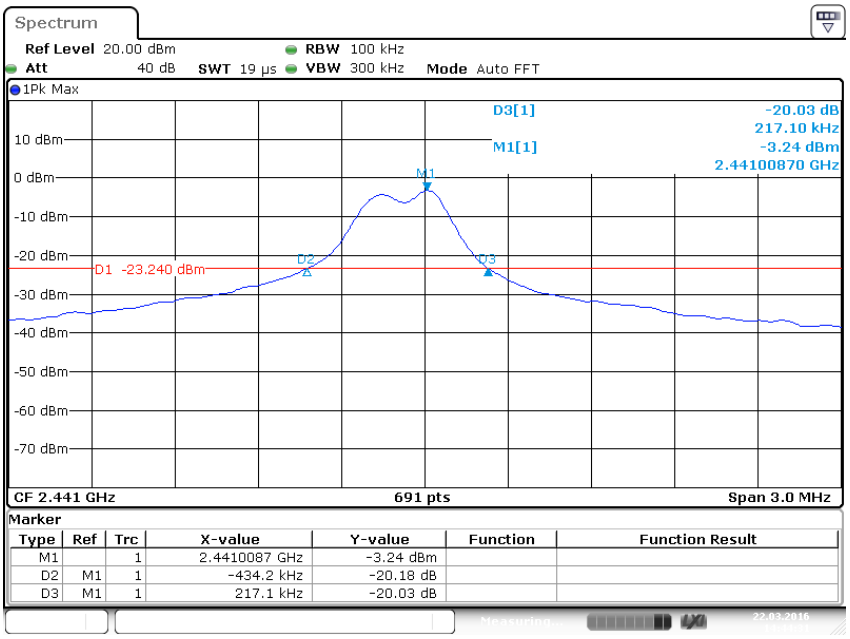
Date: 22.MAR.2016 15:26:23

Appendix A.3: 20dB Bandwidth

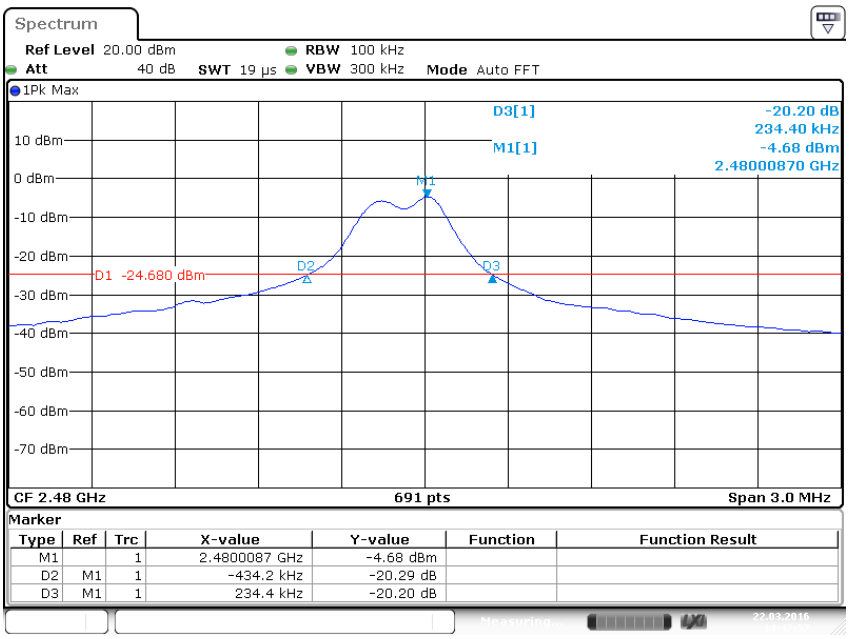
BDR Mode, DH1



Date: 22.MAR.2016 14:40:47

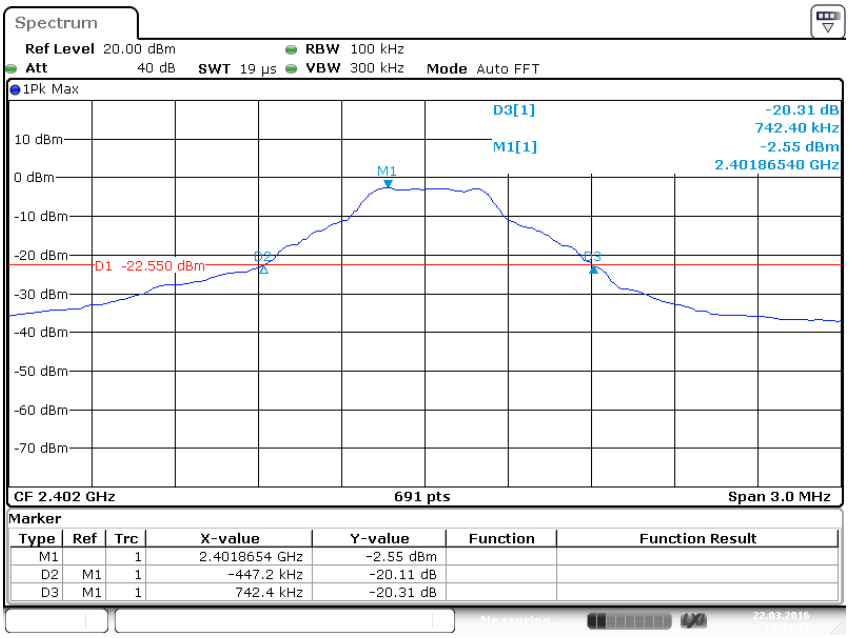


Date: 22.MAR.2016 14:44:30

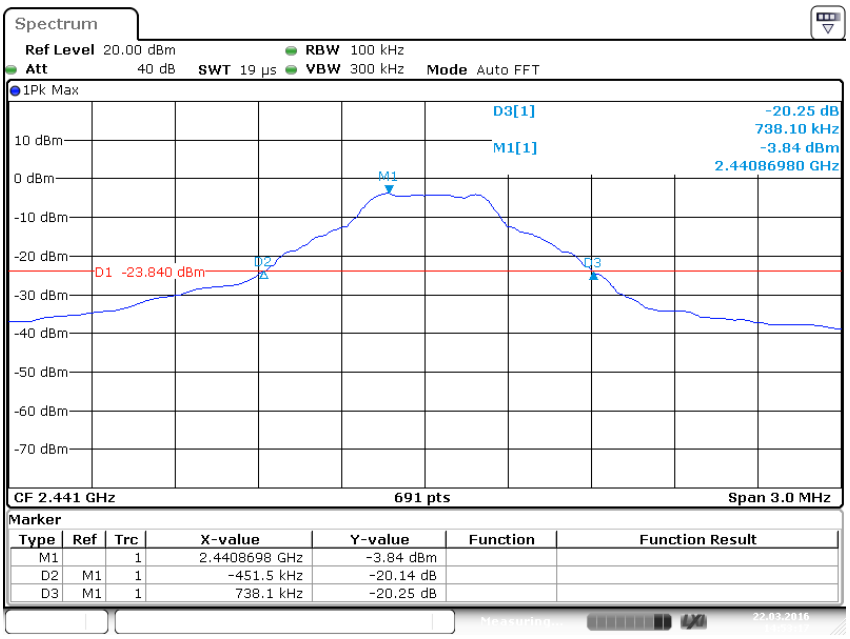


Date: 22.MAR.2016 14:47:56

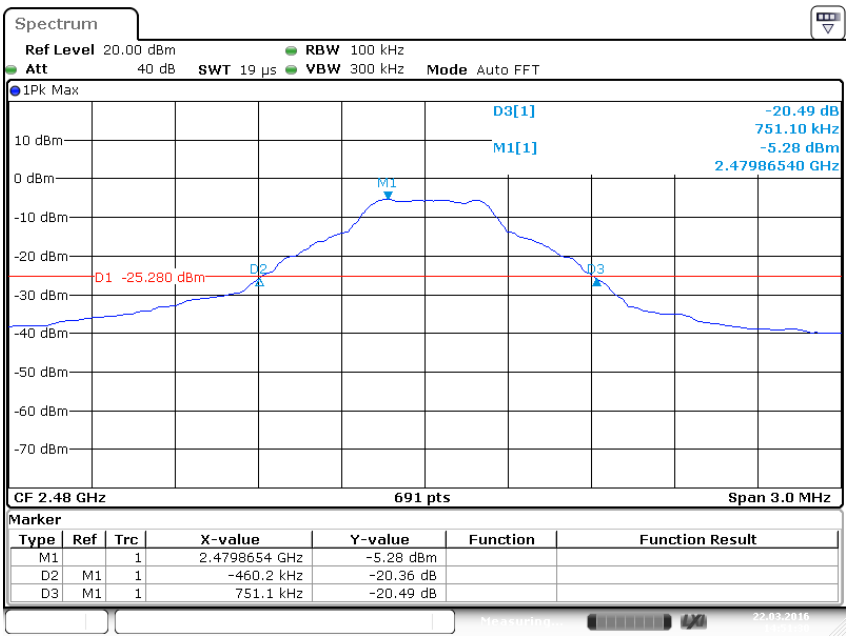
EDR Mode, 3DH1



Date: 22.MAR.2016 14:54:33



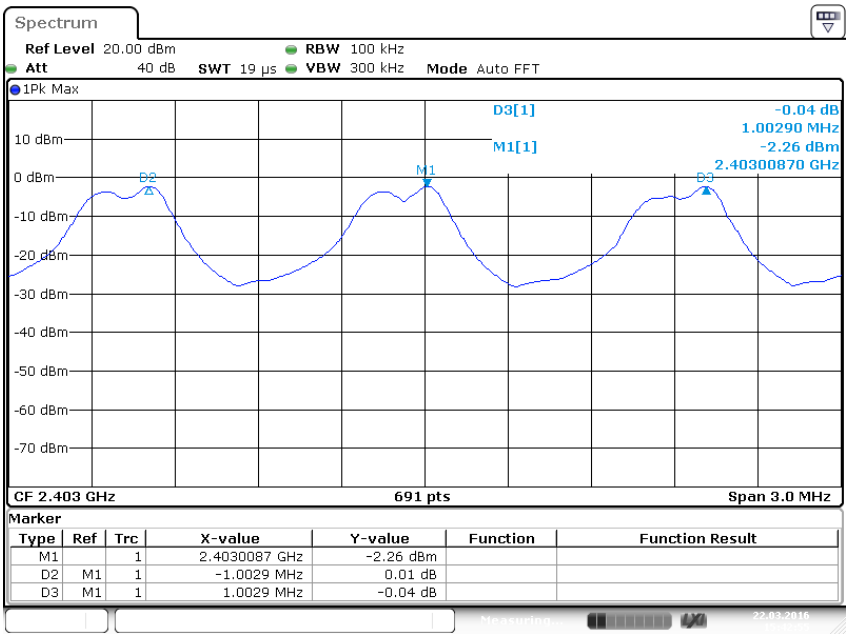
Date: 22.MAR.2016 14:53:17



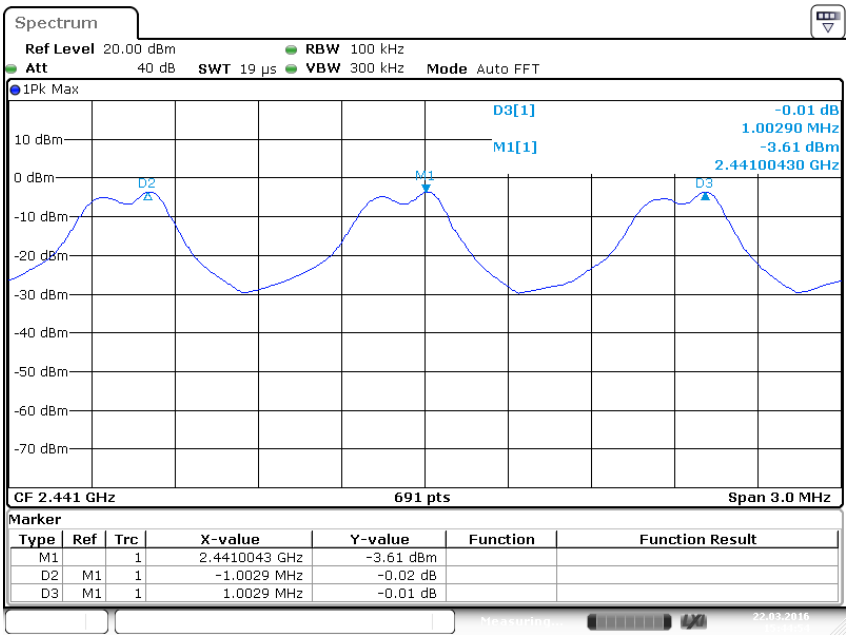
Date: 22.MAR.2016 14:51:29

Appendix A.4: Carrier Frequency Separation

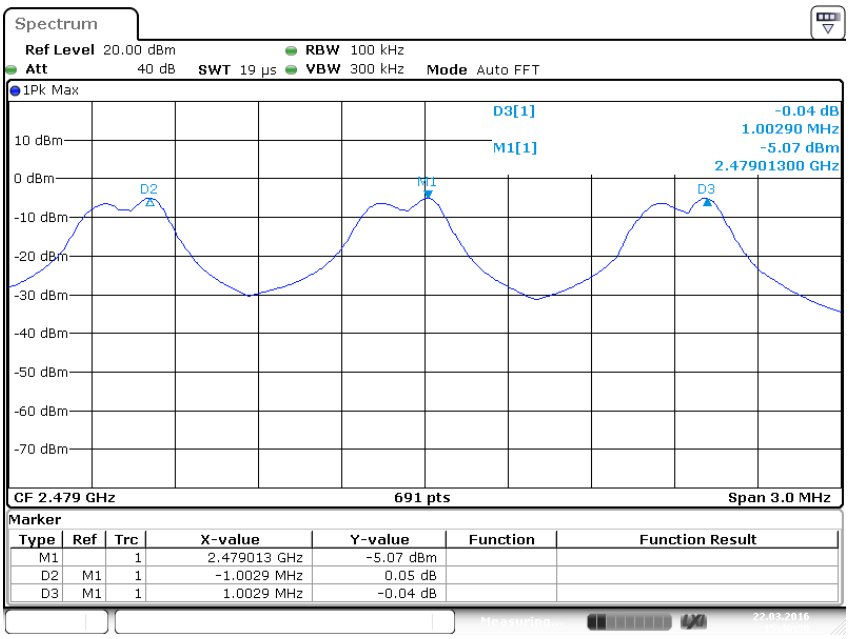
Hopping Mode



Date: 22.MAR.2016 15:42:55



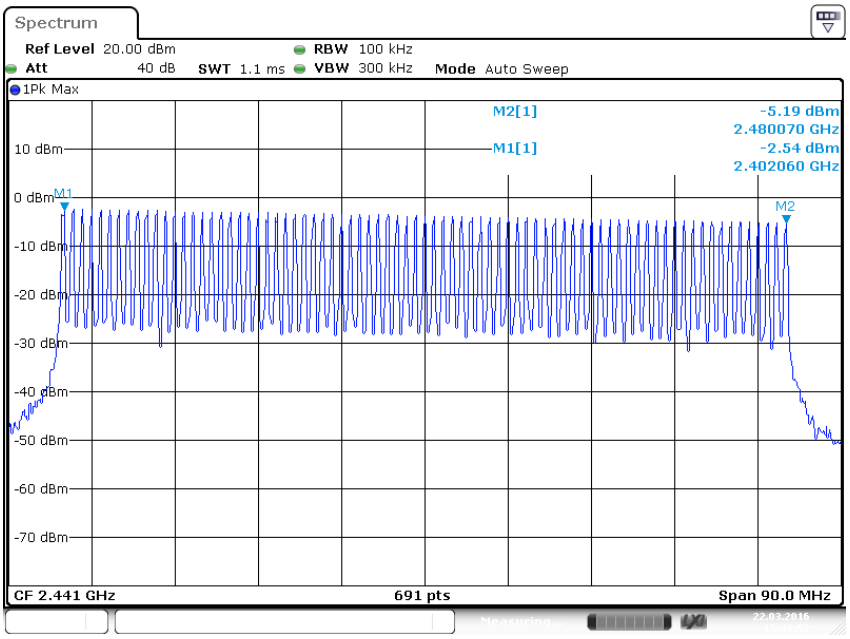
Date: 22.MAR.2016 15:44:54



Date: 22.MAR.2016 15:46:39

Appendix A.5: Number of Hopping Frequency

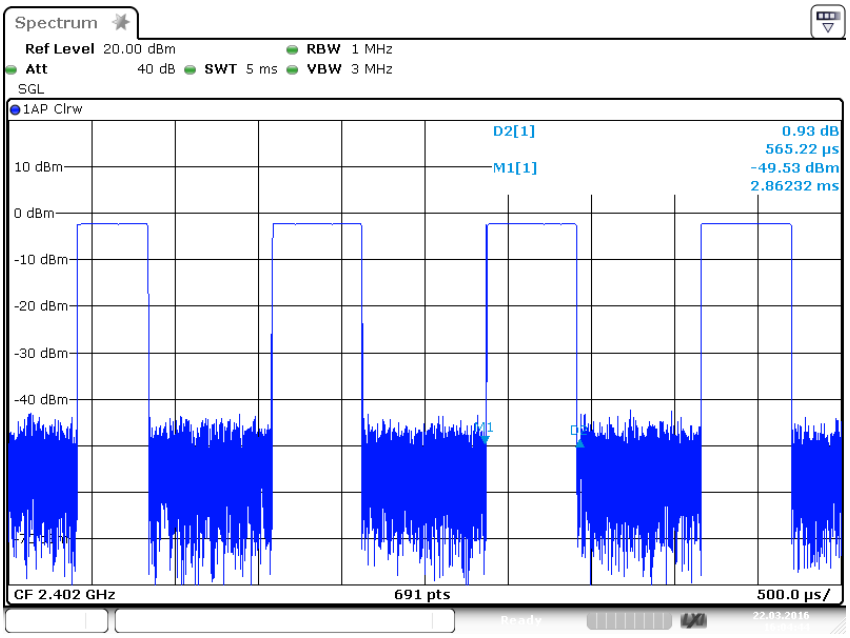
Hopping Mode



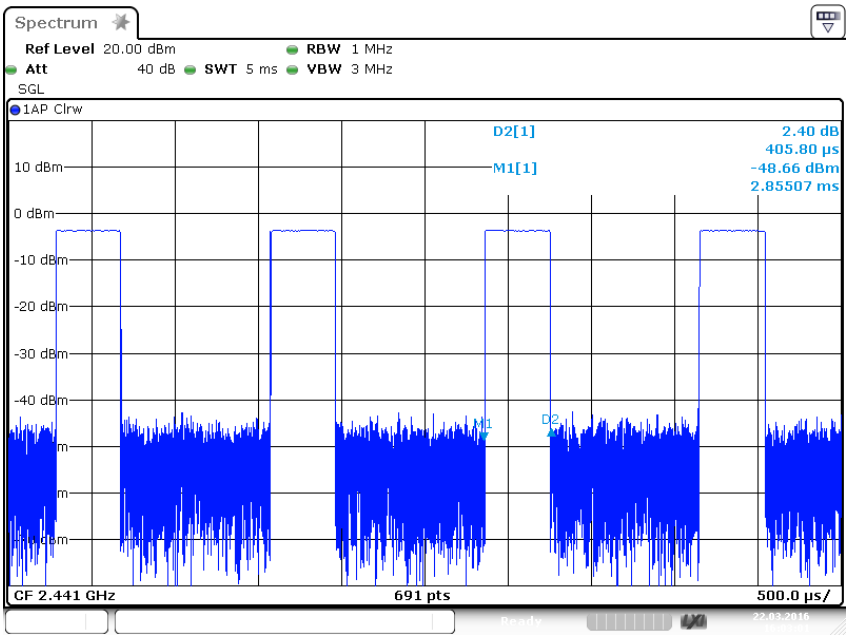
Date: 22.MAR.2016 15:49:52

Appendix A.6: Time of Occupancy

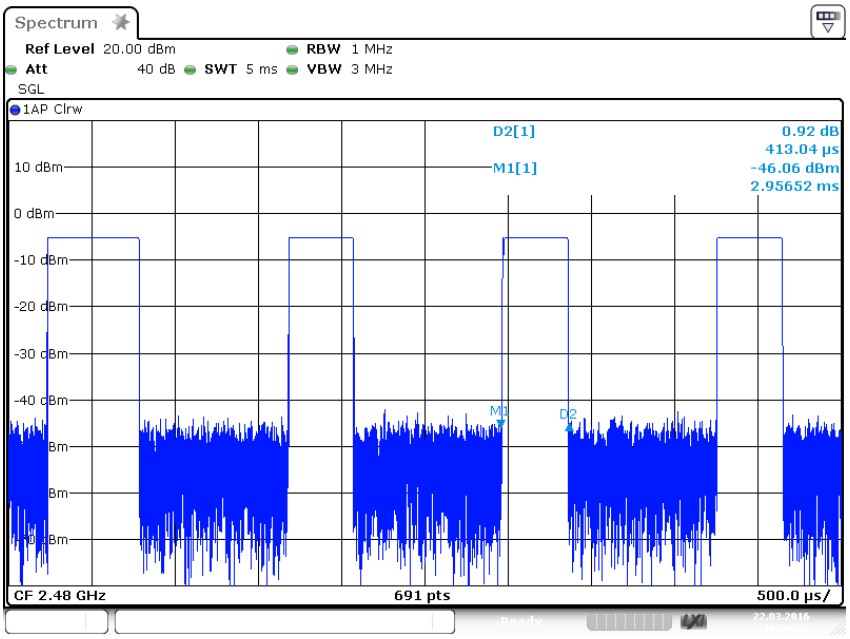
BDR Mode, DH1



Date: 22.MAR.2016 16:04:44

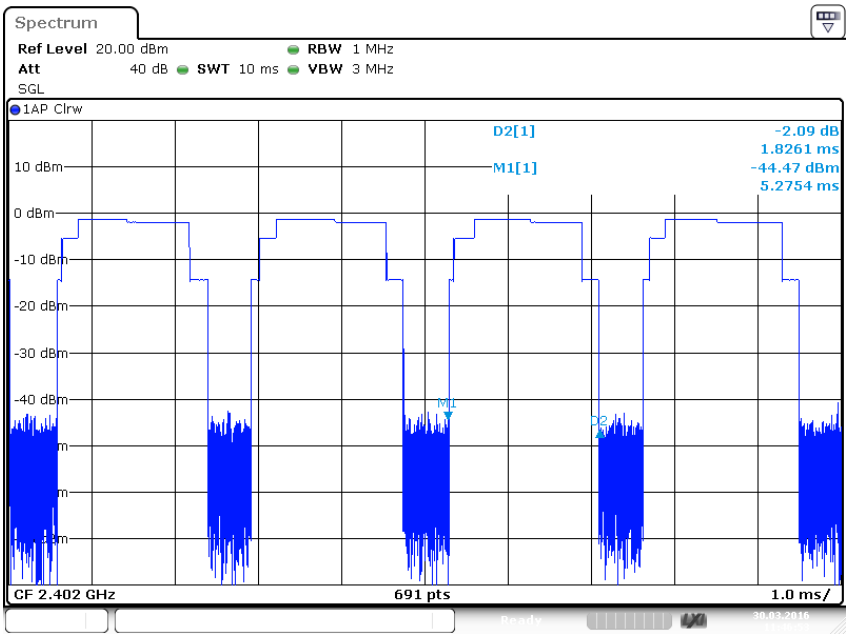


Date: 22.MAR.2016 16:03:01

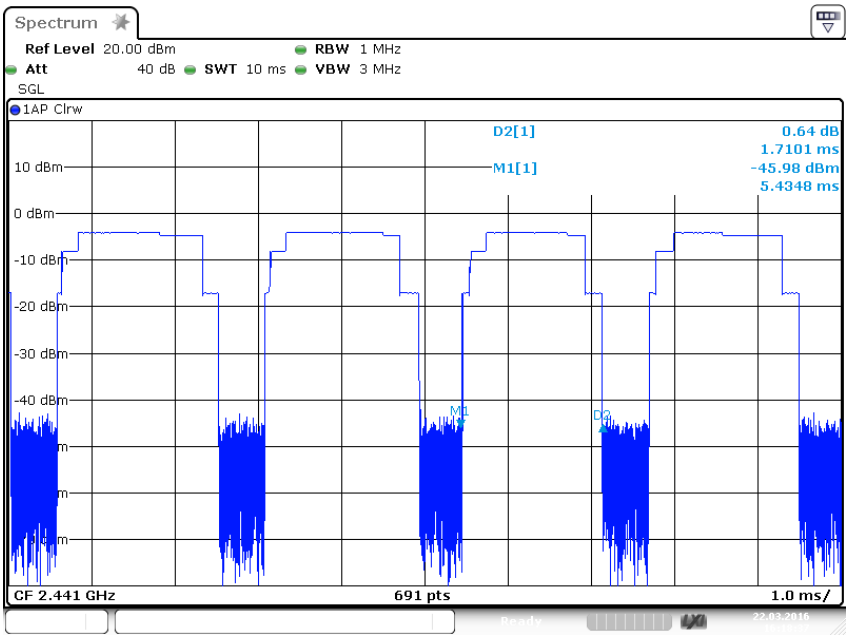


Date: 22.MAR.2016 16:06:36

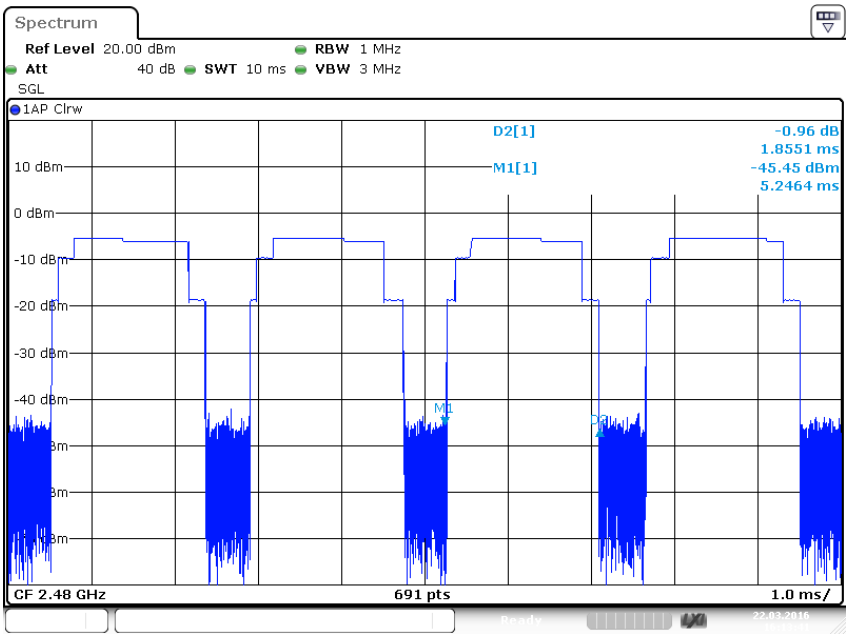
BDR Mode, DH3



Date: 30.MAR.2016 11:46:53

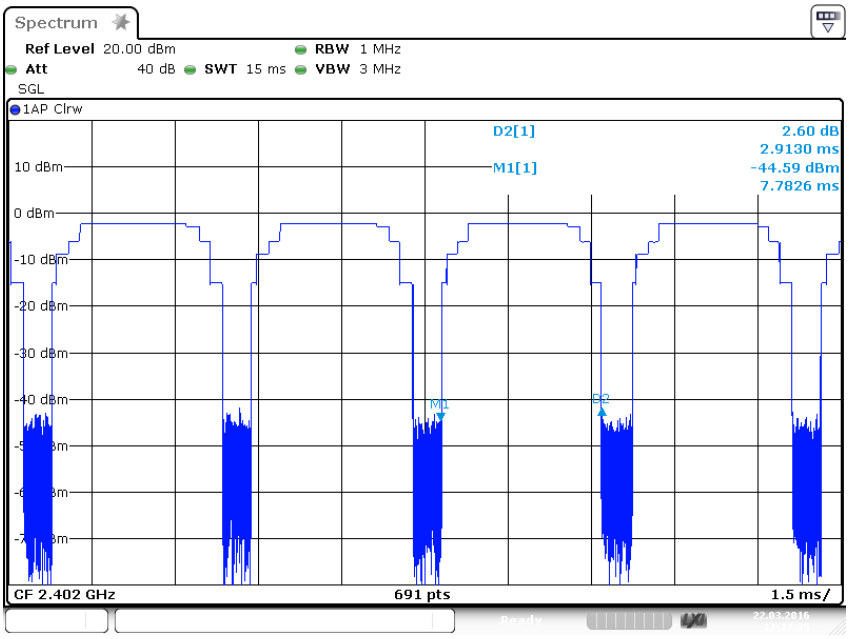


Date: 22.MAR.2016 16:18:37

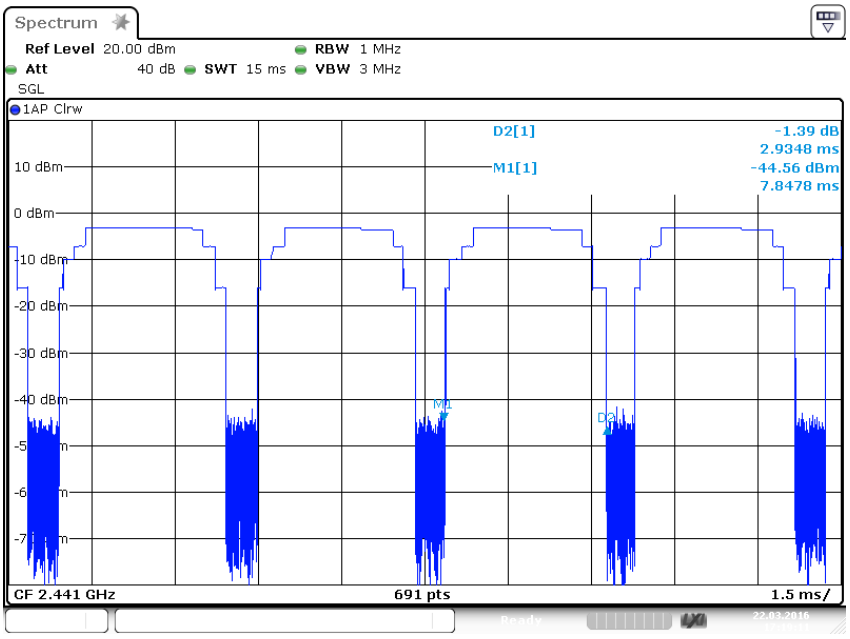


Date: 22.MAR.2016 16:13:41

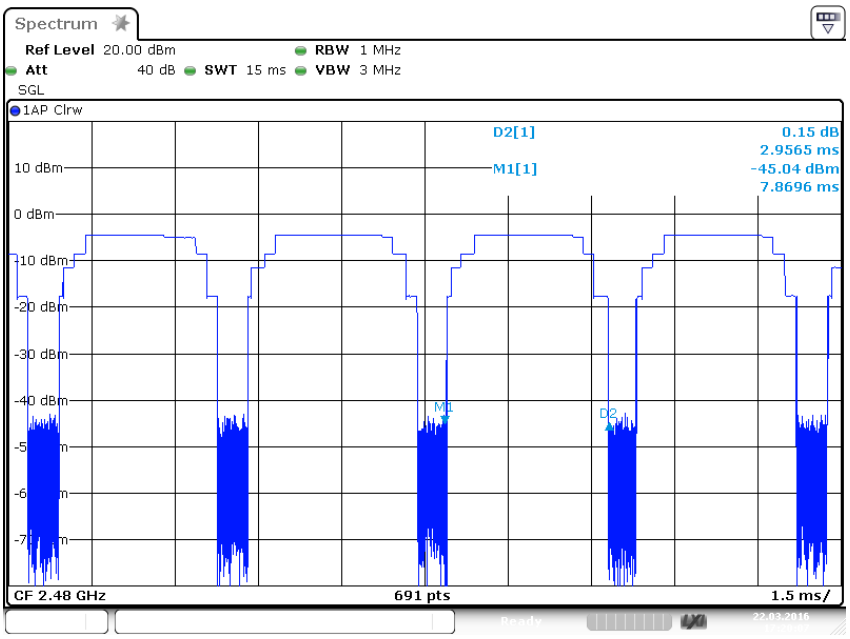
BDR Mode, DH5



Date: 22.MAR.2016 17:17:35

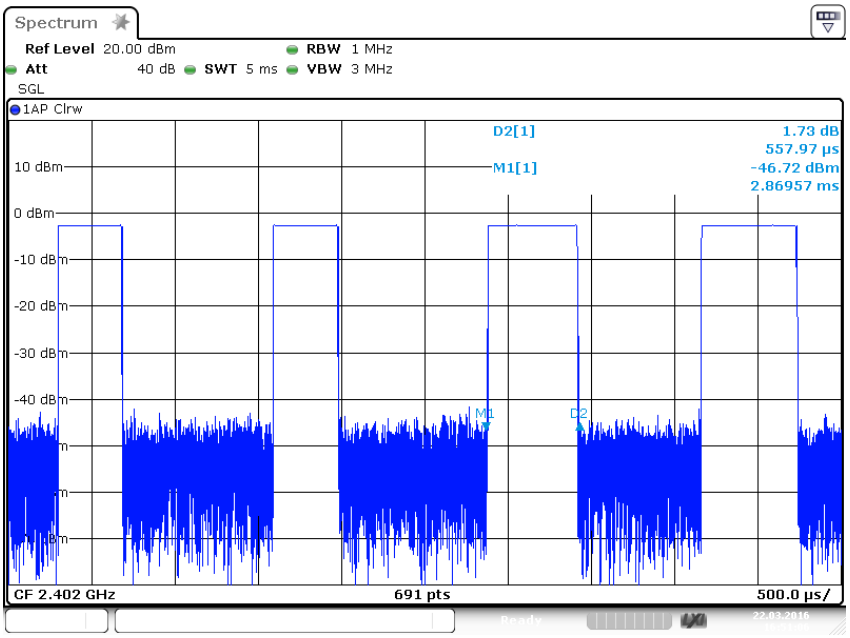


Date: 22.MAR.2016 17:19:11

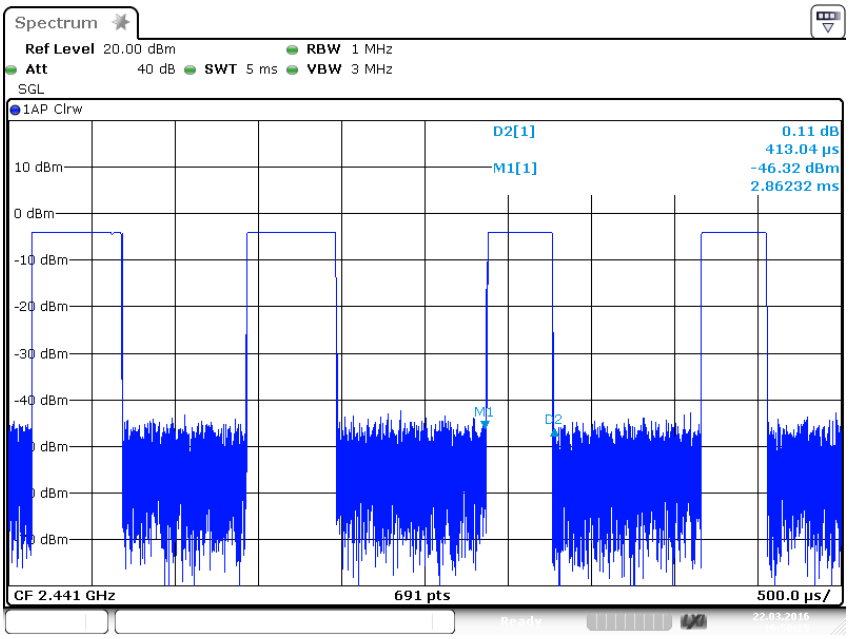


Date: 22.MAR.2016 17:20:07

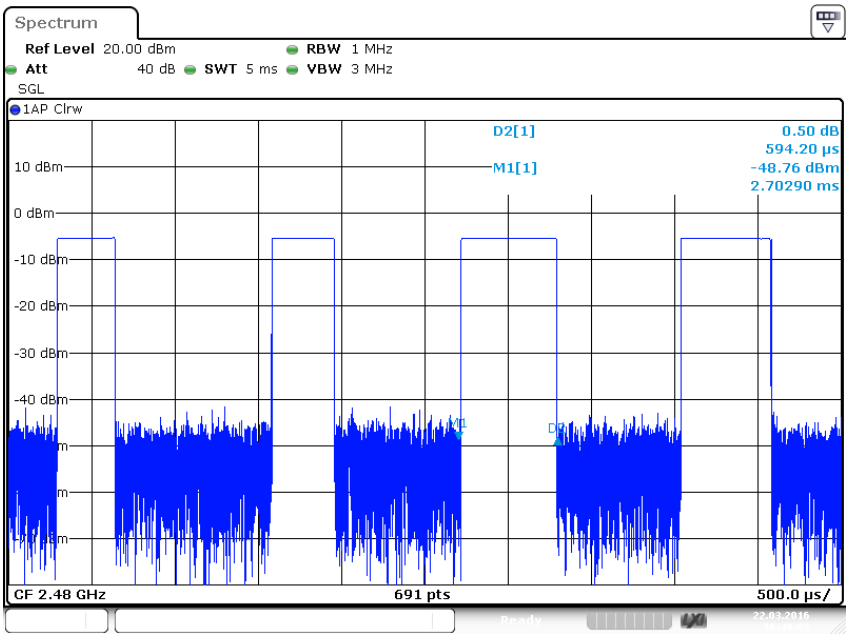
EDR Mode, 3DH1



Date: 22.MAR.2016 16:51:06

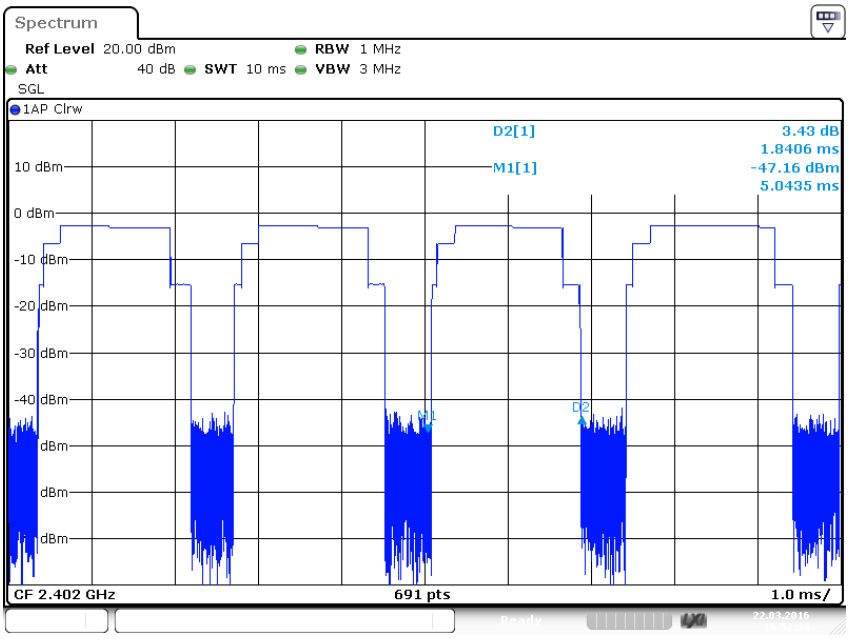


Date: 22.MAR.2016 16:50:25

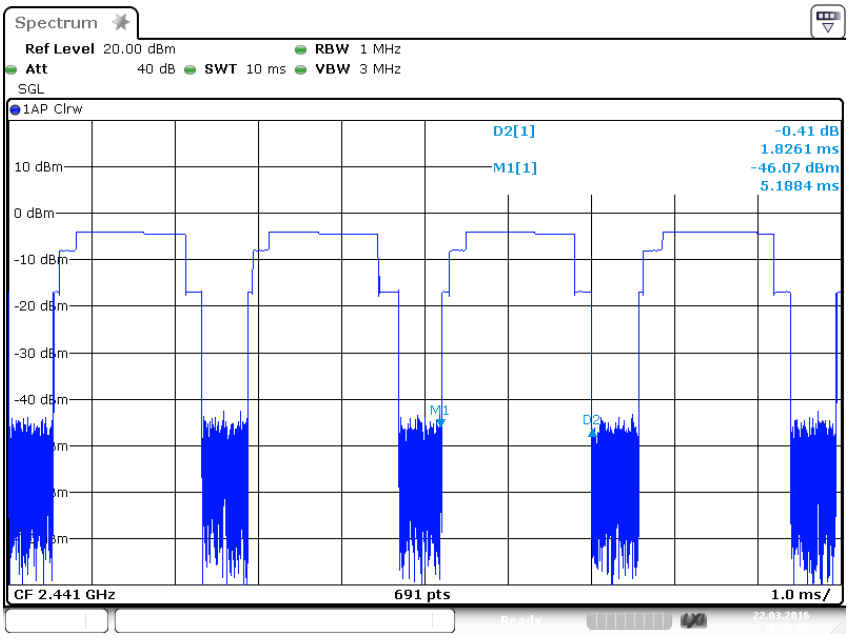


Date: 22.MAR.2016 16:49:03

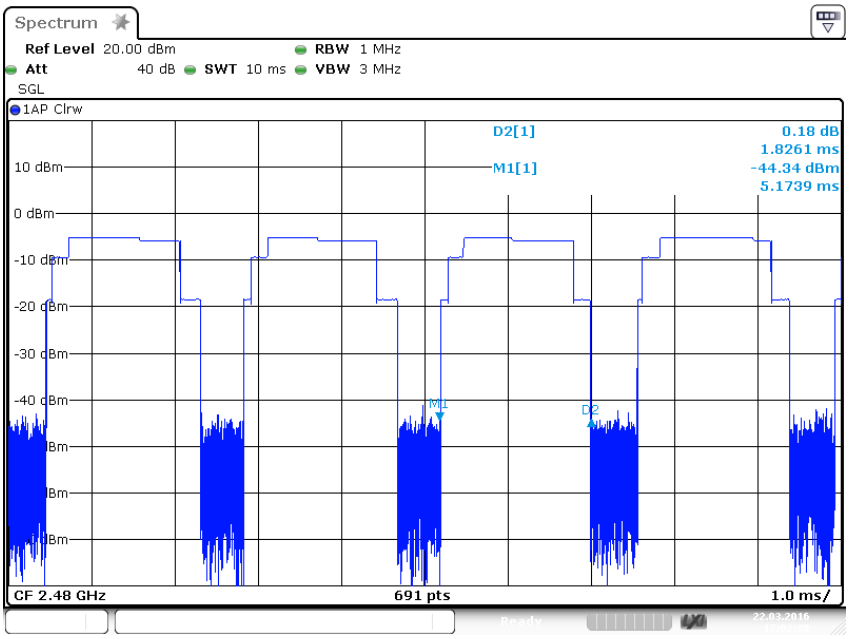
EDR Mode, 3DH3



Date: 22.MAR.2016 16:52:33

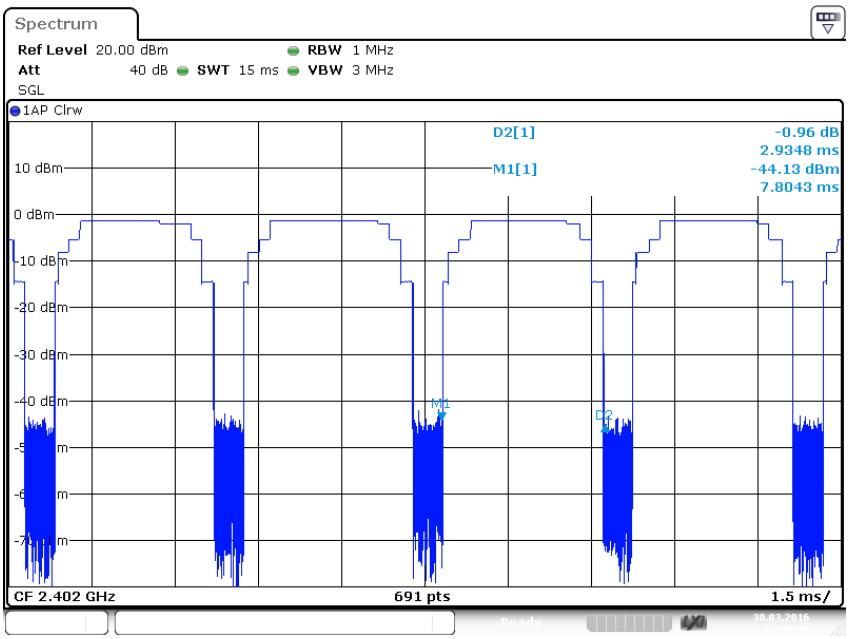


Date: 22.MAR.2016 16:58:07

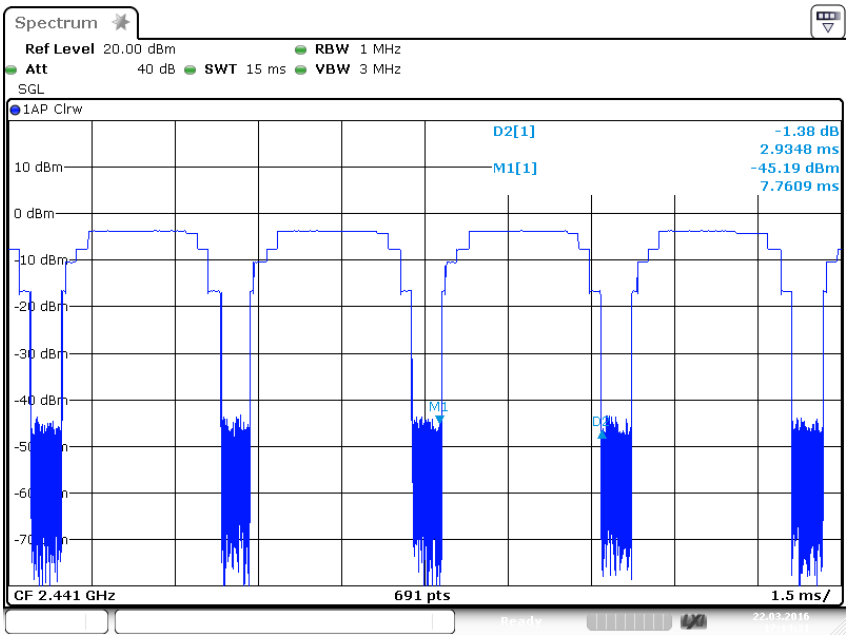


Date: 22.MAR.2016 17:02:38

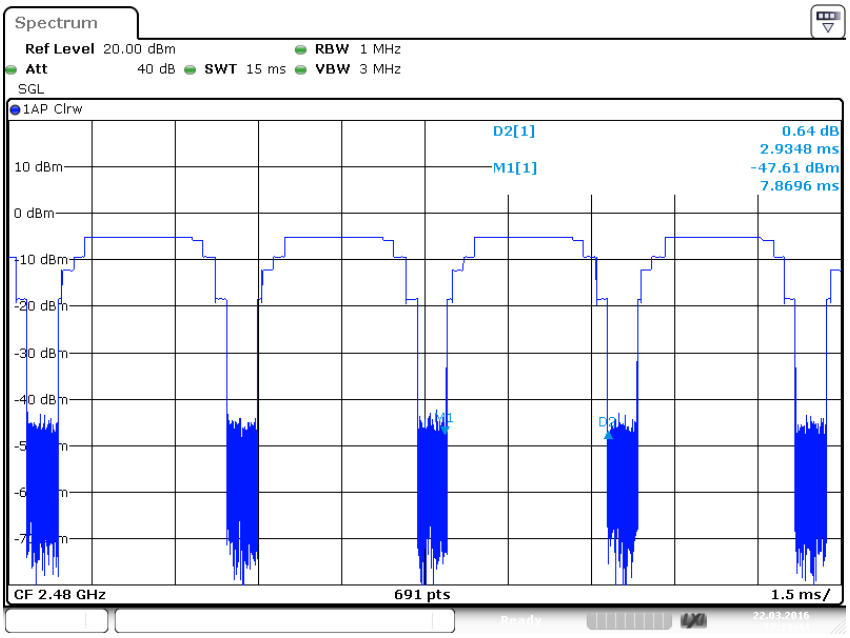
EDR Mode, 3DH5



Date: 30.MAR.2016 11:50:40



Date: 22.MAR.2016 17:14:31



Date: 22.MAR.2016 17:13:44

Appendix B

Test Results of Bluetooth 2.1+ EDR of Radiated Testing

Note: The measurements with active loop antenna were greater than 20dB below the limit, so Radiated Spurious Emissions (9kHz – 30MHz) tests were applied on BDR mode only.

Appendix B.1: Test Plots of Radiated Spurious Emission

9KHz - 30MHz

ACCURATE TECHNOLOGY CO.,LTD

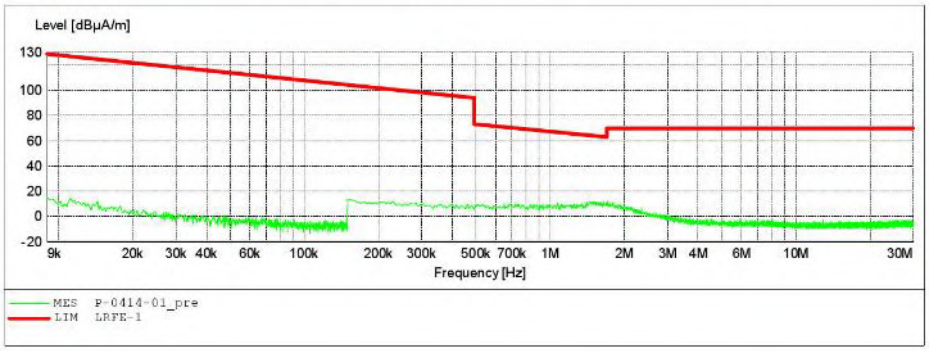
FCC Class B 3M Radiated

```
EUT:                    Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:           THUMBS UP UK LTD
Operating Condition:    TX 2402MHz
Test Site:              2# Chamber
Operator:               LGWADE
Test Specification:     DC 3.7V
Comment:                X
Start of Test:          2016-4-14 /
```

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

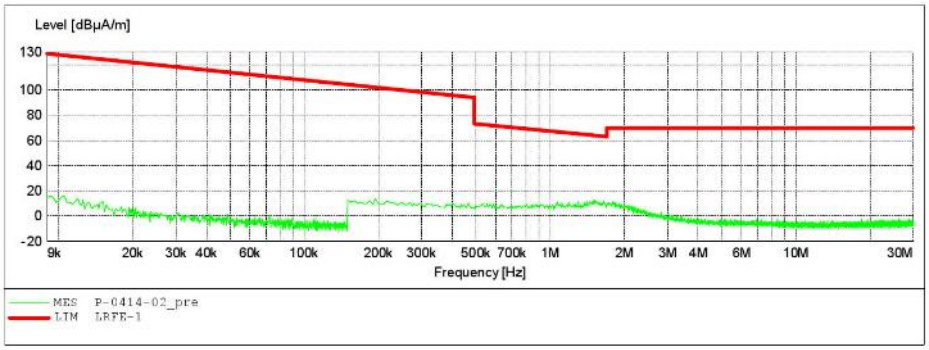
FCC Class B 3M Radiated

```
EUT:                    Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:           THUMBS UP UK LTD
Operating Condition:    TX 2402MHz
Test Site:              2# Chamber
Operator:               LGWADE
Test Specification:     DC 3.7V
Comment:                Y
Start of Test:          2016-4-14 /
```

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

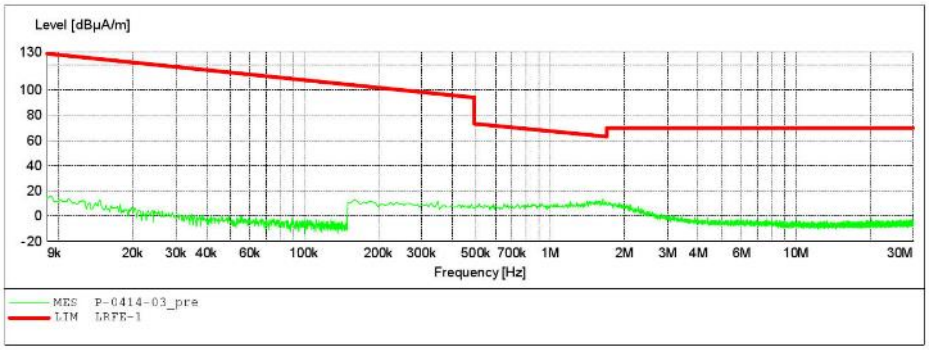
FCC Class B 3M Radiated

EUT: Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer: THUMBS UP UK LTD
Operating Condition: TX 2402MHz
Test Site: 2# Chamber
Operator: LGWADE
Test Specification: DC 3.7V
Comment: Z
Start of Test: 2016-4-14 /

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

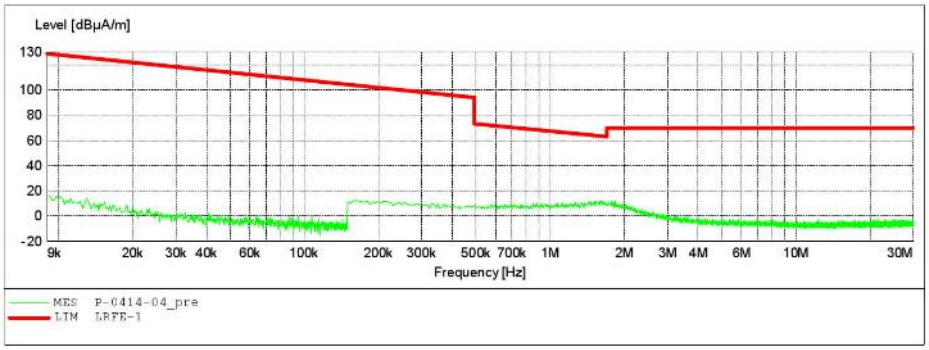
FCC Class B 3M Radiated

```
EUT:                    Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:           THUMBS UP UK LTD
Operating Condition:    TX 2441MHz
Test Site:              2# Chamber
Operator:               LGWADE
Test Specification:     DC 3.7V
Comment:                X
Start of Test:          2016-4-14 /
```

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

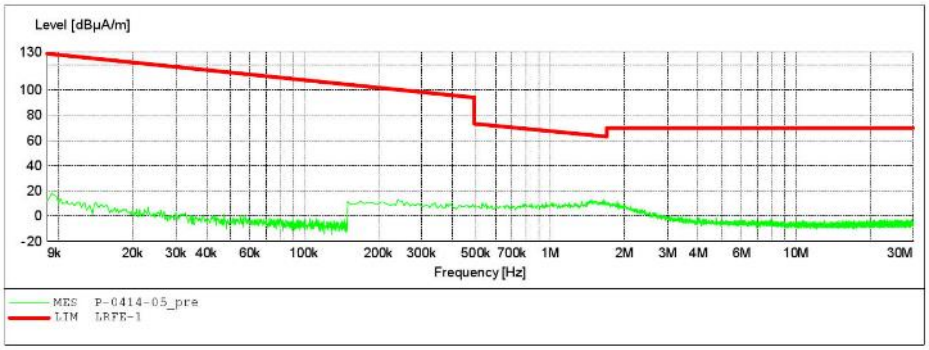
FCC Class B 3M Radiated

EUT:	Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:	THUMBS UP UK LTD
Operating Condition:	TX 2441MHz
Test Site:	2# Chamber
Operator:	LGWADE
Test Specification:	DC 3.7V
Comment:	Y
Start of Test:	2016-4-14 /

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

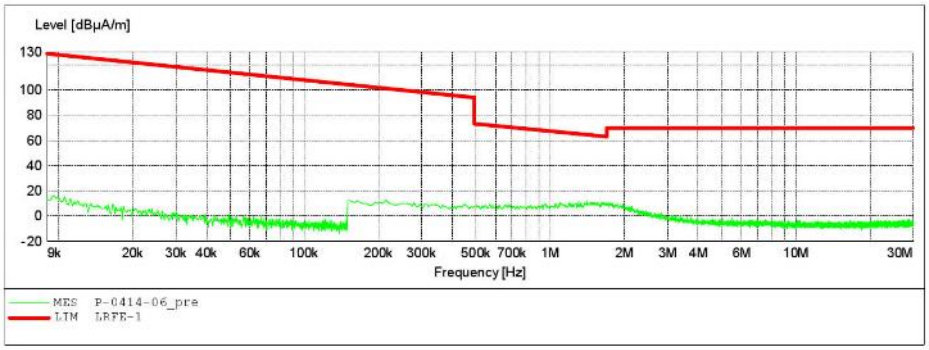
FCC Class B 3M Radiated

EUT:	Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:	THUMBS UP UK LTD
Operating Condition:	TX 2441MHz
Test Site:	2# Chamber
Operator:	LGWADE
Test Specification:	DC 3.7V
Comment:	Z
Start of Test:	2016-4-14 /

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

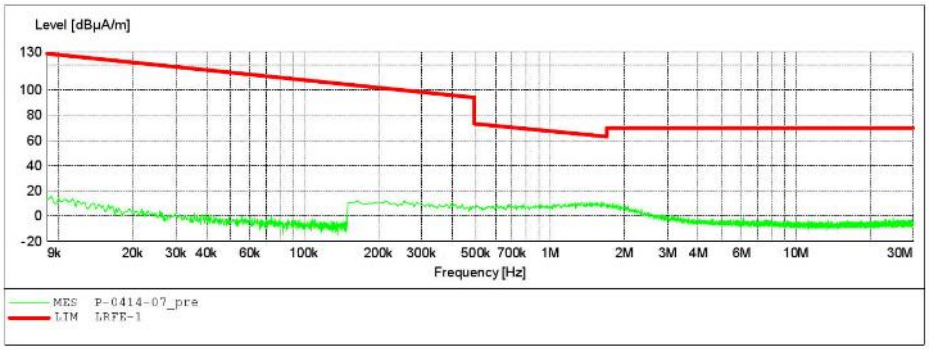
FCC Class B 3M Radiated

EUT:	Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:	THUMBS UP UK LTD
Operating Condition:	TX 2480MHz
Test Site:	2# Chamber
Operator:	LGWADE
Test Specification:	DC 3.7V
Comment:	X
Start of Test:	2016-4-14 /

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

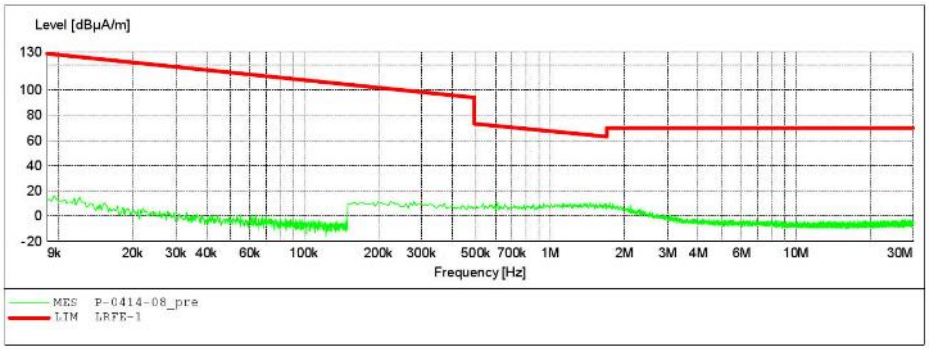
FCC Class B 3M Radiated

EUT:	Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:	THUMBS UP UK LTD
Operating Condition:	TX 2480MHz
Test Site:	2# Chamber
Operator:	LGWADE
Test Specification:	DC 3.7V
Comment:	Y
Start of Test:	2016-4-14 /

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO.,LTD

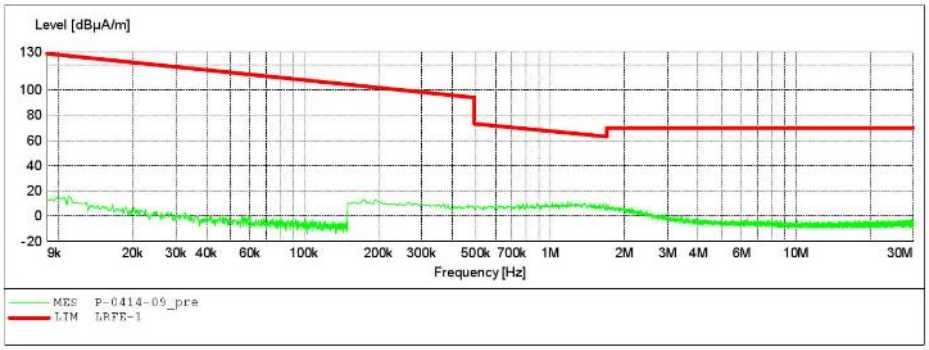
FCC Class B 3M Radiated

EUT:	Mini Metal Bluetooth Speaker M/N:MMBTSPKPKPRM
Manufacturer:	THUMBS UP UK LTD
Operating Condition:	TX 2480MHz
Test Site:	2# Chamber
Operator:	LGWADE
Test Specification:	DC 3.7V
Comment:	Z
Start of Test:	2016-4-14 /

SCAN TABLE: "LFRE Fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



30MHz - 1GHz

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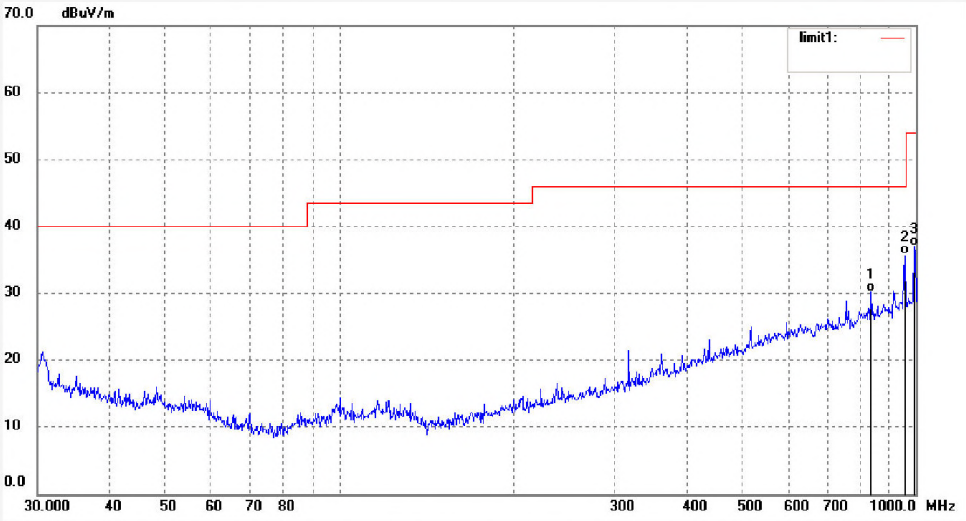
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGWADE #1271	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 16/04/14/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Mini Metal Bluetooth Speaker	Engineer Signature: LGWADE
Mode: TX 2402MHz	Distance:
Model: MMBTSPKPKPRM	
Manufacturer: THUMBS UP UK LTD	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	836.2441	29.50	0.62	30.12	46.00	-15.88	QP			
2	955.4379	33.41	2.29	35.70	46.00	-10.30	QP			
3	993.0113	34.33	2.73	37.06	54.00	-16.94	QP			

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Site: 2# Chamber
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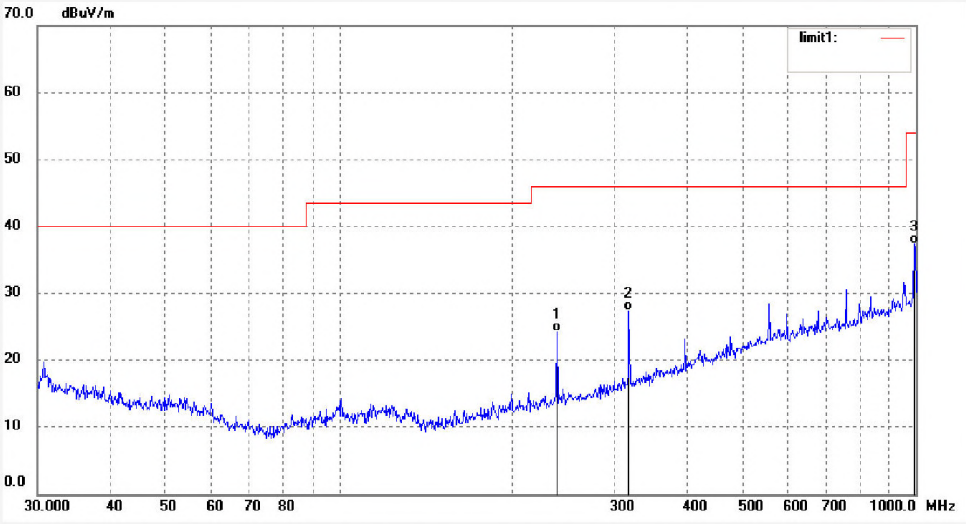
Fax:+86-0755-26503396

Job No.: LGWADE #1272	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 16/04/14/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Mini Metal Bluetooth Speaker	Engineer Signature: LGWADE
Mode: TX 2402MHz	Distance:
Model: MMBTSPKPKPRM	
Manufacturer: THUMBS UP UK LTD	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	238.3102	35.09	-10.79	24.30	46.00	-21.70	QP			
2	317.7010	36.23	-8.81	27.42	46.00	-18.58	QP			
3	993.0113	34.55	2.73	37.28	54.00	-16.72	QP			

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Site: 2# Chamber
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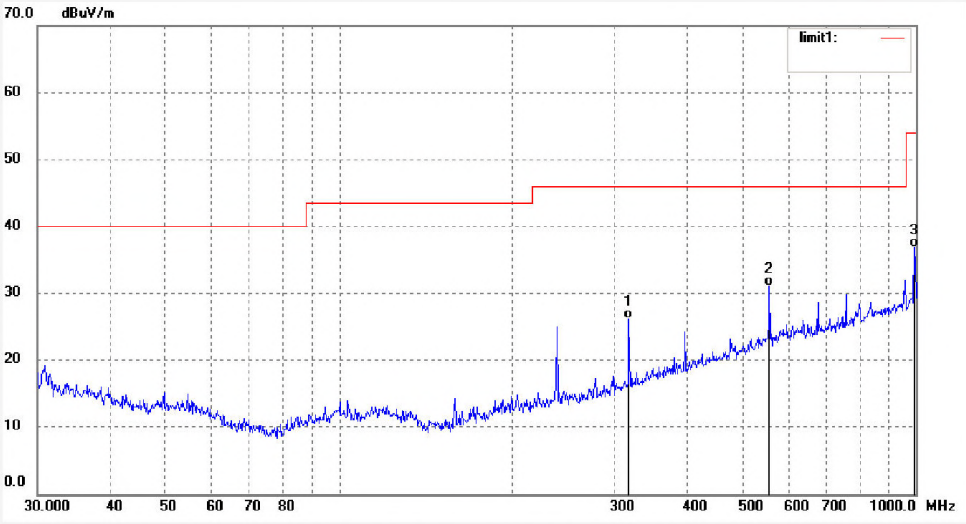
Fax:+86-0755-26503396

Job No.: LGWADE #1273	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 16/04/14/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Mini Metal Bluetooth Speaker	Engineer Signature: LGWADE
Mode: TX 2441MHz	Distance:
Model: MMBTSPKPKPRM	
Manufacturer: THUMBS UP UK LTD	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	317.7010	34.99	-8.81	26.18	46.00	-19.82	QP			
2	556.7744	34.60	-3.48	31.12	46.00	-14.88	QP			
3	993.0113	34.17	2.73	36.90	54.00	-17.10	QP			

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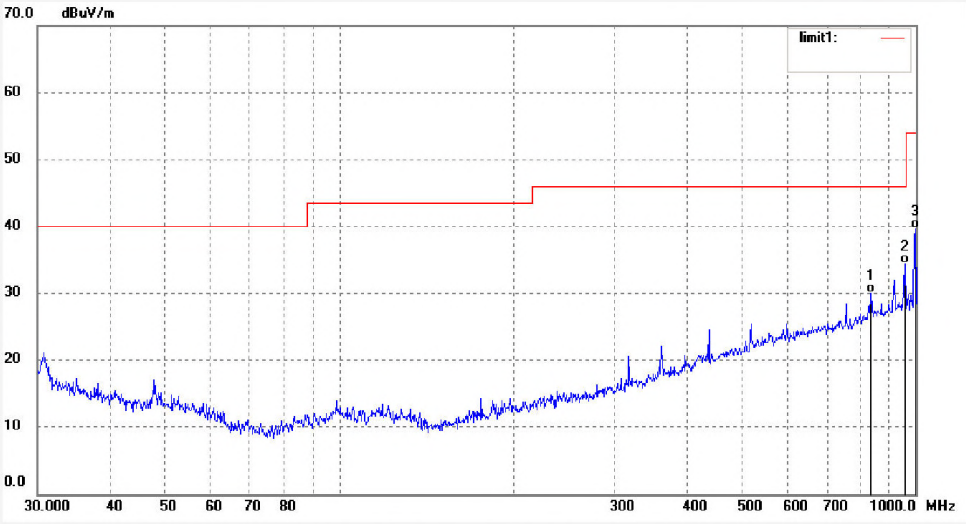
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGWADE #1274	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 16/04/14/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Mini Metal Bluetooth Speaker	Engineer Signature: LGWADE
Mode: TX 2441MHz	Distance:
Model: MMBTSPKPKPRM	
Manufacturer: THUMBS UP UK LTD	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	836.2441	29.40	0.62	30.02	46.00	-15.98	QP			
2	955.4380	32.15	2.29	34.44	46.00	-11.56	QP			
3	996.4995	36.78	2.78	39.56	54.00	-14.44	QP			

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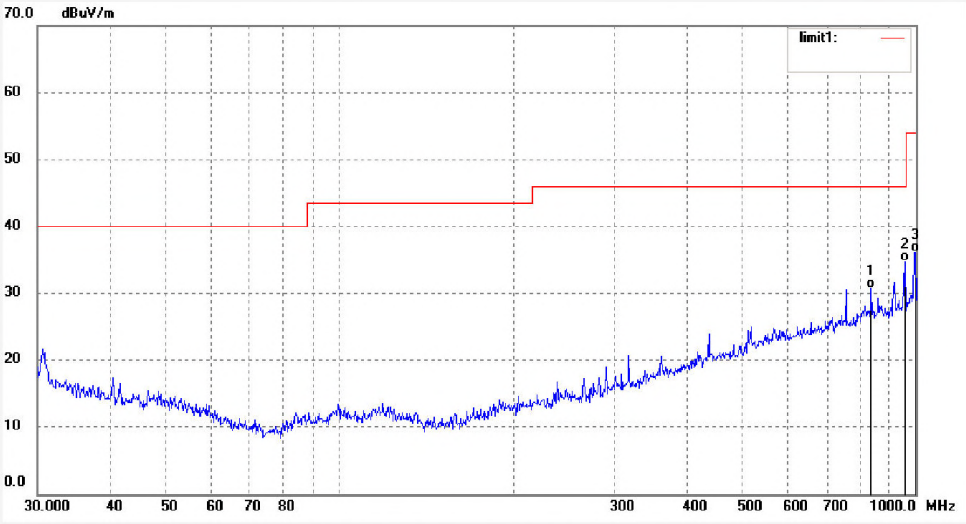
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGWADE #1275	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 16/04/14/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Mini Metal Bluetooth Speaker	Engineer Signature: LGWADE
Mode: TX 2480MHz	Distance:
Model: MMBTSPKPKPRM	
Manufacturer: THUMBS UP UK LTD	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	836.2441	30.07	0.62	30.69	46.00	-15.31	QP			
2	955.4380	32.52	2.29	34.81	46.00	-11.19	QP			
3	996.4995	33.37	2.78	36.15	54.00	-17.85	QP			

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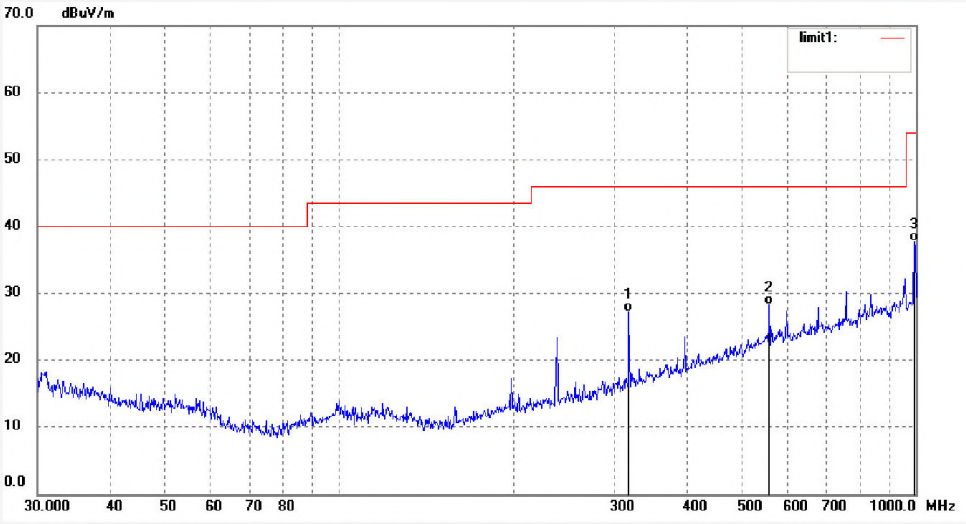
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGWADE #1276	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 16/04/14/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Mini Metal Bluetooth Speaker	Engineer Signature: LGWADE
Mode: TX 2480MHz	Distance:
Model: MMBTSPKPKPRM	
Manufacturer: THUMBS UP UK LTD	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	317.7010	35.99	-8.81	27.18	46.00	-18.82	QP			
2	556.7744	31.71	-3.48	28.23	46.00	-17.77	QP			
3	993.0113	34.99	2.73	37.72	54.00	-16.28	QP			

1GHz - 18GHz

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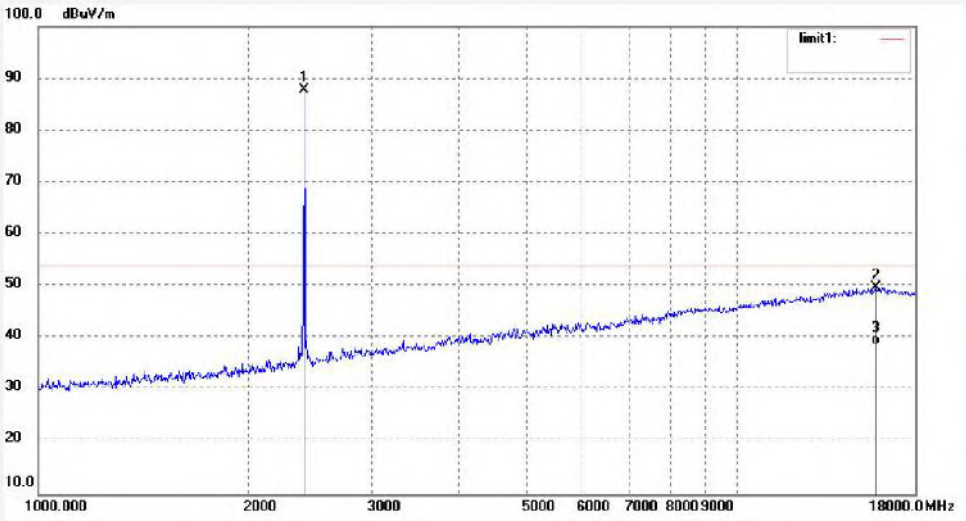
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Igwade #1099	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 16/04/14/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Mini Metal Bluetooth Speaker	Engineer Signature: LGWADE
Mode: TX 2402MHz	Distance: 3m
Model: MMBTSPKPKPRM	
Manufacturer: THUMBS UP UK LTD	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	95.14	-7.45	87.69	/	/	peak			
2	15804.663	9.71	40.04	49.75	74.00	-24.25	peak			
3	15804.663	-1.35	40.04	38.69	54.00	-15.31	AVG			