TEST REPORT

FCC Part 15.247

Equipment under test	In-vehicle Infotainment System
Model name	XSG3NA
FCC ID	YE4XSG3NA
Applicant	Glosys Inc.
Manufacturer	Glosys Inc.
Date of test(s)	2015.08.04 ~ 2015.08.19
Date of issue	2015.09.22

Issued to
Glosys Inc.
#510, Venture Valley B/D, 40, OmokcheonRo 152beonGil
GwonseonGu, SuwonSi, GyeonggiDo, korea

Issued by

KES Co., Ltd.
C-3701, Simin-daero 365-40, Dongan-gu, Anyang-si,
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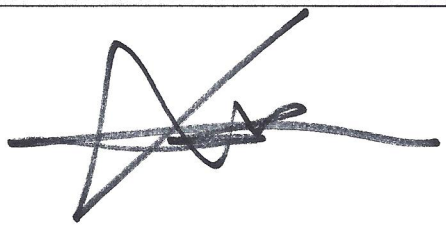
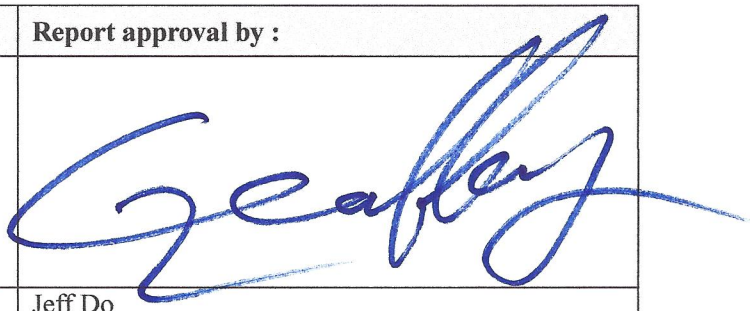
Test and report completed by :	Report approval by :
	
Kwon-se Kim Test engineer	Jeff Do Technical manager

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Revision history

Revision	Date of issue	Test report No.	Description
-	2015.08.31	KES-RF-15T0057	Initial
R1	2015.09.22	KES-RF-15T0057-R1	A change of product name

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1. General information

Applicant:	Glosys Inc.
Applicant address:	#510, Venture Valley B/D, 40, OmokcheonRo 152beonGil GwonseonGu, SuwonSi, GyeonggiDo, korea
Test site:	KES Co., Ltd.
Test site address:	C-3701, Simin-daero 365-40, Dongan-gu, Anyang-si, Gyeonggi-do,14057, Korea 473-29, Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea
FCC/IC rule part(s):	15.247
Model:	XSG3NA
FCC ID:	YE4XSG3NA
Test device serial No.:	☐ Production ☒ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test	In-vehicle Infotainment System
Frequency range	2402 ㎒ ~ 2480 ㎒
Modulation technique	FHSS
Number of channels	79
Antenna specification	Antenna type: PCB Peak gain: -4.54 ㏈i
Power source	DC 12.0 V

15.247(a)(1) that the rx input bandwidths shift frequencies in synchronization with the transmitted
15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.
15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate it channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

Pseudorandom frequency hopping sequence
The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The nominal hop rate is 1 600 hops/s.

Equal hopping frequency use
The channels of this system will be used equally over the long-term distribution of the hopsets.

Example of a 79 hopping sequence in data mode:
02, 05, 31, 24, 20, 10, 43, 36, 30, 23, 40, 06, 21, 50, 44, 09, 71, 78, 01, 13, 73, 07, 70, 72, 35, 62, 42, 11, 41, 08, 16, 29, 60, 15, 34, 61, 58, 04, 67, 12, 22, 53, 57, 18, 27, 76, 39, 32, 17, 77, 52, 33, 56, 46, 37, 47, 64, 49, 45, 38, 69, 14, 51, 26, 79, 19, 28, 65, 75, 54, 48, 03, 25, 66, 05, 16, 68, 74, 59, 63, 55,

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System receiver input bandwidth

Each channel bandwidth is 1 ㎒.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

1.2. Test configuration

The Bluetooth Car Audio FCC ID: YE4XSG3NA was tested per the guidance of ANSI C63.10-2009 and DA 00-705. ANSI C63.10-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing.

1.3. Frequency/channel operations

Ch.	Frequency (㎒)	Rate(Mbps)
00	2402	1,3
. .	. .	. .
39	2441	1,3
. .	. .	. .
78	2480	1,3

Preliminary tests were performed in different data rate and the highest power data rates(1 Mbps, 3 Mbps) were chosen for full test

Data rate	Channel (㎒)	1 Mbps(GFSK)	2 Mbps(π/4-DQPSK)	3 Mbps(8DPSK)
Output power(dBm)	2402	**-1.80**	-3.07	**-2.85**
	2441	**-1.84**	-2.96	**-2.76**
	2480	**-2.48**	-3.72	**-3.36**

1.4. Information about derivative model

N/A

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2. Summary of tests

Section in FCC Part 15	Test description	Test results
15.205, 15.209	Radiated restricted band and emission	Pass
15.207(d)	Conducted band edge and out of band emissions	Pass
15.247(a)(1)(iii)	20 dB bandwidth	Pass
15.247(b)(1)	Output power	Pass
15.247(a)(1)	Channel separation	Pass
15.247(a)(1)(iii)	Number of channels	Pass
15.247(a)(1)(iii)	Time of occupancy	Pass

Note:

1. The EUT was tested per the guidance of DA 00-705. ANSI C63.10-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing.
2. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

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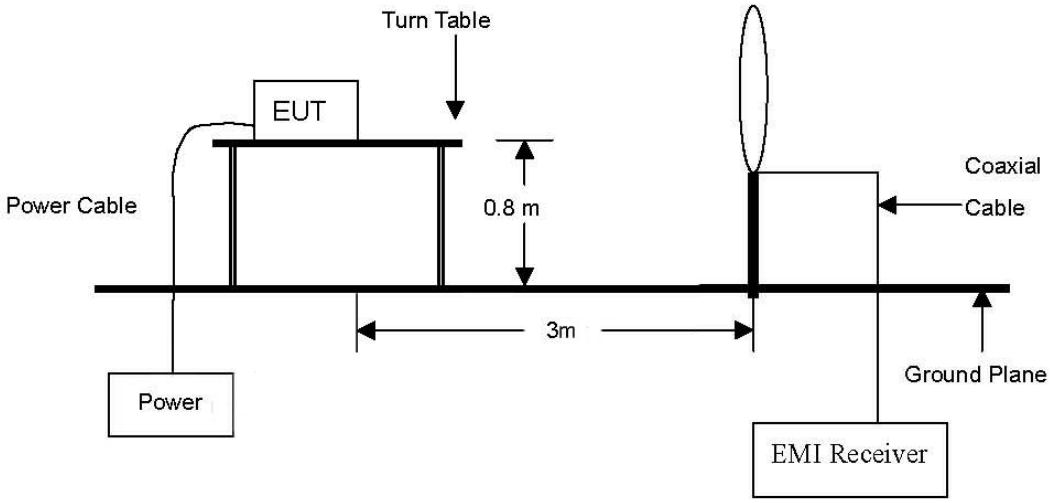
3. Test results

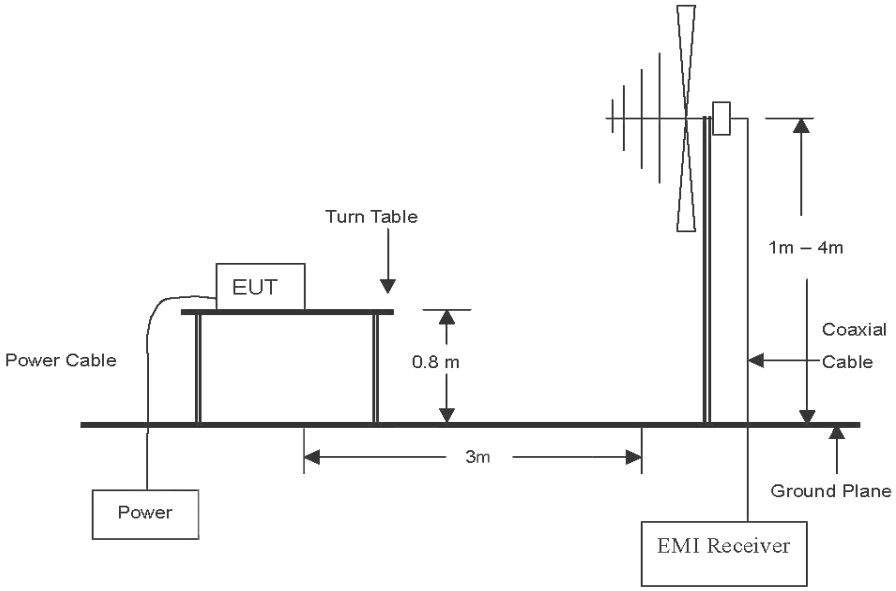
3.1. Radiated restricted band and emissions

Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



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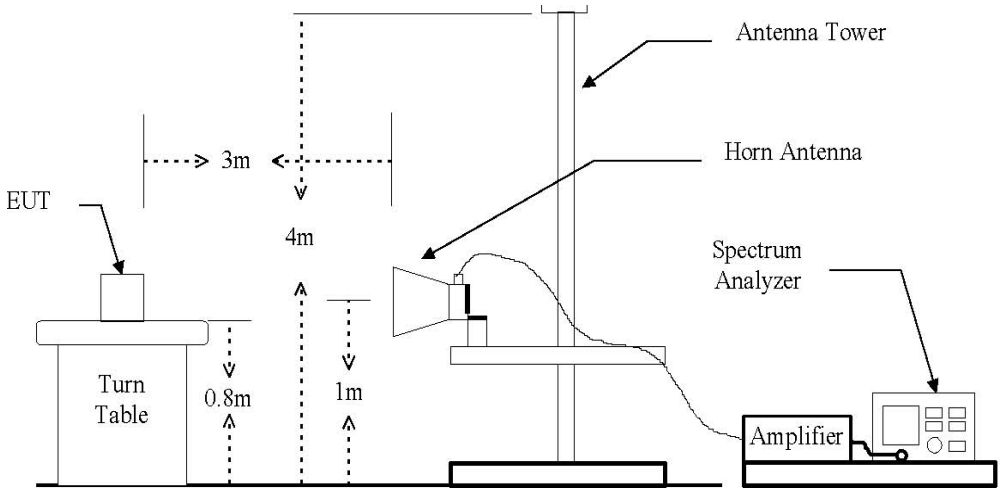
The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to 24 ㎓ emissions.



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Test procedure

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. Average measurements > 1 ㎓ using RBW = 1 ㎒ and VBW = 10 ㎐. Peak measurements > 1 ㎓ using RBW = 1 ㎒ and VBW = 3 ㎒. Both average and peak measurements were made using a peak detector.

Note:

1. The spectrum is measured from 9 ㎑ to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1 ㎓. Above 1 ㎓, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20 ㏈ of the respective limits were not reported.
2. When Average result is different from peak result over 20 ㏈ (over-averaging), according to 15.35 (c), as a “duty cycle correction factor”, pulse averaging with 20 log(duty cycle) has to be used.
3. Emissions below 18 ㎓ were measured at a 3 meter test distance while emissions above 18 ㎓ were measured at a 1 meter test distance with the application of a distance correction factor.
4. Average test would be performed if the peak result were greater than the average limit.
5. “*” means restricted band edge.
5. Field strength(㏈㎶/m) = Level(㏈㎶) + Correction factors(㏈/m) + Cable loss(㏈) + F_d(㏈)
6. Correction factors(㏈/m) = Antenna factor(㏈/m) + Cable loss(㏈) + or Amp. gain(㏈)
7. Margin(㏈) = Limit(㏈㎶/m) - Field strength(㏈㎶/m)
8. $F_d = 40\log(D_m / D_s)$

   Where:

   F_d = Distance factor in ㏈
   D_m = Measurement distance in meters
   D_s = Specification distance in meters

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Limit

According to 15.209(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (㎒)	Distance (Meters)	Radiated (㎶/m)
0.009 ~ 0.490	300	2 400 / F(㎑)
0.490 ~ 1.705	30	24 000 / F(㎑)
1.705 ~ 30.0	30	30
30 ~ 88	3	100**
88 ~ 216	3	150**
216 ~ 960	3	200**
Above 960	3	500

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 ~ 72 ㎒, 76 ~ 88 ㎒, 174 ~ 216 ㎒ or 470 ~ 806 ㎒. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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Test results (Below 30 ㎒)

Mode:	Bluetooth
Transfer rate:	1 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 402 ㎒ (Worst case)
Channel:	00

Frequency (㎒)	Level (dB㎶)	Ant. Pol.	Correction factors (dB/m)	F_d (dB)	Field strength (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
No signal detected							

Test results (Below 1 000 ㎒)

Mode:	Bluetooth
Transfer rate:	1 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 402 ㎒ (Worst case)
Channel:	00

Radiated emissions		Ant.	Correction factors		Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
95.960	20.58	H	12.99	0.75	34.32	43.50	9.18
120.210	20.89	H	16.55	0.87	38.31	43.50	5.19
167.740	24.09	H	13.51	1.06	38.66	43.50	4.84
191.020	22.62	V	11.04	1.27	34.93	43.50	8.57
217.210	31.07	H	10.92	1.33	43.32	46.00	2.68
281.230	20.62	V	12.91	1.53	35.06	46.00	10.94
313.240	23.26	H	13.77	1.63	38.66	46.00	7.34
446.130	21.68	H	16.56	1.99	40.23	46.00	5.77
539.250	21.07	V	18.59	2.28	41.94	46.00	4.06
562.530	20.02	V	19.12	2.36	41.50	46.00	4.50

Note.

1. All spurious emission at channels are almost the same below 1 ㎓, so that low channel was chosen at representative in final test.
2. Actual = Reading + Ant. factor + Cable loss
3. Detector mode: Quasi peak
4. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes.

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Test results (Above 1 000 ㎒)

Mode: Bluetooth
Transfer rate: 1 Mbps
Distance of measurement: 3 meter
Operating frequency: 2 402 ㎒
Channel: 00

Radiated emissions			Ant.	Correction factors	Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	AFCL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2361.21	49.42	Peak	H	-1.10	48.32	74.00	25.68
2389.67	51.51	Peak	V	-0.95	50.56	74.00	23.44
4799.00	41.48	Peak	H	8.03	49.51	74.00	24.49
4799.00	45.12	Peak	V	8.03	53.15	74.00	20.85

Mode: Bluetooth
Transfer rate: 1 Mbps
Distance of measurement: 3 meter
Operating frequency: 2 441 ㎒
Channel: 39

Radiated emissions			Ant.	Correction factors	Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	AFCL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
4884.00	43.28	Peak	H	8.64	51.92	74.00	22.08
4884.00	47.92	Peak	V	8.64	56.56	74.00	17.44
4884.70	27.73	Avg	V	8.65	36.38	54.00	17.62

Mode: Bluetooth
Transfer rate: 1 Mbps
Distance of measurement: 3 meter
Operating frequency: 2 480 ㎒
Channel: 78

Radiated emissions			Ant.	Correction factors	Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	AFCL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2494.92	49.82	Peak	H	-0.39	49.43	74.00	24.57
2489.35	51.56	Peak	V	-0.42	51.14	74.00	22.86
4954.00	43.95	Peak	H	9.14	53.09	74.00	20.91
4954.00	47.99	Peak	V	9.14	57.13	74.00	16.87
4962.70	28.36	Avg	V	9.20	37.56	54.00	16.44

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Mode: Bluetooth
Transfer rate: 3 Mbps
Distance of measurement: 3 meter
Operating frequency: 2 402 ㎒
Channel: 00

Radiated emissions			Ant.	Correction factors	Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	AFCL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2345.68	49.22	Peak	H	-1.18	48.04	74.00	25.96
2389.53	51.75	Peak	V	-0.95	50.80	74.00	23.20
4982.00	38.02	Peak	H	9.34	47.36	74.00	26.64
4982.00	42.30	Peak	V	9.34	51.64	74.00	22.36

Mode: Bluetooth
Transfer rate: 3 Mbps
Distance of measurement: 3 meter
Operating frequency: 2 441 ㎒
Channel: 39

Radiated emissions			Ant.	Correction factors	Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	AFCL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
4884.00	39.33	Peak	H	8.64	47.97	74.00	26.03
4884.00	41.83	Peak	V	8.64	50.47	74.00	23.53

Mode: Bluetooth
Transfer rate: 3 Mbps
Distance of measurement: 3 meter
Operating frequency: 2 480 ㎒
Channel: 78

Radiated emissions			Ant.	Correction factors	Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	AFCL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2490.15	50.10	Peak	H	-0.41	49.69	74.00	24.31
2498.30	52.11	Peak	V	-0.37	51.74	74.00	22.26
4982.00	39.10	Peak	H	9.34	48.44	74.00	25.56
4982.00	41.55	Peak	V	9.34	50.89	74.00	23.11

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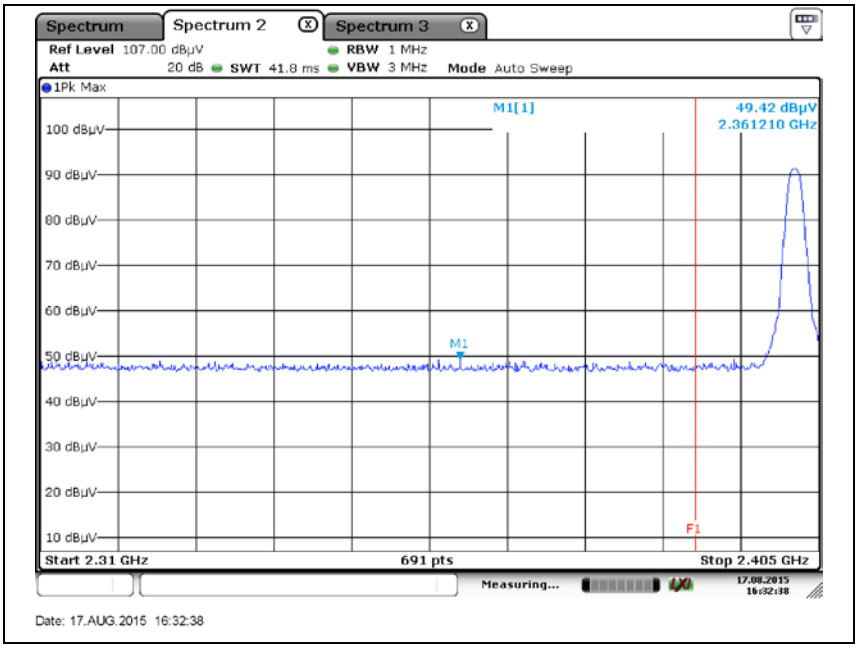
Worst case mode:	Bluetooth
Transfer rate:	1 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 402 ㎒
Channel:	00
Detected mode:	Peak, Hor



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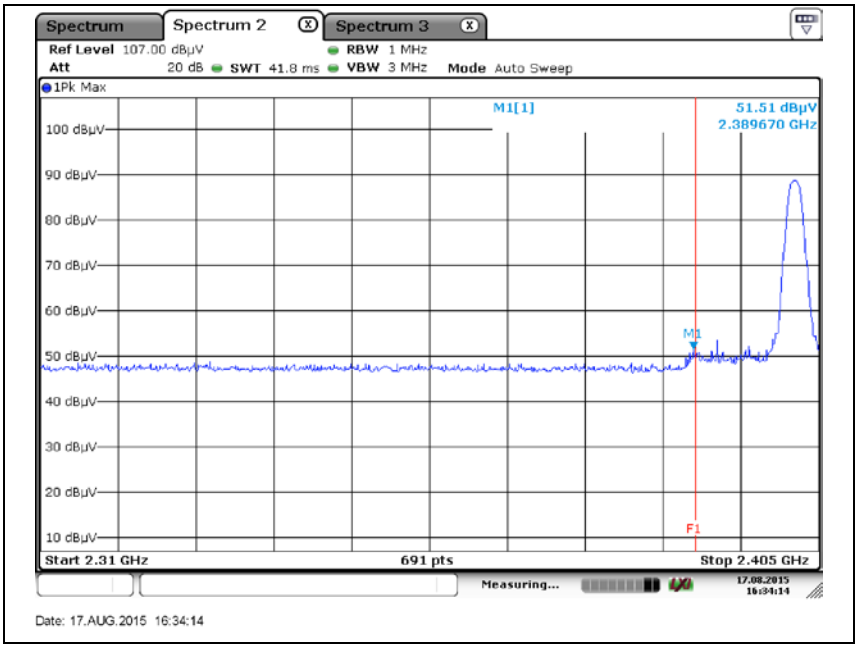
Transfer rate:	1 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 402 ㎒
Channel:	00
Detected mode:	Peak, Ver



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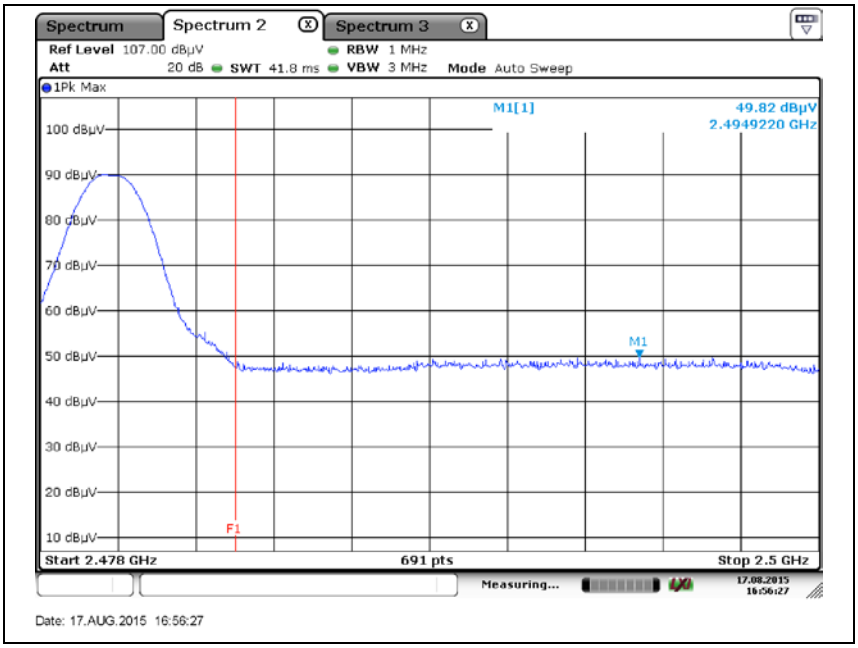
Transfer rate:	1 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 480 ㎒
Channel:	78
Detected mode:	Peak, Hor



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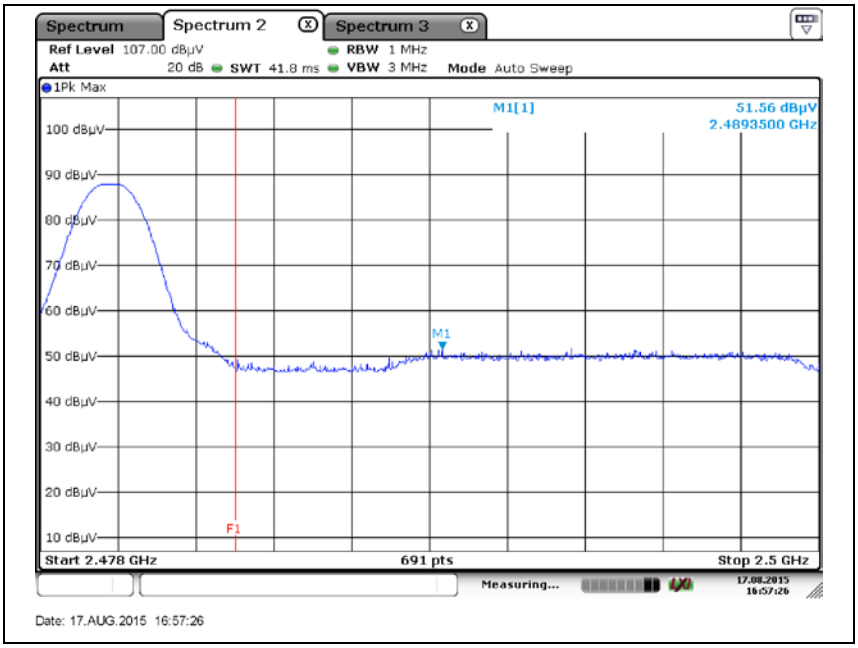
Transfer rate:	1 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 480 ㎒
Channel:	78
Detected mode:	Peak, Ver



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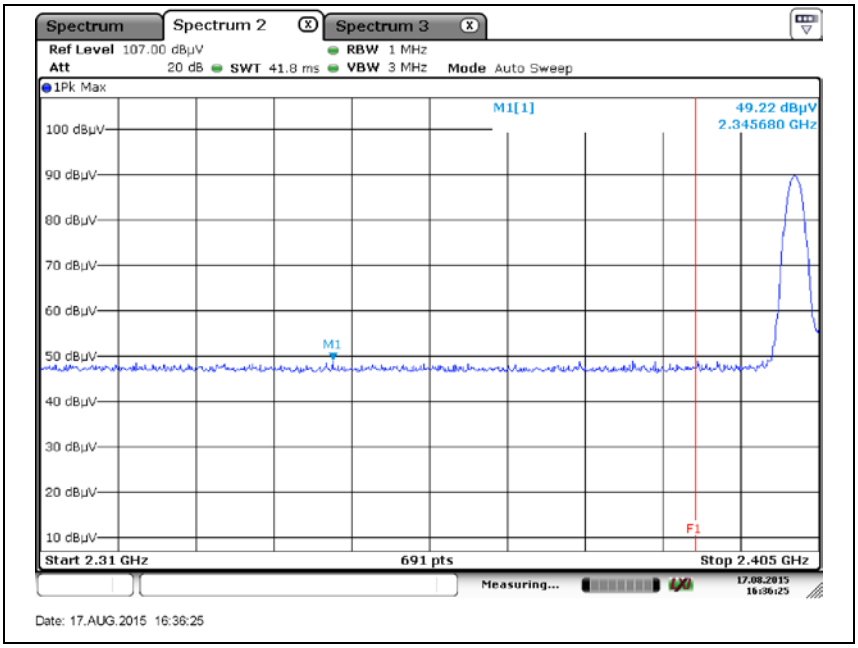
Transfer rate:	3 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 402 ㎒
Channel:	00
Detected mode:	Peak, Hor



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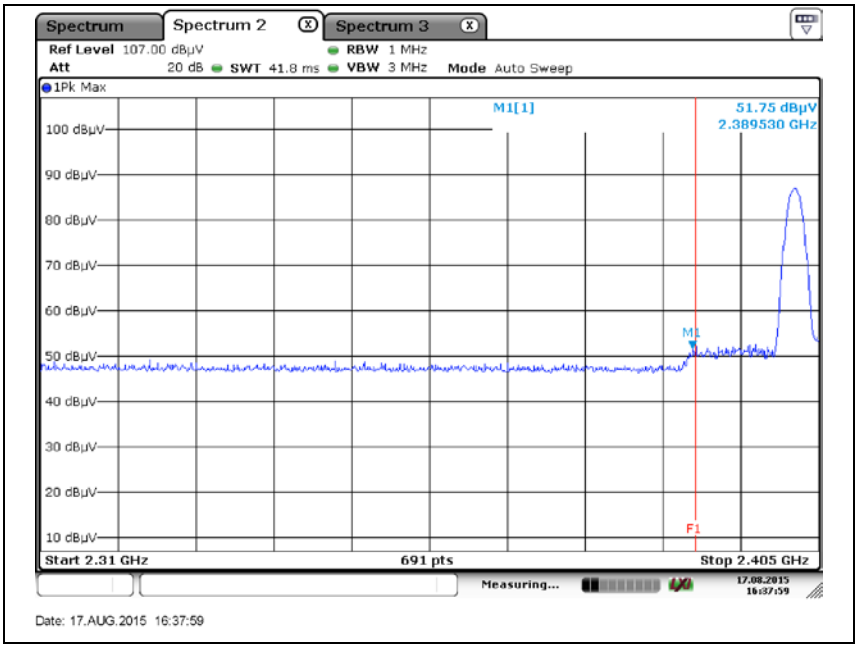
Transfer rate:	3 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 402 ㎒
Channel:	00
Detected mode:	Peak, Ver



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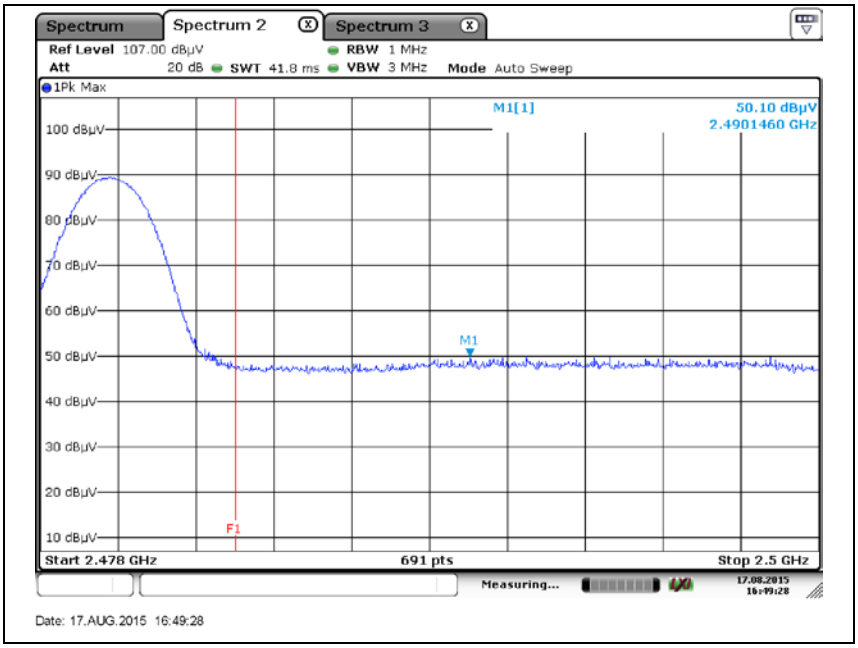

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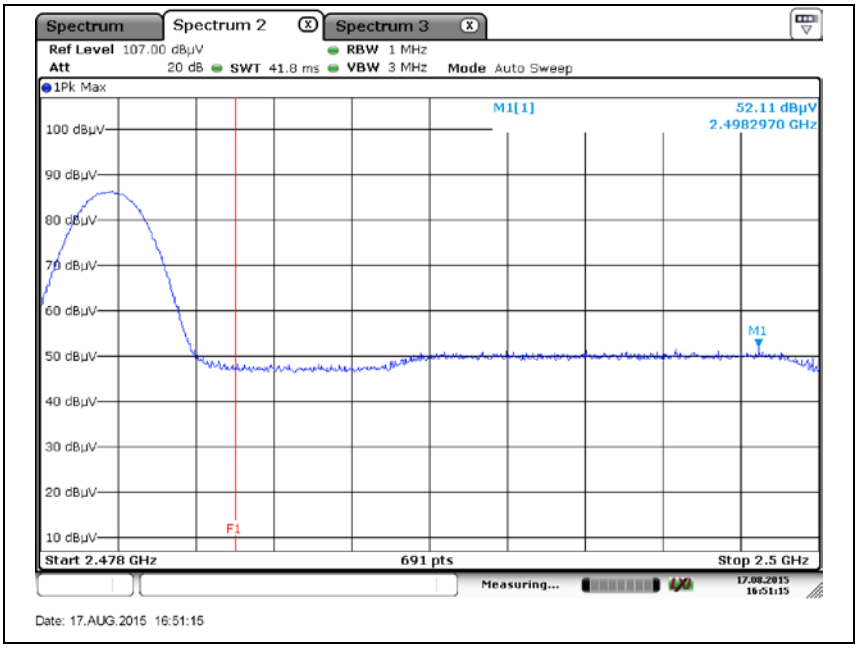
Transfer rate:	3 Mbps
Distance of measurement:	3 meter
Operating frequency:	2 480 ㎒
Channel:	78
Detected mode:	Peak, Ver



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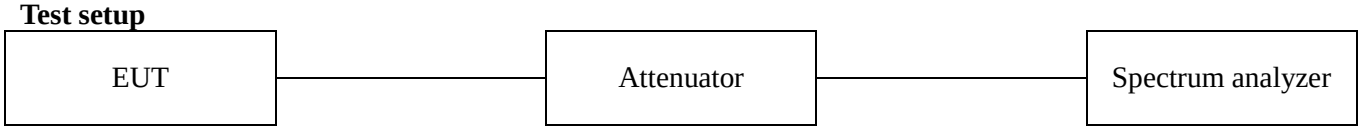
3.2. Conducted band edge and out of band emissions

Test setup



Test procedure

DA 00-705

Test setting

1. Span = wide enough to capture the peak level of the in-band emission and all spurious emissions(e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.
2. RBW = 100 ㎑
3. VBW ≥ RBW
4. Detector = Peak
5. Number of sweep points ≥ 2 × Span/RBW
7. Trace mode = max hold
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limit

According to 15.247(d), in any 100 ㎑ bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 ㏈ below that in the 100 ㎑ bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval , as permitted under paragraph(b)(3) of this section , the attenuation required under this paragraph shall be 30 ㏈ instead of 20 ㏈. Attenuation below the general limits specified in section 15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section 15.205(a), must also comply the radiated emission limits specified in section 15.209(a) (see section 15.205(c))

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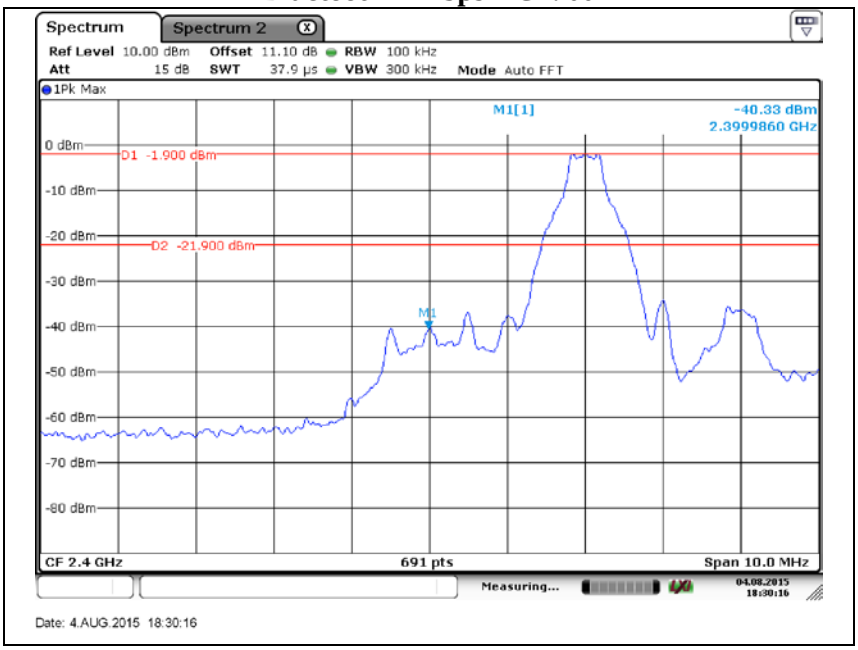
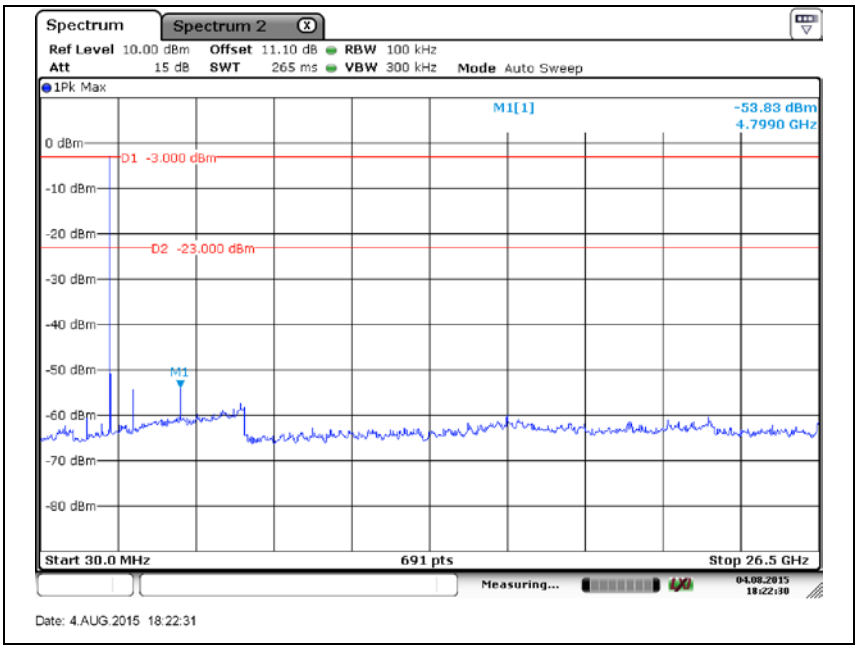
Bluetooth 1 Mbps – Ch. 00





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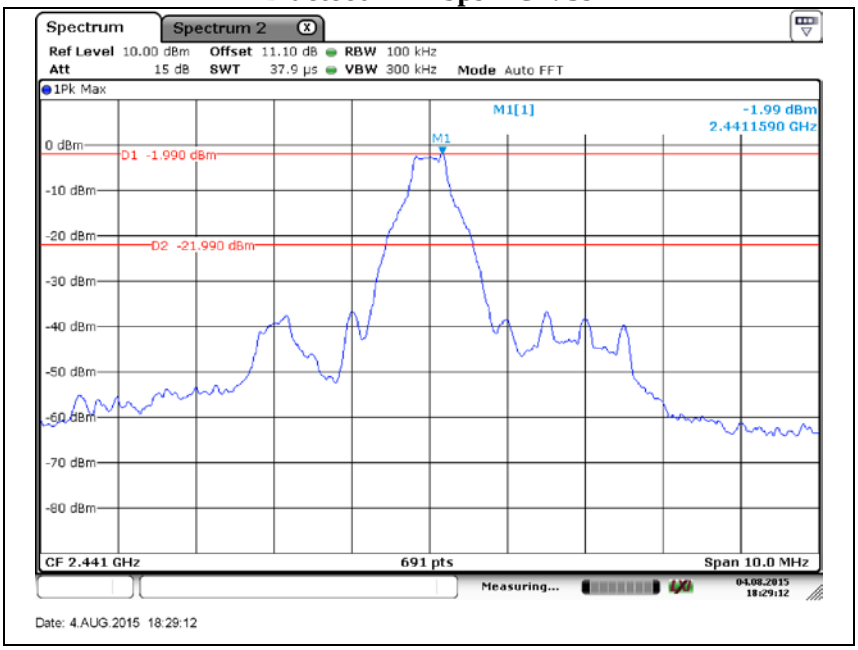
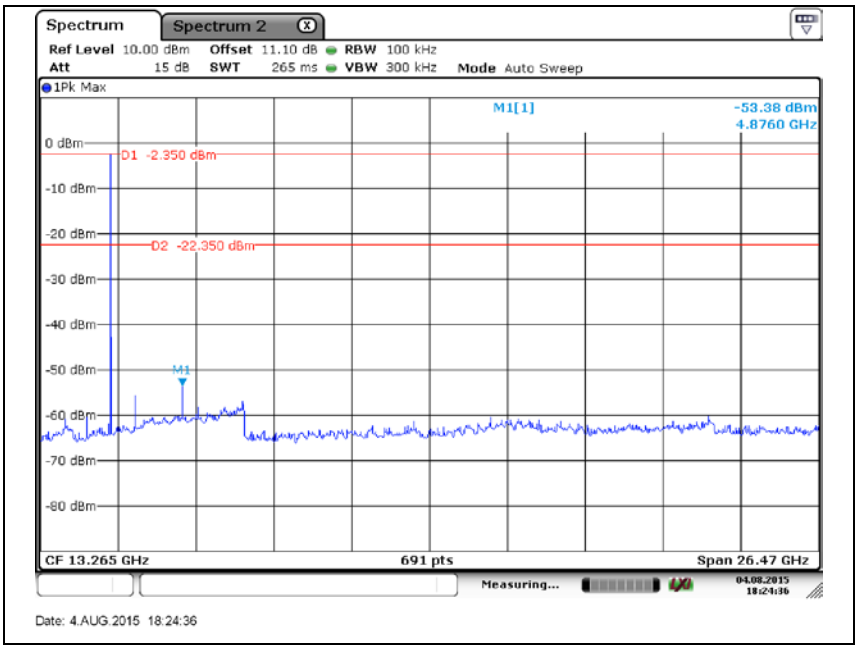
Bluetooth 1 Mbps – Ch. 39





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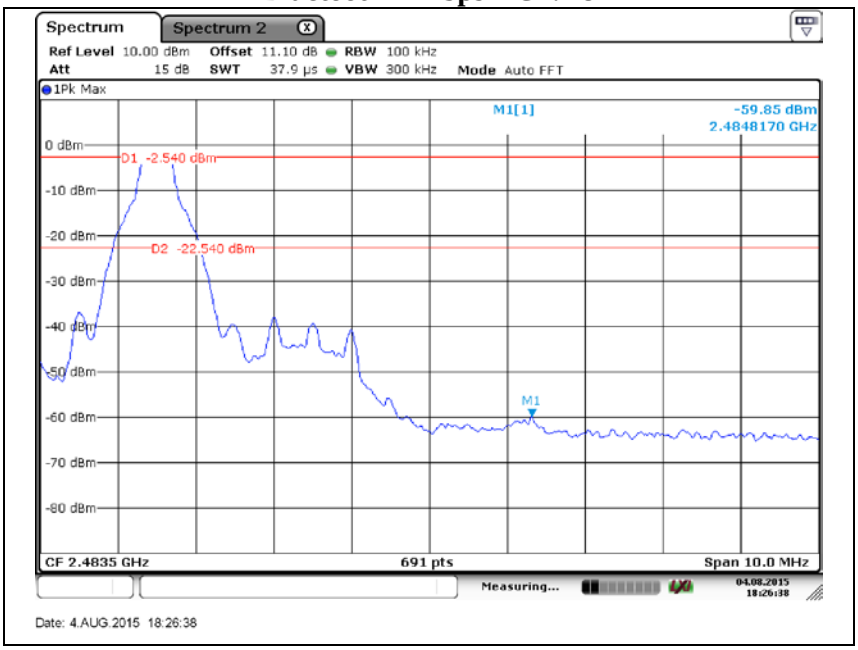
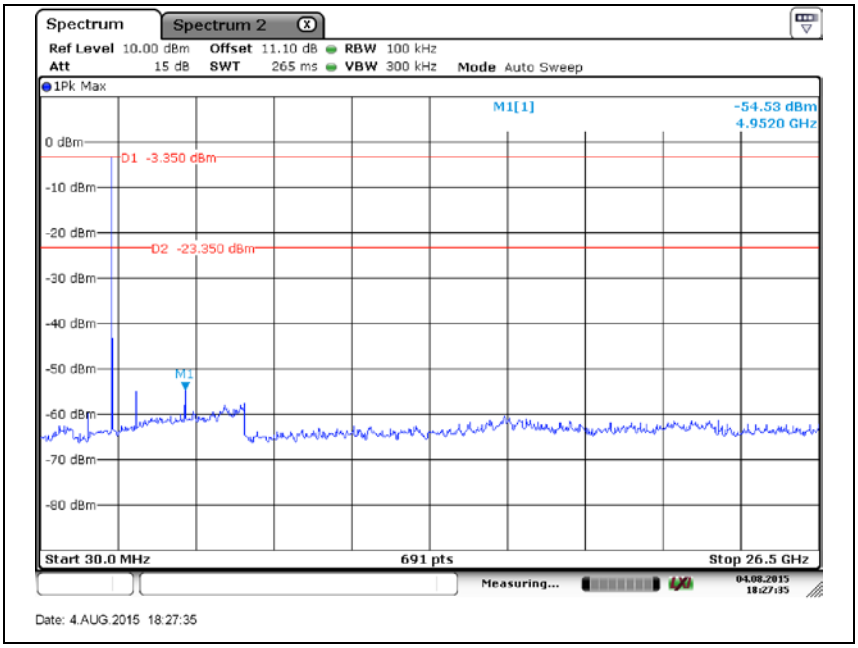
Bluetooth 1 Mbps – Ch. 78





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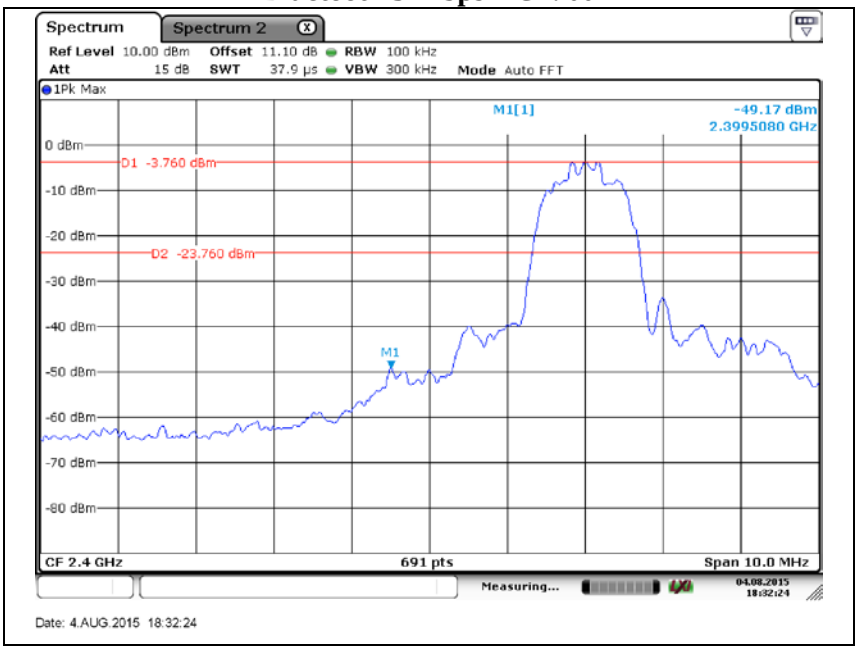
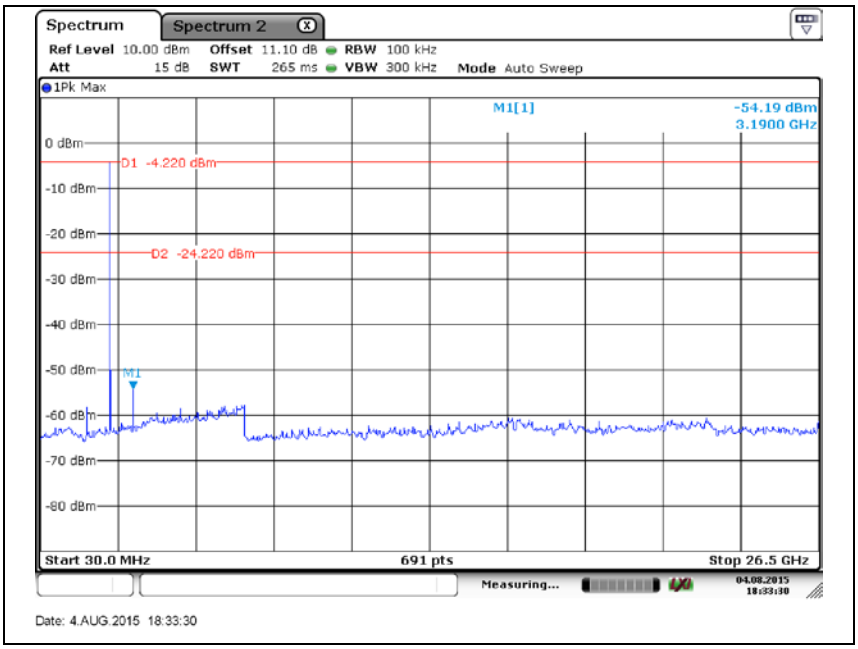
Bluetooth 3 Mbps – Ch. 00





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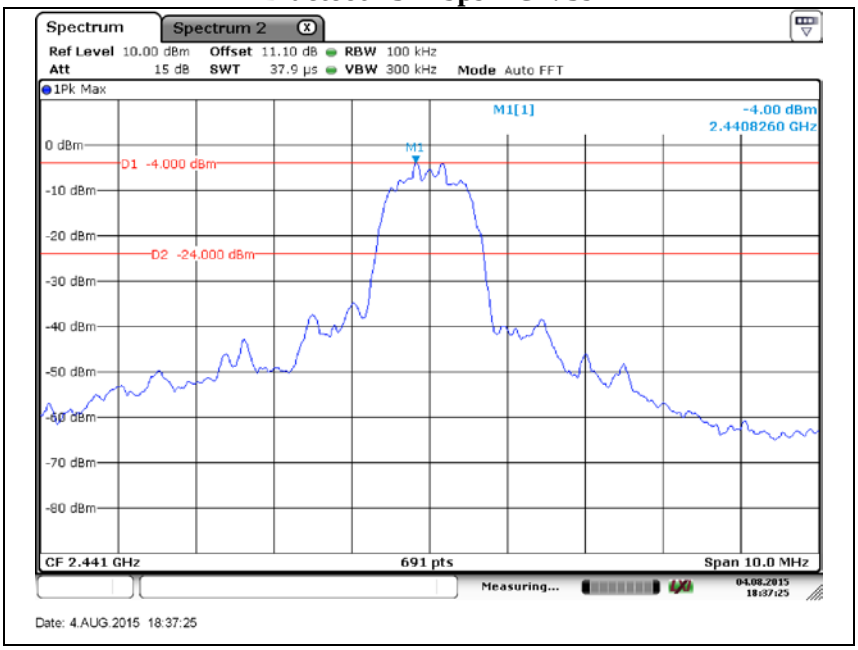
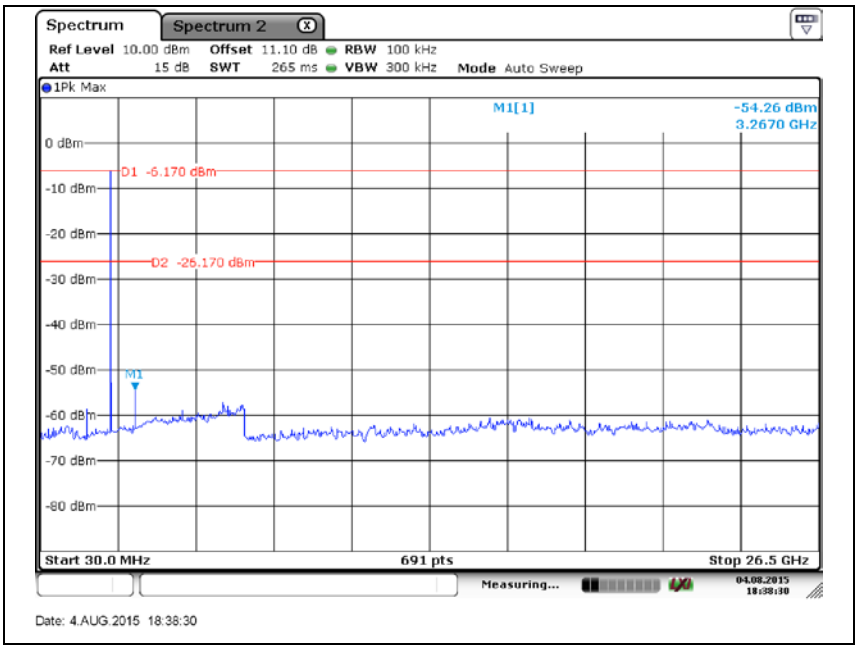
Bluetooth 3 Mbps – Ch. 39





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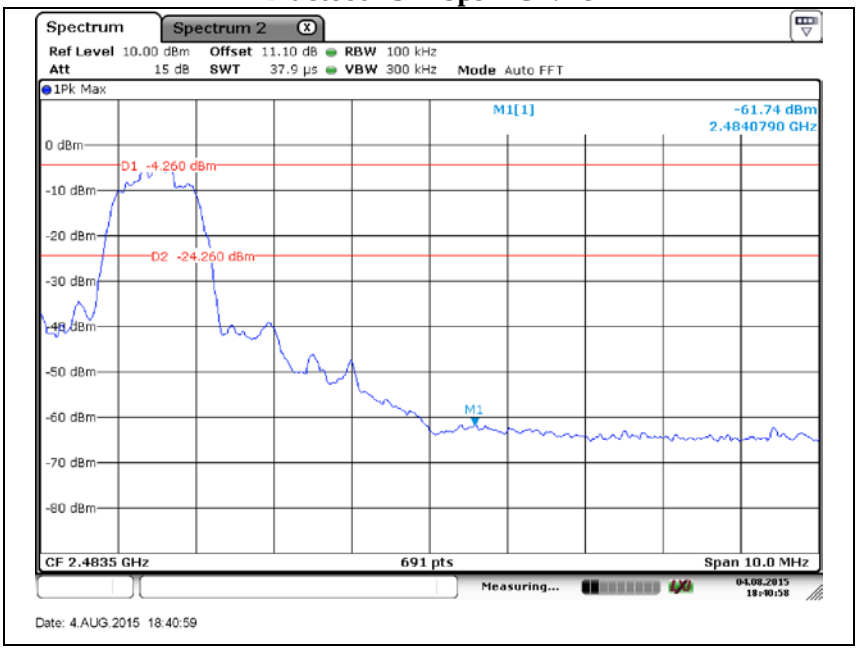
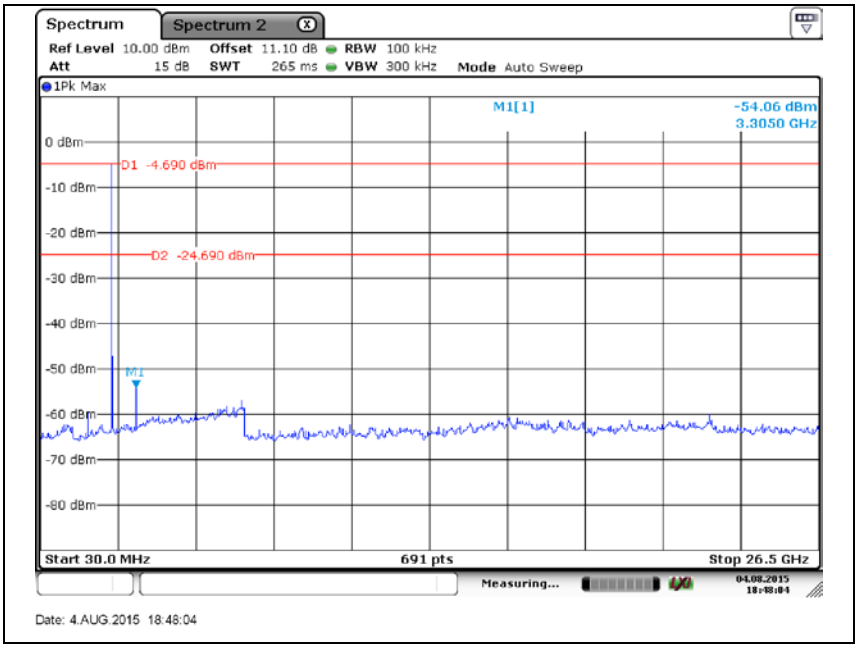
Bluetooth 3 Mbps – Ch. 78





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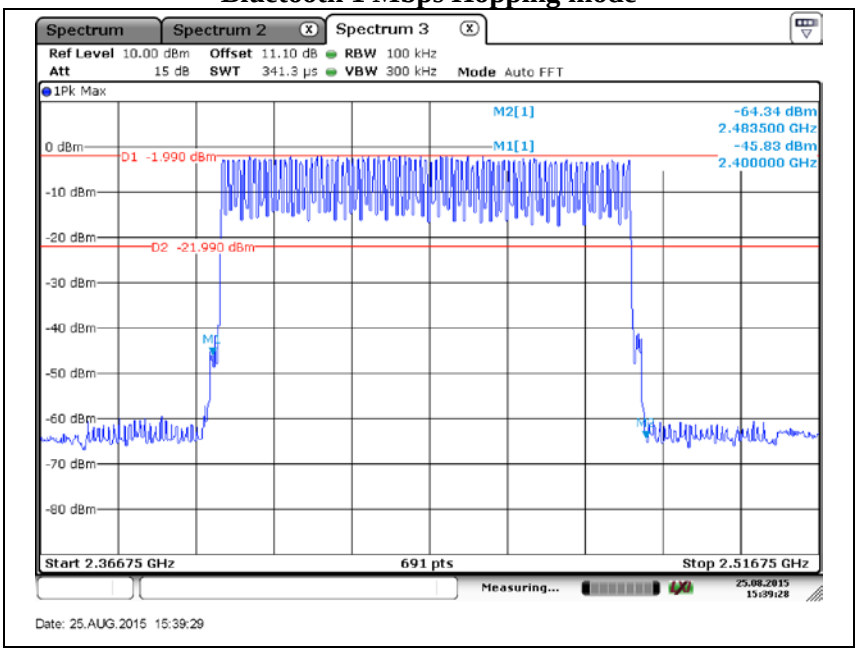
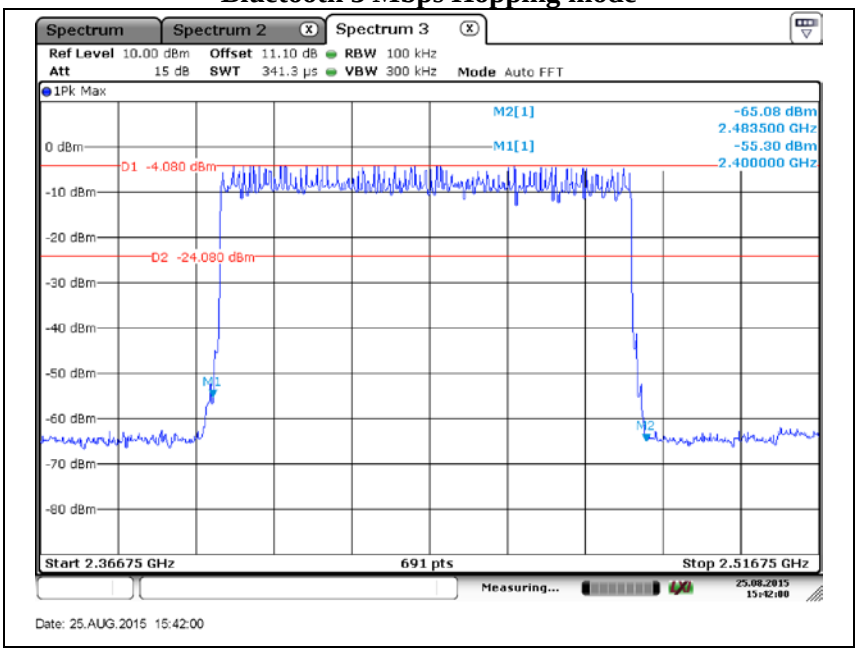
Bluetooth 1 Mbps Hopping mode



Bluetooth 3 Mbps Hopping mode



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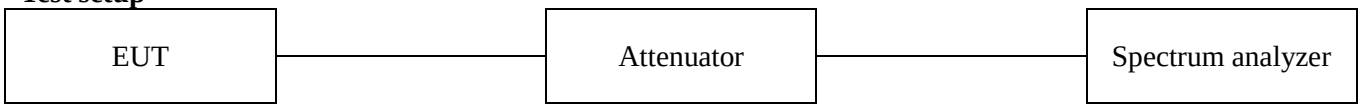
3.3. 20 dB bandwidth

Test setup



Test procedure
DA 00-075

Test setting
1. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
2. RBW ≥ 1% of the 20 dB bandwidth
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Sweep = auto couple
7. Trace mode = max hold

Limit
Not applicable

Frequency(㎒)	Channel no.	Data rate(Mbps)	Measured bandwidth(㎑)
2 402	00	1	0.808
2 441	39		0.808
2 480	78		0.808
2 402	00	3	1.207
2 441	39		1.211
2 480	78		1.211

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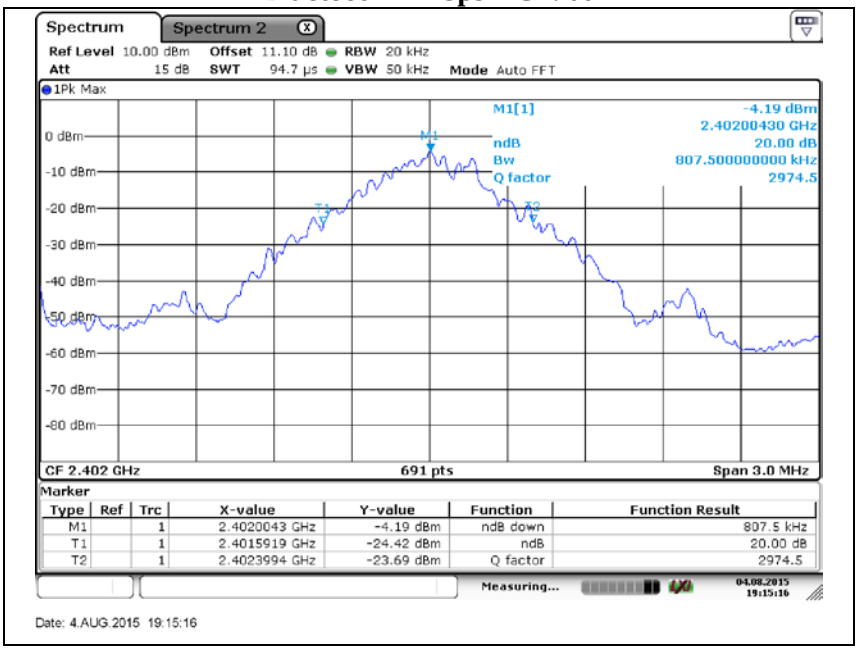
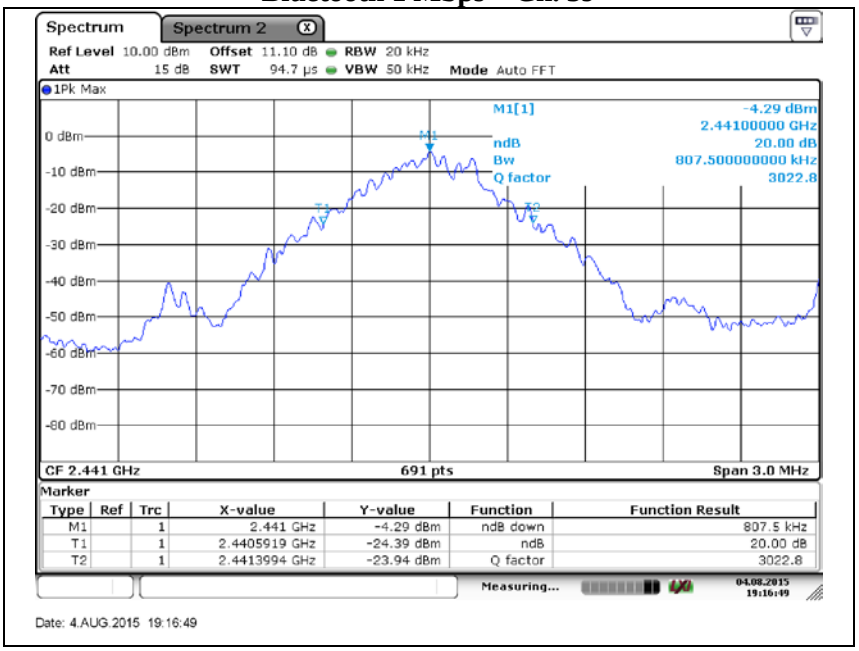


Bluetooth 1 Mbps – Ch. 39



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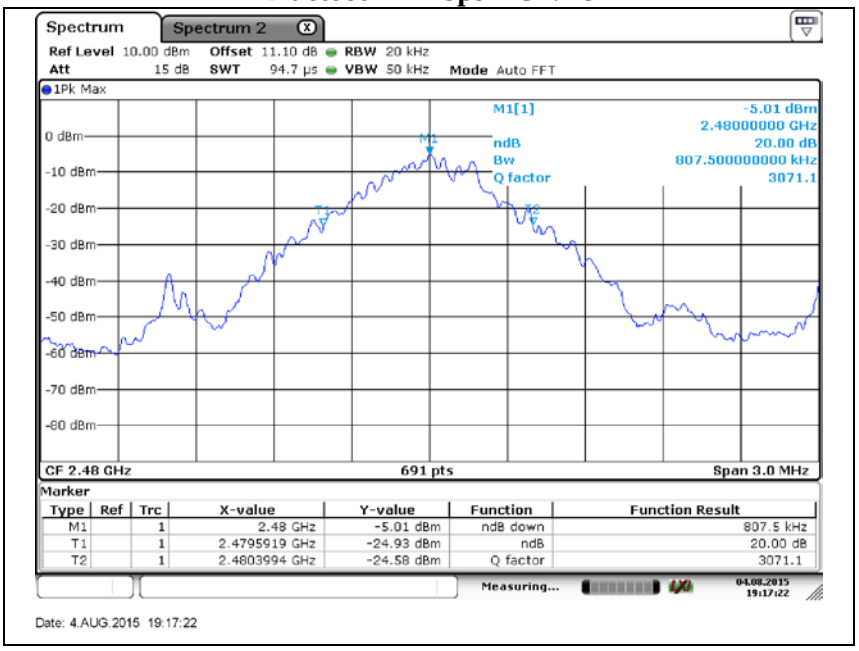
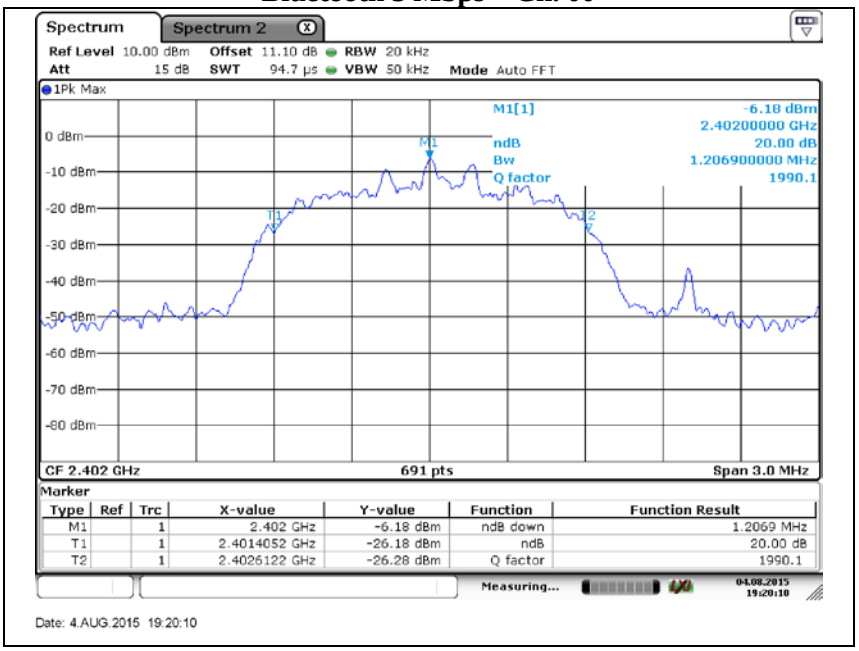


Bluetooth 3 Mbps – Ch. 00



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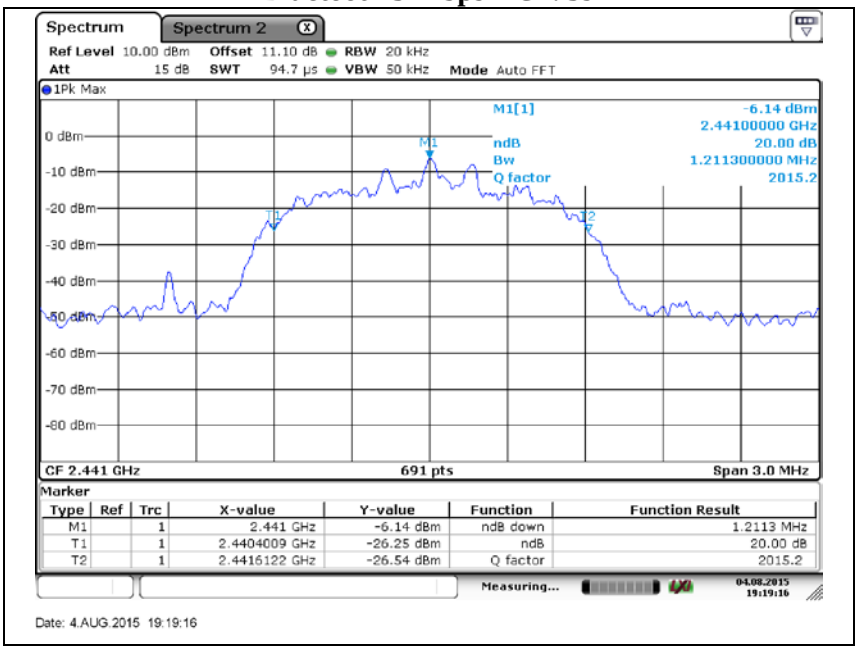
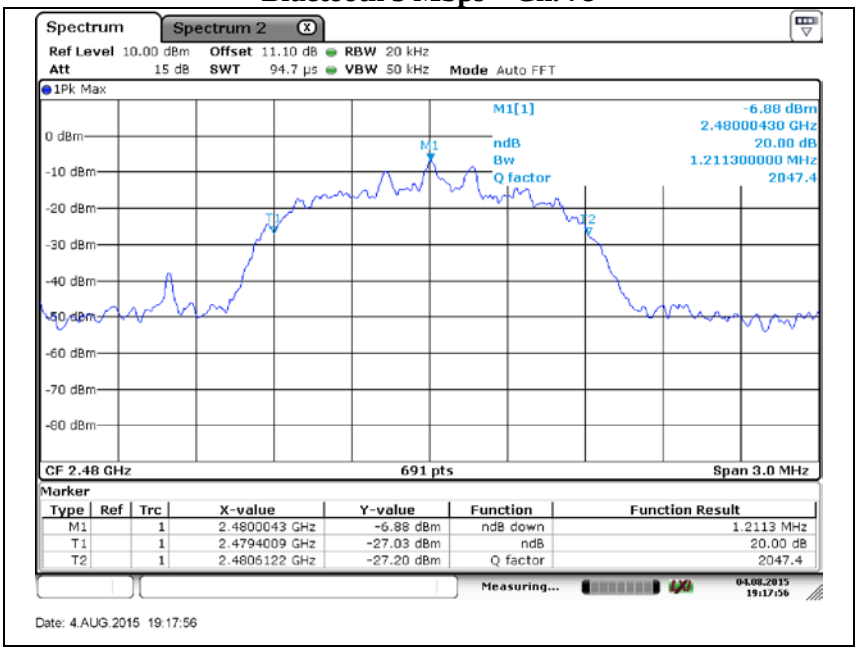
Bluetooth 3 Mbps – Ch. 39



Bluetooth 3 Mbps – Ch. 78



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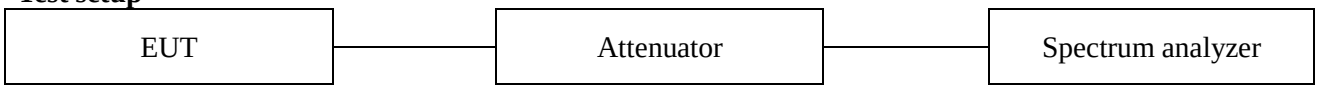
3.4. Output power

Test setup



Test procedure
DA 00-075

Test setting
1. Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
2. RBW > the 20 dB bandwidth of the emission being measured
3. VBW ≥ RBW
4. Sweep = Auto
5. Detector function = Peak
6. Trace = Max hold

Limit
According to §15.247(b)(1), For frequency hopping systems operating in the 2 400 ~ 2 483.5 ㎒ employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5 725 ~ 5 805 ㎒ band: 1 Watt.

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Frequency(㎒)	Channel no.	Data rate(Mbps)	Measured power(㏈m)
2 402	00	1	-1.80
2 441	39		-1.84
2 480	78		-2.48
2 402	00	3	-2.85
2 441	39		-2.76
2 480	78		-3.36

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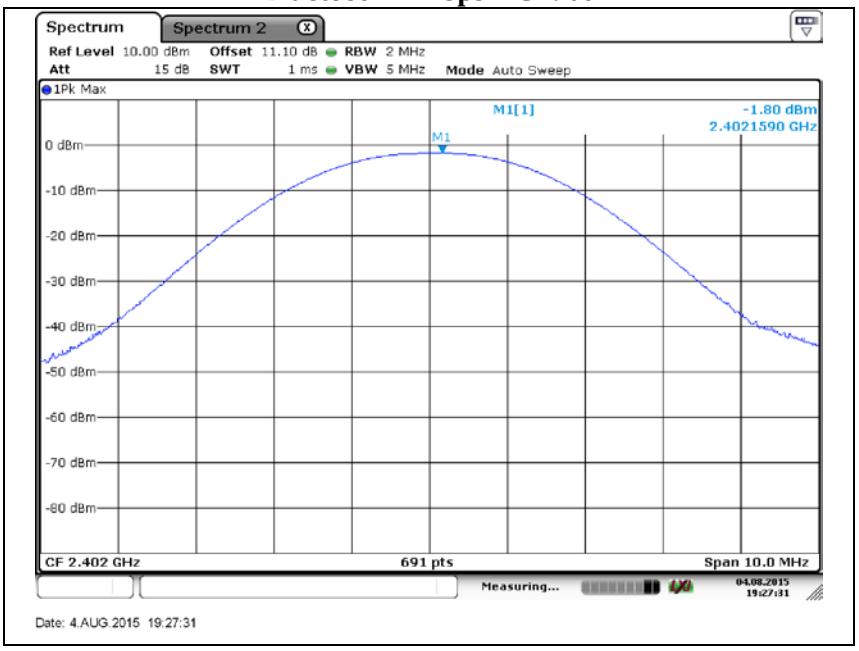
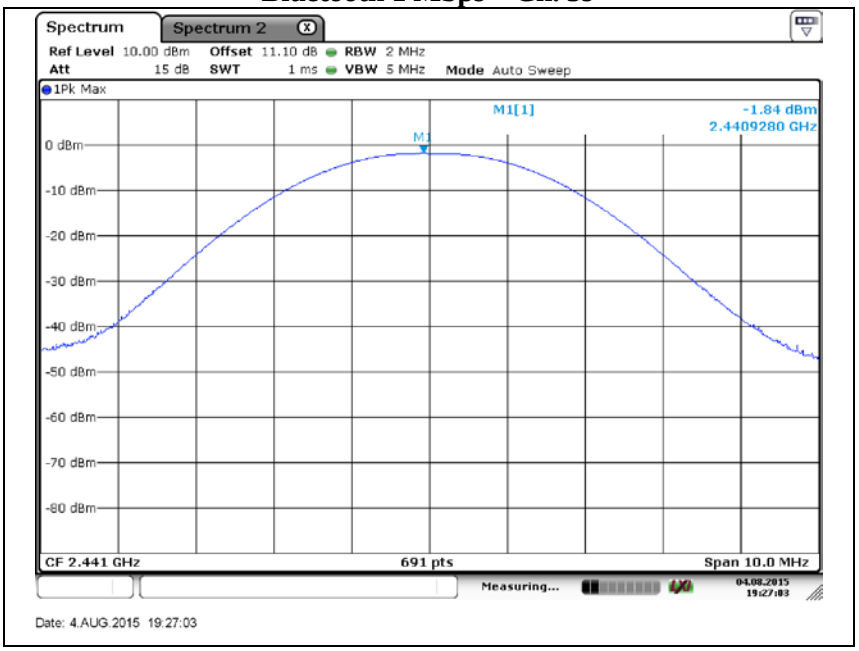


Bluetooth 1 Mbps – Ch. 39



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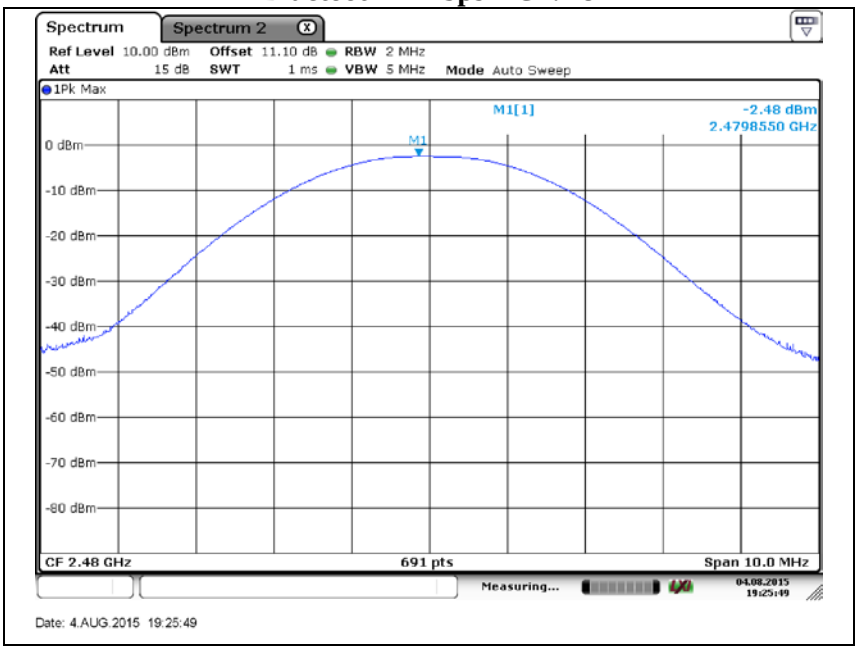
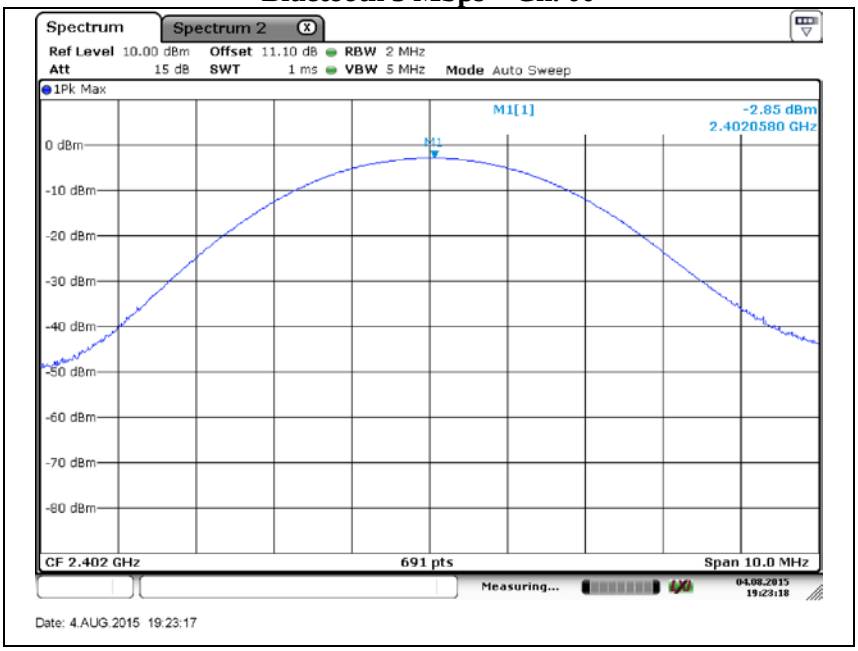
Bluetooth 1 Mbps – Ch. 78



Bluetooth 3 Mbps – Ch. 00



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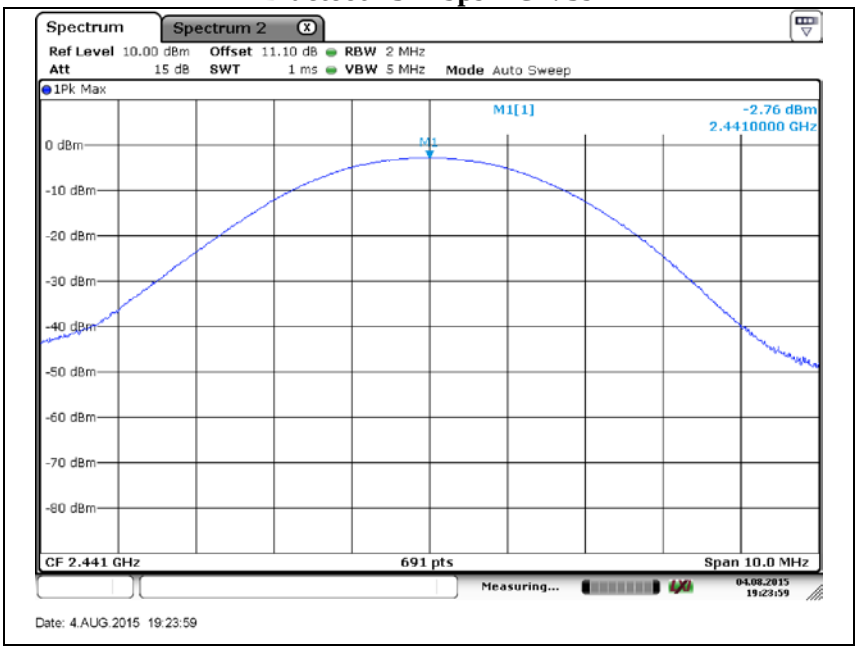
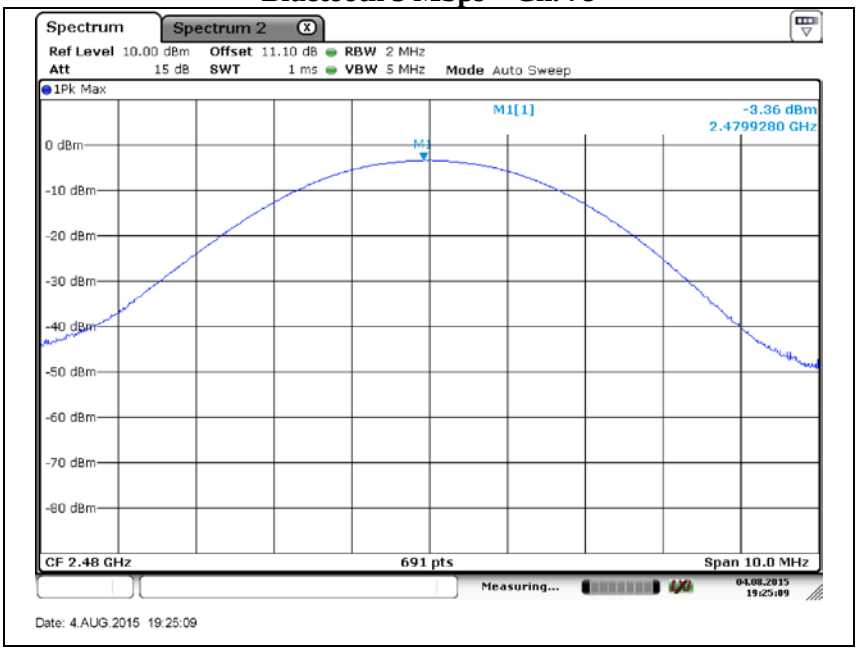
Bluetooth 3 Mbps – Ch. 39



Bluetooth 3 Mbps – Ch. 78



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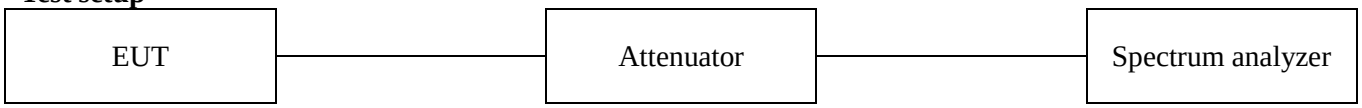
3.5. Carrier frequency separation

Test setup



Test procedure
DA 00-075

Test Setting
1. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
2. Span = wide enough to capture the peaks of two adjacent channels
3. Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
4. Video (or Average) Bandwidth (VBW) ≥ RBW
5. Sweep = auto
6. Detector function = peak
7. Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

Limit
According to 15.247(a)(1), frequency hopping system operating in 2 400 ~ 2 483.5 ㎒. Band may have hopping channel carrier frequencies that are separated by 25 ㎑ or two-third of 20 ㏈ bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 ㎽.

Frequency(㎒)	Channel no.	Data rate(Mbps)	Channel Separation (㎒)
2 441	39	1	1.000
2 441	39	3	1.012

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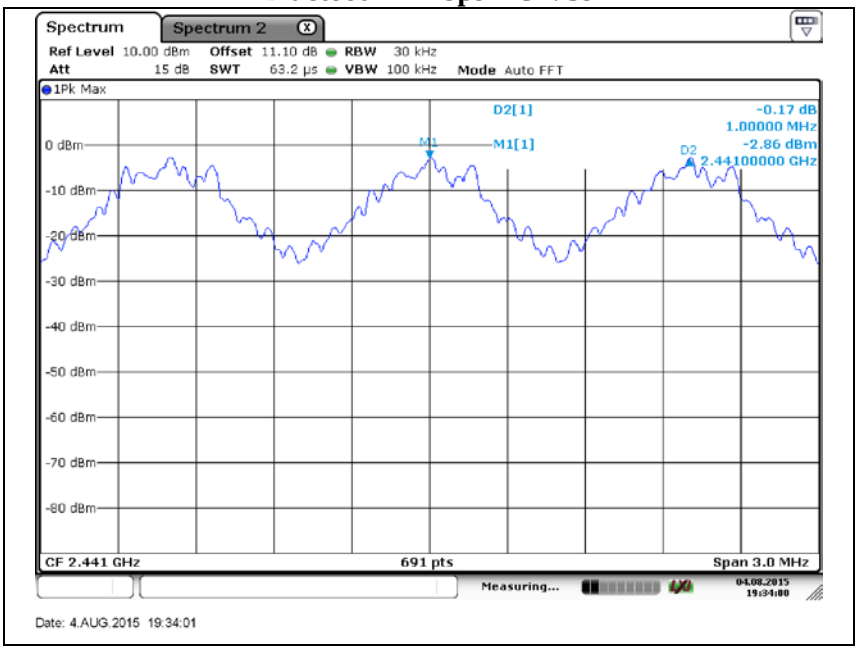
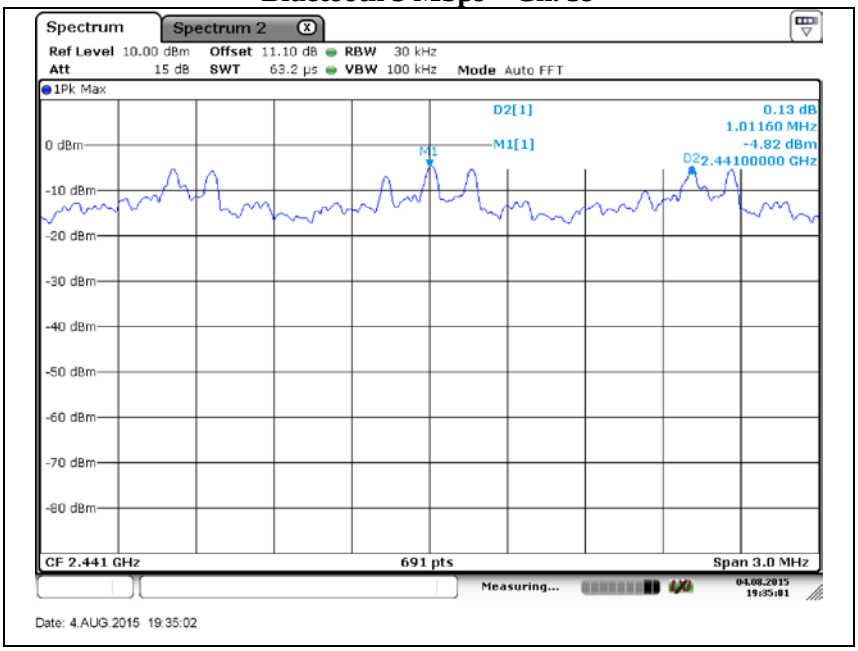


Bluetooth 3 Mbps – Ch. 39



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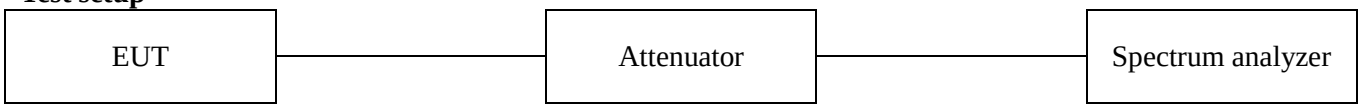
3.6. Number of hopping frequency

Test setup



Test procedure
DA 00-075

Test setting
1. The EUT must have its hopping function enabled.
2. Frequency range: 2 400 ㎒ ~ 2 441.5 ㎒, 2 441.5 ㎒ ~ 2 483.5 ㎒
3. Span = the frequency band of operation
4. RBW = 100 ㎑ (≥ 1% of the span)
5. VBW = 300 ㎑ (≥ RBW)
6. Sweep = auto
7. Detector function = peak
8. Trace = max hold

All the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

Limit
According to 15.247(a)(1)(iii), for frequency hopping system operating in the 2 400 ~ 2 483.5 ㎒ bands shall use at least 15 hopping frequencies.

Data rate(Mbps)	Number of hopping frequency	Limit
1	79	≥ 15
3	79	≥ 15

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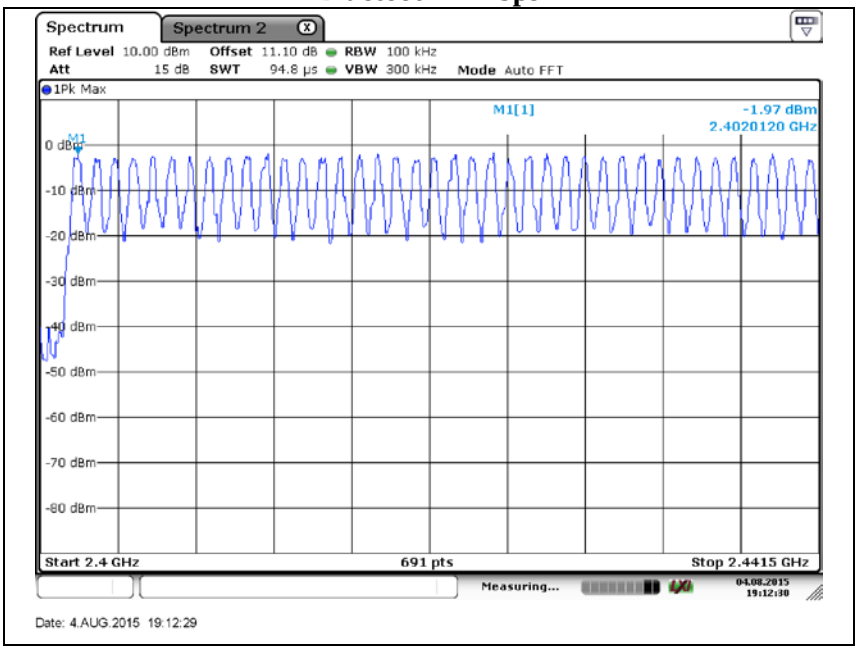
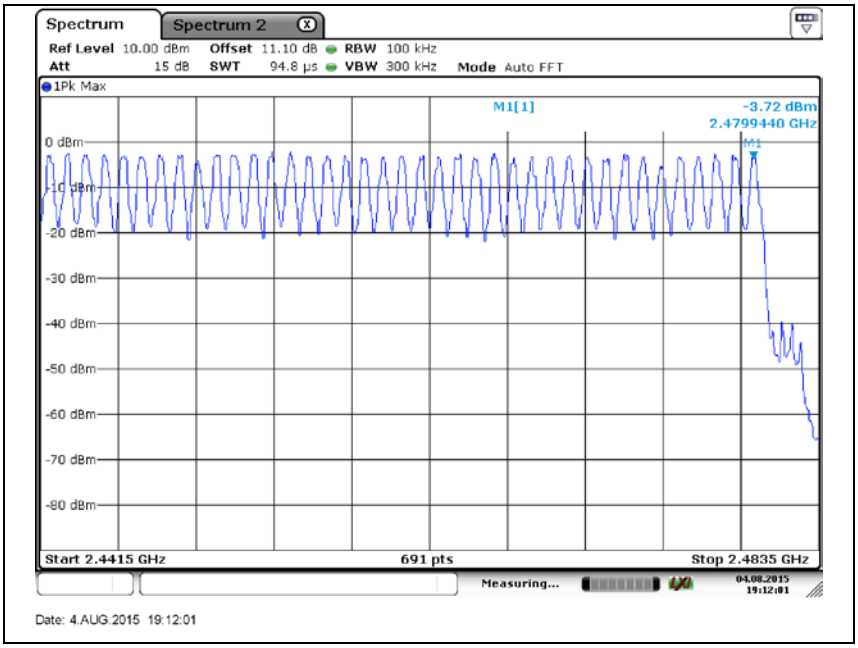
Bluetooth 1 Mbps





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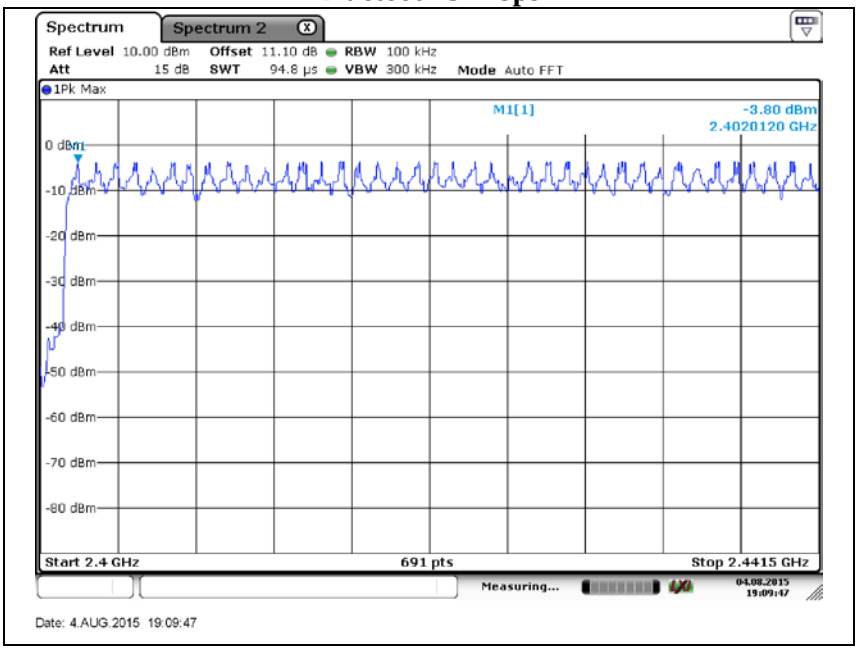
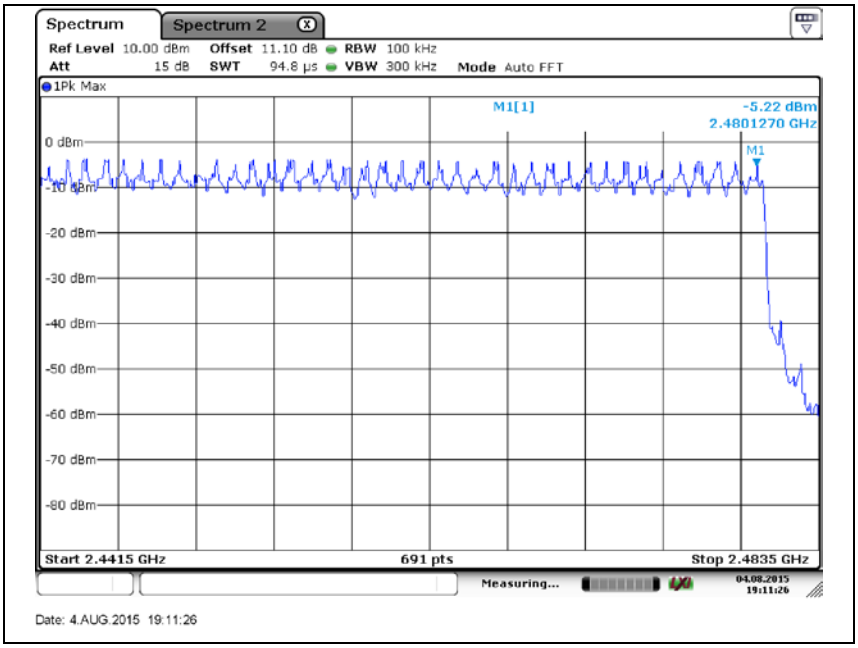
Bluetooth 3 Mbps





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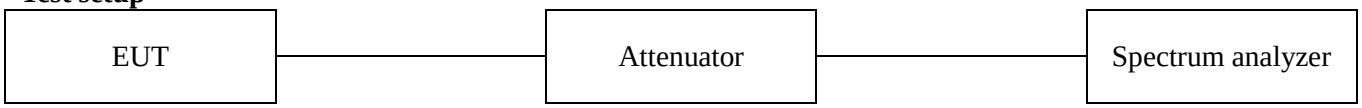
3.7. Time of occupancy

Test setup



Test procedure
DA 00-075

Test setting
1. The EUT must have its hopping function enabled.
2. Span = zero span, centered on a hopping channel
4. RBW = 1 ㎒
5. VBW = 1 ㎒ (≥ RBW)
6. Sweep = as necessary to capture the entire dwell time per hopping channel
7. Detector function = peak
8. Trace = max hold

Limit
According to 15.247(a)(1)(iii), for frequency hopping system operating in the 2 400 ~ 2 483.5 ㎒ band, the average time of occupancy on any frequency shall not be greater than 0.4 second within a 31.6 second period.

A period time = 0.4(s) × 79 = 31.6(s)

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Time of occupancy on the TX channel in 31.6 sec
= time domain slot length × (hop rate ÷ number of hop per channel) × 31.6

Packet type	Frequency (㎒)	Dwell time (ms)	Time of occupancy on the Tx channel in 31.6 sec (ms)	Limit for time of occupancy on the Tx channel in 31.6 sec (ms)
DH1	2 441	0.419	134.1	400
DH3	2 441	1.674	267.8	400
DH5	2 441	2.928	312.3	400
3-DH1	2 441	0.432	138.2	400
3-DH3	2 441	1.678	268.5	400
3-DH5	2 441	2.933	312.9	400

Note:
DH1: Dwell time (ms) × [(1 600 ÷ 2) ÷ 79] × 31.6(s) = 134.1 (ms)
DH3: Dwell time (ms) × [(1 600 ÷ 4) ÷ 79] × 31.6(s) = 267.8 (ms)
DH5: Dwell time (ms) × [(1 600 ÷ 6) ÷ 79] × 31.6(s) = 312.3 (ms)
3-DH1: Dwell time (ms) × [(1 600 ÷ 2) ÷ 79] × 31.6(s) = 138.2 (ms)
3-DH3: Dwell time (ms) × [(1 600 ÷ 4) ÷ 79] × 31.6(s) = 268.5 (ms)
3-DH5: Dwell time (ms) × [(1 600 ÷ 6) ÷ 79] × 31.6(s) = 312.9 (ms)

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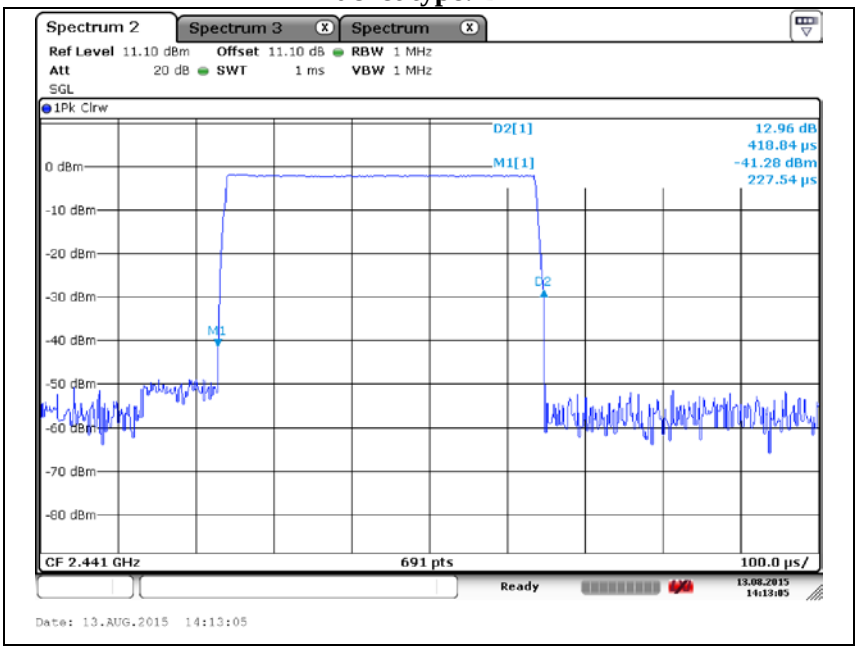
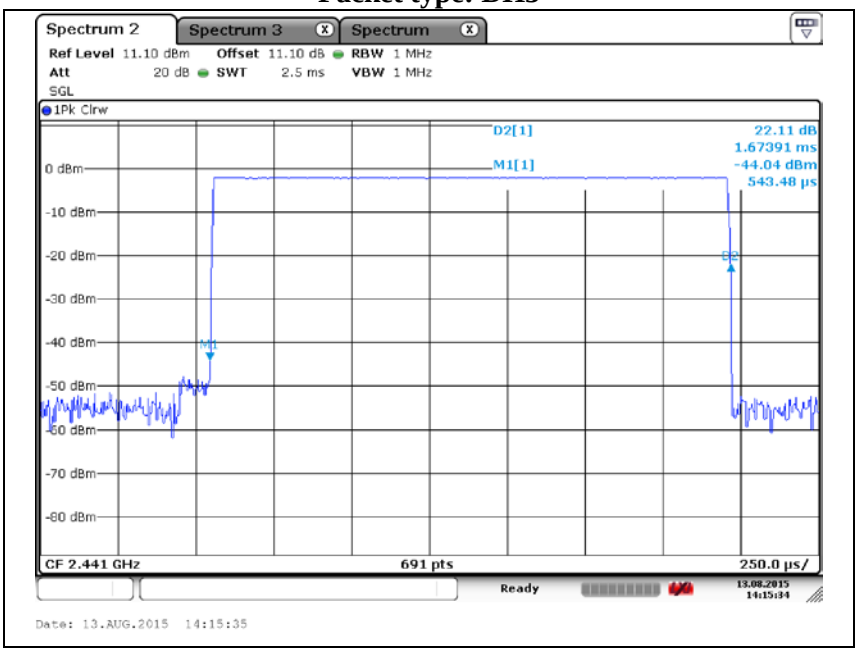
Packet type: DH1



Packet type: DH3



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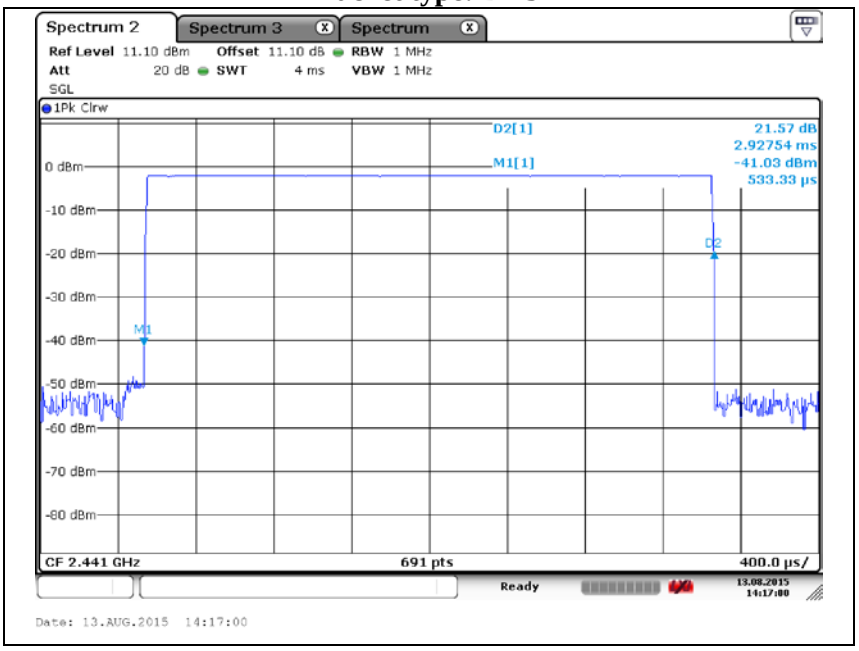
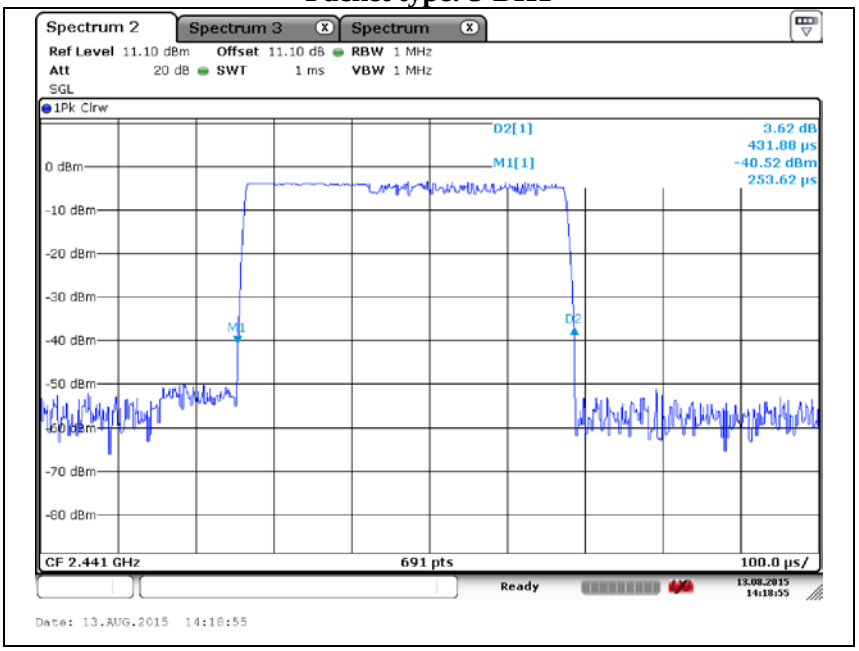
Packet type: DH5



Packet type: 3-DH1



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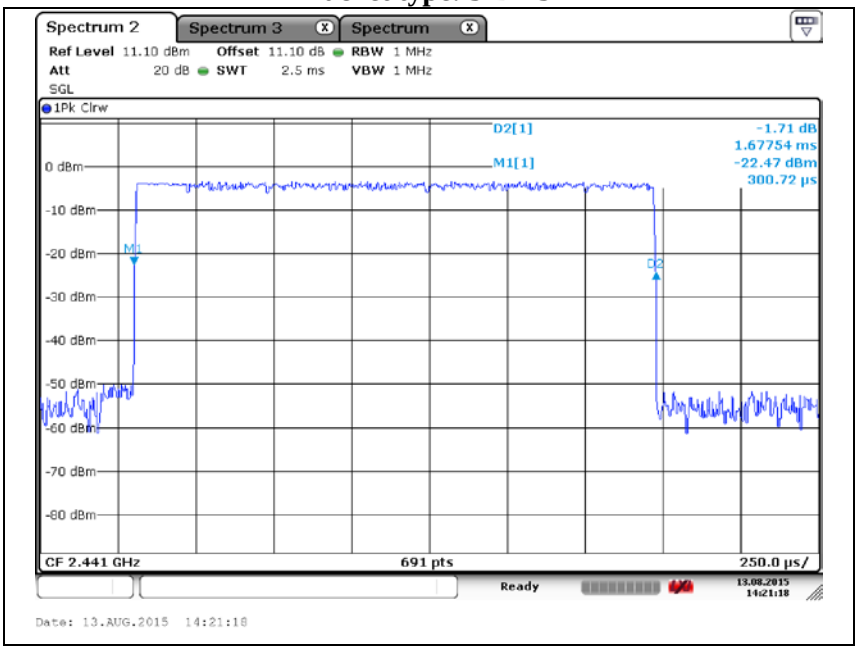
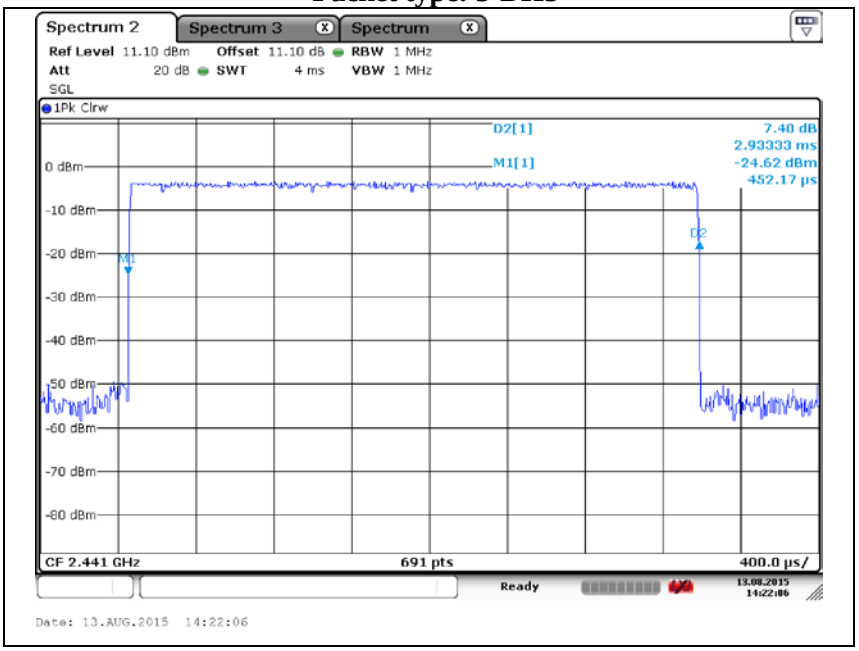
Packet type: 3-DH3



Packet type: 3-DH5



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Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum Analyzer	R&S	FSV40	101002	1 year	2016.07.25
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2016.01.23
Attenuator	HP	8493C	51401	1 year	2016.07.24
Loop Antenna	R&S	HFH2-Z2.335.4711.52	826532	2 years	2017.03.03
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-461	2 years	2017.04.03
Horn Antenna	A.H. System	SAS-571	414	2 years	2017.02.09
High Pass Filter	Wainwright Instrument	WHJS3000-10TT	1	1 year	2016.07.24
Preamplifier	SCHWARZBECK	BBV-9718	9718-246	1 year	2015.10.23
EMI Test Receiver	R & S	ESR3	101781	1 year	2016.05.06
DC power supply	SMtechno	SDP 30-5D	305DKJ119	1 year	2016.04.01

Peripheral devices

Device	Manufacturer	Model No.	Serial No.
Notebook Computer	Samsung Electronics Co., Ltd.	NT-R530	ZWC493BZC00014H
Mouse	Moneual	MSU0846	0910020101086E
Adapter	LITE-ON Technology Co., Ltd.	PA-1600-66	AD-6019R

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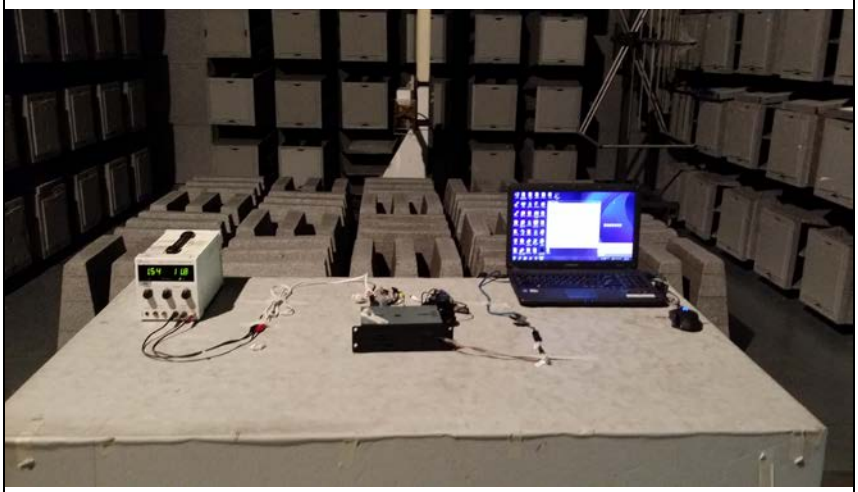
Appendix B. Test setup photo

Radiated Emission (30MHz~1GHz)

Radiated Emission (Above 1GHz)



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