

TEST REPORT



CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2018-03452
Page (1) / (76) Pages

1. Client

- Name : KAONMEDIA Co., Ltd.
- Address : KAONMEDIA Building, 884-3 Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
- Date of Receipt : 2018-10-11

2. Manufacturer

- Name : KAONMEDIA Co., Ltd.
- Address : KAONMEDIA Building, 884-3, Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea

3. Use of Report : For FCC Certification

4. Test Sample / Model: SETTOP BOX / VM3011C


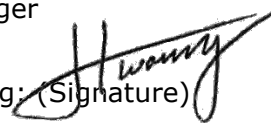
5. Date of Test : 2018-10-11 to 2018-10-26

6. Test Standard(method) used : FCC 47 CFR part 15 subpart C 15.247

7. Testing Environment: Temp.: (24 ± 5) °C, Humidity: (50 ± 3) % R.H.

8. Test Results : Compliance

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.

Affirmation	Tested by Ji-Hye, Kim: (Signature) 	Technical Manager Won-Jae, Hwang: (Signature) 
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2018-10-26

Republic of KOREA **CTK Co., Ltd.**



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Page (2) / (76)Pages

REPORT REVISION HISTORY

Date	Revision	Page No
2018-10-26	Issued (CTK-2018-03452)	all

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Report No.:
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Page (3) / (76)Pages

CONTENTS

1. General Product Description	4
1.1 Client Information	4
1.2 Product Information.....	4
1.3 Peripheral Devices	4
2. Facility and Accreditations.....	5
2.1 Test Facility.....	5
2.2 Laboratory Accreditations and Listings	5
2.3 Calibration Details of Equipment Used for Measurement	5
3. Test Specifications	6
3.1 Standards.....	6
3.2 Mode of operation during the test.....	7
3.3 Device Modifications	7
3.4 Maximum Measurement Uncertainty	7
3.5 Test Software.....	8
4. Technical Characteristic Test.....	9
4.1 6dB Bandwidth.....	9
4.2 OUTPUT POWER	20
4.3 Power Spectral Density	33
4.4 Conducted Spurious emission	46
4.5 Radiated Emission	63
4.6 AC Power Line Conducted Emissions	73
APPENDIX A – Test Equipment Used For Tests	76



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 Page (4) / (76)Pages

1. General Product Description

1.1 Client Information

Company	KAONMEDIA Co., Ltd.
Contact Point	KAONMEDIA Building, 884-3 Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
Contact Person	Name : Kim hang seob E-mail : khs79@kaonmedia.com Tel : +82-31-724-8668 Fax : +82-31-724-8999

1.2 Product Information

FCC ID	WQTVM3011C
Product Description	SETTOP BOX
Model name	VM3011C
Variant Model name	-
Operating Frequency	2 412 MHz – 2 462 MHz (20 MHz_BW) 2 422 MHz – 2 452 MHz (40 MHz_BW)
RF Output Power	802.11b : 22.24 dBm (167.64 mW) 802.11g : 19.58 dBm (90.79 mW) 802.11n_HT20 : 18.06 dBm (64.02 mW) 802.11n_HT40 : 17.56 dBm (56.96 mW)
Antenna Specification	Antenna type : PCB Antenna Peak Gain : 1.9 dBi
Number of channels	11
Type of Modulation	802.11b : DSSS 802.11g/n : OFDM
Data Rate	802.11b : 11 / 5.5 / 2 / 1 Mbps 802.11g : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps 802.11n: MCS0-31, up to 600 Mbps
Power Source	DC 12 V (Adaptor)
Hardware Rev	v1.0
Software Rev	00.00.00.01

1.3 Peripheral Devices





Device	Manufacturer	Model No.	Serial No.
Note Computer	HP	15-bs563TU	CND7253R6N
AC/DC Adapter	HP	HSTNN-CA40	-
Switching Mode Power Adaptor	SHENZHEN FRECOM ELECTRONICS CO., LTD.	F18L16-120150SPAU	-

2. Facility and Accreditations

2.1 Test Facility

The measurement facility is located at (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yong-in-si, Gyeonggi-do, Korea.

2.2 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Registration Number	Logo
USA	FCC	FCC Part 15 & 18 EMI (Electromagnetic Interference / Emission)	805871	
CANADA	ISED	ISED EMI (3/10m test site)	8737A-2	
JAPAN	VCCI	VCCI V-3 EMI (Electromagnetic Interference / Emission)	C-986 T-1843 R-3627 G-387	
KOREA	MSIP	EMI (Electromagnetic Interference / Emission) EMS (Electromagnetic Susceptibility / Immunity)	KR0025	

2.3 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.



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Report No.:
 CTK-2018-03452
 Page (6) / (76)Pages

3. Test Specifications

3.1 Standards

FCC Part Section(s)	Requirement(s)	Limit	Status (Note 1)	Test Condition
15.247(a)	6 dB Bandwidth	> 500 kHz	C	Conducted
15.247(b)	Maximum Output Power	< 1 Watt	C	
15.247(d)	Conducted Spurious emission	> 30 dBc	C	
15.247(d)	Unwanted Emission(Conducted)	> 30 dBc	C	
15.247(e)	Transmitter Power Spectral Density	< 8 dBm @ 3 kHz	C	
15.209	Radiated Emissions	15.209(a)	C	Radiated
15.207	AC Conducted Emissions	15.207(a)	C	Line Conducted
<i>Note 1:</i> C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable				
<i>Note 2:</i> The data in this test report are traceable to the national or international standards.				
<i>Note 3:</i> The sample was tested according to the following specification: FCC Part 15.247, ANSI C63.10-2013				
<i>Note 4:</i> The tests were performed according to the method of measurements prescribed in KDB No.558074.				

3.2 Mode of operation during the test

The EUT is operated in a manner representative of the typical of the equipments.
During at testing, system components were manipulated within the confines of typical usage to maximize each emission.
For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit.
All modulation modes were tests. The results are only attached worst cases.

Test Frequency

- 802.11b, 802.11g, 802.11n_HT20

Lowest channel	Middle channel	Highest channel
2 412 MHz	2 437 MHz	2 462 MHz

- 802.11n_HT40

Lowest channel	Middle channel	Highest channel
2 422 MHz	2 437 MHz	2 452 MHz

Test mode

Test mode	Modulation	Data rate	Duty Cycle	Duty Cycle Factor
802.11b	DSSS	1 Mbps	99.0%	0.00 dB
802.11g	OFDM	6 Mbps	93.7%	0.28 dB
802.11n_HT20	OFDM	MCS 0	93.4%	0.30 dB
802.11n_HT40	OFDM	MCS 0	87.1%	0.60 dB

3.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

3.4 Maximum Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter.
Coverage factor $k = 2$, Confidence levels of 95 %

Description	Uncertainty
Conducted RF Output Power	± 1.5 dB
Power Spectral Density	± 1.5 dB
Occupied Bandwidth	± 0.1 MHz
Unwanted Emission(conducted)	± 3.0 dB
Radiated Emissions (f ≤ 1 GHz)	± 4.0 dB
Radiated Emissions (f > 1 GHz)	± 5.0 dB



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Page (8) / (76)Pages

3.5 Test Software

Conducted Test	Ics Pro Ver. 6.0.3
Radiated Test	TOYO EMI software EP5RE Ver. 5.1.0
Line Conducted Test	ESCI7, ESCI3 : EMC32 Ver. 8.50.0 ESR7 : EMC32 Ver. 8.53.0



4. Technical Characteristic Test

4.1 6dB Bandwidth

Test Procedures

KDB 558074 - Section 8.2
ANSI C63.10-2013 - Section 11.8.2

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Procedures

ANSI C63.10-2013 - Section 6.9

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

Test Settings :

Center frequency = the highest, middle and the lowest channels

- a) RBW = 100 kHz
- b) VBW $\geq 3 \times$ RBW
- c) Detector = peak
- d) Trace mode = Max hold
- e) Sweep = auto couple
- f) Allow trace to fully stabilize
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Limit

6 dB Bandwidth > 500kHz



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 Page (10) / (76)Pages

Test Data:

ANT1

6 dB Bandwidth and 99% Bandwidth (MHz)						
Mode	802.11b		802.11g		802.11n_HT20	
Frequency	6dB	99%	6dB	99%	6dB	99%
2 412 MHz	8.61	10.94	16.40	16.51	17.38	17.71
2 437 MHz	8.61	10.65	16.38	16.49	17.32	17.68
2 462 MHz	8.59	10.76	16.36	16.49	17.59	17.70

6 dB Bandwidth and 99% Bandwidth (MHz)		
Mode	802.11n_HT40	
Frequency	6dB	99%
2 422 MHz	35.74	35.94
2 437 MHz	35.20	35.88
2 452 MHz	35.46	35.89

ANT2

6 dB Bandwidth and 99% Bandwidth (MHz)						
Mode	802.11b		802.11g		802.11n_HT20	
Frequency	6dB	99%	6dB	99%	6dB	99%
2 412 MHz	8.62	10.85	16.40	16.50	17.61	17.70
2 437 MHz	8.60	10.75	16.37	16.49	17.37	17.98
2 462 MHz	8.61	10.79	16.37	16.50	17.61	17.69

6 dB Bandwidth and 99% Bandwidth (MHz)		
Mode	802.11n_HT40	
Frequency	6dB	99%
2 422 MHz	35.74	35.96
2 437 MHz	35.47	35.88
2 452 MHz	35.19	35.87



ANT3

Mode	6 dB Bandwidth and 99% Bandwidth (MHz)					
	802.11b		802.11g		802.11n_HT20	
	6dB	99%	6dB	99%	6dB	99%
2 412 MHz	8.62	10.89	16.39	16.51	17.60	17.71
2 437 MHz	8.61	10.72	16.40	16.50	17.58	17.69
2 462 MHz	8.58	10.77	16.35	16.48	17.38	17.69

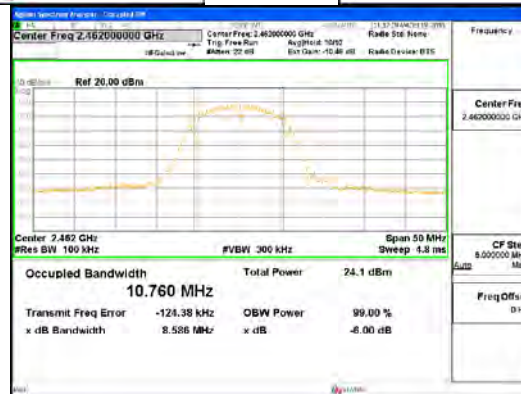
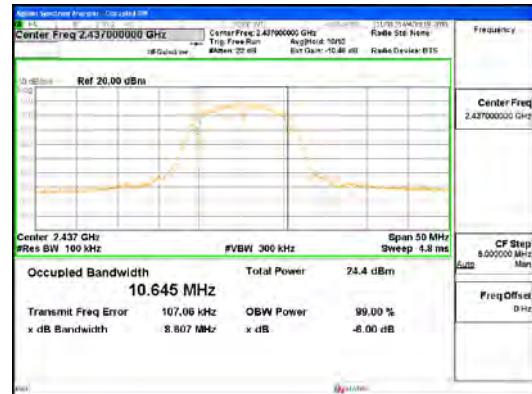
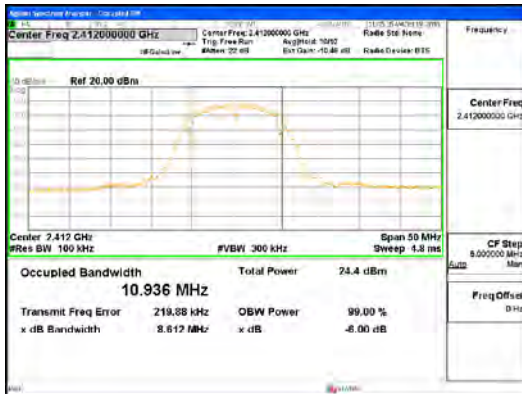
Mode	6 dB Bandwidth and 99% Bandwidth (MHz)	
	802.11n_HT40	
	6dB	99%
2 422 MHz	35.74	35.98
2 437 MHz	35.36	35.92
2 452 MHz	35.20	35.85

ANT4

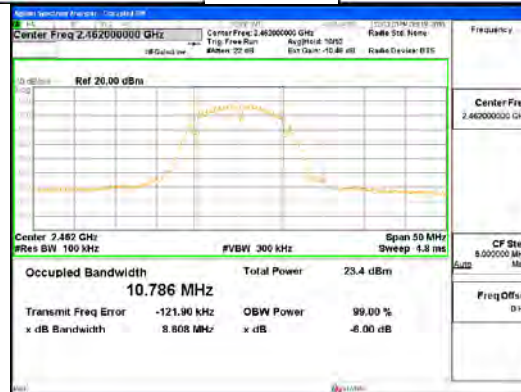
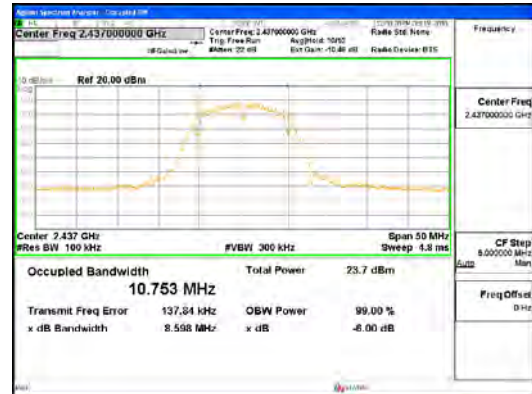
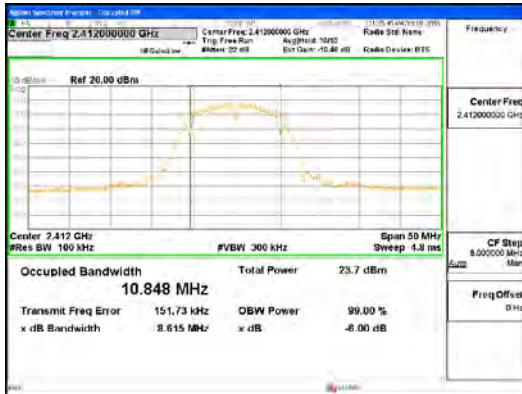
Mode	6 dB Bandwidth and 99% Bandwidth (MHz)					
	802.11b		802.11g		802.11n_HT20	
	6dB	99%	6dB	99%	6dB	99%
2 412 MHz	8.15	10.85	16.39	16.50	17.61	17.71
2 437 MHz	8.61	10.75	16.37	16.49	17.37	17.67
2 462 MHz	8.15	10.79	16.36	16.49	17.61	17.67

Mode	6 dB Bandwidth and 99% Bandwidth (MHz)	
	802.11n_HT40	
	6dB	99%
2 422 MHz	35.74	35.94
2 437 MHz	35.46	35.90
2 452 MHz	35.20	35.88

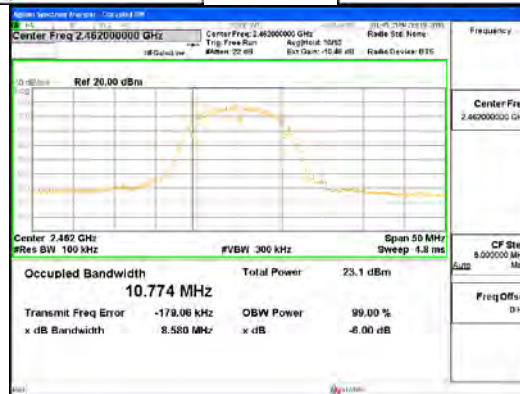
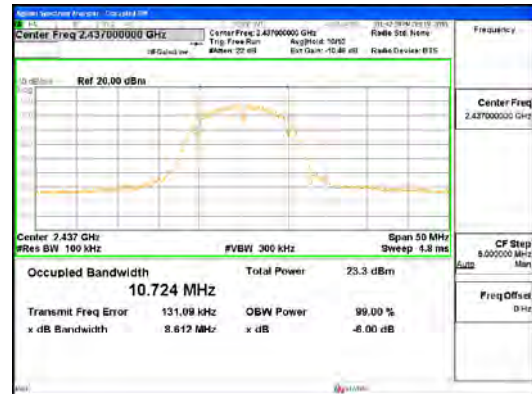
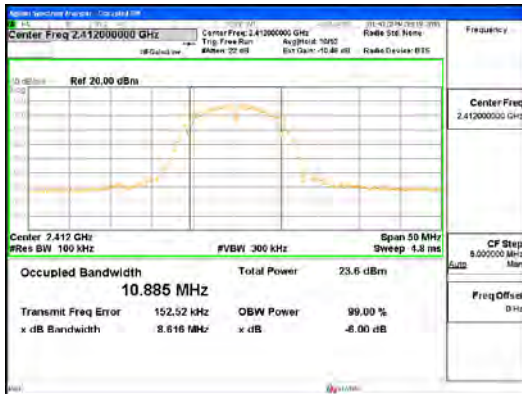
See next pages for actual measured spectrum plots.



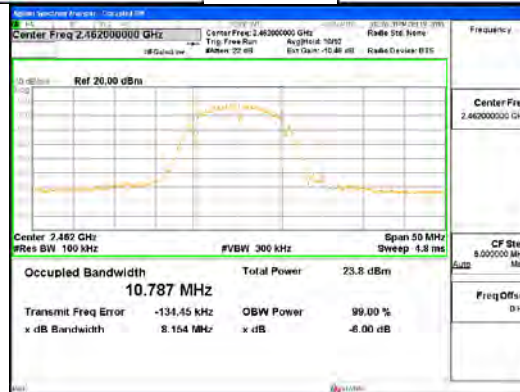
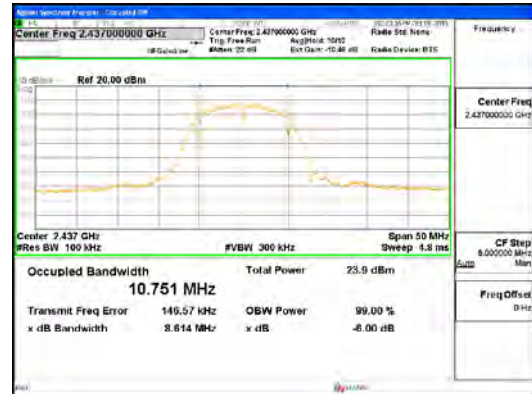
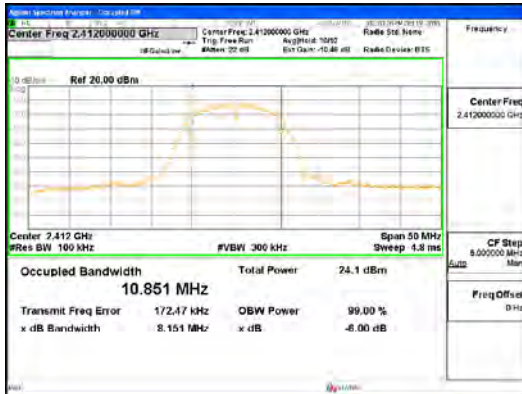
802.11b_ANT1



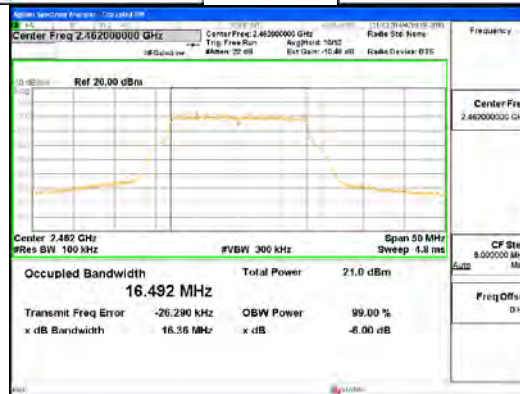
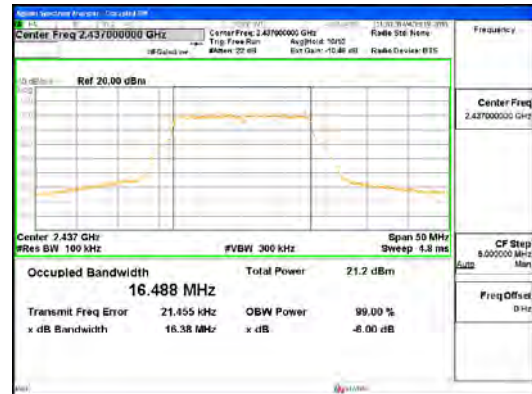
802.11b_ANT2



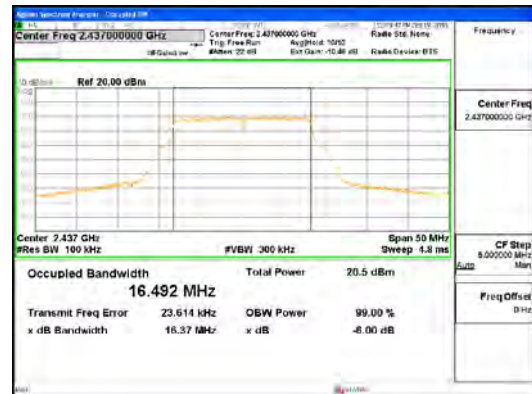
802.11b_ANT3



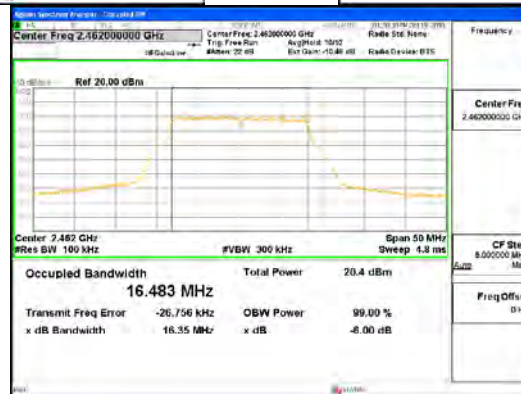
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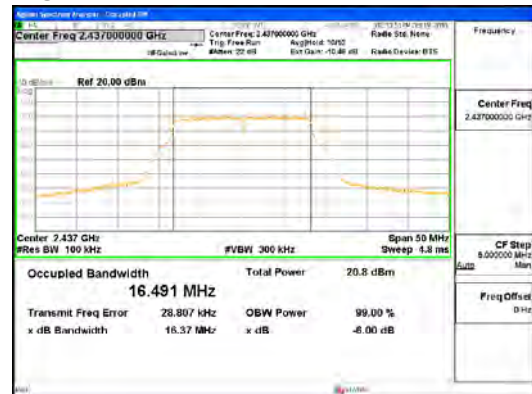
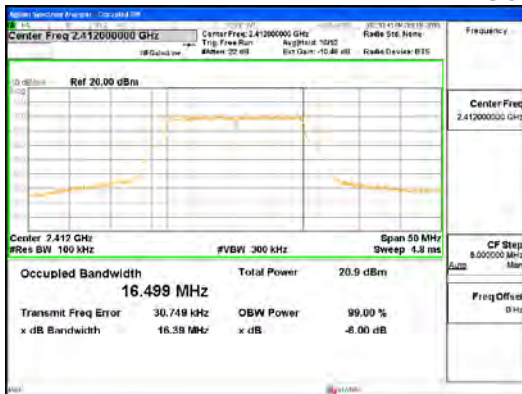
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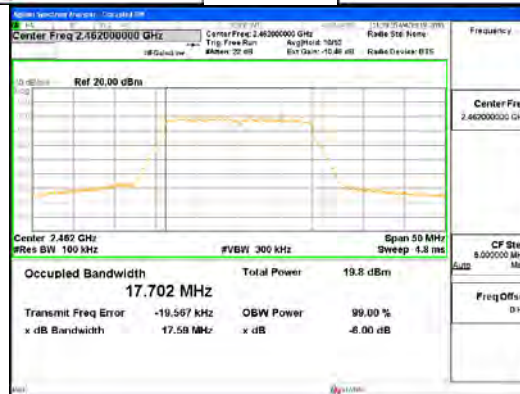
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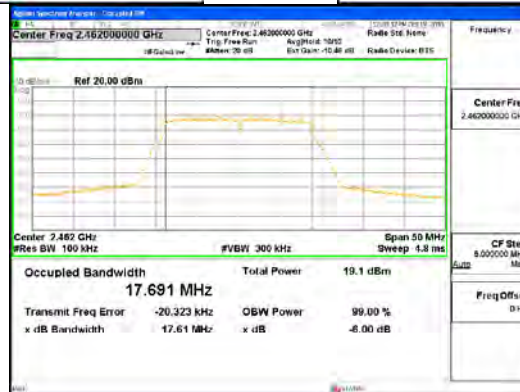
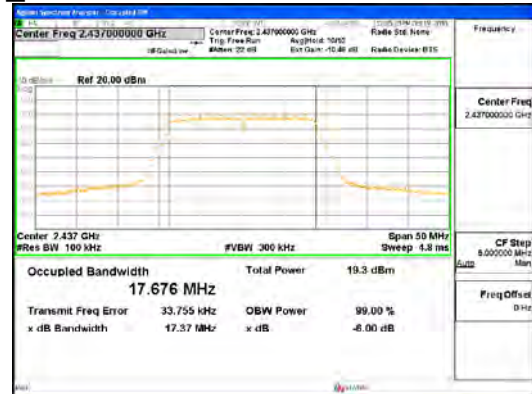
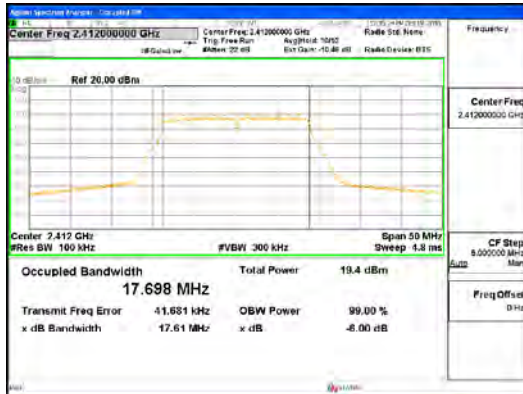
802.11g_ANT3



802.11g_ANT4



802.11n_HT20_ANT1

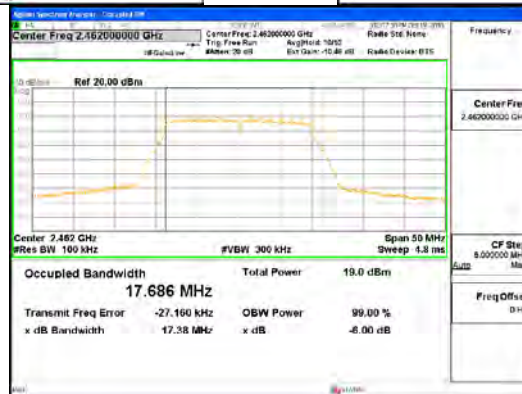
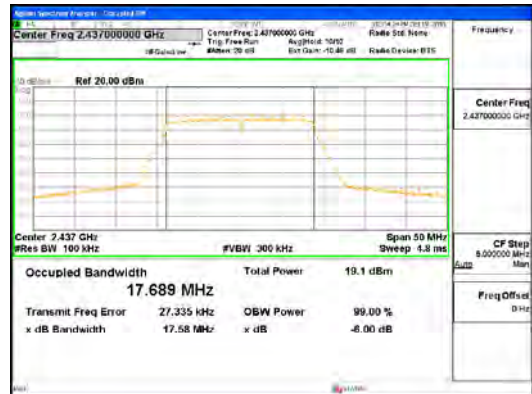


802.11n_HT20_ANT2

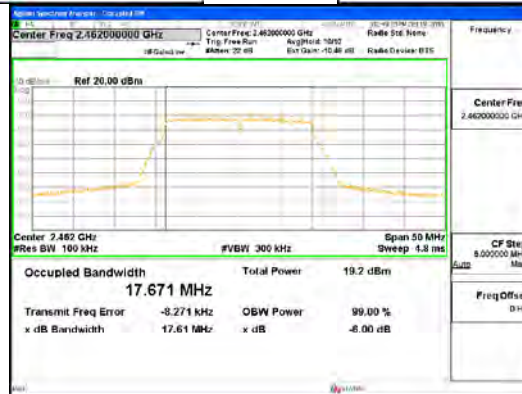
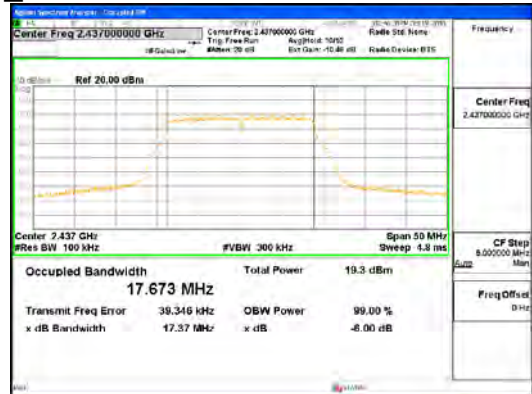
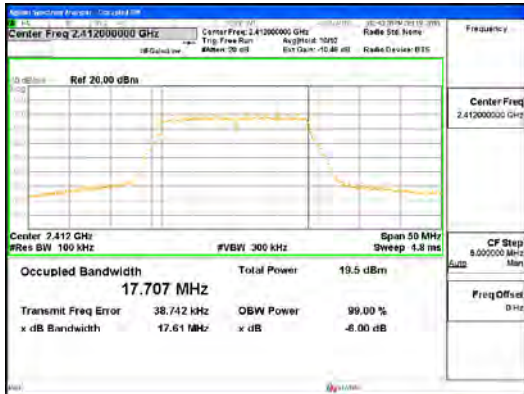


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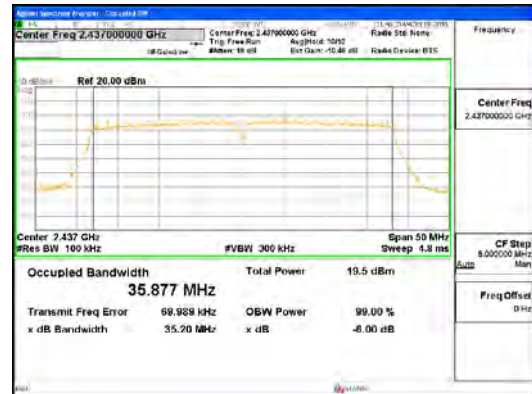
Report No.:
 CTK-2018-03452
 Page (17) / (76)Pages



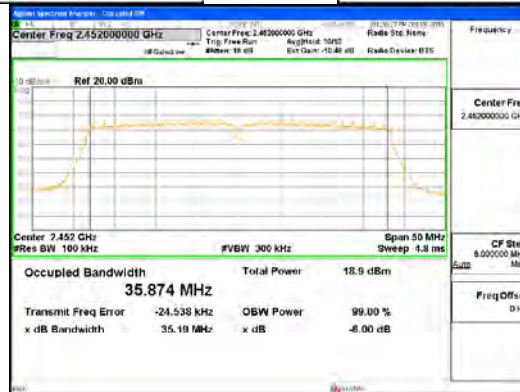
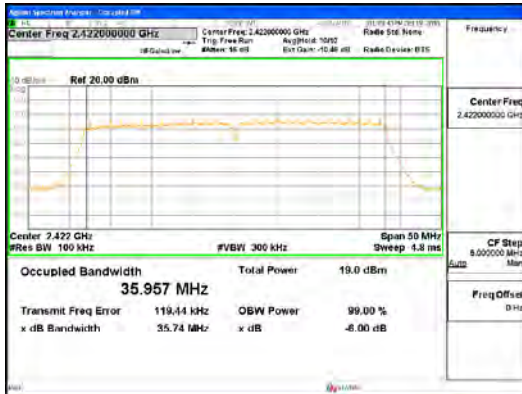
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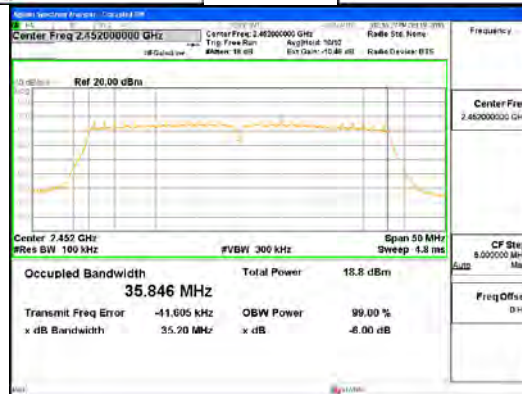
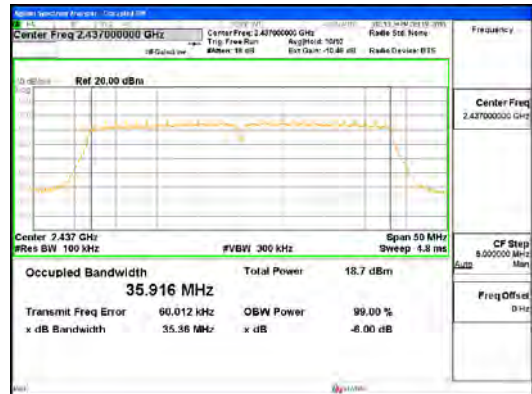
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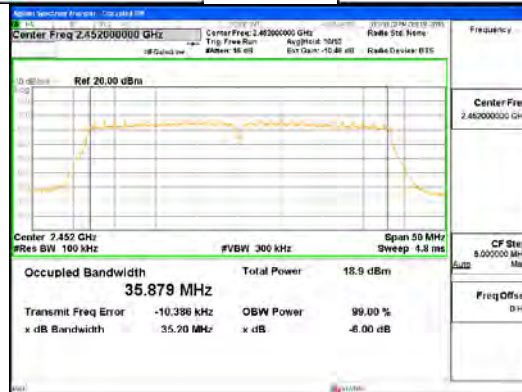
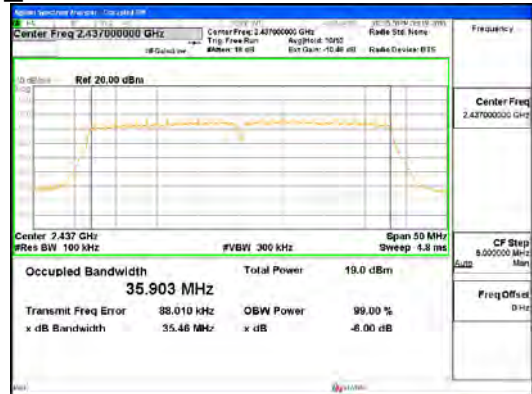
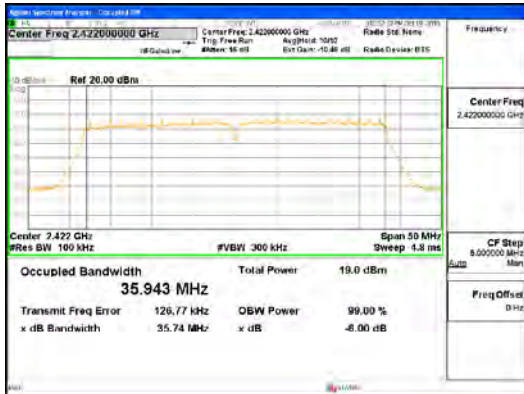
802.11n_HT40_ANT1



802.11n_HT40_ANT2



802.11n_HT40_ANT3



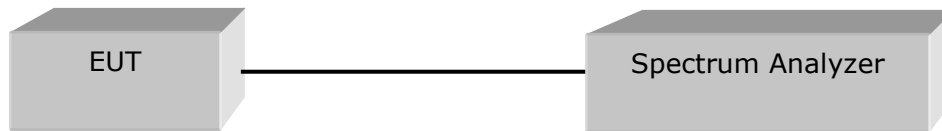
802.11n_HT40_ANT4

4.2 OUTPUT POWER

Test Procedures

KDB 558074 - Section 8.3.2.2 (Average Power)
ANSI C63.10-2013 - Section 11.9.2.2
KDB 662911 D01, D02 (Multiple Transmitter Output)

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



Test Settings:

Center frequency = the highest, middle and the lowest channels

- a) span $\geq 1.5 \times \text{OBW}$
- b) RBW = 1 MHz
- c) VBW $\geq 3 \times \text{RBW}$
- d) Sweep time = auto
- e) Detector = RMS
- f) average at least 100
- g) Duty cycle factor = $10\log(1/x)$

Test mode	Duty Cycle Factor (dB)
802.11b	0.00
802.11g	0.28
802.11n_HT20	0.30
802.11n_HT40	0.60

Limit

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)
SISO	802.11b/g/n	ANT1	1.90	30.00
SISO	802.11b/g/n	ANT2		
SISO	802.11b/g/n	ANT3		
SISO	802.11b/g/n	ANT4		
MIMO (2Tx)	802.11b/g/n	ANT1 + ANT2	4.91	30.00
MIMO (3Tx)	802.11b/g/n	ANT1 + ANT2 + ANT3	6.67	29.33
MIMO (4Tx)	802.11b/g/n	ANT1 + ANT2 + ANT3 + ANT4	7.92	28.08

Test Data

ANT1

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	16.66	0.00	16.66	30.00	13.34
	2 437	16.65	0.00	16.65	30.00	13.35
	2 462	16.37	0.00	16.37	30.00	13.63
802.11g	2 412	13.94	0.28	14.22	30.00	15.78
	2 437	13.60	0.28	13.88	30.00	16.12
	2 462	13.37	0.28	13.65	30.00	16.35
802.11n _HT20	2 412	12.22	0.30	12.52	30.00	17.48
	2 437	12.02	0.30	12.32	30.00	17.68
	2 462	11.93	0.30	12.23	30.00	17.77
802.11n _HT40	2 422	11.29	0.60	11.89	30.00	18.11
	2 437	11.35	0.60	11.95	30.00	18.05
	2 452	11.21	0.60	11.81	30.00	18.19

ANT2

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	15.98	0.00	15.98	30.00	14.02
	2 437	15.82	0.00	15.82	30.00	14.18
	2 462	15.69	0.00	15.69	30.00	14.31
802.11g	2 412	13.04	0.28	13.32	30.00	16.68
	2 437	12.81	0.28	13.09	30.00	16.91
	2 462	12.81	0.28	13.09	30.00	16.91
802.11n _HT20	2 412	11.51	0.30	11.81	30.00	18.19
	2 437	11.50	0.30	11.8	30.00	18.20
	2 462	11.26	0.30	11.56	30.00	18.44
802.11n _HT40	2 422	10.80	0.60	11.4	30.00	18.60
	2 437	10.72	0.60	11.32	30.00	18.68
	2 452	10.73	0.60	11.33	30.00	18.67



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Report No.:
 CTK-2018-03452
 Page (22) / (76)Pages

ANT3

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	15.89	0.00	15.89	30.00	14.11
	2 437	15.68	0.00	15.68	30.00	14.32
	2 462	15.45	0.00	15.45	30.00	14.55
802.11g	2 412	12.87	0.28	13.15	30.00	16.85
	2 437	12.83	0.28	13.11	30.00	16.89
	2 462	12.59	0.28	12.87	30.00	17.13
802.11n _HT20	2 412	11.51	0.30	11.81	30.00	18.19
	2 437	11.35	0.30	11.65	30.00	18.35
	2 462	11.08	0.30	11.38	30.00	18.62
802.11n _HT40	2 422	10.74	0.60	11.34	30.00	18.66
	2 437	10.58	0.60	11.18	30.00	18.82
	2 452	10.67	0.60	11.27	30.00	18.73

ANT4

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	16.32	0.00	16.32	30.00	13.68
	2 437	16.19	0.00	16.19	30.00	13.81
	2 462	16.09	0.00	16.09	30.00	13.91
802.11g	2 412	13.19	0.28	13.47	30.00	16.53
	2 437	13.24	0.28	13.52	30.00	16.48
	2 462	12.91	0.28	13.19	30.00	16.81
802.11n _HT20	2 412	11.69	0.30	11.99	30.00	18.01
	2 437	11.55	0.30	11.85	30.00	18.15
	2 462	11.26	0.30	11.56	30.00	18.44
802.11n _HT40	2 422	10.89	0.60	11.49	30.00	18.51
	2 437	10.80	0.60	11.40	30.00	18.60
	2 452	10.75	0.60	11.35	30.00	18.65



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Report No.:
 CTK-2018-03452
 Page (23) / (76)Pages

ANT1 + ANT2

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	19.34	0.00	19.34	30.00	10.66
	2 437	19.27	0.00	19.27	30.00	10.73
	2 462	19.05	0.00	19.05	30.00	10.95
802.11g	2 412	16.52	0.28	16.80	30.00	13.20
	2 437	16.23	0.28	16.51	30.00	13.49
	2 462	16.11	0.28	16.39	30.00	13.61
802.11n _HT20	2 412	14.89	0.30	15.19	30.00	14.81
	2 437	14.78	0.30	15.08	30.00	14.92
	2 462	14.62	0.30	14.92	30.00	15.08
802.11n _HT40	2 422	14.06	0.60	14.66	30.00	15.34
	2 437	14.06	0.60	14.66	30.00	15.34
	2 452	13.99	0.60	14.59	30.00	15.41

ANT1 + ANT2 + ANT3

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	20.96	0.00	20.96	29.33	8.37
	2 437	20.84	0.00	20.84	29.33	8.49
	2 462	20.63	0.00	20.63	29.33	8.70
802.11g	2 412	18.08	0.28	18.36	29.33	10.97
	2 437	17.87	0.28	18.15	29.33	11.18
	2 462	17.71	0.28	17.99	29.33	11.34
802.11n _HT20	2 412	16.53	0.30	16.83	29.33	12.50
	2 437	16.40	0.30	16.70	29.33	12.63
	2 462	16.21	0.30	16.51	29.33	12.82
802.11n _HT40	2 422	15.72	0.60	16.32	29.33	13.01
	2 437	15.67	0.60	16.27	29.33	13.06
	2 452	15.65	0.60	16.25	29.33	13.08



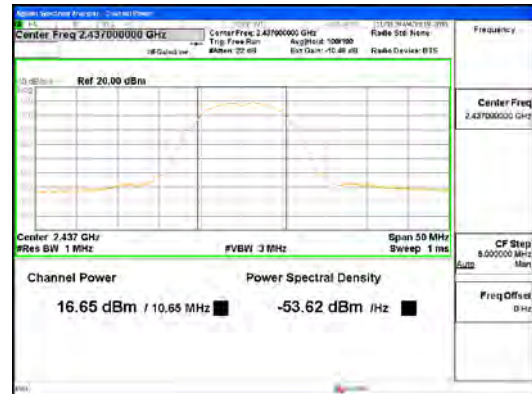
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Report No.:
 CTK-2018-03452
 Page (24) / (76)Pages

ANT1 + ANT2 + ANT3 + ANT4

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	22.24	0.00	22.24	28.08	5.84
	2 437	22.12	0.00	22.12	28.08	5.96
	2 462	21.94	0.00	21.94	28.08	6.14
802.11g	2 412	19.30	0.28	19.58	28.08	8.50
	2 437	19.15	0.28	19.43	28.08	8.65
	2 462	18.95	0.28	19.23	28.08	8.85
802.11n _HT20	2 412	17.76	0.30	18.06	28.08	10.02
	2 437	17.63	0.30	17.93	28.08	10.15
	2 462	17.42	0.30	17.72	28.08	10.36
802.11n _HT40	2 422	16.96	0.60	17.56	28.08	10.52
	2 437	16.89	0.60	17.49	28.08	10.59
	2 452	16.87	0.60	17.47	28.08	10.61

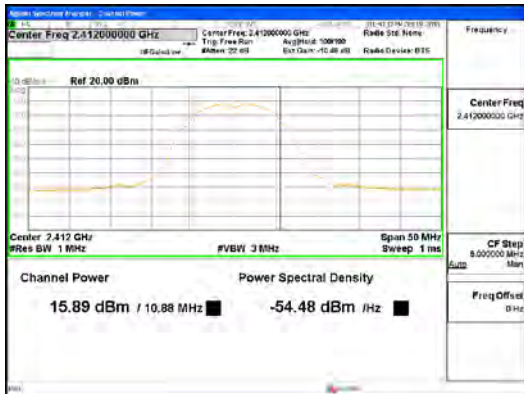
See next pages for actual measured spectrum plots.



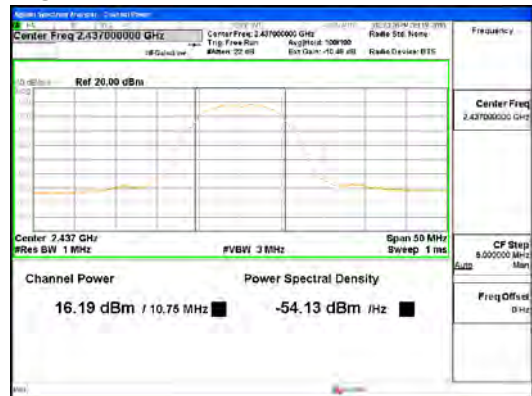
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802.11b_ANT2



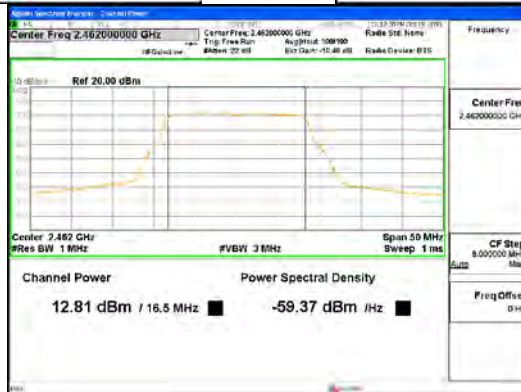
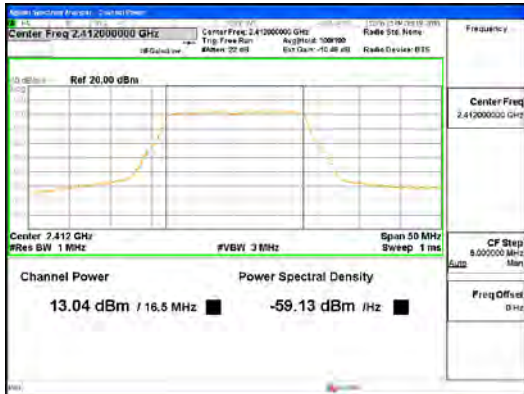
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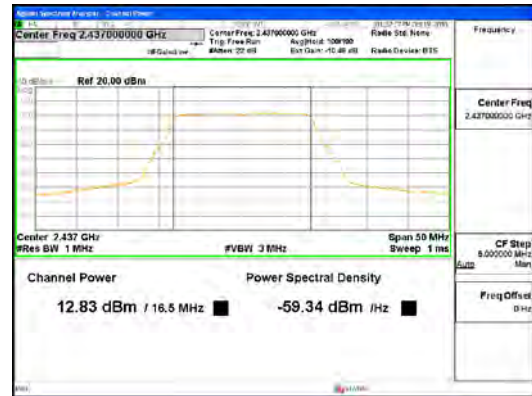
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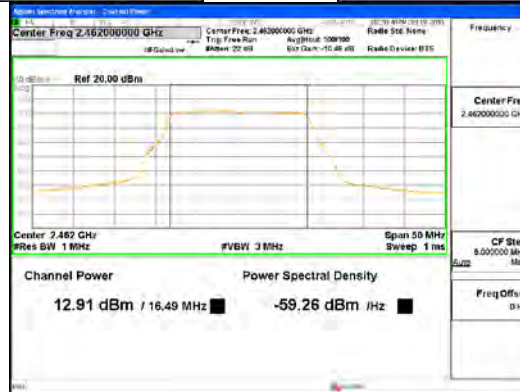
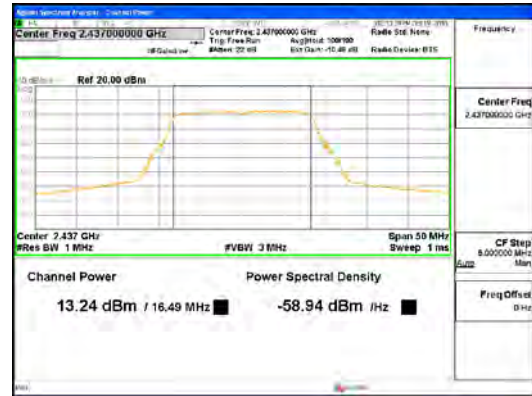
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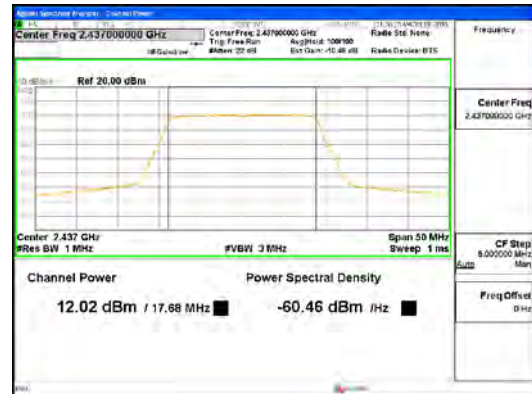
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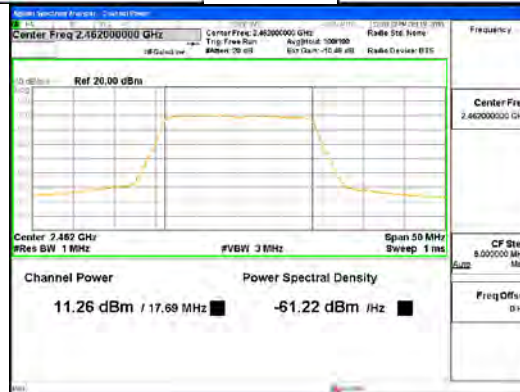
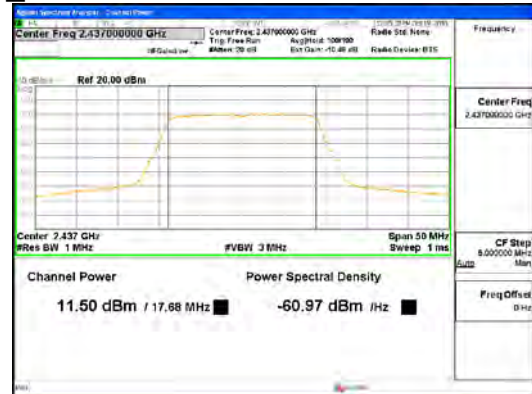
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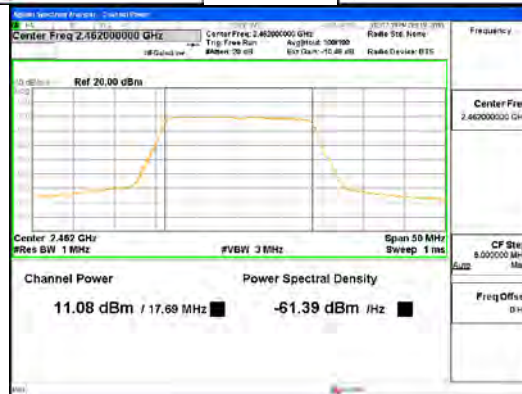
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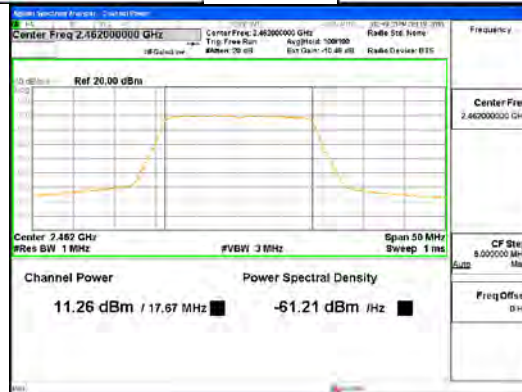
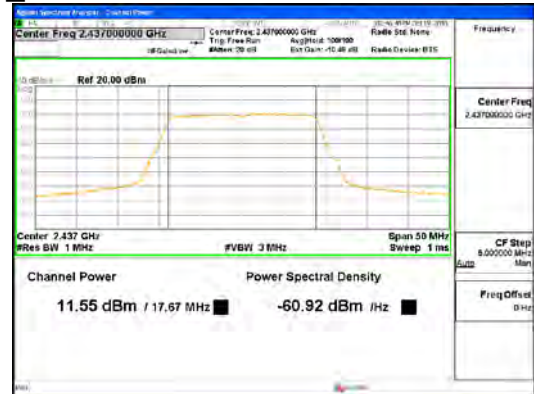
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802.11n_HT20_ANT2



802.11n_HT20_ANT3



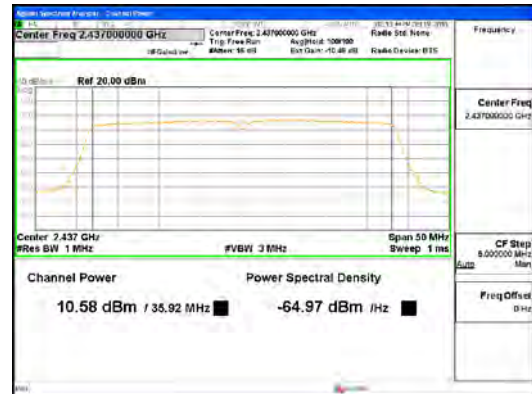
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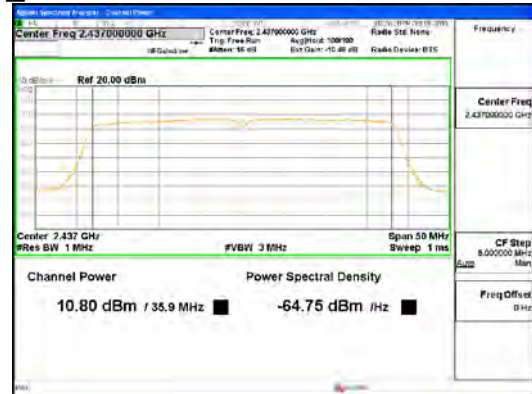
802.11n_HT40_ANT1



802.11n_HT40_ANT2



802.11n_HT40_ANT3



802.11n_HT40_ANT4



4.3 Power Spectral Density

Test Procedures

KDB 558074 - Section 8.4
 ANSI C63.10-2013 - Section 11.10.2
 KDB 662911 D01, D02 (Multiple Transmitter Output)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Test Settings:

Center frequency = the highest, middle and the lowest channels

- a) RBW : $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
- b) VBW $\geq 3 \times \text{RBW}$
- c) span $\geq 1.5 \times \text{DTS bandwidth}$
- d) Sweep time = auto couple
- e) Detector = peak
- f) Trace mode= max hold
- g) Allow trace to fully stabilize
- h) Use the peak marker function to determine the maximum amplitude level within the RBW.

Limit

Operating Mode	Mode	ANT Configuration	ANT Gain (dBi)	Limit (dBm)
SISO	802.11b/g/n	ANT1	1.90	8.00
SISO	802.11b/g/n	ANT2		
SISO	802.11b/g/n	ANT3		
SISO	802.11b/g/n	ANT4		
MIMO (2Tx)	802.11b/g/n	ANT1 + ANT2	4.91	8.00
MIMO (3Tx)	802.11b/g/n	ANT1 + ANT2 + ANT3	6.67	7.33
MIMO (4Tx)	802.11b/g/n	ANT1 + ANT2 + ANT3 + ANT4	7.92	6.08



Test Data

ANT1

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-5.62	8.00	13.62
	2 437	-5.50	8.00	13.50
	2 462	-4.81	8.00	12.81
802.11g	2 412	-10.00	8.00	18.00
	2 437	-10.63	8.00	18.63
	2 462	-9.98	8.00	17.98
802.11n_HT20	2 412	-12.90	8.00	20.90
	2 437	-11.68	8.00	19.68
	2 462	-11.99	8.00	19.99
802.11n_HT40	2 422	-15.85	8.00	23.85
	2 437	-15.46	8.00	23.46
	2 452	-15.48	8.00	23.48

ANT2

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-5.66	8.00	13.66
	2 437	-5.94	8.00	13.94
	2 462	-6.24	8.00	14.24
802.11g	2 412	-11.09	8.00	19.09
	2 437	-12.09	8.00	20.09
	2 462	-11.30	8.00	19.30
802.11n_HT20	2 412	-11.22	8.00	19.22
	2 437	-13.78	8.00	21.78
	2 462	-12.90	8.00	20.90
802.11n_HT40	2 422	-15.92	8.00	23.92
	2 437	-16.75	8.00	24.75
	2 452	-15.31	8.00	23.31



ANT3

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-6.62	8.00	14.62
	2 437	-6.98	8.00	14.98
	2 462	-7.31	8.00	15.31
802.11g	2 412	-12.18	8.00	20.18
	2 437	-12.50	8.00	20.50
	2 462	-10.91	8.00	18.91
802.11n_HT20	2 412	-13.50	8.00	21.50
	2 437	-12.89	8.00	20.89
	2 462	-12.60	8.00	20.60
802.11n_HT40	2 422	-15.82	8.00	23.82
	2 437	-16.57	8.00	24.57
	2 452	-16.20	8.00	24.20

ANT4

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-5.33	8.00	13.33
	2 437	-6.53	8.00	14.53
	2 462	-6.47	8.00	14.47
802.11g	2 412	-10.99	8.00	18.99
	2 437	-11.09	8.00	19.09
	2 462	-10.70	8.00	18.70
802.11n_HT20	2 412	-12.68	8.00	20.68
	2 437	-13.13	8.00	21.13
	2 462	-12.91	8.00	20.91
802.11n_HT40	2 422	-14.77	8.00	22.77
	2 437	-16.08	8.00	24.08
	2 452	-16.10	8.00	24.10

ANT1 + ANT2

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-2.63	8.00	10.63
	2 437	-2.70	8.00	10.70
	2 462	-2.46	8.00	10.46
802.11g	2 412	-7.50	8.00	15.50
	2 437	-8.29	8.00	16.29
	2 462	-7.58	8.00	15.58
802.11n_HT20	2 412	-8.97	8.00	16.97
	2 437	-9.59	8.00	17.59
	2 462	-9.41	8.00	17.41
802.11n_HT40	2 422	-12.87	8.00	20.87
	2 437	-13.05	8.00	21.05
	2 452	-12.38	8.00	20.38

ANT1 + ANT2 + ANT3

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-1.17	7.33	8.50
	2 437	-1.33	7.33	8.66
	2 462	-1.23	7.33	8.56
802.11g	2 412	-6.23	7.33	13.56
	2 437	-6.89	7.33	14.22
	2 462	-5.92	7.33	13.25
802.11n_HT20	2 412	-7.66	7.33	14.99
	2 437	-7.93	7.33	15.26
	2 462	-7.71	7.33	15.04
802.11n_HT40	2 422	-11.09	7.33	18.42
	2 437	-11.45	7.33	18.78
	2 452	-10.88	7.33	18.21



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Report No.:
CTK-2018-03452
Page (37) / (76)Pages

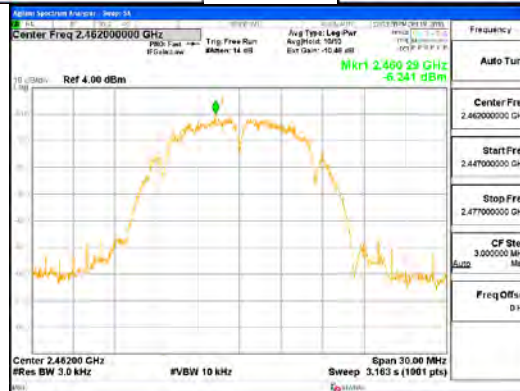
ANT1 + ANT2 + ANT3 + ANT4

Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-2.03	6.08	8.11
	2 437	-2.56	6.08	8.64
	2 462	-2.22	6.08	8.30
802.11g	2 412	-7.34	6.08	13.42
	2 437	-7.75	6.08	13.83
	2 462	-7.18	6.08	13.26
802.11n_HT20	2 412	-9.64	6.08	15.72
	2 437	-9.25	6.08	15.33
	2 462	-9.31	6.08	15.39
802.11n_HT40	2 422	-12.22	6.08	18.30
	2 437	-12.71	6.08	18.79
	2 452	-12.71	6.08	18.79

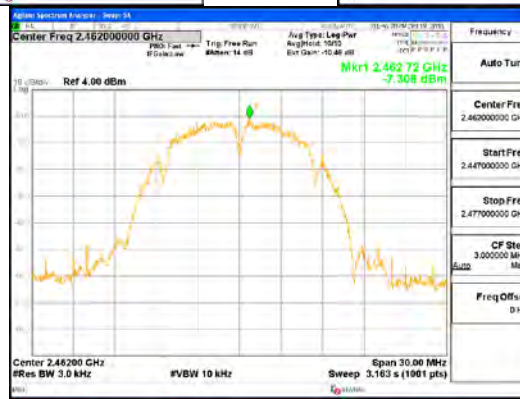
See next pages for actual measured spectrum plots.



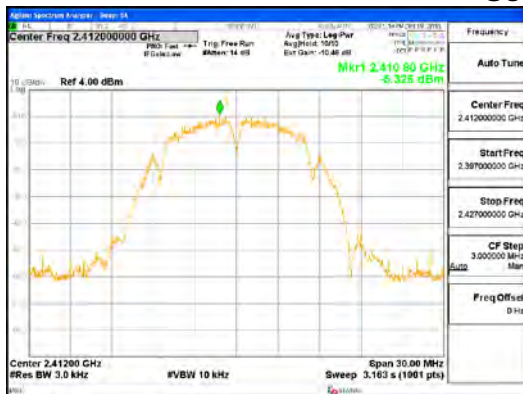
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802.11b_ANT2



802.11b_ANT3

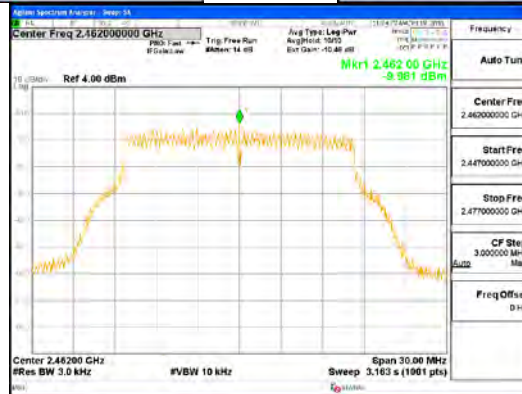
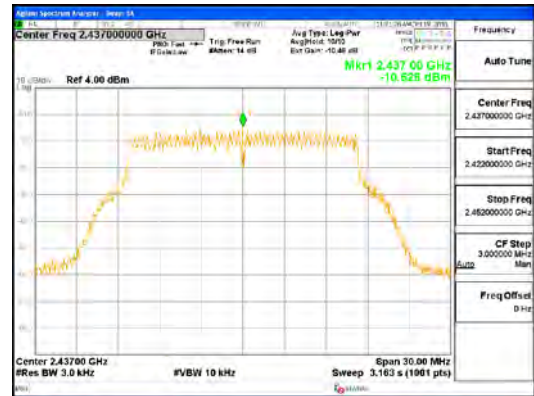
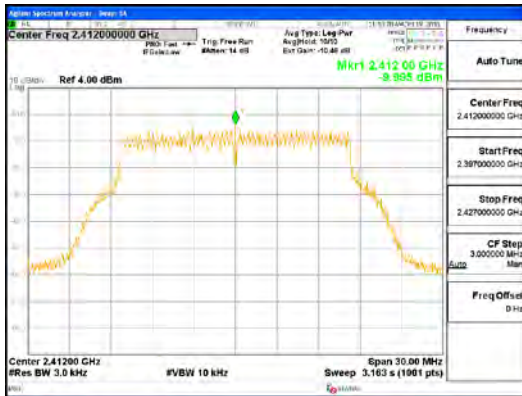


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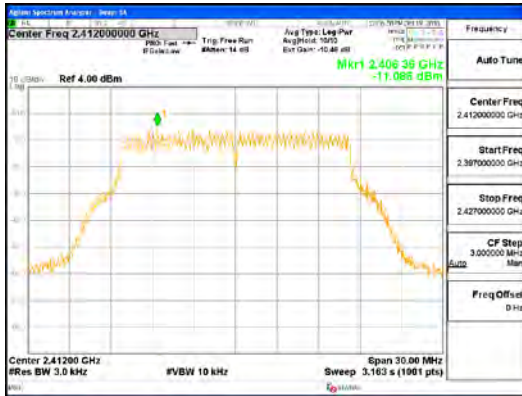


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Report No.:
 CTK-2018-03452
 Page (40) / (76)Pages



802.11g_ANT1

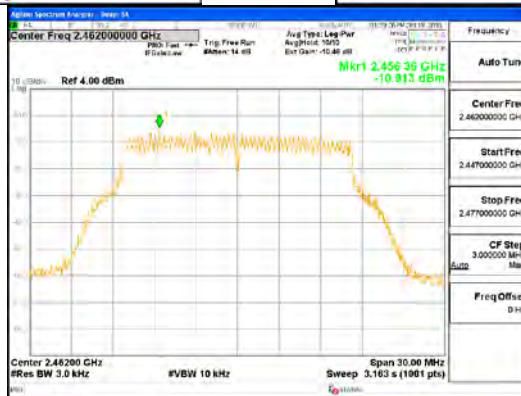
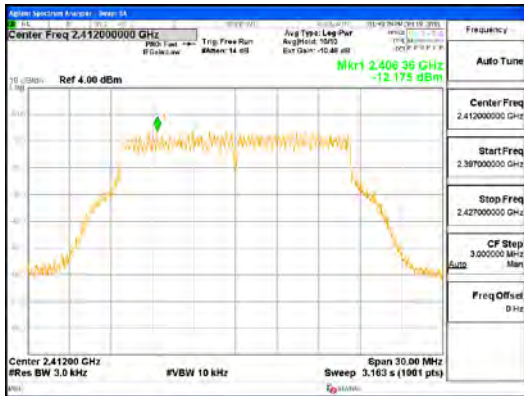


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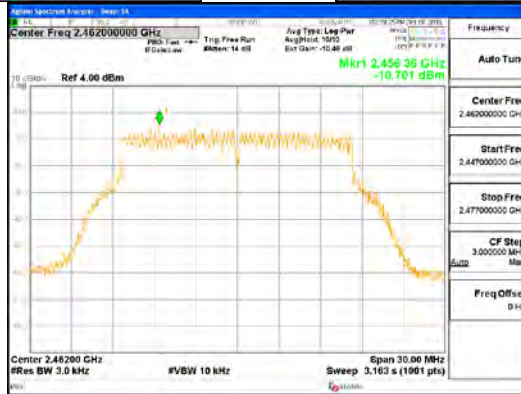
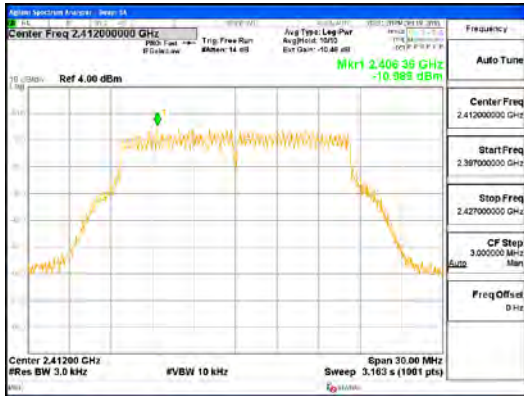


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 CTK-2018-03452
 Page (41) / (76)Pages



802.11g_ANT3



802.11g_ANT4

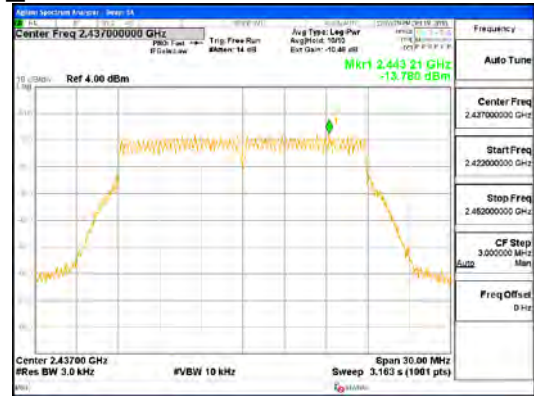
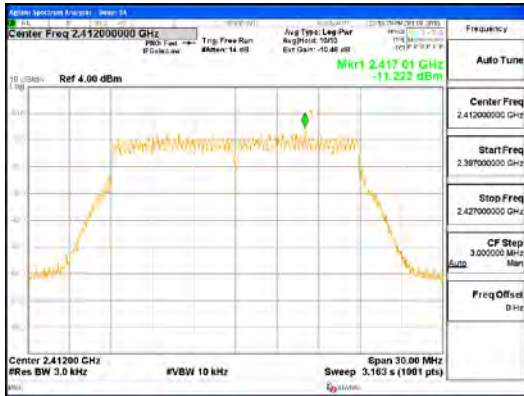


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Report No.:
 CTK-2018-03452
 Page (42) / (76)Pages



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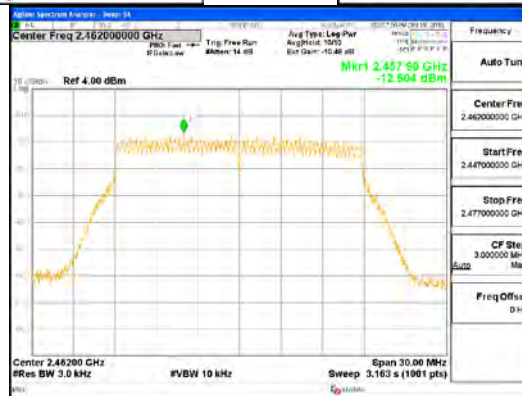
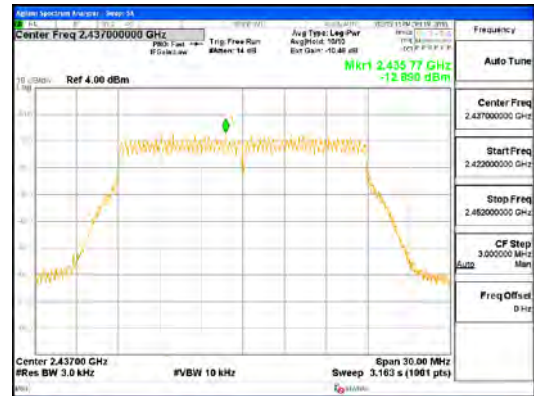
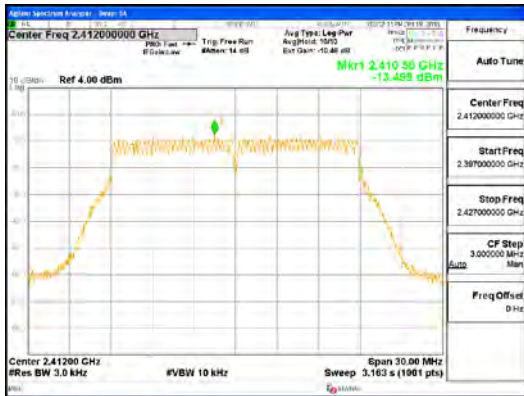


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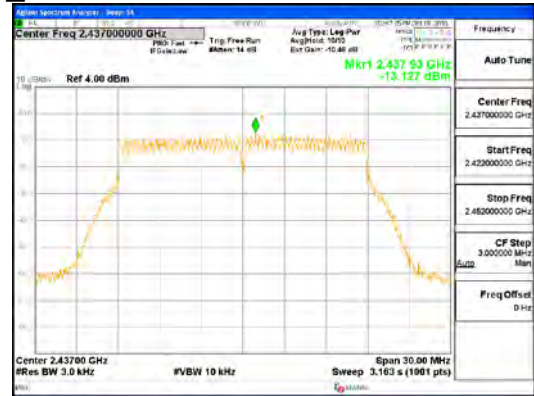
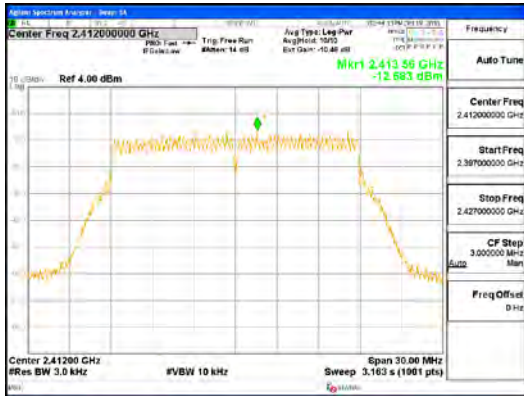


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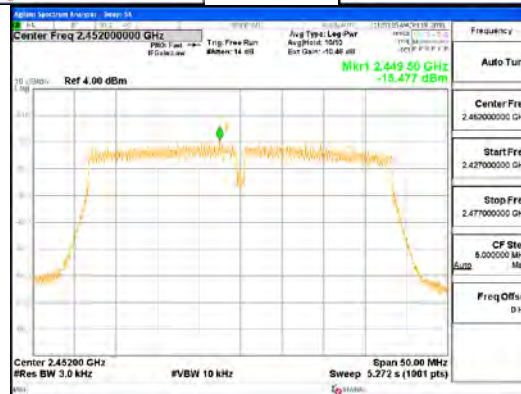
Report No.:
 CTK-2018-03452
 Page (43) / (76)Pages



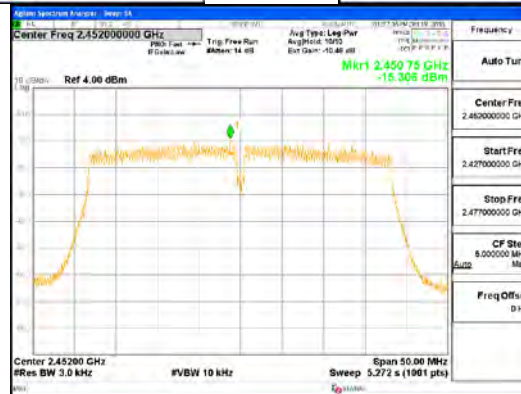
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802.11n_HT20_ANT4



802.11n_HT40_ANT1

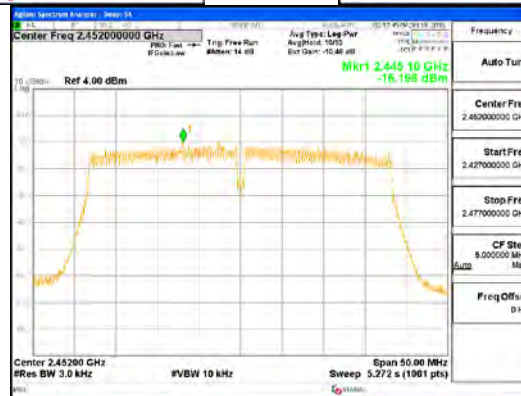
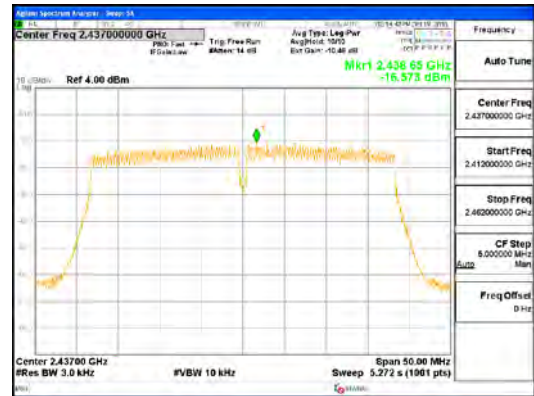


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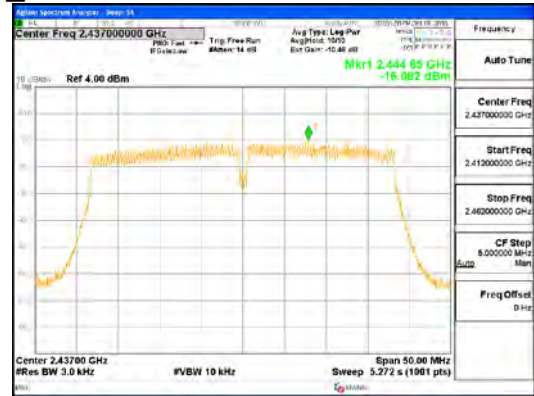


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Report No.:
CTK-2018-03452
Page (45) / (76)Pages



802.11n_HT40_ANT3



802.11n_HT40_ANT4



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Report No.:
CTK-2018-03452
Page (46) / (76)Pages

4.4 Conducted Spurious emission

Test Procedures

KDB 558074 - Section 8.5
ANSI C63.10-2013 - Section 11.11.3

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

Test Settings:

Center frequency = the highest, middle and the lowest channels

- a) RBW = 100 kHz
- b) VBW $\geq 3 \times$ RBW
- c) Detector = peak
- d) Sweep time = auto couple
- e) Trace mode= max hold
- f) Allow trace to fully stabilize
- g) Use the peak marker function to determine the maximum amplitude level.

Limit :

Emission level < 30 dBc

Test Data: Complies

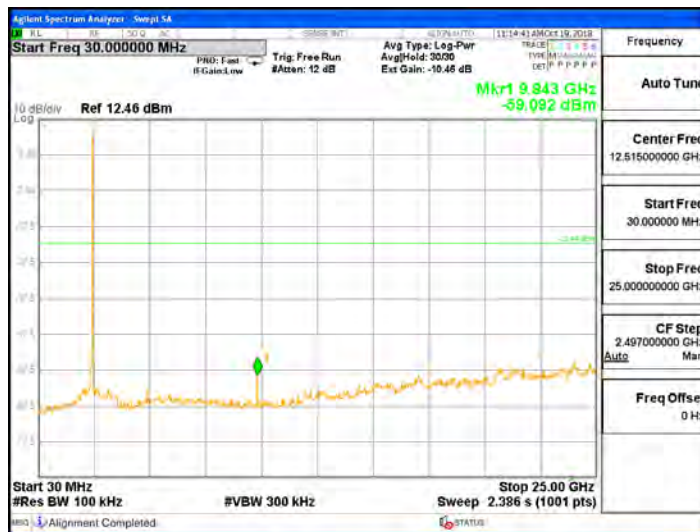
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 30dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

See next pages for actual measured spectrum plots.



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 CTK-2018-03452
 Page (47) / (76)Pages

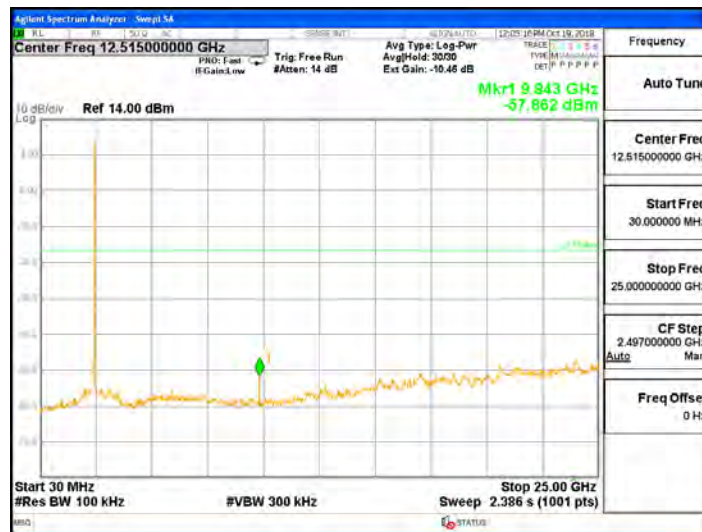


802.11b_ANT1



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 CTK-2018-03452
 Page (48) / (76)Pages

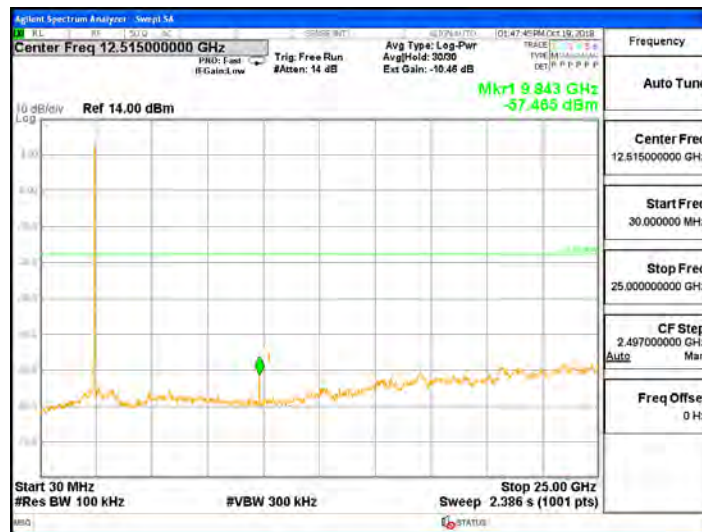
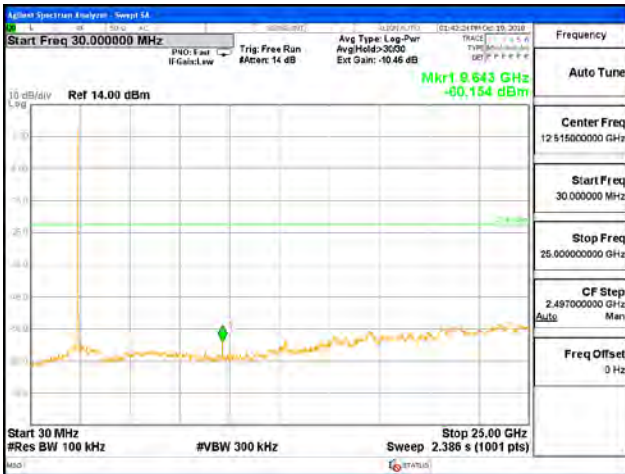


802.11b_ANT2



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Report No.:
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 Page (49) / (76)Pages

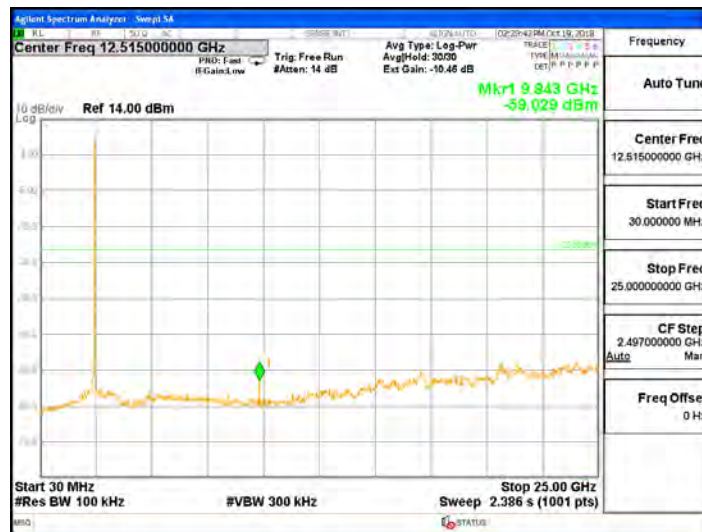


802.11b_ANT3



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Report No.:
 CTK-2018-03452
 Page (50) / (76)Pages

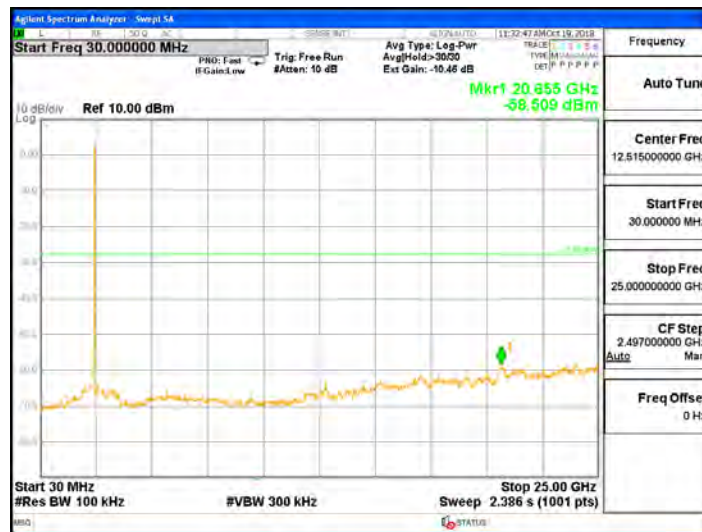
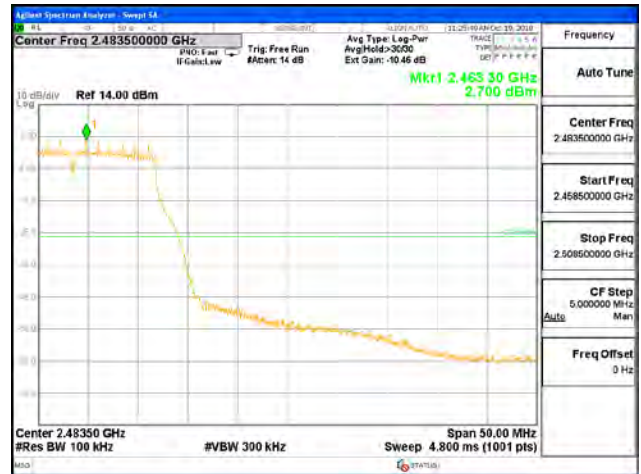
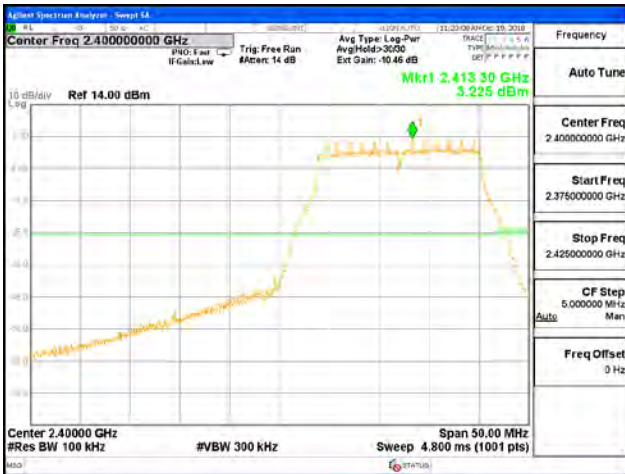


802.11b_ANT4



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Report No.:
 CTK-2018-03452
 Page (51) / (76)Pages

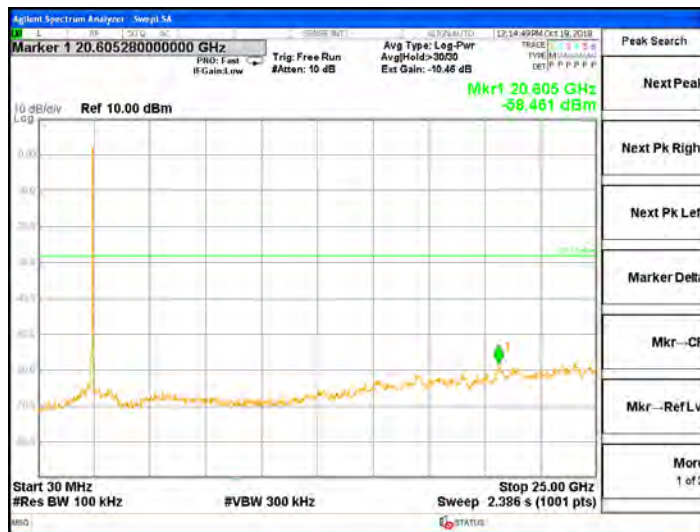


802.11g_ANT1



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Report No.:
 CTK-2018-03452
 Page (52) / (76)Pages

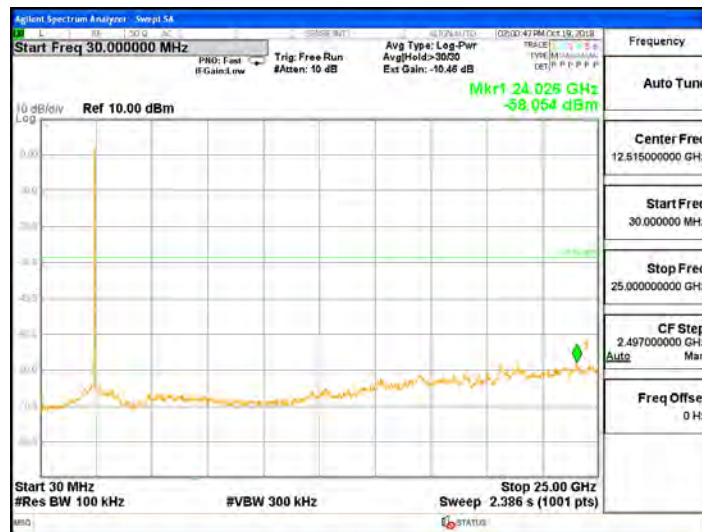
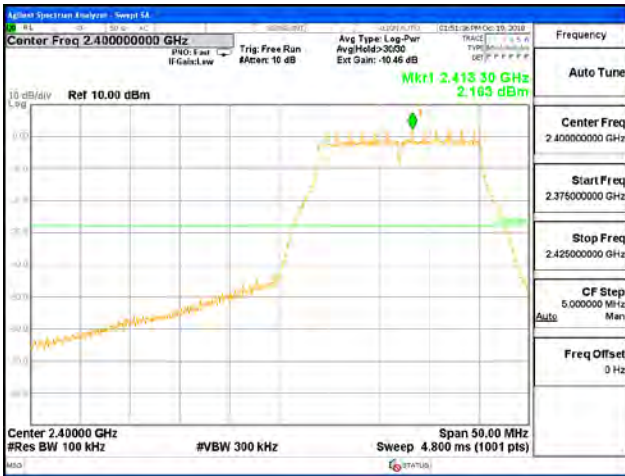


802.11g_ANT2



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Report No.:
 CTK-2018-03452
 Page (53) / (76)Pages

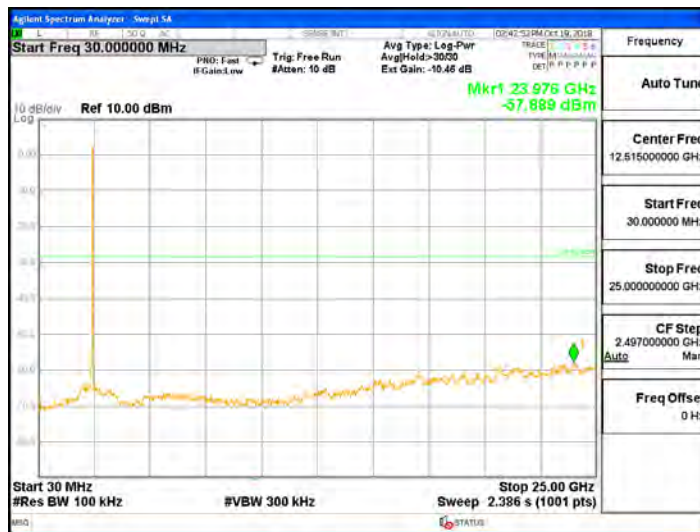


802.11g_ANT3



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Report No.:
 CTK-2018-03452
 Page (54) / (76)Pages

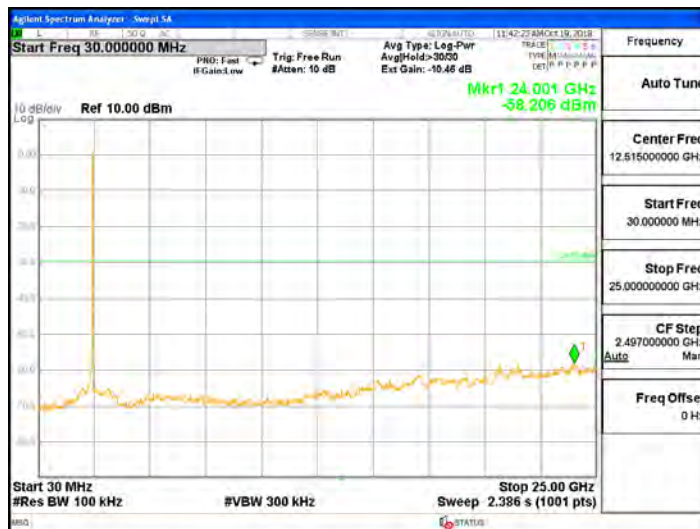
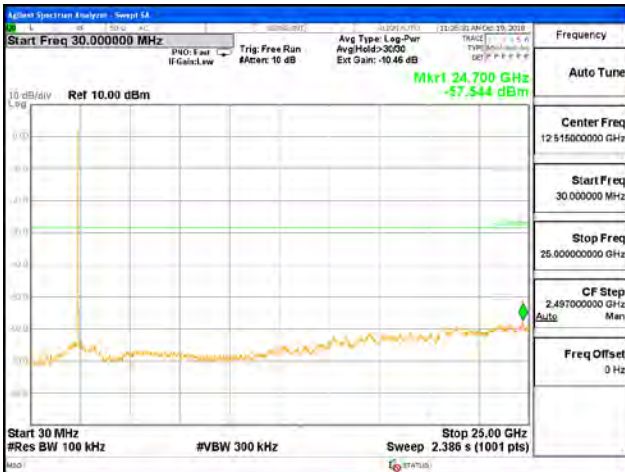
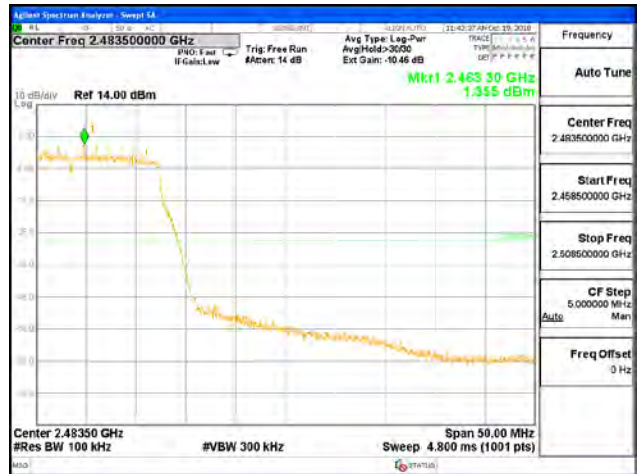


802.11g_ANT4



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Report No.:
 CTK-2018-03452
 Page (55) / (76)Pages

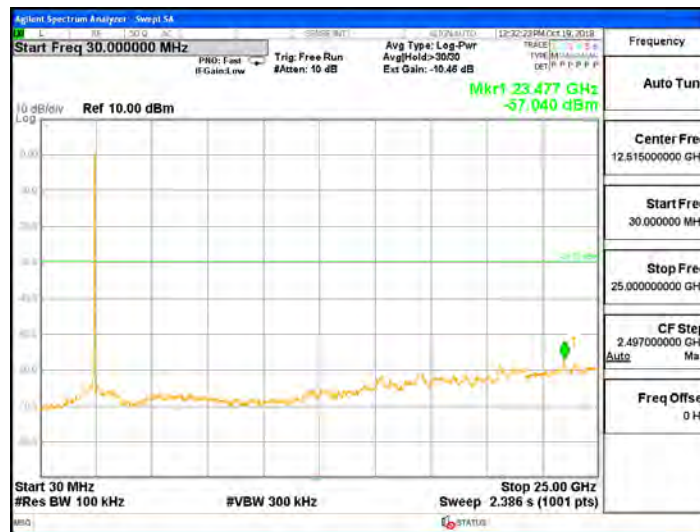
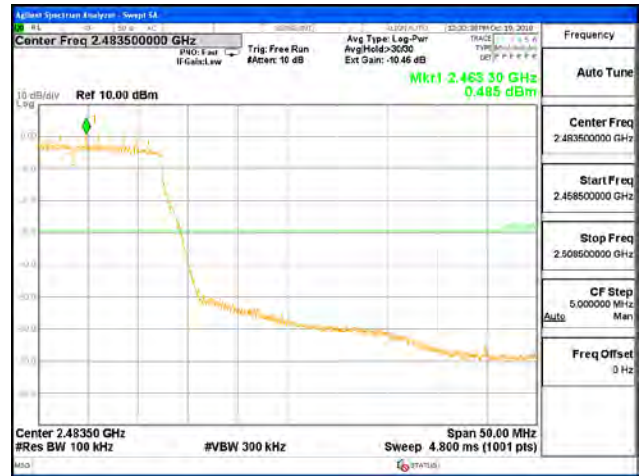
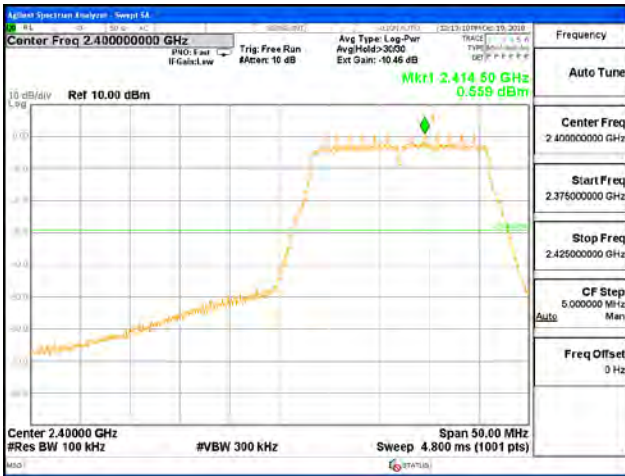


802.11n_HT20_ANT1



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Report No.:
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 Page (56) / (76)Pages

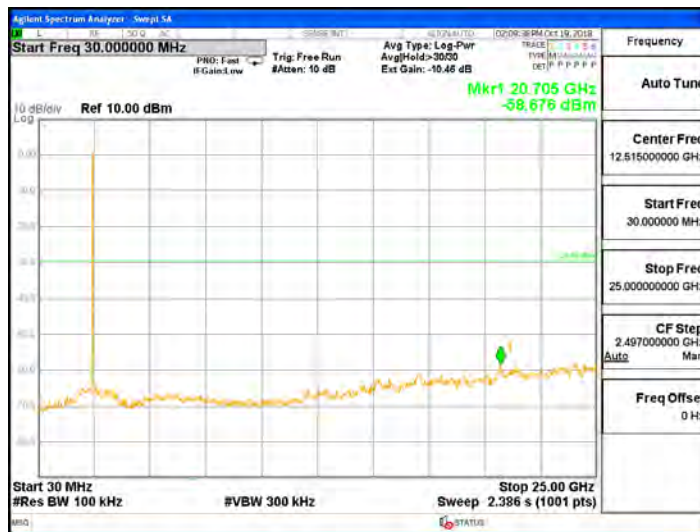
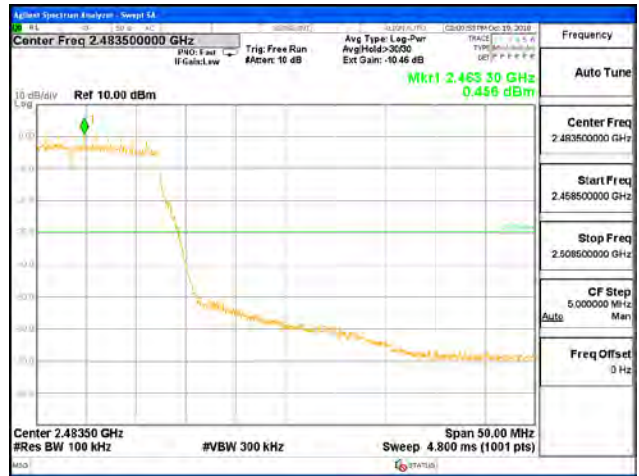
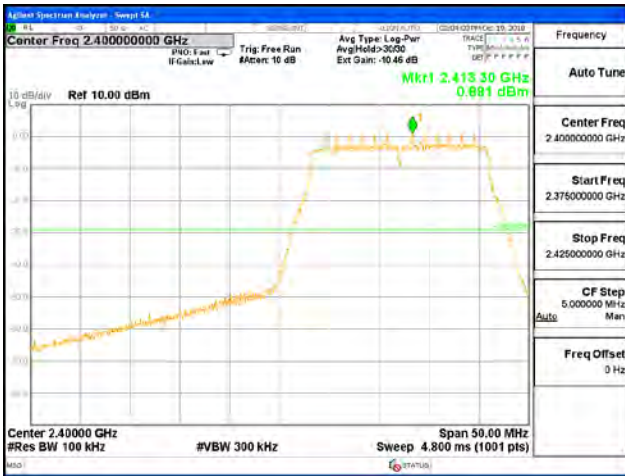


802.11n_HT20_ANT2



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Report No.:
 CTK-2018-03452
 Page (57) / (76)Pages

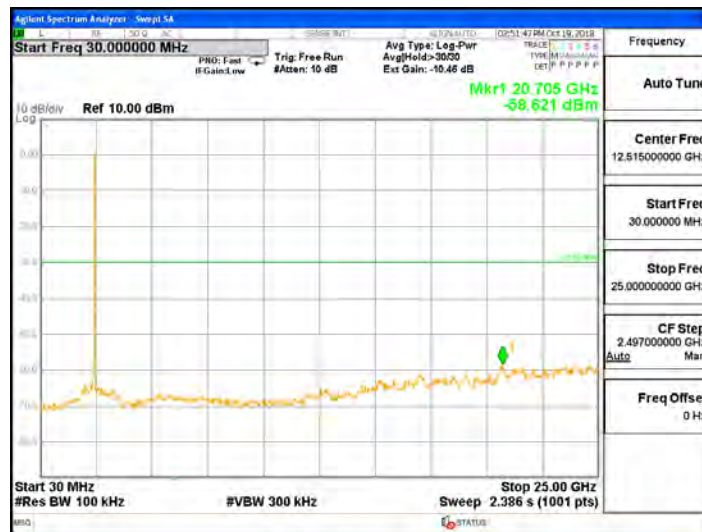
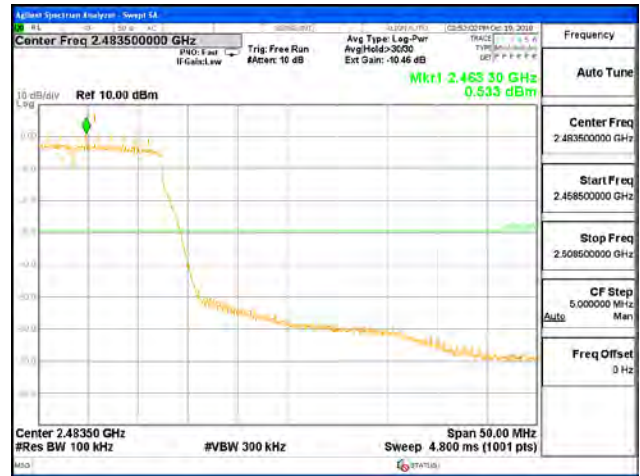


802.11n_HT20_ANT3



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Report No.:
CTK-2018-03452
Page (58) / (76)Pages

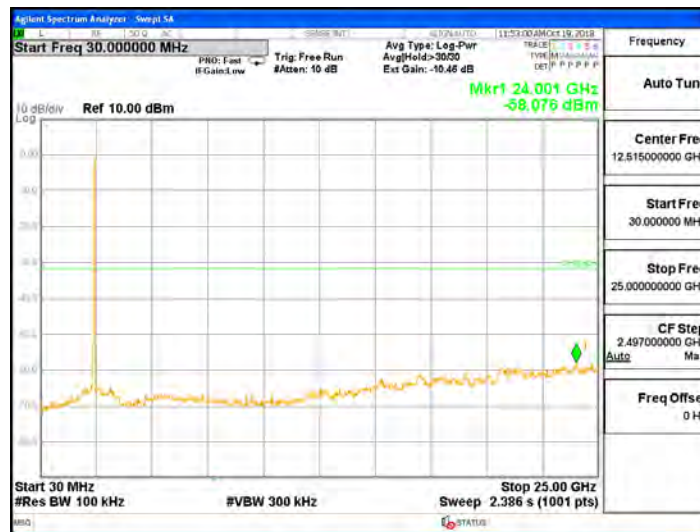
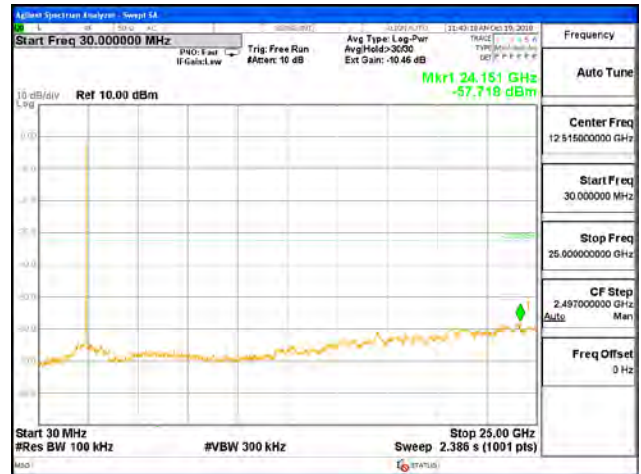
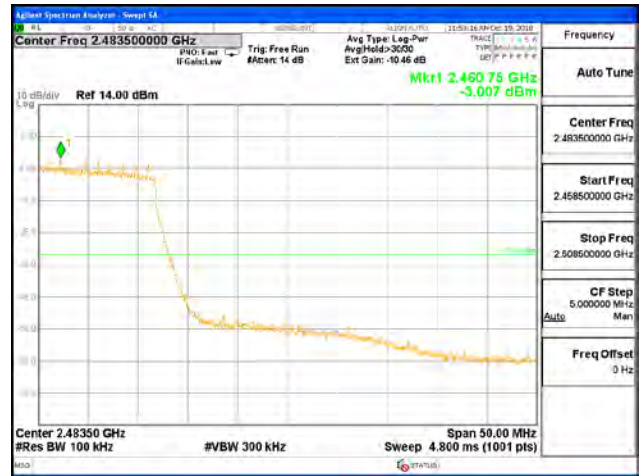
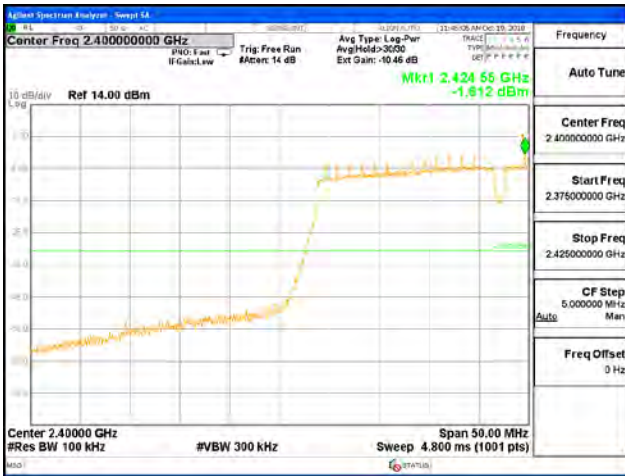


802.11n_HT20_ANT4



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Report No.:
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 Page (59) / (76)Pages

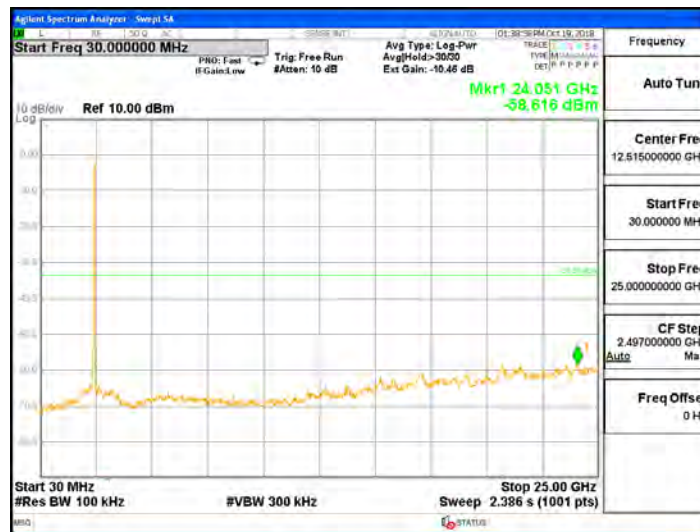
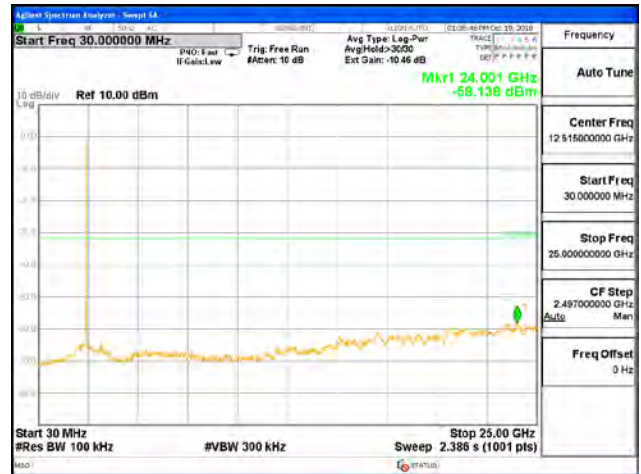
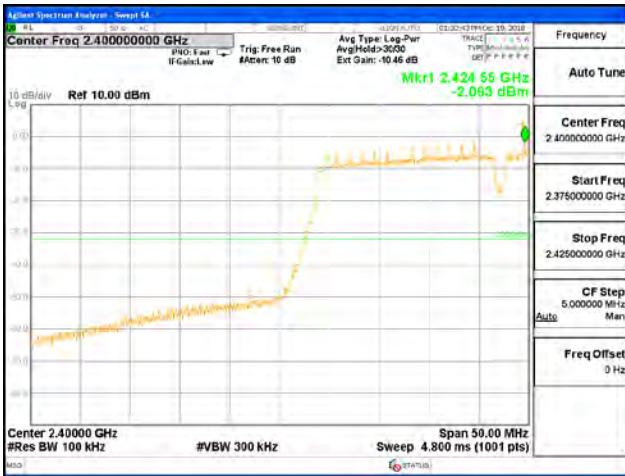


802.11n_HT40_ANT1



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Report No.:
CTK-2018-03452
Page (60) / (76)Pages

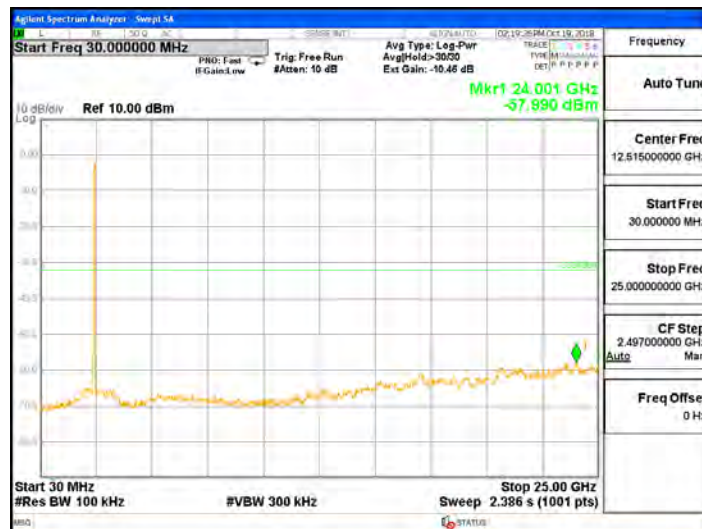
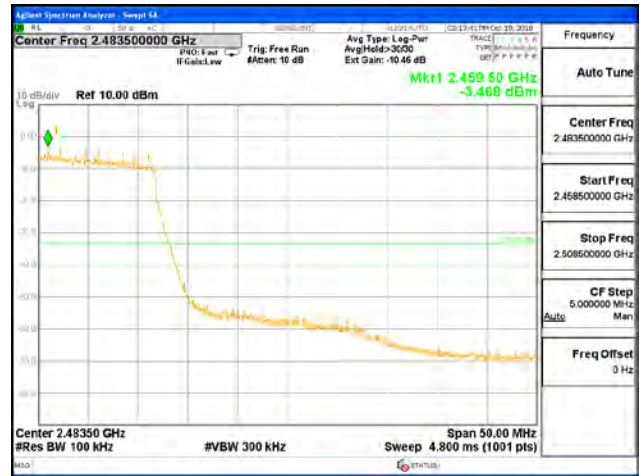
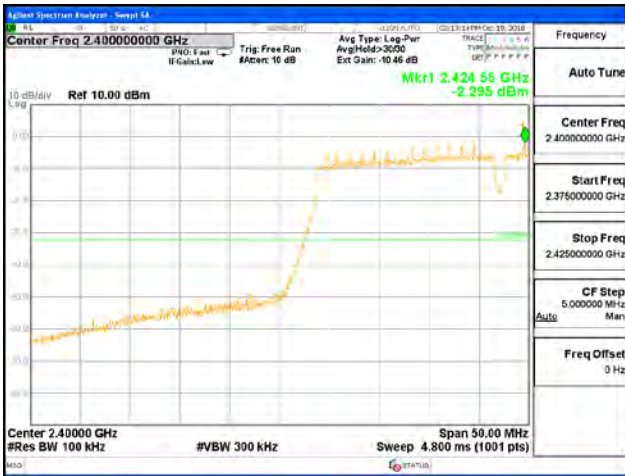


802.11n_HT40_ANT2



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Report No.:
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 Page (61) / (76)Pages

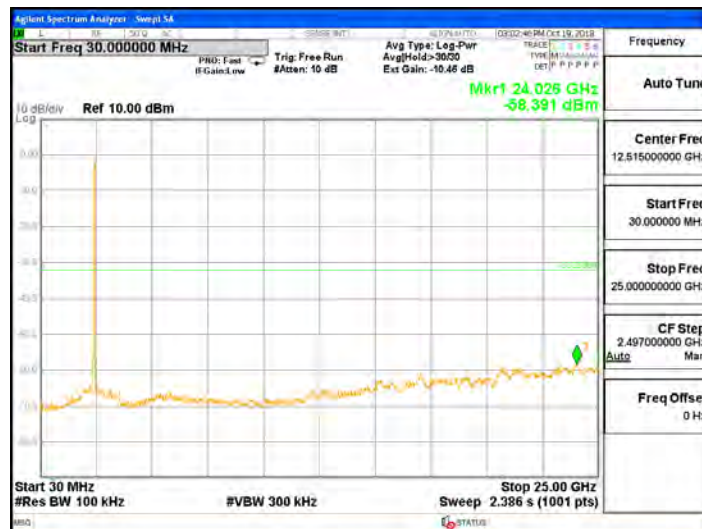
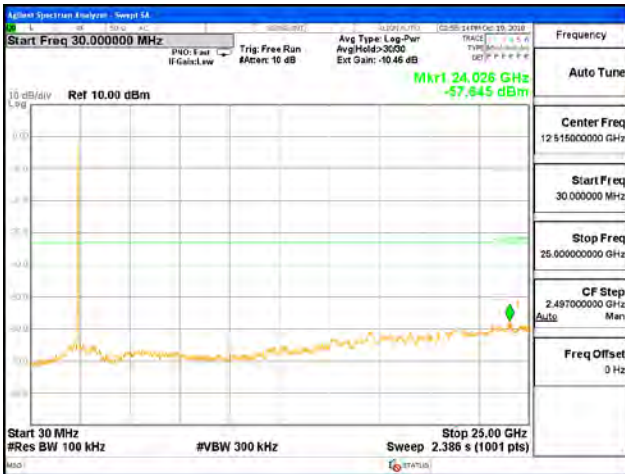
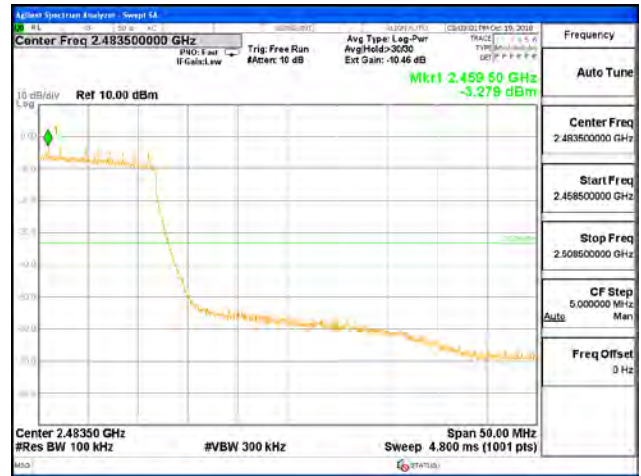


802.11n_HT40_ANT3



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Report No.:
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 Page (62) / (76)Pages



802.11n_HT40_ANT4



4.5 Radiated Emission

Test Location

- 10 m SAC (test distance : 10 m, 3 m)
 3 m SAC (test distance : 3 m)

Test Procedures

KDB 558074 - Section 8.5, 8.6
ANSI C63.10-2013 - Section 11.11, 11.12

- 1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency range above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

Test Settings:

Frequency Range = 9 kHz ~ 1 GHz

- a) RBW = 100 kHz for $f < 1$ GHz, 9 kHz for $f < 30$ MHz
b) VBW \geq RBW
c) Detector = CISPR Quasi-peak
d) Sweep time = auto couple

- Peak

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10th harmonic)

- a) RBW = 1 MHz
b) VBW $\geq 3 \times$ RBW
c) Detector = Peak
d) Sweep time = auto
e) Trace mode = max hold

- Average (duty cycle $\geq 98\%$)

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10th harmonic)

- a) RBW = 1 MHz
b) VBW $\geq 3 \times$ RBW
c) Detector = RMS
d) Sweep time = auto
e) Averaging type = power (i.e., RMS)
f) Trace mode = average (at least 100 traces)



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Report No.:
 CTK-2018-03452
 Page (64) / (76)Pages

- Average (duty cycle < 98%, duty cycle variations are less than ±2%)

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10th harmonic)

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

d) Sweep time = auto

f) Trace mode = average (at least 100 traces)

c) Detector = RMS

e) Averaging type = power (i.e., RMS)

A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 % duty cycle.

If power averaging (RMS) mode, then the applicable correction factor is $10 \log(1/x)$, where x is the duty cycle.

Test mode	Duty Cycle Factor (dB)
802.11b	0.00
802.11g	0.28
802.11n_HT20	0.30
802.11n_HT40	0.60

Limit :

FCC Part 15 § 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	MHz	GHz
0.09-0.11	8.37626-8.38675	73-74.6	399.9-410	2690-2900	10.6-12.7
¹ 0.495-0.505	8.41425-8.41475	74.8-75.2	608-614	3260-3267	13.25-13.4
2.1735-2.1905	12.29-12.293	108-121.94	960-1240	3332-3339	14.47-14.5
4.125-4.128	12.51975-12.52025	123-138	1300-1427	3345.8-3358	15.35-16.2
4.17725-4.17775	12.57675-12.57725	149.9-150.05	1435-1626.5	3600-4400	17.7-21.4
4.20725-4.20775	13.36-13.41	156.52475-156.52525	1645.5-1646.5	4500-5150	22.01-23.12
6.215-6.218	16.42-16.423	156.7-156.9	1660-1710	5350-5460	23.6-24
6.26775-6.26825	16.69475-16.69525	162.0125-167.17	1718.8-1722.2	7250-7750	31.2-31.8
6.31175-6.31225	16.80425-16.80475	167.72-173.2	2200-2300	8025-8500	36.43-36.5
8.291-8.294	25.5-25.67	240-285	2310-2390	9000-9200	² Above 38.6
8.362-8.366	37.5-38.25	322-335.4	2483.5-2500	9300-9500	

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



FCC Part 15 § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m	Deasurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	-	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

- 1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
- 2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

We have done all test mode.

The worst-case antenna configuration and Test mode are determined to be as follows.

802.11b mode : ANT1 + ANT2 + ANT3 + ANT4 (MIMO)

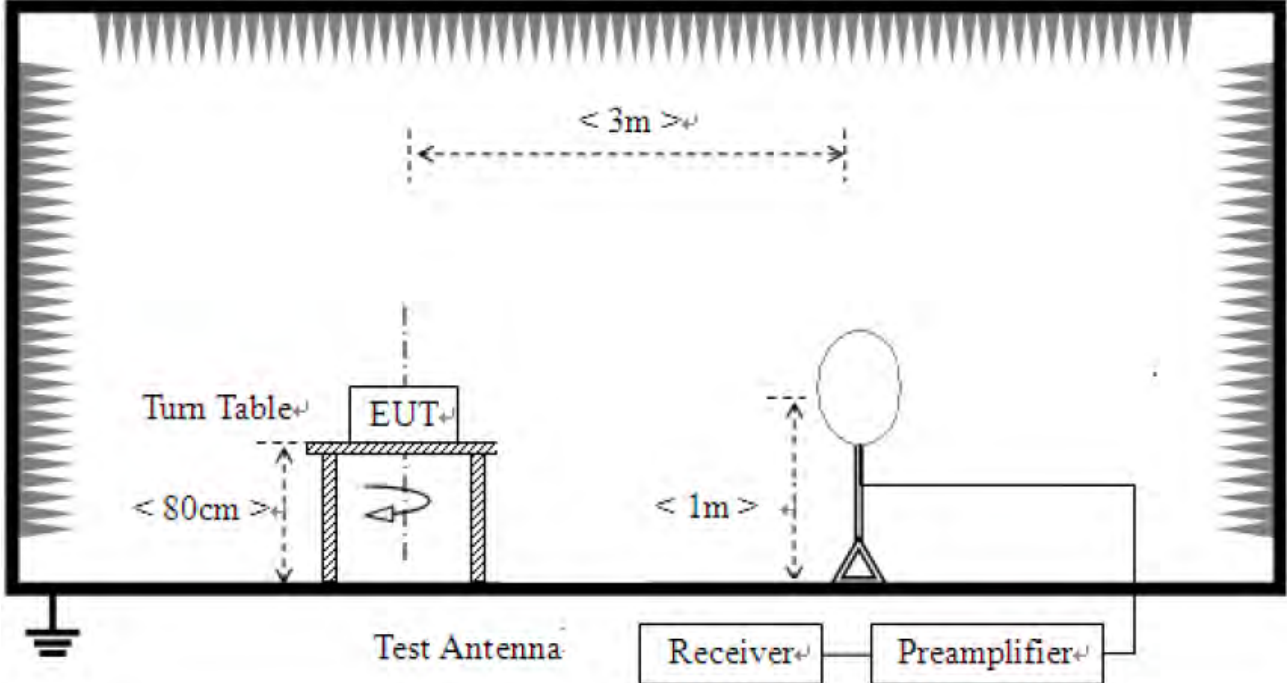
802.11g mode : ANT1 + ANT2 + ANT3 + ANT4 (MIMO)

802.11n mode : ANT1 + ANT2 + ANT3 + ANT4 (MIMO)

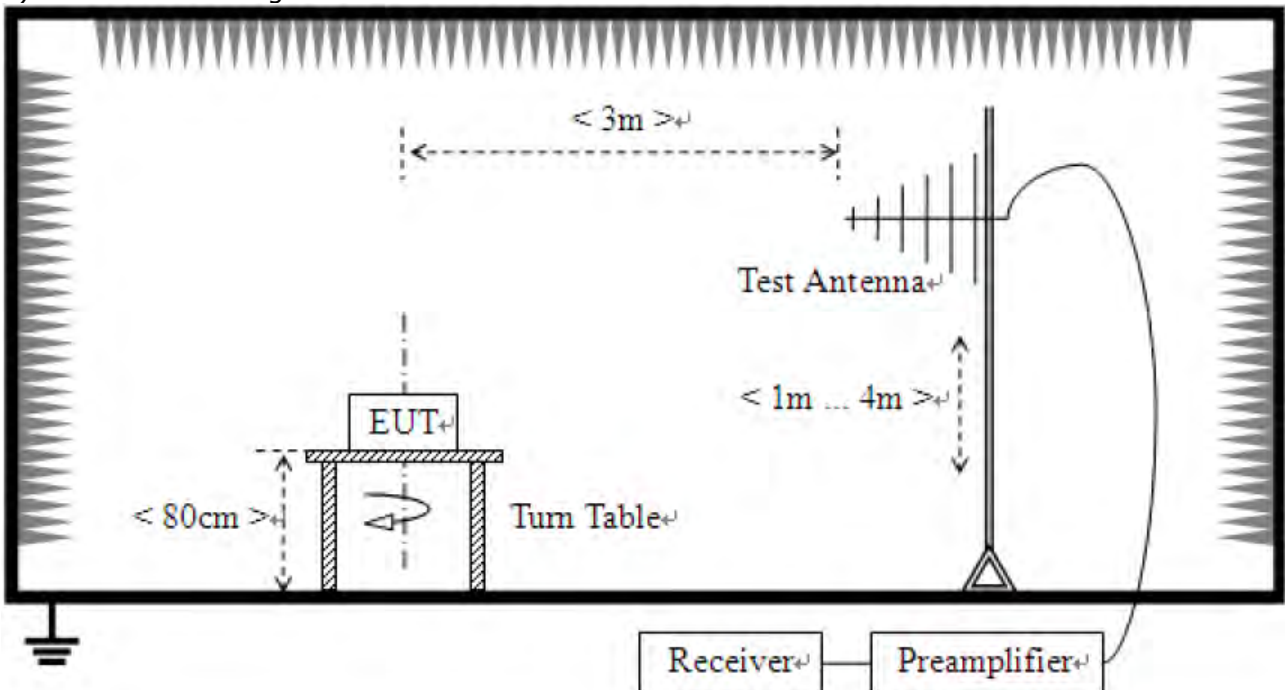
So the results are only attached worst cases.

Test Setup:

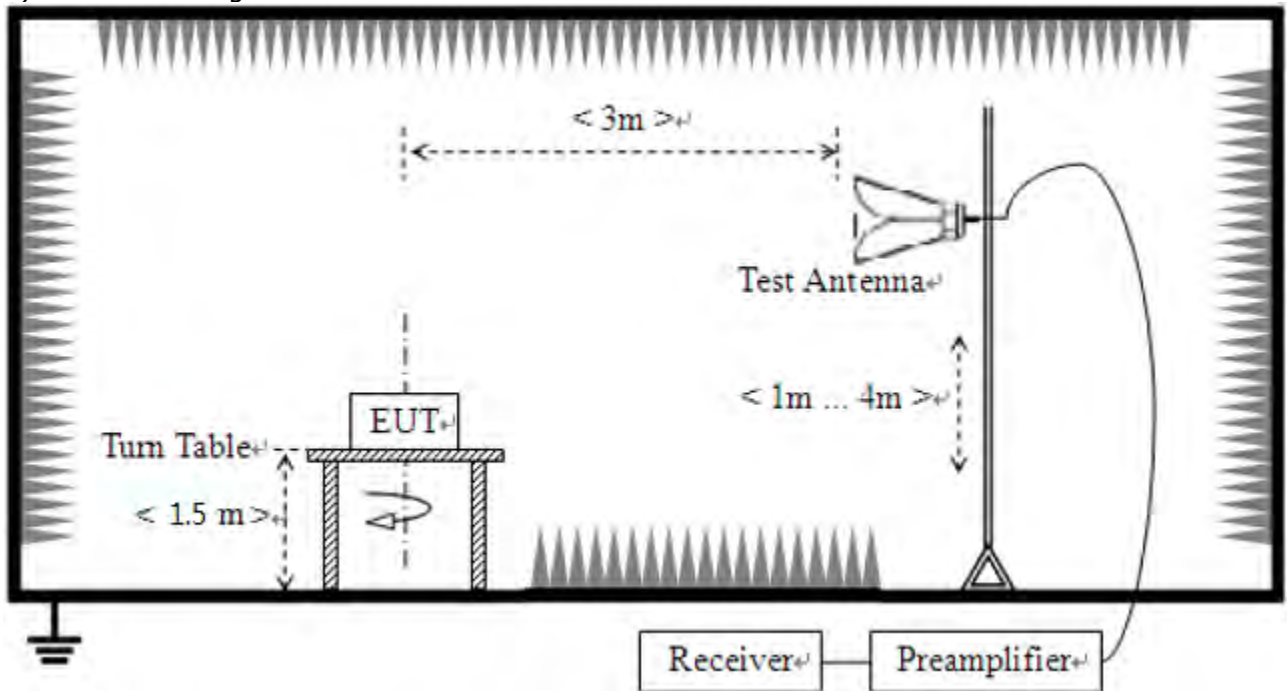
- 1) For field strength of emissions from 9 kHz to 30 MHz



- 2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



Test results

1) 9 kHz to 30 MHz

Test mode : Transmitter, Receiver, 802.11b, 802.11g, 802.11n (Worst case)

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	See note

Note :

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

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)

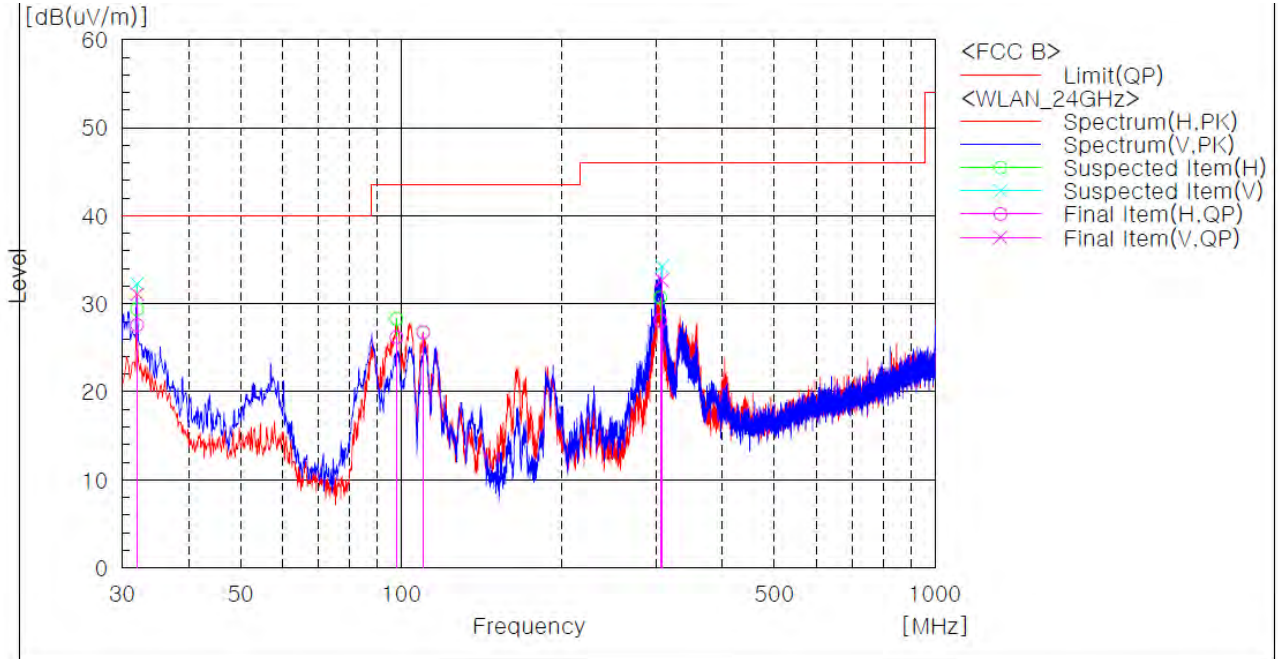
2) 30 MHz to 1 GHz

Test mode : Transmitter, 802.11b(Worst Case)

The requirements are:

Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	31.960	V	46.2	-15.1	31.1	40.0	8.9	99.8	253.7	
2	31.960	H	42.7	-15.1	27.6	40.0	12.4	99.8	9.1	
3	97.933	H	40.4	-14.2	26.2	43.5	17.3	99.8	118.8	
4	109.909	H	41.4	-14.6	26.8	43.5	16.7	99.8	262.6	
5	305.762	H	40.0	-11.9	28.1	46.0	17.9	99.8	76.1	
6	307.504	V	44.6	-11.9	32.7	46.0	13.3	99.8	253.7	

Remark :

1. The EUT was tested in three orientations in order to determine that "Y axis" was the worst case.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna loss + Cable loss + 6 dB attenuator - Amp Gain



3) above 1 GHz

Test mode : Transmitter, 802.11b

The requirements are:

Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
4 824.13	H	54.00	74.00	35.50	43.60	18.50	30.40
4 824.12	V	54.00	74.00	43.10	48.20	10.90	25.80
9 648.18	V	54.00	74.00	49.70	53.60	4.30	20.40
2 390.00	H	54.00	74.00	34.70	45.00	19.30	29.00
2 389.95	V	54.00	74.00	43.00	52.80	11.00	21.20

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
4 874.10	H	54.00	74.00	32.50	43.30	21.50	30.70
4 874.12	V	54.00	74.00	41.10	45.30	12.90	28.70
9 748.21	H	54.00	74.00	38.20	50.00	15.80	24.00
9 748.21	V	54.00	74.00	48.20	53.80	5.80	20.20

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
4 924.02	H	54.00	74.00	32.70	41.60	21.30	32.40
4 924.11	V	54.00	74.00	39.80	44.70	14.20	29.30
9 848.23	H	54.00	74.00	37.20	48.40	16.80	25.60
9 848.21	V	54.00	74.00	42.30	48.50	11.70	25.50
2 487.87	H	54.00	74.00	34.20	45.00	19.80	29.00
2 483.64	V	54.00	74.00	42.30	53.10	11.70	20.90

Remarks

1. The EUT was tested in three orientations in order to determine that "Y axis" was the worst case.



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Report No.:
CTK-2018-03452
Page (70) / (76)Pages

Test mode : Transmitter, 802.11g

The requirements are:

Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
2 339.13	H	54.00	74.00	37.18	48.20	16.82	25.80
2 390.00	V	54.00	74.00	48.48	71.40	5.52	2.60

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
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No emissions were detected at a level greater than 20dB below limit.

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
2 483.50	H	54.00	74.00	36.98	48.00	17.02	26.00
2 483.51	V	54.00	74.00	45.88	66.50	8.12	7.50

Remarks

1. The EUT was tested in three orientations in order to determine that "Y axis" was the worst case.



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Report No.:
CTK-2018-03452
Page (71) / (76)Pages

Test mode : Transmitter, 802.11n_HT20

The requirements are:

Complies

Test Data

Low(2 412 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
2 342.49	H	54.00	74.00	37.30	49.10	16.70	24.90
2 389.43	V	54.00	74.00	48.40	66.20	5.60	7.80

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
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No emissions were detected at a level greater than 20dB below limit.

High(2 462 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
2 484.56	H	54.00	74.00	37.00	48.00	17.00	26.00
2 483.50	V	54.00	74.00	50.80	68.40	3.20	5.60

Remarks

1. The EUT was tested in three orientations in order to determine that "Y axis" was the worst case.



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Report No.:
CTK-2018-03452
Page (72) / (76)Pages

Test mode : Transmitter, 802.11n_HT40

The requirements are:

Complies

Test Data

Low(2 422 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
2 339.21	H	54.00	74.00	37.30	48.20	16.70	25.80
2 389.95	V	54.00	74.00	51.10	70.00	2.90	4.00

Mid(2 437 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
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No emissions were detected at a level greater than 20dB below limit.

High(2 452 MHz)

Frequency [MHz]	(P)	Limit AV [dBuV/m]	Limit PK [dBuV/m]	Result AV [dBuV/m]	Result PK [dBuV/m]	Margin AV [dB]	Margin PK [dB]
2 487.70	H	54.00	74.00	37.60	48.80	16.40	25.20
2 483.50	V	54.00	74.00	51.80	71.20	2.20	2.80

Remarks

1. The EUT was tested in three orientations in order to determine that "Y axis" was the worst case.



4.6 AC Power Line Conducted Emissions

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits.

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average**
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* The level decreases linearly with the logarithm of the frequency.

** A linear average detector is required.

Test Results

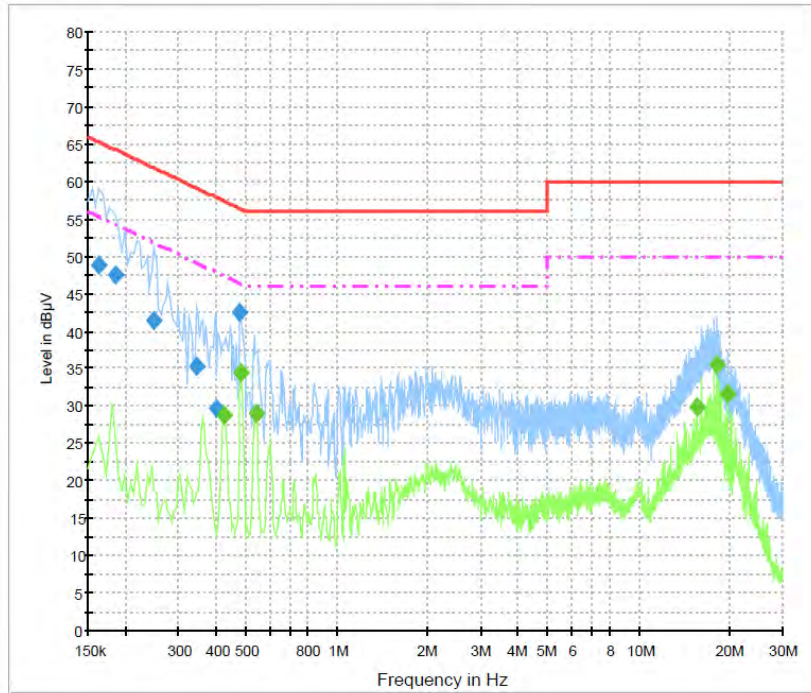
The requirements are:

Complies

Test Data

[LINE]

Class B_L1



Final Result 1

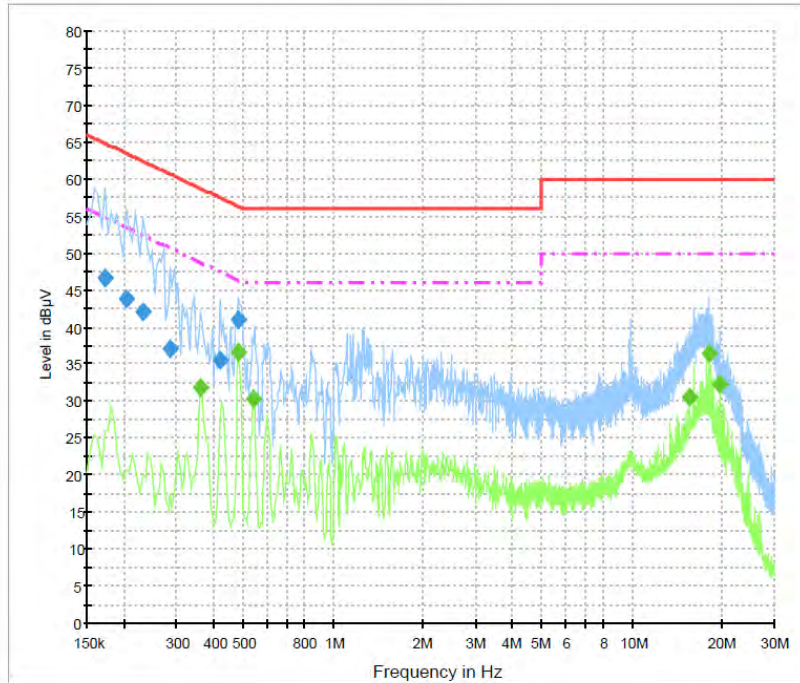
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	48.9	1000.0	9.000	On	L1	9.8	16.4	65.3
0.186000	47.6	1000.0	9.000	On	L1	9.9	16.6	64.2
0.249000	41.5	1000.0	9.000	On	L1	9.7	20.3	61.8
0.343500	35.3	1000.0	9.000	On	L1	9.9	23.8	59.1
0.397500	29.7	1000.0	9.000	On	L1	9.9	28.2	57.9
0.478500	42.5	1000.0	9.000	On	L1	9.9	13.9	56.4

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.424500	28.8	1000.0	9.000	On	L1	9.9	18.6	47.4
0.483000	34.5	1000.0	9.000	On	L1	9.9	11.8	46.3
0.541500	29.0	1000.0	9.000	On	L1	9.9	17.0	46.0
15.616500	29.8	1000.0	9.000	On	L1	10.0	20.2	50.0
18.244500	35.4	1000.0	9.000	On	L1	10.0	14.6	50.0
19.707000	31.6	1000.0	9.000	On	L1	10.0	18.4	50.0

[NEUTRAL]

Class B_N



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.172500	46.7	1000.0	9.000	On	N	9.8	18.1	64.8
0.204000	43.7	1000.0	9.000	On	N	9.9	19.7	63.4
0.231000	42.0	1000.0	9.000	On	N	9.7	20.4	62.4
0.285000	37.1	1000.0	9.000	On	N	9.7	23.6	60.7
0.420000	35.4	1000.0	9.000	On	N	9.9	22.0	57.4
0.483000	40.9	1000.0	9.000	On	N	9.9	15.4	56.3

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.361500	31.9	1000.0	9.000	On	N	9.9	16.8	48.7
0.483000	36.6	1000.0	9.000	On	N	9.9	9.6	46.3
0.541500	30.2	1000.0	9.000	On	N	9.9	15.8	46.0
15.616500	30.5	1000.0	9.000	On	N	10.0	19.5	50.0
18.244500	36.4	1000.0	9.000	On	N	10.0	13.6	50.0
19.707000	32.3	1000.0	9.000	On	N	10.0	17.7	50.0



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Report No.:
CTK-2018-03452
Page (76) / (76)Pages

APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2018-10-25	2019-10-25
2	Signal Generator	Rohde & Schwarz	SMB100A	175528	2018-10-24	2019-10-24
3	EMI Test Receiver	Rohde & Schwarz	ESCI3	100032	2018-01-31	2019-01-31
4	Bilog Antenna	Schaffner	CBL6111C	2551	2018-05-10	2020-05-10
5	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2018-05-02	2020-05-02
6	6dB Attenuator	R&S	DNF	272.4110.50-2	2018-10-25	2019-10-25
7	AMPLIFIER	SONOMA	310	291721	2018-02-02	2019-02-02
8	EMI Test Receiver	Rohde & Schwarz	ESU40	100336	2018-02-01	2019-02-01
9	Preamplifier	Agilent	8449B	3008A02011	2017-11-30	2018-11-30
10	Horn Antenna	ETS-Lindgren	3116	00062504	2017-12-04	2019-12-04
11	Horn Antenna	ETS-Lindgren	3117	00154525	2017-09-14	2019-09-14
12	Band Reject Filter	Micro Tronics	BRM50702	G233	2018-01-26	2019-01-26
13	LISN	Rohde & Schwarz	ENV216	101760	2018-01-31	2019-01-31
14	Singnal Canditioning Unit	R&S	SCU-40	10023	2018-10-24	2019-10-24