

FCC AND IC CERTIFICATION TEST REPORT

FOR

Applicant	:	Harman International Industries, Incorporated
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	Streaming wireless adaptor
Model No.	:	ADAPT+
Trade Mark	:	Harman Kardon
FCC ID	:	APIHKADAPTP
IC	:	6132A-HKADAPTP
Manufacturer	:	Harman International Industries, Incorporated
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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REPORT

TABLE OF CONTENTS

	Test report declares.....	4
1.	Summary of test results.....	5
2.	General test information	6
2.1.	Description of EUT	6
2.2.	Accessories of EUT	6
2.3.	Assistant equipment used for test	6
2.4.	Block diagram of EUT configuration for test	7
2.5.	Deviations of test standard.....	7
2.6.	Test environment conditions.....	7
2.7.	Test laboratory	8
2.8.	Measurement uncertainty.....	8
3.	Equipment used during test	9
4.	6dB Bandwidth and 99% Bandwidth	10
4.1.	Block diagram of test setup	10
4.2.	Limits	10
4.3.	Test Procedure	10
4.4.	Test Result	11
4.5.	Original test data.....	11
5.	Conducted Average Output Power	20
5.1.	Block diagram of test setup	20
5.2.	Limits	20
5.3.	Test Procedure	20
5.4.	Test Result	20
6.	Power Spectral Density.....	21
6.1.	Block diagram of test setup	21
6.2.	Limits	21
6.3.	Test Procedure	21
6.4.	Test Result	21
6.5.	Original test data.....	22
6.6.	Band Edge and Spurious Emissions (Conducted)	30
6.7.	Block diagram of test setup	30
6.8.	Limits	30
6.9.	Test Procedure	30
6.10.	Test Result	31
6.11.	Original test data.....	31
7.	Radiated Spurious Emissions	59

7.1.	Block diagram of test setup	59
7.2.	Limit	60
7.3.	Test Procedure	61
7.4.	Test result	62
8.	Radiated Band Edge Compliance	66
8.1.	Block diagram of test setup	66
8.2.	Limit	66
8.3.	Test Procedure	66
8.4.	Test result	66
9.	Power Line Conducted Emission.....	83
9.1.	Block diagram of test setup	83
9.2.	Power Line Conducted Emission Limits(Class B)	83
9.3.	Test Procedure	83
9.4.	Test Result	84
10.	Antenna Requirements.....	87
10.1.	Limit	87
10.2.	Result	87

TEST REPORT DECLARE

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Model No	:	ADAPT+
Trade Mark	:	Harman Kardon
Manufacturer	:	Harman International Industries, Incorporated
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 2 February 2017.

Test procedure used: ANSI C63.10:2013, RSS-Gen Issue 4, Nov. 2014, KDB558074 D01 DTS Meas Guidance V03r02

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&IC standards.

Report No:	DDT-R17Q0626-5E4		
Date of Receipt:	Jun. 26, 2017	Date of Test:	Jun. 26, 2017 ~ Aug. 28, 2017

Prepared By:


Damon Hu/Engineer

Approved By:

Kevin Peng/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

1. Summary of test results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	Standard	Results
6dB Bandwidth and 99% Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a)	PASS
Conducted Output Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (e)	PASS
Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	PASS
Band-edge and Spurious Emissions (Conducted)	FCC 15.247 (d) RSS-247 Clause 5.5	PASS
Radiated Spurious Emissions	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	PASS
Radiated Band Edge Compliance	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	PASS
Power Line Conducted Emission	FCC 15.207 RSS-GEN Clause 8.8	PASS
Antenna requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS

2. General test information

2.1. Description of EUT

EUT* Name	: Streaming wireless adaptor
Model Number	: ADAPT+
EUT function description	: Please reference user manual of this device
Power supply	: DC 5V from external AC ADAPTER
Radio Technology	: IEEE802.11b/g/n
FCC Operation frequency	: IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40:2422MHz—2452MHz
Modulation	: IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Transmitter rate	: IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: up to 150 Mbps, HT40: up to 300Mbps
Antenna Type	: Integrated antenna 1: 2.4G band maximum PK gain 2.60dBi Integrated antenna 2: 2.4G band maximum PK gain 4.20dBi
Sample Type	: Series production

Note: EUT is the ab.of equipment under test.

Channle information							
CH	Frequency	CH	Frequency	CH	Frequency	CH	Frequency
1	2412	5	2432	9	2452	/	/
2	2417	6	2437	10	2457	/	/
3	2422	7	2442	11	2462	/	/
4	2427	8	2447	/	/	/	/

2.2. Accessories of EUT

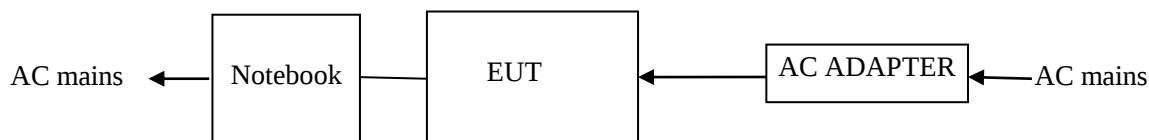
Description of Accessories	Manufacturer	Model number	Serial No.	Other
USB cable	Harman	N/A	N/A	Length: 1.5m
Audio cable	Harman	N/A	N/A	Length: 0.8m
AC Adapter	Group Intellect Power Technology Limited	F5V-2.3C-1U	N/A	Input: AC 100-240V -50/60Hz, 0.5A; Output: DC 5V, 2.3A

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	SN:
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Notebook	DELL	Latitude D610	FCC DOC	00045-534-136-300
Network Cable	N/A	N/A	N/A	Length: 1.5m

2.4. Block diagram of EUT configuration for test



EUT was connected to control to provided by manufacturer which has a standard LAN PORT connector to connect to Notebook, and the Notebook will run a special test software “The super terminal” provided by manufacturer to control EUT work in Continuous TX mode (>98% duty cycle), and select test channel, wireless mode and data rate.

Tested mode, channel, and data rate information				
Mode	Setting Tx Power	data rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11b	56	11	LCH :CH1	2412
	56	11	MCH: CH6	2437
	56	11	HCH: CH11	2462
IEEE 802.11g	56	54	LCH :CH1	2412
	56	54	MCH: CH6	2437
	56	54	HCH: CH11	2462
IEEE 802.11n HT20	56	MCS 7	LCH :CH1	2412
	56	MCS 7	MCH: CH6	2437
	56	MCS 7	HCH: CH11	2462
IEEE 802.11n HT40	56	MCS 7	LCH :CH3	2422
	56	MCS 7	MCH: CH6	2437
	54	MCS 7	HCH: CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.				

2.5. Deviations of test standard

No Deviation

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25℃
Humidity range:	40-75%
Pressure range:	86-106kPa

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-89201699 <http://www.dgddt.com>

CNAS Accreditation No. L6451; A2LA Accreditation No. 3870.01

Designation Number: CN1182; Test Firm Registration Number: 540522

Industry Canada site registration number: 10288A-1

2.8. Measurement uncertainty

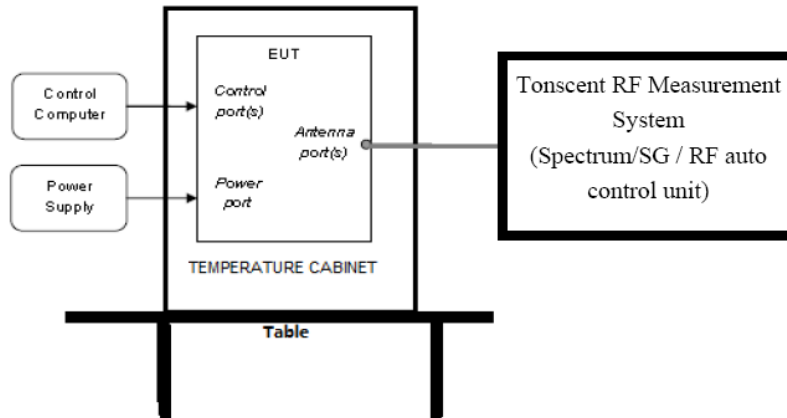
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power(Conducted)(Spectrum analyzer)	0.86dB(10 MHz $\leq$ f < 3.6GHz);
	1.38dB(3.6GHz $\leq$ f < 8GHz)
Peak Output Power(Conducted)(Power Sensor)	0.74dB
Power Spectral Density	0.74dB(10 MHz $\leq$ f < 3.6GHz);
	1.38dB(3.6GHz $\leq$ f < 8GHz)
Frequencies Stability	6.7 x 10 ⁻⁸ (Antenna couple method)
	5.5 x 10 ⁻⁸ (Conducted method)
Conducted spurious emissions	0.86dB(10 MHz $\leq$ f < 3.6GHz);
	1.40dB(3.6GHz $\leq$ f < 8GHz)
	1.66dB(8GHz $\leq$ f < 22GHz)
Uncertainty for radio frequency (RBW<20KHz)	3×10 ⁻⁸
Temperature	0.4°C
Humidity	2%
Uncertainty for Radiation Emission test (30MHz-1GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz-26GHz)	4.10dB(1-6GHz)
	4.40dB (6GHz-18Gz)
	3.54dB (18GHz-26Gz)
Uncertainty for Power line conduction emission test	3.32dB (150KHz-30MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment used during test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test					
Spectrum analyzer	R&S	FSU26	1166.1660.26	Oct. 16, 2016	1Year
Vector Signal Generator	Agilent	E8267D	MY52098743	Oct. 20, 2016	1Year
Vector Signal Generator	Agilent	N5182A	MY48180737	Jun. 16, 2017	1Year
Power Sensor	Agilent	U2021XA	MY55150010	Apr. 18, 2017	1Year
Power Sensor	Agilent	U2021XA	MY55150011	Apr. 19, 2017	1Year
DC Power Source	MATRIS	MPS-3005L-3	D813058W	Oct. 24, 2016	1Year
Attenuator	Mini-Circuits	BW-S10W2	101109	Aug. 18, 2017	1Year
RF Cable	Micable	C10-01-01-1	100309	Aug. 18, 2017	1Year
Test Software	JS Tonscend	JS1120-2	Ver.2.5	N/A	N/A
USB Data acquisition	Agilent	U2531A	TW55043503	N/A	N/A
Auto control Unit	JS Tonscend	JS0806-2	158060010	N/A	N/A
Radiated Emission Test					
EMI Test Receiver	R&S	ESU8	100316	Oct. 16, 2016	1Year
Spectrum analyzer	R&S	FSU26	1166.1660.26	Oct. 16, 2016	1Year
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	Oct. 27, 2016	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Oct. 16, 2016	1 Year
Broadband Horn antenna	Schwarzbeck	BBHA 9170	BBHA 9170 #790	Aug. 11, 2017	1 Year
Double Ridged Horn Antenna	R&S	HF907	100276	Oct. 12, 2016	1 Year
Pre-amplifier	A.H.	PAM-0118	360	Oct. 16, 2016	1 Year
RF Cable	HUBSER	CP-X2	W11.03	Oct. 16, 2016	1Year
RF Cable	HUBSER	CP-X1	W12.02	Oct. 16, 2016	1 Year
MI Cable	HUBSER	C10-01-01-1M	1091629	Oct. 16, 2016	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Power Line Conducted Emissions Test					
Test Receiver	R&S	ESU8	100316	Oct. 16, 2016	1 Year
LISN 1	R&S	ENV216	101109	Oct. 16, 2016	1 Year
LISN 2	R&S	ESH2-Z5	100309	Oct. 16, 2016	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Oct. 16, 2016	1 Year
CE Cable 1	HUBSER	ESU8/RF2	W10.01	Oct. 16, 2016	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A

4. 6dB Bandwidth and 99% Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 KHz

4.3. Test Procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

RBW:	100KHz
VBW:	300KHz
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

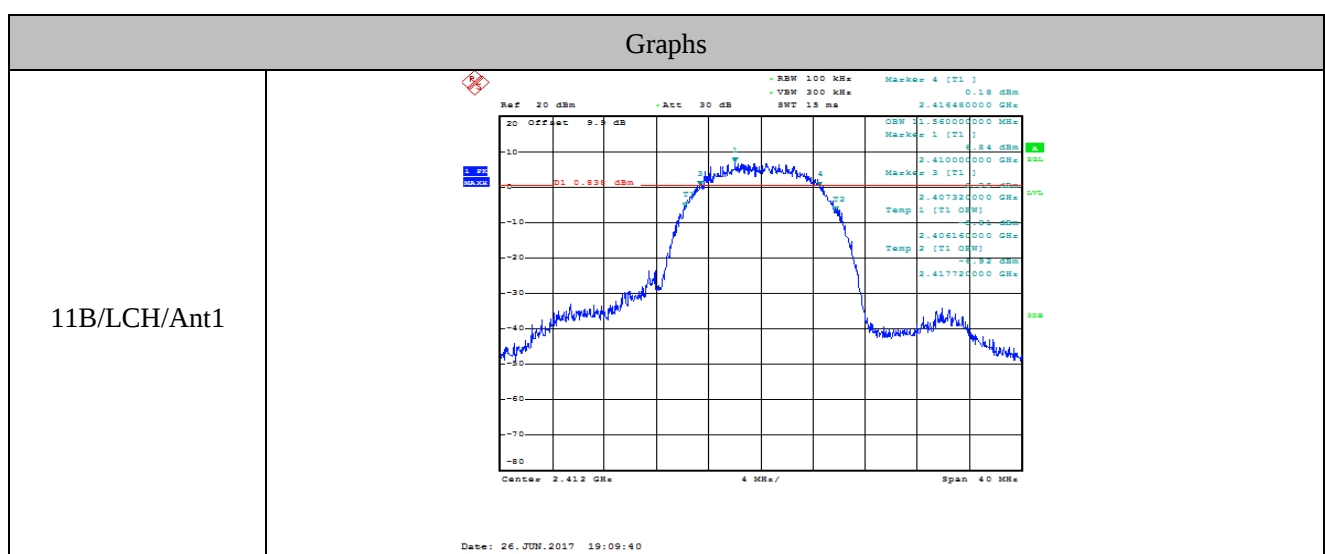
(3) Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

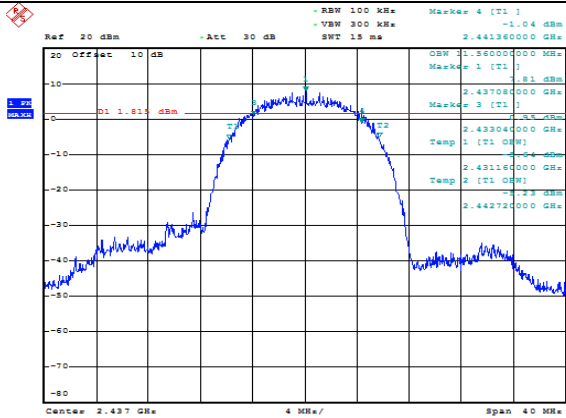
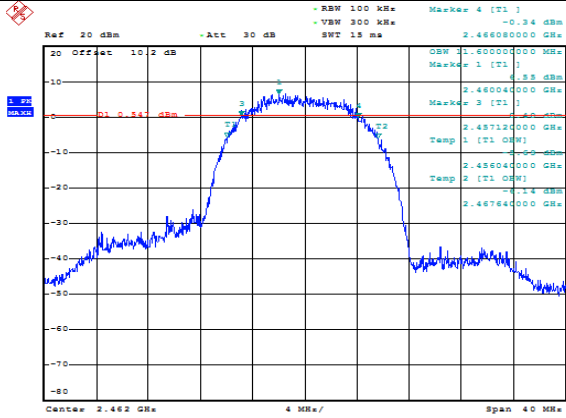
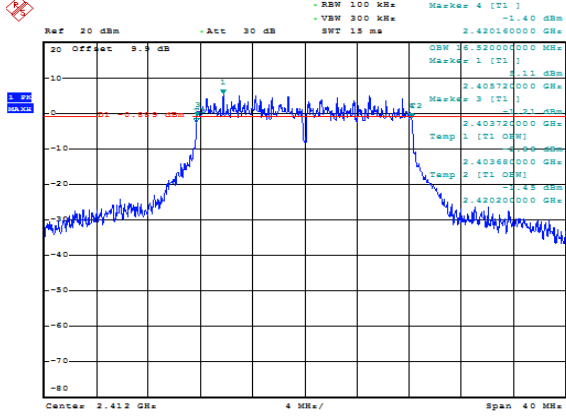
4.4. Test Result

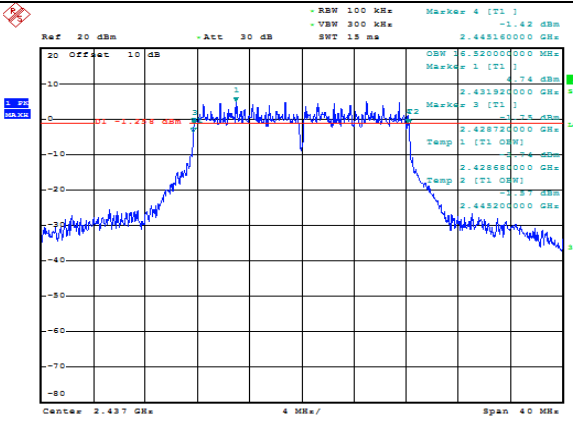
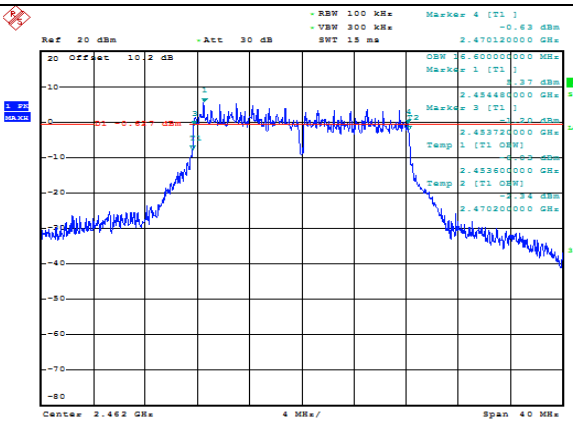
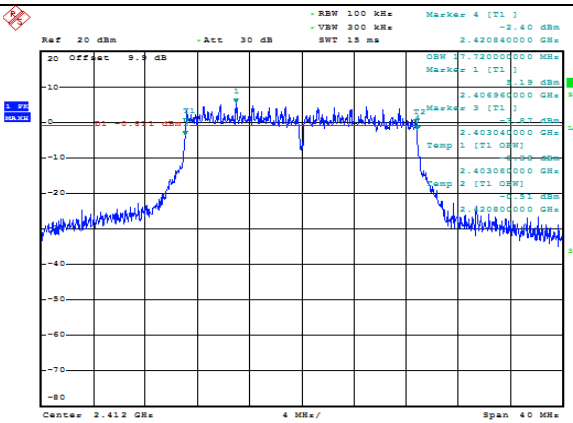
Mode	Channel	Ant	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict
11B	LCH	Ant1	9.160	11.560	PASS
11B	MCH	Ant1	8.320	11.560	PASS
11B	HCH	Ant1	8.960	11.600	PASS
11G	LCH	Ant1	16.440	16.520	PASS
11G	MCH	Ant1	16.440	16.520	PASS
11G	HCH	Ant1	16.400	16.600	PASS
11N20	LCH	Ant1	17.800	17.720	PASS
11N20	MCH	Ant1	17.800	17.720	PASS
11N20	HCH	Ant1	17.760	17.760	PASS
11N40	LCH	Ant1	36.560	36.320	PASS
11N40	MCH	Ant1	36.560	36.240	PASS
11N40	HCH	Ant1	36.160	36.320	PASS

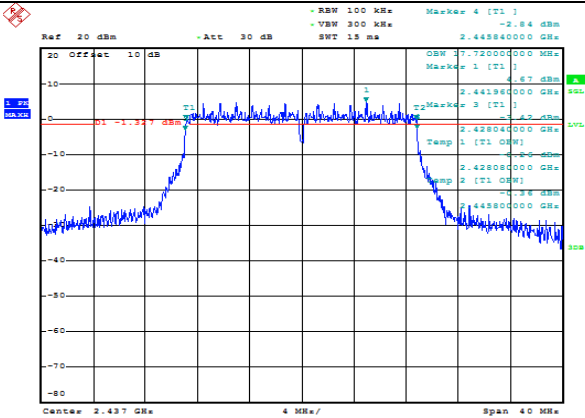
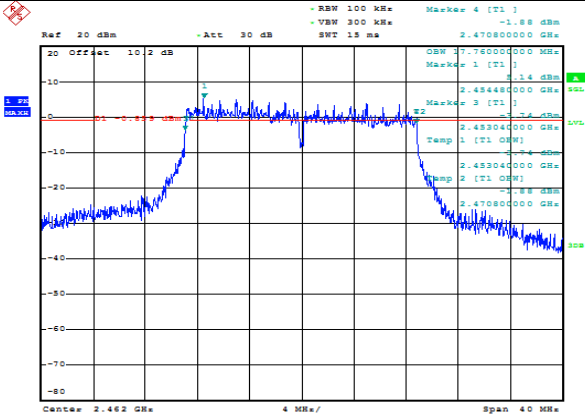
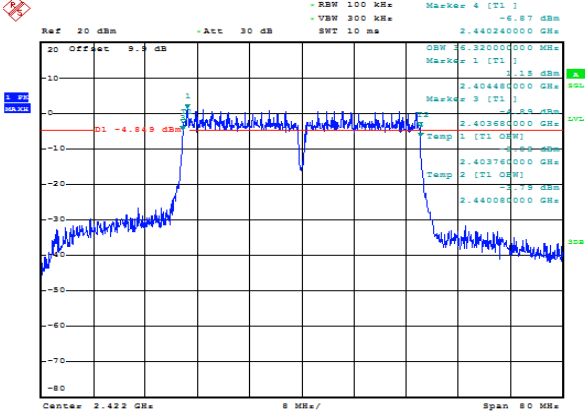
Mode	Channel	Ant	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict
11B	LCH	Ant2	9.360	11.560	PASS
11B	MCH	Ant2	9.120	11.480	PASS
11B	HCH	Ant2	8.560	11.720	PASS
11G	LCH	Ant2	16.400	16.520	PASS
11G	MCH	Ant2	16.480	16.480	PASS
11G	HCH	Ant2	16.240	16.520	PASS
11N20	LCH	Ant2	17.760	17.760	PASS
11N20	MCH	Ant2	17.800	17.720	PASS
11N20	HCH	Ant2	17.760	17.760	PASS
11N40	LCH	Ant2	36.560	36.320	PASS
11N40	MCH	Ant2	36.480	36.240	PASS
11N40	HCH	Ant2	36.480	36.160	PASS

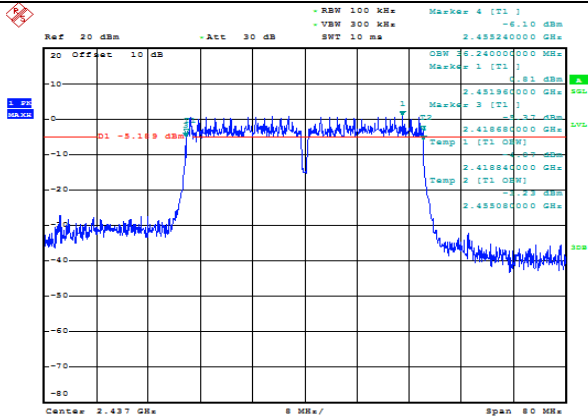
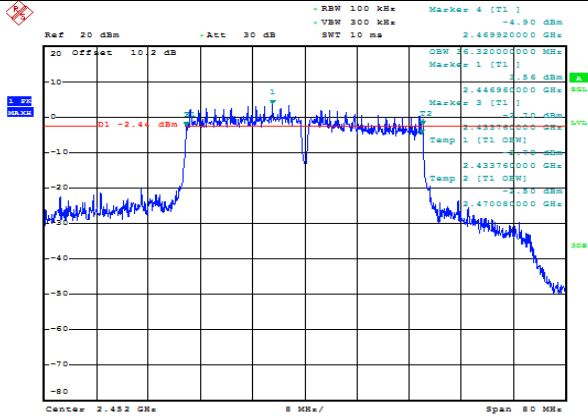
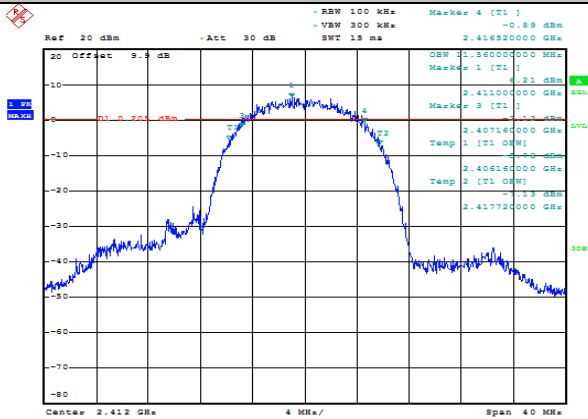
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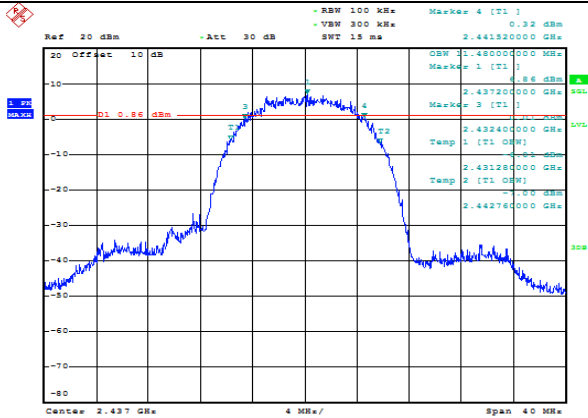
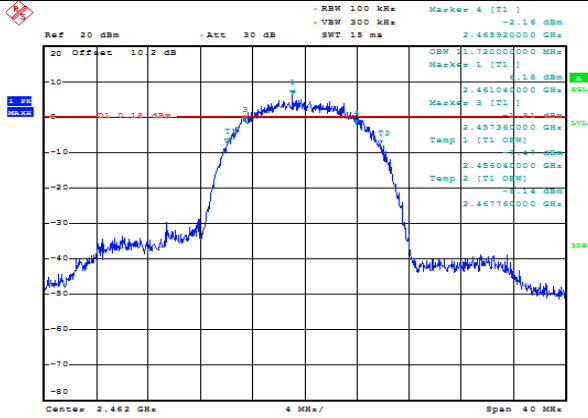
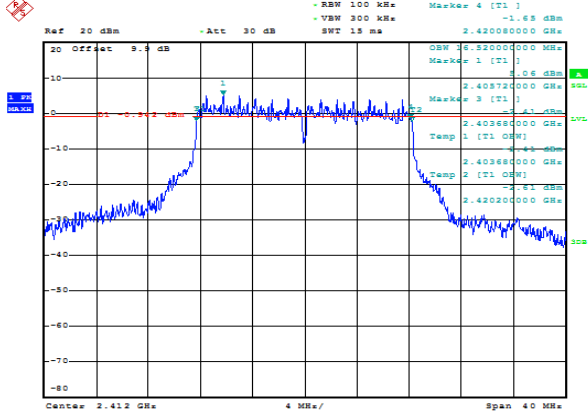


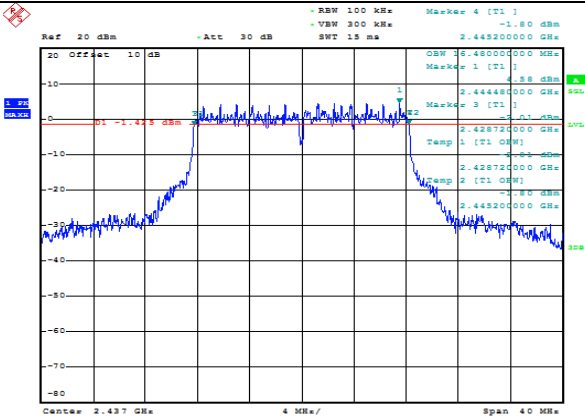
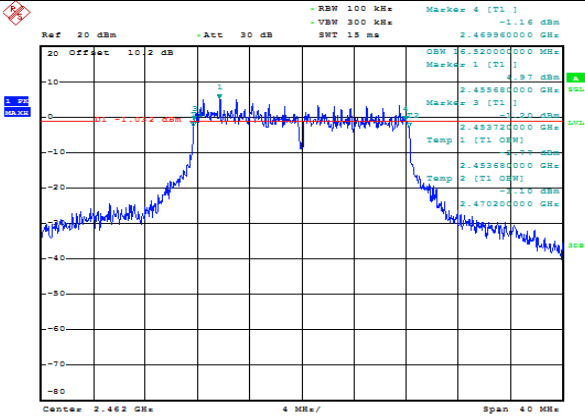
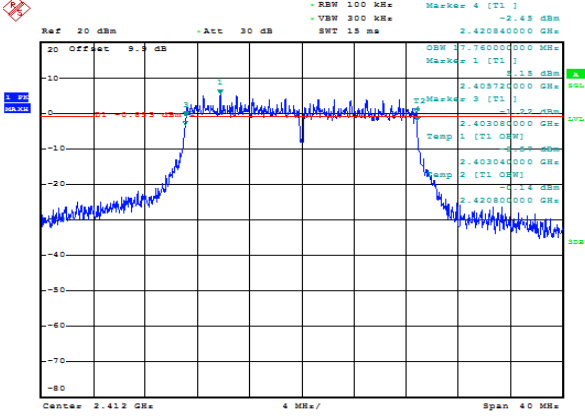
11B/MCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 100 kHz Marker 4 [T1] -1.04 dBm -VSW 300 kHz SWT 15 ms 2.437000000 GHz OSW 2.437000000 MHz Marker 1 [T1] -1.81 dBm 2.437000000 GHz Marker 3 [T1] -1.81 dBm 2.437000000 GHz Temp 1 [T1] OSW 2.437160000 GHz Temp 2 [T1] OSW 2.442720000 GHz Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 26 JUN.2017 19:14:06
11B/HCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 100 kHz Marker 4 [T1] -0.34 dBm -VSW 300 kHz SWT 15 ms 2.462000000 GHz OSW 2.462000000 MHz Marker 1 [T1] -2.54 dBm 2.462000000 GHz Marker 3 [T1] -2.54 dBm 2.462000000 GHz Temp 1 [T1] OSW 2.467120000 GHz Temp 2 [T1] OSW 2.467640000 GHz Center 2.462 GHz 4 MHz/ Span 40 MHz Date: 26 JUN.2017 19:16:31
11G/LCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 100 kHz Marker 4 [T1] -1.40 dBm -VSW 300 kHz SWT 15 ms 2.420160000 GHz OSW 2.420160000 MHz Marker 1 [T1] -1.11 dBm 2.405720000 GHz Marker 3 [T1] -1.11 dBm 2.405720000 GHz Temp 1 [T1] OSW 2.403680000 GHz Temp 2 [T1] OSW 2.420200000 GHz Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 26 JUN.2017 19:21:52

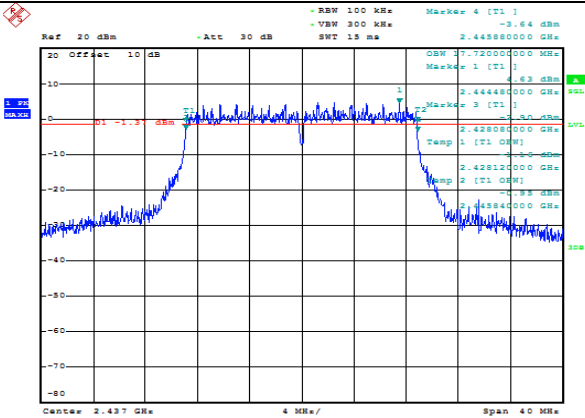
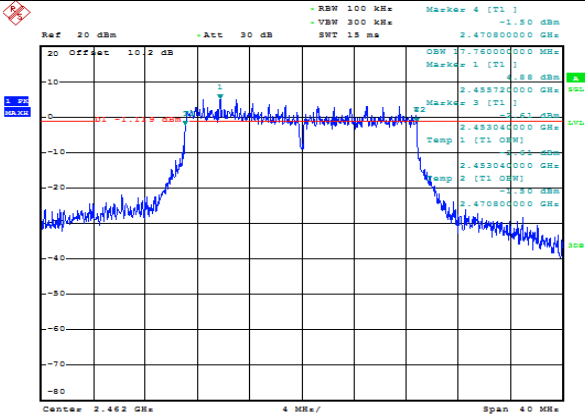
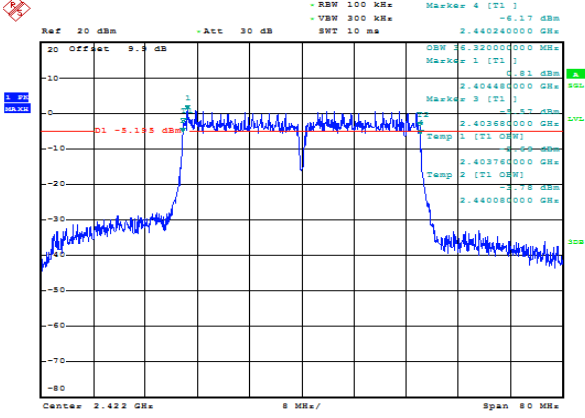
11G/MCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 100 kHz -VBW 300 kHz SWT 15 ms Marker 4 [T1] -1.42 dBm 2.4370000 GHz OSW 26.52000000 MHz Marker 1 [T1] -1.34 dBm 2.431920000 GHz Marker 3 [T1] -1.34 dBm 2.428720000 GHz Temp 1 [T1 OSW] -1.34 dBm 2.428680000 GHz Temp 2 [T1 OSW] -1.37 dBm 2.445200000 GHz Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 26.JUN.2017 19:24:59
11G/HCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 100 kHz -VBW 300 kHz SWT 15 ms Marker 4 [T1] -0.42 dBm 2.4320000 GHz OSW 26.52000000 MHz Marker 1 [T1] -1.27 dBm 2.434480000 GHz Marker 3 [T1] -1.34 dBm 2.433720000 GHz Temp 1 [T1 OSW] -1.34 dBm 2.433600000 GHz Temp 2 [T1 OSW] -1.34 dBm 2.470200000 GHz Center 2.432 GHz 4 MHz/ Span 40 MHz Date: 26.JUN.2017 19:25:00
11N20/LCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 100 kHz -VBW 300 kHz SWT 15 ms Marker 4 [T1] -2.40 dBm 2.420640000 GHz OSW 17.72000000 MHz Marker 1 [T1] -1.19 dBm 2.405960000 GHz Marker 3 [T1] -1.34 dBm 2.403040000 GHz Temp 1 [T1 OSW] -1.34 dBm 2.403080000 GHz Temp 2 [T1 OSW] -1.34 dBm 2.420800000 GHz Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 26.JUN.2017 19:25:38

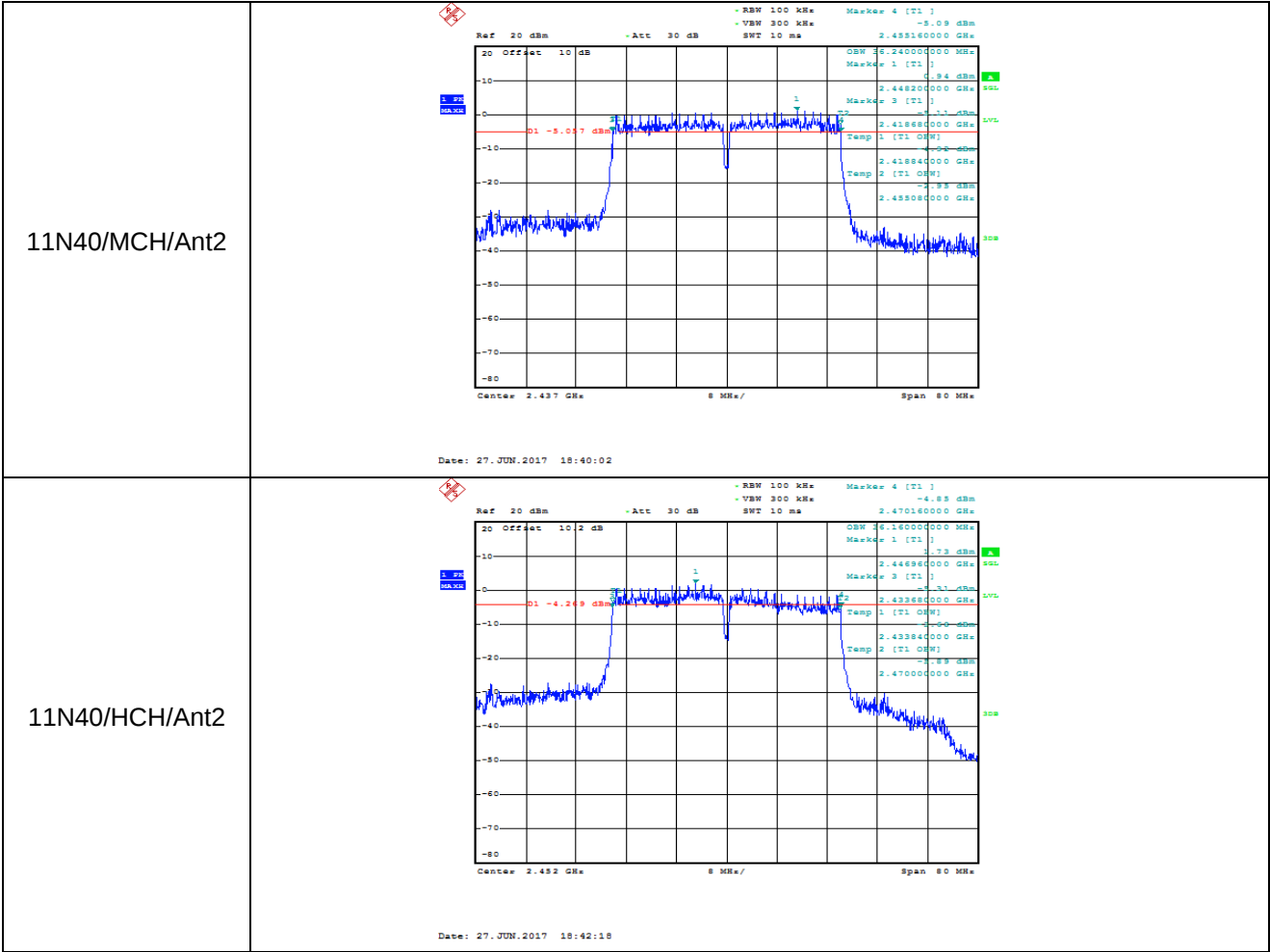
11N20/MCH/Ant1	 Ref 20 dBm - Att 30 dB - RBW 100 kHz - Marker 4 [T1] -2.84 dBm - VSW 300 kHz - 2.43840000 GHz SWT 15 ms OSW 31.72000000 MHz Marker 1 [T1] -1.67 dBm 2.441980000 GHz Marker 3 [T1] -1.42 dBm 2.428040000 GHz Temp 1 [T1 OSW] -1.40 dBm 2.428080000 GHz Temp 2 [T1 OSW] -1.38 dBm 2.438000000 GHz Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 26 JUN. 2017 19:41:29
11N20/HCH/Ant1	 Ref 20 dBm - Att 30 dB - RBW 100 kHz - Marker 4 [T1] -1.88 dBm - VSW 300 kHz - 2.470800000 GHz SWT 15 ms OSW 31.76000000 MHz Marker 1 [T1] -1.14 dBm 2.434480000 GHz Marker 3 [T1] -1.02 dBm 2.433040000 GHz Temp 1 [T1 OSW] -1.04 dBm 2.433040000 GHz Temp 2 [T1 OSW] -1.08 dBm 2.470800000 GHz Center 2.462 GHz 4 MHz/ Span 40 MHz Date: 26 JUN. 2017 19:44:01
11N40/LCH/Ant1	 Ref 20 dBm - Att 30 dB - RBW 100 kHz - Marker 4 [T1] -6.87 dBm - VSW 300 kHz - 2.440240000 GHz SWT 10 ms OSW 56.32000000 MHz Marker 1 [T1] -3.18 dBm 2.404480000 GHz Marker 3 [T1] -3.14 dBm 2.402680000 GHz Temp 1 [T1 OSW] -3.00 dBm 2.403760000 GHz Temp 2 [T1 OSW] -3.09 dBm 2.440080000 GHz Center 2.422 GHz 8 MHz/ Span 80 MHz Date: 26 JUN. 2017 19:51:31

11N40/MCH/Ant1	 Ref 20 dBm -Att 30 dB RBW 100 kHz VBW 300 kHz SWT 10 ms Marker 4 [T1] -6.10 dBm 2.435240000 GHz OSW 2.430000000 GHz Marker 1 [T1] -8.1 dBm 2.431980000 GHz Marker 3 [T1] -9.1 dBm 2.436600000 GHz Temp 1 [T1 OSW] -9.2 dBm 2.436840000 GHz Temp 2 [T1 OSW] -11.23 dBm 2.435080000 GHz Center 2.437 GHz 8 MHz/ Span 80 MHz Date: 26 JUN 2017 19:57:44
11N40/HCH/Ant1	 Ref 20 dBm -Att 30 dB RBW 100 kHz VBW 300 kHz SWT 10 ms Marker 4 [T1] -6.10 dBm 2.439920000 GHz OSW 2.430000000 GHz Marker 1 [T1] -8.1 dBm 2.446960000 GHz Marker 3 [T1] -9.1 dBm 2.433760000 GHz Temp 1 [T1 OSW] -9.2 dBm 2.433760000 GHz Temp 2 [T1 OSW] -11.23 dBm 2.470080000 GHz Center 2.432 GHz 8 MHz/ Span 80 MHz Date: 27 JUN 2017 18:15:15
Graphs	
11B/LCH/Ant2	 Ref 20 dBm -Att 30 dB RBW 100 kHz VBW 300 kHz SWT 15 ms Marker 4 [T1] -6.10 dBm 2.416920000 GHz OSW 2.410000000 GHz Marker 1 [T1] -8.1 dBm 2.411000000 GHz Marker 3 [T1] -9.1 dBm 2.407160000 GHz Temp 1 [T1 OSW] -9.2 dBm 2.406160000 GHz Temp 2 [T1 OSW] -11.23 dBm 2.417720000 GHz Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 27 JUN 2017 18:22:07

11B/MCH/Ant2	 Ref 20 dBm -Att 30 dB RBW 100 kHz Marker 4 [T1] 0.32 dBm VSW 300 kHz SWT 15 ms 2.43720000 GHz OSW 1.48000000 MHz Marker 1 [T1] -0.86 dBm 2.43720000 GHz Marker 3 [T1] -0.86 dBm 2.43240000 GHz Temp 1 [T1 OSW] -0.86 dBm 2.43128000 GHz Temp 2 [T1 OSW] -1.00 dBm 2.44276000 GHz Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 27 JUN.2017 18:24:04
11B/HCH/Ant2	 Ref 20 dBm -Att 30 dB RBW 100 kHz Marker 4 [T1] -2.16 dBm VSW 300 kHz SWT 15 ms 2.46592000 GHz OSW 1.72000000 MHz Marker 1 [T1] -1.18 dBm 2.46104000 GHz Marker 3 [T1] -1.18 dBm 2.45736000 GHz Temp 1 [T1 OSW] -1.18 dBm 2.45604000 GHz Temp 2 [T1 OSW] -1.14 dBm 2.46776000 GHz Center 2.462 GHz 4 MHz/ Span 40 MHz Date: 27 JUN.2017 18:25:52
11G/LCH/Ant2	 Ref 20 dBm -Att 30 dB RBW 100 kHz Marker 4 [T1] -1.65 dBm VSW 300 kHz SWT 15 ms 2.42008000 GHz OSW 1.63200000 MHz Marker 1 [T1] -1.06 dBm 2.40572000 GHz Marker 3 [T1] -1.06 dBm 2.40368000 GHz Temp 1 [T1 OSW] -1.06 dBm 2.40368000 GHz Temp 2 [T1 OSW] -1.06 dBm 2.42020000 GHz Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 27 JUN.2017 18:27:40

11G/MCH/Ant2	 Ref 20 dBm -Att 30 dB Marker 4 [T1] -1.45 dBm Marker 1 [T1] -1.80 dBm Marker 2 [T1] -1.80 dBm Marker 3 [T1] -1.80 dBm Temp 1 [T1] 2.425720000 GHz Temp 2 [T1] 2.444480000 GHz Temp 3 [T1] 2.445200000 GHz Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 27 JUN 2017 18:29:25
11G/HCH/Ant2	 Ref 20 dBm -Att 30 dB Marker 4 [T1] -1.16 dBm Marker 1 [T1] -1.80 dBm Marker 2 [T1] -1.80 dBm Marker 3 [T1] -1.80 dBm Temp 1 [T1] 2.435680000 GHz Temp 2 [T1] 2.453720000 GHz Temp 3 [T1] 2.453680000 GHz Temp 4 [T1] 2.470200000 GHz Center 2.452 GHz 4 MHz/ Span 40 MHz Date: 27 JUN 2017 18:29:02
11N20/LCH/Ant2	 Ref 20 dBm -Att 30 dB Marker 4 [T1] -2.45 dBm Marker 1 [T1] -1.80 dBm Marker 2 [T1] -1.80 dBm Marker 3 [T1] -1.80 dBm Temp 1 [T1] 2.403080000 GHz Temp 2 [T1] 2.403040000 GHz Temp 3 [T1] 2.420800000 GHz Center 2.412 GHz 4 MHz/ Span 40 MHz Date: 27 JUN 2017 18:29:01

11N20/MCH/Ant2	 Ref 20 dBm -Att 30 dB -RBW 100 kHz Marker 4 [T1] -3.64 dBm -VSW 300 kHz SWT 15 ms 2.425880000 GHz OSW 2.425880000 GHz Marker 1 [T1] -6.83 dBm Marker 2 [T1] -1.50 dBm Marker 3 [T1] -1.50 dBm Temp 1 [T1 OSW] -1.50 dBm Temp 2 [T1 OSW] -1.50 dBm Temp 3 [T1 OSW] -1.50 dBm Temp 4 [T1 OSW] -1.50 dBm Center 2.437 GHz 4 MHz/ Span 40 MHz Date: 27.JUN.2017 18:54:42
11N20/HCH/Ant2	 Ref 20 dBm -Att 30 dB -RBW 100 kHz Marker 4 [T1] -1.50 dBm -VSW 300 kHz SWT 15 ms 2.425880000 GHz OSW 2.425880000 GHz Marker 1 [T1] -6.83 dBm Marker 2 [T1] -1.50 dBm Marker 3 [T1] -1.50 dBm Temp 1 [T1 OSW] -1.50 dBm Temp 2 [T1 OSW] -1.50 dBm Temp 3 [T1 OSW] -1.50 dBm Temp 4 [T1 OSW] -1.50 dBm Center 2.432 GHz 4 MHz/ Span 40 MHz Date: 27.JUN.2017 18:56:22
11N40/LCH/Ant2	 Ref 20 dBm -Att 30 dB -RBW 100 kHz Marker 4 [T1] -6.17 dBm -VSW 300 kHz SWT 10 ms 2.425880000 GHz OSW 2.425880000 GHz Marker 1 [T1] -6.83 dBm Marker 2 [T1] -1.50 dBm Marker 3 [T1] -1.50 dBm Temp 1 [T1 OSW] -1.50 dBm Temp 2 [T1 OSW] -1.50 dBm Temp 3 [T1 OSW] -1.50 dBm Temp 4 [T1 OSW] -1.50 dBm Center 2.422 GHz 8 MHz/ Span 80 MHz Date: 27.JUN.2017 18:58:23



5. Conducted Average Output Power

5.1. Block diagram of test setup

Same as section 4.1

5.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.
If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.3. Test Procedure

Connect each EUT's antenna output to power sensor by RF cable and attenuator

Measure the PK output power of each antenna port by power sensor.

5.4. Test Result

EUT Set Mode	CH	Result(dBm)		
		Average		
		Antenna 1	Antenna 2	Antenna 1+2
11b	CH1	16.16	15.43	18.82
	CH6	16.22	15.61	18.94
	CH11	15.92	14.03	18.09
11g	CH1	15.86	15.87	18.88
	CH6	15.61	15.83	18.73
	CH11	15.68	15.04	18.38
11n HT20	CH1	16.10	16.0	19.06
	CH6	16.11	16.25	19.19
	CH11	15.86	15.51	18.70
11n HT40	CH3	15.31	14.99	18.16
	CH6	14.50	14.93	17.73
	CH9	16.68	15.44	19.11
Limit: 30dBm (Av Power)				Conclusion: PASS

6. Power Spectral Density

6.1. Block diagram of test setup

Same as section 4.1

6.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

6.3. Test Procedure

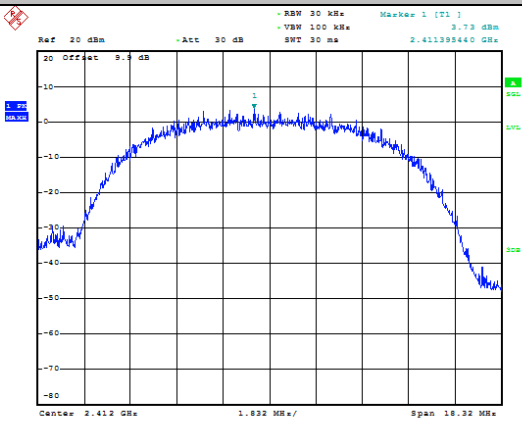
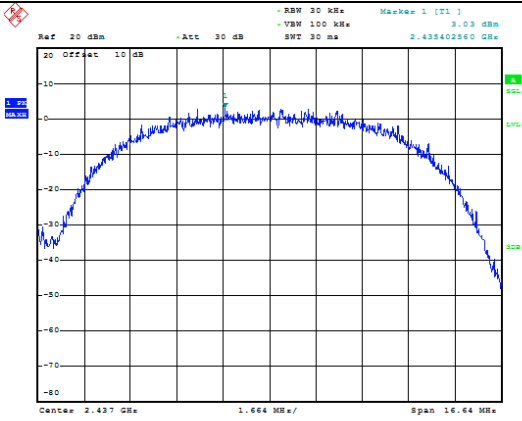
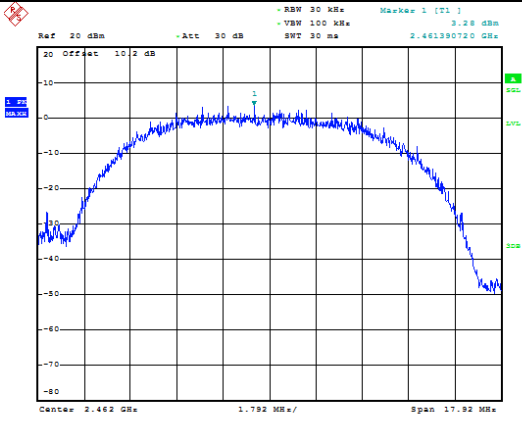
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Set the spectrum analyzer as follows:

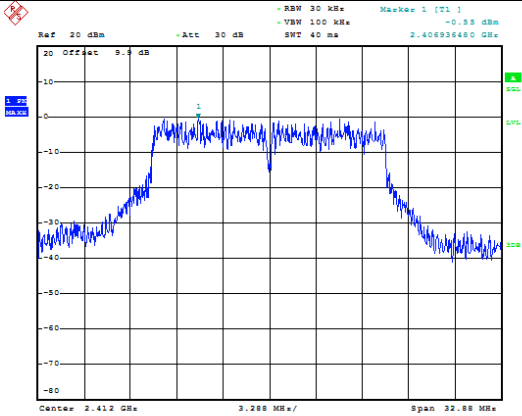
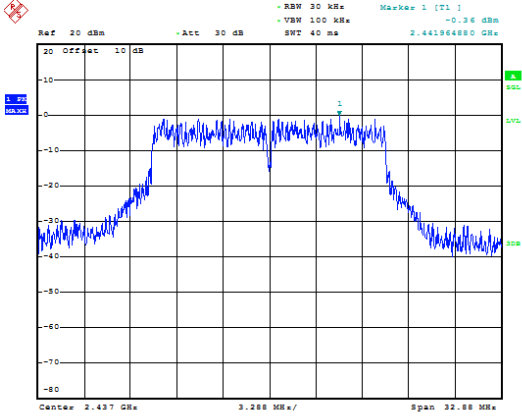
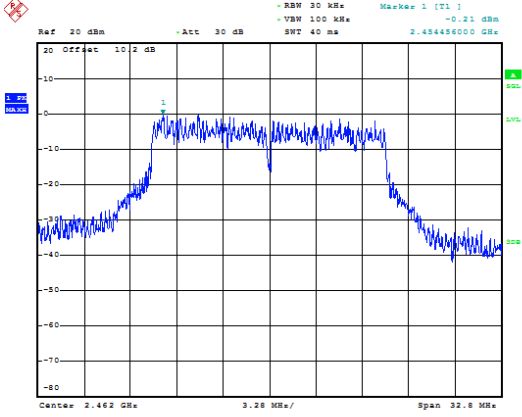
Center frequency	DTS Channel center frequency
RBW:	$3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5times the DTS bandwidth
Detector Mode:	RMS
Sweep time:	auto
Trace mode	Max hold
- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
- (4) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

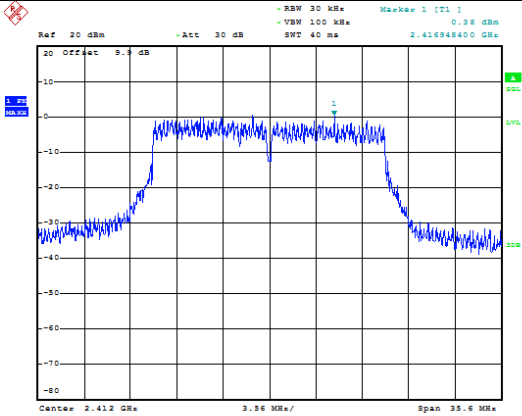
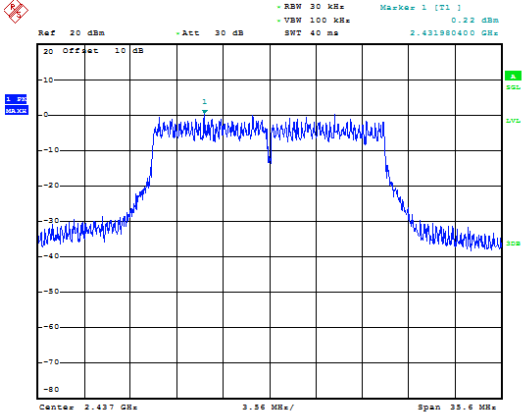
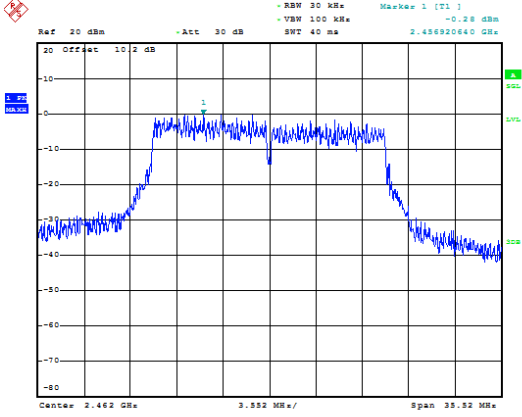
6.4. Test Result

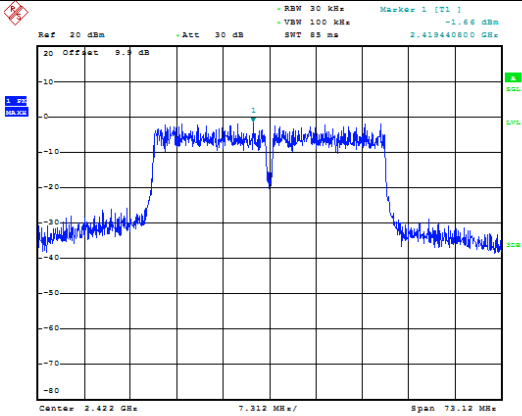
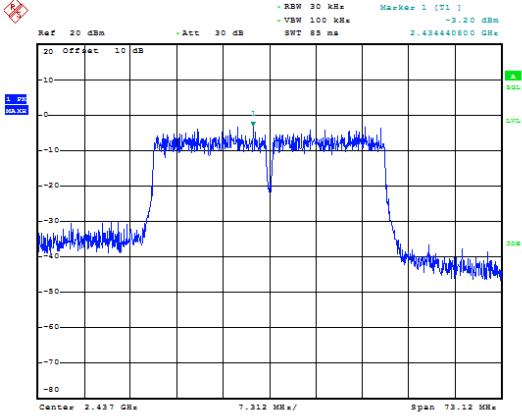
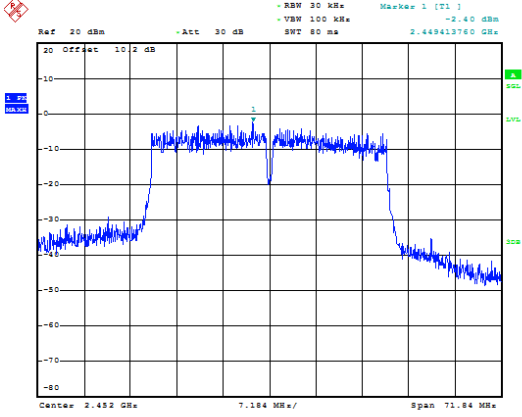
EUT Set Mode	CH or Frequency	Antenna 1 Result(dBm)	Antenna 2 Result(dBm)	Antenna 1+2 Result(dBm)
11b	CH1	3.73	2.50	7.11
	CH6	3.03	2.98	6.99
	CH11	3.28	1.38	6.53
11g	CH1	-0.55	-0.73	4.36
	CH6	-0.36	-0.31	4.55
	CH11	-0.21	-1.17	4.34
11n HT 20	CH1	0.38	-0.21	4.83
	CH6	0.22	0.34	4.96
	CH11	-0.28	-0.50	4.52
11n HT 40	CH3	-1.66	-2.16	3.60
	CH6	-3.20	-1.82	3.30
	CH9	-2.40	-0.43	3.95
Limit: <8dBm/3KHz			Conclusion: PASS	

6.5. Original test data

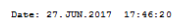
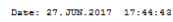
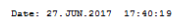
Graphs	
11B/LCH/Ant1	 Date: 26 JUN 2017 19:10:24
11B/MCH/Ant1	 Date: 26 JUN 2017 19:14:50
11B/HCH/Ant1	 Date: 26 JUN 2017 19:17:15

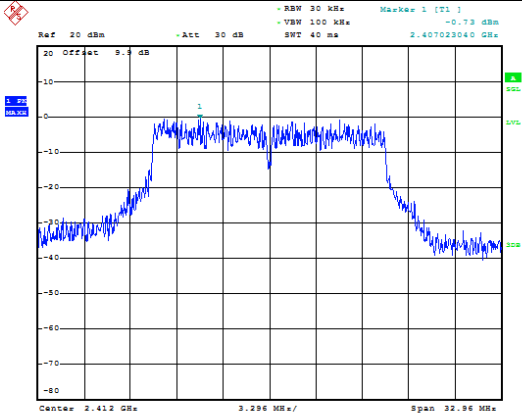
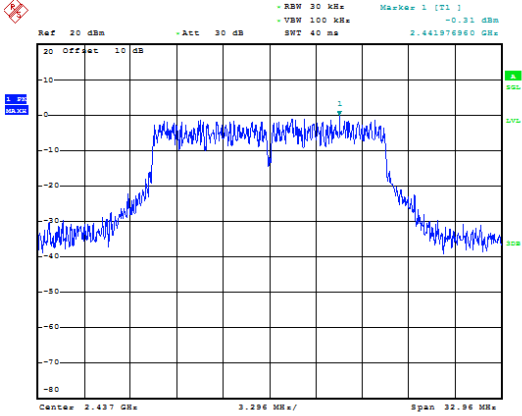
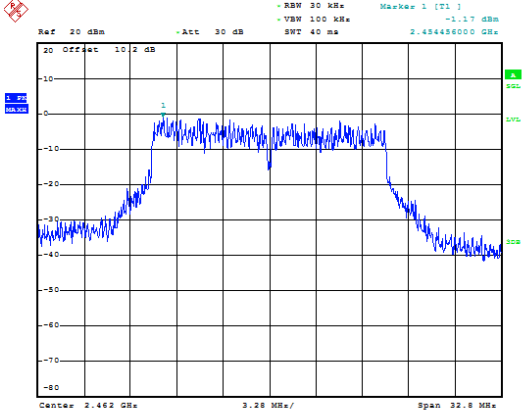
11G/LCH/Ant1	 Ref 20 dBm Att 30 dB RBW 30 KHz Marker 1 [T1] -0.38 dBm VBW 100 KHz SMT 40 ms 2.456936480 GHz Center: 2.412 GHz 3.288 MHz/ Span 32.88 MHz Date: 26 JUN 2017 19:22:56
11G/MCH/Ant1	 Ref 20 dBm Att 30 dB RBW 30 KHz Marker 1 [T1] -0.38 dBm VBW 100 KHz SMT 40 ms 2.48196480 GHz Center: 2.437 GHz 3.288 MHz/ Span 32.88 MHz Date: 26 JUN 2017 19:25:23
11G/HCH/Ant1	 Ref 20 dBm Att 30 dB RBW 30 KHz Marker 1 [T1] -0.21 dBm VBW 100 KHz SMT 40 ms 2.496166000 GHz Center: 2.462 GHz 3.28 MHz/ Span 32.8 MHz Date: 26 JUN 2017 19:28:44

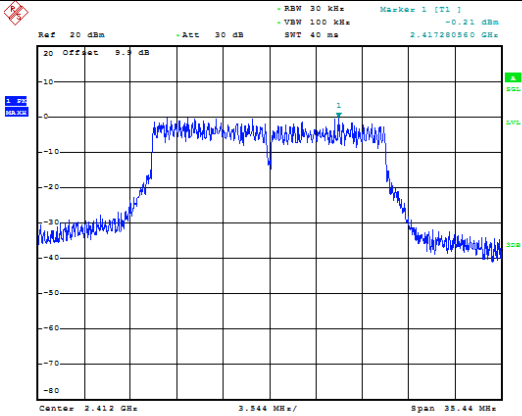
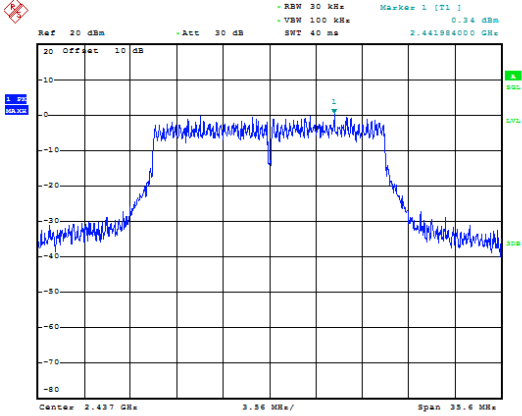
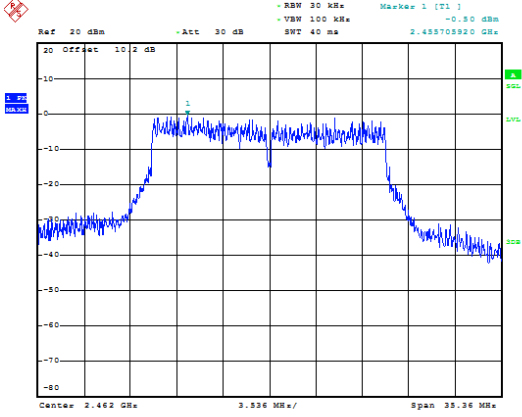
11N20/LCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 30 KHz Marker 1 [T1] 0.28 dBm -VBW 100 KHz SMT 40 ms 2.416948400 GHz 20 Offset 9.4 dB Center 2.412 GHz 3.56 MHz/ Span 35.6 MHz Date: 26 JUN 2017 19:59:22
11N20/MCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 30 KHz Marker 1 [T1] 0.28 dBm -VBW 100 KHz SMT 40 ms 2.431980400 GHz 20 Offset 10 dB Center 2.437 GHz 3.56 MHz/ Span 35.6 MHz Date: 26 JUN 2017 19:42:13
11N20/HCH/Ant1	 Ref 20 dBm -Att 30 dB -RBW 30 KHz Marker 1 [T1] 0.28 dBm -VBW 100 KHz SMT 40 ms 2.456520640 GHz 20 Offset 10.2 dB Center 2.462 GHz 3.552 MHz/ Span 35.52 MHz Date: 26 JUN 2017 19:44:45

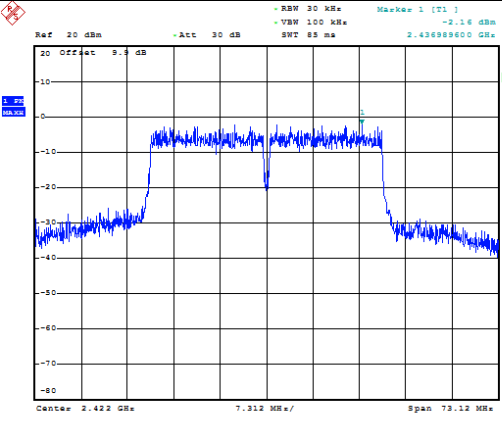
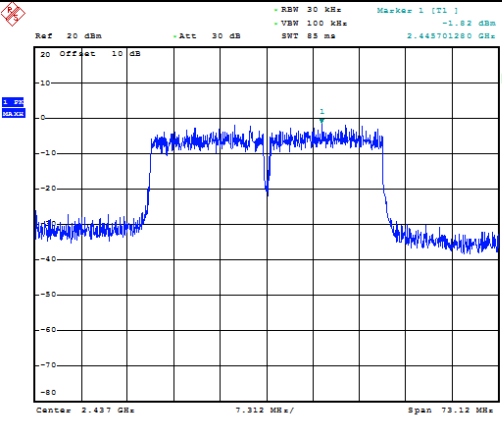
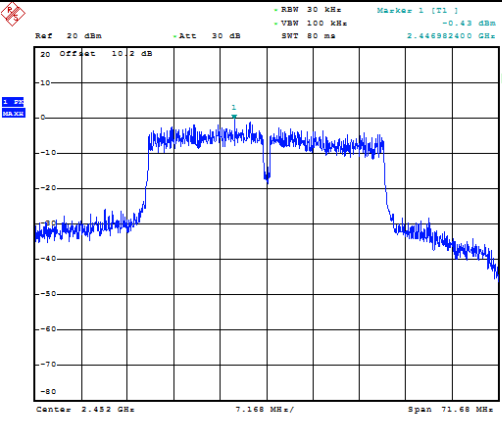
11N40/LCH/Ant1	 Ref: 20 dBm, Att: 30 dB, RBW: 30 kHz, VBW: 100 kHz, SMT: 85 ms, Marker: 1 [T1], -1.66 dBm, 2.429440800 GHz Center: 2.422 GHz, Span: 73.12 MHz Date: 26 JUN 2017 19:48:37
11N40/MCH/Ant1	 Ref: 20 dBm, Att: 30 dB, RBW: 30 kHz, VBW: 100 kHz, SMT: 85 ms, Marker: 1 [T1], -3.20 dBm, 2.434440800 GHz Center: 2.427 GHz, Span: 73.12 MHz Date: 26 JUN 2017 19:58:28
11N40/HCH/Ant1	 Ref: 20 dBm, Att: 30 dB, RBW: 30 kHz, VBW: 100 kHz, SMT: 85 ms, Marker: 1 [T1], -2.40 dBm, 2.459440800 GHz Center: 2.452 GHz, Span: 71.84 MHz Date: 26 JUN 2017 20:04:18

Graphs



11G/LCH/Ant2	 Ref 20 dBm -Att 30 dB RBW 30 kHz Marker 1 [T1] -0.73 dBm VBW 100 kHz SWT 40 ms 2.407023040 GHz Center 2.412 GHz 3.296 MHz/ Span 32.96 MHz Date: 27.JUN.2017 17:48:07
11G/MCH/Ant2	 Ref 20 dBm -Att 30 dB RBW 30 kHz Marker 1 [T1] -0.31 dBm VBW 100 kHz SWT 40 ms 2.441976960 GHz Center 2.437 GHz 3.296 MHz/ Span 32.96 MHz Date: 27.JUN.2017 17:49:57
11G/HCH/Ant2	 Ref 20 dBm -Att 30 dB RBW 30 kHz Marker 1 [T1] -1.17 dBm VBW 100 kHz SWT 40 ms 2.456456000 GHz Center 2.462 GHz 3.28 MHz/ Span 32.8 MHz Date: 27.JUN.2017 17:51:42

11N20/LCH/Ant2	 Ref 20 dBm -Att 30 dB -RBW 30 kHz Marker 1 [T1] -0.23 dBm -VSW 100 kHz SWT 40 ms 2.417280560 GHz 20 Offset 9.4 dB 1.27 Max Center 2.412 GHz 3.544 MHz/ Span 35.44 MHz Date: 27.JUN.2017 17:59:52
11N20/MCH/Ant2	 Ref 20 dBm -Att 30 dB -RBW 30 kHz Marker 1 [T1] 0.34 dBm -VSW 100 kHz SWT 40 ms 2.441984000 GHz 20 Offset 10 dB 1.27 Max Center 2.437 GHz 3.56 MHz/ Span 35.6 MHz Date: 27.JUN.2017 17:55:46
11N20/HCH/Ant2	 Ref 20 dBm -Att 30 dB -RBW 30 kHz Marker 1 [T1] -0.50 dBm -VSW 100 kHz SWT 40 ms 2.455709520 GHz 20 Offset 10.2 dB 1.27 Max Center 2.462 GHz 3.536 MHz/ Span 35.36 MHz Date: 27.JUN.2017 17:58:02

11N40/LCH/Ant2	 Date: 27.JUN.2017 16:00:32
11N40/MCH/Ant2	 Date: 27.JUN.2017 16:00:44
11N40/HCH/Ant2	 Date: 27.JUN.2017 16:05:26

6.6. Band Edge and Spurious Emissions (Conducted)

6.7. Block diagram of test setup

Same as section 4.1

6.8. Limits

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

6.9. Test Procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

Center frequency	DTS Channel center frequency
RBW:	100KHz
VBW:	300KHz
Span	1.5times the DTS bandwidth
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Set the spectrum analyzer as follows:

RBW:	100KHz
VBW:	300KHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{span/RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

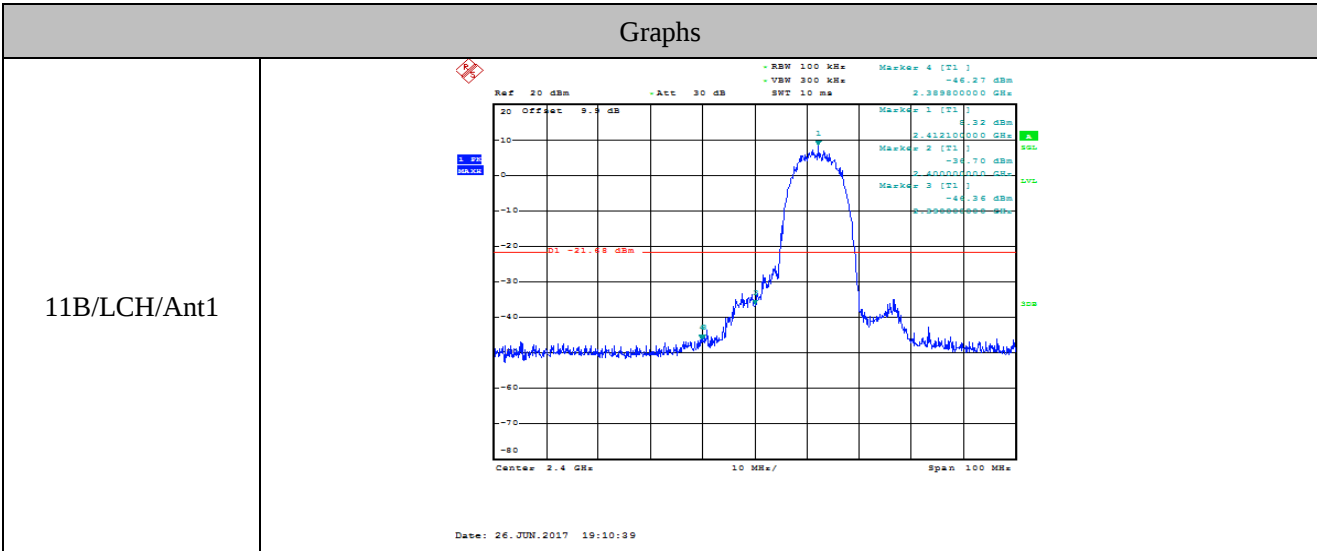
6.10. Test Result

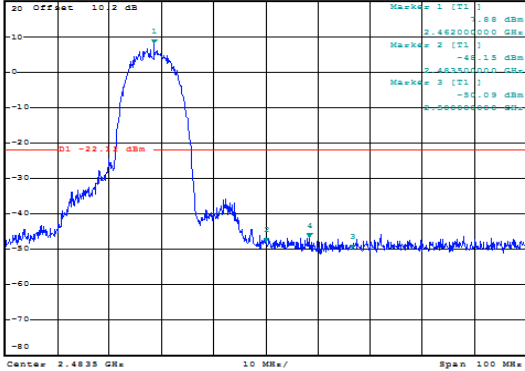
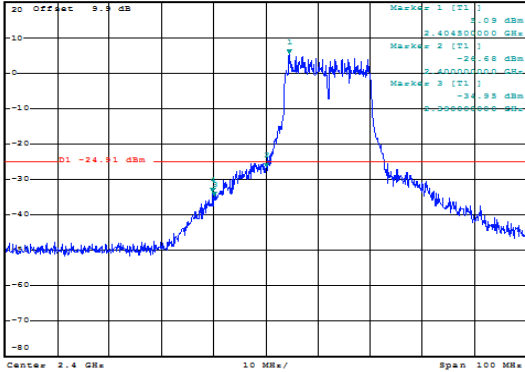
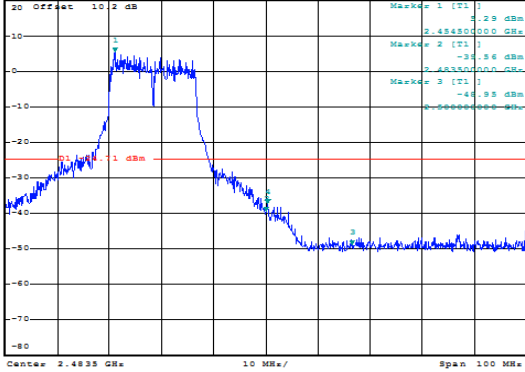
EUT Set Mode	CH or Frequency	Ant1 Result (dBm)	EUT Set Mode	CH or Frequency	Ant1 Result Result (dBm)
11b	CH1	PASS	11n HT 20	CH1	PASS
	CH6	PASS		CH6	PASS
	CH11	PASS		CH11	PASS
11g	CH1	PASS	11n HT 40	CH3	PASS
	CH6	PASS		CH6	PASS
	CH11	PASS		CH9	PASS

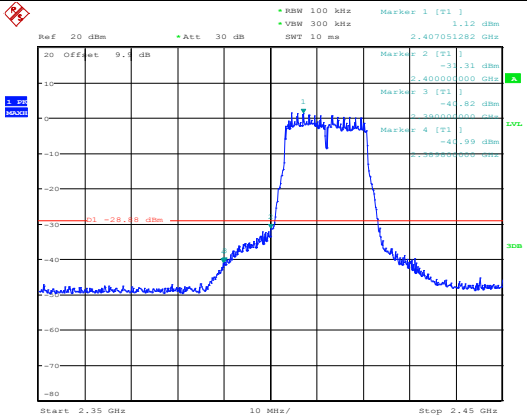
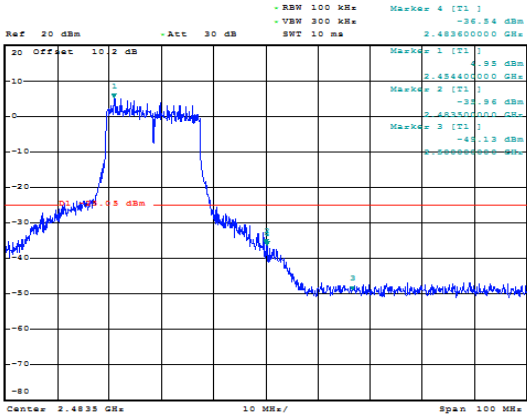
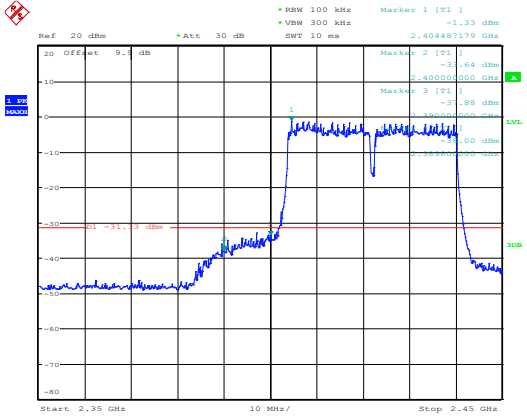
EUT Set Mode	CH or Frequency	Ant2 Result (dBm)	EUT Set Mode	CH or Frequency	Ant2 Result (dBm)
11b	CH1	PASS	11n HT 20	CH1	PASS
	CH6	PASS		CH6	PASS
	CH11	PASS		CH11	PASS
11g	CH1	PASS	11n HT 40	CH3	PASS
	CH6	PASS		CH6	PASS
	CH11	PASS		CH9	PASS

6.11. Original test data

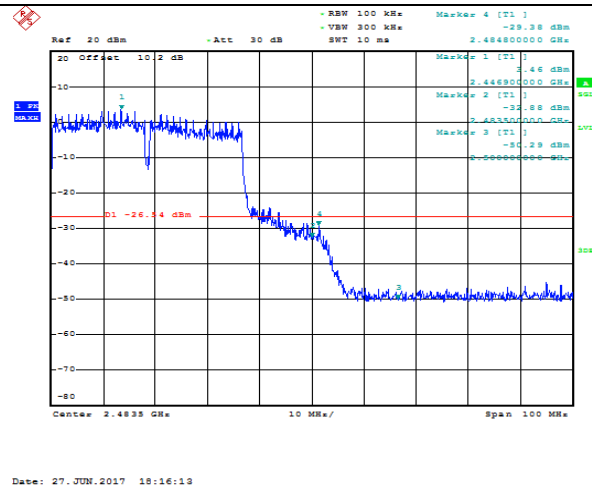
Band Edge(Worse case Ant1)



11B/HCH/Ant1	 Ref 20 dBm -Att 30 dB Marker 4 [T1] -46.82 dBm 2.481800000 GHz Marker 1 [T1] -1.88 dBm 2.482000000 GHz Marker 2 [T1] -44.15 dBm 2.482000000 GHz Marker 3 [T1] -50.08 dBm 2.482000000 GHz D1 -22.17 dBm Center 2.4835 GHz 10 MHz/ Span 100 MHz Date: 26 JUN.2017 19:17:50
11G/LCH/Ant1	 Ref 20 dBm -Att 30 dB Marker 4 [T1] -33.66 dBm 2.481800000 GHz Marker 1 [T1] -1.09 dBm 2.482000000 GHz Marker 2 [T1] -26.68 dBm 2.482000000 GHz Marker 3 [T1] -34.95 dBm 2.482000000 GHz D1 -24.11 dBm Center 2.4 GHz 10 MHz/ Span 100 MHz Date: 26 JUN.2017 19:22:51
11G/HCH/Ant1	 Ref 20 dBm -Att 30 dB Marker 4 [T1] -37.48 dBm 2.481800000 GHz Marker 1 [T1] -1.29 dBm 2.482000000 GHz Marker 2 [T1] -30.96 dBm 2.482000000 GHz Marker 3 [T1] -40.95 dBm 2.482000000 GHz D1 -24.11 dBm Center 2.4835 GHz 10 MHz/ Span 100 MHz Date: 26 JUN.2017 19:28:59

11N20/LCH/Ant1	 Ref 20 dBm Offset 9.5 dB Att 30 dB Marker 1 [T1] 2.407051282 GHz -31.31 dBm Marker 2 [T1] 2.400000000 GHz -34.82 dBm Marker 3 [T1] 2.400000000 GHz -46.99 dBm Marker 4 [T1] 2.400000000 GHz -46.99 dBm Start 2.35 GHz 10 MHz/ Stop 2.45 GHz Date: 26.JUN.2017 22:09:59
11N20/HCH/Ant1	 Ref 20 dBm Offset 10.2 dB Att 30 dB Marker 1 [T1] 2.483600000 GHz -36.94 dBm Marker 2 [T1] 2.484000000 GHz -38.96 dBm Marker 3 [T1] 2.483600000 GHz -46.13 dBm Center 2.4835 GHz 10 MHz/ Span 100 MHz Date: 26.JUN.2017 19:45:00
11N40/LCH/Ant1	 Ref 20 dBm Offset 9.5 dB Att 30 dB Marker 1 [T1] 2.404481579 GHz -31.64 dBm Marker 2 [T1] 2.400000000 GHz -34.82 dBm Marker 3 [T1] 2.400000000 GHz -46.99 dBm Marker 4 [T1] 2.400000000 GHz -46.99 dBm Start 2.35 GHz 10 MHz/ Stop 2.45 GHz Date: 26.JUN.2017 22:08:33

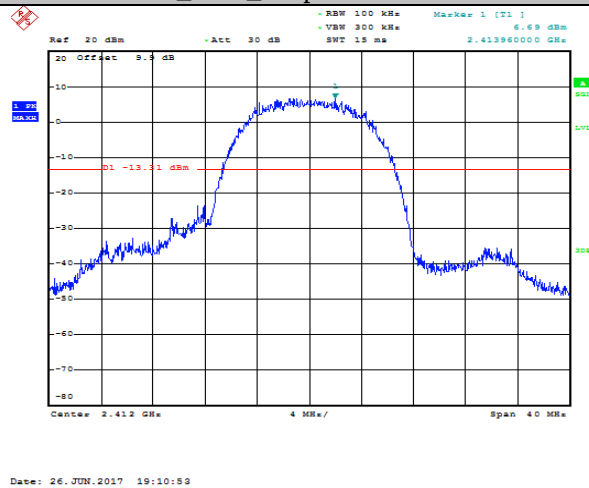
11N40/HCH/Ant1



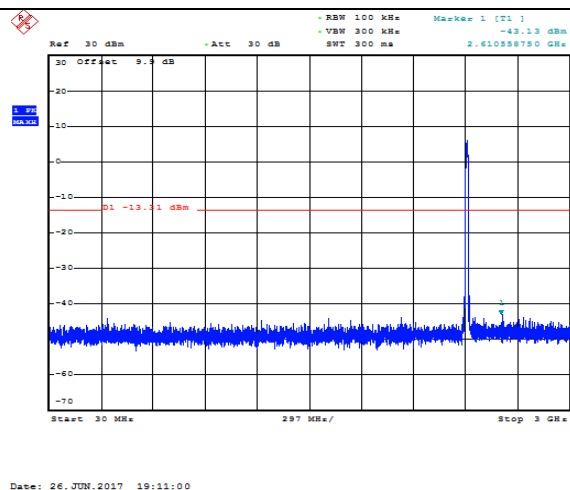
Spurious Emissions (Worse case Ant1):

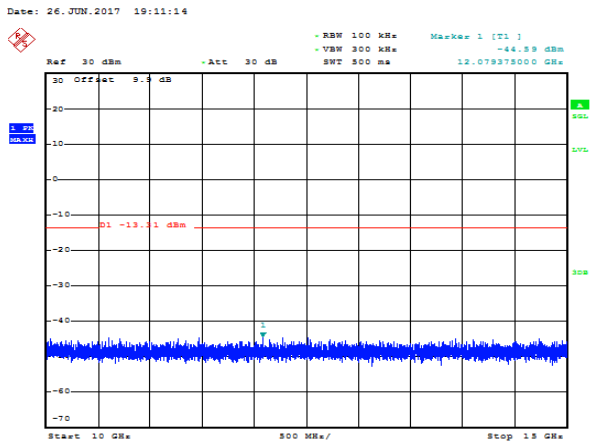
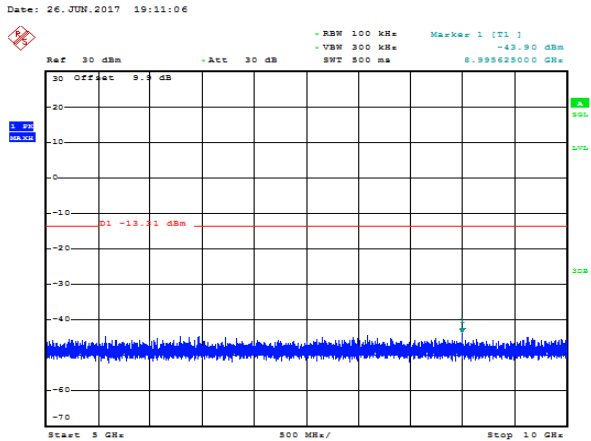
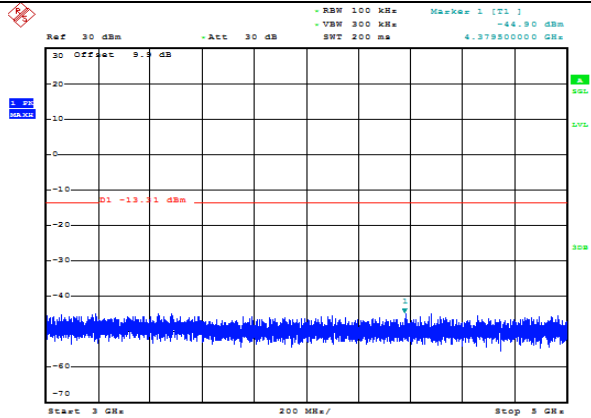
11B_LCH_Graphs

11B/LCH/Ant1

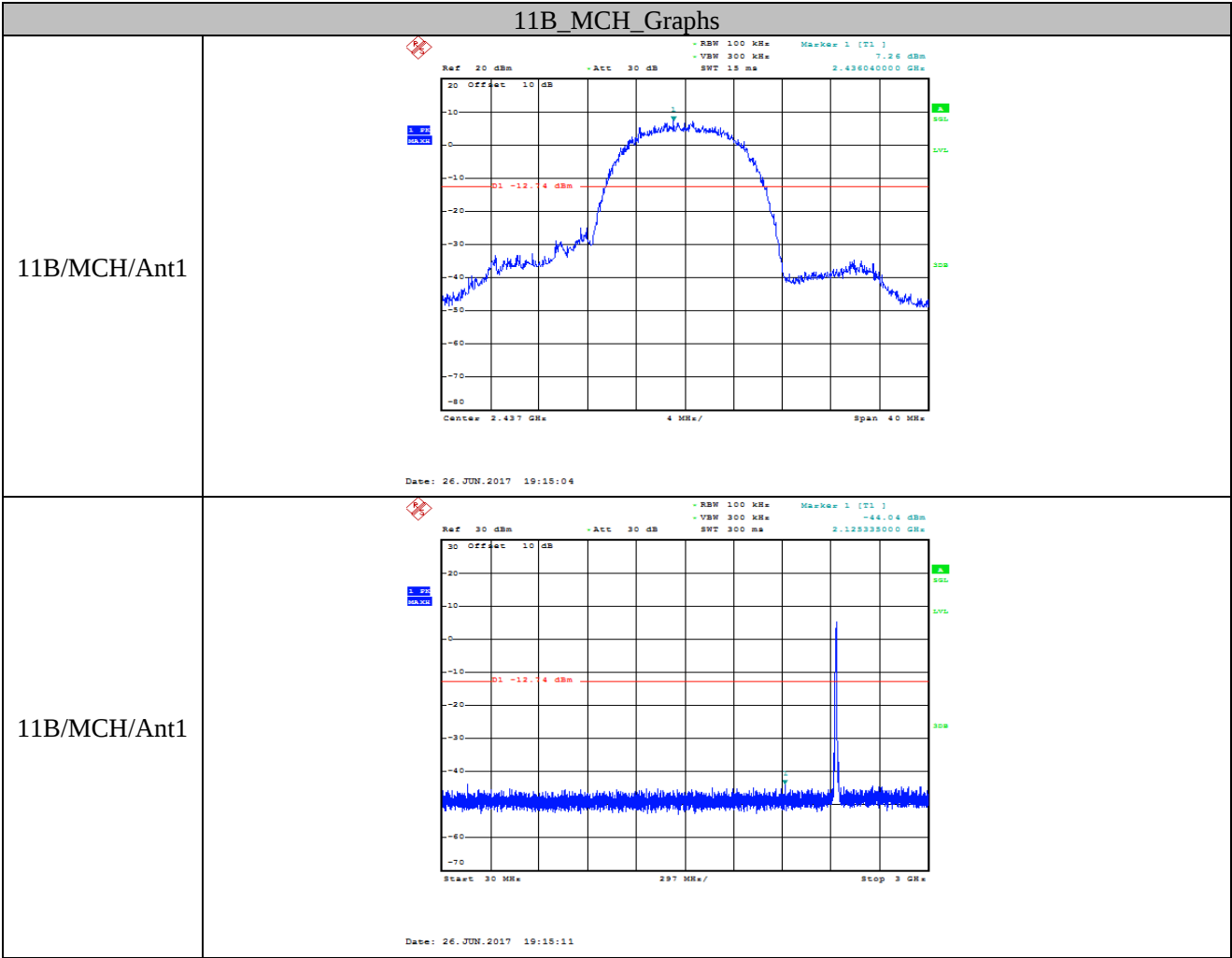
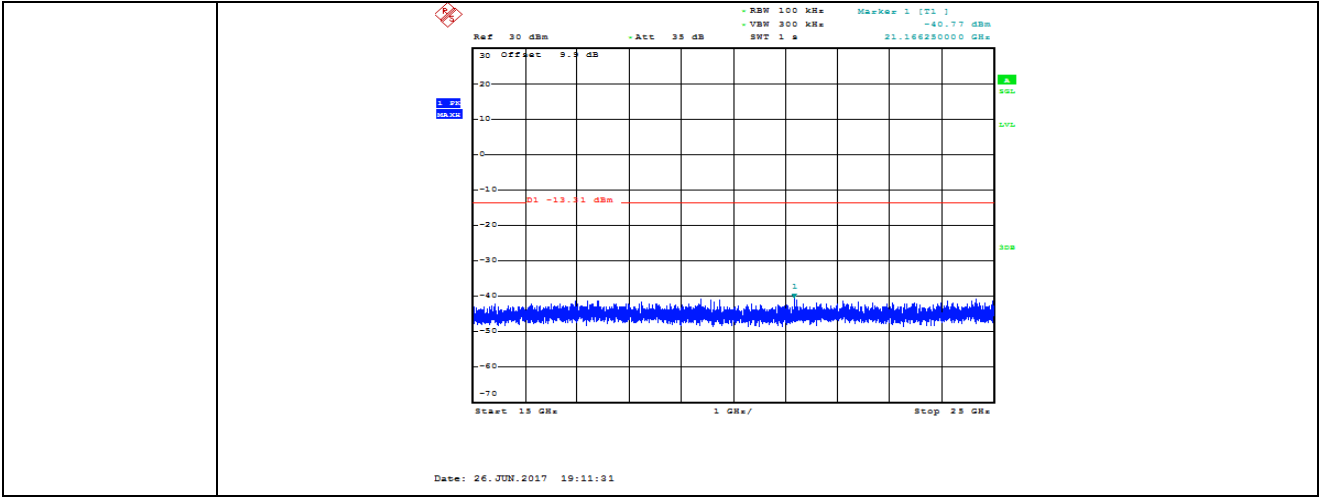


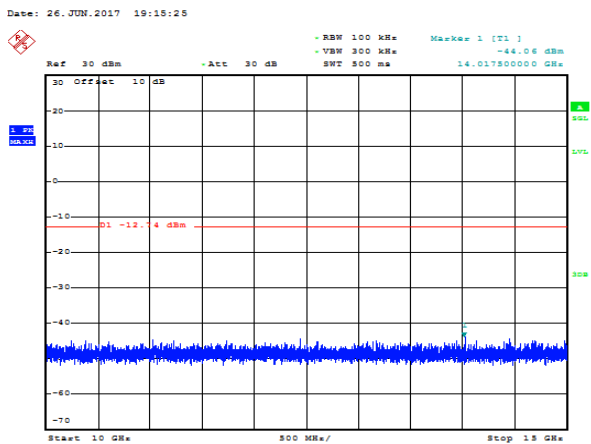
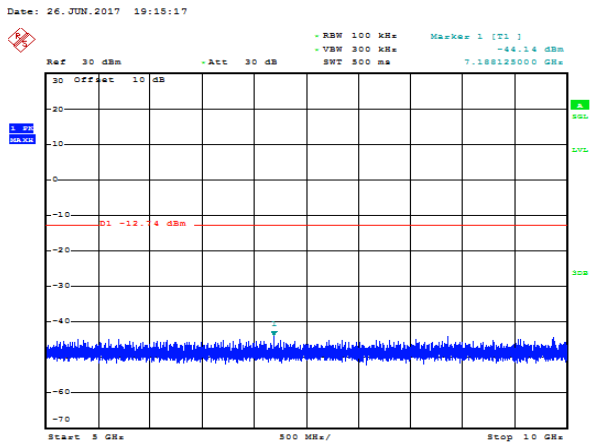
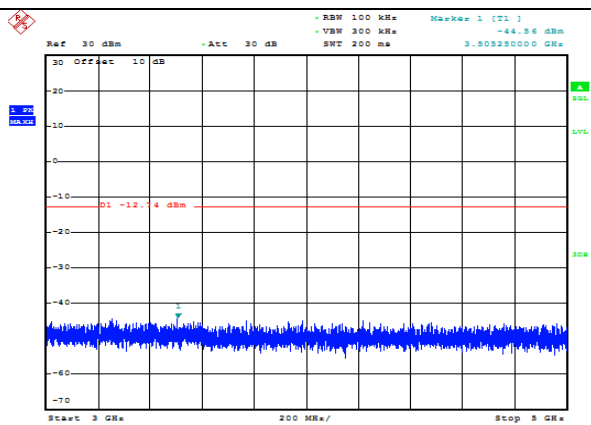
11B/LCH/Ant1



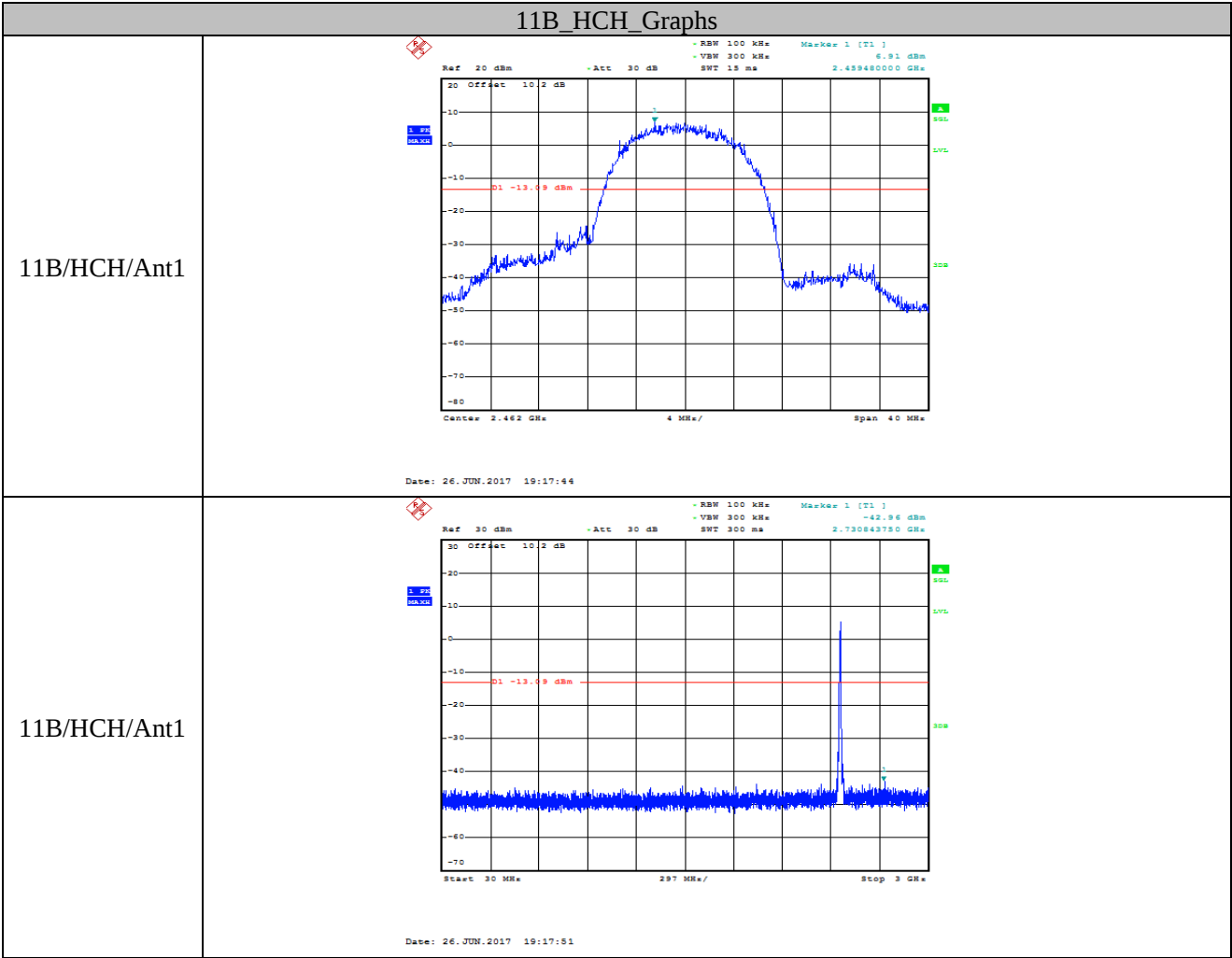
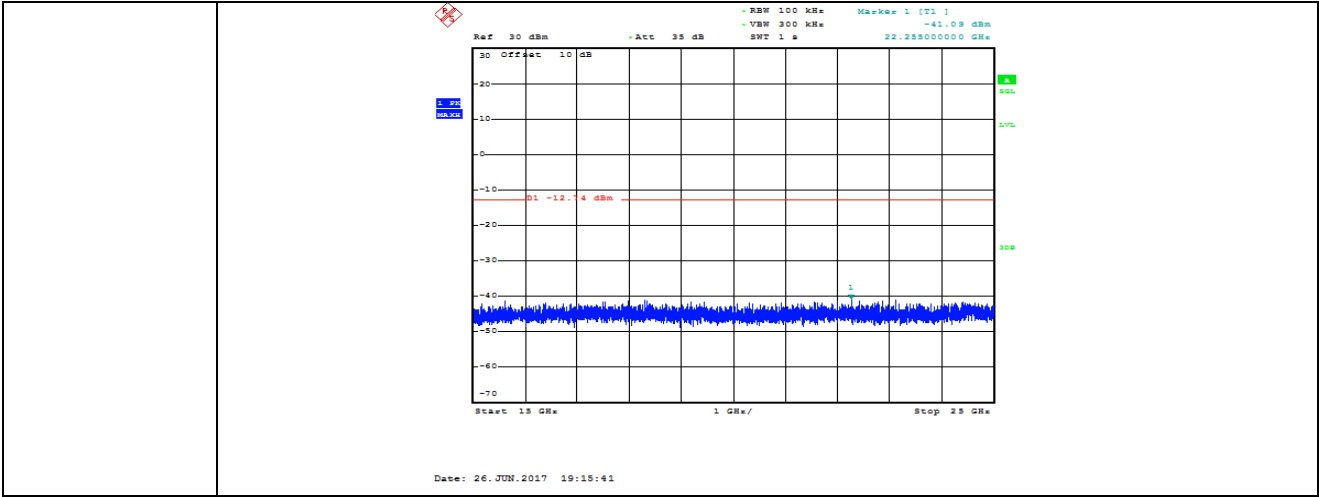


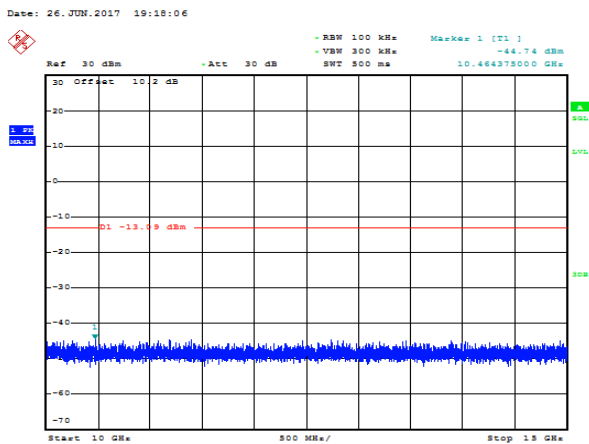
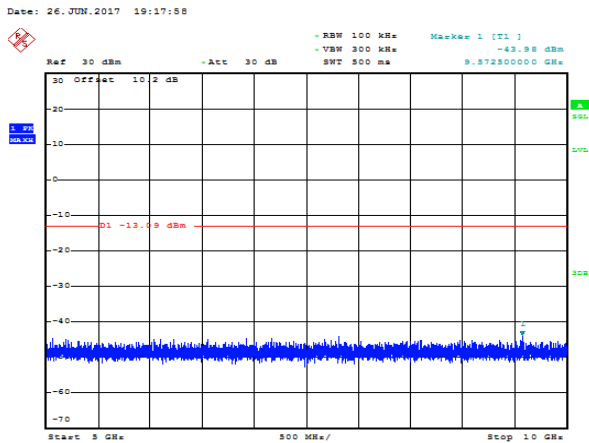
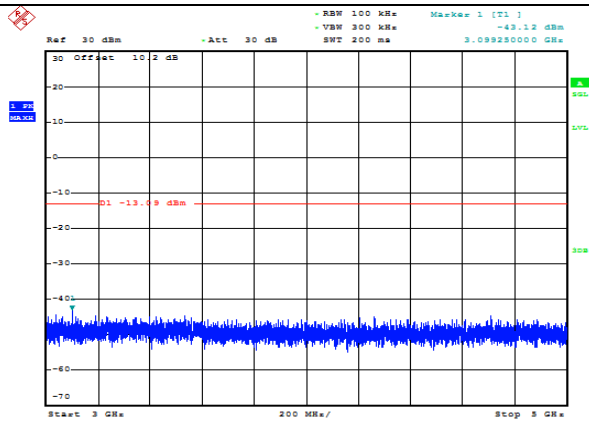
Date: 26 JUN 2017 19:11:23



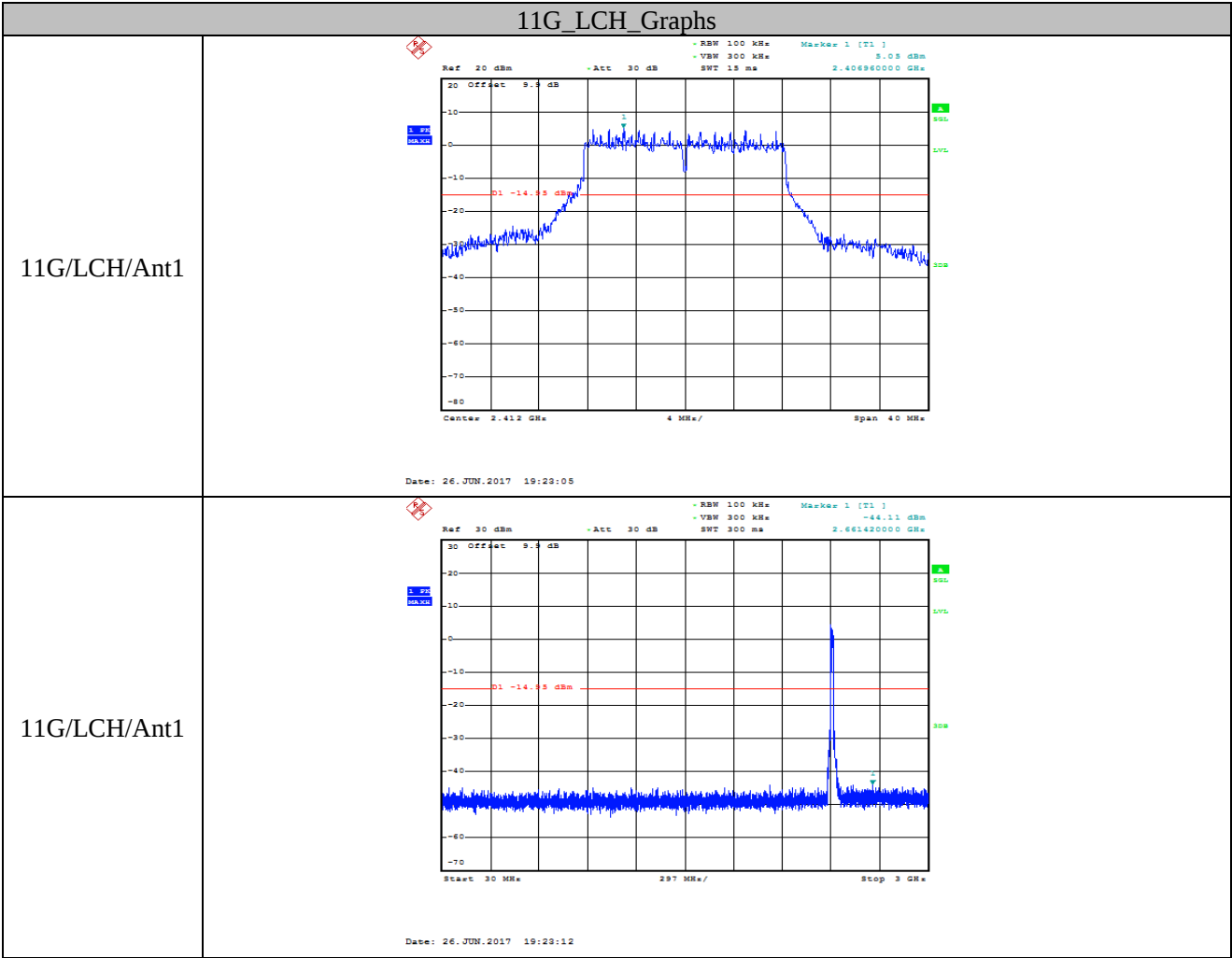
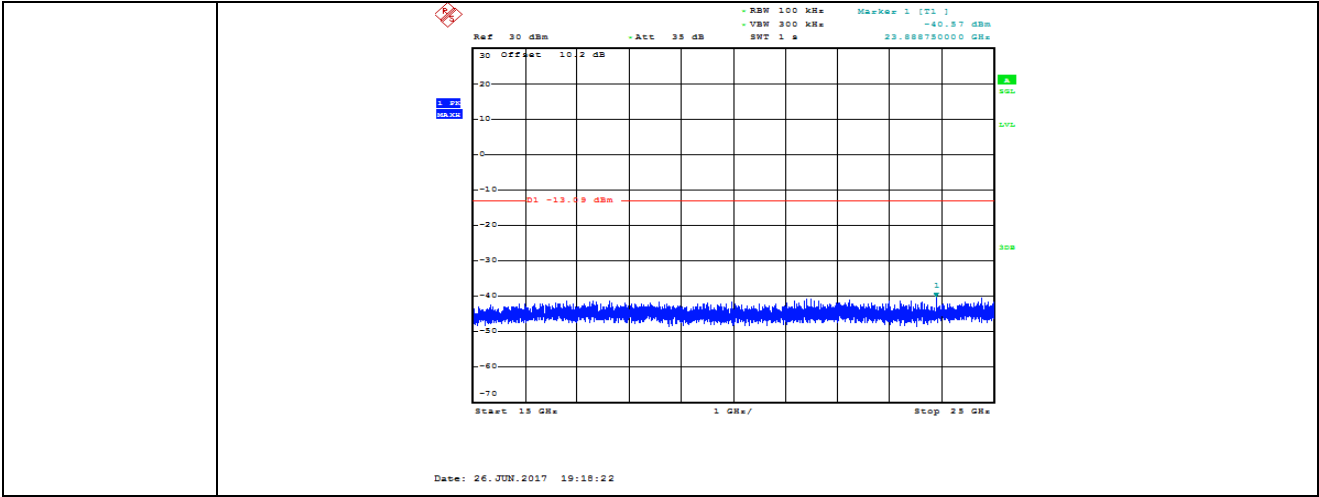


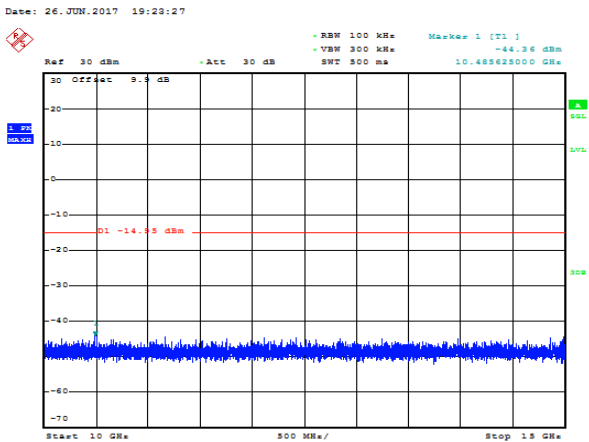
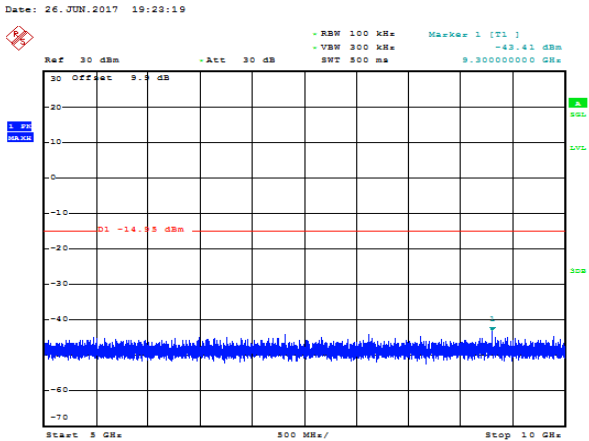
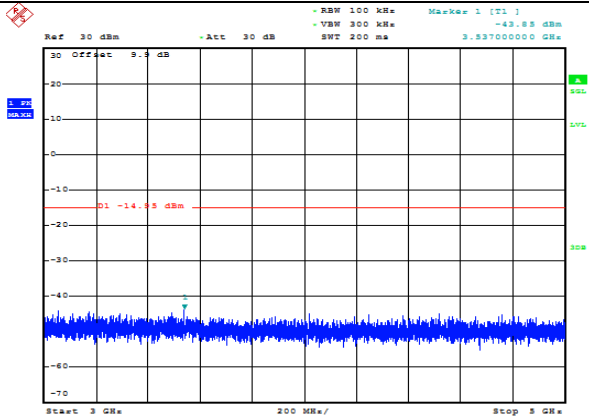
Date: 26 JUN 2017 19:15:33



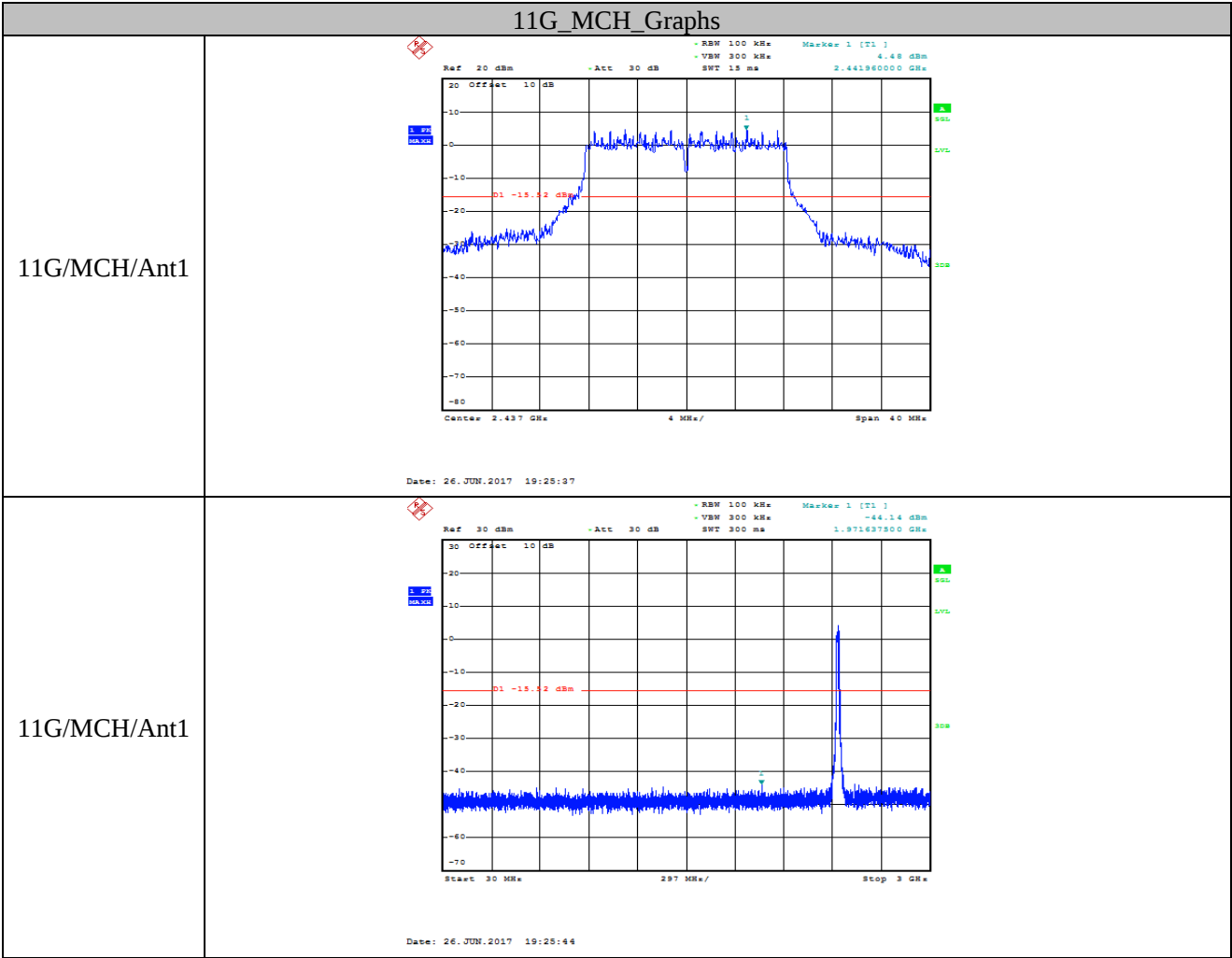
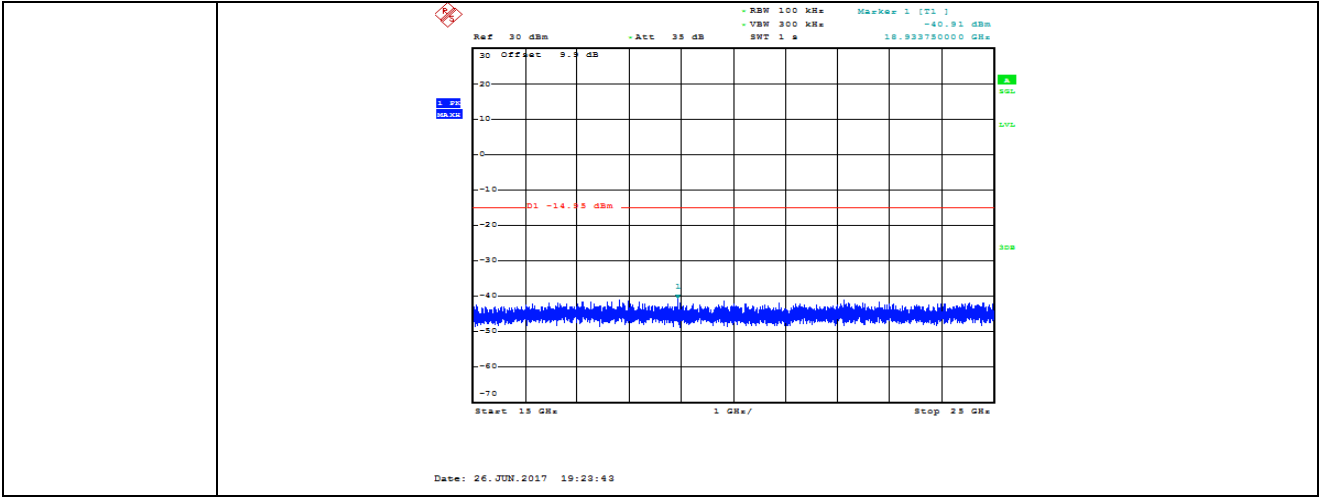


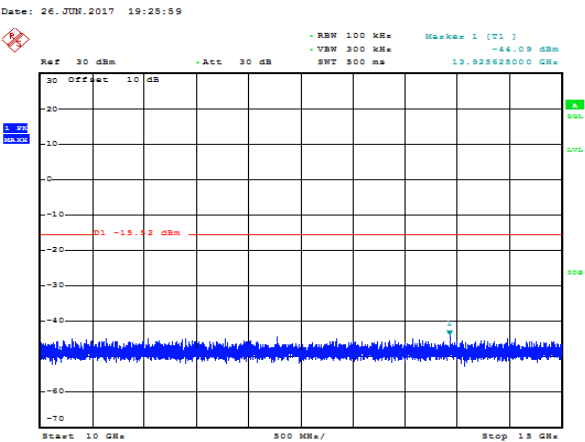
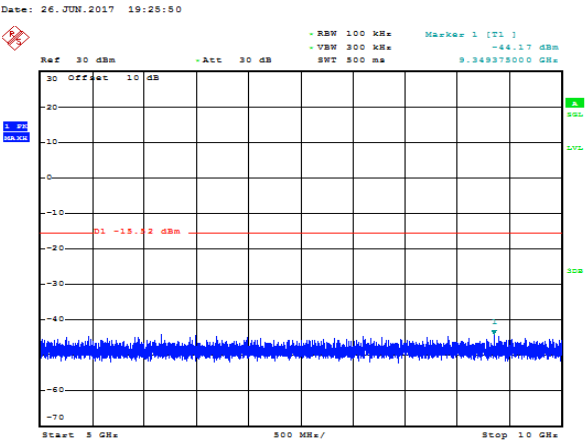
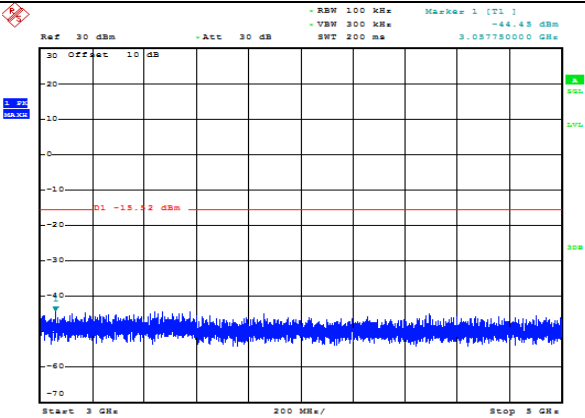
Date: 26 JUN 2017 19:18:14



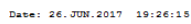


Date: 26 JUN 2017 19:28:35



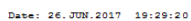


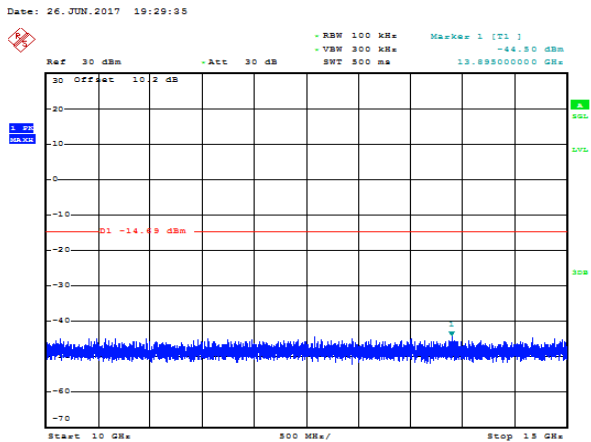
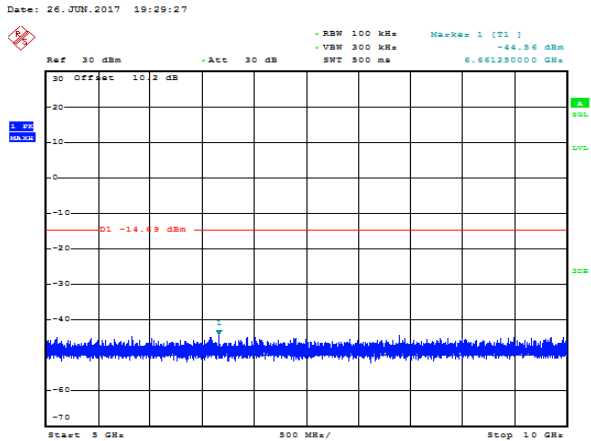
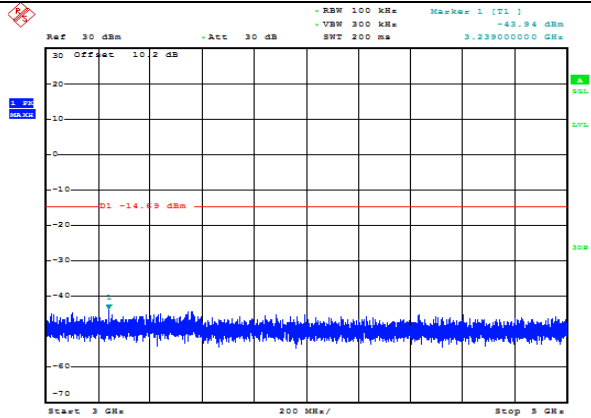
Date: 26 JUN 2017 19:26:07



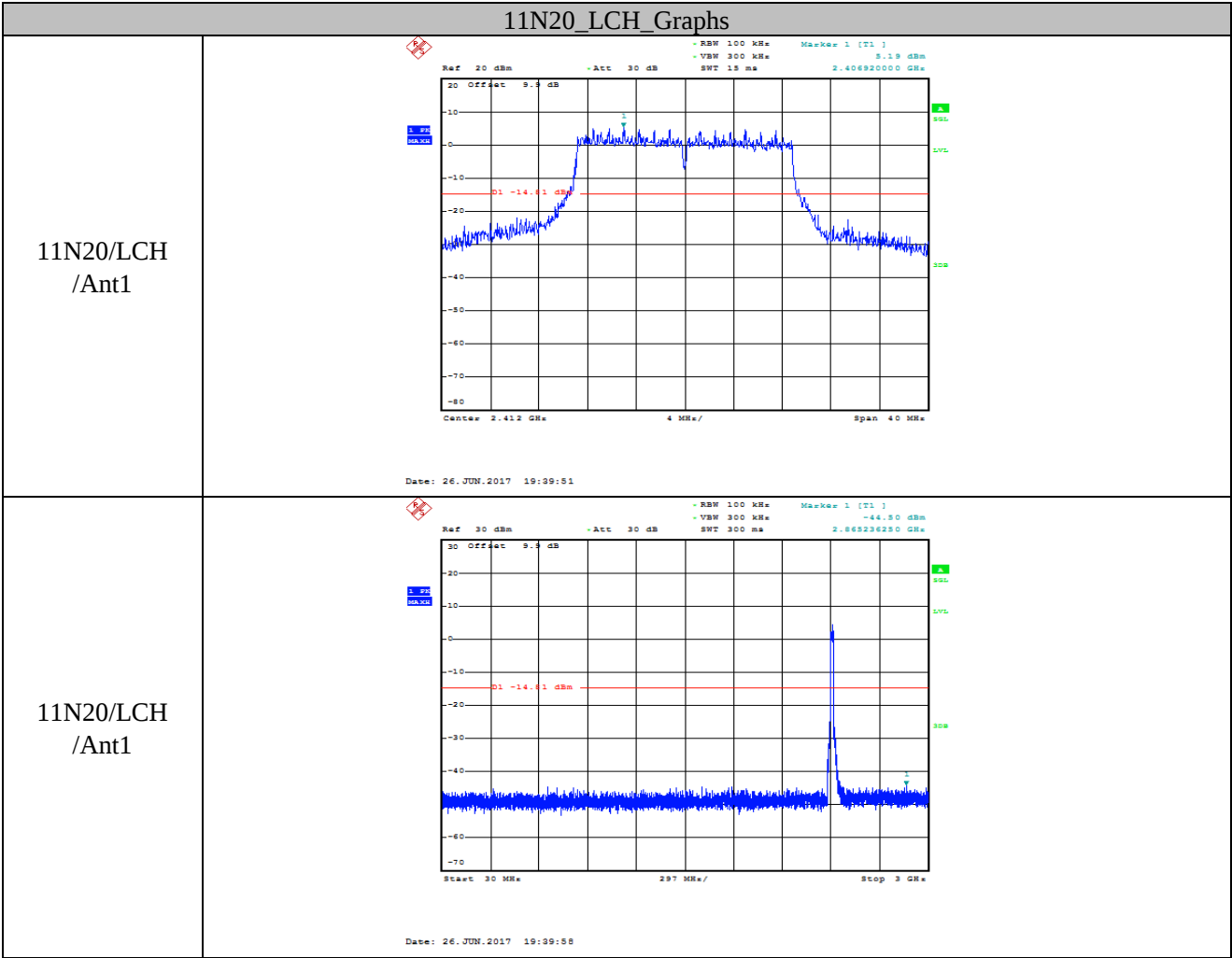
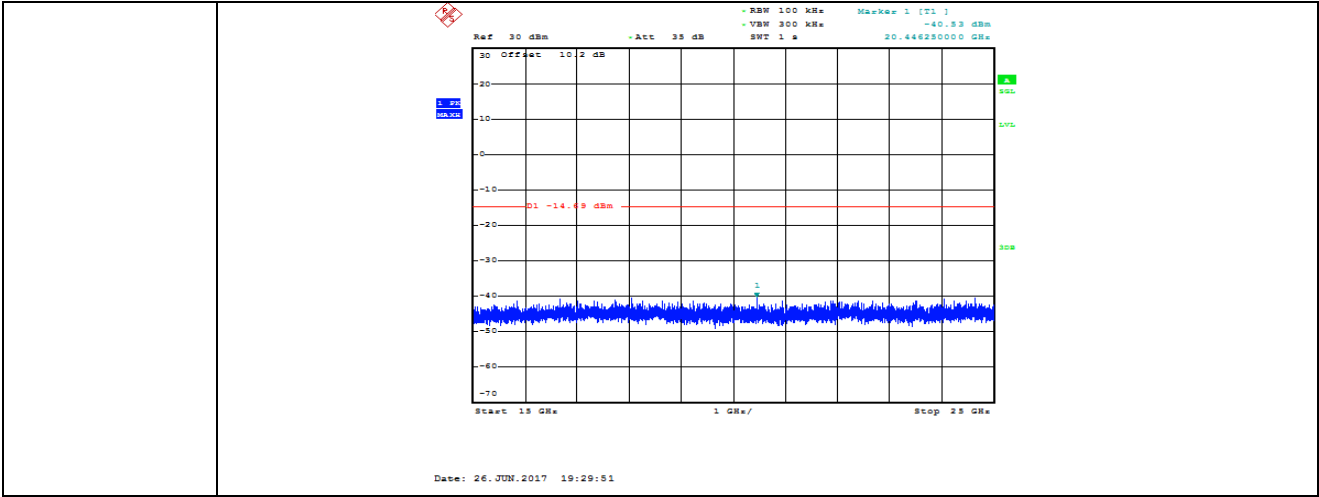
Date: 26.JUN.2017 19:29:14

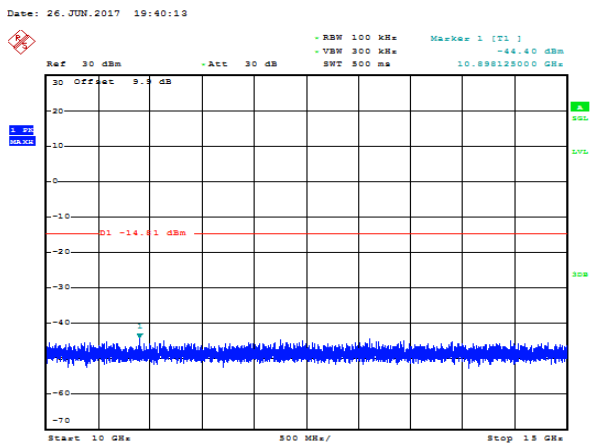
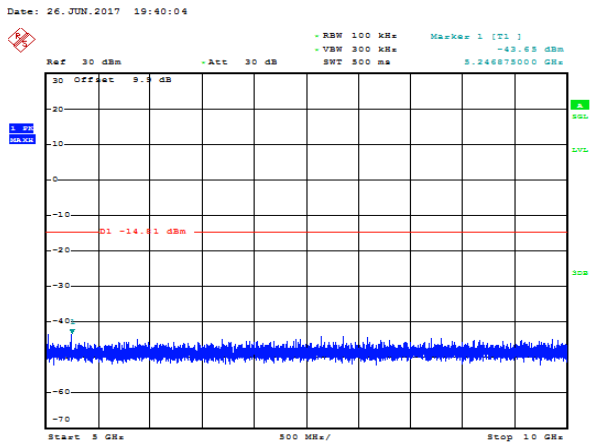
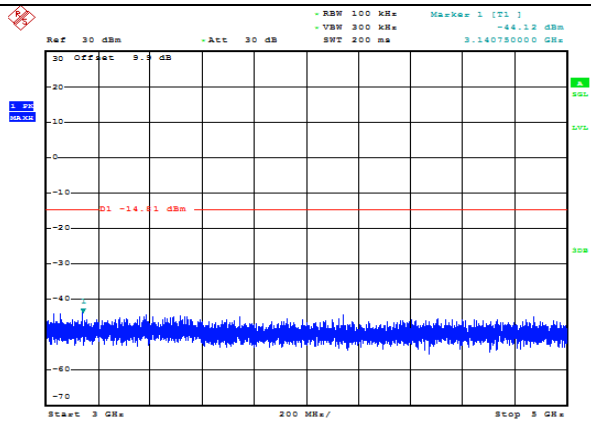
11G/HCH/Ant1



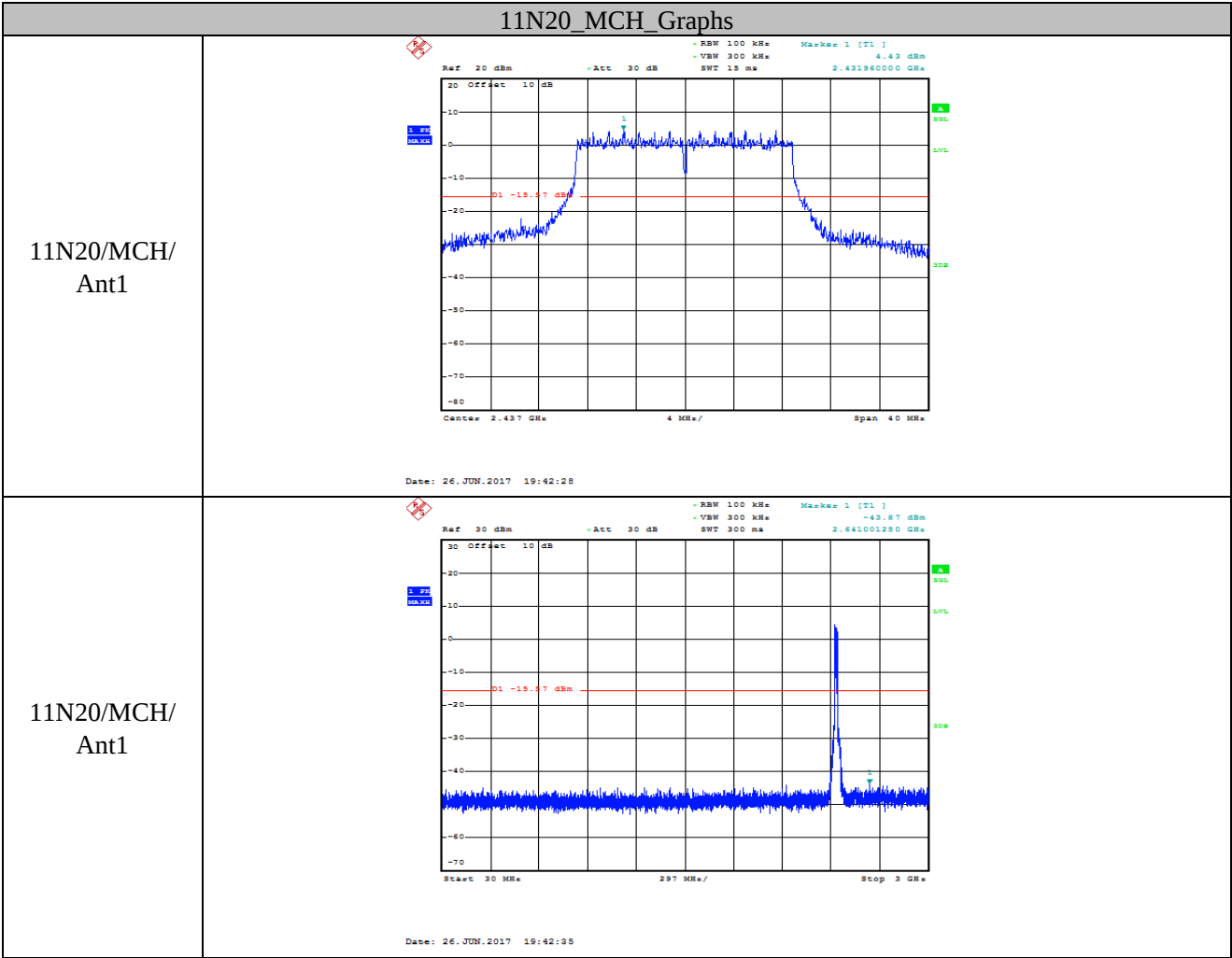
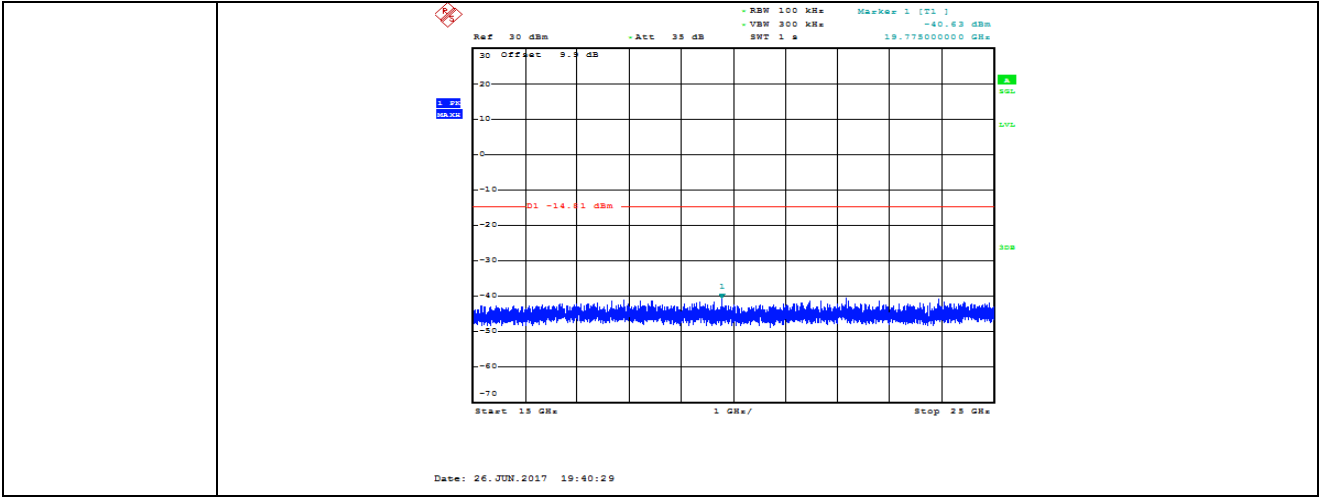


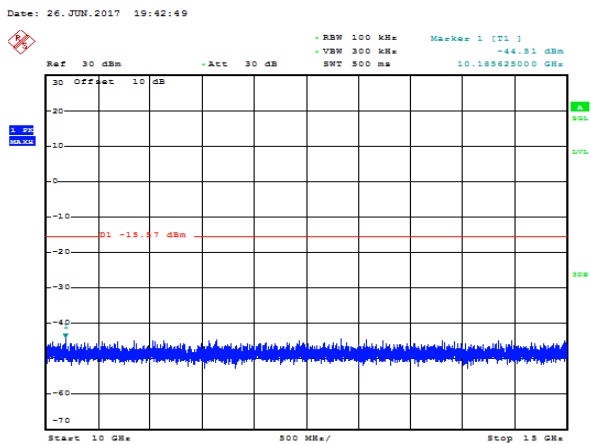
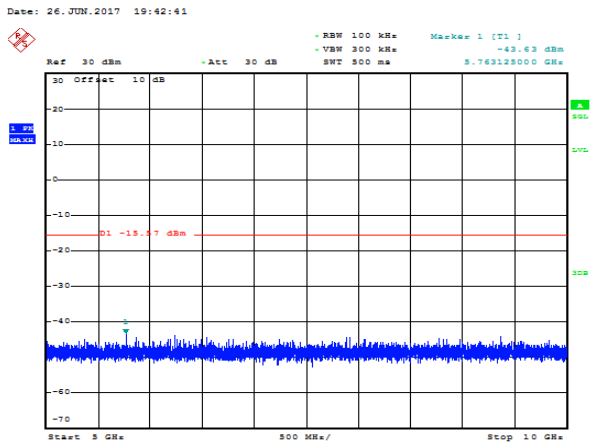
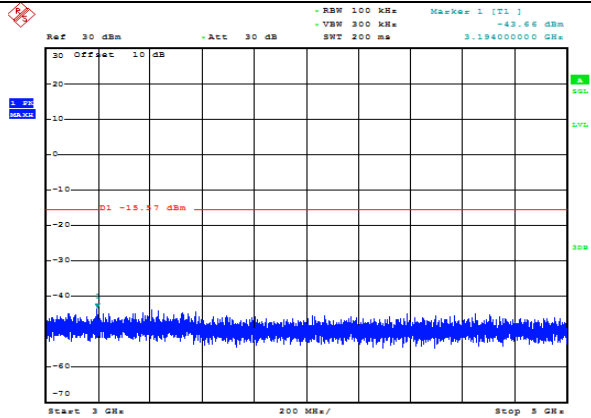
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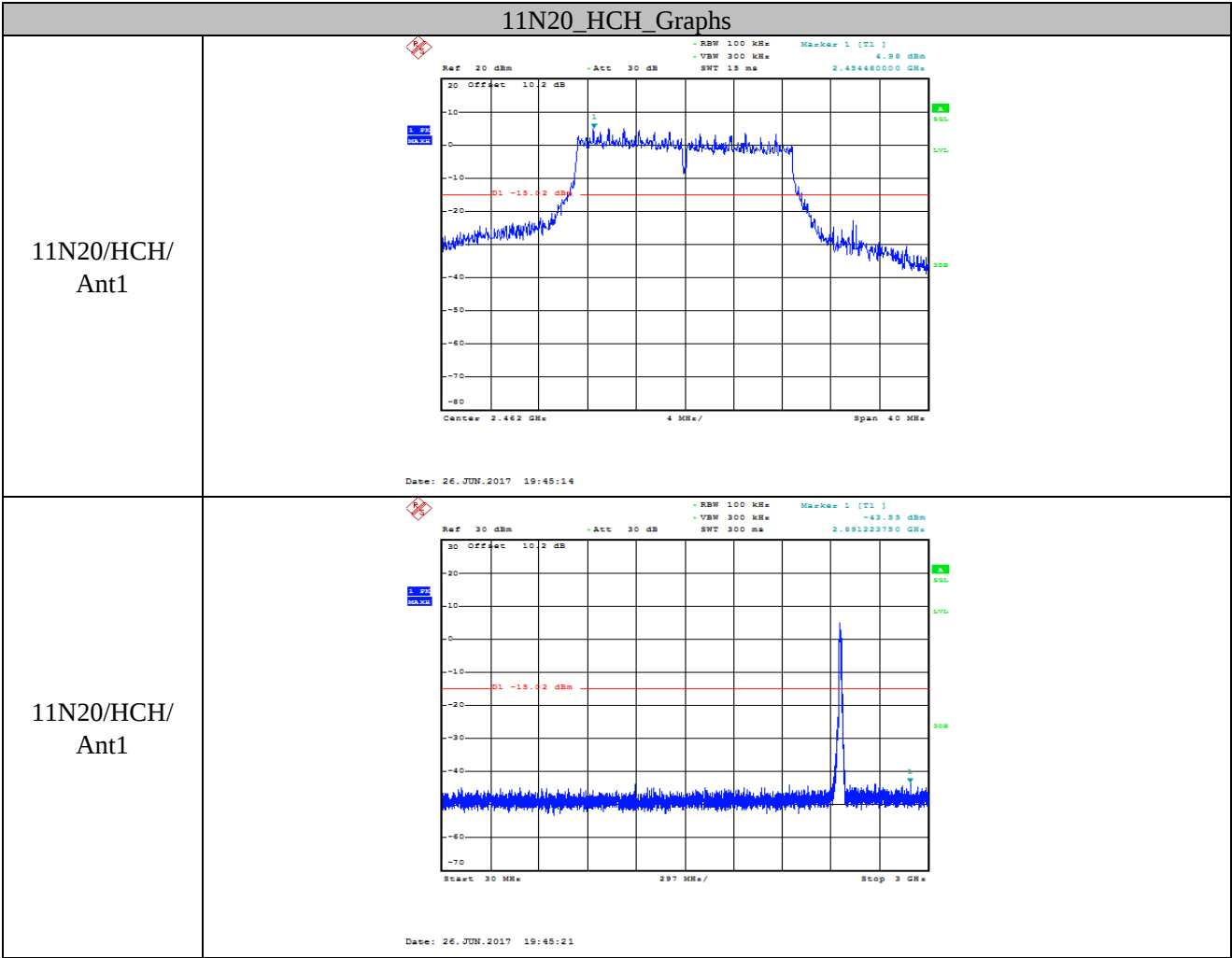
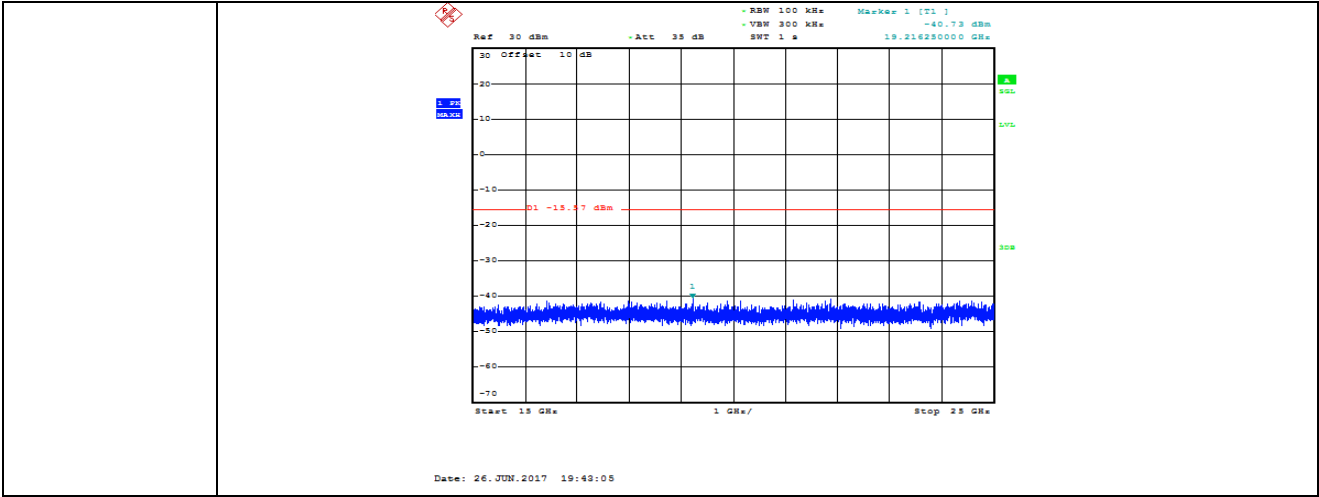


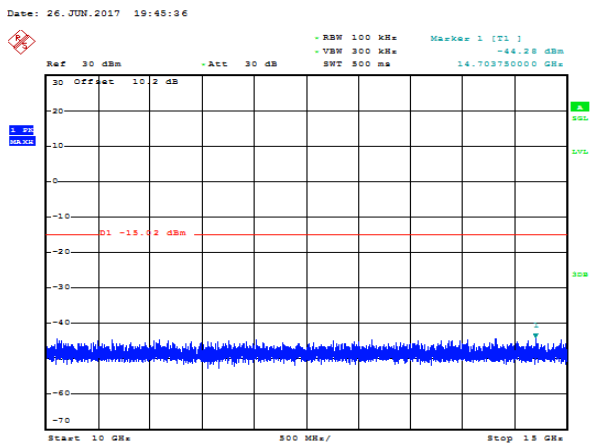
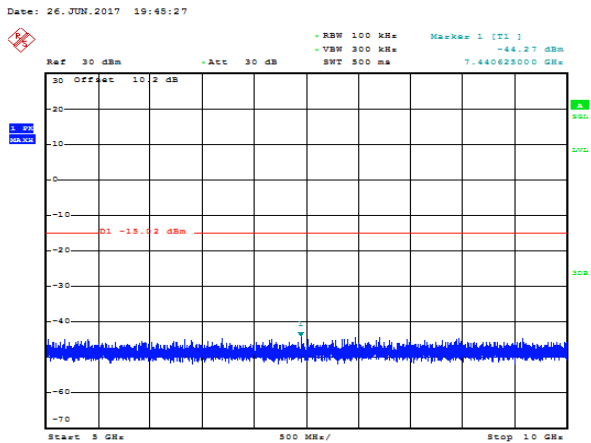
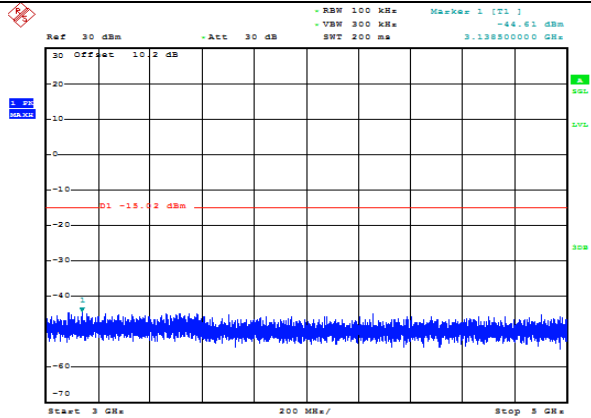
Date: 26 JUN 2017 19:40:21



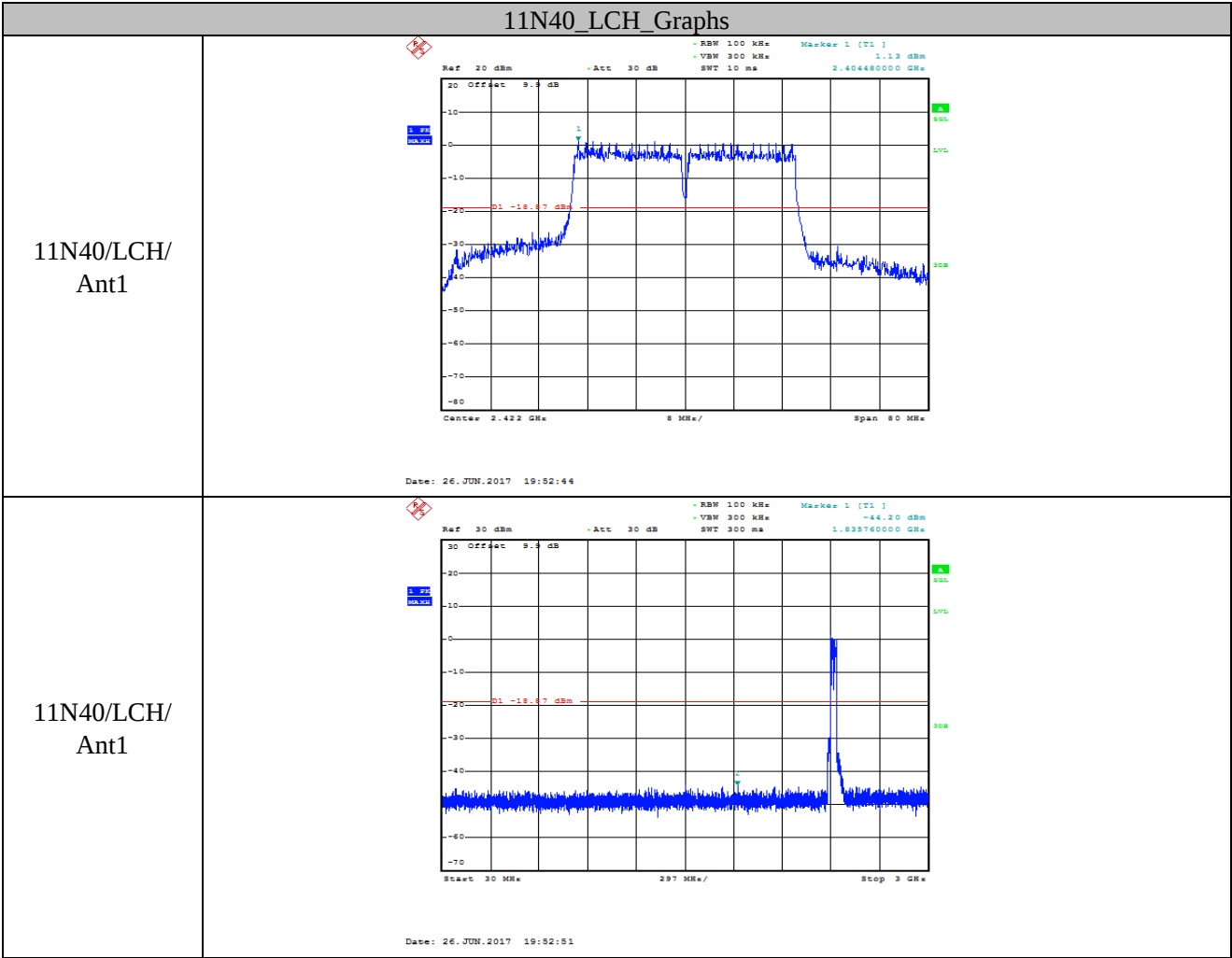
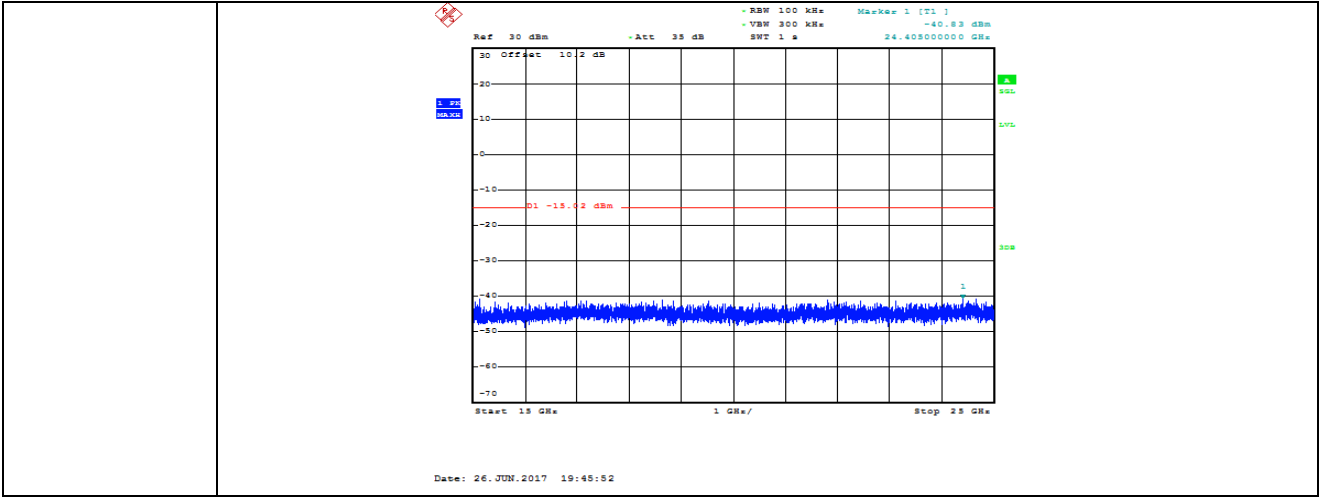


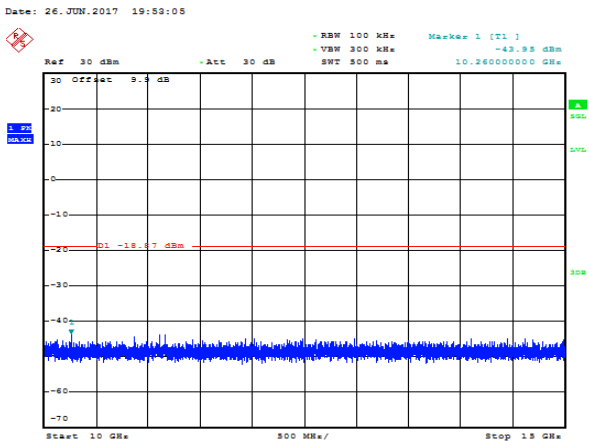
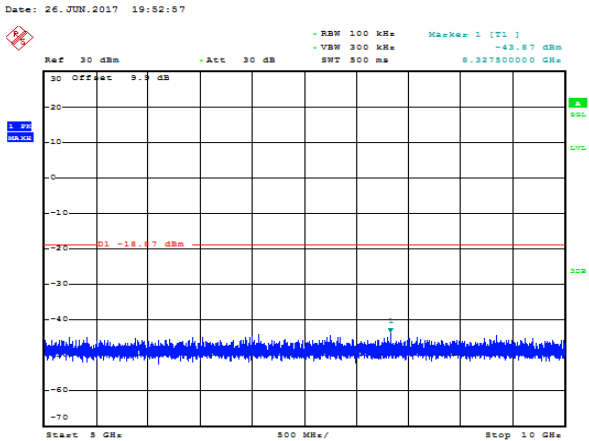
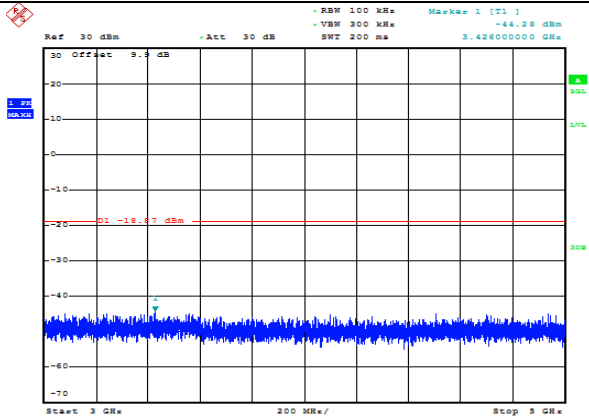
Date: 26 JUN 2017 19:42:57



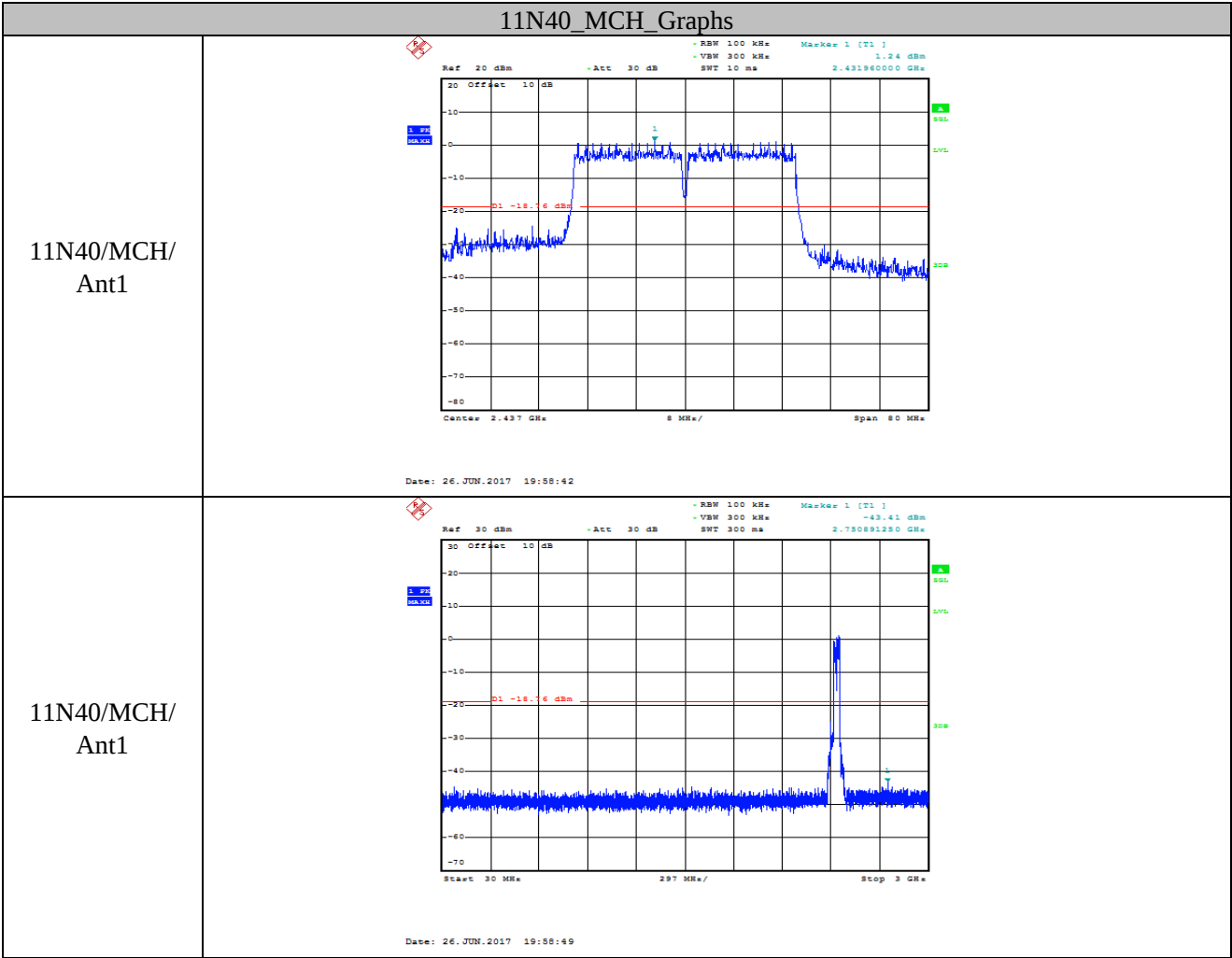
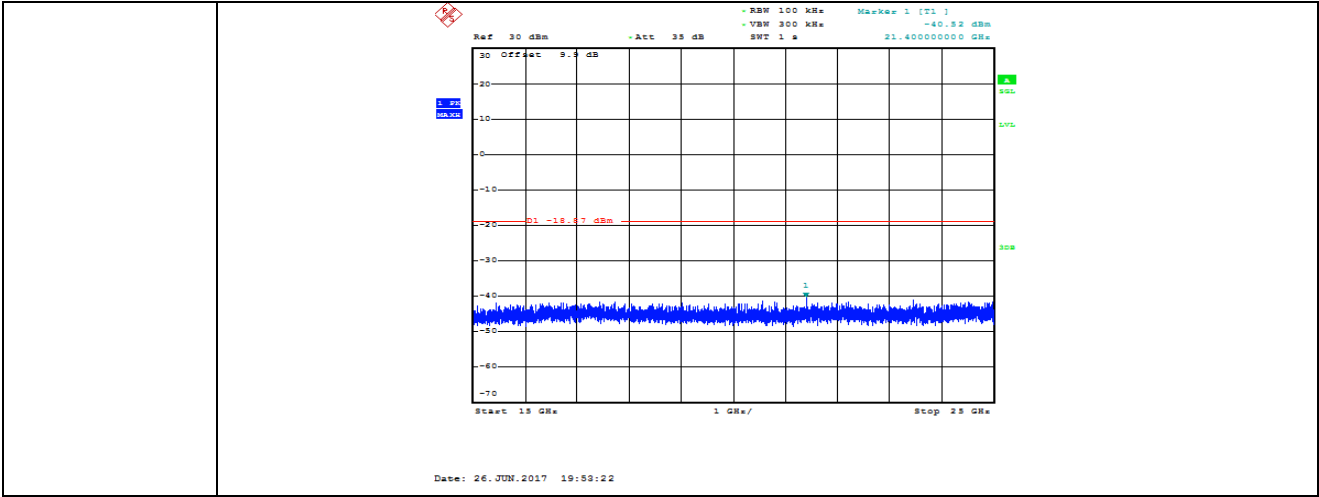


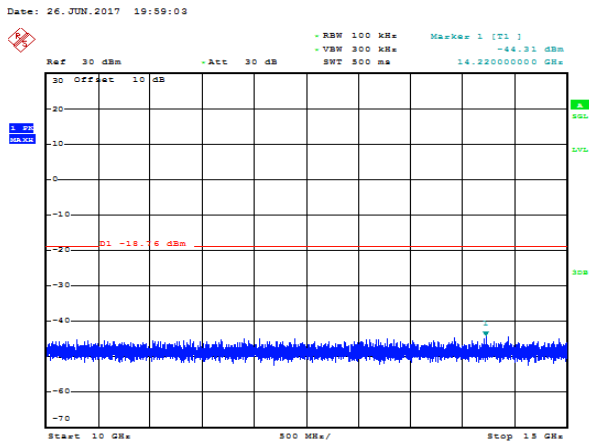
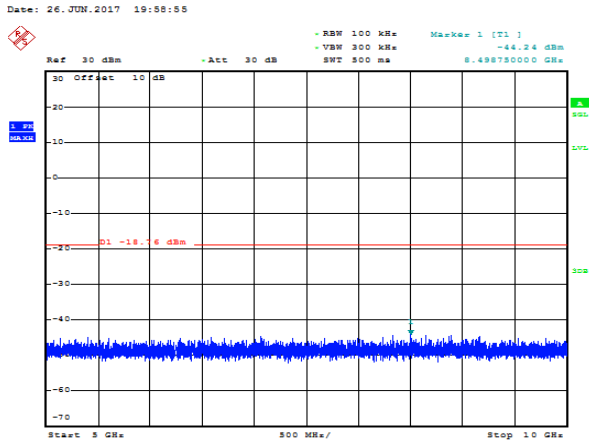
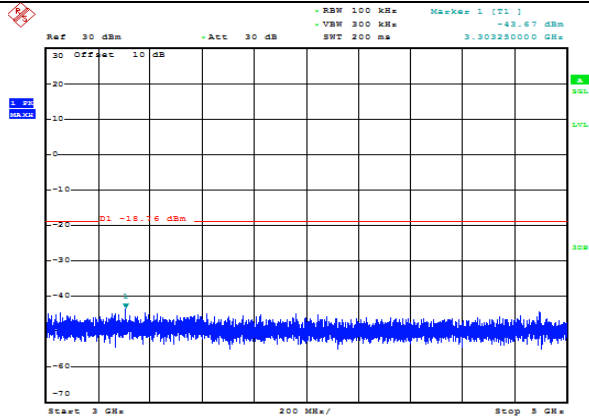
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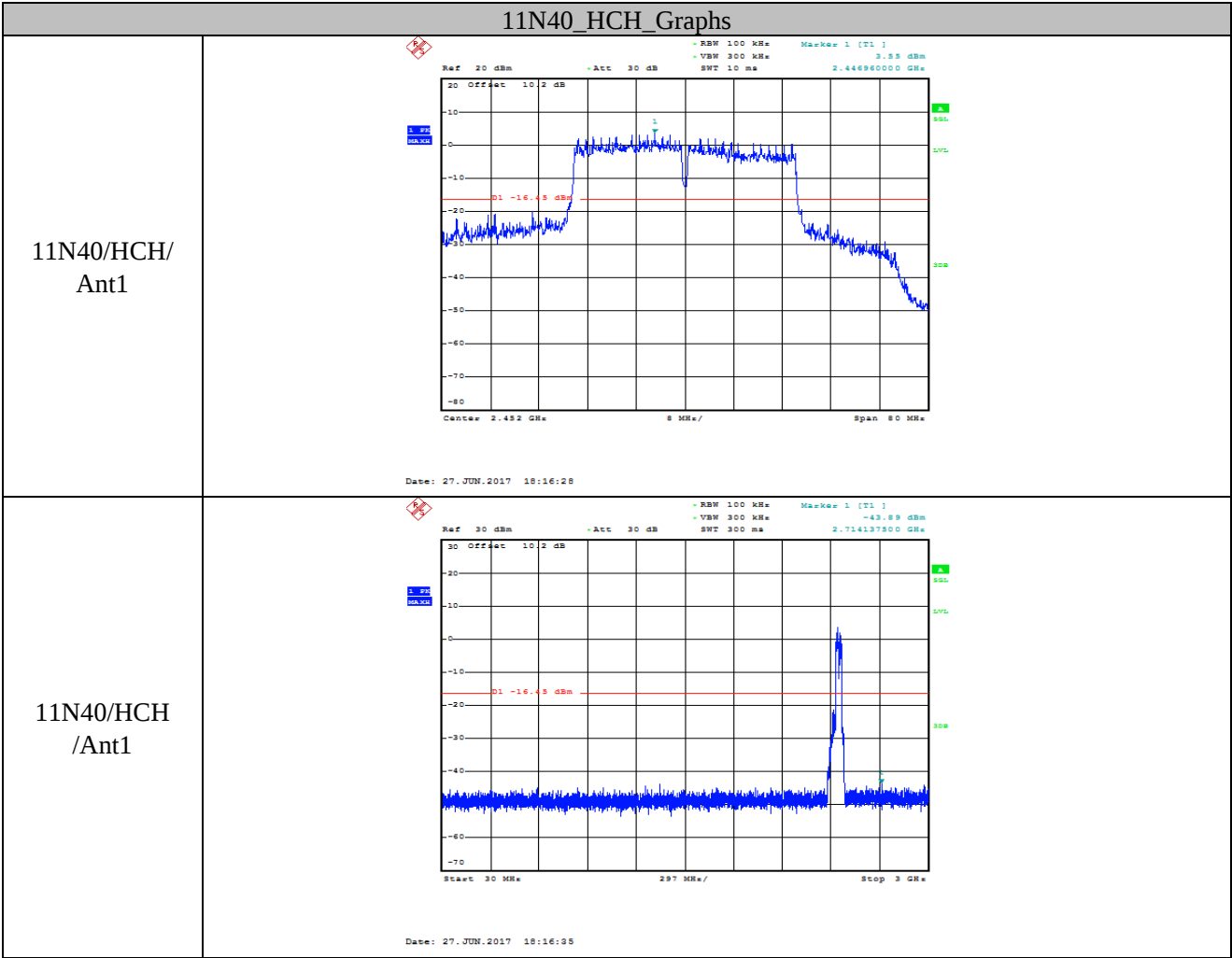
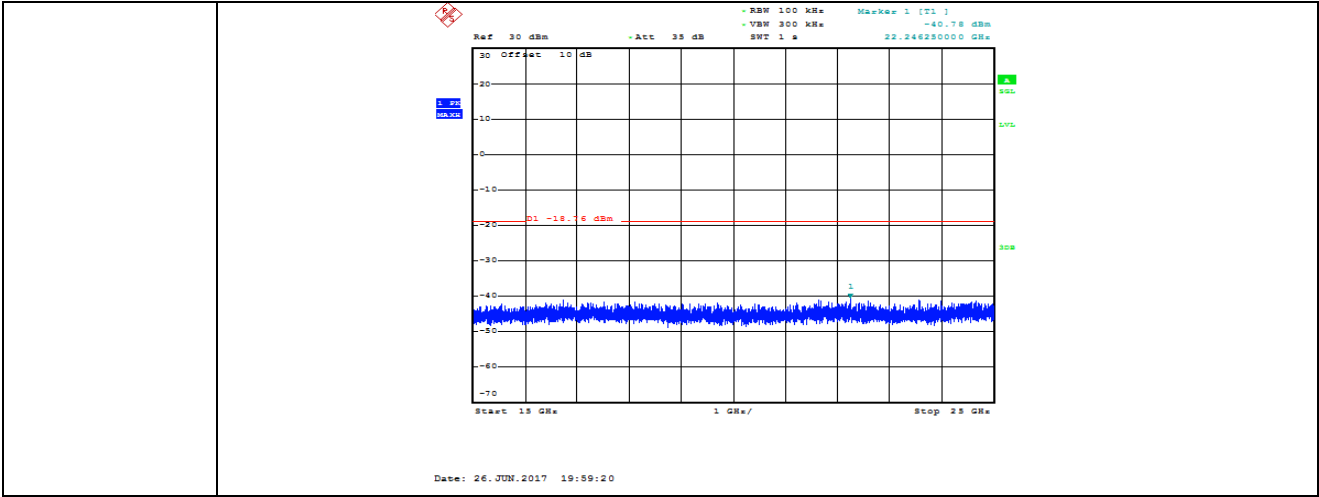


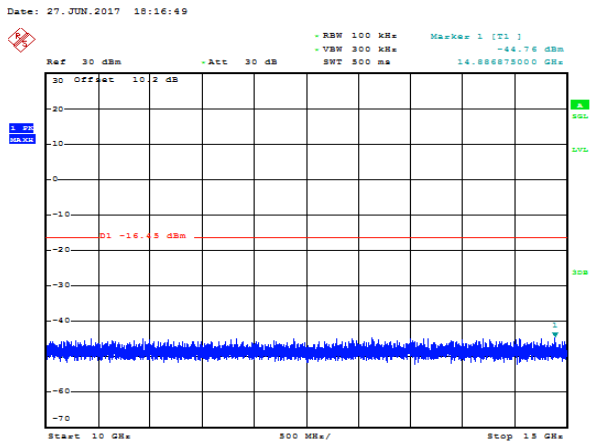
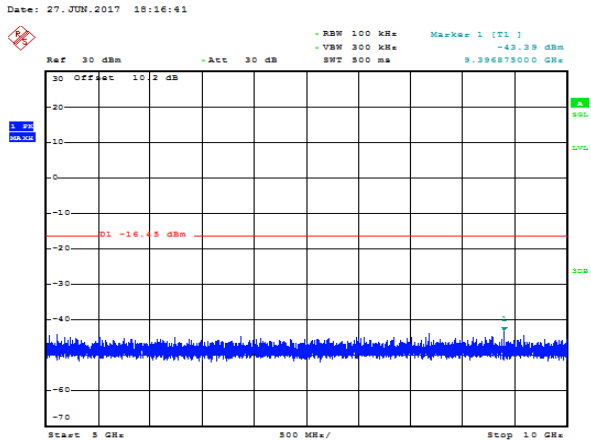
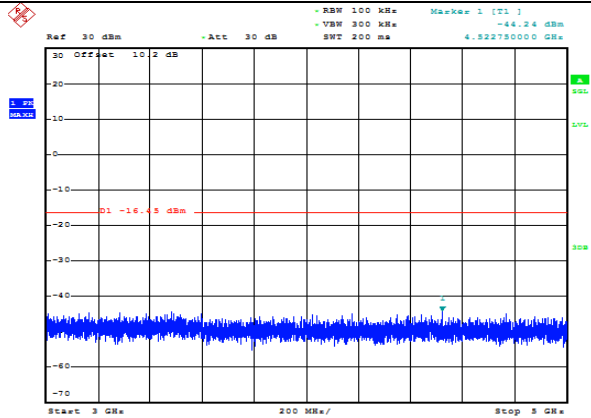
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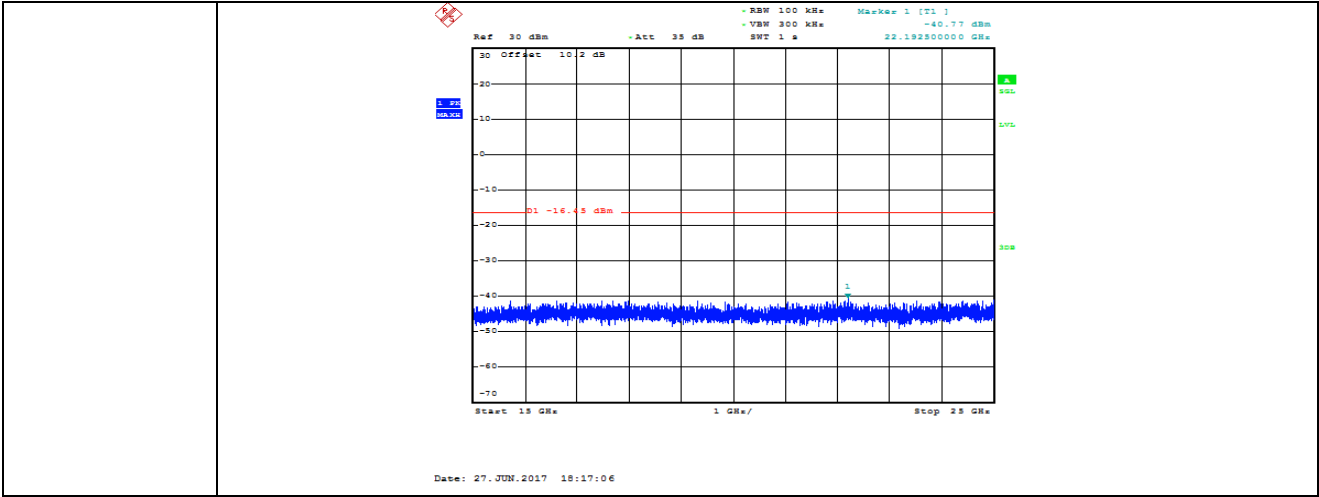


Date: 26 JUN 2017 19:59:11





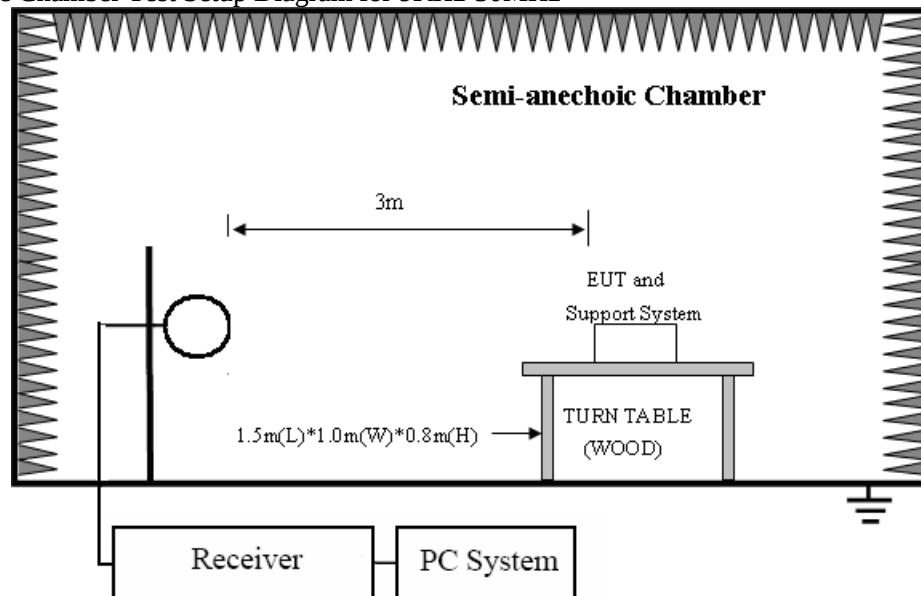
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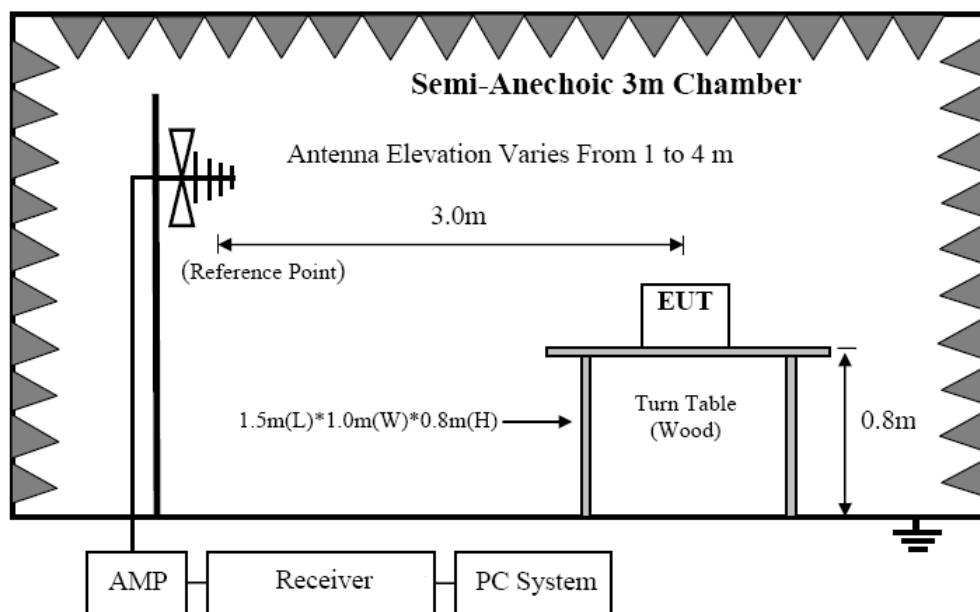
7. Radiated Spurious Emissions

7.1. Block diagram of test setup

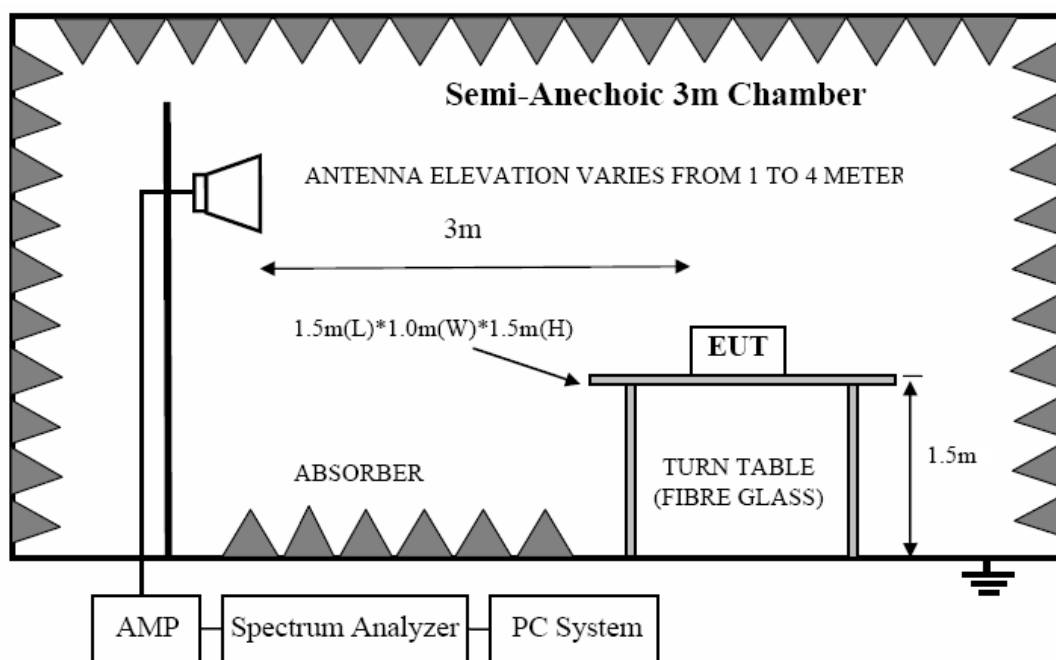
In 3m Anechoic Chamber Test Setup Diagram for 9KHz-30MHz



In 3m Anechoic Chamber Test Setup Diagram for 30MHz-1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

7.2. Limit

8.2.1 FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

8.2.2 FCC 15.209 Limit.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(KHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(KHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)
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Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\text{Log}(30m/3m)$$

8.2.3 Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

7.3. Test Procedure

(1) EUT height should be 0.8m for below 1GHz at a semi-anechoic chamber while EUT height should be 1.5m for above 1GHz at full chamber or semi-anechoic chamber ground with absorbers.

(2) The antenna used as below table.

Test frequency range	Test antenna used	Test antenna distance
9KHz-30MHz	Active Loop antenna	3m
30MHz-1GHz	Trilog Broadband Antenna	3m
1GHz-18GHz	Double Ridged Horn Antenna(1GHz-18GHz)	3m
18GHz-40GHz	Horn Antenna(18GHz-40GHz)	1m

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30MHz, the Trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of

Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9KHz to 25GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1m to 4m(Except loop antenna, it's fixed 1m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated, and

no any obvious emission were detected from 18GHz to 25GHz, so below final test was performed with frequency range from 9KHz to 18GHz.

- (4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2013 on Radiated Emission test.
- (5) The emissions from 9KHz to 1GHz were measured based on CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz, for emissions from 9KHz-90KHz, 110KHz-490KHz and above 1GHz were measured based on average detector, for emissions above 1GHz, peak emissions also be measured and need comply with Peak limit.
- (6) The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9KHz-150KHz	200Hz
150KHz-30MHz	9KHz
30MHz-1GHz	120KHz

- (7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RMS detector RBW 1MHz VBW 3MHz for Average measure(according ANSI C63.10:2013 clause 4.2.3.2.3 procedure for average measure).

7.4. Test result

PASS. (See below detailed test result)

All the emissions except fundamental emission from 9KHz to 25GHz were comply with 15.209 limit.

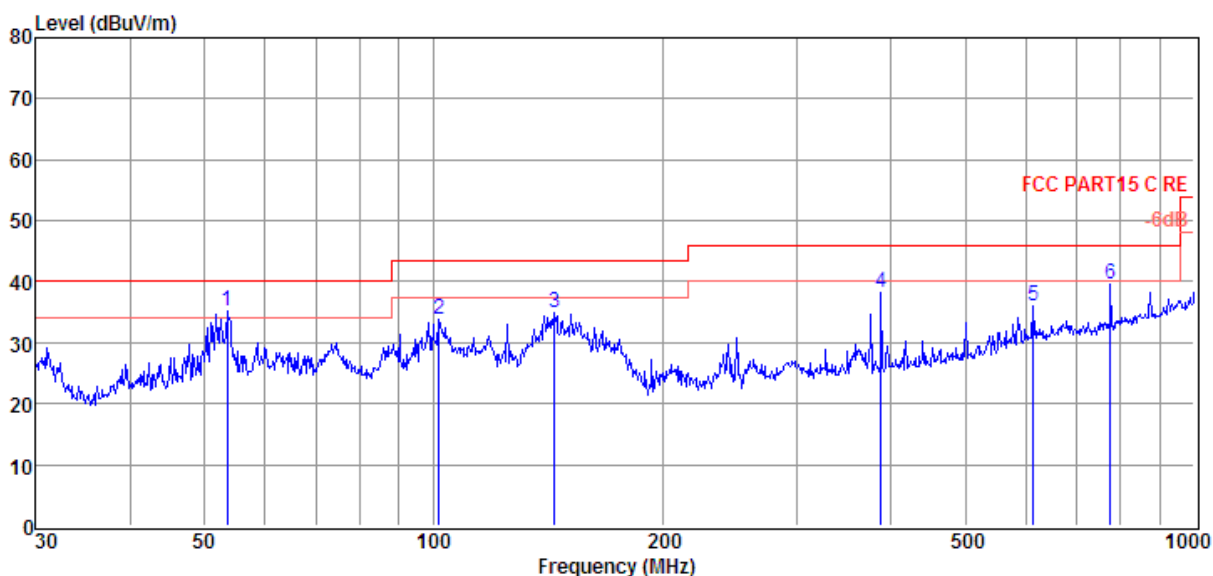
Note1: According exploratory test no any obvious emission were detected from 9kHz to 30MHz and 18GHz to 25GHz, so the final test was performed with frequency range from 30MHz to 18GHz and recorded in below.

Note2: For emissions below 1GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1GHz, the final test was only performed with EUT working in 11b, Tx CH6 mode.

Radiated Emission test (below 1GHz)**TR-4-E-009 Radiated Emission Test Result**

Test Site	: DDT 3m Chamber 1#	D:\2017 RE1# Report Data\17Q0626-5\RE.EM6
Test Date	: 2017-07-10	Tested By : Aaron
EUT	: Streaming wireless adaptor	Model Number : ADAPT+
Power Supply	: AC 120V/60Hz	Test Mode : Tx mode
Condition	: Temp:24.5'C,Humi:55%, Press:100.1kPa	Antenna/Distance : 2016 VULB9163 1#/3m/VERTICAL
Memo	:	

Data: 31



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	53.51	19.54	11.70	3.92	35.16	40.00	-4.84	QP	VERTICAL
2	101.64	17.51	11.87	4.31	33.69	43.50	-9.81	QP	VERTICAL
3	144.34	23.06	7.40	4.56	35.02	43.50	-8.48	QP	VERTICAL
4	387.99	16.95	15.44	5.75	38.14	46.00	-7.86	QP	VERTICAL
5	614.21	10.19	19.23	6.55	35.97	46.00	-10.03	QP	VERTICAL
6	776.88	11.85	20.61	7.05	39.51	46.00	-6.49	QP	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

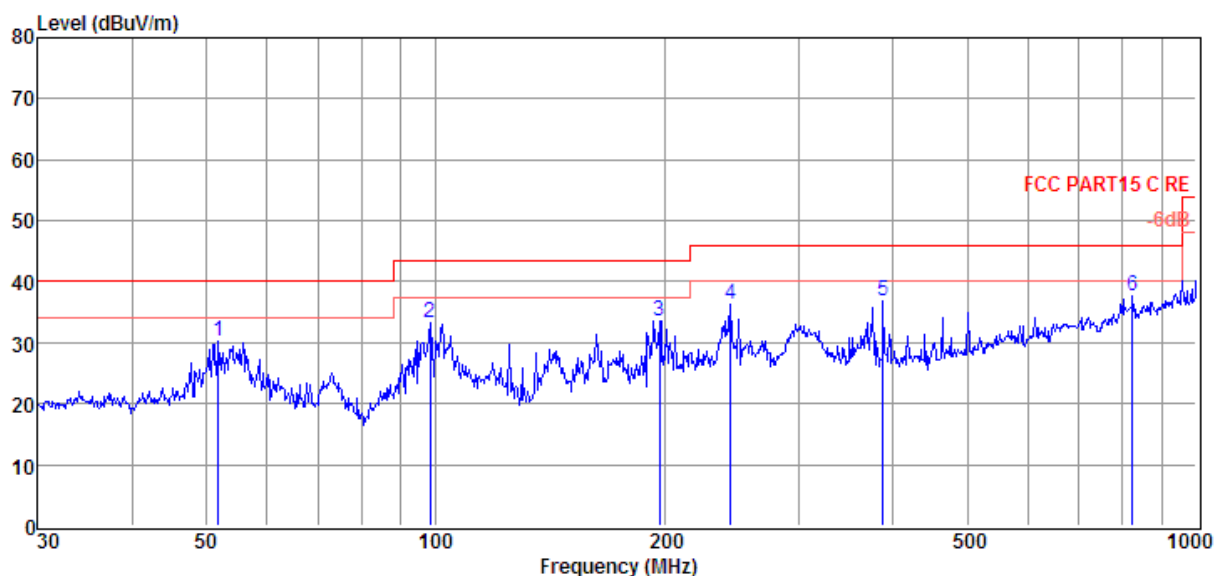
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **D:\2017 RE1# Report Data\17Q0626-5\RE.EM6**
Test Date : 2017-07-10 **Tested By** : Aaron
EUT : Streaming wireless adaptor **Model Number** : ADAPT+
Power Supply : AC 120V/60Hz **Test Mode** : Tx mode
Condition : Temp:24.5'C,Humi:55%,
Press:100.1kPa **Antenna/Distance** : 2016 VULB9163 1#/3m/HORIZONTAL
Memo :

Data: 32



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	51.84	14.57	11.72	3.91	30.20	40.00	-9.80	QP	HORIZONTAL
2	98.49	17.13	11.88	4.28	33.29	43.50	-10.21	QP	HORIZONTAL
3	197.20	18.60	10.19	4.88	33.67	43.50	-9.83	QP	HORIZONTAL
4	244.23	18.95	12.24	5.11	36.30	46.00	-9.70	QP	HORIZONTAL
5	387.99	15.70	15.44	5.75	36.89	46.00	-9.11	QP	HORIZONTAL
6	824.60	9.03	21.45	7.19	37.67	46.00	-8.33	QP	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Radiated Emission test (above 1GHz)

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	PRM Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμ V/m)	Margin (dB)	Detector type	Polarization
11b CH1									
5471.00	35.19	34.64	29.27	9.16	49.72	74.00	-24.28	Peak	HORIZONTAL
7341.00	34.99	36.48	30.59	10.72	51.60	74.00	-22.40	Peak	HORIZONTAL
8769.00	35.18	36.50	32.15	11.73	51.26	74.00	-22.74	Peak	HORIZONTAL
9755.00	34.57	36.66	32.82	12.40	50.81	74.00	-23.19	Peak	HORIZONTAL
16521.00	18.30	44.67	36.06	17.51	44.42	54.00	-9.58	Average	HORIZONTAL
16521.00	35.55	44.67	36.06	17.51	61.67	74.00	-12.33	Peak	HORIZONTAL
4808.00	34.97	33.74	29.32	8.46	47.85	74.00	-26.15	Peak	VERTICAL
5454.00	35.03	34.61	29.28	9.14	49.50	74.00	-24.50	Peak	VERTICAL
7239.00	36.25	36.39	30.52	10.65	52.77	74.00	-21.23	Peak	VERTICAL
8769.00	35.52	36.50	32.15	11.73	51.60	74.00	-22.40	Peak	VERTICAL
16606.00	18.60	44.53	36.21	17.71	44.63	54.00	-9.37	Average	VERTICAL
16606.00	34.79	44.53	36.21	17.71	60.82	74.00	-13.18	Peak	VERTICAL
11b CH6									
4111.00	35.49	33.49	29.06	7.71	47.63	74.00	-26.37	Peak	HORIZONTAL
6355.00	34.28	35.57	29.54	9.87	50.18	74.00	-23.82	Peak	HORIZONTAL
8004.00	34.96	36.69	31.13	11.13	51.65	74.00	-22.35	Peak	HORIZONTAL
12016.00	33.30	37.62	34.80	14.24	50.36	74.00	-23.64	Peak	HORIZONTAL
16334.00	20.79	44.44	35.86	17.35	46.72	54.00	-7.28	Average	HORIZONTAL
16334.00	35.79	44.44	35.86	17.35	61.72	74.00	-12.28	Peak	HORIZONTAL
4400.00	34.87	33.72	29.15	8.04	47.48	74.00	-26.52	Peak	VERTICAL
6474.00	34.12	35.76	29.78	9.93	50.03	74.00	-23.97	Peak	VERTICAL
7936.00	34.88	36.69	31.11	11.10	51.56	74.00	-22.44	Peak	VERTICAL
12016.00	32.90	37.62	34.80	14.24	49.96	74.00	-24.04	Peak	VERTICAL
16351.00	19.47	44.46	35.86	17.38	45.45	54.00	-8.55	Average	VERTICAL
16351.00	35.47	44.46	35.86	17.38	61.45	74.00	-12.55	Peak	VERTICAL
11b CH11									
4434.00	34.44	33.75	29.18	8.08	47.09	74.00	-26.91	Peak	HORIZONTAL
7069.00	35.13	36.26	30.42	10.50	51.47	74.00	-22.53	Peak	HORIZONTAL
8939.00	35.39	37.24	32.26	11.79	52.16	74.00	-21.84	Peak	HORIZONTAL
13206.00	34.69	39.01	35.54	14.73	52.89	74.00	-21.11	Peak	HORIZONTAL
16300.00	20.48	44.38	35.80	17.33	46.39	54.00	-7.61	Average	HORIZONTAL
16300.00	35.48	44.38	35.80	17.33	61.39	74.00	-12.61	Peak	HORIZONTAL
4060.00	35.96	33.45	29.05	7.67	48.03	74.00	-25.97	Peak	VERTICAL
6644.00	33.82	35.92	30.08	10.08	49.74	74.00	-24.26	Peak	VERTICAL
7936.00	35.30	36.69	31.11	11.10	51.98	74.00	-22.02	Peak	VERTICAL
12985.00	34.75	38.79	35.70	14.67	52.51	74.00	-21.49	Peak	VERTICAL
16589.00	20.27	44.56	36.21	17.64	46.26	54.00	-7.74	Average	VERTICAL
16589.00	36.27	44.56	36.21	17.64	62.26	74.00	-11.74	Peak	VERTICAL

Note: 1.30MHz~25GHz: (Scan with 11b mode, 11g mode, 11n HT20 mode, and 11n HT40 mode, the worst case is 11b mode)

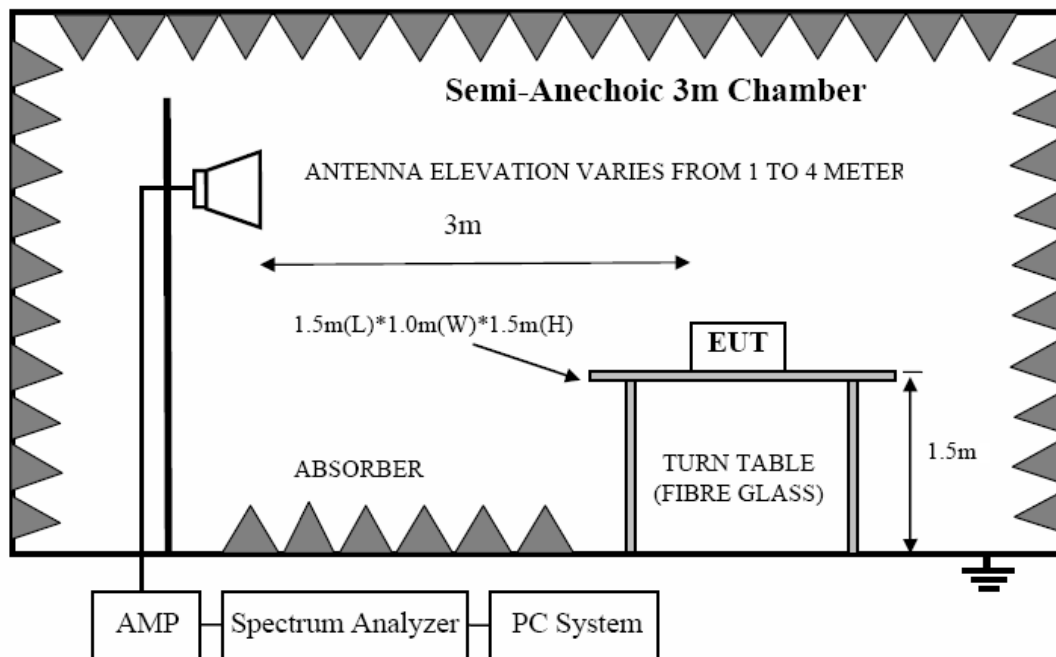
2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

4: For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

8. Radiated Band Edge Compliance

8.1. Block diagram of test setup



8.2. Limit

All restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with RSS-Gen Issue 3 clause 7.2.5 (Same as FCC 15.209) limits.

8.3. Test Procedure

Same with clause 8.3 except change investigated frequency range from 2100MHz to 2450MHz and 2450MHz to 2500MHz.

Remark: All restriction band have been tested, and only the worse case is shown in report.

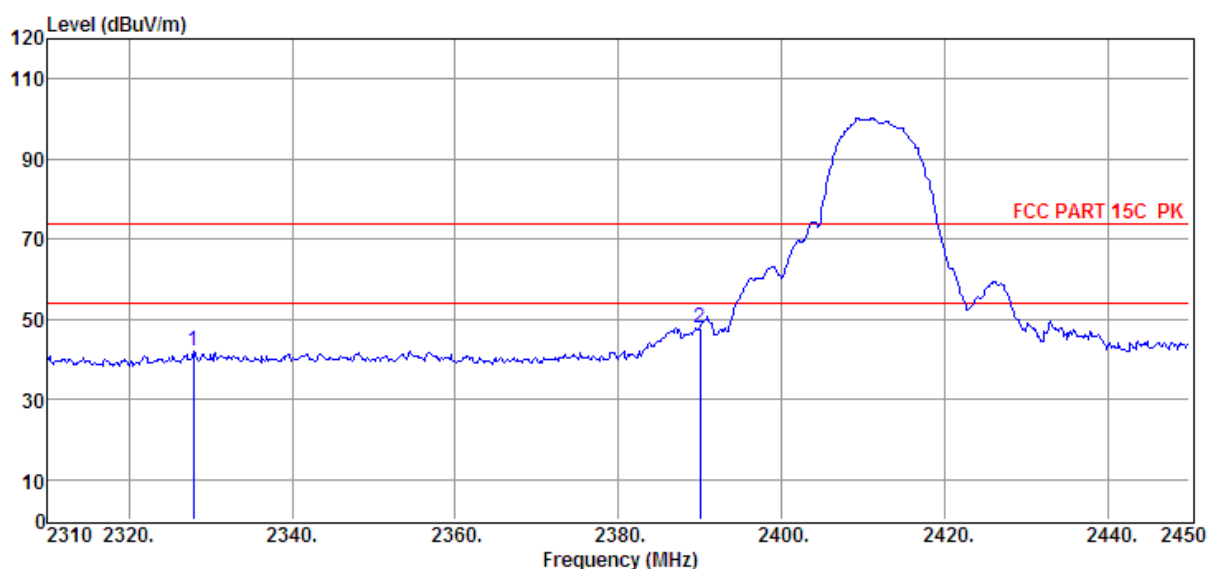
8.4. Test result

PASS. (See below detailed test result)

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11b 2412MHz (ant1)

Data: 3



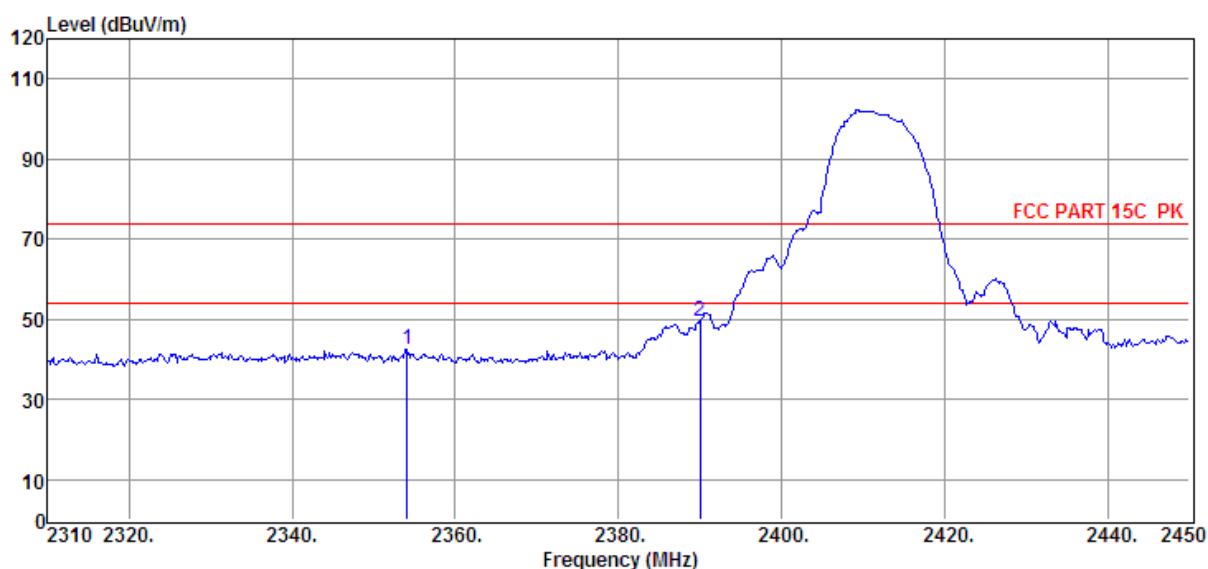
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2327.92	35.96	29.53	29.31	5.94	42.12	74.00	-31.88	Peak	HORIZONTAL
2	2390.00	41.47	29.78	29.42	6.03	47.86	74.00	-26.14	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11b 2412MHz (ant1)

Data: 4



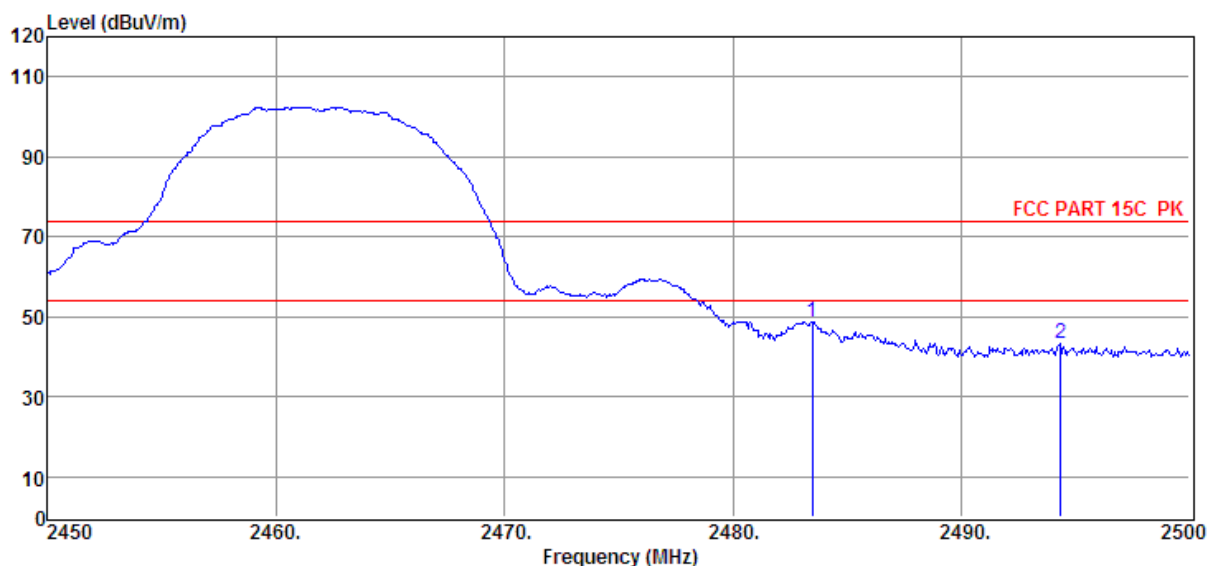
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2354.10	36.06	29.63	29.34	5.96	42.31	74.00	-31.69	Peak	VERTICAL
2	2390.00	43.05	29.78	29.42	6.03	49.44	74.00	-24.56	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11b 2462MHz (ant1)

Data: 9



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	42.15	30.14	29.71	6.13	48.71	74.00	-25.29	Peak	VERTICAL
2	2494.35	36.67	30.18	29.73	6.17	43.29	74.00	-30.71	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

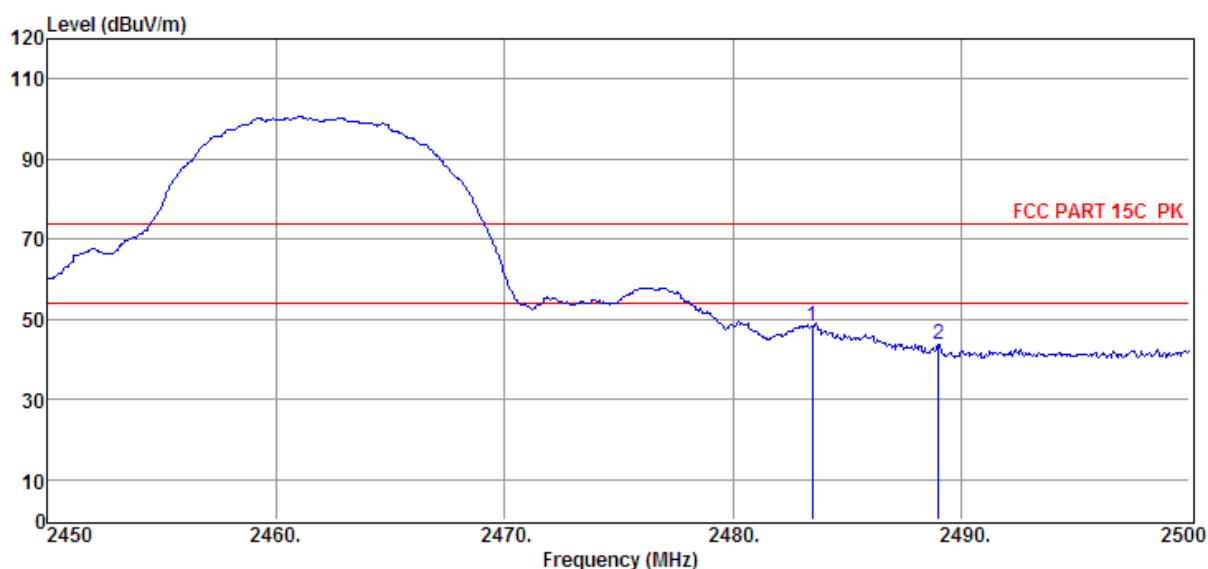
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11b 2462MHz (ant1)

Data: 10



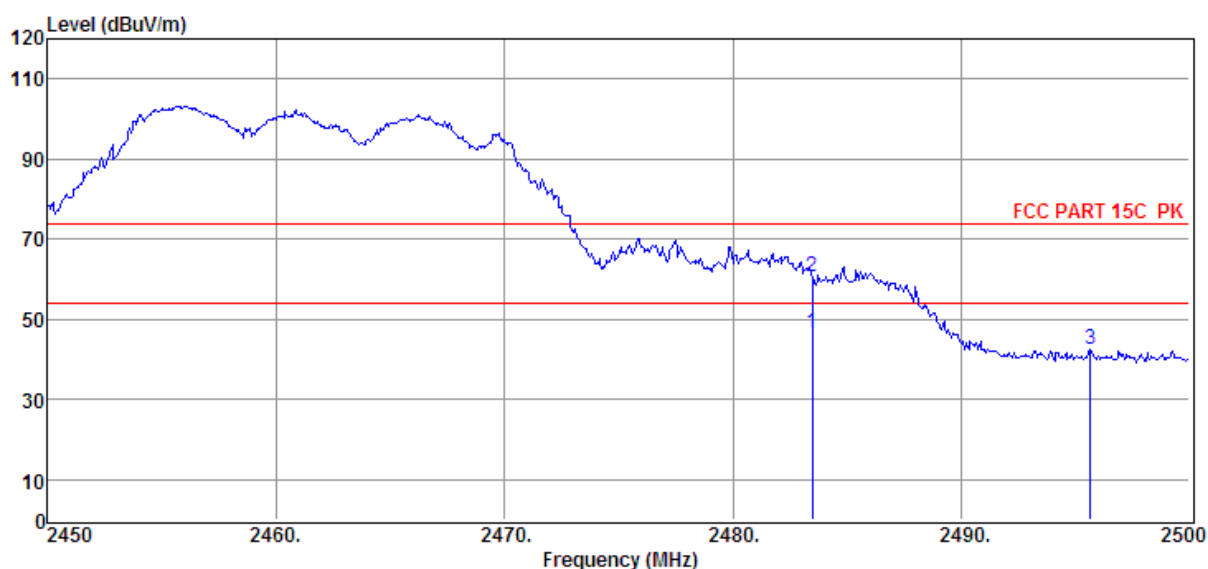
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	41.77	30.14	29.71	6.13	48.33	74.00	-25.67	Peak	HORIZONTAL
2	2489.00	37.26	30.16	29.71	6.13	43.84	74.00	-30.16	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11g 2462MHz (ant1)

Data: 11



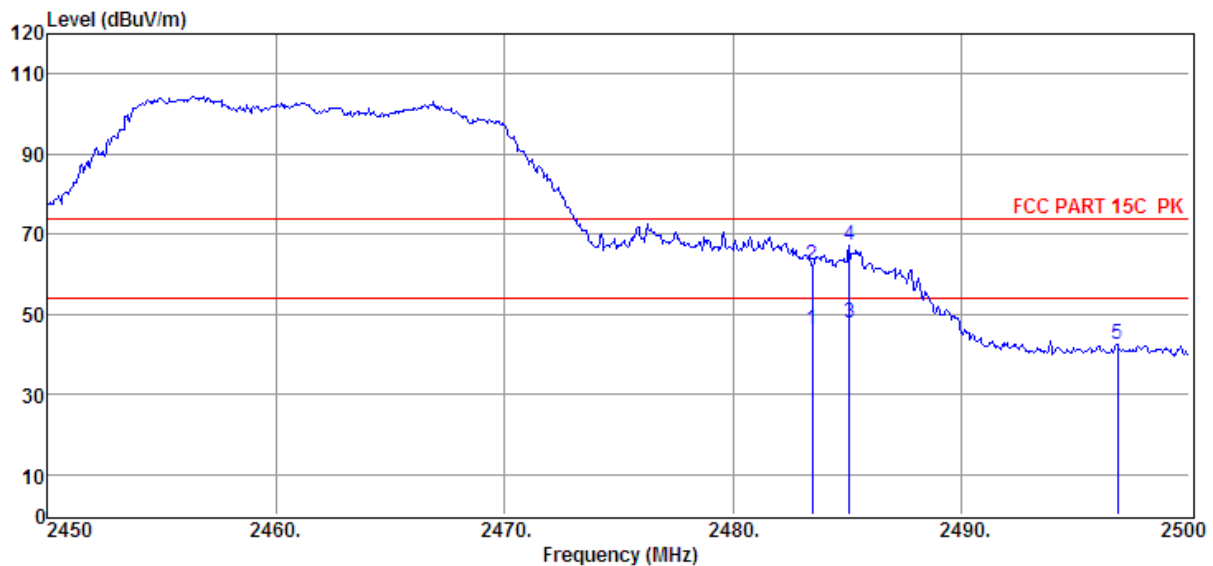
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	40.19	30.14	29.71	6.13	46.75	54.00	-7.25	Average	HORIZONTAL
2	2483.50	53.98	30.14	29.71	6.13	60.54	74.00	-13.46	Peak	HORIZONTAL
3	2495.65	36.05	30.18	29.73	6.17	42.67	74.00	-31.33	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11g 2462MHz (ant1)

Data: 12



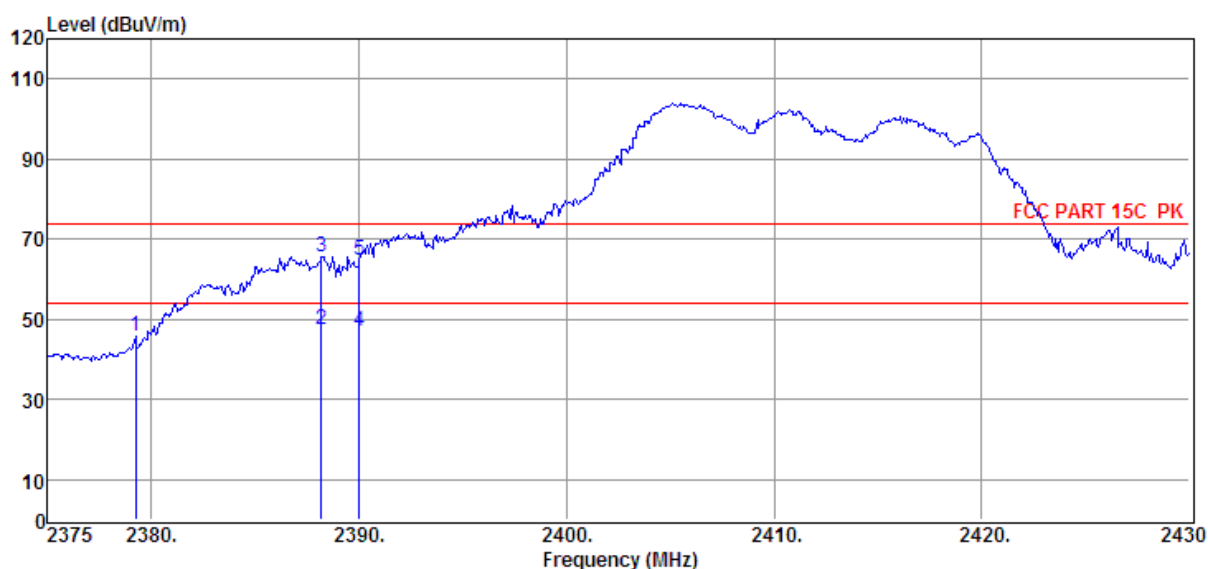
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	39.43	30.14	29.71	6.13	45.99	54.00	-8.01	Average	VERTICAL
2	2483.50	55.79	30.14	29.71	6.13	62.35	74.00	-11.65	Peak	VERTICAL
3	2485.10	41.40	30.14	29.71	6.13	47.96	54.00	-6.04	Average	VERTICAL
4	2485.10	60.63	30.14	29.71	6.13	67.19	74.00	-6.81	Peak	VERTICAL
5	2496.85	35.81	30.19	29.73	6.17	42.44	74.00	-31.56	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11g 2412MHz (ant1)

Data: 19



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2379.24	39.47	29.73	29.39	6.01	45.82	74.00	-28.18	Peak	HORIZONTAL
2	2388.20	41.03	29.77	29.41	6.01	47.40	54.00	-6.60	Average	HORIZONTAL
3	2388.20	59.30	29.77	29.41	6.01	65.67	74.00	-8.33	Peak	HORIZONTAL
4	2390.00	40.71	29.78	29.42	6.03	47.10	54.00	-6.90	Average	HORIZONTAL
5	2390.00	58.50	29.78	29.42	6.03	64.89	74.00	-9.11	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

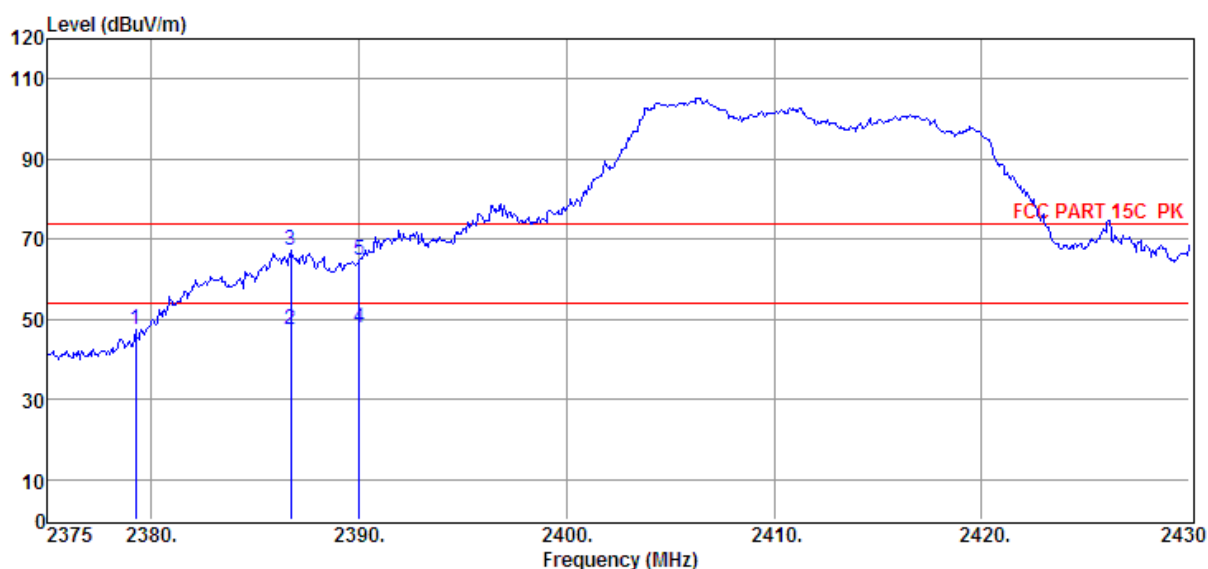
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11g 2412MHz (ant1)

Data: 20



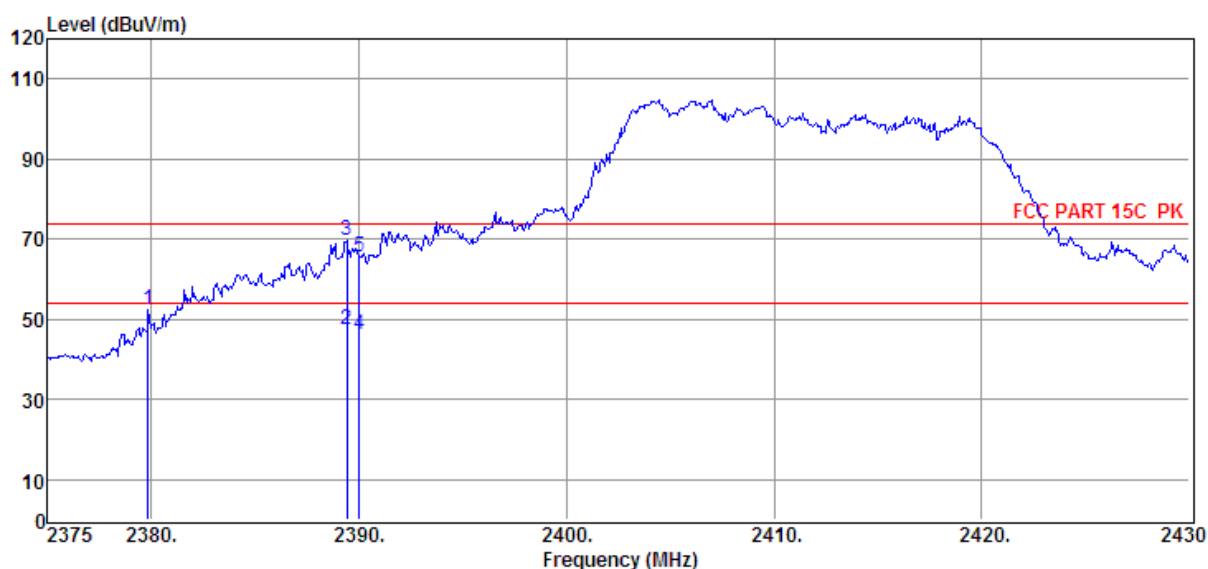
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2379.24	41.12	29.73	29.39	6.01	47.47	74.00	-26.53	Peak	VERTICAL
2	2386.72	41.00	29.76	29.41	6.01	47.36	54.00	-6.64	Average	VERTICAL
3	2386.72	61.00	29.76	29.41	6.01	67.36	74.00	-6.64	Peak	VERTICAL
4	2390.00	41.38	29.78	29.42	6.03	47.77	54.00	-6.23	Average	VERTICAL
5	2390.00	58.38	29.78	29.42	6.03	64.77	74.00	-9.23	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11n 20 2412MHz (ant1+ant2)

Data: 21



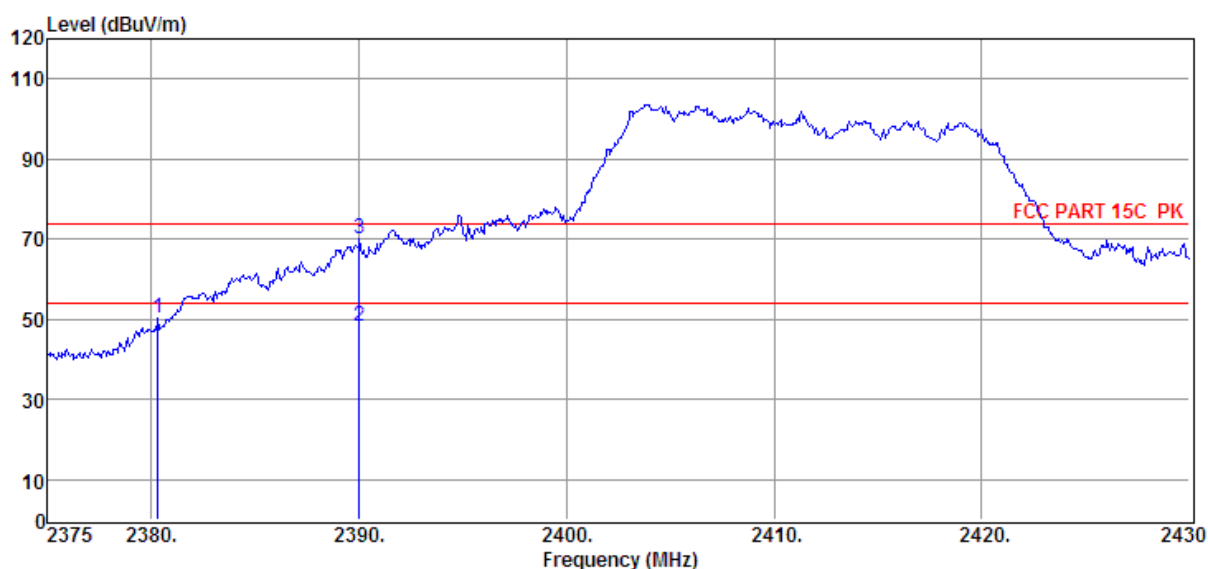
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2379.84	45.96	29.74	29.39	6.01	52.32	74.00	-21.68	Peak	VERTICAL
2	2389.41	40.96	29.77	29.42	6.01	47.32	54.00	-6.68	Average	VERTICAL
3	2389.41	63.26	29.77	29.42	6.01	69.62	74.00	-4.38	Peak	VERTICAL
4	2390.00	39.86	29.78	29.42	6.03	46.25	54.00	-7.75	Average	VERTICAL
5	2390.00	59.26	29.78	29.42	6.03	65.65	74.00	-8.35	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11n 20 2412MHz (ant1+ant2)

Data: 22



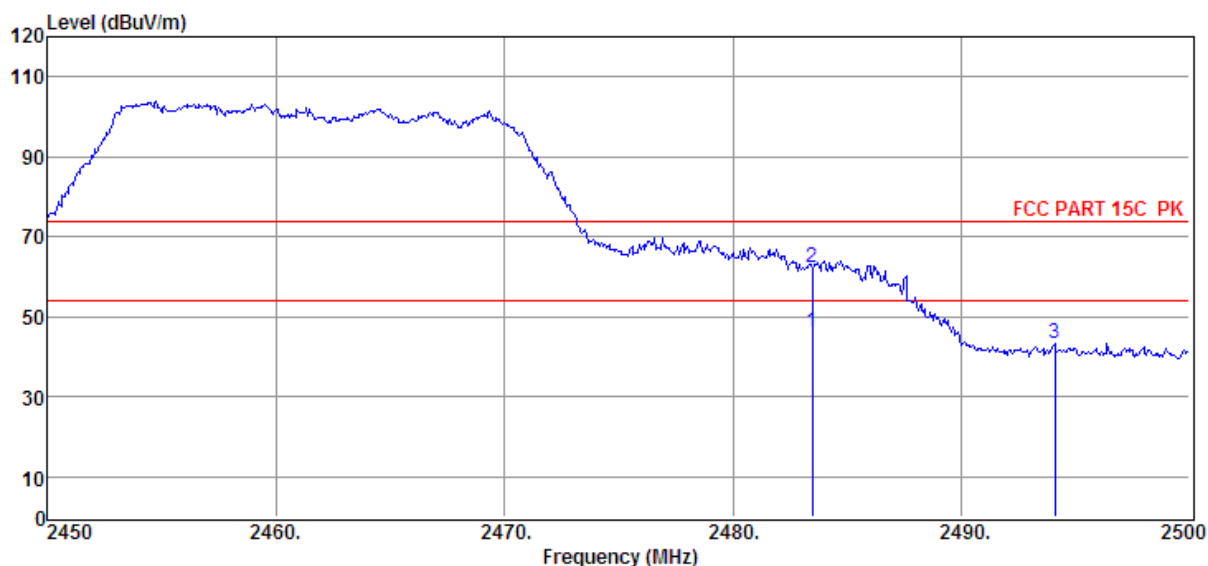
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2380.34	43.97	29.74	29.39	6.01	50.33	74.00	-23.67	Peak	HORIZONTAL
2	2390.00	41.68	29.78	29.42	6.03	48.07	54.00	-5.93	Average	HORIZONTAL
3	2390.00	63.66	29.78	29.42	6.03	70.05	74.00	-3.95	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11n 20 2462MHz (ant1+ant2)

Data: 29



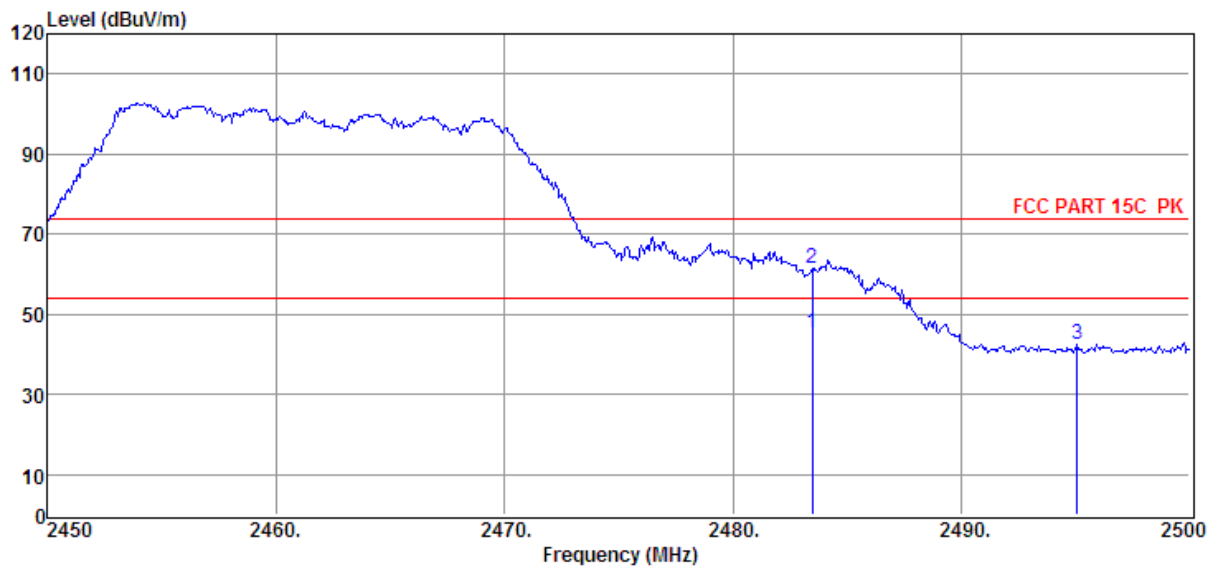
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	39.67	30.14	29.71	6.13	46.23	54.00	-7.77	Average	VERTICAL
2	2483.50	55.67	30.14	29.71	6.13	62.23	74.00	-11.77	Peak	VERTICAL
3	2494.10	36.87	30.18	29.73	6.17	43.49	74.00	-30.51	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11n 20 2462MHz (ant1+ant2)

Data: 30



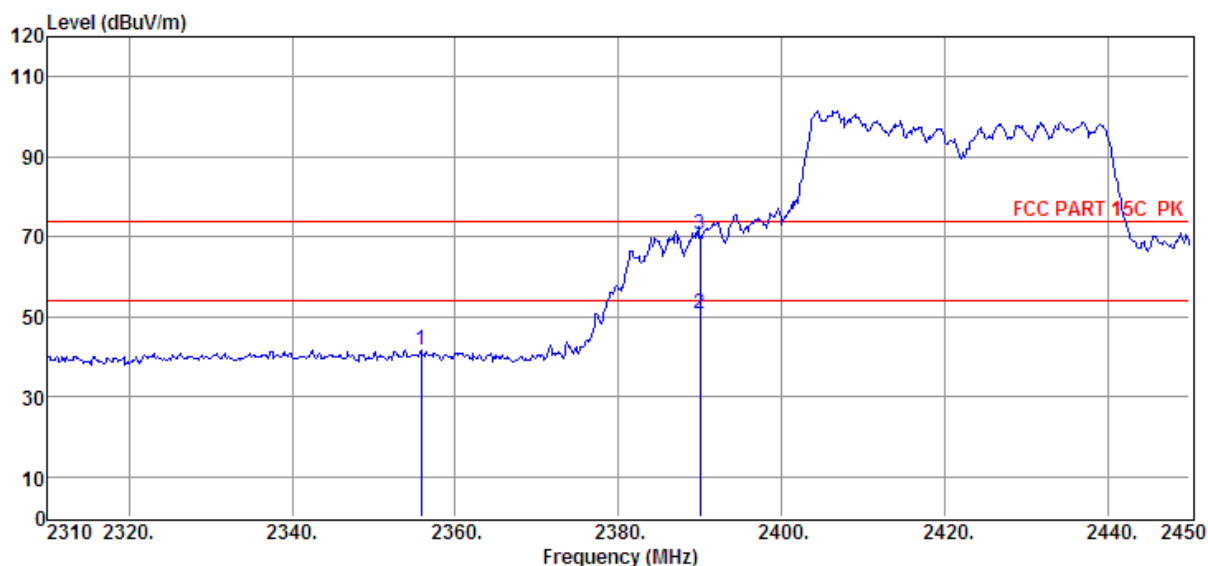
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	38.97	30.14	29.71	6.13	45.53	54.00	-8.47	Average	HORIZONTAL
2	2483.50	54.97	30.14	29.71	6.13	61.53	74.00	-12.47	Peak	HORIZONTAL
3	2495.10	35.76	30.18	29.73	6.17	42.38	74.00	-31.62	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11n 40 2422MHz (ant1+ant2)

Data: 33



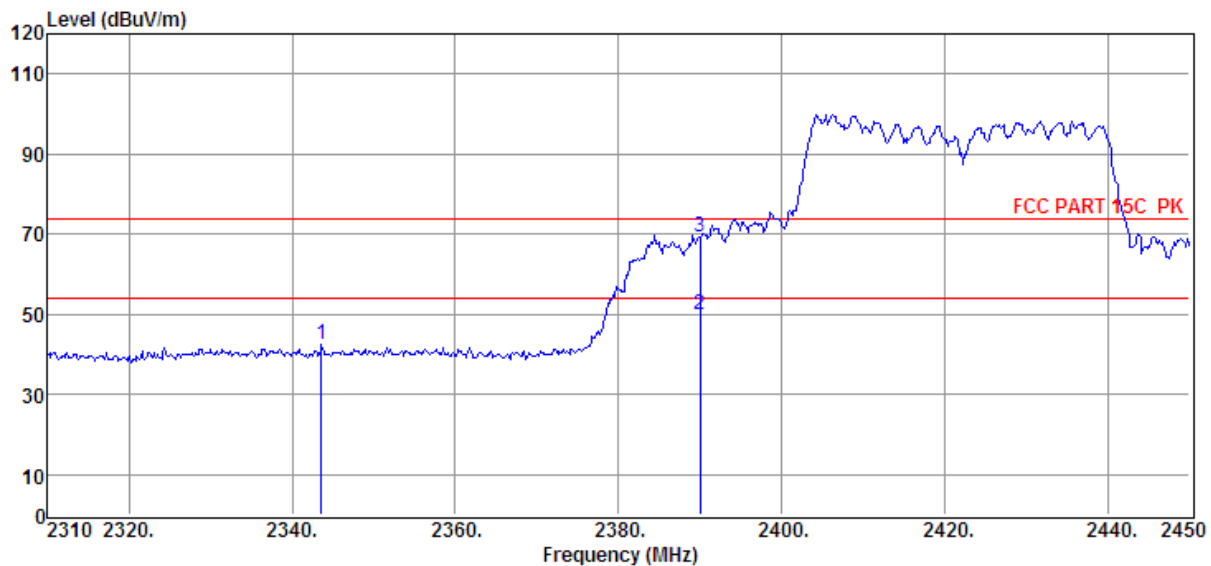
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2355.78	35.55	29.64	29.34	5.96	41.81	74.00	-32.19	Peak	VERTICAL
2	2390.00	44.47	29.78	29.42	6.03	50.86	54.00	-3.14	Average	VERTICAL
3	2390.00	64.12	29.78	29.42	6.03	70.51	74.00	-3.49	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:**2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11n 40 2422MHz (ant1+ant2)

Data: 34



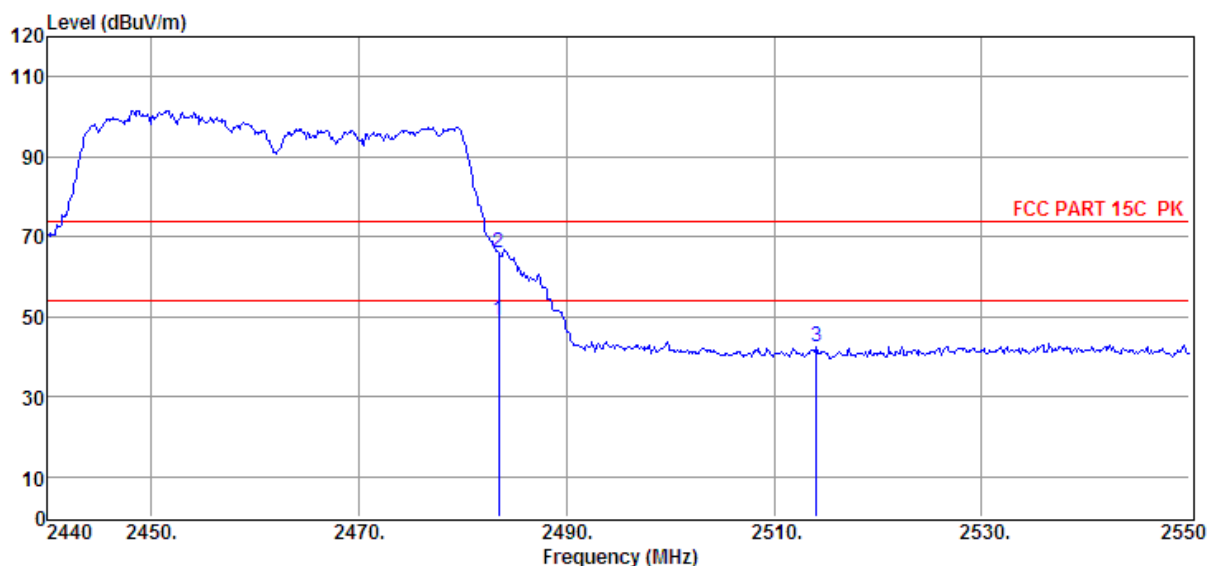
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2343.60	36.08	29.59	29.33	5.96	42.30	74.00	-31.70	Peak	HORIZONTAL
2	2390.00	43.62	29.78	29.42	6.03	50.01	54.00	-3.99	Average	HORIZONTAL
3	2390.00	62.73	29.78	29.42	6.03	69.12	74.00	-4.88	Peak	HORIZONTAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/HORIZONTAL
Memo : 11n 40 2452MHz (ant1+ant2)

Data: 39



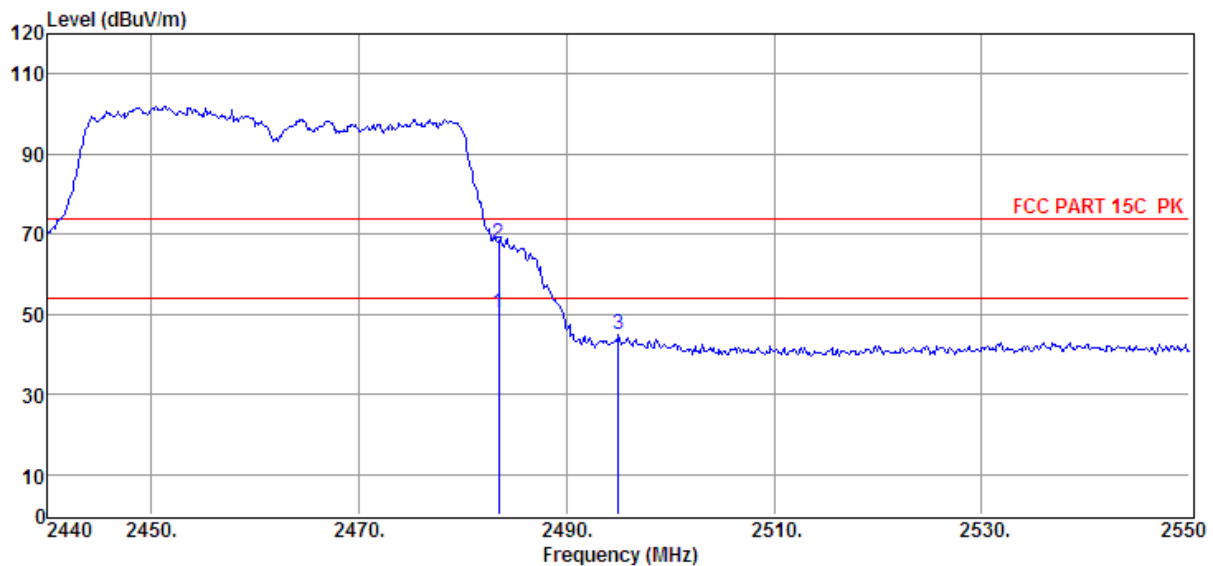
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	42.49	30.14	29.71	6.13	49.05	54.00	-4.95	Average	HORIZONTAL
2	2483.50	59.53	30.14	29.71	6.13	66.09	74.00	-7.91	Peak	HORIZONTAL
3	2514.03	35.77	30.25	29.78	6.17	42.41	74.00	-31.59	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1# **Y:\2017 RE1# Report Data\17Q0626-5\RF FCC 2.4WIFI.EM6**
Test Date : 2017-07-22 **Tested By** : Jerry
EUT : Streaming Wireless Adaptor **Model Number** : ADAPT+
Power Supply : DC 5V from Adapter **Test Mode** : TX mode
Condition : Temp:24.5°C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2016 HF907/3m/VERTICAL
Memo : 11n 40 2452MHz (ant1+ant2)

Data: 40

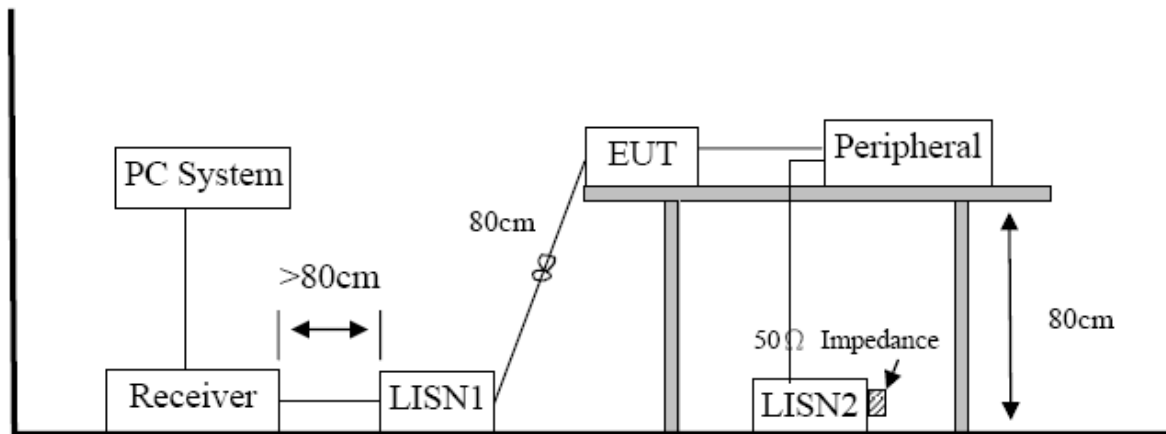


Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2483.50	43.66	30.14	29.71	6.13	50.22	54.00	-3.78	Average	VERTICAL
2	2483.50	61.10	30.14	29.71	6.13	67.66	74.00	-6.34	Peak	VERTICAL
3	2495.00	38.22	30.18	29.73	6.17	44.84	74.00	-29.16	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

9. Power Line Conducted Emission

9.1. Block diagram of test setup



9.2. Power Line Conducted Emission Limits(Class B)

Frequency	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

9.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

9.4. Test Result

PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

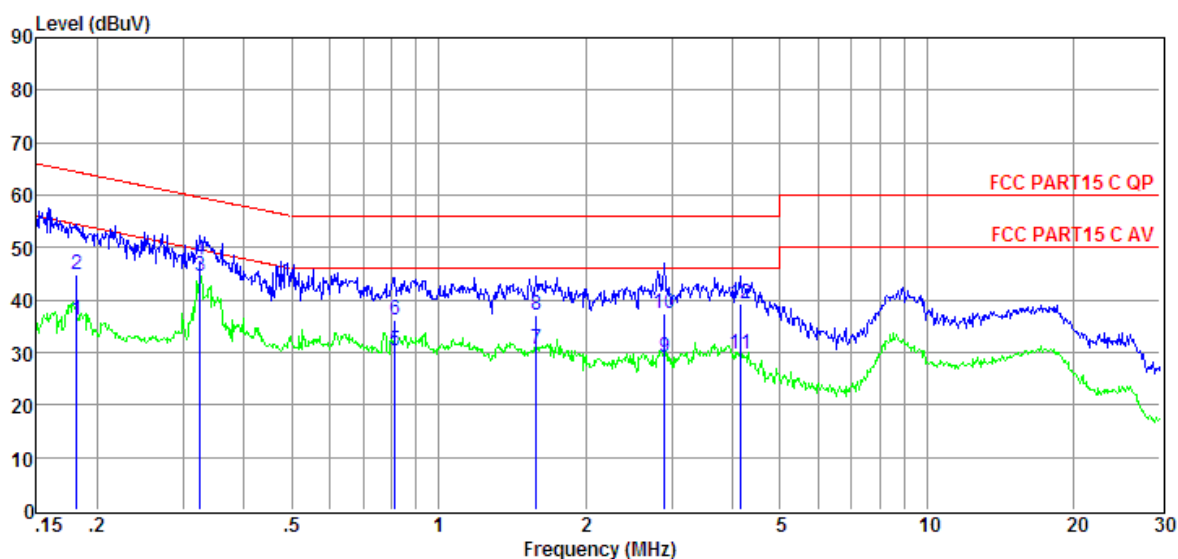
Note2: “----” means peak detection; “-----” means average detection

Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded worst case (AC 120V/60Hz).

TR-4-E-010 Conducted Emission Test Result

Test Site	: DDT 1# Shield Room	E:\2017 CE report data\17Q0626-5\CE.EM6
Test Date	: 2017-08-24	Tested By : Sunny
EUT	: Streaming wireless adaptor	Model Number : ADAPT+
Power Supply	: AC 120V/60Hz	Test Mode : Tx mode
Condition	: Temp:24.5'C,Humi:55%, Press:100.1kPa	LISN : 2016 ENV216/NEUTRAL
Memo	:	

Data: 48



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.18	16.80	9.61	0.02	9.86	36.29	54.42	-18.13	Average	NEUTRAL
2	0.18	25.20	9.61	0.02	9.86	44.69	64.42	-19.73	QP	NEUTRAL
3	0.33	25.00	9.61	0.02	9.86	44.49	49.57	-5.08	Average	NEUTRAL
4	0.33	28.06	9.61	0.02	9.86	47.55	59.57	-12.02	QP	NEUTRAL
5	0.81	10.78	9.61	0.03	9.86	30.28	46.00	-15.72	Average	NEUTRAL
6	0.81	16.54	9.61	0.03	9.86	36.04	56.00	-19.96	QP	NEUTRAL
7	1.59	11.08	9.62	0.04	9.86	30.60	46.00	-15.40	Average	NEUTRAL
8	1.59	17.74	9.62	0.04	9.86	37.26	56.00	-18.74	QP	NEUTRAL
9	2.90	9.40	9.64	0.05	9.87	28.96	46.00	-17.04	Average	NEUTRAL
10	2.90	17.91	9.64	0.05	9.87	37.47	56.00	-18.53	QP	NEUTRAL
11	4.14	10.15	9.65	0.06	9.88	29.74	46.00	-16.26	Average	NEUTRAL
12	4.14	19.55	9.65	0.06	9.88	39.14	56.00	-16.86	QP	NEUTRAL

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

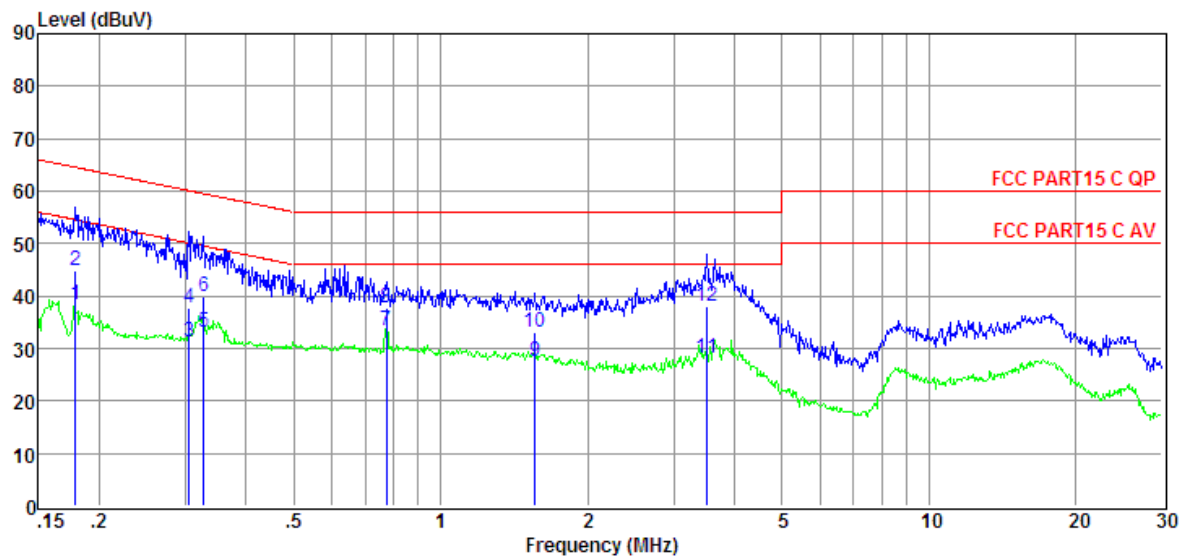
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room **E:\2017 CE report data\17Q0626-5\CE.EM6**
Test Date : 2017-08-24 **Tested By** : Sunny
EUT : Streaming wireless adaptor **Model Number** : ADAPT+
Power Supply : AC 120V/60Hz **Test Mode** : Tx mode
Condition : Temp:24.5'C,Humi:55%,
Press:100.1kPa **LISN** : 2016 ENV216/LINE
Memo :

Data: 50



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.18	18.94	9.61	0.02	9.86	38.43	54.55	-16.12	Average	LINE
2	0.18	25.51	9.61	0.02	9.86	45.00	64.55	-19.55	QP	LINE
3	0.31	11.86	9.61	0.02	9.86	31.35	50.10	-18.75	Average	LINE
4	0.31	18.15	9.61	0.02	9.86	37.64	60.10	-22.46	QP	LINE
5	0.33	13.53	9.61	0.02	9.86	33.02	49.53	-16.51	Average	LINE
6	0.33	20.54	9.61	0.02	9.86	40.03	59.53	-19.50	QP	LINE
7	0.78	13.96	9.61	0.03	9.86	33.46	46.00	-12.54	Average	LINE
8	0.78	18.26	9.61	0.03	9.86	37.76	56.00	-18.24	QP	LINE
9	1.56	8.10	9.62	0.04	9.86	27.62	46.00	-18.38	Average	LINE
10	1.56	13.43	9.62	0.04	9.86	32.95	56.00	-23.05	QP	LINE
11	3.51	8.41	9.65	0.06	9.87	27.99	46.00	-18.01	Average	LINE
12	3.51	18.50	9.65	0.06	9.87	38.08	56.00	-17.92	QP	LINE

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

10. Antenna Requirements

10.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2. Result

The antennas used for this product are integrated antenna and other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 4.20dBi.

END OF REPORT