



FCC 47 CFR PART 15 SUBPART C TEST REPORT

For

ShenZhen Egreat Technology Co., Ltd.

4/F, 1 Building, ShaSan Chuang Ye Industrial Park, Sha Jing, Bao An, ShenZhen, China

**Model: A1, A2, A3, A4, A5, A6, A7, A8, A9, A10,
A11, A12, A13, A14, A15, A16, A17, A18, A19, A20**

This Report Concerns: Original Report	Equipment Type: Media Player
Test Engineer:	Anna Lv <i>Anna Lv</i>
Report No.:	16ZCTE1226001FR
FCC ID:	2AAWZEGREATA5
Receive EUT Date/Test Date:	Dec 20, 2016 / Dec 20, 2016- Dec 26, 2016
Reviewed By:	Tomy Wu <i>Tomy Wu</i>
Prepared By:	Shenzhen ZCT Technology Co.,Ltd. 3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District,Shenzhen, China Tel: 400-805-1899 Fax: 0755-23702323



TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	6
SPECIAL ACCESSORIES	6
EQUIPMENT MODIFICATIONS	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
6 dB BANDWIDTH.....	9
LIMITS	9
TEST PROCEDURE	9
TEST SETUP	9
TEST EQUIPMENT LIST AND DETAILS.....	10
TEST DATA	10
Maximum Peak Output Power.....	23
LIMITS	23
TEST PROCEDURE	23
TEST SETUP	23
TEST EQUIPMENT LIST AND DETAILS.....	23
TEST DATA	23
POWER SPECTRAL DENSITY	25
LIMITS	25
TEST PROCEDURE	25
TEST SETUP	25
TEST EQUIPMENT LIST AND DETAILS.....	26
TEST DATA	26
EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	33
LIMITS	33
TEST PROCEDURE	33
TEST SETUP	33
TEST EQUIPMENT LIST AND DETAILS.....	34
TEST DATA	34
Radiated Emission	58
LIMITS	58
TEST SETUP AND PROCEDURE	58
TEST EQUIPMENT LIST AND DETAILS.....	61
TEST DATA	61
POWER LINE CONDUCTED EMISSION.....	68
LIMITS	68
TEST SETUP AND PROCEDURE	68
TEST EQUIPMENT LIST AND DETAILS.....	68

Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



RESULTS	68
Antenna Requirements.....	70
REQUIREMENTS.....	70
ANTENNA CONNECTOR	70
ANTENNA GAIN	70
EXHIBIT B - EUT PHOTOGRAPHS	71
EUT – ALL VIEW	71
EXHIBIT C - TEST SETUP PHOTOGRAPHS	78
RADIATED SPURIOUS EMISSIONS	78
POWER LINE CONDUCTED EMISSION	79



GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Equipment	Media Player
Model Name	A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20
Difference of Model	All models are identical in interior structure, electrical circuits, only the appearance, color model No. are different. So we prepare A5 for test only.
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)
Power Supply	DC 12V
Battery	N/A
Adapter	AC 120V/60Hz
Antenna Type	Integrated antenna, maximum PK gain: 2 dBi

Measurement uncertainty

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.32dB
Radiated Disturbance, 9k to 30 MHz	2.76dB (9KHz-150KHz) 2.45dB(150KHz-30MHz)
Radiated Disturbance, 30 to 1000 MHz	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Radiated Disturbance, 1 to 18 GHz	4.10dB(1-6GHz) 4.40dB (6GHz-18Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

Test Facility

Test Location	Dongguan Dongdian Testing Service Co., Ltd
Address	No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Dongguan City, Guangdong Province, 523808, China
Accreditation Certificate	Dongguan Dongdian Testing Service Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 270092, Renewal date March 11, 2015, valid time is until July 12, 2017. The 3m Alternate Test Site of Dongguan Dongdian Testing Service Co., Ltd. Has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.10288A on April 23,

Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



	2015, valid time is until April 23, 2018.
--	---



SYSTEM TEST CONFIGURATION

Description of Test Configuration

EUT was connected to control to a special test jig provided by manufacturer which has a standard RSS-232 connector to connect to Notebook, and the Notebook will run a special test software “MP_Kit_RTL11n_8188EUS_USB” provided by manufacturer to control EUT work in Continuous TX mode (>98% duty cycle), and select test channel, wireless mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
IEEE 802.11b	Low :CH1	2412
	Middle: CH6	2437
	High: CH11	2462
IEEE 802.11g	Low :CH1	2412
	Middle: CH6	2437
	High: CH11	2462
IEEE 802.11n HT20	Low :CH1	2412
	Middle: CH6	2437
	High: CH11	2462
IEEE 802.11n HT40	Low :CH3	2422
	Middle: CH6	2437
	High: 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.

EUT Exercise Software

N/A

Special Accessories

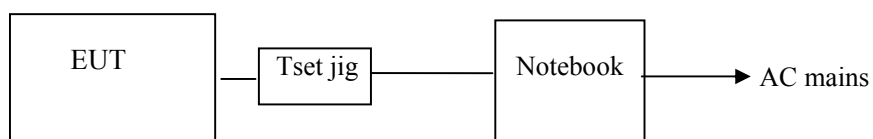
Description of Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	SN
Notebook	DELL	Latitude D610	FCC DOC	00045-534-136-300

Equipment Modifications

No modification was made to the EUT.



Block Diagram of Test Setup



**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 Part 15: 15.247 KDB558074	PASS
Peak Output Power	FCC Part 15: 15.247 KDB558074	PASS
Power Spectral Density	FCC Part 15: 15.247 KDB558074	PASS
Emissions in non-restricted frequency bands	FCC Part 15: 15.247 KDB558074	PASS
Emissions in restricted frequency bands	FCC Part 15: 15.209 FCC Part 15: 15.247 ANSI C63.10: 2013 ANSI C63.4:2014 KDB558074	PASS
Band Edge Compliance	FCC Part 15: 15.209 FCC Part 15: 15.247 ANSI C63.10: 2013 ANSI C63.4:2014 KDB558074	PASS
Power Line Conducted Emission	FCC Part 15: 15.207 ANSI C63.10: 2013 ANSI C63.4:2014	PASS
Antenna requirement	FCC Part 15: 15.203	PASS



6 dB BANDWIDTH

LIMITS

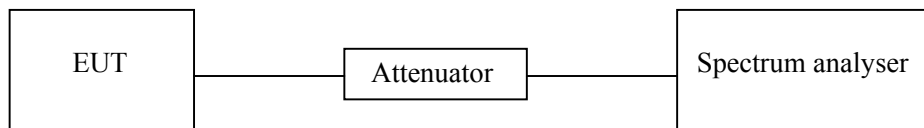
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 KHz

Test Procedure

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100K
VBW	$\geq 3 \times \text{RBW}$
Trace	Max hold
Sweep	Auto couple

TEST SETUP



**Test Equipment List and Details**

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrum analyzer	R&S	FSU26	1166.1660.26	2016/10/16	2017/10/16
Attenuator	Mini-Circuits	BW-S10W2	101109	2016/08/18	2017/08/18
RF Cable	Micable	C10-01-01-1	100309	2016/08/18	2017/08/18

Test Data**Environmental Conditions**

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0kPa

*Test Mode: Transmitting mode***RESULTS**

EUT Set Mode	CH or Frequency	6 dB bandwidth	99% dB bandwidth
		Result (MHz)	Result (MHz)
11b	CH1	10.096	15.304
	CH6	10.096	15.224
	CH11	10.096	15.224
11g	CH1	16.506	16.667
	CH6	16.506	16.667
	CH11	16.506	16.667
11n HT 20	CH1	17.788	17.788
	CH6	17.788	17.788
	CH11	17.788	17.869
11n HT 40	CH3	36.218	36.058
	CH6	36.218	36.218
	CH9	36.218	36.218

11b (6dB bandwidth):



*RBW 100 kHz

Marker 2 [T1]

*VBW 300 kHz

7.64 dBm

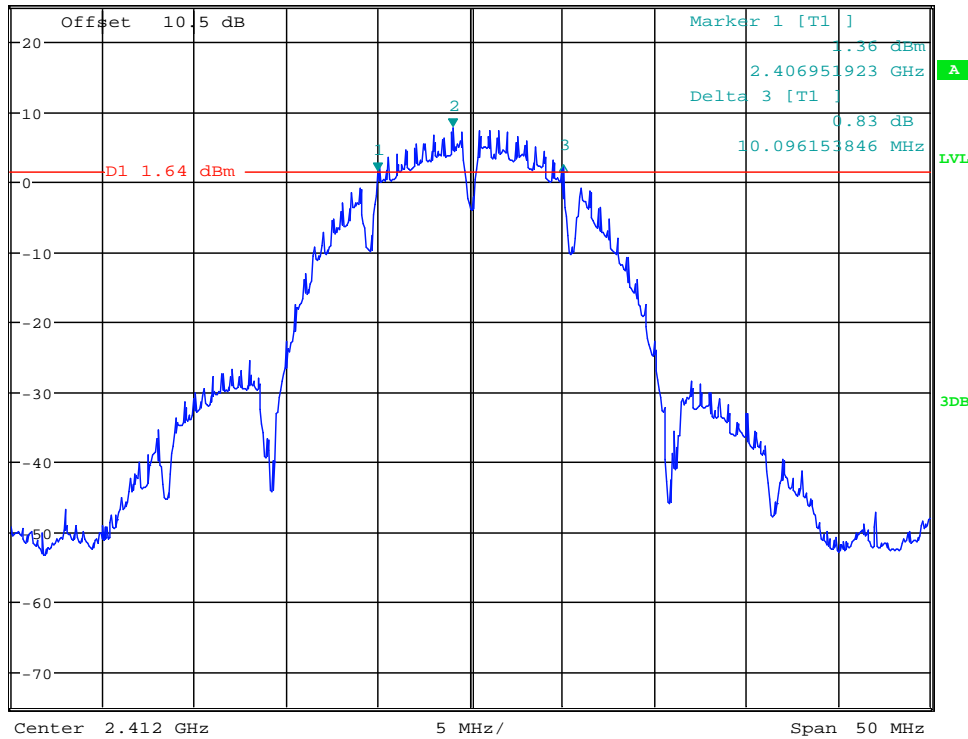
Ref 25 dBm

*Att 10 dB

SWT 20 ms

2.411038462 GHz

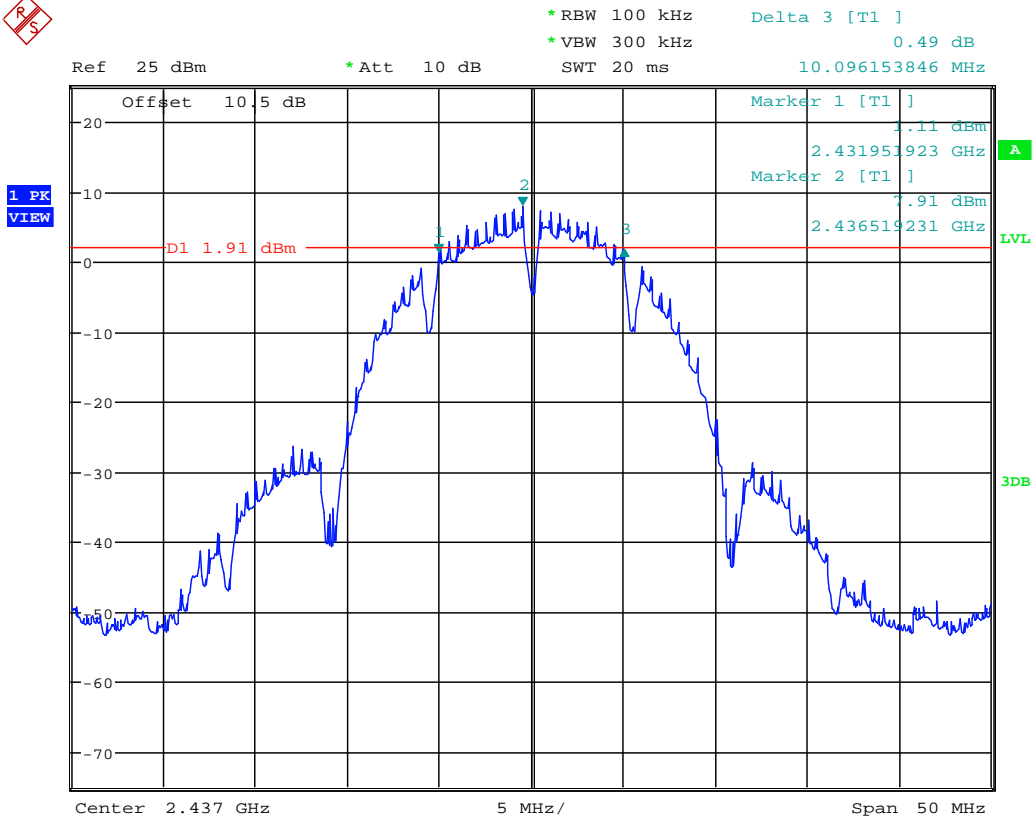
1 PK
VIEW

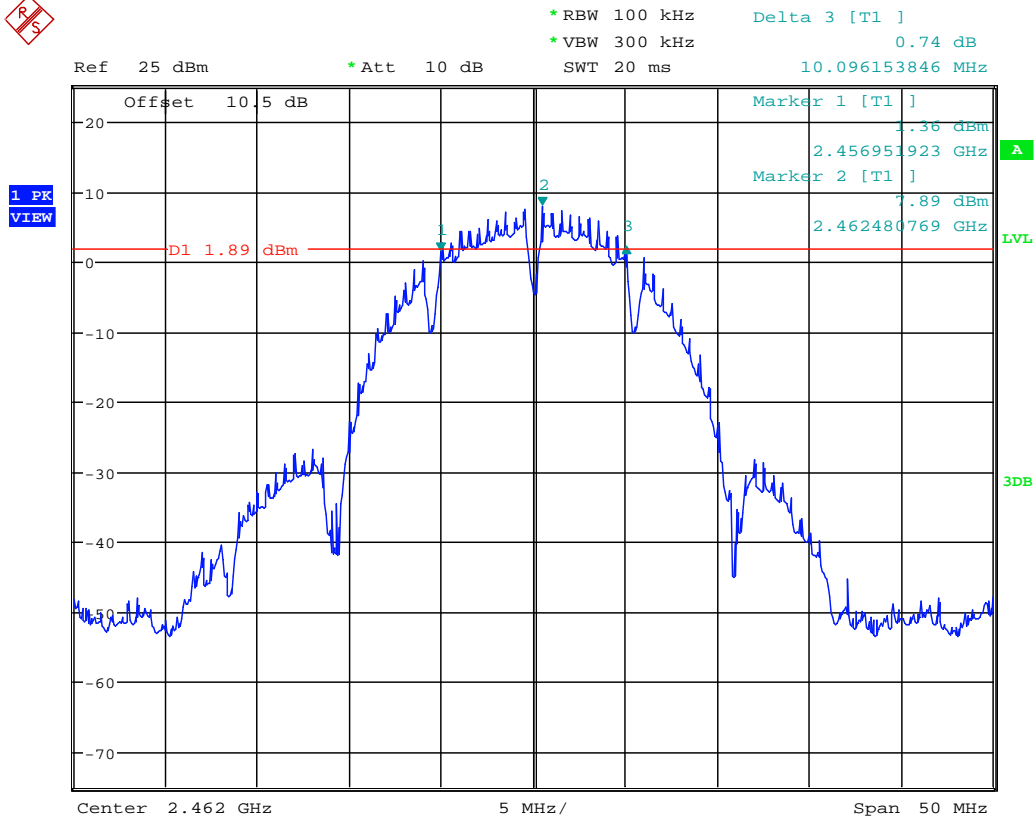


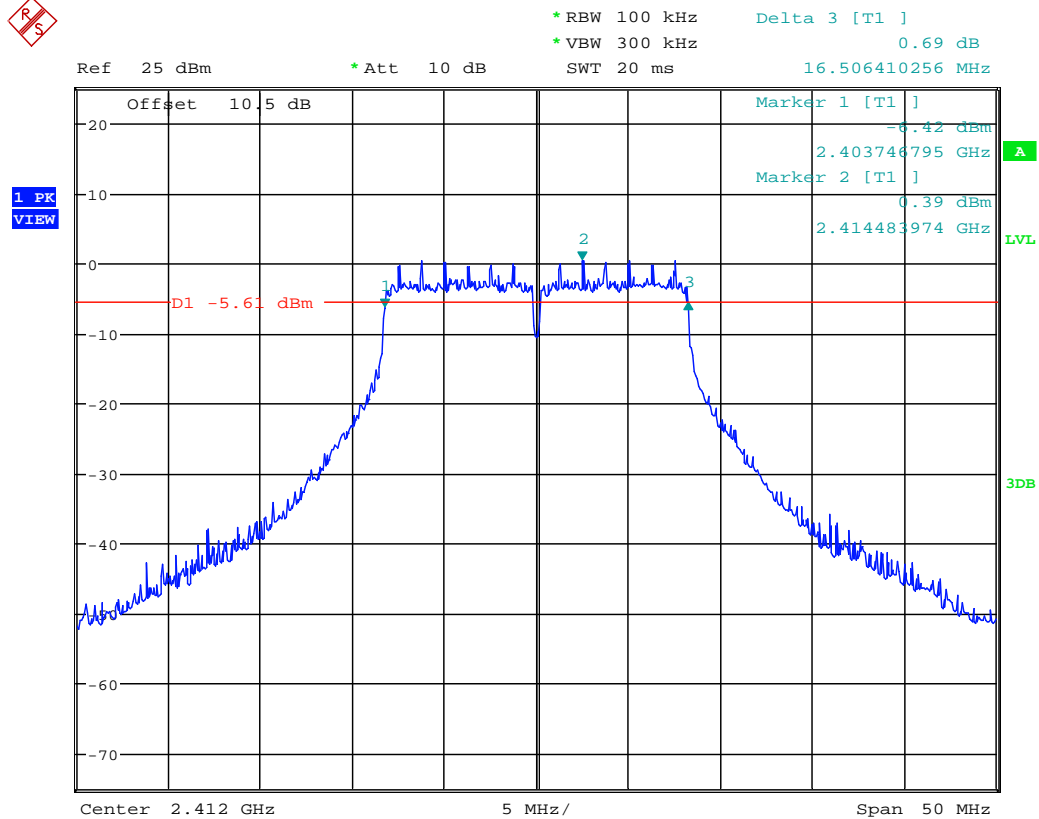
Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>





**11g (6dB bandwidth):**

Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



*RBW 100 kHz

Delta 3 [T1]

*VBW 300 kHz

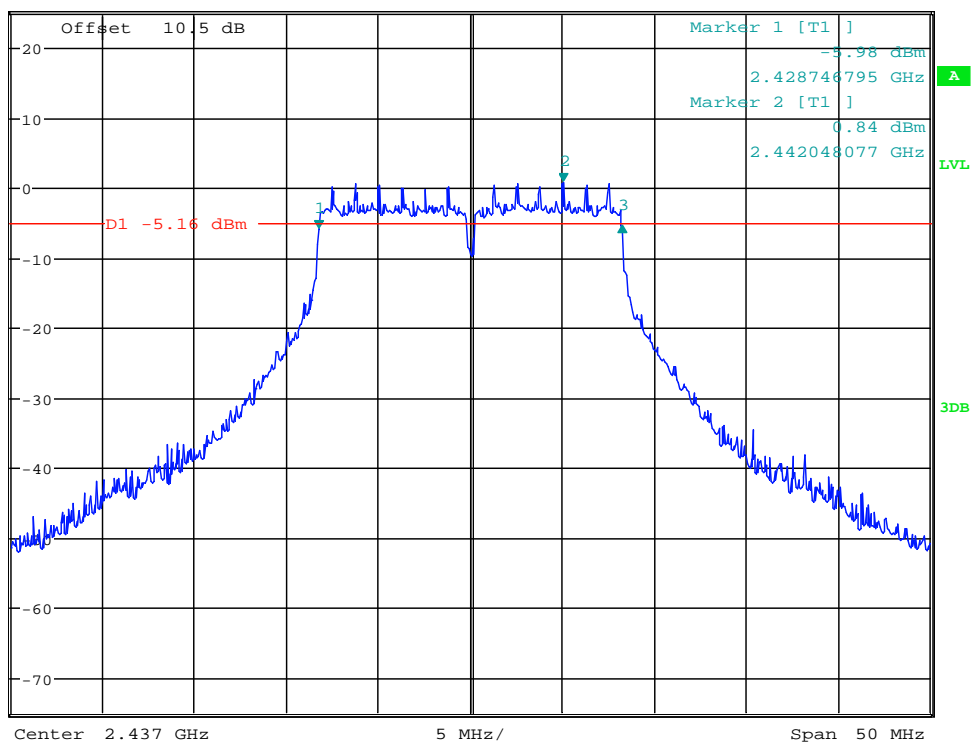
0.34 dB

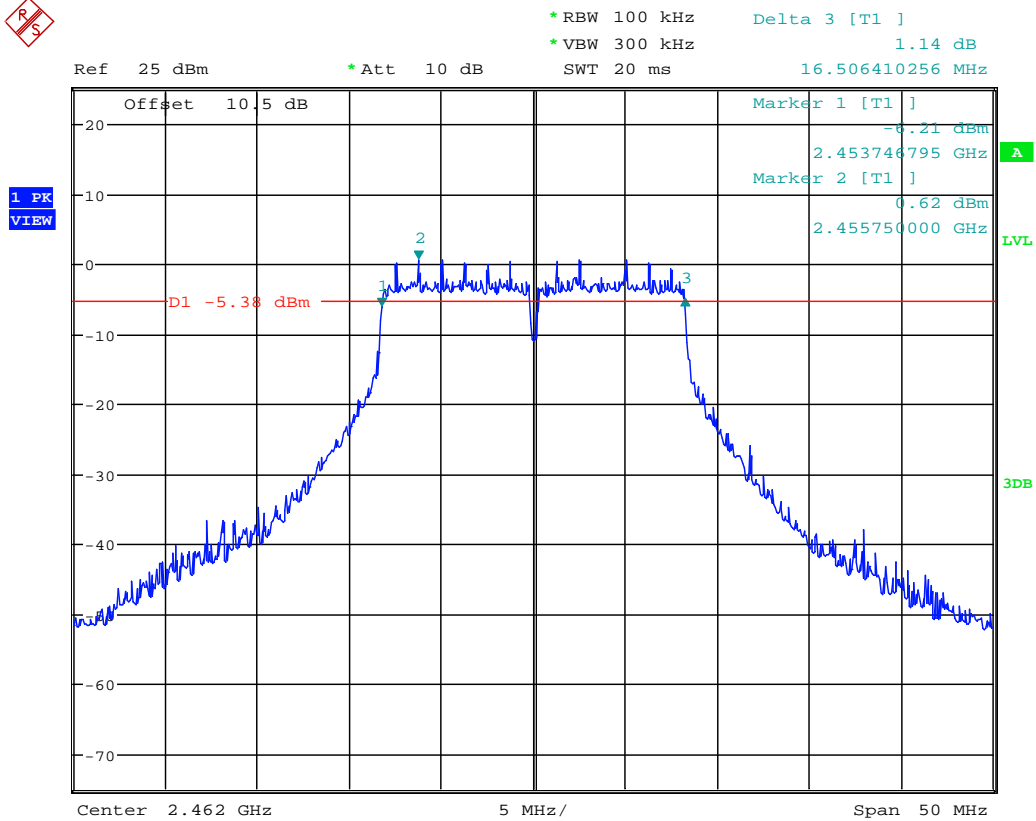
Ref 25 dBm

*Att 10 dB

SWT 20 ms

16.506410256 MHz

1 PK
VIEW



11n HT20 (6dB bandwidth):



*RBW 100 kHz

Delta 3 [T1]

*VBW 300 kHz

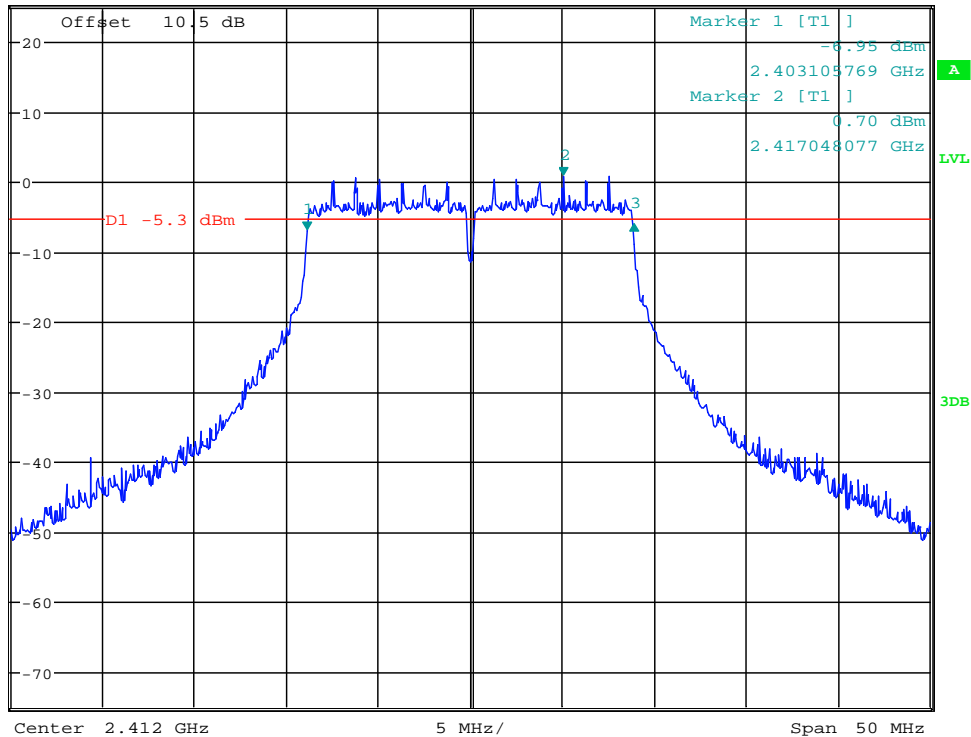
0.75 dB

Ref 25 dBm

*Att 10 dB

SWT 20 ms

17.788461538 MHz

1 PK
VIEW

Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



*RBW 100 kHz

Delta 3 [T1]

*VBW 300 kHz

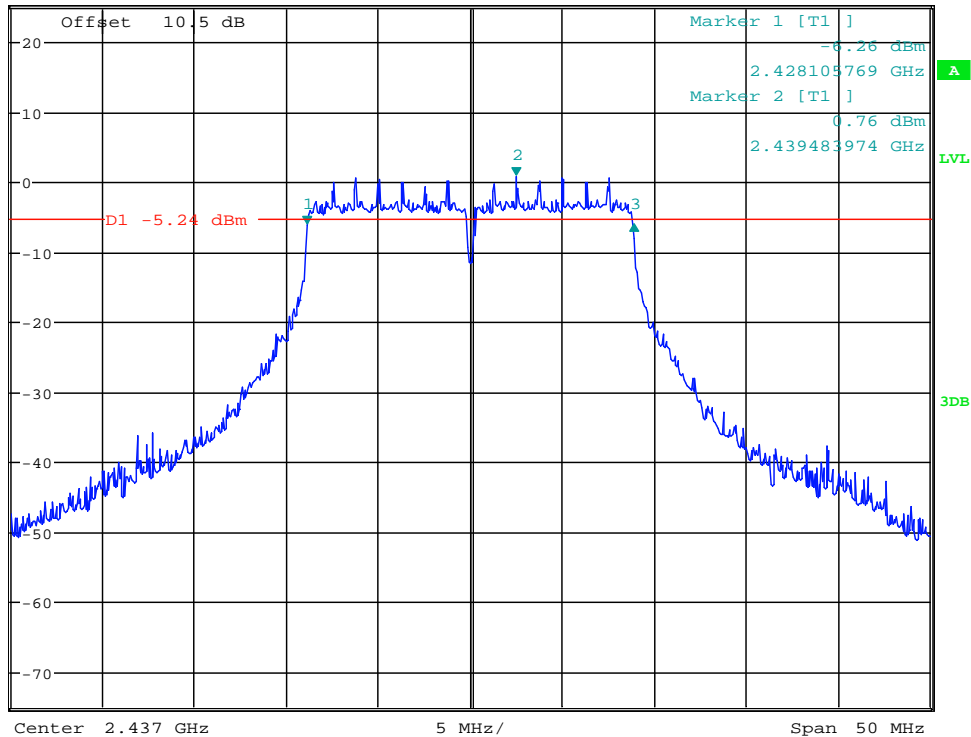
-0.02 dB

Ref 25 dBm

*Att 10 dB

SWT 20 ms

17.788461538 MHz

1 PK
VIEW



*RBW 100 kHz

Delta 3 [T1]

*VBW 300 kHz

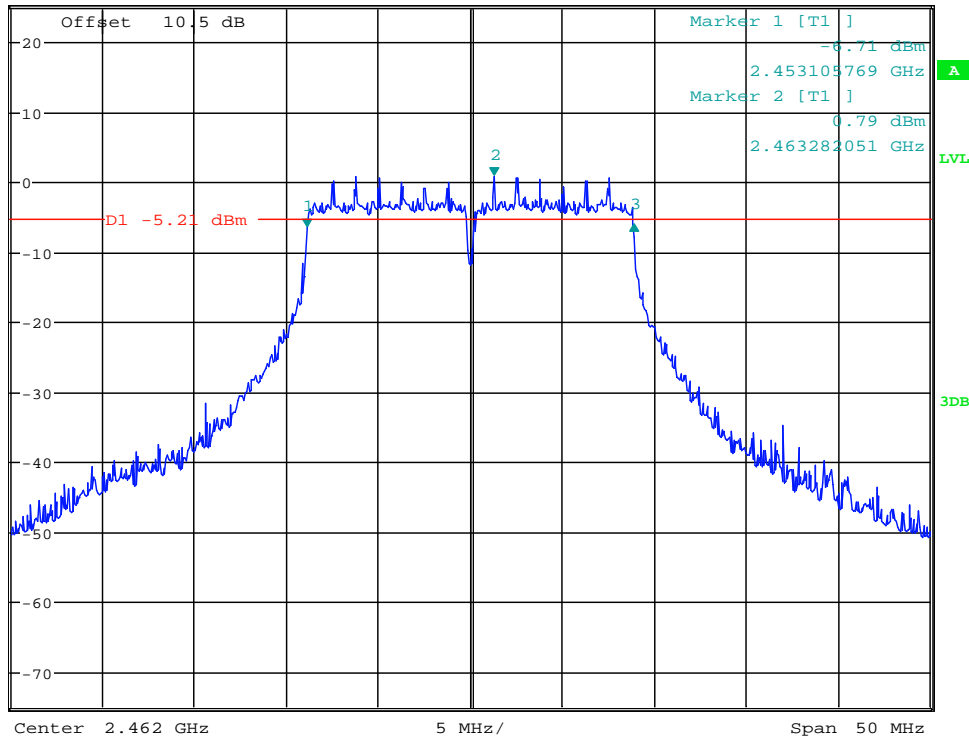
0.48 dB

Ref 25 dBm

*Att 10 dB

SWT 20 ms

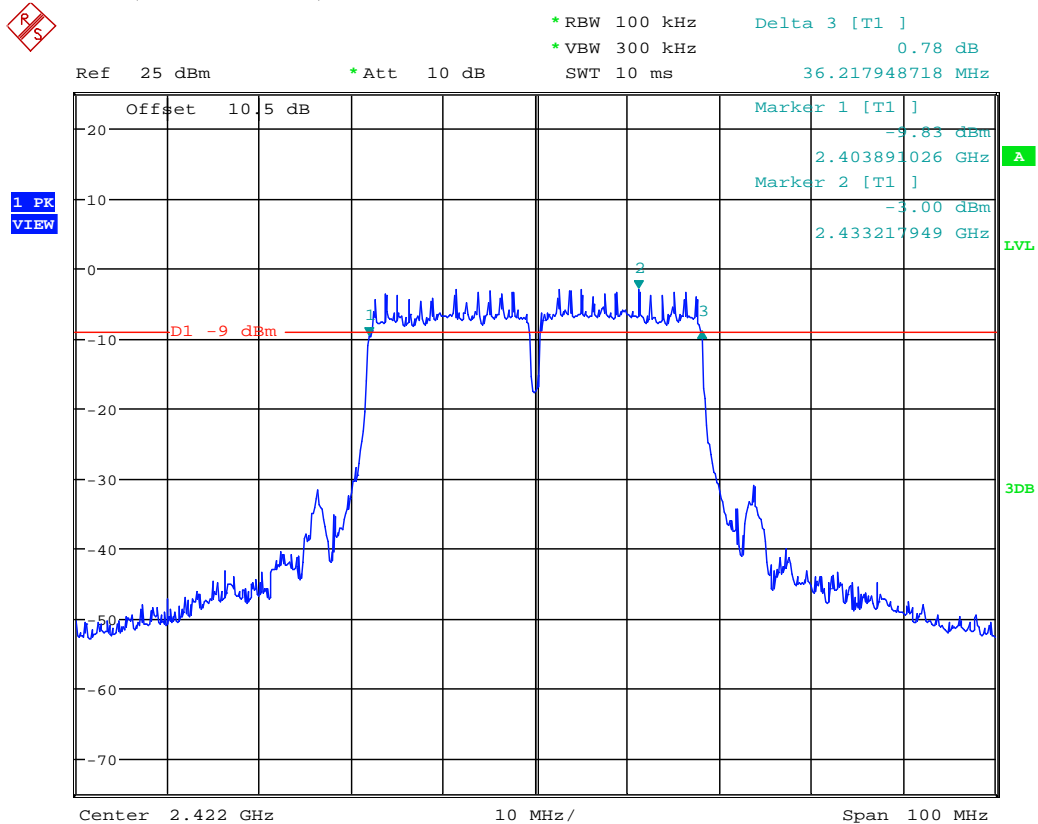
17.788461538 MHz

1 PK
VIEW

Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>

**11n HT40 (6dB bandwidth):**

Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



*RBW 100 kHz

Delta 3 [T1]

*VBW 300 kHz

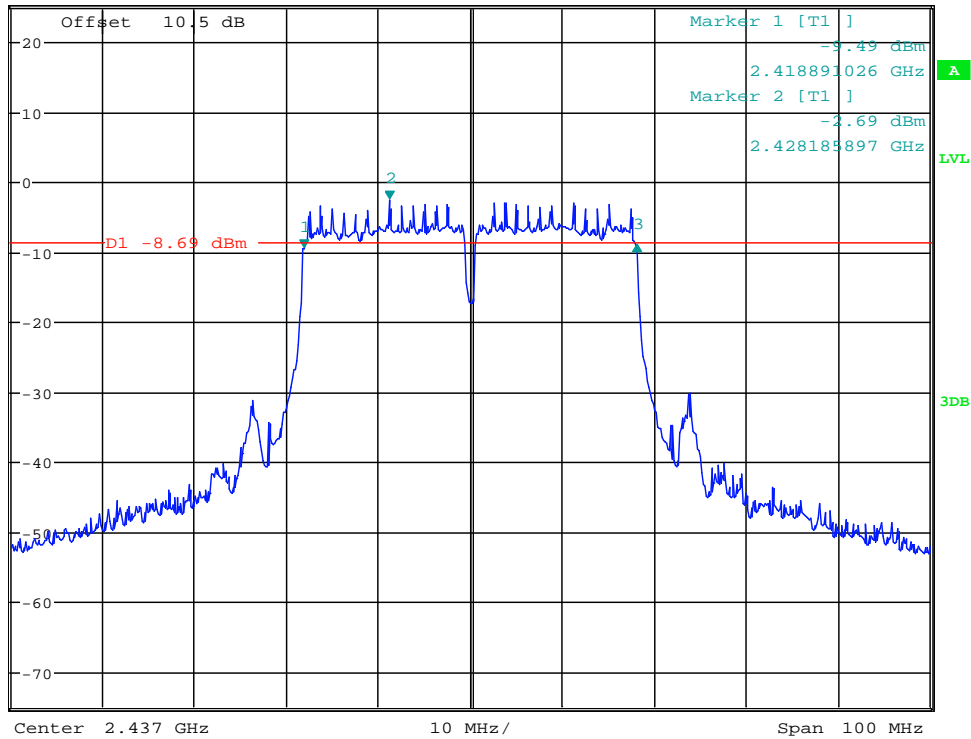
0.44 dB

Ref 25 dBm

*Att 10 dB

SWT 10 ms

36.217948718 MHz

1 PK
VIEW



*RBW 100 kHz

Delta 3 [T1]

*VBW 300 kHz

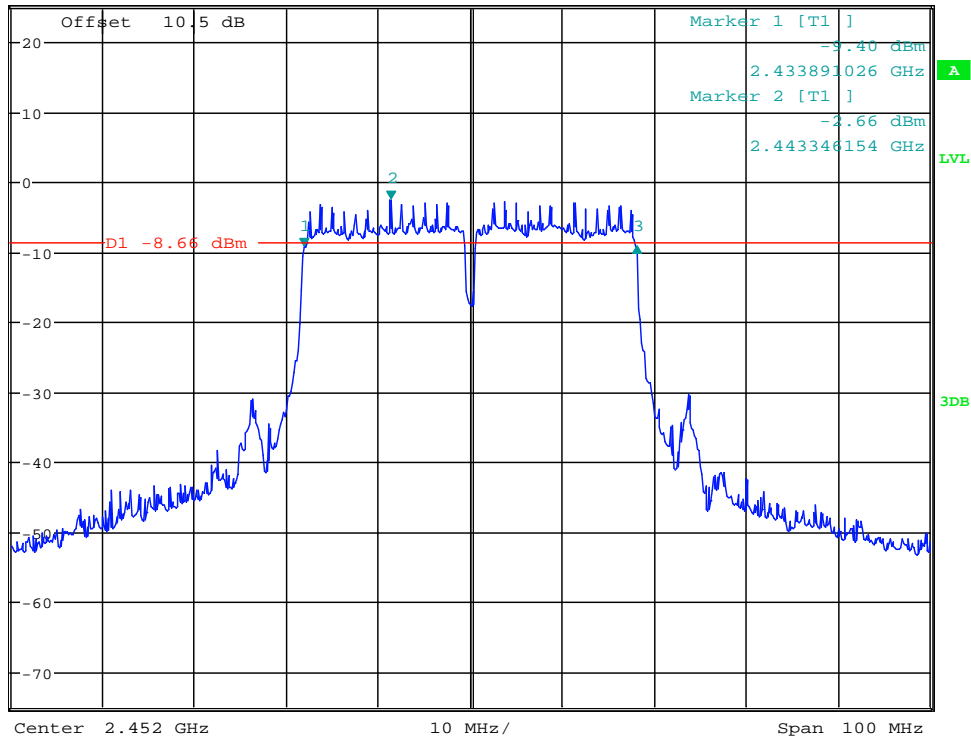
0.11 dB

Ref 25 dBm

*Att 10 dB

SWT 10 ms

36.217948718 MHz

1 PK
VIEW



Maximum Peak Output Power

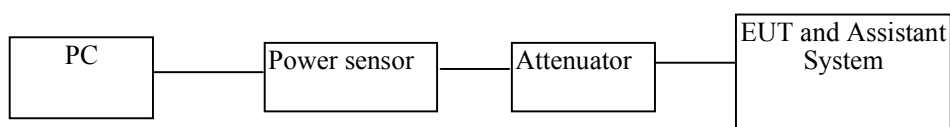
LIMITS

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.

Test Procedure

- (1) Connect each EUT's antenna output to power sensor by RF cable and attenuator
- (2) Measure out the Average and PK output power of each antenna port by power meter.

TEST SETUP



Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrum analyzer	R&S	FSU26	1166.1660.26	2016/10/16	2017/10/16
Attenuator	Mini-Circuits	BW-S10W2	101109	2016/08/18	2017/08/18
Power sensor	Anritsu	MA2411B	1243433	2016/08/18	2017/08/18
RF Cable	Micable	C10-01-01-1	100309	2016/08/18	2017/08/18

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0kPa

Test Mode: Transmitting mode

RESULTS

Shenzhen ZCT Technology Co., Ltd.
3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.
Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



EUT Set Mode	Soft power set	Data Rate (Mbps)	CH	Result(dBm)
				Peak
11b	53	11	CH1	18.12
			CH6	18.14
			CH11	18.45
11g	53	6	CH1	16.25
			CH6	16.57
			CH11	16.59
11n HT20	53	MCS 0	CH1	16.23
			CH6	16.05
			CH11	15.62
11n HT40	53	MCS0	CH3	14.25
			CH6	14.56
			CH9	14.63



POWER SPECTRAL DENSITY

LIMITS

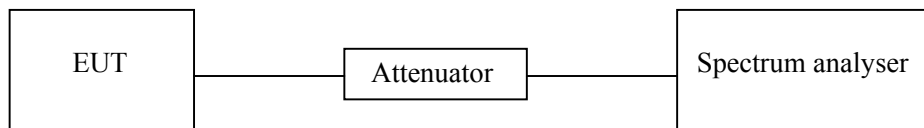
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	$3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$
VBW	$\geq 3\text{RBW}$
Trace	Max hold
Sweep	Auto couple

TEST SETUP



**Test Equipment List and Details**

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrum analyzer	R&S	FSU26	1166.1660.26	2016/10/16	2017/10/16
Attenuator	Mini-Circuits	BW-S10W2	101109	2016/08/18	2017/08/18
RF Cable	Micable	C10-01-01-1	100309	2016/08/18	2017/08/18

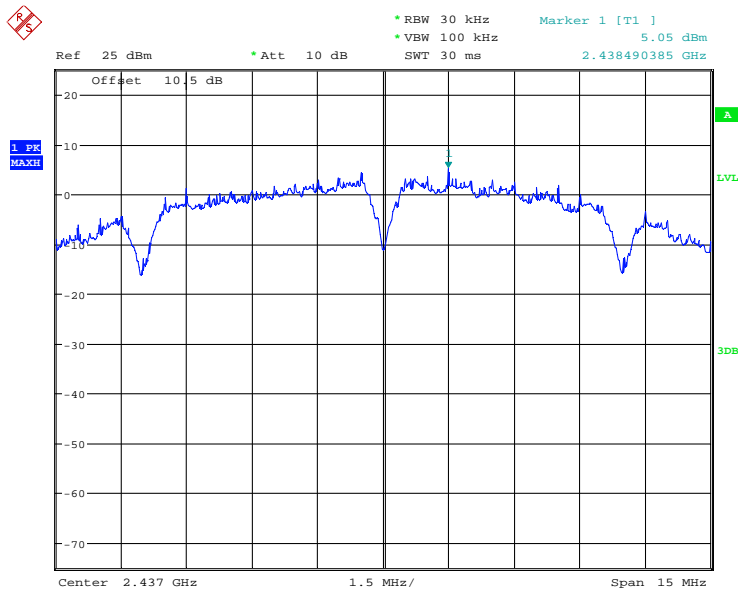
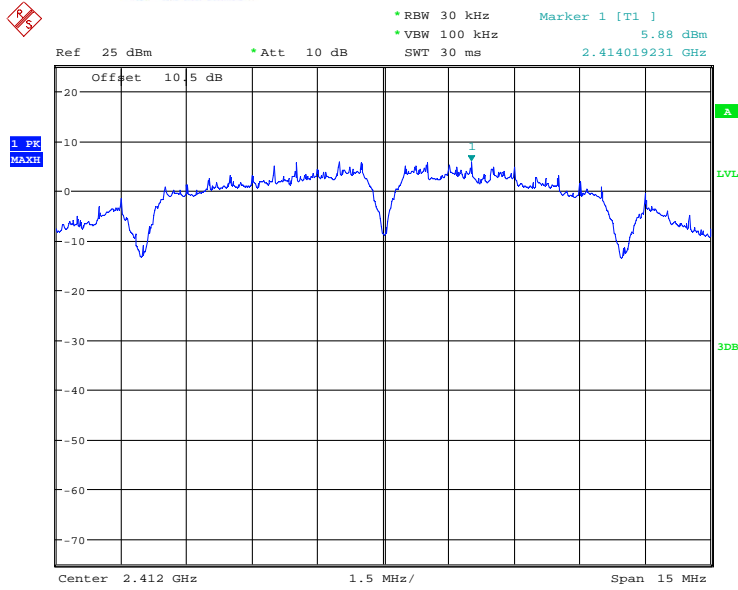
Test Data**Environmental Conditions**

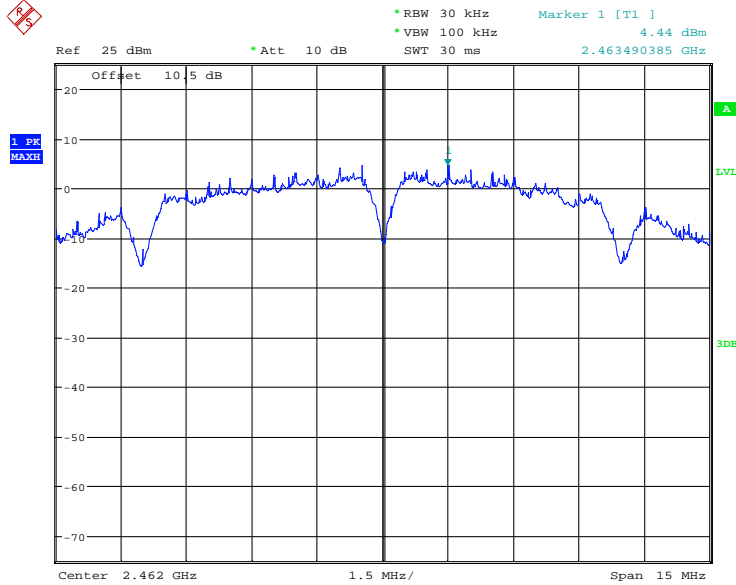
Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0kPa

*Test Mode: Transmitting mode***RESULTS**

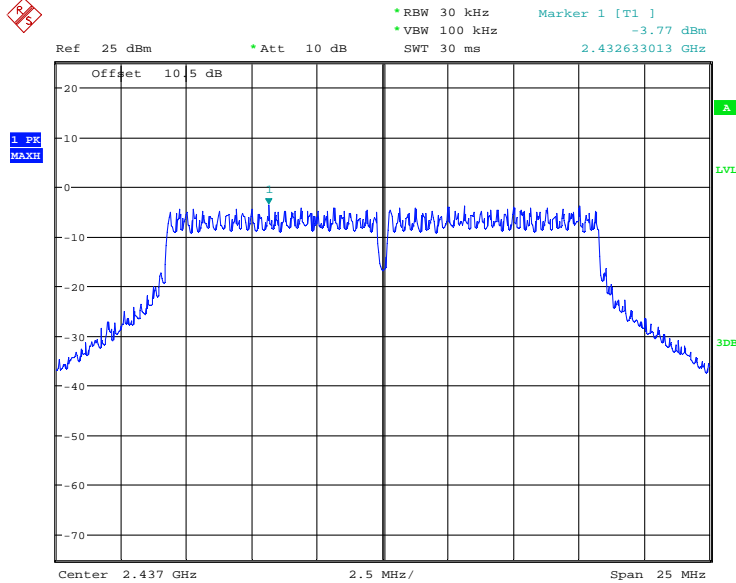
EUT Set Mode	CH or Frequency	Result	EUT Set Mode	CH or Frequency	Result
11b	CH1	5.88dBm/30KHz	11n HT 20	CH1	-4.12dBm/30KHz
	CH6	5.05dBm/30KHz		CH6	-4.03dBm/30KHz
	CH11	4.44dBm/30KHz		CH11	-3.96dBm/30KHz
11g	CH1	-4.03dBm/30KHz	11n HT 40	CH3	-7.69dBm/30KHz
	CH6	-3.77dBm/30KHz		CH6	-7.04dBm/30KHz
	CH11	-3.99dBm/30KHz		CH9	-7.72dBm/30KHz

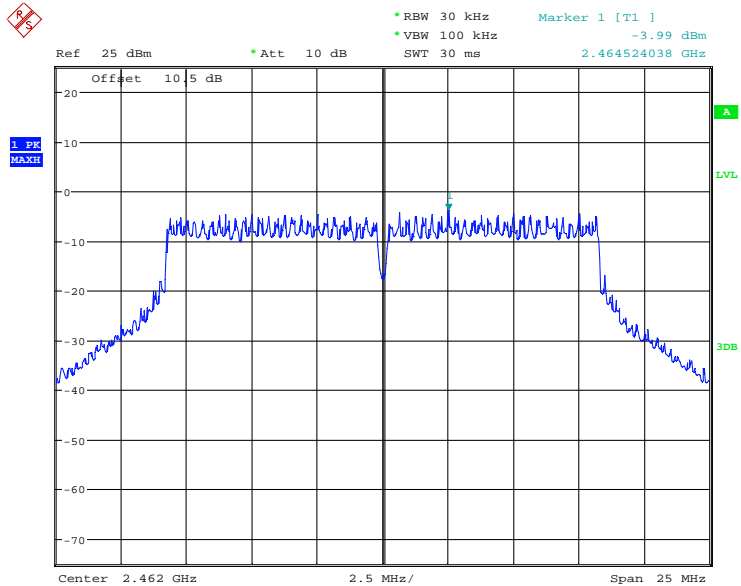
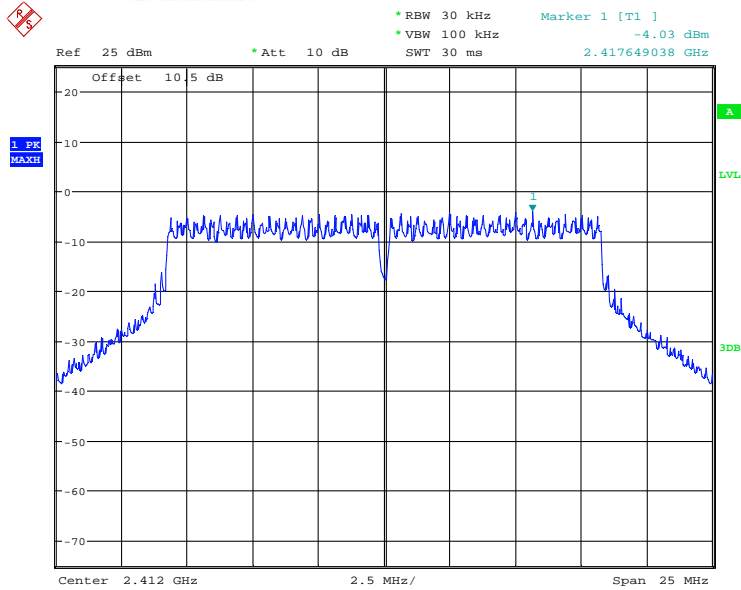
11b:



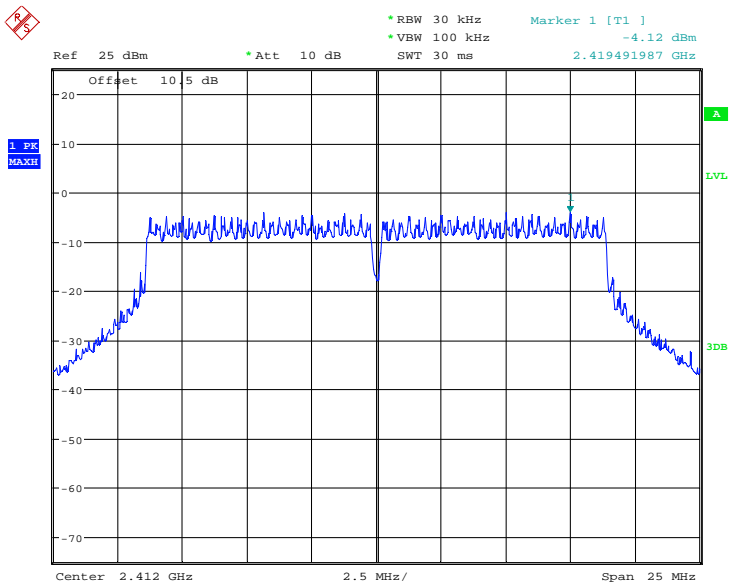
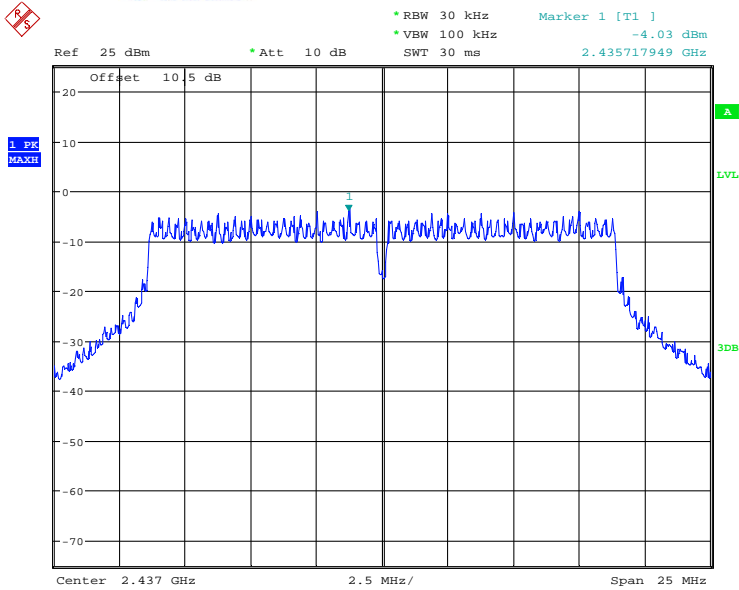


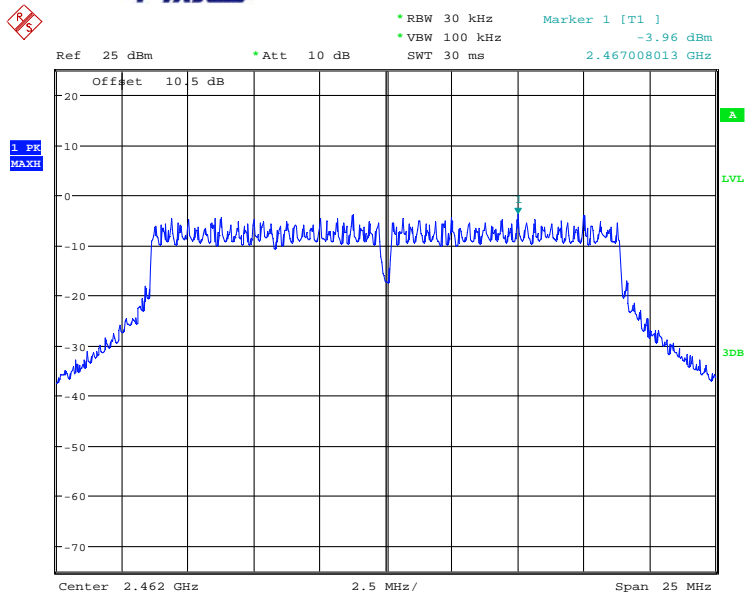
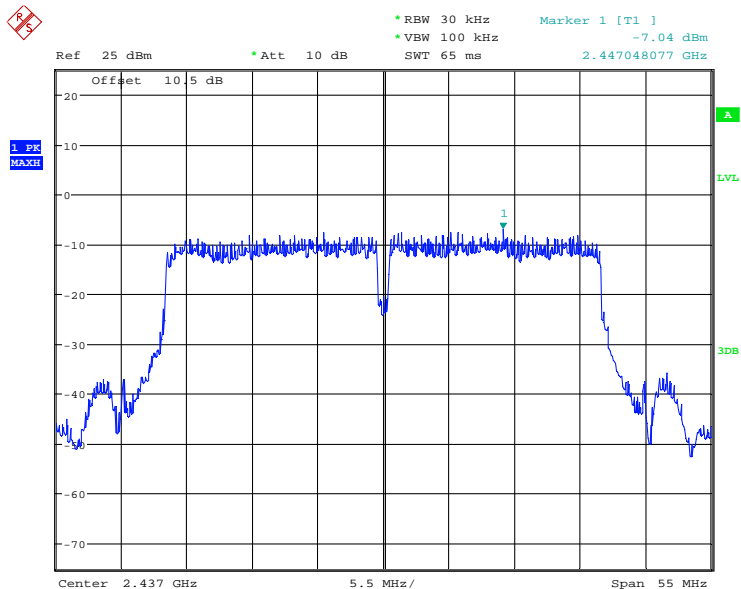
11g:

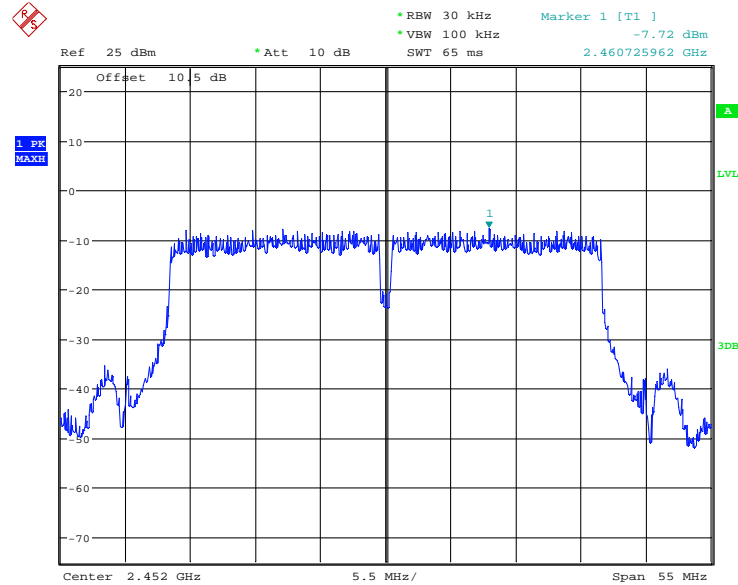
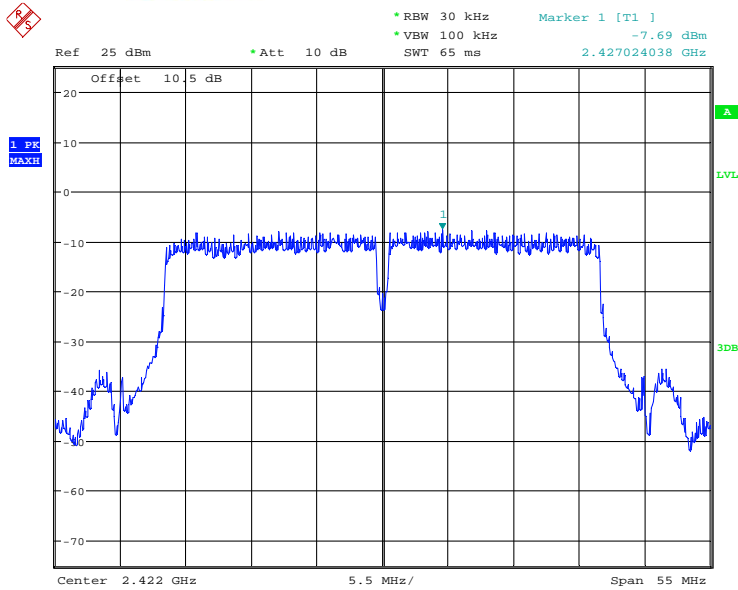




11n HT20:



**11n HT40:**





EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

LIMITS

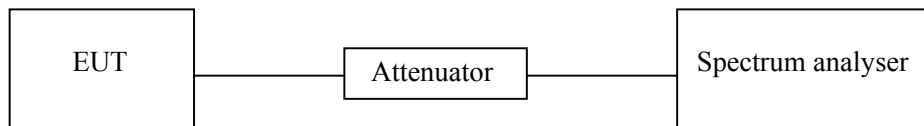
In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

Test Procedure

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100KHz
VBW	300KHz
Trace	Max hold
Sweep	Auto couple

TEST SETUP





Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrum analyzer	R&S	FSU26	1166.1660.26	2016/10/16	2017/10/16
Attenuator	Mini-Circuits	BW-S10W2	101109	2016/08/18	2017/08/18
RF Cable	Micable	C10-01-01-1	100309	2016/08/18	2017/08/18

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0kPa

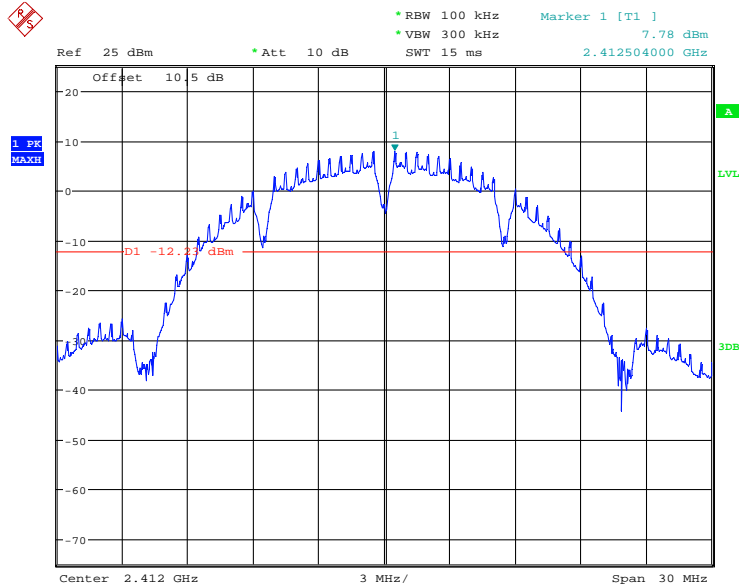
Test Mode: Transmitting mode

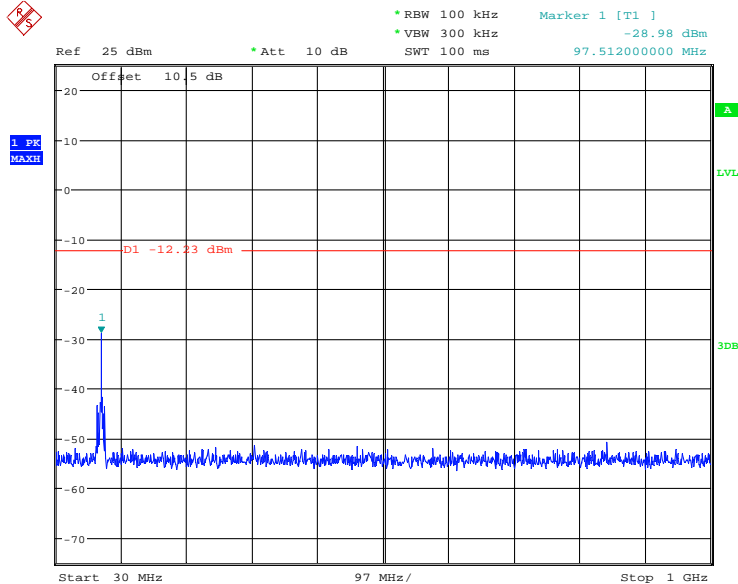
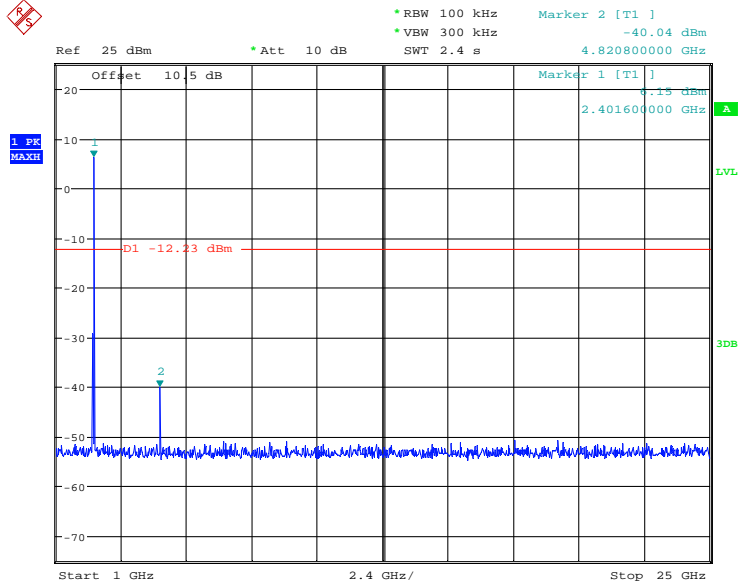
RESULTS

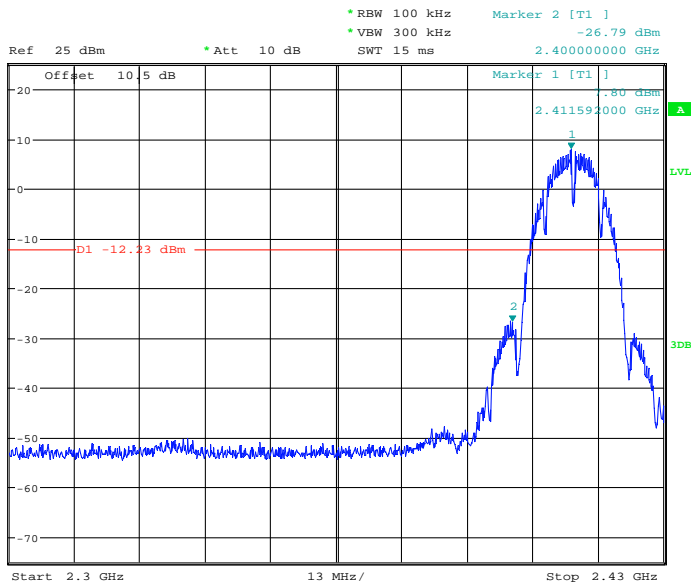
EUT Set Mode	CH or Frequency	Measured Range	Result (dBm)	EUT Set Mode	CH or Frequency	Measured Range	Result (dBm)
11b	CH1	30MHz-1GHz	PASS	11n HT 20	CH1	30MHz-1GHz	PASS
		1GHz-25GHz	PASS			1GHz-25GHz	PASS
		2.3GHz-2.43GHz	PASS			2.3GHz-2.43GHz	PASS
	CH6	30MHz-1GHz	PASS		CH6	30MHz-1GHz	PASS
		1GHz-25GHz	PASS			1GHz-25GHz	PASS
	CH11	30MHz-1GHz	PASS		CH11	30MHz-1GHz	PASS
		1GHz-25GHz	PASS			1GHz-25GHz	PASS
		2.45GHz-2.6GHz	PASS			2.45GHz-2.6GHz	PASS
11g	CH1	30MHz-1GHz	PASS	11n HT 40	CH3	30MHz-1GHz	PASS
		1GHz-25GHz	PASS			1GHz-25GHz	PASS
		2.3GHz-2.43GHz	PASS			2.3GHz-2.43GHz	PASS
	CH6	30MHz-1GHz	PASS		CH6	30MHz-1GHz	PASS
		1GHz-25GHz	PASS			1GHz-25GHz	PASS
	CH11	30MHz-1GHz	PASS		CH9	30MHz-1GHz	PASS
		1GHz-25GHz	PASS			1GHz-25GHz	PASS
		2.45GHz-2.6GHz	PASS			2.43-2.6GHz	PASS



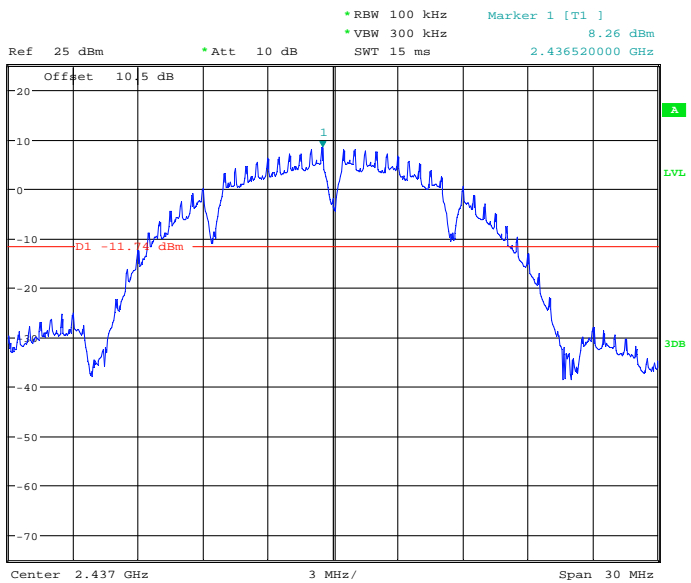
11b CH1:

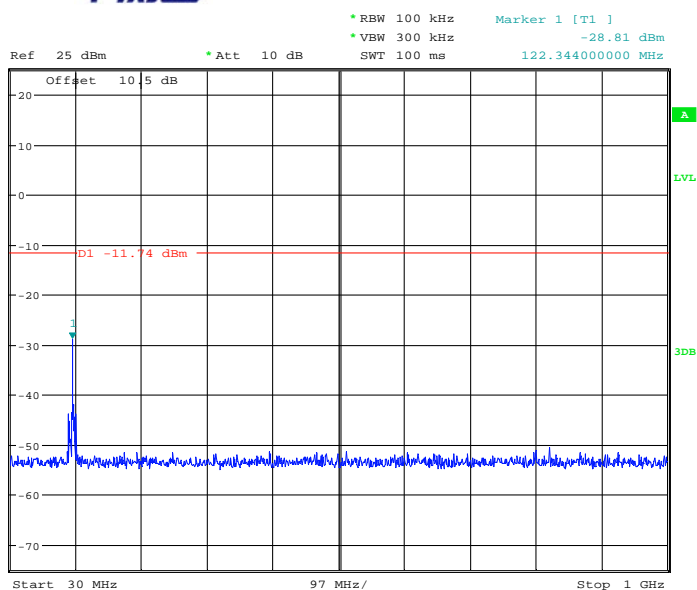
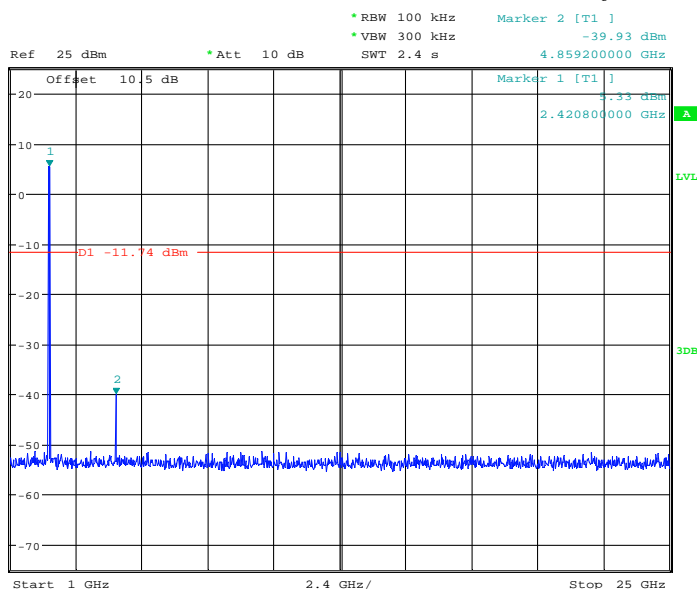






11b CH6:

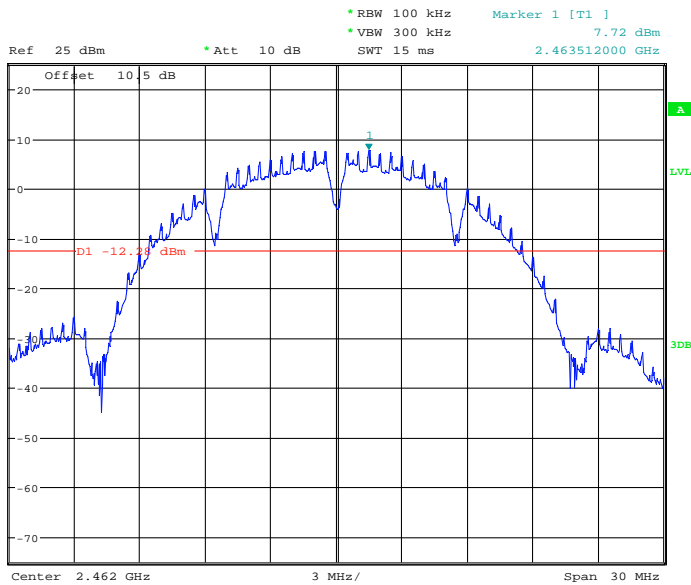


1 PK
MAXH1 PK
MAXH

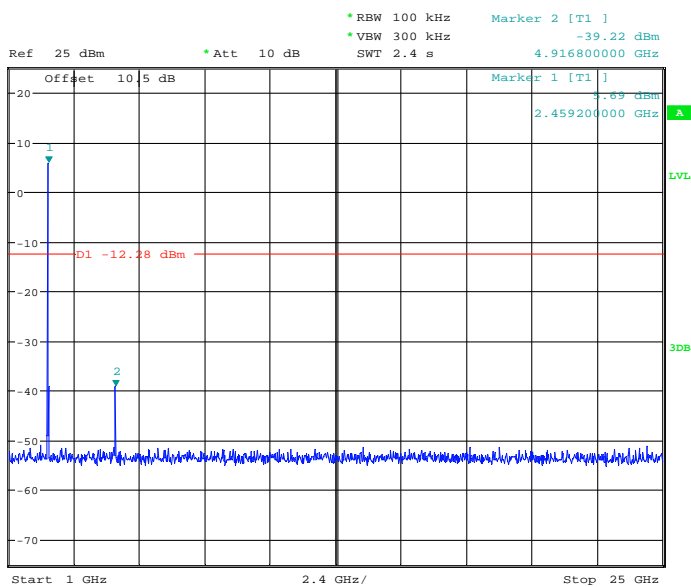
11b CH11:



1 PK
MAXH

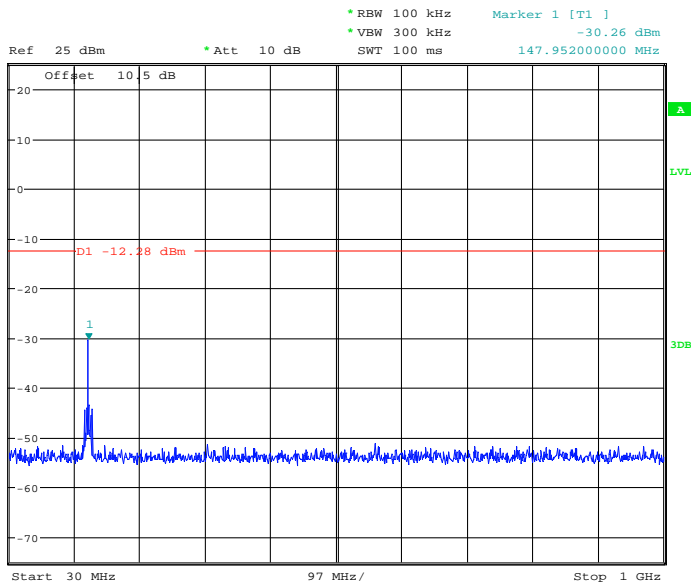


1 PK
MAXH

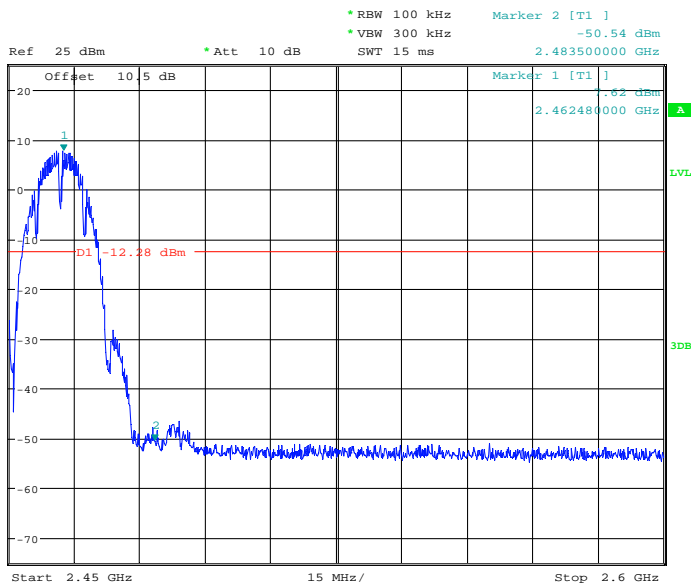




1 PK
MAXH



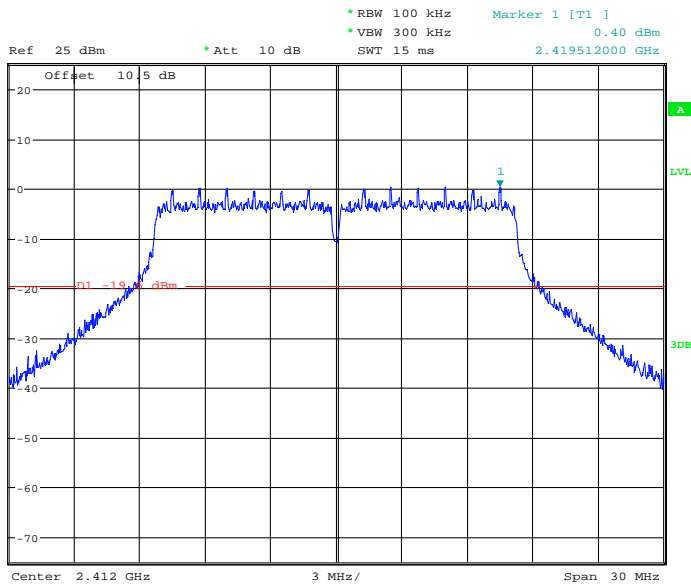
1 PK
MAXH



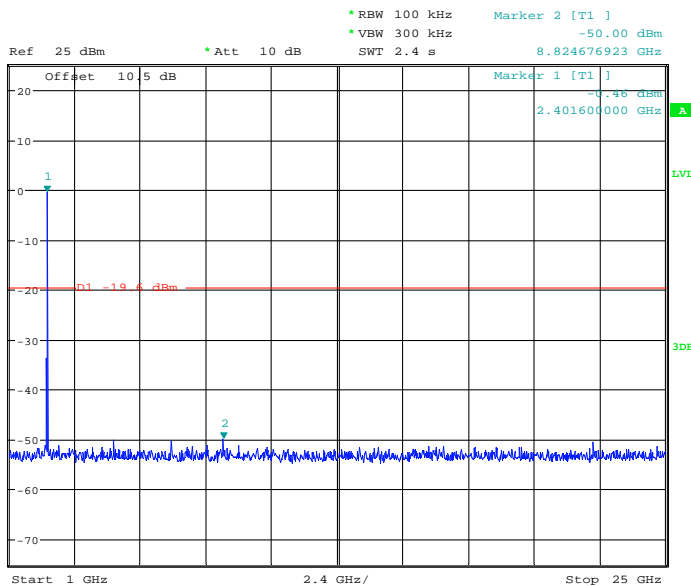
11g CH1:

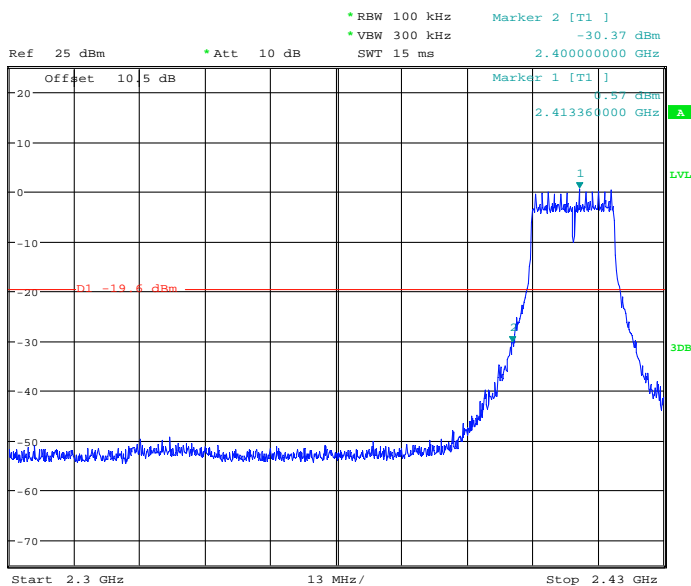
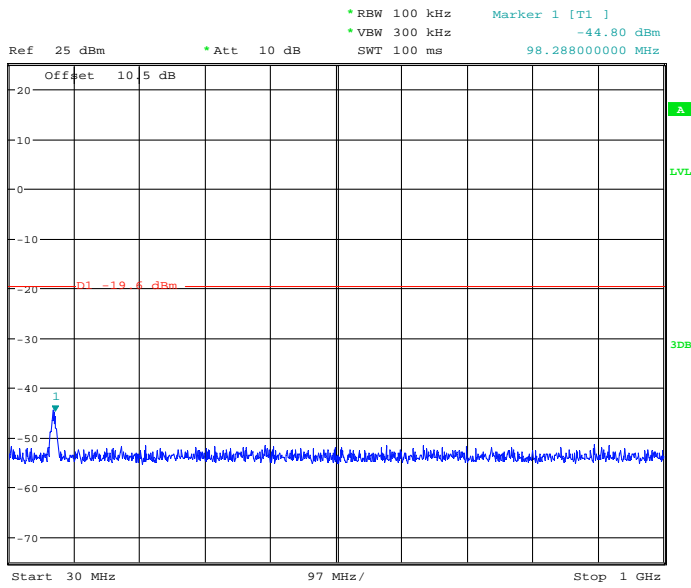


1 PK
MAXH



1 PK
MAXH

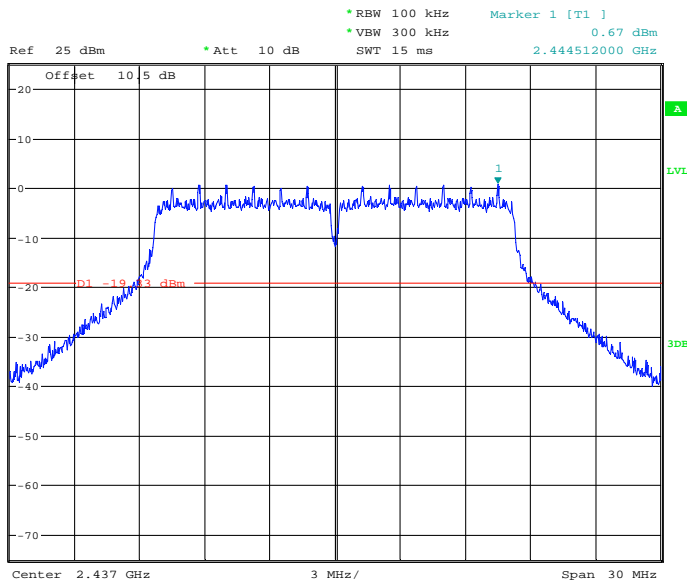




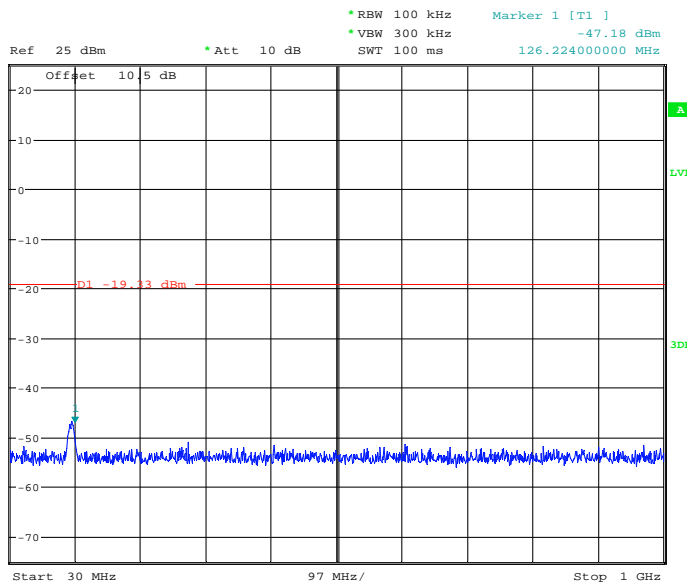
11g CH6:

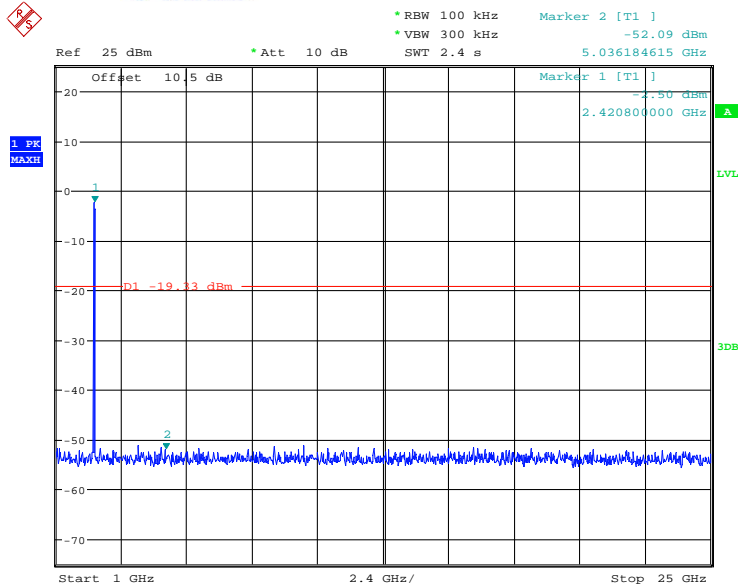


1 PK
MAXH

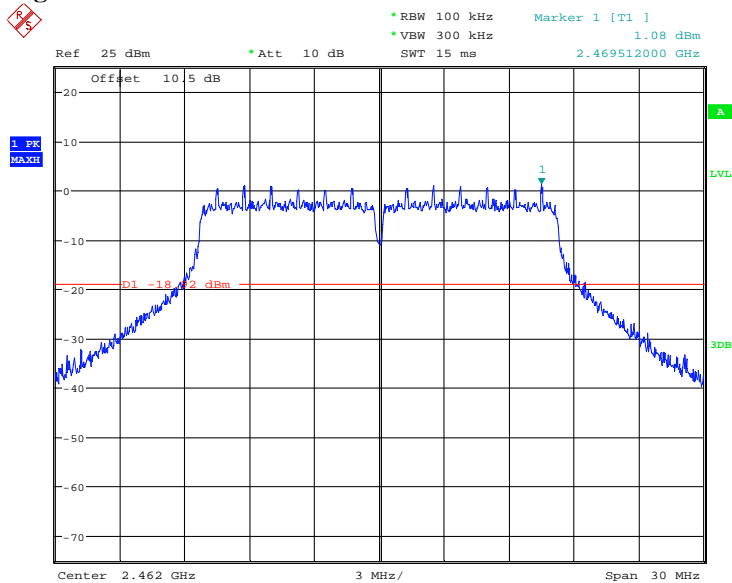


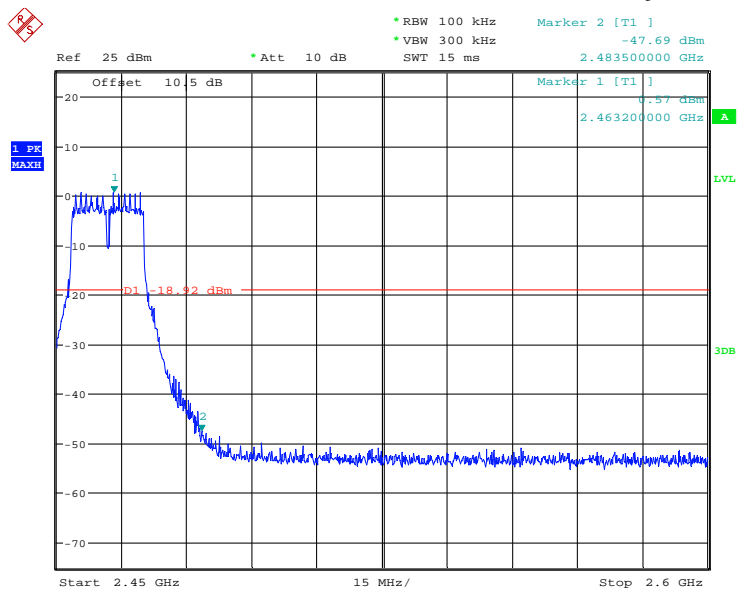
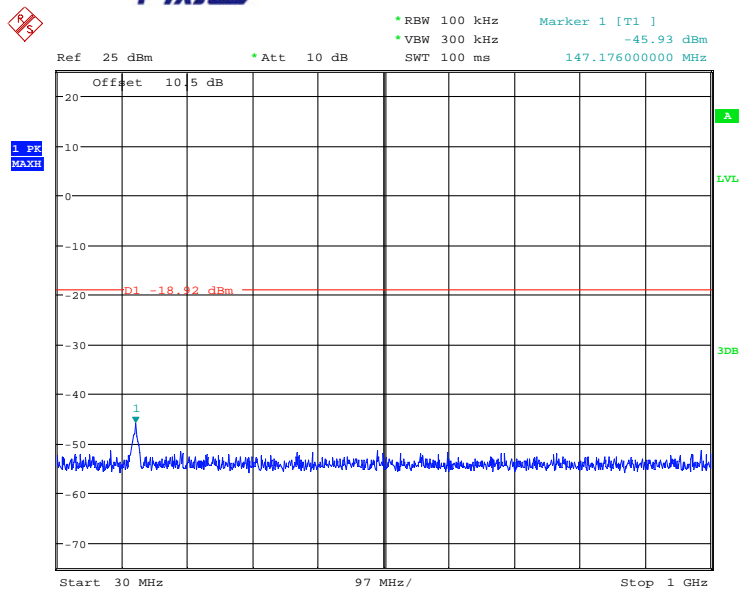
1 PK
MAXH





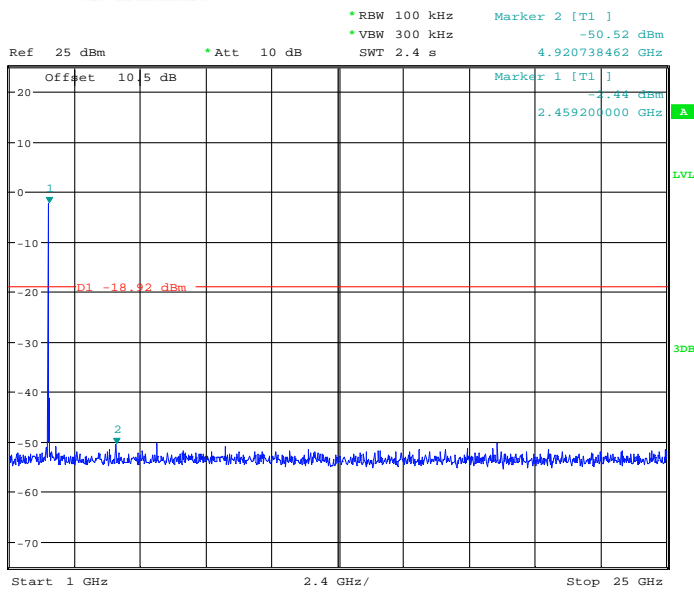
11g CH11:







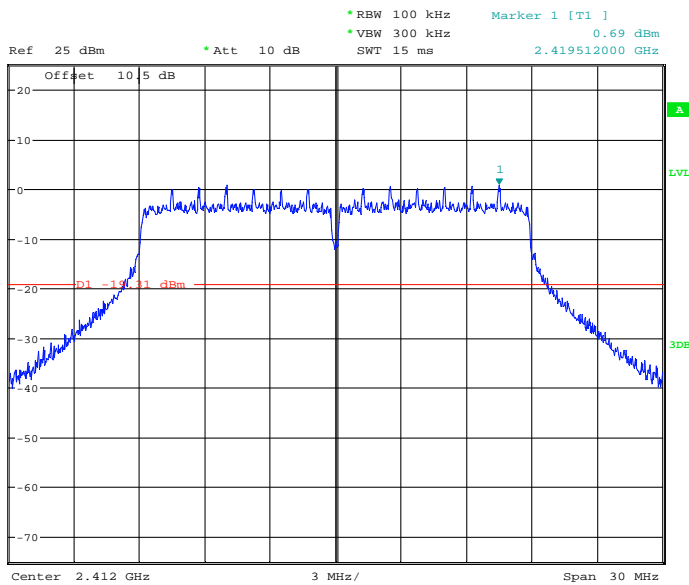
1 PK
MAXH

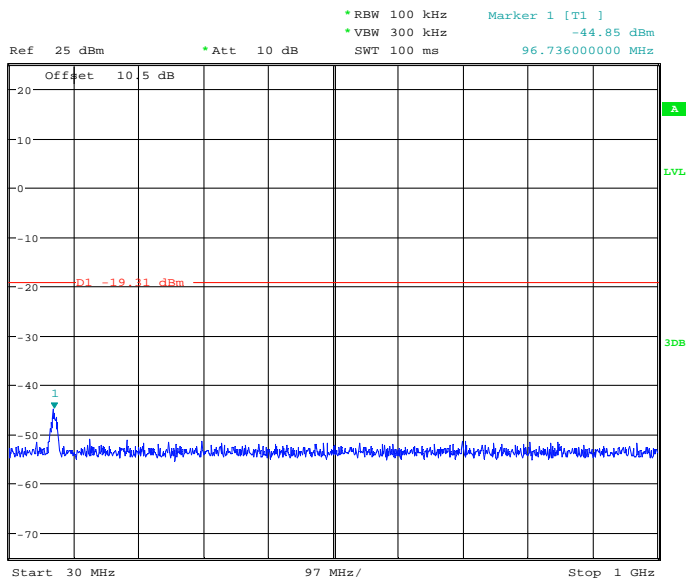
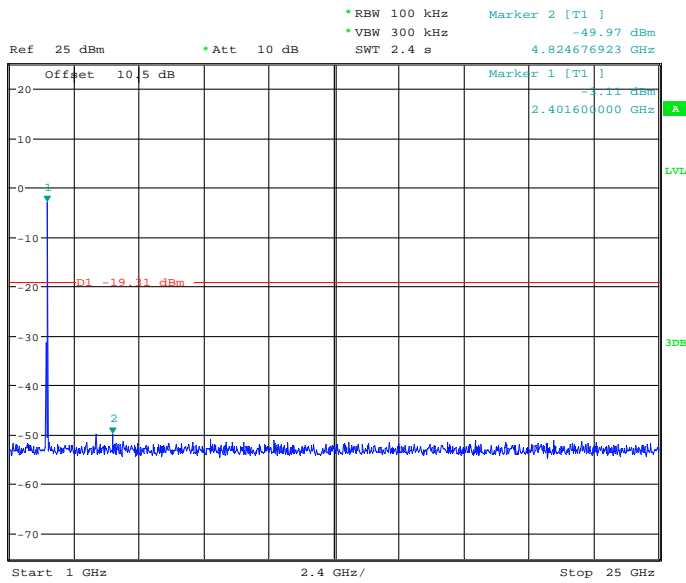


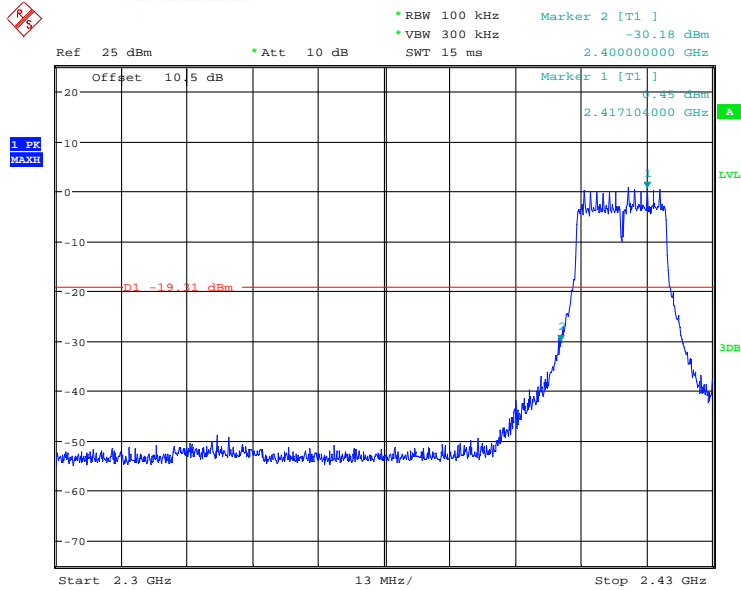
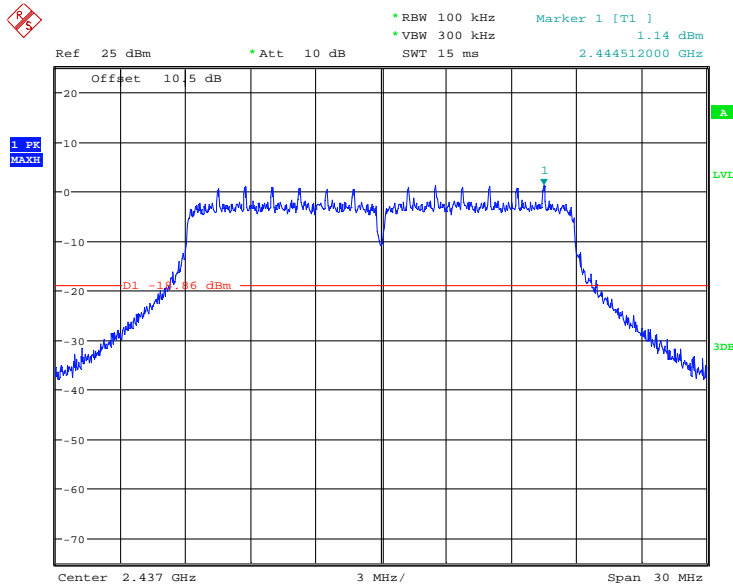
11n HT20 CH1:



1 PK
MAXH

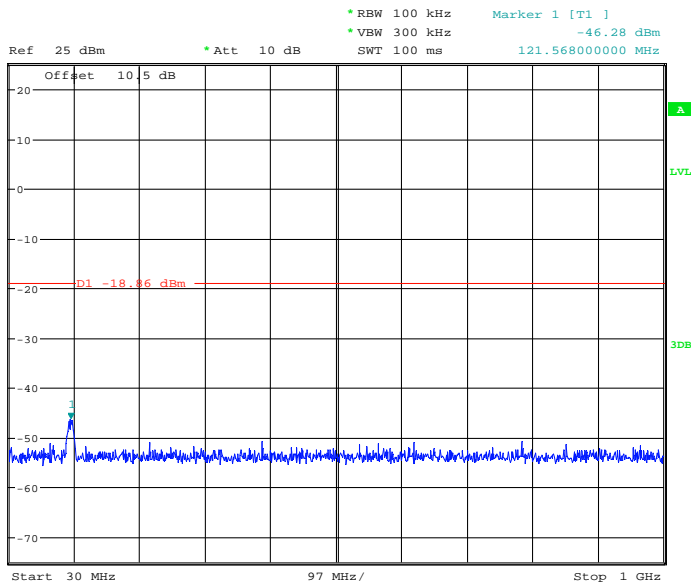




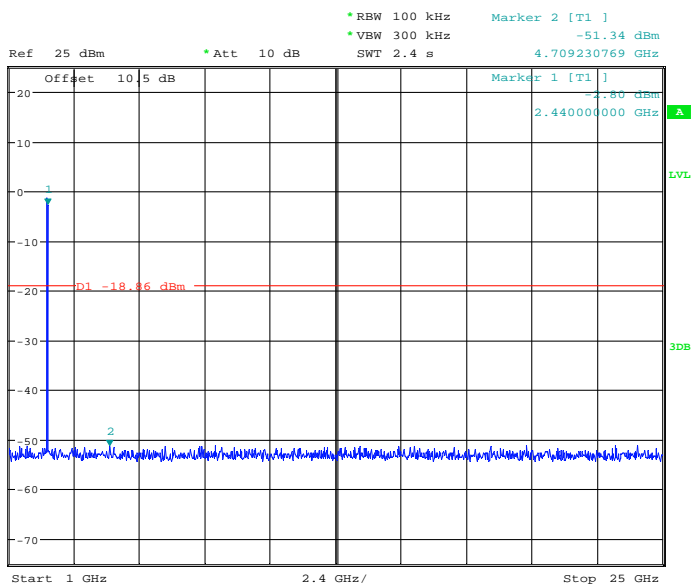
**11n HT20 CH6:**



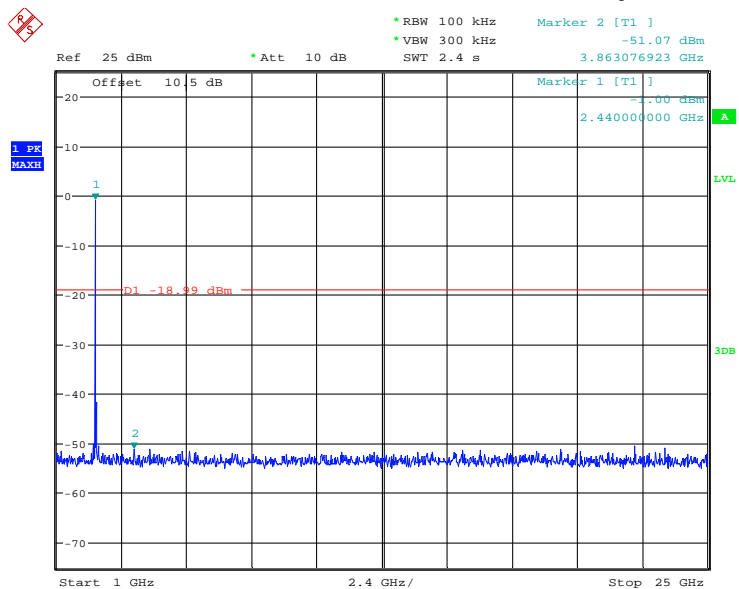
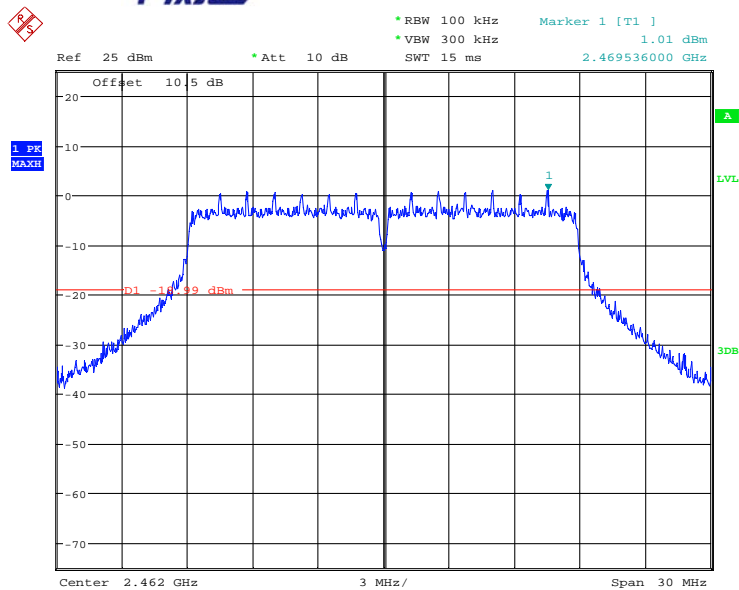
1 PK
MAXH



1 PK
MAXH

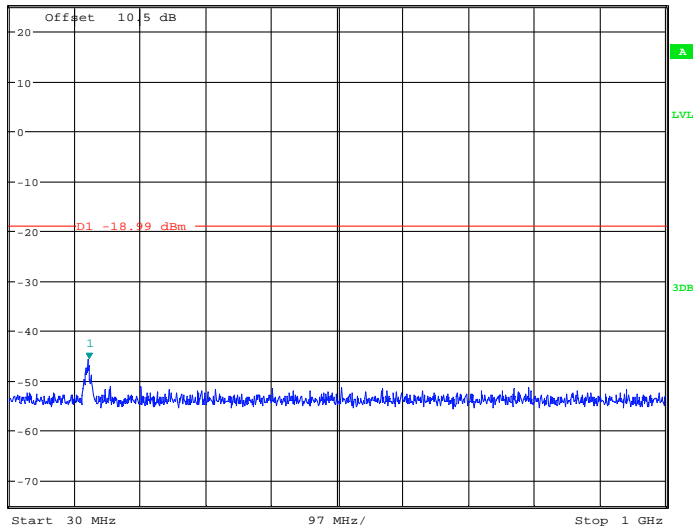


11n HT20 CH11:

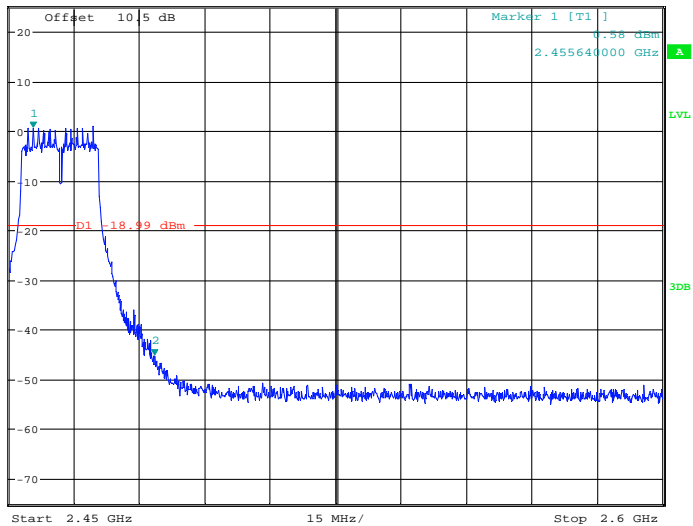




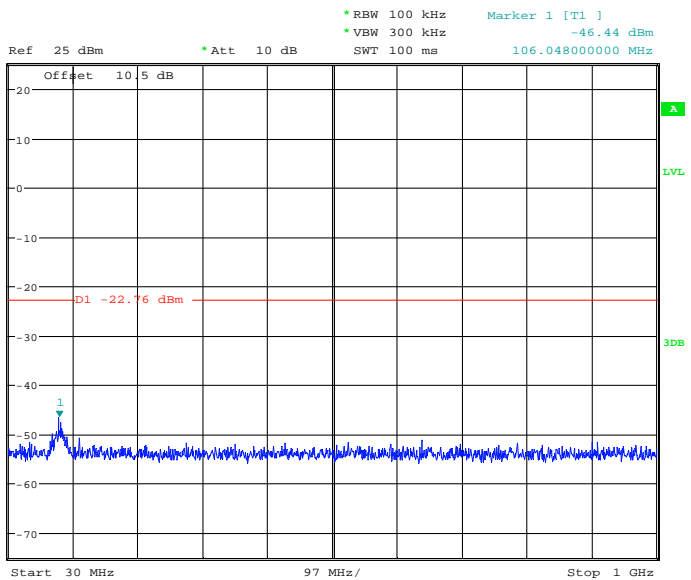
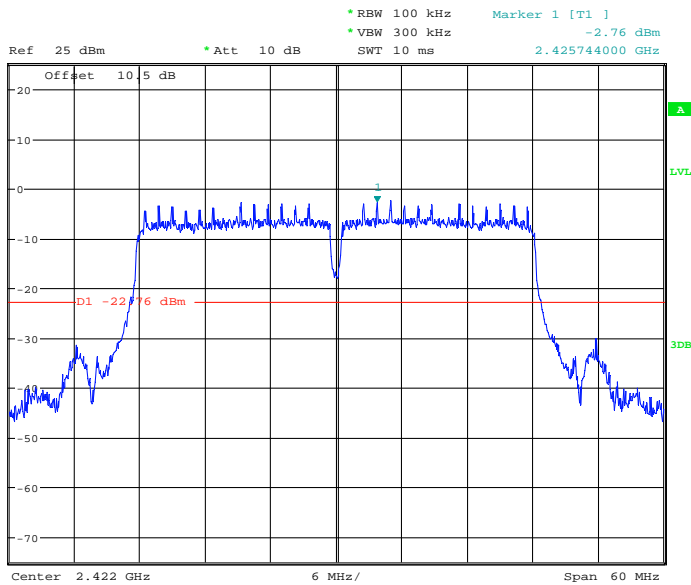
Ref 25 dBm * Att 10 dB * RBW 100 kHz * VBW 300 kHz * Marker 1 [T1] -45.72 dBm
SWT 100 ms 147.95200000 MHz



Ref 25 dBm * Att 10 dB * RBW 100 kHz * VBW 300 kHz * Marker 1 [T1] -45.33 dBm
SWT 15 ms 2.483500000 GHz

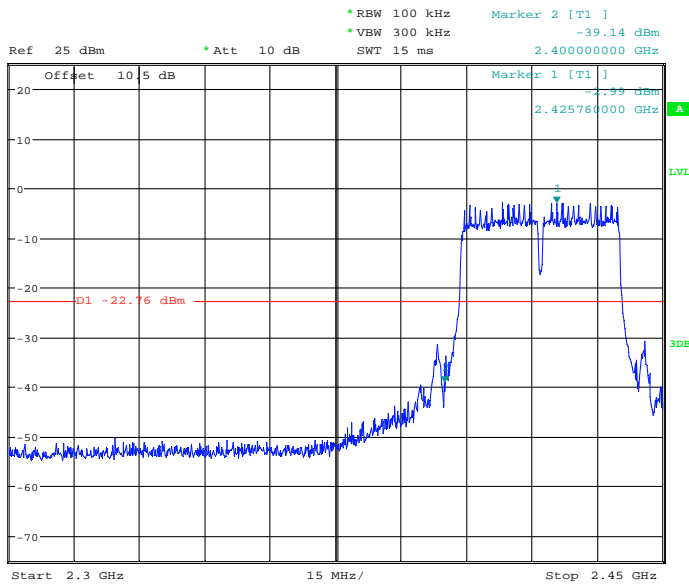


11n HT40 CH3:

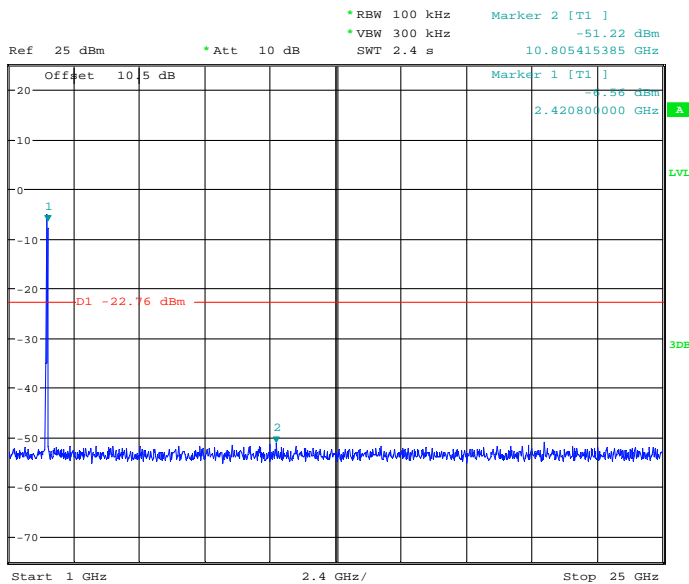




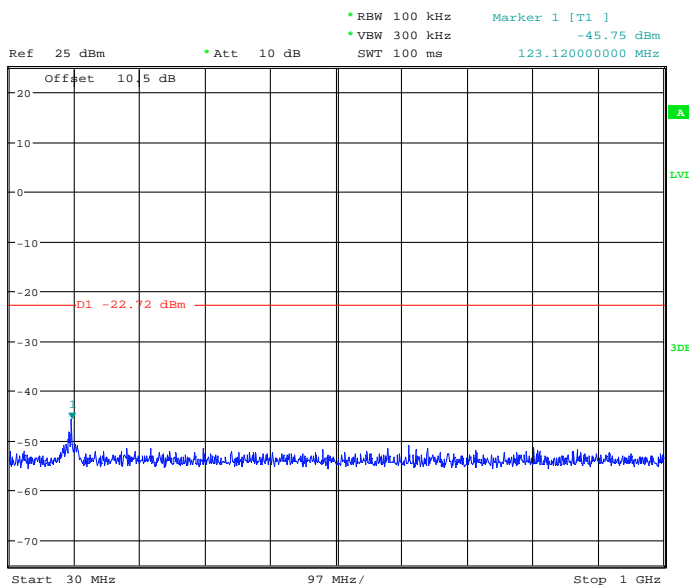
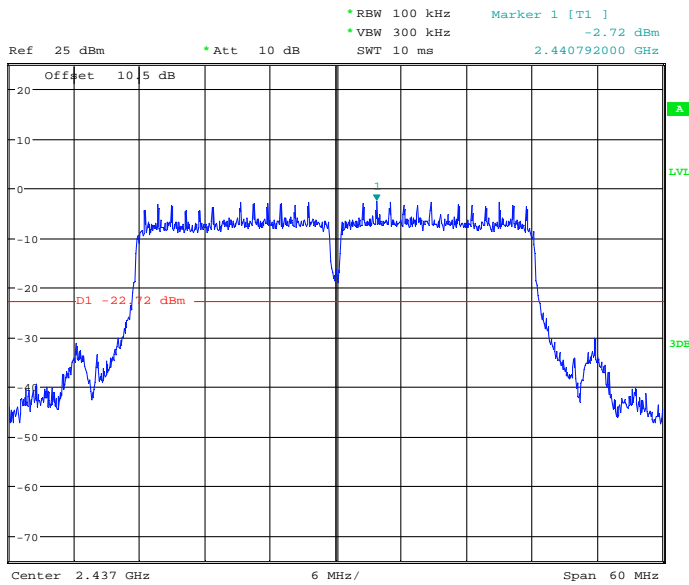
1 PK
MAXH

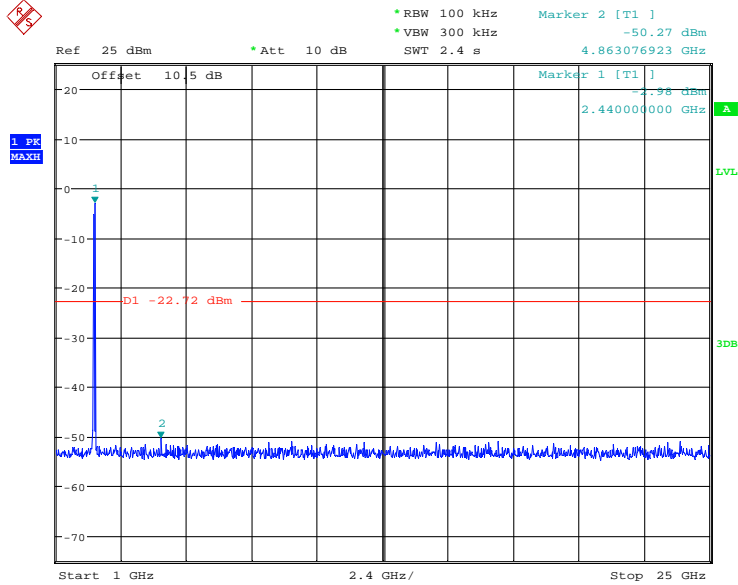


1 PK
MAXH

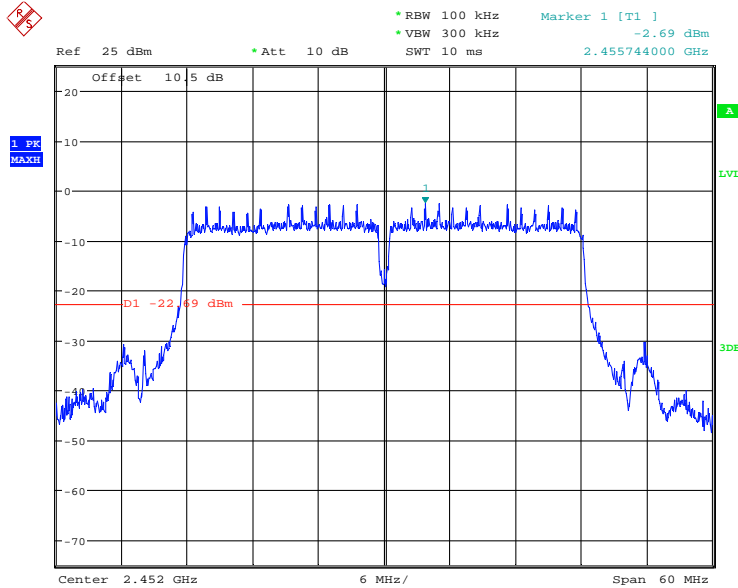


11n HT40 CH6:



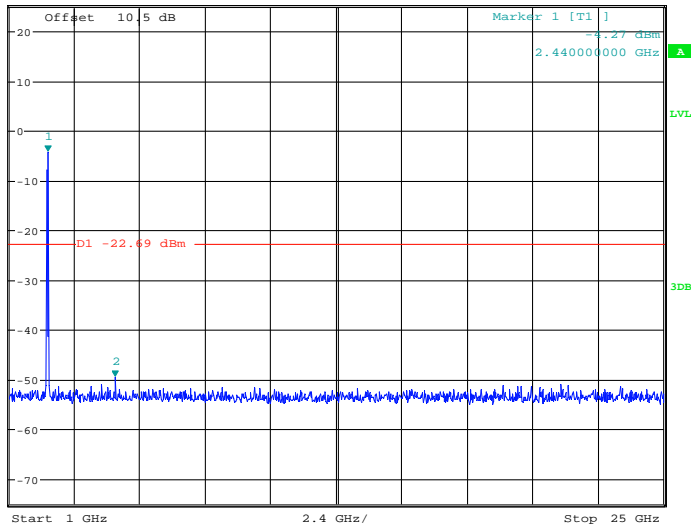


11n HT40 CH9:

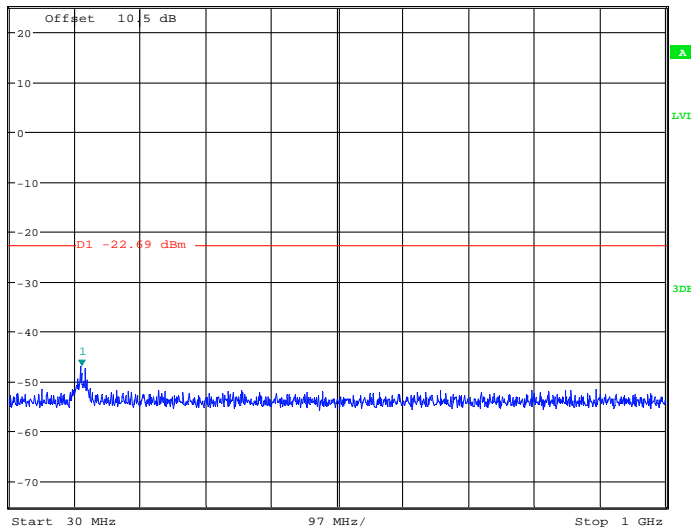


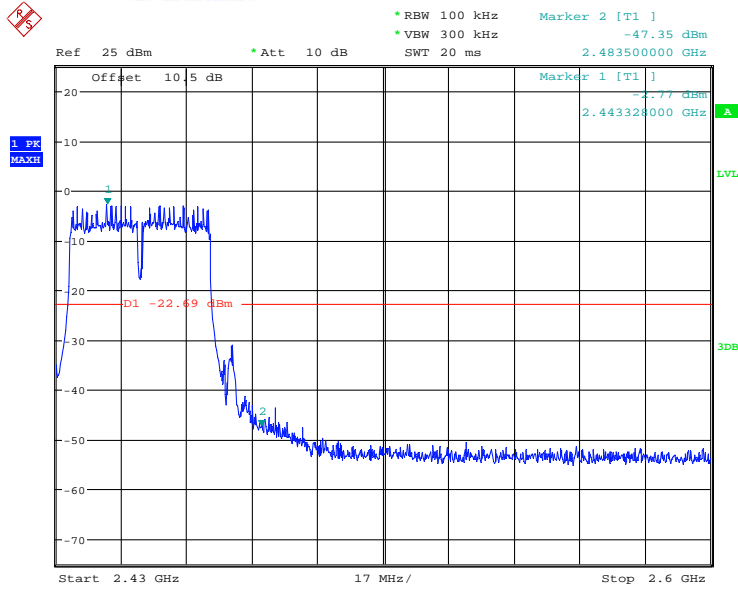


Ref 25 dBm * Att 10 dB * RBW 100 kHz * VBW 300 kHz * Marker 2 [T1] -49.55 dBm
SWT 2.4 s 4.901538462 GHz



Ref 25 dBm * Att 10 dB * RBW 100 kHz * VBW 300 kHz * Marker 1 [T1] -47.03 dBm
SWT 100 ms 137.098000000 MHz







Radiated Emission

LIMITS

Please refer to FCC §15.205 and §15.209

Please refer to FCC §15.247 (a)(d)(e)

The field strength of emissions from intentional radiators operated within these frequency bands			
Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3

Emissions radiated outside of the specified frequency bands			
Frequency Range (MHz) 30 - 88	Field Strength Limit (uV/m) at 3 m 100	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

Test Setup and Procedure

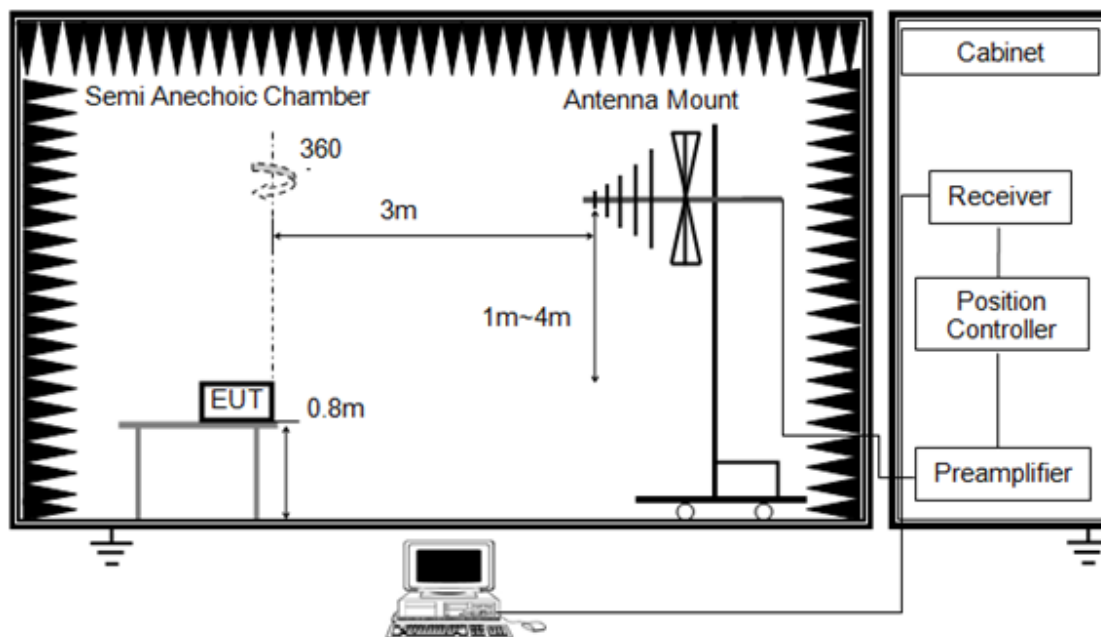
Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>

TEST SETUP AND PROCEDURE

Below 1G



The setting of the spectrum analyser

RBW	120K
VBW	300K
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

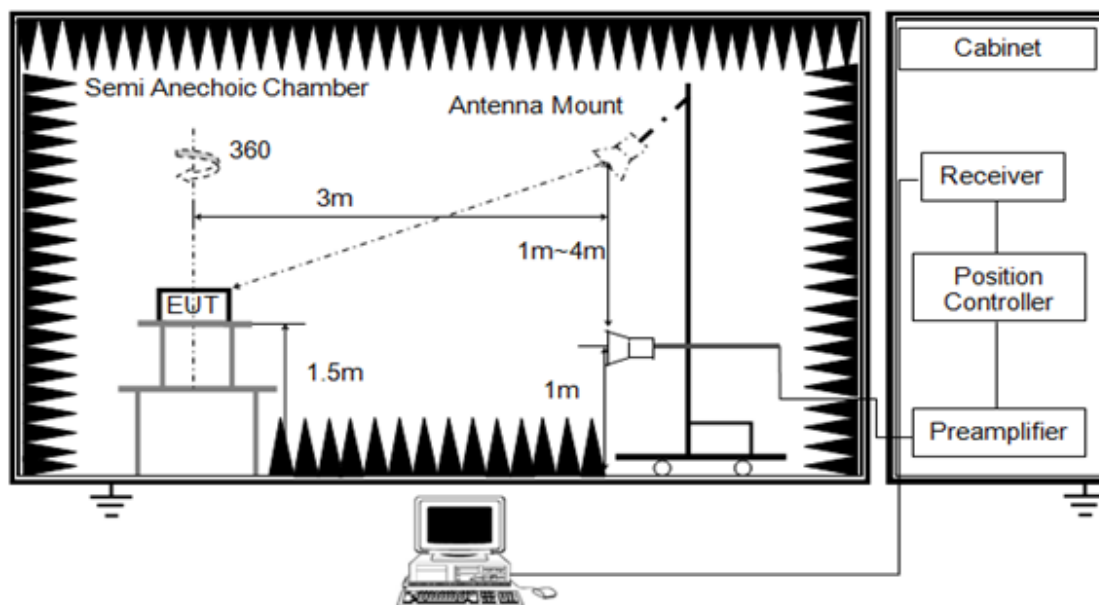
1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

7. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

ABOVE 1G



The setting of the spectrum analyser

RBW	1M
VBW	3M/10Hz for Average
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test



in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5 meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

6. For measurement above 1GHz, the emission measurement will be measured by the peak detector and the AV detector.

7. For fundamental frequency test, set spectrum analyzer's RBW=3MHz, VBW=10MHz. peak detector for PK, RMS detector for AV, Read the Level in spectrum analyzer and record.

8. 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.

Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESU8	100316	2016/10/16	2017/10/16
Spectrum analyzer	R&S	FSU26	1166.1660.26	2016/10/16	2017/10/16
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2016/10/27	2017/10/27
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	2016/10/27	2017/10/27
Double Ridged Horn Antenna	R&S	HF907	100276	2016/10/12	2017/10/12
Pre-amplifier	A.H.	PAM-0118	360	2016/10/16	2017/10/16
RF Cable	HUBSER	CP-X2	W11.03	2016/10/16	2017/10/16
RF Cable	HUBSER	CP-X1	W12.02	2016/10/16	2017/10/16
MI Cable	HUBSER	C10-01-01-1M	1091629	2016/10/16	2017/10/16
Test software	Audix	E3	V 6.11111b	/	/

Test Data

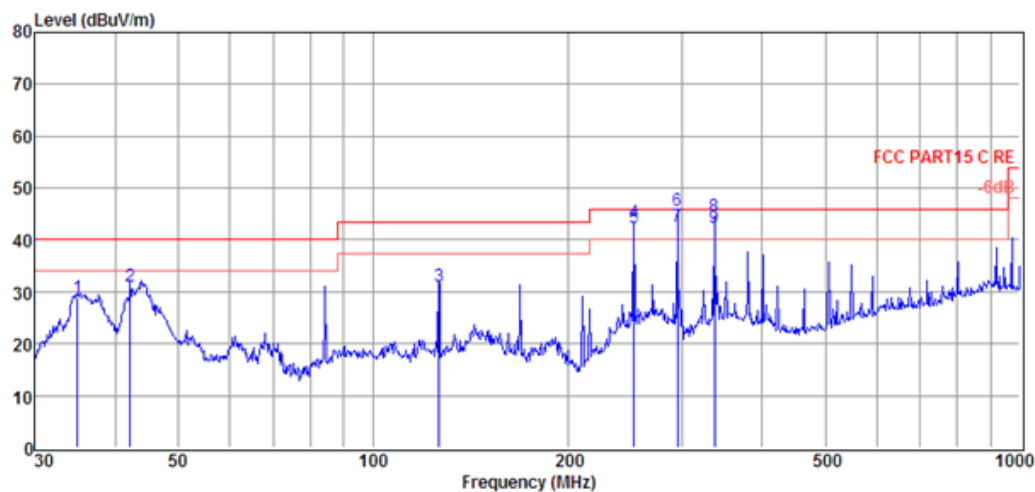
Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa



Test Result: Compliant.

SPURIOUS EMISSIONS BELOW 1 GHz
(TX mode, VERTICAL)



Item (Mark)	Freq. (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	34.88	15.52	12.30	0.94	28.76	40.00	-11.24	QP	VERTICAL
2	42.15	16.16	14.00	1.01	31.17	40.00	-8.83	QP	VERTICAL
3	126.33	20.78	8.83	1.59	31.20	43.50	-12.30	QP	VERTICAL
4	252.95	29.27	11.64	2.47	43.38	46.00	-2.62	Peak	VERTICAL
5	252.95	28.27	11.64	2.47	42.38	46.00	-3.62	QP	VERTICAL
6	295.15	28.74	14.27	2.69	45.70	46.00	-0.30	Peak	VERTICAL
7	295.15	25.74	14.27	2.69	42.70	46.00	-3.30	QP	VERTICAL
8	337.22	27.45	14.14	2.84	44.43	46.00	-1.57	Peak	VERTICAL
9	337.22	25.45	14.14	2.84	42.43	46.00	-3.57	QP	VERTICAL

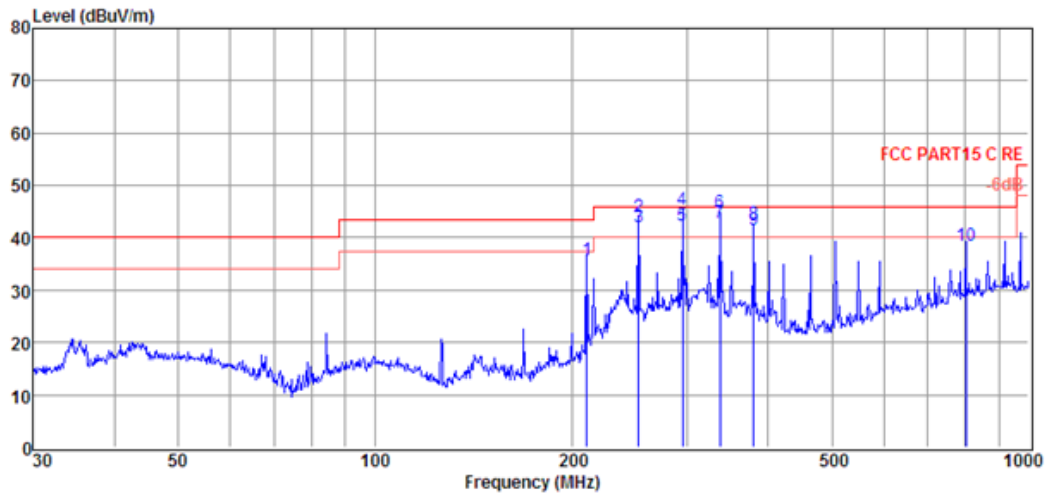
Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



(TX mode, HORIZONTAL)



Item (Mark)	Freq. (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	210.79	24.42	9.20	2.18	35.80	43.50	-7.70	QP	HORIZONTAL
2	252.95	44.02	0.00	0.00	44.02	46.00	-1.98	Peak	HORIZONTAL
3	252.95	27.91	11.64	2.47	42.02	46.00	-3.98	QP	HORIZONTAL
4	295.15	28.43	14.27	2.69	45.39	46.00	-0.61	Peak	HORIZONTAL
5	295.15	25.43	14.27	2.69	42.39	46.00	-3.61	QP	HORIZONTAL
6	337.22	27.96	14.14	2.84	44.94	46.00	-1.06	Peak	HORIZONTAL
7	337.22	25.96	14.14	2.84	42.94	46.00	-3.06	QP	HORIZONTAL
8	379.91	23.95	15.52	3.17	42.64	46.00	-3.36	Peak	HORIZONTAL
9	379.91	22.95	15.52	3.17	41.64	46.00	-4.36	QP	HORIZONTAL
10	801.79	13.33	20.40	4.69	38.42	46.00	-7.58	QP	HORIZONTAL

*SPURIOUS EMISSIONS (1~18GHz)*

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									
1329.00	49.74	24.73	29.37	4.49	49.59	74.00	-24.41	Peak	VERTICAL
4824.00	33.26	33.73	29.32	8.50	46.17	54.00	-7.83	Average	VERTICAL
4824.00	45.09	33.73	29.32	8.50	58.00	74.00	-16.00	Peak	VERTICAL
7236.00	33.68	36.39	30.52	10.63	50.18	74.00	-23.82	Peak	VERTICAL
1329.00	44.23	24.73	29.37	4.49	44.08	74.00	-29.92	Peak	HORIZONTAL
4824.00	36.60	33.73	29.32	8.50	49.51	54.00	-4.49	Average	HORIZONTAL
4824.00	49.27	33.73	29.32	8.50	62.18	74.00	-11.82	Peak	HORIZONTAL
7236.00	36.28	36.39	30.52	10.63	52.78	74.00	-21.22	Peak	HORIZONTAL
11b CH6									
1322.00	44.36	24.70	29.37	4.49	44.18	74.00	-29.82	Peak	HORIZONTAL
4874.00	36.07	33.72	29.33	8.56	49.02	54.00	-4.98	Average	HORIZONTAL
4874.00	51.23	33.72	29.33	8.56	64.18	74.00	-9.82	Peak	HORIZONTAL
7311.00	37.86	36.45	30.57	10.69	54.43	74.00	-19.57	Peak	HORIZONTAL
1329.00	52.05	24.73	29.37	4.49	51.90	74.00	-22.10	Peak	VERTICAL
4874.00	33.27	33.72	29.33	8.56	46.22	54.00	-7.78	Average	VERTICAL
4874.00	44.33	33.72	29.33	8.56	57.28	74.00	-16.72	Peak	VERTICAL
7311.00	36.49	36.45	30.57	10.69	53.06	74.00	-20.94	Peak	VERTICAL
11b CH11									
1329.00	51.82	24.73	29.37	4.49	51.67	74.00	-22.33	Peak	VERTICAL
4924.00	33.00	33.71	29.34	8.60	45.97	54.00	-8.03	Average	VERTICAL
4924.00	44.33	33.71	29.34	8.60	57.30	74.00	-16.70	Peak	VERTICAL
7386.00	36.64	36.51	30.65	10.75	53.25	74.00	-20.75	Peak	VERTICAL
1329.00	44.82	24.73	29.37	4.49	44.67	74.00	-29.33	Peak	HORIZONTAL
4924.00	36.98	33.71	29.34	8.60	49.95	54.00	-4.05	Average	HORIZONTAL
4924.00	53.81	33.71	29.34	8.60	66.78	74.00	-7.22	Peak	HORIZONTAL
7386.00	39.46	36.51	30.65	10.75	56.07	74.00	-17.93	Peak	HORIZONTAL

Note: 1.30MHz~18GHz: (Scan with 11b, 11g, 11n HT20 and 11n HT40, 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.

Note2: 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.

**RESTRICTED BANDEDGE**

Mode 11b CH1

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	2390.04	37.41	29.99	30.21	5.17	42.36	74.00	-31.64	Peak	HORIZONTAL
2	2400.00	60.47	29.99	30.21	5.17	65.42	74.00	-8.58	Peak	HORIZONTAL

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	2390.04	35.39	29.99	30.21	5.17	40.34	74.00	-33.66	Peak	VERTICAL
2	2400.00	57.34	29.99	30.21	5.17	62.29	74.00	-11.71	Peak	VERTICAL

Mode 11b CH11

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	2461.50	97.26	30.20	30.25	5.31	102.52	/	/	Peak	HORIZONTAL
2	2483.50	35.61	30.25	30.25	5.31	40.92	74.00	-33.08	Peak	HORIZONTAL

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	33.74	30.25	30.25	5.31	39.05	74.00	-34.95	Peak	VERTICAL
2	2487.60	37.60	30.30	30.25	5.31	42.96	74.00	-31.04	Peak	VERTICAL

Mode 11b CH1

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	2390.00	34.33	29.99	30.21	5.17	39.28	74.00	-34.72	Peak	VERTICAL
2	2400.00	57.73	29.99	30.21	5.17	62.68	74.00	-11.32	Peak	VERTICAL

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	2390.00	36.90	29.99	30.21	5.17	41.85	74.00	-32.15	Peak	HORIZONTAL
2	2400.00	60.86	29.99	30.21	5.17	65.81	74.00	-8.19	Peak	HORIZONTAL



Mode 11b CH11

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	49.06	30.25	30.25	5.31	54.37	74.00	-19.63	Peak	HORIZONTAL
2	2483.50	37.60	30.25	30.25	5.31	42.91	54.00	-11.09	Average	HORIZONTAL

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
2	2483.50	47.52	30.25	30.25	5.31	52.83	74.00	-21.17	Peak	VERTICAL
3	2483.50	35.20	30.25	30.25	5.31	40.51	54.00	-13.49	Average	VERTICAL
4	2484.55	49.38	30.25	30.25	5.31	54.69	74.00	-19.31	Peak	VERTICAL
5	2484.55	36.20	30.25	30.25	5.31	41.51	54.00	-12.49	Average	VERTICAL

Mode 11n HT20 CH1

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	2390.00	47.53	29.99	30.21	5.17	52.48	74.00	-21.52	Peak	HORIZONTAL

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	2326.08	47.01	29.78	30.18	5.06	51.67	74.00	-22.33	Peak	VERTICAL
2	2390.00	44.59	29.99	30.21	5.17	49.54	74.00	-24.46	Peak	VERTICAL

Mode 11n HT20 CH11

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	48.60	30.25	30.25	5.31	53.91	74.00	-20.09	Peak	HORIZONTAL

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	48.69	30.25	30.25	5.31	54.00	74.00	-20.00	Peak	VERTICAL
2	2483.50	36.10	30.25	30.25	5.31	41.41	54.00	-12.59	Average	VERTICAL

Mode 11n HT40 CH3



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	2319.38	42.73	29.78	30.18	5.06	47.39	74.00	-26.61	Peak	HORIZONTAL
2	2340.94	42.90	29.83	30.19	5.11	47.65	74.00	-26.35	Peak	HORIZONTAL
3	2390.00	42.08	29.99	30.21	5.17	47.03	74.00	-26.97	Peak	HORIZONTAL
4	2400.00	61.01	29.99	30.21	5.17	65.96	74.00	-8.04	Peak	HORIZONTAL

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	2314.34	47.35	29.73	30.18	5.06	51.96	74.00	-22.04	Peak	VERTICAL
2	2328.34	47.65	29.78	30.18	5.06	52.31	74.00	-21.69	Peak	VERTICAL
3	2378.46	45.63	29.94	30.21	5.17	50.53	74.00	-23.47	Peak	VERTICAL
4	2390.00	45.15	29.99	30.21	5.17	50.10	74.00	-23.90	Peak	VERTICAL
5	2400.00	62.73	29.99	30.21	5.17	67.68	74.00	-6.32	Peak	VERTICAL

Mode 11n HT40 CH9

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	50.52	30.25	30.25	5.31	55.83	74.00	-18.17	Peak	HORIZONTAL
2	2483.50	38.20	30.25	30.25	5.31	43.51	54.00	-10.49	Average	HORIZONTAL
3	2487.19	55.23	30.25	30.25	5.31	60.54	74.00	-13.46	Peak	HORIZONTAL
4	2487.19	38.30	30.25	30.25	5.31	43.61	54.00	-10.39	Average	HORIZONTAL

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	45.87	30.25	30.25	5.31	51.18	74.00	-22.82	Peak	VERTICAL
2	2483.50	37.60	30.25	30.25	5.31	42.91	54.00	-11.09	Average	VERTICAL
3	2485.51	49.47	30.25	30.25	5.31	54.78	74.00	-19.22	Peak	VERTICAL
4	2485.51	35.80	30.25	30.25	5.31	41.11	54.00	-12.89	Average	VERTICAL

POWER LINE CONDUCTED EMISSION

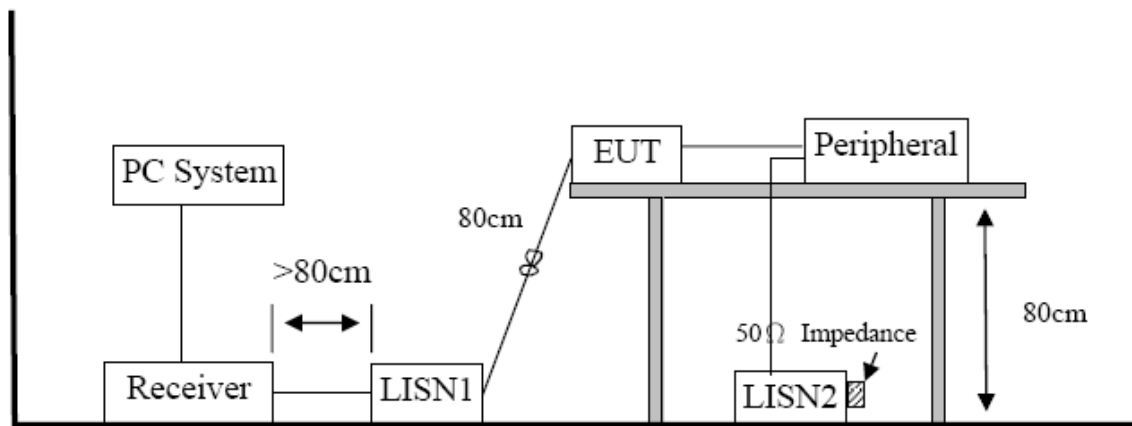
LIMITS

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.

Test Setup and Procedure



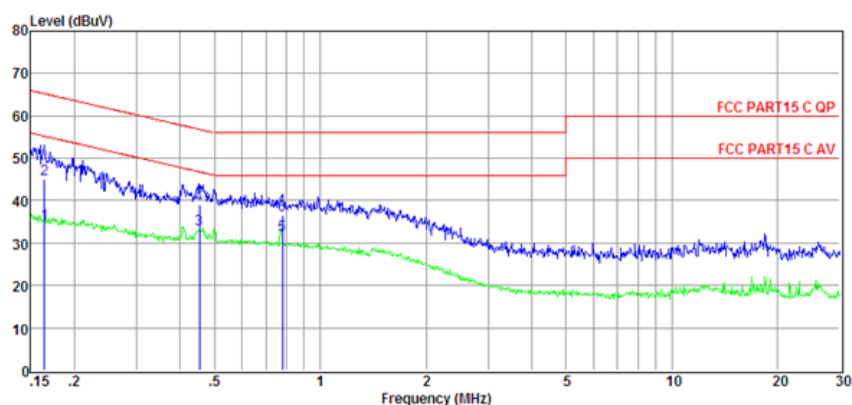
Test Equipment List and Details

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Test Receiver	R&S	ESU8	100316	2016/10/16	2017/10/16
LISN 1	R&S	ENV216	101109	2016/10/16	2017/10/16
LISN 2	R&S	ESH2-Z5	100309	2016/10/16	2017/10/16
Pulse Limiter	R&S	ESH3-Z2	101242	2016/10/16	2017/10/16

RESULTS

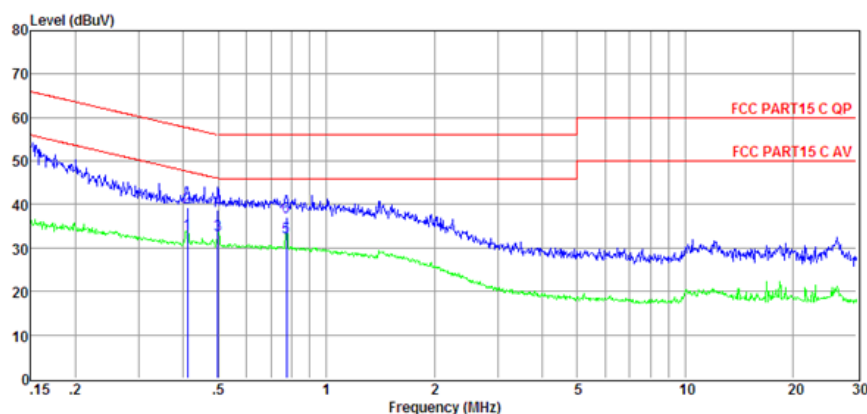


LINE



Item	Freq.	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV)	(dBuV)	(dB)		
1	0.164	15.14	9.61	0.02	9.86	34.63	55.25	-20.62	Average	LINE
2	0.164	25.56	9.61	0.02	9.86	45.05	65.25	-20.20	QP	LINE
3	0.454	13.80	9.61	0.02	9.86	33.29	46.80	-13.51	Average	LINE
4	0.454	19.50	9.61	0.02	9.86	38.99	56.80	-17.81	QP	LINE
5	0.779	12.46	9.61	0.03	9.86	31.96	46.00	-14.04	Average	LINE
6	0.779	17.17	9.61	0.03	9.86	36.67	56.00	-19.33	QP	LINE

NEUTRAL



Item	Freq.	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV)	(dBuV)	(dB)		
1	0.410	13.83	9.61	0.02	9.86	33.32	47.64	-14.32	Average	NEUTRAL
2	0.410	19.76	9.61	0.02	9.86	39.25	57.64	-18.39	QP	NEUTRAL
3	0.499	13.54	9.61	0.02	9.86	33.03	46.01	-12.98	Average	NEUTRAL
4	0.499	19.28	9.61	0.02	9.86	38.77	56.01	-17.24	QP	NEUTRAL
5	0.775	12.91	9.61	0.03	9.86	32.41	46.00	-13.59	Average	NEUTRAL
6	0.775	17.71	9.61	0.03	9.86	37.21	56.00	-18.79	QP	NEUTRAL

Shenzhen ZCT Technology Co., Ltd.

3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China.

Tel: 400-805-1899; Fax:86-755-23702323; <http://www.renzhengjiance.com>



Antenna Requirements

Requirements

Please refer to FCC §15.203

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

Antenna connector

EUT has an Integrated antenna without antenna connector.

Antenna Gain

The antenna gain of EUT is less than 2 dBi.

EXHIBIT B - EUT PHOTOGRAPHS

EUT – All View

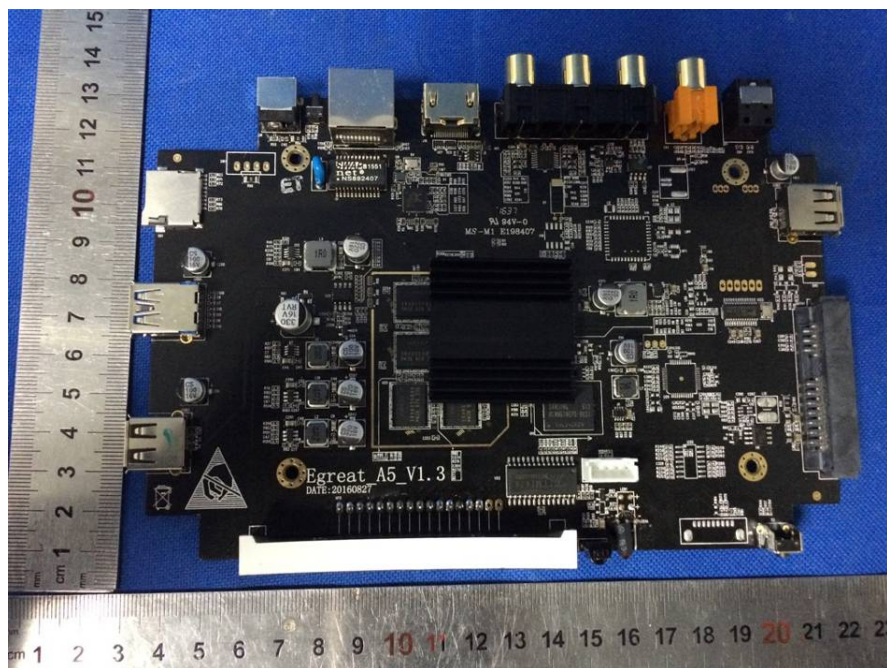
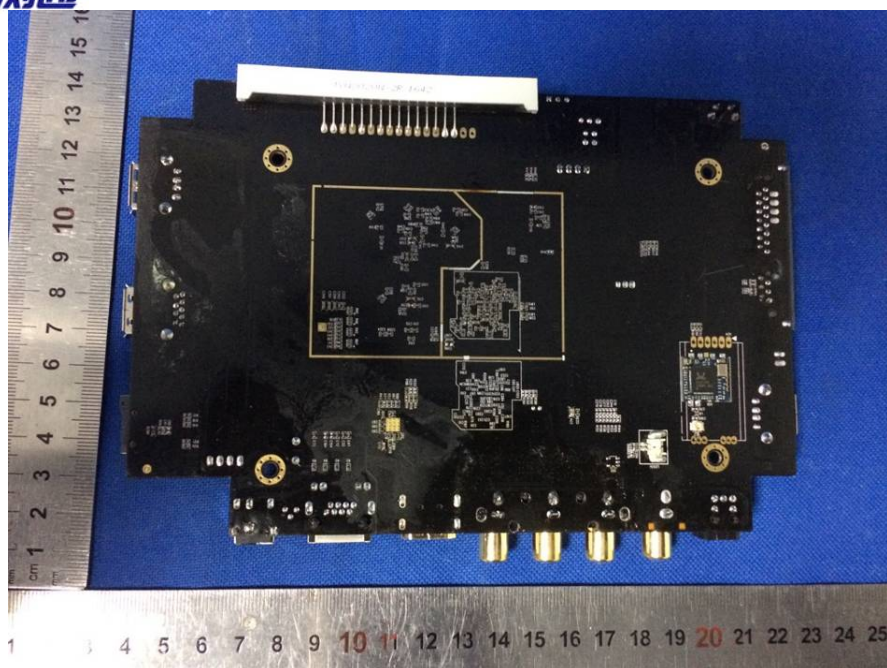












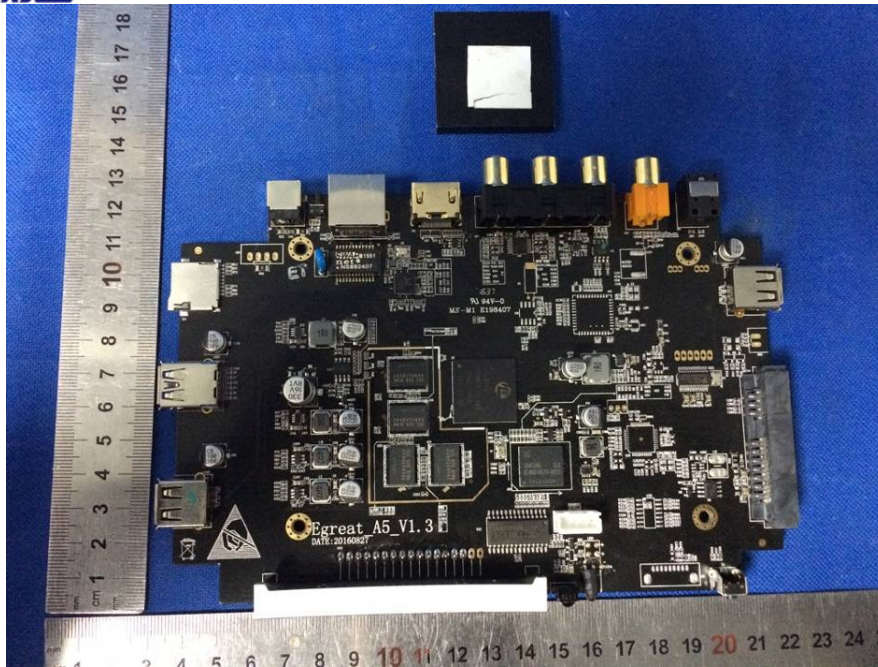
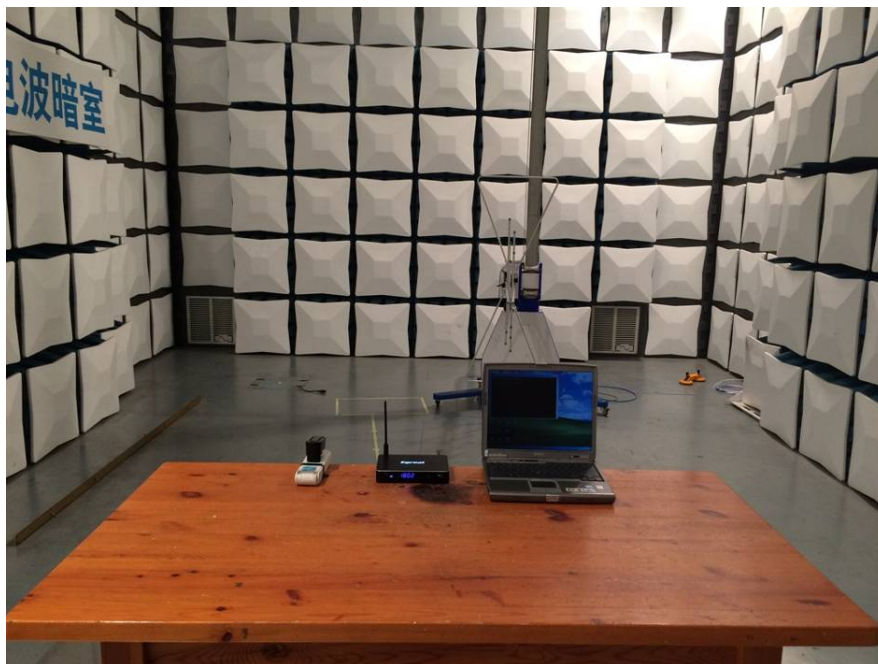


EXHIBIT C - TEST SETUP PHOTOGRAPHS

Radiated Spurious Emissions





Power Line Conducted Emission



*****END OF REPORT*****