



FCC RADIO TEST REPORT

FCC ID : UZ7ET51CT
Equipment : Tablet
Brand Name : Zebra
Model Name : ET51CT
Applicant : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Manufacturer : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Standard : FCC Part 15 Subpart C §15.247

The product was received on Jun. 16, 2019 and testing was started from Jun. 30, 2019 and completed on Jul. 27, 2019. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FR911641C	01	Initial issue of report	Aug. 08, 2019



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 1.20 dB at 2484.560 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 7.26 dB at 13.560 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Yimin Ho



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Tablet
Brand Name	Zebra
Model Name	ET51CT
FCC ID	UZ7ET51CT
EUT supports Radios application	NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DV2
SW Version	Android version 8.1.0
FW Version	01-20-16-00-OG-U00-PRD
FW Version for TXBF	01-20-19-00-OG-U00-PLT
MFD	19JUN20
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Specification of Accessories				
Spare Standard Battery 36.75Wh	Brand Name	Zebra	Model Name	BT-000394

Supported Unit Used in Test Configuration and System				
Cradle (Dock) for EMC	Brand Name	Zebra	Part Number	CRD-ET5X-1SCG1
Cradle (Dock) for RSE	Brand Name	Zebra	Part Number	CHG-ET5X-CBL1-01
Adapter	Brand Name	Zebra	Part Number	PWRBGA12V50W0WW
DC Cable	Brand Name	Zebra	Part Number	CBL-DC-388A1-01



1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Average) Output Power to antenna <CDD Mode>	<p><Ant. 1> 802.11b : 20.90 dBm (0.1230 W) 802.11g : 19.40 dBm (0.0871 W) 802.11n HT20 : 18.80 dBm (0.0759 W) 802.11n HT40 : 17.60 dBm (0.0575 W) 802.11ac VHT20 : 17.80 dBm (0.0603 W) 802.11ac VHT40 : 17.50 dBm (0.0562 W)</p> <p><Ant. 2> 802.11b : 20.80 dBm (0.1202 W) 802.11g : 19.40 dBm (0.0871 W) 802.11n HT20 : 18.70 dBm (0.0741 W) 802.11n HT40 : 17.10 dBm (0.0513 W) 802.11ac VHT20 : 17.70 dBm (0.0589 W) 802.11ac VHT40 : 17.00 dBm (0.0501 W)</p> <p><MIMO Ant. 1 + 2> 802.11b : 23.71 dBm (0.2350 W) 802.11g : 22.41 dBm (0.1742 W) 802.11n HT20 : 21.81 dBm (0.1517 W) 802.11n HT40 : 20.61 dBm (0.1151 W) 802.11ac VHT20 : 20.76 dBm (0.1191 W) 802.11ac VHT40 : 20.51 dBm (0.1125 W)</p>
Maximum (Average) Output Power to antenna <TXBF Mode>	<p><MIMO Ant. 1 + 2> 802.11ac VHT20 : 20.81 dBm (0.1205 W) 802.11ac VHT40 : 20.26 dBm (0.1062 W)</p>
99% Occupied Bandwidth <CDD Mode>	<p><Ant. 1> 802.11b : 13.10 MHz 802.11g : 16.80 MHz 802.11n HT20 : 17.95 MHz 802.11n HT40 : 36.70 MHz</p> <p><Ant. 2> 802.11b : 12.95 MHz 802.11g : 16.95 MHz 802.11n HT20 : 17.95 MHz 802.11n HT40 : 36.60 MHz</p> <p><MIMO Ant. 1> 802.11b : 13.10 MHz 802.11g : 16.85 MHz 802.11n HT20 : 17.95 MHz 802.11n HT40 : 36.60 MHz</p> <p><MIMO Ant. 2> 802.11b : 13.15 MHz 802.11g : 16.75 MHz 802.11n HT20 : 17.95 MHz 802.11n HT40 : 36.60 MHz</p>



Standards-related Product Specification			
99% Occupied Bandwidth <TXBF Mode>	<MIMO Ant. 1> 802.11ac VHT20 : 18.05 MHz 802.11ac VHT40 : 36.90 MHz		
	<MIMO Ant. 2> 802.11ac VHT20 : 18.00 MHz 802.11ac VHT40 : 36.60 MHz		
Antenna Type / Gain	<Ant. 1> Chip Antenna with gain 2.93 dBi <Ant. 2> Chip Antenna with gain 1.88 dBi		
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)		
Antenna Function Description		Ant. 1	Ant. 2
	802.11 b/g/n/ac	V	V
	802.11 b/g/n/ac MIMO	V	V
	802.11 ac TXBF	V	V

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

1.3 Modification of EUT

No modifications are made to the EUT during all test items.



1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH05-HY	CO05-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH11-HY	

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW0007

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		



2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

Single Mode

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0

MIMO Mode

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0

TXBF Mode

Modulation	Data Rate
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Link + Bluetooth Link + NFC On + Rear Camera + SD Card (Play MP3) + USB Type C Cable with LCD Monitor + USB File transfer with Notebook (Notebook to SD Card) + Adapter (PWRBGA12V50W0WW) with DC cable (CBL-DC-388A1-01) + Dock (CRD-ET5X-1SCG1) (Charging with EUT)



<Ant. 1>

802.11b RF Avg Output Power (dBm)						
Power vs. Channel			Power vs Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	20.90	CH 01	20.80	20.80	20.80
CH 06	2437	20.80				
CH 11	2462	20.70				

802.11g RF Avg Output Power (dBm)									
Power vs. Channel			Power vs Data Rate						
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)					
		6M		9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps
CH 01	2412	15.50	CH 06	19.30	19.30	19.30	19.30	19.30	19.30
CH 06	2437	19.40							
CH 11	2462	18.30							

802.11n HT20 RF Avg Output Power (dBm)									
Power vs. Channel			Power vs Data Rate						
Channel	Frequency (MHz)	Data Rate (bps)	Channel	MCS Index					
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6
CH 01	2412	14.40	CH 06	18.70	18.70	18.70	18.70	18.70	18.70
CH 06	2437	18.80							
CH 11	2462	17.70							

802.11n HT40 RF Avg Output Power (dBm)									
Power vs. Channel			Power vs Data Rate						
Channel	Frequency (MHz)	Data Rate (bps)	Channel	MCS Index					
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6
CH 03	2422	12.70	CH 06	17.50	17.50	17.50	17.50	17.50	17.50
CH 06	2437	17.60							
CH 09	2452	14.90							

802.11ac VHT20 RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	MCS Index						
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7
CH 01	2412	14.30	CH 06	17.70	17.70	17.70	17.70	17.70	17.70	17.70
CH 06	2437	17.80								
CH 11	2462	17.60								

802.11ac VHT40 RF Avg Output Power (dBm)											
Power vs. Channel			Power vs Data Rate								
Channel	Frequency (MHz)	Data Rate (bps)	Channel	MCS Index							
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8
CH 03	2422	12.60	CH 06	17.40	17.40	17.40	17.40	17.40	17.40	17.40	
CH 06	2437	17.50									
CH 09	2452	14.80									



<Ant. 2>

802.11b RF Avg Output Power (dBm)						
Power vs. Channel			Power vs Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	20.70	CH 06	20.60	20.50	20.60
CH 06	2437	20.80				
CH 11	2462	20.70				

802.11g RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412	15.60	CH 06	19.30	19.30	19.30	19.30	19.30	19.30	19.30
CH 06	2437	19.40								
CH 11	2462	18.40								

802.11n HT20 RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7
CH 01	2412	14.40	CH 06	18.60	18.60	18.60	18.60	18.60	18.60	18.60
CH 06	2437	18.70								
CH 11	2462	17.80								

802.11n HT40 RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7
CH 03	2422	12.90	CH 06	17.00	17.00	16.90	17.00	17.00	17.00	17.00
CH 06	2437	17.10								
CH 09	2452	14.60								

802.11ac VHT20 RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7
CH 01	2412	14.30	CH 06	17.60	17.60	17.50	17.50	17.60	17.60	17.60
CH 06	2437	17.70								
CH 11	2462	17.70								

802.11ac VHT40 RF Avg Output Power (dBm)											
Power vs. Channel			Power vs Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8
CH 03	2422	12.80	CH 06	16.90	16.90	16.90	16.90	16.90	16.90	16.90	16.90
CH 06	2437	17.00									
CH 09	2452	14.50									



MIMO <Ant. 1+2>

<CDD Mode>

802.11b RF Avg Output Power (dBm)						
Power vs. Channel			Power vs Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	23.66	CH 11	23.61	23.61	23.61
CH 06	2437	23.61				
CH 11	2462	23.71				

802.11g RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412	18.01	CH 06	22.31	22.31	22.26	22.31	22.26	22.31	22.31
CH 06	2437	22.41								
CH 11	2462	20.36								

802.11n HT20 RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	16.81	CH 06	21.71	21.71	21.71	21.66	21.66	21.71	21.66
CH 06	2437	21.81								
CH 11	2462	19.16								

802.11n HT40 RF Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	15.06	CH 06	20.51	20.46	20.51	20.46	20.51	20.51	20.46
CH 06	2437	20.61								
CH 09	2452	16.66								

802.11ac VHT20 RF Avg Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7
CH 01	2412	16.71	CH 06	20.66	20.66	20.56	20.66	20.66	20.66	20.66
CH 06	2437	20.76								
CH 11	2462	19.06								

802.11ac VHT40 RF Avg Output Power (dBm)												
Power vs. Channel			Power vs Data Rate									
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index								
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
CH 03	2422	14.96	CH 06	20.41	20.41	20.41	20.36	20.36	20.41	20.41	20.41	20.36
CH 06	2437	20.51										
CH 09	2452	16.56										



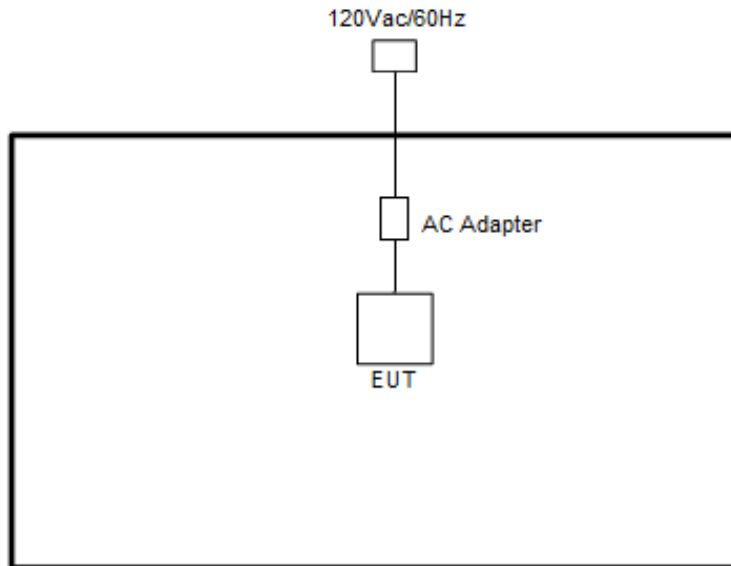
<TXBF Mode>

802.11ac VHT20 RF Avg Output Power (dBm)											
Power vs. Channel			Power vs Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8
CH 01	2412	18.26	CH 06	20.76	20.71	20.71	20.66	20.67	20.67	20.67	20.72
CH 06	2437	20.81									
CH 11	2462	18.36									

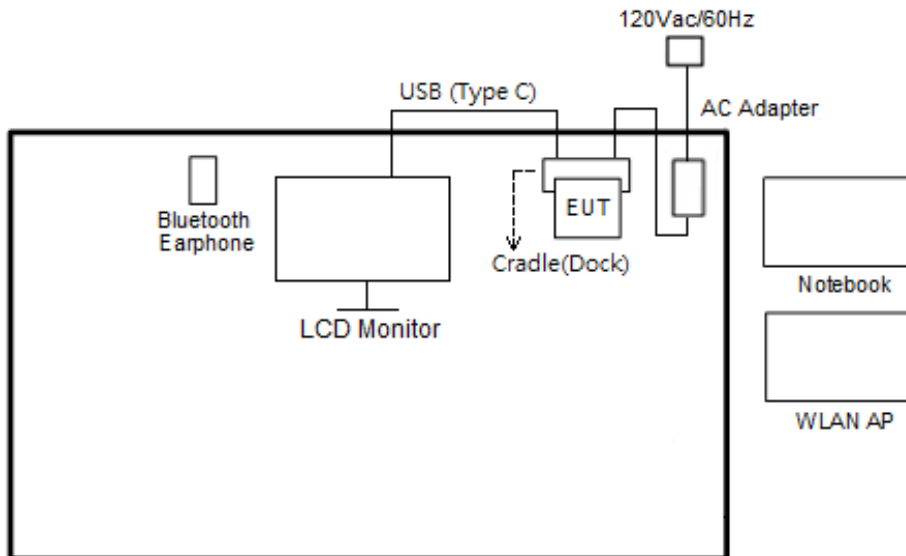
802.11ac VHT40 RF Avg Output Power (dBm)												
Power vs. Channel			Power vs Data Rate									
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index								
		MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
CH 03	2422	17.87	CH 06	20.21	20.14	20.23	20.00	20.03	19.90	20.00	19.83	19.67
CH 06	2437	20.26										
CH 09	2452	17.91										

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>





2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude E3340	FCC DoC/ Contains FCC ID: PD97260NGU	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	LCD Monitor	DELL	P2715Qt	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT v3.0-00271” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

For TXBF mode, the modulation modes and data rates manipulated by the command lines in the engineering program made the EUT link to another EUT by power under the normal operation. The “adb” software tool was used to enable the EUT to transmit signals continuously.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

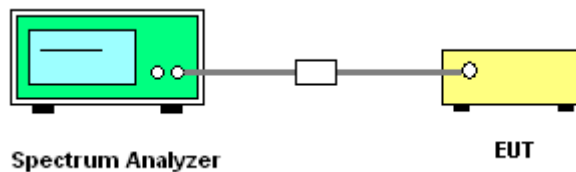
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * RBW$.
6. Measure and record the results in the test report.

3.1.4 Test Setup



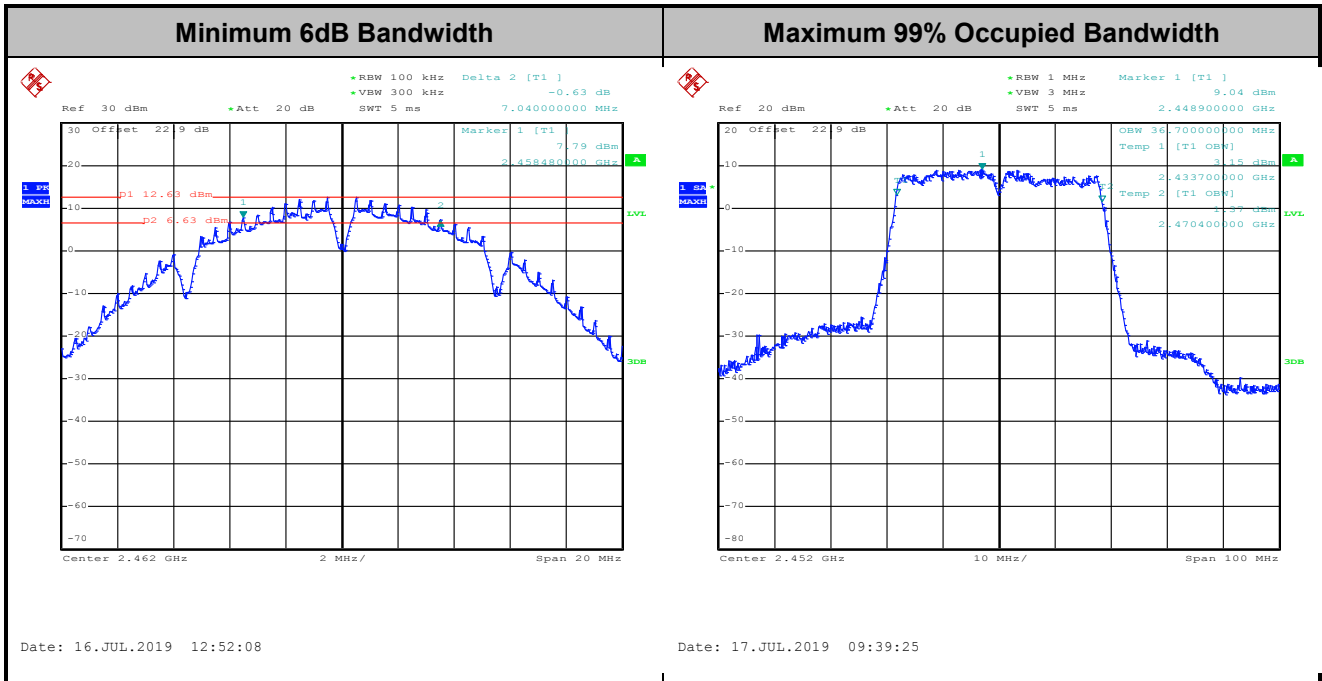


3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

<CDD Mode>

Test Engineer :	Shiming Liu	Temperature :	21~25°C
		Relative Humidity :	51~54%

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2		
11b	1Mbps	1	1	2412	12.95	12.60	7.06	7.54	0.50	Pass
11b	1Mbps	1	6	2437	12.95	12.75	8.00	8.04	0.50	Pass
11b	1Mbps	1	11	2462	13.10	12.95	8.04	7.04	0.50	Pass
11g	6Mbps	1	1	2412	16.70	16.75	15.44	15.44	0.50	Pass
11g	6Mbps	1	6	2437	16.80	16.90	15.52	15.68	0.50	Pass
11g	6Mbps	1	11	2462	16.80	16.95	15.44	15.76	0.50	Pass
HT20	MCS0	1	1	2412	17.90	17.95	15.92	15.96	0.50	Pass
HT20	MCS0	1	6	2437	17.95	17.95	16.16	15.92	0.50	Pass
HT20	MCS0	1	11	2462	17.90	17.95	16.48	16.80	0.50	Pass
HT40	MCS0	1	3	2422	36.60	36.40	35.07	35.07	0.50	Pass
HT40	MCS0	1	6	2437	36.50	36.50	35.68	35.72	0.50	Pass
HT40	MCS0	1	9	2452	36.70	36.60	35.12	35.12	0.50	Pass
11b	1Mbps	2	1	2412	13.00	12.85	7.52	7.52	0.50	Pass
11b	1Mbps	2	6	2437	13.00	12.65	8.00	7.06	0.50	Pass
11b	1Mbps	2	11	2462	13.10	13.15	7.56	8.04	0.50	Pass
11g	6Mbps	2	1	2412	16.75	16.70	15.44	15.72	0.50	Pass
11g	6Mbps	2	6	2437	16.85	16.75	15.47	15.34	0.50	Pass
11g	6Mbps	2	11	2462	16.80	16.70	15.32	16.28	0.50	Pass
HT20	MCS0	2	1	2412	17.95	17.90	15.92	16.08	0.50	Pass
HT20	MCS0	2	6	2437	17.95	17.95	16.52	15.96	0.50	Pass
HT20	MCS0	2	11	2462	17.90	17.90	15.92	16.76	0.50	Pass
HT40	MCS0	2	3	2422	36.50	36.40	35.04	35.07	0.50	Pass
HT40	MCS0	2	6	2437	36.40	36.50	35.67	35.28	0.50	Pass
HT40	MCS0	2	9	2452	36.60	36.60	35.12	35.07	0.50	Pass



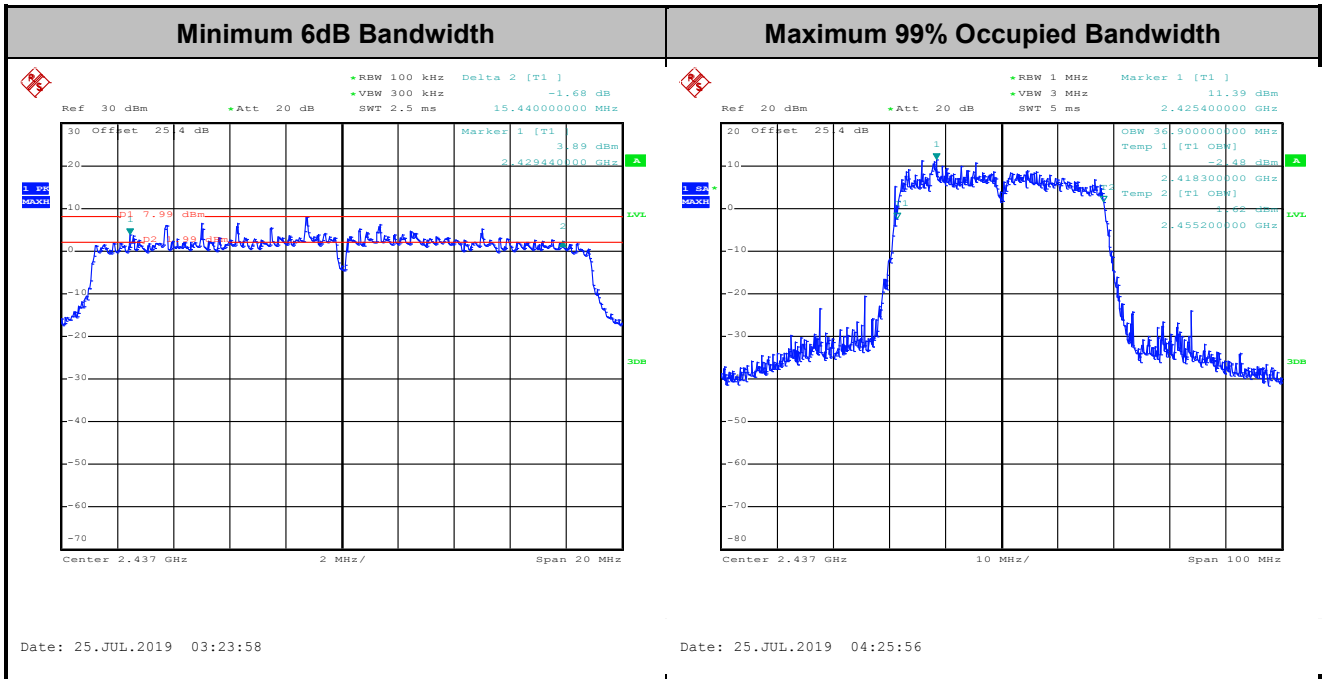
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



<TXBF Modes>

Test Engineer :	Richard Qiu and Luffy Lin	Temperature :	21~25°C
		Relative Humidity :	51~54%

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2		
VHT20	MCS0	2	1	2412	18.00	17.95	17.56	15.56	0.50	Pass
VHT20	MCS0	2	6	2437	17.90	17.95	15.44	16.52	0.50	Pass
VHT20	MCS0	2	11	2462	18.05	18.00	17.60	16.52	0.50	Pass
VHT40	MCS0	2	3	2422	36.50	36.30	33.84	35.12	0.50	Pass
VHT40	MCS0	2	6	2437	36.90	36.60	31.36	35.76	0.50	Pass
VHT40	MCS0	2	9	2452	36.60	36.60	36.32	33.84	0.50	Pass



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

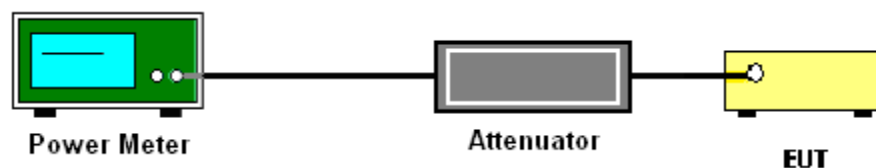
<CDD Modes>

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

<TXBF Modes>

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup





3.2.5 Test Result of Average Output Power

<CDD Mode>

Test Engineer :	Shiming Liu	Temperature :	21~25°C
		Relative Humidity :	51~54%

2.4GHz Band																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	20.90	20.70		30.00	30.00	2.93	1.88	23.83	22.58	36.00	36.00	Pass
11b	1Mbps	1	6	2437	20.80	20.80		30.00	30.00	2.93	1.88	23.73	22.68	36.00	36.00	Pass
11b	1Mbps	1	11	2462	20.70	20.70		30.00	30.00	2.93	1.88	23.63	22.58	36.00	36.00	Pass
11g	6Mbps	1	1	2412	15.50	15.60		30.00	30.00	2.93	1.88	18.43	17.48	36.00	36.00	Pass
11g	6Mbps	1	6	2437	19.40	19.40		30.00	30.00	2.93	1.88	22.33	21.28	36.00	36.00	Pass
11g	6Mbps	1	11	2462	18.30	18.40		30.00	30.00	2.93	1.88	21.23	20.28	36.00	36.00	Pass
HT20	MCS0	1	1	2412	14.40	14.40		30.00	30.00	2.93	1.88	17.33	16.28	36.00	36.00	Pass
HT20	MCS0	1	6	2437	18.80	18.70		30.00	30.00	2.93	1.88	21.73	20.58	36.00	36.00	Pass
HT20	MCS0	1	11	2462	17.70	17.80		30.00	30.00	2.93	1.88	20.63	19.68	36.00	36.00	Pass
HT40	MCS0	1	3	2422	12.70	12.90		30.00	30.00	2.93	1.88	15.63	14.78	36.00	36.00	Pass
HT40	MCS0	1	6	2437	17.60	17.10		30.00	30.00	2.93	1.88	20.53	18.98	36.00	36.00	Pass
HT40	MCS0	1	9	2452	14.90	14.60		30.00	30.00	2.93	1.88	17.83	16.48	36.00	36.00	Pass
VHT20	MCS0	1	1	2412	14.30	14.30		30.00	30.00	2.93	1.88	17.23	16.18	36.00	36.00	Pass
VHT20	MCS0	1	6	2437	17.80	17.70		30.00	30.00	2.93	1.88	20.73	19.58	36.00	36.00	Pass
VHT20	MCS0	1	11	2462	17.60	17.70		30.00	30.00	2.93	1.88	20.53	19.58	36.00	36.00	Pass
VHT40	MCS0	1	3	2422	12.60	12.80		30.00	30.00	2.93	1.88	15.53	14.68	36.00	36.00	Pass
VHT40	MCS0	1	6	2437	17.50	17.00		30.00	30.00	2.93	1.88	20.43	18.88	36.00	36.00	Pass
VHT40	MCS0	1	9	2452	14.80	14.50		30.00	30.00	2.93	1.88	17.73	16.38	36.00	36.00	Pass
11b	1Mbps	2	1	2412	20.70	20.60	23.66	30.00		2.93		26.59		36.00		Pass
11b	1Mbps	2	6	2437	20.60	20.60	23.61	30.00		2.93		26.54		36.00		Pass
11b	1Mbps	2	11	2462	20.60	20.80	23.71	30.00		2.93		26.64		36.00		Pass
11g	6Mbps	2	1	2412	15.00	15.00	18.01	30.00		2.93		20.94		36.00		Pass
11g	6Mbps	2	6	2437	19.40	19.40	22.41	30.00		2.93		25.34		36.00		Pass
11g	6Mbps	2	11	2462	17.50	17.20	20.36	30.00		2.93		23.29		36.00		Pass
HT20	MCS0	2	1	2412	13.80	13.80	16.81	30.00		2.93		19.74		36.00		Pass
HT20	MCS0	2	6	2437	18.80	18.80	21.81	30.00		2.93		24.74		36.00		Pass
HT20	MCS0	2	11	2462	16.20	16.10	19.16	30.00		2.93		22.09		36.00		Pass
HT40	MCS0	2	3	2422	12.00	12.10	15.06	30.00		2.93		17.99		36.00		Pass
HT40	MCS0	2	6	2437	17.60	17.60	20.61	30.00		2.93		23.54		36.00		Pass
HT40	MCS0	2	9	2452	13.70	13.60	16.66	30.00		2.93		19.59		36.00		Pass
VHT20	MCS0	2	1	2412	13.70	13.70	16.71	30.00		2.93		19.64		36.00		Pass
VHT20	MCS0	2	6	2437	17.90	17.60	20.76	30.00		2.93		23.69		36.00		Pass
VHT20	MCS0	2	11	2462	16.10	16.00	19.06	30.00		2.93		21.99		36.00		Pass
VHT40	MCS0	2	3	2422	11.90	12.00	14.96	30.00		2.93		17.89		36.00		Pass
VHT40	MCS0	2	6	2437	17.50	17.50	20.51	30.00		2.93		23.44		36.00		Pass
VHT40	MCS0	2	9	2452	13.60	13.50	16.56	30.00		2.93		19.49		36.00		Pass



<TXBF Mode>

Test Engineer :	Richard Qiu and Luffy Lin	Temperature :	21~25°C
		Relative Humidity :	51~54%

2.4GHz Band																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
VHT20	MCS0	2	1	2412	15.20	15.30	18.26	30.00	30.00	5.43	5.43	23.69	23.69	36.00	36.00	Pass
VHT20	MCS0	2	6	2437	18.00	17.70	20.81	30.00	30.00	5.43	5.43	26.24	26.24	36.00	36.00	Pass
VHT20	MCS0	2	11	2462	15.30	15.40	18.36	30.00	30.00	5.43	5.43	23.79	23.79	36.00	36.00	Pass
VHT40	MCS0	2	3	2422	15.50	14.10	17.87	30.00	30.00	5.43	5.43	23.30	23.30	36.00	36.00	Pass
VHT40	MCS0	2	6	2437	17.30	18.30	20.26	30.00	30.00	5.43	5.43	25.69	25.69	36.00	36.00	Pass
VHT40	MCS0	2	9	2452	15.50	14.20	17.91	30.00	30.00	5.43	5.43	23.34	23.34	36.00	36.00	Pass

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

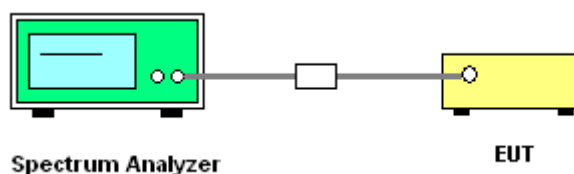
If measurements performed using method (2) plus $10 \log(N)$ exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

Method (2): Measure and add $10 \log(N)$ dB, where N is the number of outputs. (N=2)

3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

<CDD Mode>

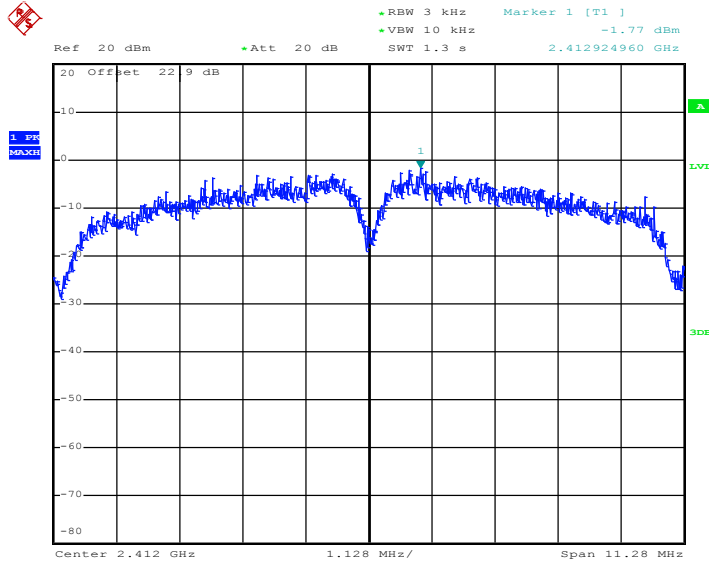
Test Engineer :	Shiming Liu	Temperature :	21~25°C
		Relative Humidity :	51~54%

2.4GHz Band												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant 1	Ant 2	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	-1.65	-0.64	-	2.93	1.88	8.00	8.00	Pass
11b	1Mbps	1	6	2437	-0.83	-1.67	-	2.93	1.88	8.00	8.00	Pass
11b	1Mbps	1	11	2462	-1.36	-1.76	-	2.93	1.88	8.00	8.00	Pass
11g	6Mbps	1	1	2412	-9.35	-11.54	-	2.93	1.88	8.00	8.00	Pass
11g	6Mbps	1	6	2437	-7.68	-8.34	-	2.93	1.88	8.00	8.00	Pass
11g	6Mbps	1	11	2462	-8.84	-9.20	-	2.93	1.88	8.00	8.00	Pass
HT20	MCS0	1	1	2412	-13.08	-12.17	-	2.93	1.88	8.00	8.00	Pass
HT20	MCS0	1	6	2437	-7.78	-7.76	-	2.93	1.88	8.00	8.00	Pass
HT20	MCS0	1	11	2462	-8.57	-9.59	-	2.93	1.88	8.00	8.00	Pass
HT40	MCS0	1	3	2422	-17.01	-15.73	-	2.93	1.88	8.00	8.00	Pass
HT40	MCS0	1	6	2437	-12.49	-12.20	-	2.93	1.88	8.00	8.00	Pass
HT40	MCS0	1	9	2452	-15.64	-15.45	-	2.93	1.88	8.00	8.00	Pass
11b	1Mbps	2	1	2412	-1.77	0.05	3.06	5.43		8.00		Pass
11b	1Mbps	2	6	2437	-2.39	-1.72	1.29	5.43		8.00		Pass
11b	1Mbps	2	11	2462	-1.72	-0.67	2.34	5.43		8.00		Pass
11g	6Mbps	2	1	2412	-11.81	-12.44	-8.80	5.43		8.00		Pass
11g	6Mbps	2	6	2437	-8.41	-8.65	-5.40	5.43		8.00		Pass
11g	6Mbps	2	11	2462	-10.76	-10.51	-7.50	5.43		8.00		Pass
HT20	MCS0	2	1	2412	-13.68	-13.62	-10.61	5.43		8.00		Pass
HT20	MCS0	2	6	2437	-9.07	-8.26	-5.25	5.43		8.00		Pass
HT20	MCS0	2	11	2462	-10.84	-11.22	-7.83	5.43		8.00		Pass
HT40	MCS0	2	3	2422	-17.70	-18.22	-14.69	5.43		8.00		Pass
HT40	MCS0	2	6	2437	-12.11	-12.27	-9.10	5.43		8.00		Pass
HT40	MCS0	2	9	2452	-16.26	-15.34	-12.33	5.43		8.00		Pass

Measured power density (dBm) has offset with cable loss.

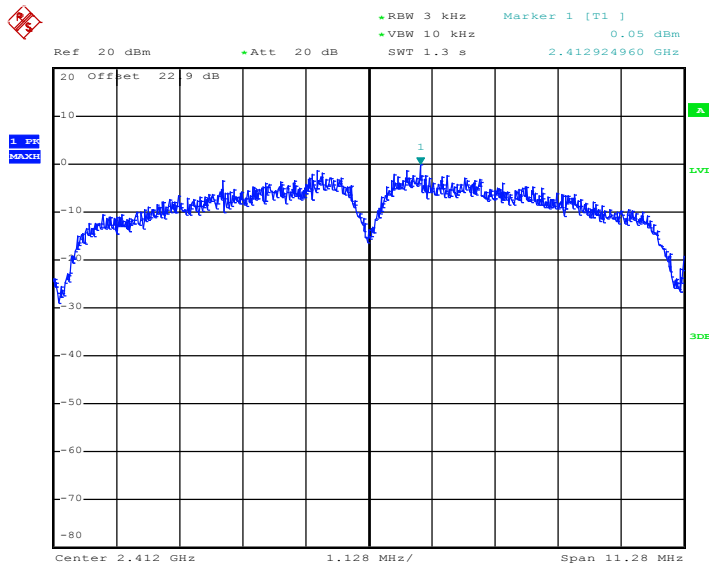


Worst Case Power Density (dBm/3kHz) for MIMO Ant. 1



Date: 16.JUL.2019 14:42:43

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2



Date: 16.JUL.2019 14:47:55



<TXBF Mode>

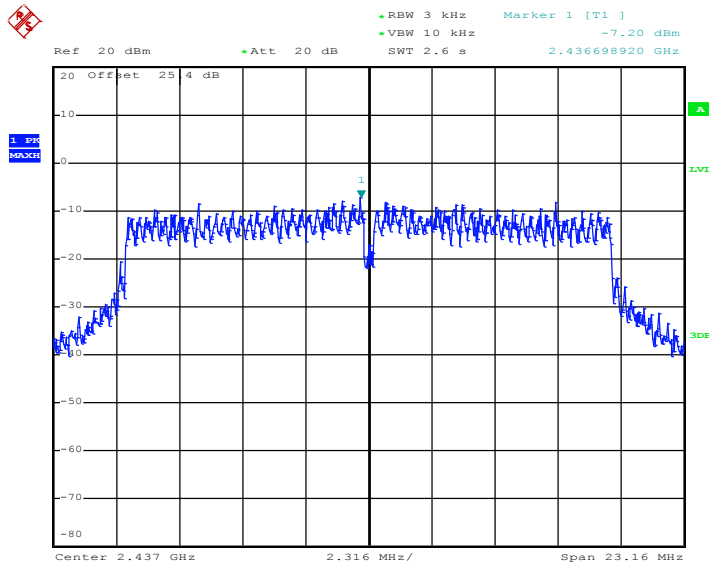
Test Engineer :	Richard Qiu and Luffy Lin	Temperature :	21~25°C
		Relative Humidity :	51~54%

2.4GHz Band												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant 1	Ant 2	Worse + 3.01	Ant 1	Ant 2	Ant 1	Ant 2	
VHT20	MCS0	2	1	2412	-11.63	-11.24	-8.23	5.43		8.00		Pass
VHT20	MCS0	2	6	2437	-7.20	-7.09	-4.08	5.43		8.00		Pass
VHT20	MCS0	2	11	2462	-10.99	-11.60	-7.98	5.43		8.00		Pass
VHT40	MCS0	2	3	2422	-11.63	-14.29	-8.62	5.43		8.00		Pass
VHT40	MCS0	2	6	2437	-12.85	-10.86	-7.85	5.43		8.00		Pass
VHT40	MCS0	2	9	2452	-12.29	-15.27	-9.28	5.43		8.00		Pass

Measured power density (dBm) has offset with cable loss.

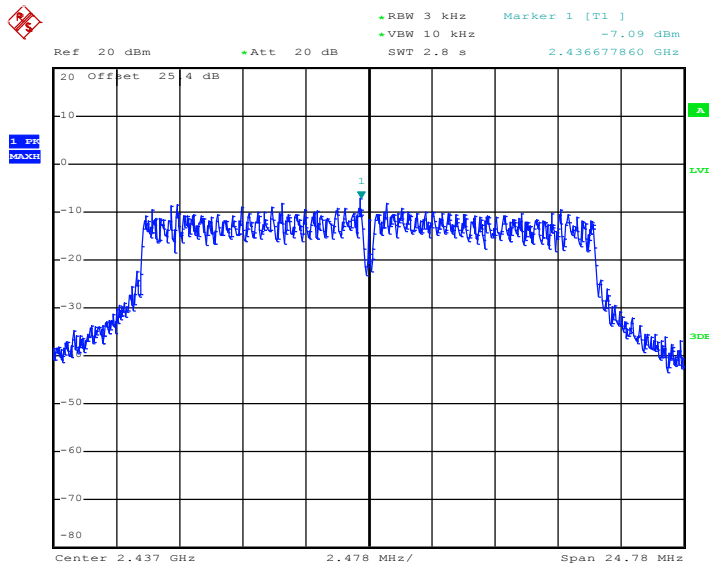


Worst Case Power Density (dBm/3kHz) for MIMO Ant. 1



Date: 25.JUL.2019 03:24:34

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2



Date: 25.JUL.2019 03:30:58

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

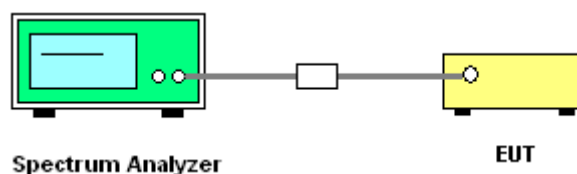
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



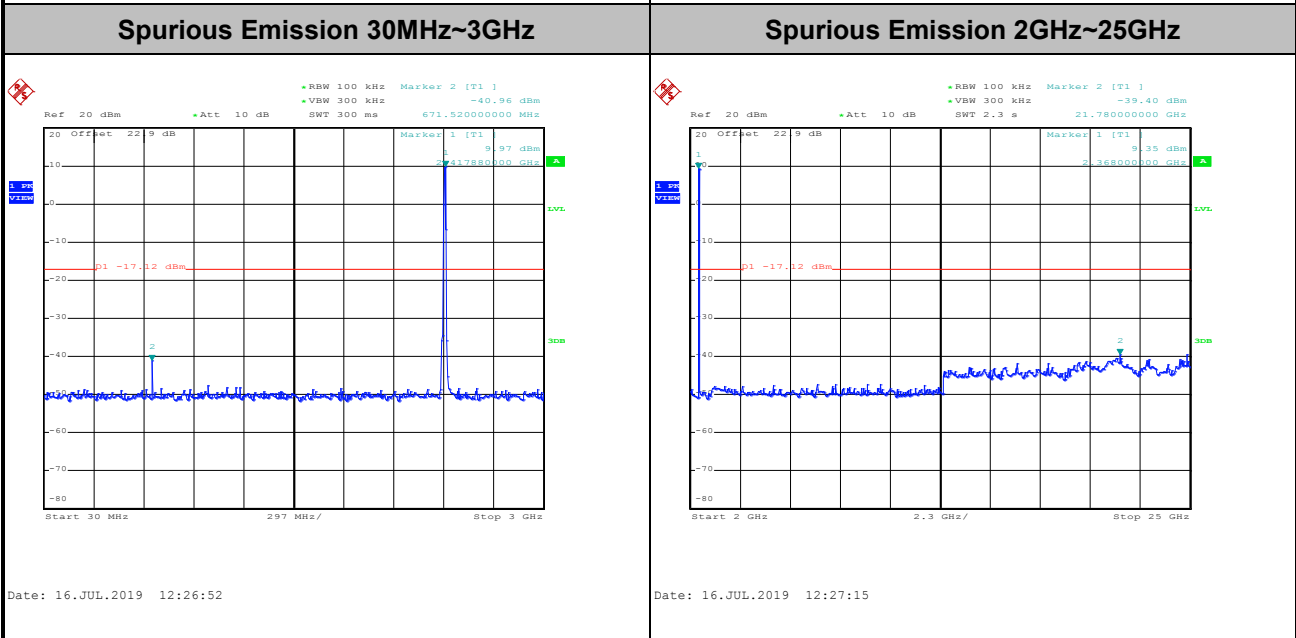
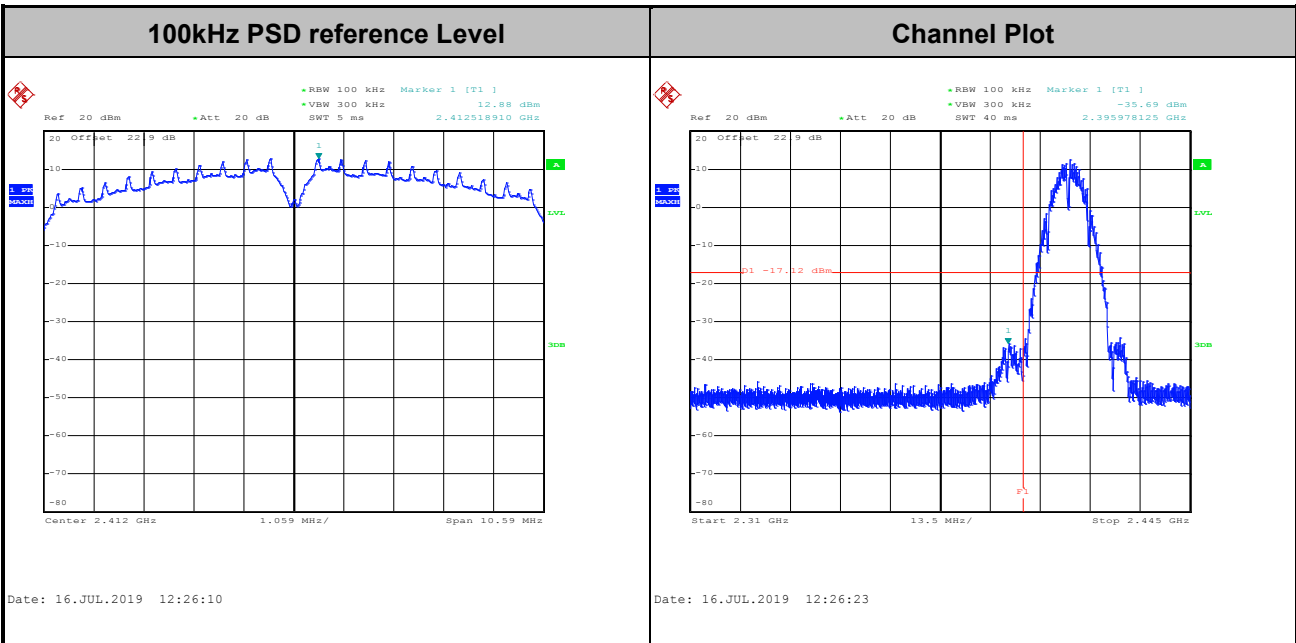


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer : Shiming Liu	Temperature :	21~25°C
	Relative Humidity :	51~54%

Number of TX = 1, Ant. 1 (Measured)

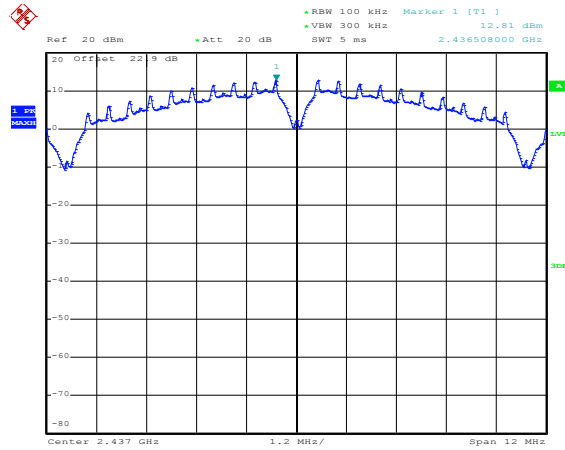
Test Mode :	802.11b	Test Channel :	01
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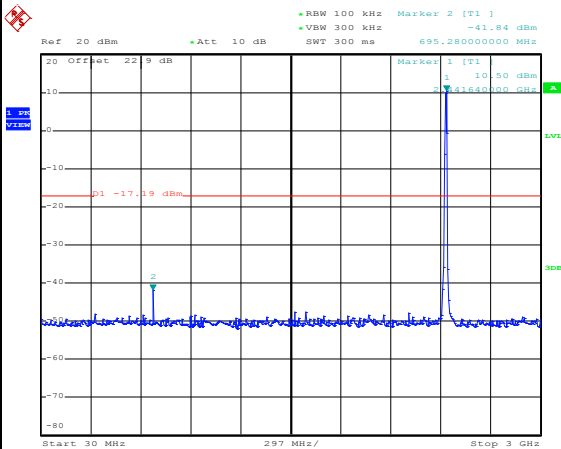
Test Mode :	802.11b	Test Channel :	06
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100kHz PSD reference Level



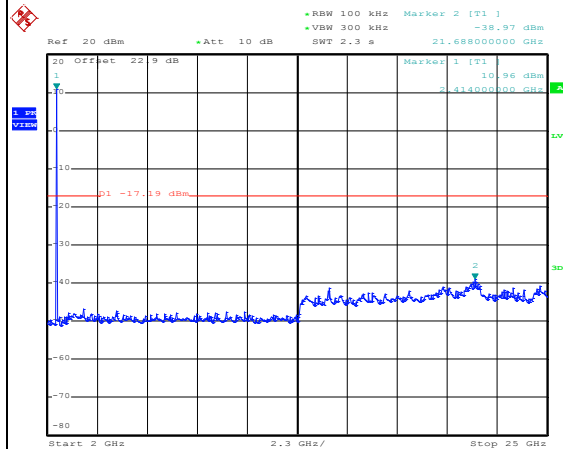
Date: 16.JUL.2019 12:33:27

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 12:34:08

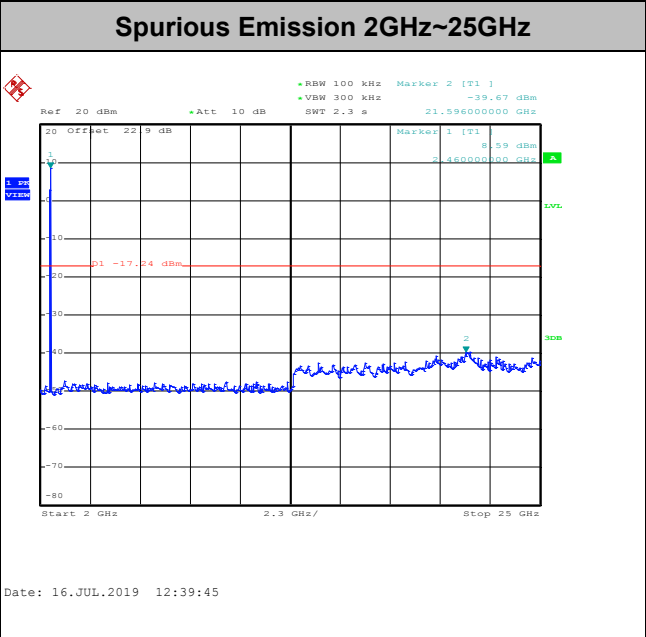
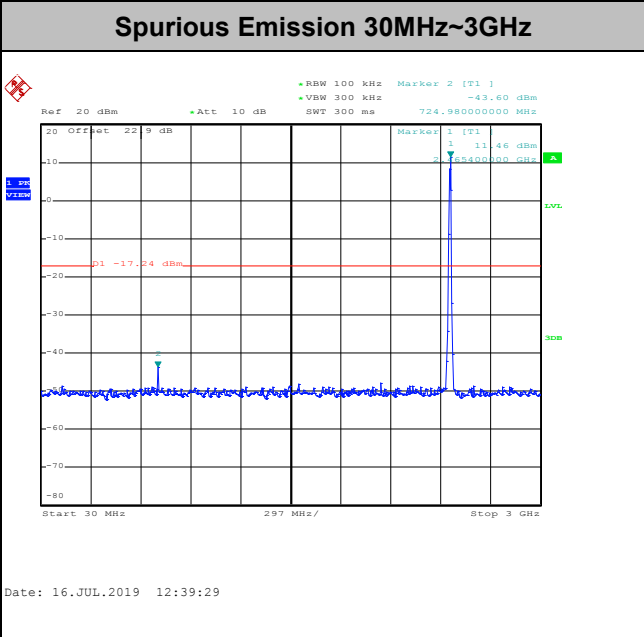
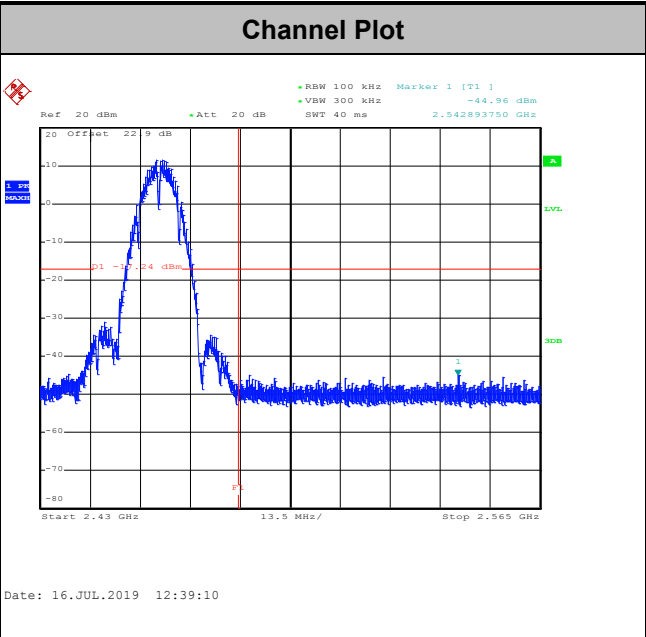
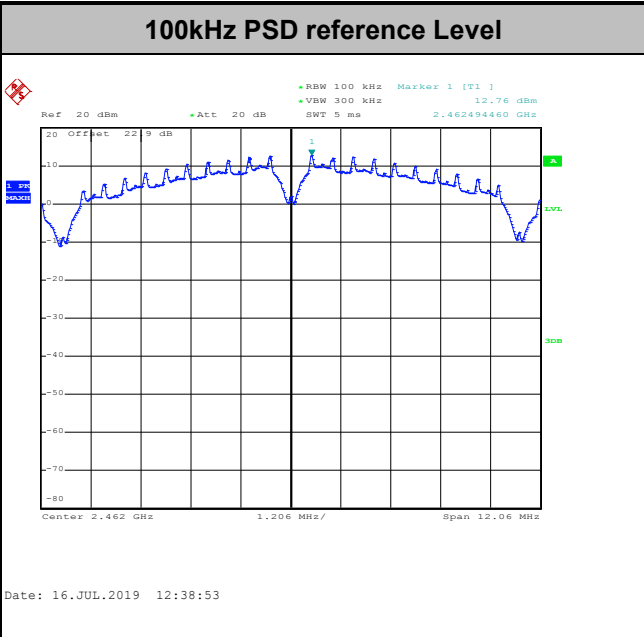
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 12:34:26

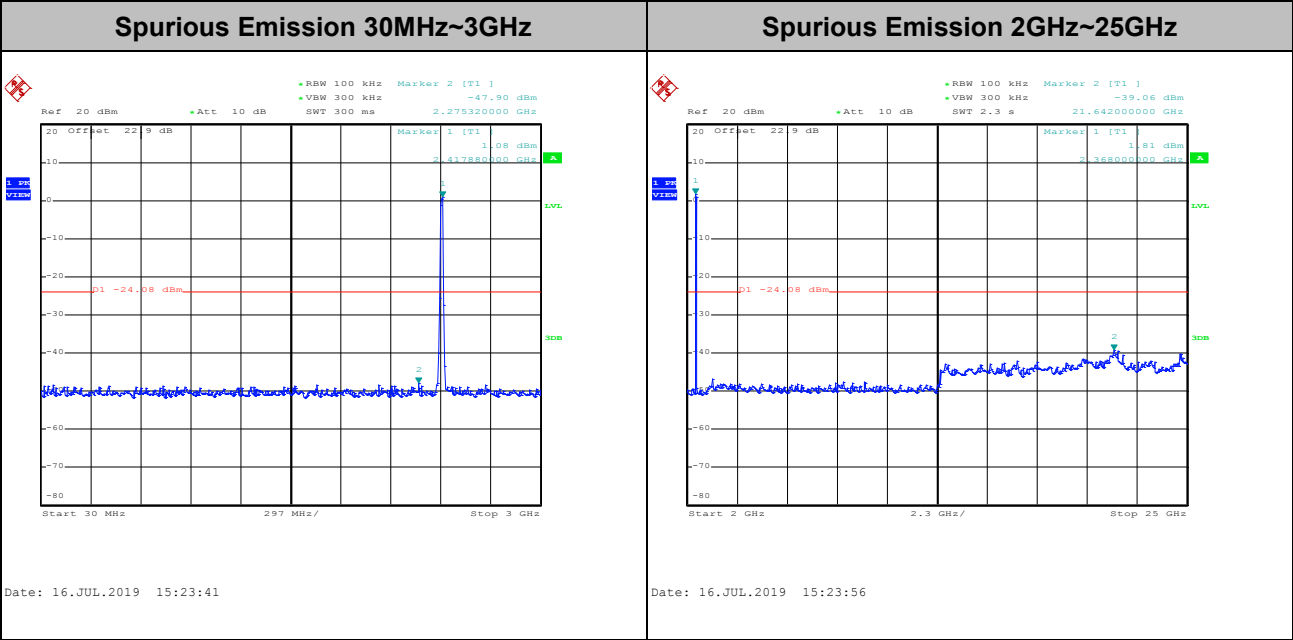
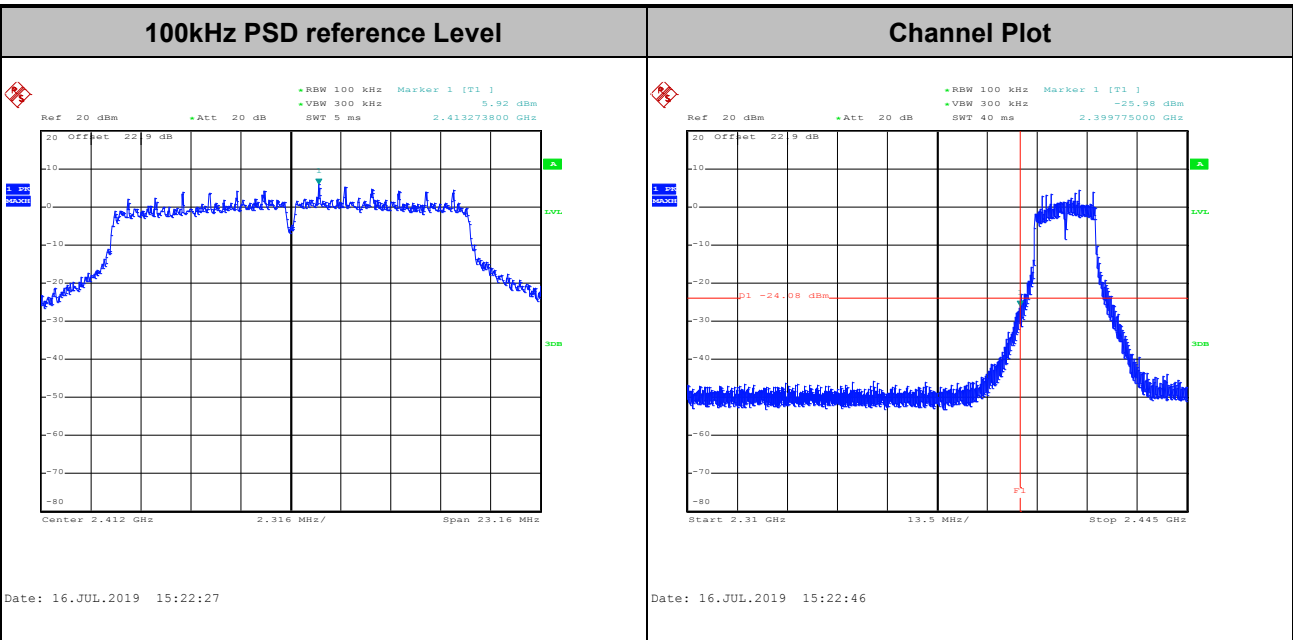


Test Mode :	802.11b	Test Channel :	11
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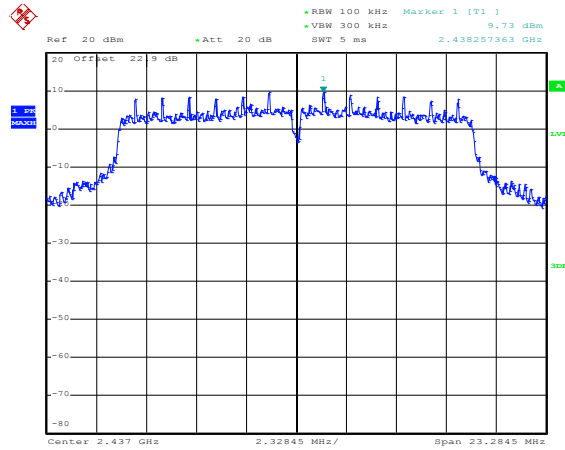
Test Mode :	802.11g	Test Channel :	01
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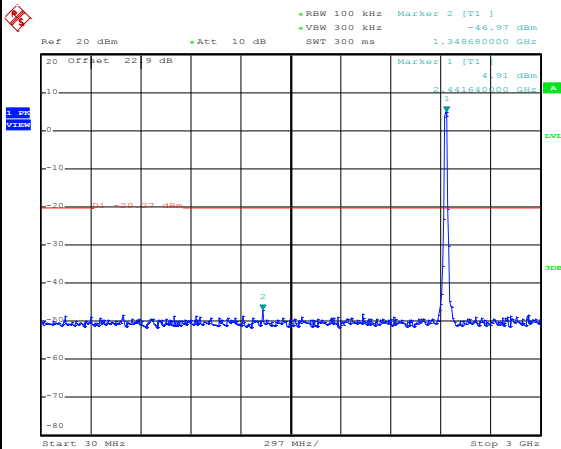
Test Mode :	802.11g	Test Channel :	06
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100kHz PSD reference Level



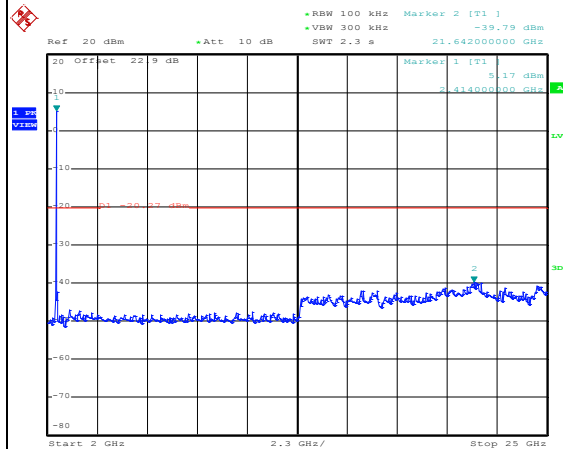
Date: 16.JUL.2019 15:27:51

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 15:28:13

Spurious Emission 2GHz~25GHz

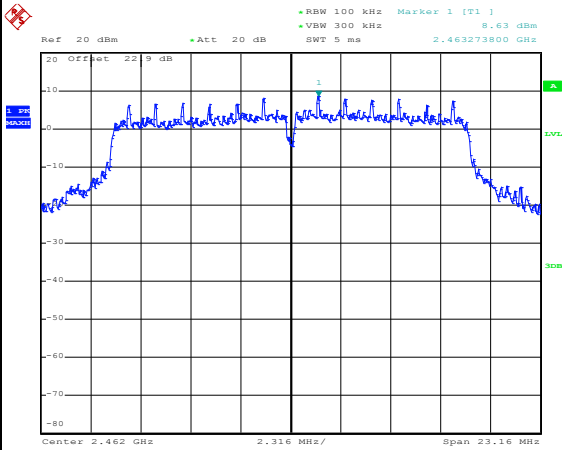


Date: 16.JUL.2019 15:28:38



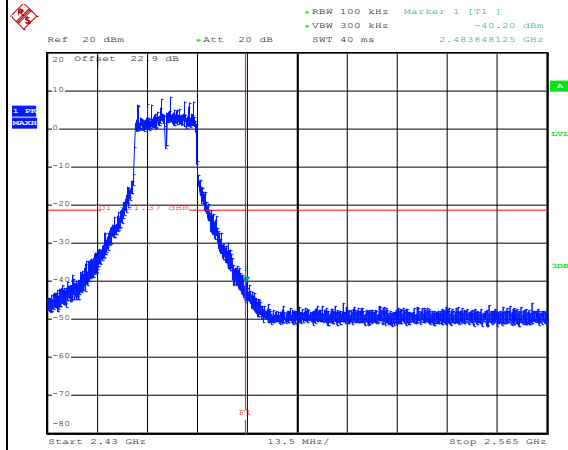
Test Mode : 802.11g Test Channel : 11

100kHz PSD reference Level



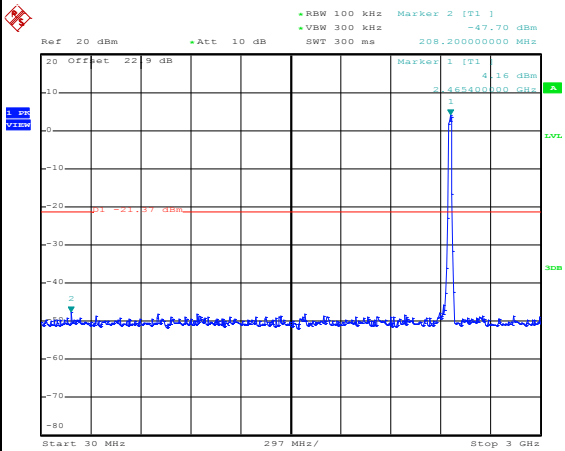
Date: 16.JUL.2019 15:33:30

Channel Plot



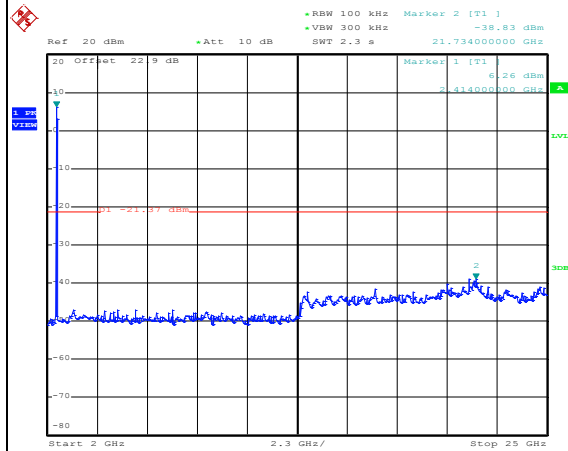
Date: 16.JUL.2019 15:33:59

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 15:34:30

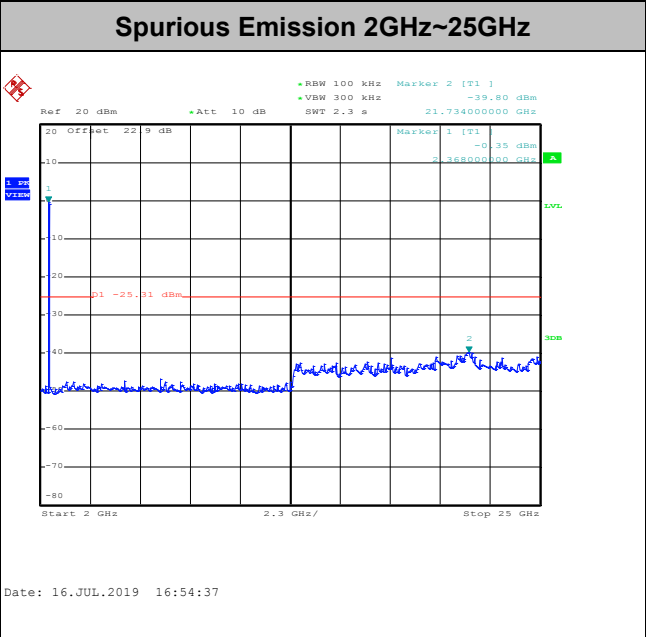
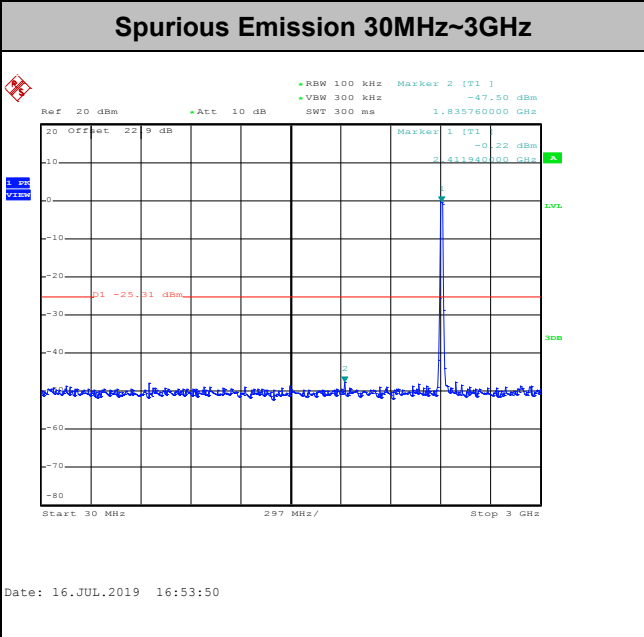
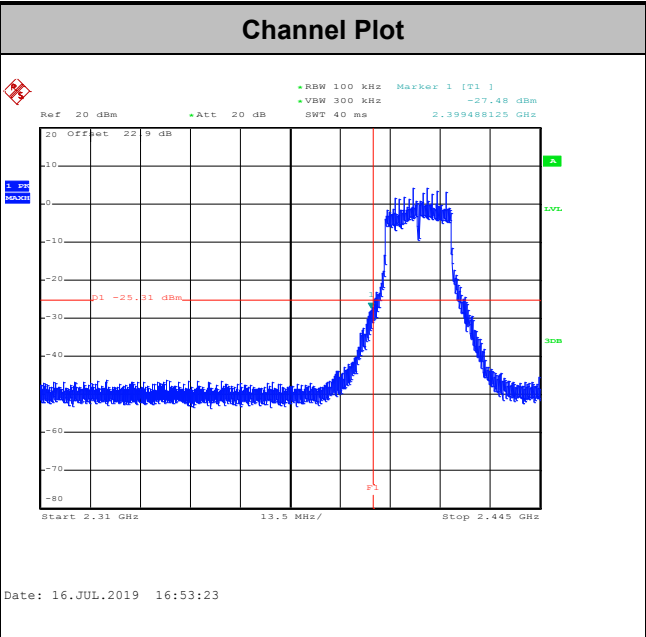
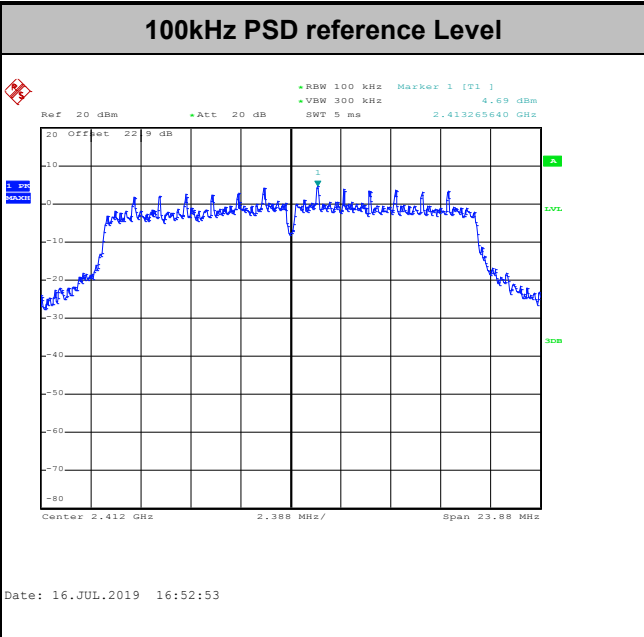
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 15:34:52



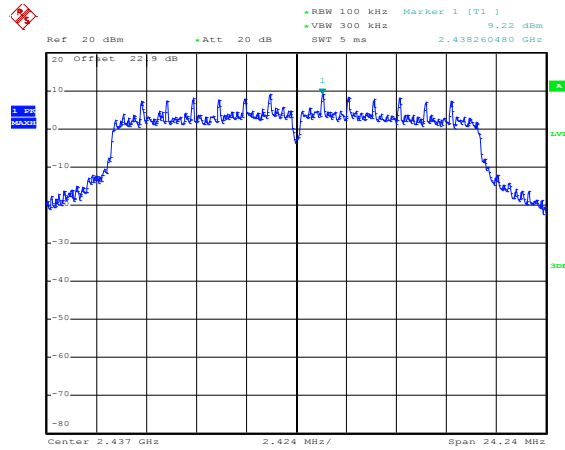
Test Mode :	802.11n HT20	Test Channel :	01
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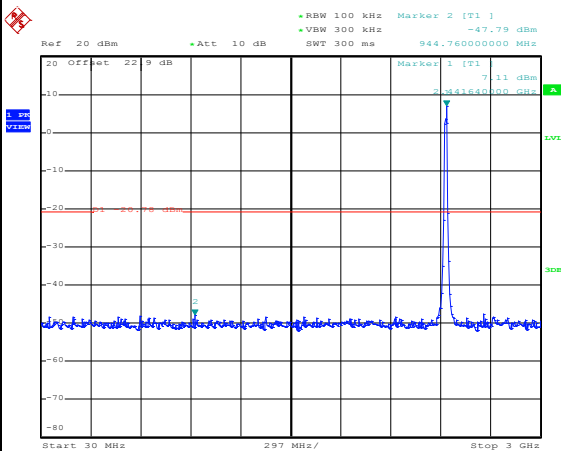
Test Mode :	802.11n HT20	Test Channel :	06
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100kHz PSD reference Level



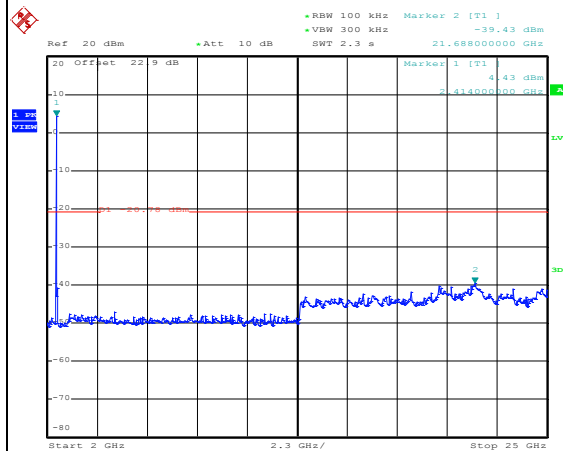
Date: 16.JUL.2019 17:02:30

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 17:03:01

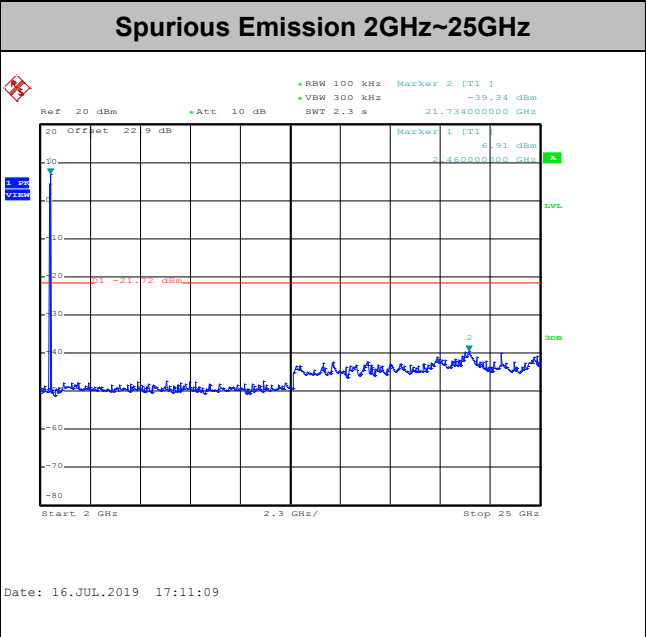
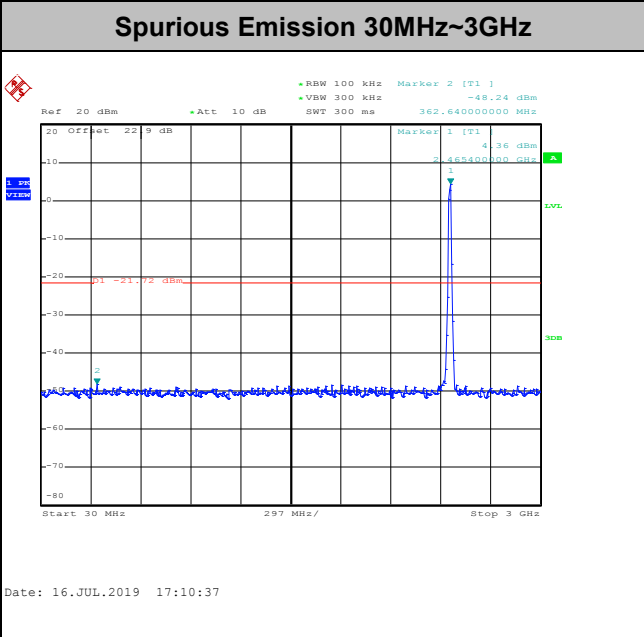
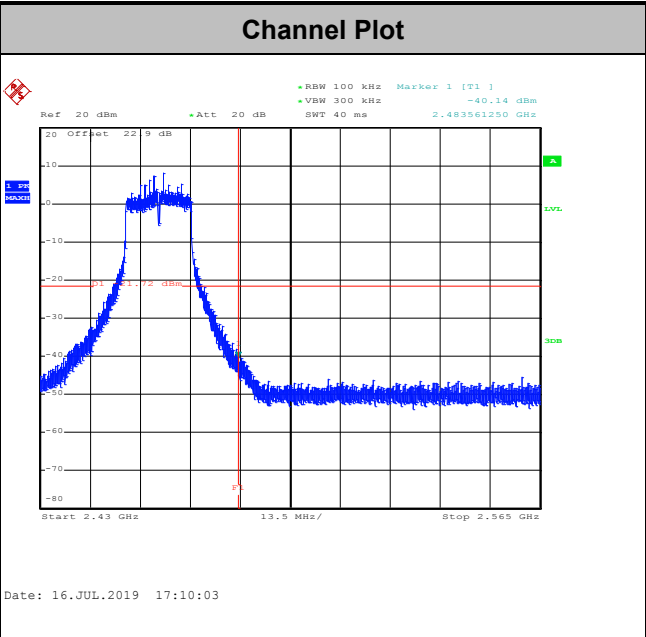
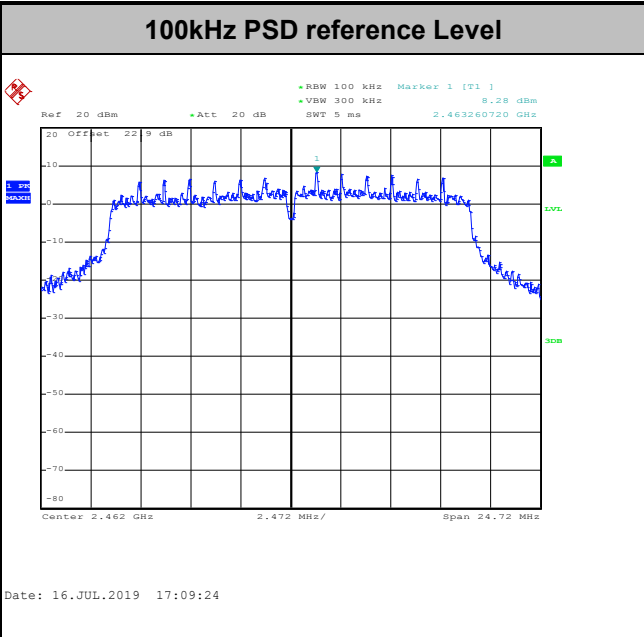
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 17:03:18

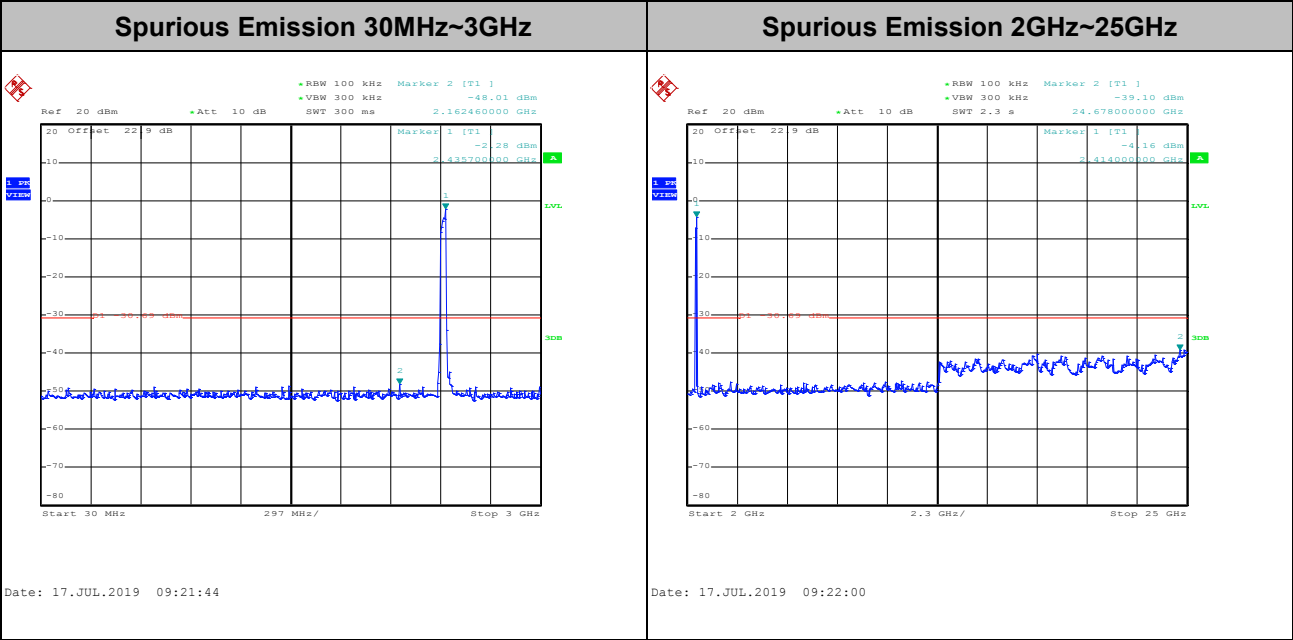
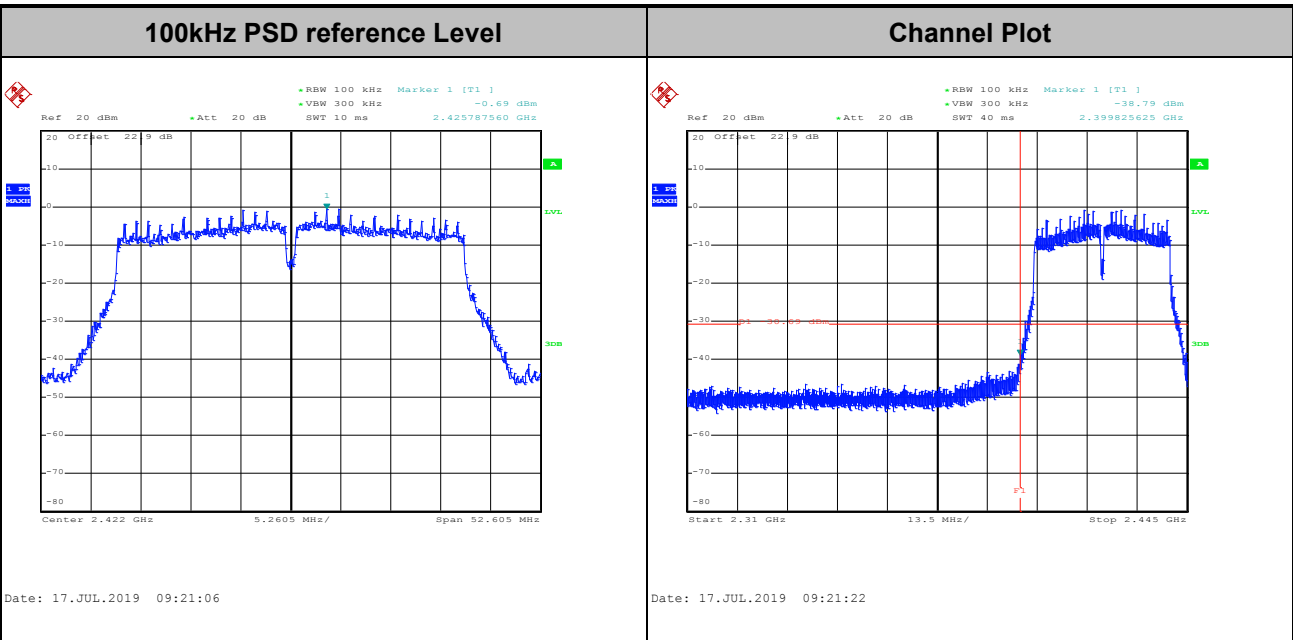


Test Mode :	802.11n HT20	Test Channel :	11
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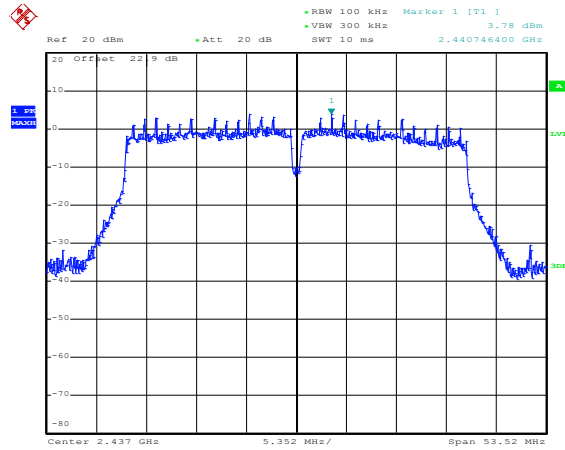
Test Mode :	802.11n HT40	Test Channel :	03
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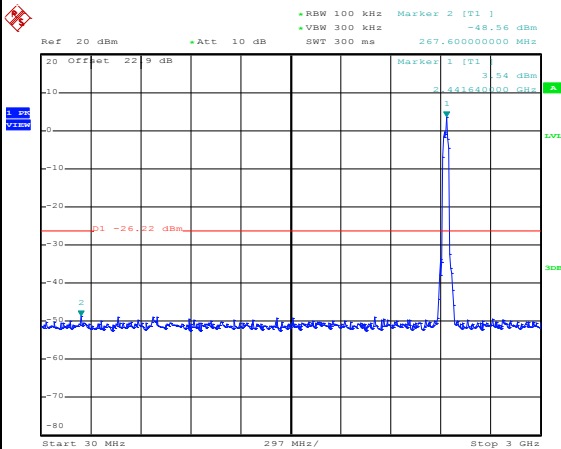
Test Mode :	802.11n HT40	Test Channel :	06
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100kHz PSD reference Level



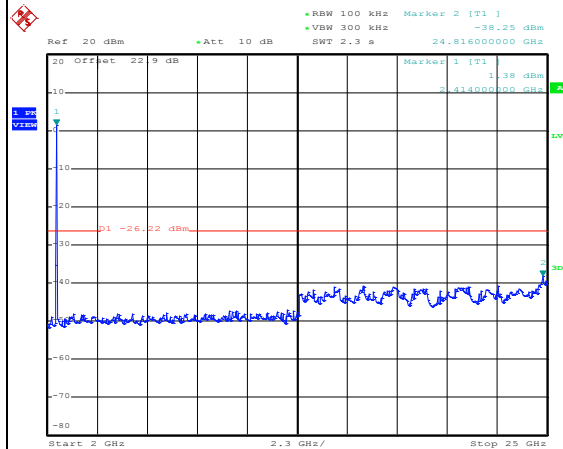
Date: 17.JUL.2019 09:25:41

Spurious Emission 30MHz~3GHz



Date: 17.JUL.2019 09:26:44

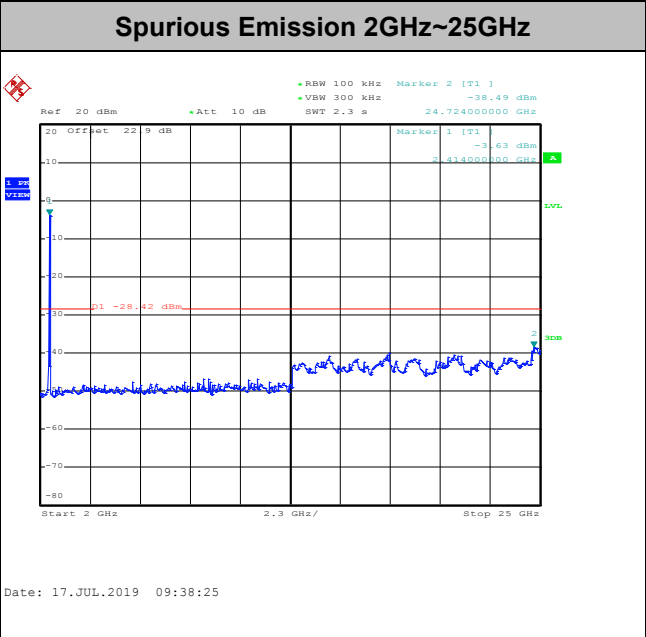
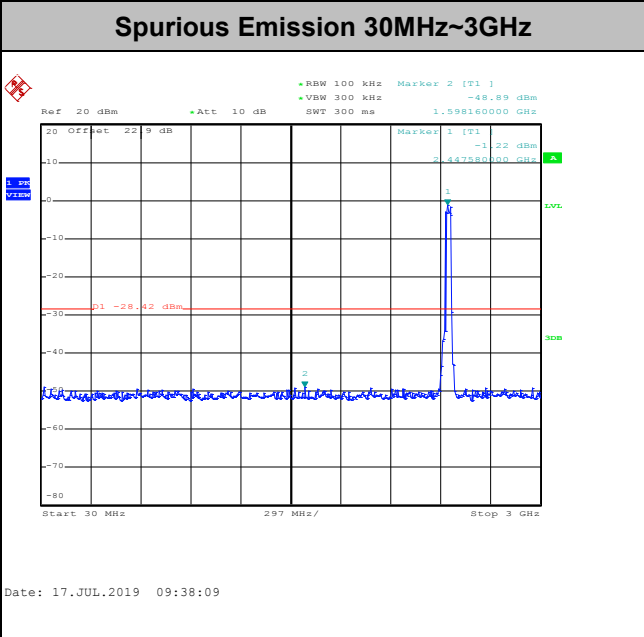
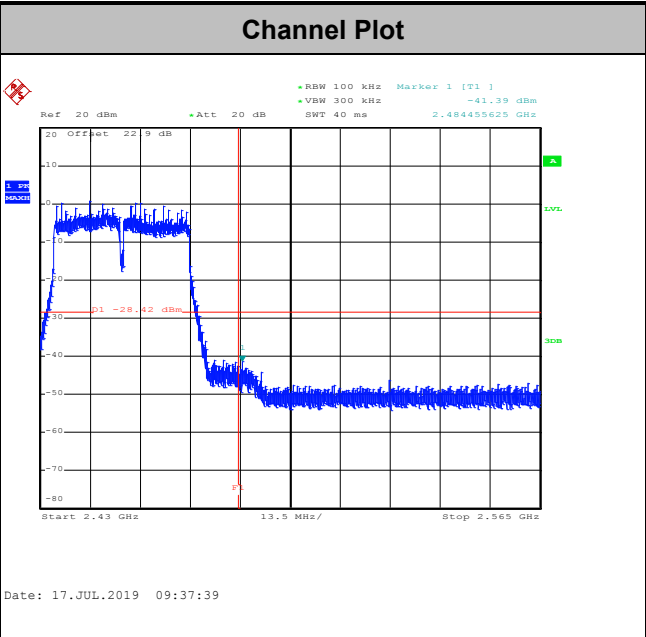
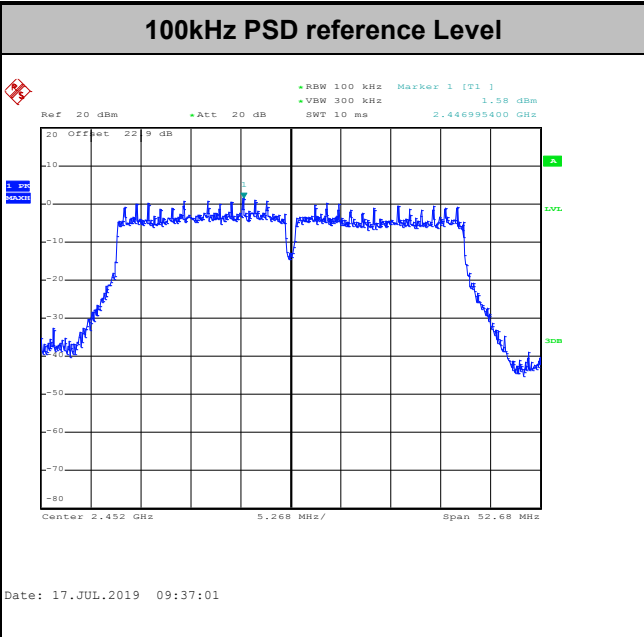
Spurious Emission 2GHz~25GHz



Date: 17.JUL.2019 09:26:59



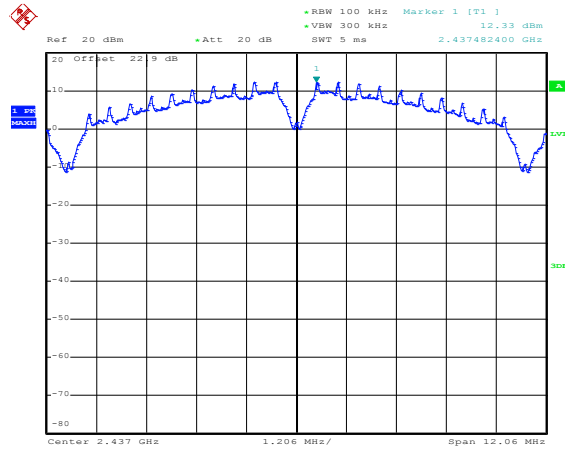
Test Mode : 802.11n HT40 Test Channel : 09





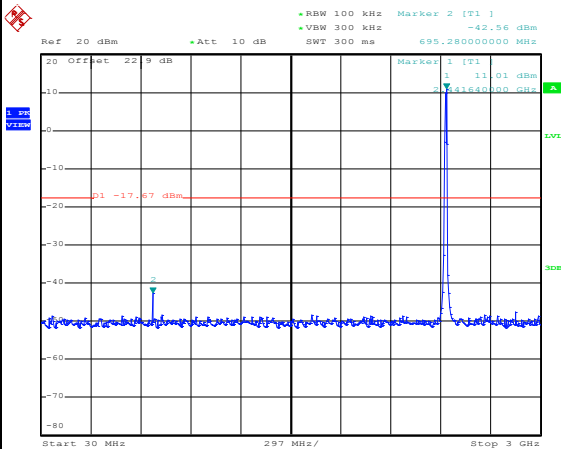
Test Mode :	802.11b	Test Channel :	06
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100kHz PSD reference Level



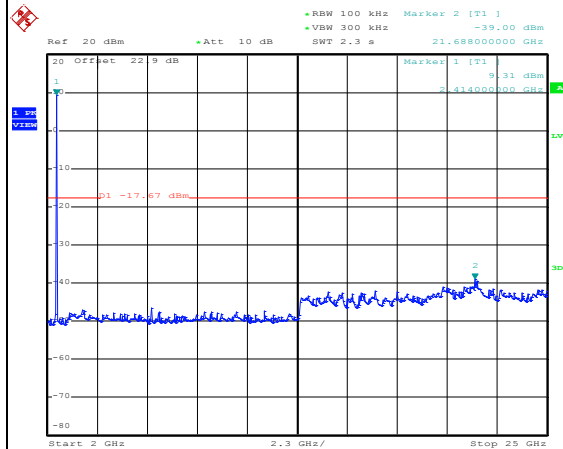
Date: 16.JUL.2019 12:49:35

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 12:49:54

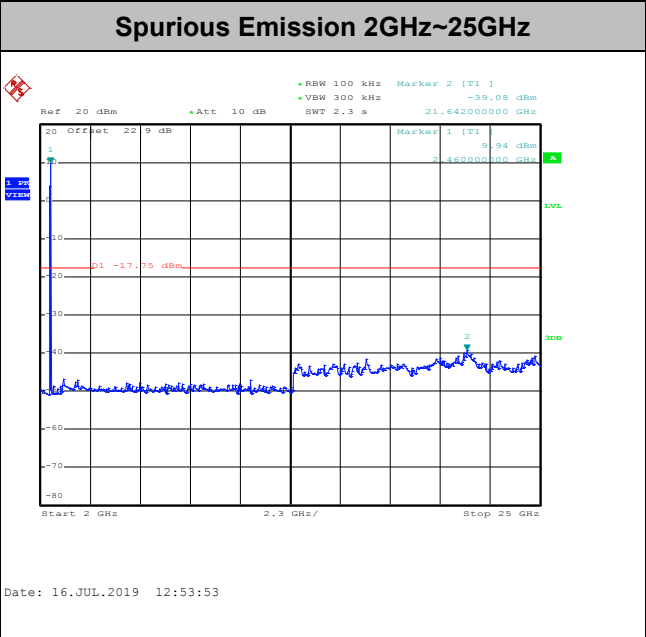
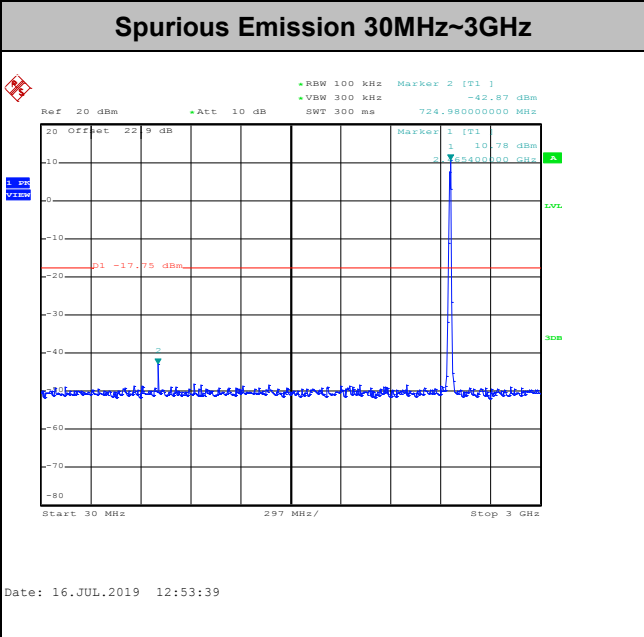
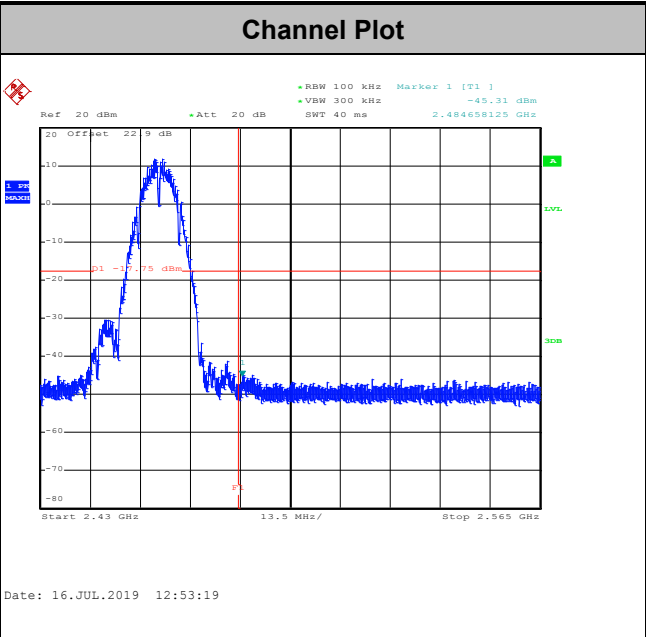
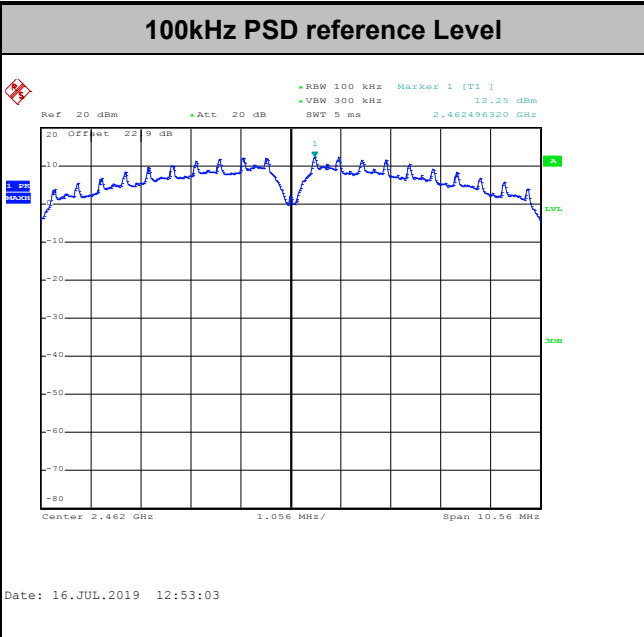
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 12:50:10

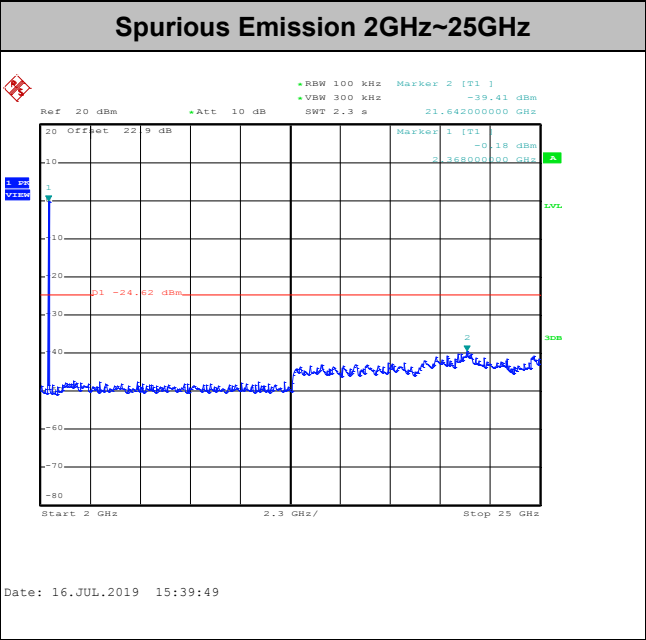
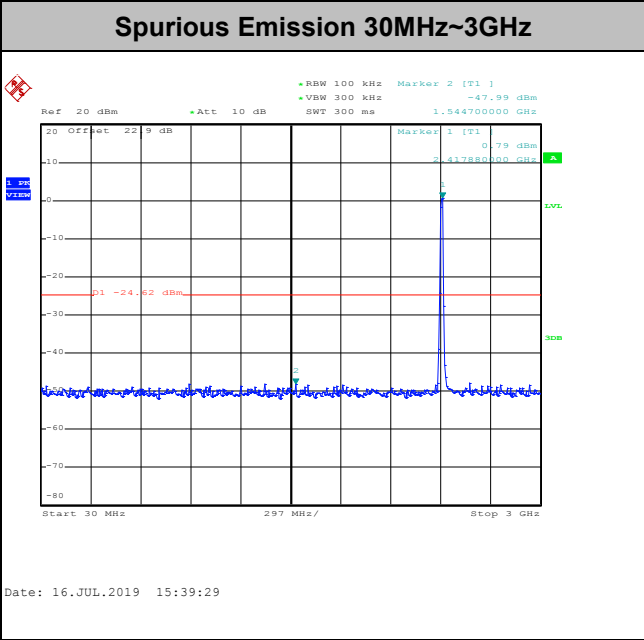
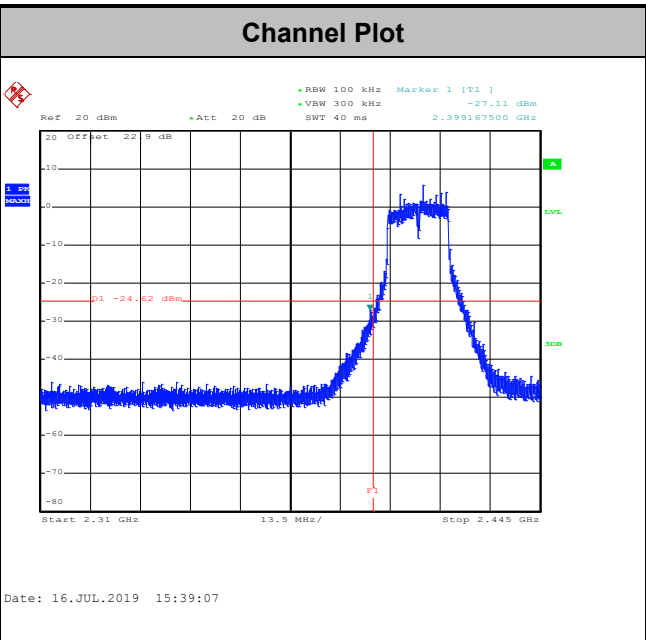
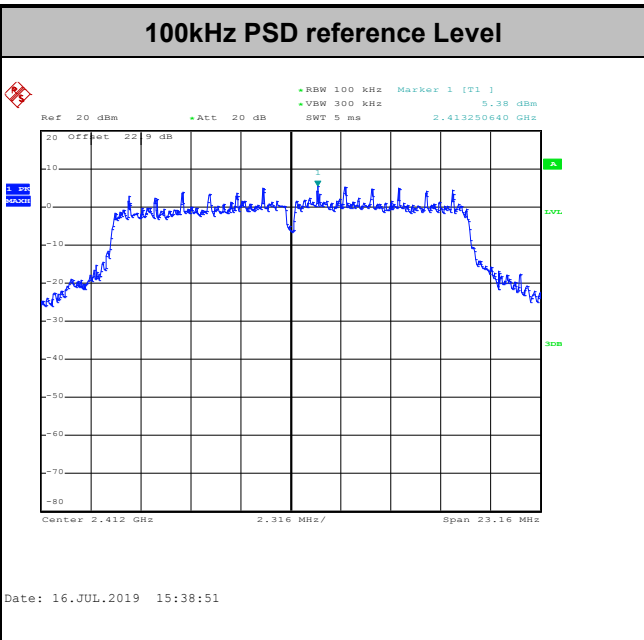


Test Mode :	802.11b	Test Channel :	11
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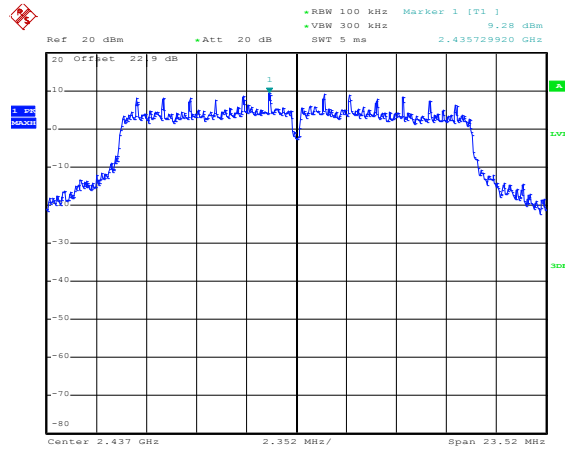
Test Mode : 802.11g Test Channel : 01





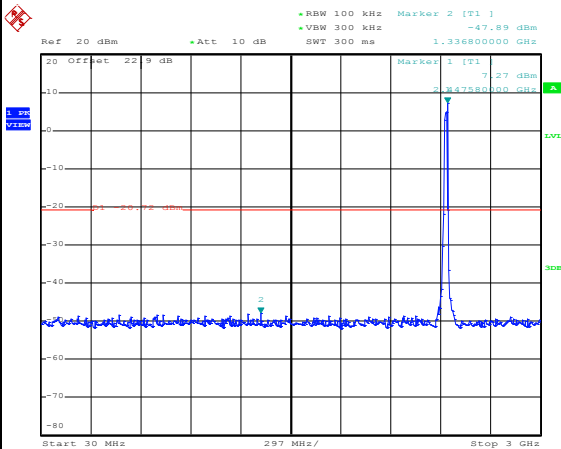
Test Mode :	802.11g	Test Channel :	06
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100kHz PSD reference Level



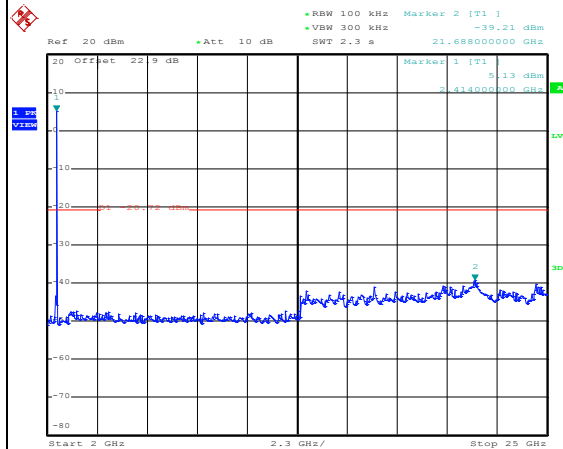
Date: 16.JUL.2019 15:42:39

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 15:43:00

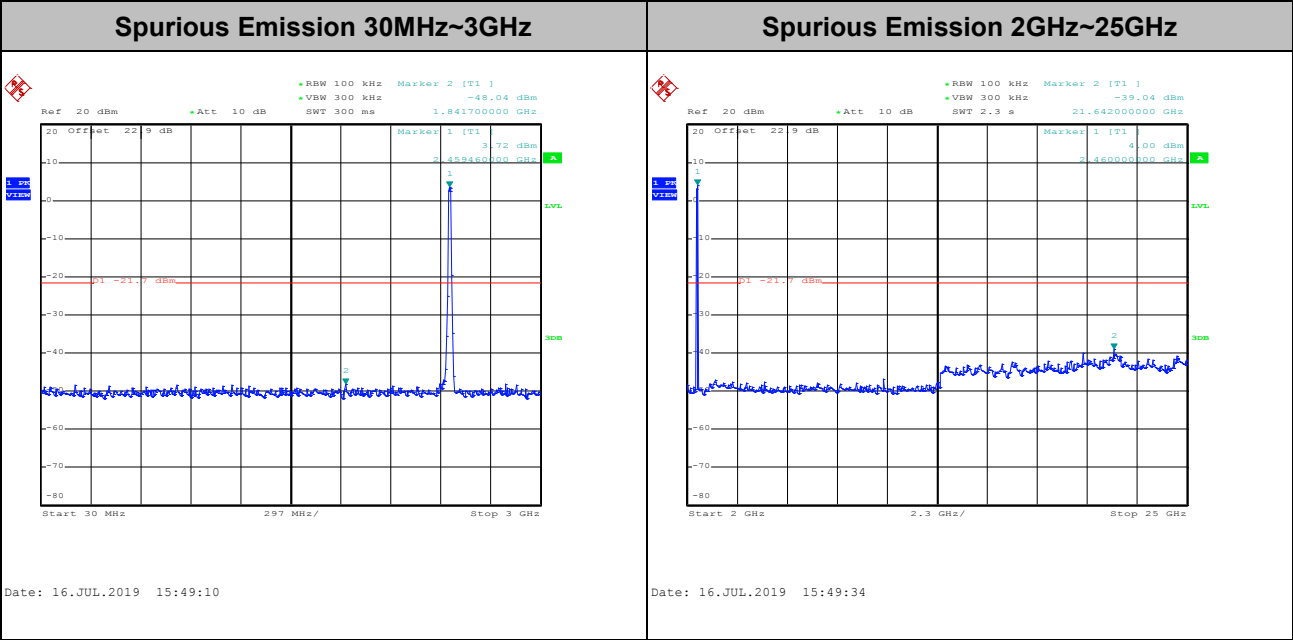
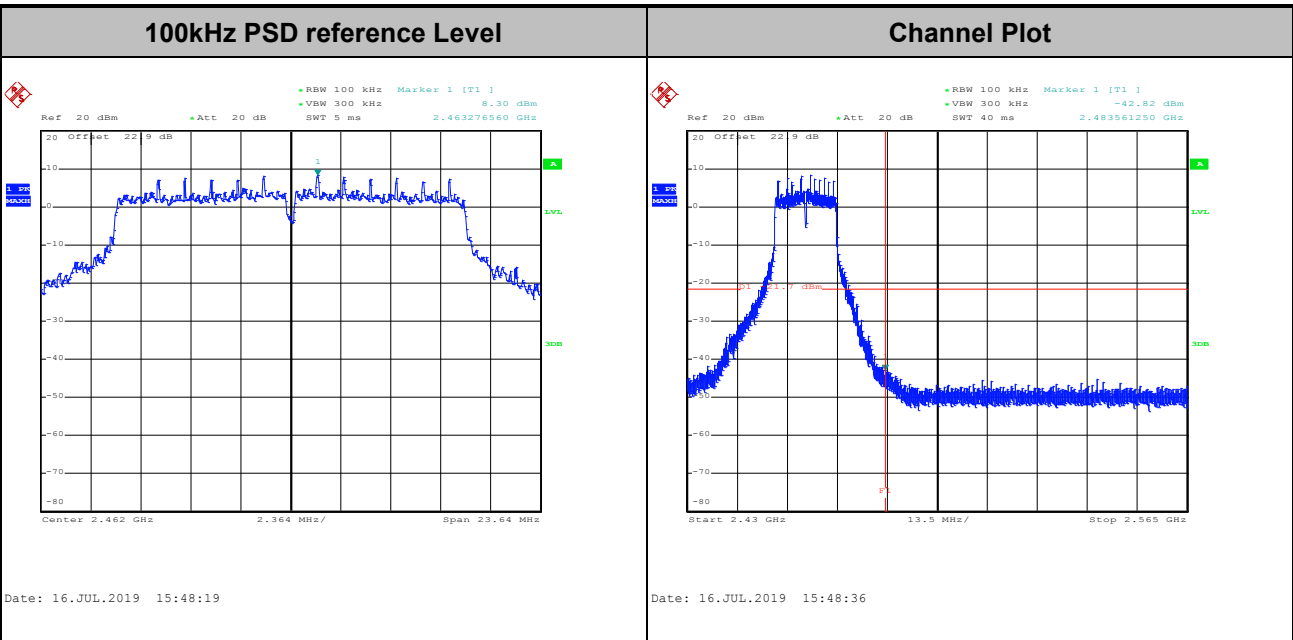
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 15:43:29

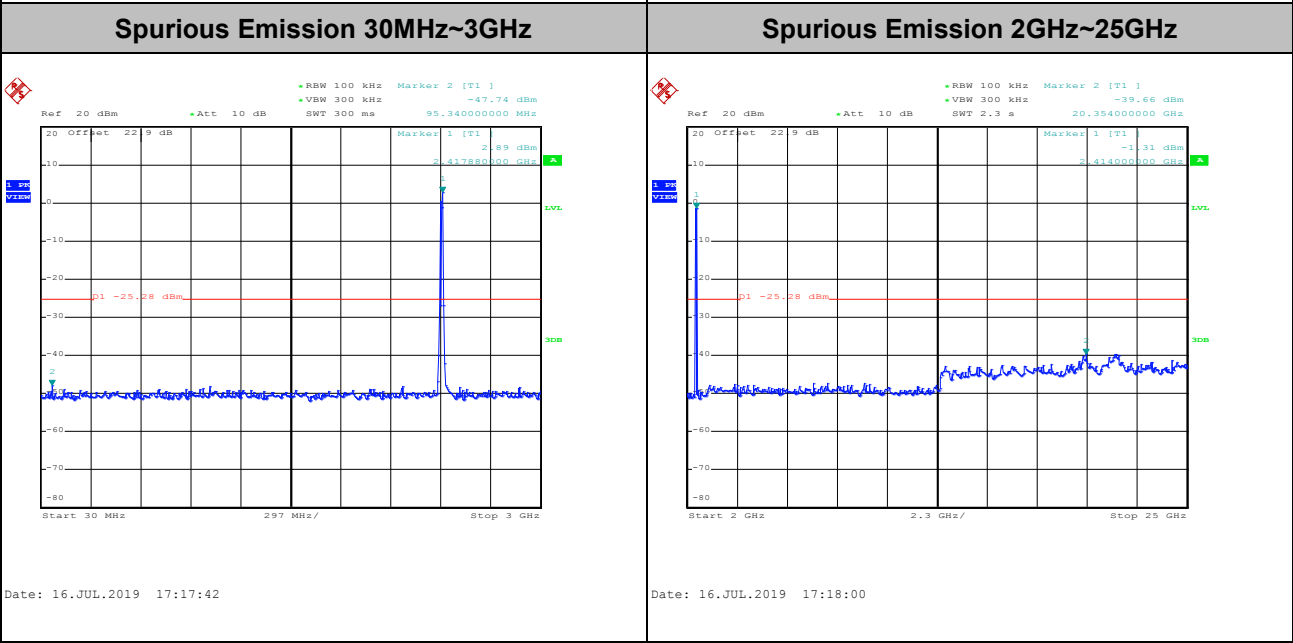
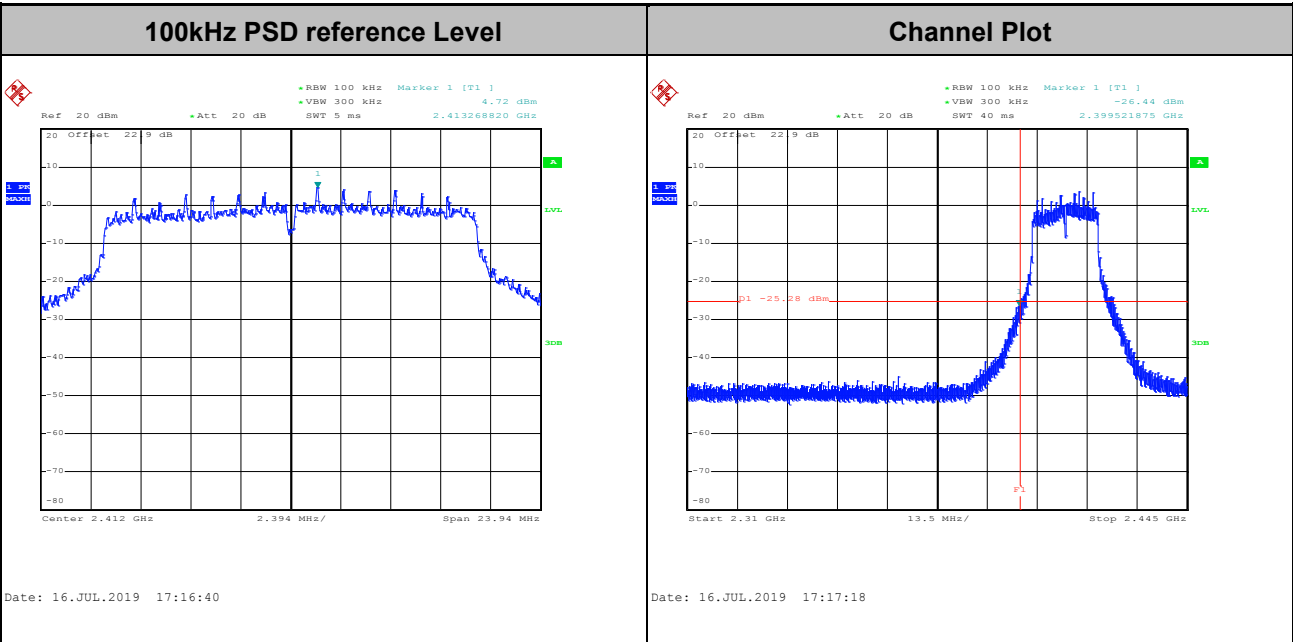


Test Mode :	802.11g	Test Channel :	11
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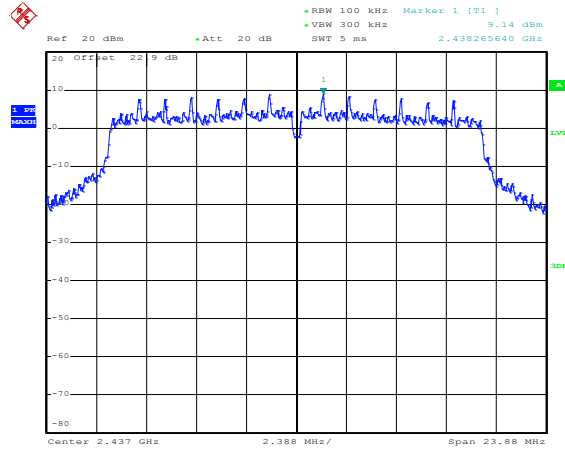
Test Mode :	802.11n HT20	Test Channel :	01
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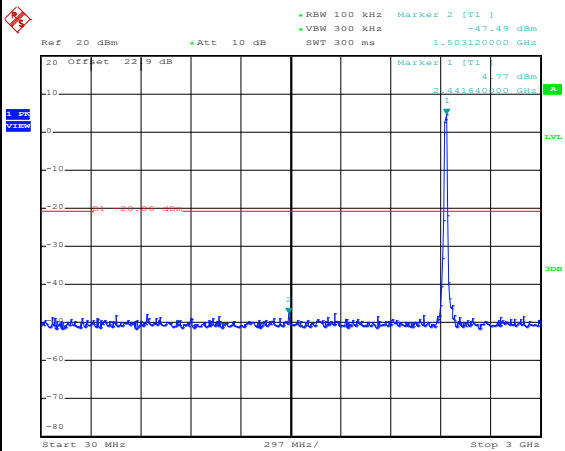
Test Mode :	802.11n HT20	Test Channel :	06
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100kHz PSD reference Level



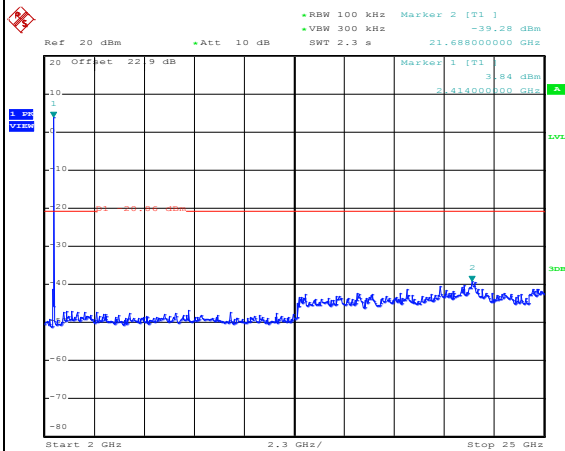
Date: 16.JUL.2019 17:22:25

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 17:24:01

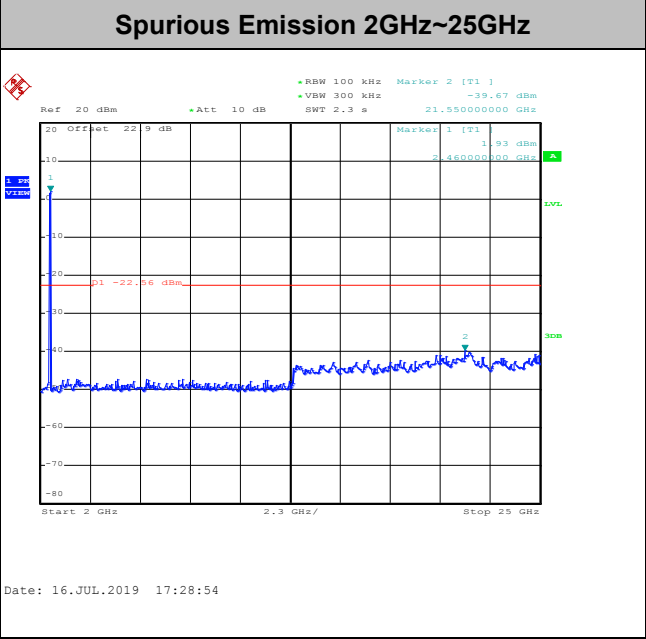
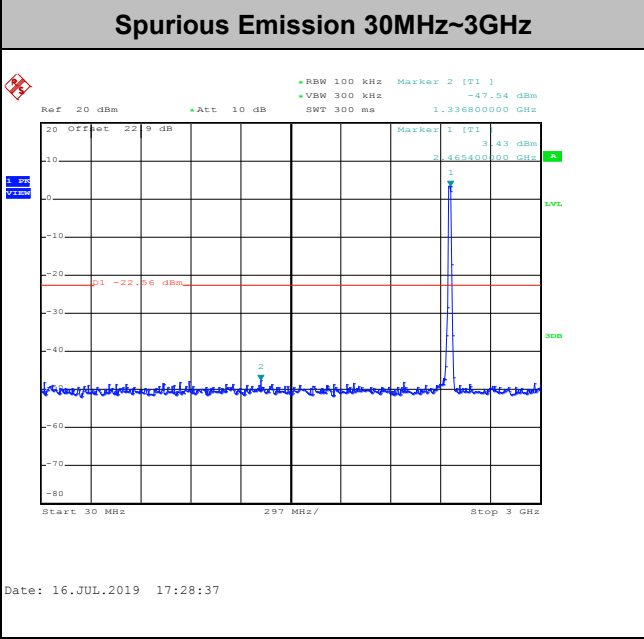
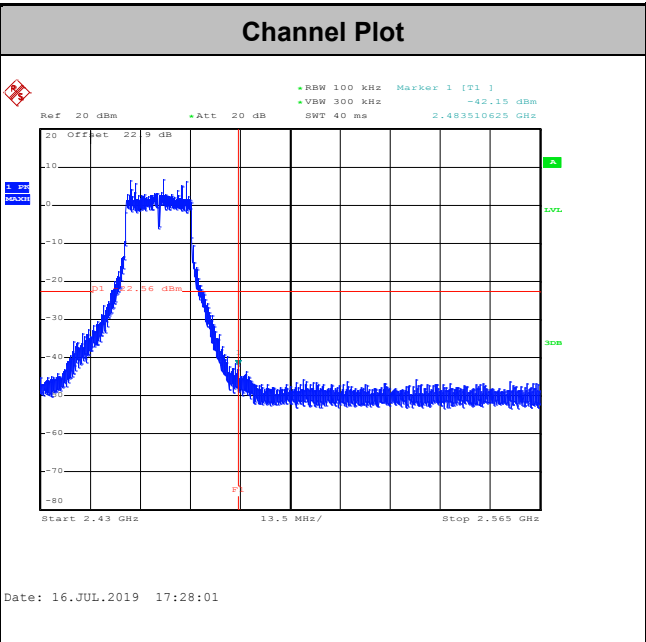
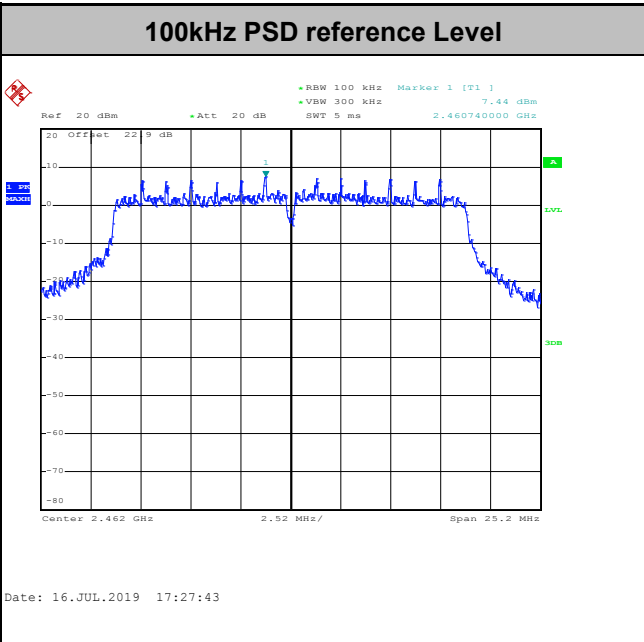
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 17:24:19

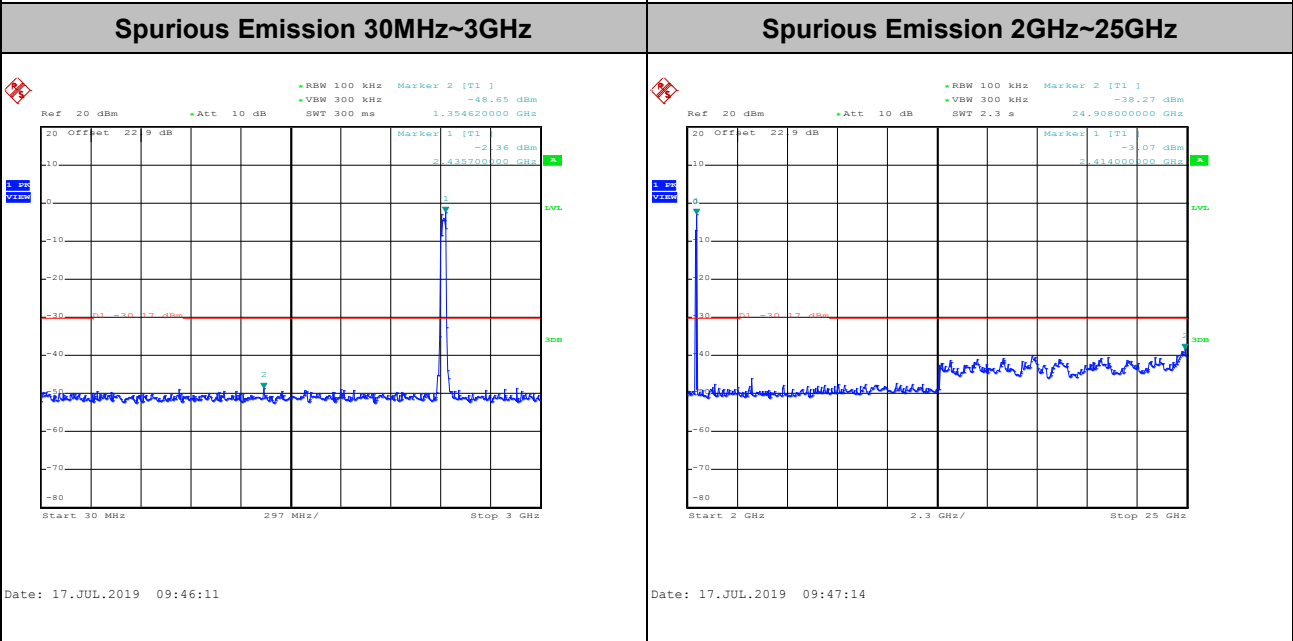
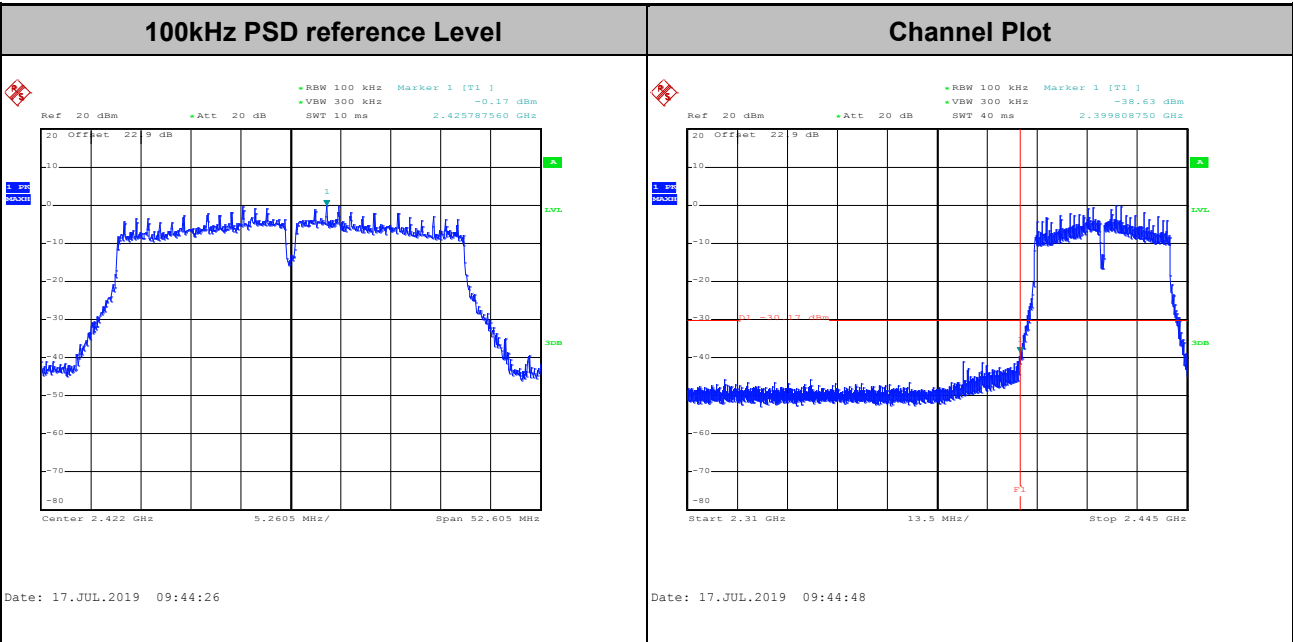


Test Mode :	802.11n HT20	Test Channel :	11
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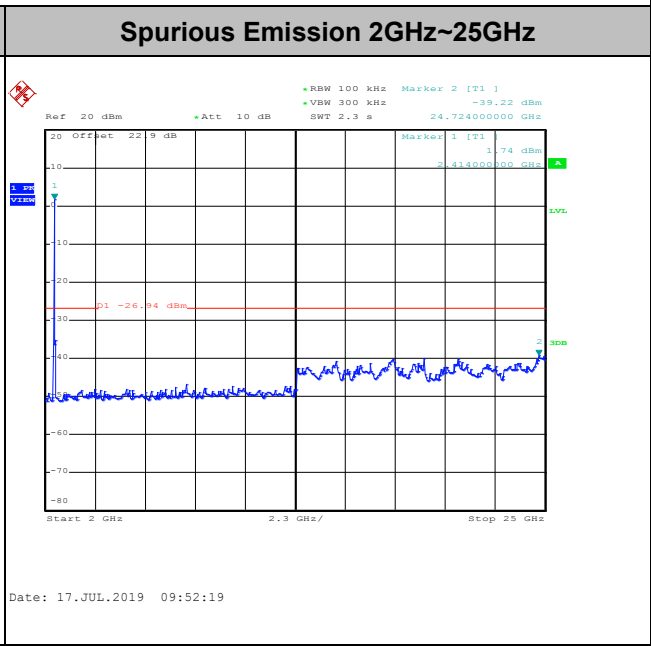
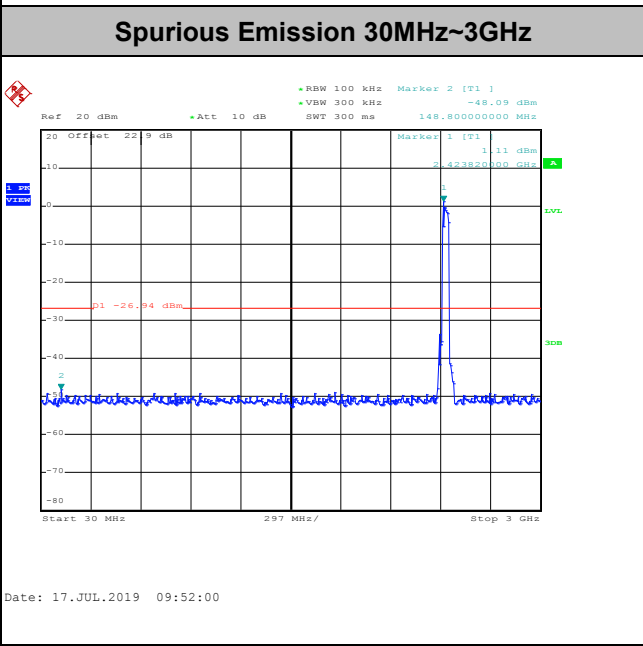
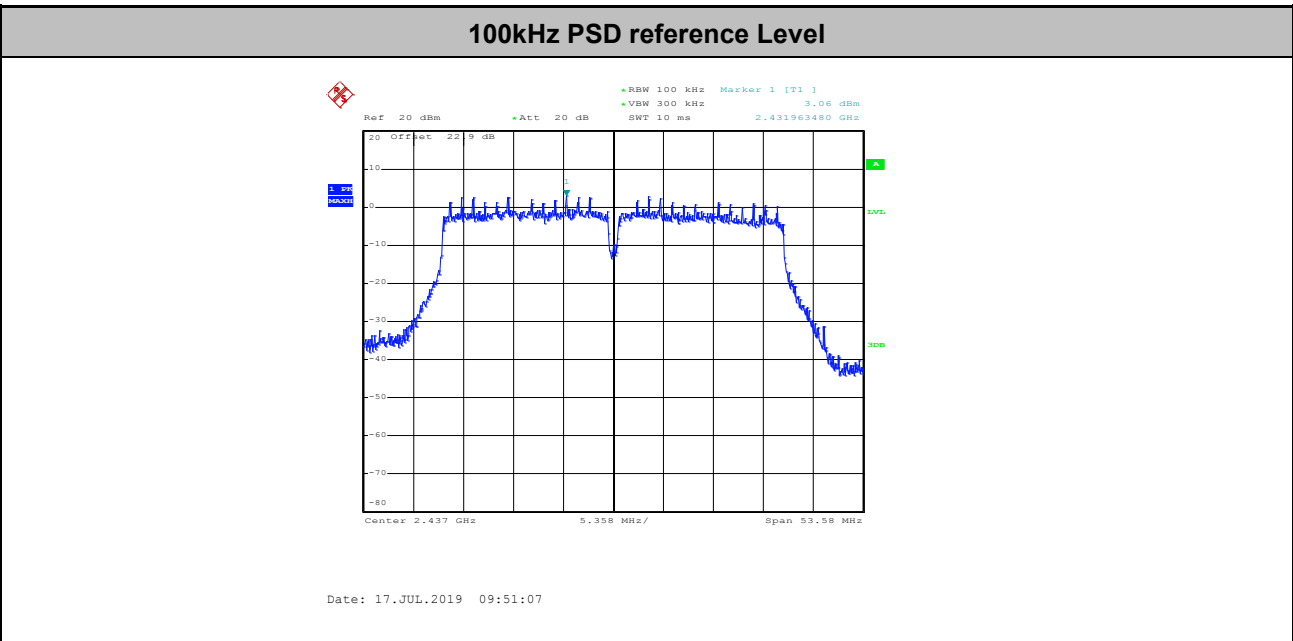


Test Mode :	802.11n HT40	Test Channel :	03
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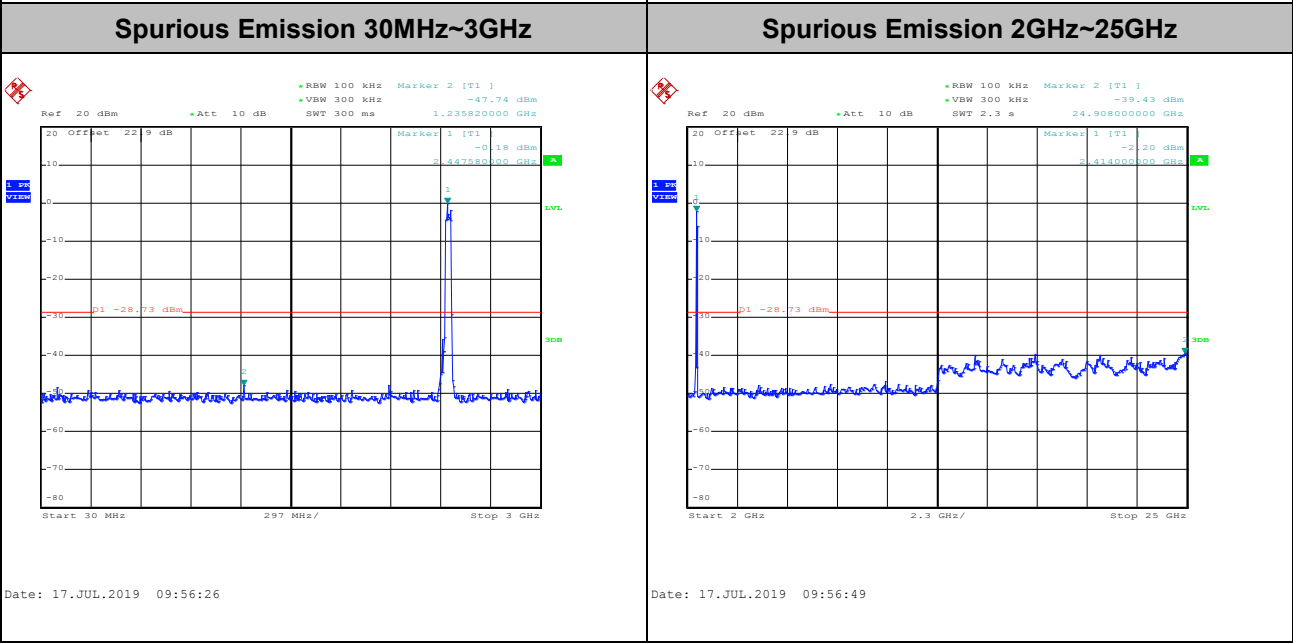
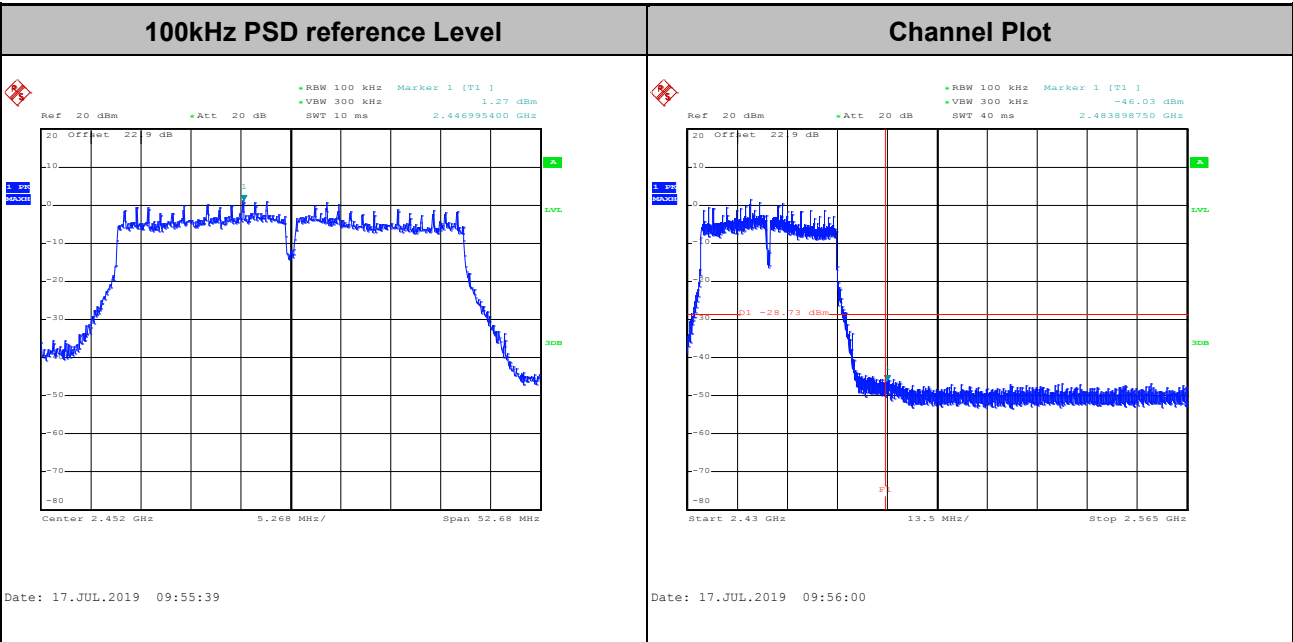


Test Mode :	802.11n HT40	Test Channel :	06
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Test Mode :	802.11n HT40	Test Channel :	09
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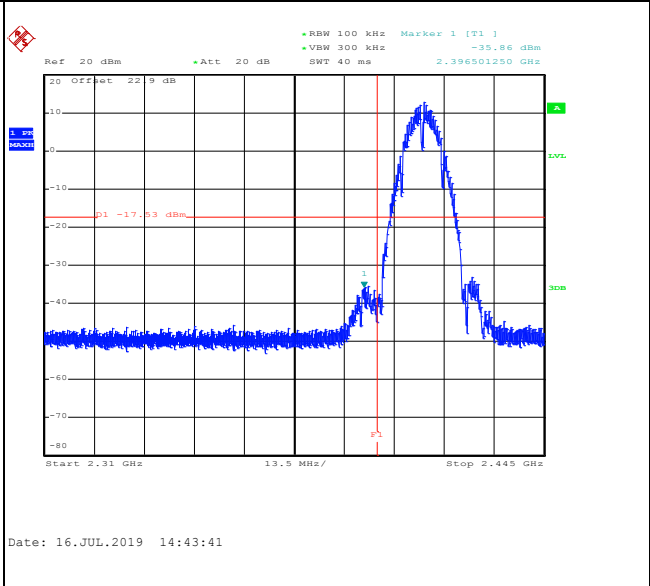
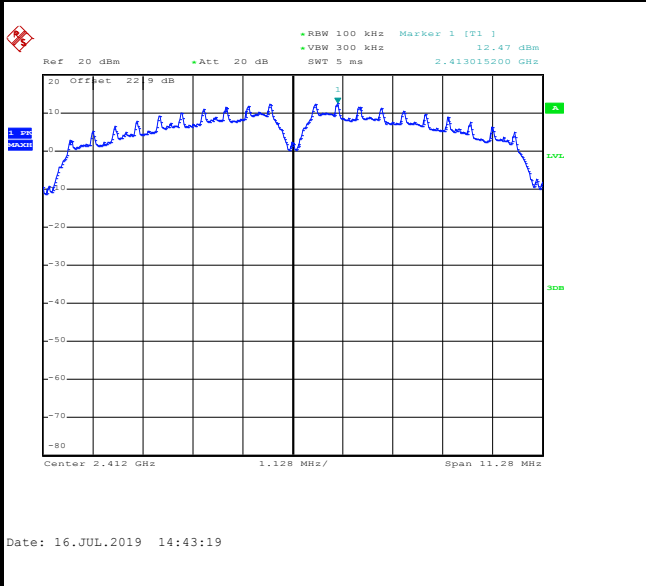


<CDD Modes>

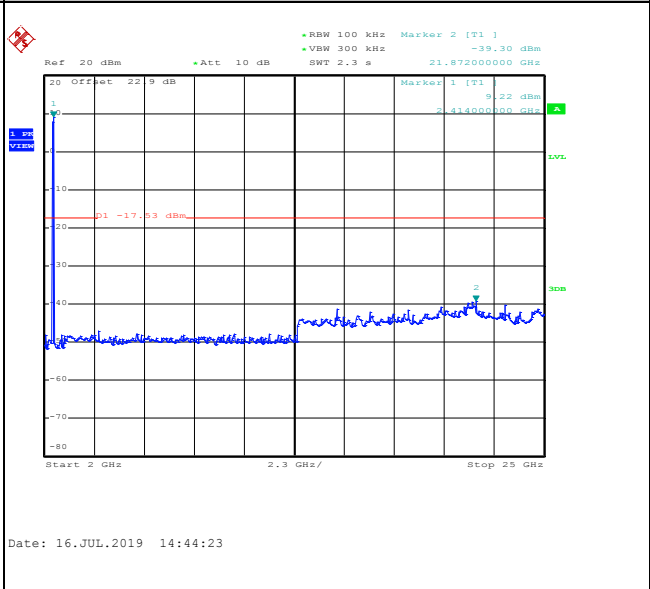
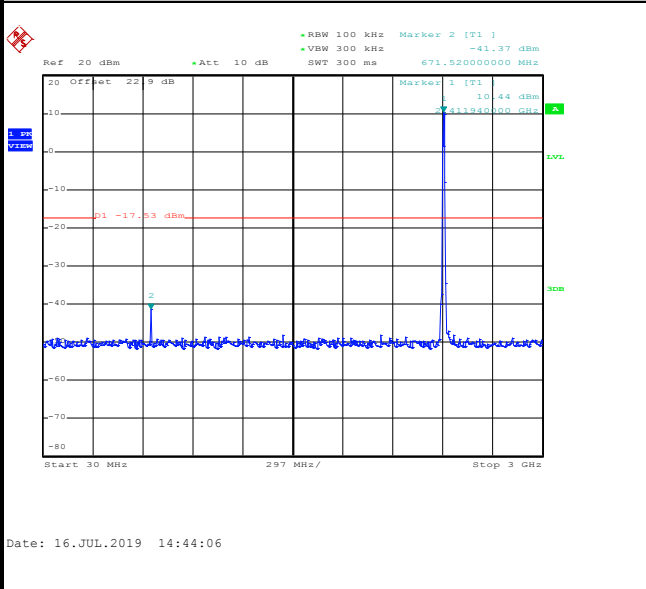
Number of TX = 2, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01
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100kHz PSD reference Level	Channel Plot
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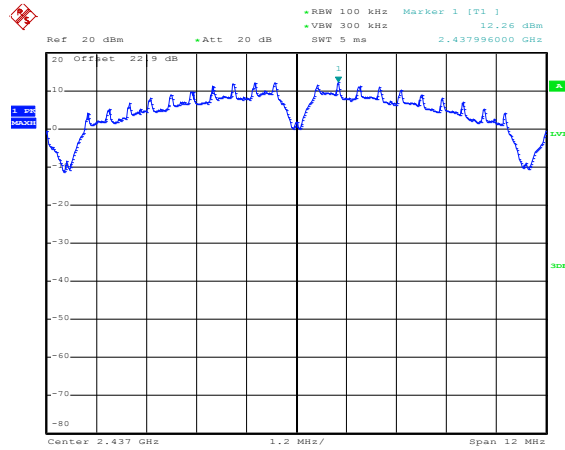
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
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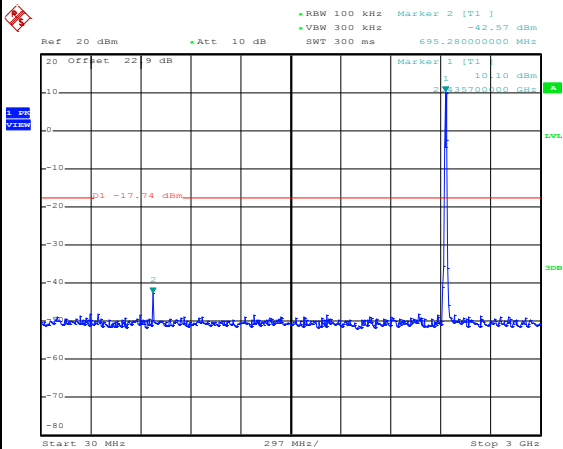
Test Mode :	802.11b	Test Channel :	06
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100kHz PSD reference Level



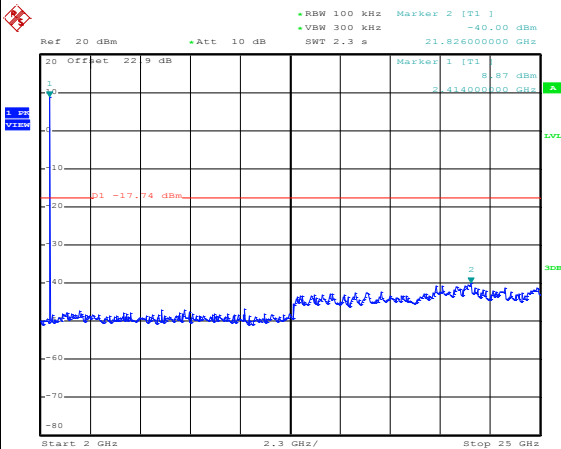
Date: 16.JUL.2019 14:53:49

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 14:54:57

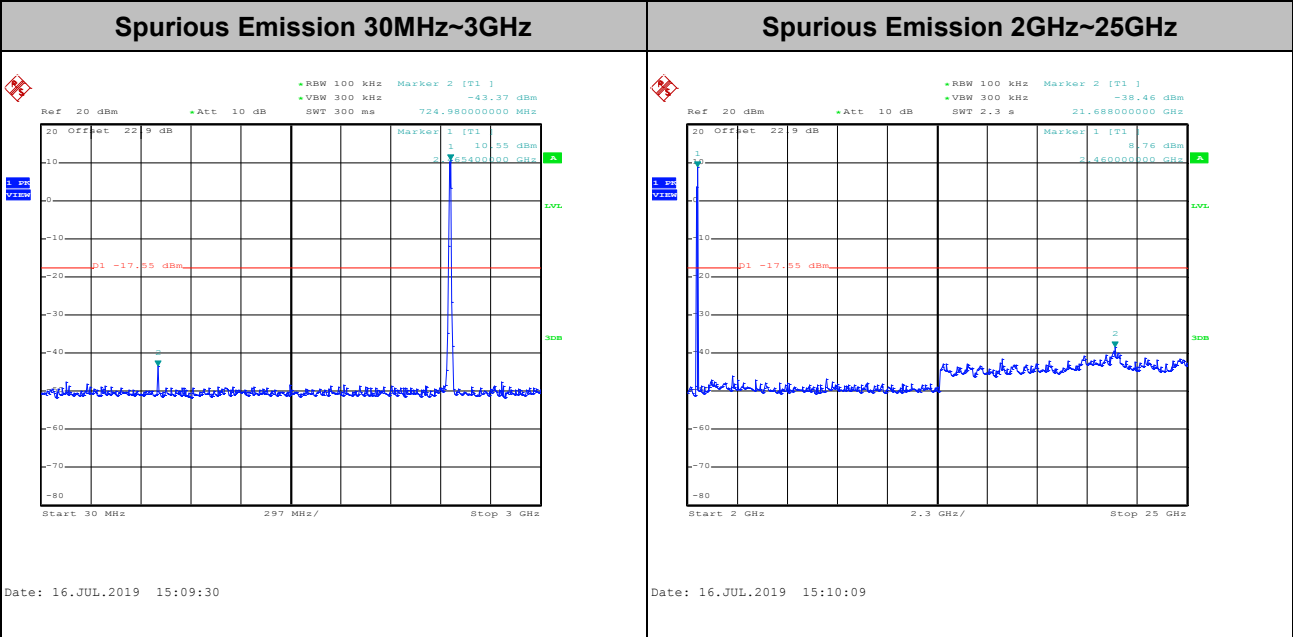
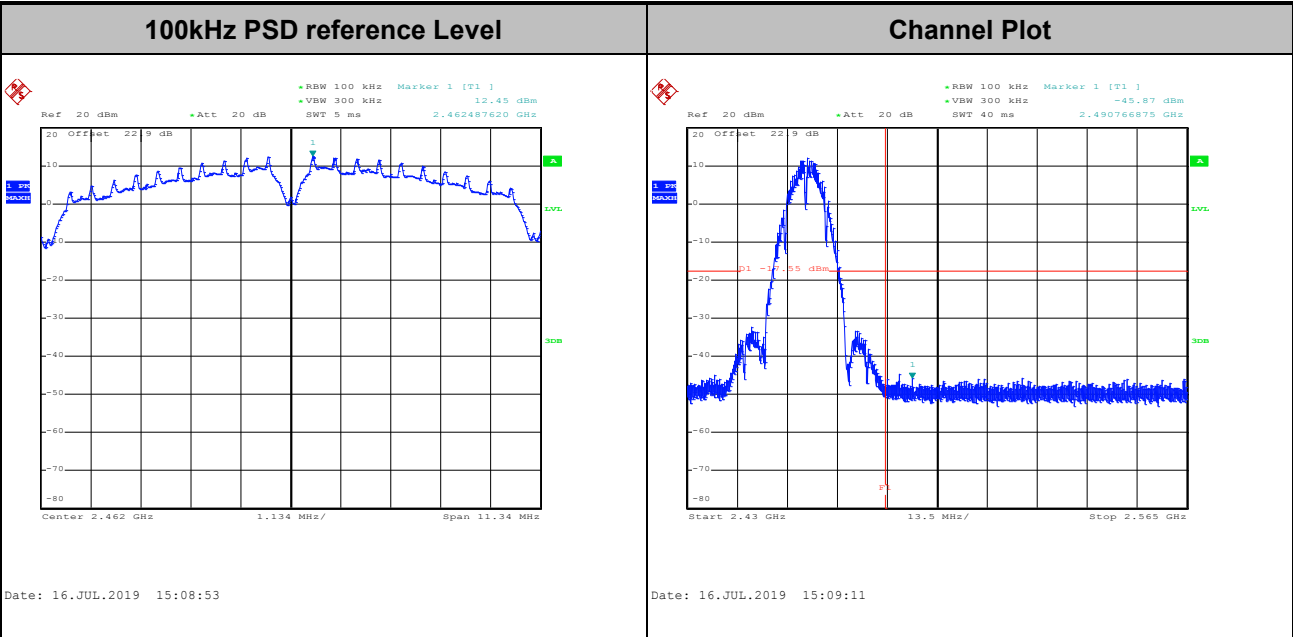
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 14:55:14

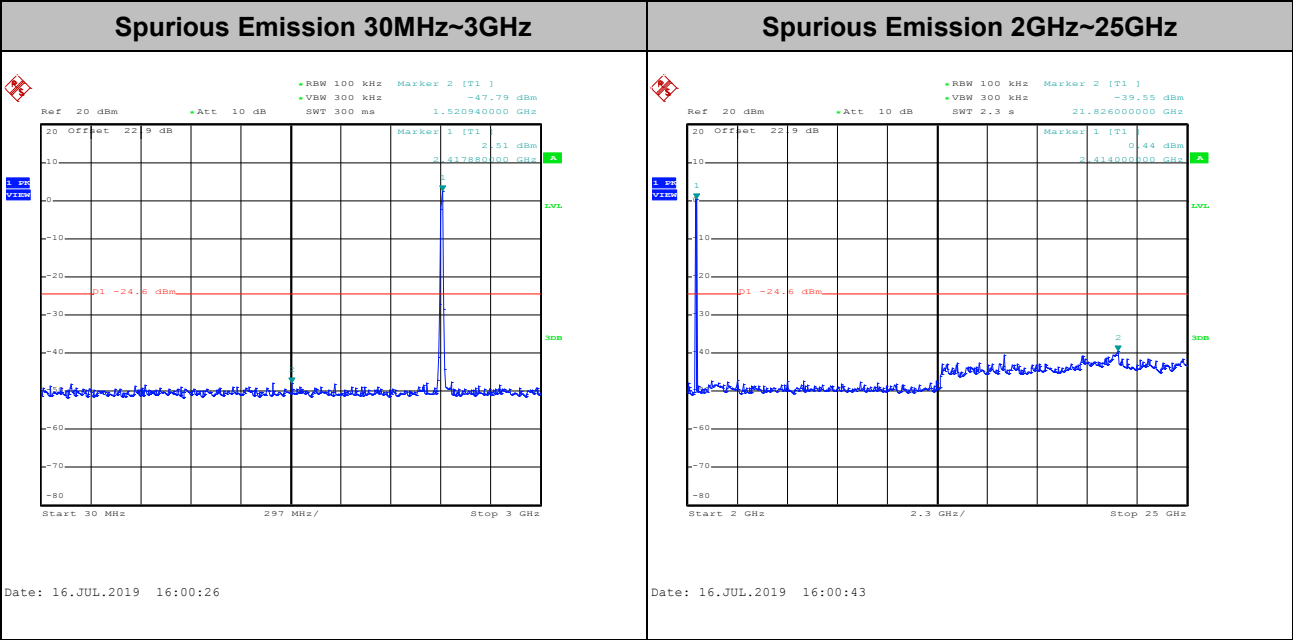
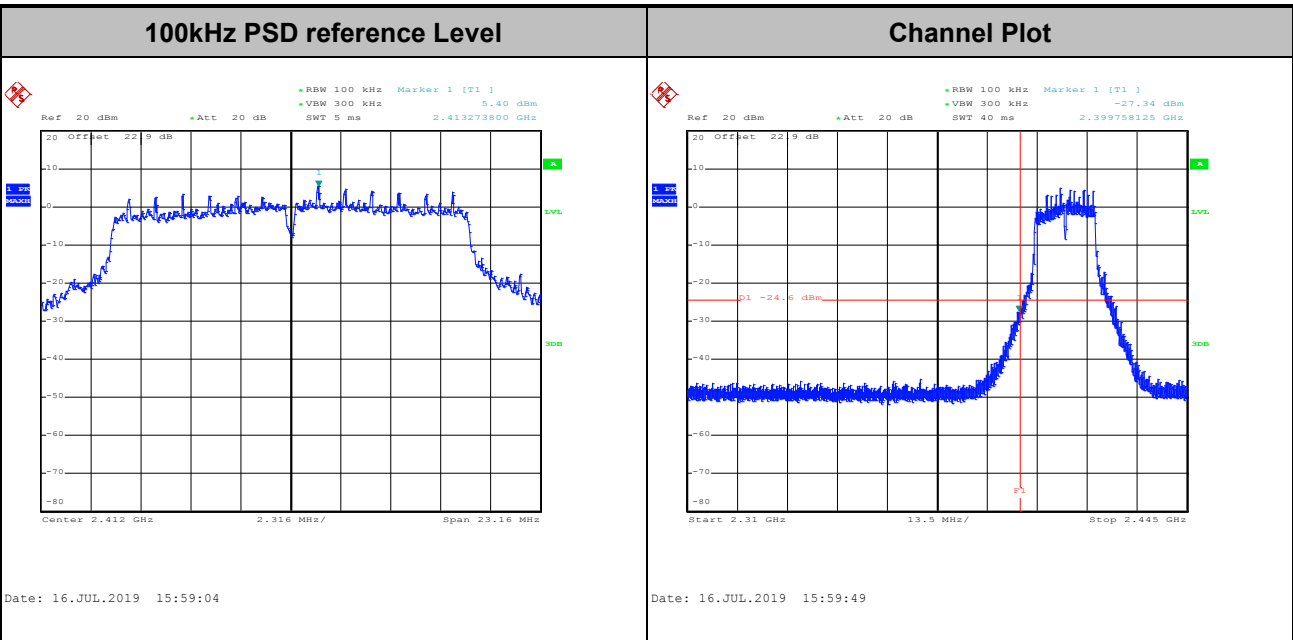


Test Mode :	802.11b	Test Channel :	11
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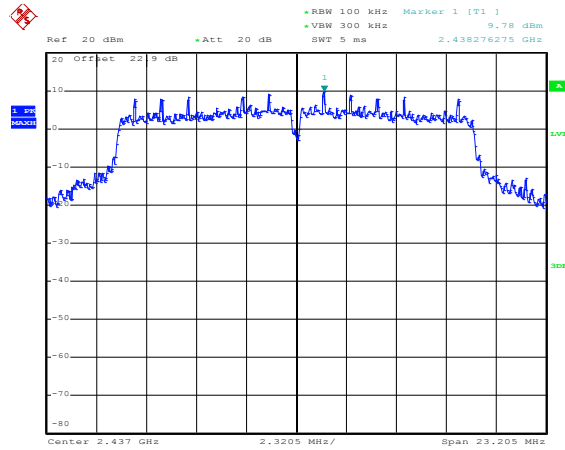
Test Mode :	802.11g	Test Channel :	01
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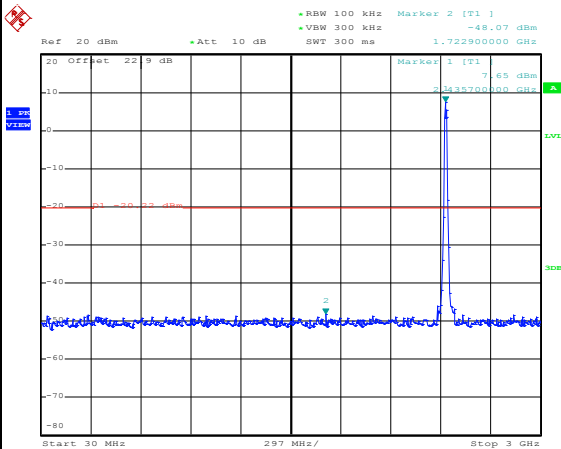
Test Mode :	802.11g	Test Channel :	06
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100kHz PSD reference Level



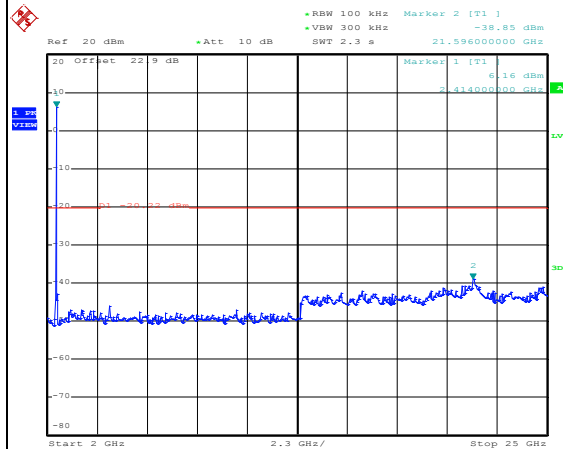
Date: 16.JUL.2019 16:12:17

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 16:13:27

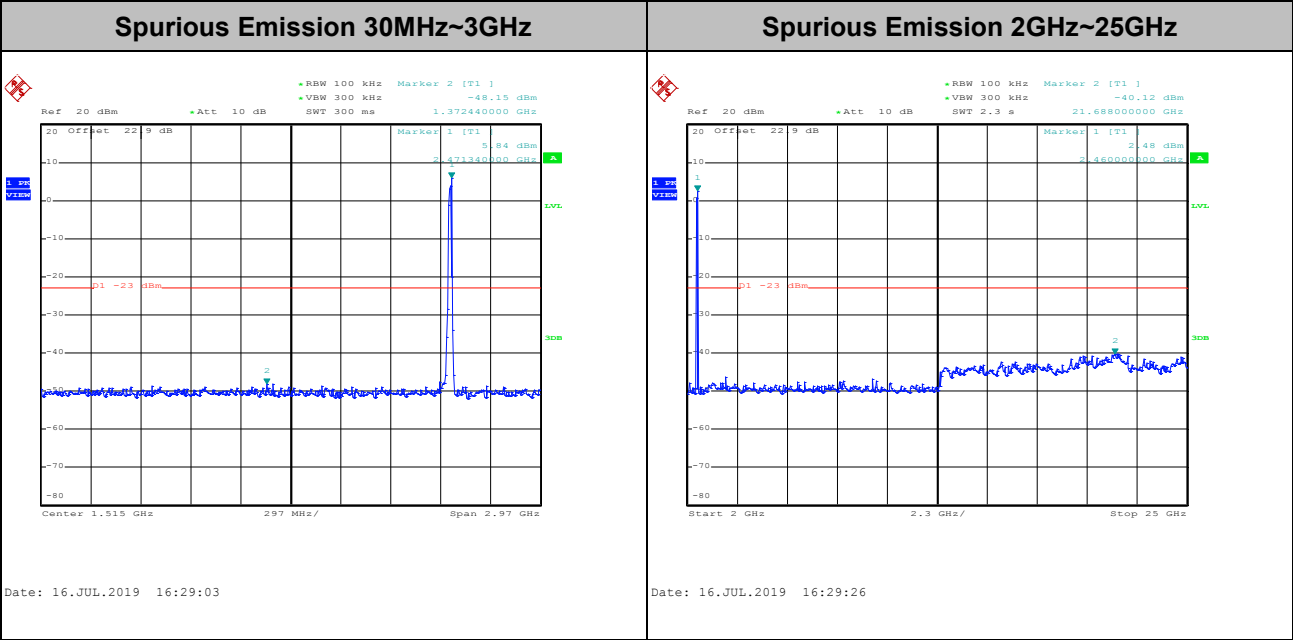
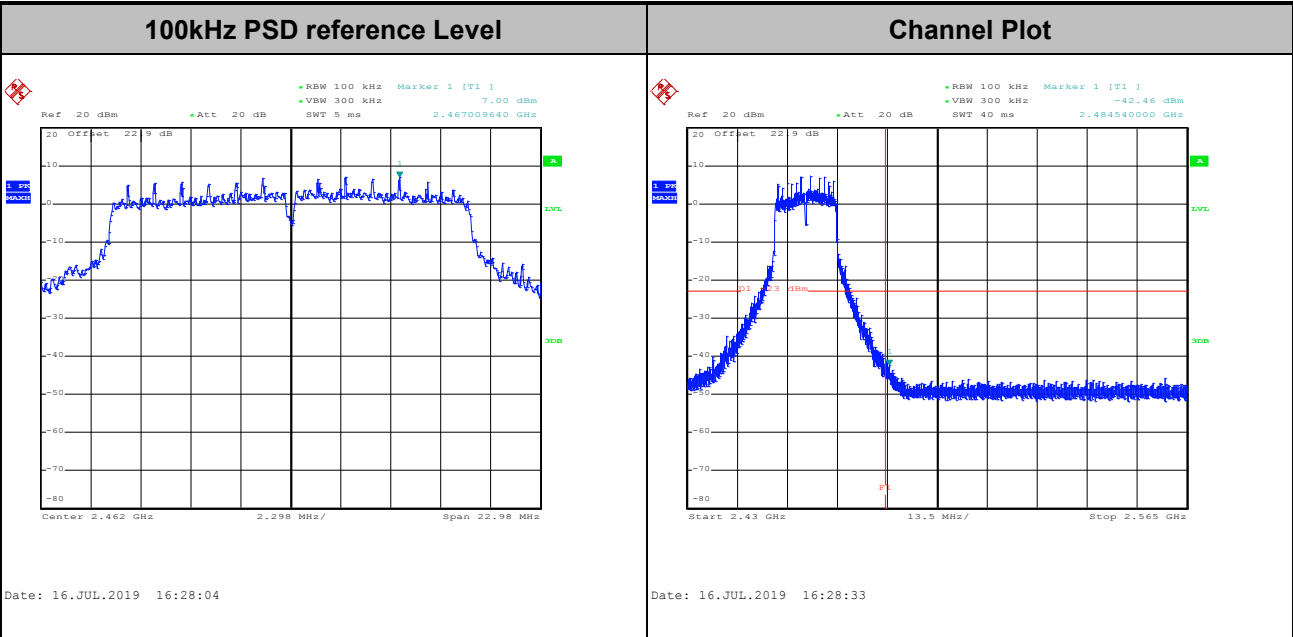
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 16:13:52

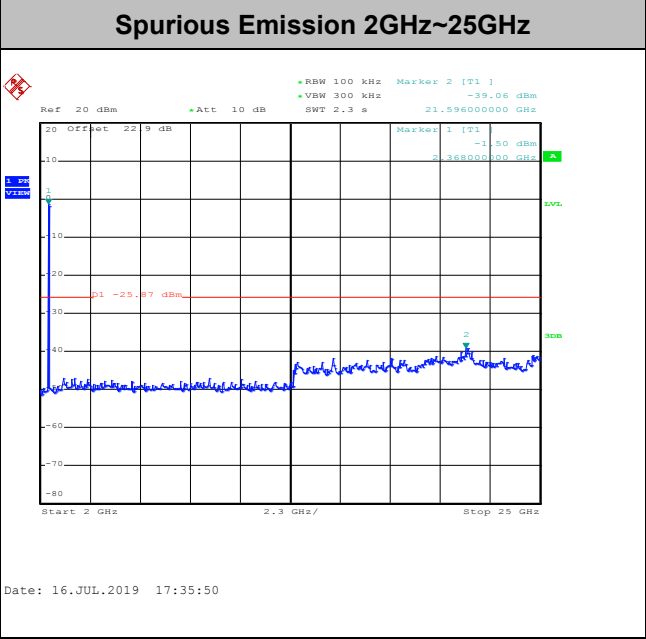
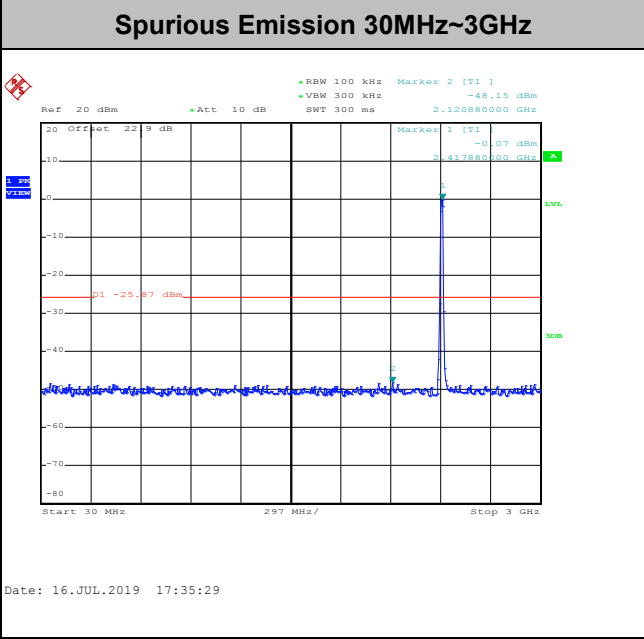
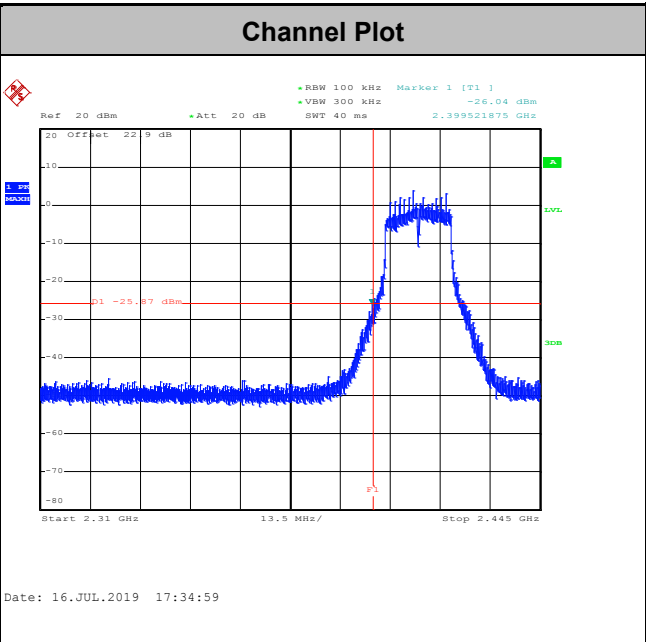
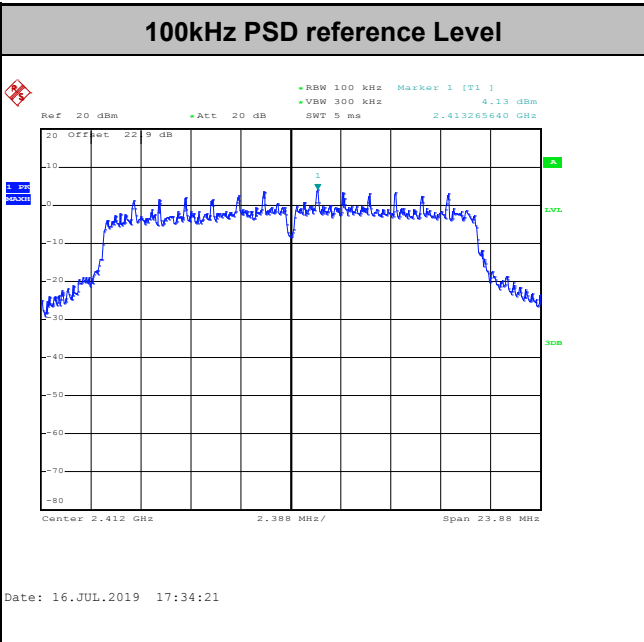


Test Mode :	802.11g	Test Channel :	11
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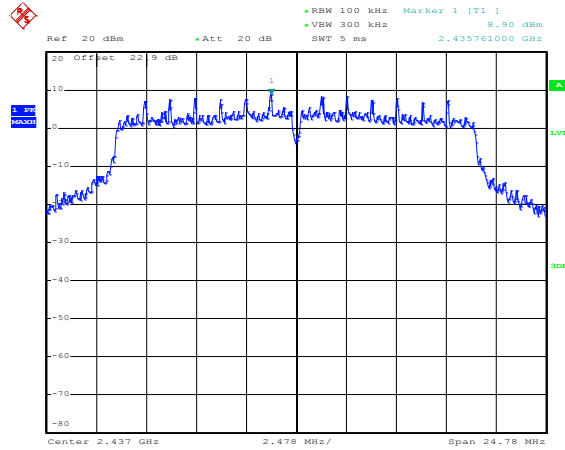
Test Mode :	802.11n HT20	Test Channel :	01
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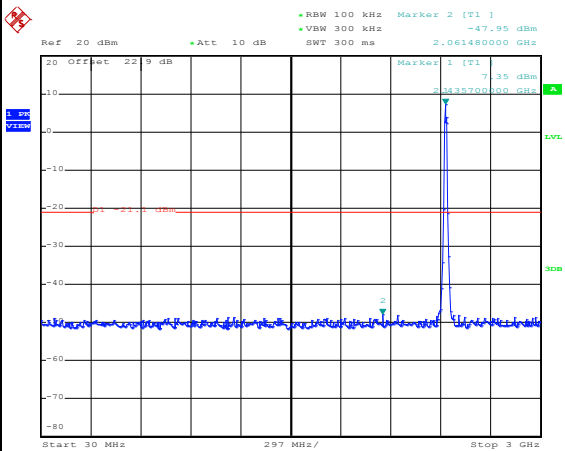
Test Mode :	802.11n HT20	Test Channel :	06
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100kHz PSD reference Level



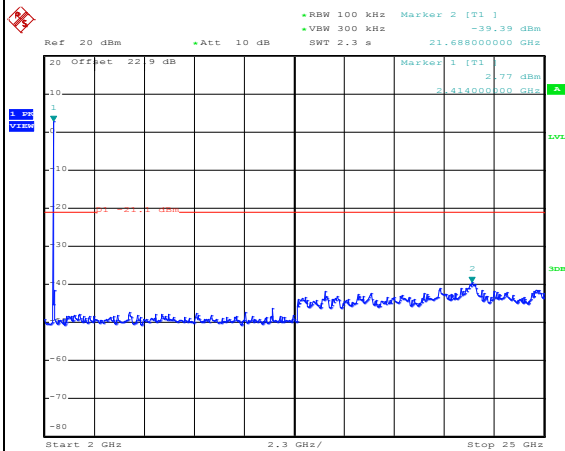
Date: 16.JUL.2019 17:39:09

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 17:39:32

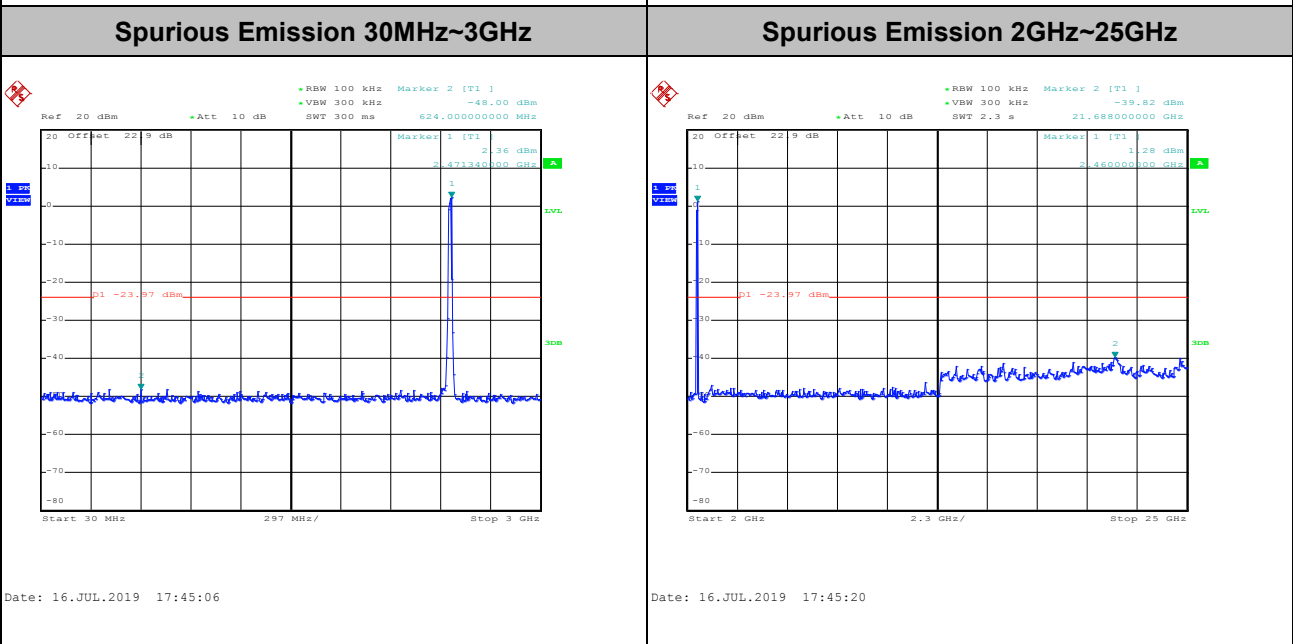
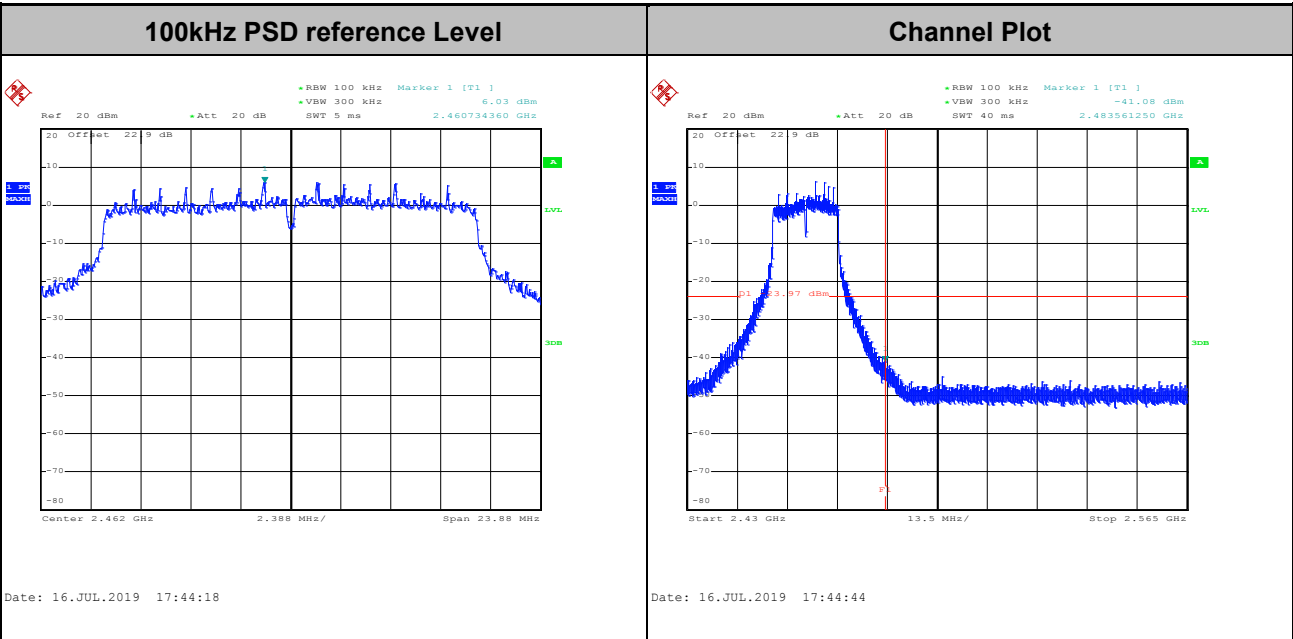
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 17:39:48

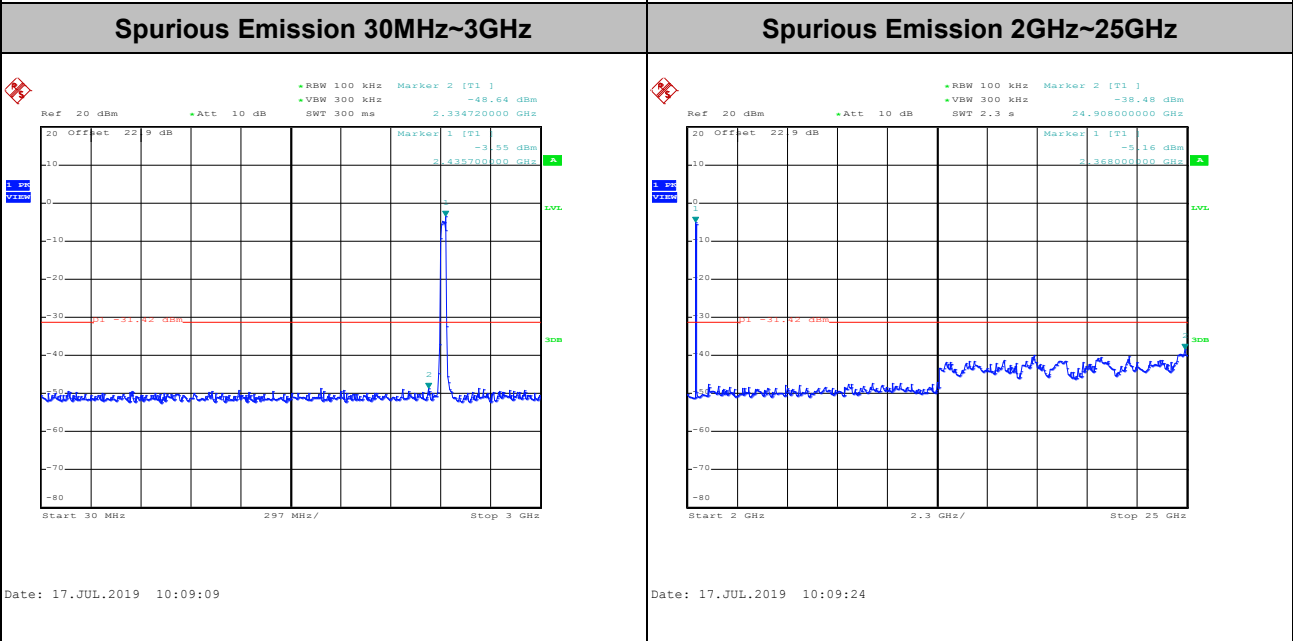
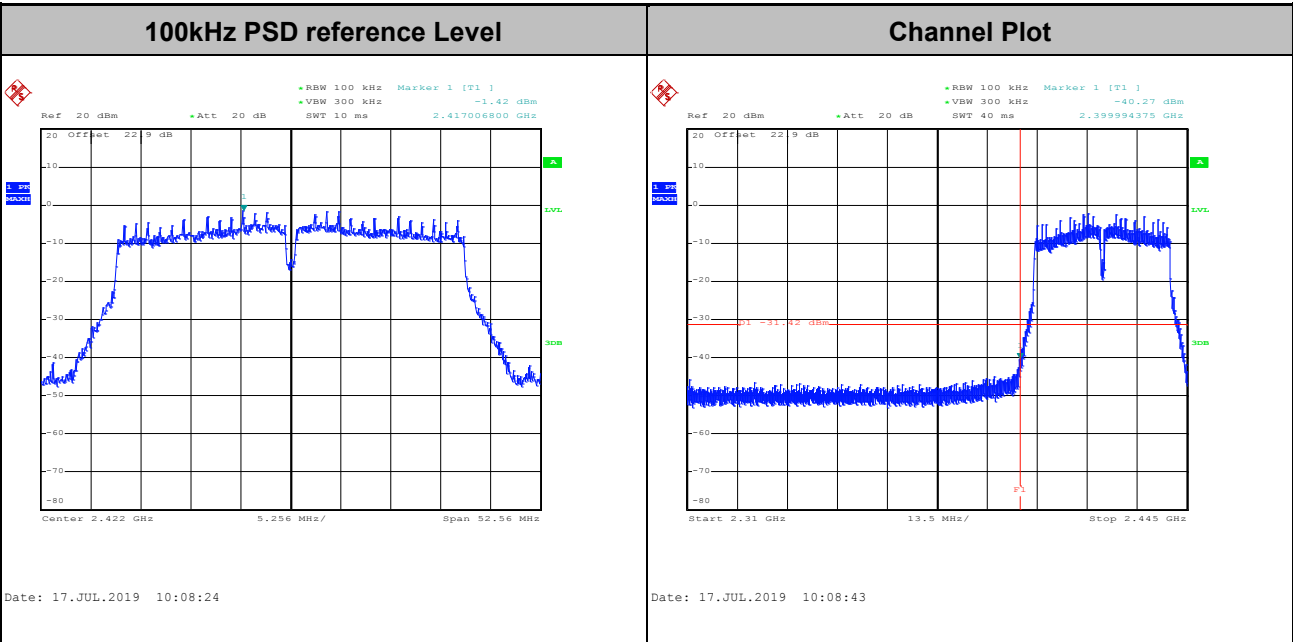


Test Mode :	802.11n HT20	Test Channel :	11
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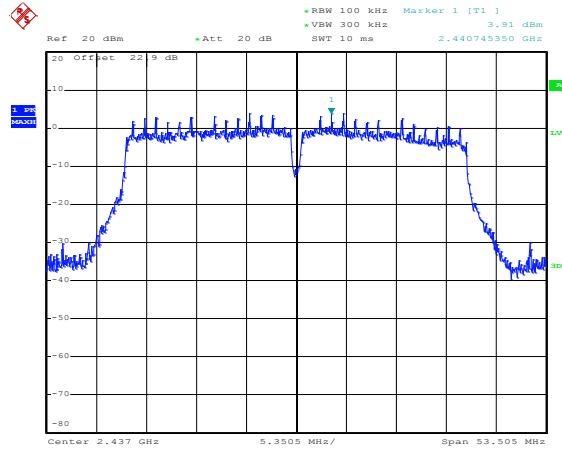
Test Mode :	802.11n HT40	Test Channel :	03
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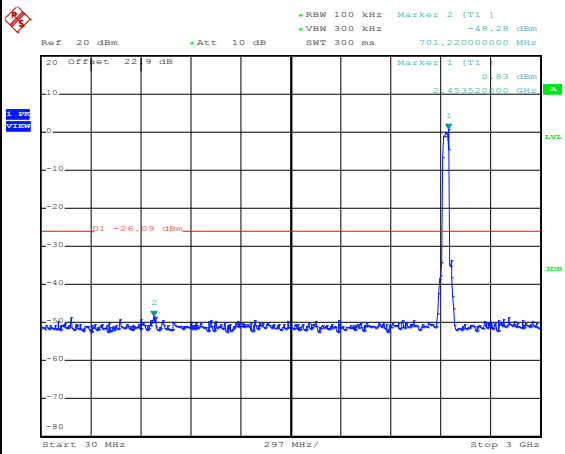
Test Mode :	802.11n HT40	Test Channel :	06
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100kHz PSD reference Level



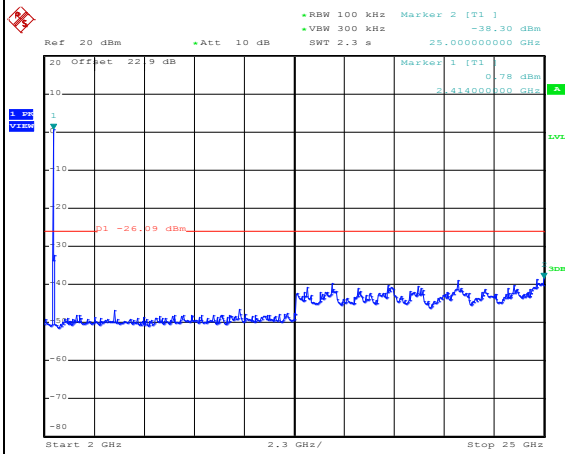
Date: 17.JUL.2019 10:28:09

Spurious Emission 30MHz~3GHz



Date: 17.JUL.2019 10:28:37

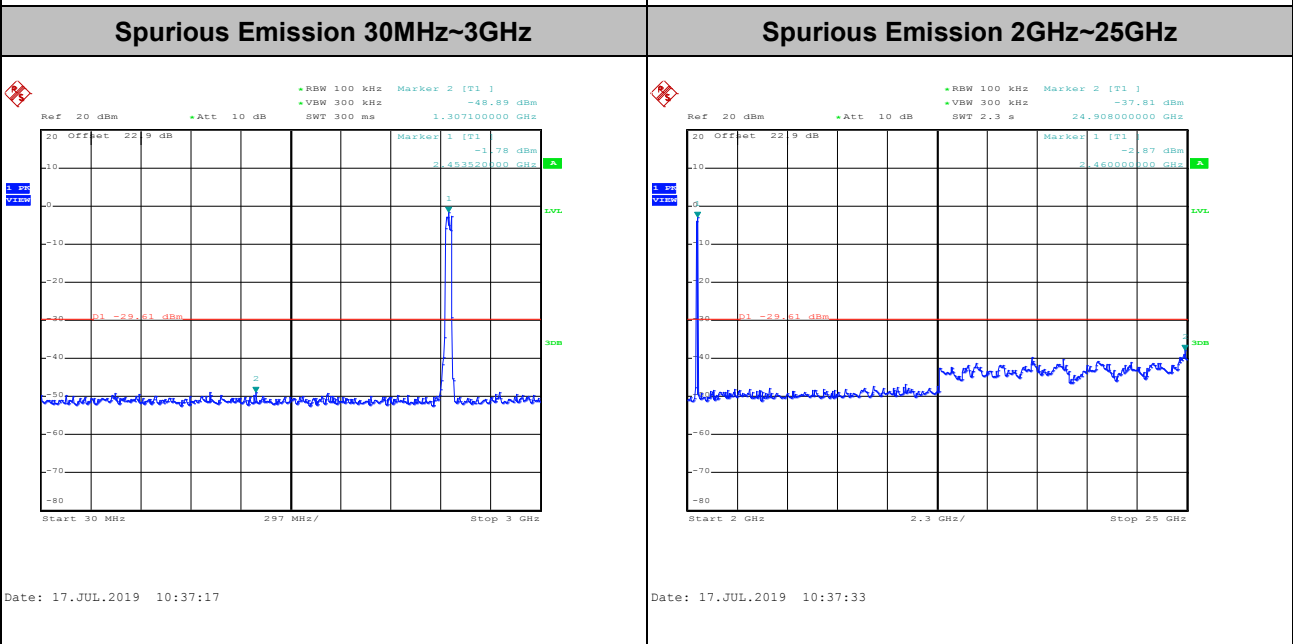
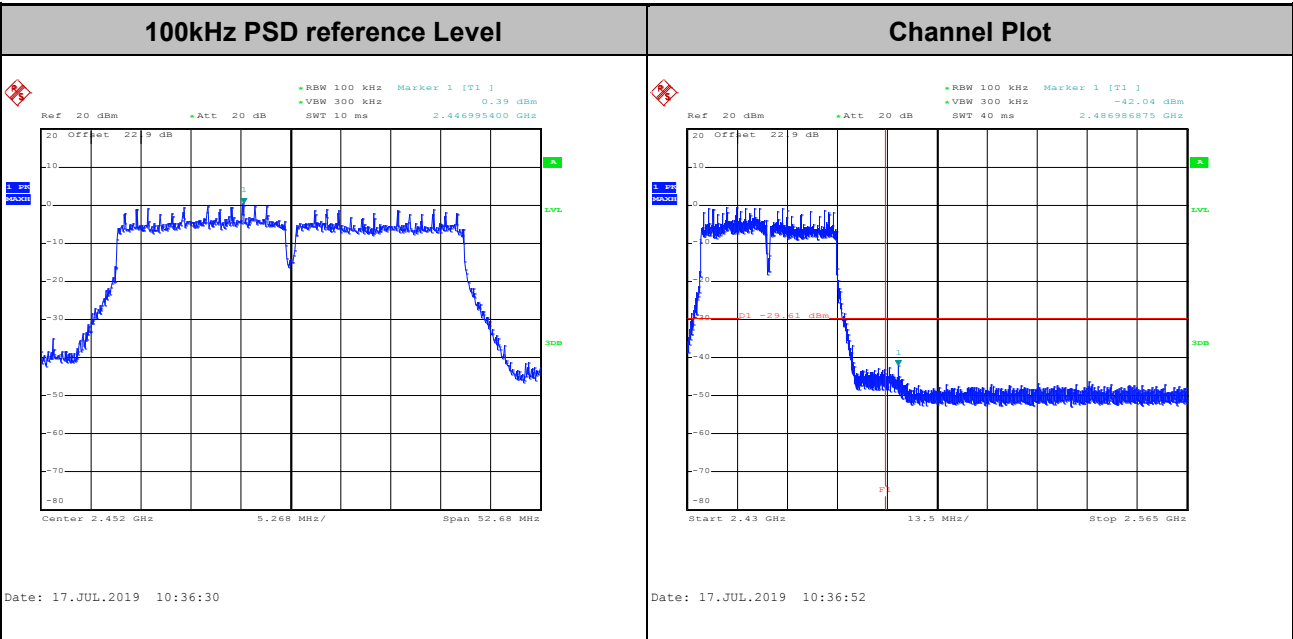
Spurious Emission 2GHz~25GHz



Date: 17.JUL.2019 10:28:54



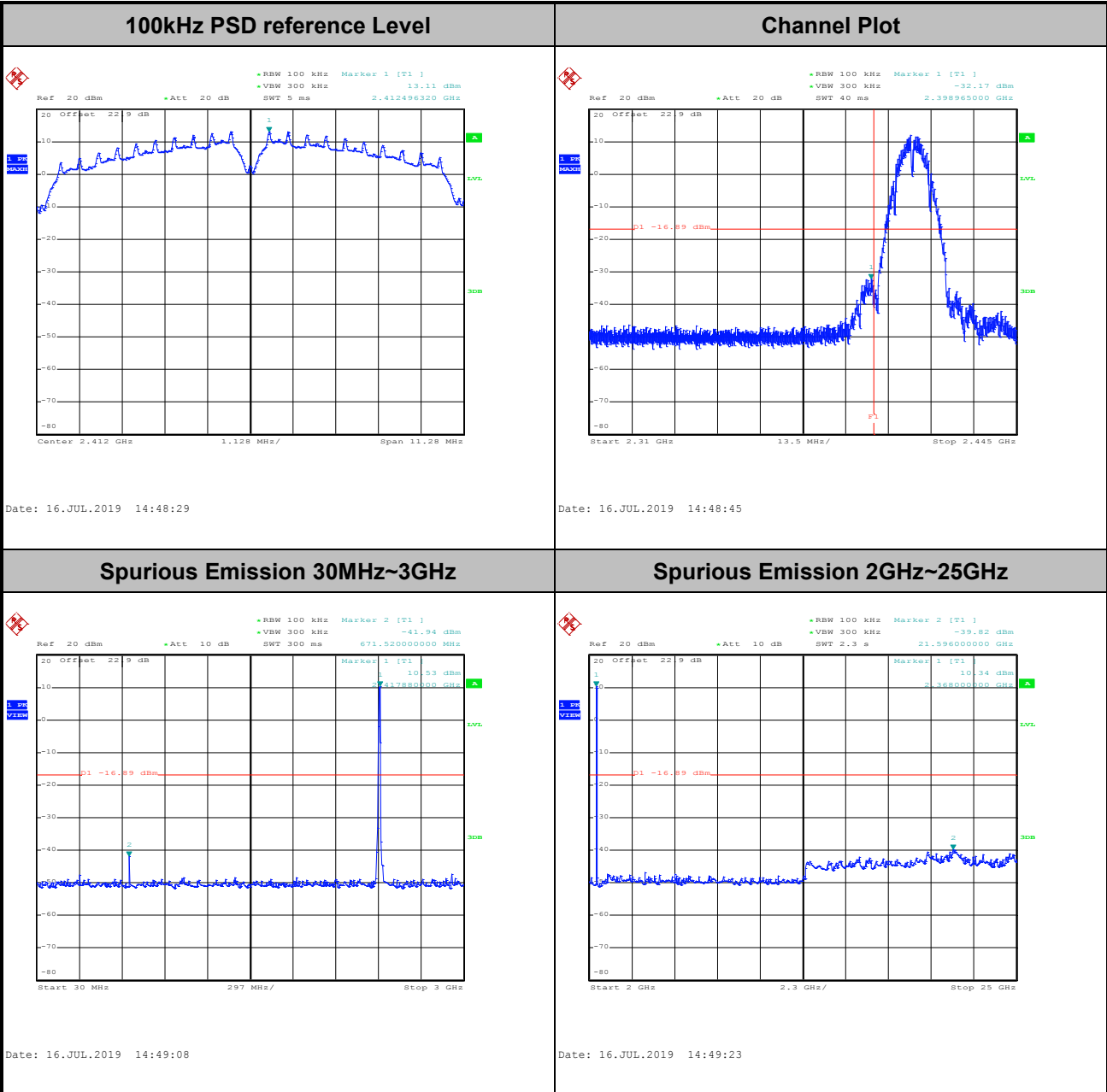
Test Mode :	802.11n HT40	Test Channel :	09
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Number of TX = 2, Ant. 2 (Measured)

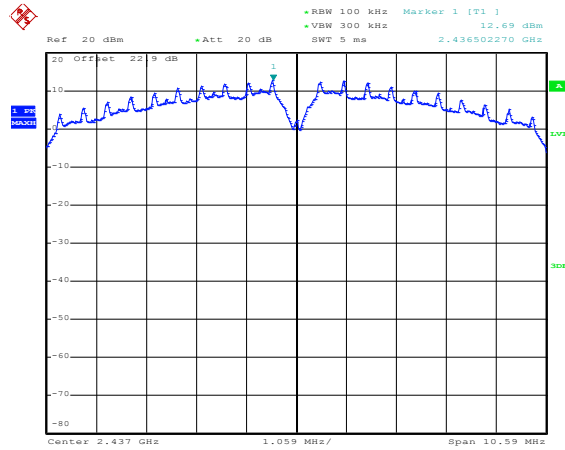
Test Mode :	802.11b	Test Channel :	01
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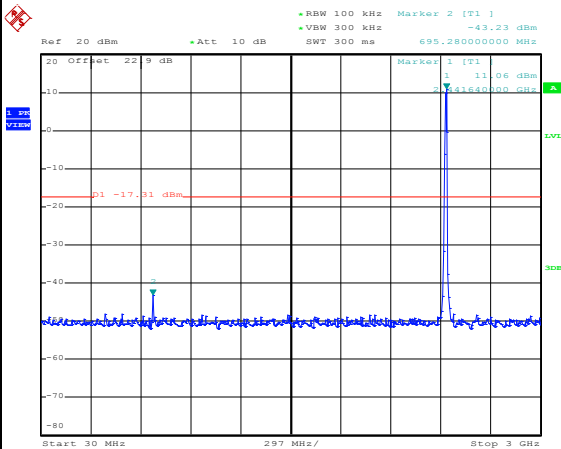
Test Mode :	802.11b	Test Channel :	06
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100kHz PSD reference Level



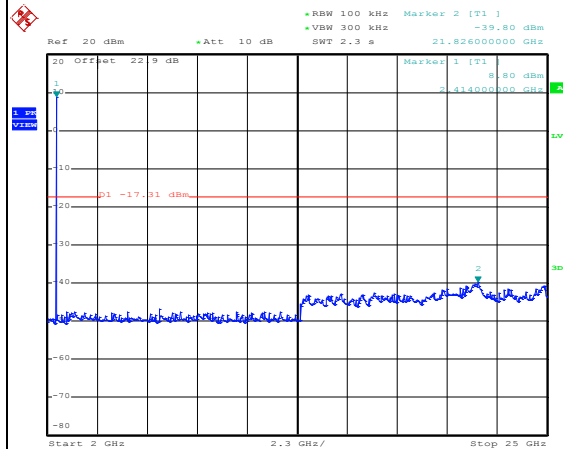
Date: 16.JUL.2019 15:00:25

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 15:00:49

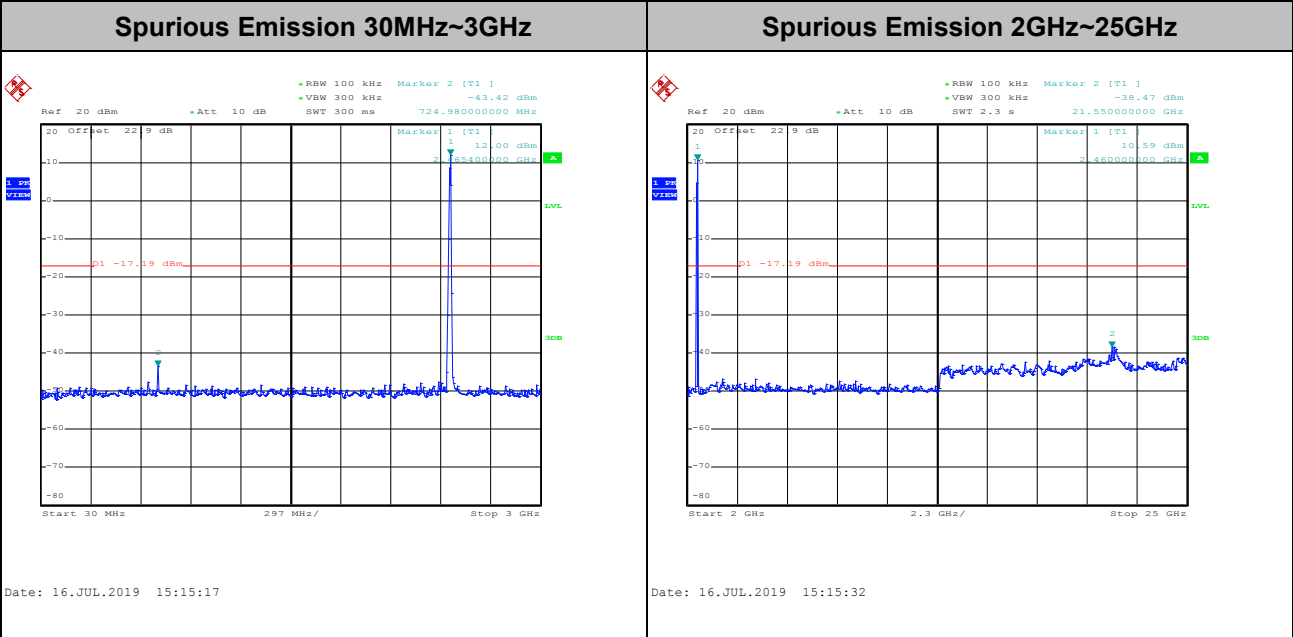
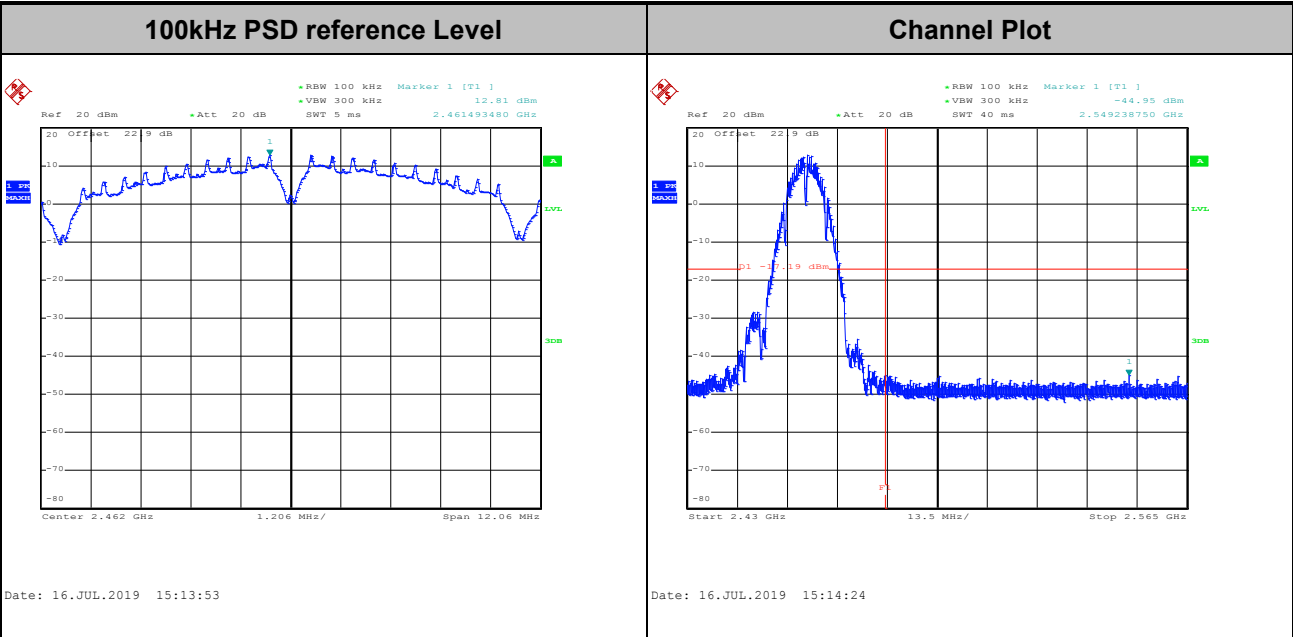
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 15:01:04

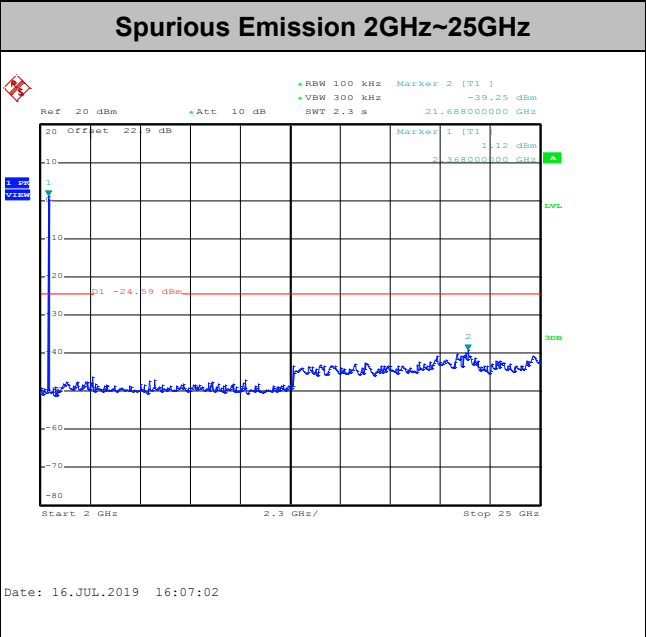
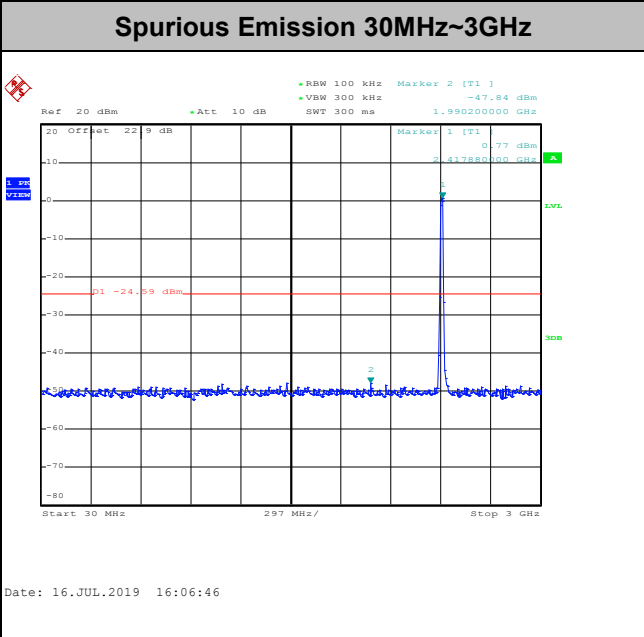
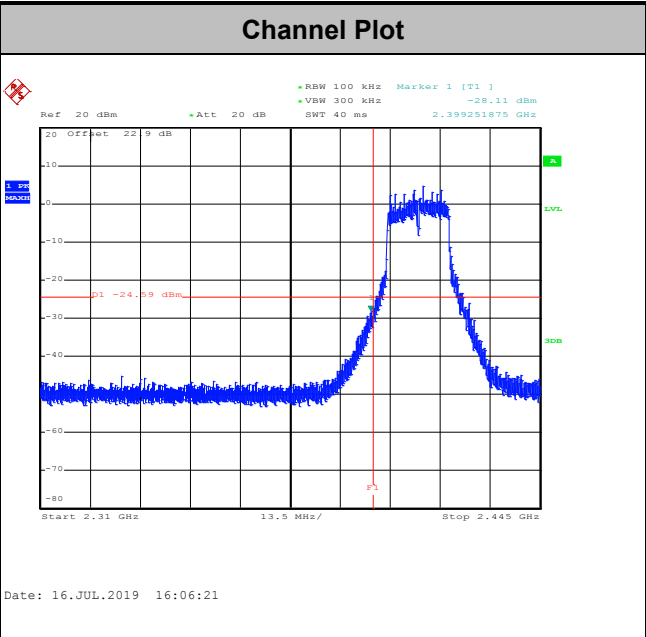
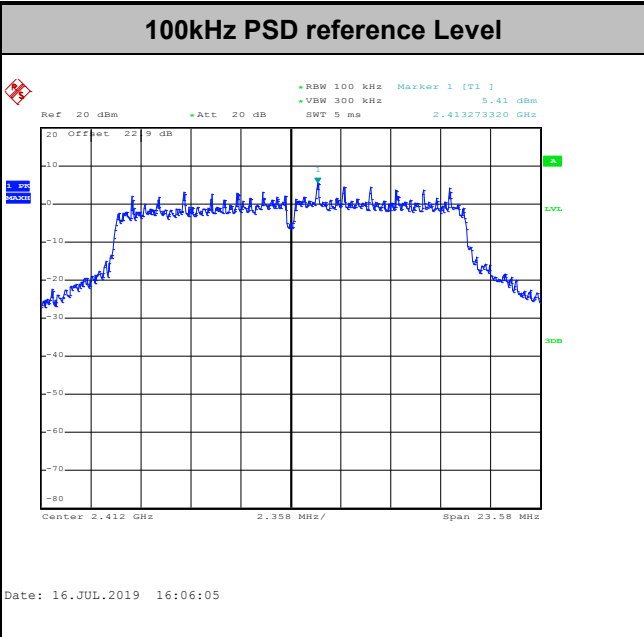


Test Mode :	802.11b	Test Channel :	11
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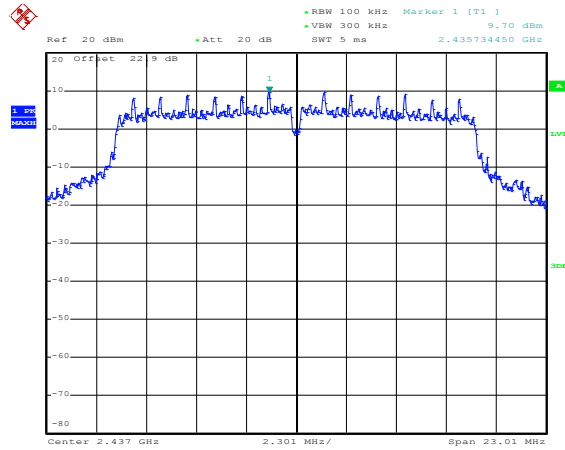
Test Mode : 802.11g Test Channel : 01





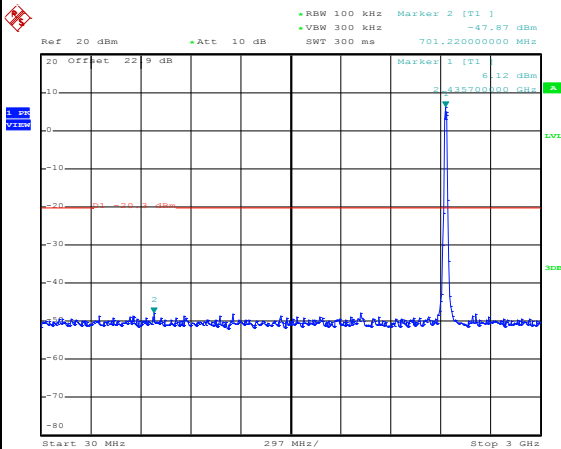
Test Mode :	802.11g	Test Channel :	06
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100kHz PSD reference Level



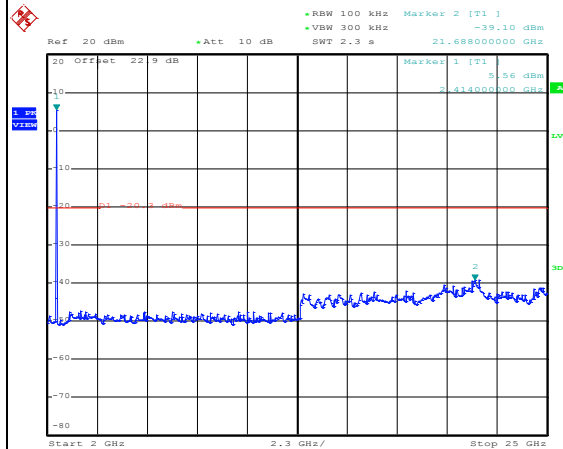
Date: 16.JUL.2019 16:19:39

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 16:21:54

Spurious Emission 2GHz~25GHz

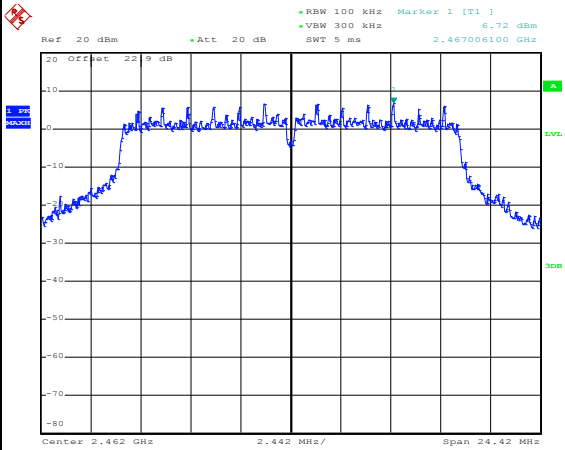


Date: 16.JUL.2019 16:22:15



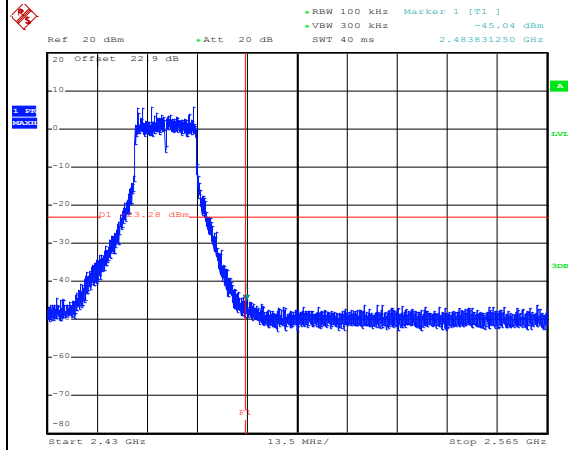
Test Mode : 802.11g Test Channel : 11

100kHz PSD reference Level



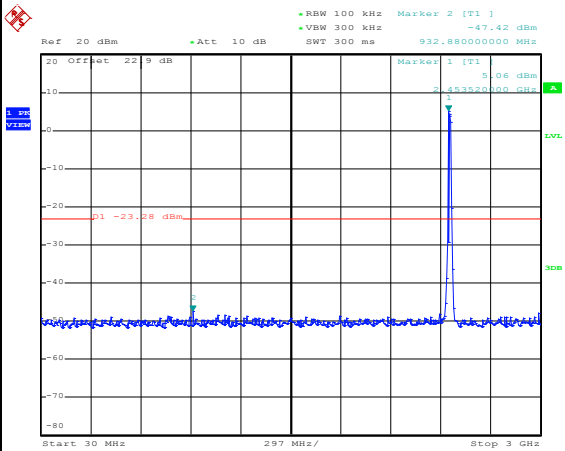
Date: 16.JUL.2019 16:33:54

Channel Plot



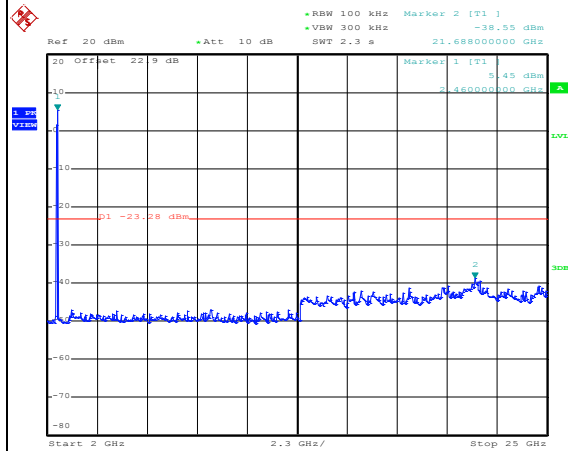
Date: 16.JUL.2019 16:34:13

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 16:36:21

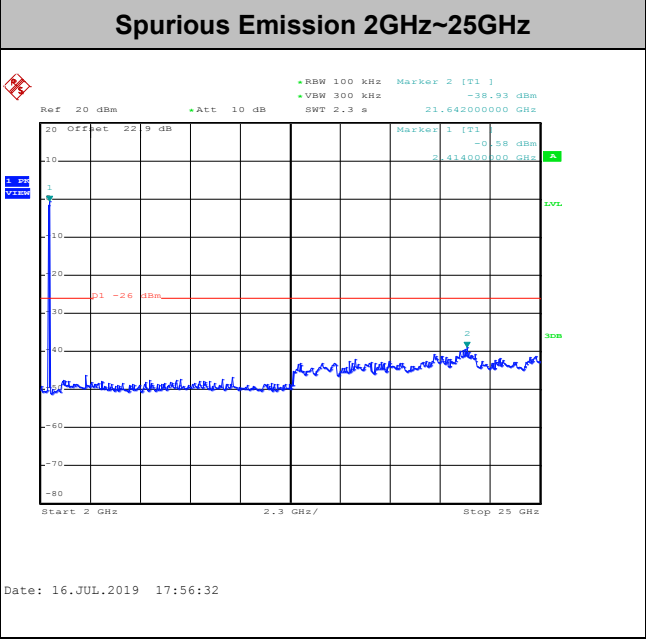
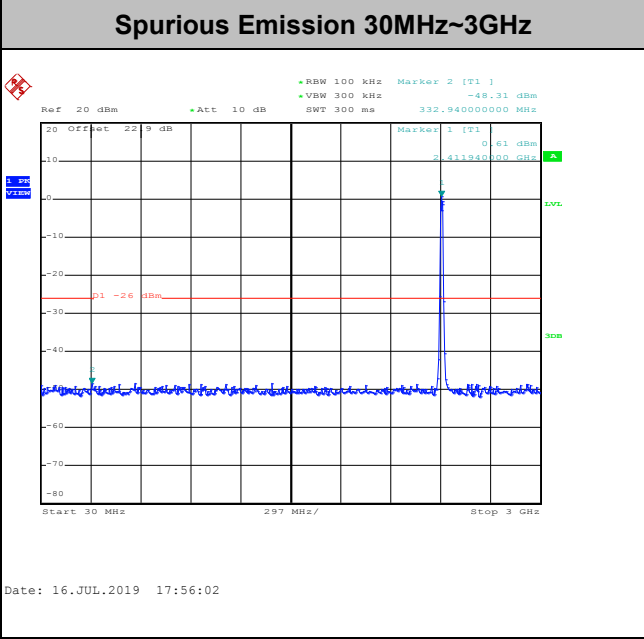
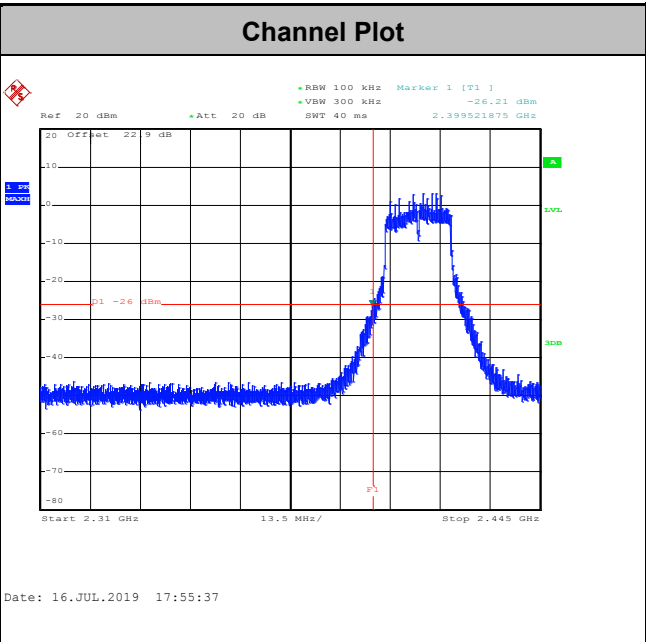
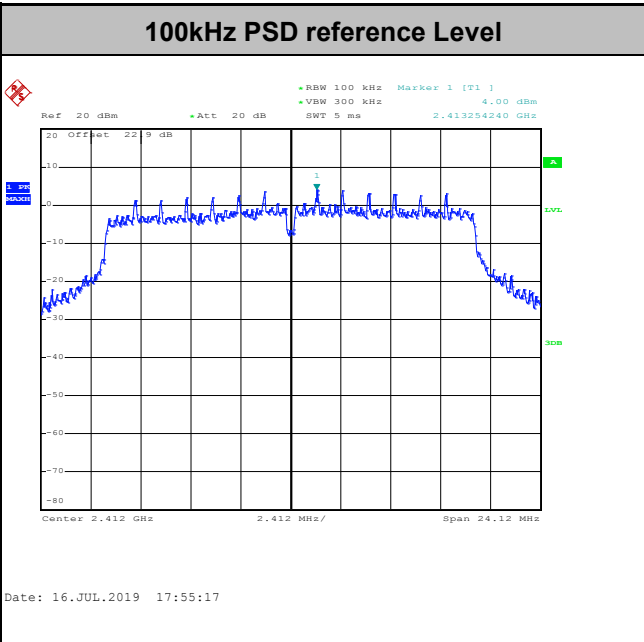
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 16:36:51



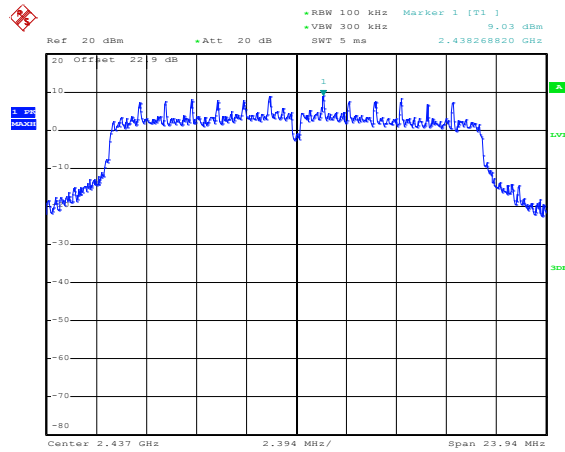
Test Mode :	802.11n HT20	Test Channel :	01
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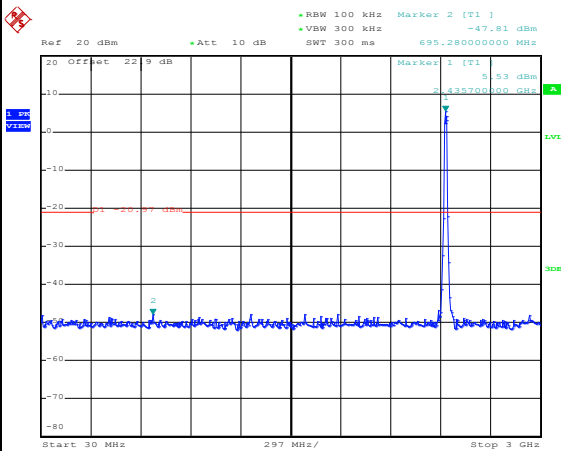
Test Mode :	802.11n HT20	Test Channel :	06
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100kHz PSD reference Level



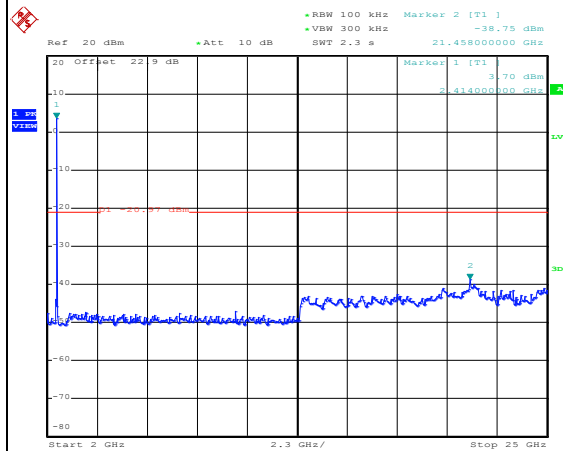
Date: 16.JUL.2019 17:59:12

Spurious Emission 30MHz~3GHz



Date: 16.JUL.2019 17:59:35

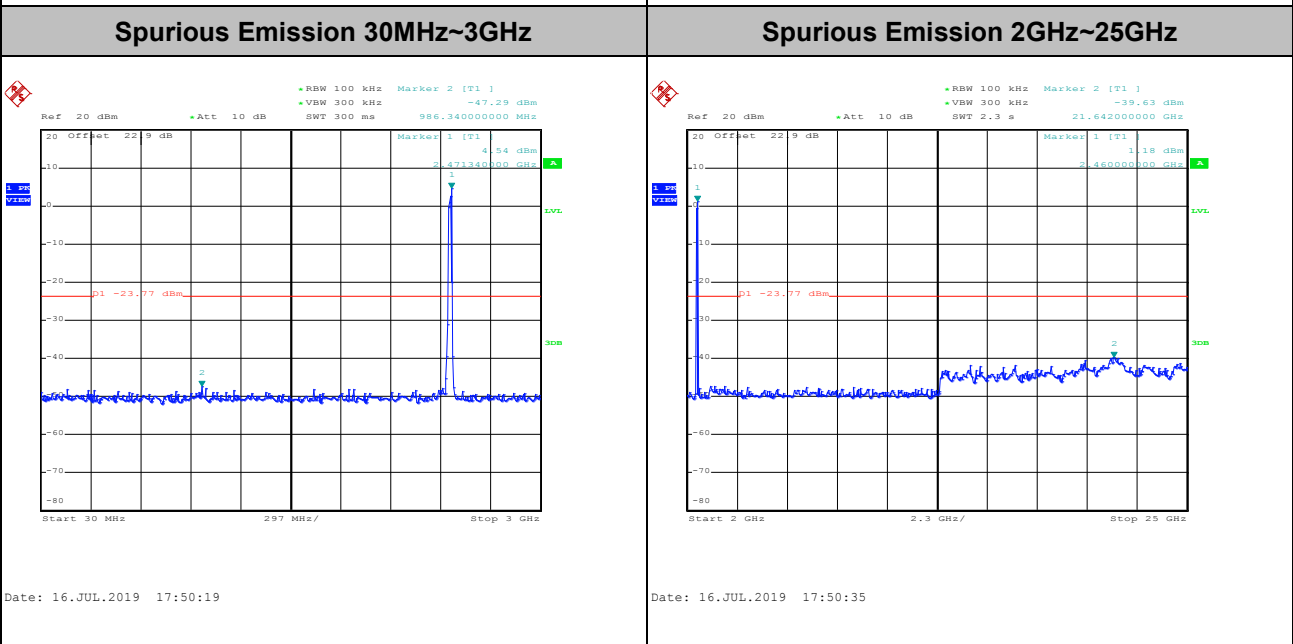
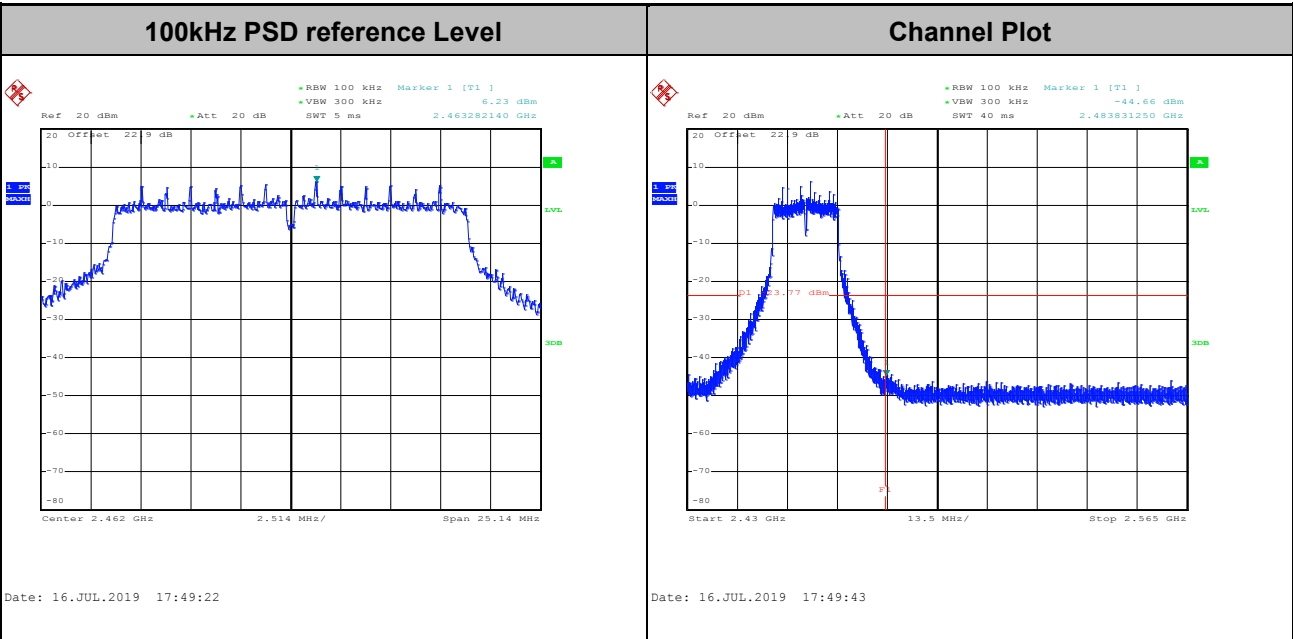
Spurious Emission 2GHz~25GHz



Date: 16.JUL.2019 17:59:50

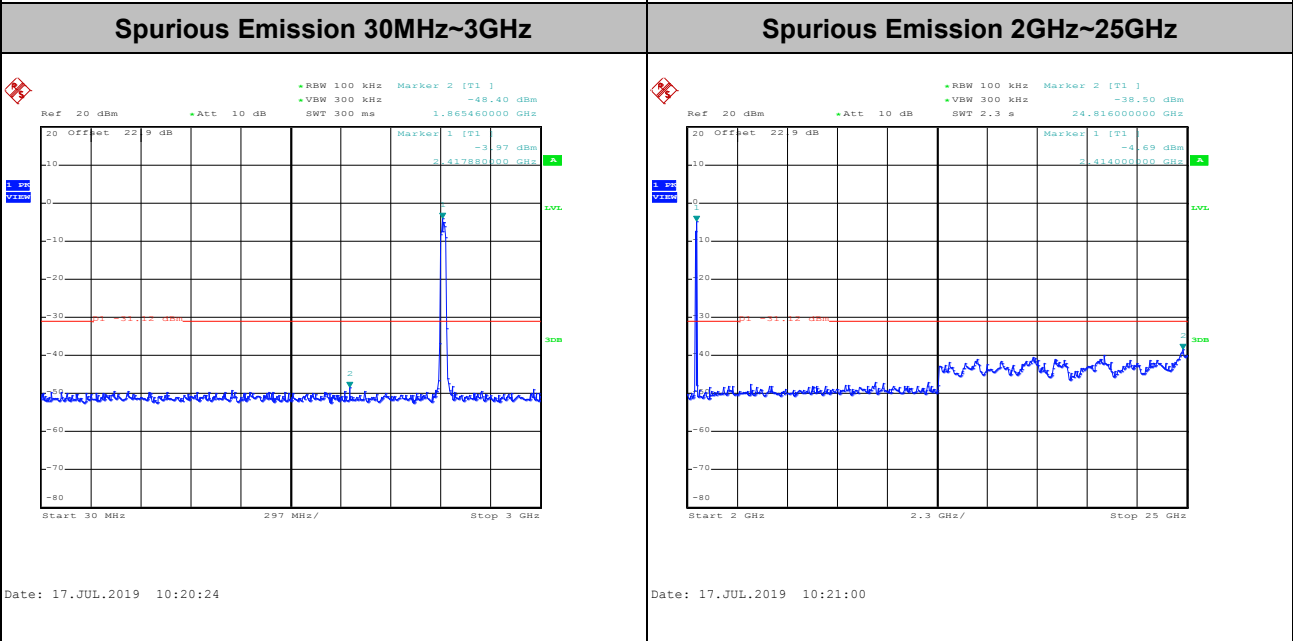
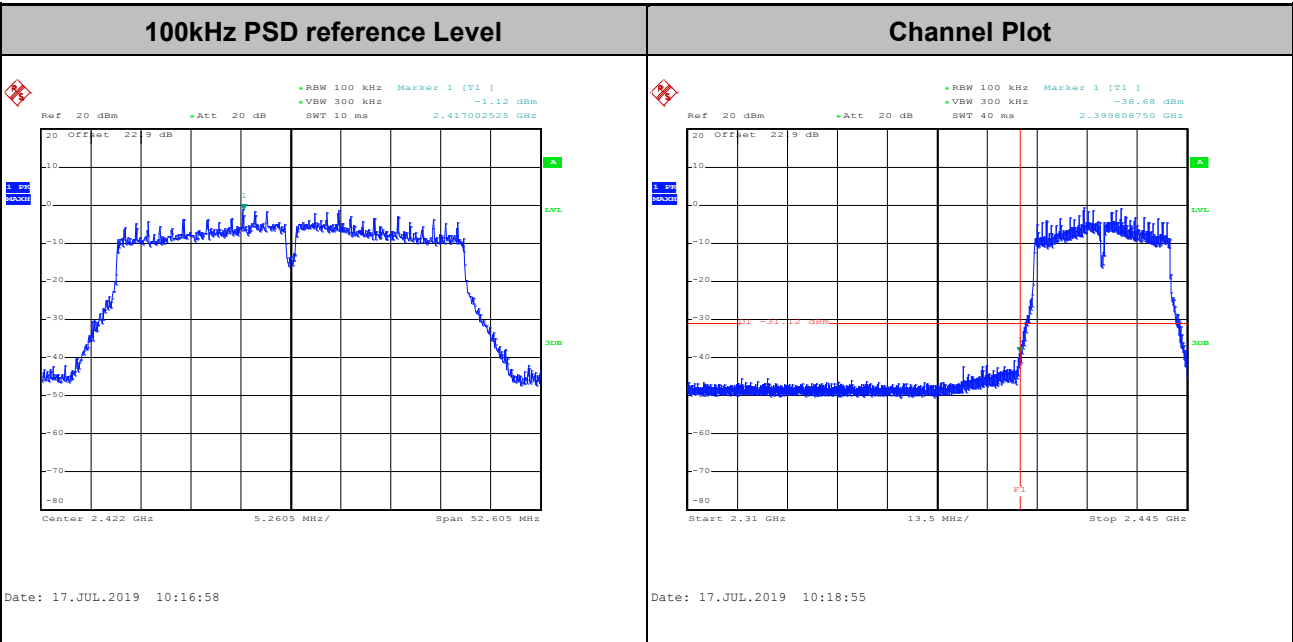


Test Mode :	802.11n HT20	Test Channel :	11
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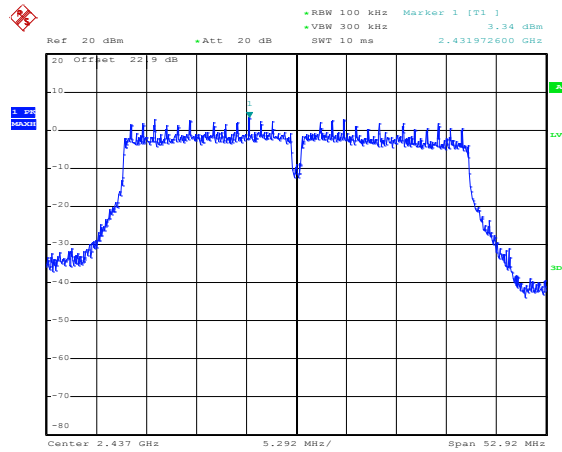
Test Mode :	802.11n HT40	Test Channel :	03
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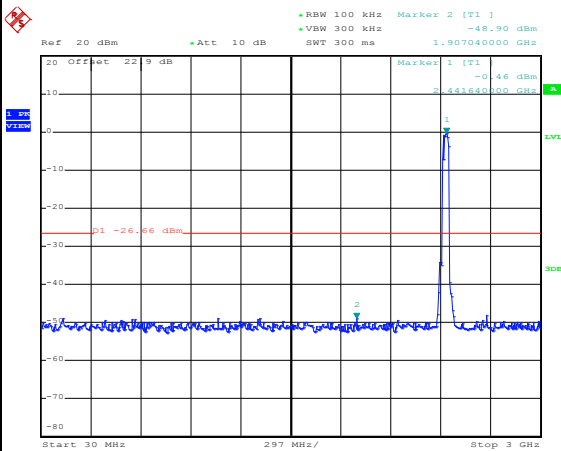
Test Mode :	802.11n HT40	Test Channel :	06
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100kHz PSD reference Level



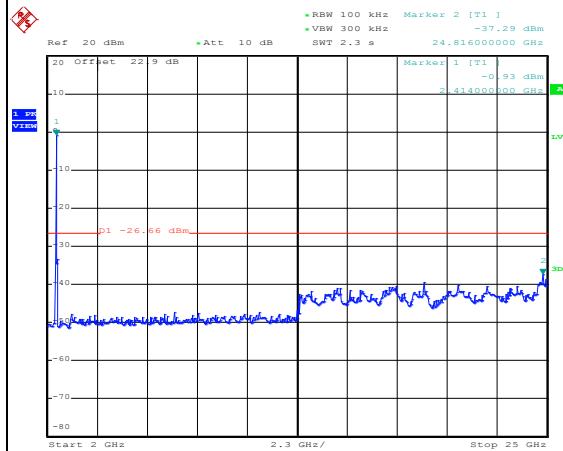
Date: 17.JUL.2019 10:32:36

Spurious Emission 30MHz~3GHz



Date: 17.JUL.2019 10:33:00

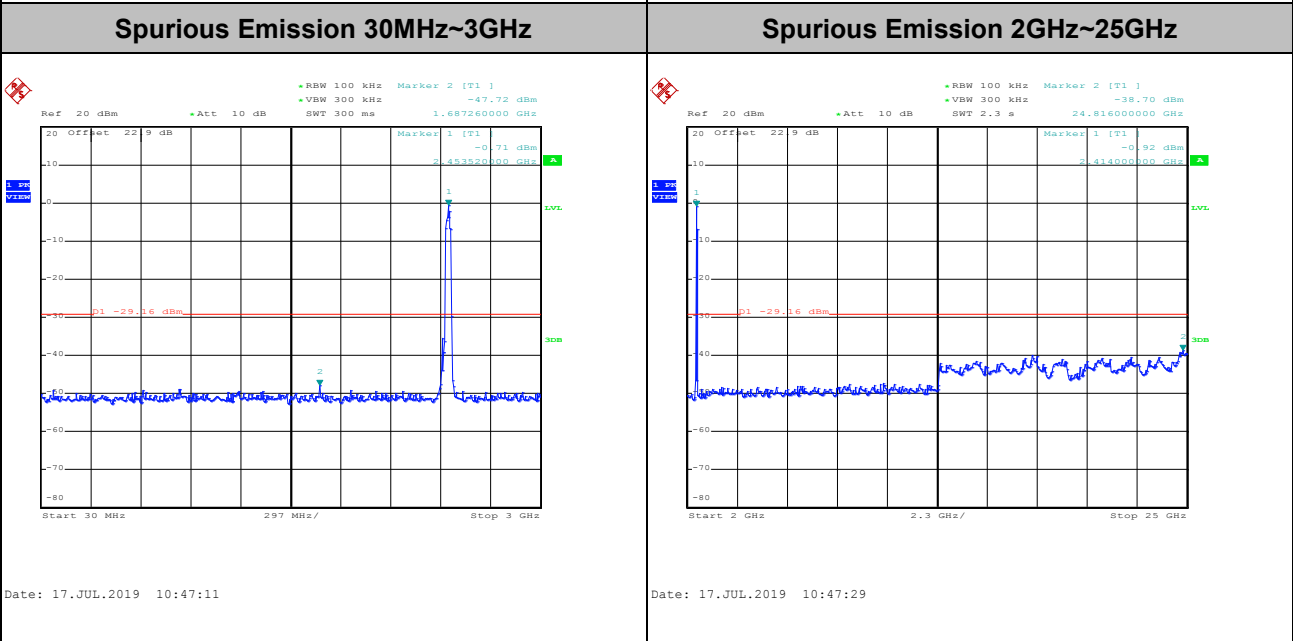
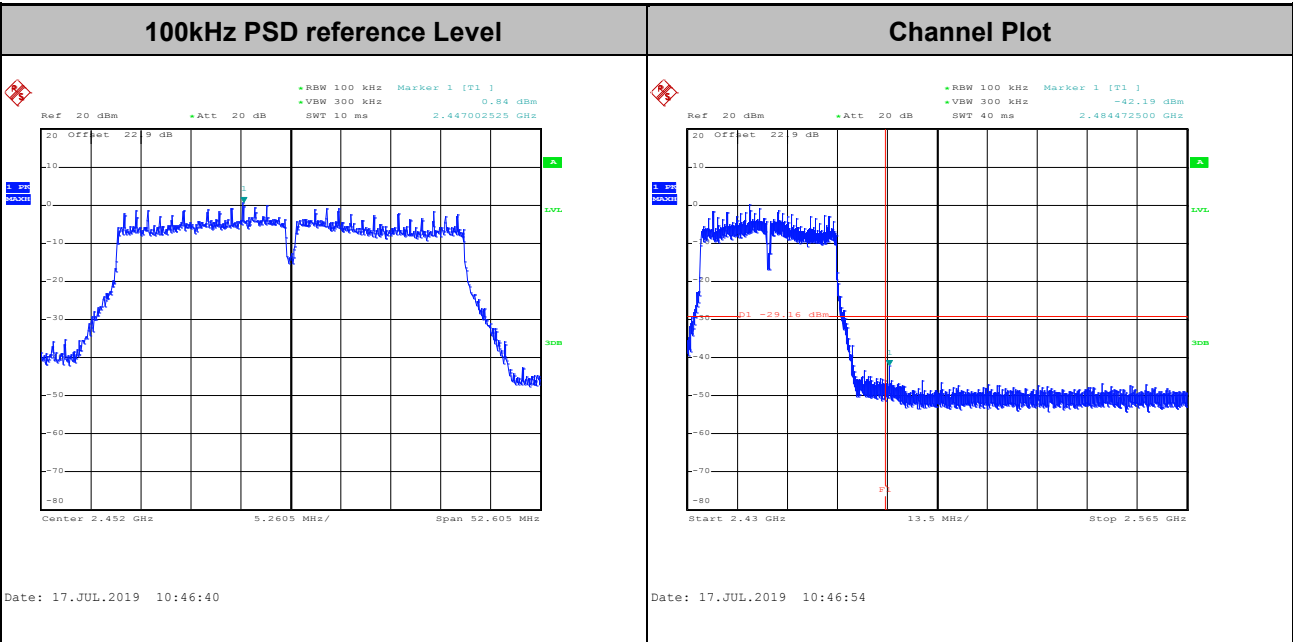
Spurious Emission 2GHz~25GHz



Date: 17.JUL.2019 10:33:18



Test Mode :	802.11n HT40	Test Channel :	09
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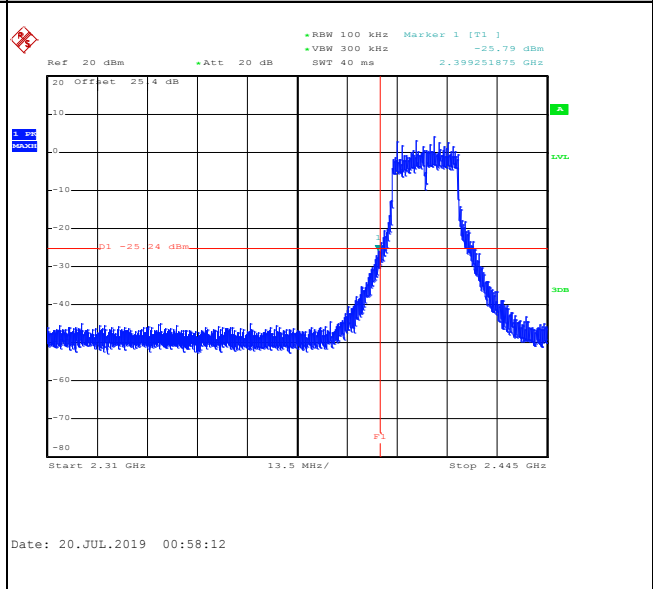
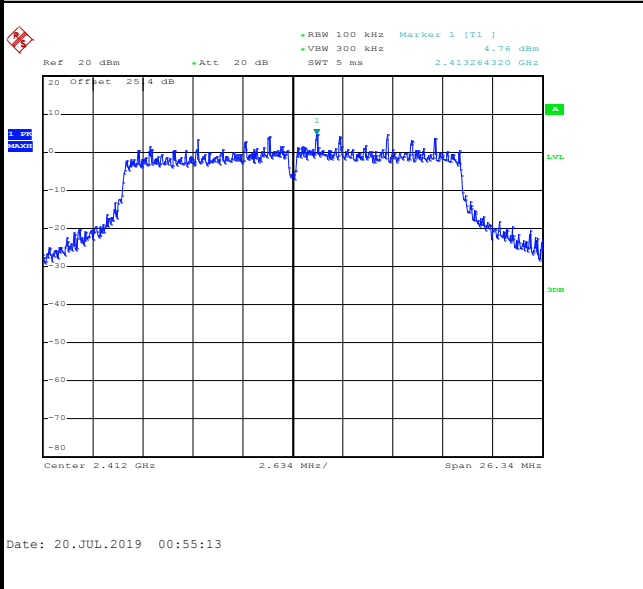


<TXBF Modes>

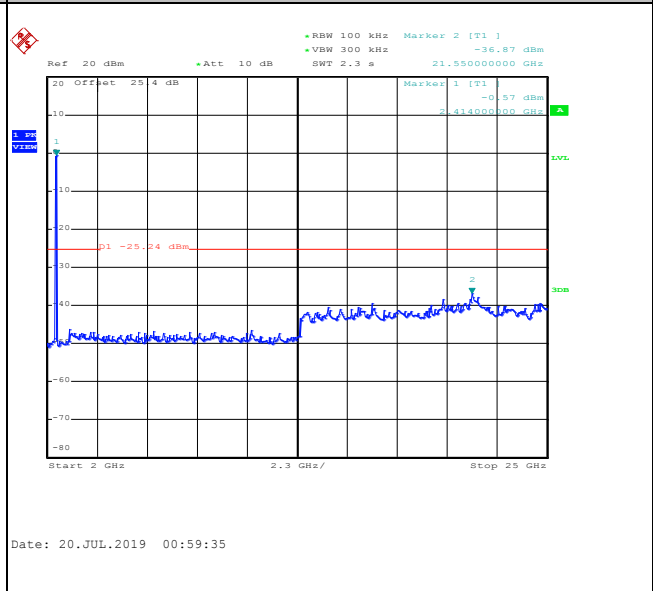
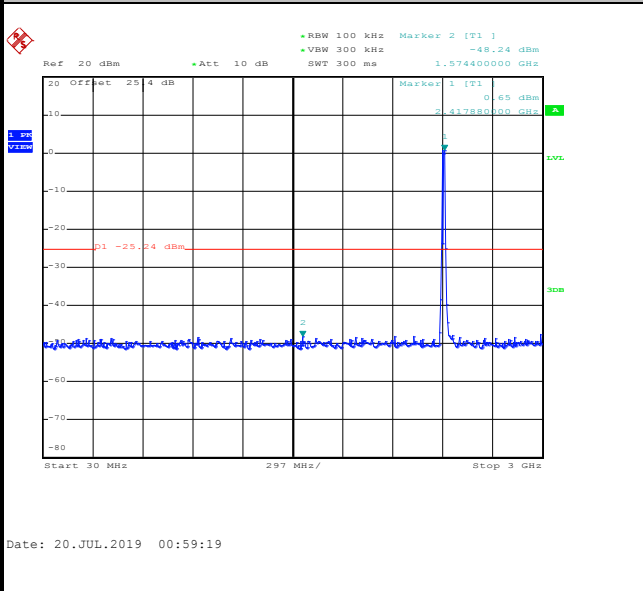
Number of TX = 2, Ant. 1 (Measured)

Test Mode :	802.11ac VHT20	Test Channel :	01
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100kHz PSD reference Level	Channel Plot
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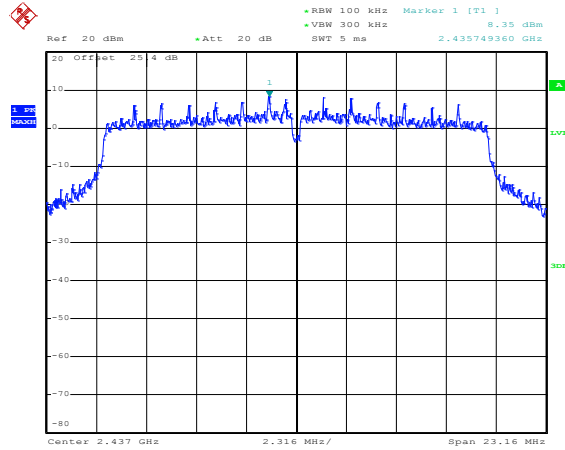
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
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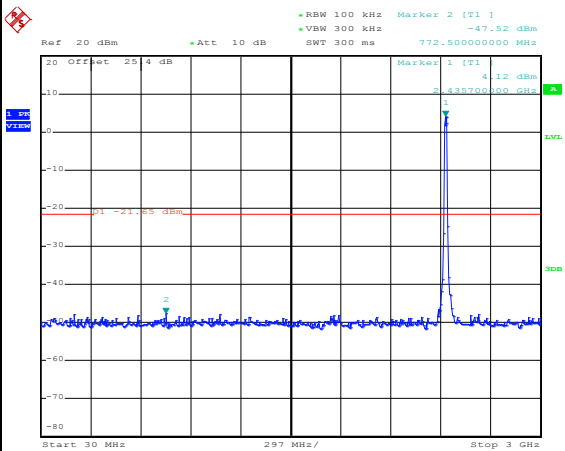
Test Mode :	802.11ac VHT20	Test Channel :	06
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100kHz PSD reference Level



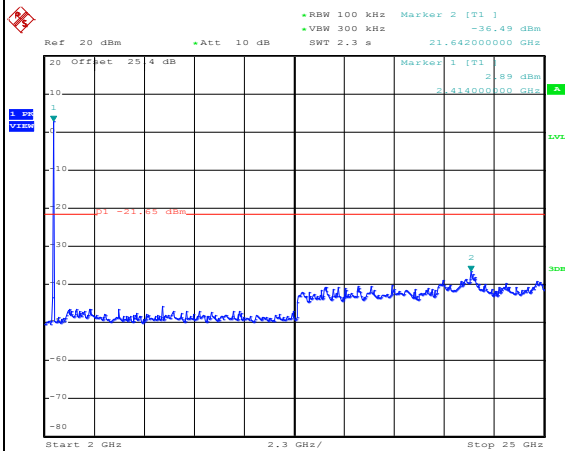
Date: 25.JUL.2019 03:24:48

Spurious Emission 30MHz~3GHz



Date: 25.JUL.2019 03:25:10

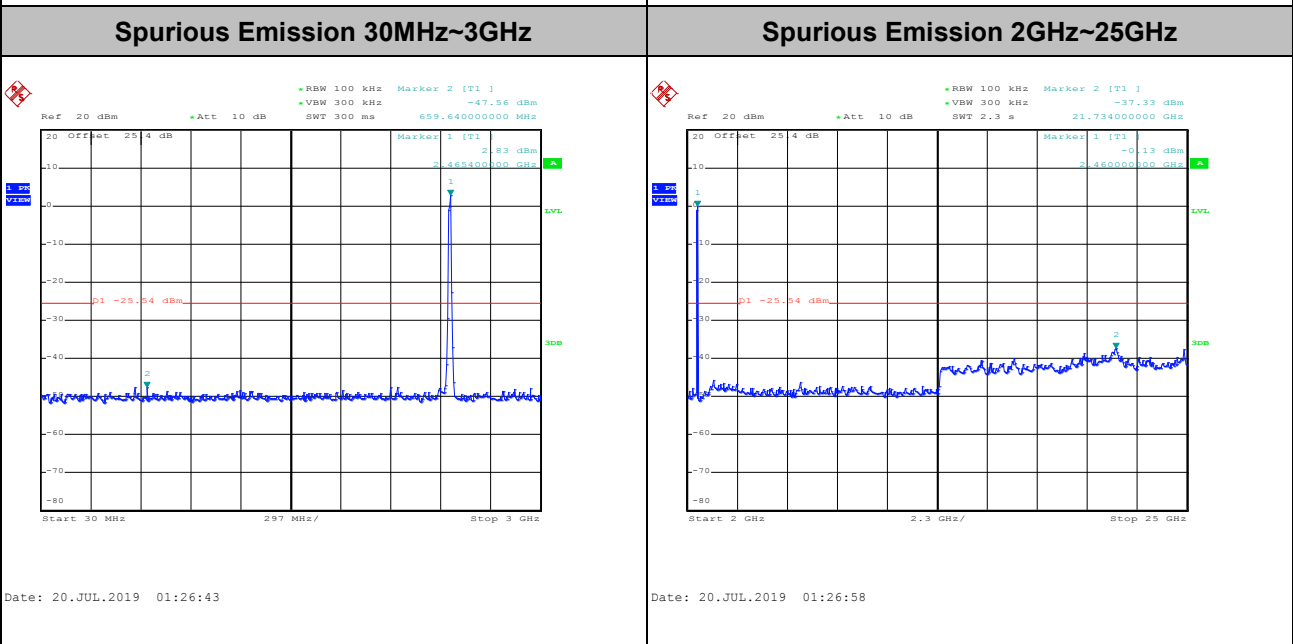
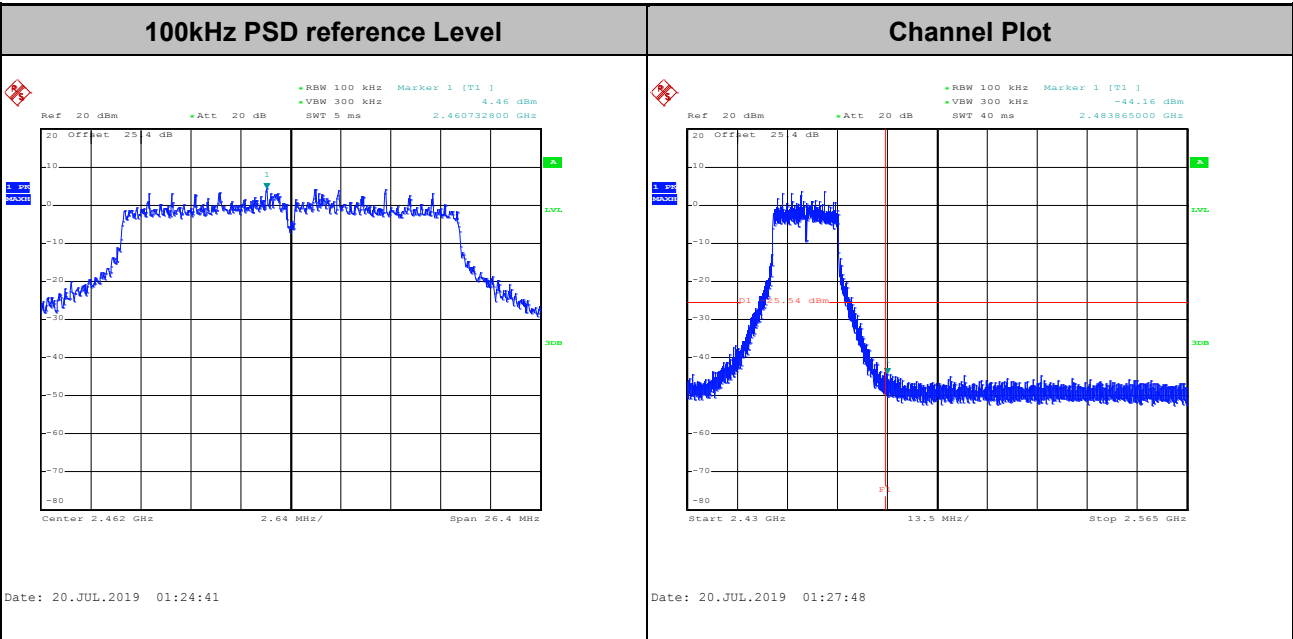
Spurious Emission 2GHz~25GHz



Date: 25.JUL.2019 03:25:28

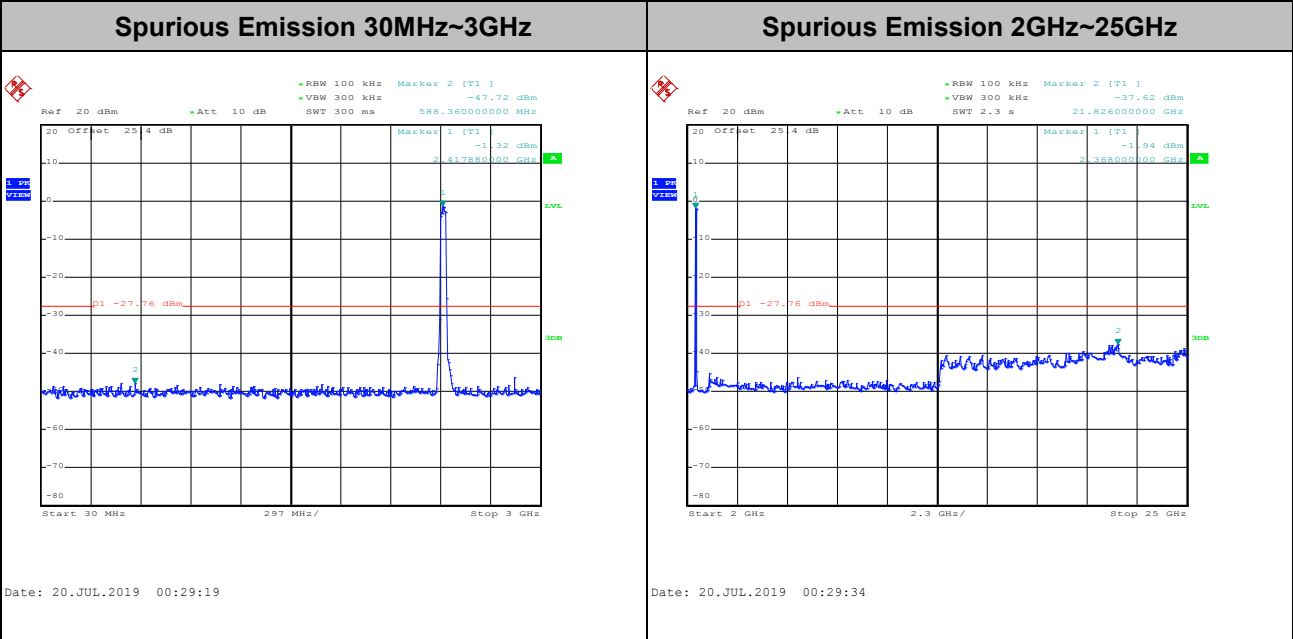
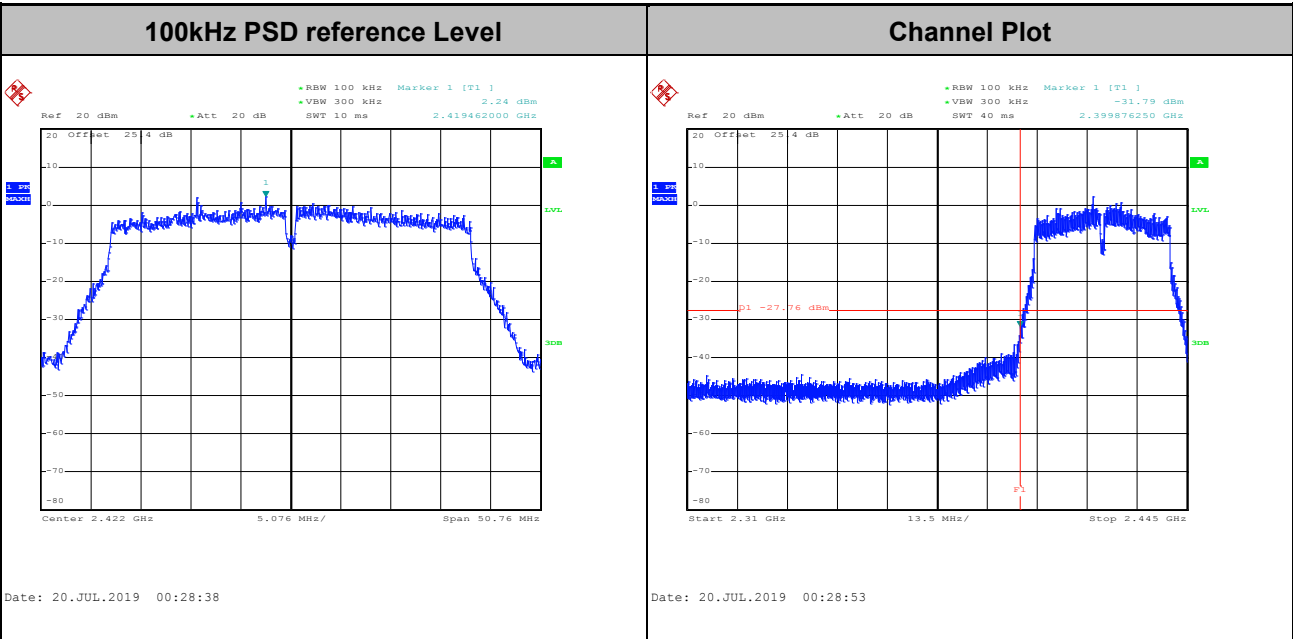


Test Mode :	802.11ac VHT20	Test Channel :	11
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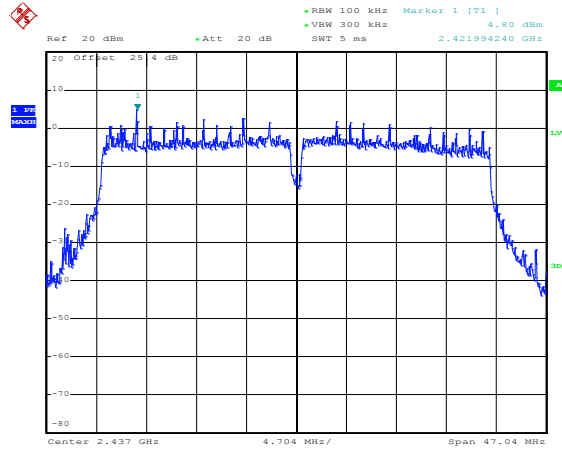
Test Mode :	802.11ac VHT40	Test Channel :	03
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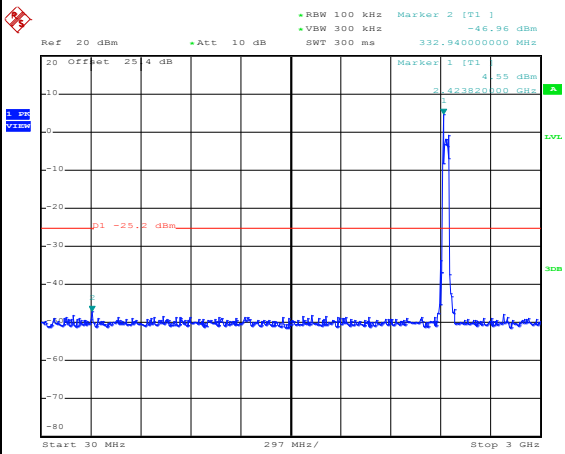
Test Mode :	802.11ac VHT40	Test Channel :	06
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100kHz PSD reference Level



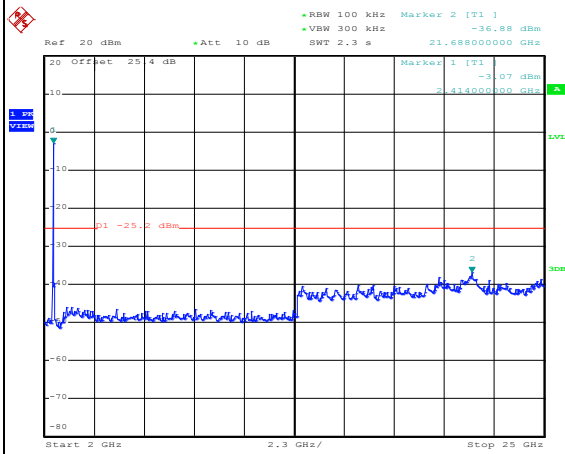
Date: 25.JUL.2019 04:24:32

Spurious Emission 30MHz~3GHz



Date: 25.JUL.2019 04:25:19

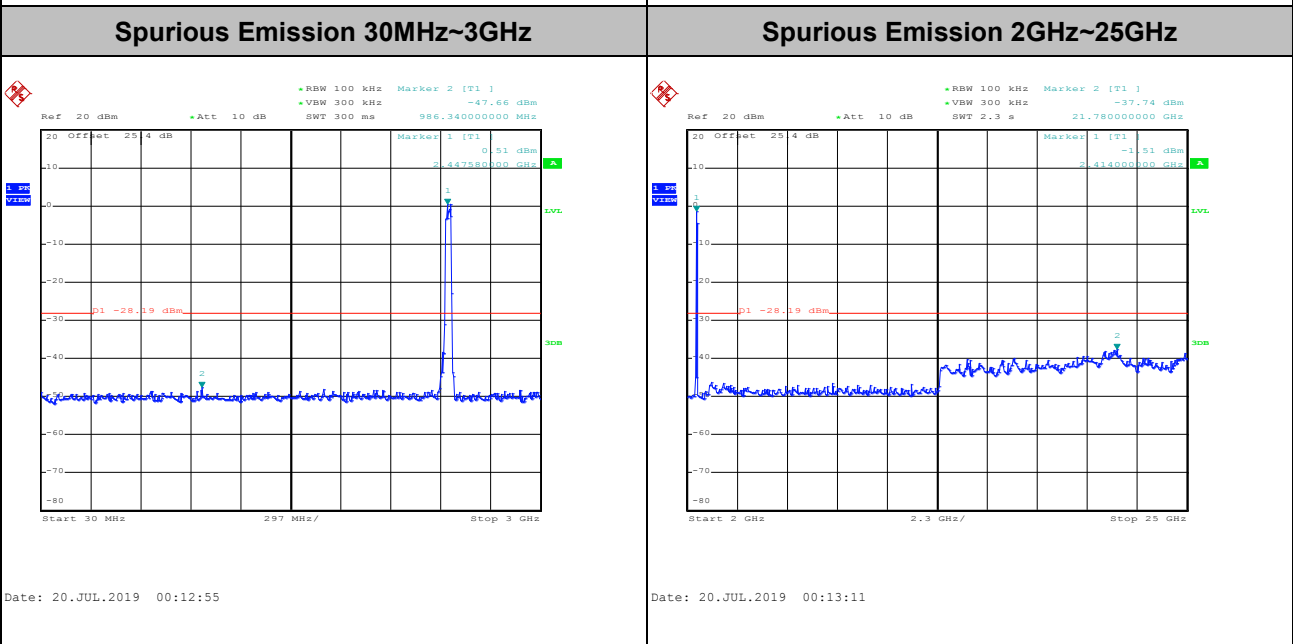
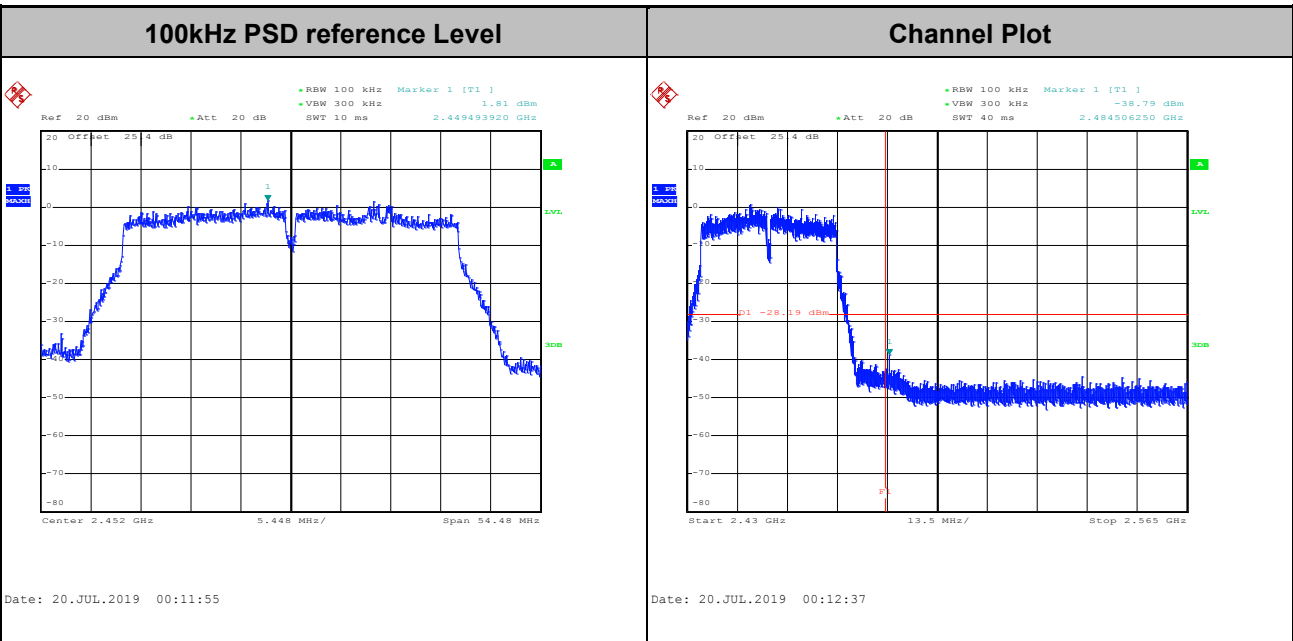
Spurious Emission 2GHz~25GHz



Date: 25.JUL.2019 04:25:36



Test Mode :	802.11ac VHT40	Test Channel :	09
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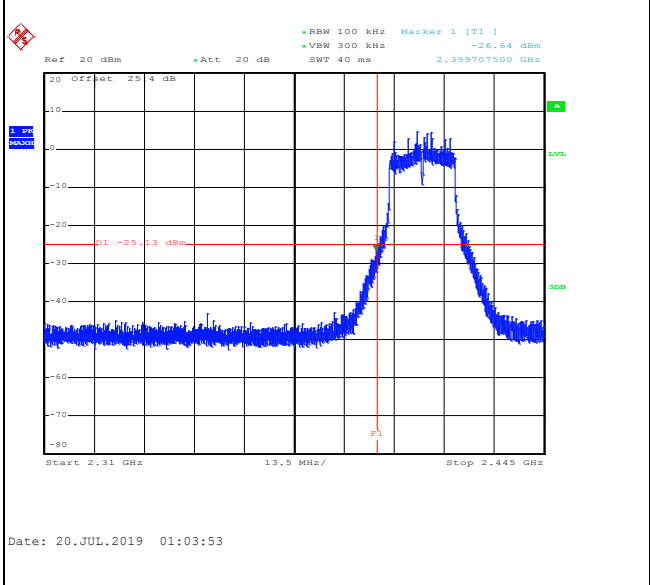
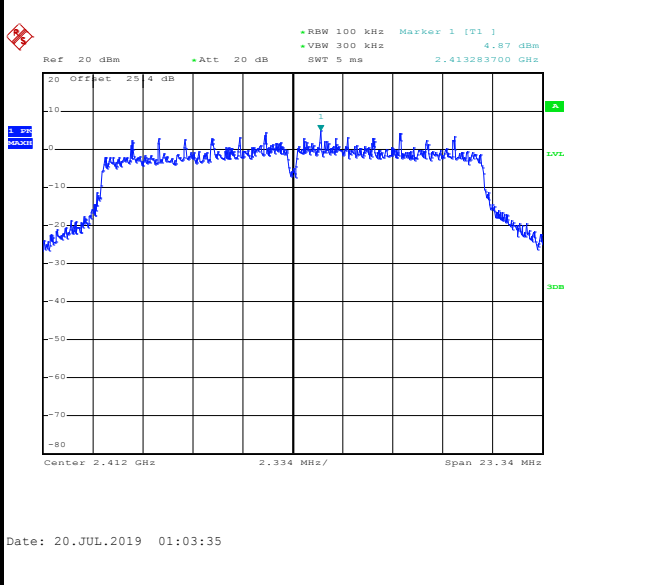




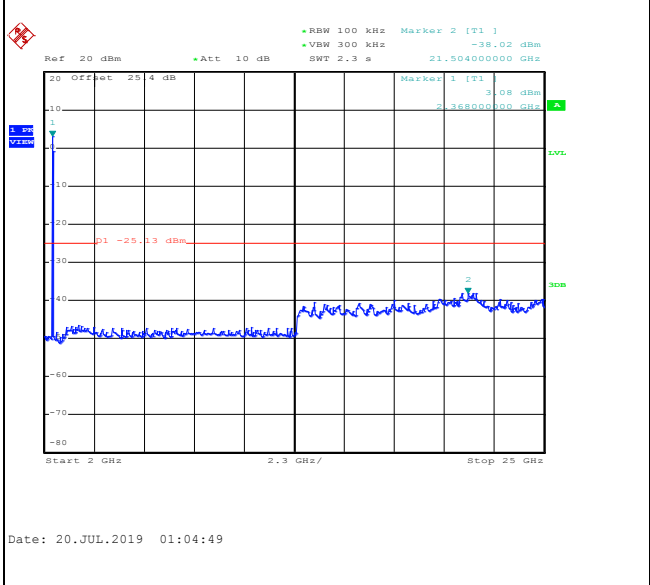
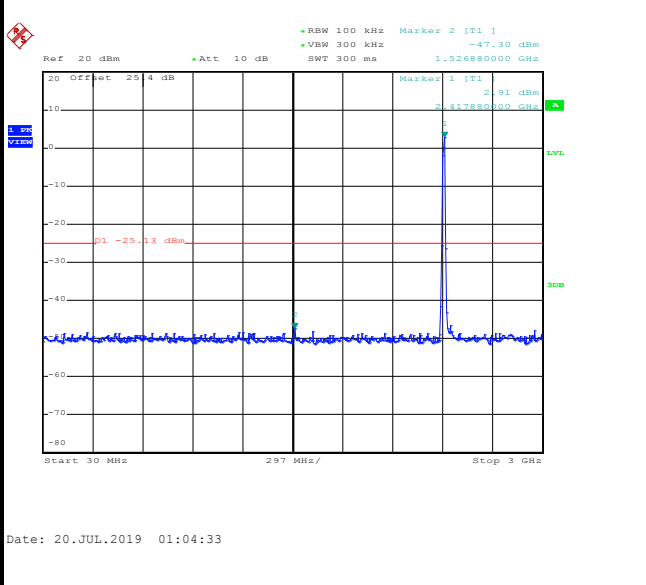
Number of TX = 2, Ant. 2 (Measured)

Test Mode :	802.11ac VHT20	Test Channel :	01
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100kHz PSD reference Level	Channel Plot
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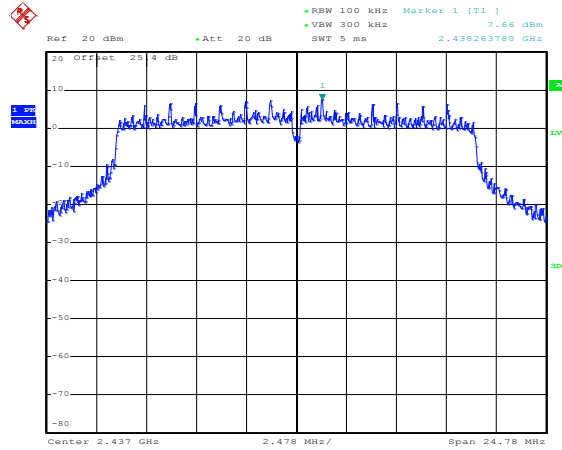
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
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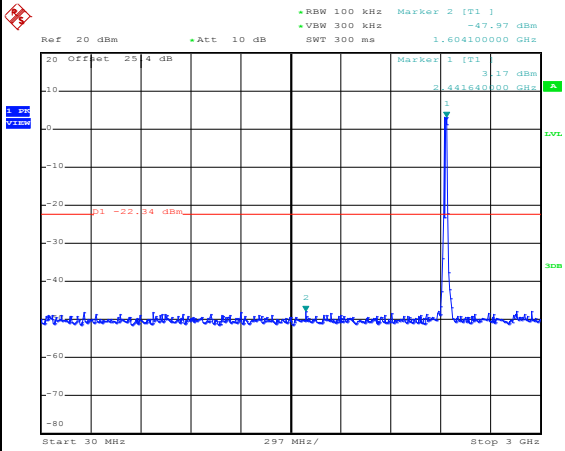
Test Mode :	802.11ac VHT20	Test Channel :	06
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100kHz PSD reference Level



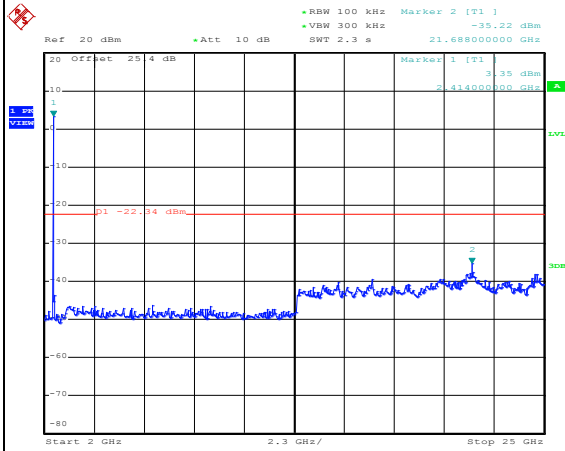
Date: 25.JUL.2019 03:31:15

Spurious Emission 30MHz~3GHz



Date: 25.JUL.2019 03:31:45

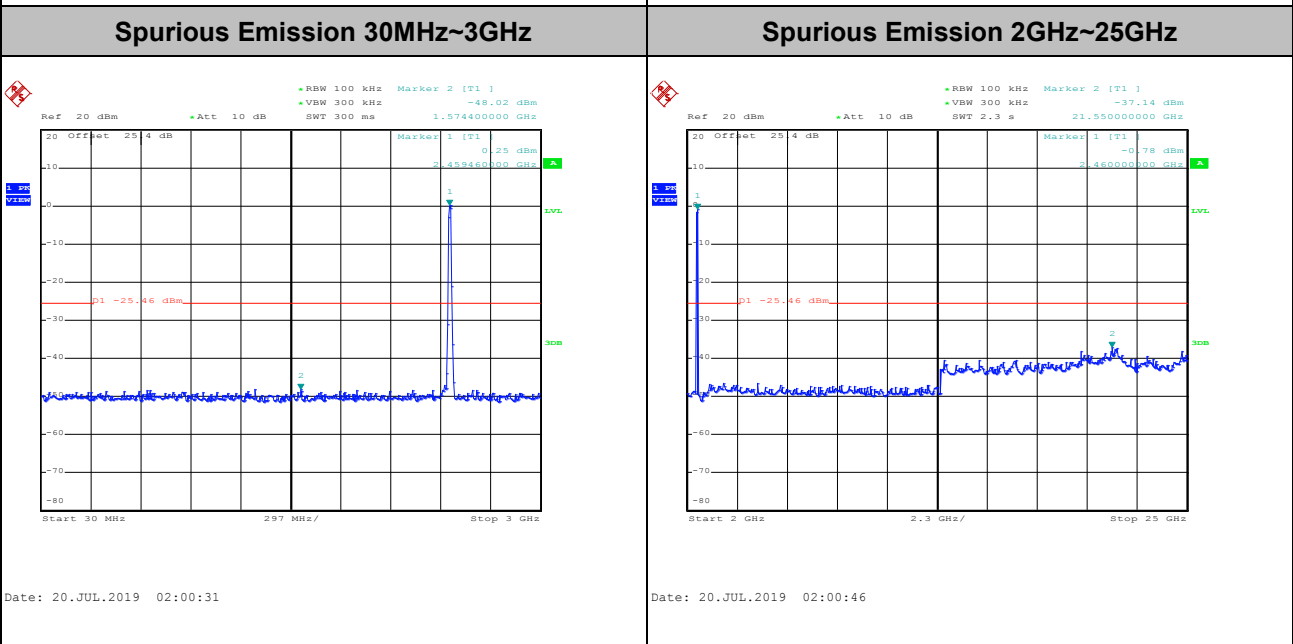
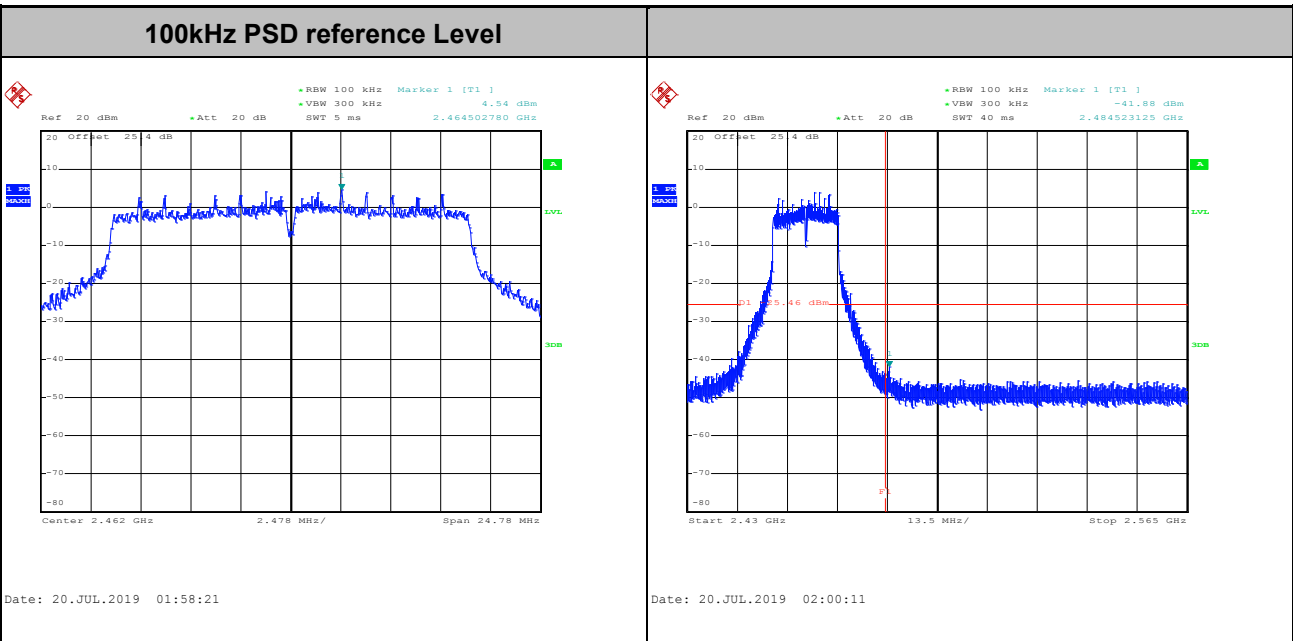
Spurious Emission 2GHz~25GHz



Date: 25.JUL.2019 03:32:00

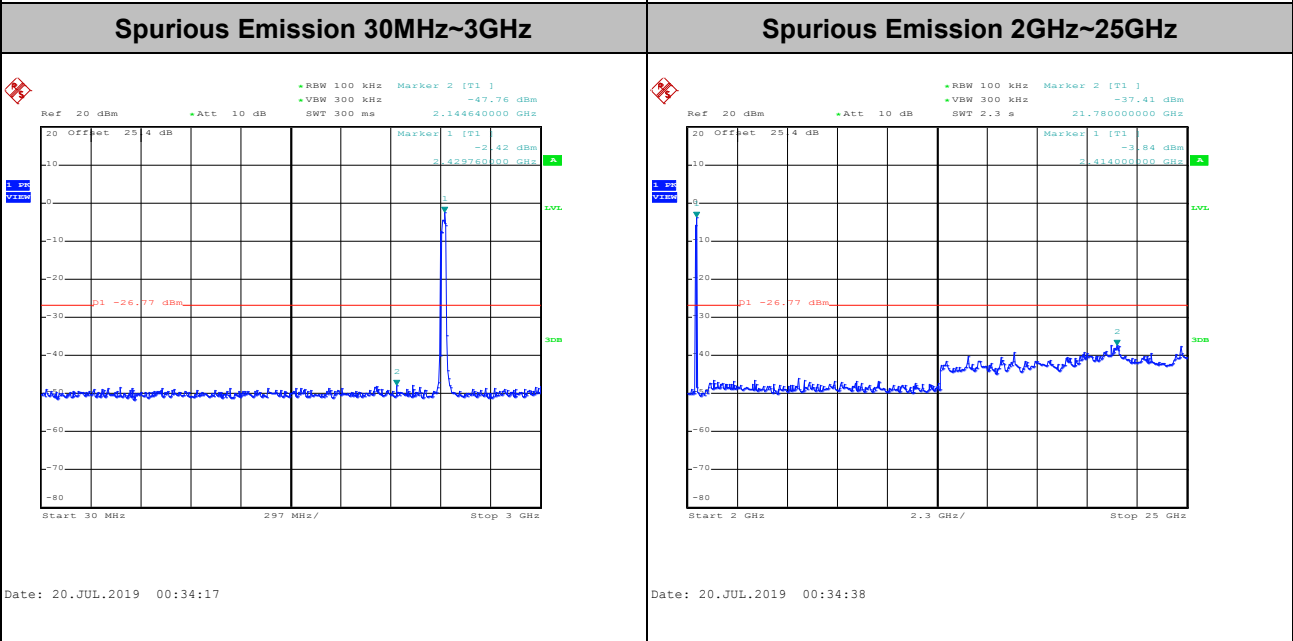
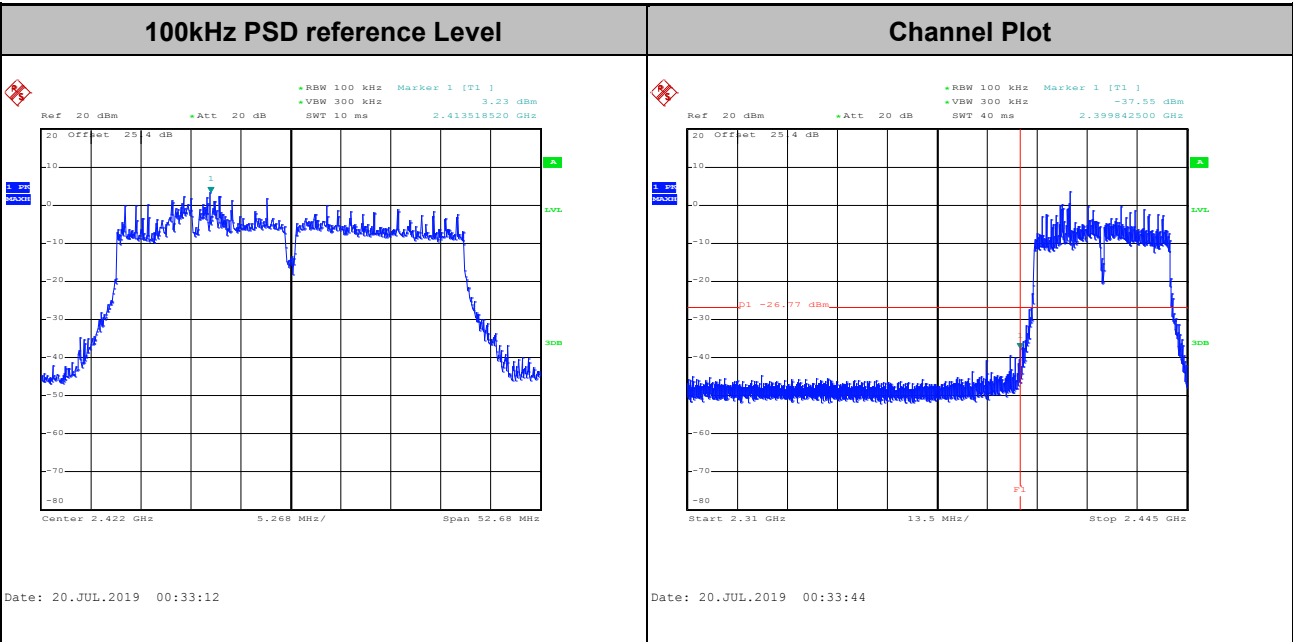


Test Mode :	802.11ac VHT20	Test Channel :	11
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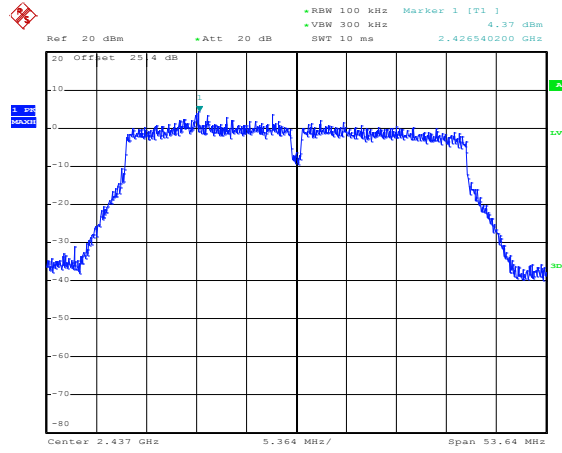
Test Mode :	802.11ac VHT40	Test Channel :	03
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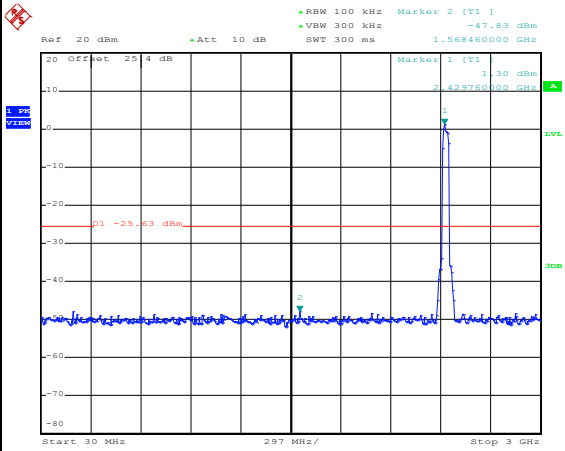
Test Mode :	802.11ac VHT40	Test Channel :	06
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100kHz PSD reference Level



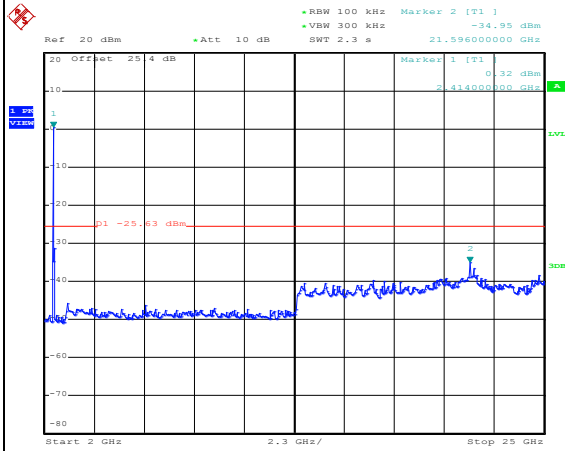
Date: 25.JUL.2019 04:27:40

Spurious Emission 30MHz~3GHz



Date: 25.JUL.2019 04:28:03

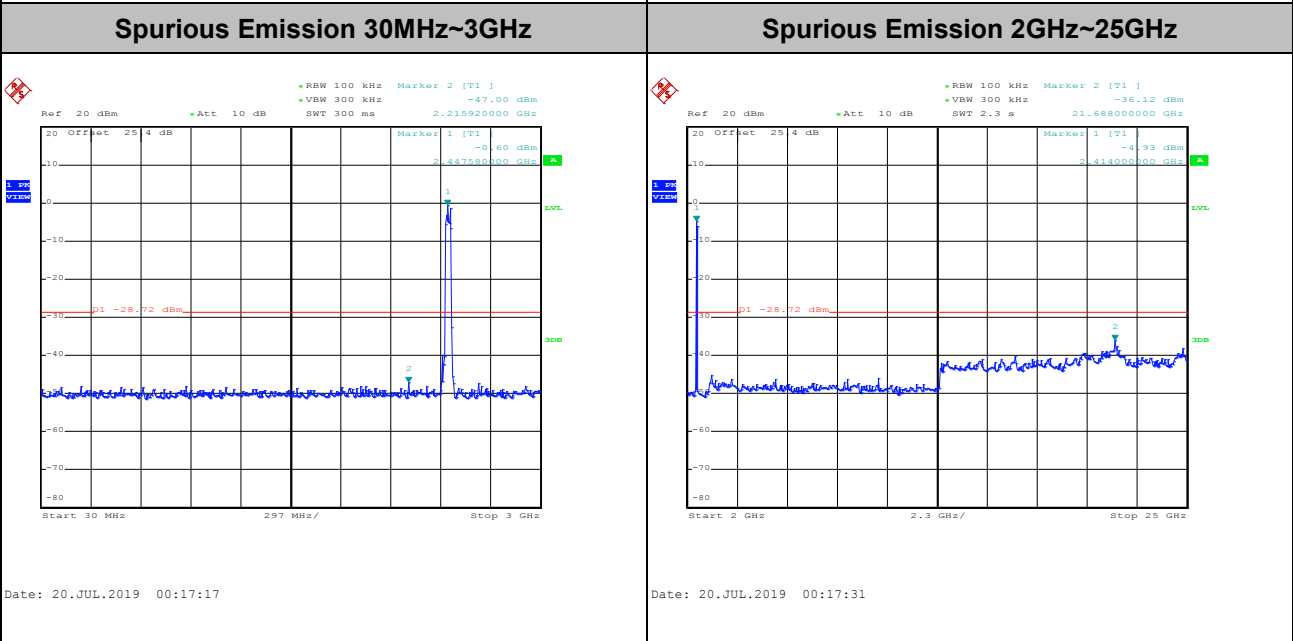
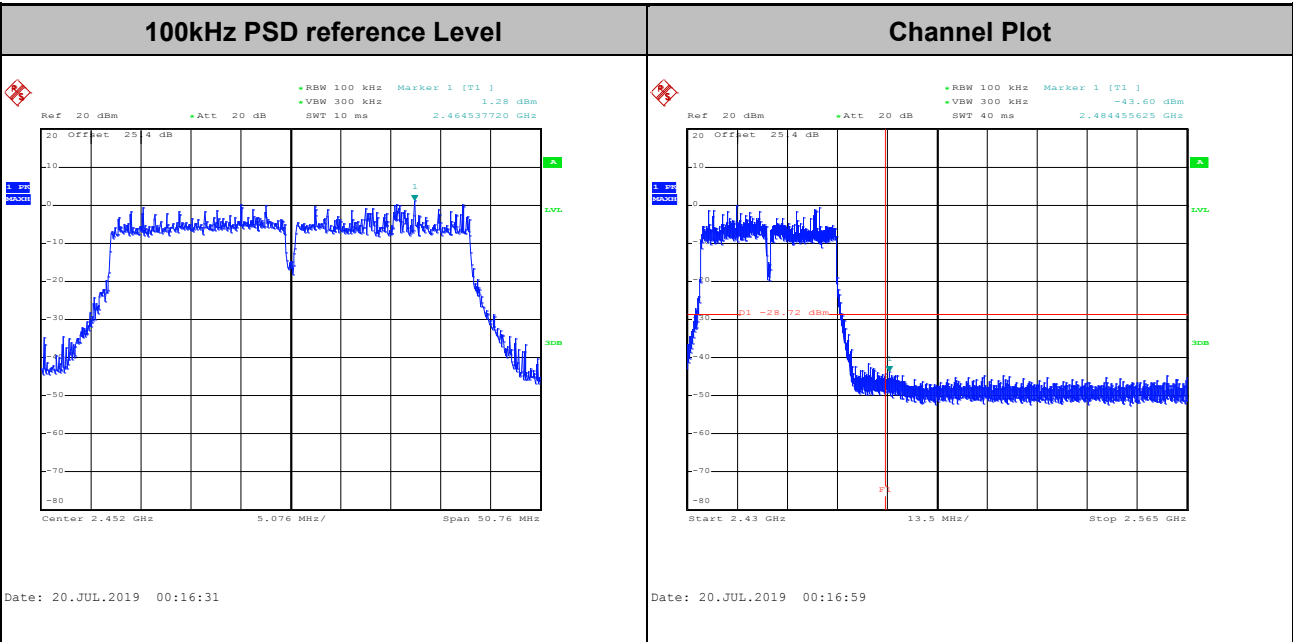
Spurious Emission 2GHz~25GHz



Date: 25.JUL.2019 04:28:19



Test Mode :	802.11ac VHT40	Test Channel :	09
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3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

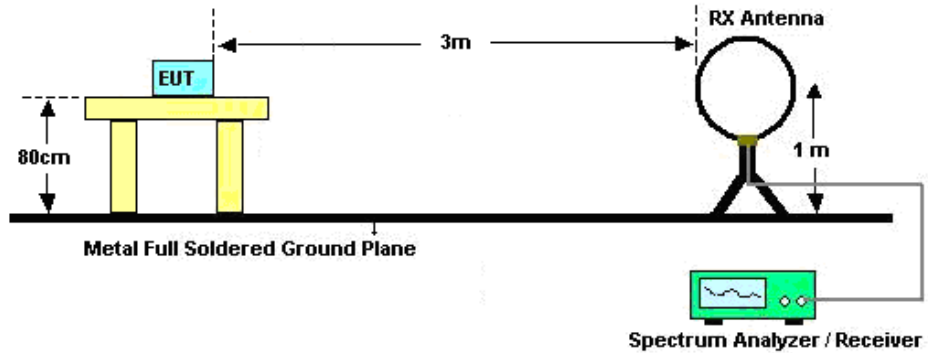
See list of measuring equipment of this test report.

**3.5.3 Test Procedures**

1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements
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.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively 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 testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

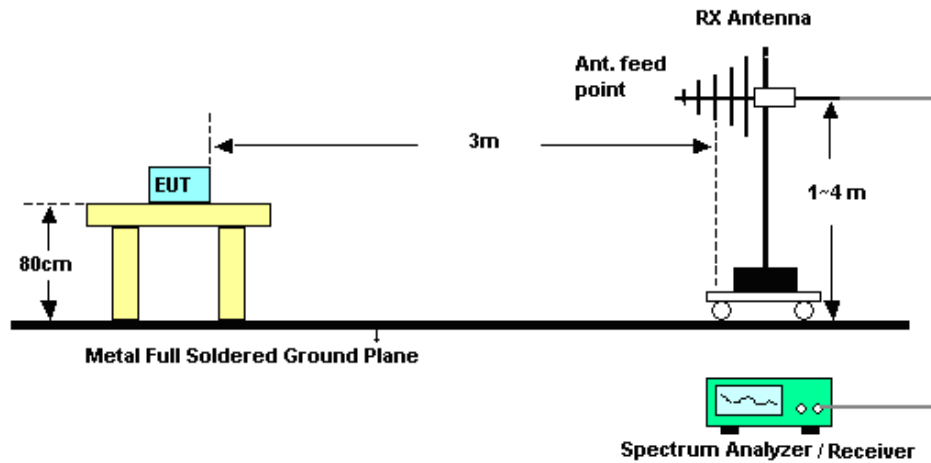
3.5.4 Test Setup

For radiated emissions below 30MHz

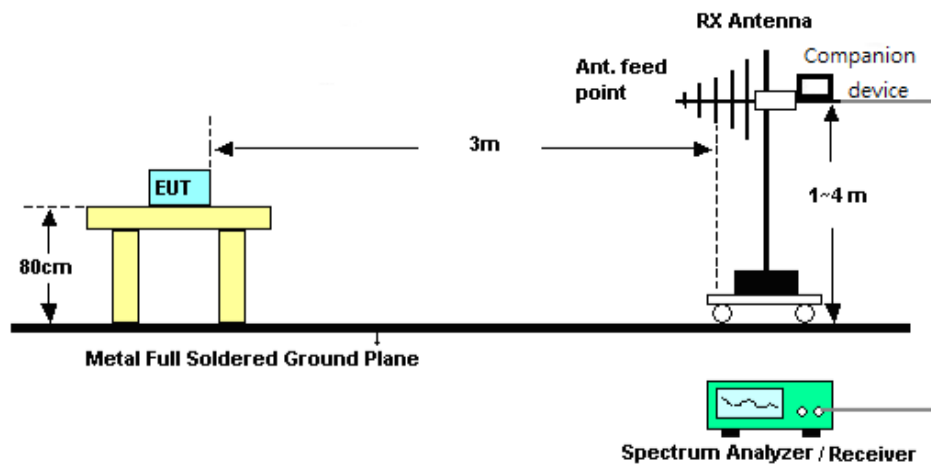


For radiated emissions from 30MHz to 1GHz

<CDD Mode>

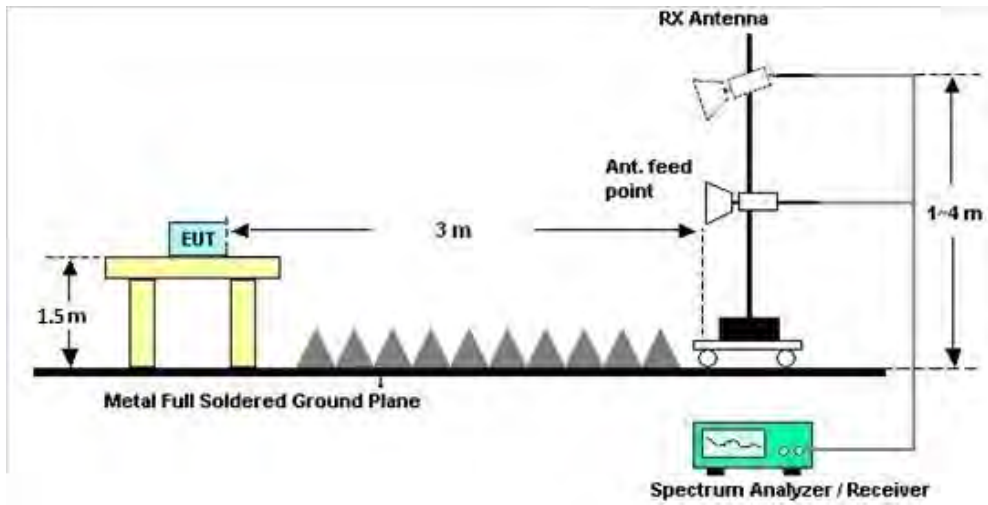


<TXBF Modes>

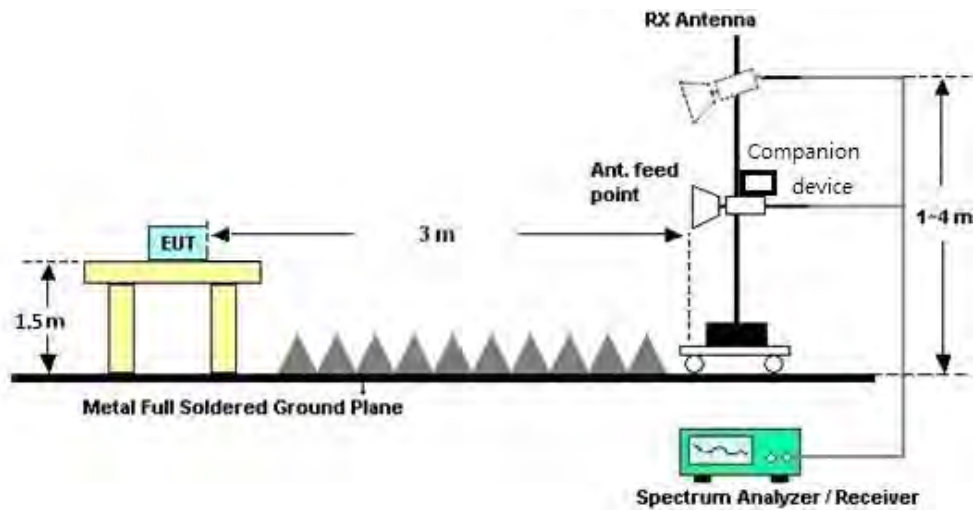


For radiated emissions above 1GHz

<CDD Mode>



<TXBF Modes>





3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B and C.



3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

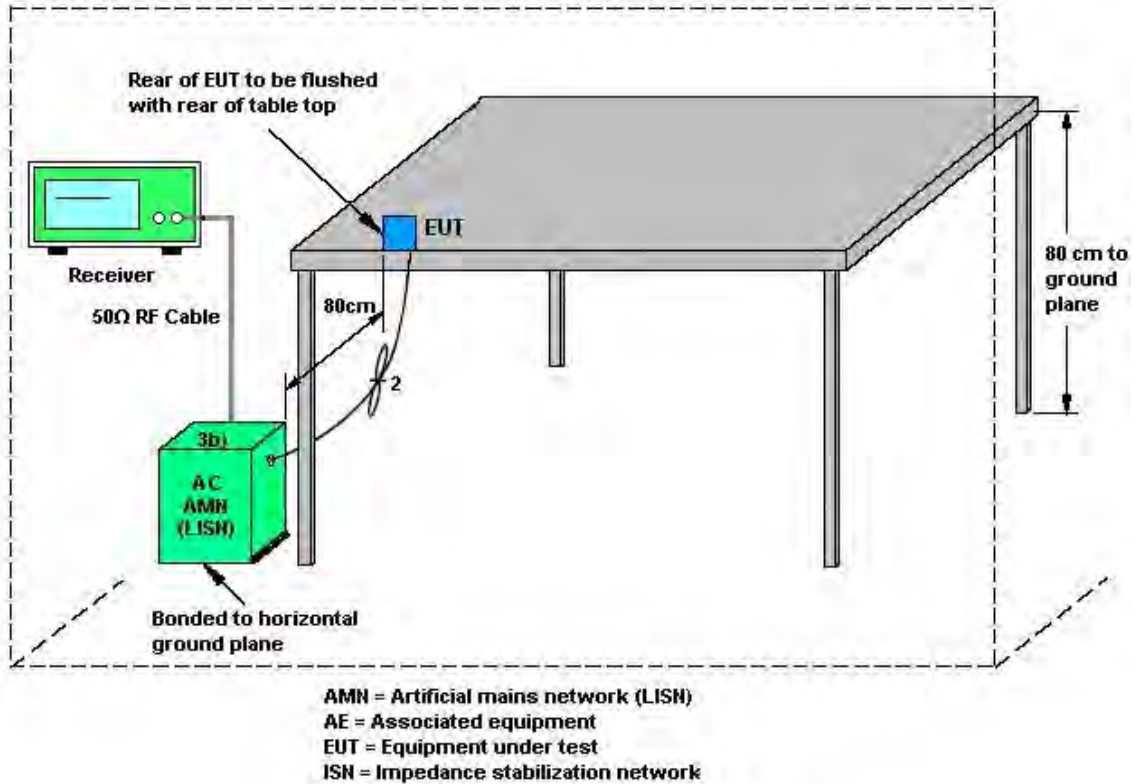
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix A.



3.7 Antenna Requirements

3.7.1 Standard Applicable

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. 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 rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = $G_{ANT} + \text{Array Gain}$, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

<CDD Modes>						
			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant. 1	Ant. 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	2.93	1.88	2.93	5.43	0.00	0.00

$Power\ Limit\ Reduction = DG(Power) - 6dBi, (min = 0)$

$PSD\ Limit\ Reduction = DG(PSD) - 6dBi, (min = 0)$

TXBF modes

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k / 20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

The EUT supports beamforming for 802.11ac modes.

The directional gain calculation is following F)2)e)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

			DG	DG	Power	PSD
	Ant. 1	Ant. 2	for	for	Limit	Limit
	(dBi)	(dBi)	Power	PSD	Reduction	Reduction
			(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	2.93	1.88	5.43	5.43	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	Jun. 30, 2019~ Jul. 18, 2019	Dec. 05, 2019	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 04, 2018	Jun. 30, 2019~ Jul. 18, 2019	Dec. 03, 2019	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-0 6	35414&AT- N0602	30MHz~1GHz	Oct. 13, 2018	Jun. 30, 2019~ Jul. 18, 2019	Oct. 12, 2019	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-132 6	1GHz ~ 18GHz	Oct. 30, 2018	Jun. 30, 2019~ Jul. 18, 2019	Oct. 29, 2019	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 22, 2018	Jun. 30, 2019~ Jul. 18, 2019	Nov. 21, 2019	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY532700 80	1GHz~26.5GHz	Nov. 14, 2018	Jun. 30, 2019~ Jul. 18, 2019	Nov. 13, 2020	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz ~ 44GHz	Oct. 19, 2018	Jun. 30, 2019~ Jul. 18, 2019	Oct. 18, 2019	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	Jun. 30, 2019~ Jul. 18, 2019	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Jun. 30, 2019~ Jul. 18, 2019	N/A	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	171000180 0055007	1GHz~18GHz	Apr. 01, 2019	Jun. 30, 2019~ Jul. 18, 2019	Mar. 31, 2020	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Dec. 05, 2018	Jun. 30, 2019~ Jul. 18, 2019	Dec. 04, 2019	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY541300 85	N/A	Nov. 01, 2018	Jun. 30, 2019~ Jul. 18, 2019	Oct. 31, 2019	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-00104 2	N/A	N/A	Jun. 30, 2019~ Jul. 18, 2019	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz-30MHz	Mar. 13, 2019	Jun. 30, 2019~ Jul. 18, 2019	Mar. 12, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 13, 2019	Jun. 30, 2019~ Jul. 18, 2019	Mar. 12, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	30M-18G	Mar. 13, 2019	Jun. 30, 2019~ Jul. 18, 2019	Mar. 12, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 13, 2019	Jun. 30, 2019~ Jul. 18, 2019	Mar. 12, 2020	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-1 530-8000-40S S	SN11	1G Low Pass	Sep. 16, 2018	Jun. 30, 2019~ Jul. 18, 2019	Sep. 17, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60SS	SN3	2.7G High Pass	Sep. 17, 2018	Jun. 30, 2019~ Jul. 18, 2019	Sep. 16, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000 -40ST	SN3	6.75GHz High Pass	Sep. 17, 2018	Jun. 30, 2019~ Jul. 18, 2019	Sep. 16, 2019	Radiation (03CH11-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 06, 2019	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 12, 2018	Jul. 06, 2019	Nov. 11, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 14, 2018	Jul. 06, 2019	Nov. 13, 2019	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jul. 06, 2019	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Dec. 31, 2018	Jul. 06, 2019	Dec. 30, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Dec. 31, 2018	Jul. 06, 2019	Dec. 30, 2019	Conduction (CO05-HY)
<CDD Mode>								
Power Sensor	DARE	RPR3006W	13I00030S NO32	9kHz~6GHz	Dec. 03, 2018	Jul. 05, 2019~ Jul. 24, 2019	Dec. 02, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 21, 2018	Jul. 05, 2019~ Jul. 24, 2019	Nov. 20, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC120838 2	N/A	Mar. 27, 2019	Jul. 05, 2019~ Jul. 24, 2019	Mar. 26, 2020	Conducted (TH05-HY)
<TXBF Mode>								
Power Sensor	DARE	RPR3006W	16I00054S NO10	10MHz~6GHz	Dec. 19, 2018	Jul. 12, 2019~ Jul. 27, 2019	Dec. 18, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 21, 2018	Jul. 12, 2019~ Jul. 27, 2019	Nov. 20, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	EM	EMSW18	SW107090 3	N/A	Dec. 19, 2018	Jul. 12, 2019~ Jul. 27, 2019	Dec. 18, 2019	Conducted (TH05-HY)



5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.20
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.20
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.50
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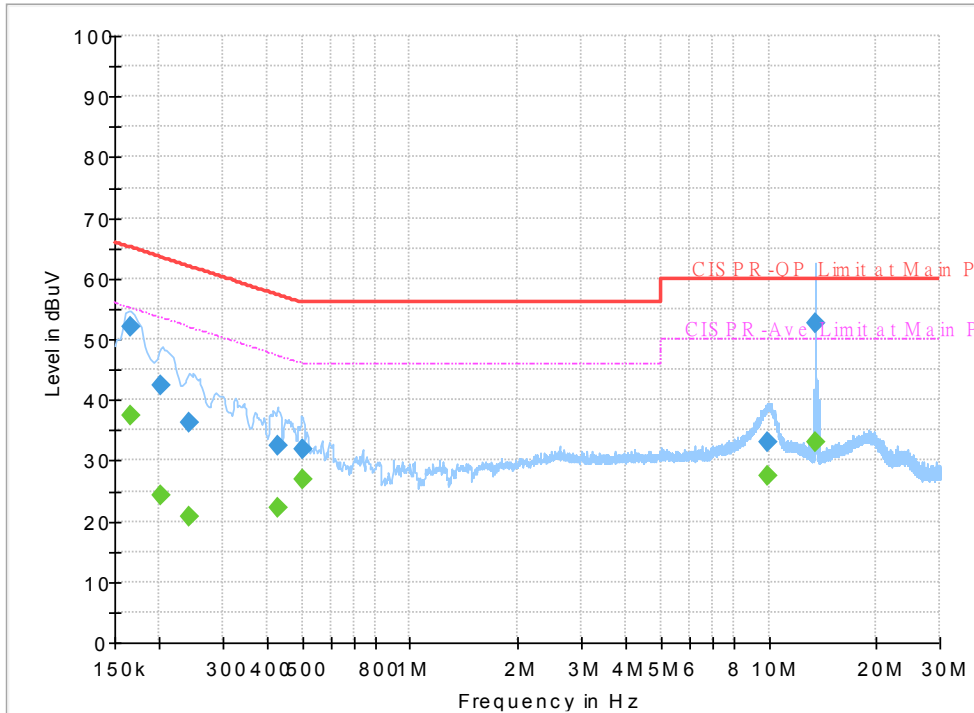
Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.20
---	------



Appendix A. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	Temperature :	22~24°C
		Relative Humidity :	64.4~68.2%
Test Voltage :	120Vac / 60Hz	Phase :	Line

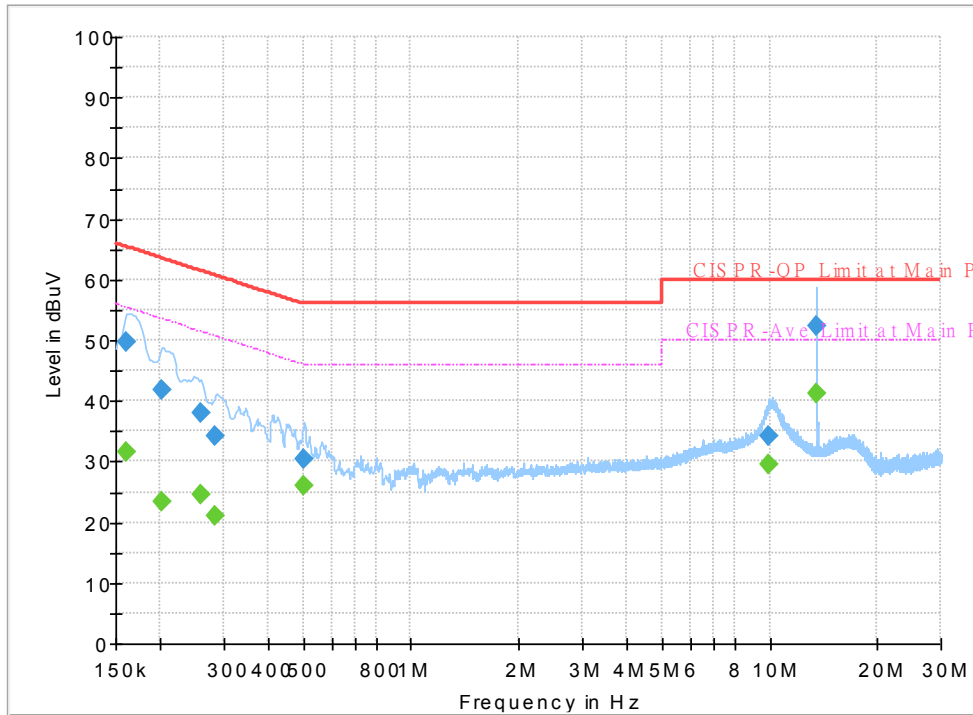


Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.165750	---	37.32	55.17	17.85	L1	OFF	19.4
0.165750	52.01	---	65.17	13.16	L1	OFF	19.4
0.201750	---	24.21	53.54	29.33	L1	OFF	19.4
0.201750	42.36	---	63.54	21.18	L1	OFF	19.4
0.242250	---	20.66	52.02	31.36	L1	OFF	19.4
0.242250	36.26	---	62.02	25.76	L1	OFF	19.4
0.429000	---	22.23	47.27	25.04	L1	OFF	19.4
0.429000	32.35	---	57.27	24.92	L1	OFF	19.4
0.501000	---	26.82	46.00	19.18	L1	OFF	19.4
0.501000	31.84	---	56.00	24.16	L1	OFF	19.4
9.939750	---	27.37	50.00	22.63	L1	OFF	19.6
9.939750	32.95	---	60.00	27.05	L1	OFF	19.6
13.560000	---	32.98	50.00	17.02	L1	OFF	19.6
13.560000	52.74	---	60.00	7.26	L1	OFF	19.6



Test Engineer :	Louis Chung	Temperature :	22~24°C
		Relative Humidity :	64.4~68.2%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.161250	---	31.53	55.40	23.87	N	OFF	19.4
0.161250	49.76	---	65.40	15.64	N	OFF	19.4
0.201750	---	23.50	53.54	30.04	N	OFF	19.4
0.201750	41.70	---	63.54	21.84	N	OFF	19.4
0.258000	---	24.64	51.50	26.86	N	OFF	19.4
0.258000	37.92	---	61.50	23.58	N	OFF	19.4
0.285000	---	21.09	50.67	29.58	N	OFF	19.4
0.285000	34.19	---	60.67	26.48	N	OFF	19.4
0.503250	---	25.99	46.00	20.01	N	OFF	19.5
0.503250	30.30	---	56.00	25.70	N	OFF	19.5
9.984750	---	29.44	50.00	20.56	N	OFF	19.7
9.984750	34.21	---	60.00	25.79	N	OFF	19.7
13.560000	---	41.09	50.00	8.91	N	OFF	19.7
13.560000	52.36	---	60.00	7.64	N	OFF	19.7



Appendix B. Radiated Spurious Emission

Test Engineer :	Hao Hsu, Fu Chen and Troye Hsieh	Temperature :	21~26°C
		Relative Humidity :	50.2~67.6%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11b CH 01 2412MHz		2389.065	55.64	-18.36	74	45.19	27.44	16.64	33.63	114	315	P	H	
		2389.065	46.2	-7.8	54	35.75	27.44	16.64	33.63	114	315	A	H	
	*	2412	112.4	-	-	101.98	27.38	16.66	33.62	114	315	P	H	
	*	2412	109.18	-	-	98.76	27.38	16.66	33.62	114	315	A	H	
													H	
														H
			2389.59	53.9	-20.1	74	43.45	27.44	16.64	33.63	385	5	P	V
			2389.065	43.85	-10.15	54	33.4	27.44	16.64	33.63	385	5	A	V
	*		2412	108.03	-	-	97.61	27.38	16.66	33.62	385	5	P	V
	*		2412	104.91	-	-	94.49	27.38	16.66	33.62	385	5	A	V
														V
														V
802.11b CH 06 2437MHz		2355.28	52.68	-21.32	74	42.14	27.58	16.6	33.64	134	216	P	H	
		2310.32	41.52	-12.48	54	30.87	27.76	16.55	33.66	134	216	A	H	
	*	2437	110.55	-	-	100.14	27.33	16.69	33.61	134	216	P	H	
	*	2437	107.39	-	-	96.98	27.33	16.69	33.61	134	216	A	H	
			2487.76	52.87	-21.13	74	42.42	27.3	16.74	33.59	134	216	P	H
			2485.68	41.99	-12.01	54	31.55	27.3	16.74	33.6	134	216	A	H
			2353.52	53.19	-20.81	74	42.64	27.59	16.6	33.64	332	4	P	V
			2315.76	41.52	-12.48	54	30.89	27.74	16.55	33.66	332	4	A	V
	*		2437	108.15	-	-	97.74	27.33	16.69	33.61	332	4	P	V
	*		2437	105.03	-	-	94.62	27.33	16.69	33.61	332	4	A	V
			2487.28	52.71	-21.29	74	42.26	27.3	16.74	33.59	332	4	P	V
			2485.84	41.82	-12.18	54	31.38	27.3	16.74	33.6	332	4	A	V



802.11b CH 11 2462MHz	*	2462	111.29	-	-	100.87	27.3	16.72	33.6	106	214	P	H
	*	2462	108.1	-	-	97.68	27.3	16.72	33.6	106	214	A	H
		2483.84	54.81	-19.19	74	44.37	27.3	16.74	33.6	106	214	P	H
		2483.52	43.41	-10.59	54	32.97	27.3	16.74	33.6	106	214	A	H
													H
													H
	*	2462	109.48	-	-	99.06	27.3	16.72	33.6	364	357	P	V
	*	2462	106.27	-	-	95.85	27.3	16.72	33.6	364	357	A	V
		2484.36	56.05	-17.95	74	45.61	27.3	16.74	33.6	364	357	P	V
		2485.8	43.22	-10.78	54	32.78	27.3	16.74	33.6	364	357	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11b CH 01 2412MHz		4824	36.78	-37.22	74	53.82	31.1	11.02	59.16	100	0	P	H	
													H	
													H	
													H	
			4824	37.1	-36.9	74	54.14	31.1	11.02	59.16	100	0	P	V
														V
														V
802.11b CH 06 2437MHz		4874	37.36	-36.64	74	54.42	31.05	11.06	59.17	100	0	P	H	
		7311	40.74	-33.26	74	49.74	36.52	13.66	59.18	100	0	P	H	
													H	
													H	
			4874	37.34	-36.66	74	54.4	31.05	11.06	59.17	100	0	P	V
			7311	41.57	-32.43	74	50.57	36.52	13.66	59.18	100	0	P	V
														V
802.11b CH 11 2462MHz		4924	38.08	-35.92	74	55.03	31.14	11.09	59.18	100	0	P	H	
		7386	40.98	-33.02	74	50.09	36.46	13.58	59.15	100	0	P	H	
													H	
													H	
			4924	38.29	-35.71	74	55.24	31.14	11.09	59.18	100	0	P	V
			7386	41.19	-32.81	74	50.3	36.46	13.58	59.15	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



**2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11g CH 01 2412MHz		2390	63.55	-10.45	74	53.1	27.44	16.64	33.63	112	316	P	H	
		2390	52.44	-1.56	54	41.99	27.44	16.64	33.63	112	316	A	H	
	*	2412	110.93	-	-	100.51	27.38	16.66	33.62	112	316	P	H	
	*	2412	103.73	-	-	93.31	27.38	16.66	33.62	112	316	A	H	
													H	
													H	
			2390	58.44	-15.56	74	47.99	27.44	16.64	33.63	344	3	P	V
			2390	48.81	-5.19	54	38.36	27.44	16.64	33.63	344	3	A	V
	*		2412	105.87	-	-	95.45	27.38	16.66	33.62	344	3	P	V
	*		2412	98.56	-	-	88.14	27.38	16.66	33.62	344	3	A	V
														V
														V
802.11g CH 06 2437MHz		2321.84	53.42	-20.58	74	42.8	27.71	16.56	33.65	111	211	P	H	
		2390	43.48	-10.52	54	33.03	27.44	16.64	33.63	111	211	A	H	
	*	2437	111.12	-	-	100.71	27.33	16.69	33.61	111	211	P	H	
	*	2437	103.12	-	-	92.71	27.33	16.69	33.61	111	211	A	H	
			2484.24	54.38	-19.62	74	43.94	27.3	16.74	33.6	111	211	P	H
			2485.68	43.77	-10.23	54	33.33	27.3	16.74	33.6	111	211	A	H
			2383.92	52.77	-21.23	74	42.31	27.46	16.63	33.63	332	6	P	V
			2388.72	42.95	-11.05	54	32.49	27.45	16.64	33.63	332	6	A	V
	*		2437	109.1	-	-	98.69	27.33	16.69	33.61	332	6	P	V
	*		2437	101.49	-	-	91.08	27.33	16.69	33.61	332	6	A	V
			2484.56	53.02	-20.98	74	42.58	27.3	16.74	33.6	332	6	P	V
			2485.92	43.75	-10.25	54	33.31	27.3	16.74	33.6	332	6	A	V



802.11g CH 11 2462MHz	*	2462	110.52	-	-	100.1	27.3	16.72	33.6	106	211	P	H
	*	2462	102.71	-	-	92.29	27.3	16.72	33.6	106	211	A	H
		2484.44	64.23	-9.77	74	53.79	27.3	16.74	33.6	106	211	P	H
		2483.52	52.62	-1.38	54	42.18	27.3	16.74	33.6	106	211	A	H
													H
													H
	*	2462	109.76	-	-	99.34	27.3	16.72	33.6	327	354	P	V
	*	2462	102.14	-	-	91.72	27.3	16.72	33.6	327	354	A	V
		2484.56	63.11	-10.89	74	52.67	27.3	16.74	33.6	327	354	P	V
		2483.52	51.53	-2.47	54	41.09	27.3	16.74	33.6	327	354	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11g CH 01 2412MHz		4824	36.48	-37.52	74	53.52	31.1	11.02	59.16	100	0	P	H	
													H	
													H	
													H	
			4824	36.77	-37.23	74	53.81	31.1	11.02	59.16	100	0	P	V
														V
														V
802.11g CH 06 2437MHz		4874	37.29	-36.71	74	54.35	31.05	11.06	59.17	100	0	P	H	
		7311	40.94	-33.06	74	49.94	36.52	13.66	59.18	100	0	P	H	
													H	
													H	
			4874	36.7	-37.3	74	53.76	31.05	11.06	59.17	100	0	P	V
			7311	41.11	-32.89	74	50.11	36.52	13.66	59.18	100	0	P	V
														V
802.11g CH 11 2462MHz		4924	37.75	-36.25	74	54.7	31.14	11.09	59.18	100	0	P	H	
		7386	40.74	-33.26	74	49.85	36.46	13.58	59.15	100	0	P	H	
													H	
													H	
			4924	37.28	-36.72	74	54.23	31.14	11.09	59.18	100	0	P	V
			7386	40.38	-33.62	74	49.49	36.46	13.58	59.15	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11n HT20 CH 01 2412MHz		2389.695	63.03	-10.97	74	52.58	27.44	16.64	33.63	113	315	P	H	
		2390	52.09	-1.91	54	41.64	27.44	16.64	33.63	113	315	A	H	
	*	2412	109.49	-	-	99.07	27.38	16.66	33.62	113	315	P	H	
	*	2412	101.48	-	-	91.06	27.38	16.66	33.62	113	315	A	H	
													H	
													H	
			2389.8	60.35	-13.65	74	49.9	27.44	16.64	33.63	344	5	P	V
			2390	48.91	-5.09	54	38.46	27.44	16.64	33.63	344	5	A	V
		*	2412	104.6	-	-	94.18	27.38	16.66	33.62	344	5	P	V
		*	2412	96.87	-	-	86.45	27.38	16.66	33.62	344	5	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2378	52.66	-21.34	74	42.18	27.49	16.62	33.63	136	215	P	H	
		2389.68	43.39	-10.61	54	32.94	27.44	16.64	33.63	136	215	A	H	
	*	2437	110.57	-	-	100.16	27.33	16.69	33.61	136	215	P	H	
	*	2437	102.85	-	-	92.44	27.33	16.69	33.61	136	215	A	H	
			2485.36	53.12	-20.88	74	42.68	27.3	16.74	33.6	136	215	P	H
			2483.6	43.87	-10.13	54	33.43	27.3	16.74	33.6	136	215	A	H
			2389.52	52.61	-21.39	74	42.16	27.44	16.64	33.63	331	5	P	V
			2389.52	43.02	-10.98	54	32.57	27.44	16.64	33.63	331	5	A	V
		*	2437	108.94	-	-	98.53	27.33	16.69	33.61	331	5	P	V
		*	2437	101.37	-	-	90.96	27.33	16.69	33.61	331	5	A	V
		2484.64	53.41	-20.59	74	42.97	27.3	16.74	33.6	331	5	P	V	
		2486.48	43.54	-10.46	54	33.09	27.3	16.74	33.59	331	5	A	V	



802.11n HT20 CH 11 2462MHz	*	2462	108.46	-	-	98.04	27.3	16.72	33.6	104	214	P	H
	*	2462	100.56	-	-	90.14	27.3	16.72	33.6	104	214	A	H
		2483.8	61.35	-12.65	74	50.91	27.3	16.74	33.6	104	214	P	H
		2483.68	51.28	-2.72	54	40.84	27.3	16.74	33.6	104	214	A	H
													H
													H
	*	2462	107.61	-	-	97.19	27.3	16.72	33.6	324	356	P	V
	*	2462	99.52	-	-	89.1	27.3	16.72	33.6	324	356	A	V
		2483.76	60.26	-13.74	74	49.82	27.3	16.74	33.6	324	356	P	V
		2483.52	49.99	-4.01	54	39.55	27.3	16.74	33.6	324	356	A	V
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	36.38	-37.62	74	53.42	31.1	11.02	59.16	100	0	P	H
													H
													H
													H
		4824	37.31	-36.69	74	54.35	31.1	11.02	59.16	100	0	P	V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	38.44	-35.56	74	55.5	31.05	11.06	59.17	100	0	P	H
		7311	40.68	-33.32	74	49.68	36.52	13.66	59.18	100	0	P	H
													H
													H
		4874	38.43	-35.57	74	55.49	31.05	11.06	59.17	100	0	P	V
		7311	41.08	-32.92	74	50.08	36.52	13.66	59.18	100	0	P	V
													V
802.11n HT20 CH 11 2462MHz		4924	36.73	-37.27	74	53.68	31.14	11.09	59.18	100	0	P	H
		7386	40.64	-33.36	74	49.75	36.46	13.58	59.15	100	0	P	H
													H
													H
		4924	36.94	-37.06	74	53.89	31.14	11.09	59.18	100	0	P	V
		7386	40.69	-33.31	74	49.8	36.46	13.58	59.15	100	0	P	V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		2390	60.3	-13.7	74	49.85	27.44	16.64	33.63	113	316	P	H
		2389.68	52.24	-1.76	54	41.79	27.44	16.64	33.63	113	316	A	H
	*	2422	103.33	-	-	92.92	27.36	16.67	33.62	113	316	P	H
	*	2422	95.53	-	-	85.12	27.36	16.67	33.62	113	316	A	H
		2495.28	53.45	-20.55	74	42.99	27.3	16.75	33.59	113	316	P	H
		2487.28	43.71	-10.29	54	33.26	27.3	16.74	33.59	113	316	A	H
		2390	57.51	-16.49	74	47.06	27.44	16.64	33.63	332	3	P	V
		2389.68	47.64	-6.36	54	37.19	27.44	16.64	33.63	332	3	A	V
	*	2422	98.49	-	-	88.08	27.36	16.67	33.62	332	3	P	V
	*	2422	90.92	-	-	80.51	27.36	16.67	33.62	332	3	A	V
	2487.04	52.32	-21.68	74	41.87	27.3	16.74	33.59	332	3	P	V	
	2484.72	43.5	-10.5	54	33.06	27.3	16.74	33.6	332	3	A	V	
802.11n HT40 CH 06 2437MHz		2389.68	61.59	-12.41	74	51.14	27.44	16.64	33.63	107	329	P	H
		2389.52	50.93	-3.07	54	40.48	27.44	16.64	33.63	107	329	A	H
	*	2437	105.39	-	-	94.98	27.33	16.69	33.61	107	329	P	H
	*	2437	98.2	-	-	87.79	27.33	16.69	33.61	107	329	A	H
		2484	61.68	-12.32	74	51.24	27.3	16.74	33.6	107	329	P	H
		2483.52	51.43	-2.57	54	40.99	27.3	16.74	33.6	107	329	A	H
		2389.36	57.55	-16.45	74	47.1	27.44	16.64	33.63	332	5	P	V
		2390	47.29	-6.71	54	36.84	27.44	16.64	33.63	332	5	A	V
	*	2437	104.09	-	-	93.68	27.33	16.69	33.61	332	5	P	V
	*	2437	96.46	-	-	86.05	27.33	16.69	33.61	332	5	A	V
	2483.68	61.28	-12.72	74	50.84	27.3	16.74	33.6	332	5	P	V	
	2483.68	51.31	-2.69	54	40.87	27.3	16.74	33.6	332	5	A	V	



802.11n HT40 CH 09 2452MHz		2389.04	53.28	-20.72	74	42.83	27.44	16.64	33.63	111	322	P	H
		2388.72	44.15	-9.85	54	33.69	27.45	16.64	33.63	111	322	A	H
	*	2452	102.42	-	-	92.03	27.3	16.7	33.61	111	322	P	H
	*	2452	94.46	-	-	84.07	27.3	16.7	33.61	111	322	A	H
		2484.72	61.26	-12.74	74	50.82	27.3	16.74	33.6	111	322	P	H
		2485.2	52.65	-1.35	54	42.21	27.3	16.74	33.6	111	322	A	H
		2338.96	54.27	-19.73	74	43.7	27.64	16.58	33.65	335	23	P	V
		2346.96	43.45	-10.55	54	32.9	27.61	16.59	33.65	335	23	A	V
	*	2452	101.64	-	-	91.25	27.3	16.7	33.61	335	23	P	V
	*	2452	93.99	-	-	83.6	27.3	16.7	33.61	335	23	A	V
		2484.96	60.46	-13.54	74	50.02	27.3	16.74	33.6	335	23	P	V
		2485.76	52.16	-1.84	54	41.72	27.3	16.74	33.6	335	23	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		4844	36.47	-37.53	74	53.51	31.1	11.03	59.17	100	0	P	H
		7266	41.08	-32.92	74	50.11	36.43	13.73	59.19	100	0	P	H
													H
													H
		4844	36.67	-37.33	74	53.71	31.1	11.03	59.17	100	0	P	V
		7266	40.4	-33.6	74	49.43	36.43	13.73	59.19	100	0	P	V
													V
													V
802.11n HT40 CH 06 2437MHz		4874	37.32	-36.68	74	54.38	31.05	11.06	59.17	100	0	P	H
		7311	41.22	-32.78	74	50.22	36.52	13.66	59.18	100	0	P	H
													H
													H
		4874	36.77	-37.23	74	53.83	31.05	11.06	59.17	100	0	P	V
		7311	40.97	-33.03	74	49.97	36.52	13.66	59.18	100	0	P	V
													V
													V
802.11n HT40 CH 09 2452MHz		4904	36.68	-37.32	74	53.77	31.02	11.07	59.18	100	0	P	H
		7356	40.87	-33.13	74	49.84	36.58	13.61	59.16	100	0	P	H
													H
													H
		4904	37.73	-36.27	74	54.82	31.02	11.07	59.18	100	0	P	V
		7356	40.83	-33.17	74	49.8	36.58	13.61	59.16	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11b CH 01 2412MHz		2389.065	55.64	-18.36	74	45.19	27.44	16.64	33.63	100	245	P	H	
		2389.065	46	-8	54	35.55	27.44	16.64	33.63	100	245	A	H	
	*	2412	112.43	-	-	102.01	27.38	16.66	33.62	100	245	P	H	
	*	2412	108.98	-	-	98.56	27.38	16.66	33.62	100	245	A	H	
													H	
														H
			2389.59	53.9	-20.1	74	43.45	27.44	16.64	33.63	285	239	P	V
			2389.065	43.85	-10.15	54	33.4	27.44	16.64	33.63	285	239	A	V
	*		2412	108.03	-	-	97.61	27.38	16.66	33.62	285	239	P	V
	*		2412	104.91	-	-	94.49	27.38	16.66	33.62	285	239	A	V
														V
														V
802.11b CH 06 2437MHz		2387.92	54.45	-19.55	74	43.99	27.45	16.64	33.63	136	262	P	H	
		2388.72	42.6	-11.4	54	32.14	27.45	16.64	33.63	136	262	A	H	
	*	2437	115.9	-	-	105.49	27.33	16.69	33.61	136	262	P	H	
	*	2437	112.66	-	-	102.25	27.33	16.69	33.61	136	262	A	H	
			2487.04	53.02	-20.98	74	42.57	27.3	16.74	33.59	136	262	P	H
			2484	42.99	-11.01	54	32.55	27.3	16.74	33.6	136	262	A	H
			2315.6	52.61	-21.39	74	41.98	27.74	16.55	33.66	250	211	P	V
			2390	42.11	-11.89	54	31.66	27.44	16.64	33.63	250	211	A	V
	*		2437	113.53	-	-	103.12	27.33	16.69	33.61	250	211	P	V
	*		2437	110.35	-	-	99.94	27.33	16.69	33.61	250	211	A	V
			2485.84	52.85	-21.15	74	42.41	27.3	16.74	33.6	250	211	P	V
			2484	42.46	-11.54	54	32.02	27.3	16.74	33.6	250	211	A	V



802.11b CH 11 2462MHz	*	2462	115.61	-	-	105.19	27.3	16.72	33.6	100	257	P	H
	*	2462	112.25	-	-	101.83	27.3	16.72	33.6	100	257	A	H
		2484.84	60.15	-13.85	74	49.71	27.3	16.74	33.6	100	257	P	H
		2483.52	51.52	-2.48	54	41.08	27.3	16.74	33.6	100	257	A	H
													H
													H
	*	2462	114.13	-	-	103.71	27.3	16.72	33.6	282	218	P	V
	*	2462	110.89	-	-	100.47	27.3	16.72	33.6	282	218	A	V
		2485.08	57.26	-16.74	74	46.82	27.3	16.74	33.6	282	218	P	V
		2483.52	49.64	-4.36	54	39.2	27.3	16.74	33.6	282	218	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11b CH 01 2412MHz		4824	40.78	-33.22	74	57.82	31.1	11.02	59.16	100	0	P	H	
													H	
													H	
													H	
			4824	40.07	-33.93	74	57.11	31.1	11.02	59.16	100	0	P	V
														V
														V
802.11b CH 06 2437MHz		4874	38.16	-35.84	74	55.22	31.05	11.06	59.17	100	0	P	H	
		7311	42.34	-31.66	74	51.34	36.52	13.66	59.18	100	0	P	H	
													H	
													H	
			4874	38.83	-35.17	74	55.89	31.05	11.06	59.17	100	0	P	V
			7311	43.86	-30.14	74	52.86	36.52	13.66	59.18	100	0	P	V
														V
802.11b CH 11 2462MHz		4924	40.17	-33.83	74	57.12	31.14	11.09	59.18	100	0	P	H	
		7386	41.16	-32.84	74	50.27	36.46	13.58	59.15	100	0	P	H	
													H	
													H	
			4924	41.57	-32.43	74	58.52	31.14	11.09	59.18	100	0	P	V
			7386	43.64	-30.36	74	52.75	36.46	13.58	59.15	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



**2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11g CH 01 2412MHz		2389.905	62.14	-11.86	74	51.69	27.44	16.64	33.63	108	254	P	H	
		2390	52.41	-1.59	54	41.96	27.44	16.64	33.63	108	254	A	H	
	*	2412	109.6	-	-	99.18	27.38	16.66	33.62	108	254	P	H	
	*	2412	101.54	-	-	91.12	27.38	16.66	33.62	108	254	A	H	
													H	
														H
			2389.8	59.12	-14.88	74	48.67	27.44	16.64	33.63	399	162	P	V
			2390	48.28	-5.72	54	37.83	27.44	16.64	33.63	399	162	A	V
	*		2412	106.96	-	-	96.54	27.38	16.66	33.62	399	162	P	V
	*		2412	98.79	-	-	88.37	27.38	16.66	33.62	399	162	A	V
														V
														V
802.11g CH 06 2437MHz		2387.92	57.35	-16.65	74	46.89	27.45	16.64	33.63	100	257	P	H	
		2389.2	47.84	-6.16	54	37.39	27.44	16.64	33.63	100	257	A	H	
	*	2437	116.62	-	-	106.21	27.33	16.69	33.61	100	257	P	H	
	*	2437	108.87	-	-	98.46	27.33	16.69	33.61	100	257	A	H	
			2486.88	57.78	-16.22	74	47.33	27.3	16.74	33.59	100	257	P	H
			2484.24	48.12	-5.88	54	37.68	27.3	16.74	33.6	100	257	A	H
			2328.4	53.42	-20.58	74	42.81	27.69	16.57	33.65	240	130	P	V
			2390	44.64	-9.36	54	34.19	27.44	16.64	33.63	240	130	A	V
	*		2437	112.66	-	-	102.25	27.33	16.69	33.61	240	130	P	V
	*		2437	104.9	-	-	94.49	27.33	16.69	33.61	240	130	A	V
			2484.48	55.57	-18.43	74	45.13	27.3	16.74	33.6	240	130	P	V
			2483.6	45.47	-8.53	54	35.03	27.3	16.74	33.6	240	130	A	V



802.11g CH 11 2462MHz	*	2462	112.97	-	-	102.55	27.3	16.72	33.6	107	260	P	H
	*	2462	105.05	-	-	94.63	27.3	16.72	33.6	107	260	A	H
		2483.65	65.4	-8.6	74	54.96	27.3	16.74	33.6	107	260	P	H
		2483.55	52.62	-1.38	54	42.18	27.3	16.74	33.6	107	260	A	H
													H
													H
	*	2462	109.14	-	-	98.72	27.3	16.72	33.6	235	129	P	V
	*	2462	101.27	-	-	90.85	27.3	16.72	33.6	235	129	A	V
		2486.95	60.96	-13.04	74	50.51	27.3	16.74	33.59	235	129	P	V
		2484	49.21	-4.79	54	38.77	27.3	16.74	33.6	235	129	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11g CH 01 2412MHz		4824	37.07	-36.93	74	54.11	31.1	11.02	59.16	100	0	P	H	
													H	
													H	
													H	
			4824	36.95	-37.05	74	53.99	31.1	11.02	59.16	100	0	P	V
														V
														V
802.11g CH 06 2437MHz		4874	37.21	-36.79	74	54.27	31.05	11.06	59.17	100	0	P	H	
		7311	41.09	-32.91	74	50.09	36.52	13.66	59.18	100	0	P	H	
													H	
													H	
			4874	36.61	-37.39	74	53.67	31.05	11.06	59.17	100	0	P	V
			7311	41.48	-32.52	74	50.48	36.52	13.66	59.18	100	0	P	V
														V
802.11g CH 11 2462MHz		4924	38.07	-35.93	74	55.02	31.14	11.09	59.18	100	0	P	H	
		7386	40.51	-33.49	74	49.62	36.46	13.58	59.15	100	0	P	H	
													H	
													H	
			4924	38.13	-35.87	74	55.08	31.14	11.09	59.18	100	0	P	V
			7386	39.98	-34.02	74	49.09	36.46	13.58	59.15	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 01 2412MHz		2388.96	60.51	-13.49	74	50.06	27.44	16.64	33.63	110	261	P	H	
		2390	51.01	-2.99	54	40.56	27.44	16.64	33.63	110	261	A	H	
	*	2412	108.6	-	-	98.18	27.38	16.66	33.62	110	261	P	H	
	*	2412	100.76	-	-	90.34	27.38	16.66	33.62	110	261	A	H	
													H	
														H
			2389.59	60.68	-13.32	74	50.23	27.44	16.64	33.63	248	230	P	V
			2390	49.6	-4.4	54	39.15	27.44	16.64	33.63	248	230	A	V
		*	2412	106.61	-	-	96.19	27.38	16.66	33.62	248	230	P	V
		*	2412	99.22	-	-	88.8	27.38	16.66	33.62	248	230	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2389.04	56.23	-17.77	74	45.78	27.44	16.64	33.63	100	262	P	H	
		2390	47.31	-6.69	54	36.86	27.44	16.64	33.63	100	262	A	H	
	*	2437	116.62	-	-	106.21	27.33	16.69	33.61	100	262	P	H	
	*	2437	108.29	-	-	97.88	27.33	16.69	33.61	100	262	A	H	
			2485.12	58.44	-15.56	74	48	27.3	16.74	33.6	100	262	P	H
			2484.08	48.01	-5.99	54	37.57	27.3	16.74	33.6	100	262	A	H
			2389.52	53.28	-20.72	74	42.83	27.44	16.64	33.63	211	238	P	V
			2389.68	45.2	-8.8	54	34.75	27.44	16.64	33.63	211	238	A	V
		*	2437	113.04	-	-	102.63	27.33	16.69	33.61	211	238	P	V
		*	2437	105.59	-	-	95.18	27.33	16.69	33.61	211	238	A	V
		2485.84	55.86	-18.14	74	45.42	27.3	16.74	33.6	211	238	P	V	
		2483.6	45.92	-8.08	54	35.48	27.3	16.74	33.6	211	238	A	V	



802.11n HT20 CH 11 2462MHz	*	2462	111.22	-	-	100.8	27.3	16.72	33.6	129	259	P	H
	*	2462	103.11	-	-	92.69	27.3	16.72	33.6	129	259	A	H
		2483.84	65.93	-8.07	74	55.49	27.3	16.74	33.6	129	259	P	H
		2484.24	51.31	-2.69	54	40.87	27.3	16.74	33.6	129	259	A	H
													H
													H
	*	2462	108.69	-	-	98.27	27.3	16.72	33.6	341	173	P	V
	*	2462	100.65	-	-	90.23	27.3	16.72	33.6	341	173	A	V
		2483.52	60.47	-13.53	74	50.03	27.3	16.74	33.6	341	173	P	V
		2484.64	48.1	-5.9	54	37.66	27.3	16.74	33.6	341	173	A	V
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	36.15	-37.85	74	53.19	31.1	11.02	59.16	100	0	P	H
													H
													H
													H
		4824	36.46	-37.54	74	53.5	31.1	11.02	59.16	100	0	P	V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	36.92	-37.08	74	53.98	31.05	11.06	59.17	100	0	P	H
		7311	41.57	-32.43	74	50.57	36.52	13.66	59.18	100	0	P	H
													H
													H
		4874	36.81	-37.19	74	53.87	31.05	11.06	59.17	100	0	P	V
		7311	42.78	-31.22	74	51.78	36.52	13.66	59.18	100	0	P	V
													V
802.11n HT20 CH 11 2462MHz		4924	37.09	-36.91	74	54.04	31.14	11.09	59.18	100	0	P	H
		7386	40.58	-33.42	74	49.69	36.46	13.58	59.15	100	0	P	H
													H
													H
		4924	37.93	-36.07	74	54.88	31.14	11.09	59.18	100	0	P	V
		7386	40.03	-33.97	74	49.14	36.46	13.58	59.15	100	0	P	V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		2390	59.67	-14.33	74	49.22	27.44	16.64	33.63	140	255	P	H
		2389.84	52.43	-1.57	54	41.98	27.44	16.64	33.63	140	255	A	H
	*	2422	105.9	-	-	95.49	27.36	16.67	33.62	140	255	P	H
	*	2422	97.85	-	-	87.44	27.36	16.67	33.62	140	255	A	H
		2484.88	53.09	-20.91	74	42.65	27.3	16.74	33.6	140	255	P	H
		2485.84	44.07	-9.93	54	33.63	27.3	16.74	33.6	140	255	A	H
		2389.2	54.65	-19.35	74	44.2	27.44	16.64	33.63	391	162	P	V
		2390	46.48	-7.52	54	36.03	27.44	16.64	33.63	391	162	A	V
	*	2422	102.92	-	-	92.51	27.36	16.67	33.62	391	162	P	V
	*	2422	95.13	-	-	84.72	27.36	16.67	33.62	391	162	A	V
802.11n HT40 CH 06 2437MHz		2389.68	62.36	-11.64	74	51.91	27.44	16.64	33.63	108	258	P	H
		2390	51.4	-2.6	54	40.95	27.44	16.64	33.63	108	258	A	H
	*	2437	108.12	-	-	97.71	27.33	16.69	33.61	108	258	P	H
	*	2437	100.35	-	-	89.94	27.33	16.69	33.61	108	258	A	H
		2484.88	59.03	-14.97	74	48.59	27.3	16.74	33.6	108	258	P	H
		2483.6	50.08	-3.92	54	39.64	27.3	16.74	33.6	108	258	A	H
		2390	56.93	-17.07	74	46.48	27.44	16.64	33.63	393	164	P	V
		2389.84	47.26	-6.74	54	36.81	27.44	16.64	33.63	393	164	A	V
	*	2437	105.69	-	-	95.28	27.33	16.69	33.61	393	164	P	V
	*	2437	97.95	-	-	87.54	27.33	16.69	33.61	393	164	A	V
	2484.24	56.62	-17.38	74	46.18	27.3	16.74	33.6	393	164	P	V	
	2484.08	47.88	-6.12	54	37.44	27.3	16.74	33.6	393	164	A	V	



802.11n HT40 CH 09 2452MHz		2387.28	54.75	-19.25	74	44.29	27.45	16.64	33.63	106	258	P	H
		2390	46.01	-7.99	54	35.56	27.44	16.64	33.63	106	258	A	H
	*	2452	108.8	-	-	98.41	27.3	16.7	33.61	106	258	P	H
	*	2452	101.21	-	-	90.82	27.3	16.7	33.61	106	258	A	H
		2484.64	61.41	-12.59	74	50.97	27.3	16.74	33.6	106	258	P	H
		2484.56	52.8	-1.2	54	42.36	27.3	16.74	33.6	106	258	P	H
		2390	53.1	-20.9	74	42.65	27.44	16.64	33.63	340	166	P	V
		2388.4	44.23	-9.77	54	33.77	27.45	16.64	33.63	340	166	A	V
	*	2452	106.45	-	-	96.06	27.3	16.7	33.61	340	166	P	V
	*	2452	99.24	-	-	88.85	27.3	16.7	33.61	340	166	A	V
		2485.36	58.47	-15.53	74	48.03	27.3	16.74	33.6	340	166	P	V
		2484.72	50.12	-3.88	54	39.68	27.3	16.74	33.6	340	166	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		4844	36.88	-37.12	74	53.92	31.1	11.03	59.17	100	0	P	H
		7266	40.09	-33.91	74	49.12	36.43	13.73	59.19	100	0	P	H
													H
													H
		4844	37.31	-36.69	74	54.35	31.1	11.03	59.17	100	0	P	V
		7266	40.93	-33.07	74	49.96	36.43	13.73	59.19	100	0	P	V
													V
													V
802.11n HT40 CH 06 2437MHz		4874	37.32	-36.68	74	54.38	31.05	11.06	59.17	100	0	P	H
		7311	41.02	-32.98	74	50.02	36.52	13.66	59.18	100	0	P	H
													H
													H
		4874	37.45	-36.55	74	54.51	31.05	11.06	59.17	100	0	P	V
		7311	40.75	-33.25	74	49.75	36.52	13.66	59.18	100	0	P	V
													V
													V
802.11n HT40 CH 09 2452MHz		4904	37	-37	74	54.09	31.02	11.07	59.18	100	0	P	H
		7356	41.27	-32.73	74	50.24	36.58	13.61	59.16	100	0	P	H
													H
													H
		4904	37.21	-36.79	74	54.3	31.02	11.07	59.18	100	0	P	V
		7356	41.71	-32.29	74	50.68	36.58	13.61	59.16	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



<CDD Mode>

2.4GHz 2400~2483.5MHz
WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11b CH 01 2412MHz		2388.33	58.29	-15.71	74	47.83	27.45	16.64	33.63	107	256	P	H	
		2389.485	48.92	-5.08	54	38.47	27.44	16.64	33.63	107	256	A	H	
	*	2412	118.5	-	-	108.08	27.38	16.66	33.62	107	256	P	H	
	*	2412	115.56	-	-	105.14	27.38	16.66	33.62	107	256	A	H	
													H	
														H
			2387.595	54.37	-19.63	74	43.91	27.45	16.64	33.63	398	173	P	V
			2387.91	46.42	-7.58	54	35.96	27.45	16.64	33.63	398	173	A	V
	*		2412	112.56	-	-	102.14	27.38	16.66	33.62	398	173	P	V
	*		2412	109.48	-	-	99.06	27.38	16.66	33.62	398	173	A	V
														V
														V
802.11b CH 06 2437MHz		2383.28	53.29	-20.71	74	42.82	27.47	16.63	33.63	100	264	P	H	
		2388.24	43.13	-10.87	54	32.67	27.45	16.64	33.63	100	264	A	H	
	*	2437	117.85	-	-	107.44	27.33	16.69	33.61	100	264	P	H	
	*	2437	114.57	-	-	104.16	27.33	16.69	33.61	100	264	A	H	
			2484.4	53.25	-20.75	74	42.81	27.3	16.74	33.6	100	264	P	H
			2485.2	42.48	-11.52	54	32.04	27.3	16.74	33.6	100	264	A	H
			2315.12	52.5	-21.5	74	41.87	27.74	16.55	33.66	395	176	P	V
			2387.92	42.11	-11.89	54	31.65	27.45	16.64	33.63	395	176	A	V
	*		2437	113.42	-	-	103.01	27.33	16.69	33.61	395	176	P	V
	*		2437	110.4	-	-	99.99	27.33	16.69	33.61	395	176	A	V
			2485.36	52.4	-21.6	74	41.96	27.3	16.74	33.6	395	176	P	V
			2484.48	42.03	-11.97	54	31.59	27.3	16.74	33.6	395	176	A	V



802.11b CH 11 2462MHz	*	2462	117.5	-	-	107.08	27.3	16.72	33.6	106	255	P	H
	*	2462	114.6	-	-	104.18	27.3	16.72	33.6	106	255	A	H
		2483.68	59.44	-14.56	74	49	27.3	16.74	33.6	106	255	P	H
		2484.72	49.57	-4.43	54	39.13	27.3	16.74	33.6	106	255	A	H
													H
													H
	*	2462	113.02	-	-	102.6	27.3	16.72	33.6	397	167	P	V
	*	2462	109.94	-	-	99.52	27.3	16.72	33.6	397	167	A	V
		2483.52	55.37	-18.63	74	44.93	27.3	16.74	33.6	397	167	P	V
		2483.52	48.28	-5.72	54	37.84	27.3	16.74	33.6	397	167	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11b CH 01 2412MHz		4824	41.12	-32.88	74	58.16	31.1	11.02	59.16	100	0	P	H	
													H	
													H	
													H	
			4824	40.54	-33.46	74	57.58	31.1	11.02	59.16	100	0	P	V
														V
														V
802.11b CH 06 2437MHz		4874	37.71	-36.29	74	54.77	31.05	11.06	59.17	100	0	P	H	
		7311	42.32	-31.68	74	51.32	36.52	13.66	59.18	100	0	P	H	
													H	
													H	
			4874	39.08	-34.92	74	56.14	31.05	11.06	59.17	100	0	P	V
			7311	42.63	-31.37	74	51.63	36.52	13.66	59.18	100	0	P	V
														V
802.11b CH 11 2462MHz		4924	41.24	-32.76	74	58.19	31.14	11.09	59.18	100	0	P	H	
		7386	41.47	-32.53	74	50.58	36.46	13.58	59.15	100	0	P	H	
													H	
													H	
			4924	41.77	-32.23	74	58.72	31.14	11.09	59.18	100	0	P	V
			7386	43.14	-30.86	74	52.25	36.46	13.58	59.15	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



**2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11g CH 01 2412MHz		2389.905	62.5	-11.5	74	52.05	27.44	16.64	33.63	106	255	P	H	
		2390	52.49	-1.51	54	42.04	27.44	16.64	33.63	106	255	A	H	
	*	2412	112.68	-	-	102.26	27.38	16.66	33.62	106	255	P	H	
	*	2412	104.48	-	-	94.06	27.38	16.66	33.62	106	255	A	H	
													H	
														H
			2389.8	54.75	-19.25	74	44.3	27.44	16.64	33.63	396	156	P	V
			2390	44.78	-9.22	54	34.33	27.44	16.64	33.63	396	156	A	V
	*		2412	108.63	-	-	98.21	27.38	16.66	33.62	396	156	P	V
	*		2412	100.99	-	-	90.57	27.38	16.66	33.62	396	156	A	V
														V
														V
802.11g CH 06 2437MHz		2389.68	57.09	-16.91	74	46.64	27.44	16.64	33.63	133	252	P	H	
		2390	47.86	-6.14	54	37.41	27.44	16.64	33.63	133	252	A	H	
	*	2437	118.51	-	-	108.1	27.33	16.69	33.61	133	252	P	H	
	*	2437	110.97	-	-	100.56	27.33	16.69	33.61	133	252	A	H	
			2485.04	56.39	-17.61	74	45.95	27.3	16.74	33.6	133	252	P	H
			2484	47.22	-6.78	54	36.78	27.3	16.74	33.6	133	252	A	H
			2388.56	52.64	-21.36	74	42.18	27.45	16.64	33.63	388	164	P	V
			2389.84	43.61	-10.39	54	33.16	27.44	16.64	33.63	388	164	A	V
	*		2437	114.78	-	-	104.37	27.33	16.69	33.61	388	164	P	V
	*		2437	107.57	-	-	97.16	27.33	16.69	33.61	388	164	A	V
			2484.16	54.67	-19.33	74	44.23	27.3	16.74	33.6	388	164	P	V
			2483.92	45.52	-8.48	54	35.08	27.3	16.74	33.6	388	164	A	V



802.11g CH 11 2462MHz	*	2462	114.63	-	-	104.21	27.3	16.72	33.6	106	253	P	H
	*	2462	106.94	-	-	96.52	27.3	16.72	33.6	106	253	A	H
		2484.36	63.56	-10.44	74	53.12	27.3	16.74	33.6	106	253	P	H
		2483.52	52.58	-1.42	54	42.14	27.3	16.74	33.6	106	253	A	H
													H
													H
	*	2462	110.31	-	-	99.89	27.3	16.72	33.6	331	164	P	V
	*	2462	102.52	-	-	92.1	27.3	16.72	33.6	331	164	P	V
		2484.52	61.18	-12.82	74	50.74	27.3	16.74	33.6	331	164	P	V
		2484.04	49.24	-4.76	54	38.8	27.3	16.74	33.6	331	164	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Harmonic @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11g CH 01 2412MHz		4824	38.8	-35.2	74	55.84	31.1	11.02	59.16	100	0	P	H	
													H	
													H	
													H	
			4824	38.02	-35.98	74	55.06	31.1	11.02	59.16	100	0	P	V
														V
														V
802.11g CH 06 2437MHz		4874	37.06	-36.94	74	54.12	31.05	11.06	59.17	100	0	P	H	
		7311	41.38	-32.62	74	50.38	36.52	13.66	59.18	100	0	P	H	
													H	
													H	
			4874	37.53	-36.47	74	54.59	31.05	11.06	59.17	100	0	P	V
			7311	42.17	-31.83	74	51.17	36.52	13.66	59.18	100	0	P	V
														V
802.11g CH 11 2462MHz		4924	37.67	-36.33	74	54.62	31.14	11.09	59.18	100	0	P	H	
		7386	40.74	-33.26	74	49.85	36.46	13.58	59.15	100	0	P	H	
													H	
													H	
			4924	37.9	-36.1	74	54.85	31.14	11.09	59.18	100	0	P	V
			7386	40.96	-33.04	74	50.07	36.46	13.58	59.15	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11n HT20 CH 01 2412MHz		2389.8	63.36	-10.64	74	52.91	27.44	16.64	33.63	110	257	P	H	
		2390	52.54	-1.46	54	42.09	27.44	16.64	33.63	110	257	A	H	
	*	2412	110.67	-	-	100.25	27.38	16.66	33.62	110	257	P	H	
	*	2412	102.4	-	-	91.98	27.38	16.66	33.62	110	257	A	H	
													H	
													H	
			2390	55.43	-18.57	74	44.98	27.44	16.64	33.63	396	154	P	V
			2390	45.99	-8.01	54	35.54	27.44	16.64	33.63	396	154	A	V
		*	2412	108.54	-	-	98.12	27.38	16.66	33.62	396	154	P	V
		*	2412	100.17	-	-	89.75	27.38	16.66	33.62	396	154	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2389.84	58.07	-15.93	74	47.62	27.44	16.64	33.63	107	253	P	H	
		2389.68	48.56	-5.44	54	38.11	27.44	16.64	33.63	107	253	A	H	
	*	2437	118.13	-	-	107.72	27.33	16.69	33.61	107	253	P	H	
	*	2437	110.45	-	-	100.04	27.33	16.69	33.61	107	253	A	H	
			2483.76	56.49	-17.51	74	46.05	27.3	16.74	33.6	107	253	P	H
			2483.92	47.18	-6.82	54	36.74	27.3	16.74	33.6	107	253	A	H
			2389.52	53.41	-20.59	74	42.96	27.44	16.64	33.63	385	152	P	V
			2389.84	43.22	-10.78	54	32.77	27.44	16.64	33.63	385	152	A	V
		*	2437	114.39	-	-	103.98	27.33	16.69	33.61	385	152	P	V
		*	2437	106.99	-	-	96.58	27.33	16.69	33.61	385	152	A	V
			2483.52	54.73	-19.27	74	44.29	27.3	16.74	385	152	P	V	
			2483.68	45.77	-8.23	54	35.33	27.3	16.74	385	152	A	V	



FCC RADIO TEST REPORT

Report No. : FR911641C

802.11n HT20 CH 11 2462MHz	*	2462	114.09	-	-	103.67	27.3	16.72	33.6	105	257	P	H
	*	2462	105.19	-	-	94.77	27.3	16.72	33.6	105	257	A	H
		2483.8	62.5	-11.5	74	52.06	27.3	16.74	33.6	105	257	P	H
		2483.76	52.74	-1.26	54	42.3	27.3	16.74	33.6	105	257	A	H
													H
													H
	*	2462	109.32	-	-	98.9	27.3	16.72	33.6	397	164	P	V
	*	2462	101.14	-	-	90.72	27.3	16.72	33.6	397	164	A	V
		2485.92	56.08	-17.92	74	45.64	27.3	16.74	33.6	397	164	P	V
		2484.52	45.74	-8.26	54	35.3	27.3	16.74	33.6	397	164	A	V
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	36.43	-37.57	74	53.47	31.1	11.02	59.16	100	0	P	H
													H
													H
													H
		4824	36.39	-37.61	74	53.43	31.1	11.02	59.16	100	0	P	V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	37.23	-36.77	74	54.29	31.05	11.06	59.17	100	0	P	H
		7311	40.97	-33.03	74	49.97	36.52	13.66	59.18	100	0	P	H
													H
													H
		4874	37.64	-36.36	74	54.7	31.05	11.06	59.17	100	0	P	V
		7311	41.26	-32.74	74	50.26	36.52	13.66	59.18	100	0	P	V
													V
802.11n HT20 CH 11 2462MHz		4924	36.89	-37.11	74	53.84	31.14	11.09	59.18	100	0	P	H
		7386	41.27	-32.73	74	50.38	36.46	13.58	59.15	100	0	P	H
													H
													H
		4924	36.94	-37.06	74	53.89	31.14	11.09	59.18	100	0	P	V
		7386	40.31	-33.69	74	49.42	36.46	13.58	59.15	100	0	P	V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		2389.2	59.38	-14.62	74	48.93	27.44	16.64	33.63	109	256	P	H
		2390	51.43	-2.57	54	40.98	27.44	16.64	33.63	109	256	A	H
	*	2422	108.03	-	-	97.62	27.36	16.67	33.62	109	256	P	H
	*	2422	99.99	-	-	89.58	27.36	16.67	33.62	109	256	A	H
		2495.12	52.22	-21.78	74	41.76	27.3	16.75	33.59	109	256	P	H
		2484.32	43.72	-10.28	54	33.28	27.3	16.74	33.6	109	256	A	H
		2385.68	54.04	-19.96	74	43.58	27.46	16.63	33.63	396	161	P	V
		2390	45.74	-8.26	54	35.29	27.44	16.64	33.63	396	161	A	V
	*	2422	103.32	-	-	92.91	27.36	16.67	33.62	396	161	P	V
	*	2422	95.54	-	-	85.13	27.36	16.67	33.62	396	161	A	V
	2494	52.8	-21.2	74	42.34	27.3	16.75	33.59	396	161	P	V	
	2488.56	43.13	-10.87	54	32.68	27.3	16.74	33.59	396	161	A	V	
802.11n HT40 CH 06 2437MHz		2389.68	64.65	-9.35	74	54.2	27.44	16.64	33.63	109	250	P	H
		2389.84	52.76	-1.24	54	42.31	27.44	16.64	33.63	109	250	P	H
	*	2437	112.35	-	-	101.94	27.33	16.69	33.61	109	250	P	H
	*	2437	104.1	-	-	93.69	27.33	16.69	33.61	109	250	A	H
		2485.92	58.84	-15.16	74	48.4	27.3	16.74	33.6	109	250	P	H
		2486	49.05	-4.95	54	38.61	27.3	16.74	33.6	109	250	A	H
		2389.84	54.43	-19.57	74	43.98	27.44	16.64	33.63	388	158	P	V
		2390	44.57	-9.43	54	34.12	27.44	16.64	33.63	388	158	A	V
	*	2437	107.75	-	-	97.34	27.33	16.69	33.61	388	158	P	V
	*	2437	99.59	-	-	89.18	27.33	16.69	33.61	388	158	A	V
	2483.84	57.87	-16.13	74	47.43	27.3	16.74	33.6	388	158	P	V	
	2483.76	48.95	-5.05	54	38.51	27.3	16.74	33.6	388	158	A	V	



802.11n HT40 CH 09 2452MHz		2388.08	52.8	-21.2	74	42.34	27.45	16.64	33.63	133	254	P	H
		2387.44	44.01	-9.99	54	33.55	27.45	16.64	33.63	133	254	A	H
	*	2452	107.65	-	-	97.26	27.3	16.7	33.61	133	254	P	H
	*	2452	100.23	-	-	89.84	27.3	16.7	33.61	133	254	A	H
		2484.64	60.62	-13.38	74	50.18	27.3	16.74	33.6	133	254	P	H
		2484.16	51.48	-2.52	54	41.04	27.3	16.74	33.6	133	254	A	H
		2327.92	52.78	-21.22	74	42.17	27.69	16.57	33.65	400	170	P	V
		2354.48	43.28	-10.72	54	32.74	27.58	16.6	33.64	400	170	A	V
	*	2452	103.2	-	-	92.81	27.3	16.7	33.61	400	170	P	V
	*	2452	95.71	-	-	85.32	27.3	16.7	33.61	400	170	A	V
		2486.4	54.45	-19.55	74	44	27.3	16.74	33.59	400	170	P	V
		2486.88	46.38	-7.62	54	35.93	27.3	16.74	33.59	400	170	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT40 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 03 2422MHz		4844	36.81	-37.19	74	53.85	31.1	11.03	59.17	100	0	P	H
		7266	40.67	-33.33	74	49.7	36.43	13.73	59.19	100	0	P	H
													H
													H
		4844	36.51	-37.49	74	53.55	31.1	11.03	59.17	100	0	P	V
		7266	40.85	-33.15	74	49.88	36.43	13.73	59.19	100	0	P	V
													V
802.11n HT40 CH 06 2437MHz		4874	37.48	-36.52	74	54.54	31.05	11.06	59.17	100	0	P	H
		7311	40.8	-33.2	74	49.8	36.52	13.66	59.18	100	0	P	H
													H
													H
		4874	37.15	-36.85	74	54.21	31.05	11.06	59.17	100	0	P	V
		7311	40.99	-33.01	74	49.99	36.52	13.66	59.18	100	0	P	V
													V
802.11n HT40 CH 09 2452MHz		4904	37.49	-36.51	74	54.58	31.02	11.07	59.18	100	0	P	H
		7356	41.58	-32.42	74	50.55	36.58	13.61	59.16	100	0	P	H
													H
													H
		4904	37.96	-36.04	74	55.05	31.02	11.07	59.18	100	0	P	V
		7356	40.58	-33.42	74	49.55	36.58	13.61	59.16	100	0	P	V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



<TXBF Mode>

2.4GHz 2400~2483.5MHz

WIFI 802.11ac VHT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11ac VHT20 CH 01 2412MHz		2389.905	63.21	-10.79	74	52.76	27.44	16.64	33.63	111	255	P	H	
		2389.905	51.66	-2.34	54	41.21	27.44	16.64	33.63	111	255	A	H	
	*	2412	112.22	-	-	101.8	27.38	16.66	33.62	111	255	P	H	
	*	2412	103.12	-	-	92.7	27.38	16.66	33.62	111	255	A	H	
													H	
														H
			2389.8	59.9	-14.1	74	49.45	27.44	16.64	33.63	356	144	P	V
			2390	50.75	-3.25	54	40.3	27.44	16.64	33.63	356	144	A	V
	*		2412	109.38	-	-	98.96	27.38	16.66	33.62	356	144	P	V
	*		2412	101.15	-	-	90.73	27.38	16.66	33.62	356	144	A	V
													V	
													V	
802.11ac VHT20 CH 06 2437MHz		2388.72	55.18	-18.82	74	44.72	27.45	16.64	33.63	111	257	P	H	
		2390	47.03	-6.97	54	36.58	27.44	16.64	33.63	111	257	A	H	
	*	2437	114.85	-	-	104.44	27.33	16.69	33.61	111	257	P	H	
	*	2437	106.74	-	-	96.33	27.33	16.69	33.61	111	257	A	H	
			2484	56.4	-17.6	74	45.96	27.3	16.74	33.6	111	257	P	H
			2483.68	45.89	-8.11	54	35.45	27.3	16.74	33.6	111	257	A	H
			2389.52	53.48	-20.52	74	43.03	27.44	16.64	33.63	387	161	P	V
			2390	43.02	-10.98	54	32.57	27.44	16.64	33.63	387	161	A	V
	*		2437	112.42	-	-	102.01	27.33	16.69	33.61	387	161	P	V
	*		2437	103.96	-	-	93.55	27.33	16.69	33.61	387	161	A	V
		2483.92	53.28	-20.72	74	42.84	27.3	16.74	33.6	387	161	P	V	
		2483.68	43.32	-10.68	54	32.88	27.3	16.74	33.6	387	161	A	V	



802.11ac VHT20 CH 11 2462MHz	*	2462	110.78	-	-	100.36	27.3	16.72	33.6	107	255	P	H
	*	2462	102.75	-	-	92.33	27.3	16.72	33.6	107	255	A	H
		2483.8	63.21	-10.79	74	52.77	27.3	16.74	33.6	107	255	P	H
		2483.56	52.59	-1.41	54	42.15	27.3	16.74	33.6	107	255	A	H
													H
													H
	*	2462	106.82	-	-	96.4	27.3	16.72	33.6	380	157	P	V
	*	2462	99.16	-	-	88.74	27.3	16.72	33.6	380	157	A	V
		2483.52	59.83	-14.17	74	49.39	27.3	16.74	33.6	380	157	P	V
		2483.64	48.47	-5.53	54	38.03	27.3	16.74	33.6	380	157	A	V
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11ac VHT20 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11ac VHT20 CH 01 2412MHz		4824	37.55	-36.45	74	54.59	31.1	11.02	59.16	100	0	P	H	
													H	
													H	
													H	
			4824	36.71	-37.29	74	53.75	31.1	11.02	59.16	100	0	P	V
														V
														V
802.11ac VHT20 CH 06 2437MHz		4874	36.77	-37.23	74	53.83	31.05	11.06	59.17	100	0	P	H	
		7311	40.79	-33.21	74	49.79	36.52	13.66	59.18	100	0	P	H	
													H	
													H	
			4874	36.91	-37.09	74	53.97	31.05	11.06	59.17	100	0	P	V
			7311	41.39	-32.61	74	50.39	36.52	13.66	59.18	100	0	P	V
														V
802.11ac VHT20 CH 11 2462MHz		4924	37.19	-36.81	74	54.14	31.14	11.09	59.18	100	0	P	H	
		7386	40.28	-33.72	74	49.39	36.46	13.58	59.15	100	0	P	H	
													H	
													H	
			4924	36.8	-37.2	74	53.75	31.14	11.09	59.18	100	0	P	V
			7386	40.1	-33.9	74	49.21	36.46	13.58	59.15	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



**2.4GHz 2400~2483.5MHz
WIFI 802.11ac VHT40 (Band Edge @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT40 CH 03 2422MHz		2390	60.05	-13.95	74	49.6	27.44	16.64	33.63	100	236	P	H
		2389.36	51.4	-2.6	54	40.95	27.44	16.64	33.63	100	236	A	H
	*	2422	106.65	-	-	96.24	27.36	16.67	33.62	100	236	P	H
	*	2422	97.67	-	-	87.26	27.36	16.67	33.62	100	236	A	H
		2484.32	52.96	-21.04	74	42.52	27.3	16.74	33.6	100	236	P	H
		2484	42.87	-11.13	54	32.43	27.3	16.74	33.6	100	236	A	H
		2390	58.04	-15.96	74	47.59	27.44	16.64	33.63	400	121	P	V
		2390	48.25	-5.75	54	37.8	27.44	16.64	33.63	400	121	A	V
	*	2422	103.66	-	-	93.25	27.36	16.67	33.62	400	121	P	V
	*	2422	94.11	-	-	83.7	27.36	16.67	33.62	400	121	A	V
802.11ac VHT40 CH 06 2437MHz		2388.72	62.83	-11.17	74	52.37	27.45	16.64	33.63	114	223	P	H
		2390	52.73	-1.27	54	42.28	27.44	16.64	33.63	114	223	A	H
	*	2437	110.26	-	-	99.85	27.33	16.69	33.61	114	223	P	H
	*	2437	101.47	-	-	91.06	27.33	16.69	33.61	114	223	A	H
		2483.84	63.43	-10.57	74	52.99	27.3	16.74	33.6	114	223	P	H
		2483.6	51.86	-2.14	54	41.42	27.3	16.74	33.6	114	223	A	H
		2389.2	60.54	-13.46	74	50.09	27.44	16.64	33.63	388	165	P	V
		2390	49.18	-4.82	54	38.73	27.44	16.64	33.63	388	165	A	V
	*	2437	110.05	-	-	99.64	27.33	16.69	33.61	388	165	P	V
	*	2437	99.61	-	-	89.2	27.33	16.69	33.61	388	165	A	V
	2484.56	60.05	-13.95	74	49.61	27.3	16.74	33.6	388	165	P	V	
	2483.92	49.29	-4.71	54	38.85	27.3	16.74	33.6	388	165	A	V	



802.11ac VHT40 CH 09 2452MHz		2389.2	53.92	-20.08	74	43.47	27.44	16.64	33.63	100	261	P	H
		2389.84	44.35	-9.65	54	33.9	27.44	16.64	33.63	100	261	A	H
	*	2452	108.48	-	-	98.09	27.3	16.7	33.61	100	261	P	H
	*	2452	99.76	-	-	89.37	27.3	16.7	33.61	100	261	A	H
		2484.08	61.24	-12.76	74	50.8	27.3	16.74	33.6	100	261	P	H
		2483.6	51.75	-2.25	54	41.31	27.3	16.74	33.6	100	261	A	H
		2351.28	52.58	-21.42	74	42.04	27.59	16.59	33.64	373	154	P	V
		2389.04	41.78	-12.22	54	31.33	27.44	16.64	33.63	373	154	A	V
	*	2452	104.23	-	-	93.84	27.3	16.7	33.61	373	154	P	V
	*	2452	96.11	-	-	85.72	27.3	16.7	33.61	373	154	A	V
		2483.6	62.33	-11.67	74	51.89	27.3	16.74	33.6	373	154	P	V
	2483.84	49.82	-4.18	54	39.38	27.3	16.74	33.6	373	154	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11ac VHT40 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT40 CH 03 2422MHz		4844	36.82	-37.18	74	53.86	31.1	11.03	59.17	100	0	P	H
		7266	40.35	-33.65	74	49.38	36.43	13.73	59.19	100	0	P	H
													H
													H
		4844	35.91	-38.09	74	52.95	31.1	11.03	59.17	100	0	P	V
		7266	40.8	-33.2	74	49.83	36.43	13.73	59.19	100	0	P	V
													V
802.11ac VHT40 CH 06 2437MHz		4874	37.3	-36.7	74	54.36	31.05	11.06	59.17	100	0	P	H
		7311	40.45	-33.55	74	49.45	36.52	13.66	59.18	100	0	P	H
													H
													H
		4874	36.75	-37.25	74	53.81	31.05	11.06	59.17	100	0	P	V
		7311	40.61	-33.39	74	49.61	36.52	13.66	59.18	100	0	P	V
													V
802.11ac VHT40 CH 09 2452MHz		4904	37.17	-36.83	74	54.26	31.02	11.07	59.18	100	0	P	H
		7356	40.75	-33.25	74	49.72	36.58	13.61	59.16	100	0	P	H
													H
													H
		4904	37.47	-36.53	74	54.56	31.02	11.07	59.18	100	0	P	V
		7356	41.9	-32.1	74	50.87	36.58	13.61	59.16	100	0	P	V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz
2.4GHz WIFI 802.11ac VHT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz 802.11ac VHT20 LF		106.63	28.95	-14.55	43.5	43.32	16.56	1.38	32.31	-	-	P	H	
		108.57	31.05	-12.45	43.5	45.27	16.69	1.4	32.31	-	-	P	H	
		178.41	26.31	-17.19	43.5	41.8	14.88	1.89	32.26	-	-	P	H	
		921.43	32.45	-13.55	46	30.19	29.17	4.24	31.15	-	-	P	H	
		940.83	33.84	-12.16	46	30.52	30	4.29	30.97	100	0	P	H	
		955.38	33.71	-12.29	46	29.42	30.81	4.32	30.84	-	-	P	H	
														H
														H
														H
														H
														H
														H
			34.85	30.1	-9.9	40	39.78	21.88	0.81	32.37	-	-	P	V
			42.61	33.38	-6.62	40	47.13	17.75	0.87	32.37	100	0	P	V
			53.28	32.2	-7.8	40	50.88	12.72	0.97	32.37	-	-	P	V
			949.56	32.83	-13.17	46	28.86	30.55	4.31	30.89	-	-	P	V
			954.41	33.46	-12.54	46	29.22	30.77	4.32	30.85	-	-	P	V
			958.29	33.97	-12.03	46	29.51	30.93	4.34	30.81	-	-	P	V
													V	
													V	
													V	
													V	
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.													



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBµV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBµV/m) – Limit Line(dBµV/m)

For Peak Limit @ 2390MHz:

1. Level(dBµV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBµV) – 35.86 (dB)
= 55.45 (dBµV/m)
2. Over Limit(dB)
= Level(dBµV/m) – Limit Line(dBµV/m)
= 55.45(dBµV/m) – 74(dBµV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBµV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBµV) – 35.86 (dB)
= 43.54 (dBµV/m)
2. Over Limit(dB)
= Level(dBµV/m) – Limit Line(dBµV/m)
= 43.54(dBµV/m) – 54(dBµV/m)
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix C. Radiated Spurious Emission Plots

Test Engineer :	Hao Hsu, Fu Chen and Troye Hsieh	Temperature :	21~26°C
		Relative Humidity :	50.2~67.6%

Note symbol

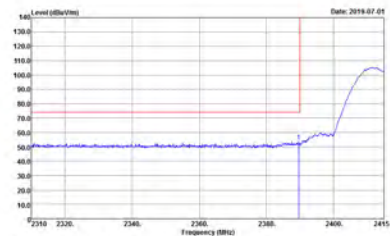
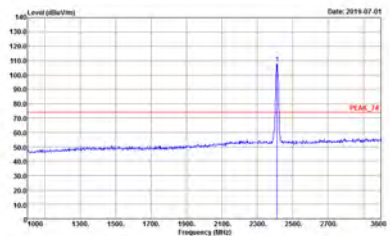
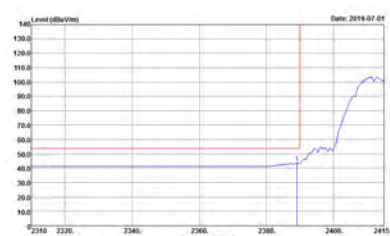
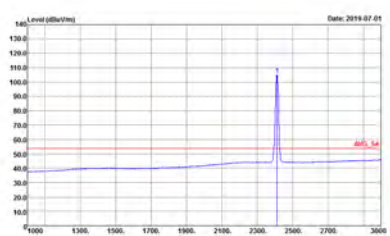
-L	Low channel location
-R	High channel location



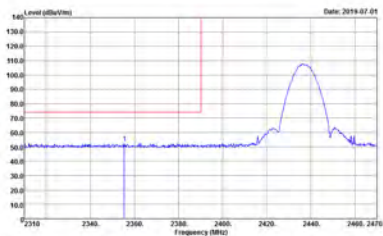
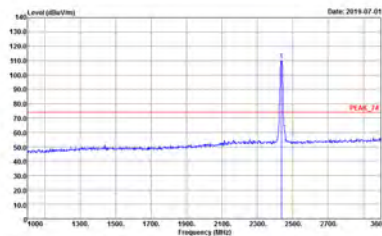
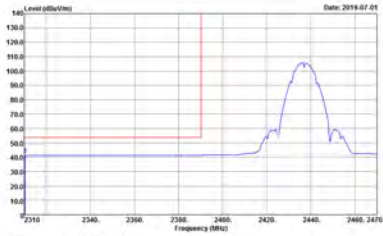
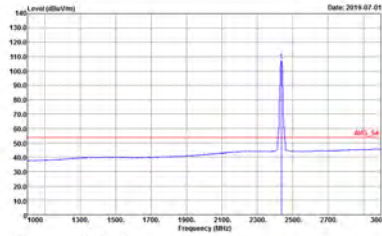
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH11-FY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:3000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>	<p>Site : 03CH11-FY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL RBW:3000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>
Avg.	<p>Site : 03CH11-FY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>	<p>Site : 03CH11-FY Condition : AVG_54 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>

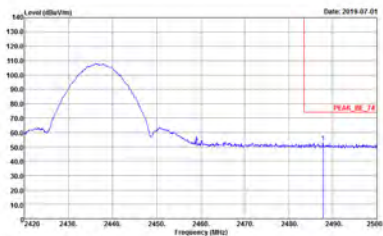
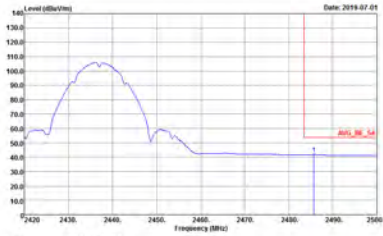


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH11-FY Condition : PEAK_36_74 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>	 <p>Site : 03CH11-FY Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>
Avg.	 <p>Site : 03CH11-FY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>	 <p>Site : 03CH11-FY Condition : AVG_54 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>

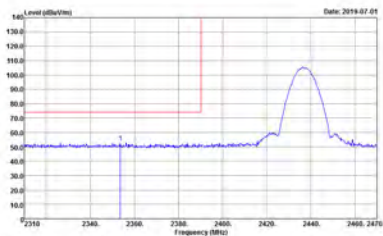
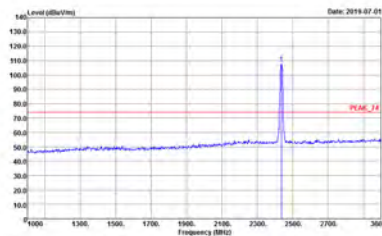
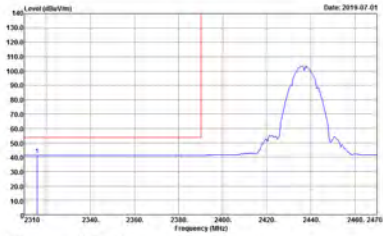
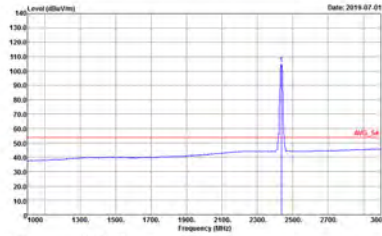


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-FY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:3000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>	 <p>Site : 03CH11-FY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL RBW:3000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>
Avg.	 <p>Site : 03CH11-FY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>	 <p>Site : 03CH11-FY Condition : AVG_54 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>

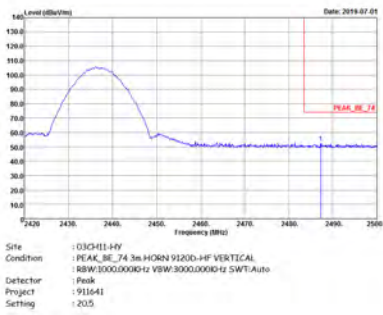
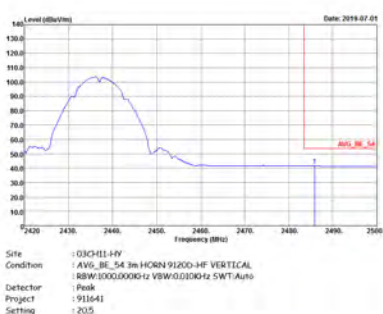


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>	Left blank
Avg.	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 20.5</p>	Left blank

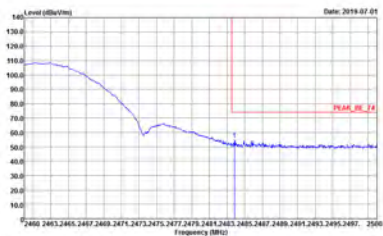
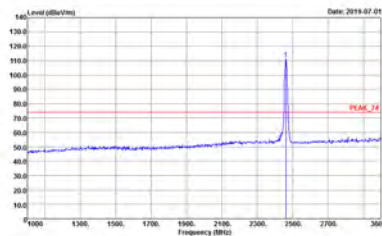
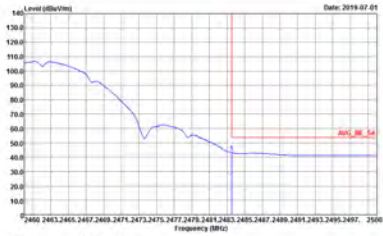
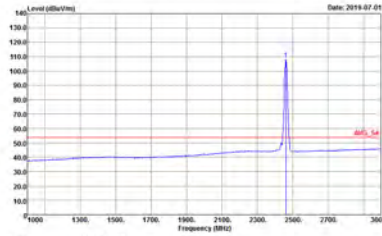


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>
Avg.	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>	 <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : 205</p>

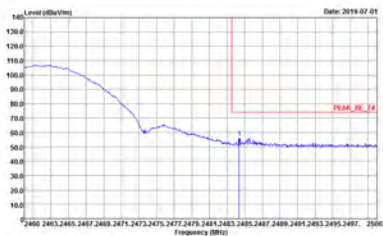
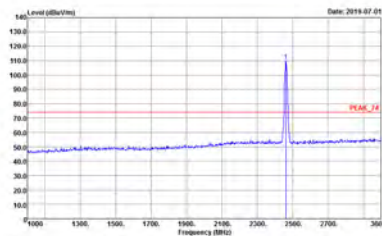
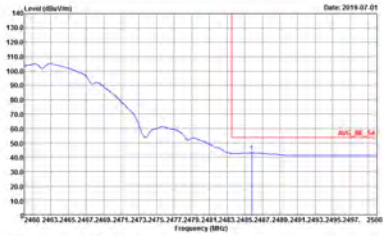
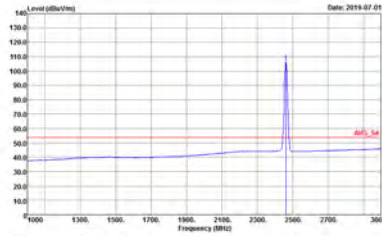


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-FY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>	 <p>Site : 03CH11-FY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>
Avg.	 <p>Site : 03CH11-FY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>	 <p>Site : 03CH11-FY Condition : AVG_54 3m HORN 91200-HF HORIZONTAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH11-FY Condition : PEAK_BE_74 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>	 <p>Site : 03CH11-FY Condition : PEAK_74 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:3000.0000Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>
Avg.	 <p>Site : 03CH11-FY Condition : AVG_BE_54 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>	 <p>Site : 03CH11-FY Condition : AVG_54 3m HORN 91200-HF VERTICAL RBW:1000.0000Hz VSW:0.0100Hz SWT:Auto Detector : Peak Project : 911641 Setting : Z1</p>