



# FCC RADIO TEST REPORT

FCC ID : 2ARGE-6383  
Equipment : Digital Media Receiver  
Model Name : O2T2V3  
Applicant : Flake LLC  
4321 W. College Avenue; Suite 200  
Appleton, Wisconsin 54914  
Standard : FCC Part 15 Subpart C §15.247

The product was received on Jan. 22, 2019 and testing was started from Apr. 26, 2019 and completed on Jul. 10, 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.

Approved by: Jones Tsai

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
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
3.6	15.207	AC Conducted Emission	Pass
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass

<b>Declaration of Conformity:</b> The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
<b>Comments and Explanations:</b> 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: Aileen Huang**



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Digital Media Receiver
Model Name	O2T2V3
FCC ID	2ARGE-6383
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE Zigbee

## 1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2472 MHz
Maximum Output Power to antenna	<p>&lt;Ant. 0&gt; 802.11b : 20.20 dBm (0.1047 W) 802.11g : 23.65 dBm (0.2317 W) 802.11n HT20 : 23.77 dBm (0.2382 W)</p> <p>&lt;Ant. 1&gt; 802.11b : 20.31 dBm (0.1074 W) 802.11g : 24.17 dBm (0.2612 W) 802.11n HT20 : 24.22 dBm (0.2642 W)</p> <p>&lt;MIMO Ant. 0 + 1&gt; 802.11b : 23.35 dBm (0.2163 W) 802.11g : 26.85 dBm (0.4842 W) 802.11n HT20 : 26.86 dBm (0.4853 W)</p>
99% Occupied Bandwidth	<p>&lt;Ant. 0&gt; 802.11b : 14.00 MHz 802.11g : 16.90 MHz 802.11n HT20 : 18.15 MHz</p> <p>&lt;Ant. 1&gt; 802.11b : 13.70 MHz 802.11g : 16.80 MHz 802.11n HT20 : 17.85 MHz</p> <p>&lt;MIMO Ant. 0&gt; 802.11b : 14.05 MHz 802.11g : 16.95 MHz 802.11n HT20 : 17.95 MHz</p> <p>&lt;MIMO Ant. 1&gt; 802.11b : 13.90 MHz 802.11g : 16.75 MHz 802.11n HT20 : 17.75 MHz</p>
Antenna Type / Gain	<p>&lt;Ant. 0&gt; PCB IFA AntennaType with gain 4.6 dBi &lt;Ant. 1&gt; PCB IFA AntennaType with gain 4.5 dBi</p>
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)



Standards-related Product Specification			
Antenna Function Description		Ant. 0	Ant. 1
	802.11 b/g/n	V	V
	802.11 b/g/n MIMO	V	V

Note: MIMO Ant. 0+1 is a calculated result from sum of the power MIMO Ant. 0 and MIMO Ant. 1.

### 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.	<b>Sporton Site No.</b>		
	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.	<b>Sporton Site No.</b>		
	03CH16-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:** All test items were verified and recorded according to the standards and without any deviation during the test.



## 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 two setup, without accessories and with accessories. The worst cases (without accessories) 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	8	2447
	2	2417	9	2452
	3	2422	10	2457
	4	2427	11	2462
	5	2432	12	2467
	6	2437	13	2472
	7	2442		

### 2.2 Test Mode

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

#### Single Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

#### MIMO Antenna

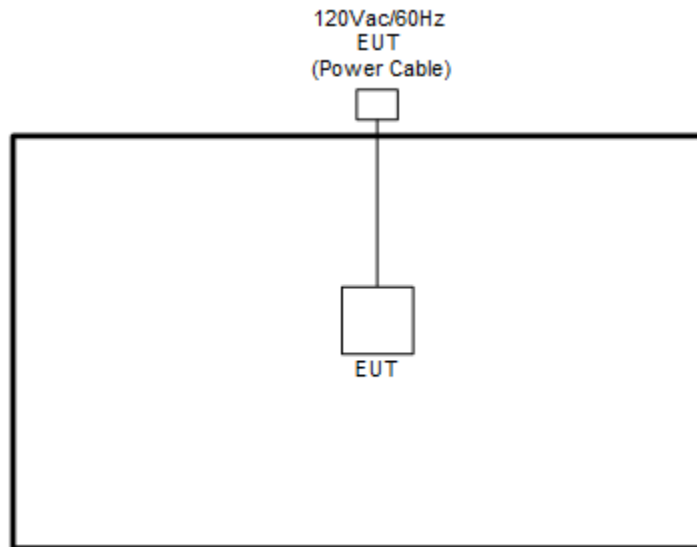
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0



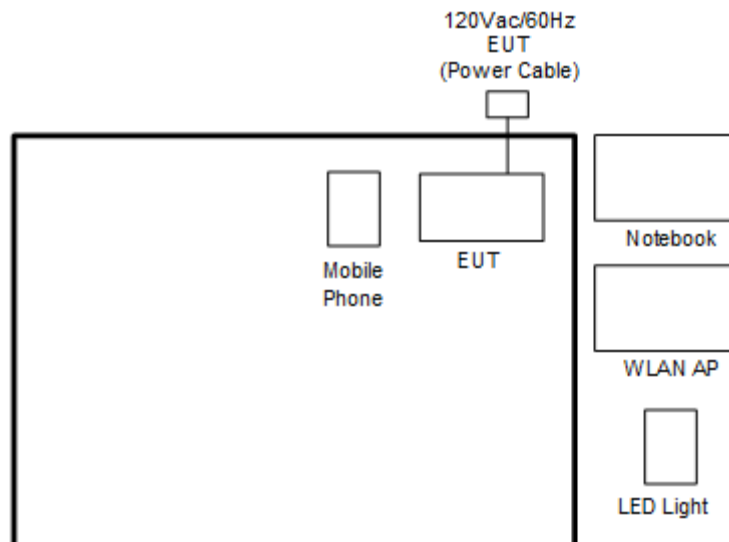
Test Cases	
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Link with AP Router + WLAN (5GHz) Link with Notebook + Bluetooth Link + Zigbee Link + Play Audio from Bluetooth Phone

## 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.	WLAN AP	Net Gear	R7000	FCC DoC	N/A	Unshielded,1.8m
2.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Notebook	DELL	Latitude E5570	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Mobile Phone	Apple	A1524	FCC DoC	N/A	N/A
5.	LED light	OSRAM	73674	DZO-IQHOME	N/A	N/A

### 2.5 EUT Operation Test Setup

The RF test items, utility “Compliance.exe Version 1.0.0.50” 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.

### 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.

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

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

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.2 + 10 = 14.2 \text{ (dB)} \end{aligned}$$

### 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.

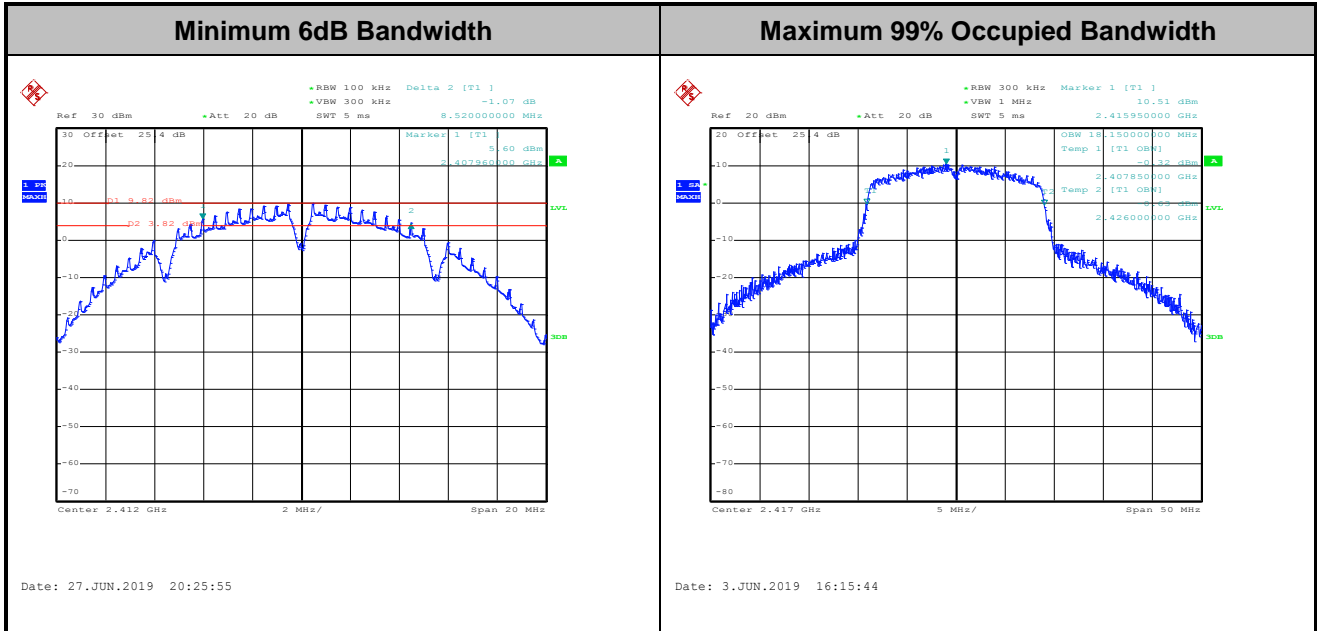
##### 3.1.4 Test Setup





### 3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



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 peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak 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.

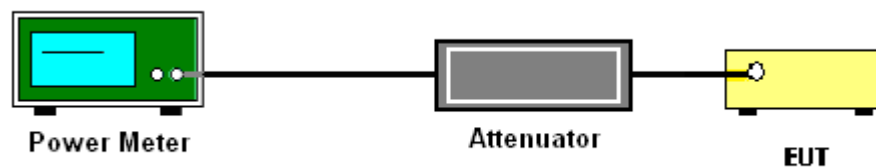
### 3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

### 3.2.3 Test Procedures

1. For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.3 PKPM1
2. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
3. 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.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Measure the conducted output power and record the results in the test report.
6. 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 Peak Output Power

Please refer to Appendix A.

### 3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.



### **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)



## 3.4 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.

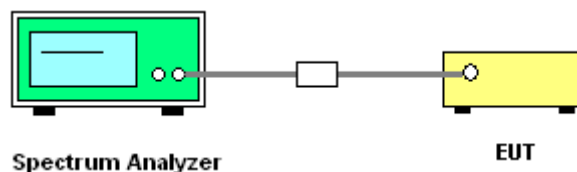
### 3.4.2 Measuring Instruments

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





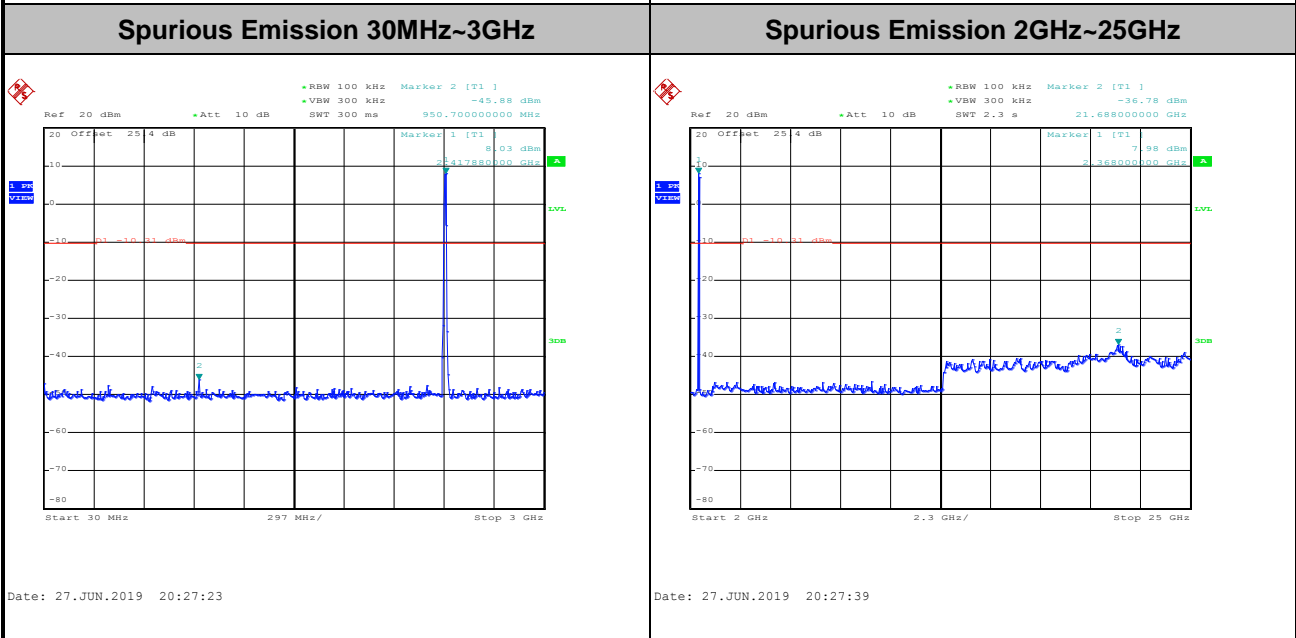
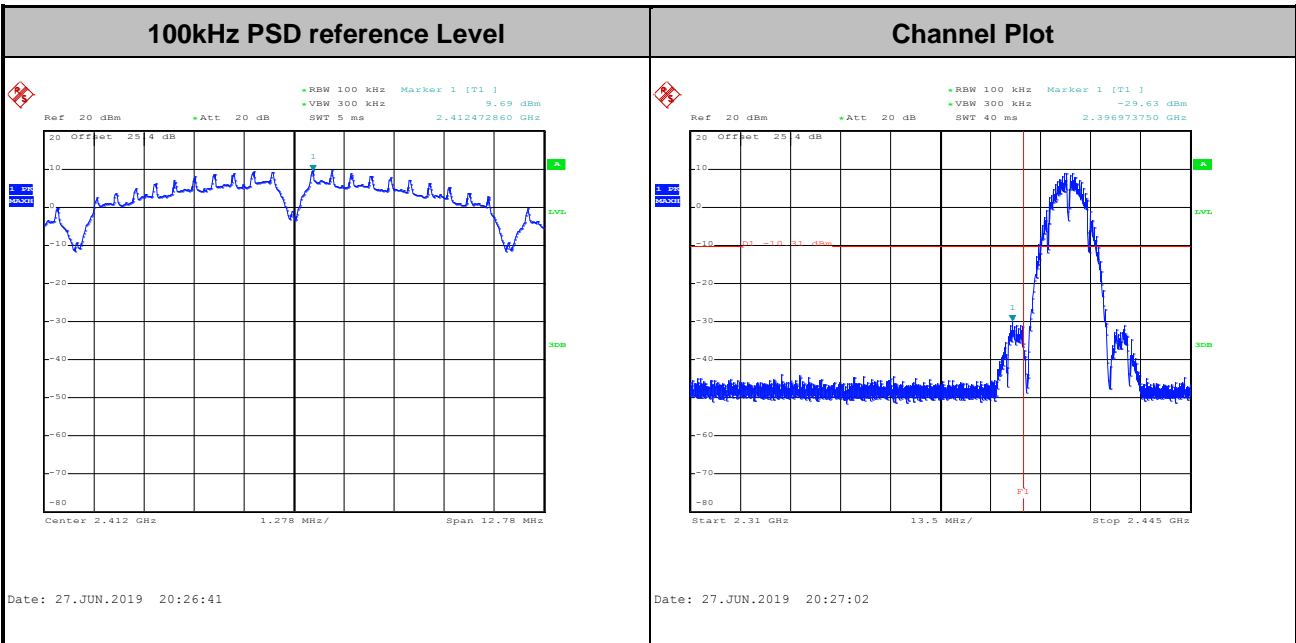


### 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

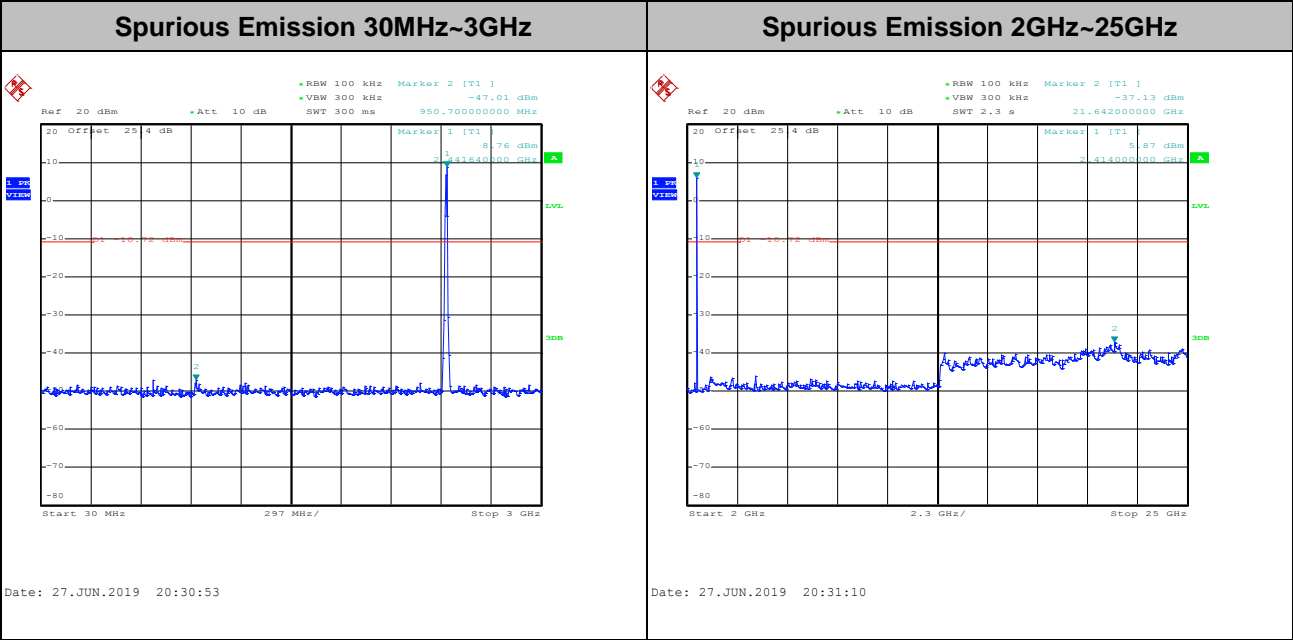
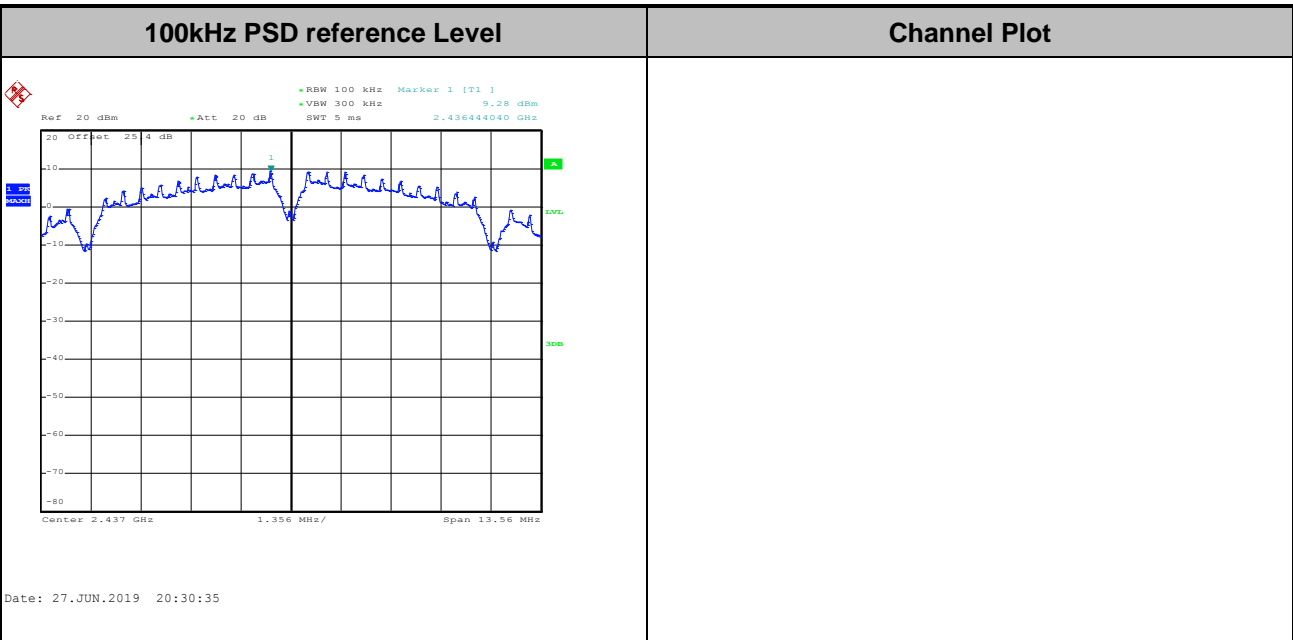
Number of TX = 1, Ant. 0 (Measured)

Test Mode :	802.11b	Test Channel :	01
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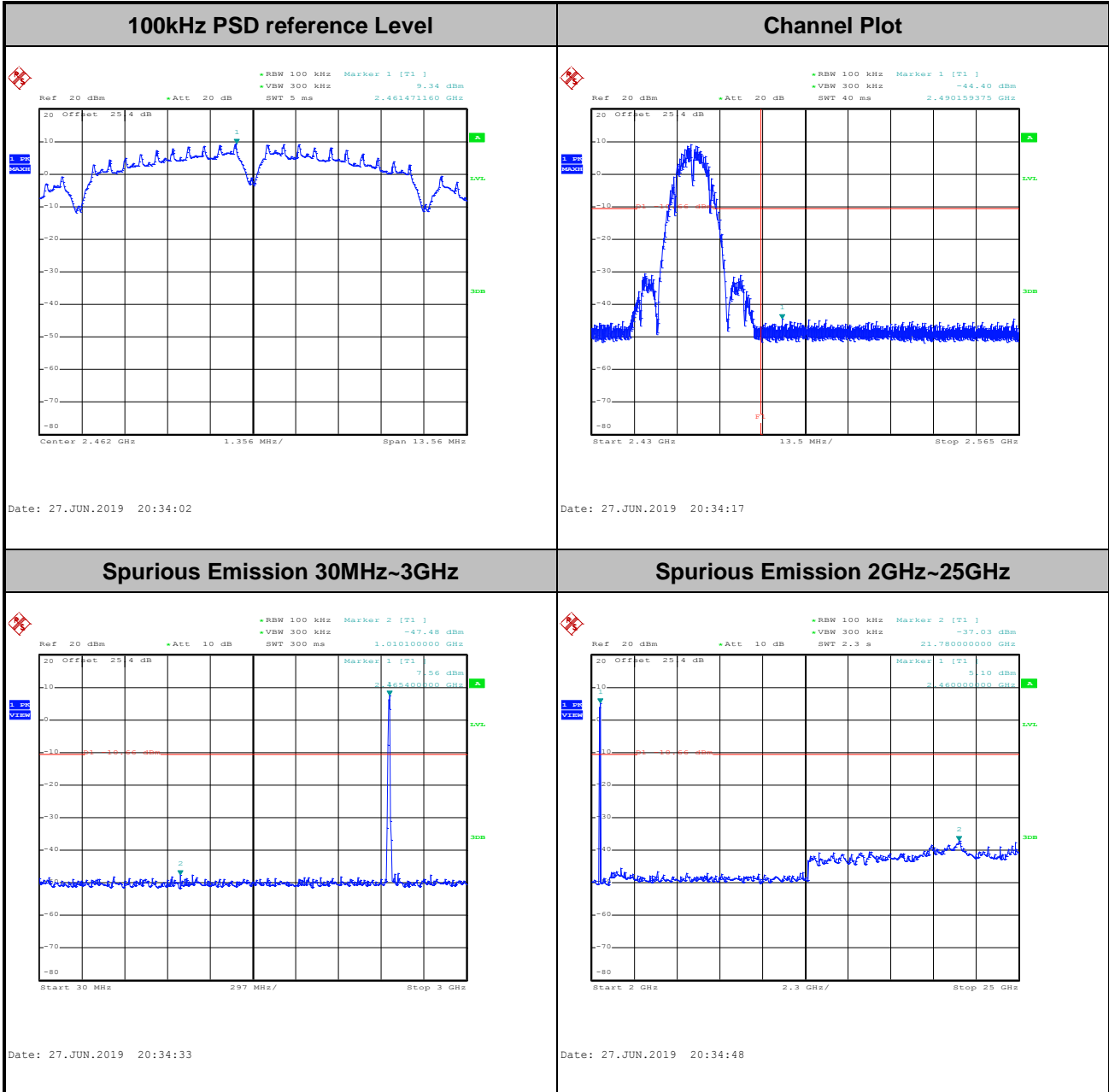


Test Mode :	802.11b	Test Channel :	06
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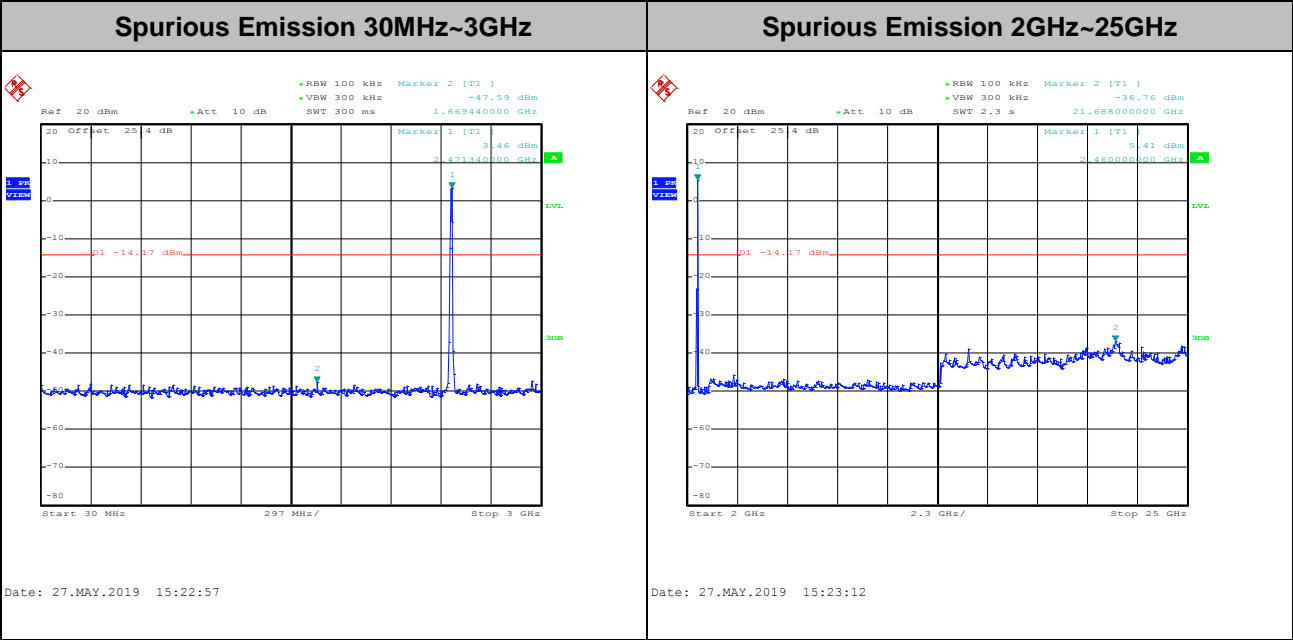
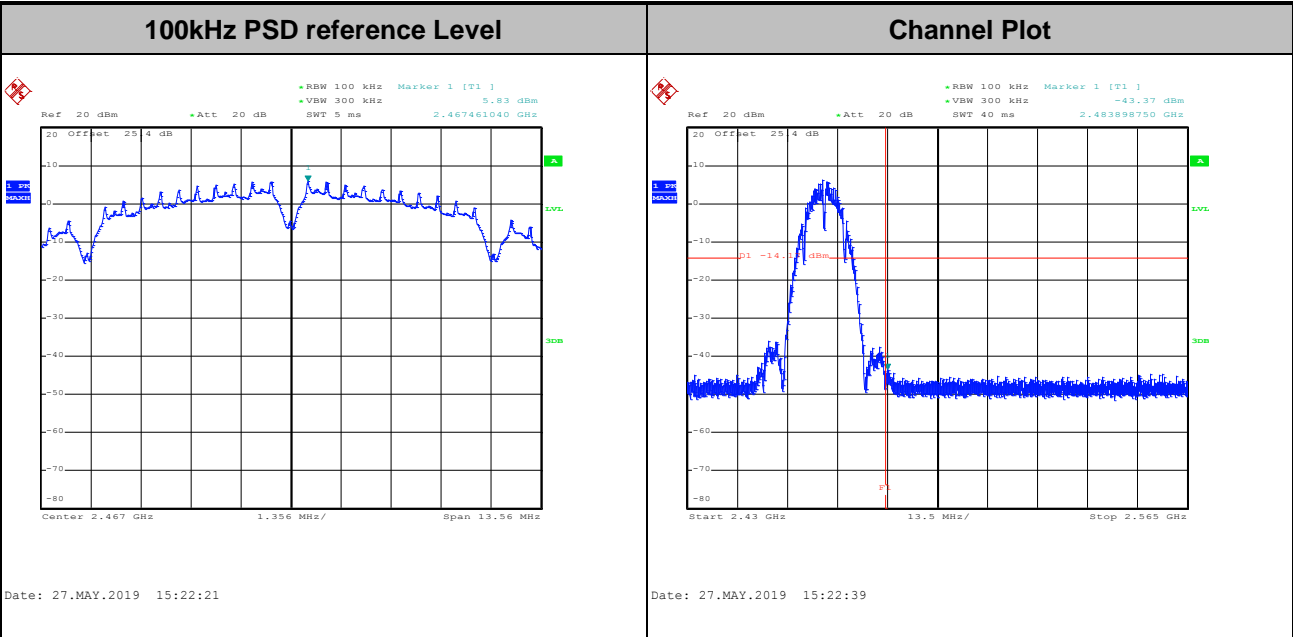


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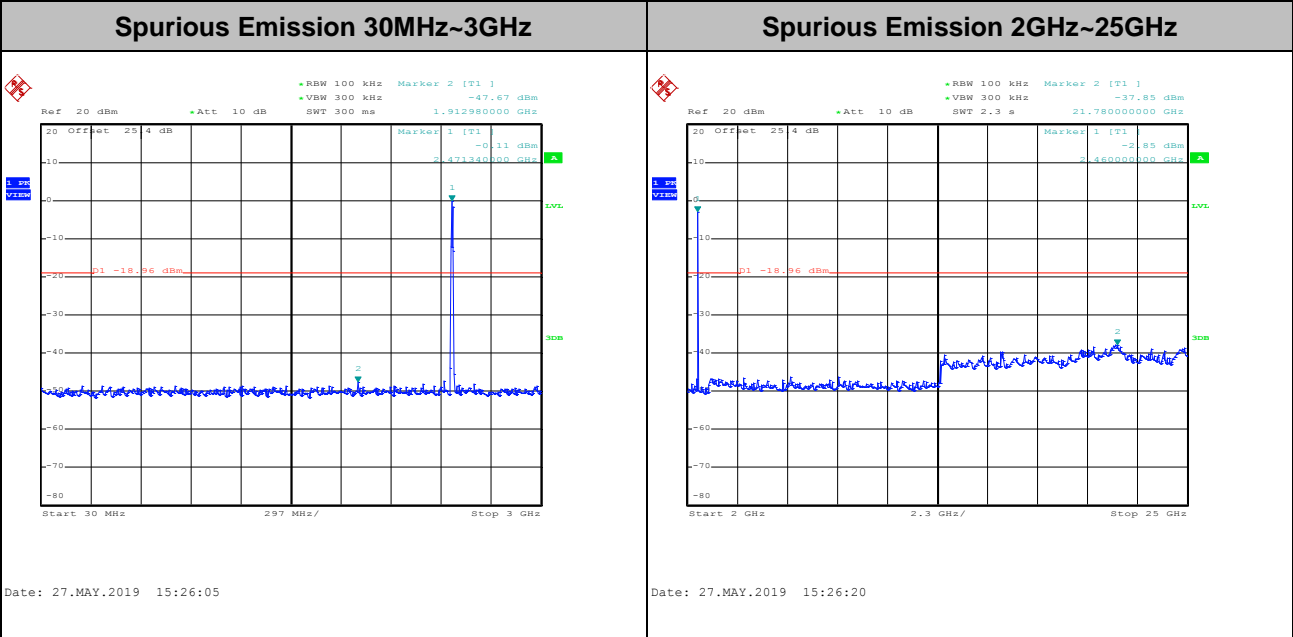
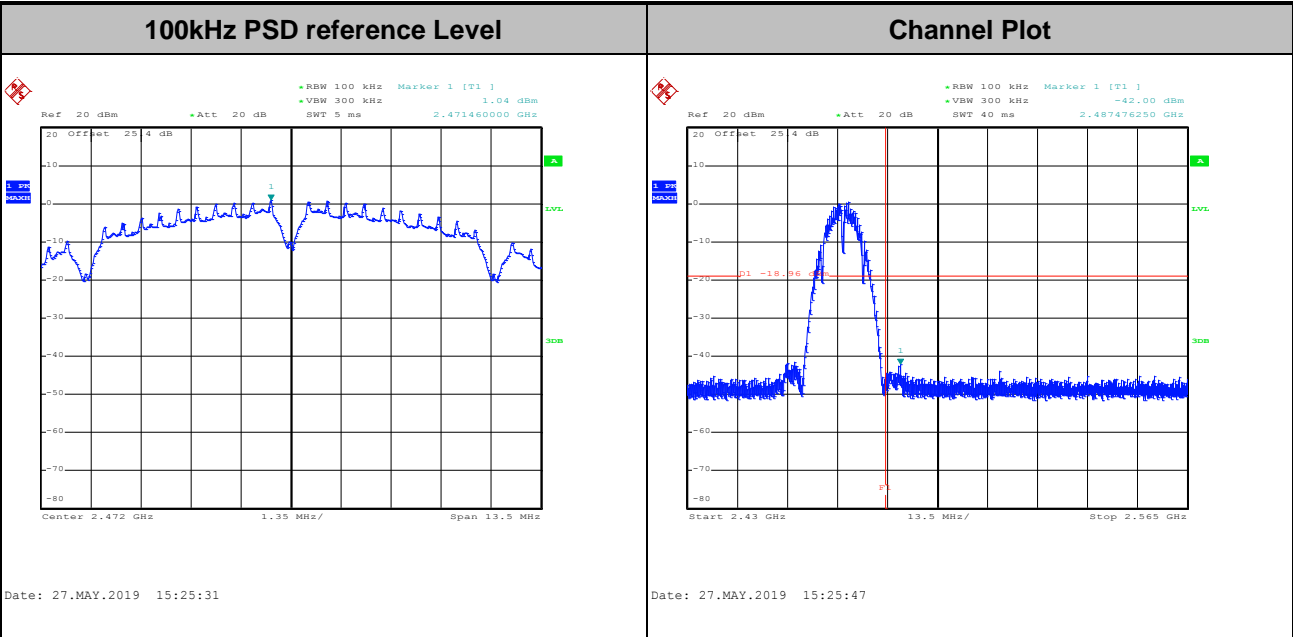


Test Mode :	802.11b	Test Channel :	12
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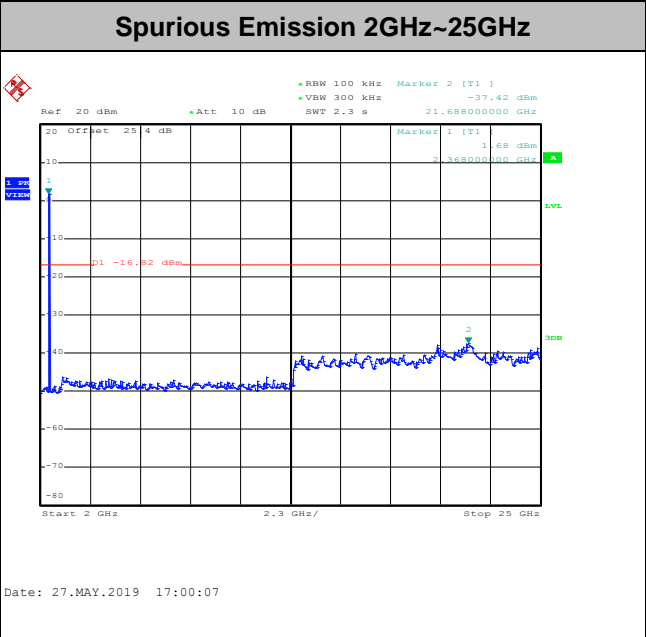
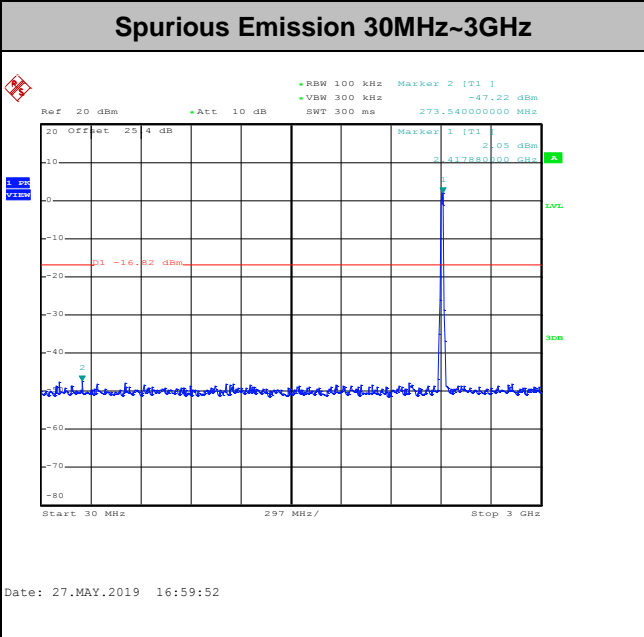
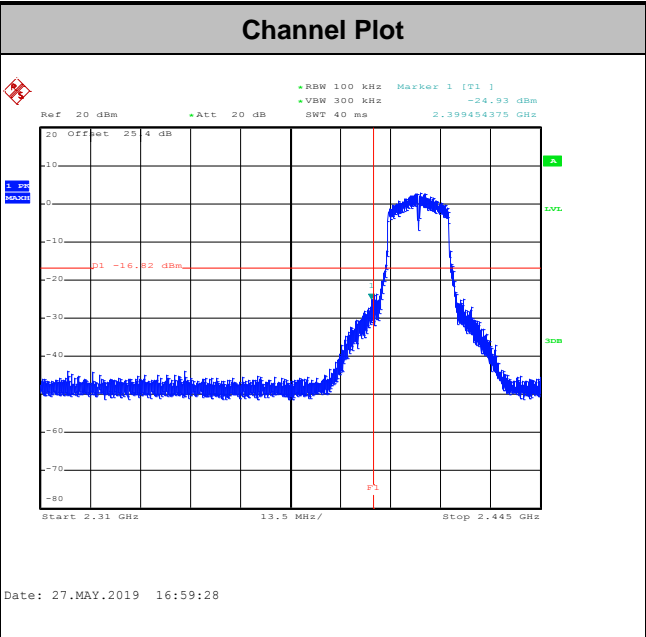
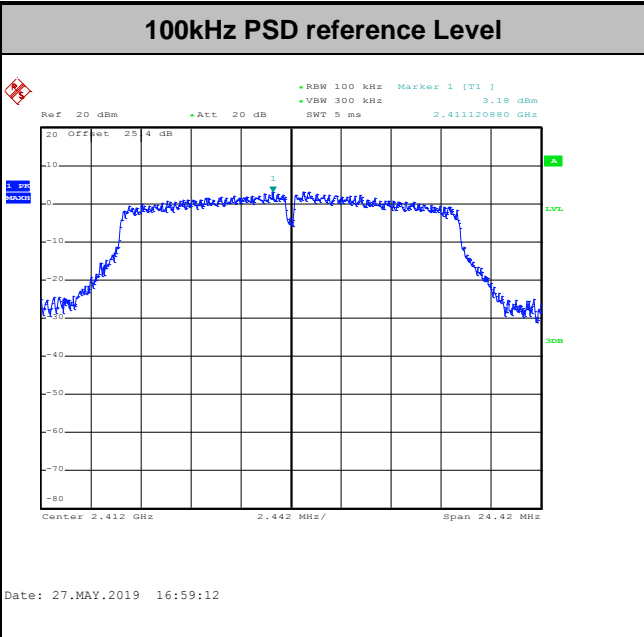


Test Mode :	802.11b	Test Channel :	13
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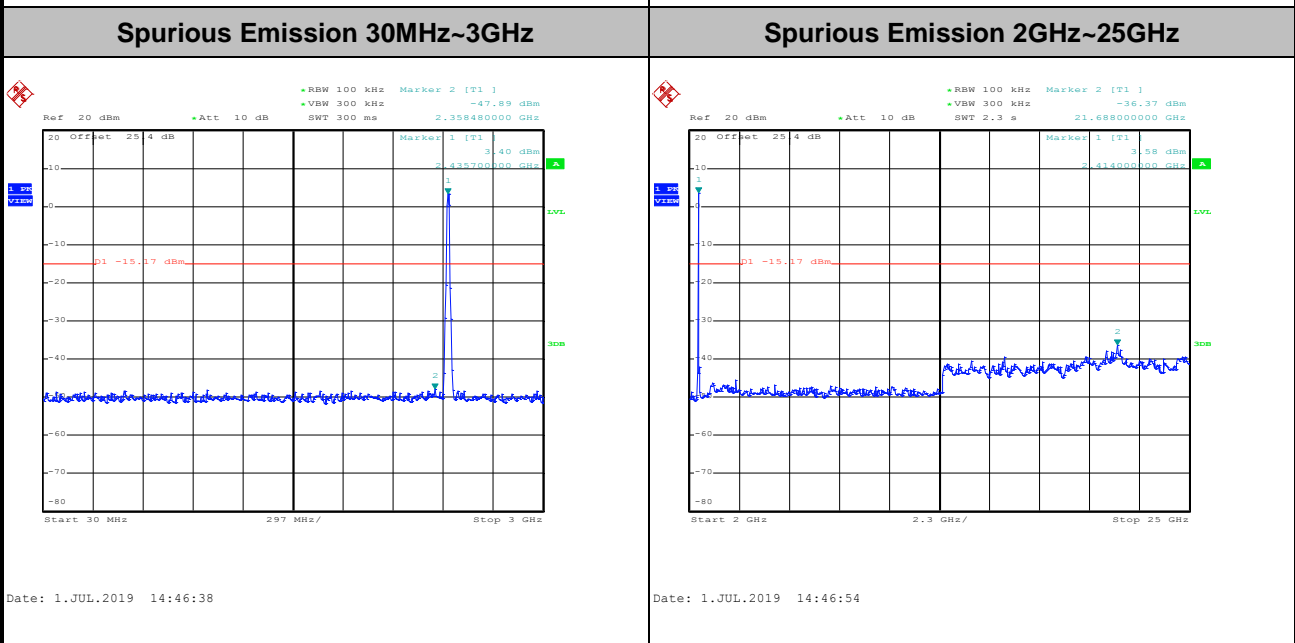
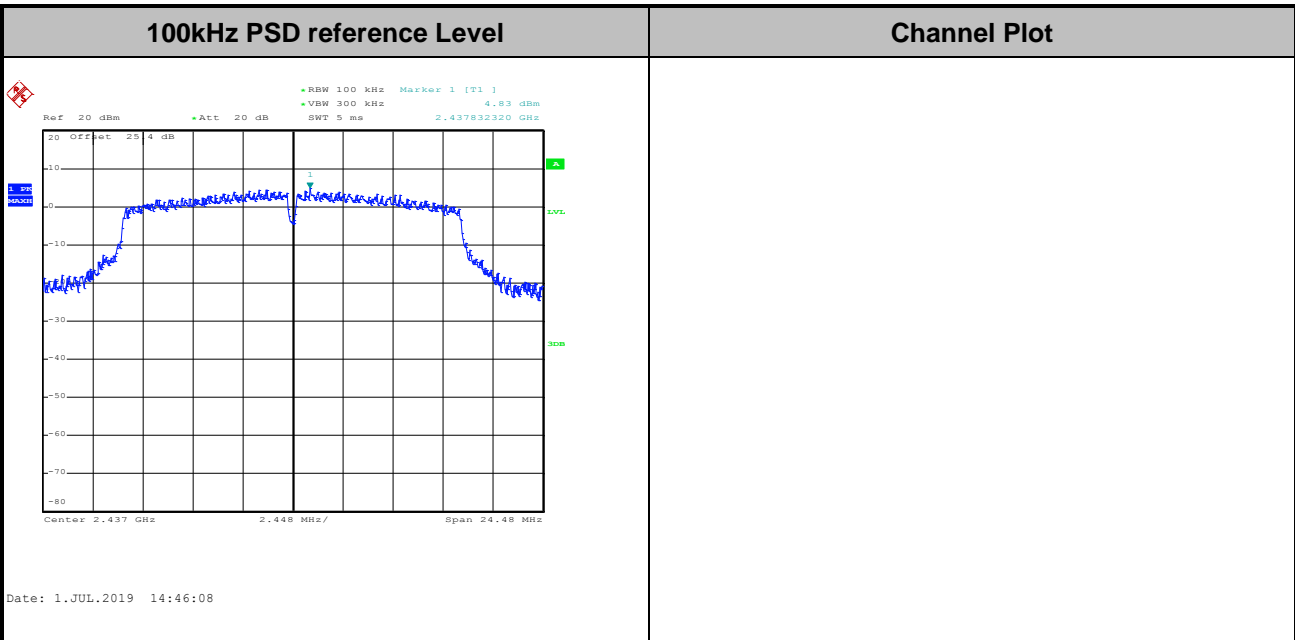


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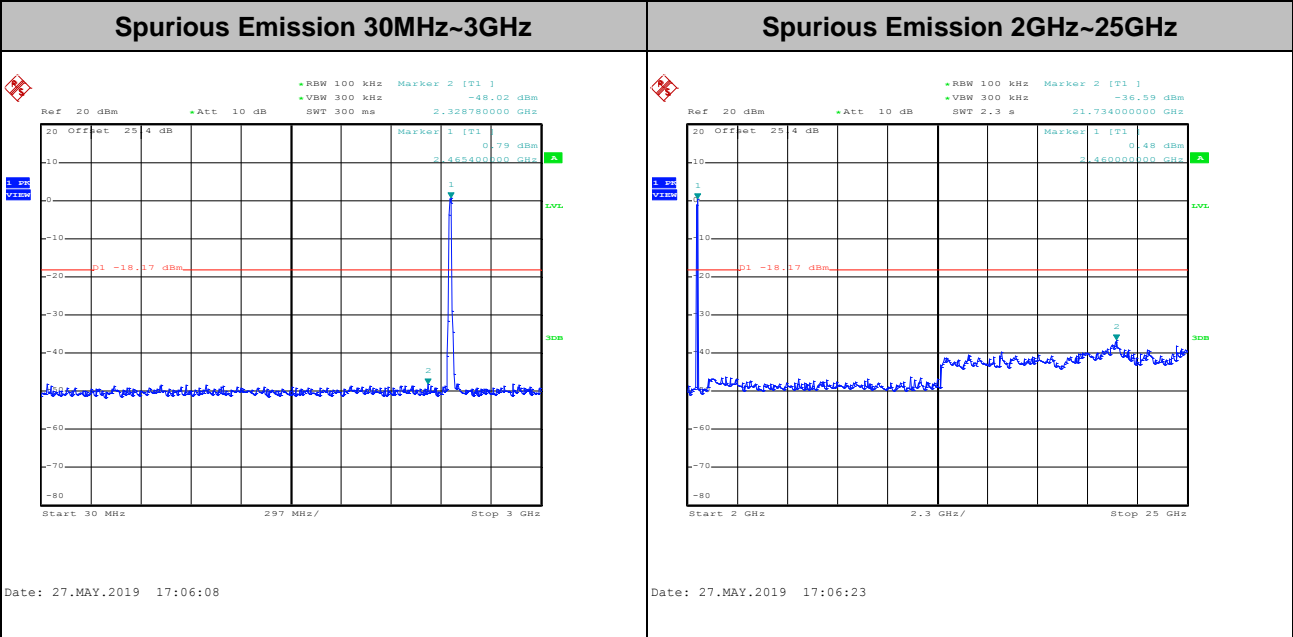
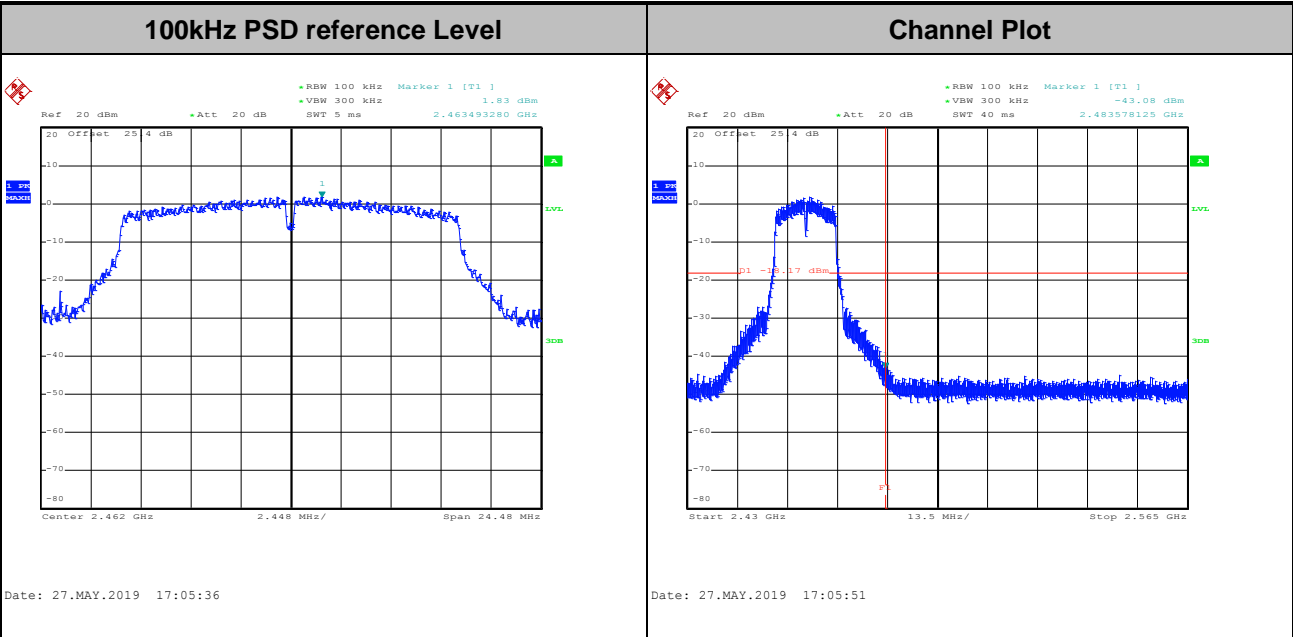


Test Mode :	802.11g	Test Channel :	06
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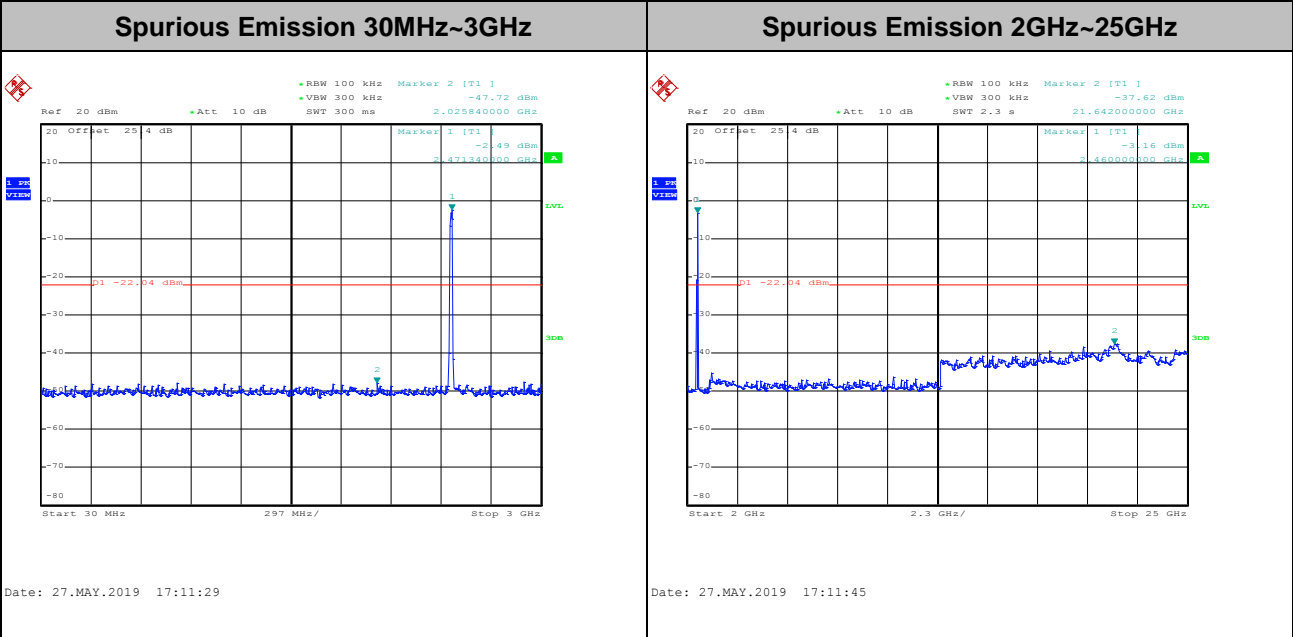
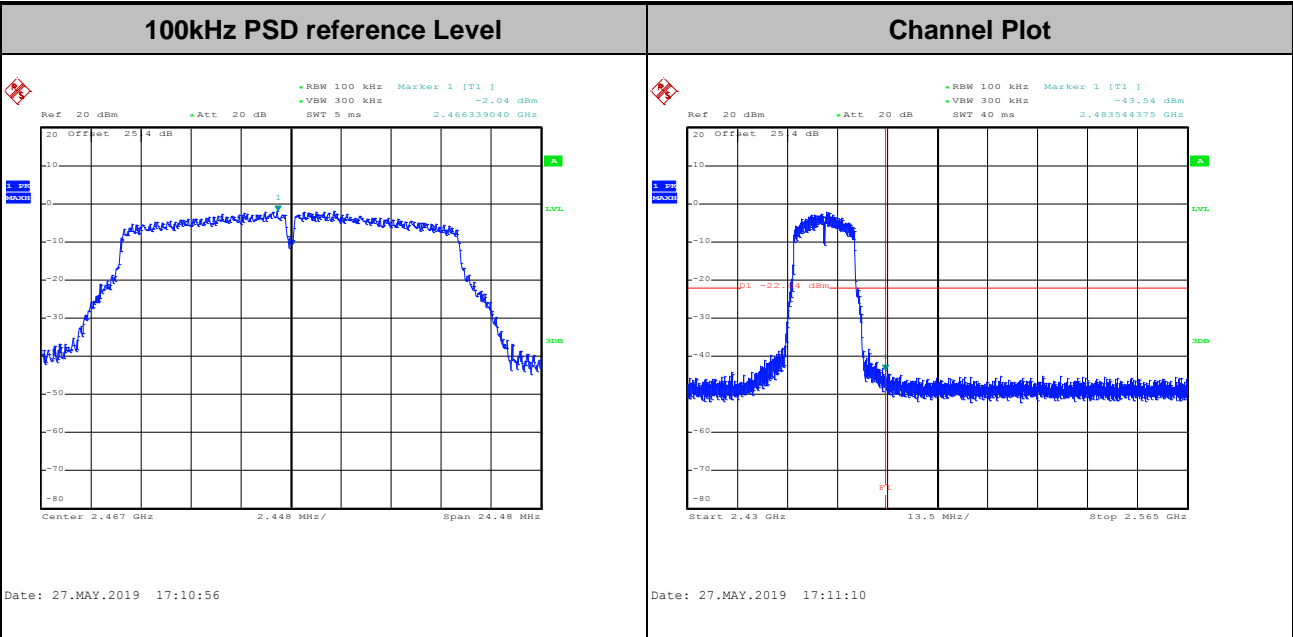
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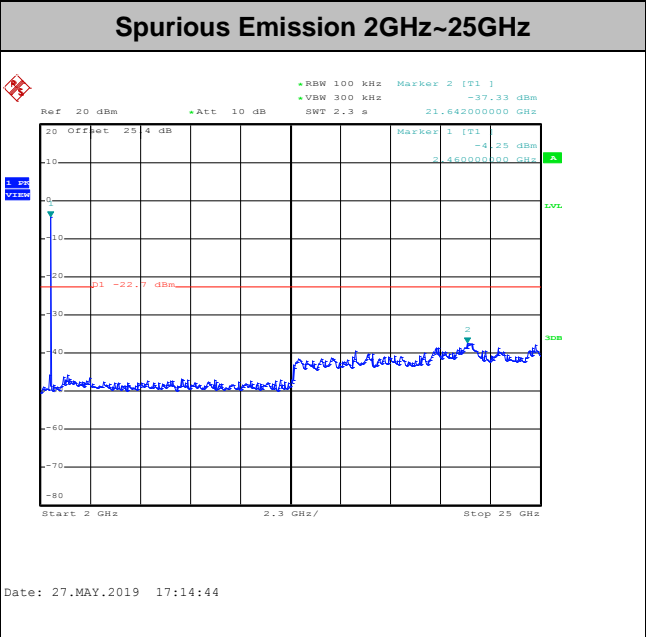
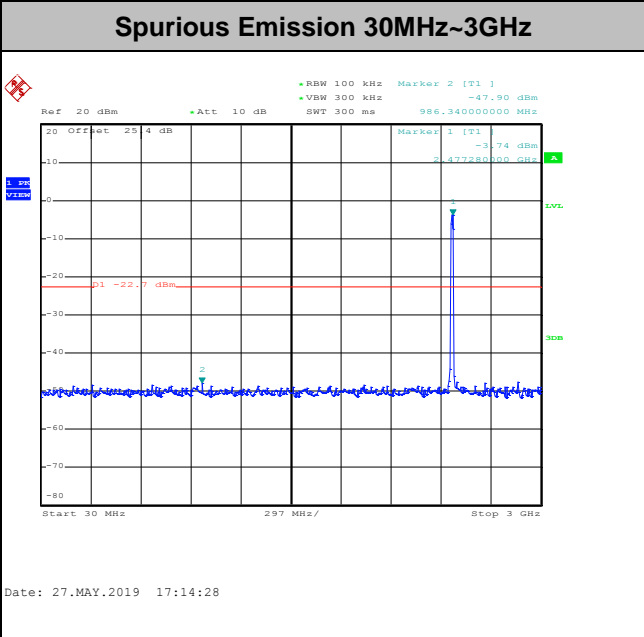
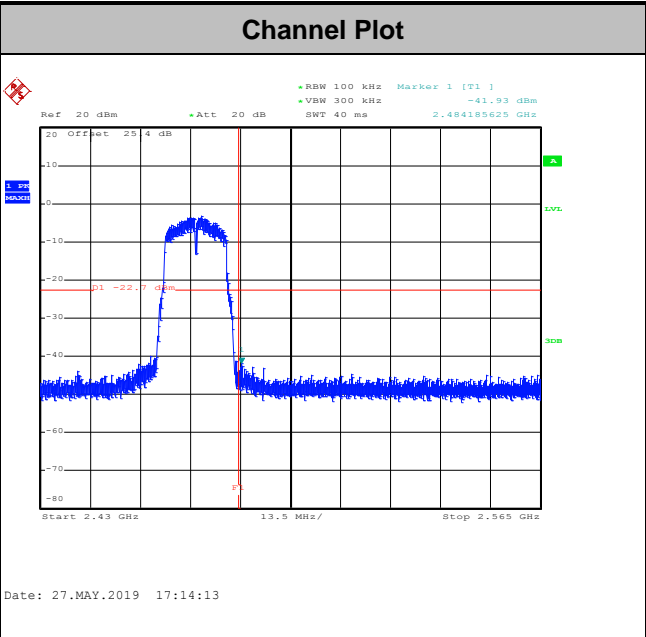
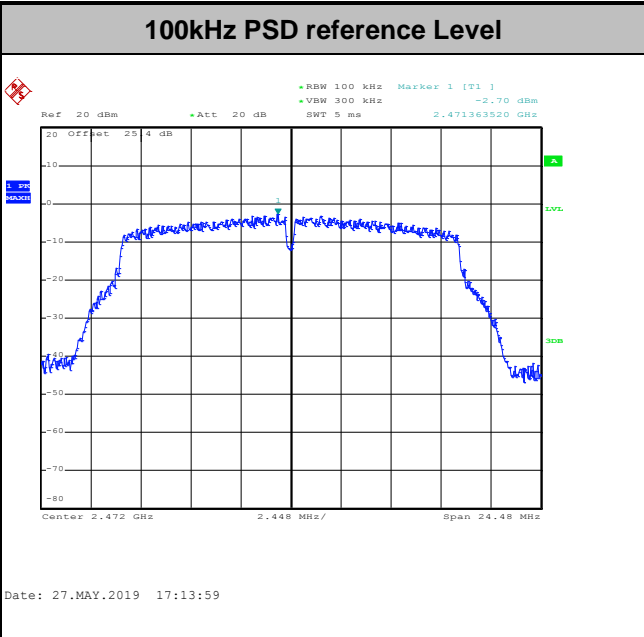


Test Mode :	802.11g	Test Channel :	12
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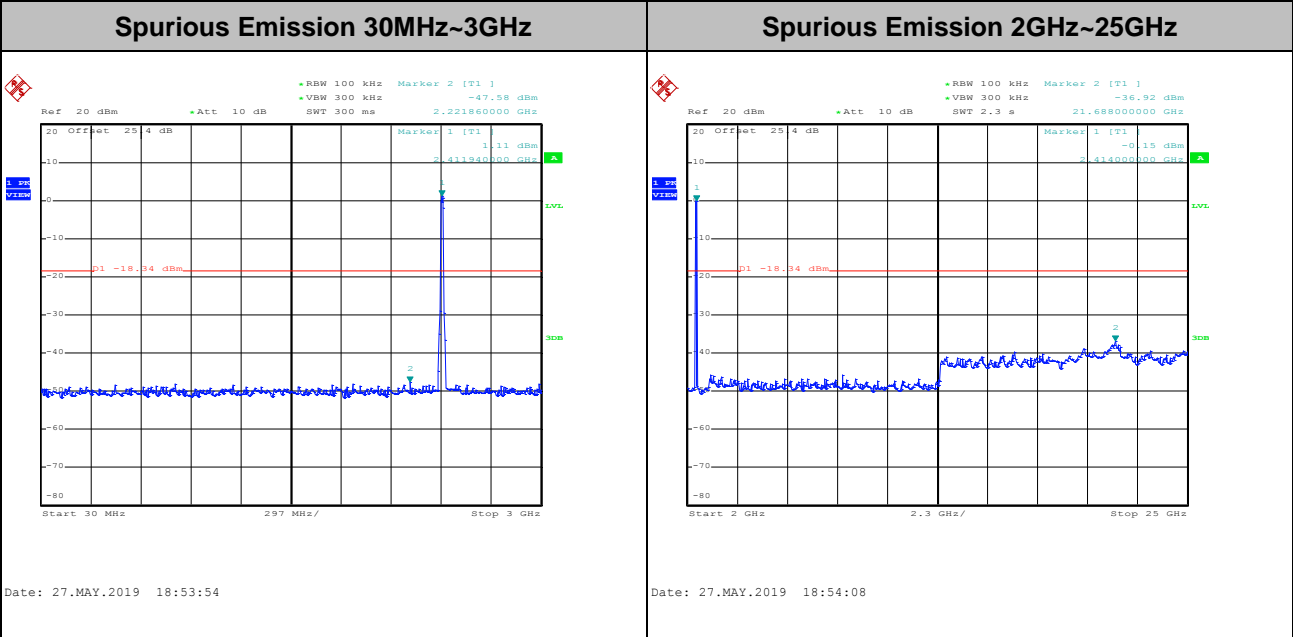
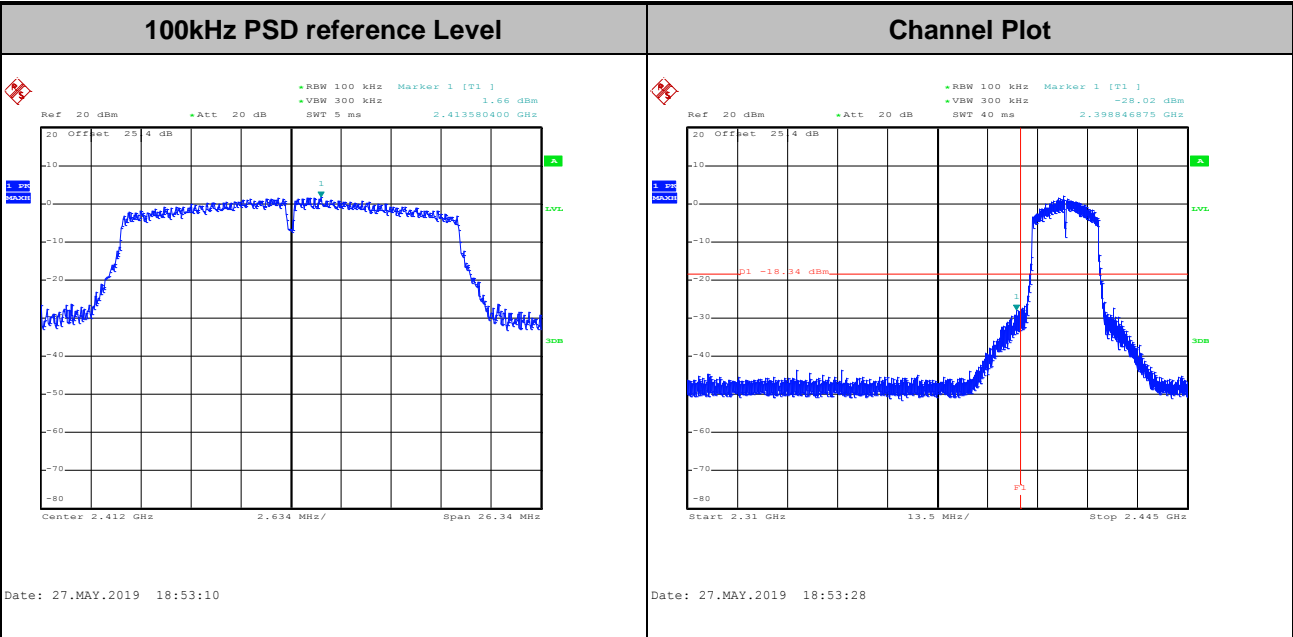


Test Mode :	802.11g	Test Channel :	13
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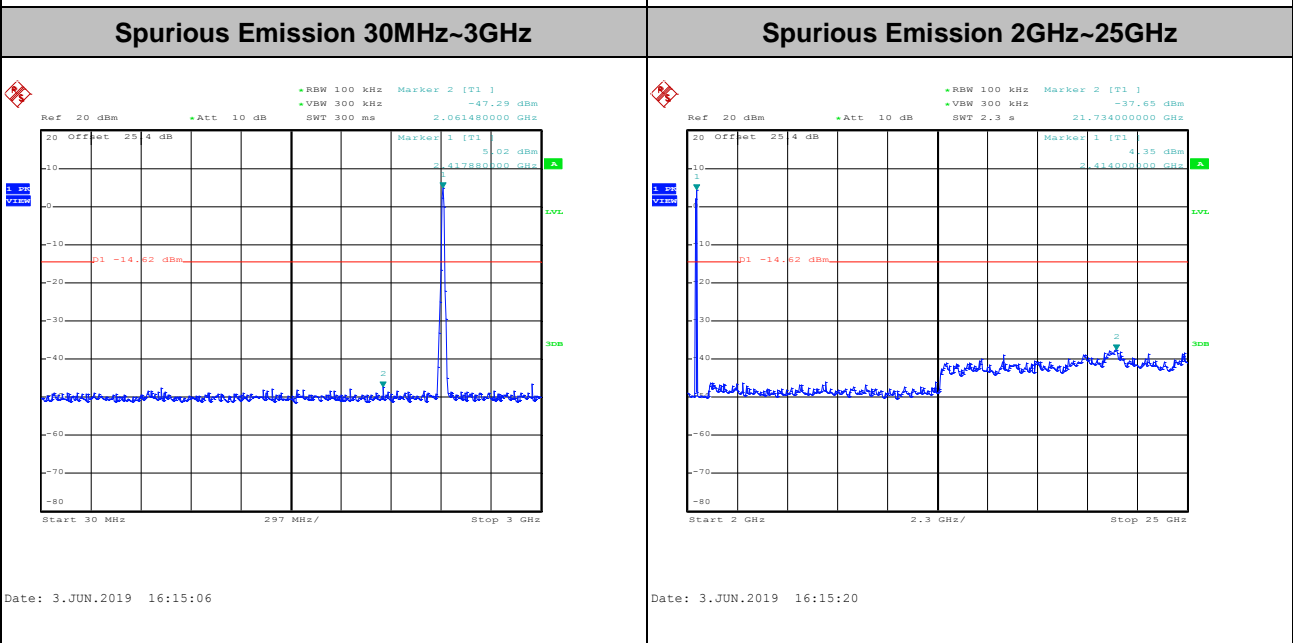
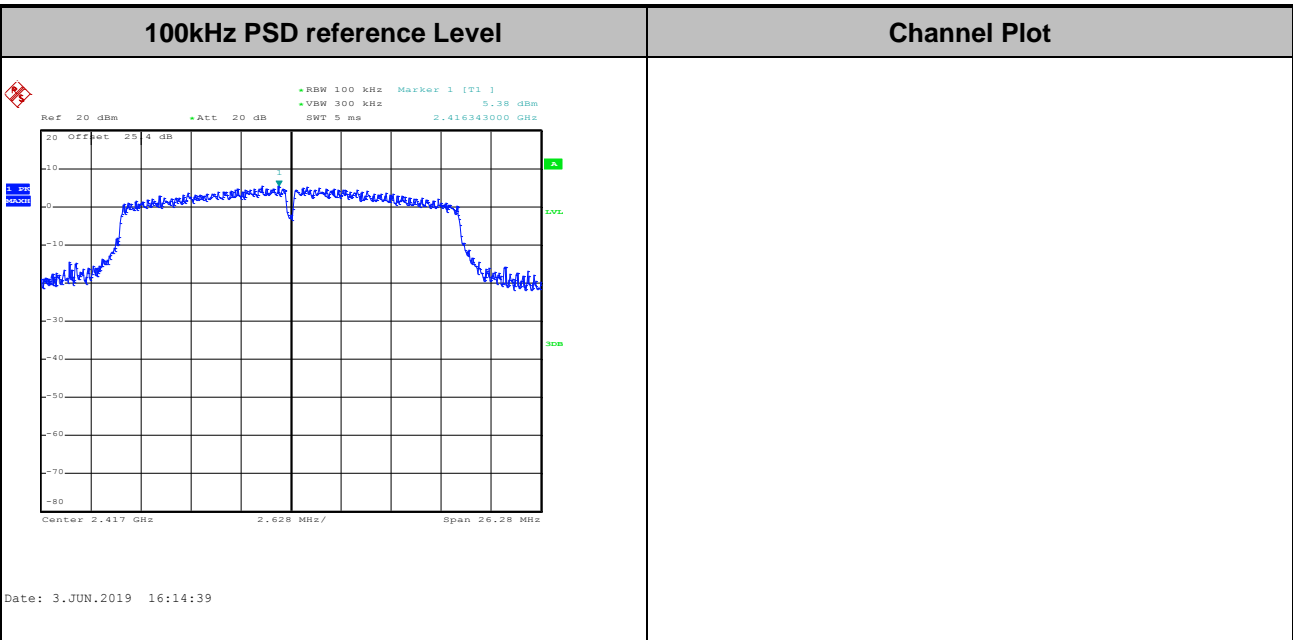


Test Mode :	802.11n HT20	Test Channel :	01
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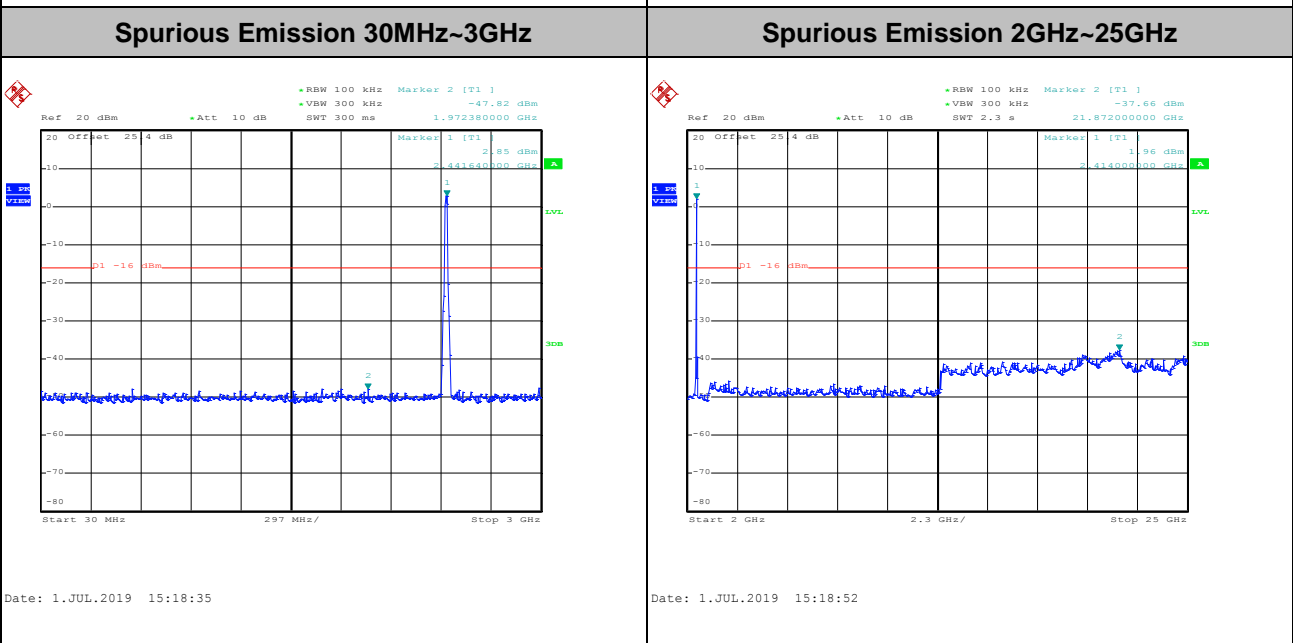
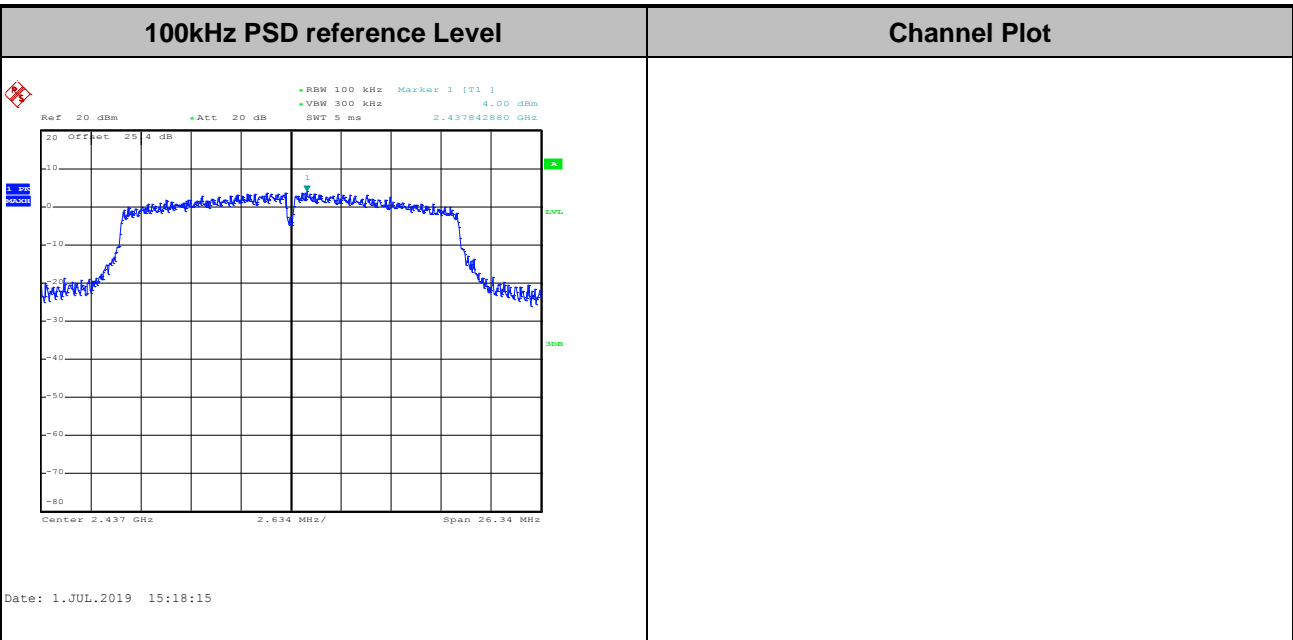


Test Mode :	802.11n HT20	Test Channel :	02
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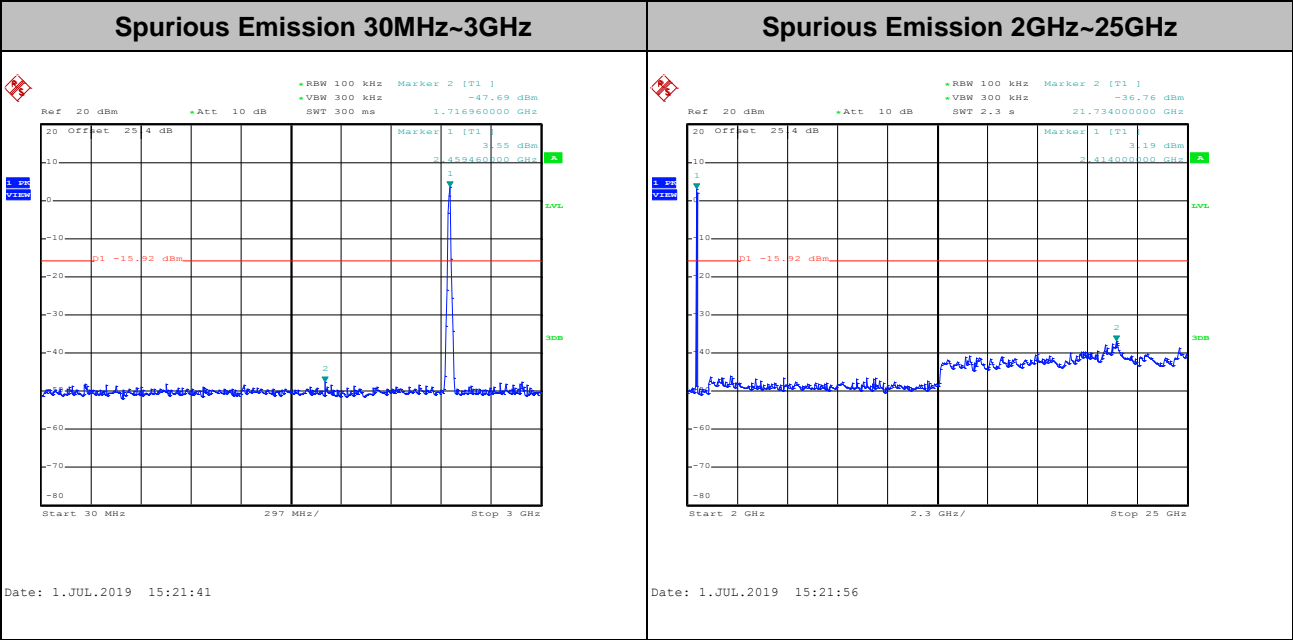
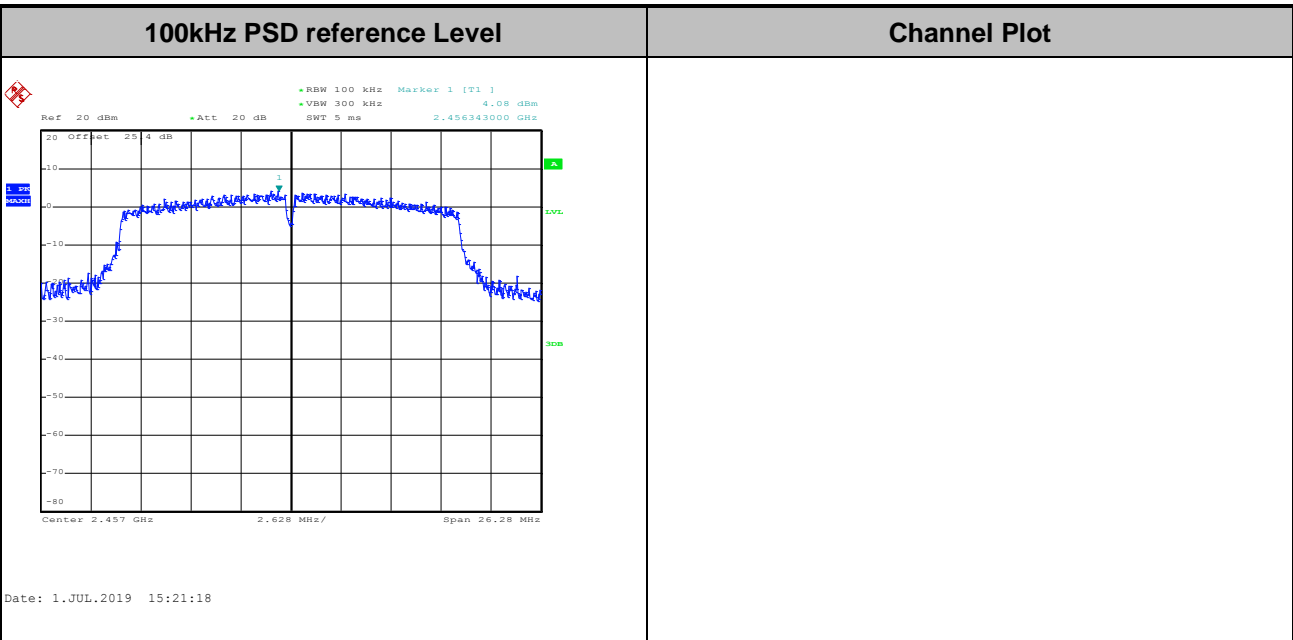


Test Mode :	802.11n HT20	Test Channel :	06
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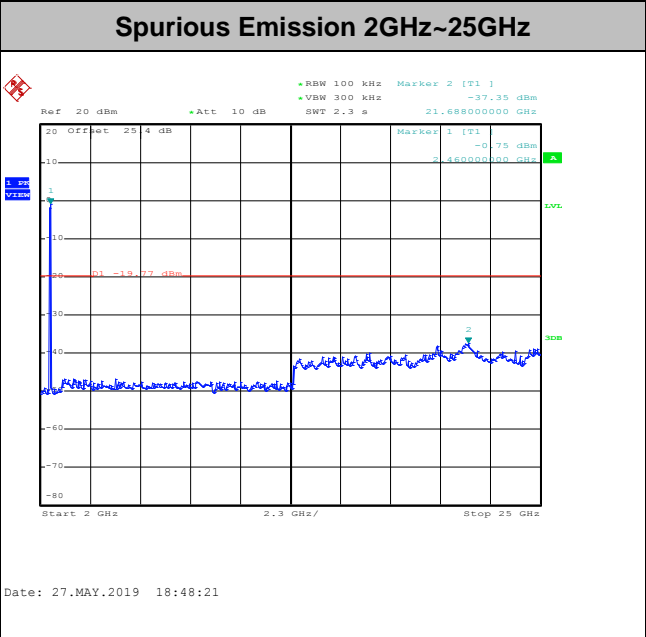
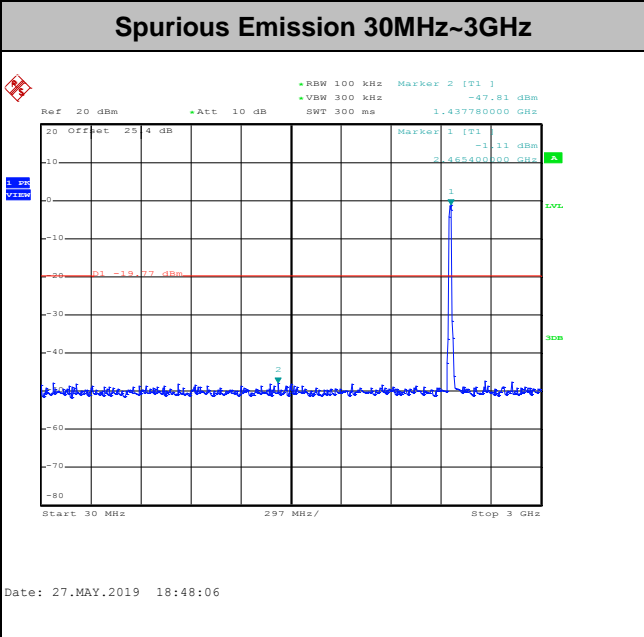
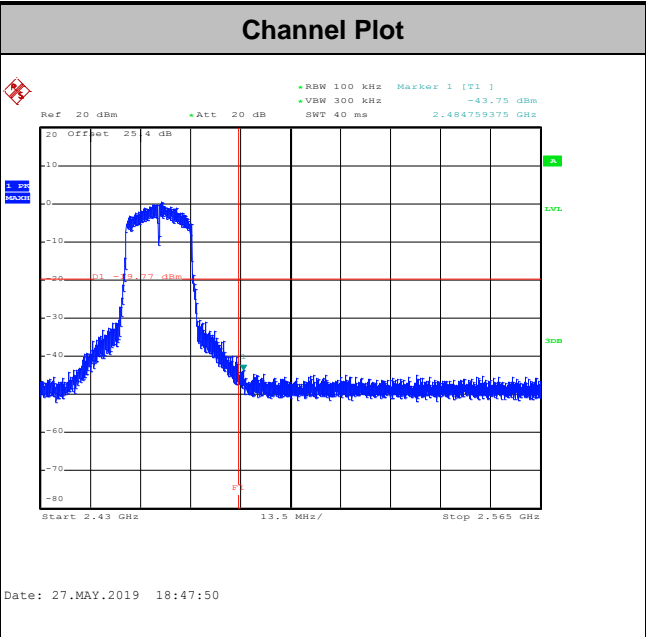
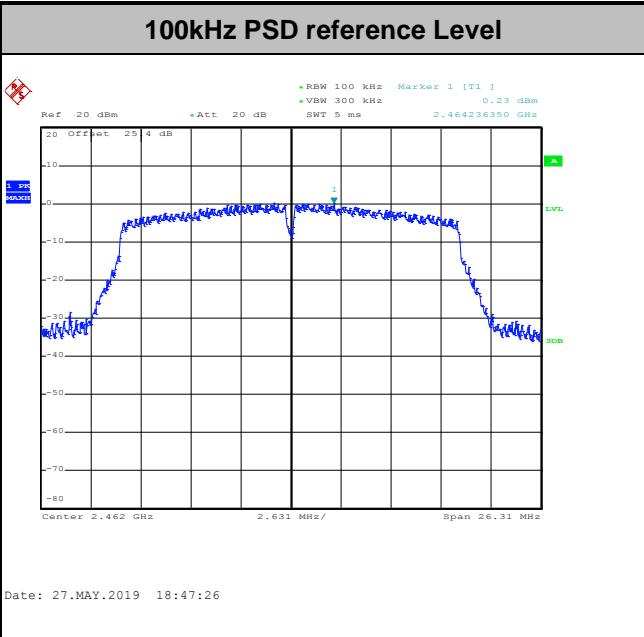


Test Mode :	802.11n HT20	Test Channel :	10
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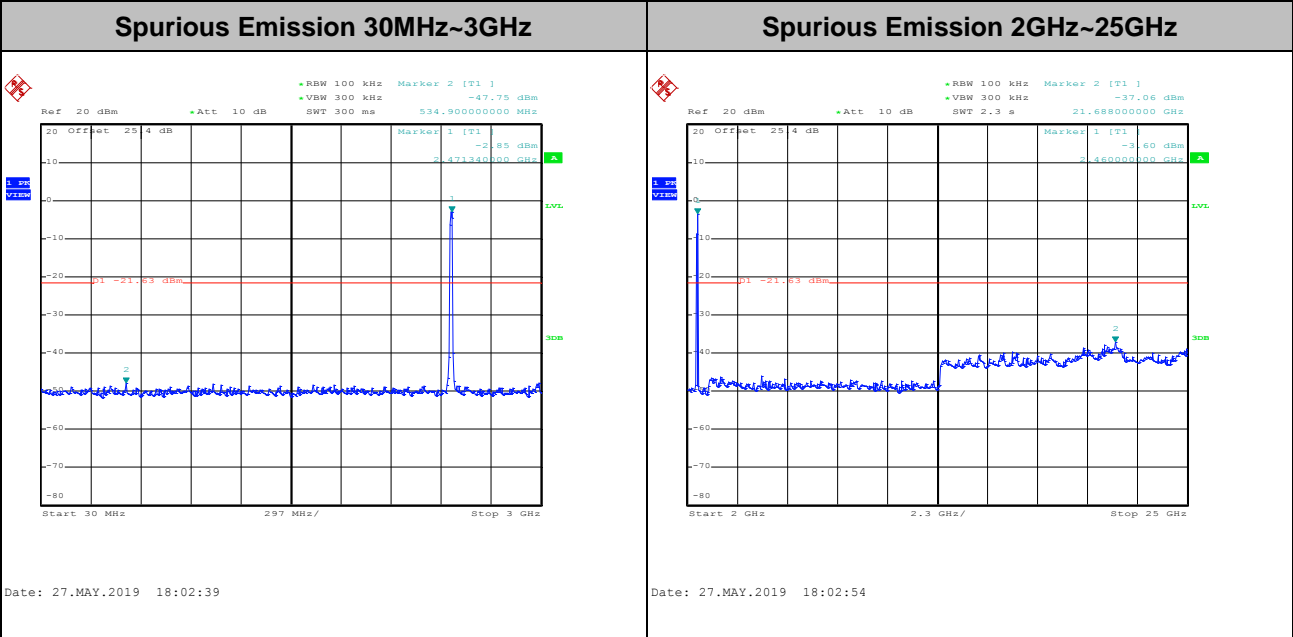
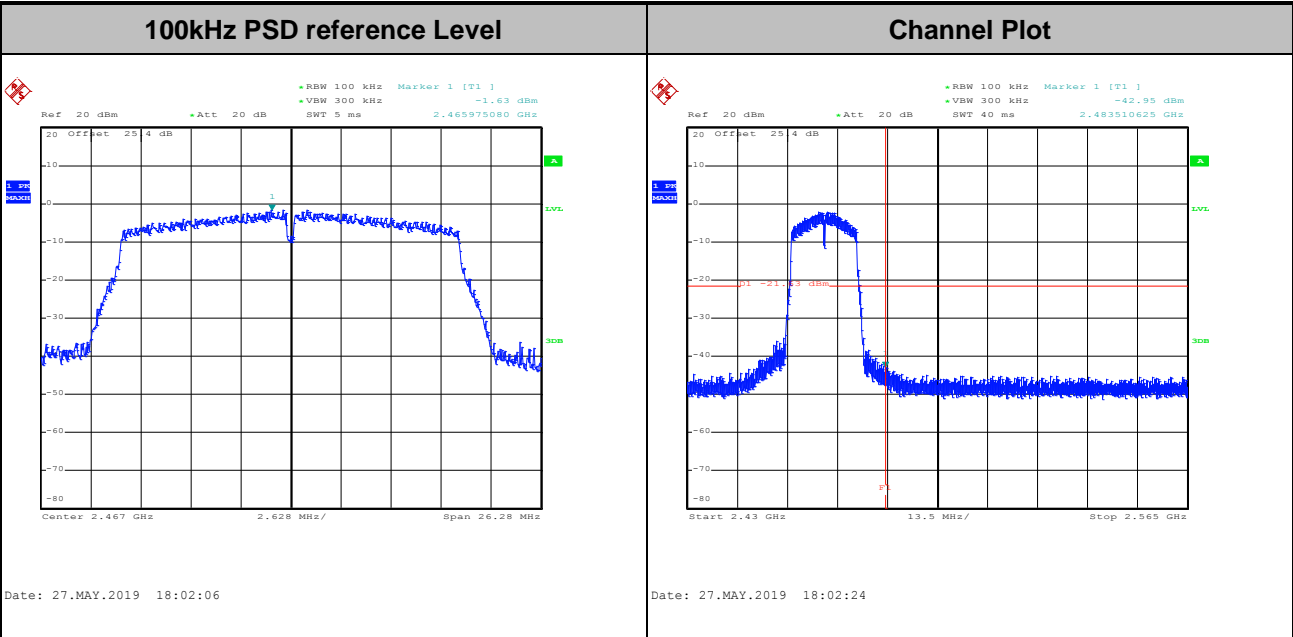


Test Mode :	802.11n HT20	Test Channel :	11
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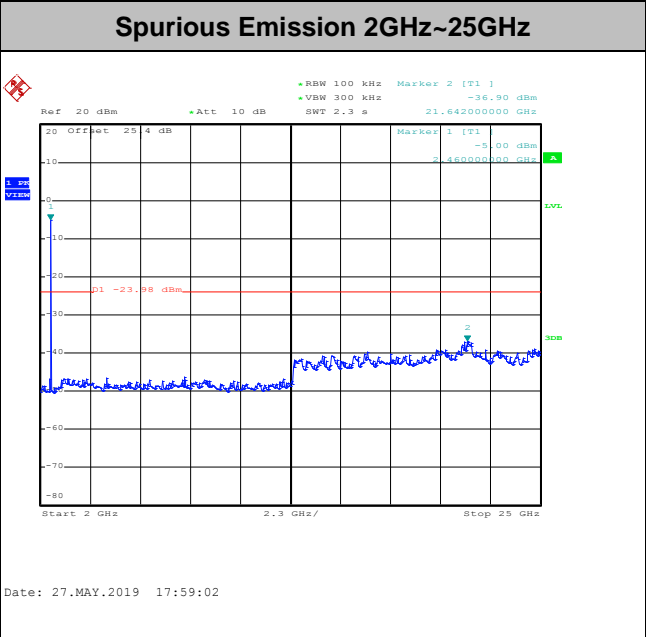
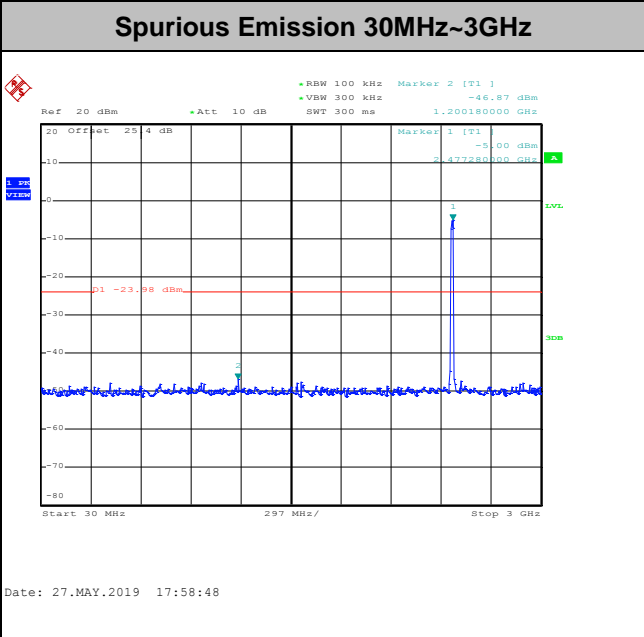
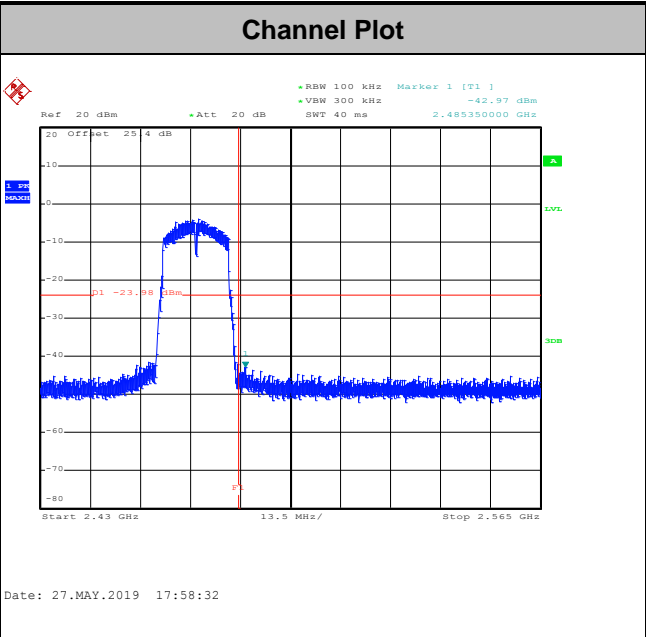
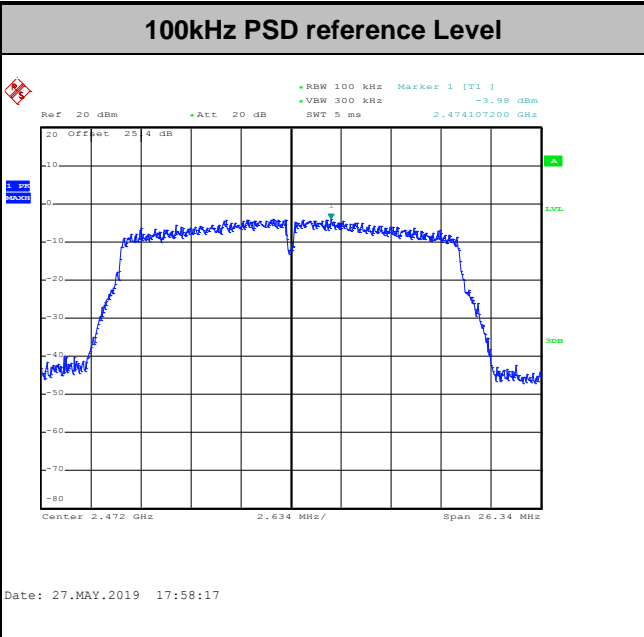
Test Mode :	802.11n HT20	Test Channel :	12
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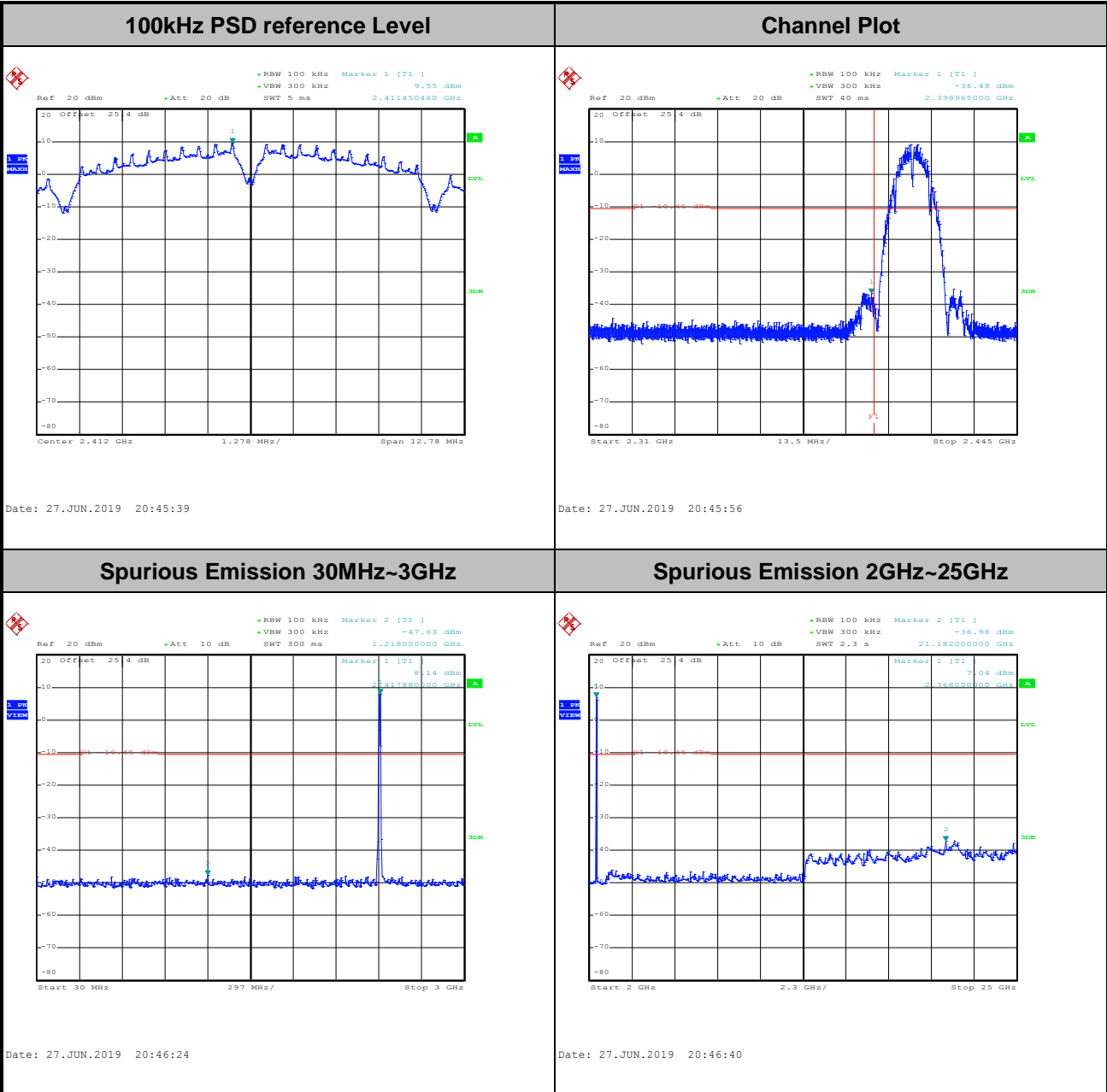
Test Mode :	802.11n HT20	Test Channel :	13
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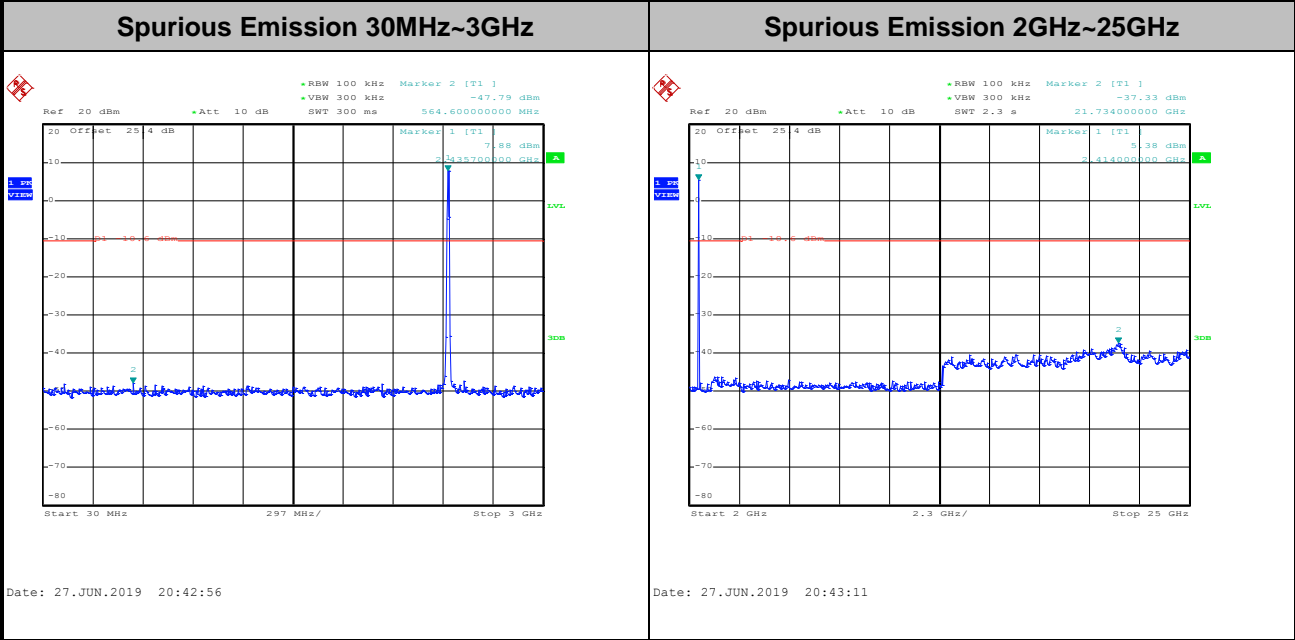
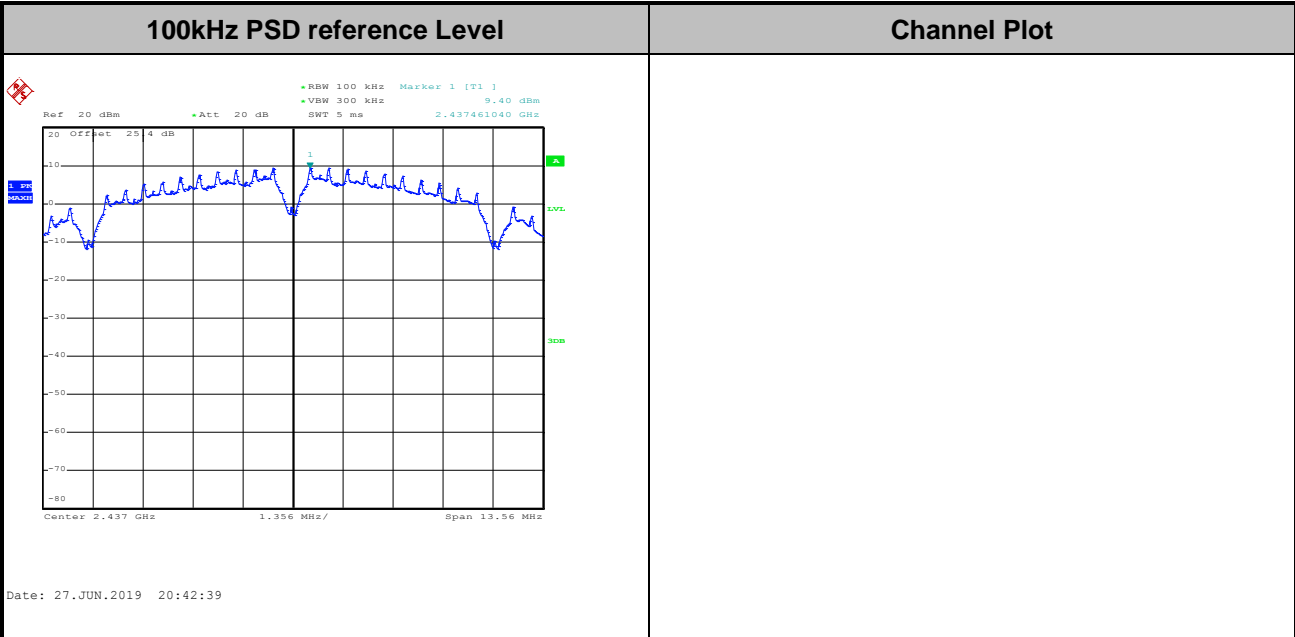
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01
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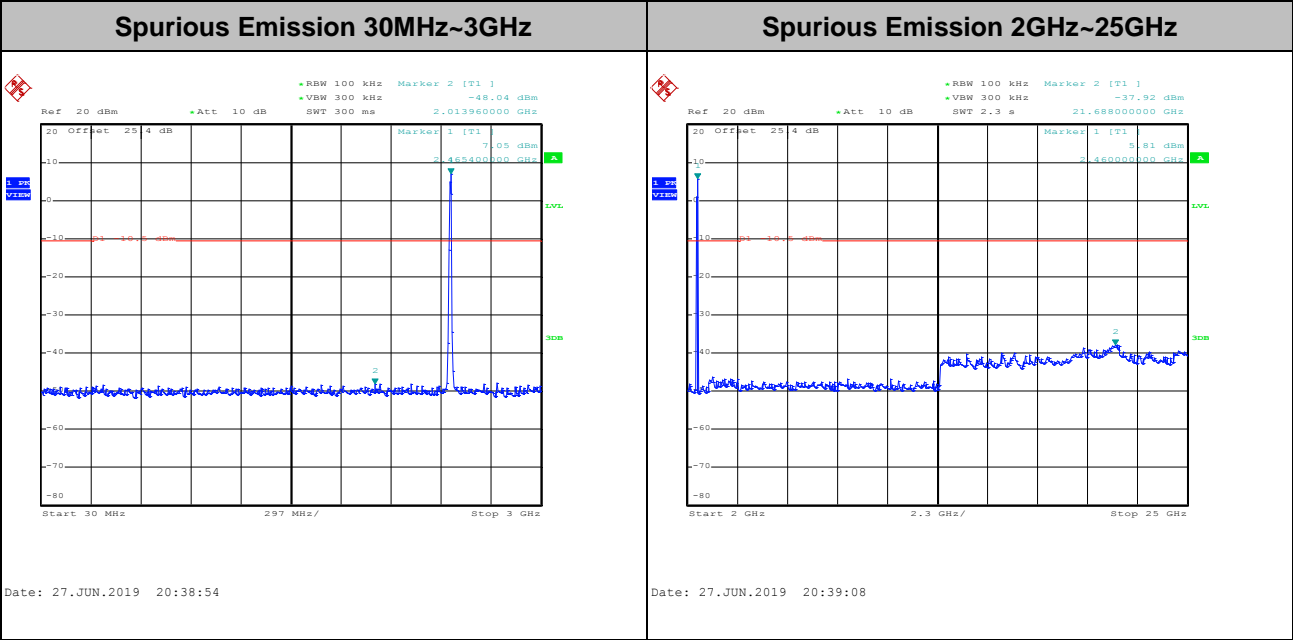
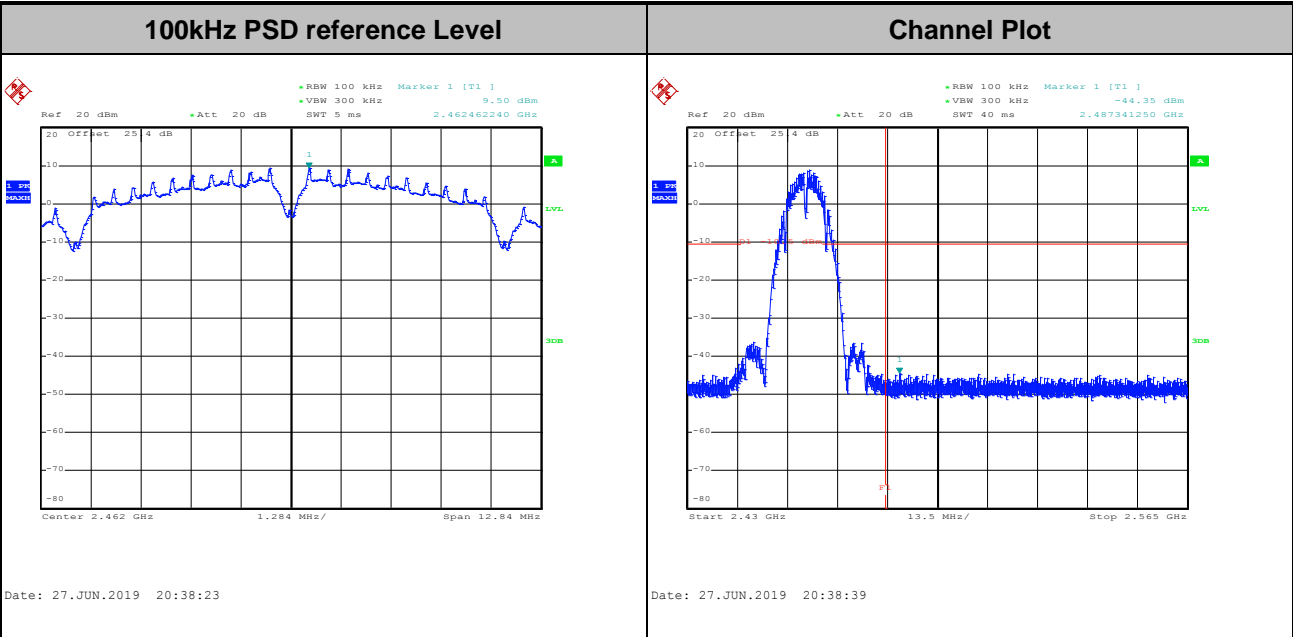


Test Mode :	802.11b	Test Channel :	06
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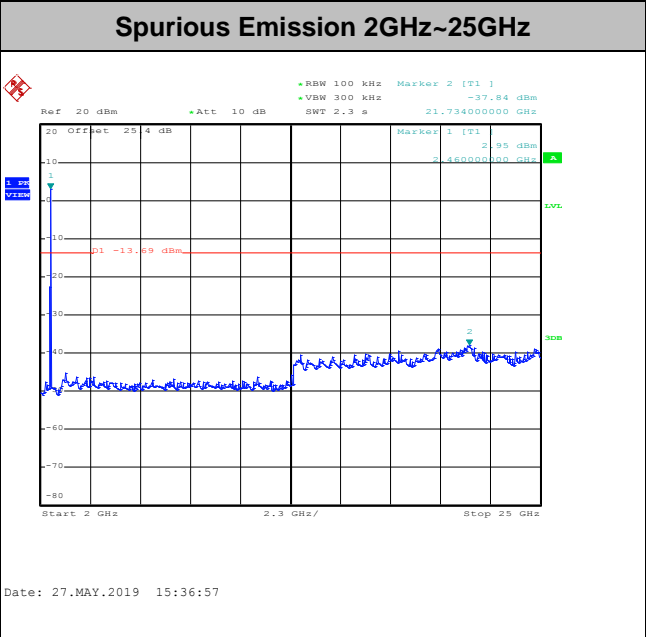
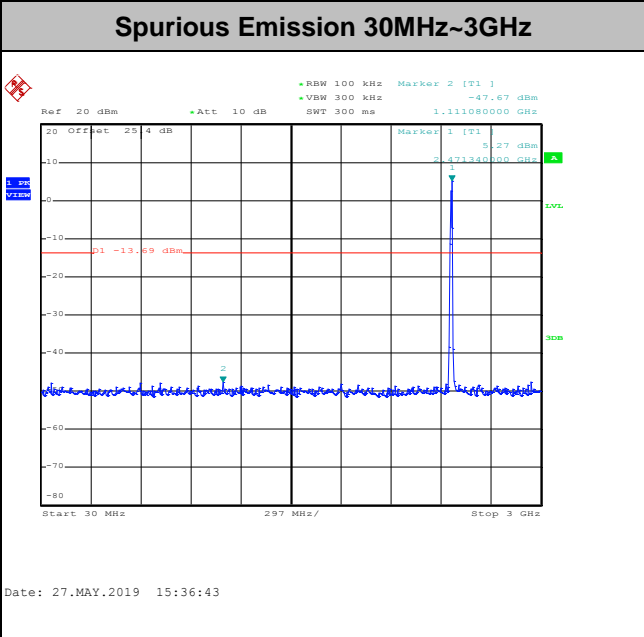
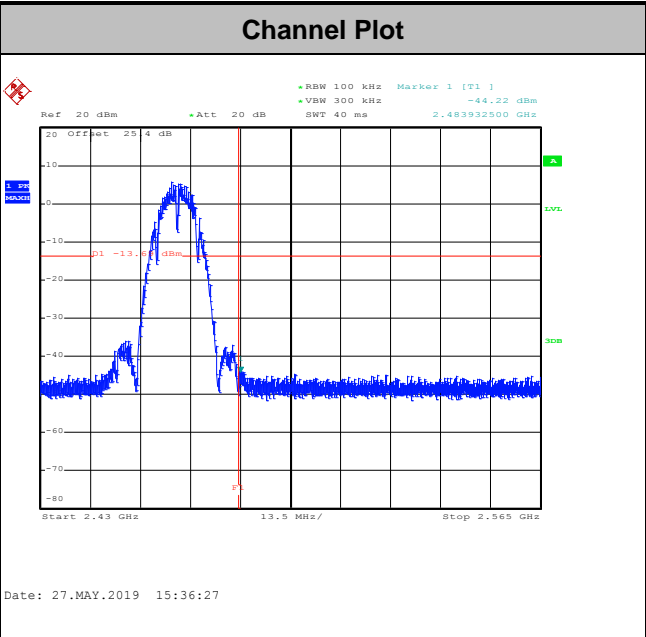
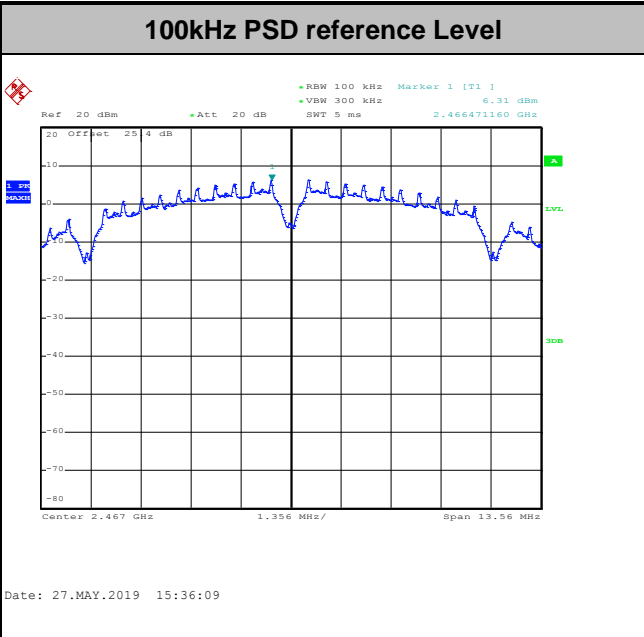


Test Mode :	802.11b	Test Channel :	11
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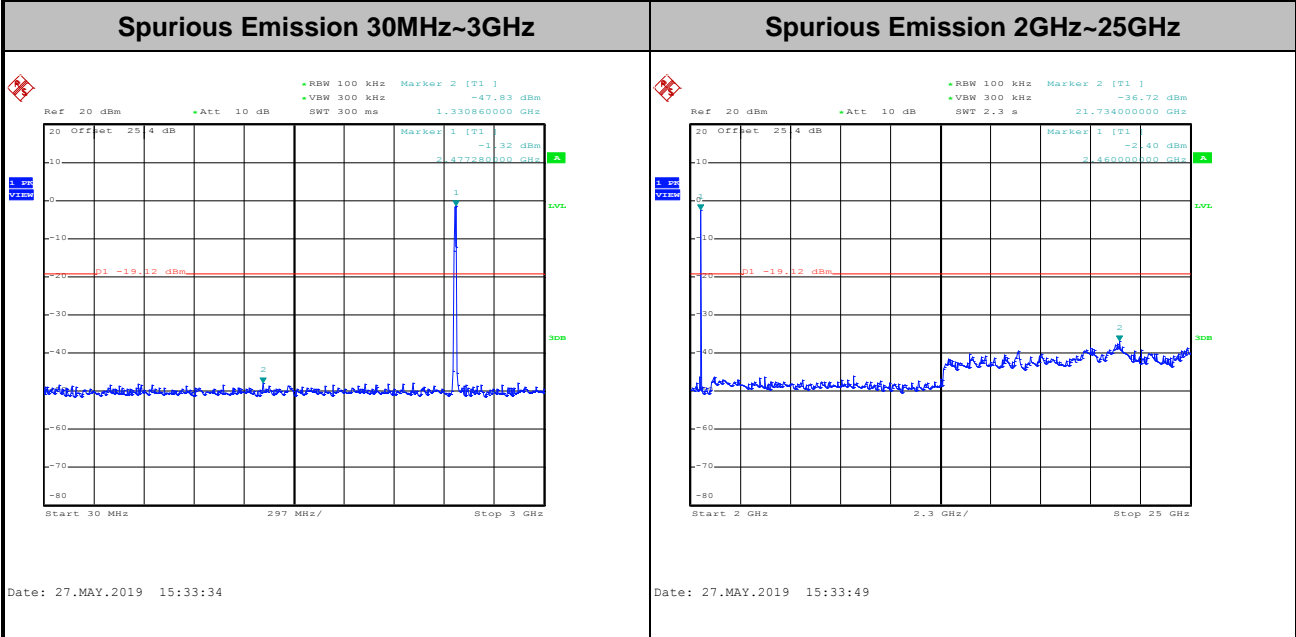
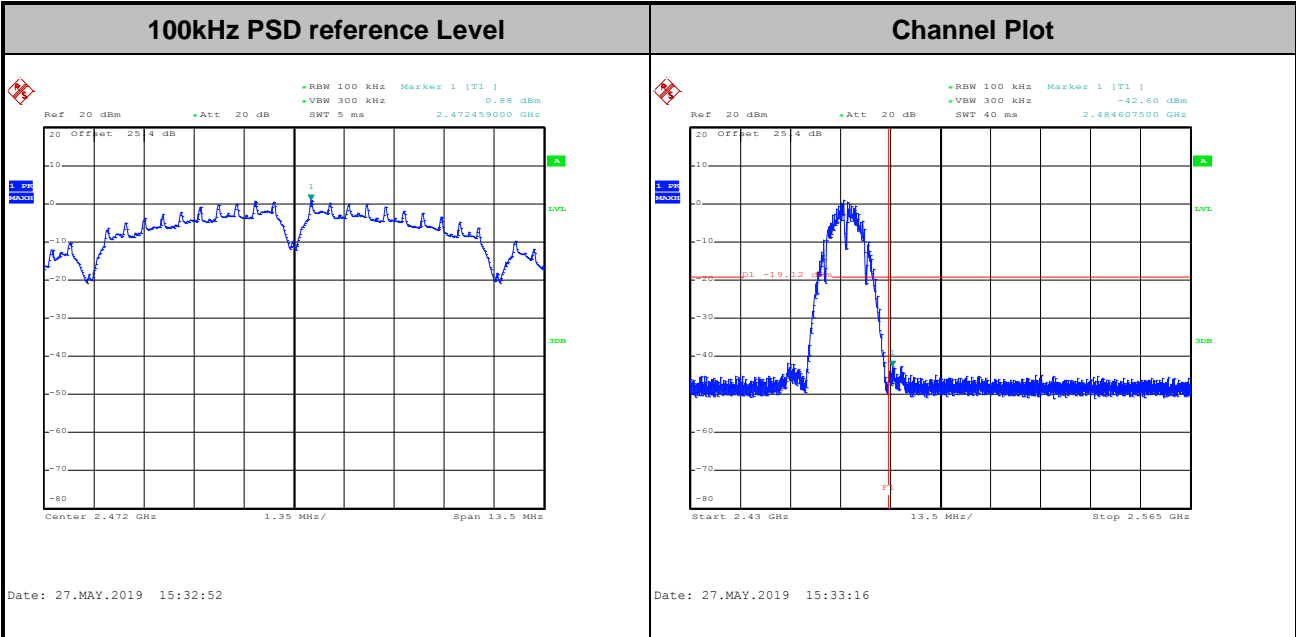


Test Mode :	802.11b	Test Channel :	12
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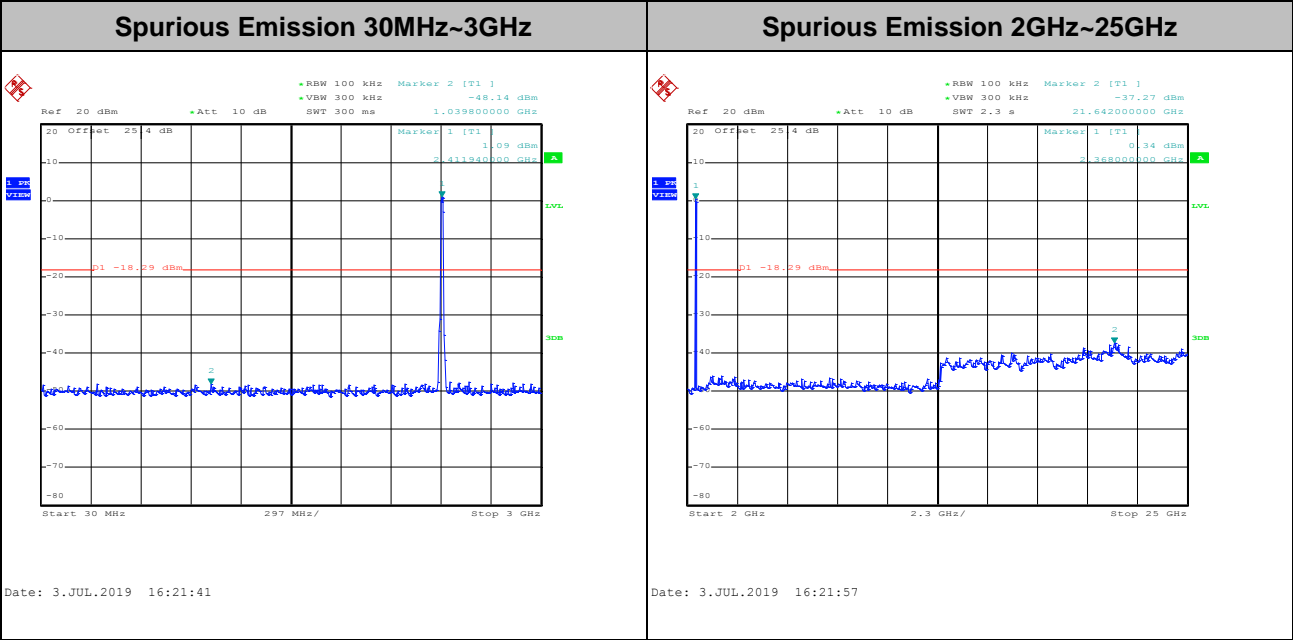
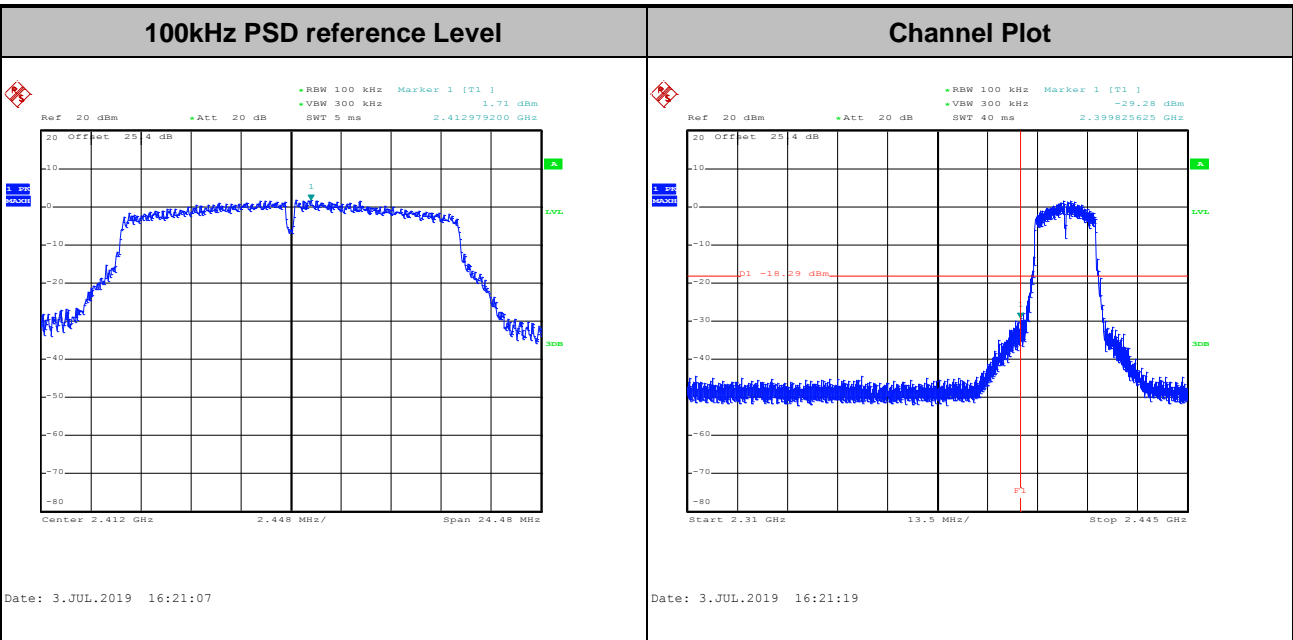


Test Mode :	802.11b	Test Channel :	13
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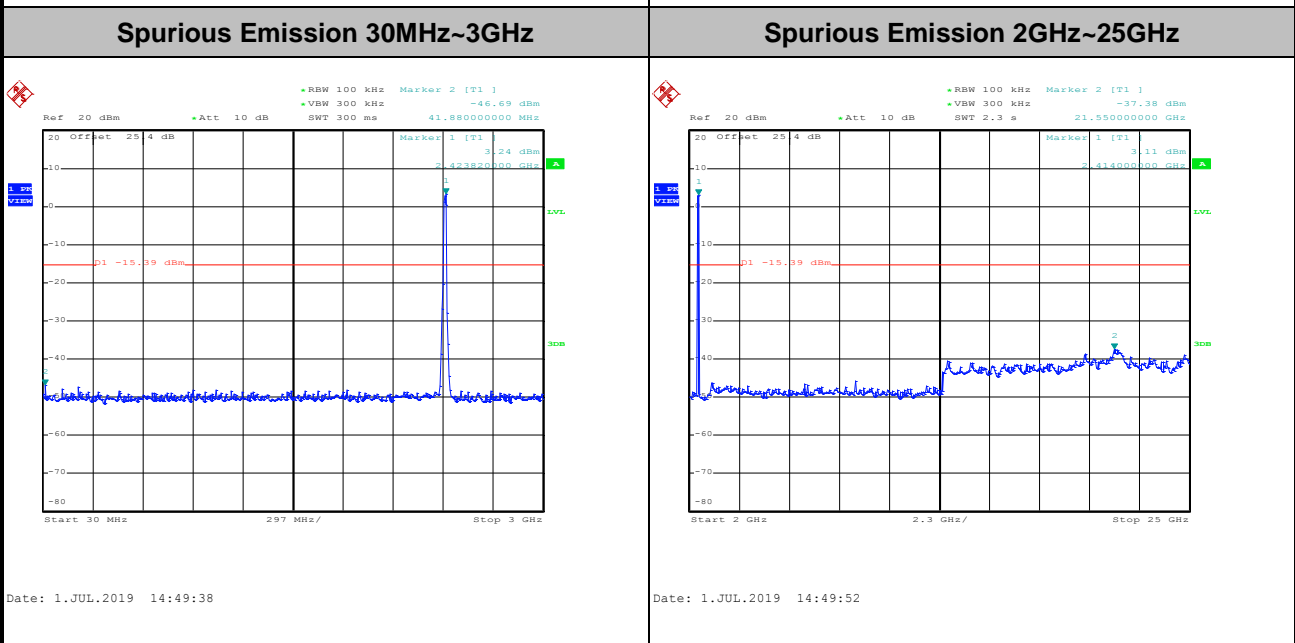
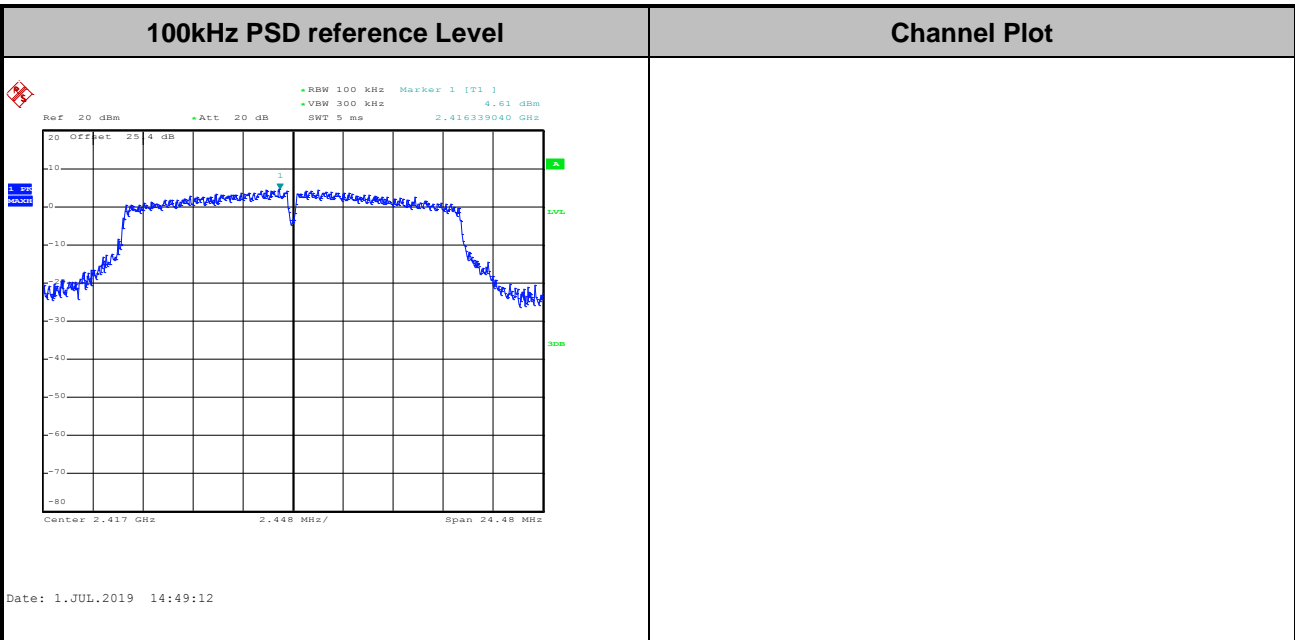


Test Mode :	802.11g	Test Channel :	01
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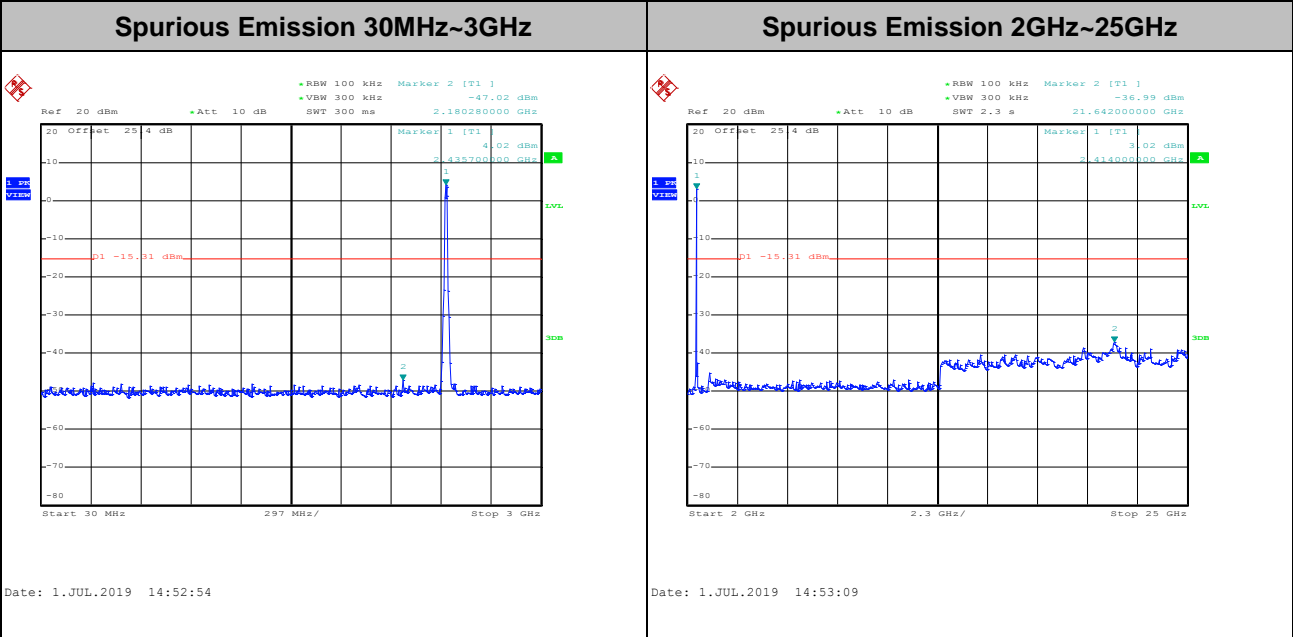
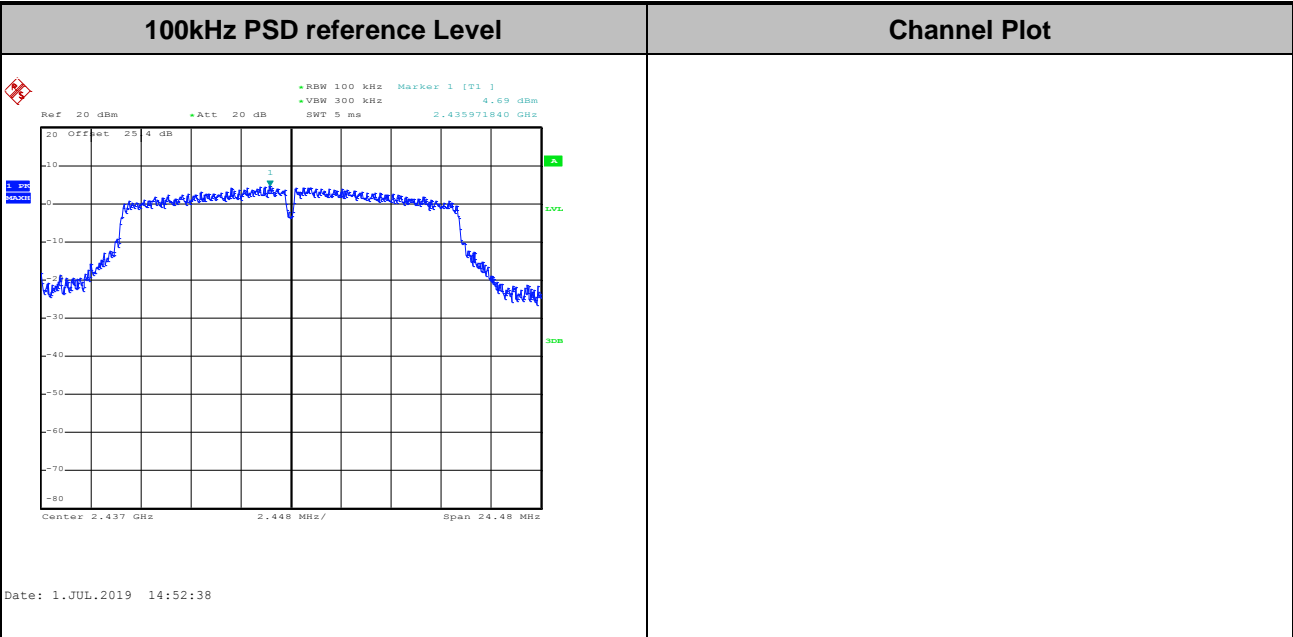
Test Mode :	802.11g	Test Channel :	02
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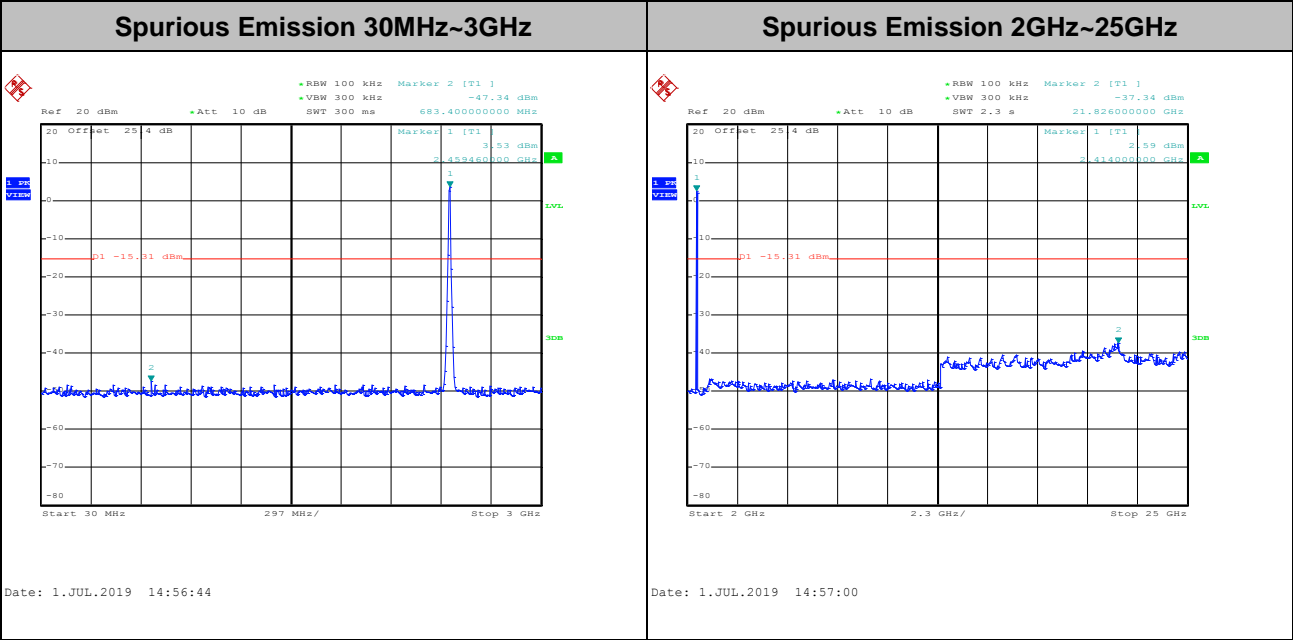
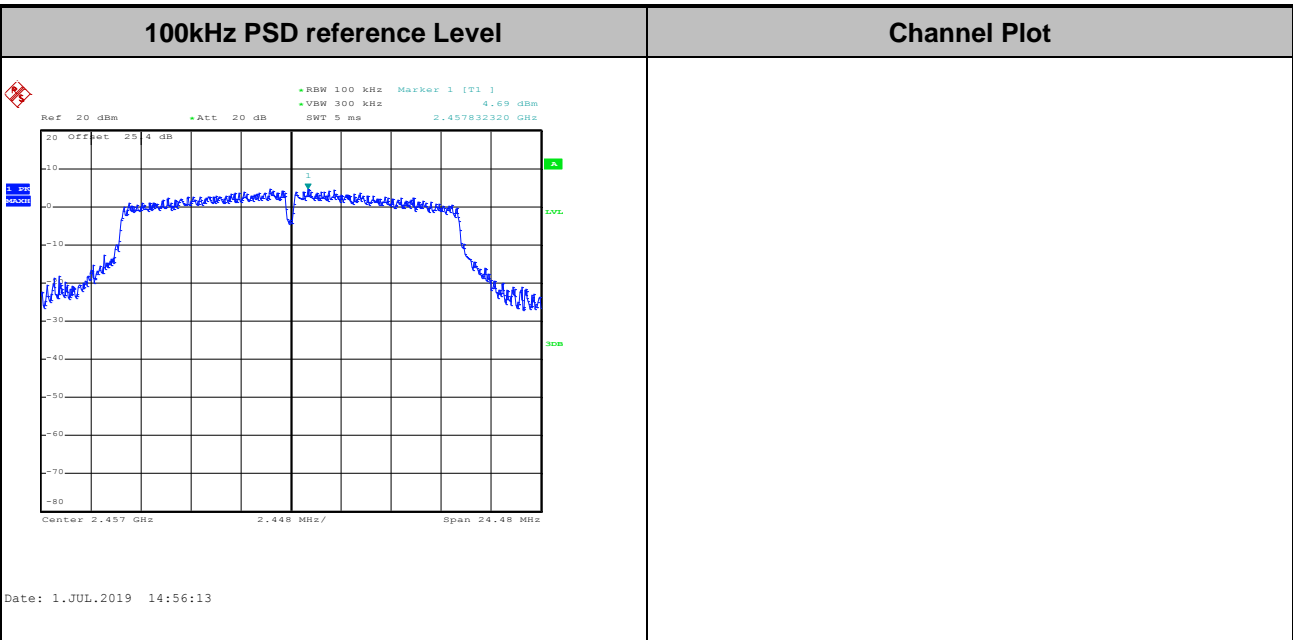


Test Mode :	802.11g	Test Channel :	06
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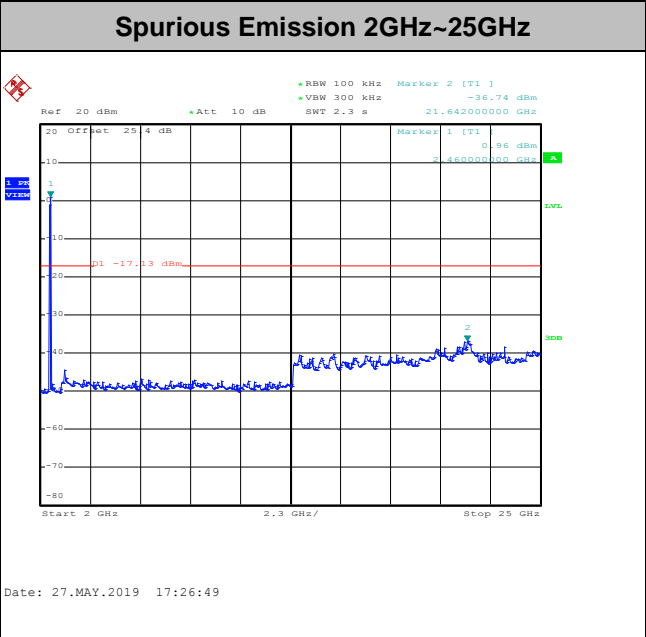
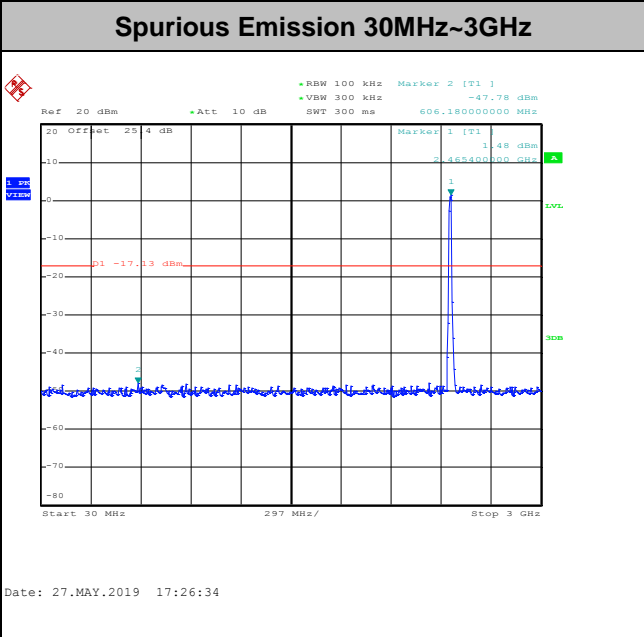
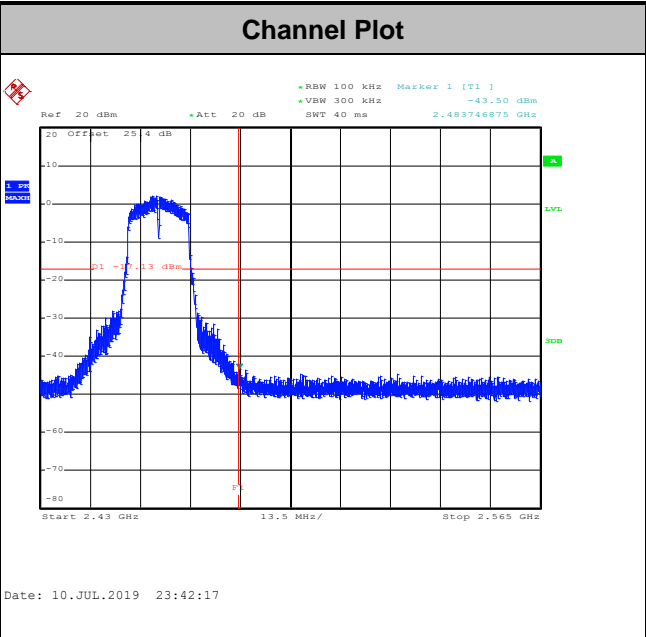
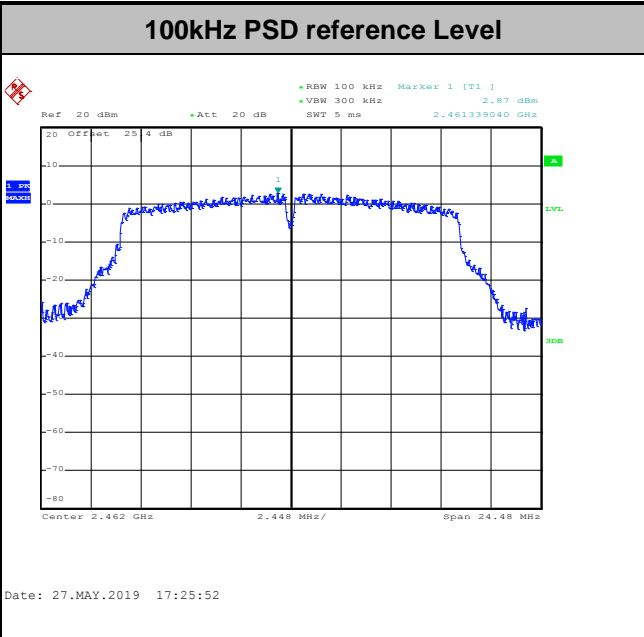


Test Mode :	802.11g	Test Channel :	10
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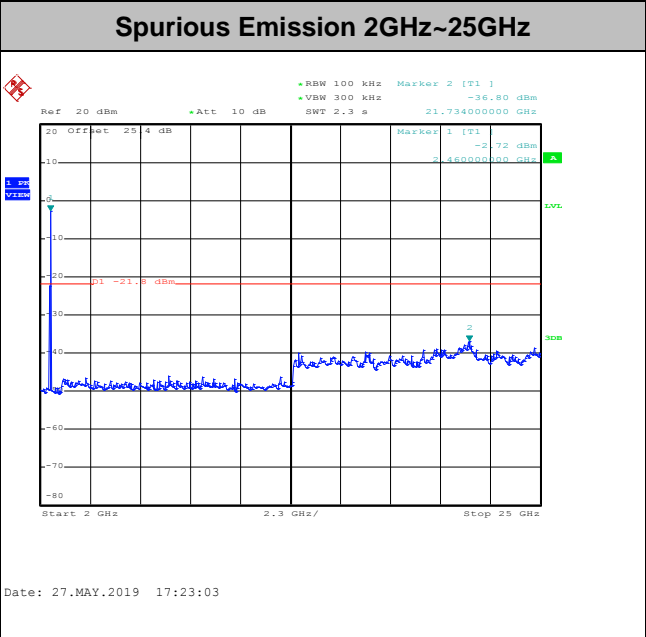
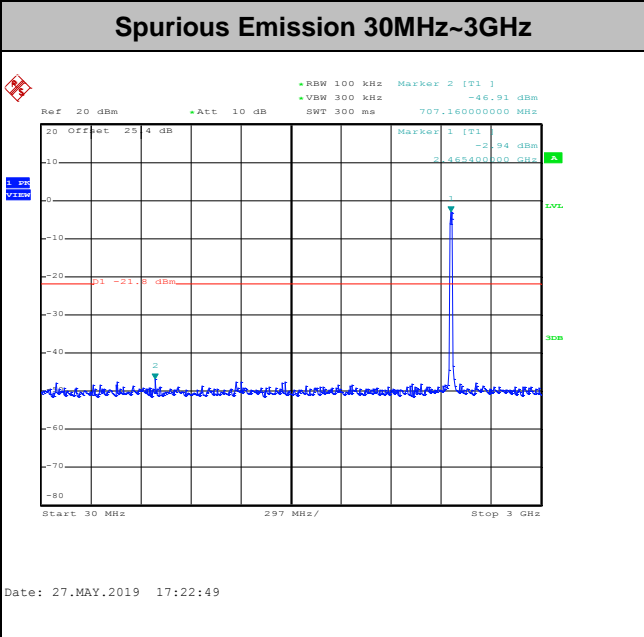
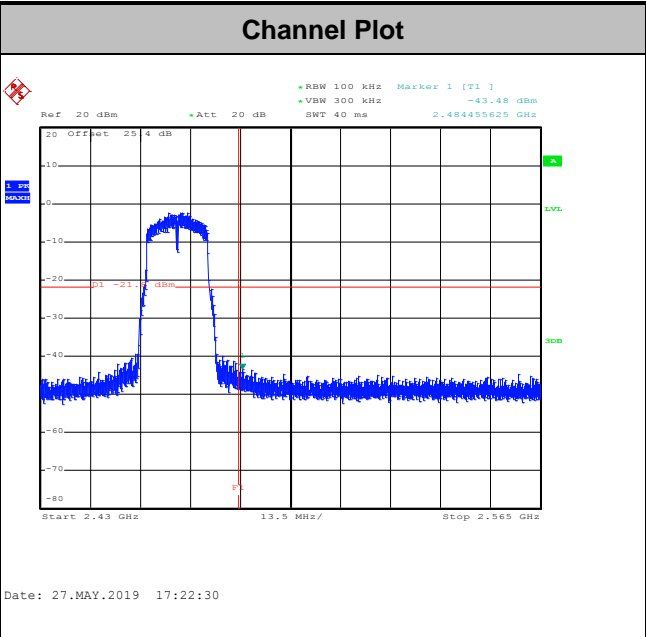
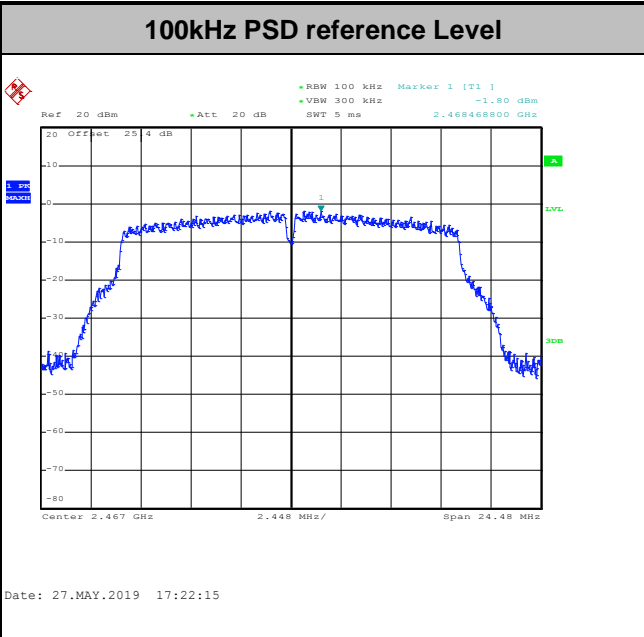


Test Mode :	802.11g	Test Channel :	11
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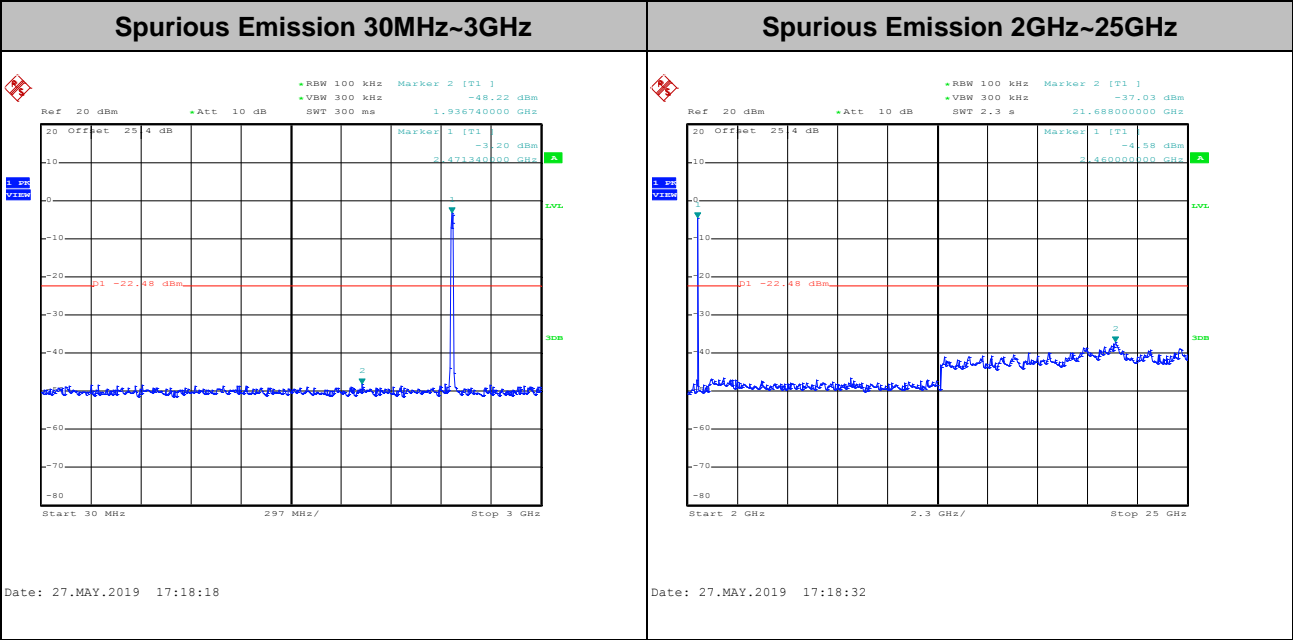
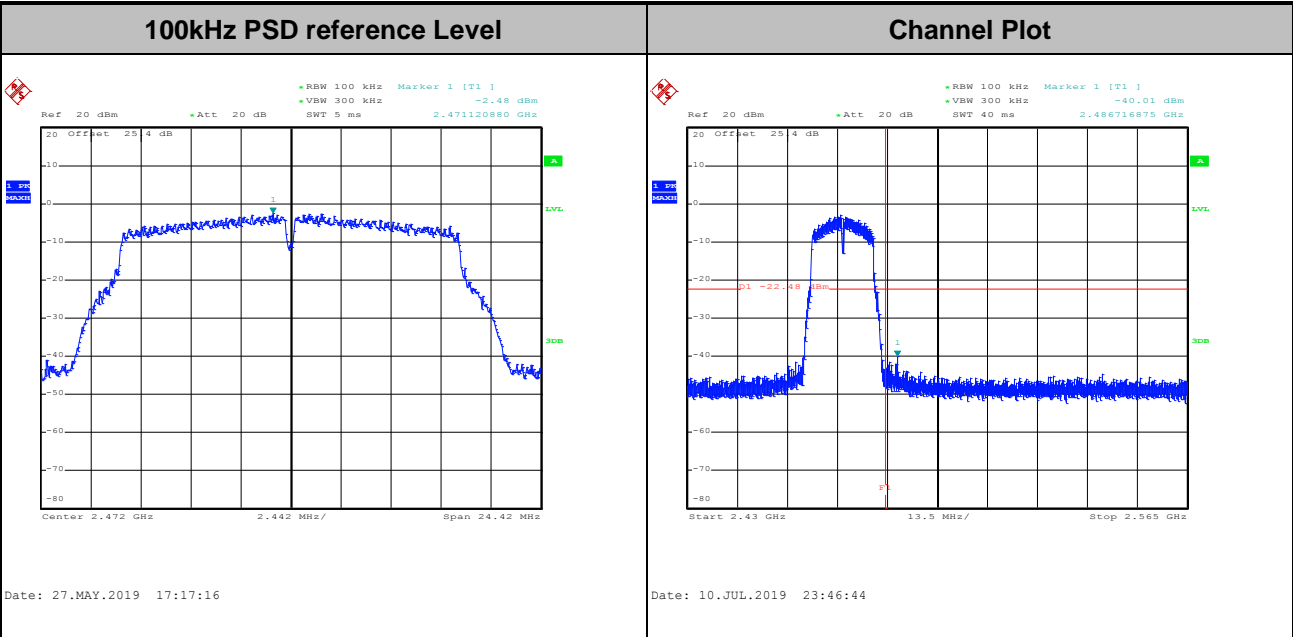


Test Mode :	802.11g	Test Channel :	12
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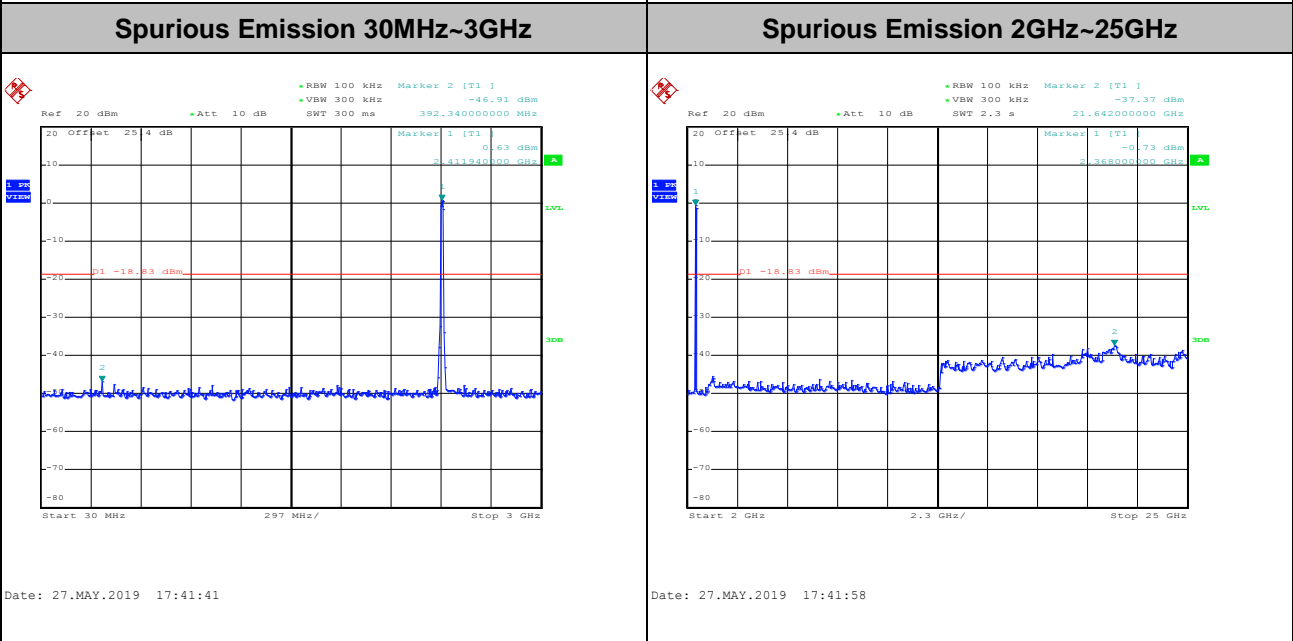
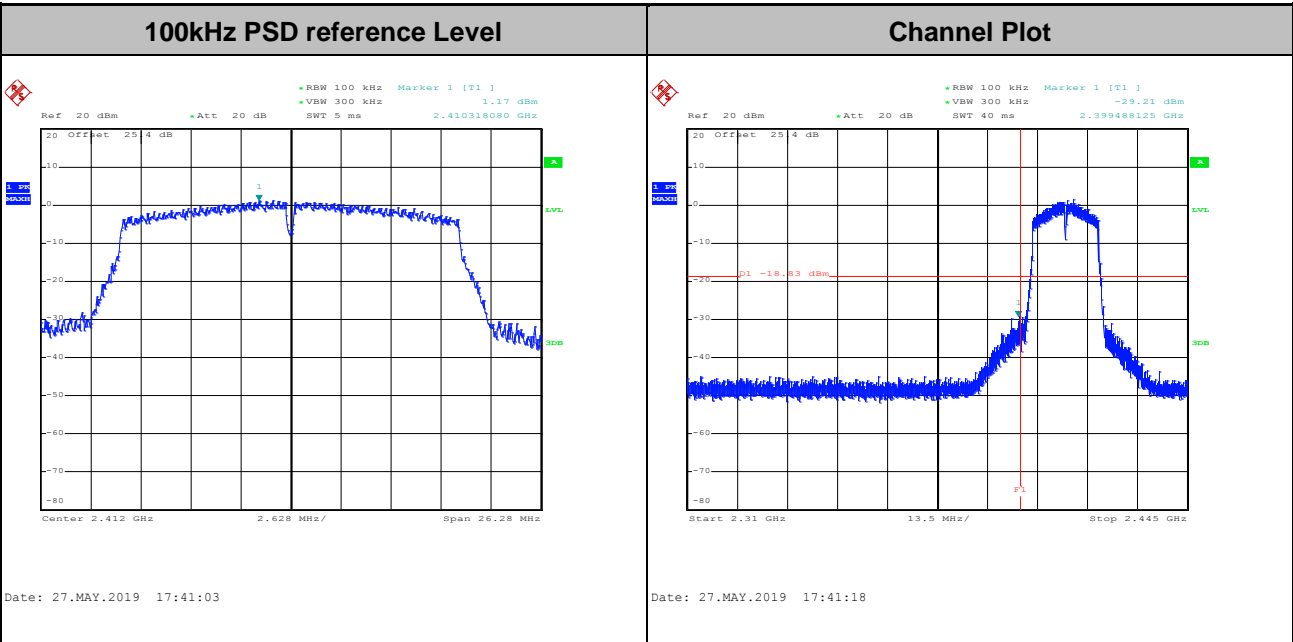


Test Mode :	802.11g	Test Channel :	13
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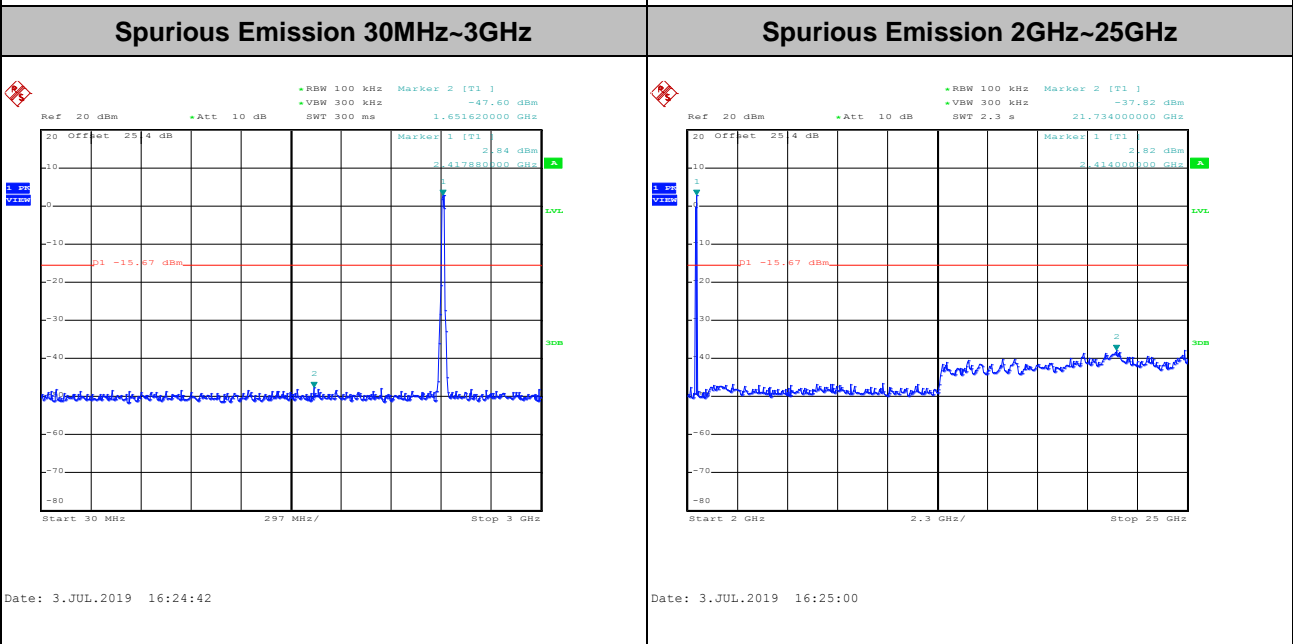
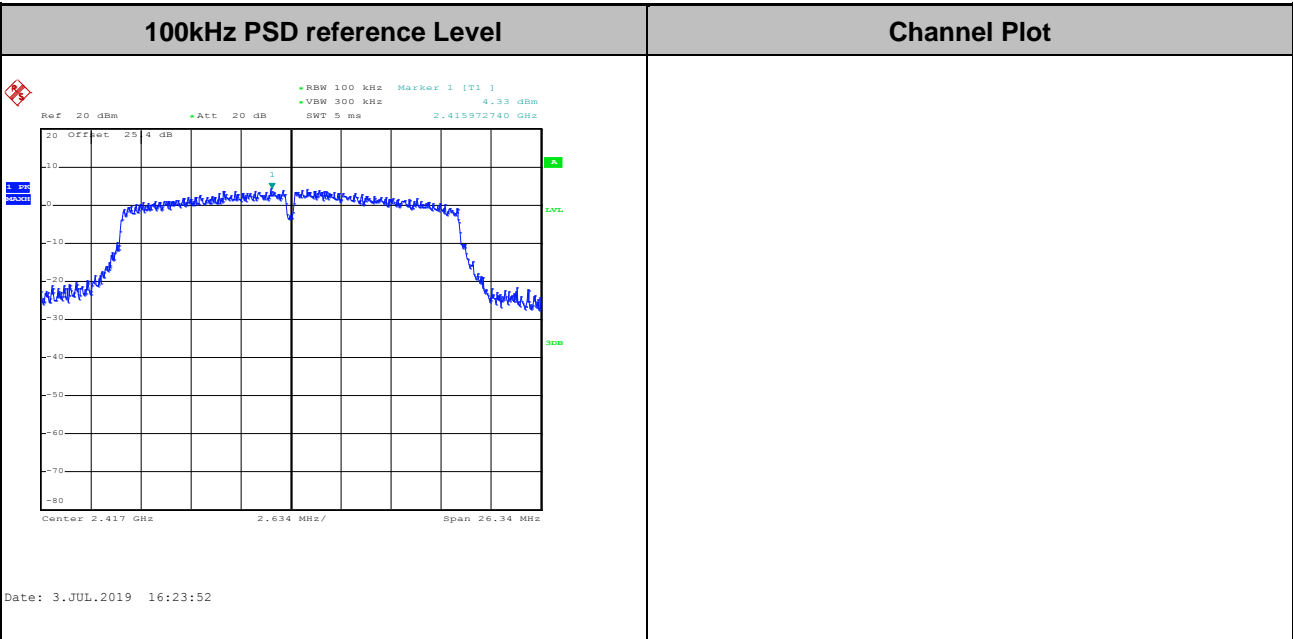


Test Mode :	802.11n HT20	Test Channel :	01
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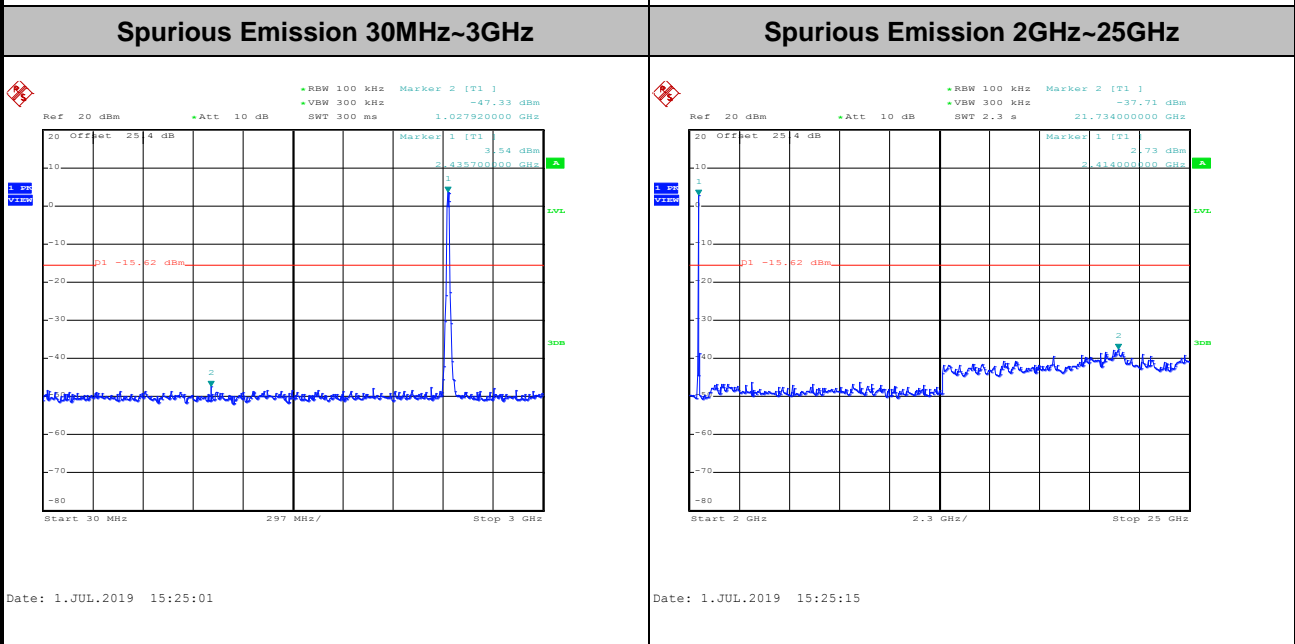
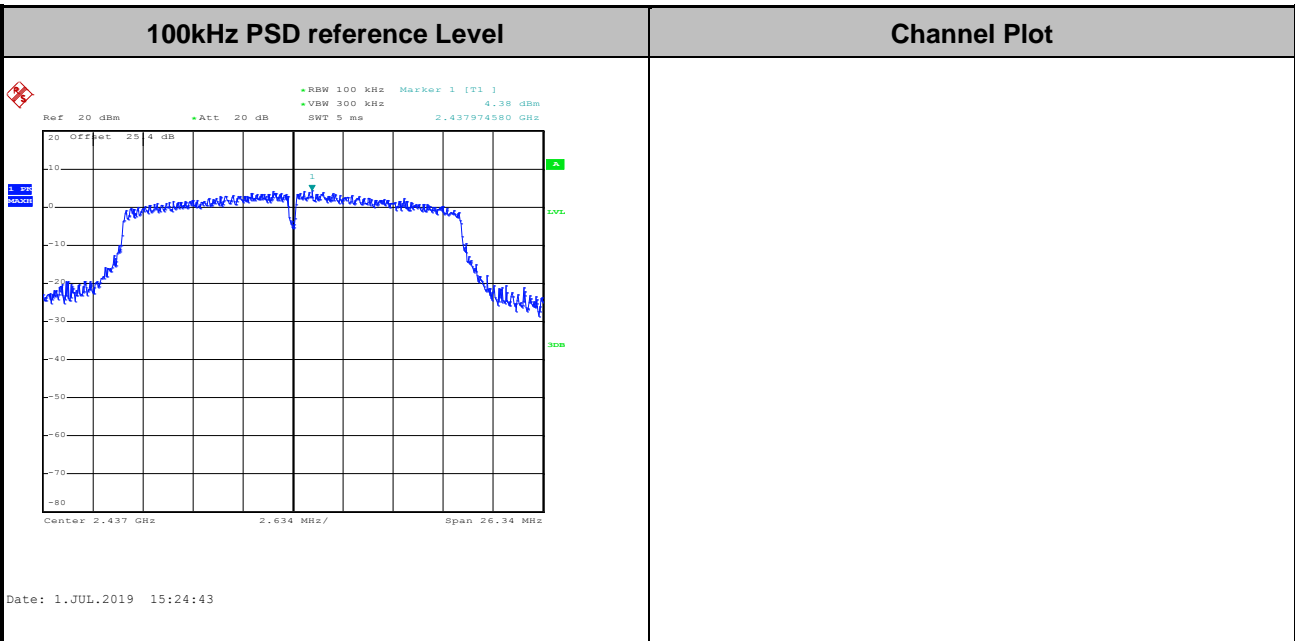


Test Mode :	802.11n HT20	Test Channel :	02
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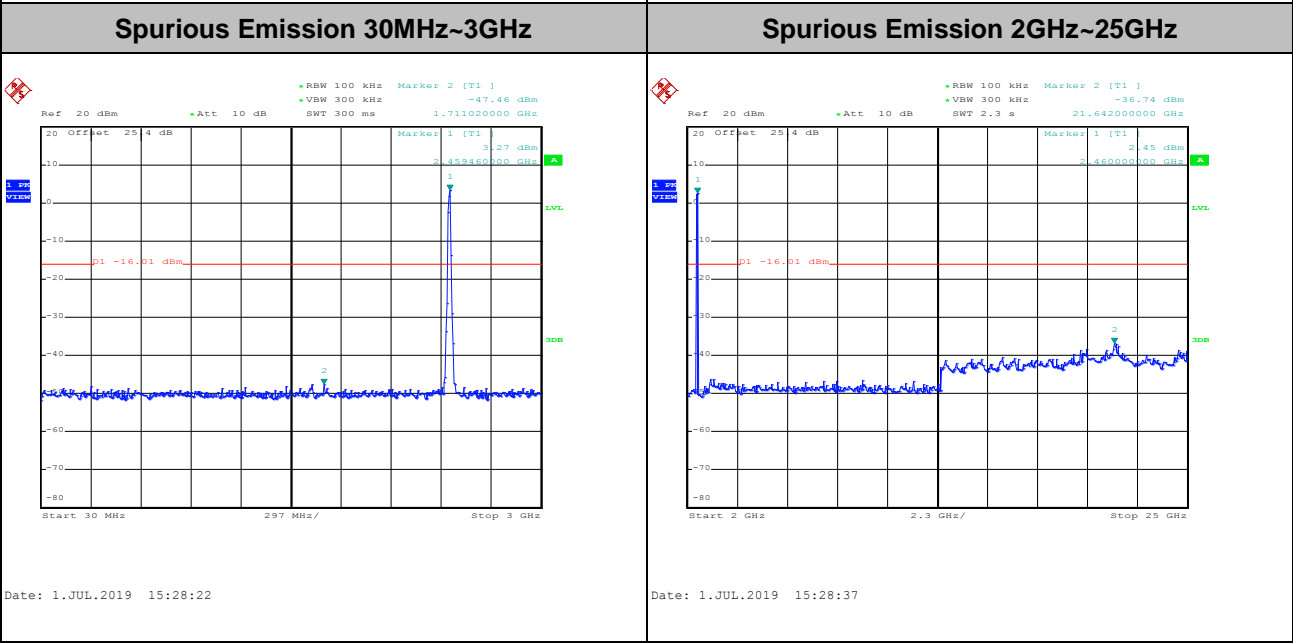
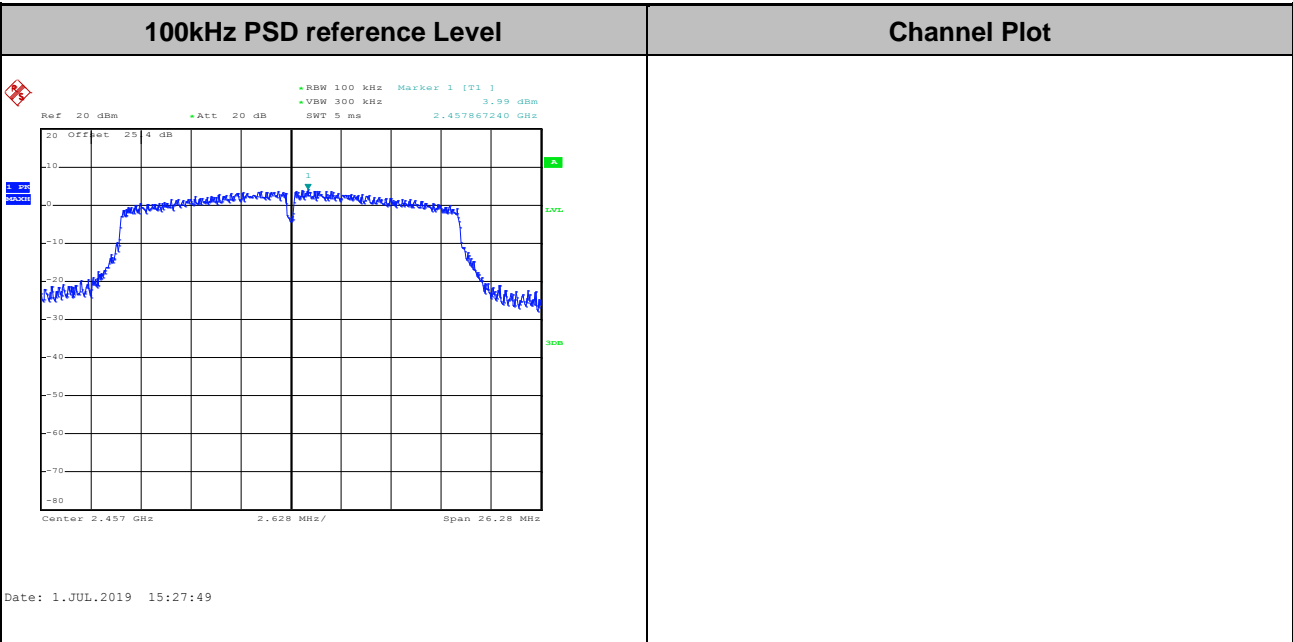
Test Mode :	802.11n HT20	Test Channel :	06
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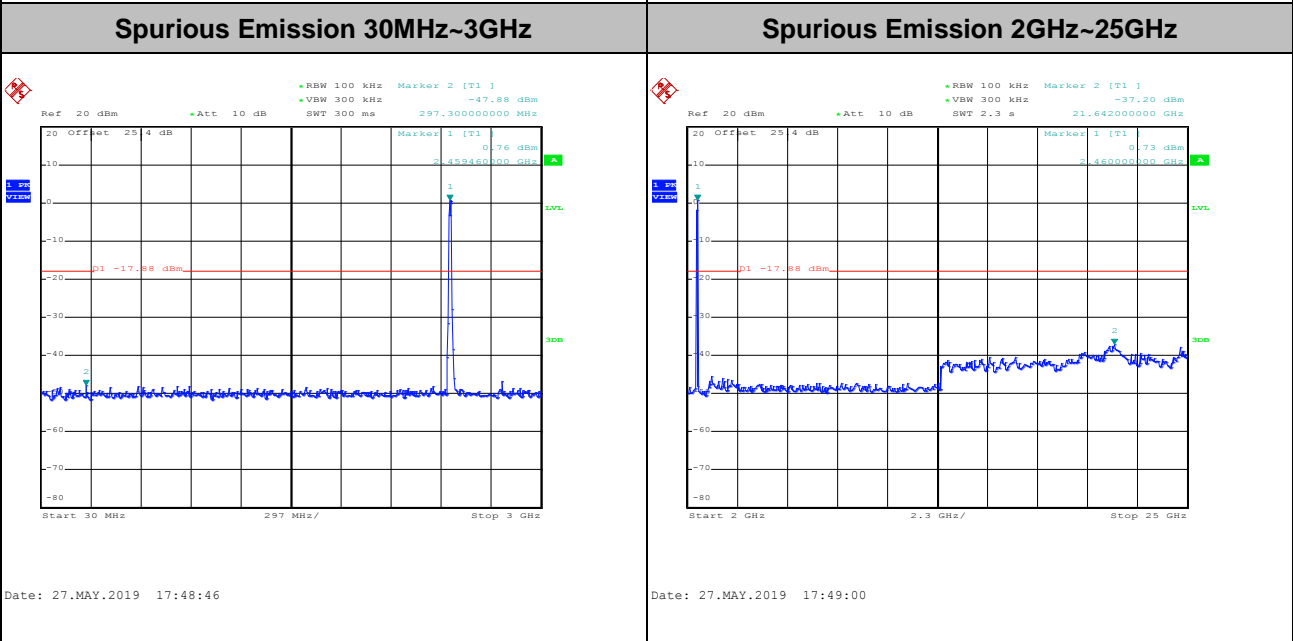
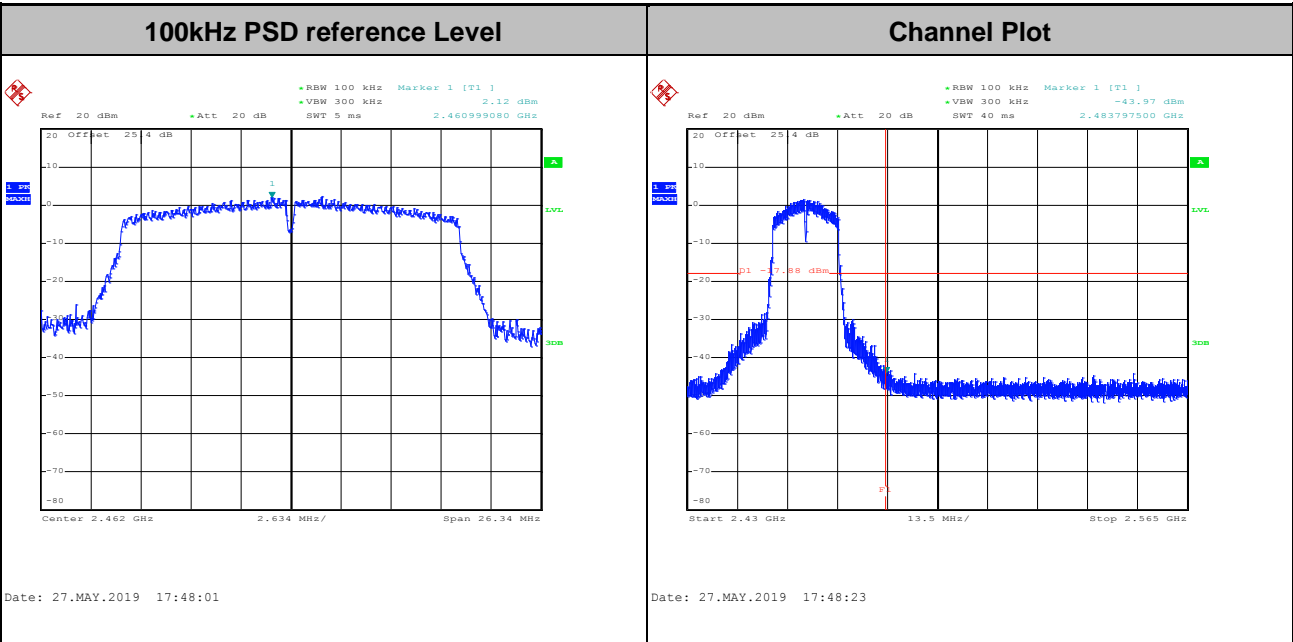


Test Mode :	802.11n HT20	Test Channel :	10
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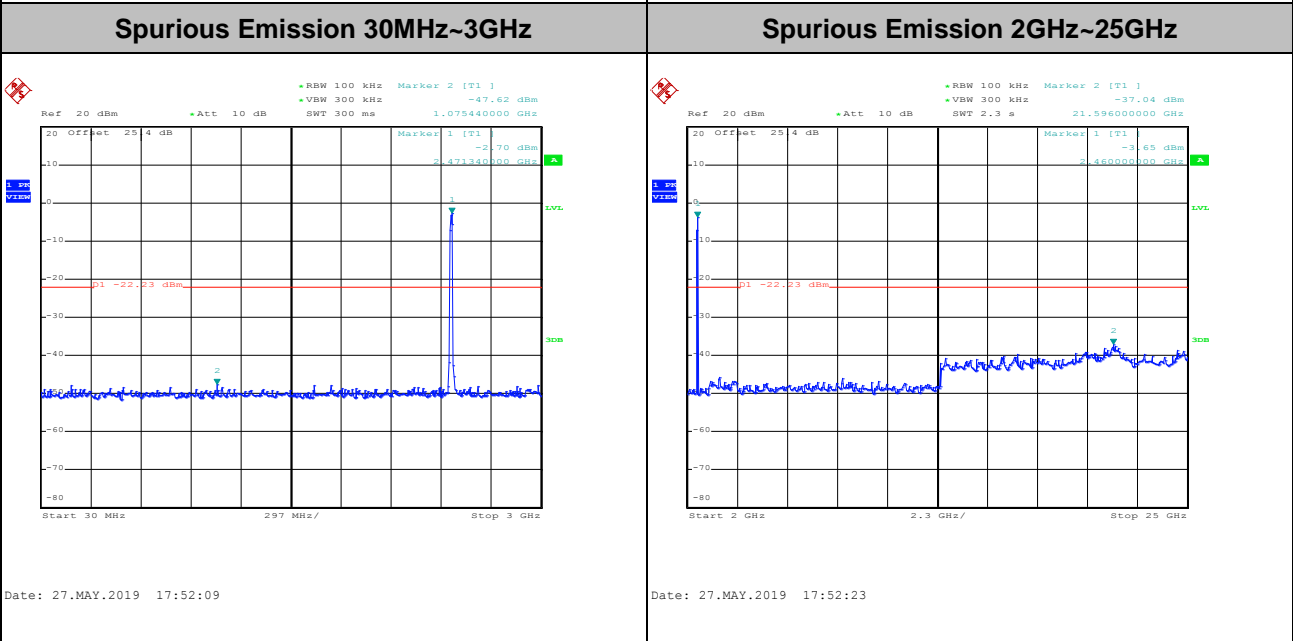
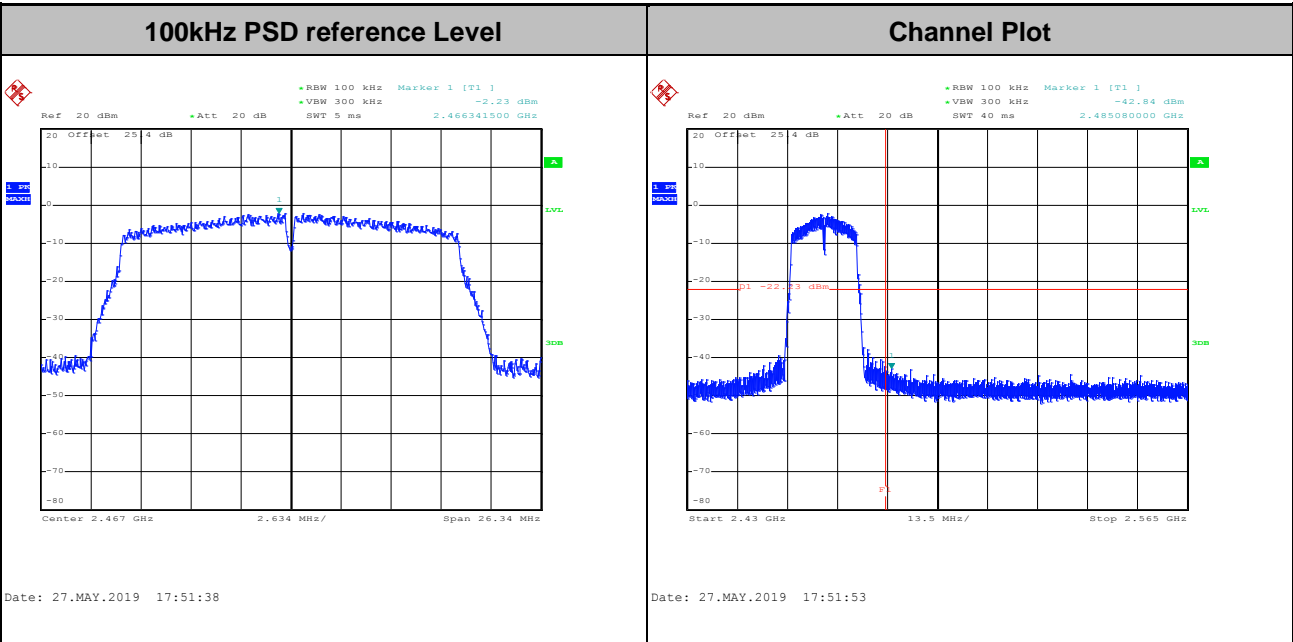


Test Mode :	802.11n HT20	Test Channel :	11
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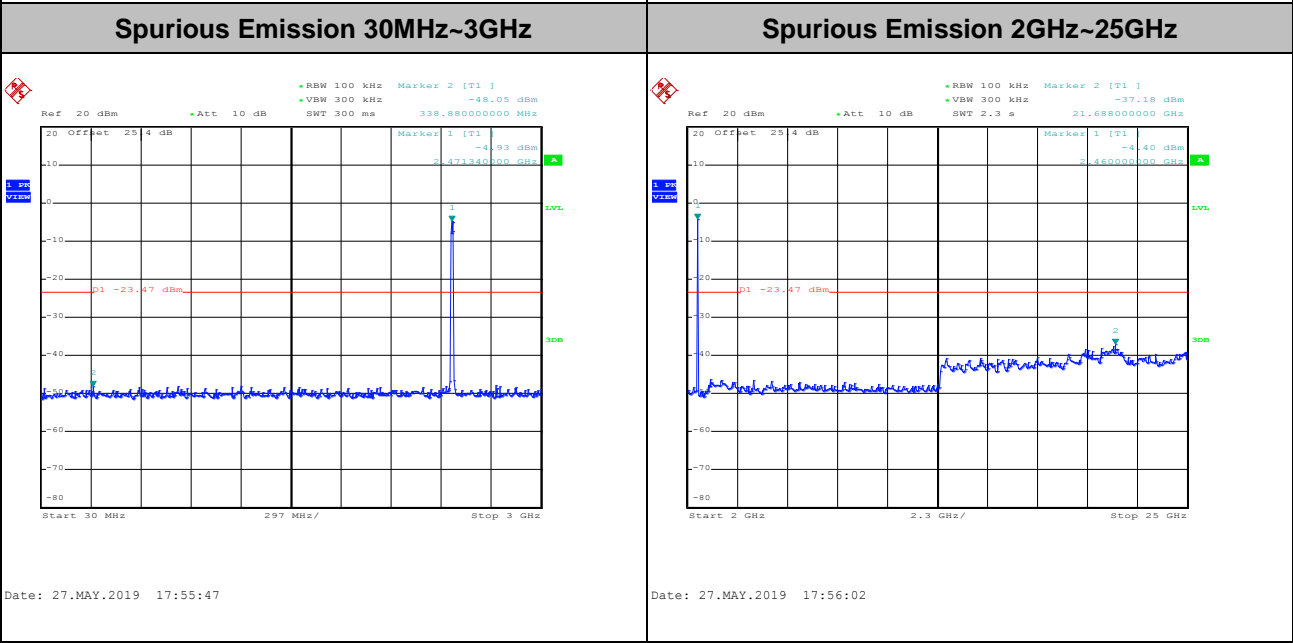
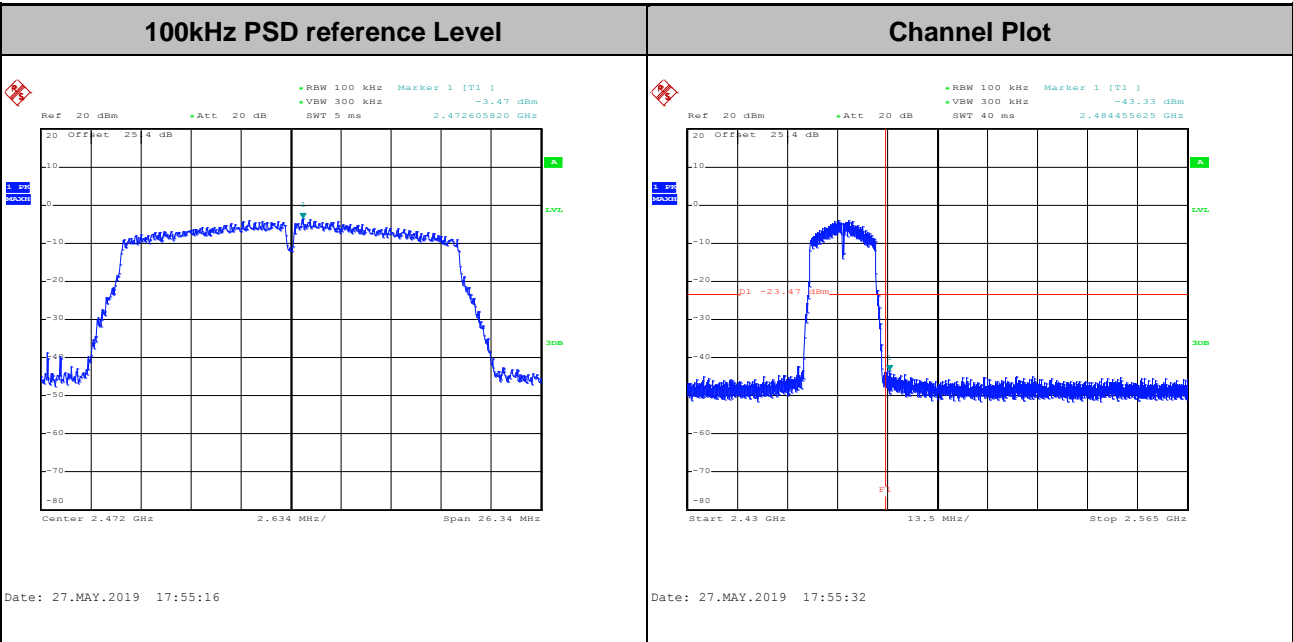


Test Mode :	802.11n HT20	Test Channel :	12
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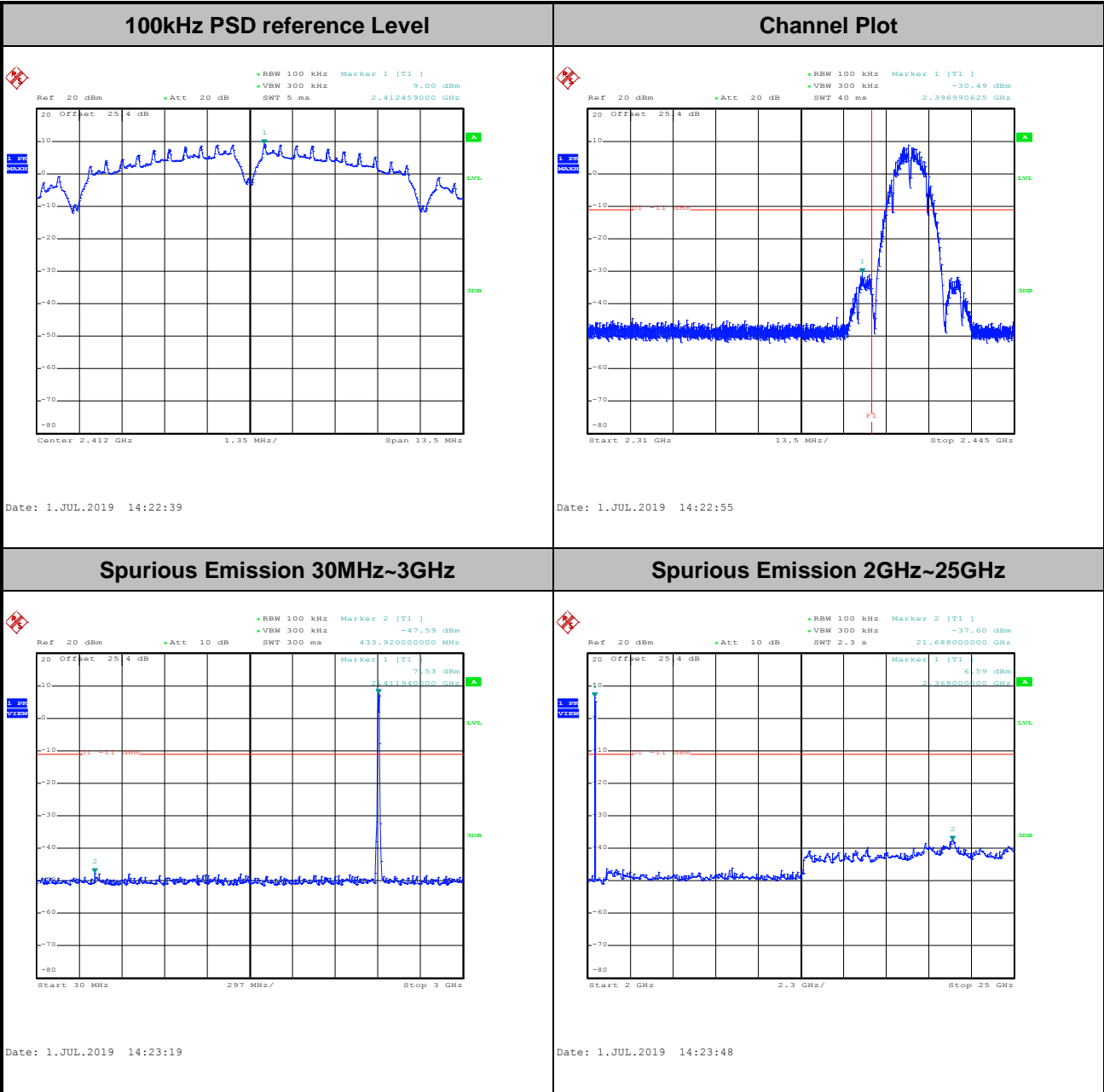
Test Mode : 802.11n HT20 Test Channel : 13





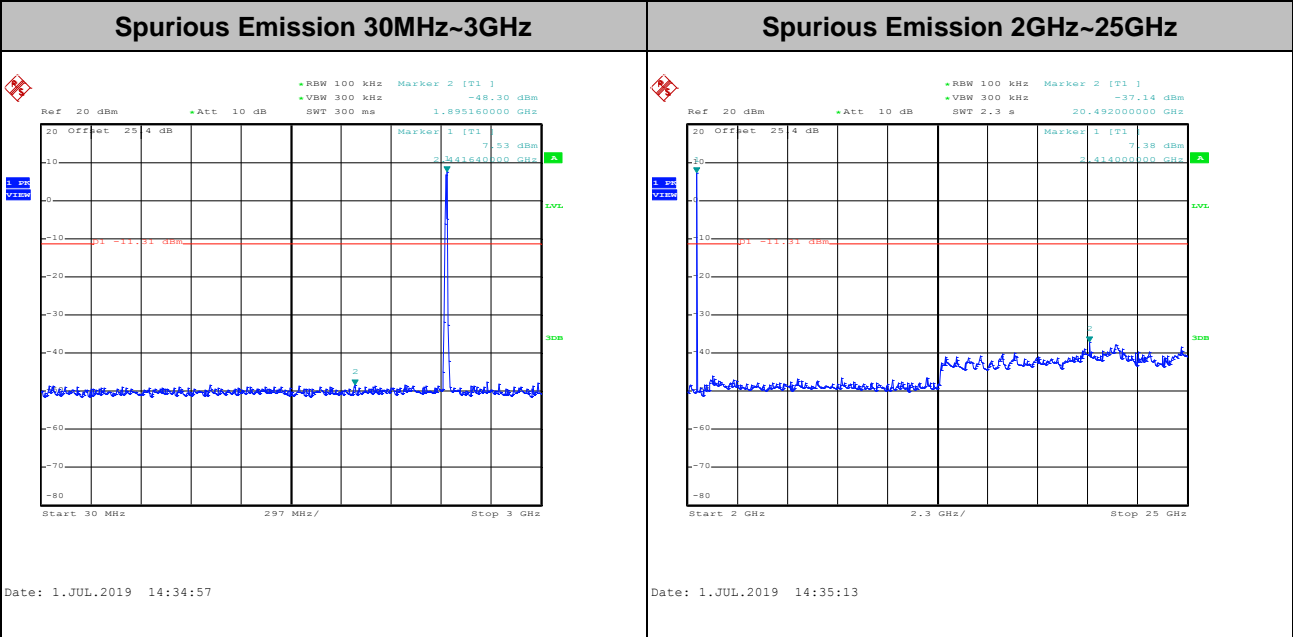
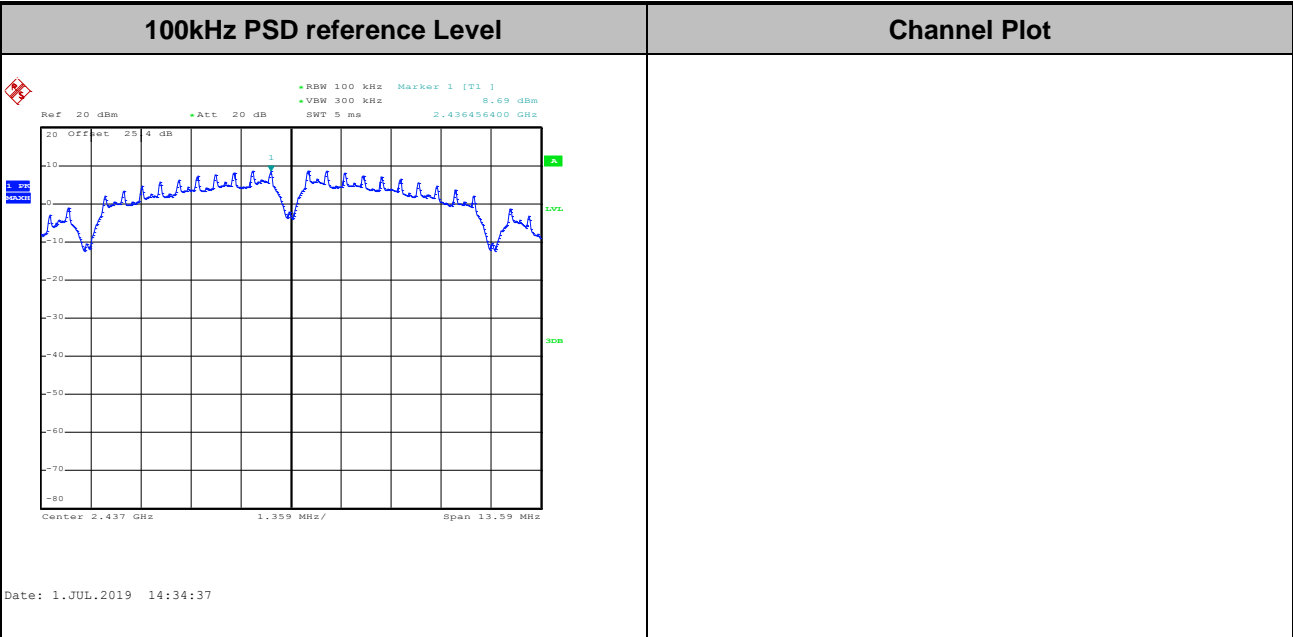
Number of TX = 2, Ant. 0 (Measured)

Test Mode :	802.11b	Test Channel :	01
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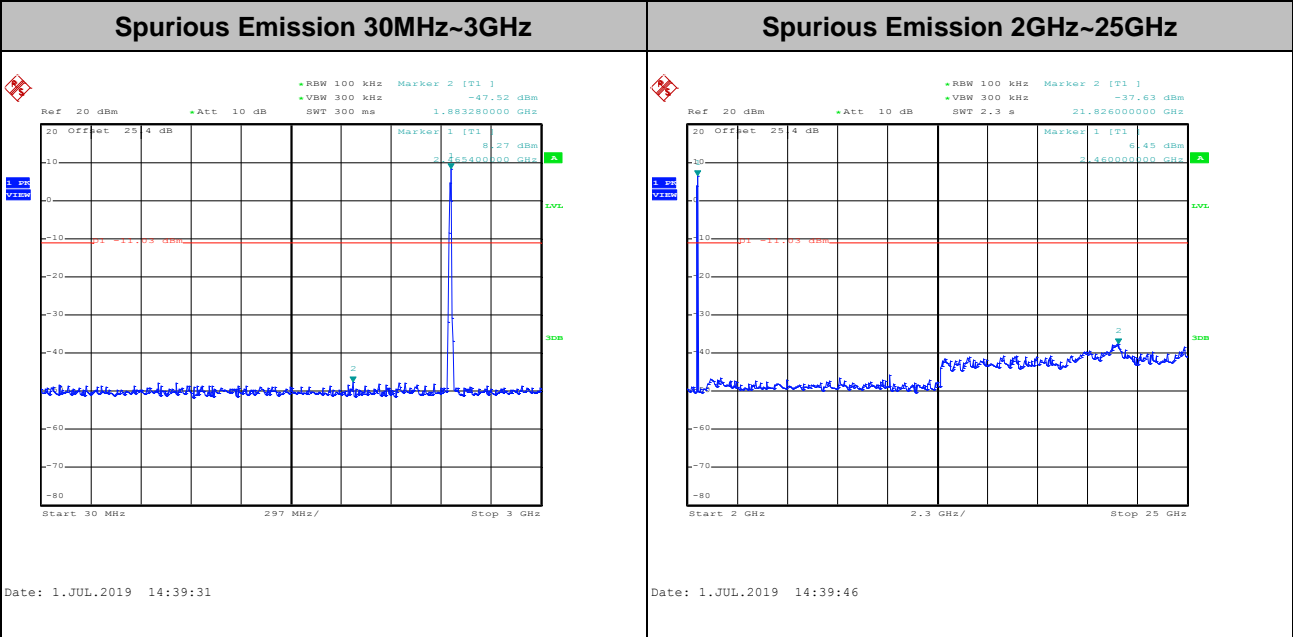
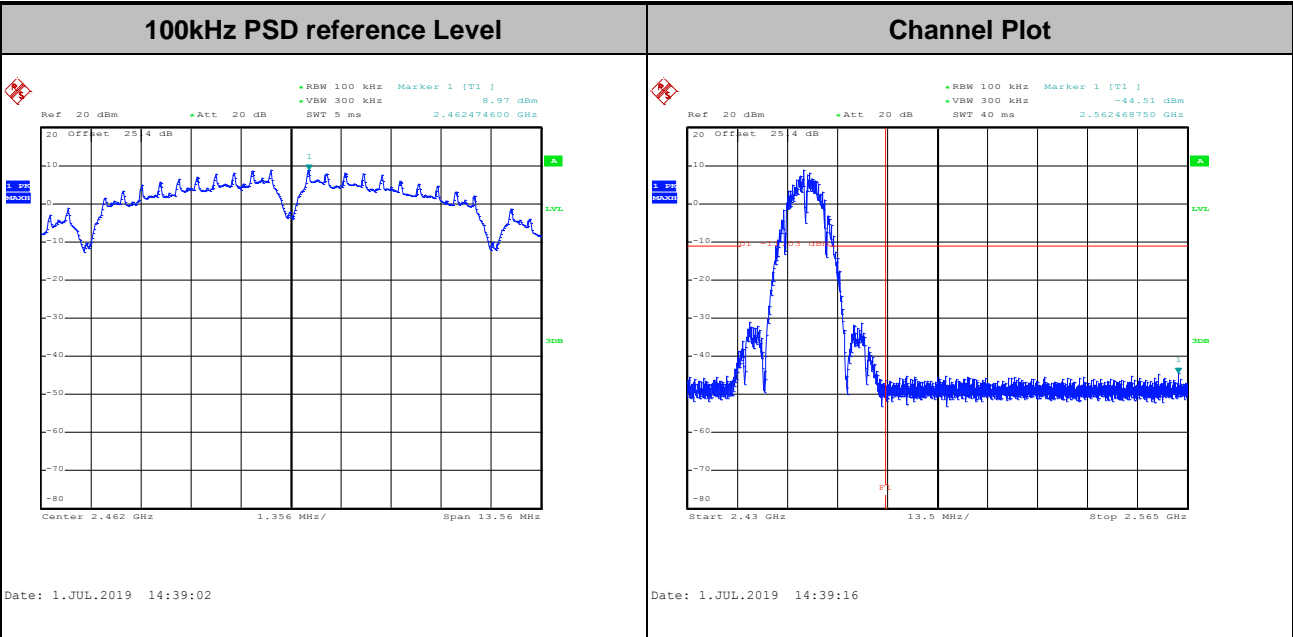


Test Mode :	802.11b	Test Channel :	06
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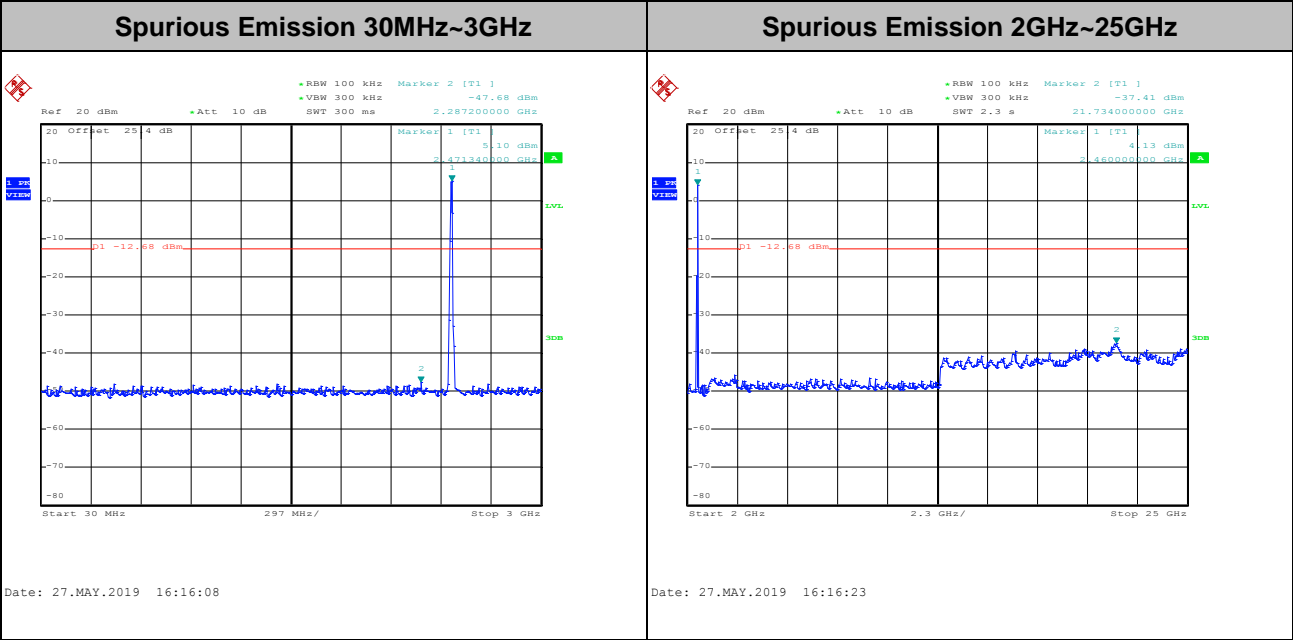
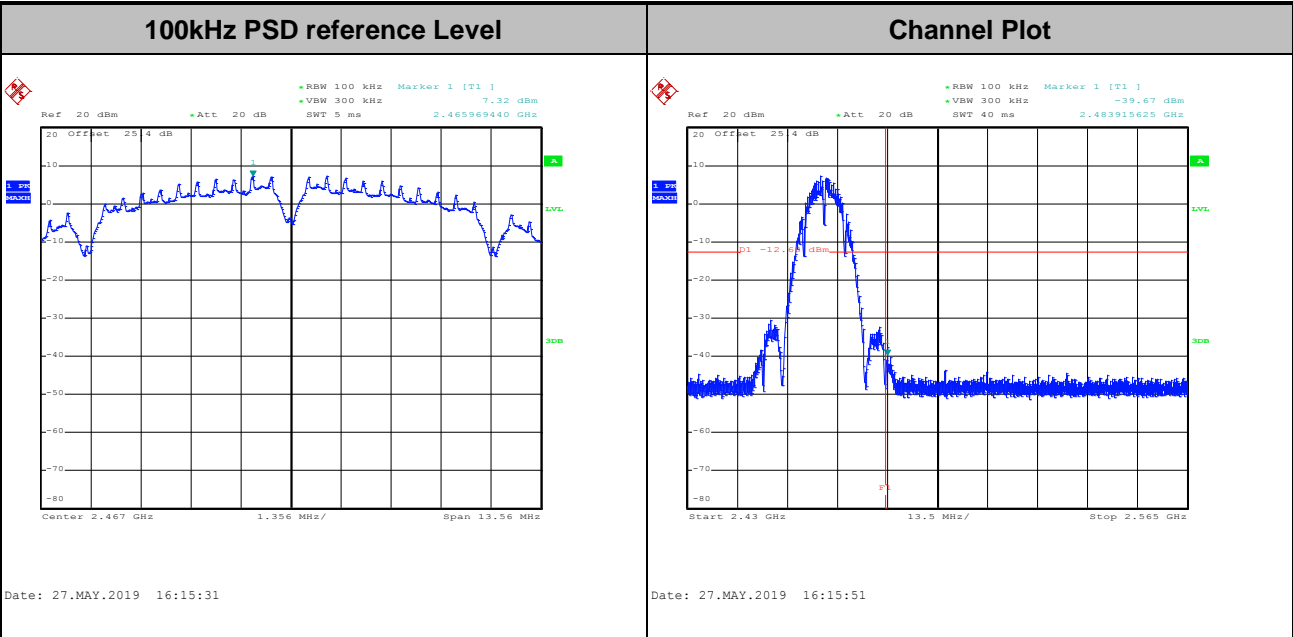


Test Mode :	802.11b	Test Channel :	11
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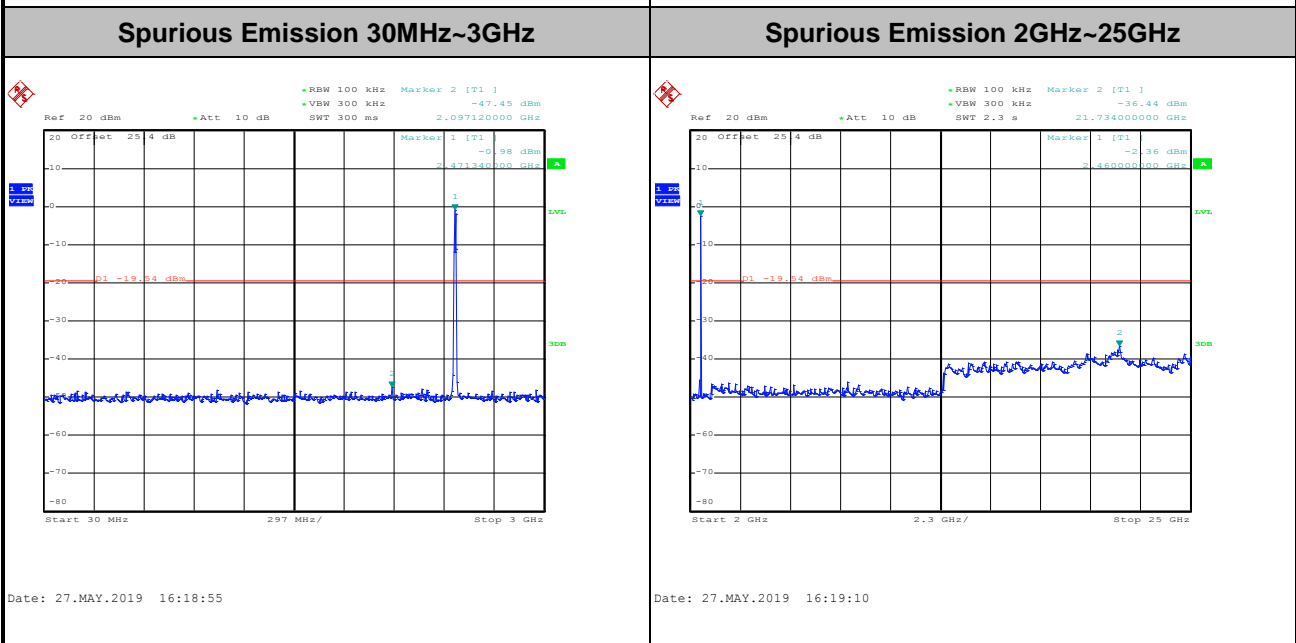
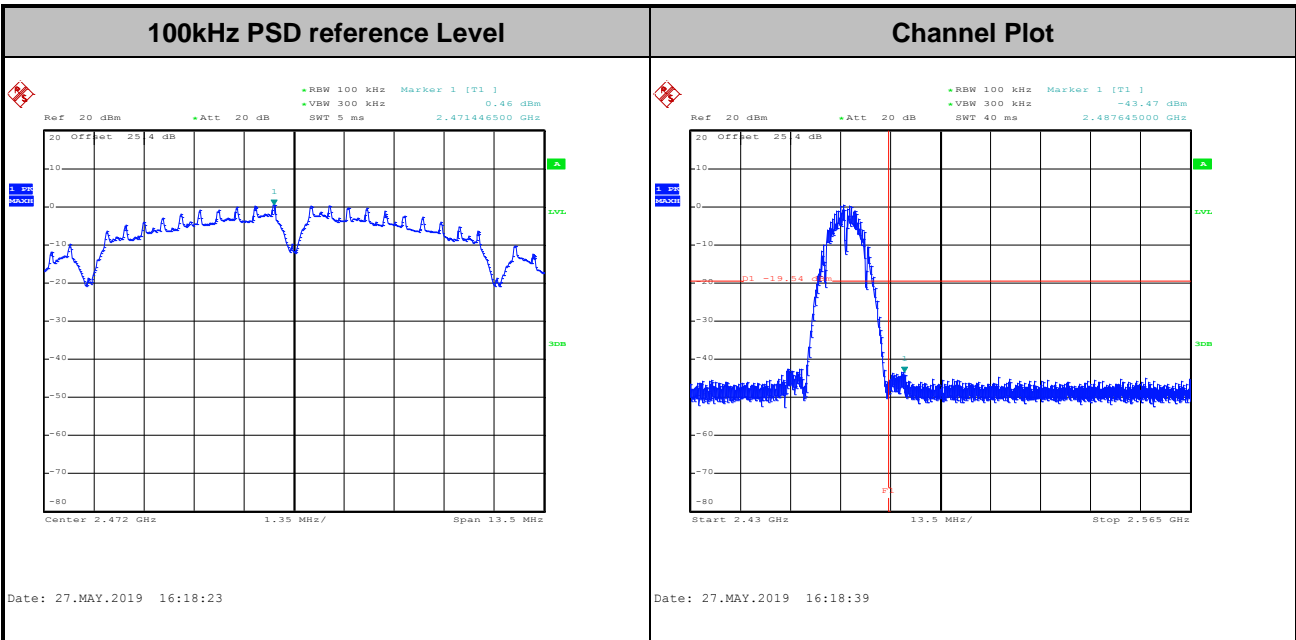
Test Mode :	802.11b	Test Channel :	12
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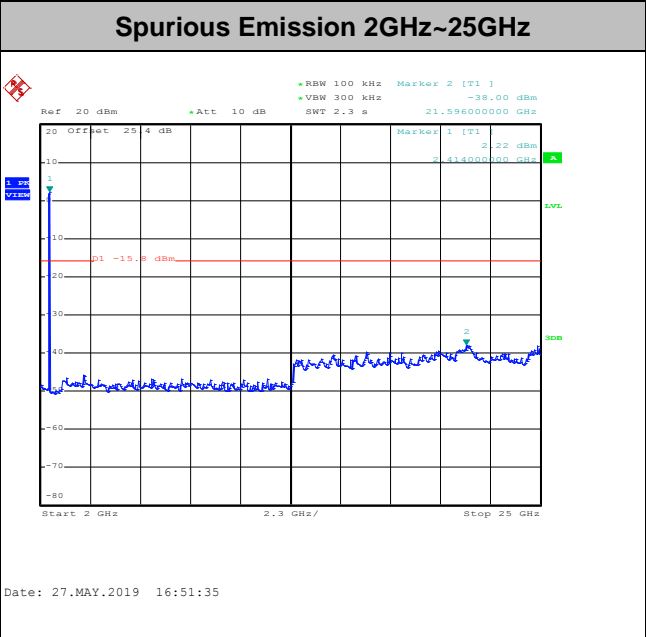
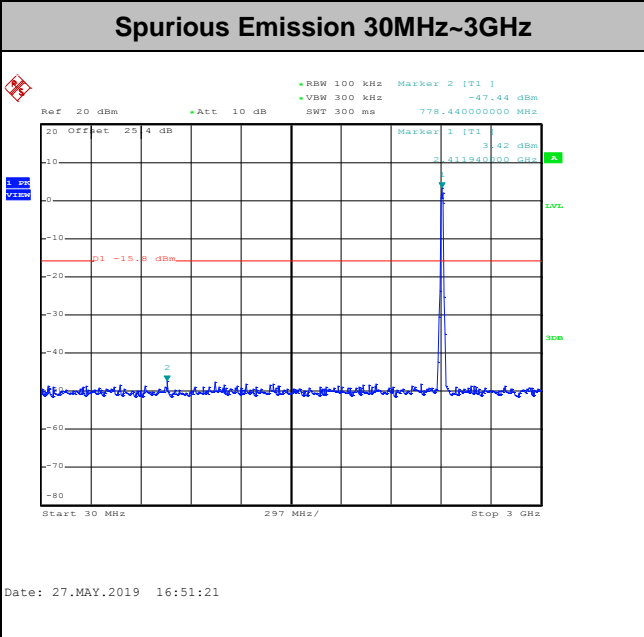
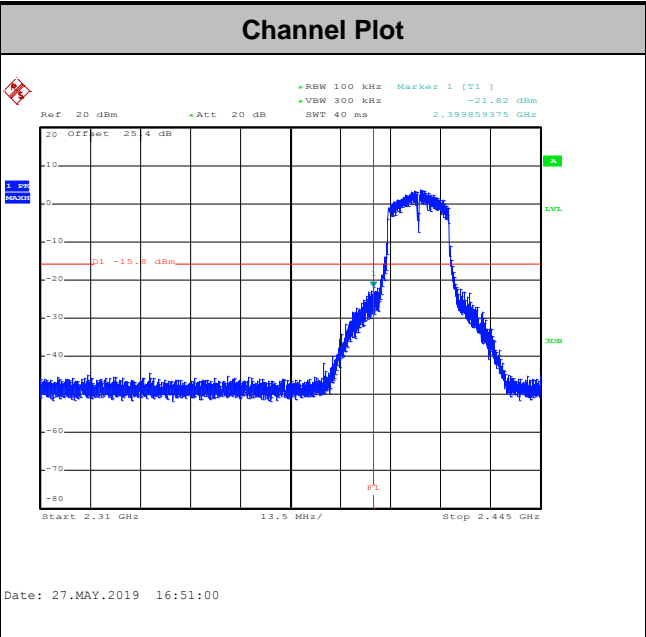
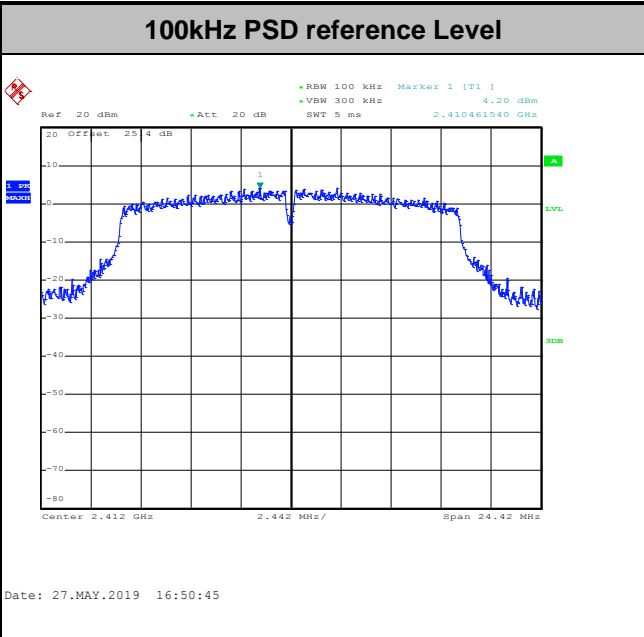


Test Mode :	802.11b	Test Channel :	13
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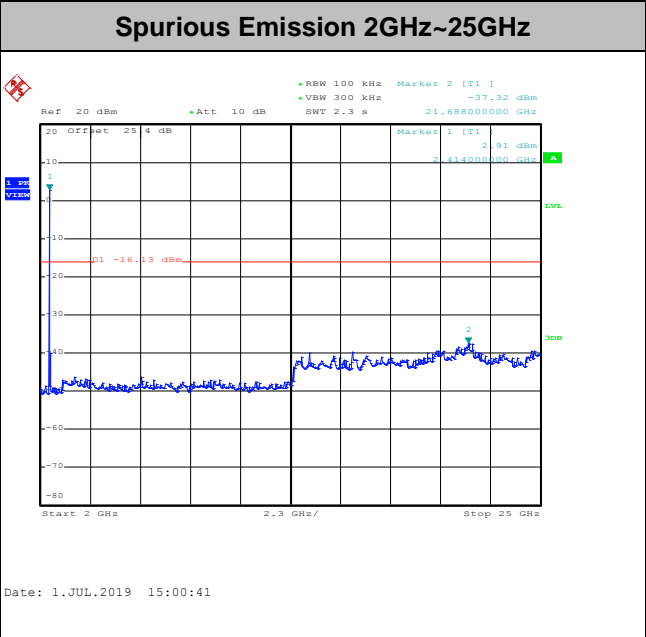
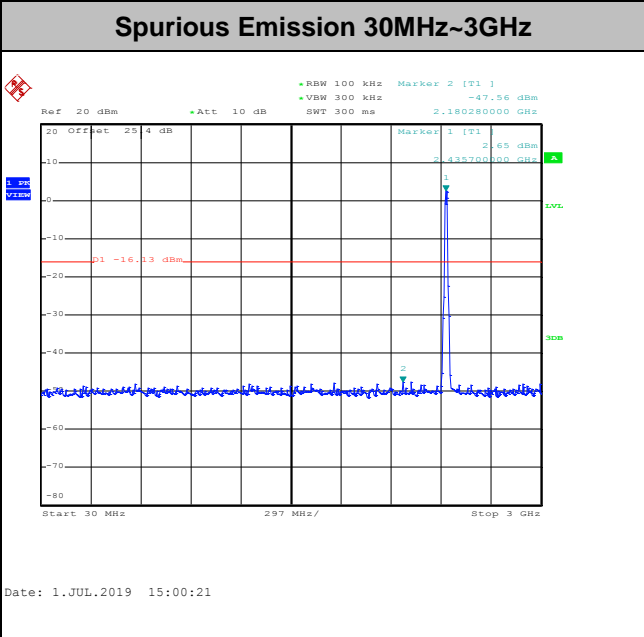
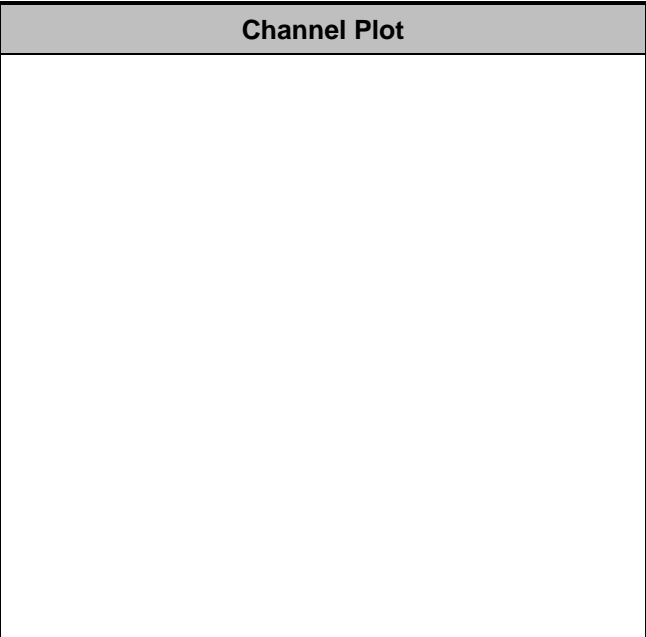
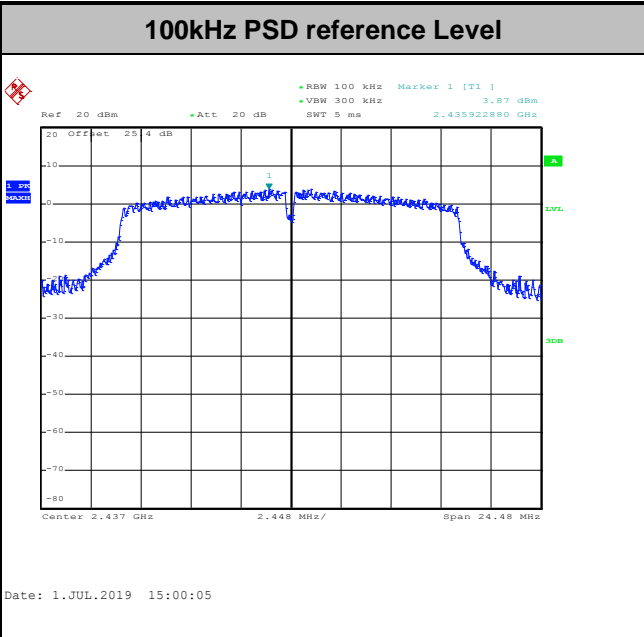


Test Mode : 802.11g Test Channel : 01



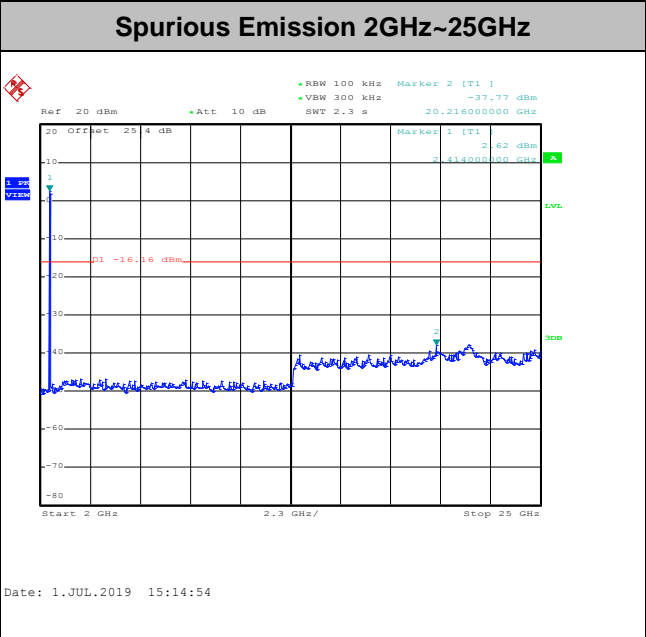
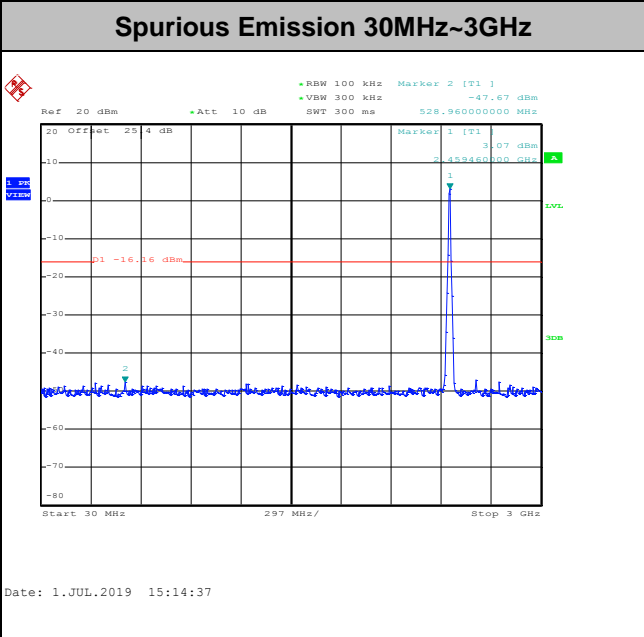
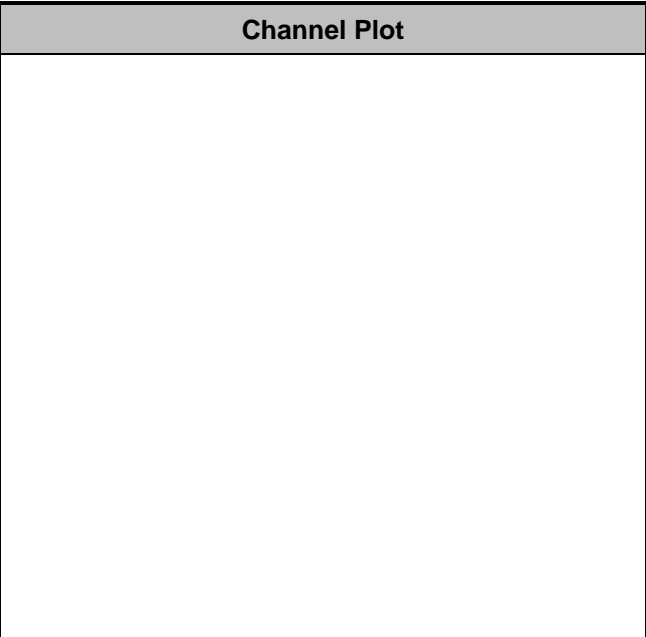
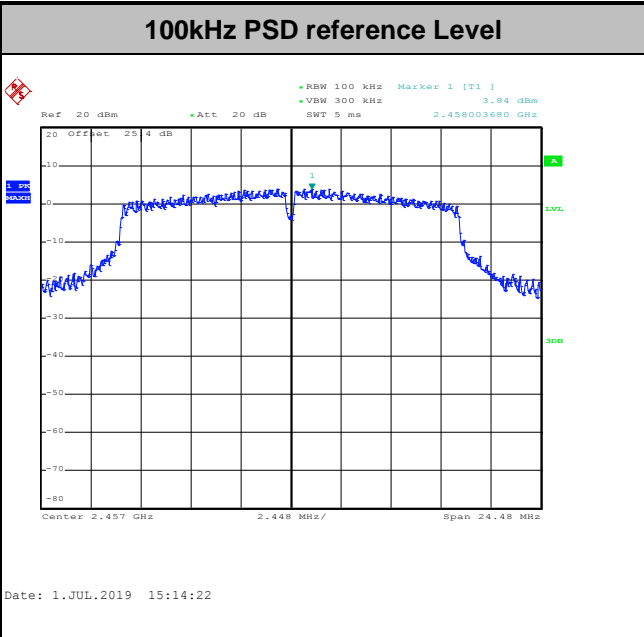


Test Mode :	802.11g	Test Channel :	06
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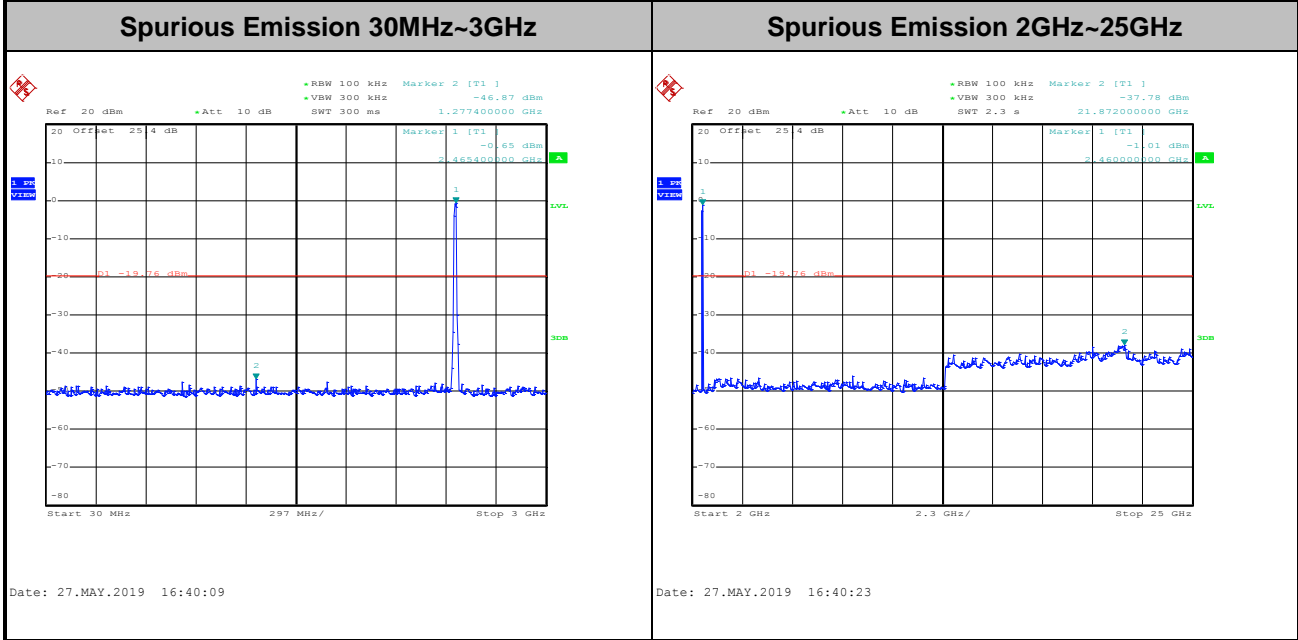
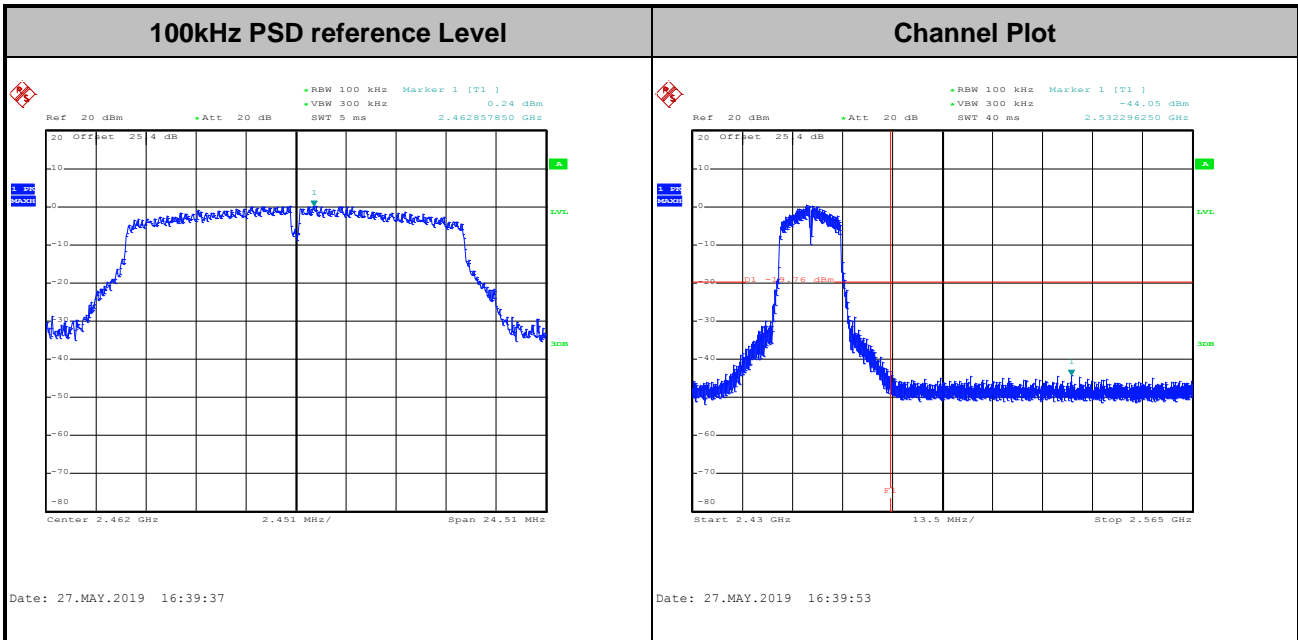


Test Mode :	802.11g	Test Channel :	10
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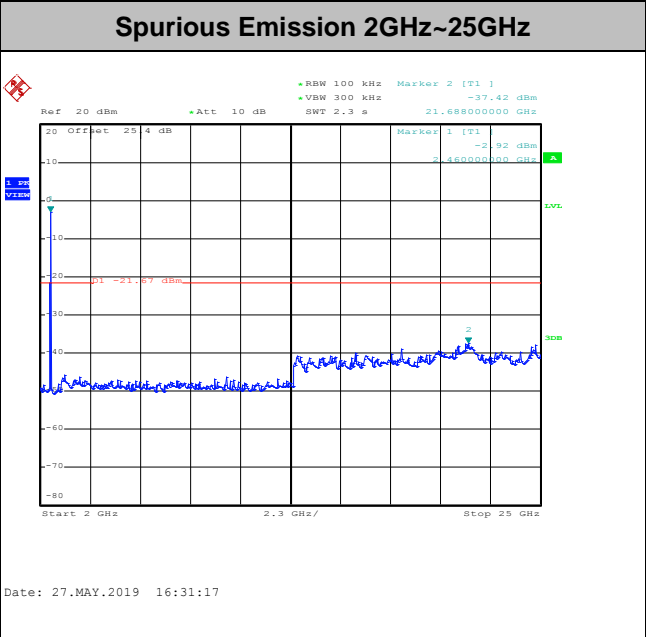
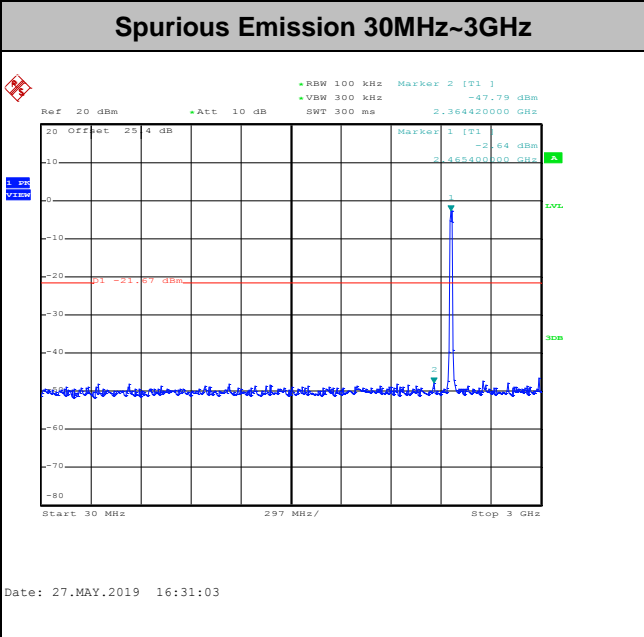
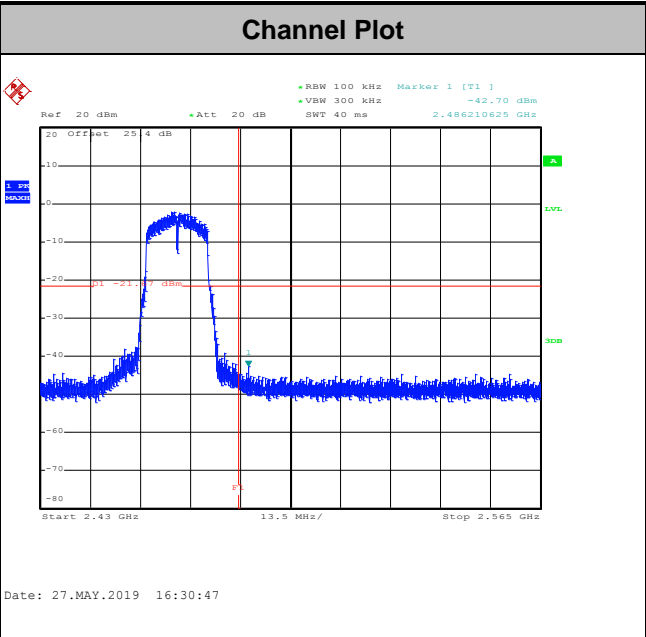
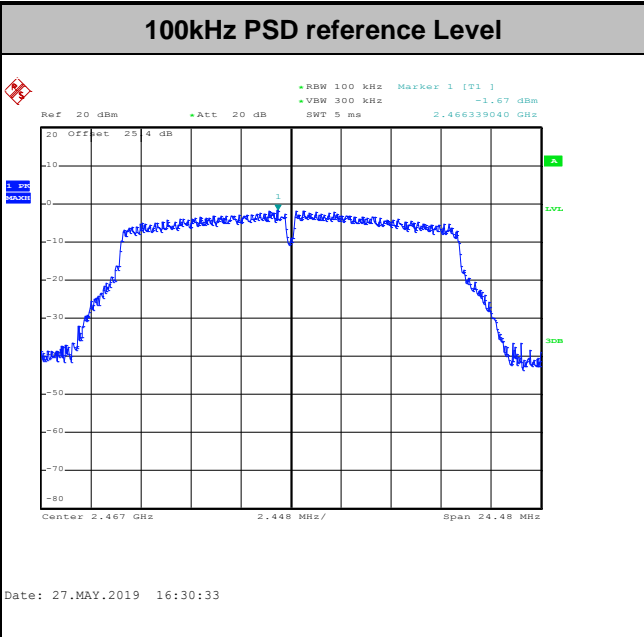


Test Mode :	802.11g	Test Channel :	11
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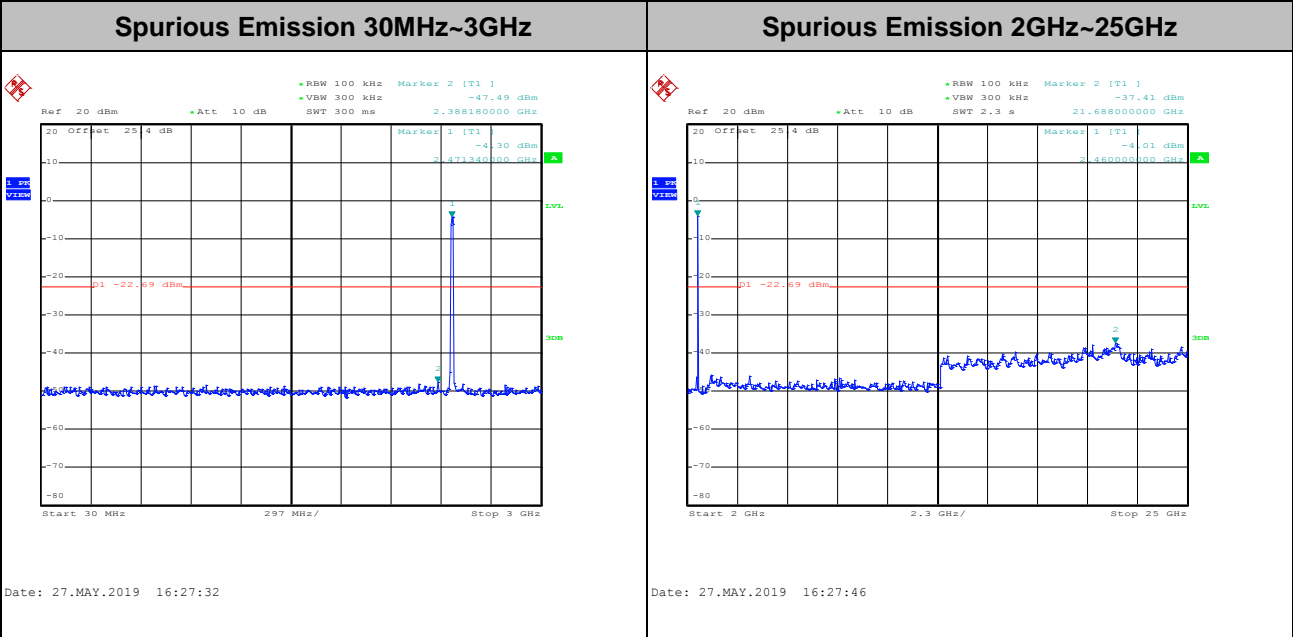
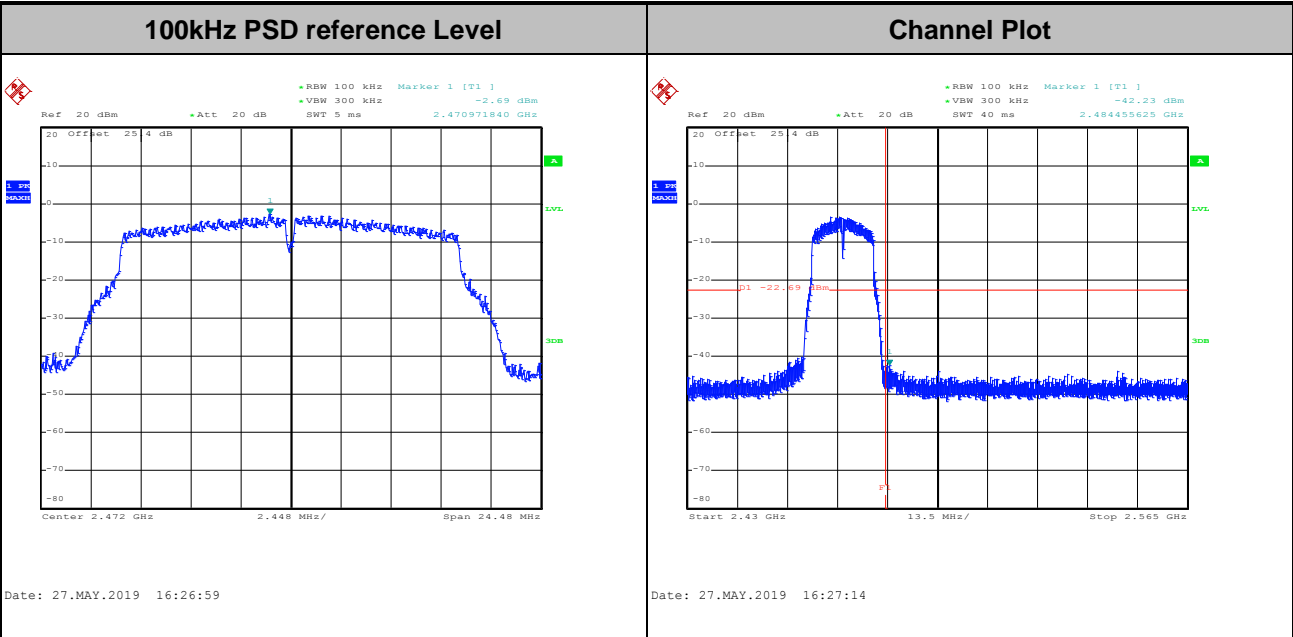


Test Mode :	802.11g	Test Channel :	12
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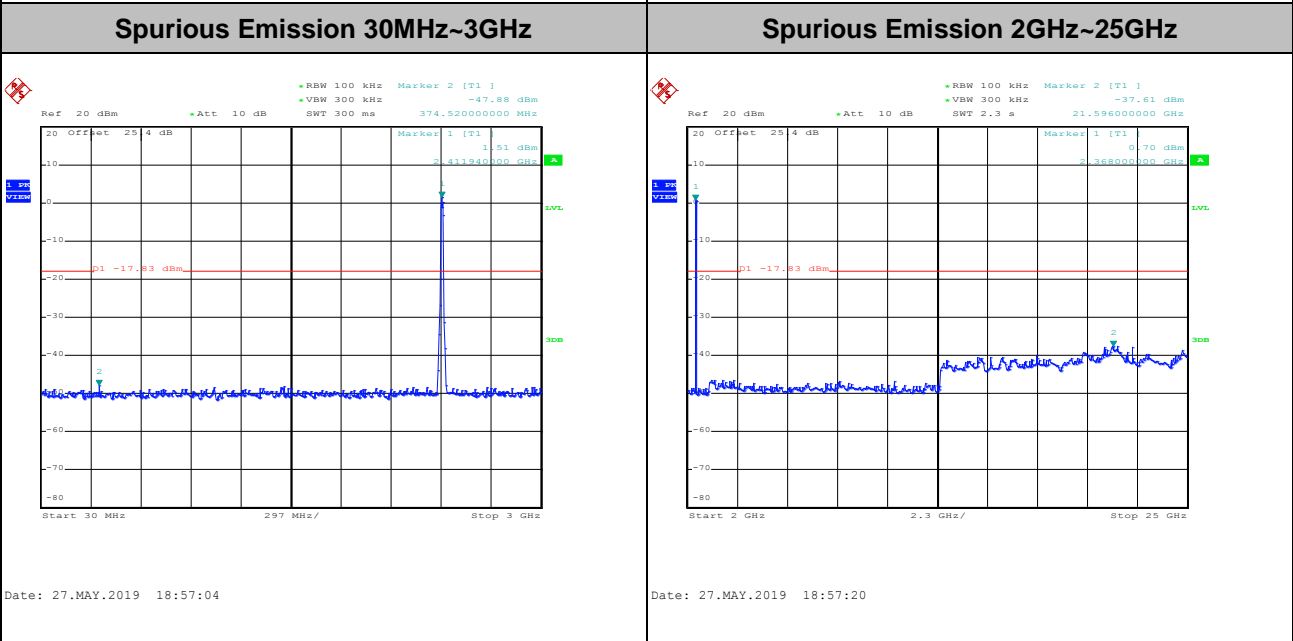
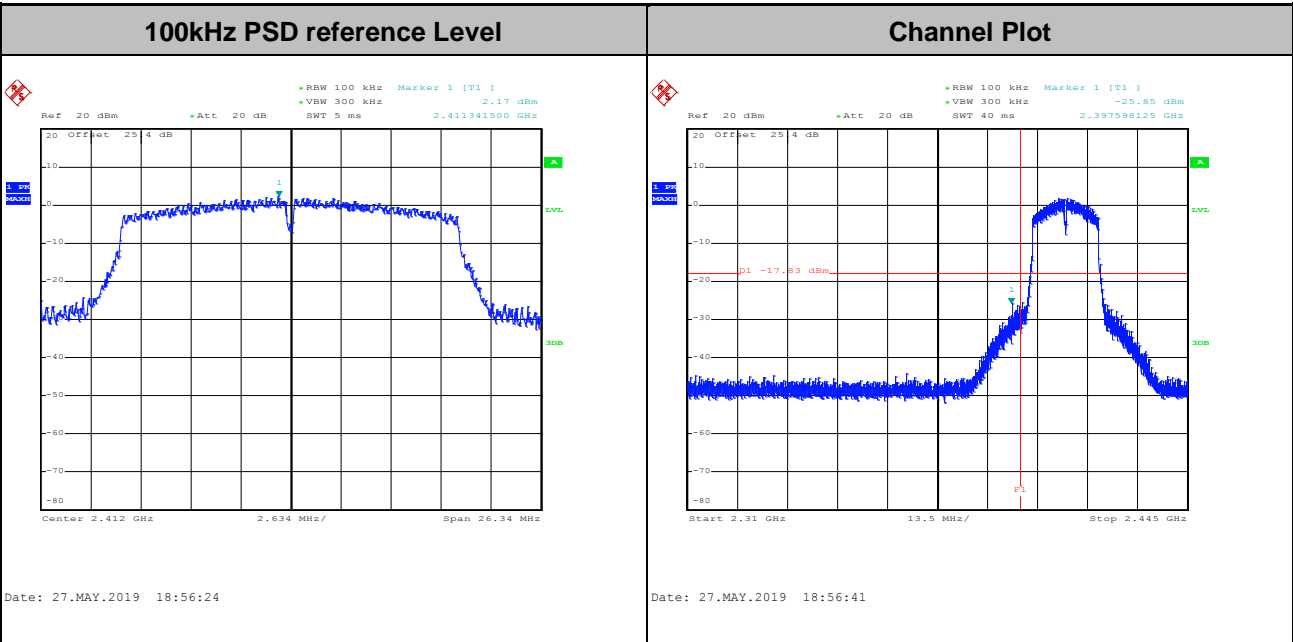


Test Mode :	802.11g	Test Channel :	13
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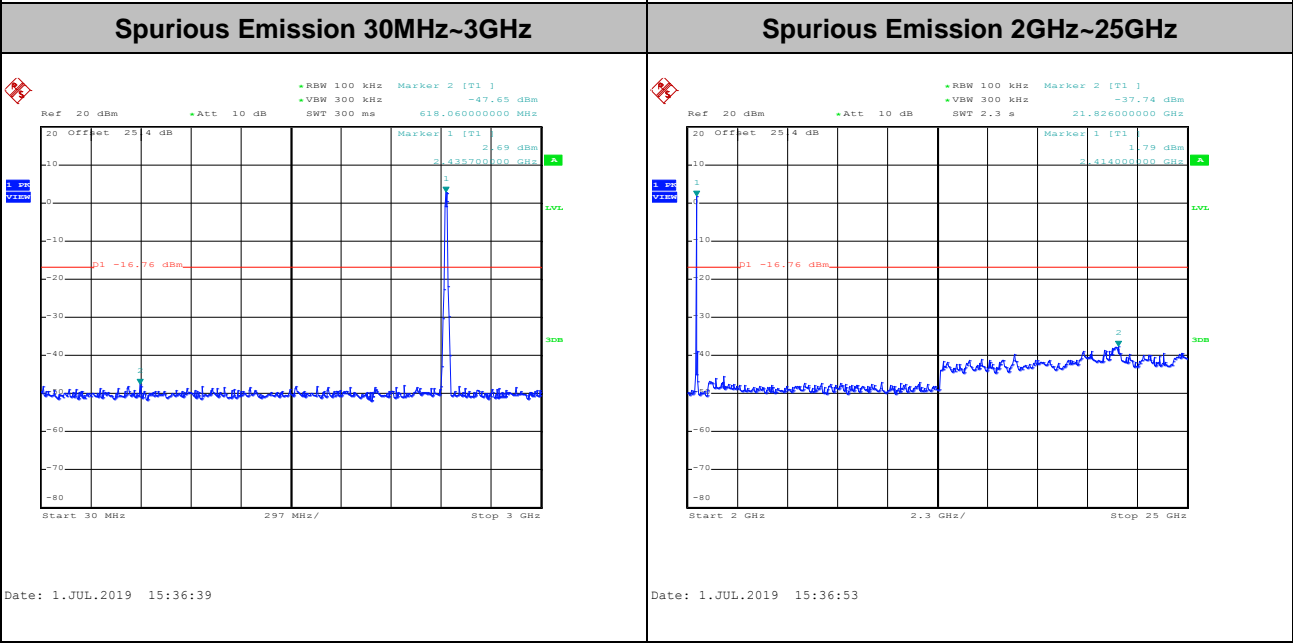
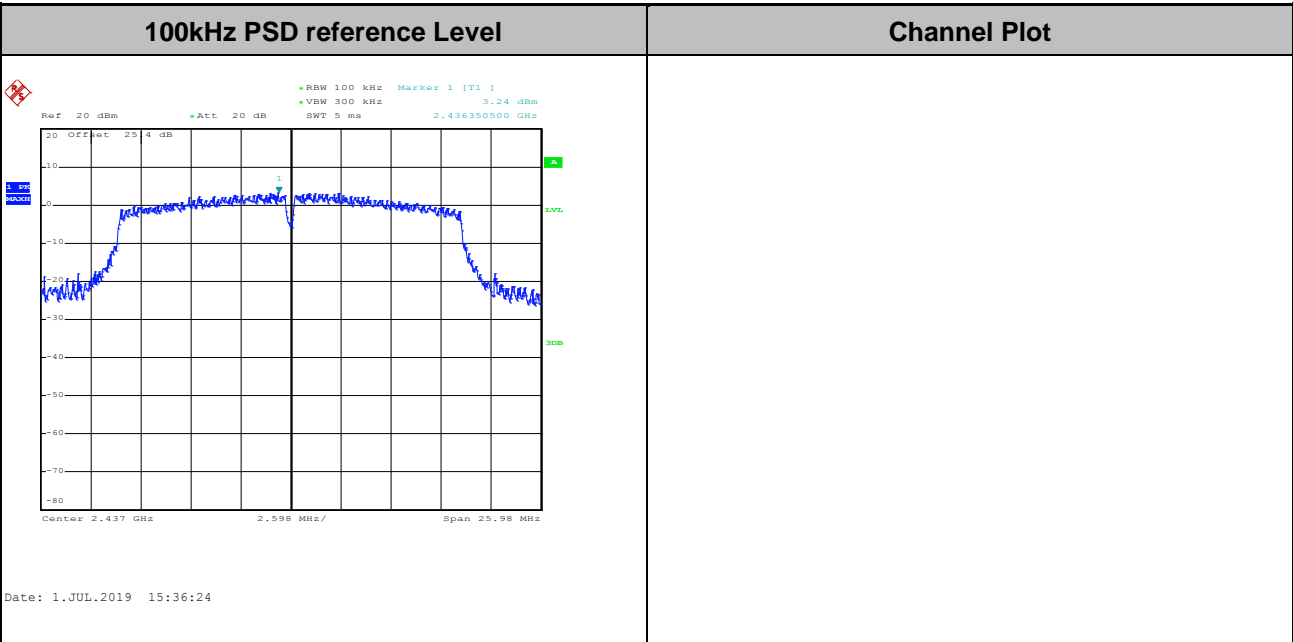
Test Mode :	802.11n HT20	Test Channel :	01
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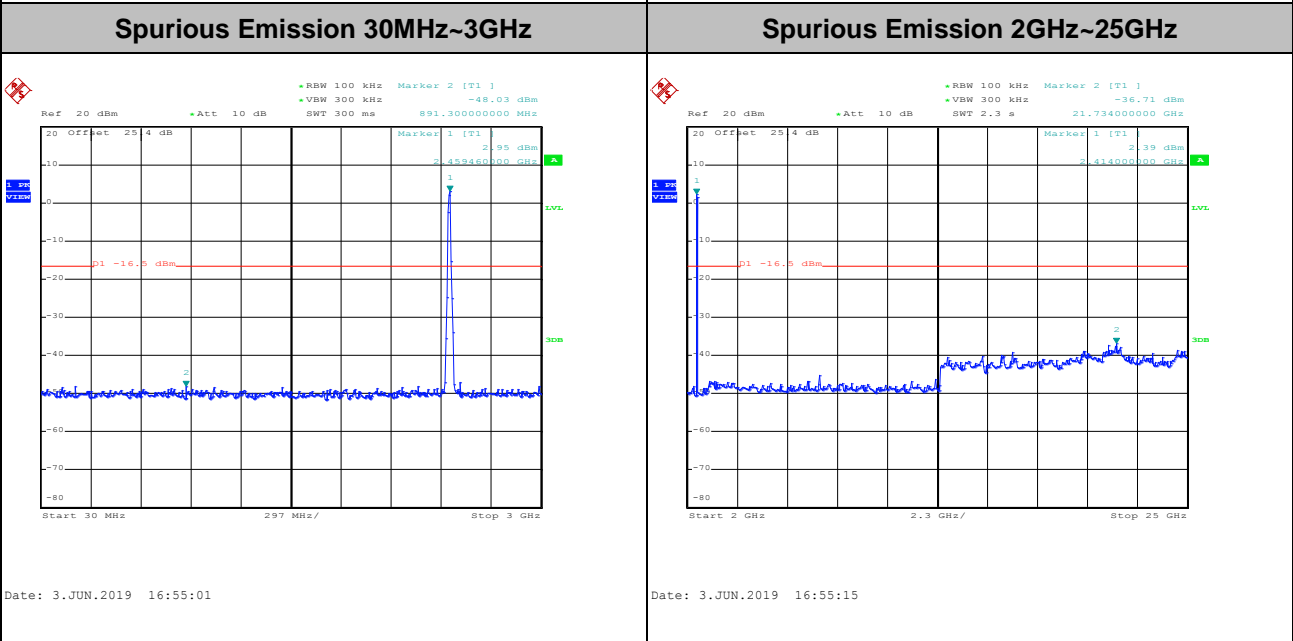
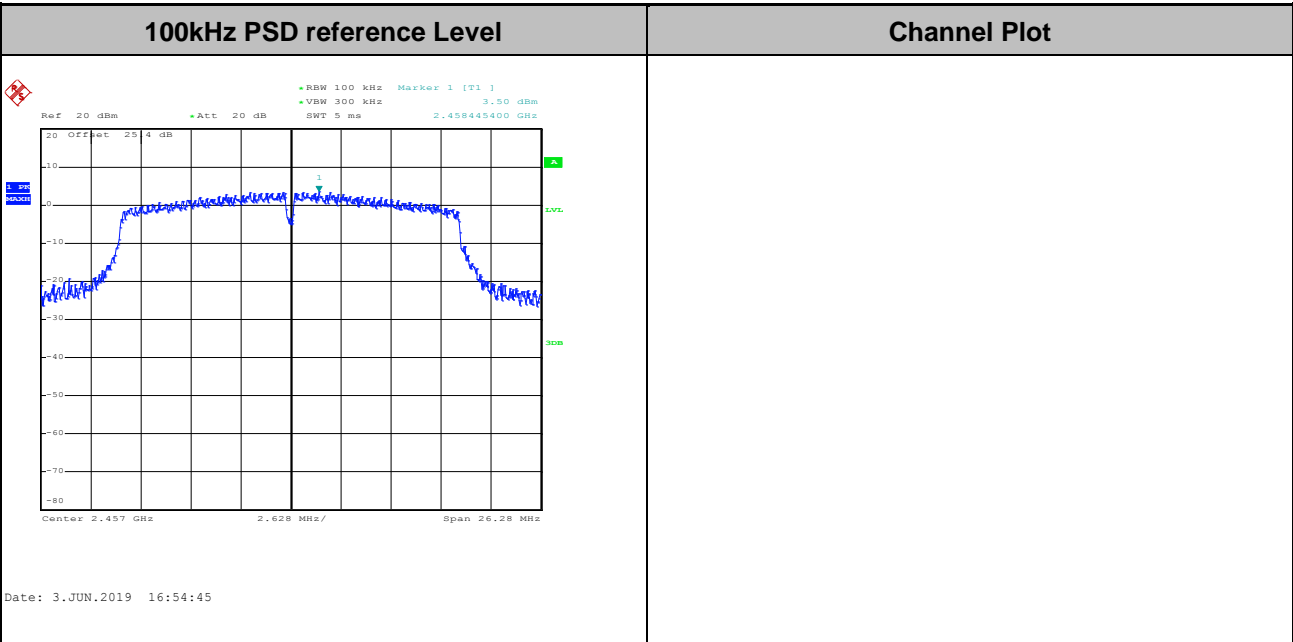


Test Mode :	802.11n HT20	Test Channel :	06
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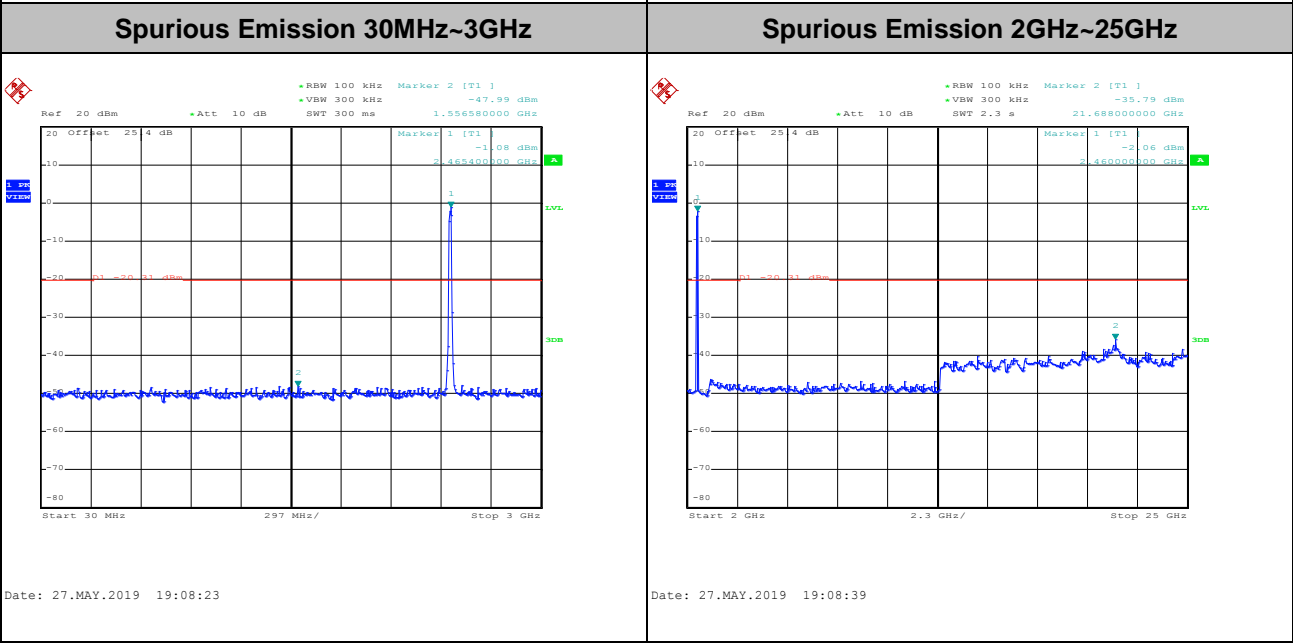
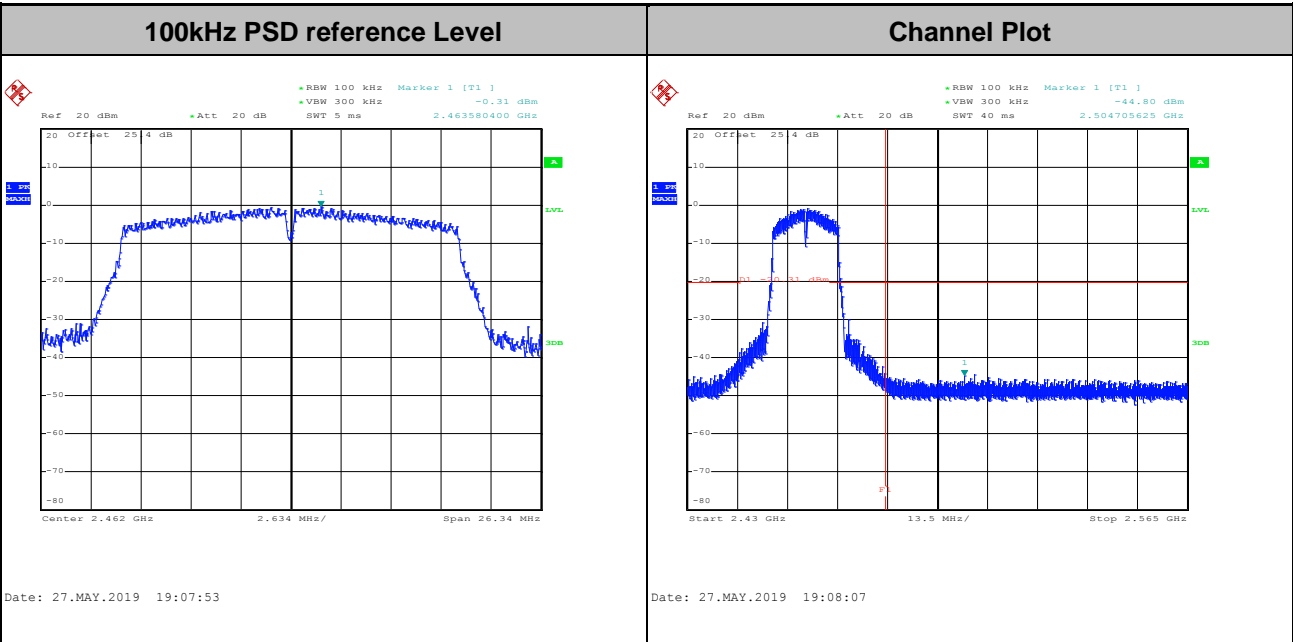


Test Mode :	802.11n HT20	Test Channel :	10
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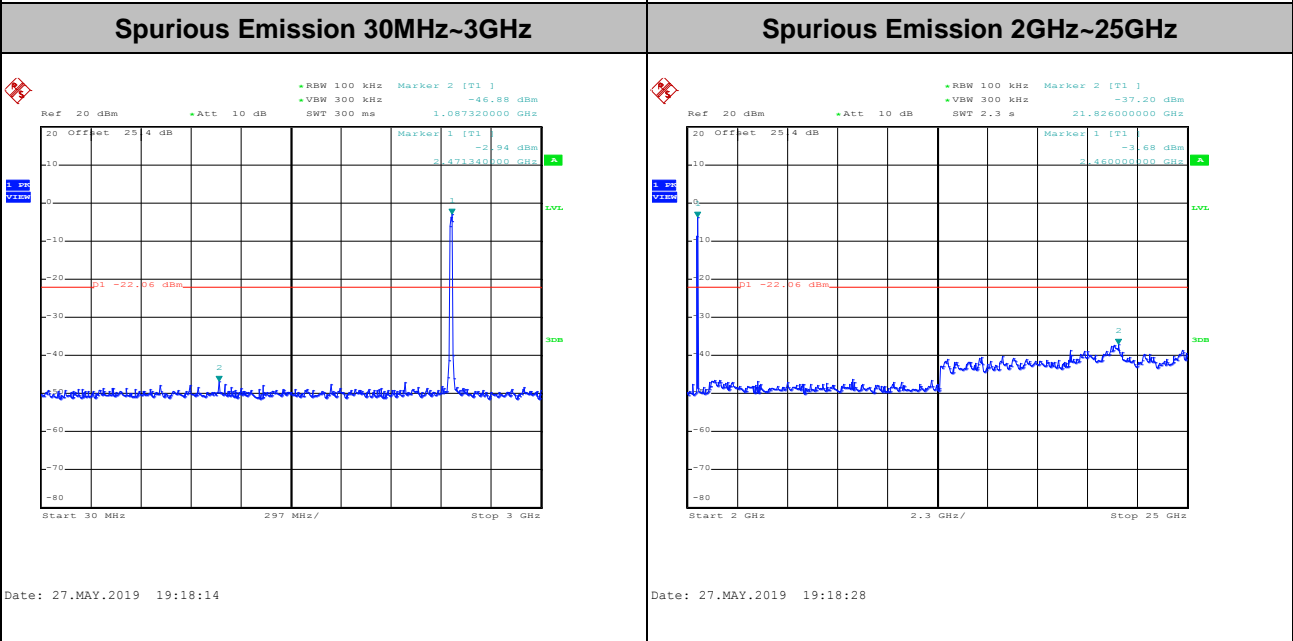
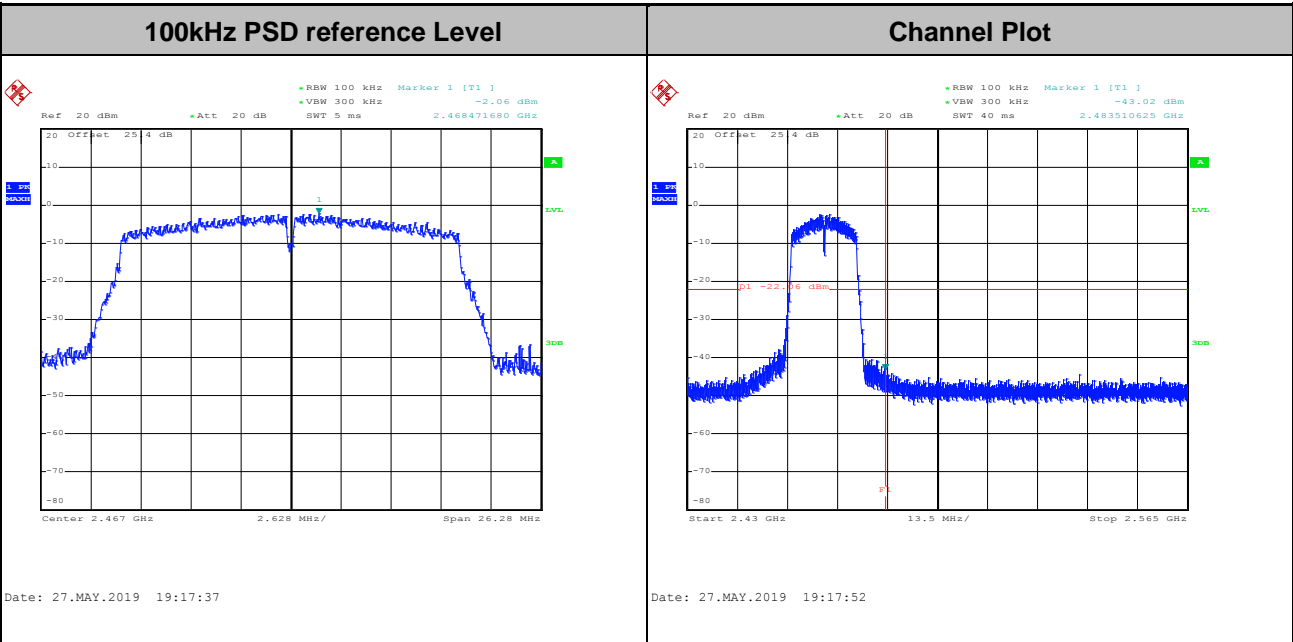


Test Mode :	802.11n HT20	Test Channel :	11
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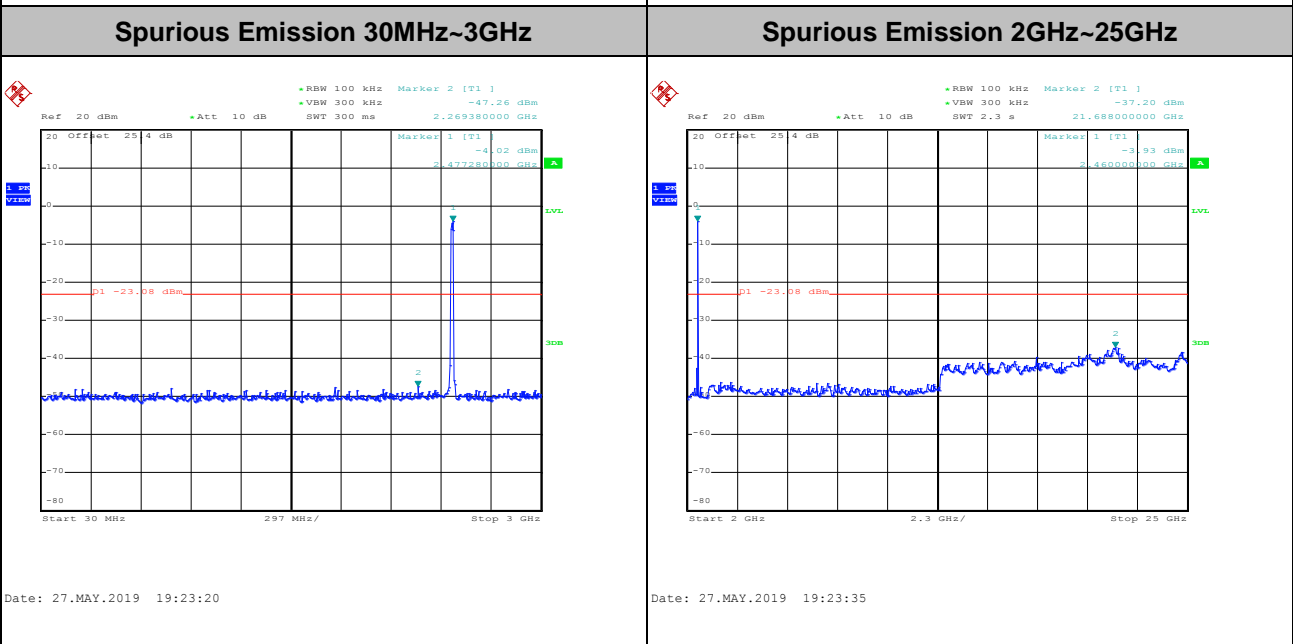
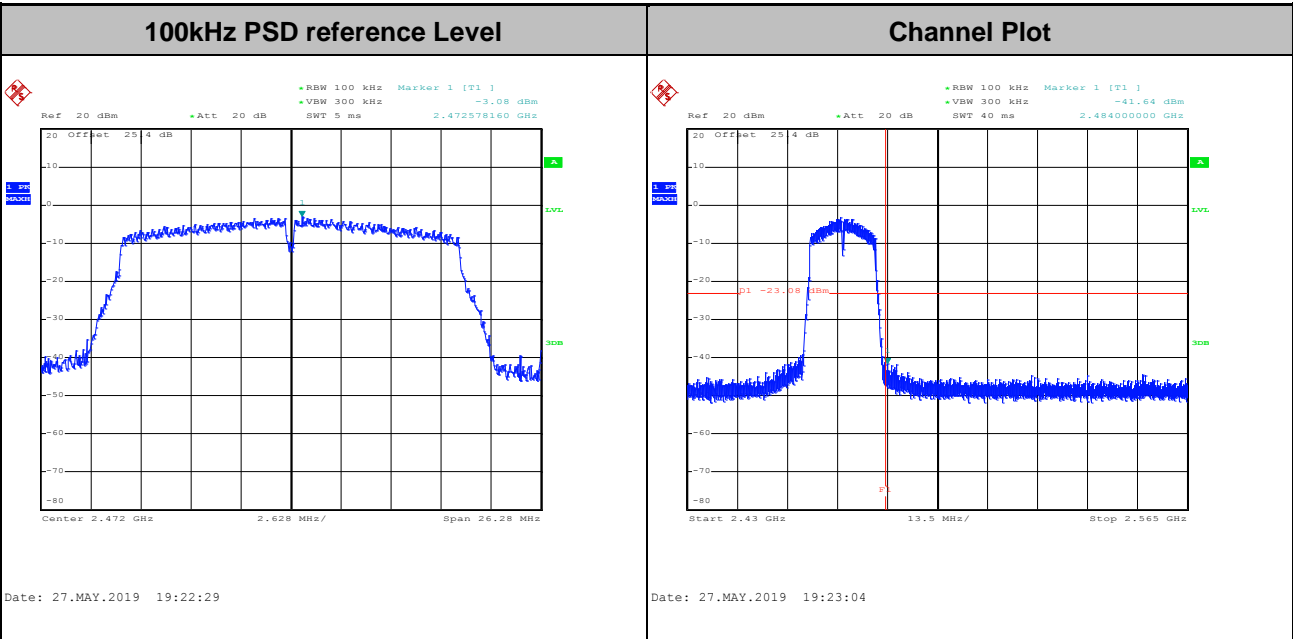


Test Mode :	802.11n HT20	Test Channel :	12
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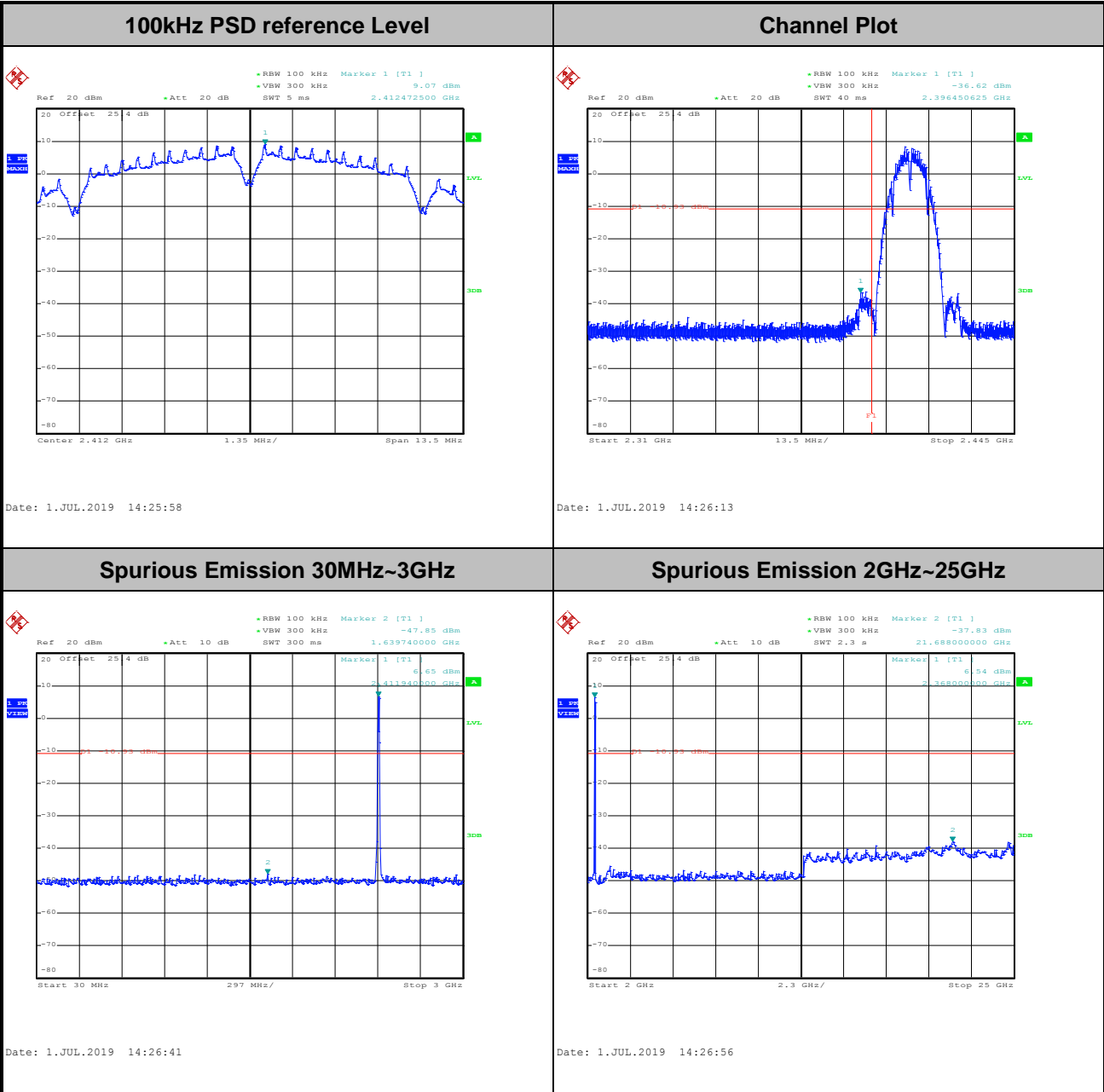
<b>Test Mode :</b>	802.11n HT20	<b>Test Channel :</b>	13
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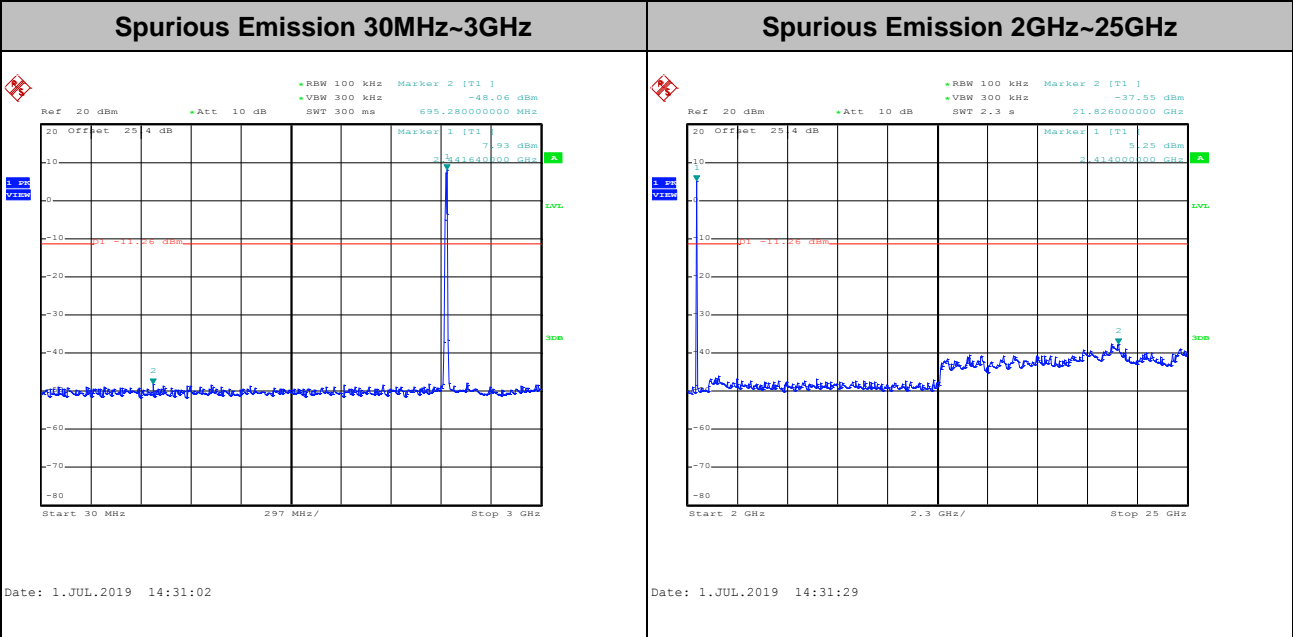
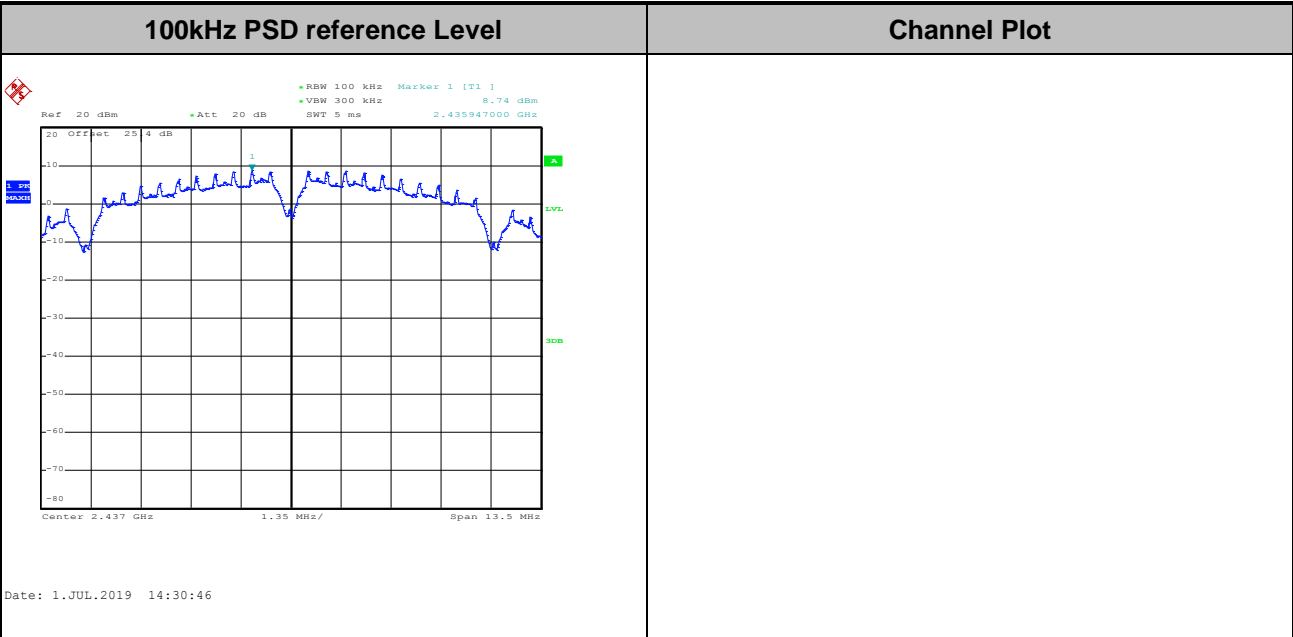
Number of TX = 2, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01
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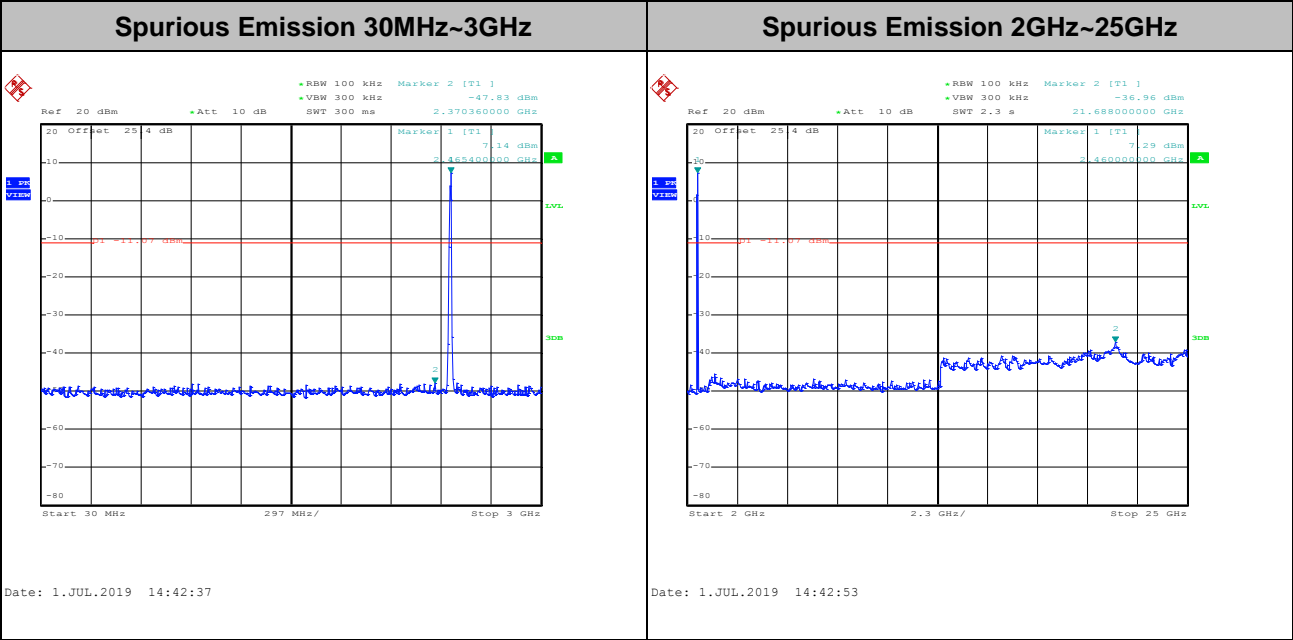
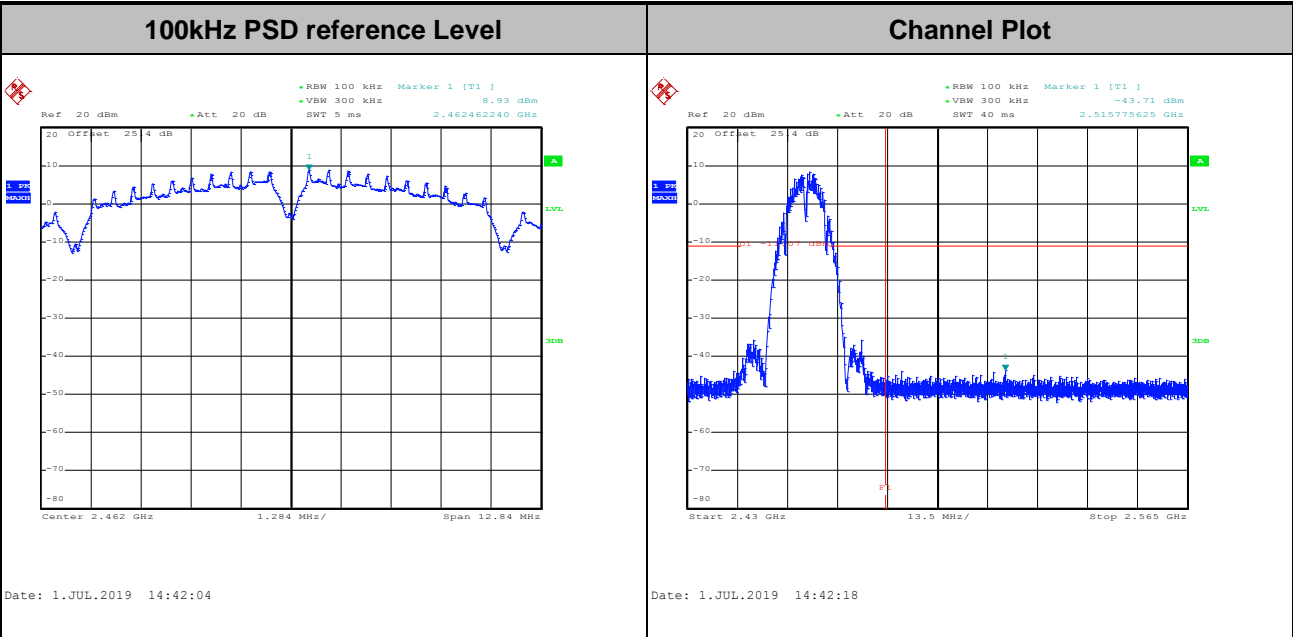


Test Mode :	802.11b	Test Channel :	06
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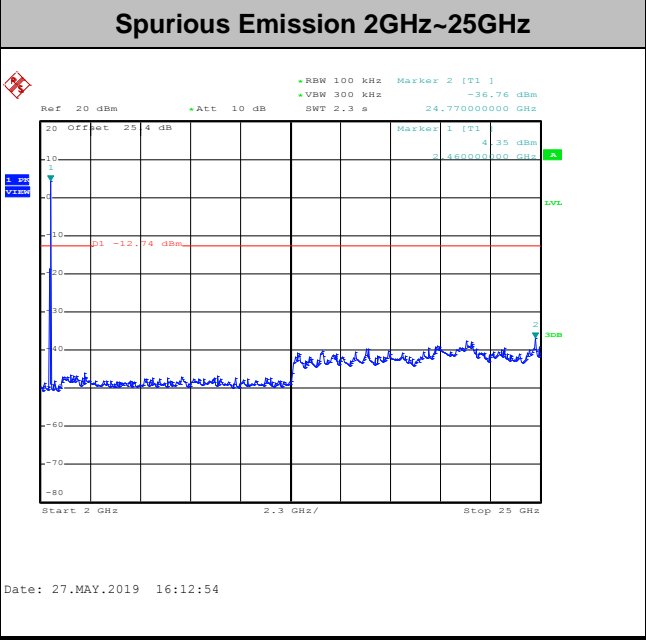
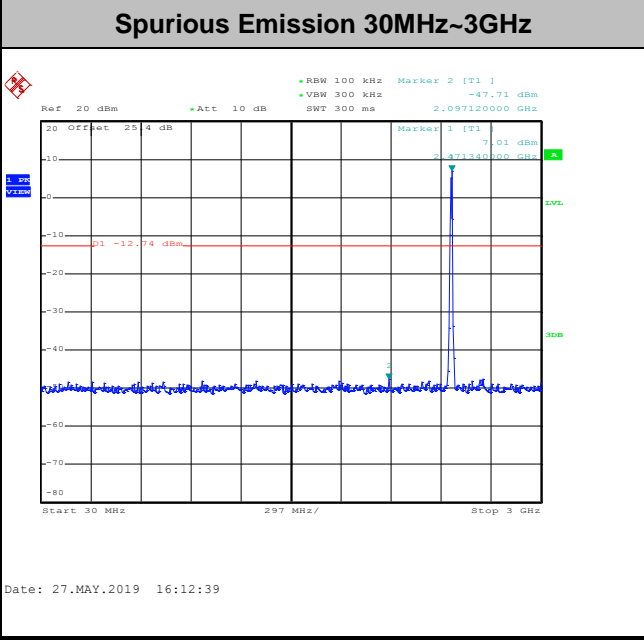
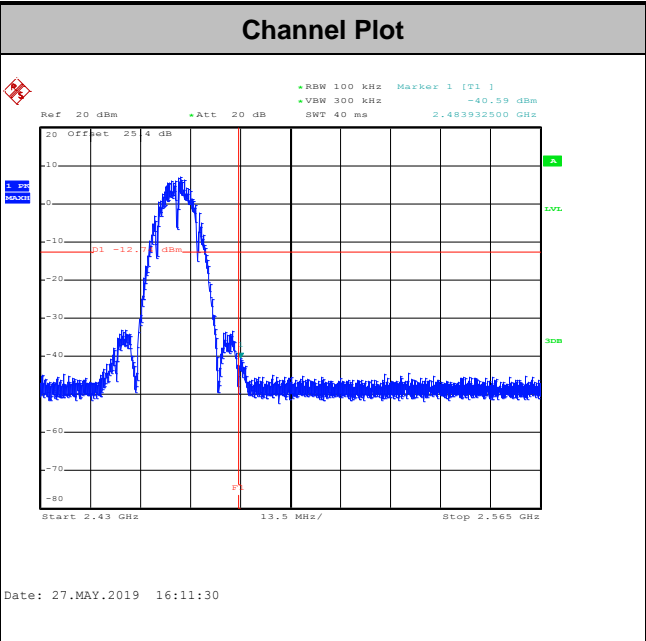
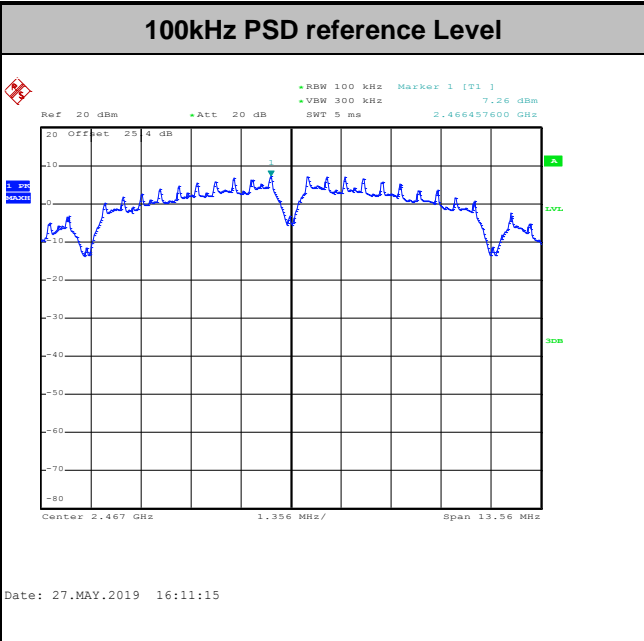
Test Mode :	802.11b	Test Channel :	11
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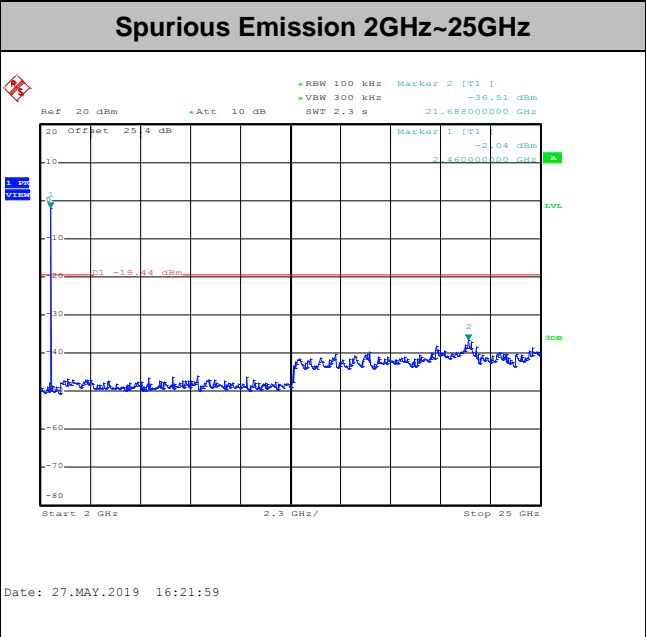
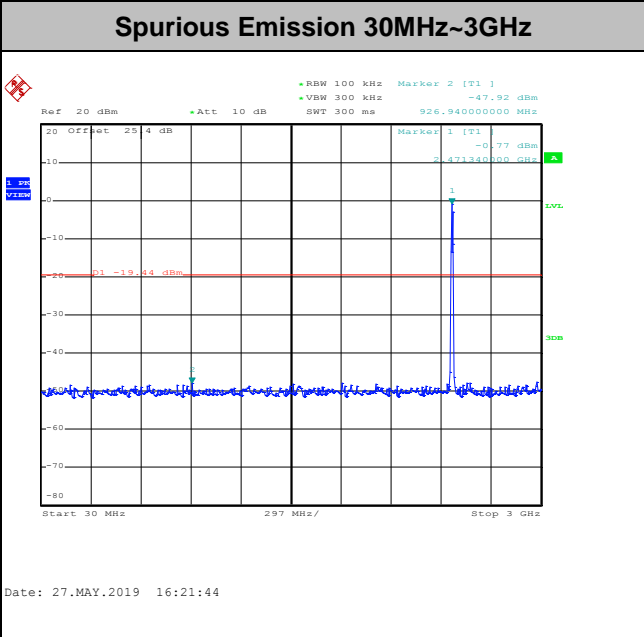
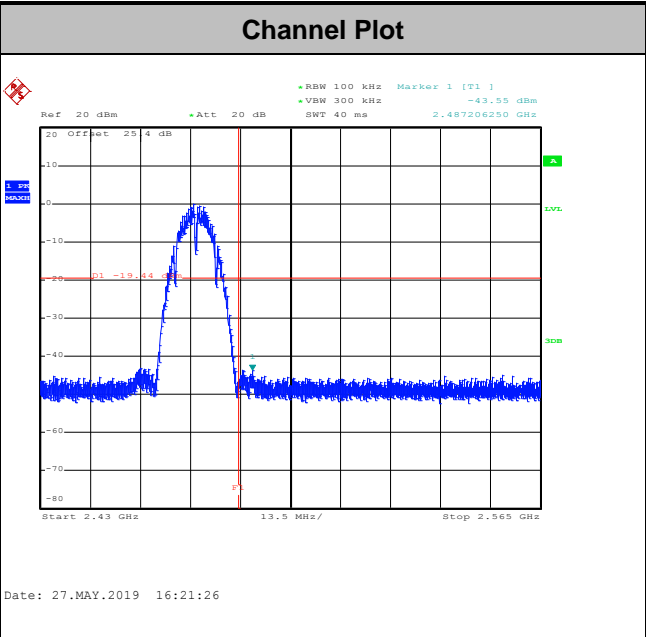
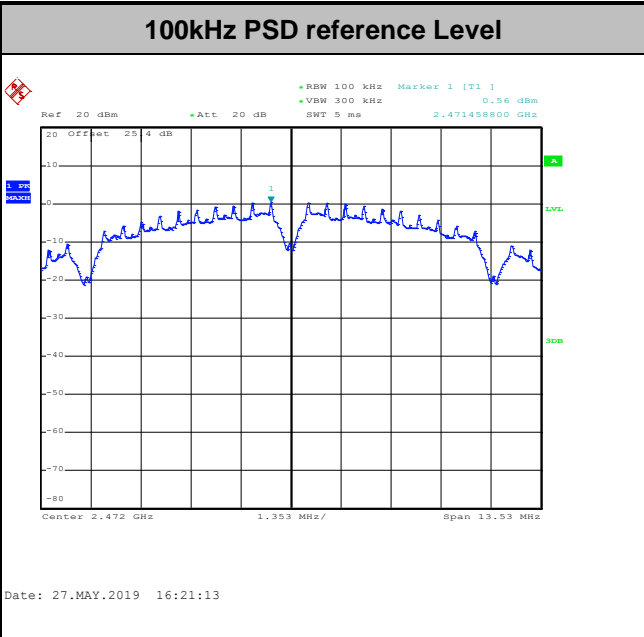


Test Mode :	802.11b	Test Channel :	12
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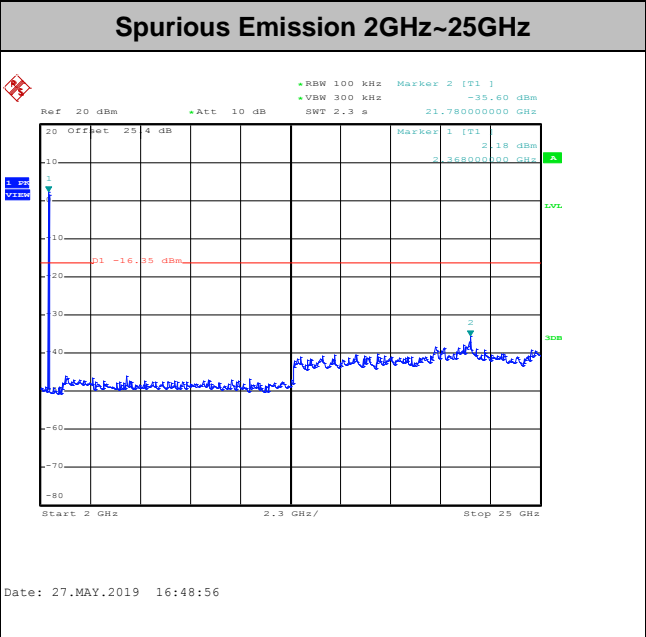
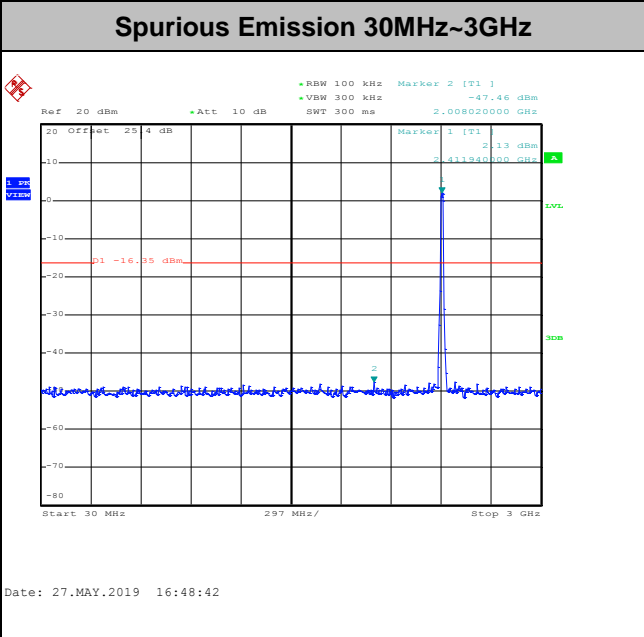
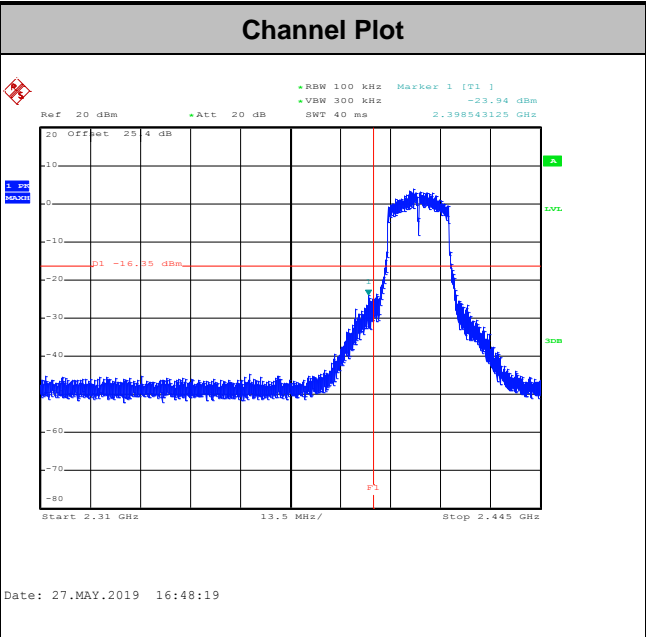
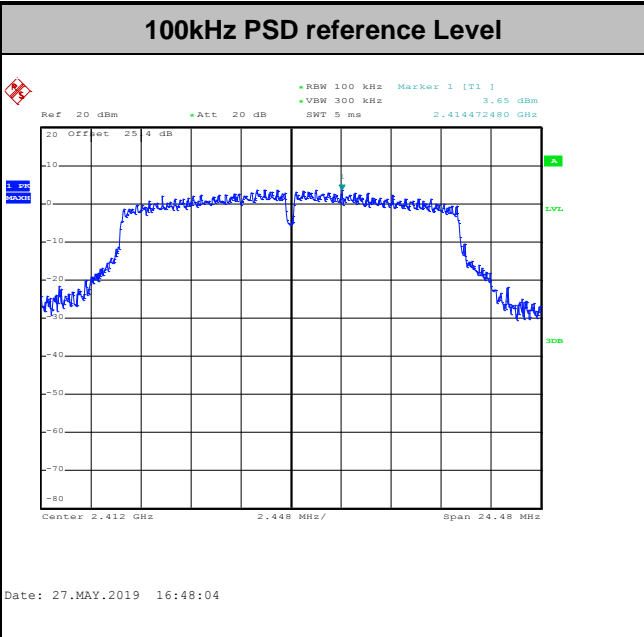


Test Mode :	802.11b	Test Channel :	13
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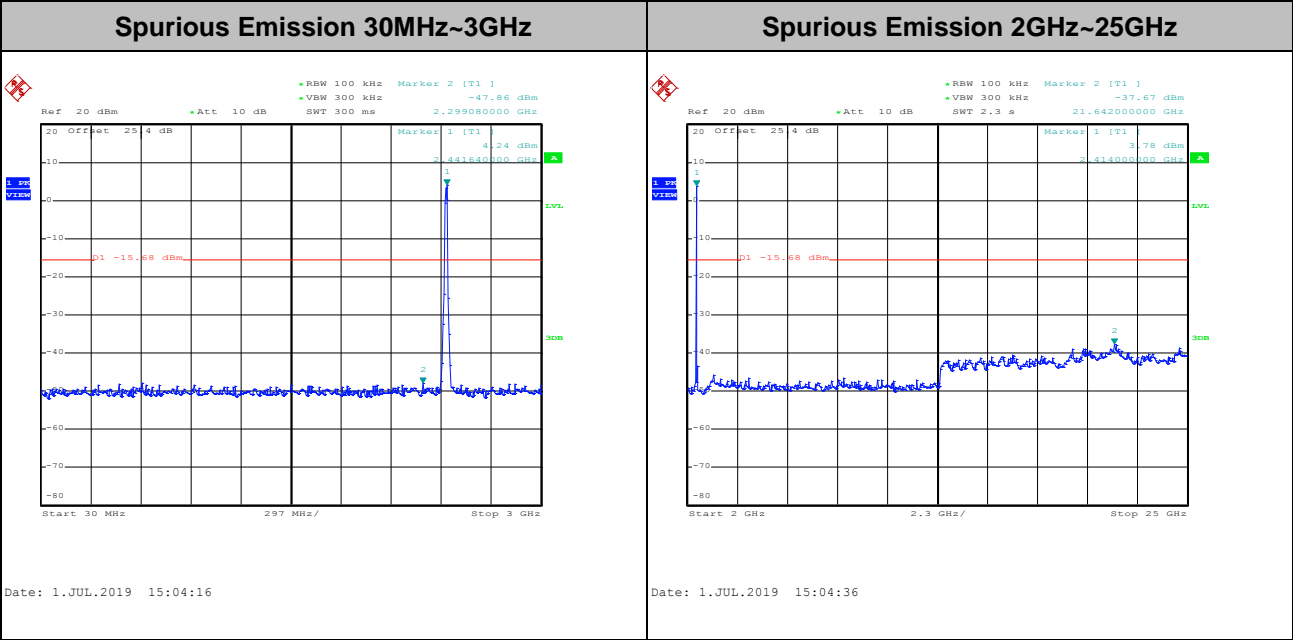
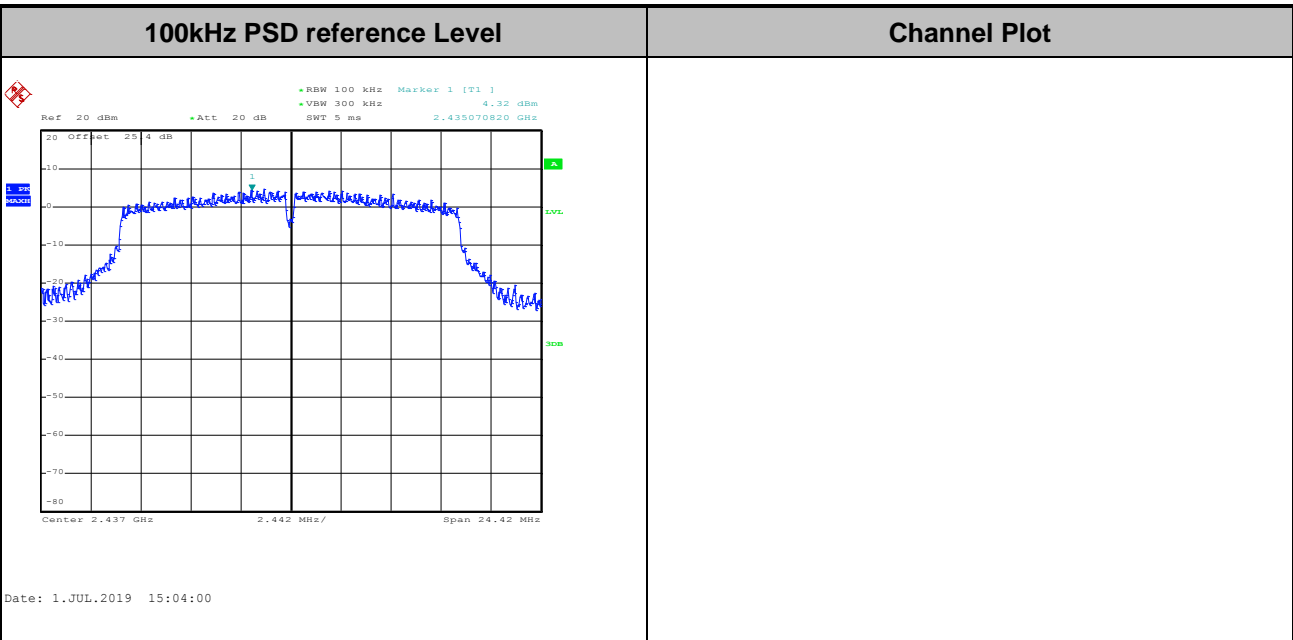


Test Mode :	802.11g	Test Channel :	01
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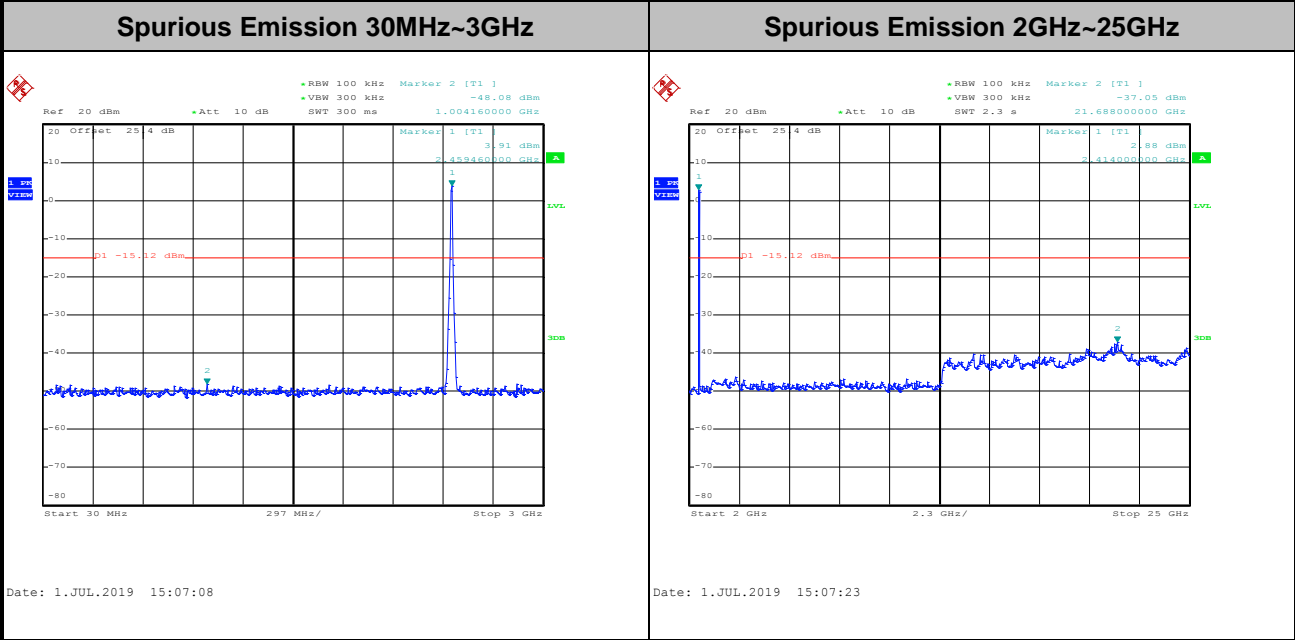
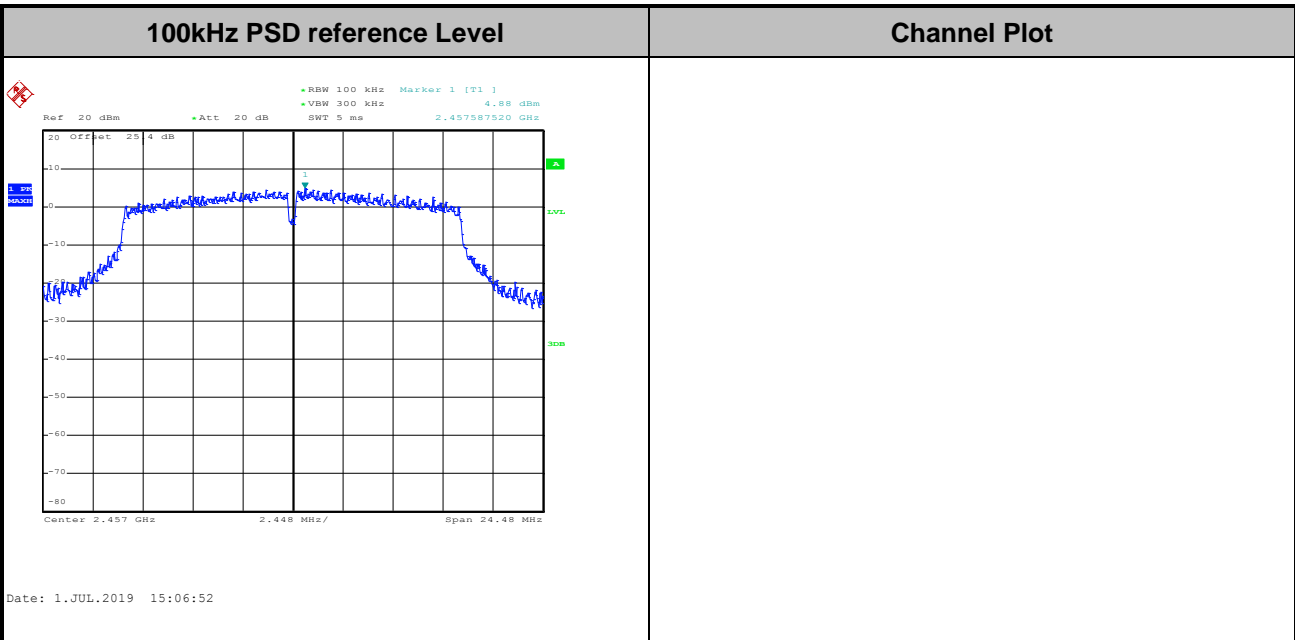


Test Mode :	802.11g	Test Channel :	06
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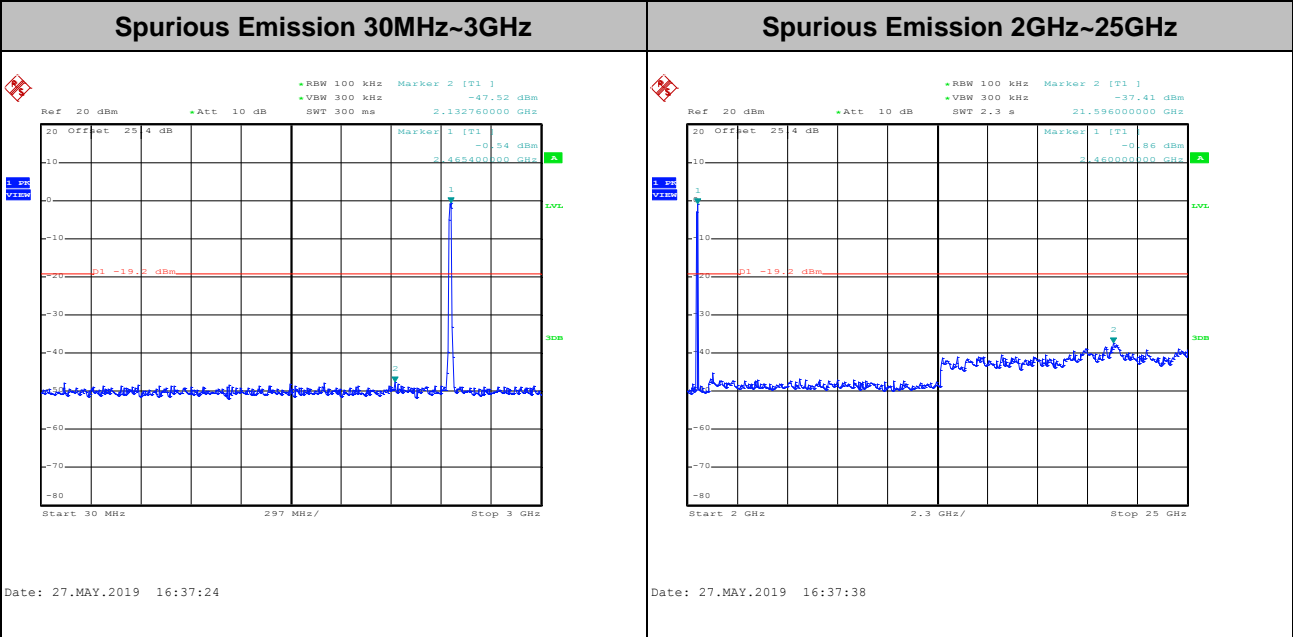
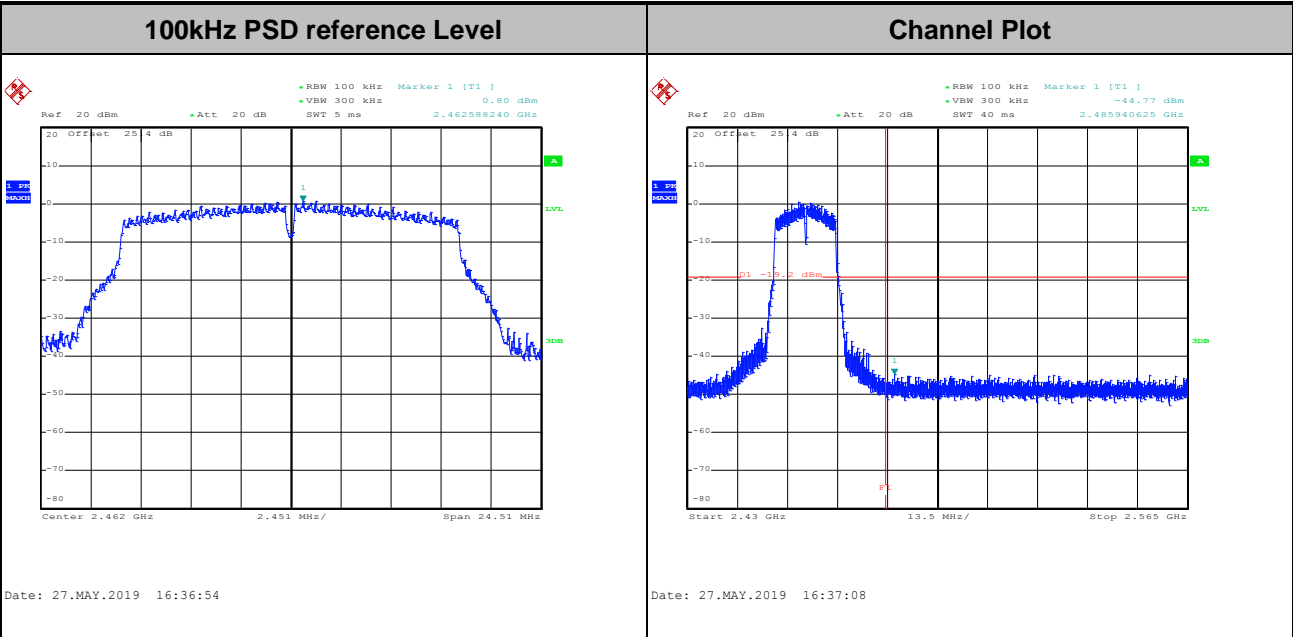


Test Mode :	802.11g	Test Channel :	10
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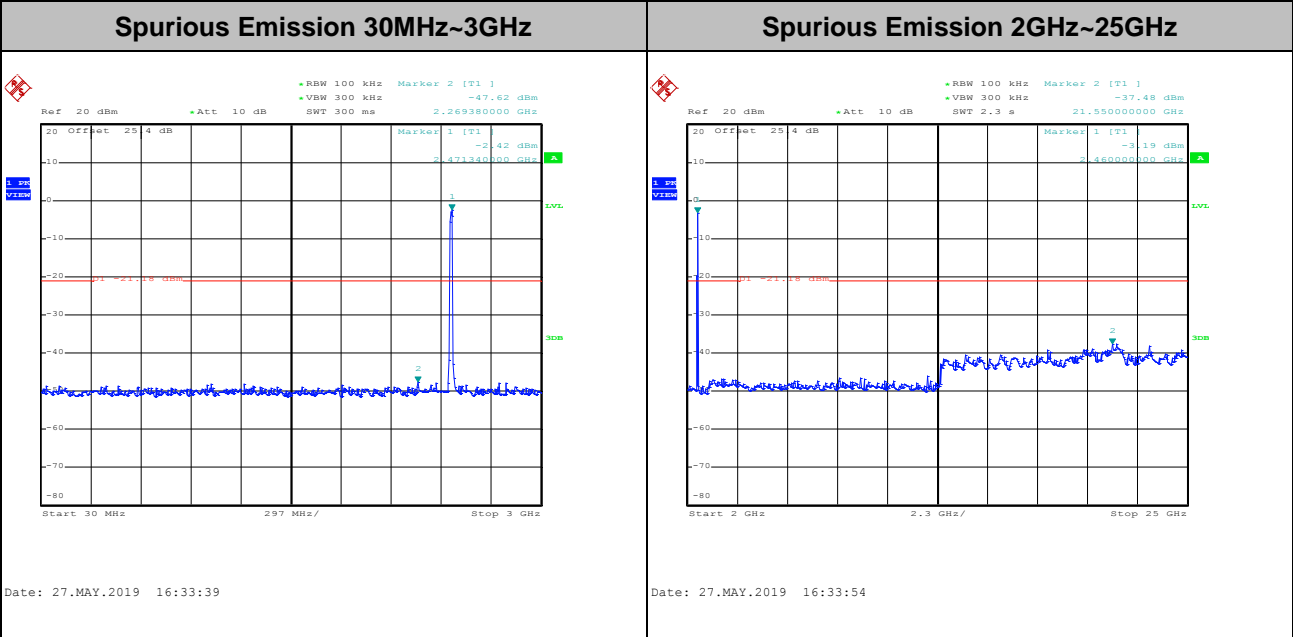
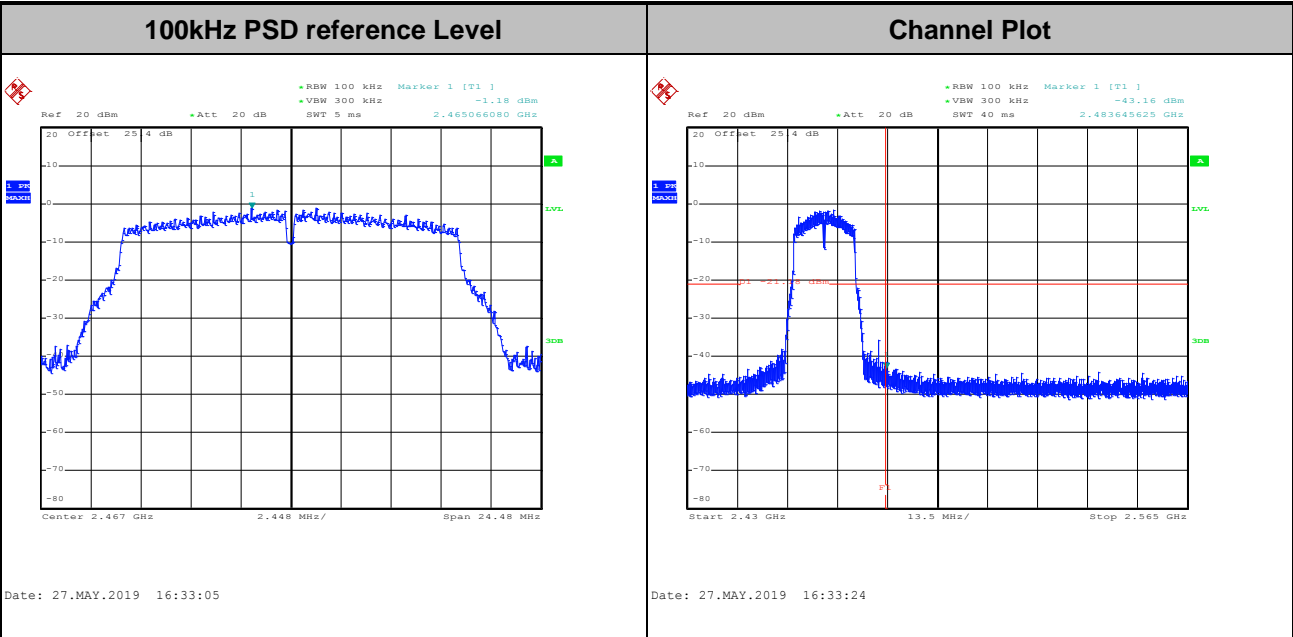


Test Mode :	802.11g	Test Channel :	11
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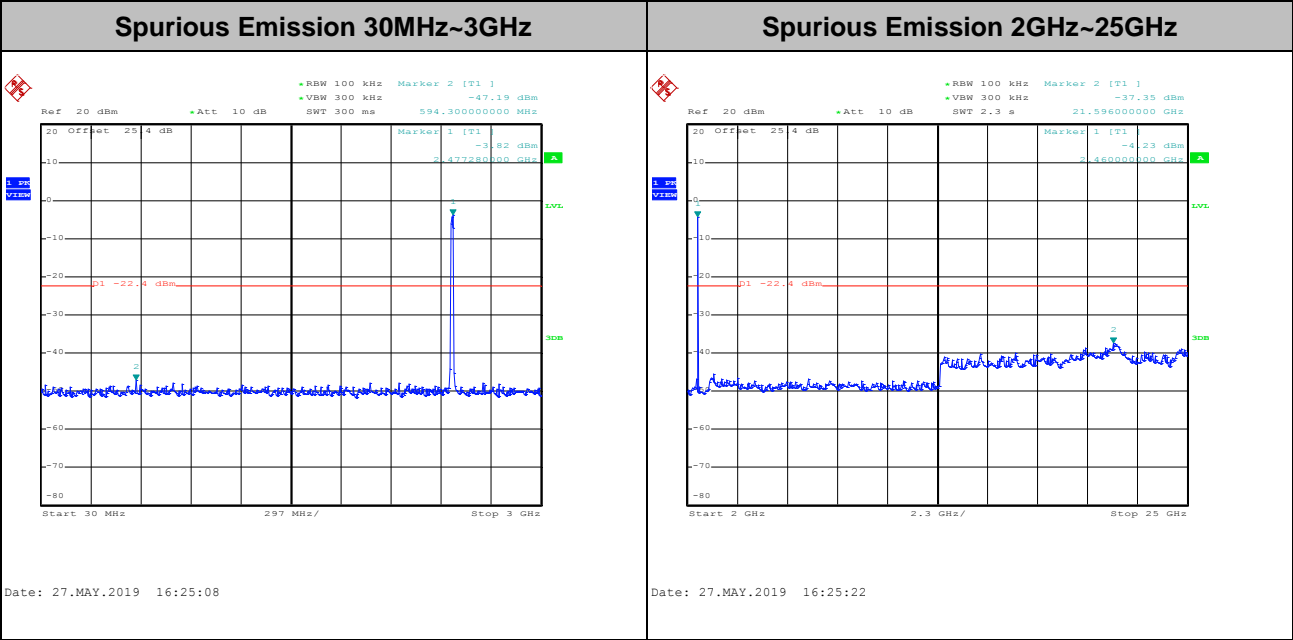
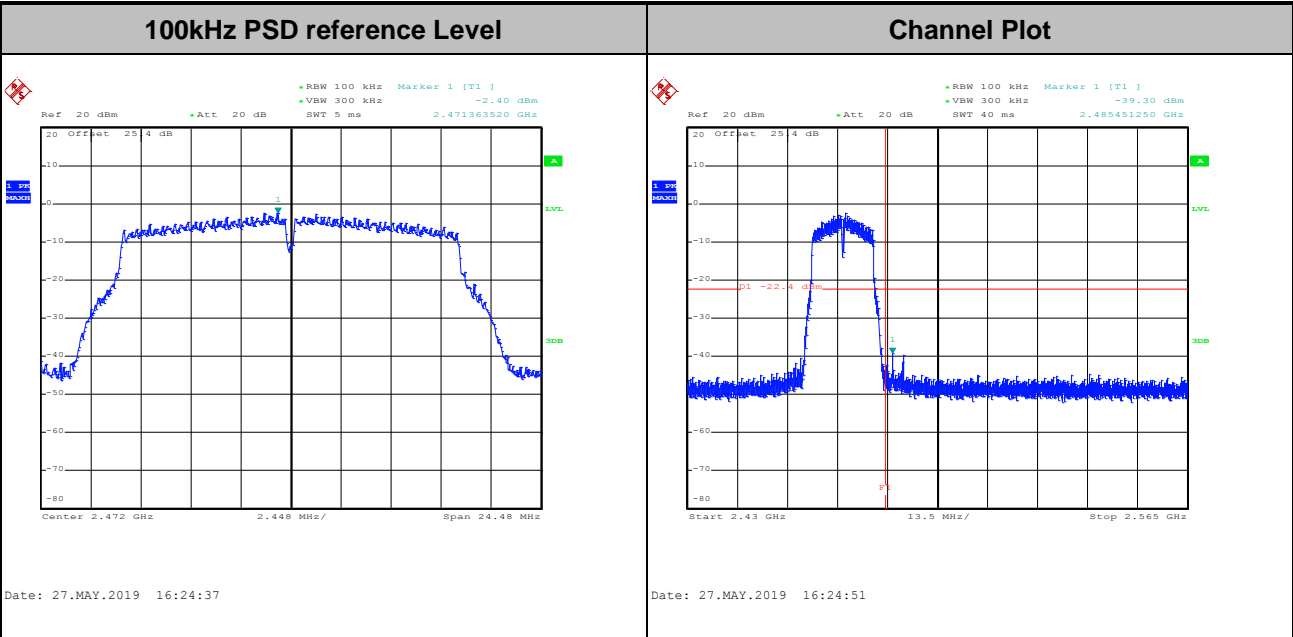


Test Mode :	802.11g	Test Channel :	12
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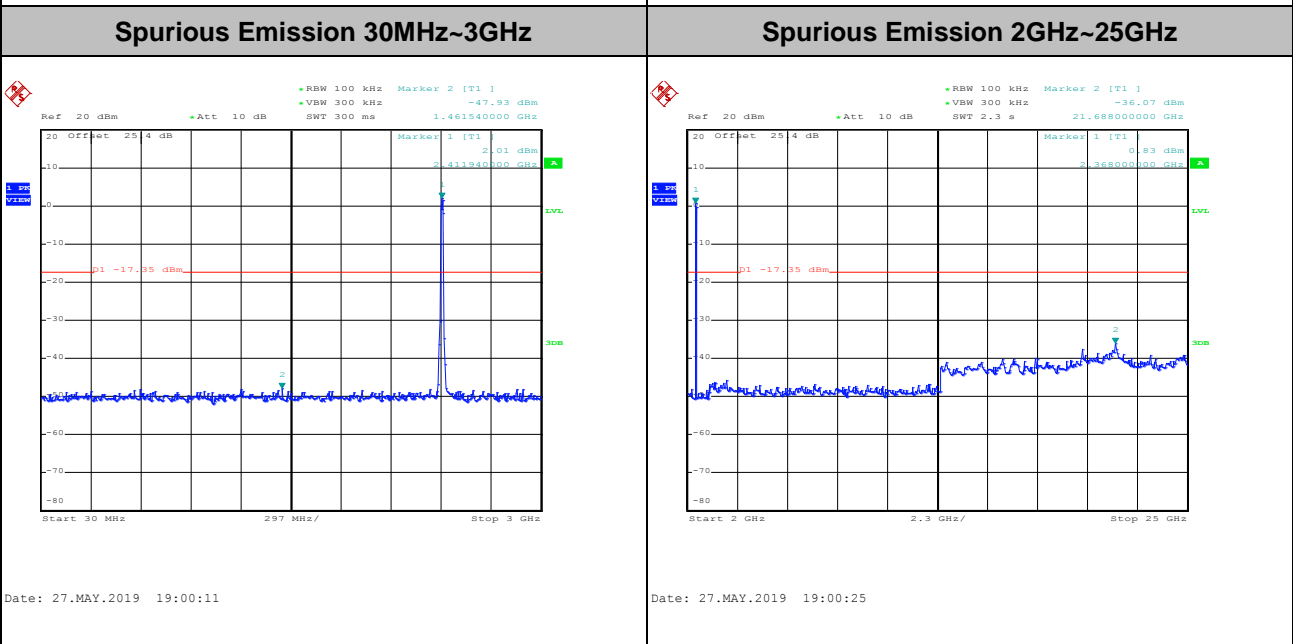
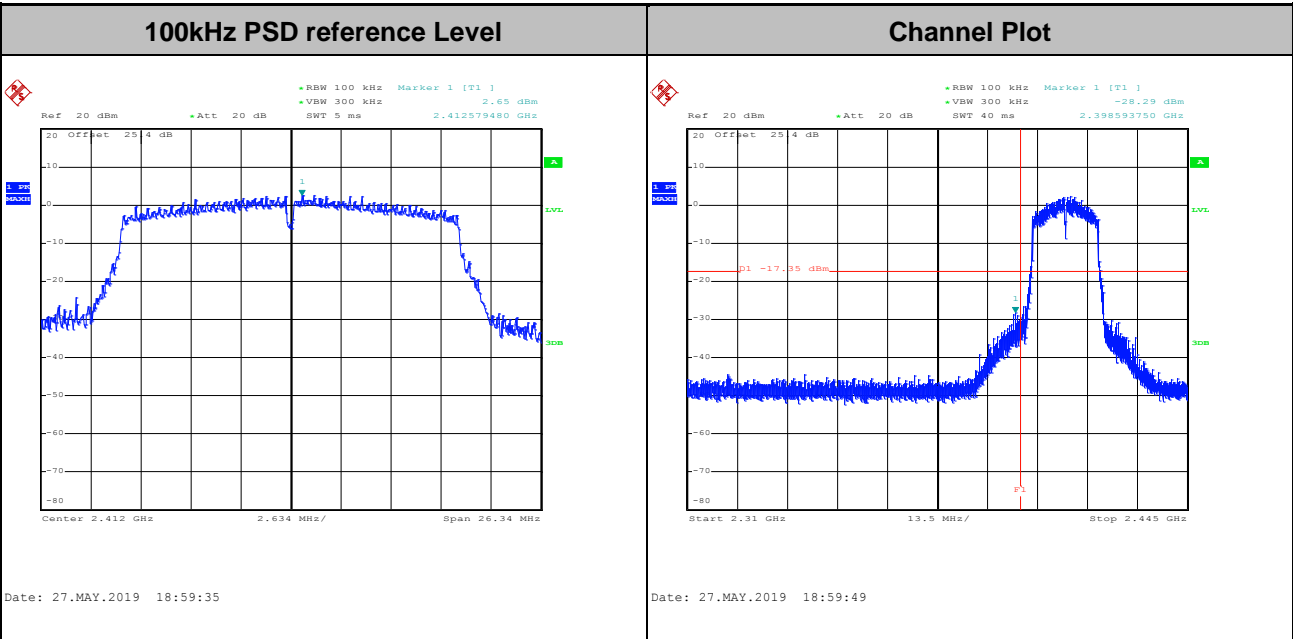
Test Mode :	802.11g	Test Channel :	13
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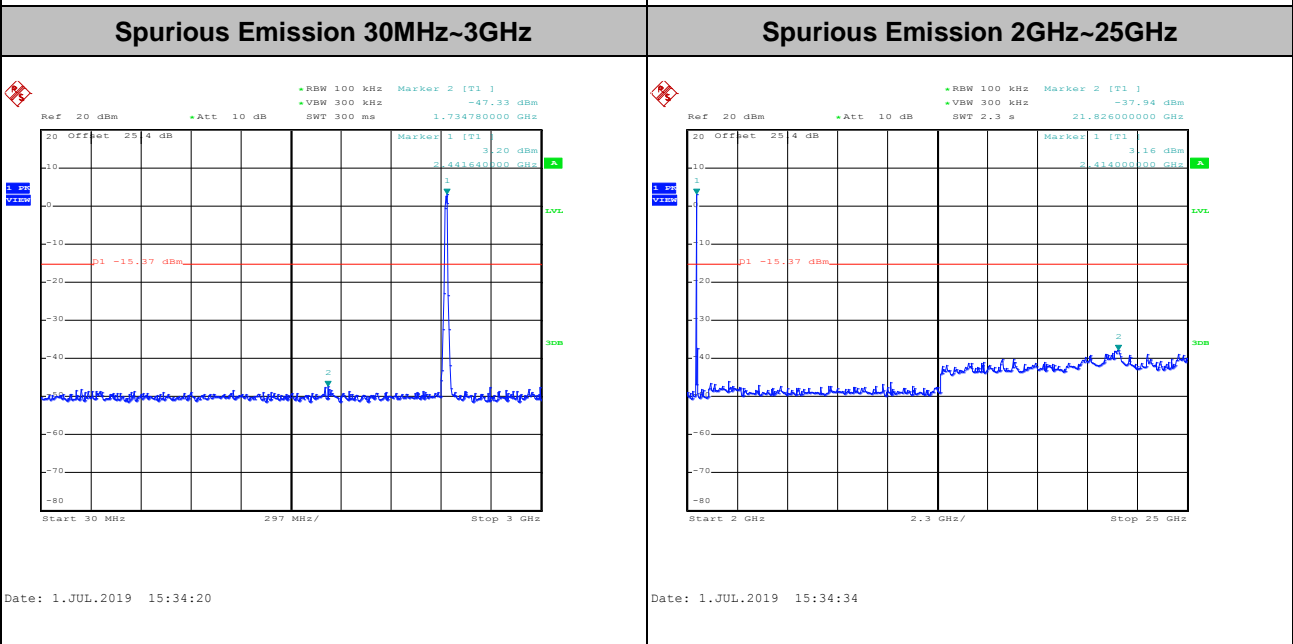
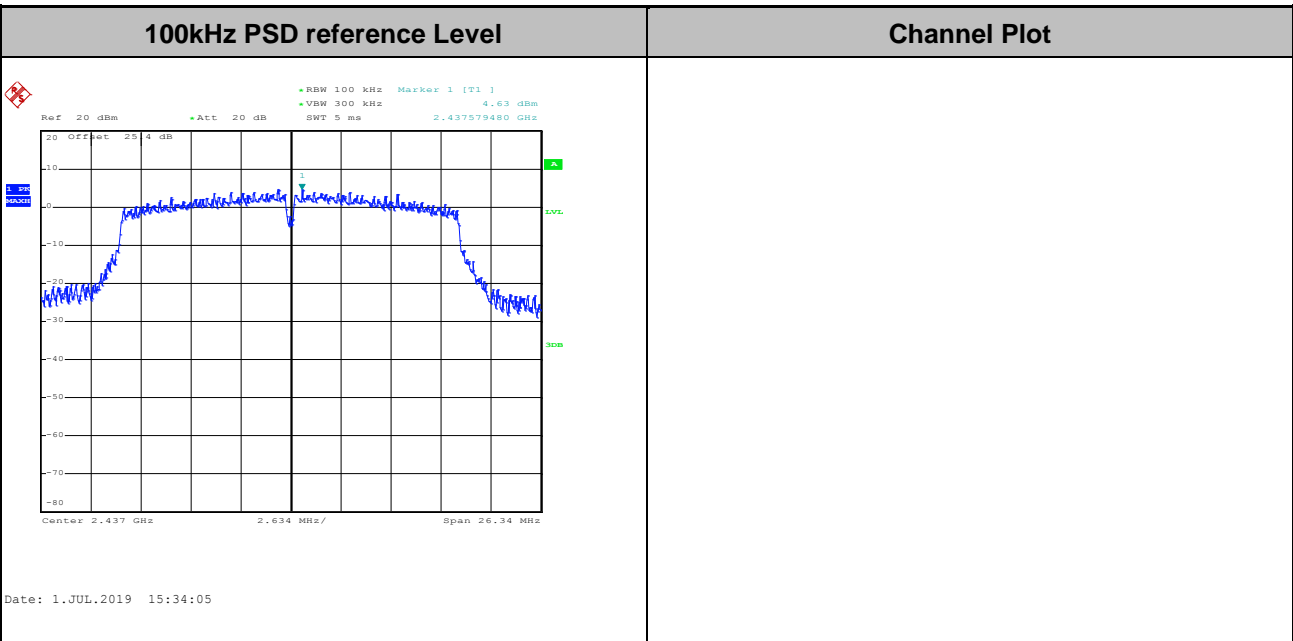


Test Mode :	802.11n HT20	Test Channel :	01
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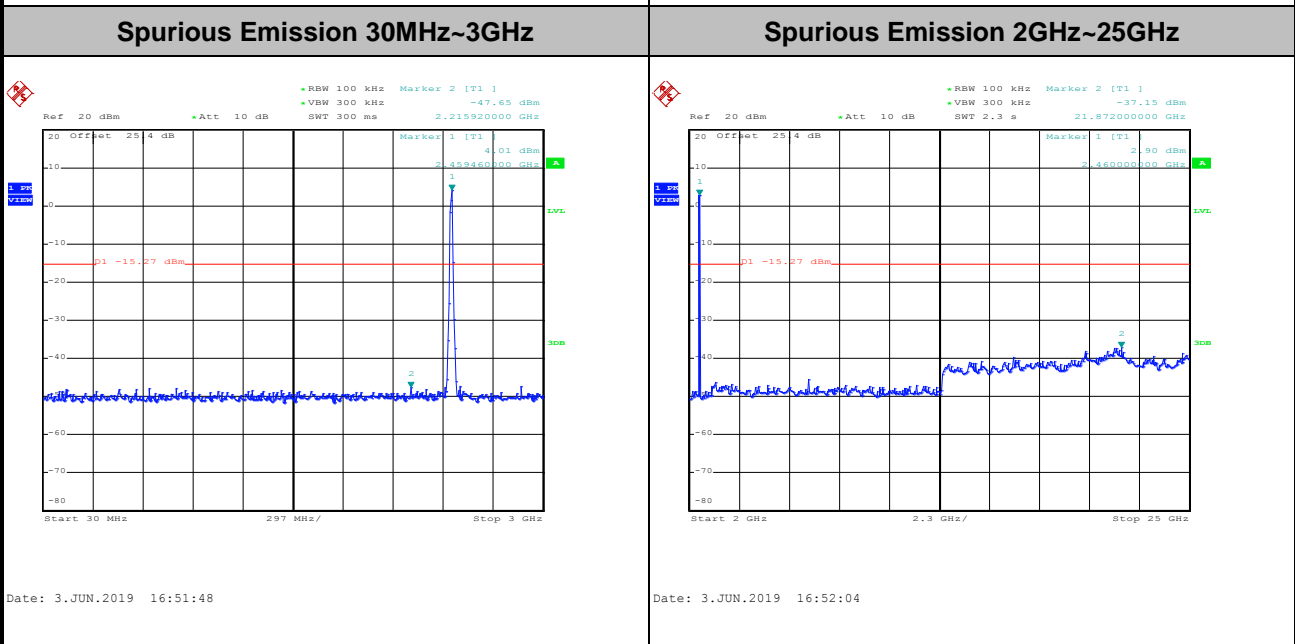
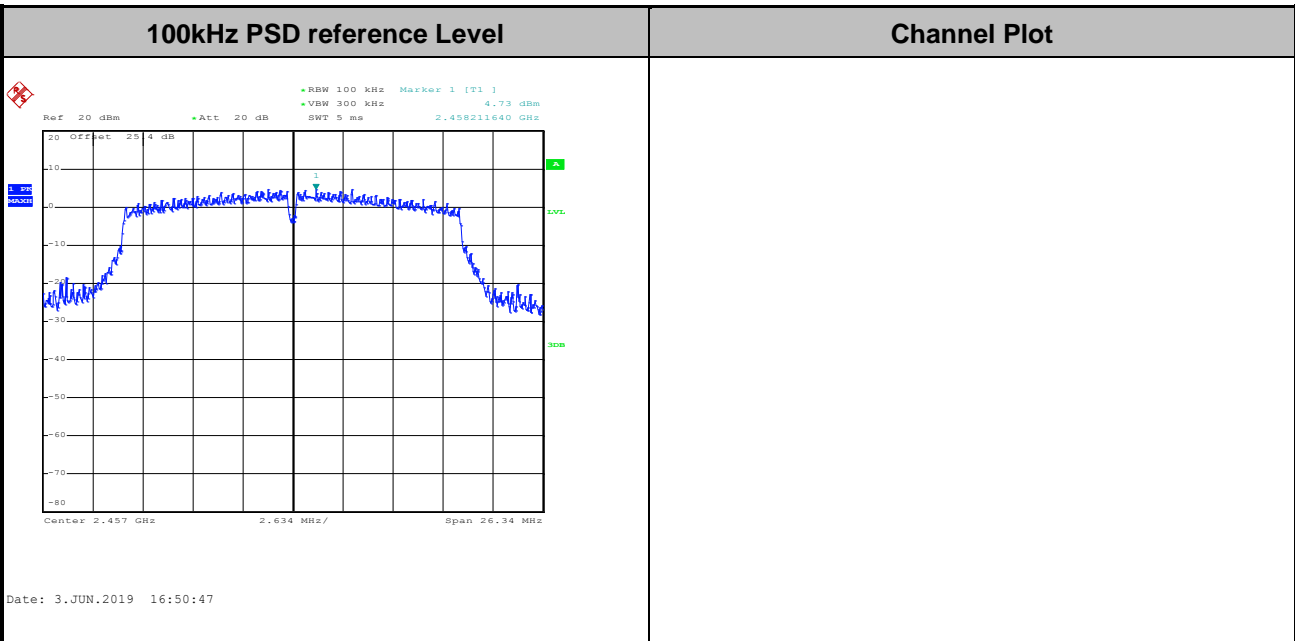


Test Mode :	802.11n HT20	Test Channel :	06
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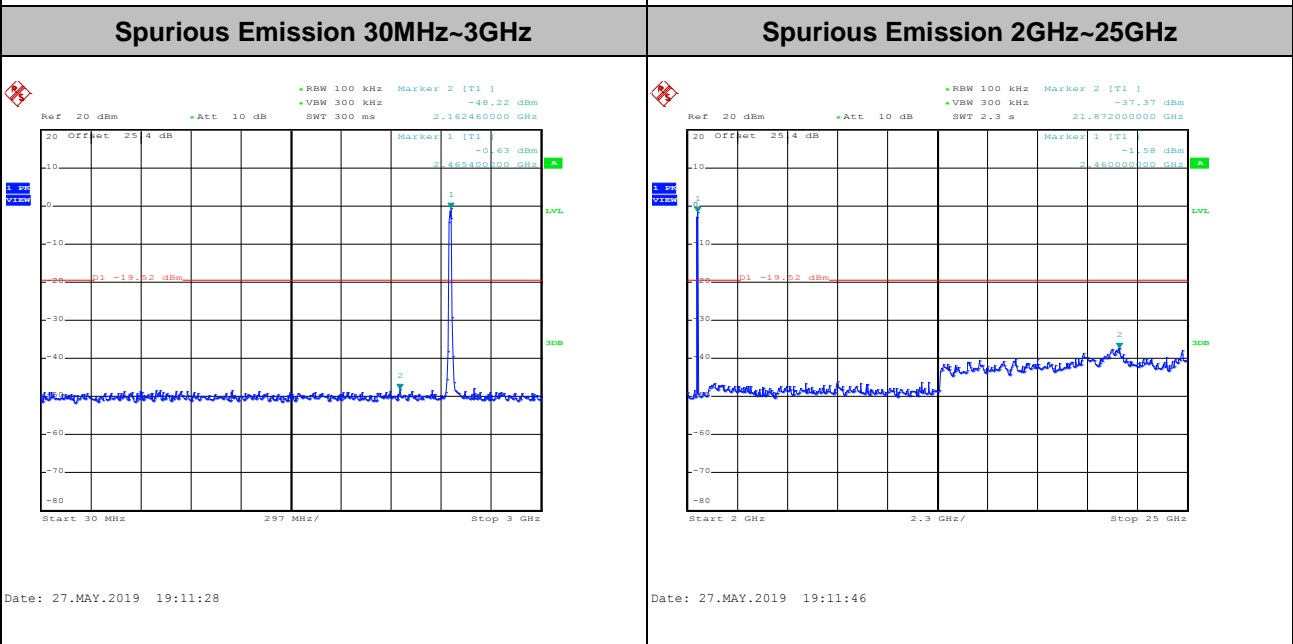
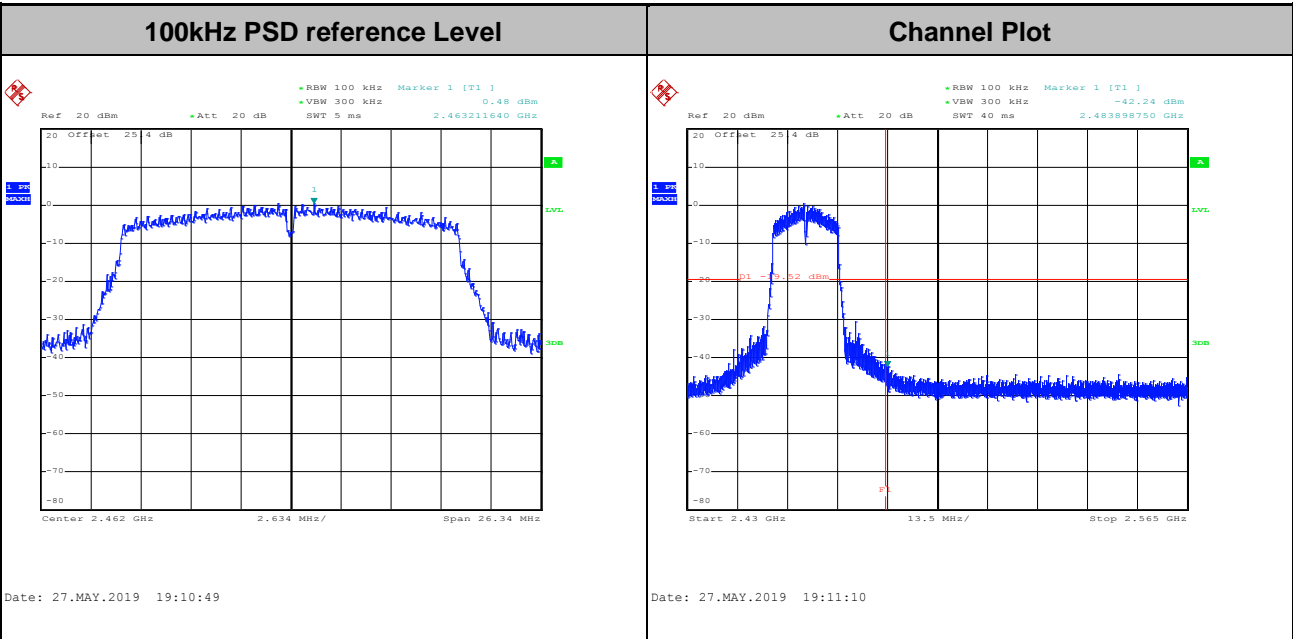


Test Mode :	802.11n HT20	Test Channel :	10
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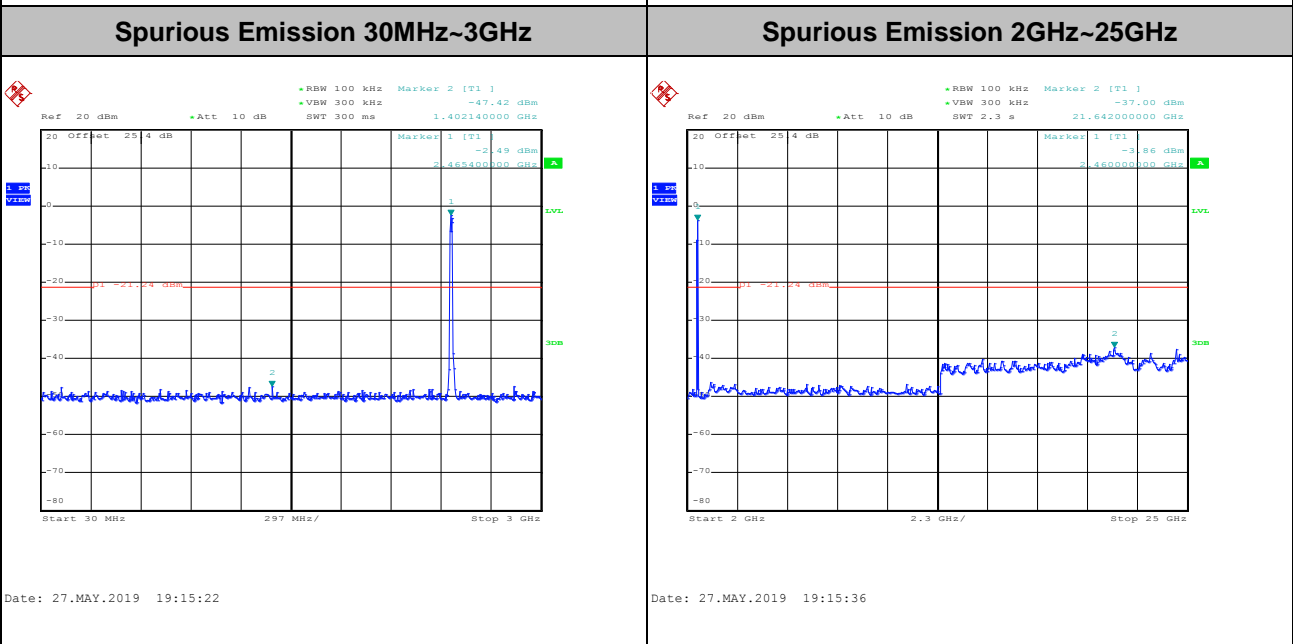
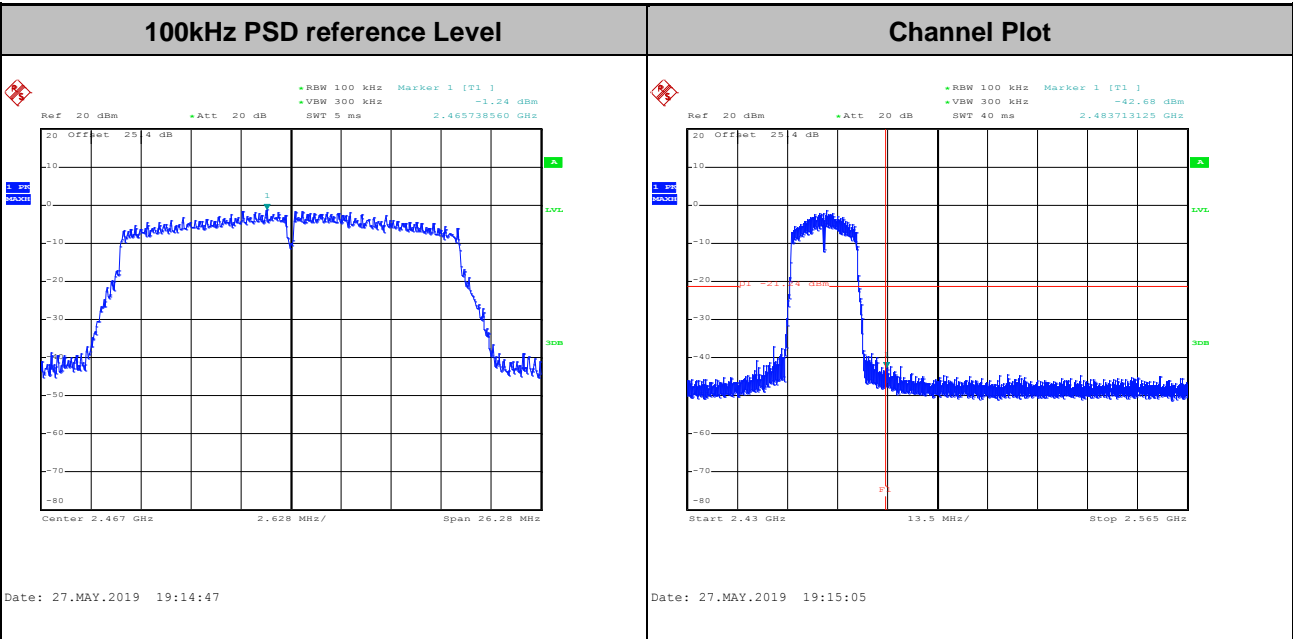


Test Mode :	802.11n HT20	Test Channel :	11
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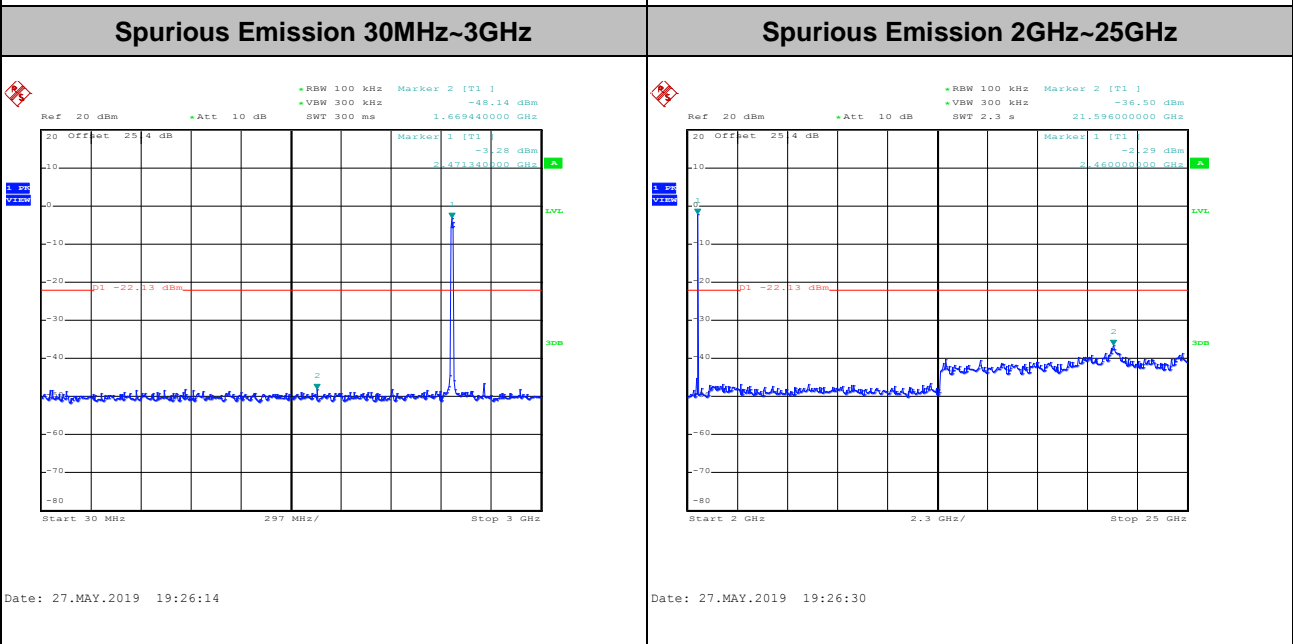
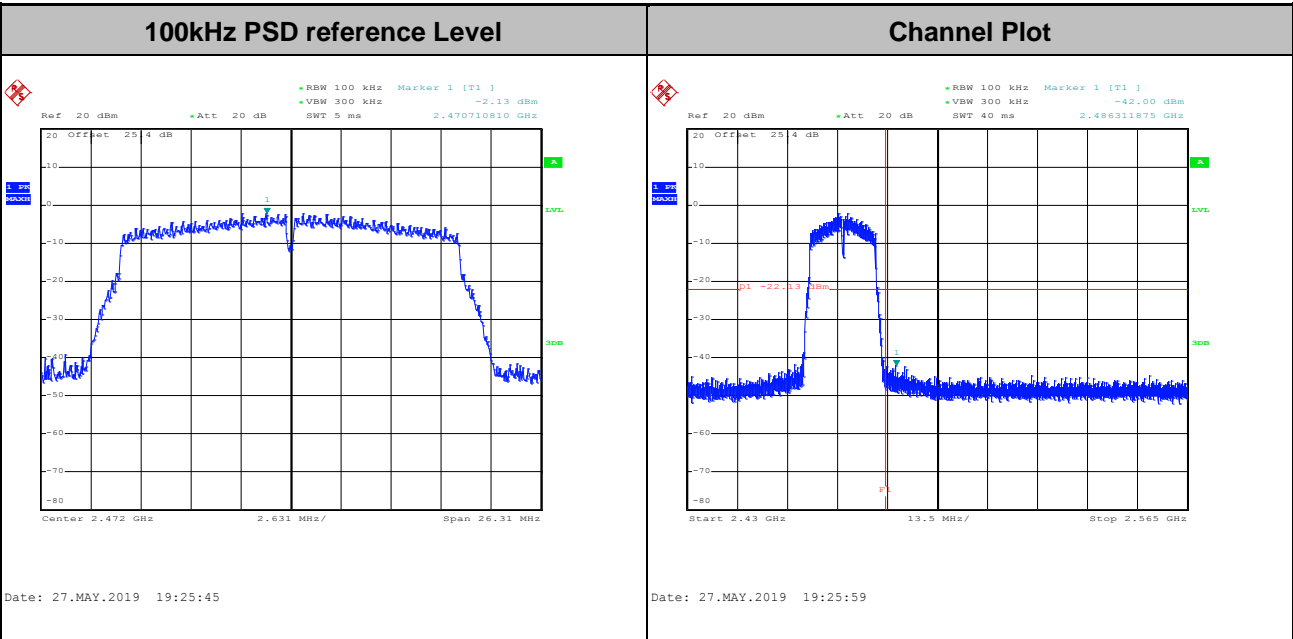


Test Mode :	802.11n HT20	Test Channel :	12
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<b>Test Mode :</b>	802.11n HT20	<b>Test Channel :</b>	13
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### 3.5 Radiated Band Edges and Spurious Emission Measurement

#### 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.



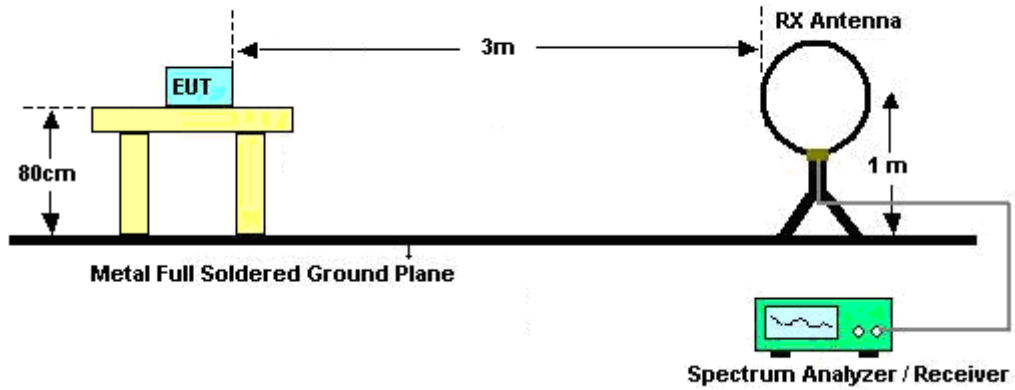
### 3.5.3 Test Procedures

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.

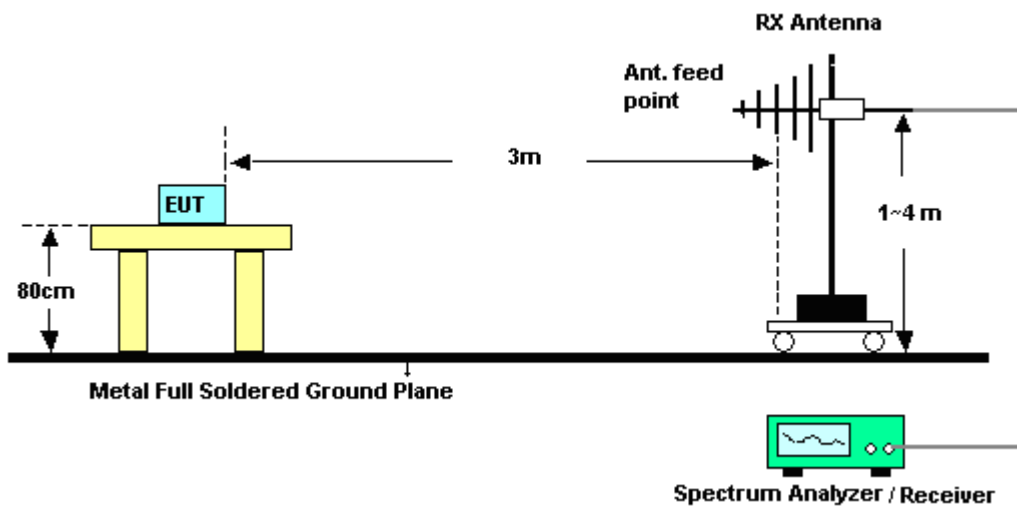


### 3.5.4 Test Setup

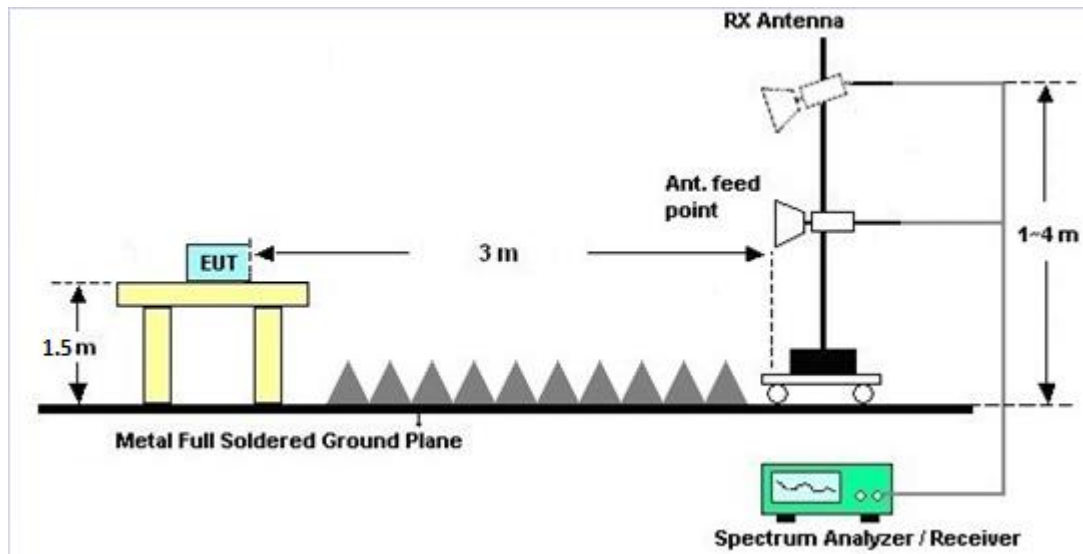
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 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 C and D.

### 3.5.7 Duty Cycle

Please refer to Appendix E.

### 3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10<sup>th</sup> Harmonic)

Please refer to Appendix C and D.



### 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 B.



### 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 =  $G_{ANT}$  + 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 for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. 0 (dBi)	Ant. 1 (dBi)				
2.4 GHz	4.60	4.50	4.60	7.56	0.00	1.56

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

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



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 11, 2019	May 01, 2019~ Jun. 27, 2019	Jan. 10, 2020	Radiation (03CH16-HY)
Bilog Antenna	TESEQ	CBL6111D&0 0802N1D01N- 06	47020&06	30MHz to 1GHz	Oct. 13, 2018	May 01, 2019~ Jun. 27, 2019	Oct. 12, 2019	Radiation (03CH16-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-152 2	1G~18GHz	Sep. 07, 2018	May 01, 2019~ Jun. 27, 2019	Sep. 06, 2019	Radiation (03CH16-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 251	18GHz ~ 40GHz	Nov. 20, 2018	May 01, 2019~ Jun. 27, 2019	Nov. 19, 2019	Radiation (03CH16-HY)
Amplifier	SONOMA	310N	371607	9kHz~1000MHz	Oct. 02, 2018	May 01, 2019~ Jun. 27, 2019	Oct. 01, 2019	Radiation (03CH16-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	171000180 0055007	1GHz~18GHz	Apr. 01, 2019	May 01, 2019~ Jun. 27, 2019	Mar. 31, 2020	Radiation (03CH16-HY)
Preamplifier	Keysight	83017A	MY532702 64	1GHz~26.5GHz	Dec. 12, 2018	May 01, 2019~ Jun. 27, 2019	Dec.11, 2019	Radiation (03CH16-HY)
Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	May 01, 2019~ Jun. 27, 2019	Jul. 15, 2019	Radiation (03CH16-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY572901 11	3Hz~26.5GHz	Nov. 29, 2018	May 01, 2019~ Jun. 27, 2019	Nov. 28, 2019	Radiation (03CH16-HY)
Spectrum Analyzer	Agilent	N9010A	MY542004 86	10Hz~44GHz	Oct. 19, 2018	May 01, 2019~ Jun. 27, 2019	Oct. 18, 2019	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	MY1082/2 6EA	30M-18G	Oct. 15, 2018	May 01, 2019~ Jun. 27, 2019	Oct. 14, 2019	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15539/ 4	30M-18G	Feb. 26, 2019	May 01, 2019~ Jun. 27, 2019	Feb. 25, 2020	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36980/ 4	30M~18GHz	Apr. 15, 2019	May 01, 2019~ Jun. 27, 2019	Apr. 14, 2020	Radiation (03CH16-HY)
Software	Audix	E3 6.2009-8-24	RK-001136	N/A	N/A	May 01, 2019~ Jun. 27, 2019	N/A	Radiation (03CH16-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 10, 2019	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 12, 2018	Jul. 10, 2019	Nov. 11, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 14, 2018	Jul. 10, 2019	Nov. 13, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 09, 2018	Jul. 10, 2019	Nov. 08, 2019	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jul. 10, 2019	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Dec. 31, 2018	Jul. 10, 2019	Dec. 30, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Dec. 31, 2018	Jul. 10, 2019	Dec. 30, 2019	Conduction (CO05-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1132003	N/A	Aug. 16, 2018	Apr. 26, 2019~ Jul. 10, 2019	Aug. 15, 2019	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1126017	300MHz~40GHz	Aug. 16, 2018	Apr. 26, 2019~ Jul. 10, 2019	Aug. 15, 2019	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO10	10MHz~6GHz	Dec. 19, 2018	Apr. 26, 2019~ Jul. 10, 2019	Dec. 18, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 21, 2018	Apr. 26, 2019~ Jul. 10, 2019	Nov. 20, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC120838 2	N/A	Mar. 27, 2019	Apr. 26, 2019~ Jul. 10, 2019	Mar. 26, 2020	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% ( $U = 2Uc(y)$ )	4.90
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.80
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.90
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**Appendix A. Test Result of Conducted Test Items**

Test Engineer:	Luffy Lin/Richard Qiu	Temperature:	21~25	°C
Test Date:	2019/4/26~2019/7/10	Relative Humidity:	51~54	%

**TEST RESULTS DATA**  
**6dB and 99% Occupied Bandwidth**

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant 0	Ant 1	Ant 0	Ant 1		
11b	1Mbps	1	1	2412	13.90	13.55	8.52	8.52	0.50	Pass
11b	1Mbps	1	6	2437	14.00	13.55	9.04	9.04	0.50	Pass
11b	1Mbps	1	11	2462	13.95	13.50	9.04	8.56	0.50	Pass
11b	1Mbps	1	12	2467	13.80	13.70	9.04	9.04	0.50	Pass
11b	1Mbps	1	13	2472	13.60	13.60	9.00	9.00	0.50	Pass
11g	6Mbps	1	1	2412	16.70	16.65	16.28	16.32	0.50	Pass
11g	6Mbps	1	6	2437	16.90	16.80	16.32	16.32	0.50	Pass
11g	6Mbps	1	11	2462	16.75	16.65	16.32	16.32	0.50	Pass
11g	6Mbps	1	12	2467	16.60	16.60	16.32	16.32	0.50	Pass
11g	6Mbps	1	13	2472	16.60	16.60	16.32	16.28	0.50	Pass
HT20	MCS0	1	1	2412	17.70	17.70	17.56	17.52	0.50	Pass
HT20	MCS0	1	2	2417	18.15	17.80	17.52	17.56	0.50	Pass
HT20	MCS0	1	6	2437	17.95	17.85	17.56	17.56	0.50	Pass
HT20	MCS0	1	10	2457	18.00	17.80	17.52	17.52	0.50	Pass
HT20	MCS0	1	11	2462	17.65	17.70	17.54	17.56	0.50	Pass
HT20	MCS0	1	12	2467	17.70	17.65	17.52	17.56	0.50	Pass
HT20	MCS0	1	13	2472	17.70	17.65	17.56	17.56	0.50	Pass
11b	1Mbps	2	1	2412	13.95	13.50	9.00	9.00	0.50	Pass
11b	1Mbps	2	6	2437	13.90	13.55	9.06	9.00	0.50	Pass
11b	1Mbps	2	11	2462	13.90	13.55	9.04	8.56	0.50	Pass
11b	1Mbps	2	12	2467	14.05	13.90	9.04	9.04	0.50	Pass
11b	1Mbps	2	13	2472	13.60	13.55	9.00	9.02	0.50	Pass
11g	6Mbps	2	1	2412	16.80	16.55	16.28	16.32	0.50	Pass
11g	6Mbps	2	6	2437	16.90	16.75	16.32	16.28	0.50	Pass
11g	6Mbps	2	10	2457	16.95	16.70	16.32	16.32	0.50	Pass
11g	6Mbps	2	11	2462	16.60	16.55	16.34	16.34	0.50	Pass
11g	6Mbps	2	12	2467	16.55	16.50	16.32	16.32	0.50	Pass
11g	6Mbps	2	13	2472	16.60	16.50	16.32	16.32	0.50	Pass
HT20	MCS0	2	1	2412	17.75	17.65	17.56	17.56	0.50	Pass
HT20	MCS0	2	6	2437	17.95	17.75	17.32	17.56	0.50	Pass
HT20	MCS0	2	10	2457	17.95	17.70	17.52	17.56	0.50	Pass
HT20	MCS0	2	11	2462	17.70	17.65	17.56	17.56	0.50	Pass
HT20	MCS0	2	12	2467	17.65	17.65	17.52	17.52	0.50	Pass
HT20	MCS0	2	13	2472	17.70	17.65	17.52	17.54	0.50	Pass

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1	Ant 0	Ant 1	Ant 0	Ant 1	
11b	1Mbps	1	1	2412	20.20	20.31	-	30.00	30.00	4.60	4.50	24.80	24.81	36.00	36.00	Pass
11b	1Mbps	1	6	2437	19.83	20.13	-	30.00	30.00	4.60	4.50	24.43	24.63	36.00	36.00	Pass
11b	1Mbps	1	11	2462	19.87	19.72	-	30.00	30.00	4.60	4.50	24.47	24.22	36.00	36.00	Pass
11b	1Mbps	1	12	2467	16.55	16.56	-	30.00	30.00	4.60	4.50	21.15	21.06	36.00	36.00	Pass
11b	1Mbps	1	13	2472	11.51	11.35	-	30.00	30.00	4.60	4.50	16.11	15.85	36.00	36.00	Pass
11g	6Mbps	1	1	2412	23.65	23.57	-	30.00	30.00	4.60	4.50	28.25	28.07	36.00	36.00	Pass
11g	6Mbps	1	6	2437	23.57	24.17	-	30.00	30.00	4.60	4.50	28.17	28.67	36.00	36.00	Pass
11g	6Mbps	1	11	2462	22.96	23.65	-	30.00	30.00	4.60	4.50	27.56	28.15	36.00	36.00	Pass
11g	6Mbps	1	12	2467	20.30	20.35	-	30.00	30.00	4.60	4.50	24.90	24.85	36.00	36.00	Pass
11g	6Mbps	1	13	2472	19.95	19.65	-	30.00	30.00	4.60	4.50	24.55	24.15	36.00	36.00	Pass
HT20	MCS0	1	1	2412	22.98	22.98	-	30.00	30.00	4.60	4.50	27.58	27.48	36.00	36.00	Pass
HT20	MCS0	1	2	2417	23.77	24.22	-	30.00	30.00	4.60	4.50	28.37	28.72	36.00	36.00	Pass
HT20	MCS0	1	6	2437	23.53	24.14	-	30.00	30.00	4.60	4.50	28.13	28.64	36.00	36.00	Pass
HT20	MCS0	1	10	2457	23.44	23.95	-	30.00	30.00	4.60	4.50	28.04	28.45	36.00	36.00	Pass
HT20	MCS0	1	11	2462	22.12	23.65	-	30.00	30.00	4.60	4.50	26.72	28.15	36.00	36.00	Pass
HT20	MCS0	1	12	2467	20.32	20.43	-	30.00	30.00	4.60	4.50	24.92	24.93	36.00	36.00	Pass
HT20	MCS0	1	13	2472	19.11	19.24	-	30.00	30.00	4.60	4.50	23.71	23.74	36.00	36.00	Pass
11b	1Mbps	2	1	2412	20.44	20.23	23.35	30.00		4.60		27.95		36.00		Pass
11b	1Mbps	2	6	2437	19.64	20.01	22.84	30.00		4.60		27.44		36.00		Pass
11b	1Mbps	2	11	2462	19.78	19.71	22.76	30.00		4.60		27.36		36.00		Pass
11b	1Mbps	2	12	2467	17.45	17.32	20.40	30.00		4.60		25.00		36.00		Pass
11b	1Mbps	2	13	2472	11.12	11.01	14.08	30.00		4.60		18.68		36.00		Pass
11g	6Mbps	2	1	2412	23.64	23.77	26.72	30.00		4.60		31.32		36.00		Pass
11g	6Mbps	2	6	2437	23.48	24.17	26.85	30.00		4.60		31.45		36.00		Pass
11g	6Mbps	2	10	2457	23.33	24.13	26.76	30.00		4.60		31.36		36.00		Pass
11g	6Mbps	2	11	2462	21.87	22.32	25.11	30.00		4.60		29.71		36.00		Pass
11g	6Mbps	2	12	2467	20.21	20.26	23.25	30.00		4.60		27.85		36.00		Pass
11g	6Mbps	2	13	2472	19.61	19.52	22.58	30.00		4.60		27.18		36.00		Pass
HT20	MCS0	2	1	2412	23.12	23.56	26.36	30.00		4.60		30.96		36.00		Pass
HT20	MCS0	2	6	2437	23.55	24.13	26.86	30.00		4.60		31.46		36.00		Pass
HT20	MCS0	2	10	2457	23.13	23.82	26.50	30.00		4.60		31.10		36.00		Pass
HT20	MCS0	2	11	2462	21.13	20.98	24.07	30.00		4.60		28.67		36.00		Pass
HT20	MCS0	2	12	2467	20.03	20.13	23.09	30.00		4.60		27.69		36.00		Pass
HT20	MCS0	2	13	2472	19.35	19.35	22.36	30.00		4.60		26.96		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant 0	Ant 1	Ant 0	Ant 1	SUM
11b	1Mbps	1	1	2412	0.00	0.00	17.90	18.00	-
11b	1Mbps	1	6	2437	0.00	0.00	17.80	17.80	
11b	1Mbps	1	11	2462	0.00	0.00	17.80	17.50	
11b	1Mbps	1	12	2467	0.00	0.00	14.50	14.60	
11b	1Mbps	1	13	2472	0.00	0.00	9.20	9.20	
11g	6Mbps	1	1	2412	0.00	0.00	16.30	15.50	
11g	6Mbps	1	6	2437	0.00	0.00	17.40	17.70	
11g	6Mbps	1	11	2462	0.00	0.00	15.10	16.00	
11g	6Mbps	1	12	2467	0.00	0.00	11.20	11.40	
11g	6Mbps	1	13	2472	0.00	0.00	10.20	10.40	
HT20	MCS0	1	1	2412	0.00	0.00	15.10	14.80	
HT20	MCS0	1	2	2417	0.00	0.00	17.90	17.50	
HT20	MCS0	1	6	2437	0.00	0.00	17.40	17.50	
HT20	MCS0	1	10	2457	0.00	0.00	17.40	17.50	
HT20	MCS0	1	11	2462	0.00	0.00	13.90	15.40	
HT20	MCS0	1	12	2467	0.00	0.00	11.60	11.30	
HT20	MCS0	1	13	2472	0.00	0.00	9.40	9.90	
11b	1Mbps	2	1	2412	0.00	0.00	18.50	18.10	21.31
11b	1Mbps	2	6	2437	0.00	0.00	17.40	17.60	20.51
11b	1Mbps	2	11	2462	0.00	0.00	17.90	17.50	20.71
11b	1Mbps	2	12	2467	0.00	0.00	15.90	15.80	18.86
11b	1Mbps	2	13	2472	0.00	0.00	9.00	8.80	11.91
11g	6Mbps	2	1	2412	0.00	0.00	16.90	16.40	19.67
11g	6Mbps	2	6	2437	0.00	0.00	17.40	17.80	20.61
11g	6Mbps	2	10	2457	0.00	0.00	17.40	17.70	20.56
11g	6Mbps	2	11	2462	0.00	0.00	14.10	13.80	16.96
11g	6Mbps	2	12	2467	0.00	0.00	11.40	11.40	14.41
11g	6Mbps	2	13	2472	0.00	0.00	10.40	10.50	13.46
HT20	MCS0	2	1	2412	0.00	0.00	15.70	15.30	18.51
HT20	MCS0	2	6	2437	0.00	0.00	17.30	17.70	20.51
HT20	MCS0	2	10	2457	0.00	0.00	16.80	17.20	20.01
HT20	MCS0	2	11	2462	0.00	0.00	12.80	12.80	15.81
HT20	MCS0	2	12	2467	0.00	0.00	11.20	11.30	14.26
HT20	MCS0	2	13	2472	0.00	0.00	10.30	10.30	13.31

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Peak Power Spectral Density**

2.4GHz Band												
Mod.	Data Rate	N <sub>TX</sub>	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant 0	Ant 1	Worse + 3.01	Ant 0	Ant 1	Ant 0	Ant 1	
11b	1Mbps	1	1	2412	-4.18	-5.11	-	4.60	4.50	8.00	8.00	Pass
11b	1Mbps	1	6	2437	-4.60	-4.27	-	4.60	4.50	8.00	8.00	Pass
11b	1Mbps	1	11	2462	-4.33	-4.27	-	4.60	4.50	8.00	8.00	Pass
11b	1Mbps	1	12	2467	-7.43	-7.92	-	4.60	4.50	8.00	8.00	Pass
11b	1Mbps	1	13	2472	-12.97	-13.34	-	4.60	4.50	8.00	8.00	Pass
11g	6Mbps	1	1	2412	-8.28	-9.80	-	4.60	4.50	8.00	8.00	Pass
11g	6Mbps	1	6	2437	-7.96	-6.91	-	4.60	4.50	8.00	8.00	Pass
11g	6Mbps	1	11	2462	-9.25	-8.23	-	4.60	4.50	8.00	8.00	Pass
11g	6Mbps	1	12	2467	-13.01	-13.08	-	4.60	4.50	8.00	8.00	Pass
11g	6Mbps	1	13	2472	-13.99	-14.78	-	4.60	4.50	8.00	8.00	Pass
HT20	MCS0	1	1	2412	-7.70	-10.51	-	4.60	4.50	8.00	8.00	Pass
HT20	MCS0	1	2	2417	-6.58	-7.82	-	4.60	4.50	8.00	8.00	Pass
HT20	MCS0	1	6	2437	-7.67	-7.38	-	4.60	4.50	8.00	8.00	Pass
HT20	MCS0	1	10	2457	-7.94	-6.87	-	4.60	4.50	8.00	8.00	Pass
HT20	MCS0	1	11	2462	-10.45	-9.71	-	4.60	4.50	8.00	8.00	Pass
HT20	MCS0	1	12	2467	-12.87	-14.10	-	4.60	4.50	8.00	8.00	Pass
HT20	MCS0	1	13	2472	-14.65	-14.85	-	4.60	4.50	8.00	8.00	Pass
11b	1Mbps	2	1	2412	-4.93	-5.05	-1.92	7.56		6.44		Pass
11b	1Mbps	2	6	2437	-5.19	-4.38	-1.37	7.56		6.44		Pass
11b	1Mbps	2	11	2462	-4.82	-4.90	-1.81	7.56		6.44		Pass
11b	1Mbps	2	12	2467	-7.05	-6.72	-3.71	7.56		6.44		Pass
11b	1Mbps	2	13	2472	-13.76	-13.95	-10.75	7.56		6.44		Pass
11g	6Mbps	2	1	2412	-7.70	-8.10	-4.69	7.56		6.44		Pass
11g	6Mbps	2	6	2437	-8.36	-7.68	-4.67	7.56		6.44		Pass
11g	6Mbps	2	10	2457	-7.71	-7.16	-4.15	7.56		6.44		Pass
11g	6Mbps	2	11	2462	-10.97	-11.76	-7.96	7.56		6.44		Pass
11g	6Mbps	2	12	2467	-12.57	-13.81	-9.56	7.56		6.44		Pass
11g	6Mbps	2	13	2472	-13.26	-15.05	-10.25	7.56		6.44		Pass
HT20	MCS0	2	1	2412	-8.23	-9.35	-5.22	7.56		6.44		Pass
HT20	MCS0	2	6	2437	-8.31	-7.51	-4.50	7.56		6.44		Pass
HT20	MCS0	2	10	2457	-7.74	-6.51	-3.50	7.56		6.44		Pass
HT20	MCS0	2	11	2462	-9.87	-12.19	-6.86	7.56		6.44		Pass
HT20	MCS0	2	12	2467	-12.62	-14.68	-9.61	7.56		6.44		Pass
HT20	MCS0	2	13	2472	-14.38	-14.97	-11.37	7.56		6.44		Pass

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



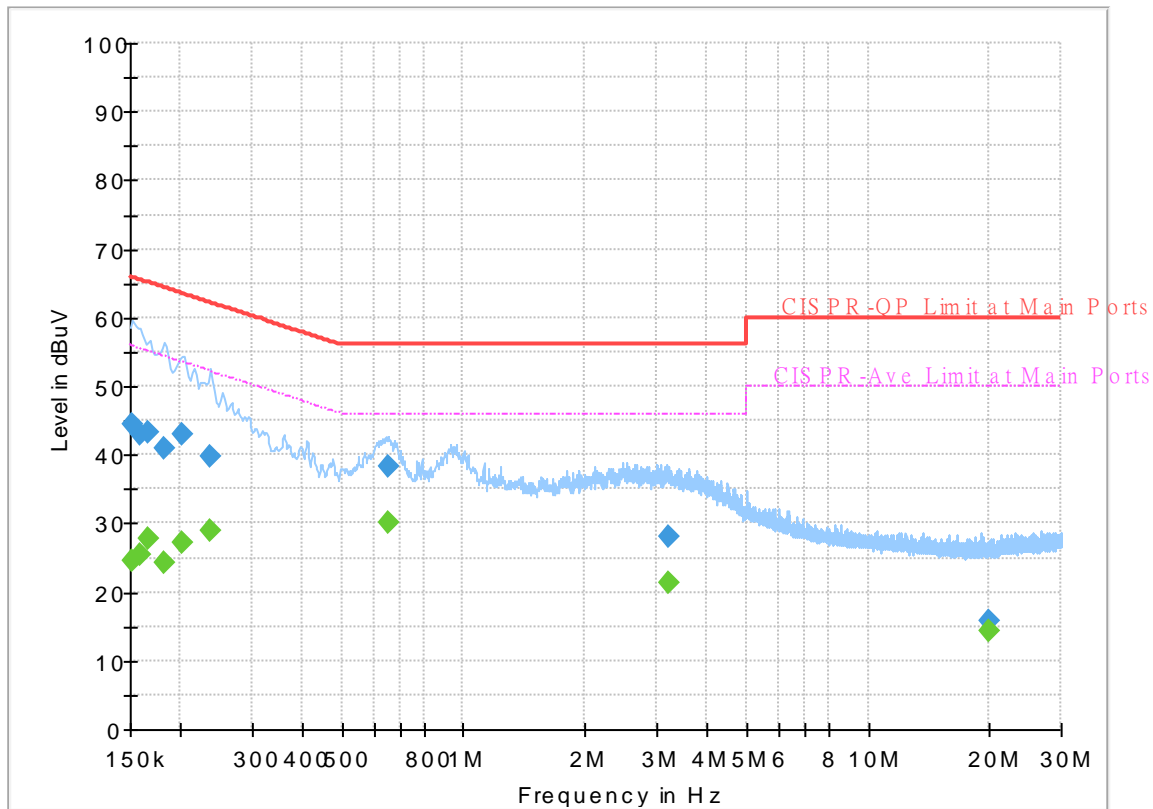
## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	Temperature :	23.9~26°C
		Relative Humidity :	63.3~70.3%

# EUT Information

Report NO : 800521-02  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Line

Full Spectrum



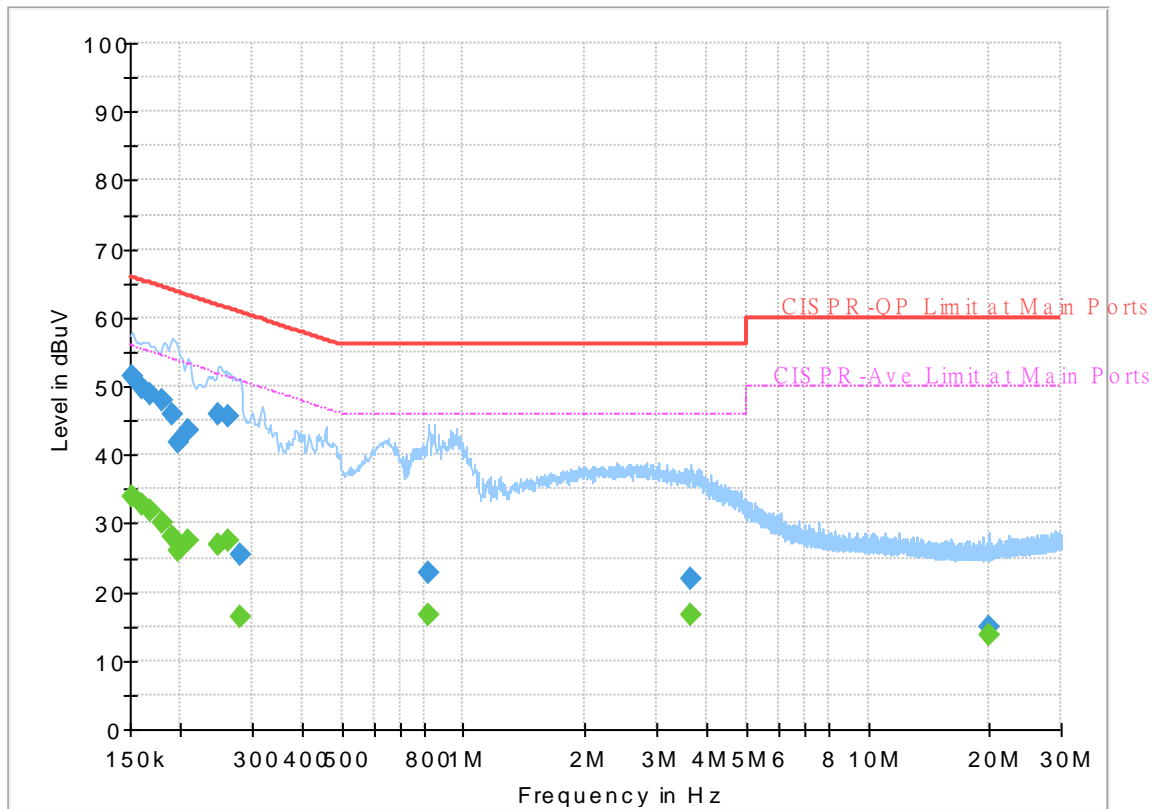
## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	24.70	55.88	31.18	L1	OFF	19.4
0.152250	44.32	---	65.88	21.56	L1	OFF	19.4
0.159000	---	25.35	55.52	30.17	L1	OFF	19.4
0.159000	43.10	---	65.52	22.42	L1	OFF	19.4
0.165750	---	27.91	55.17	27.26	L1	OFF	19.4
0.165750	43.18	---	65.17	21.99	L1	OFF	19.4
0.181500	---	24.24	54.42	30.18	L1	OFF	19.4
0.181500	40.88	---	64.42	23.54	L1	OFF	19.4
0.201750	---	27.29	53.54	26.25	L1	OFF	19.4
0.201750	43.05	---	63.54	20.49	L1	OFF	19.4
0.235500	---	29.05	52.25	23.20	L1	OFF	19.4
0.235500	39.91	---	62.25	22.34	L1	OFF	19.4
0.651750	---	29.98	46.00	16.02	L1	OFF	19.4
0.651750	38.39	---	56.00	17.61	L1	OFF	19.4
3.212250	---	21.46	46.00	24.54	L1	OFF	19.5
3.212250	28.17	---	56.00	27.83	L1	OFF	19.5
19.846500	---	14.33	50.00	35.67	L1	OFF	19.7
19.846500	15.76	---	60.00	44.24	L1	OFF	19.7

# EUT Information

Report NO : 800521-02  
 Test Mode : Mode 1  
 Test Voltage : 120Vac/60Hz  
 Phase : Neutral

Full Spectrum



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	33.88	55.88	22.00	N	OFF	19.4
0.152250	51.51	---	65.88	14.37	N	OFF	19.4
0.161250	---	32.84	55.40	22.56	N	OFF	19.4
0.161250	49.81	---	65.40	15.59	N	OFF	19.4
0.168000	---	31.83	55.06	23.23	N	OFF	19.4
0.168000	48.85	---	65.06	16.21	N	OFF	19.4
0.179250	---	30.23	54.52	24.29	N	OFF	19.4
0.179250	47.98	---	64.52	16.54	N	OFF	19.4
0.190500	---	28.21	54.02	25.81	N	OFF	19.4
0.190500	46.03	---	64.02	17.99	N	OFF	19.4
0.197250	---	26.08	53.73	27.65	N	OFF	19.4
0.197250	41.86	---	63.73	21.87	N	OFF	19.4
0.208500	---	27.36	53.27	25.91	N	OFF	19.4
0.208500	43.64	---	63.27	19.63	N	OFF	19.4
0.249000	---	27.02	51.79	24.77	N	OFF	19.4
0.249000	45.77	---	61.79	16.02	N	OFF	19.4
0.262500	---	27.59	51.35	23.76	N	OFF	19.4
0.262500	45.60	---	61.35	15.75	N	OFF	19.4
0.280500	---	16.31	50.80	34.49	N	OFF	19.4
0.280500	25.46	---	60.80	35.34	N	OFF	19.4
0.820500	---	16.72	46.00	29.28	N	OFF	19.5



<b>0.820500</b>	<b>22.67</b>	<b>---</b>	<b>56.00</b>	<b>33.33</b>	<b>N</b>	<b>OFF</b>	<b>19.5</b>
<b>3.630750</b>	<b>---</b>	<b>16.63</b>	<b>46.00</b>	<b>29.37</b>	<b>N</b>	<b>OFF</b>	<b>19.5</b>
<b>3.630750</b>	<b>21.88</b>	<b>---</b>	<b>56.00</b>	<b>34.12</b>	<b>N</b>	<b>OFF</b>	<b>19.5</b>
<b>19.981500</b>	<b>---</b>	<b>13.81</b>	<b>50.00</b>	<b>36.19</b>	<b>N</b>	<b>OFF</b>	<b>19.8</b>
<b>19.981500</b>	<b>14.78</b>	<b>---</b>	<b>60.00</b>	<b>45.22</b>	<b>N</b>	<b>OFF</b>	<b>19.8</b>



### Appendix C. Radiated Spurious Emission

Test Engineer :	Jacky Hung, Austin Li and CR Liao	Temperature :	20~25°C
		Relative Humidity :	50~60%

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.	
0		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b CH 01 2412MHz		2389.59	60.02	-13.98	74	44.58	27.41	18.31	30.28	220	264	P	H
		2389.38	52.29	-1.71	54	36.85	27.41	18.31	30.28	220	264	A	H
	*	2412	118.65	-	-	103.12	27.47	18.34	30.28	220	264	P	H
	*	2412	115.53	-	-	100	27.47	18.34	30.28	220	264	A	H
		2389.38	57.59	-16.41	74	42.15	27.41	18.31	30.28	298	53	P	V
		2389.275	47.75	-6.25	54	32.31	27.41	18.31	30.28	298	53	A	V
	*	2412	113.8	-	-	98.27	27.47	18.34	30.28	298	53	P	V
	*	2412	110.66	-	-	95.13	27.47	18.34	30.28	298	53	A	V
802.11b CH 06 2437MHz		2367.68	57.78	-16.22	74	42.43	27.36	8.36	30.29	207	301	P	H
		2386.58	46.53	-7.47	54	31.09	27.41	8.39	30.28	207	301	A	H
	*	2437	118.57	-	-	102.95	27.54	8.43	30.27	207	301	P	H
	*	2437	115.45	-	-	99.83	27.54	8.43	30.27	207	301	A	H
		2492.79	57	-17	74	41.18	27.68	8.47	30.25	207	301	P	H
		2485.65	45.93	-8.07	54	30.14	27.66	8.46	30.25	207	301	A	H
		2350.6	56.5	-17.5	74	41.22	27.31	8.34	30.29	298	103	P	V
		2386.44	44.91	-9.09	54	29.48	27.4	8.39	30.28	298	103	A	V
	*	2437	113.43	-	-	97.81	27.54	8.43	30.27	298	103	P	V
	*	2437	110.3	-	-	94.68	27.54	8.43	30.27	298	103	A	V
		2494.05	56.52	-17.48	74	40.7	27.68	8.47	30.25	298	103	P	V
		2487.54	44.86	-9.14	54	29.06	27.67	8.46	30.25	298	103	A	V



<b>802.11b</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	116.96	-	-	101.25	27.6	18.37	30.26	227	267	P	H
	*	2462	113.83	-	-	98.12	27.6	18.37	30.26	227	267	A	H
		2489.12	60.17	-13.83	74	44.37	27.67	18.38	30.25	227	267	P	H
		2487.84	52.12	-1.88	54	36.32	27.67	18.38	30.25	227	267	A	H
	*	2462	111.67	-	-	95.96	27.6	18.37	30.26	288	47	P	V
	*	2462	108.56	-	-	92.85	27.6	18.37	30.26	288	47	A	V
		2490.88	58.56	-15.44	74	42.75	27.68	18.38	30.25	288	47	P	V
		2487.88	48.97	-5.03	54	33.17	27.67	18.38	30.25	288	47	A	V
<b>802.11b</b> <b>CH 12</b> <b>2467MHz</b>	*	2467	110.58	-	-	94.86	27.61	18.37	30.26	215	331	P	H
	*	2467	107.45	-	-	91.73	27.61	18.37	30.26	215	331	A	H
		2483.56	61.56	-12.44	74	45.77	27.66	18.38	30.25	215	331	P	H
		2484	53.28	-0.72	54	37.49	27.66	18.38	30.25	215	331	A	H
	*	2467	105.72	-	-	90	27.61	18.37	30.26	254	115	P	V
	*	2467	102.57	-	-	86.85	27.61	18.37	30.26	254	115	A	V
		2483.92	58.99	-15.01	74	43.2	27.66	18.38	30.25	254	115	P	V
		2483.92	49.45	-4.55	54	33.66	27.66	18.38	30.25	254	115	A	V
<b>802.11b</b> <b>CH 13</b> <b>2472MHz</b>	*	2472	105.28	-	-	89.54	27.63	18.37	30.26	197	333	P	H
	*	2472	102.16	-	-	86.42	27.63	18.37	30.26	197	333	A	H
		2486.96	61.21	-12.79	74	45.41	27.67	18.38	30.25	197	333	P	H
		2487.28	53.32	-0.68	54	37.52	27.67	18.38	30.25	197	333	A	H
	*	2472	100	-	-	84.26	27.63	18.37	30.26	232	117	P	V
	*	2472	96.97	-	-	81.23	27.63	18.37	30.26	232	117	A	V
		2486.32	59.26	-14.74	74	43.47	27.66	18.38	30.25	232	117	P	V
		2487.12	49.67	-4.33	54	33.87	27.67	18.38	30.25	232	117	A	V
<b>Remark</b>	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. 0	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		4824	44.09	-29.91	74	56.96	32.45	13.23	59.16	100	0	P	H
		4824	43	-31	74	55.87	32.45	13.23	59.16	100	0	P	V
802.11b CH 06 2437MHz		4874	44.87	-29.13	74	57.57	32.55	13.32	59.17	100	0	P	H
		7311	57.33	-16.67	74	64.02	37.24	14.87	59.18	180	290	A	H
		7311	48.68	-5.32	54	55.37	37.24	14.87	59.18	180	290	P	H
		4874	43.7	-30.3	74	56.4	32.55	13.32	59.17	100	0	P	V
802.11b CH 11 2462MHz		7311	47.64	-26.36	74	54.33	37.24	14.87	59.18	100	0	A	V
		4924	45.31	-28.69	74	57.83	32.65	13.42	59.18	100	0	P	H
		7386	44.11	-29.89	74	50.75	37.34	14.86	59.15	100	0	P	H
		4924	42.52	-31.48	74	55.04	32.65	13.42	59.18	100	0	P	V
802.11b CH 12 2467MHz		7386	44.67	-29.33	74	51.31	37.34	14.86	59.15	100	0	P	V
		4934	44.82	-29.18	74	60.26	32.67	14.01	62.12	100	0	P	H
		7401	47	-27	74	57.5	37.36	15.16	63.02	100	0	P	H
		4934	44.54	-29.46	74	59.98	32.67	14.01	62.12	100	0	P	V
802.11b CH 13 2472MHz		7401	46.47	-27.53	74	56.97	37.36	15.16	63.02	100	0	P	V
		4944	44.85	-29.15	74	60.25	32.69	14.03	62.12	100	0	P	H
		7416	49.01	-24.99	74	59.43	37.38	15.21	63.01	100	0	P	H
		4944	43.53	-30.47	74	58.93	32.69	14.03	62.12	100	0	P	V
	7416	47.97	-26.03	74	58.39	37.38	15.21	63.01	100	0	P	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. 0	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		2390	67.99	-6.01	74	52.54	27.41	18.32	30.28	242	267	P	H
		2390	52.42	-1.58	54	36.97	27.41	18.32	30.28	242	267	A	H
	*	2412	114.17	-	-	98.64	27.47	18.34	30.28	242	267	P	H
	*	2412	106.67	-	-	91.14	27.47	18.34	30.28	242	267	A	H
		2389.695	59.82	-14.18	74	44.37	27.41	18.32	30.28	297	53	P	V
		2390	47.6	-6.4	54	32.15	27.41	18.32	30.28	297	53	A	V
	*	2412	109.51	-	-	93.98	27.47	18.34	30.28	297	53	P	V
	*	2412	101.83	-	-	86.3	27.47	18.34	30.28	297	53	A	V
802.11g CH 06 2437MHz		2388.54	57.73	-16.27	74	42.29	27.41	18.31	30.28	193	333	P	H
		2389.94	46.26	-7.74	54	30.81	27.41	18.32	30.28	193	333	A	H
	*	2437	118.29	-	-	102.67	27.54	18.35	30.27	193	333	P	H
	*	2437	111.03	-	-	95.41	27.54	18.35	30.27	193	333	A	H
		2489.29	57.48	-16.52	74	41.68	27.67	18.38	30.25	193	333	P	H
		2483.5	45.83	-8.17	54	30.04	27.66	18.38	30.25	193	333	A	H
		2383.5	56.64	-17.36	74	41.21	27.4	18.31	30.28	259	133	P	V
		2389.24	44.61	-9.39	54	29.17	27.41	18.31	30.28	259	133	A	V
	*	2437	112.51	-	-	96.89	27.54	18.35	30.27	259	133	P	V
	*	2437	105.46	-	-	89.84	27.54	18.35	30.27	259	133	A	V
		2487.61	56.36	-17.64	74	40.56	27.67	18.38	30.25	259	133	P	V
		2489.22	44.87	-9.13	54	29.07	27.67	18.38	30.25	259	133	A	V



<b>802.11g</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	113.04	-	-	97.33	27.6	18.37	30.26	224	267	P	H
	*	2462	105.5	-	-	89.79	27.6	18.37	30.26	224	267	A	H
		2483.64	68.95	-5.05	74	53.16	27.66	18.38	30.25	224	267	P	H
		2483.52	53.04	-0.96	54	37.25	27.66	18.38	30.25	224	267	A	H
	*	2462	108	-	-	92.29	27.6	18.37	30.26	257	108	P	V
	*	2462	100.39	-	-	84.68	27.6	18.37	30.26	257	108	A	V
		2483.56	62.79	-11.21	74	47	27.66	18.38	30.25	257	108	P	V
		2483.52	48.46	-5.54	54	32.67	27.66	18.38	30.25	257	108	A	V
<b>802.11g</b> <b>CH 12</b> <b>2467MHz</b>	*	2467	110.3	-	-	94.58	27.61	18.37	30.26	229	334	P	H
	*	2467	102.9	-	-	87.18	27.61	18.37	30.26	229	334	A	H
		2484.48	69.1	-4.9	74	53.31	27.66	18.38	30.25	229	334	P	H
		2483.52	52.49	-1.51	54	36.7	27.66	18.38	30.25	229	334	A	H
	*	2467	104.4	-	-	88.68	27.61	18.37	30.26	231	133	P	V
	*	2467	96.47	-	-	80.75	27.61	18.37	30.26	231	133	A	V
		2483.6	66.48	-7.52	74	50.69	27.66	18.38	30.25	231	133	P	V
		2483.52	47.9	-6.1	54	32.11	27.66	18.38	30.25	231	133	A	V
<b>802.11g</b> <b>CH 13</b> <b>2472MHz</b>	*	2472	108.98	-	-	93.24	27.63	18.37	30.26	205	334	P	H
	*	2472	101.48	-	-	85.74	27.63	18.37	30.26	205	334	A	H
		2487.24	69.79	-4.21	74	53.99	27.67	18.38	30.25	205	334	P	H
		2483.52	53.1	-0.9	54	37.31	27.66	18.38	30.25	205	334	A	H
	*	2472	103.31	-	-	87.57	27.63	18.37	30.26	257	116	P	V
	*	2472	95.88	-	-	80.14	27.63	18.37	30.26	257	116	A	V
		2486.52	64.94	-9.06	74	49.15	27.66	18.38	30.25	257	116	P	V
		2483.52	48.54	-5.46	54	32.75	27.66	18.38	30.25	257	116	A	V
<b>Remark</b>	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. 0	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		4824	43.46	-30.54	74	59.27	32.45	13.84	62.1	100	0	P	H
		4824	43.35	-30.65	74	59.16	32.45	13.84	62.1	100	0	P	V
802.11g CH 06 2437MHz		4874	43.99	-30.01	74	59.63	32.55	13.92	62.11	100	0	P	H
		7311	46.78	-27.22	74	57.34	37.24	15.25	63.05	100	0	P	H
		4874	44.78	-29.22	74	60.42	32.55	13.92	62.11	100	0	P	V
802.11g CH 11 2462MHz		7311	46.93	-27.07	74	57.49	37.24	15.25	63.05	100	0	P	V
		4924	44.27	-29.73	74	59.73	32.65	14.01	62.12	100	0	P	H
		7386	46.68	-27.32	74	57.19	37.34	15.17	63.02	100	0	P	H
		4924	42.92	-31.08	74	58.38	32.65	14.01	62.12	100	0	P	V
802.11g CH 12 2467MHz		7386	45.84	-28.16	74	56.35	37.34	15.17	63.02	100	0	P	V
		4934	42.98	-31.02	74	58.42	32.67	14.01	62.12	100	0	P	H
		7401	46.46	-27.54	74	56.96	37.36	15.16	63.02	100	0	P	H
		4934	43.45	-30.55	74	58.89	32.67	14.01	62.12	100	0	P	V
802.11g CH 13 2472MHz		7401	46.4	-27.6	74	56.9	37.36	15.16	63.02	100	0	P	V
		4944	43.62	-30.38	74	59.02	32.69	14.03	62.12	100	0	P	H
		7416	46.68	-27.32	74	57.1	37.38	15.21	63.01	100	0	P	H
		4944	43.07	-30.93	74	58.47	32.69	14.03	62.12	100	0	P	V
802.11g CH 13 2472MHz		7416	46.76	-27.24	74	57.18	37.38	15.21	63.01	100	0	P	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. 0	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		2389.905	67.65	-6.35	74	52.2	27.41	18.32	30.28	248	268	P	H
		2390	52.64	-1.36	54	37.19	27.41	18.32	30.28	248	268	A	H
	*	2412	112.82	-	-	97.29	27.47	18.34	30.28	248	268	P	H
	*	2412	105.48	-	-	89.95	27.47	18.34	30.28	248	268	A	H
		2389.8	62.42	-11.58	74	46.97	27.41	18.32	30.28	298	50	P	V
		2390	47.9	-6.1	54	32.45	27.41	18.32	30.28	298	50	A	V
	*	2412	108.24	-	-	92.71	27.47	18.34	30.28	298	50	P	V
	*	2412	100.7	-	-	85.17	27.47	18.34	30.28	298	50	A	V
802.11n HT20 CH 02 2417MHz		2388.96	61.71	-12.29	74	46.27	27.41	18.31	30.28	268	298	P	H
		2388.54	52.18	-1.82	54	36.74	27.41	18.31	30.28	268	298	A	H
	*	2417	116.83	-	-	101.28	27.48	18.34	30.27	268	298	P	H
	*	2417	109.34	-	-	93.79	27.48	18.34	30.27	268	298	A	H
		2388.4	57.98	-16.02	74	42.54	27.41	18.31	30.28	266	103	P	V
		2389.8	45.16	-8.84	54	29.71	27.41	18.32	30.28	266	103	A	V
	*	2417	110.95	-	-	95.4	27.48	18.34	30.27	266	103	P	V
	*	2417	103.37	-	-	87.82	27.48	18.34	30.27	266	103	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												





WIFI Ant. 0	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 06 2437MHz		2385.88	57.32	-16.68	74	41.89	27.4	18.31	30.28	208	331	P	H
		2389.66	46.3	-7.7	54	30.85	27.41	18.32	30.28	208	331	A	H
	*	2437	118.02	-	-	102.4	27.54	18.35	30.27	208	331	P	H
	*	2437	110.86	-	-	95.24	27.54	18.35	30.27	208	331	A	H
		2490.9	57.82	-16.18	74	42.01	27.68	18.38	30.25	208	331	P	H
		2483.5	45.85	-8.15	54	30.06	27.66	18.38	30.25	208	331	A	H
		2386.3	56.39	-17.61	74	40.96	27.4	18.31	30.28	258	131	P	V
		2385.46	44.53	-9.47	54	29.1	27.4	18.31	30.28	258	131	A	V
	*	2437	112.7	-	-	97.08	27.54	18.35	30.27	258	131	P	V
	*	2437	105.2	-	-	89.58	27.54	18.35	30.27	258	131	A	V
		2495.8	57.9	-16.1	74	42.07	27.69	18.39	30.25	258	131	P	V
		2486.98	44.88	-9.12	54	29.08	27.67	18.38	30.25	258	131	A	V
802.11n HT20 CH 10 2457MHz	*	2457	116.35	-	-	100.66	27.59	18.36	30.26	252	300	P	H
	*	2457	108.96	-	-	93.27	27.59	18.36	30.26	252	300	A	H
		2486.98	69.45	-4.55	74	53.65	27.67	18.38	30.25	252	300	P	H
		2483.5	51.59	-2.41	54	35.8	27.66	18.38	30.25	252	300	A	H
	*	2457	111.89	-	-	96.2	27.59	18.36	30.26	257	85	P	V
	*	2457	104.25	-	-	88.56	27.59	18.36	30.26	257	85	A	V
		2483.92	64.63	-9.37	74	48.84	27.66	18.38	30.25	257	85	P	V
		2483.5	48.36	-5.64	54	32.57	27.66	18.38	30.25	257	85	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WIFI Ant. 0	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 11 2462MHz	*	2462	112.05	-	-	96.34	27.6	18.37	30.26	226	266	P	H
	*	2462	104.53	-	-	88.82	27.6	18.37	30.26	226	266	A	H
		2483.56	68.56	-5.44	74	52.77	27.66	18.38	30.25	226	266	P	H
		2483.52	53.17	-0.83	54	37.38	27.66	18.38	30.25	226	266	A	H
	*	2462	106.81	-	-	91.1	27.6	18.37	30.26	296	48	P	V
	*	2462	99.27	-	-	83.56	27.6	18.37	30.26	296	48	A	V
		2483.56	64.62	-9.38	74	48.83	27.66	18.38	30.25	296	48	P	V
	2483.52	49.68	-4.32	54	33.89	27.66	18.38	30.25	296	48	A	V	
802.11n HT20 CH 12 2467MHz	*	2467	109.44	-	-	93.72	27.61	18.37	30.26	215	333	P	H
	*	2467	102.1	-	-	86.38	27.61	18.37	30.26	215	333	A	H
		2483.6	70.43	-3.57	74	54.64	27.66	18.38	30.25	215	333	P	H
		2483.52	52.85	-1.15	54	37.06	27.66	18.38	30.25	215	333	A	H
	*	2467	103.69	-	-	87.97	27.61	18.37	30.26	256	129	P	V
	*	2467	96.41	-	-	80.69	27.61	18.37	30.26	256	129	A	V
		2484.64	64.74	-9.26	74	48.95	27.66	18.38	30.25	256	129	P	V
	2483.52	48.55	-5.45	54	32.76	27.66	18.38	30.25	256	129	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WIFI Ant. 0	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 13 2472MHz	*	2472	108.06	-	-	92.32	27.63	18.37	30.26	210	336	P	H
	*	2472	100.71	-	-	84.97	27.63	18.37	30.26	210	336	A	H
		2485.24	68.53	-5.47	74	52.74	27.66	18.38	30.25	210	336	P	H
		2483.52	52.59	-1.41	54	36.8	27.66	18.38	30.25	210	336	A	H
	*	2472	102.53	-	-	86.79	27.63	18.37	30.26	286	128	P	V
	*	2472	94.93	-	-	79.19	27.63	18.37	30.26	286	128	A	V
		2483.64	62.84	-11.16	74	47.05	27.66	18.38	30.25	286	128	P	V
	2483.52	48.23	-5.77	54	32.44	27.66	18.38	30.25	286	128	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 HT20 (Harmonic @ 3m)**

WIFI Ant. 0	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		4824	43.11	-30.89	74	58.92	32.45	13.84	62.1	100	0	P	H
		4824	43.33	-30.67	74	59.14	32.45	13.84	62.1	100	0	P	V
802.11n HT20 CH 06 2437MHz		4874	43.88	-30.12	74	59.52	32.55	13.92	62.11	100	0	P	H
		7311	47.7	-26.3	74	58.26	37.24	15.25	63.05	100	0	P	H
		4874	43.81	-30.19	74	59.45	32.55	13.92	62.11	100	0	P	V
		7311	47.2	-26.8	74	57.76	37.24	15.25	63.05	100	0	P	V
802.11n HT20 CH 11 2462MHz		4924	44.2	-29.8	74	59.66	32.65	14.01	62.12	100	0	P	H
		7386	46.54	-27.46	74	57.05	37.34	15.17	63.02	100	0	P	H
		4924	43.13	-30.87	74	58.59	32.65	14.01	62.12	100	0	P	V
		7386	45.92	-28.08	74	56.43	37.34	15.17	63.02	100	0	P	V
802.11n HT20 CH 12 2467MHz		4934	43.48	-30.52	74	58.92	32.67	14.01	62.12	100	0	P	H
		7401	47.37	-26.63	74	57.87	37.36	15.16	63.02	100	0	P	H
		4934	43.33	-30.67	74	58.77	32.67	14.01	62.12	100	0	P	V
		7401	46.48	-27.52	74	56.98	37.36	15.16	63.02	100	0	P	V
802.11n HT20 CH 13 2472MHz		4944	43.68	-30.32	74	59.08	32.69	14.03	62.12	100	0	P	H
		7416	47.19	-26.81	74	57.61	37.38	15.21	63.01	100	0	P	H
		4944	43.34	-30.66	74	58.74	32.69	14.03	62.12	100	0	P	V
		7416	46.89	-27.11	74	57.31	37.38	15.21	63.01	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI Ant. 0	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 )
2.4GHz 802.11b LF		91.11	25.87	-17.63	43.5	42.39	14.86	1	32.38	-	-	P	H
		196.84	28.83	-14.67	43.5	44.5	14.94	1.74	32.35	-	-	P	H
		242.43	28.68	-17.32	46	41.28	17.58	2.2	32.38	-	-	P	H
		347.19	34.27	-11.73	46	43.61	20.32	2.8	32.46	-	-	P	H
		425.76	27.68	-18.32	46	34.26	22.75	3.19	32.52	-	-	P	H
		891.36	35.71	-10.29	46	33.9	29	4.65	31.84	100	0	P	H
		92.08	27.56	-15.94	43.5	43.98	14.95	1.01	32.38	-	-	P	V
		190.05	31.39	-12.11	43.5	47.21	14.82	1.71	32.35	-	-	P	V
		345.25	33.43	-12.57	46	42.84	20.26	2.79	32.46	-	-	P	V
		426.73	30.02	-15.98	46	36.59	22.76	3.19	32.52	-	-	P	V
		753.62	30.81	-15.19	46	30.56	28.18	4.51	32.44	-	-	P	V
	890.39	38.32	-7.68	46	36.52	28.99	4.65	31.84	100	0	P	V	
Remark	1. No other spurious found. 2. All results are PASS against 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.	
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11b CH 01 2412MHz		2359.98	57.57	-16.43	74	42.25	27.34	18.27	30.29	266	60	P	H
		2387.91	46.58	-7.42	54	31.14	27.41	18.31	30.28	266	60	A	H
	*	2412	114.92	-	-	99.39	27.47	18.34	30.28	266	60	P	H
	*	2412	111.85	-	-	96.32	27.47	18.34	30.28	266	60	A	H
		2380.56	56.46	-17.54	74	41.06	27.39	18.3	30.29	100	122	P	V
		2387.385	44.58	-9.42	54	29.14	27.41	18.31	30.28	100	122	A	V
	*	2412	108.11	-	-	92.58	27.47	18.34	30.28	100	122	P	V
	*	2412	105	-	-	89.47	27.47	18.34	30.28	100	122	A	V
802.11b CH 06 2437MHz		2381.96	57.9	-16.1	74	42.5	27.39	18.3	30.29	261	57	P	H
		2389.66	45.55	-8.45	54	30.1	27.41	18.32	30.28	261	57	A	H
	*	2437	116.12	-	-	100.5	27.54	18.35	30.27	261	57	P	H
	*	2437	112.98	-	-	97.36	27.54	18.35	30.27	261	57	A	H
		2498.18	57.77	-16.23	74	41.93	27.7	18.39	30.25	261	57	P	H
		2484.53	46.11	-7.89	54	30.32	27.66	18.38	30.25	261	57	A	H
		2361.1	55.95	-18.05	74	40.63	27.34	18.27	30.29	110	126	P	V
		2388.4	44.47	-9.53	54	29.03	27.41	18.31	30.28	110	126	A	V
	*	2437	108.77	-	-	93.15	27.54	18.35	30.27	110	126	P	V
	*	2437	105.63	-	-	90.01	27.54	18.35	30.27	110	126	A	V
		2497.48	57.6	-16.4	74	41.77	27.69	18.39	30.25	110	126	P	V
		2497.97	45.02	-8.98	54	29.19	27.69	18.39	30.25	110	126	A	V



<b>802.11b</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	115.09	-	-	99.38	27.6	18.37	30.26	242	48	P	H
	*	2462	111.93	-	-	96.22	27.6	18.37	30.26	242	48	A	H
		2489.68	58.25	-15.75	74	42.45	27.67	18.38	30.25	242	48	P	H
		2486.8	47.54	-6.46	54	31.74	27.67	18.38	30.25	242	48	A	H
	*	2462	109.03	-	-	93.32	27.6	18.37	30.26	197	288	P	V
	*	2462	105.87	-	-	90.16	27.6	18.37	30.26	197	288	A	V
		2486.76	56.84	-17.16	74	41.04	27.67	18.38	30.25	197	288	P	V
		2486.8	45.17	-8.83	54	29.37	27.67	18.38	30.25	197	288	A	V
<b>802.11b</b> <b>CH 12</b> <b>2467MHz</b>	*	2467	109.94	-	-	94.22	27.61	18.37	30.26	280	49	P	H
	*	2467	106.8	-	-	91.08	27.61	18.37	30.26	280	49	A	H
		2484	60.54	-13.46	74	44.75	27.66	18.38	30.25	280	49	P	H
		2484.04	52.04	-1.96	54	36.25	27.66	18.38	30.25	280	49	A	H
	*	2467	102.59	-	-	86.87	27.61	18.37	30.26	107	121	P	V
	*	2467	99.57	-	-	83.85	27.61	18.37	30.26	107	121	A	V
		2483.64	57.96	-16.04	74	42.17	27.66	18.38	30.25	107	121	P	V
		2484.08	47.09	-6.91	54	31.3	27.66	18.38	30.25	107	121	A	V
<b>802.11b</b> <b>CH 13</b> <b>2472MHz</b>	*	2472	104.51	-	-	88.77	27.63	18.37	30.26	269	53	P	H
	*	2472	101.37	-	-	85.63	27.63	18.37	30.26	269	53	A	H
		2484.6	60.83	-13.17	74	45.04	27.66	18.38	30.25	269	53	P	H
		2484.72	52.89	-1.11	54	37.1	27.66	18.38	30.25	269	53	A	H
	*	2472	97.86	-	-	82.12	27.63	18.37	30.26	108	112	P	V
	*	2472	94.7	-	-	78.96	27.63	18.37	30.26	108	112	A	V
		2486.88	58.46	-15.54	74	42.66	27.67	18.38	30.25	108	112	P	V
		2484.68	47.79	-6.21	54	32	27.66	18.38	30.25	108	112	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												