CE Test Report

Equipment	:	**802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module** **(Please refer to section 1.1.1 for more details)**
Model No.	:	**ST60-2230C** **(Please refer to section 1.1.1 for more details)**
Brand Name	:	**Laird Connectivity**
Applicant	:	**Laird Connectivity, Inc.**
Address	:	**W66N220 Commerce Court, Cedarburg, Wisconsin 53012, USA**
Standard	:	**EN 300 328 V2.2.2 (2019-07)**
Received Date	:	**Jun. 05, 2020**
Tested Date	:	**Apr. 24 ~ Jun. 01, 2017 (for original test)** **Jun. 05, 2020 (for new test)**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

James Fan / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
ER740701-11AC	Rev. 01	Initial issue	Feb. 25, 2021

Summary of Test Results

Ref. Std. Clause	Test Items	Measured	Result
4.3.2.2	RF Output Power	19.86 dBm.	Pass
4.3.2.3	Power Spectral Density	Meet the requirement of limit.	Pass
4.3.2.4	Duty Cycle, Tx-sequence, Tx-gap	Only for non-adaptive equipment.	N/A
4.3.2.5	Medium Utilisation (MU) factor	Only for non-adaptive equipment.	N/A
4.3.2.6	Adaptivity	Meet the requirement of limit.	Pass
4.3.2.7	Occupied Channel Bandwidth	Meet the requirement of limit.	Pass
4.3.2.8	Transmitter unwanted emissions in the out of band domain	Meet the requirement of limit.	Pass
4.3.2.9	Transmitter unwanted emissions in the spurious domain	Meet the requirement of limit.	Pass
4.3.2.10	Receiver spurious emissions	Meet the requirement of limit.	Pass
4.3.2.11	Receiver Blocking	Meet the requirement of limit.	Pass
4.3.2.12	Geo-location Capability	The device has no this capability.	N/A

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

This report is issued as a supplementary report to original ICC report no. ER740701-08AC. The modification is

1. Additional model and product names
2. Resistance of CONFIG_HOST0/1/2 are different to switch interface
3. Update to the latest SW version

After verification, above changes does not impact to original test results. Thus test results remain the same.

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Laird Connectivity	ST60-2230C	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module	with carrier board
	ST60-2230C-P	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module PCIe/UART interface	PCIe/UART interface
	ST60-2230C-PU	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module PCIe/USB interface	PCIe/USB interface
	ST60-2230C-SS	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module SDIO/SDIO Interface	SDIO/SDIO Interface
	ST60-2230C-U	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module USB/UART Interface	USB/UART Interface
	ST60-2230C-UU	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module USB/USB interface	USB/USB interface
	ST60-2230C-Q	802.11 ac/a/b/g/n M.2 2230 + Bluetooth 4.2 module,ST60-2230C-Q	The difference between ST60-2230C and ST60-2230C-Q the OTP parameter is different for ID recognition. SW is exactly the same.
✦ The above models, model **ST60-2230C** was selected as a representative one for the final test and only its data was recorded in this report.			

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
2400-2483.5	b	2412-2472	1-13 [13]	1	1-11 Mbps
				2	1-11 Mbps
2400-2483.5	g	2412-2472	1-13 [13]	1	6-54 Mbps
				2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2472	1-13 [13]	1	MCS 0-7
				2	MCS 0-7
				2	MCS 8-15
2400-2483.5	n (HT40)	2422-2462	3-11 [9]	1	MCS 0-7
				2	MCS 0-7
				2	MCS 8-15

Note 1: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
Note 2: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
Note 3: The device supports TX antenna diversity function. The conducted power of single chain is same for 1TX and 2TX operating mode. Therefore, Ant1 + Ant 2 configuration is chosen for final testing.

1.1.3 Antenna Details

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	**5150~5250**	**5250~5350**	**5470~5725**	**5725~5850**
1	LSR/001-0009	Dipole	IPEX U.FL	2	2	2	2	2
2	Laird NanoBlade-IP04	PCB Dipole	IPEX U.FL	2	3.9	3.9	4	4
3	Laird MAF95310 Mini NanoBlade Flex	PCB Dipole	IPEX U.FL	2.79	3.38	3.38	3.38	3.38
4	LSR/FlexPIFA 001-0016	PIFA	IPEX U.FL	2.5	3	3	3	3
5	Ethertronics WLAN_1000146	Isolated Magnetic Dipole	IPEX U.FL	2.5	3.5	3.5	3.5	3.5
6	Laird/MIMO FlexPIFA Antenna	PIFA	IPEX U.FL	2	3	3	3	3

1.1.4 EUT Operational Condition

Power Supply Type	DC 3.3V from host		
SW Version	laird-backport-7.0.0.136 (only for ST60-2230C-UU) laird-backport-7.0.0.70 (others)		
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (85°C)	☒ Tmin (-30°C)

1.1.5 Accessories

N/A

1.1.6 Adaptive Equipment

Adaptive Equipment		
☐	non-Adaptive Equipment:	
	The maximum RF Output Power (e.i.r.p.): dBm	
	The maximum (corresponding) Duty Cycle: %	
☒	Adaptive Equipment without the possibility to switch to a non-adaptive mode:	
	☒	The equipment has implemented an LBT based DAA mechanism:
		☐ The equipment is Frame Based equipment
		☒ The equipment is Load Based equipment
		☐ The equipment can switch dynamically between Frame Based and Load Based equipment
	☐	The equipment has implemented an non-LBT based DAA mechanism
	☐	The equipment can operate in more than one adaptive mode
	☐	Adaptive Frequency Hopping using other forms of DAA (non-LBT based)/without Short Control Signaling Transmissions
☐	Adaptive Equipment which can also operate in a non-adaptive mode	

1.1.7 Channel List

Frequency band (MHz)		2400~2483.5	
802.11 b / g / n HT20		802.11n HT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	10	2457
9	2452	11	2462
10	2457	---	---
11	2462	---	---
12	2467	---	---
13	2472	---	---

1.1.8 Test Tool and Duty Cycle

Test tool	Command
Duty Cycle Of Test Signal (%)	100% - IEEE 802.11b 100% - IEEE 802.11g 100% - IEEE 802.11n (HT20) 100% - IEEE 802.11n (HT40)
Duty Factor	0.00 - IEEE 802.11b 0.00 - IEEE 802.11g 0.00 - IEEE 802.11n (HT20) 0.00 - IEEE 802.11n (HT40)

1.1.9 Power Setting

Configuration 1 : Dipole Antenna

Modulation Mode	Test Frequency (MHz)					
	b / g / n HT20			n HT40		
	2412	2442	2472	2422	2442	2462
b	14	14	14	---	---	---
g	14	14	14	---	---	---
n (HT20)	14	14	14	---	---	---
n (HT40)	---	---	---	14	14	14

Configuration 2 : PCB Dipole Antenna

Modulation Mode	Test Frequency (MHz)					
	b / g / n HT20			n HT40		
	2412	2442	2472	2422	2442	2462
b	13	13	13	---	---	---
g	13	13	13	---	---	---
n (HT20)	13	13	13	---	---	---
n (HT40)	---	---	---	13	13	13

Configuration 3 : PIFA Antenna & Configuration 4: Isolated Magnetic Dipole Antenna

Modulation Mode	Test Frequency (MHz)					
	b / g / n HT20			n HT40		
	2412	2442	2472	2422	2442	2462
b	13	13	13	---	---	---
g	13	13	13	---	---	---
n (HT20)	13	13	13	---	---	---
n (HT40)	---	---	---	13	13	13

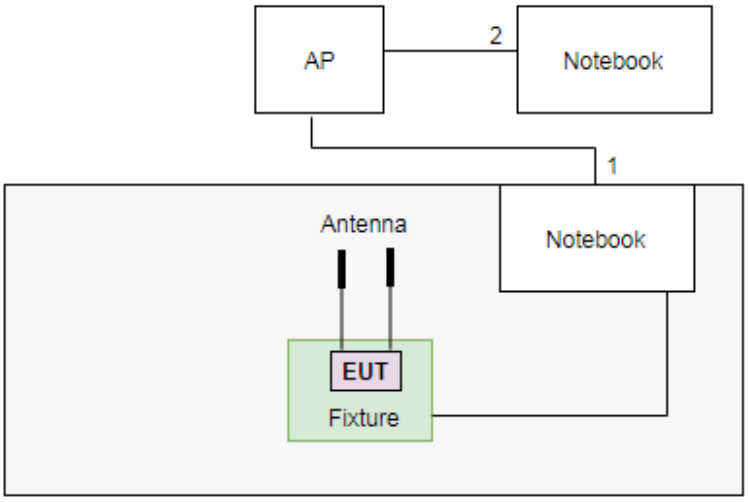
1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E5420	DoC	RJ45, 1m non-shielded
2	Notebook	Lenovo	T430	DoC	RJ45, 1m non-shielded
3	Fixture	---	---	---	---
4	AP	D-LINK	DIR-818LW	---	---

Note: No2 and 3 were provided by applicant.

1.3 Test Setup Chart

Test Setup Diagram



1. RJ45, 1m non-shielded
2. RJ45, 1m non-shielded

1.4 Test Equipment List and Calibration Data

Test Item	Radiated Emissions				
Test Site	Fully-anechoic chamber 2 / (05CH02-WS)				
Tested Date	Apr. 25, 2017				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY52221474	Oct. 14, 2016	Oct. 13, 2017
Bilog Antenna 30-1000MHz	SCHWARZBECK	VULB9168	9168-563	Jan. 05, 2017	Jan. 04, 2018
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	9120D-1205	Jan. 05, 2017	Jan. 04, 2018
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Dec. 29, 2016	Dec. 28, 2017
Preamplifier	Agilent	83017A	MY53270013	Jan. 10, 2017	Jan. 09, 2018
Preamplifier 30-1000MHz	EMC	EMC02325	980188	Dec. 13, 2016	Dec. 12, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22622/4	Dec. 13, 2016	Dec. 12, 2017
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22623/4	Dec. 14, 2016	Dec. 13, 2017
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22621/4	Dec. 14, 2016	Dec. 13, 2017
RF cable-4M	HUBER+SUHNER	SUCOFLEX104	MY22579/4	Dec. 14, 2016	Dec. 13, 2017
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-002	Dec. 14, 2016	Dec. 13, 2017
LF cable-3M	EMC	EMC8D-NM-NM-3000	131102	Dec. 14, 2016	Dec. 13, 2017
LF cable-10M	EMC	EMC8D-NM-NM-10000	131101	Dec. 14, 2016	Dec. 13, 2017
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	May 06, 2017				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 09, 2016	Sep. 08, 2017
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 21, 2016	Nov. 20, 2017
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
Signal Generator	R&S	SMB100A	175727	Oct. 19, 2016	Oct. 18, 2017
Radio Communication Analyzer	Anritsu	MT8820C	6201465544	Aug. 19, 2016	Aug. 18, 2017
MXG-B RF Vector Signal Generator	Agilent	N5182B	MY53050081	Apr. 15, 2017	Apr. 14, 2018
DC POWER SOURCE	GW INSTEK	GPC-6030D	EM892433	Oct. 20, 2016	Oct. 19, 2017
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Adaptivity				
Test Site	(TH01-WS)				
Tested Date	Jun. 01, 2017				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum	Keysight	N9010A	MY54200247	Aug. 30, 2016	Aug. 29, 2017
RF cable-4M	HUBER+SUHNER	SUCOFLEX_104	MY15686/4	Dec. 16, 2016	Dec. 15, 2017
RF cable-0.5M	HUBER+SUHNER	SUCOFLEX_104	296081/4	Dec. 16, 2016	Dec. 15, 2017
RF cable-0.2M	HUBER+SUHNER	SUCOFLEX_104	329023/4	Dec. 16, 2016	Dec. 15, 2017
RF cable-0.2M	HUBER+SUHNER	SUCOFLEX_104	329021/4	Dec. 16, 2016	Dec. 15, 2017
MXG-B RF Vector Signal Generator	Agilent	N5182B	MY53051912	Nov. 21, 2016	Nov. 20, 2017
Preamplifier	Burgeon	BPA-530	100219	Nov. 02, 2016	Nov. 01, 2017
Oscilloscope	National Instruments	USB-5133	F651FF	Jun. 22, 2016	Jun. 21, 2017
Measurement Software	Sporton	Sporton_3	2.2.0.0	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Receiver Blocking				
Test Site	(05CH02-WS)				
Tested Date	Jun. 05, 2020				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Wireless connectivity tester	ROHDE&SCHWARZ	CMW270	100856	Oct. 24, 2019	Oct. 23, 2020
Signal Generator	ROHDE&SCHWARZ	SMB100A	175727	Dec. 27, 2019	Dec. 26, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX_104	500202/4	Oct. 16, 2019	Oct. 15, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX_104	296088/4	Oct. 16, 2019	Oct. 15, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX_104	329023/4	Oct. 16, 2019	Oct. 15, 2020
Combiner(1X2)	WOKEN	2WAYDIV	12101200003	Oct. 16, 2019	Oct. 15, 2020
Note: Calibration Interval of instruments listed above is one year.					

1.5 Testing Applied Standards

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

EN 300 328 V2.2.2 (2019-07)

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty		
Parameters	**Uncertainty**	**Limit**
Occupied Channel Bandwidth	±0.0034 %	±5 %
RF output power, conducted	±0.537 dB	±1.5 dB
Power Spectral Density, conducted	±0.463 dB	±3 dB
Unwanted Emissions, conducted	±2.505 dB	±3 dB
All emissions, radiated	±3.401 dB	±6 dB
Temperature	±0.6 ^{o}C	±3 °C
Supply voltages	±0.16 %	±3 %
Time	±0.1 %	±5 %

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
RF Conducted	TH01-WS	23°C / 62%	Jack Li
Radiated Emission	05CH02-WS	24°C / 65%	Penguin Jiang
Adaptivity	TH01-WS	23°C / 67%	Jack Li
Receiver Blocking	05CH02-WS	25°C / 65%	Ryan Lee

2.2 Testing Facility

Test Laboratory	International Certification Corp.
Test Site	TH01-WS
Address of Test Site (Kwei Shan)	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.
Test Laboratory	International Certification Corp.
Test Site	05CH02-WS
Address of Test Site (Kwei Shan II)	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

2.3 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
RF Output Power Power Spectral Density	11b 11g HT20 HT40	2412 / 2442 / 2472 2412 / 2442 / 2472 2412 / 2442 / 2472 2422 / 2442 / 2462	1 Mbps 6 Mbps MCS 0 MCS 0	1, 2, 3, 4
Occupied Channel Bandwidth Transmitter unwanted emissions in the out of band domain	11b 11g HT20 HT40	2412 / 2472 2412 / 2472 2412 / 2472 2422 / 2462	1 Mbps 6 Mbps MCS 0 MCS 0	1, 2, 3, 4
Transmitter Spurious Emissions ≤ 1GHz	11g HT40	2412 / 2472 2422 / 2462	6 Mbps MCS 0	1, 2, 3, 4
Transmitter Spurious Emissions > 1GHz	11b 11g HT20 HT40	2412 / 2472 2412 / 2472 2412 / 2472 2422 / 2462	1 Mbps 6 Mbps MCS 0 MCS 0	1, 2, 3, 4
Receiver Spurious Emissions	11g HT40	2412 / 2472 2422 / 2462	6 Mbps MCS 0	1, 2, 3, 4
Adaptivity	11b 11g HT20 HT40	2412 / 2472 2412 / 2472 2412 / 2472 2422 / 2462	1 Mbps 6 Mbps MCS 0 MCS 0	1
Receiver Blocking	11b	2412 / 2472	1 Mbps	2

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.
2. The device can be operated under adapter mode and charging mode. Each mode was selected for related test items as below configuration.

   Configuration 1 : Dipole Antenna

   Configuration 2 : PCB Dipole Antenna

   Configuration 3 : PIFA Antenna

   Configuration 4: Isolated Magnetic Dipole Antenna

3 Transmitter Test Results

3.1 RF Output Power

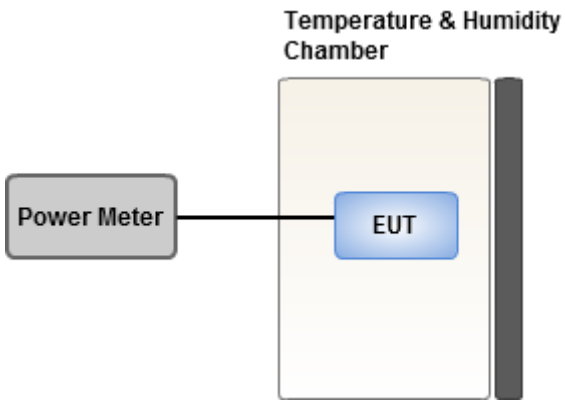
3.1.1 Limit of RF Output Power

For adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be 20 dBm.

3.1.2 Test Procedures

Reference to clause 5.4.2.2 of ETSI EN 300 328 V2.2.2 (2019-07).

3.1.3 Test Setup



3.1.4 Test Result of RF Output Power

Configuration 1 : Dipole Antenna

RF Output Power (dBm)				
Modulation Mode	11b/1Mbps			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.96	20	Pass
$T_{min}V_{nom}$	2412	19.68	20	Pass
$T_{max}V_{nom}$	2412	18.43	20	Pass
$T_{nom}V_{nom}$	2442	18.89	20	Pass
$T_{min}V_{nom}$	2442	19.69	20	Pass
$T_{max}V_{nom}$	2442	18.23	20	Pass
$T_{nom}V_{nom}$	2472	18.95	20	Pass
$T_{min}V_{nom}$	2472	19.79	20	Pass
$T_{max}V_{nom}$	2472	18.28	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	11g/6Mbps			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.89	20	Pass
$T_{min}V_{nom}$	2412	19.70	20	Pass
$T_{max}V_{nom}$	2412	18.24	20	Pass
$T_{nom}V_{nom}$	2442	18.96	20	Pass
$T_{min}V_{nom}$	2442	19.80	20	Pass
$T_{max}V_{nom}$	2442	18.33	20	Pass
$T_{nom}V_{nom}$	2472	18.97	20	Pass
$T_{min}V_{nom}$	2472	19.71	20	Pass
$T_{max}V_{nom}$	2472	18.42	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	HT20/MCS 0			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	19.04	20	Pass
$T_{min}V_{nom}$	2412	19.85	20	Pass
$T_{max}V_{nom}$	2412	18.28	20	Pass
$T_{nom}V_{nom}$	2442	19.02	20	Pass
$T_{min}V_{nom}$	2442	**19.86**	20	Pass
$T_{max}V_{nom}$	2442	18.27	20	Pass
$T_{nom}V_{nom}$	2472	19.04	20	Pass
$T_{min}V_{nom}$	2472	19.78	20	Pass
$T_{max}V_{nom}$	2472	18.35	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	HT40/MCS 0			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2422	18.92	20	Pass
$T_{min}V_{nom}$	2422	19.66	20	Pass
$T_{max}V_{nom}$	2422	18.13	20	Pass
$T_{nom}V_{nom}$	2442	18.93	20	Pass
$T_{min}V_{nom}$	2442	19.56	20	Pass
$T_{max}V_{nom}$	2442	18.06	20	Pass
$T_{nom}V_{nom}$	2462	18.91	20	Pass
$T_{min}V_{nom}$	2462	19.52	20	Pass
$T_{max}V_{nom}$	2462	18.10	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

Configuration 2 : PCB Dipole Antenna

RF Output Power (dBm)				
Modulation Mode	11b/1Mbps			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.81	20	Pass
$T_{min}V_{nom}$	2412	19.53	20	Pass
$T_{max}V_{nom}$	2412	18.28	20	Pass
$T_{nom}V_{nom}$	2442	18.78	20	Pass
$T_{min}V_{nom}$	2442	19.58	20	Pass
$T_{max}V_{nom}$	2442	18.12	20	Pass
$T_{nom}V_{nom}$	2472	18.71	20	Pass
$T_{min}V_{nom}$	2472	19.55	20	Pass
$T_{max}V_{nom}$	2472	18.04	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	11g/6Mbps			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.71	20	Pass
$T_{min}V_{nom}$	2412	19.52	20	Pass
$T_{max}V_{nom}$	2412	18.06	20	Pass
$T_{nom}V_{nom}$	2442	18.73	20	Pass
$T_{min}V_{nom}$	2442	19.57	20	Pass
$T_{max}V_{nom}$	2442	18.10	20	Pass
$T_{nom}V_{nom}$	2472	18.76	20	Pass
$T_{min}V_{nom}$	2472	19.50	20	Pass
$T_{max}V_{nom}$	2472	18.21	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	HT20/MCS 0			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.93	20	Pass
$T_{min}V_{nom}$	2412	**19.74**	20	Pass
$T_{max}V_{nom}$	2412	18.17	20	Pass
$T_{nom}V_{nom}$	2442	18.86	20	Pass
$T_{min}V_{nom}$	2442	19.70	20	Pass
$T_{max}V_{nom}$	2442	18.11	20	Pass
$T_{nom}V_{nom}$	2472	18.85	20	Pass
$T_{min}V_{nom}$	2472	19.59	20	Pass
$T_{max}V_{nom}$	2472	18.16	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	HT40/MCS 0			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2422	18.77	20	Pass
$T_{min}V_{nom}$	2422	19.51	20	Pass
$T_{max}V_{nom}$	2422	17.98	20	Pass
$T_{nom}V_{nom}$	2442	18.76	20	Pass
$T_{min}V_{nom}$	2442	19.39	20	Pass
$T_{max}V_{nom}$	2442	17.89	20	Pass
$T_{nom}V_{nom}$	2462	18.78	20	Pass
$T_{min}V_{nom}$	2462	19.39	20	Pass
$T_{max}V_{nom}$	2462	17.97	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

Configuration 3 : PIFA Antenna & Configuration 4: Isolated Magnetic Dipole Antenna

RF Output Power (dBm)				
Modulation Mode	11b/1Mbps			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.52	20	Pass
$T_{min}V_{nom}$	2412	19.24	20	Pass
$T_{max}V_{nom}$	2412	17.99	20	Pass
$T_{nom}V_{nom}$	2442	18.49	20	Pass
$T_{min}V_{nom}$	2442	19.29	20	Pass
$T_{max}V_{nom}$	2442	17.83	20	Pass
$T_{nom}V_{nom}$	2472	18.42	20	Pass
$T_{min}V_{nom}$	2472	19.26	20	Pass
$T_{max}V_{nom}$	2472	17.75	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	11g/6Mbps			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.42	20	Pass
$T_{min}V_{nom}$	2412	19.23	20	Pass
$T_{max}V_{nom}$	2412	17.77	20	Pass
$T_{nom}V_{nom}$	2442	18.44	20	Pass
$T_{min}V_{nom}$	2442	19.28	20	Pass
$T_{max}V_{nom}$	2442	17.81	20	Pass
$T_{nom}V_{nom}$	2472	18.47	20	Pass
$T_{min}V_{nom}$	2472	19.21	20	Pass
$T_{max}V_{nom}$	2472	17.92	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	HT20/MCS 0			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2412	18.64	20	Pass
$T_{min}V_{nom}$	2412	**19.45**	20	Pass
$T_{max}V_{nom}$	2412	17.88	20	Pass
$T_{nom}V_{nom}$	2442	18.57	20	Pass
$T_{min}V_{nom}$	2442	19.41	20	Pass
$T_{max}V_{nom}$	2442	17.82	20	Pass
$T_{nom}V_{nom}$	2472	18.56	20	Pass
$T_{min}V_{nom}$	2472	19.30	20	Pass
$T_{max}V_{nom}$	2472	17.87	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

RF Output Power (dBm)				
Modulation Mode	HT40/MCS 0			
Condition	**Freq. (MHz)**	**EIRP Power**	**Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	2422	18.48	20	Pass
$T_{min}V_{nom}$	2422	19.22	20	Pass
$T_{max}V_{nom}$	2422	17.69	20	Pass
$T_{nom}V_{nom}$	2442	18.47	20	Pass
$T_{min}V_{nom}$	2442	19.10	20	Pass
$T_{max}V_{nom}$	2442	17.60	20	Pass
$T_{nom}V_{nom}$	2462	18.49	20	Pass
$T_{min}V_{nom}$	2462	19.10	20	Pass
$T_{max}V_{nom}$	2462	17.68	20	Pass

Note: EIRP = Measured conducted power + Antenna gain.

3.2 Power Spectral Density

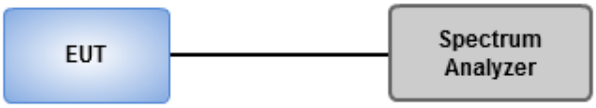
3.2.1 Limit of Power Spectral Density

For equipment using wide band modulations other than FHSS, the maximum Power Spectral Density is limited to 10 dBm per MHz.

3.2.2 Test Procedures

Reference to clause 5.4.3.2 of ETSI EN 300 328 V2.2.2 (2019-07).

3.2.3 Test Setup



3.2.4 Test Result of Power Spectral Density

Configuration 1 : Dipole Antenna

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz)	Limit (dBm/1MHz)	Results
11b/1Mbps	2412	9.88	10	Pass
11b/1Mbps	2442	9.83	10	Pass
11b/1Mbps	2472	9.91	10	Pass
11g/6Mbps	2412	7.81	10	Pass
11g/6Mbps	2442	7.79	10	Pass
11g/6Mbps	2472	7.76	10	Pass
HT20/MCS 0	2412	7.38	10	Pass
HT20/MCS 0	2442	7.34	10	Pass
HT20/MCS 0	2472	7.37	10	Pass
HT40/MCS 0	2422	4.40	10	Pass
HT40/MCS 0	2442	4.43	10	Pass
HT40/MCS 0	2462	4.39	10	Pass

Configuration 2 : PCB Dipole Antenna

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz)	Limit (dBm/1MHz)	Results
11b/1Mbps	2412	9.81	10	Pass
11b/1Mbps	2442	9.76	10	Pass
11b/1Mbps	2472	9.78	10	Pass
11g/6Mbps	2412	7.68	10	Pass
11g/6Mbps	2442	7.58	10	Pass
11g/6Mbps	2472	7.56	10	Pass
HT20/MCS 0	2412	7.22	10	Pass
HT20/MCS 0	2442	7.10	10	Pass
HT20/MCS 0	2472	7.07	10	Pass
HT40/MCS 0	2422	4.33	10	Pass
HT40/MCS 0	2442	4.28	10	Pass
HT40/MCS 0	2462	4.30	10	Pass

Configuration 3 : PIFA Antenna & Configuration 4: Isolated Magnetic Dipole Antenna

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz)	Limit (dBm/1MHz)	Results
11b/1Mbps	2412	9.56	10	Pass
11b/1Mbps	2442	9.51	10	Pass
11b/1Mbps	2472	9.48	10	Pass
11g/6Mbps	2412	7.53	10	Pass
11g/6Mbps	2442	7.54	10	Pass
11g/6Mbps	2472	7.52	10	Pass
HT20/MCS 0	2412	6.98	10	Pass
HT20/MCS 0	2442	6.91	10	Pass
HT20/MCS 0	2472	6.88	10	Pass
HT40/MCS 0	2422	3.96	10	Pass
HT40/MCS 0	2442	3.91	10	Pass
HT40/MCS 0	2462	3.85	10	Pass

3.3 Occupied Channel Bandwidth

3.3.1 Limit of Occupied Channel Bandwidth

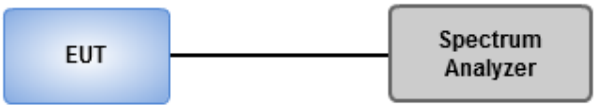
The Occupied Channel Bandwidth shall fall completely within 2.4~2.4835 GHz.

In addition, for non-adaptive equipment using wide band modulations other than FHSS and with e.i.r.p greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

3.3.2 Test Procedures

Reference to clause 5.4.7.2 of ETSI EN 300 328 V2.2.2 (2019-07).

3.3.3 Test Setup



3.3.4 Test Result of Occupied Channel Bandwidth

Configuration 1 : Dipole Antenna

Modulation Mode	Frequency (MHz)	99% Bandwidth (MHz)	F_L at 99% BW (MHz)	F_H at 99% BW (MHz)	Limit F_L / F_H (MHz)
11b/1Mbps	2412	13.83	2405.11	2418.94	2400.0
11b/1Mbps	2472	13.71	2464.64	2478.36	2483.5
11g/6Mbps	2412	17.36	2403.37	2420.74	2400.0
11g/6Mbps	2472	17.13	2463.60	2480.74	2483.5
HT20/MCS 0	2412	18.11	2403.08	2421.20	2400.0
HT20/MCS 0	2472	17.71	2463.54	2481.26	2483.5
HT40/MCS 0	2422	36.70	2403.70	2440.40	2400.0
HT40/MCS 0	2462	36.58	2443.82	2480.40	2483.5

Configuration 2 : PCB Dipole Antenna

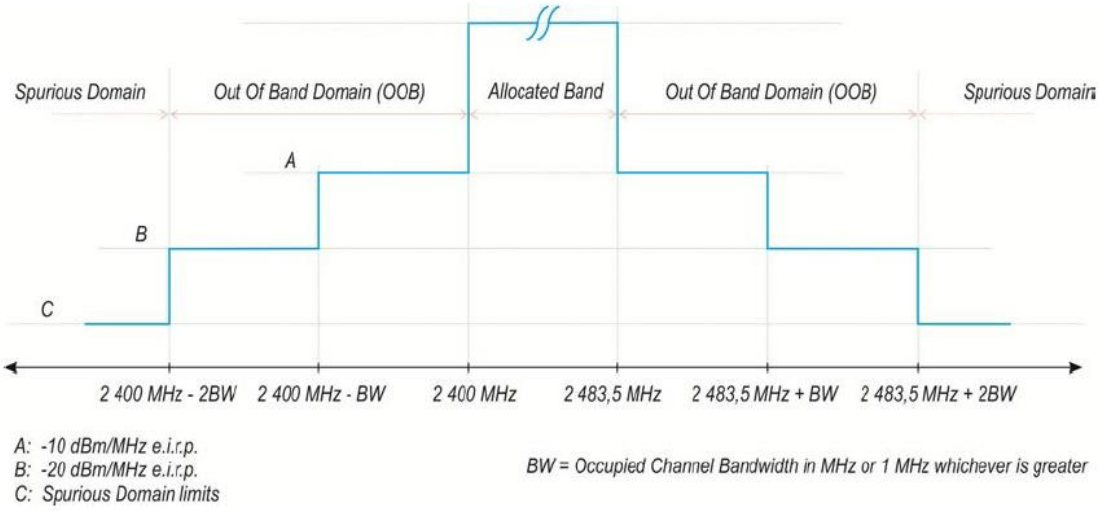
Modulation Mode	Frequency (MHz)	99% Bandwidth (MHz)	F_L at 99% BW (MHz)	F_H at 99% BW (MHz)	Limit F_L / F_H (MHz)
11b/1Mbps	2412	13.83	2405.11	2418.94	2400.0
11b/1Mbps	2472	13.71	2464.64	2478.36	2483.5
11g/6Mbps	2412	17.36	2403.37	2420.74	2400.0
11g/6Mbps	2472	17.13	2463.60	2480.74	2483.5
HT20/MCS 0	2412	18.11	2403.08	2421.20	2400.0
HT20/MCS 0	2472	17.71	2463.54	2480.12	2483.5
HT40/MCS 0	2422	36.70	2403.70	2440.40	2400.0
HT40/MCS 0	2462	36.58	2443.82	2480.40	2483.5

Configuration 3 : PIFA Antenna & Configuration 4: Isolated Magnetic Dipole Antenna

Modulation Mode	Frequency (MHz)	99% Bandwidth (MHz)	F_L at 99% BW (MHz)	F_H at 99% BW (MHz)	Limit F_L / F_H (MHz)
11b/1Mbps	2412	13.83	2405.11	2418.94	2400.0
11b/1Mbps	2472	13.71	2464.64	2478.36	2483.5
11g/6Mbps	2412	17.36	2403.37	2420.74	2400.0
11g/6Mbps	2472	17.13	2463.60	2480.74	2483.5
HT20/MCS 0	2412	18.11	2403.08	2421.20	2400.0
HT20/MCS 0	2472	17.71	2463.54	2480.12	2483.5
HT40/MCS 0	2422	36.70	2403.70	2440.40	2400.0
HT40/MCS 0	2462	36.58	2443.82	2480.40	2483.5

3.4 Transmitter Unwanted Emissions in the Out-Of-Band Domain

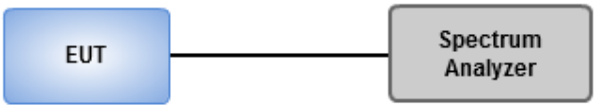
3.4.1 Limit of Transmitter Unwanted Emissions in the Out-Of-Band Domain



3.4.2 Test Procedures

Reference to clause 5.4.8.2 of ETSI EN 300 328 V2.2.2 (2019-07).

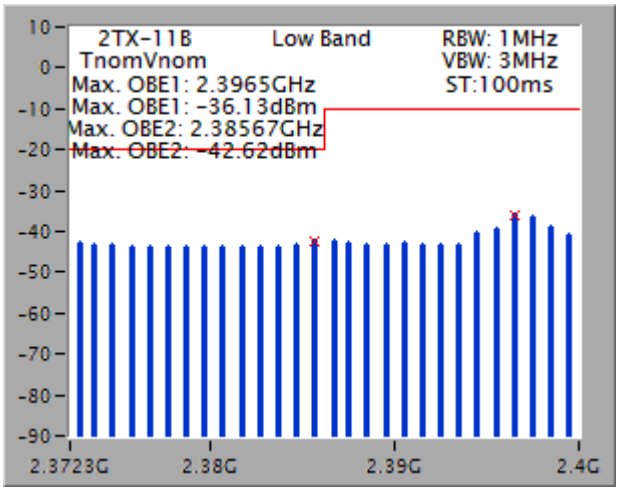
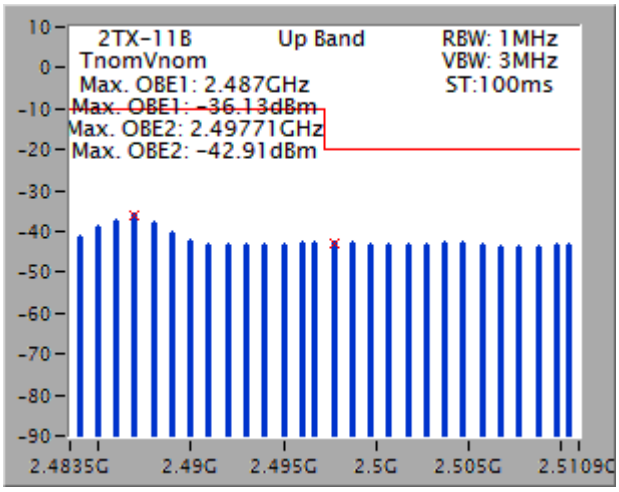
3.4.3 Test Setup



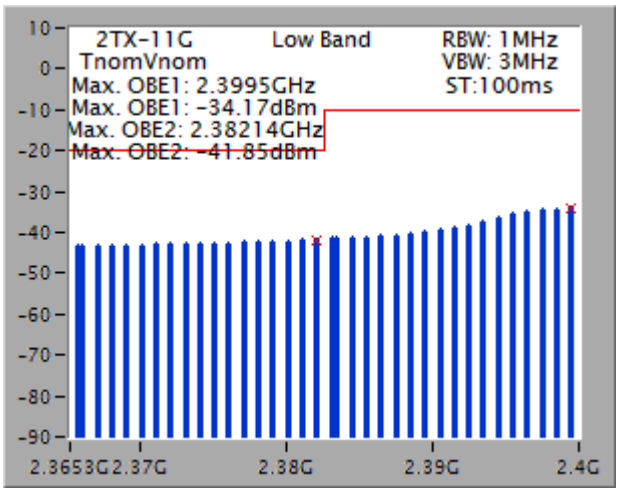
3.4.4 Test Result of Transmitter Unwanted Emissions in the Out-Of-Band Domain

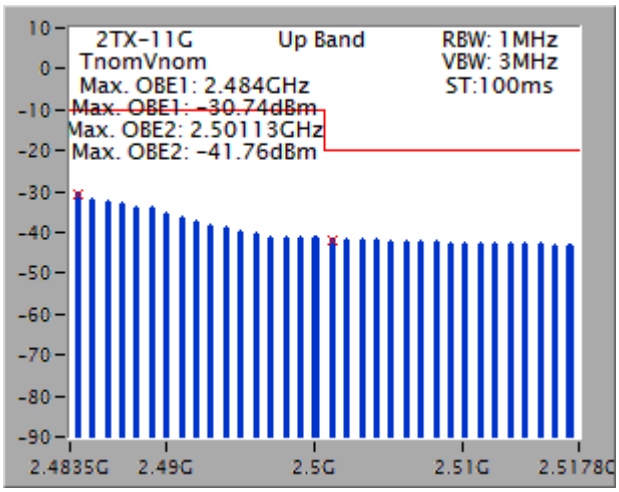
Configuration 1 : Dipole Antenna

Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	11b/1Mbps	2412	2396.50	-36.13	-10.00
$T_{nom}V_{nom}$	11b/1Mbps	2412	2385.67	-42.62	-20.00
$T_{nom}V_{nom}$	11b/1Mbps	2472	2487.00	-36.13	-10.00
$T_{nom}V_{nom}$	11b/1Mbps	2472	2497.71	-42.91	-20.00

Low Band	Up Band
	

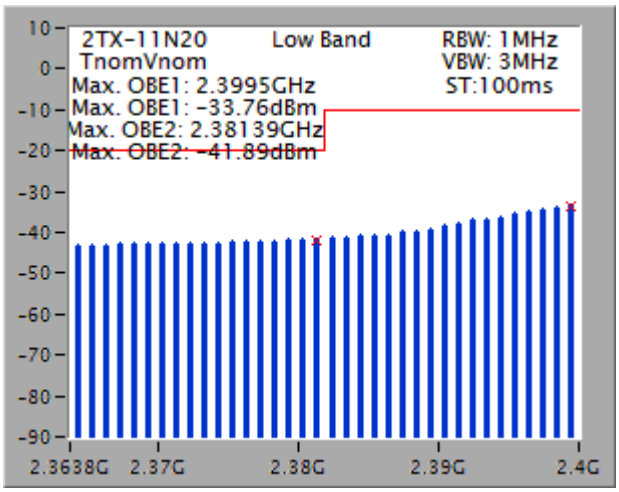
Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	11g/6Mbps	2412	2399.50	-34.17	-10.00
$T_{nom}V_{nom}$	11g/6Mbps	2412	2382.14	-41.85	-20.00
$T_{nom}V_{nom}$	11g/6Mbps	2472	2484.00	-30.74	-10.00
$T_{nom}V_{nom}$	11g/6Mbps	2472	2501.13	-41.76	-20.00
Low Band			**Up Band**		



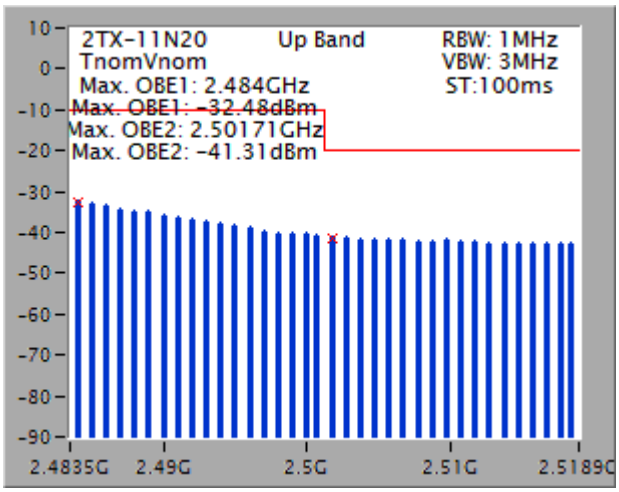


Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	HT20/MCS 0	2412	2399.50	-33.76	-10.00
$T_{nom}V_{nom}$	HT20/MCS 0	2412	2381.39	-41.89	-20.00
$T_{nom}V_{nom}$	HT20/MCS 0	2472	2484.00	-32.48	-10.00
$T_{nom}V_{nom}$	HT20/MCS 0	2472	2501.71	-41.31	-20.00

Low Band

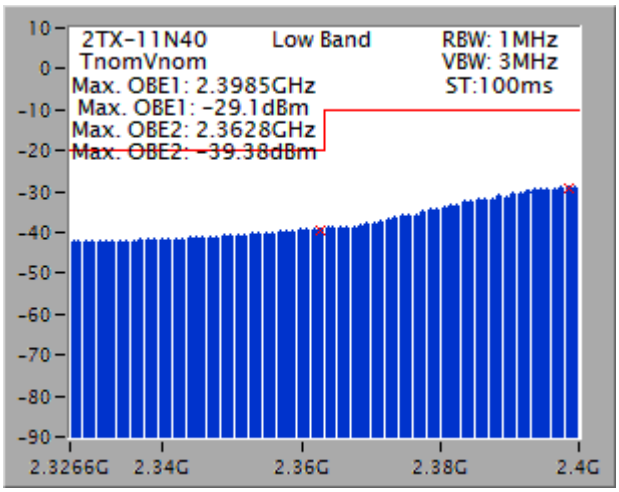


Up Band

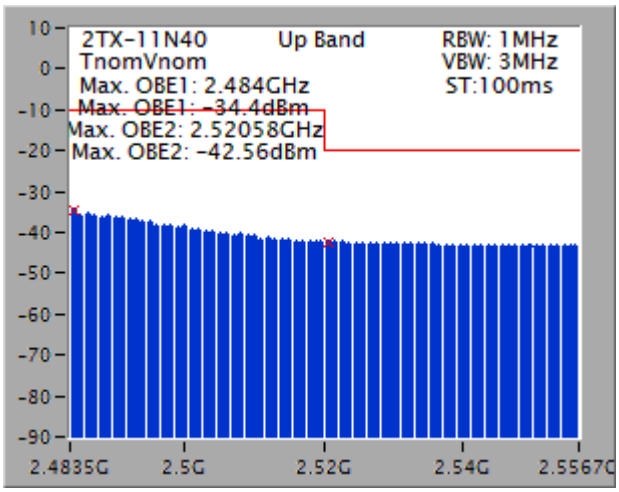


Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	HT40/MCS 0	2422	2398.50	-29.10	-10.00
$T_{nom}V_{nom}$	HT40/MCS 0	2422	2362.80	-39.38	-20.00
$T_{nom}V_{nom}$	HT40/MCS 0	2462	2484.00	-34.40	-10.00
$T_{nom}V_{nom}$	HT40/MCS 0	2462	2520.58	-42.56	-20.00

Low Band



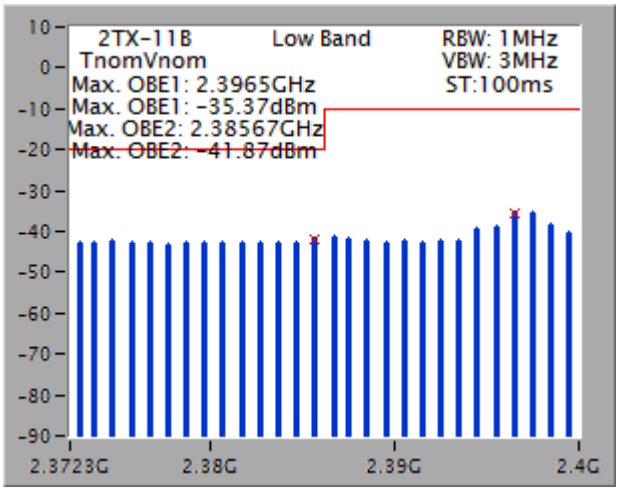
Up Band



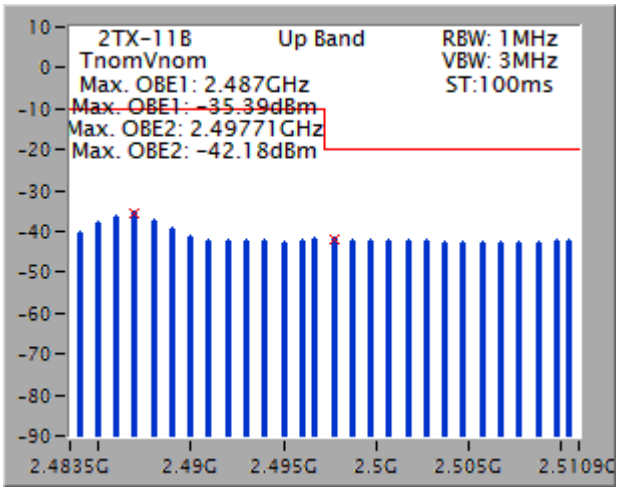
Configuration 2 : PCB Dipole Antenna

Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	11b/1Mbps	2412	2396.50	-35.37	-10.00
$T_{nom}V_{nom}$	11b/1Mbps	2412	2385.67	-41.87	-20.00
$T_{nom}V_{nom}$	11b/1Mbps	2472	2487.00	-35.39	-10.00
$T_{nom}V_{nom}$	11b/1Mbps	2472	2497.71	-42.18	-20.00

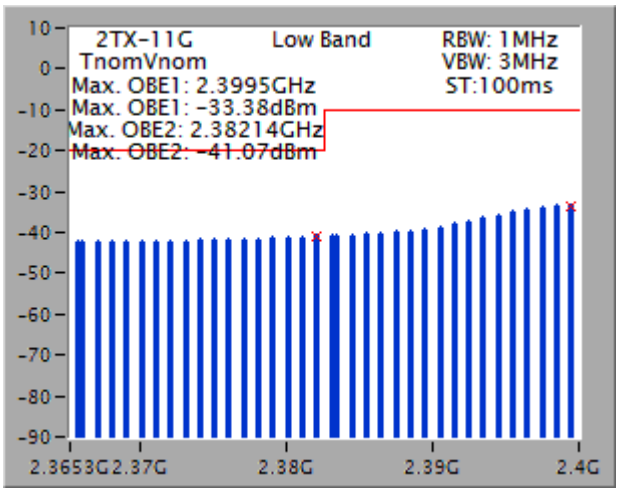
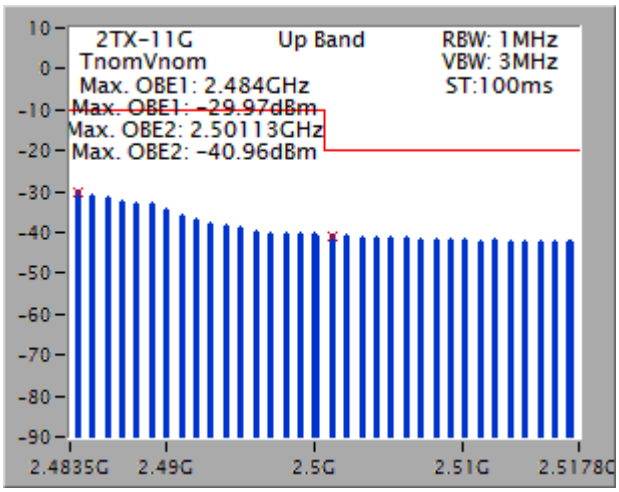
Low Band



Up Band

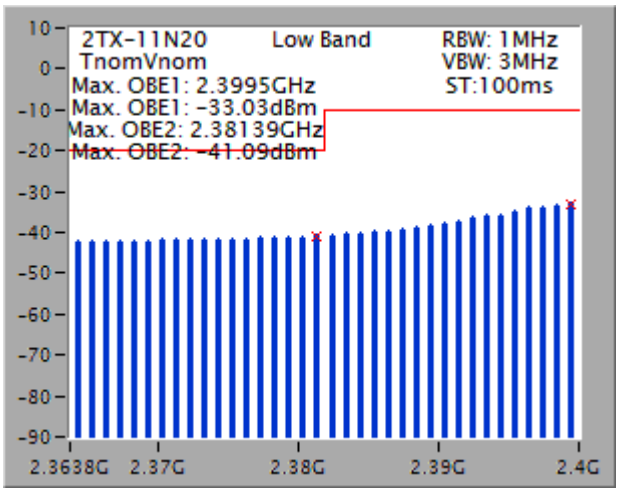


Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	11g/6Mbps	2412	2399.50	-33.38	-10.00
$T_{nom}V_{nom}$	11g/6Mbps	2412	2382.14	-41.07	-20.00
$T_{nom}V_{nom}$	11g/6Mbps	2472	2484.00	-29.97	-10.00
$T_{nom}V_{nom}$	11g/6Mbps	2472	2501.13	-40.96	-20.00

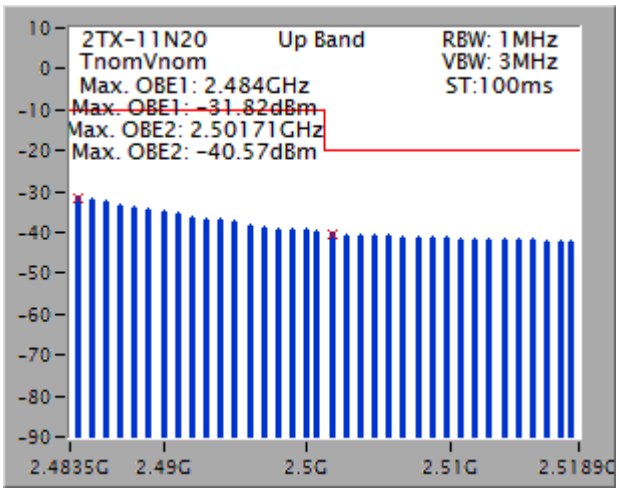
Low Band	Up Band
	

Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	HT20/MCS 0	2412	2399.50	-33.03	-10.00
$T_{nom}V_{nom}$	HT20/MCS 0	2412	2381.39	-41.09	-20.00
$T_{nom}V_{nom}$	HT20/MCS 0	2472	2484.00	-31.82	-10.00
$T_{nom}V_{nom}$	HT20/MCS 0	2472	2501.71	-40.57	-20.00

Low Band

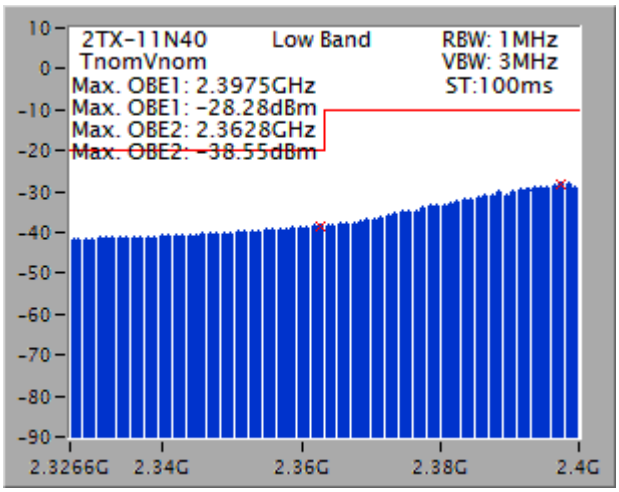


Up Band

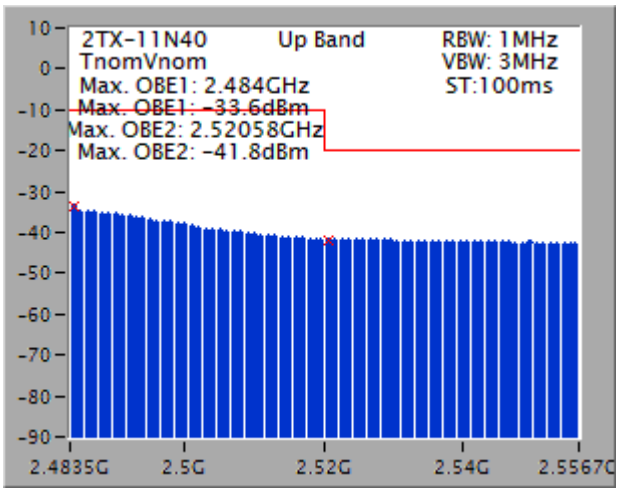


Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	HT40/MCS 0	2422	2397.50	-28.28	-10.00
$T_{nom}V_{nom}$	HT40/MCS 0	2422	2362.80	-38.55	-20.00
$T_{nom}V_{nom}$	HT40/MCS 0	2462	2484.00	-33.60	-10.00
$T_{nom}V_{nom}$	HT40/MCS 0	2462	2520.58	-41.80	-20.00

Low Band



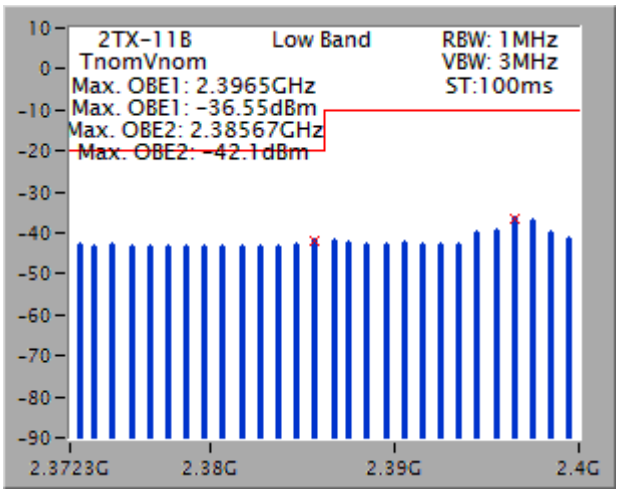
Up Band



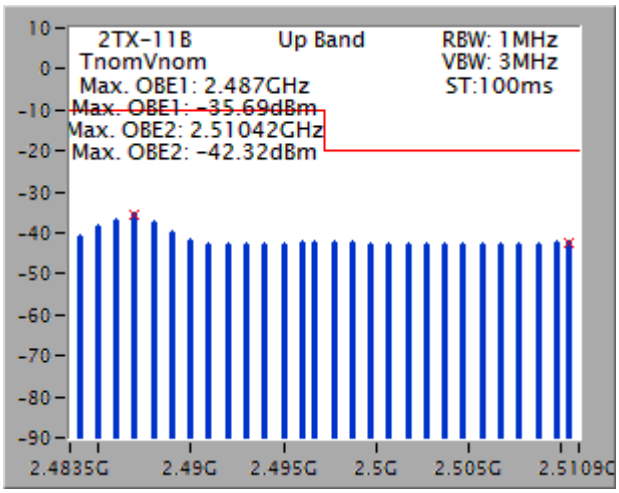
Configuration 3 : PIFA Antenna & Configuration 4: Isolated Magnetic Dipole Antenna

Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	11b/1Mbps	2412	2396.50	-36.55	-10.00
$T_{nom}V_{nom}$	11b/1Mbps	2412	2385.67	-42.10	-20.00
$T_{nom}V_{nom}$	11b/1Mbps	2472	2487.00	-35.69	-10.00
$T_{nom}V_{nom}$	11b/1Mbps	2472	2510.42	-42.32	-20.00

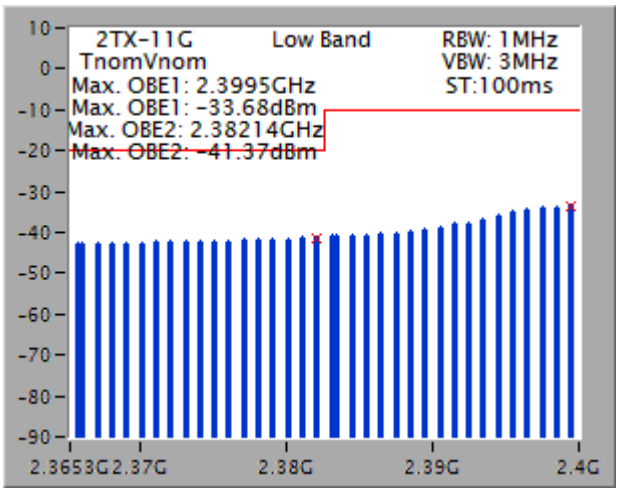
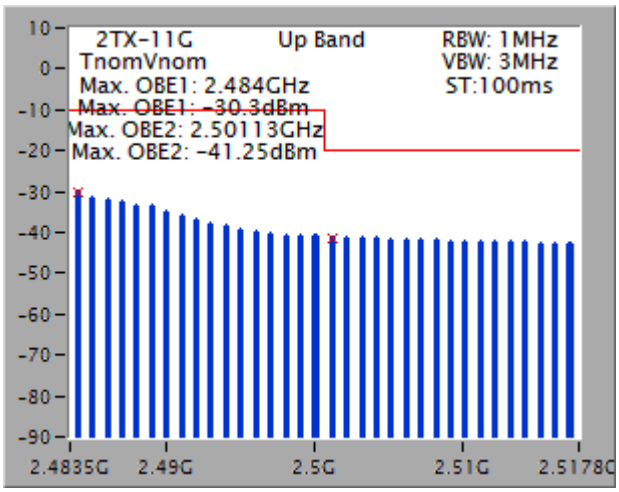
Low Band



Up Band

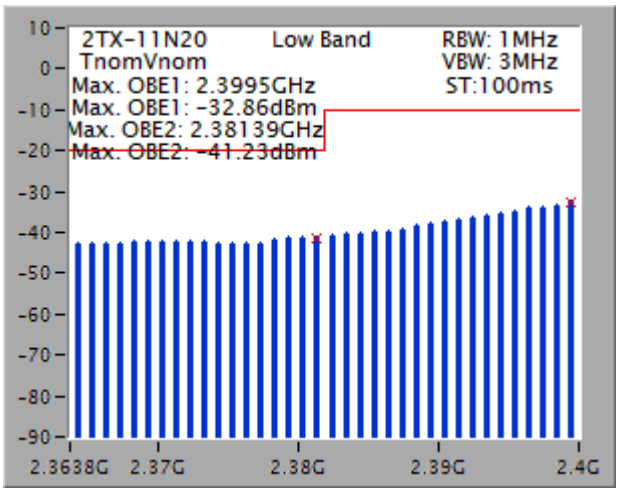


Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	11g/6Mbps	2412	2399.50	-33.68	-10.00
$T_{nom}V_{nom}$	11g/6Mbps	2412	2382.14	-41.37	-20.00
$T_{nom}V_{nom}$	11g/6Mbps	2472	2484.00	-30.30	-10.00
$T_{nom}V_{nom}$	11g/6Mbps	2472	2501.13	-41.25	-20.00

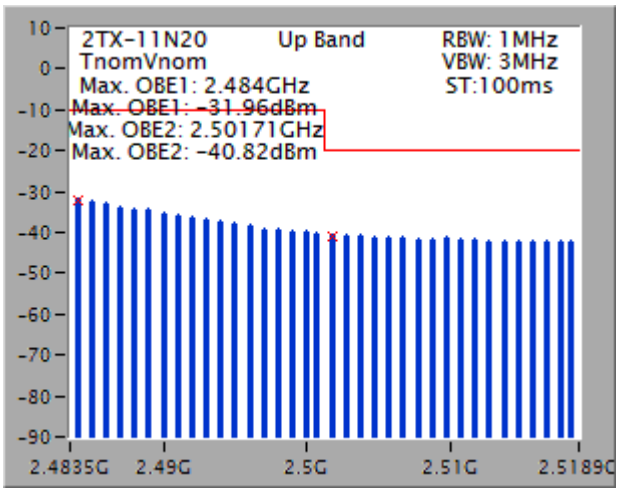
Low Band	Up Band
	

Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	HT20/MCS 0	2412	2399.50	-32.86	-10.00
$T_{nom}V_{nom}$	HT20/MCS 0	2412	2381.39	-41.23	-20.00
$T_{nom}V_{nom}$	HT20/MCS 0	2472	2484.00	-31.96	-10.00
$T_{nom}V_{nom}$	HT20/MCS 0	2472	2501.71	-40.82	-20.00

Low Band

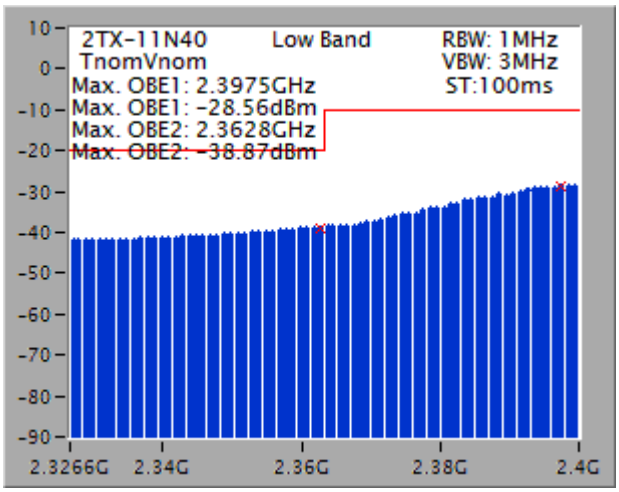


Up Band

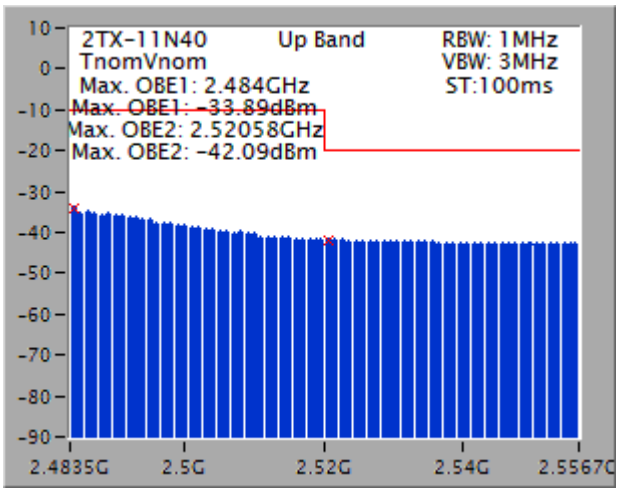


Condition	Modulation Mode	Freq. (MHz)	OOB Freq. (MHz)	OOB Emissions (dBm)	Limit (dBm)
$T_{nom}V_{nom}$	HT40/MCS 0	2422	2397.50	-28.56	-10.00
$T_{nom}V_{nom}$	HT40/MCS 0	2422	2362.80	-38.87	-20.00
$T_{nom}V_{nom}$	HT40/MCS 0	2462	2484.00	-33.89	-10.00
$T_{nom}V_{nom}$	HT40/MCS 0	2462	2520.58	-42.09	-20.00

Low Band



Up Band



3.5 Transmitter Unwanted Emissions in the Spurious Domain

3.5.1 Limit of Transmitter Unwanted Emissions in the Spurious Domain

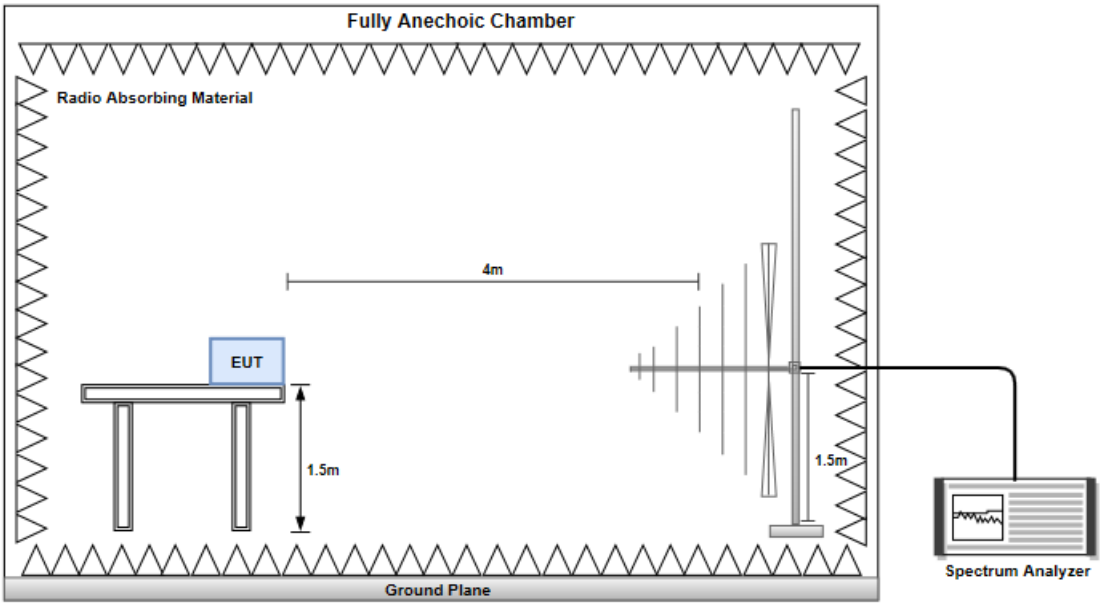
Frequency Range (MHz)	Maximum power (dBm)	Bandwidth (kHz)
30 to 47	-36	100
47 to 74	-54	100
74 to 87,5	-36	100
87,5 to 118	-54	100
118 to 174	-36	100
174 to 230	-54	100
230 to 470	-36	100
470 to 694	-54	100
694 to 1000	-36	100
1000 to 12750	-30	1000

3.5.2 Test Procedures

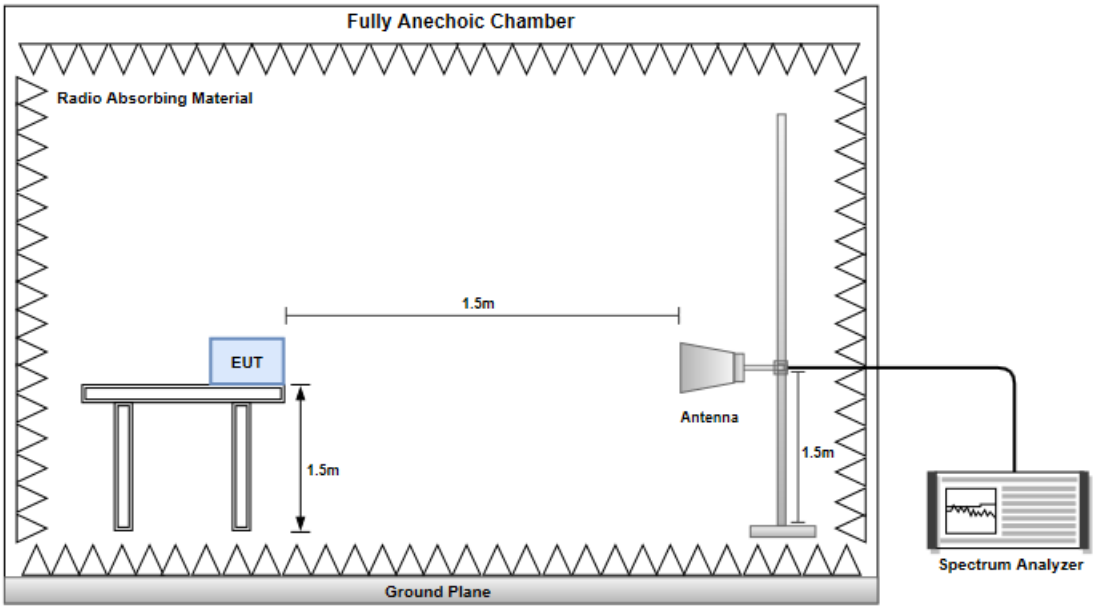
Reference to clause 5.4.9.2 of ETSI EN 300 328 V2.2.2 (2019-07).

3.5.3 Test Setup

Below 1GHz



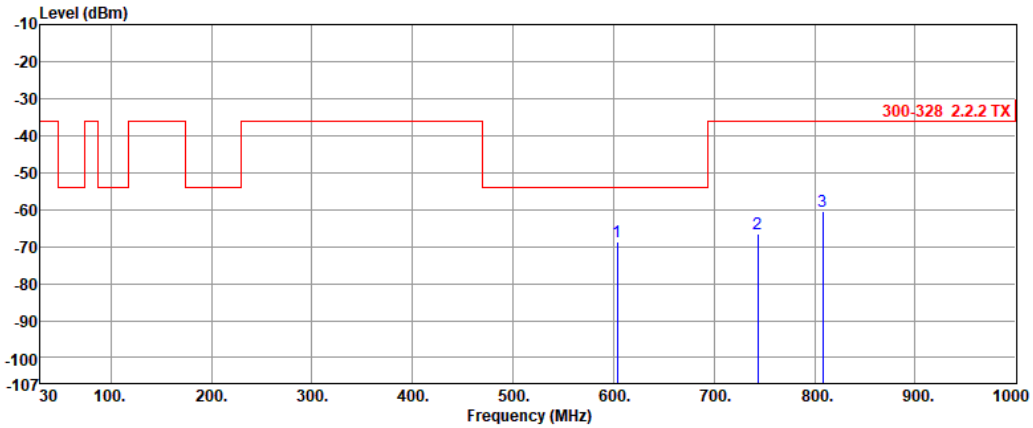
Above 1 GHz



Configuration 1 : Dipole Antenna

3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

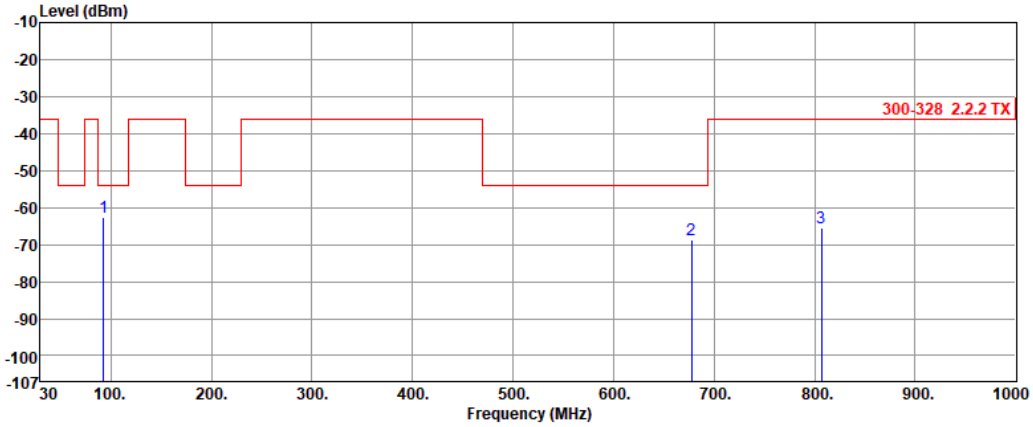
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	603.81	-68.55	-54.00	-14.55	6.93	-75.48
2	743.73	-66.45	-36.00	-30.45	9.41	-75.86
3	807.94	-60.64	-36.00	-24.64	9.75	-70.39

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

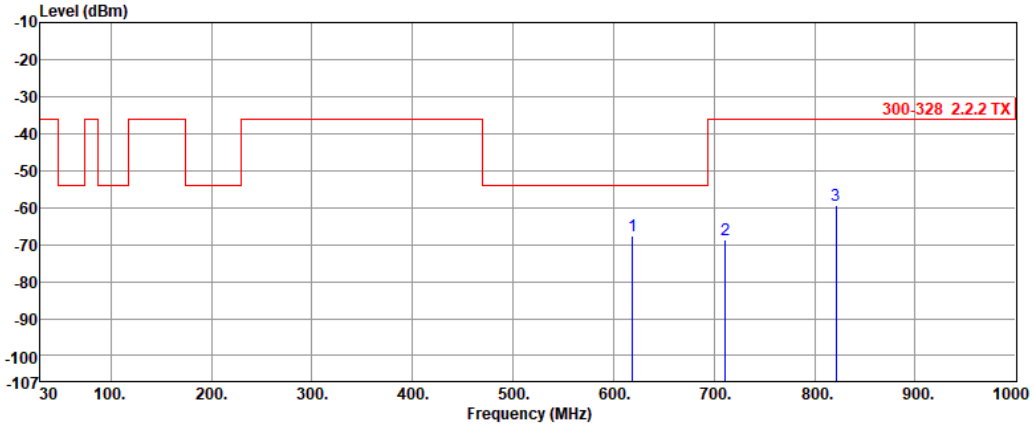
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.48	-62.53	-54.00	-8.53	-4.94	-57.59
2	677.39	-68.74	-54.00	-14.74	7.22	-75.96
3	806.97	-65.42	-36.00	-29.42	9.53	-74.95

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

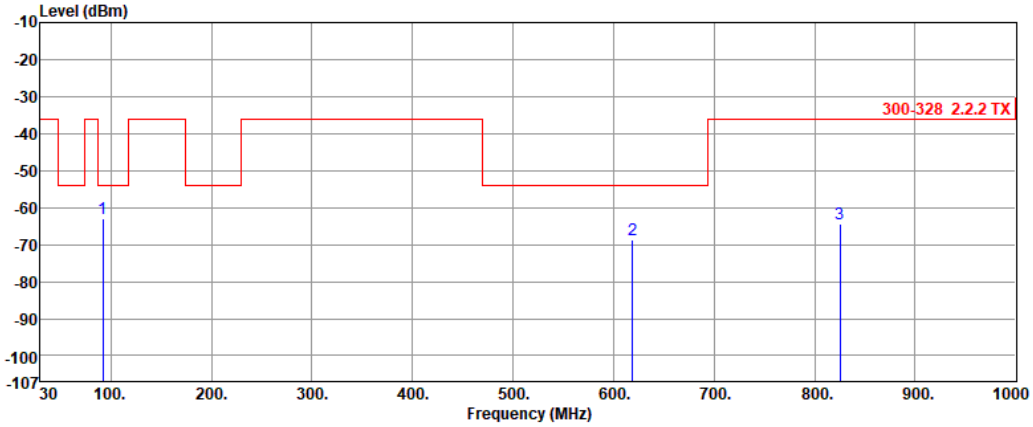
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	618.72	-67.51	-54.00	-13.51	7.00	-74.51
2	711.27	-68.57	-36.00	-32.57	8.26	-76.83
3	821.52	-59.46	-36.00	-23.46	9.97	-69.43

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

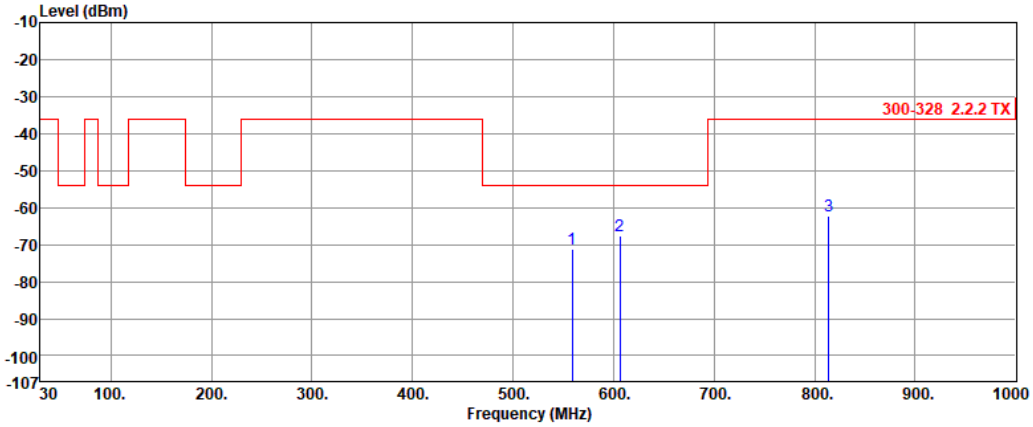
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.25	-62.82	-54.00	-8.82	-4.96	-57.86
2	618.58	-68.61	-54.00	-14.61	7.25	-75.86
3	825.40	-64.40	-36.00	-28.40	10.00	-74.40

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

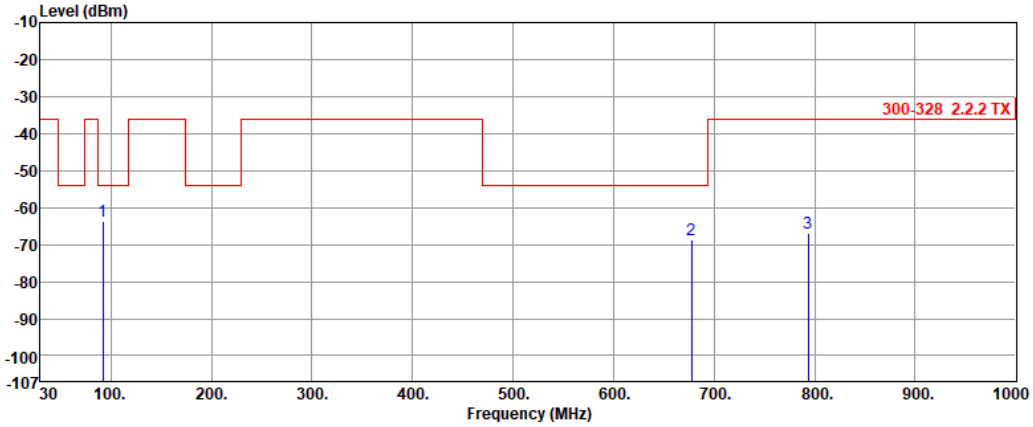
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	558.63	-71.26	-54.00	-17.26	4.68	-75.94
2	606.47	-67.51	-54.00	-13.51	6.43	-73.94
3	813.76	-62.27	-36.00	-26.27	9.81	-72.08

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

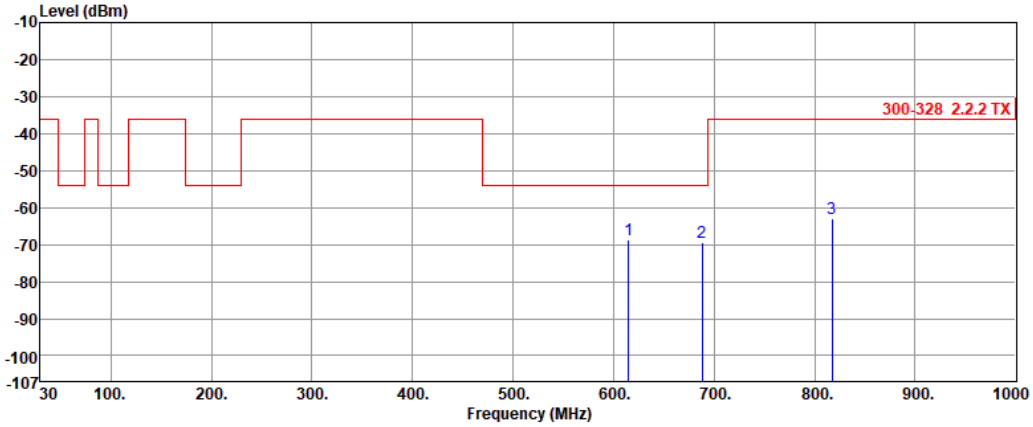
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.79	-63.61	-54.00	-9.61	-4.99	-58.62
2	677.61	-68.81	-54.00	-14.81	7.21	-76.02
3	793.39	-66.99	-36.00	-30.99	9.14	-76.13

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

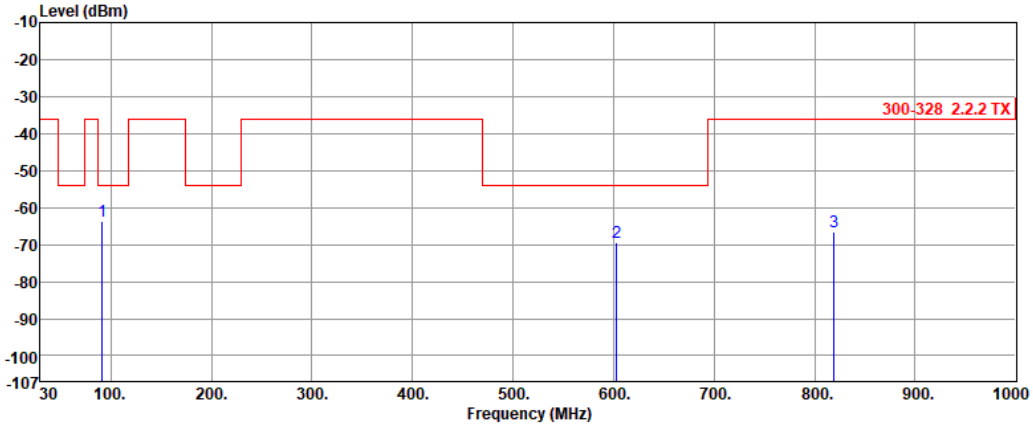
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	615.17	-68.60	-54.00	-14.60	7.02	-75.62
2	687.78	-69.26	-54.00	-15.26	7.57	-76.83
3	817.64	-62.96	-36.00	-26.96	9.89	-72.85

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

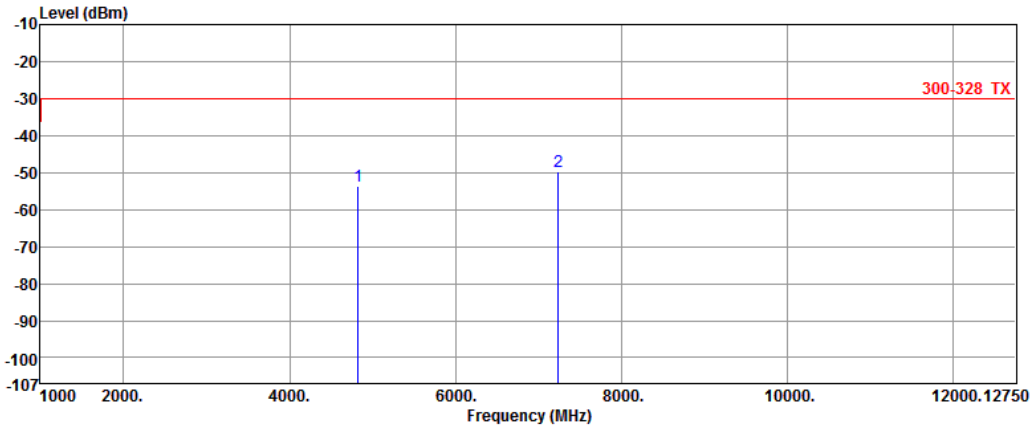


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.64	-63.57	-54.00	-9.57	-5.00	-58.57
2	603.15	-69.33	-54.00	-15.33	7.38	-76.71
3	819.58	-66.67	-36.00	-30.67	9.78	-76.45

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11b

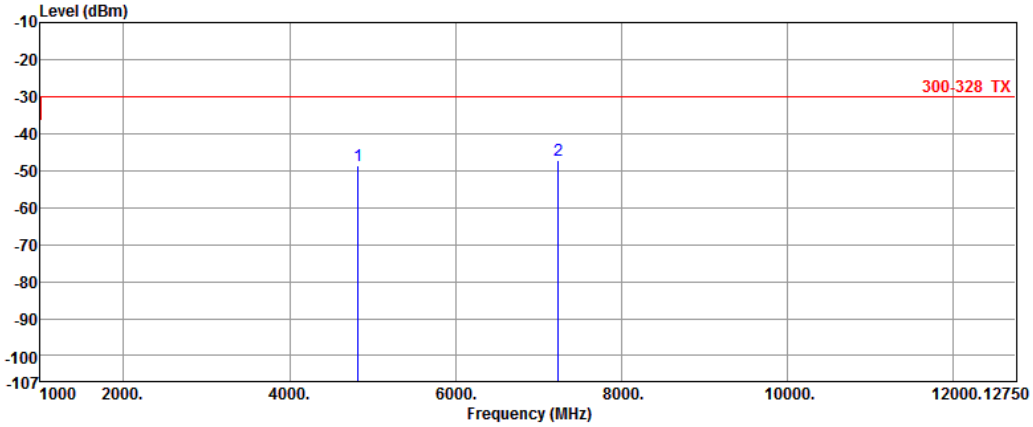
Modulation	11b	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4824.12	-53.50	-30.00	-23.50	11.62	-65.12
2	7237.60	-49.73	-30.00	-19.73	17.41	-67.14

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

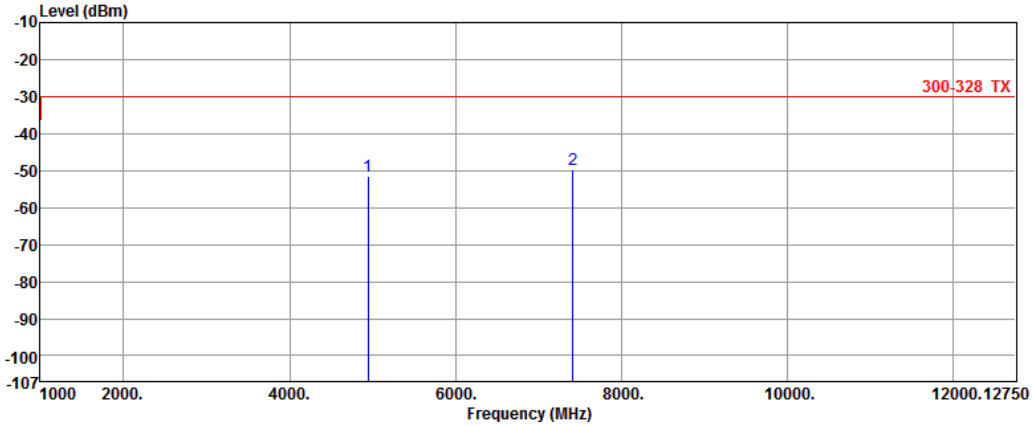
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4823.95	-48.53	-30.00	-18.53	11.76	-60.29
2	7236.00	-47.07	-30.00	-17.07	17.25	-64.32

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

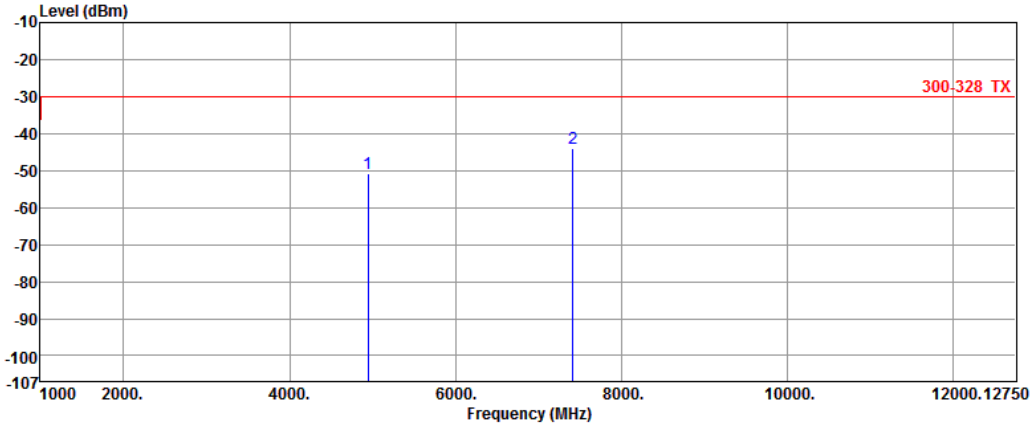
Modulation	11b	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4944.39	-51.65	-30.00	-21.65	12.05	-63.70
2	7417.20	-49.66	-30.00	-19.66	16.94	-66.60

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11b	Test Freq. (MHz)	2472
Polarization	Vertical		

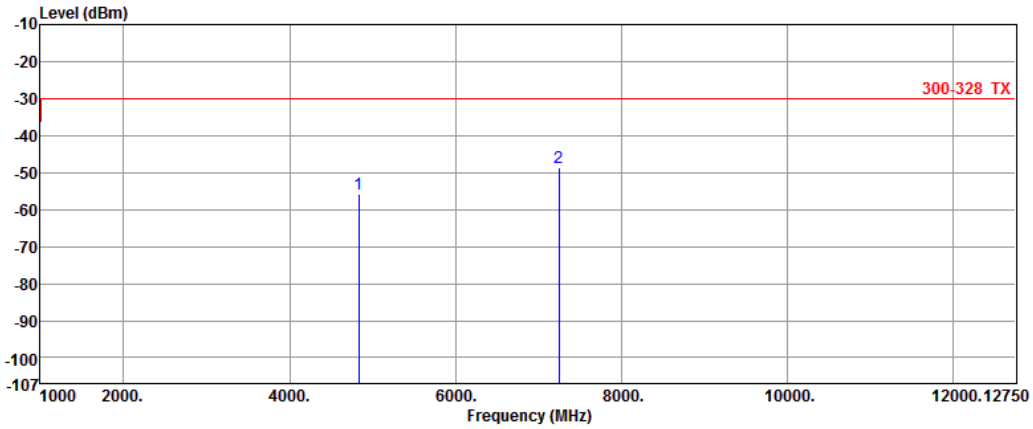


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.97	-50.86	-30.00	-20.86	11.56	-62.42
2	7417.92	-44.05	-30.00	-14.05	17.85	-61.90

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11g

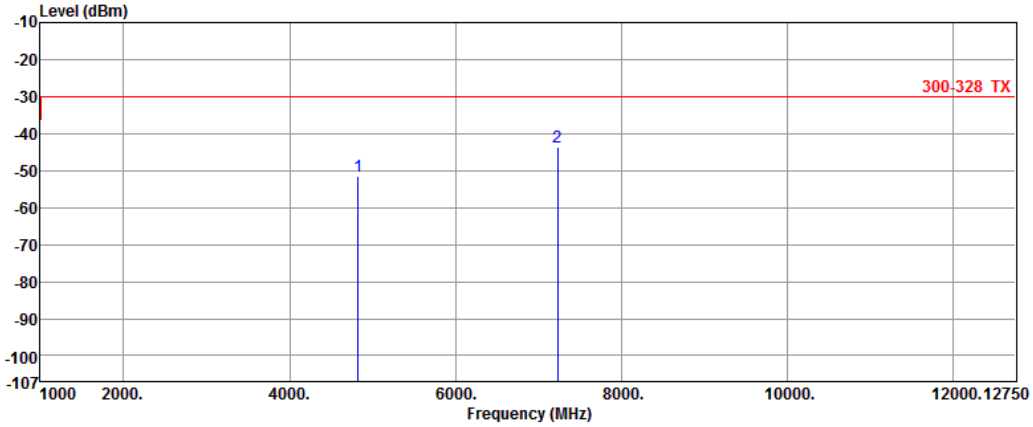
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4831.26	-55.75	-30.00	-25.75	11.61	-67.36
2	7245.30	-48.59	-30.00	-18.59	17.41	-66.00

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

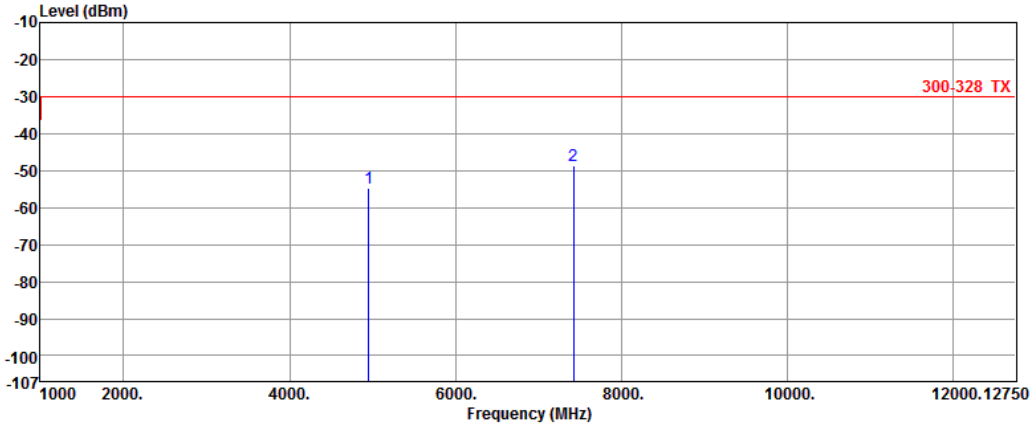
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4825.75	-51.69	-30.00	-21.69	11.75	-63.44
2	7230.30	-43.56	-30.00	-13.56	17.24	-60.80

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

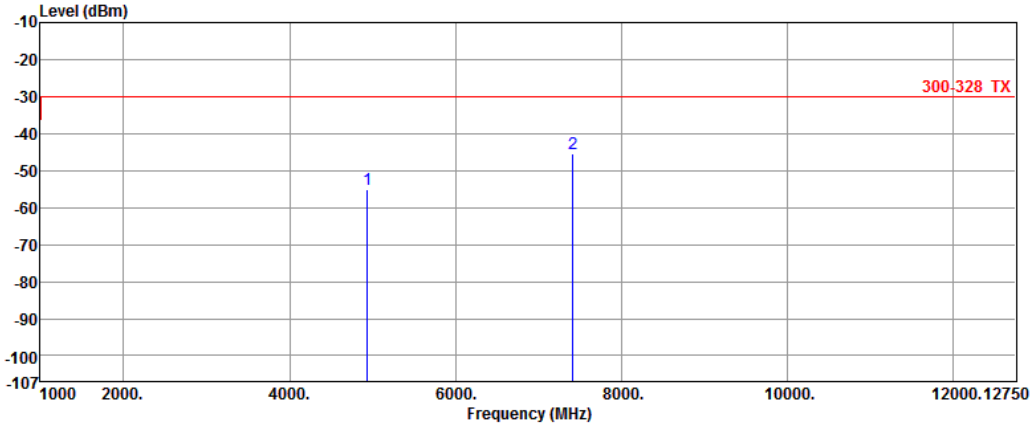
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4953.36	-54.81	-30.00	-24.81	12.16	-66.97
2	7425.66	-48.82	-30.00	-18.82	16.96	-65.78

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		

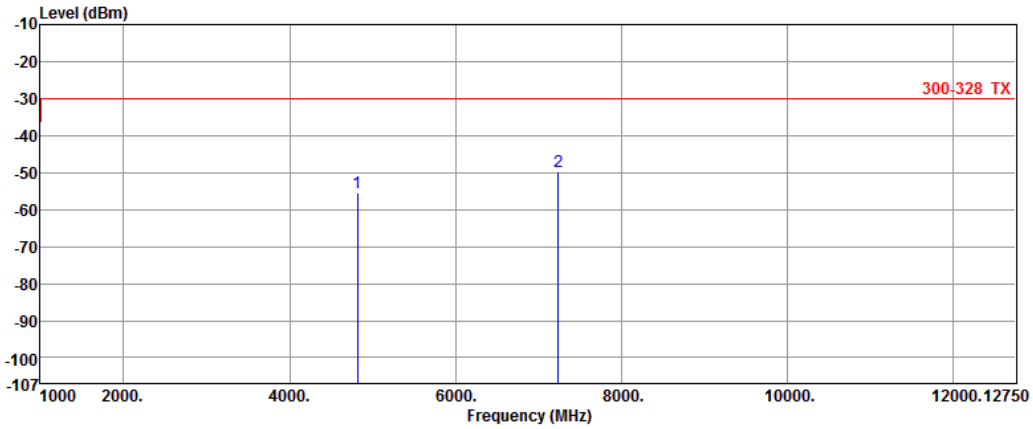


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4941.74	-55.00	-30.00	-25.00	11.55	-66.55
2	7416.20	-45.35	-30.00	-15.35	17.86	-63.21

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT20

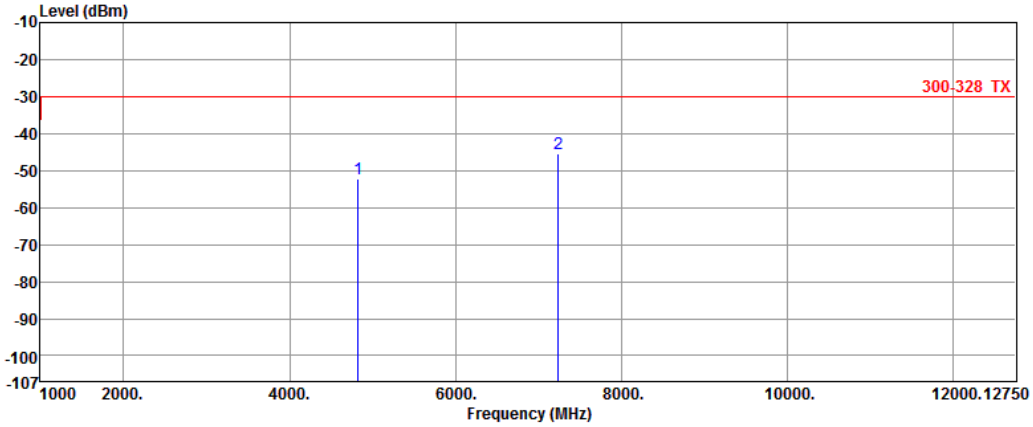
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4821.50	-55.41	-30.00	-25.41	11.62	-67.03
2	7235.90	-49.62	-30.00	-19.62	17.40	-67.02

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

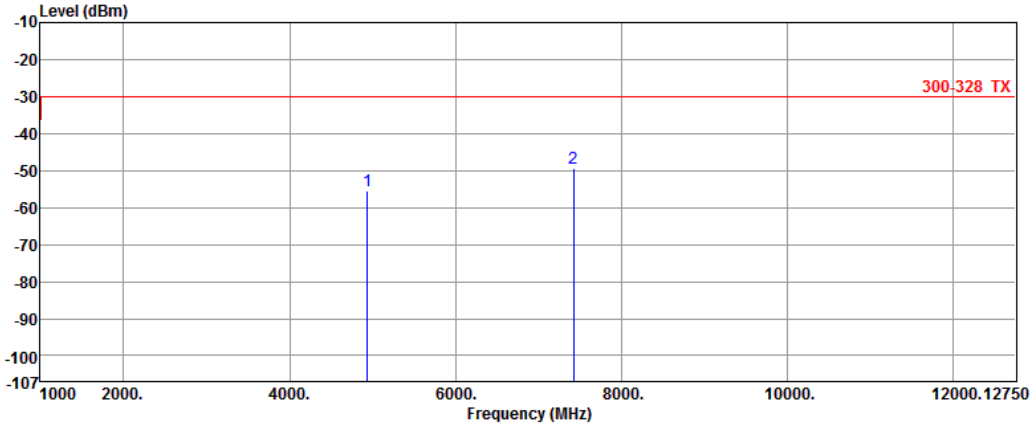
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4825.55	-52.41	-30.00	-22.41	11.75	-64.16
2	7240.30	-45.58	-30.00	-15.58	17.27	-62.85

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

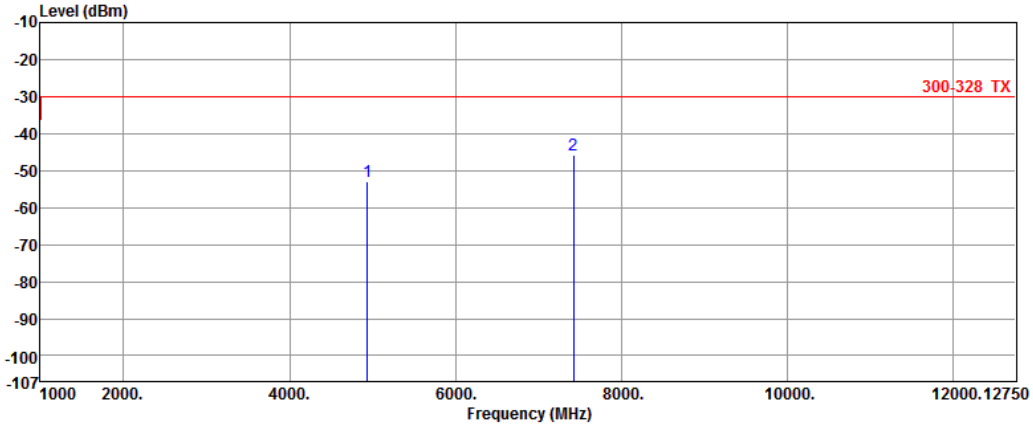
Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4941.65	-55.63	-30.00	-25.63	12.02	-67.65
2	7424.75	-49.47	-30.00	-19.47	16.96	-66.43

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Vertical		

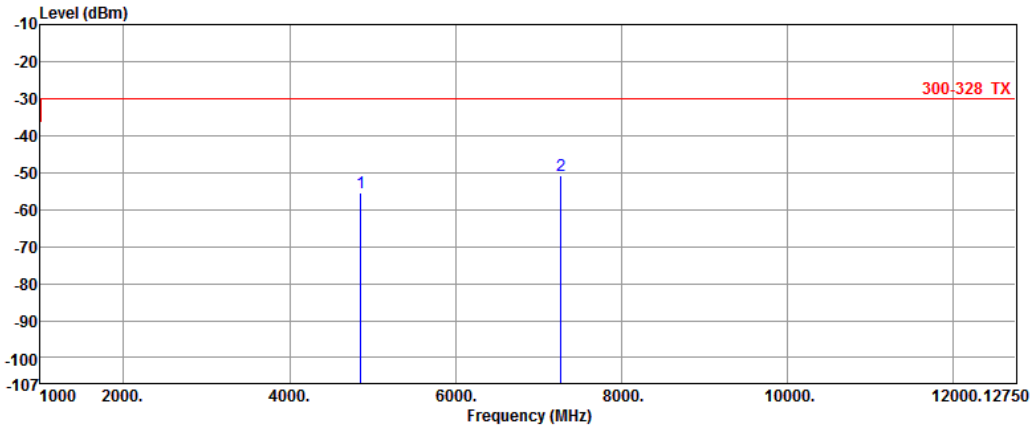


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4941.50	-52.82	-30.00	-22.82	11.55	-64.37
2	7424.75	-45.63	-30.00	-15.63	17.80	-63.43

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT40

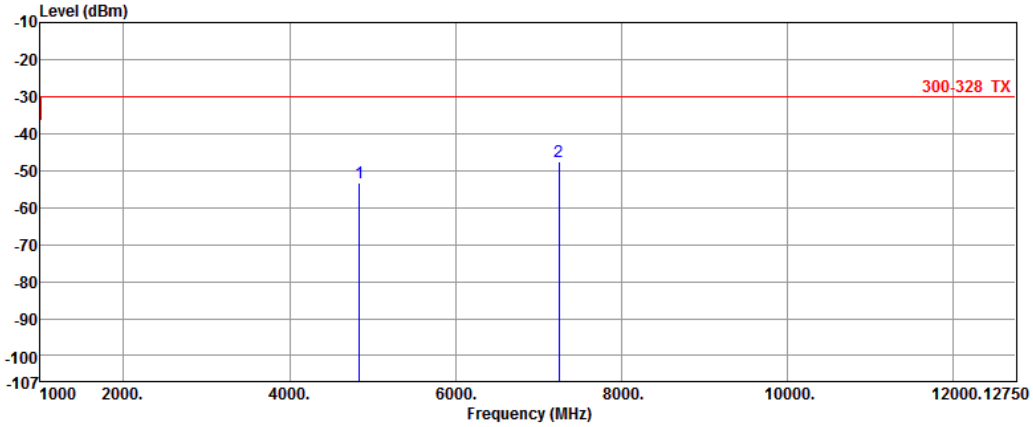
Modulation	HT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4856.12	-55.43	-30.00	-25.43	11.58	-67.01
2	7269.60	-50.67	-30.00	-20.67	17.44	-68.11

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

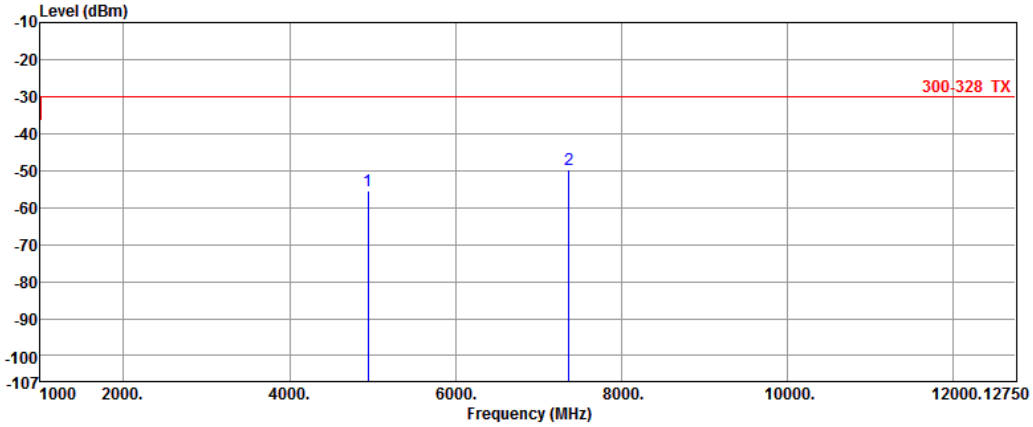
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4840.30	-53.29	-30.00	-23.29	11.66	-64.95
2	7249.04	-47.72	-30.00	-17.72	17.29	-65.01

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

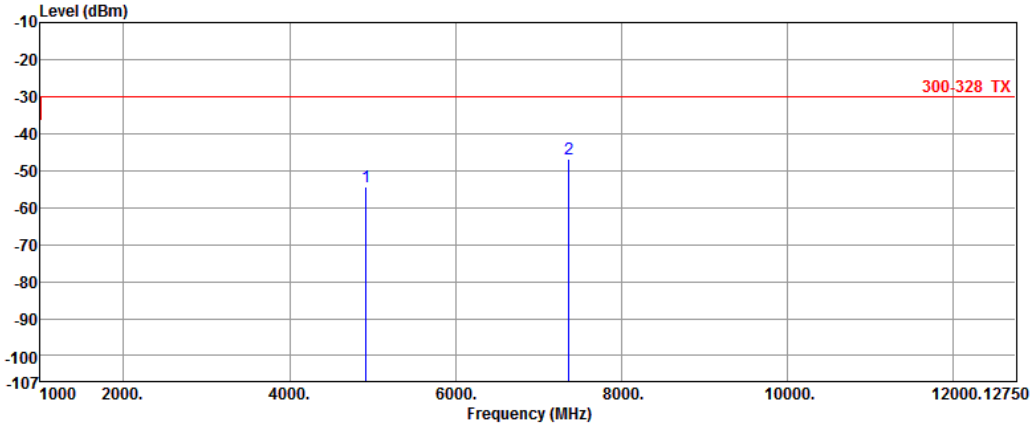
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.76	-55.47	-30.00	-25.47	12.04	-67.51
2	7362.32	-49.65	-30.00	-19.65	17.11	-66.76

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



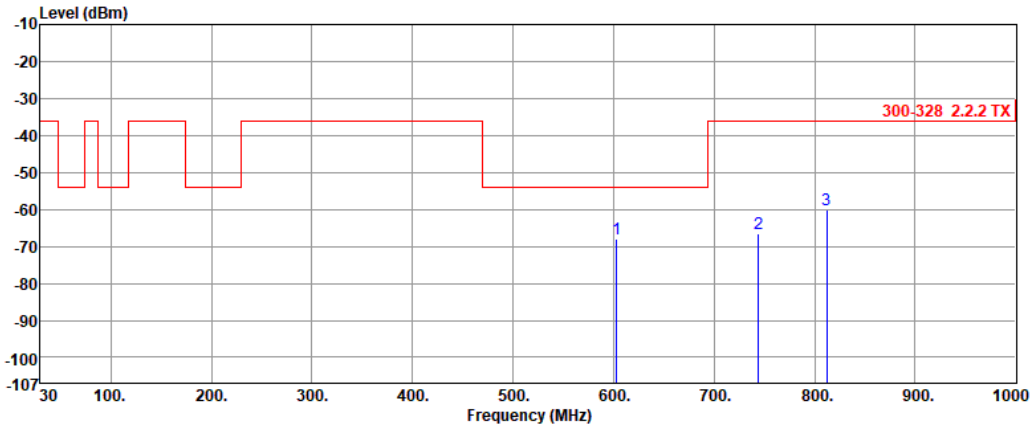
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4921.52	-54.49	-30.00	-24.49	11.43	-65.92
2	7362.32	-47.00	-30.00	-17.00	17.77	-64.77

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Configuration 2 : PCB Dipole Antenna

3.5.9 Transmitter Radiated Unwanted Emissions (Below 1GHz)

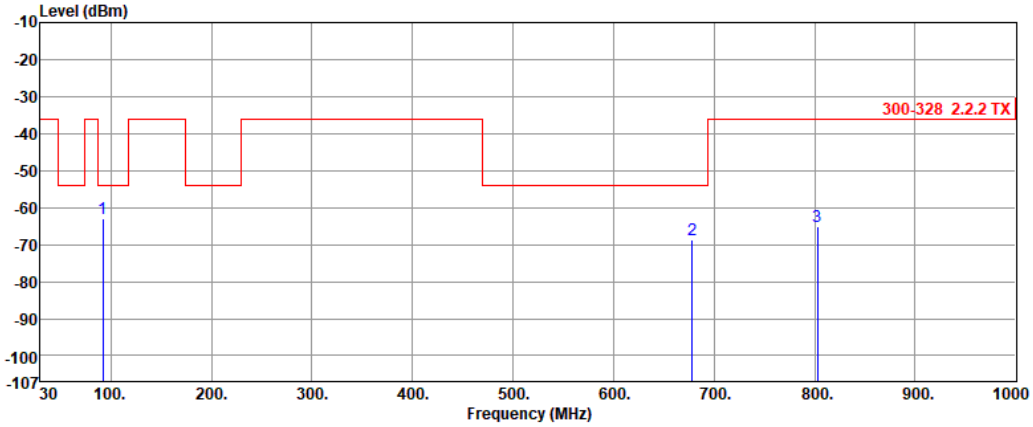
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	603.27	-68.13	-54.00	-14.13	6.91	-75.04
2	743.92	-66.41	-36.00	-30.41	9.41	-75.82
3	811.82	-60.00	-36.00	-24.00	9.77	-69.77

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

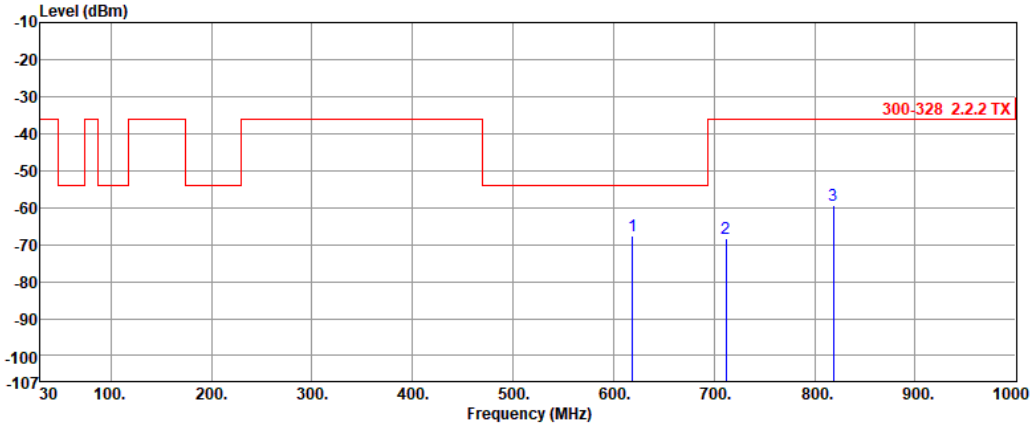
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.08	-62.83	-54.00	-8.83	-4.97	-57.86
2	677.96	-68.61	-54.00	-14.61	7.19	-75.80
3	803.09	-65.30	-36.00	-29.30	9.42	-74.72

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

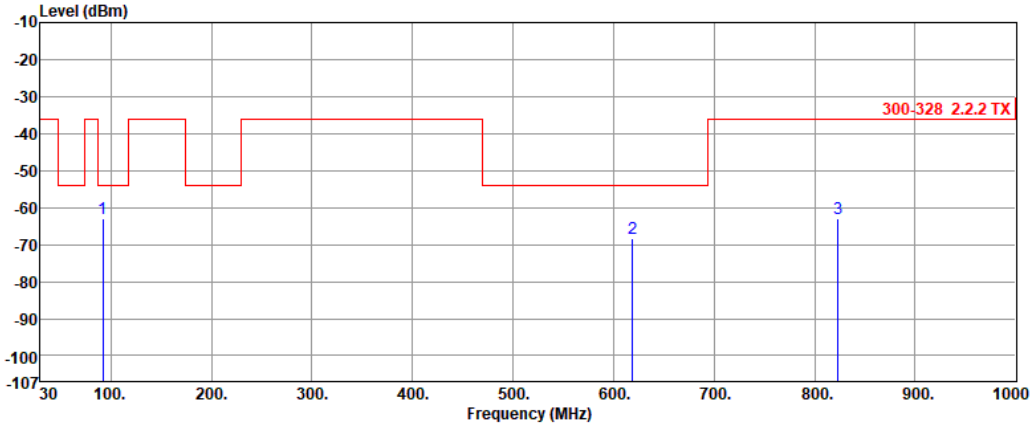
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	618.79	-67.54	-54.00	-13.54	7.00	-74.54
2	711.91	-68.37	-36.00	-32.37	8.26	-76.63
3	818.61	-59.24	-36.00	-23.24	9.92	-69.16

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

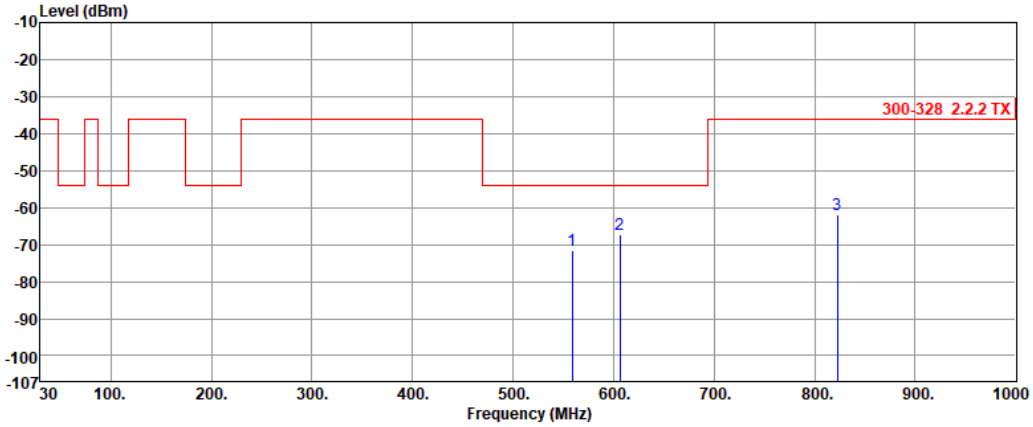
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.08	-62.98	-54.00	-8.98	-4.97	-58.01
2	618.79	-68.50	-54.00	-14.50	7.24	-75.74
3	823.46	-63.09	-36.00	-27.09	9.94	-73.03

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

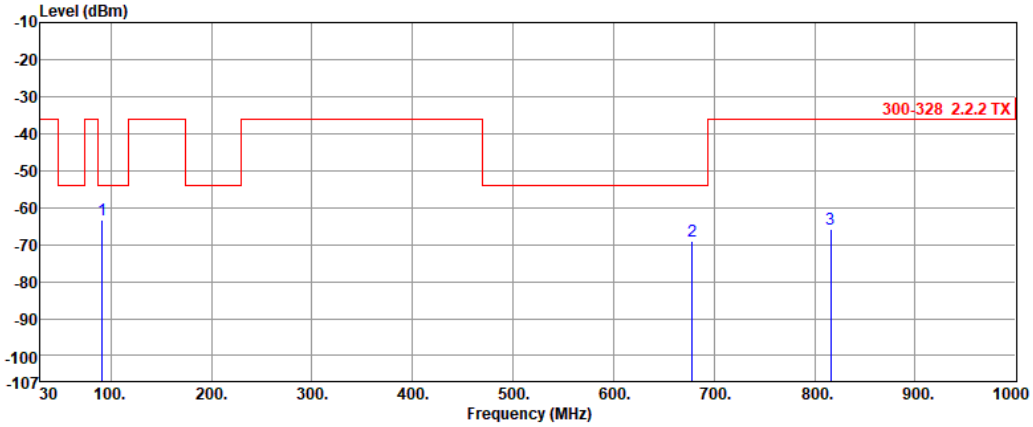
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	558.65	-71.51	-54.00	-17.51	4.68	-76.19
2	606.18	-67.31	-54.00	-13.31	6.54	-73.85
3	822.49	-61.95	-36.00	-25.95	9.98	-71.93

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

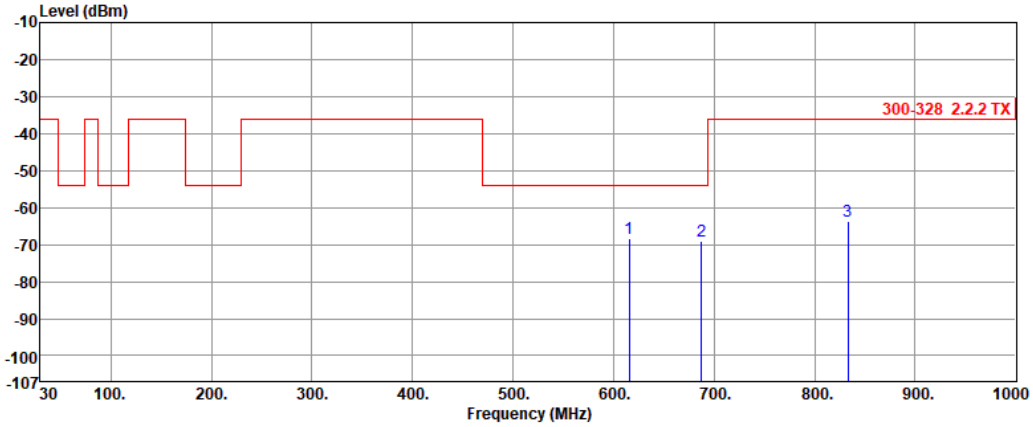
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.11	-63.19	-54.00	-9.19	-5.03	-58.16
2	677.96	-68.91	-54.00	-14.91	7.19	-76.10
3	815.70	-65.89	-36.00	-29.89	9.78	-75.67

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

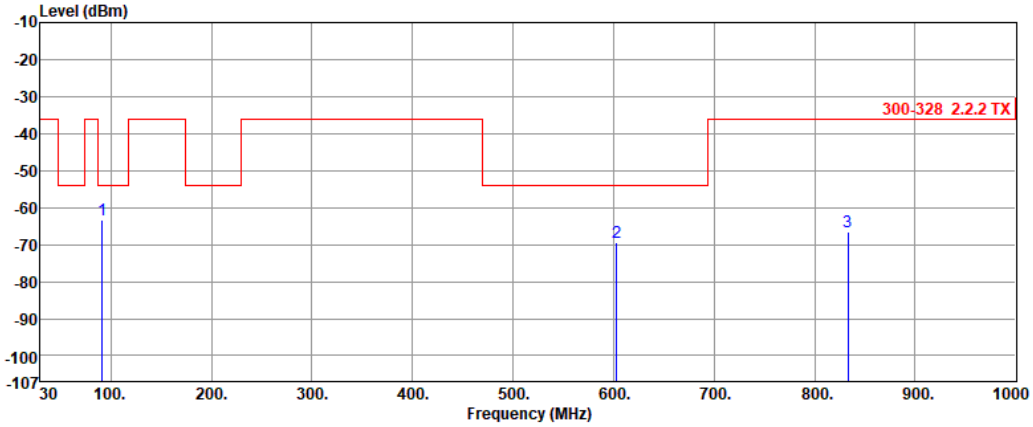
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	615.88	-68.42	-54.00	-14.42	7.01	-75.43
2	687.66	-69.02	-54.00	-15.02	7.56	-76.58
3	833.16	-63.58	-36.00	-27.58	9.99	-73.57

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

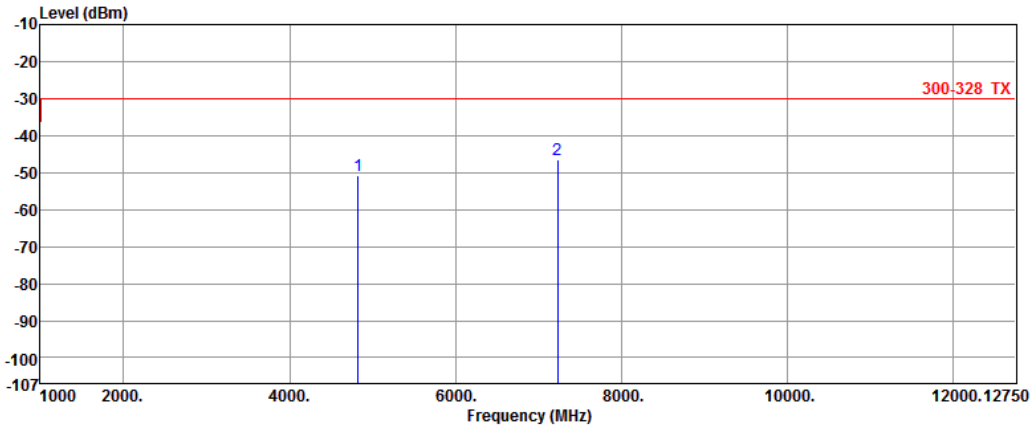


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.11	-63.48	-54.00	-9.48	-5.03	-58.45
2	603.27	-69.30	-54.00	-15.30	7.39	-76.69
3	833.16	-66.69	-36.00	-30.69	9.94	-76.63

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.10 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11b

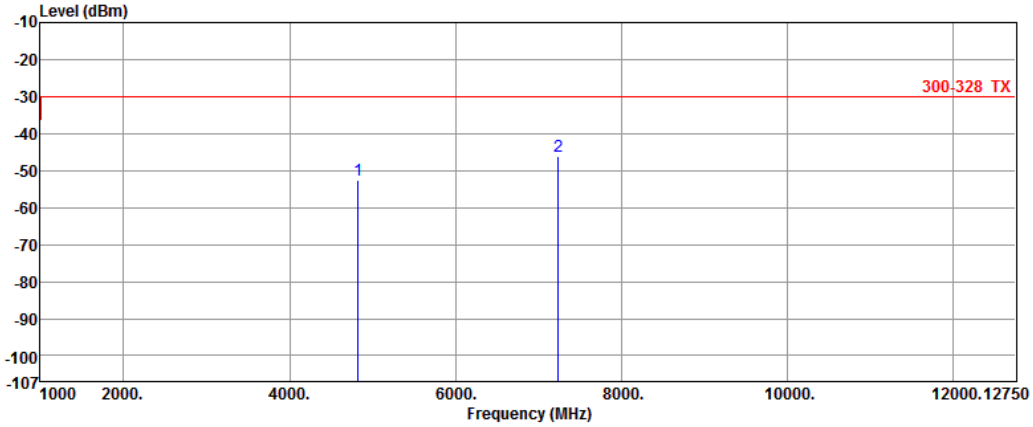
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4824.12	-50.85	-30.00	-20.85	11.62	-62.47
2	7234.10	-46.42	-30.00	-16.42	17.40	-63.82

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

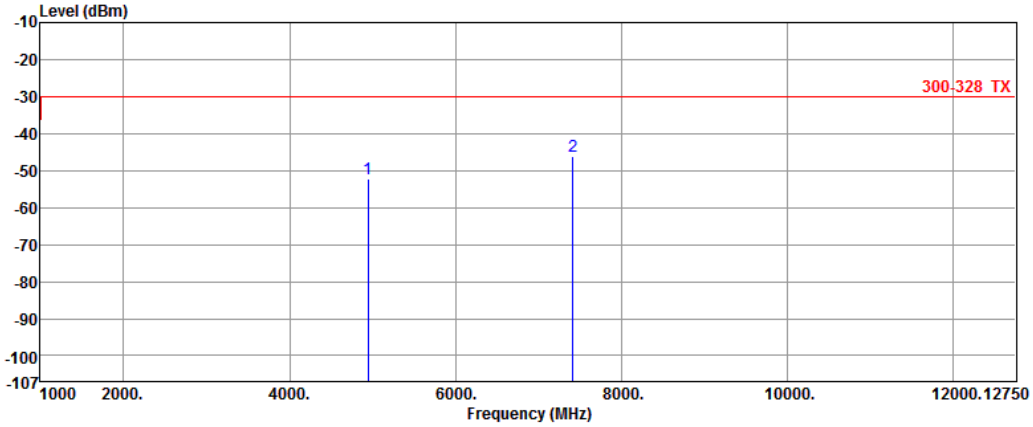
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4823.97	-52.76	-30.00	-22.76	11.76	-64.52
2	7238.07	-46.21	-30.00	-16.21	17.26	-63.47

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

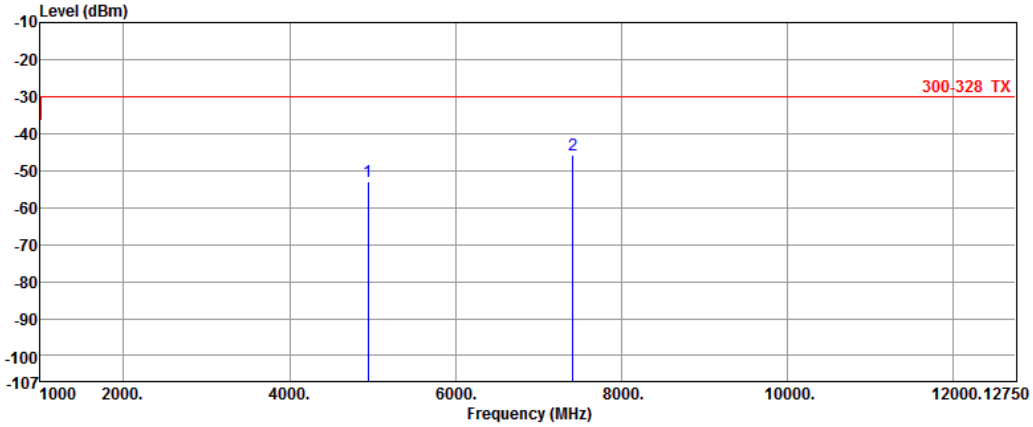
Modulation	11b	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.81	-52.24	-30.00	-22.24	12.04	-64.28
2	7413.56	-46.21	-30.00	-16.21	16.93	-63.14

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11b	Test Freq. (MHz)	2472
Polarization	Vertical		

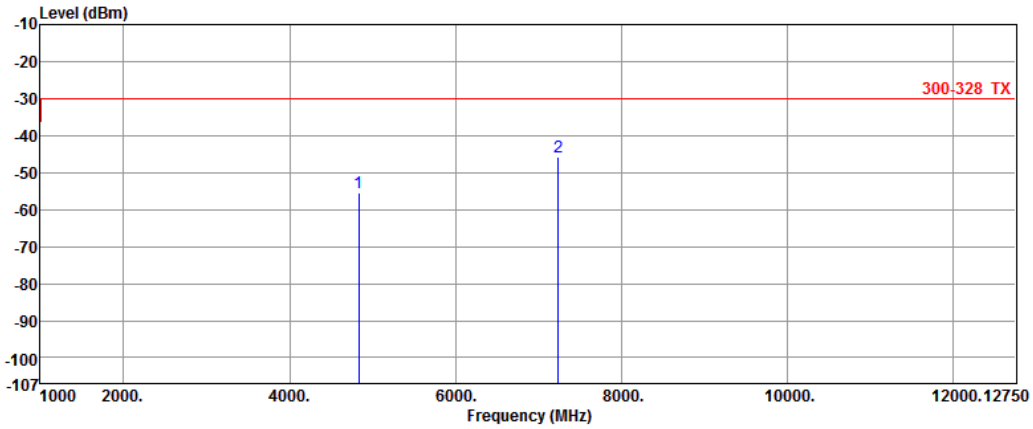


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4944.17	-53.01	-30.00	-23.01	11.56	-64.57
2	7414.53	-45.97	-30.00	-15.97	17.86	-63.83

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.11 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11g

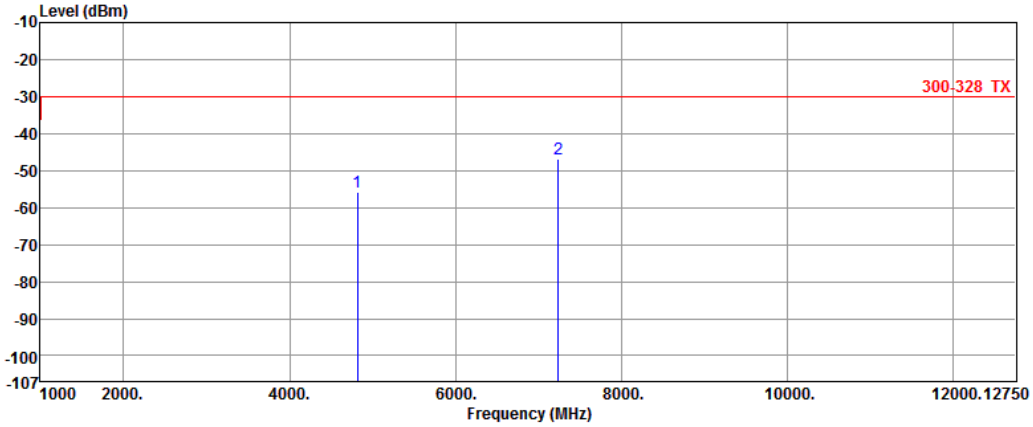
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4831.23	-55.34	-30.00	-25.34	11.61	-66.95
2	7240.14	-45.78	-30.00	-15.78	17.41	-63.19

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

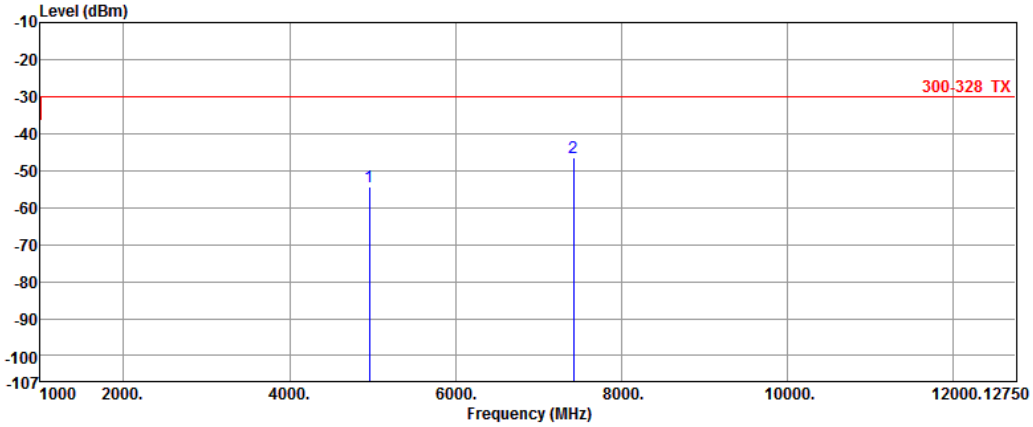
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4817.10	-55.91	-30.00	-25.91	11.81	-67.72
2	7236.12	-46.96	-30.00	-16.96	17.25	-64.21

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

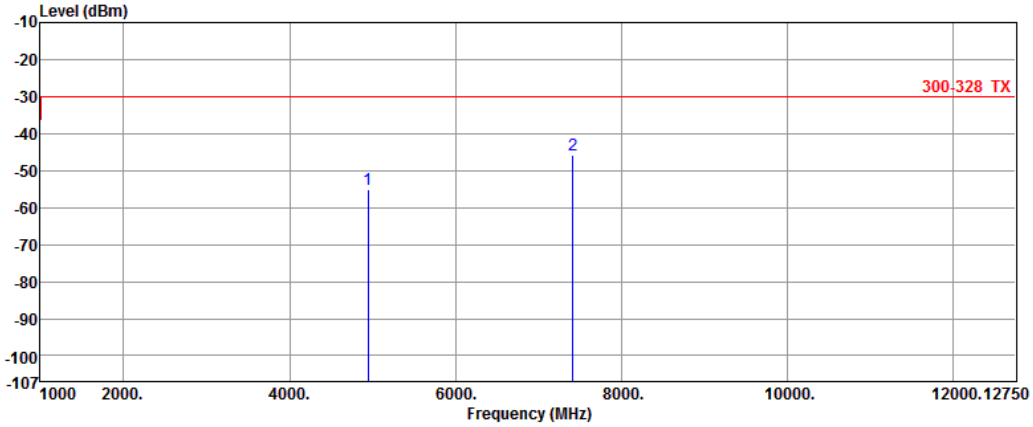
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4958.13	-54.44	-30.00	-24.44	12.21	-66.65
2	7419.33	-46.43	-30.00	-16.43	16.95	-63.38

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		

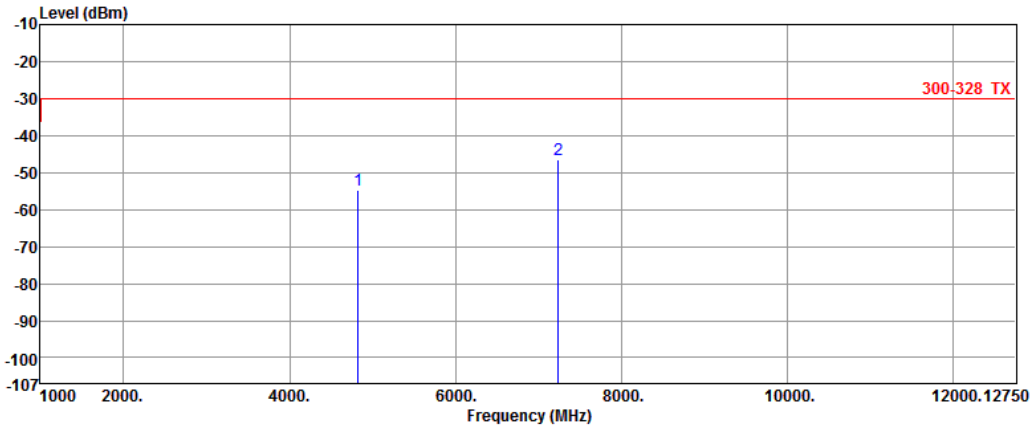


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4945.38	-55.02	-30.00	-25.02	11.57	-66.59
2	7417.77	-45.63	-30.00	-15.63	17.85	-63.48

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.12 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT20

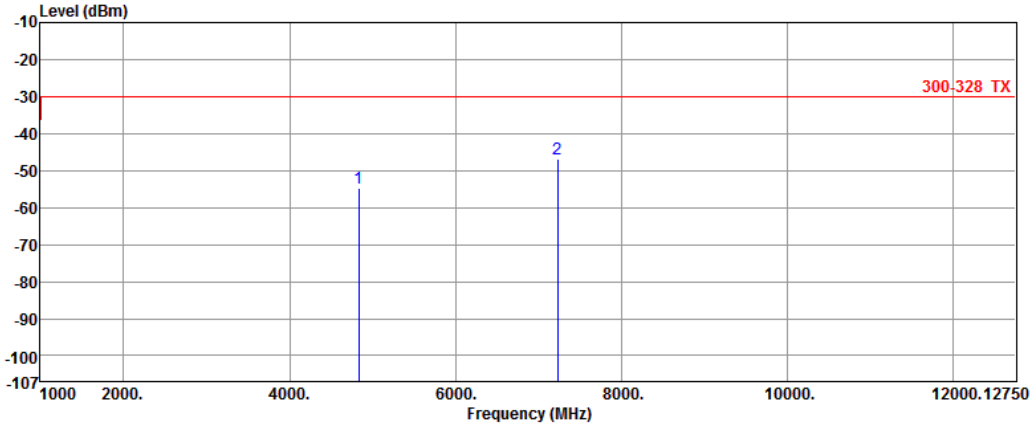
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4829.88	-54.71	-30.00	-24.71	11.61	-66.32
2	7240.11	-46.43	-30.00	-16.43	17.41	-63.84

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

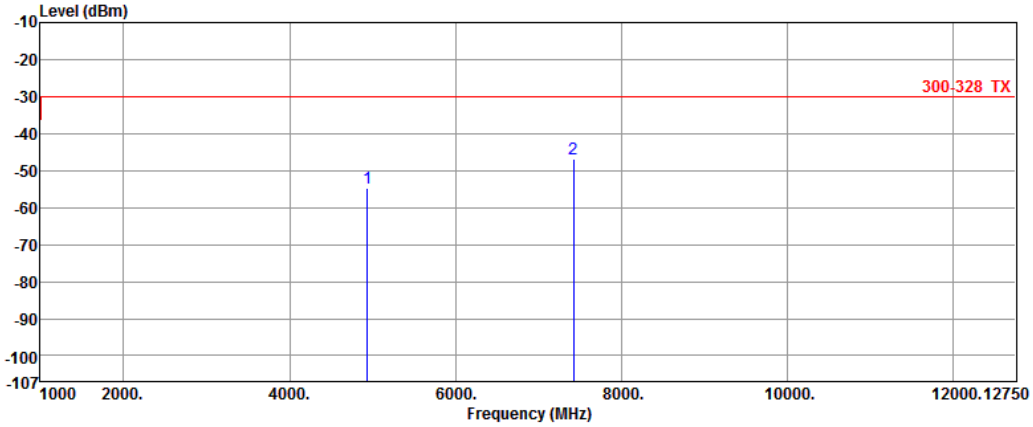
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4833.15	-54.69	-30.00	-24.69	11.71	-66.40
2	7231.23	-46.99	-30.00	-16.99	17.24	-64.23

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

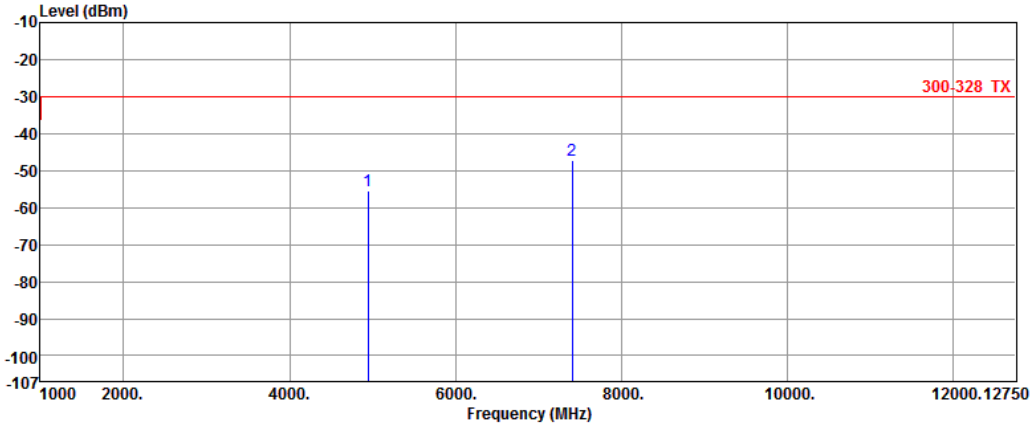
Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4936.11	-54.92	-30.00	-24.92	11.96	-66.88
2	7424.22	-46.76	-30.00	-16.76	16.95	-63.71

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Vertical		

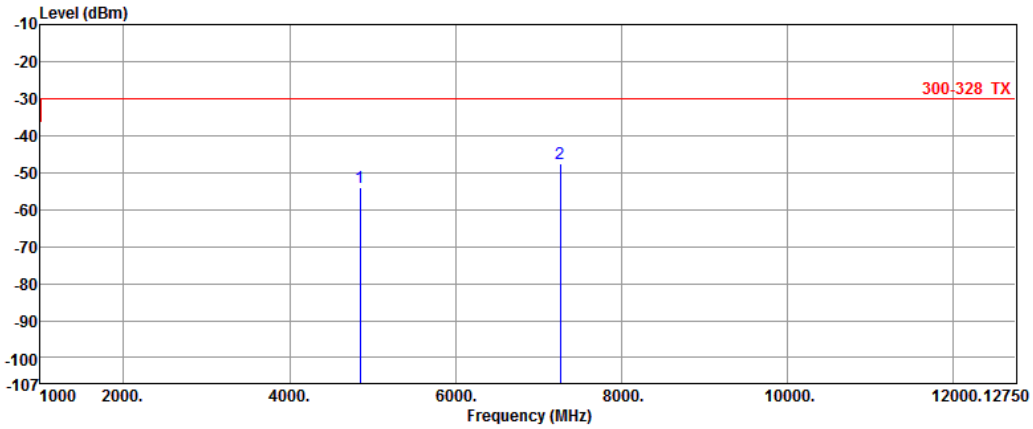


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.64	-55.30	-30.00	-25.30	11.56	-66.86
2	7408.77	-47.06	-30.00	-17.06	17.90	-64.96

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.13 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT40

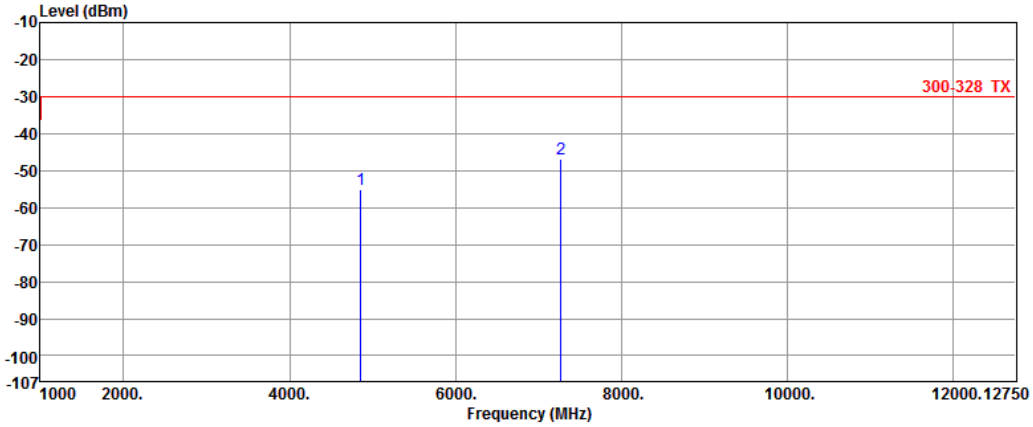
Modulation	HT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4849.25	-54.13	-30.00	-24.13	11.59	-65.72
2	7263.35	-47.67	-30.00	-17.67	17.43	-65.10

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

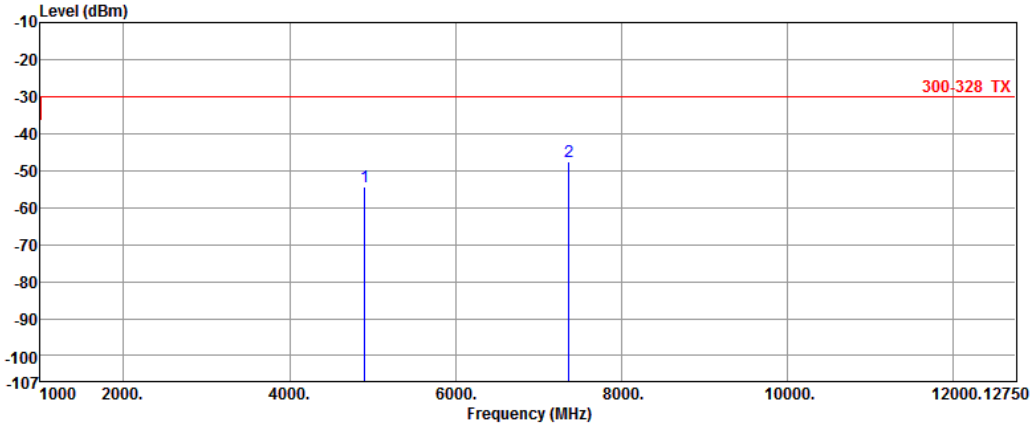
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4860.70	-55.09	-30.00	-25.09	11.54	-66.63
2	7268.51	-46.98	-30.00	-16.98	17.35	-64.33

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

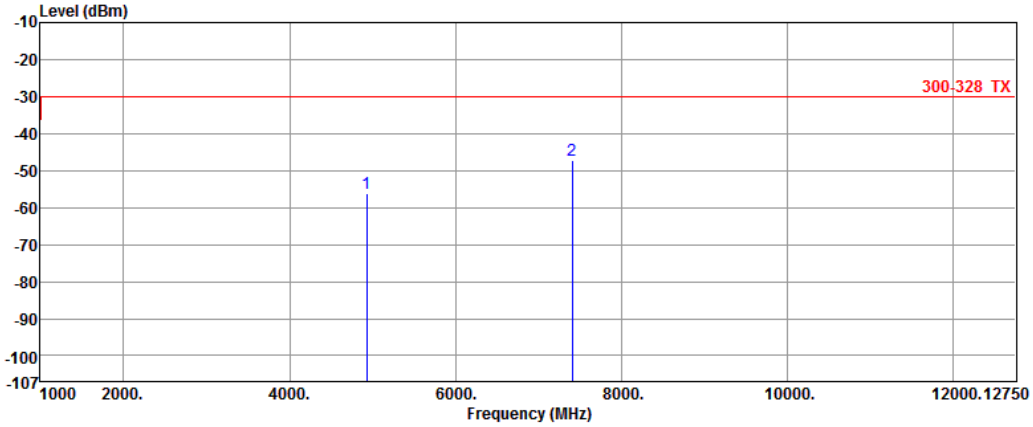
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4907.30	-54.33	-30.00	-24.33	11.62	-65.95
2	7369.45	-47.69	-30.00	-17.69	17.07	-64.76

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



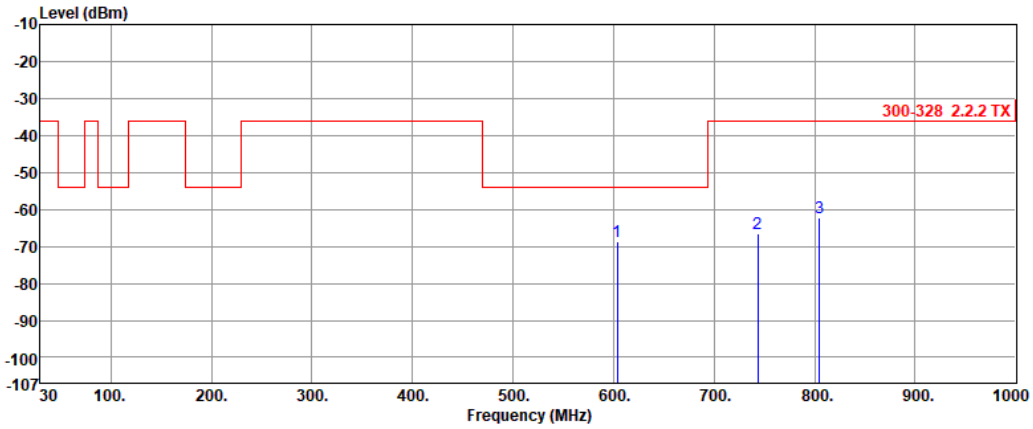
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4931.85	-56.17	-30.00	-26.17	11.49	-67.66
2	7405.45	-47.17	-30.00	-17.17	17.92	-65.09

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Configuration 3 : PIFA Antenna

3.5.14 Transmitter Radiated Unwanted Emissions (Below 1GHz)

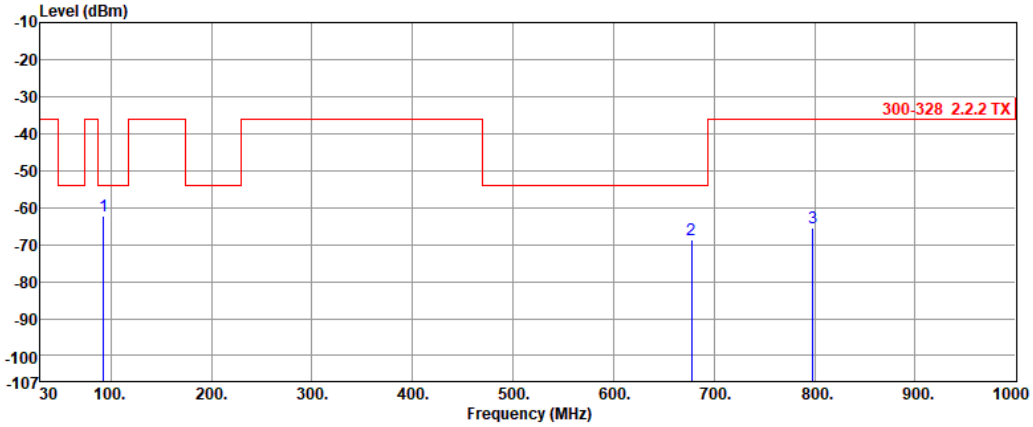
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	603.37	-68.84	-54.00	-14.84	6.91	-75.75
2	743.30	-66.40	-36.00	-30.40	9.39	-75.79
3	805.03	-62.28	-36.00	-26.28	9.75	-72.03

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

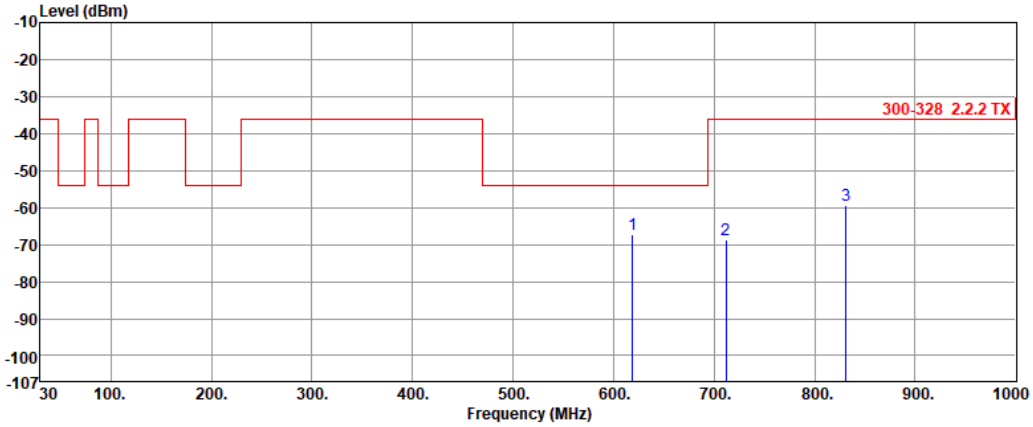
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.39	-62.30	-54.00	-8.30	-4.95	-57.35
2	677.35	-68.84	-54.00	-14.84	7.22	-76.06
3	798.24	-65.60	-36.00	-29.60	9.29	-74.89

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

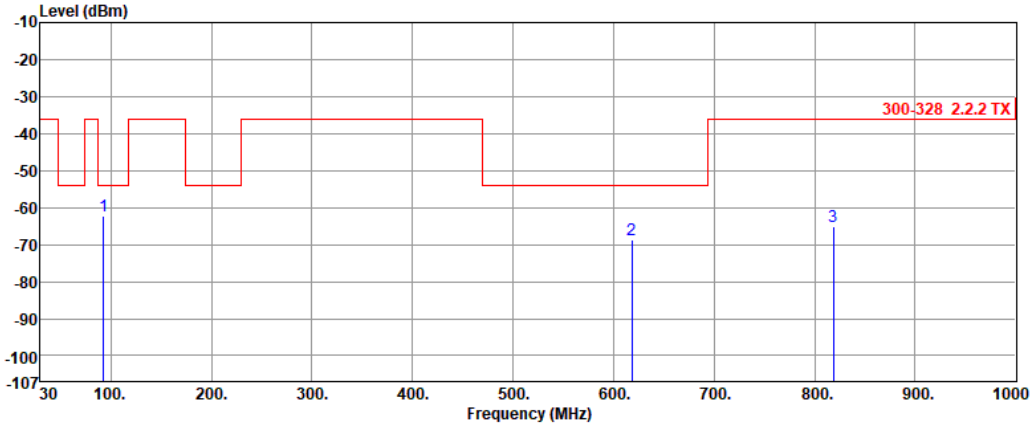
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	618.70	-67.35	-54.00	-13.35	7.00	-74.35
2	711.54	-68.85	-36.00	-32.85	8.26	-77.11
3	831.22	-59.41	-36.00	-23.41	10.03	-69.44

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

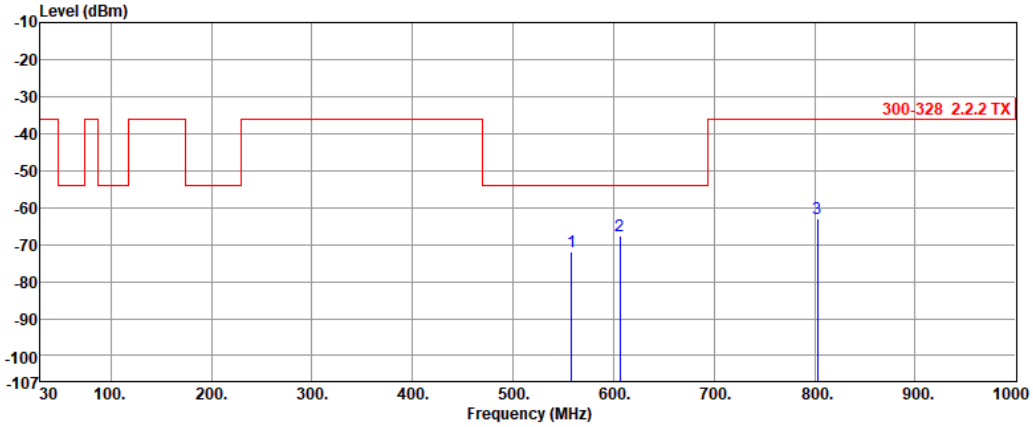
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.70	-62.15	-54.00	-8.15	-4.93	-57.22
2	618.17	-68.78	-54.00	-14.78	7.26	-76.04
3	818.61	-65.01	-36.00	-29.01	9.78	-74.79

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

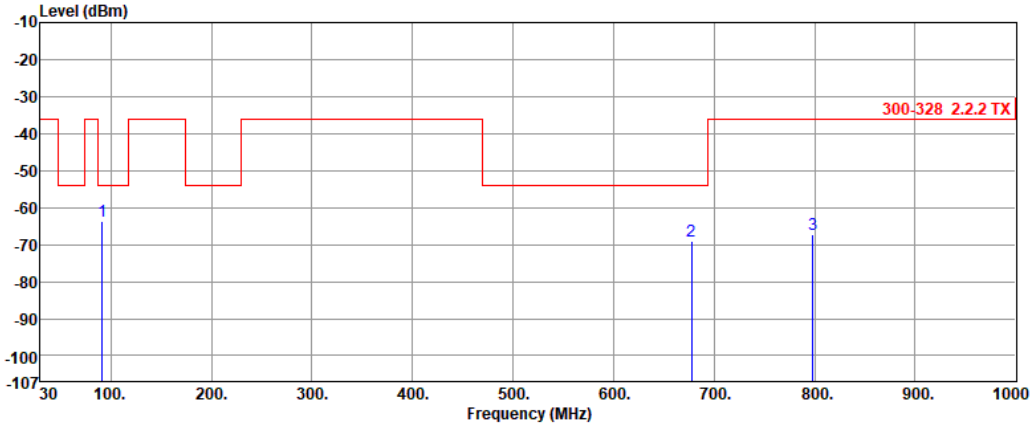
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	558.36	-71.81	-54.00	-17.81	4.67	-76.48
2	606.50	-67.55	-54.00	-13.55	6.42	-73.97
3	803.09	-63.04	-36.00	-27.04	9.78	-72.82

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

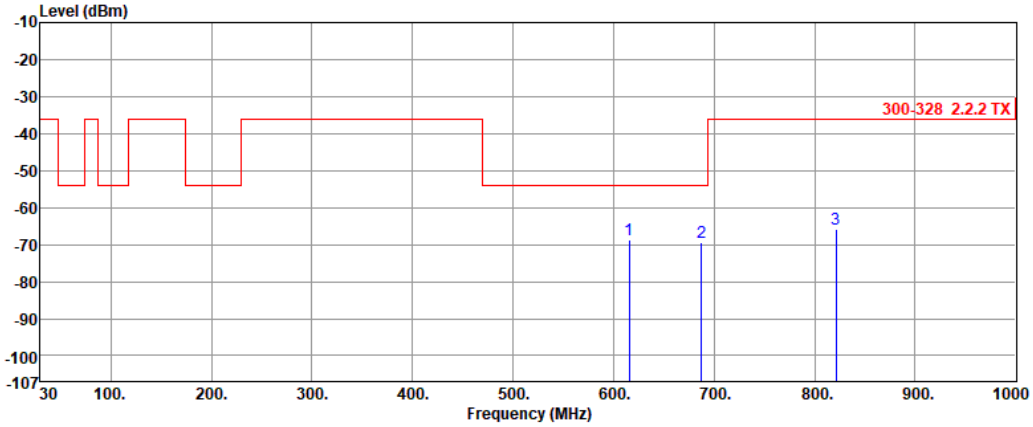
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.33	-63.84	-54.00	-9.84	-5.02	-58.82
2	677.37	-68.89	-54.00	-14.89	7.22	-76.11
3	798.24	-67.19	-36.00	-31.19	9.29	-76.48

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

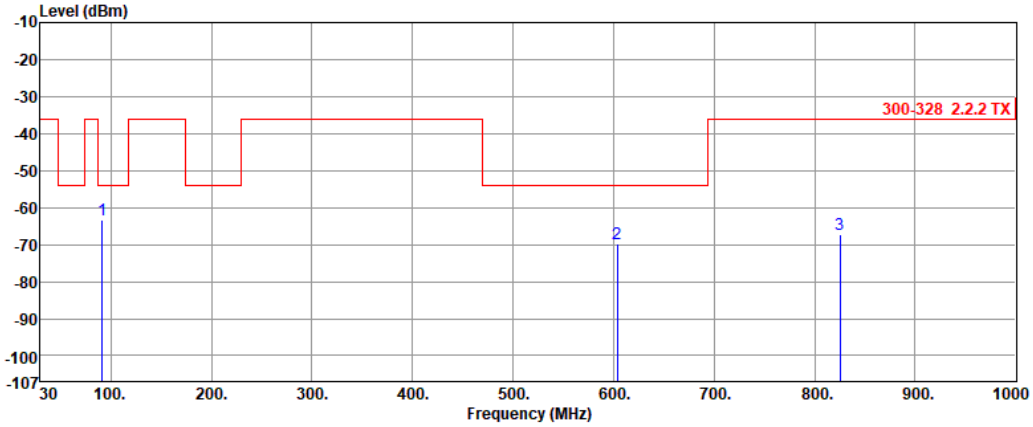
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	615.38	-68.59	-54.00	-14.59	7.02	-75.61
2	687.12	-69.52	-54.00	-15.52	7.52	-77.04
3	821.52	-65.72	-36.00	-29.72	9.97	-75.69

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

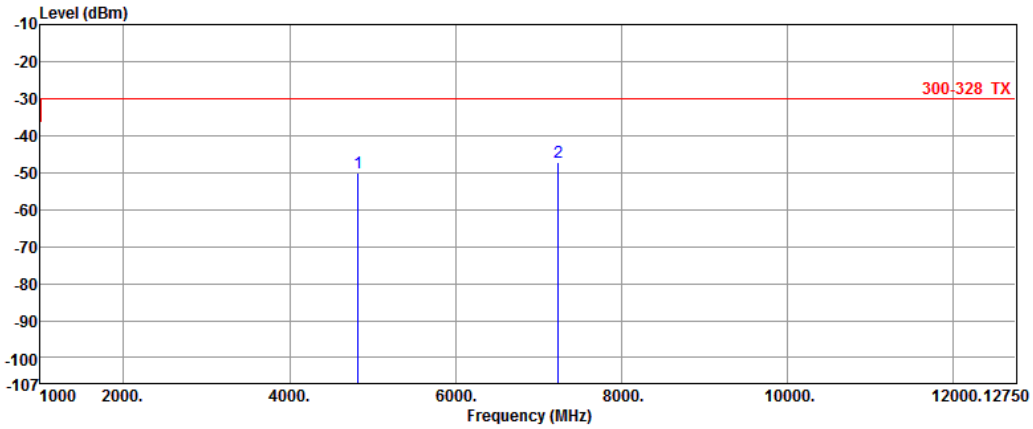


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.53	-63.37	-54.00	-9.37	-5.00	-58.37
2	603.84	-69.69	-54.00	-15.69	7.44	-77.13
3	825.40	-67.25	-36.00	-31.25	10.00	-77.25

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.15 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11b

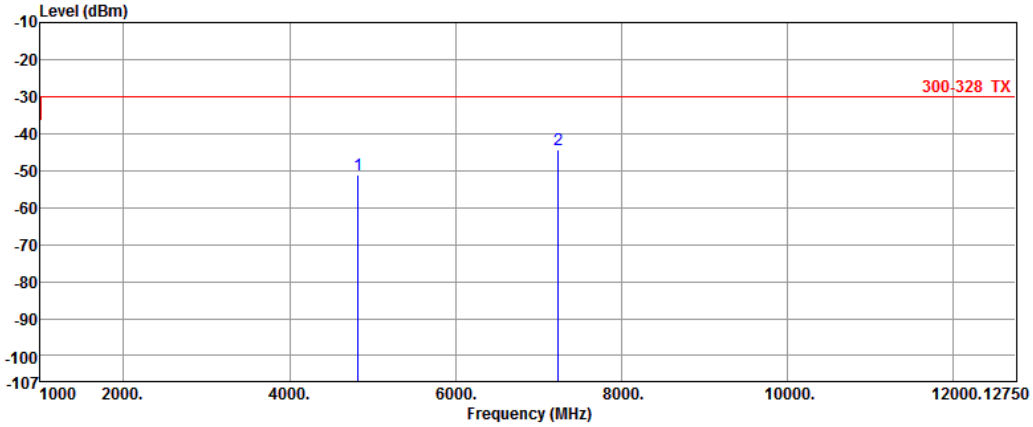
Modulation	11b	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4823.85	-50.12	-30.00	-20.12	11.62	-61.74
2	7235.12	-47.39	-30.00	-17.39	17.40	-64.79

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

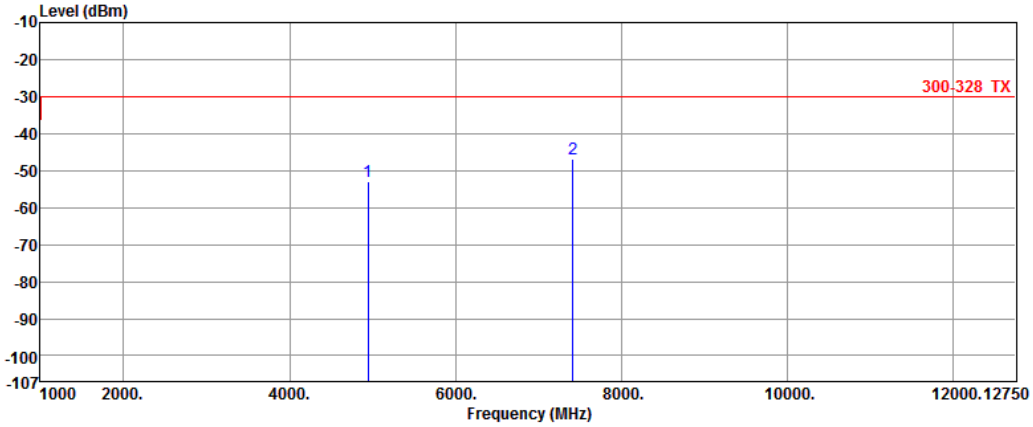
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4823.97	-51.27	-30.00	-21.27	11.76	-63.03
2	7235.08	-44.31	-30.00	-14.31	17.25	-61.56

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

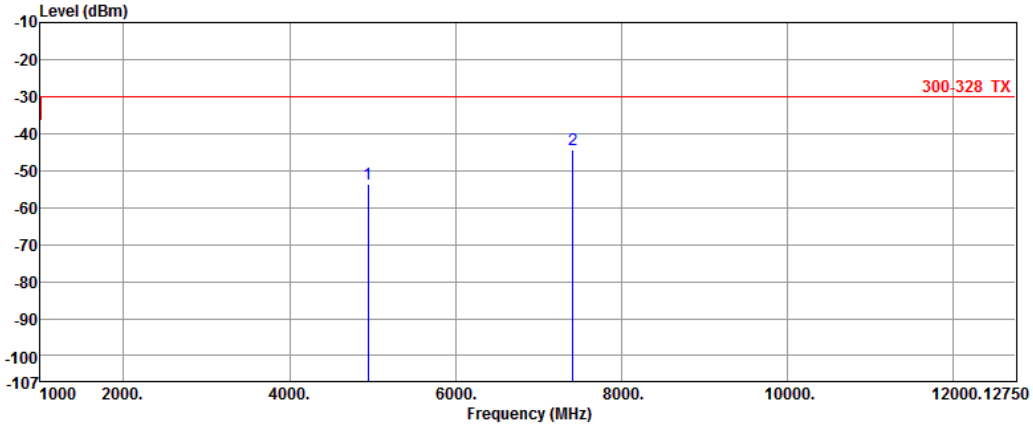
Modulation	11b	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4942.69	-53.06	-30.00	-23.06	12.03	-65.09
2	7414.26	-47.04	-30.00	-17.04	16.93	-63.97

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11b	Test Freq. (MHz)	2472
Polarization	Vertical		

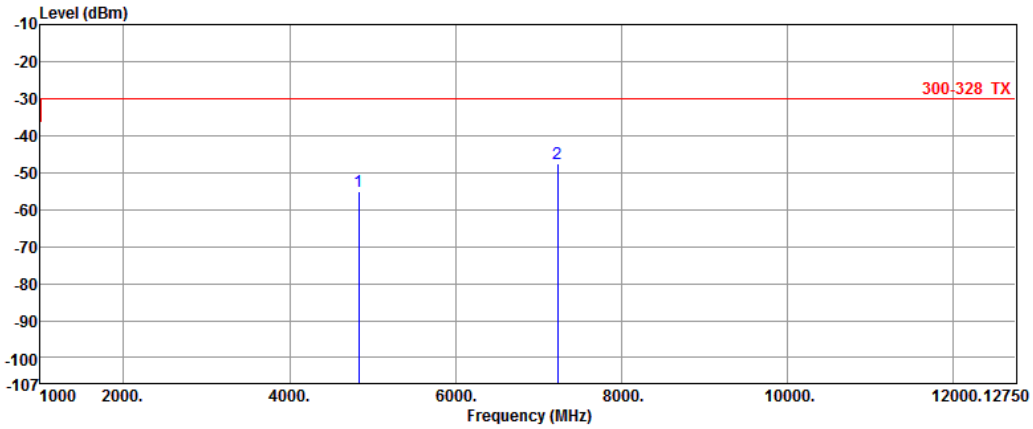


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.82	-53.52	-30.00	-23.52	11.56	-65.08
2	7413.54	-44.18	-30.00	-14.18	17.87	-62.05

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.16 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11g

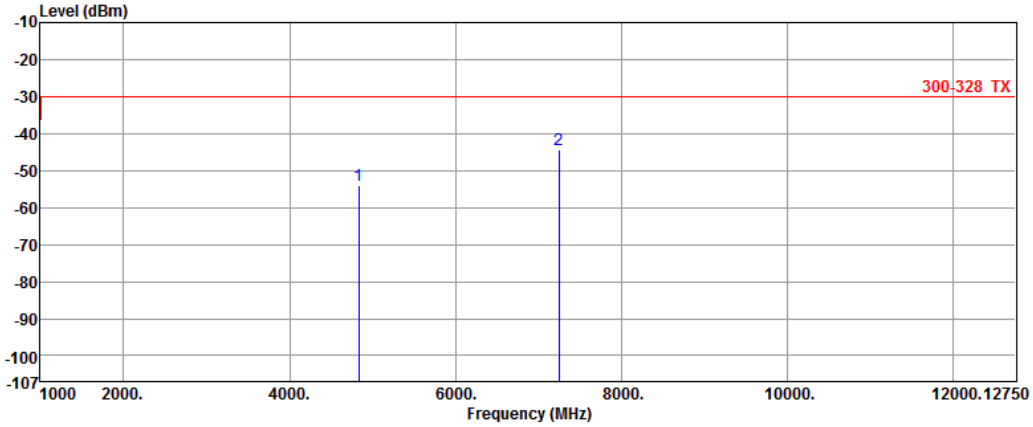
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4833.06	-55.22	-30.00	-25.22	11.61	-66.83
2	7230.45	-47.58	-30.00	-17.58	17.40	-64.98

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

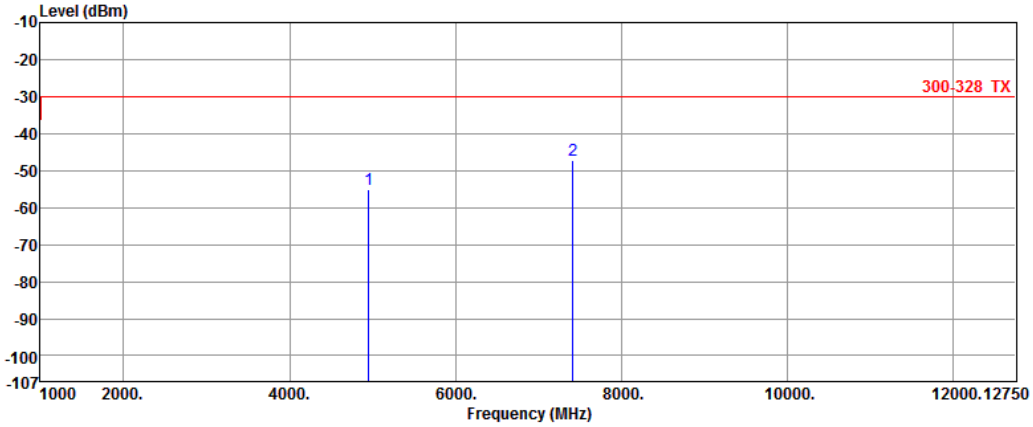
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4837.80	-54.04	-30.00	-24.04	11.68	-65.72
2	7242.81	-44.37	-30.00	-14.37	17.28	-61.65

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

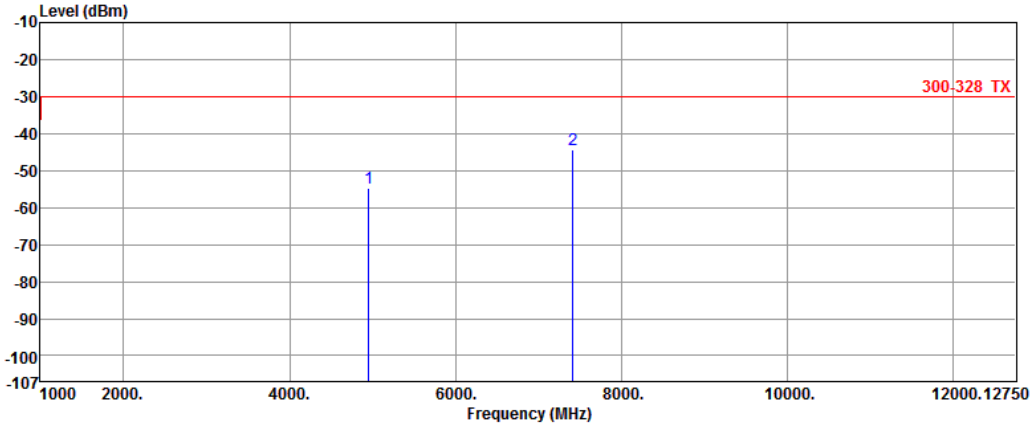
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4956.42	-54.96	-30.00	-24.96	12.19	-67.15
2	7413.96	-47.33	-30.00	-17.33	16.93	-64.26

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		

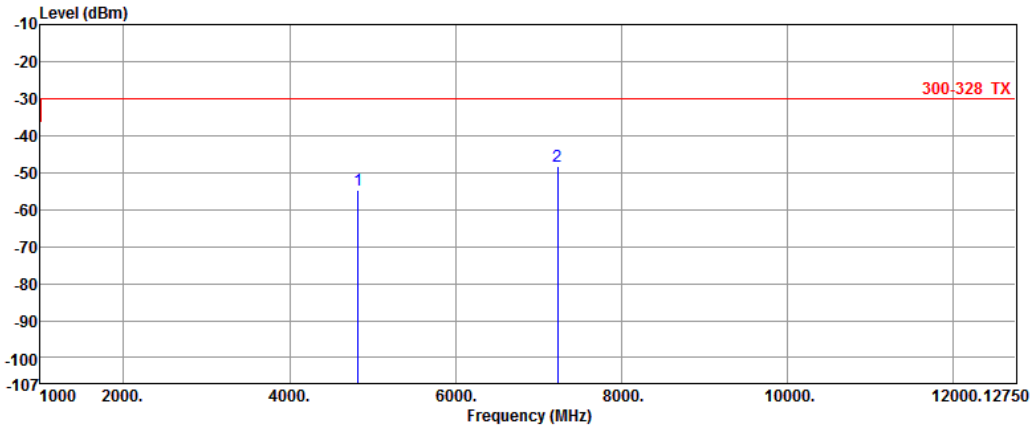


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4955.46	-54.88	-30.00	-24.88	11.64	-66.52
2	7417.98	-44.26	-30.00	-14.26	17.85	-62.11

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.17 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT20

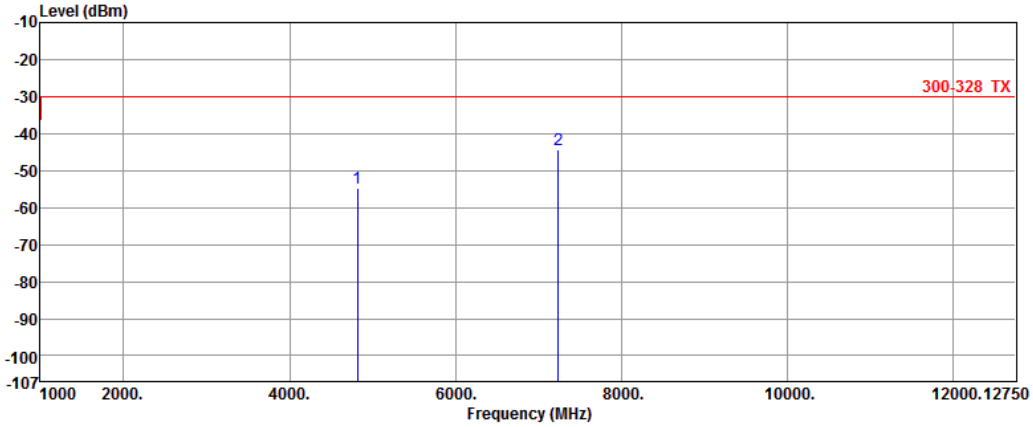
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4829.07	-54.81	-30.00	-24.81	11.61	-66.42
2	7231.20	-48.45	-30.00	-18.45	17.41	-65.86

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

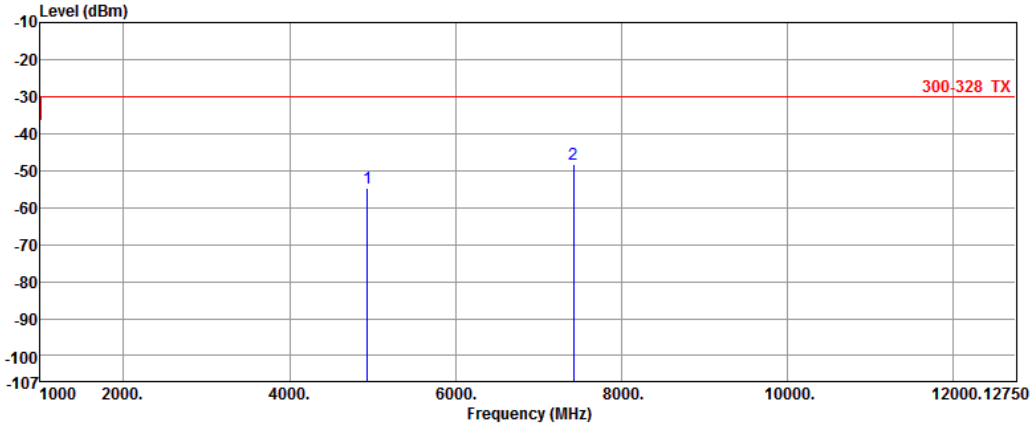
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4819.35	-54.84	-30.00	-24.84	11.80	-66.64
2	7241.70	-44.53	-30.00	-14.53	17.27	-61.80

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

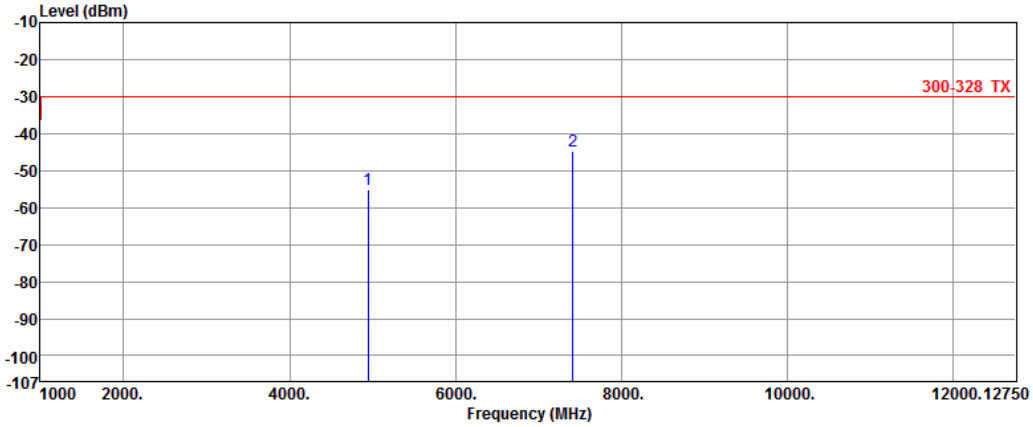
Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4934.76	-54.74	-30.00	-24.74	11.94	-66.68
2	7419.36	-48.32	-30.00	-18.32	16.95	-65.27

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Vertical		

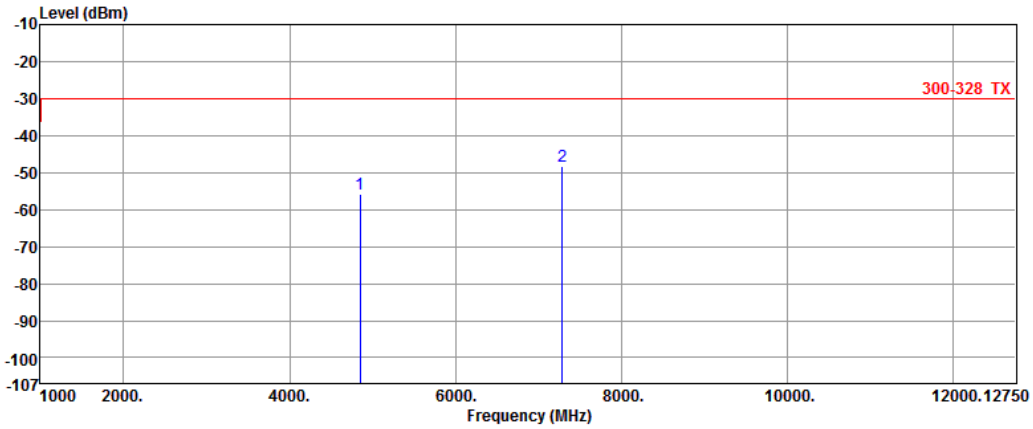


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4948.62	-55.15	-30.00	-25.15	11.60	-66.75
2	7412.94	-44.71	-30.00	-14.71	17.87	-62.58

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.18 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT40

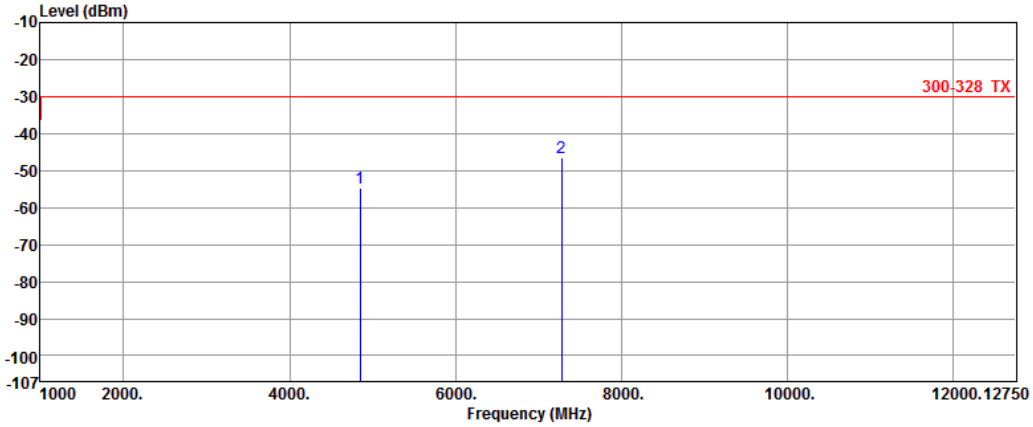
Modulation	HT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4850.25	-55.66	-30.00	-25.66	11.59	-67.25
2	7286.50	-48.35	-30.00	-18.35	17.46	-65.81

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

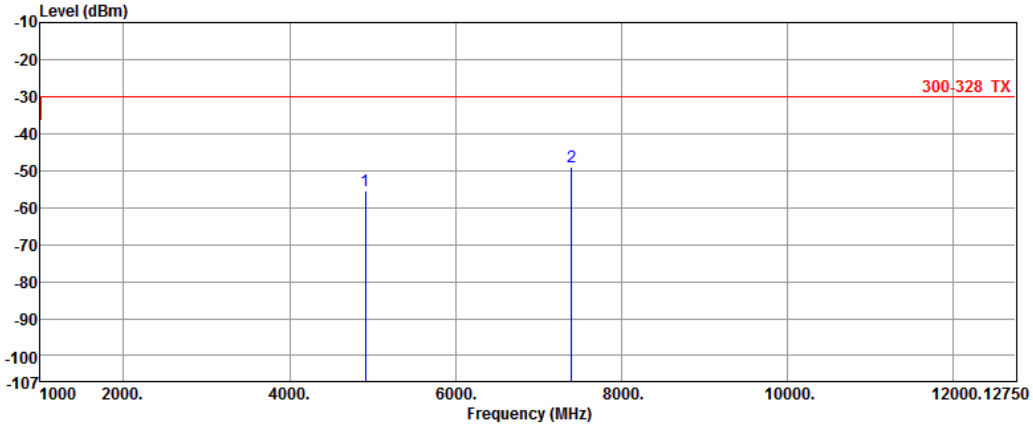
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4847.05	-54.84	-30.00	-24.84	11.63	-66.47
2	7276.60	-46.42	-30.00	-16.42	17.38	-63.80

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

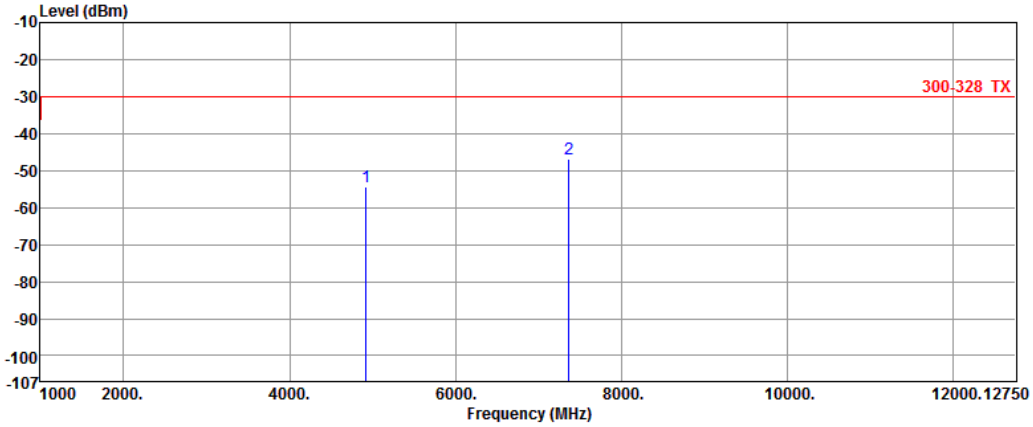
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4916.20	-55.51	-30.00	-25.51	11.72	-67.23
2	7401.65	-49.10	-30.00	-19.10	16.90	-66.00

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



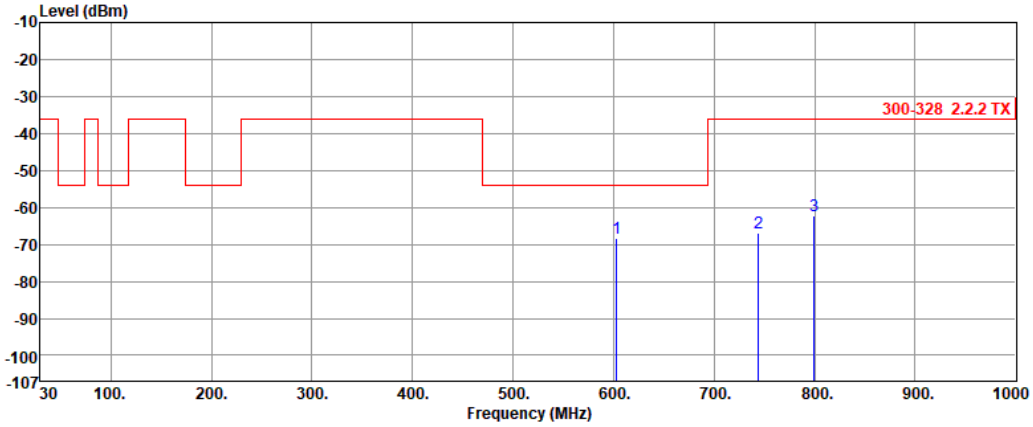
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4921.20	-54.47	-30.00	-24.47	11.43	-65.90
2	7367.60	-46.75	-30.00	-16.75	17.79	-64.54

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Configuration 4: Isolated Magnetic Dipole Antenna

3.5.19 Transmitter Radiated Unwanted Emissions (Below 1GHz)

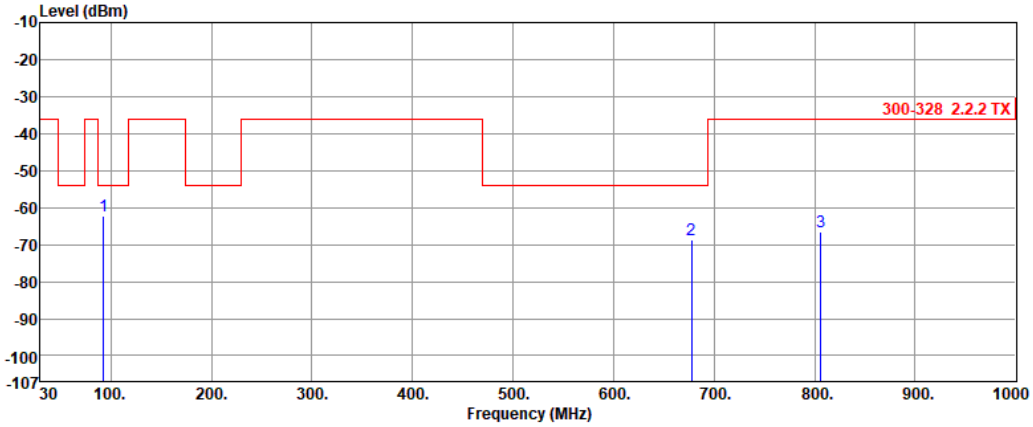
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	603.27	-68.49	-54.00	-14.49	6.91	-75.40
2	743.83	-66.91	-36.00	-30.91	9.41	-76.32
3	799.21	-62.22	-36.00	-26.22	9.81	-72.03

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

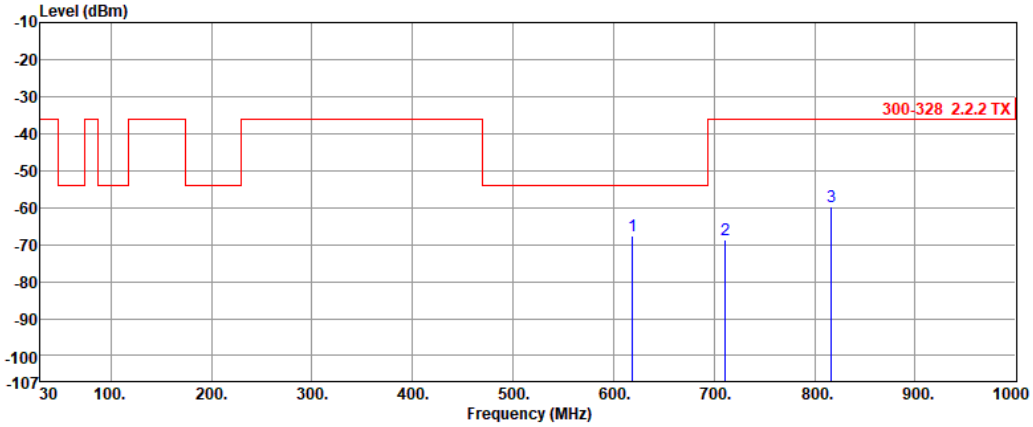
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.90	-62.44	-54.00	-8.44	-4.92	-57.52
2	677.56	-68.78	-54.00	-14.78	7.21	-75.99
3	806.15	-66.58	-36.00	-30.58	9.51	-76.09

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

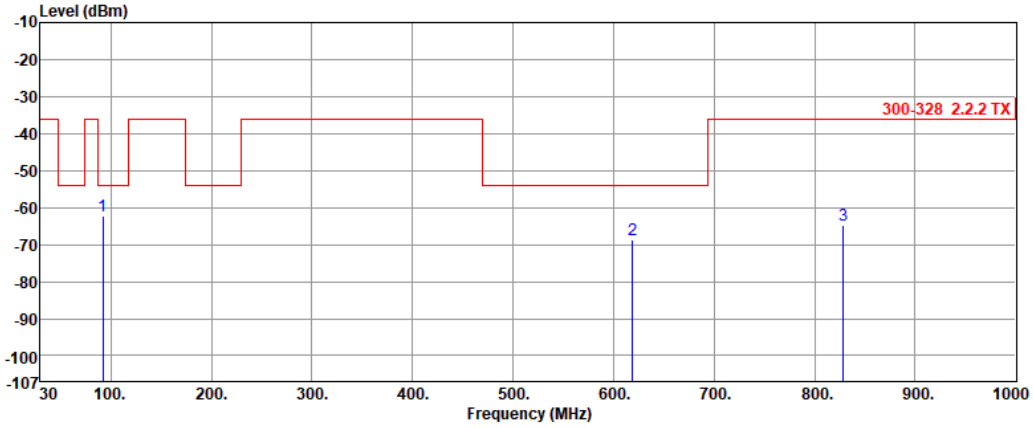
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	618.70	-67.76	-54.00	-13.76	7.00	-74.76
2	711.33	-68.69	-36.00	-32.69	8.26	-76.95
3	816.67	-59.91	-36.00	-23.91	9.87	-69.78

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

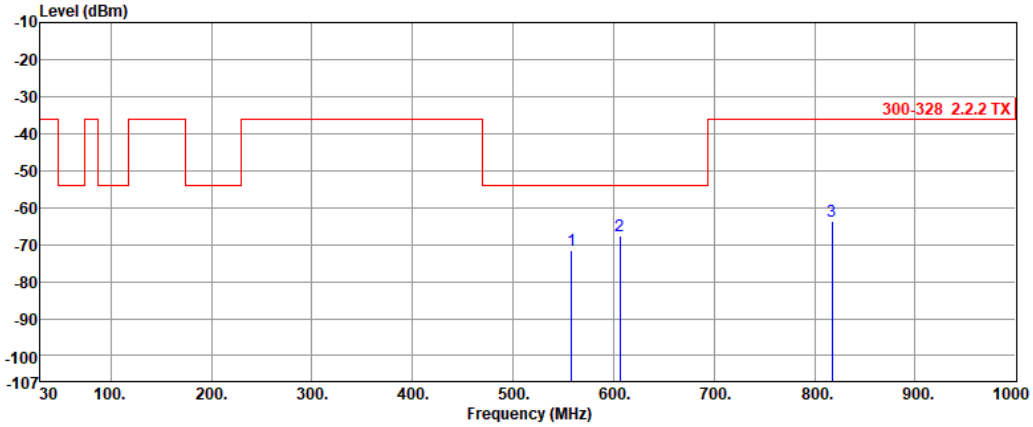
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	92.26	-62.33	-54.00	-8.33	-4.96	-57.37
2	618.56	-68.82	-54.00	-14.82	7.25	-76.07
3	828.31	-64.89	-36.00	-28.89	9.95	-74.84

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

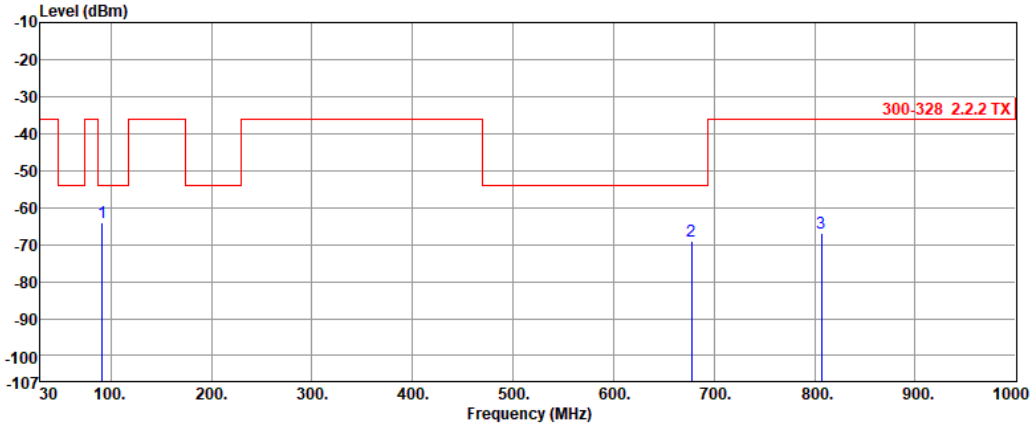
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	558.37	-71.56	-54.00	-17.56	4.67	-76.23
2	606.55	-67.64	-54.00	-13.64	6.40	-74.04
3	817.64	-63.66	-36.00	-27.66	9.89	-73.55

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

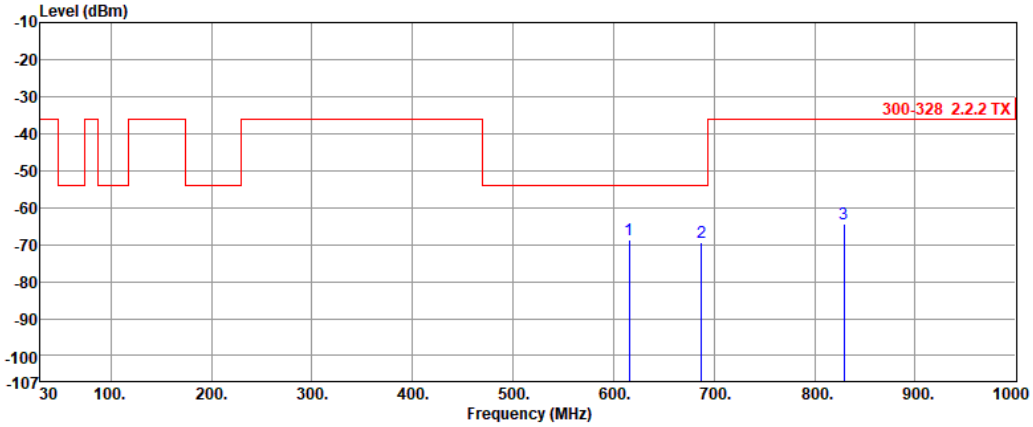
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.29	-63.94	-54.00	-9.94	-5.02	-58.92
2	677.39	-68.88	-54.00	-14.88	7.22	-76.10
3	806.97	-66.76	-36.00	-30.76	9.53	-76.29

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

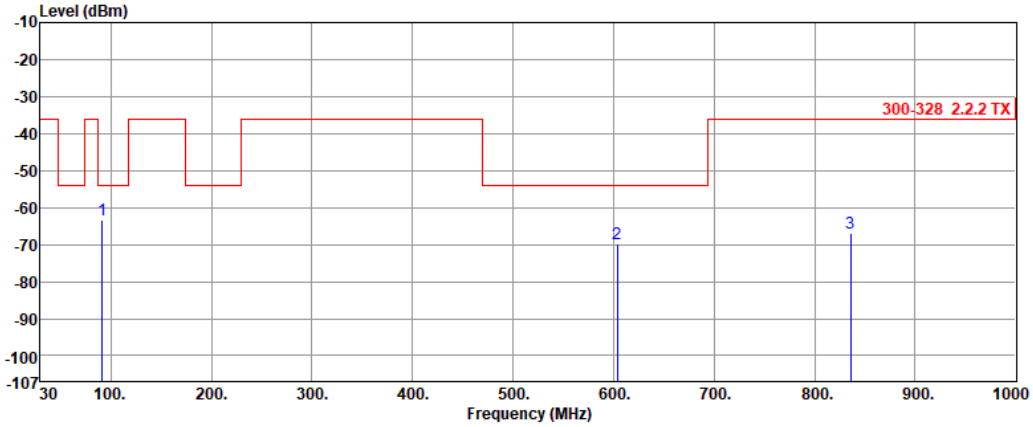
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	615.29	-68.85	-54.00	-14.85	7.02	-75.87
2	687.69	-69.32	-54.00	-15.32	7.57	-76.89
3	829.28	-64.46	-36.00	-28.46	10.04	-74.50

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

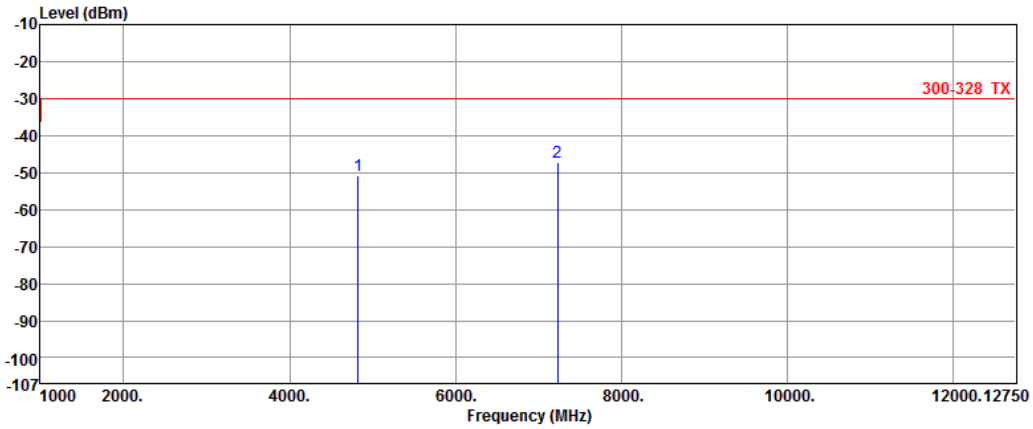


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	91.25	-63.36	-54.00	-9.36	-5.02	-58.34
2	603.40	-69.65	-54.00	-15.65	7.40	-77.05
3	836.07	-67.04	-36.00	-31.04	9.98	-77.02

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.20 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11b

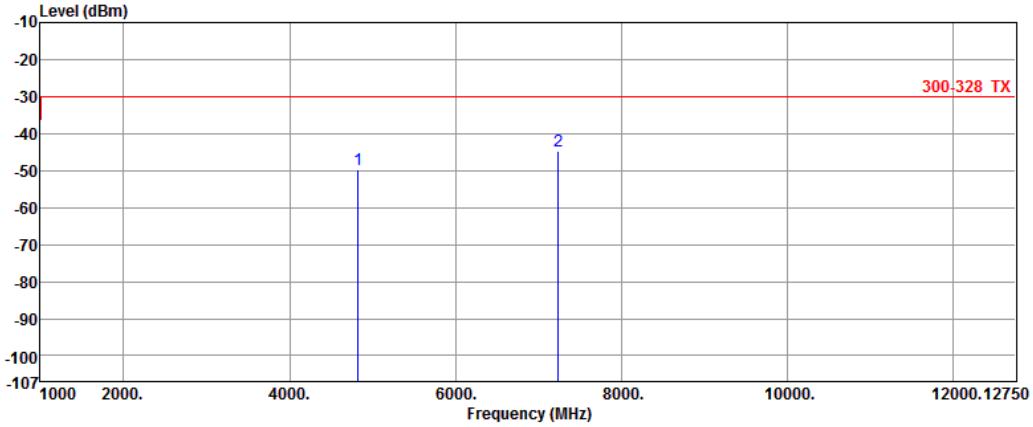
Modulation	11b	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4824.05	-50.75	-30.00	-20.75	11.62	-62.37
2	7234.36	-47.26	-30.00	-17.26	17.40	-64.66

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

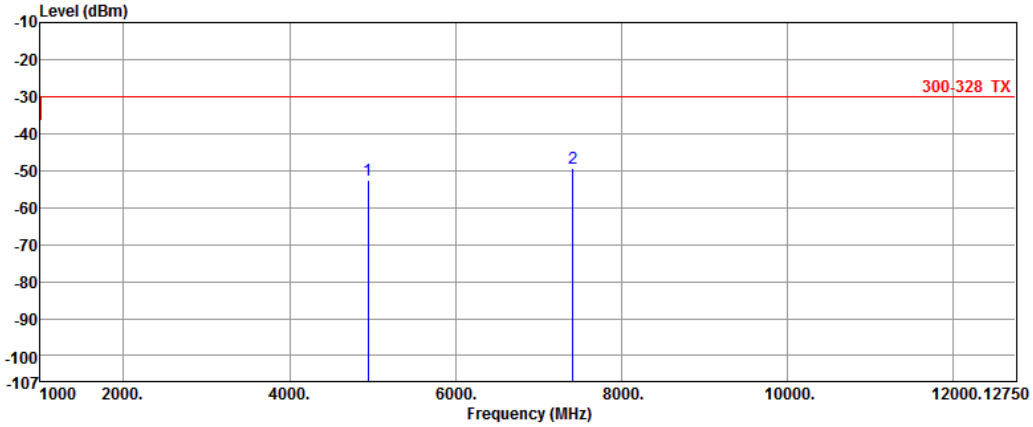
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4823.89	-49.82	-30.00	-19.82	11.77	-61.59
2	7236.06	-44.67	-30.00	-14.67	17.25	-61.92

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

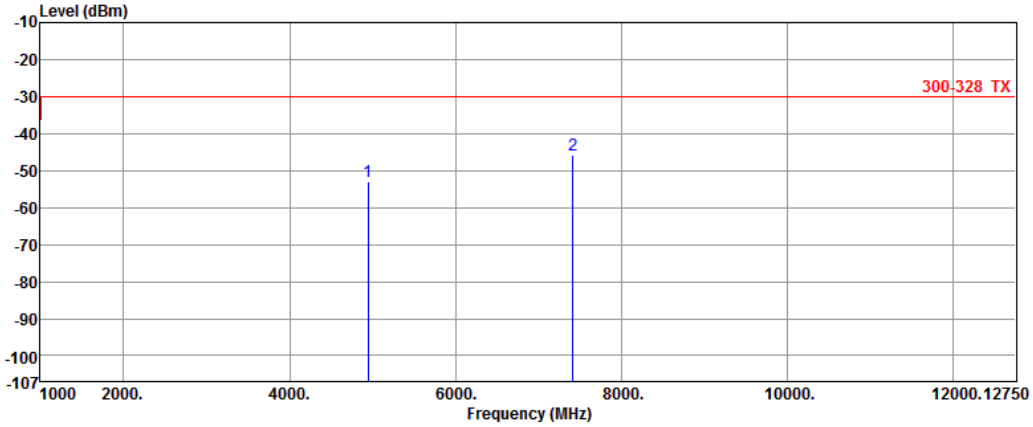
Modulation	11b	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.74	-52.75	-30.00	-22.75	12.04	-64.79
2	7411.12	-49.28	-30.00	-19.28	16.92	-66.20

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11b	Test Freq. (MHz)	2472
Polarization	Vertical		

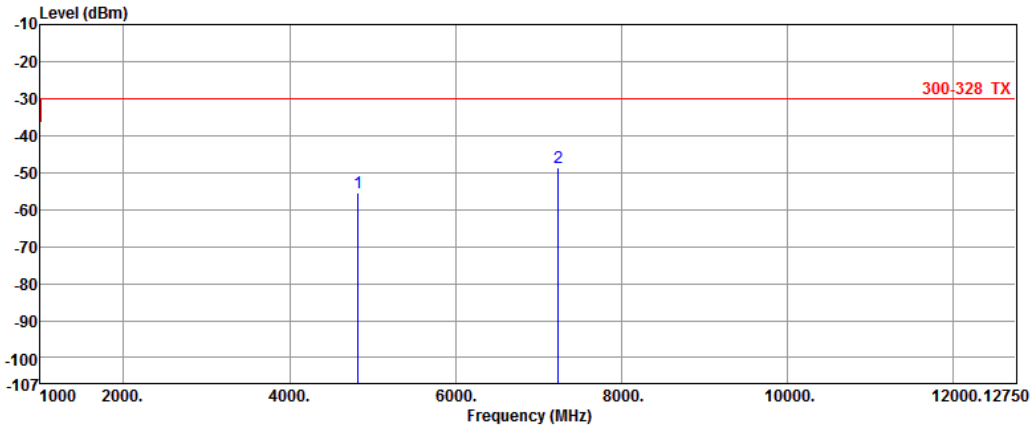


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4944.15	-53.05	-30.00	-23.05	11.56	-64.61
2	7416.99	-45.77	-30.00	-15.77	17.85	-63.62

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.21 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11g

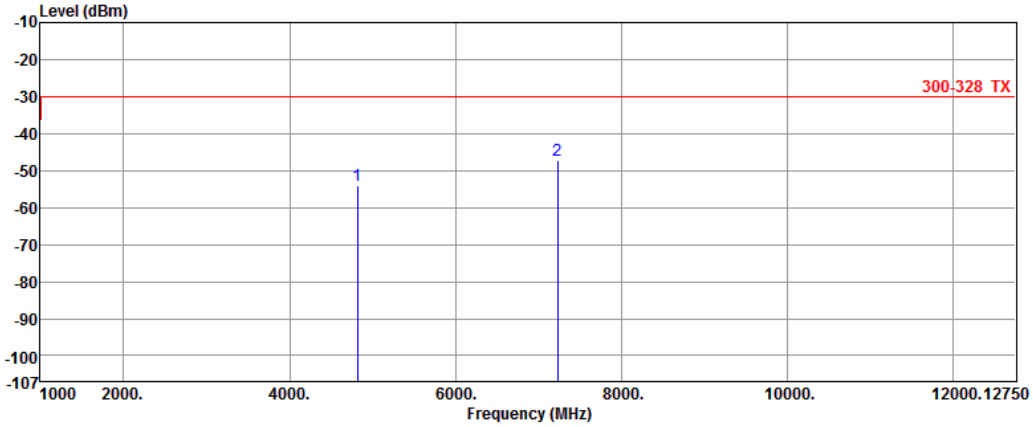
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4828.68	-55.61	-30.00	-25.61	11.61	-67.22
2	7236.57	-48.63	-30.00	-18.63	17.41	-66.04

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

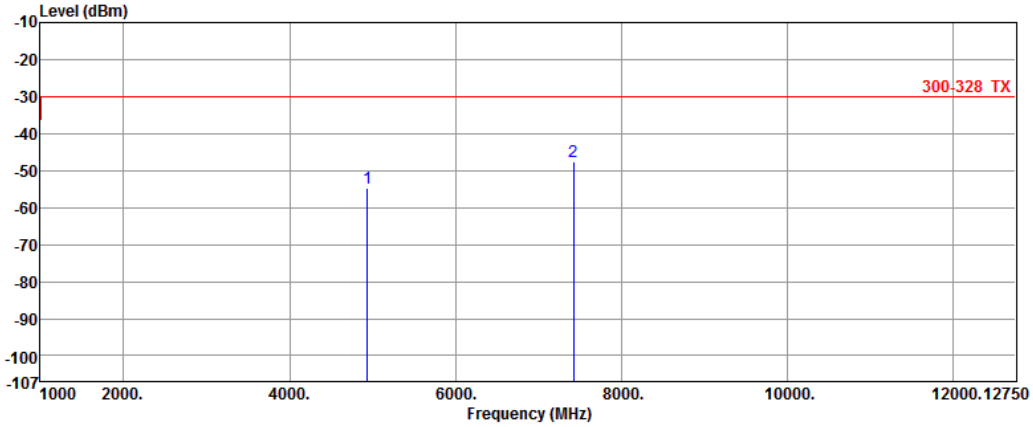
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4816.83	-54.17	-30.00	-24.17	11.81	-65.98
2	7227.33	-47.10	-30.00	-17.10	17.23	-64.33

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

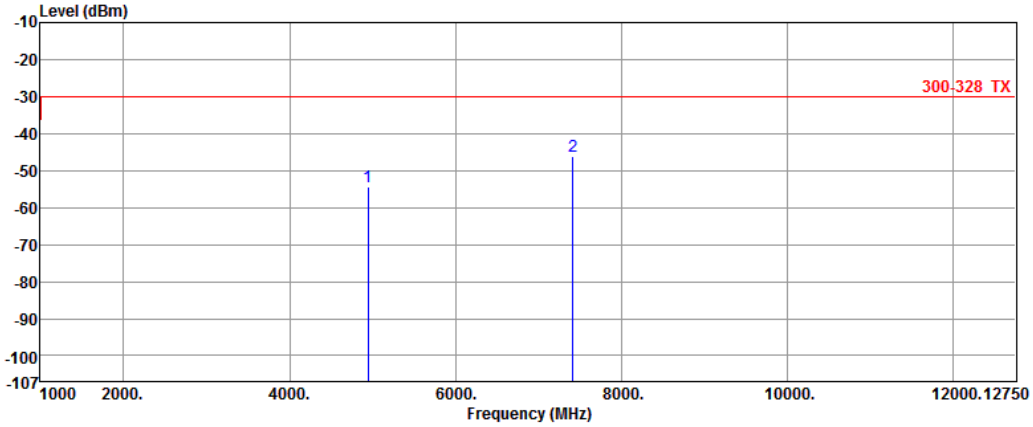
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4941.92	-54.68	-30.00	-24.68	12.02	-66.70
2	7418.70	-47.73	-30.00	-17.73	16.95	-64.68

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		

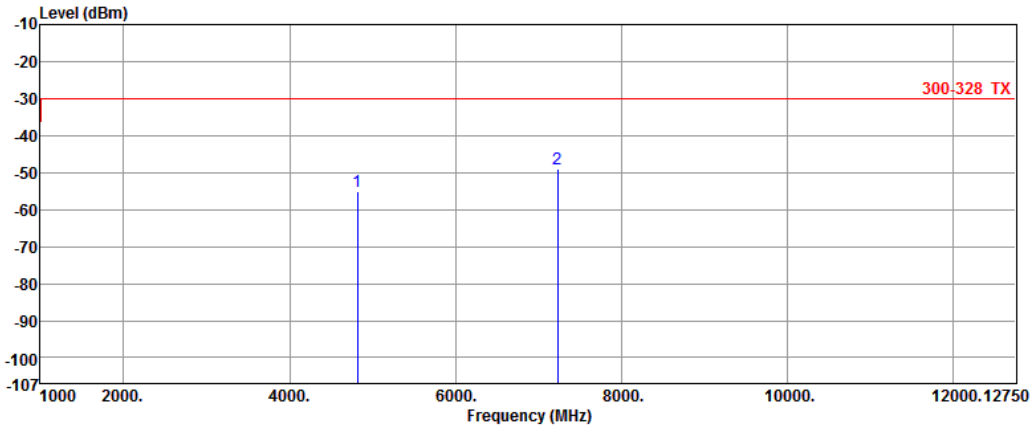


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4942.78	-54.35	-30.00	-24.35	11.56	-65.91
2	7415.22	-46.11	-30.00	-16.11	17.86	-63.97

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.22 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT20

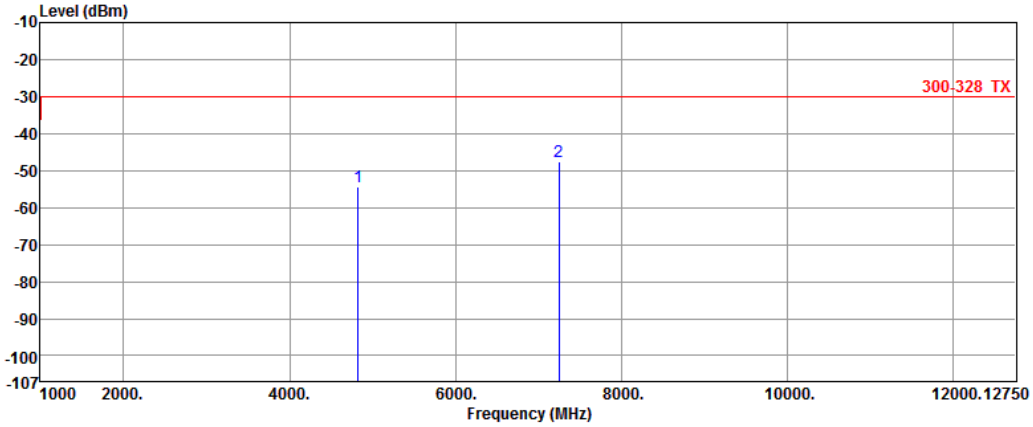
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4818.14	-54.97	-30.00	-24.97	11.63	-66.60
2	7230.20	-49.11	-30.00	-19.11	17.40	-66.51

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

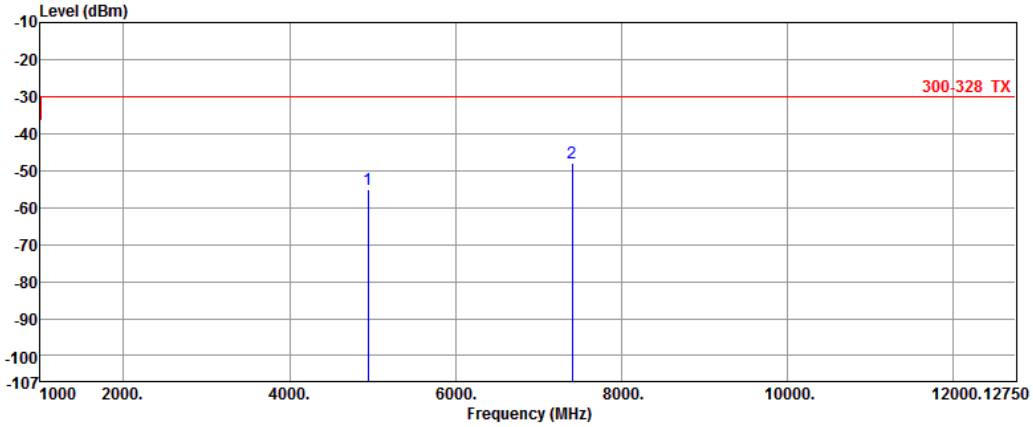
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4824.02	-54.28	-30.00	-24.28	11.76	-66.04
2	7242.98	-47.48	-30.00	-17.48	17.28	-64.76

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

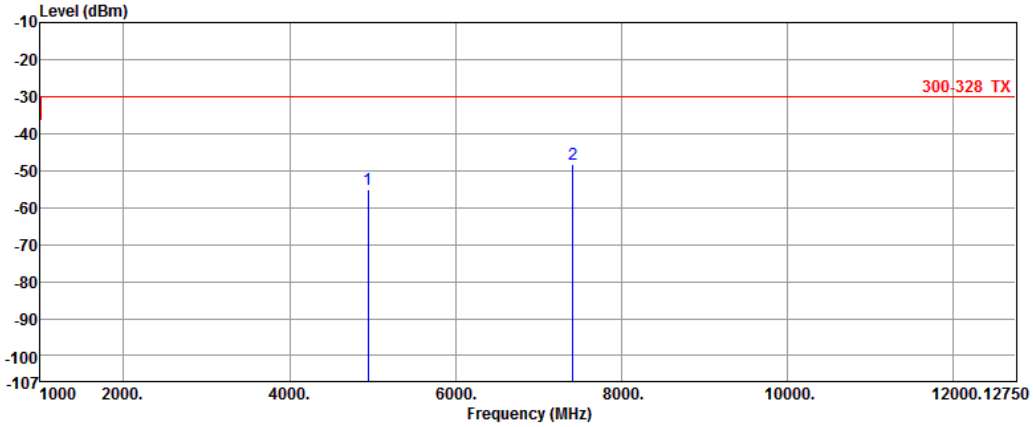
Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.98	-55.16	-30.00	-25.16	12.04	-67.20
2	7408.38	-48.09	-30.00	-18.09	16.92	-65.01

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT20	Test Freq. (MHz)	2472
Polarization	Vertical		

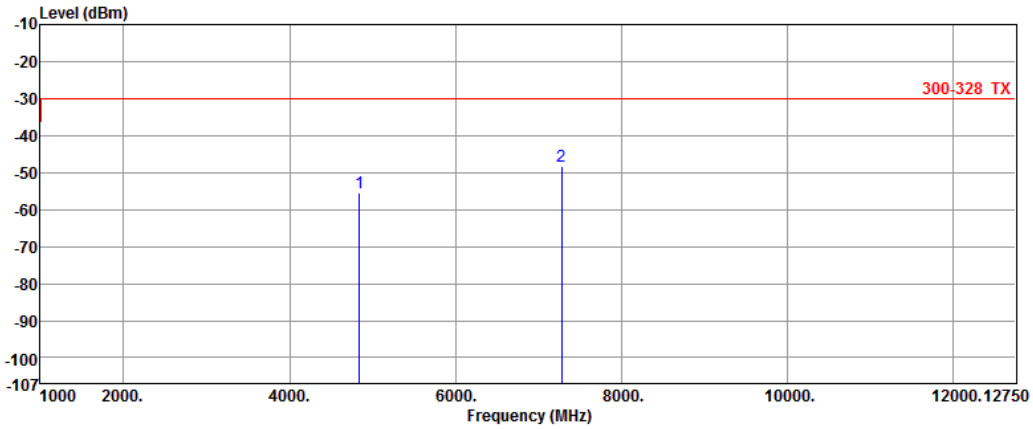


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4943.44	-55.26	-30.00	-25.26	11.56	-66.82
2	7413.48	-48.18	-30.00	-18.18	17.87	-66.05

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

3.5.23 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 802.11n HT40

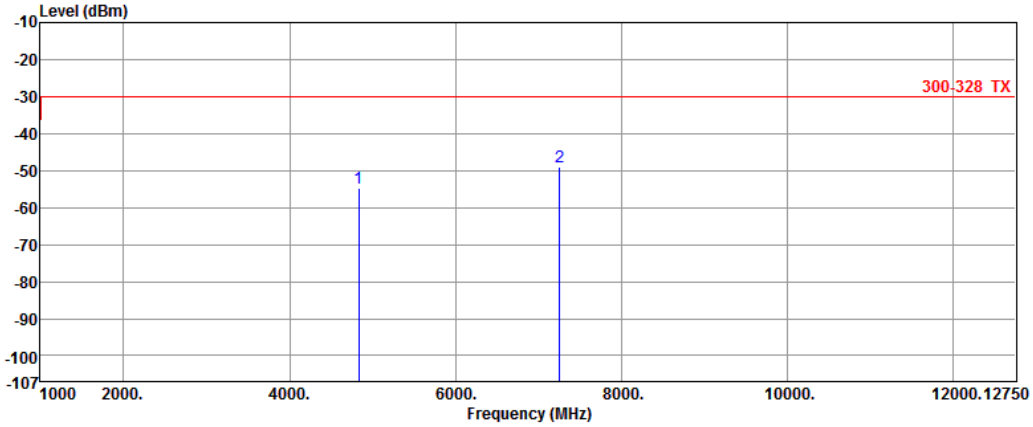
Modulation	HT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4840.96	-55.46	-30.00	-25.46	11.60	-67.06
2	7279.86	-48.48	-30.00	-18.48	17.44	-65.92

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

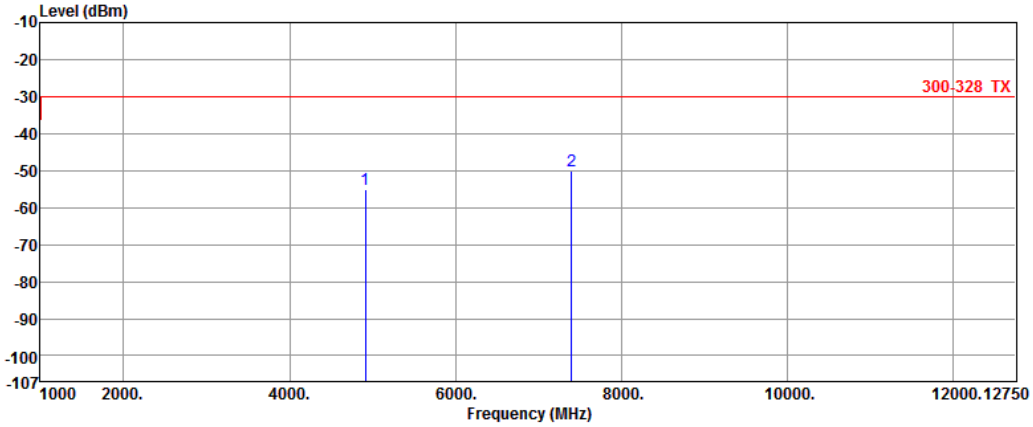
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4834.84	-54.59	-30.00	-24.59	11.70	-66.29
2	7255.20	-48.95	-30.00	-18.95	17.32	-66.27

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

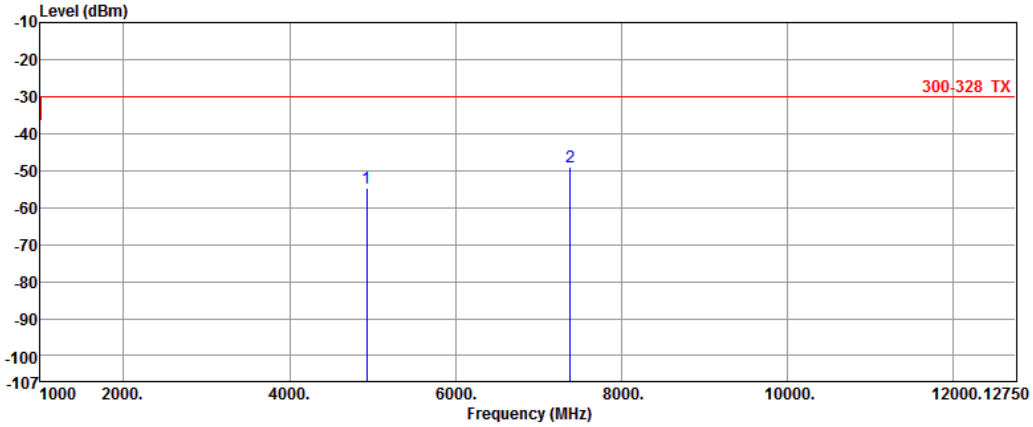
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4915.04	-55.03	-30.00	-25.03	11.71	-66.74
2	7395.44	-49.95	-30.00	-19.95	16.92	-66.87

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	4926.60	-54.84	-30.00	-24.84	11.46	-66.30
2	7383.70	-49.11	-30.00	-19.11	17.87	-66.98

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

4 Receiver Test Results

4.1 Receiver Spurious Emissions

4.1.1 Limit of Receiver Spurious Emissions

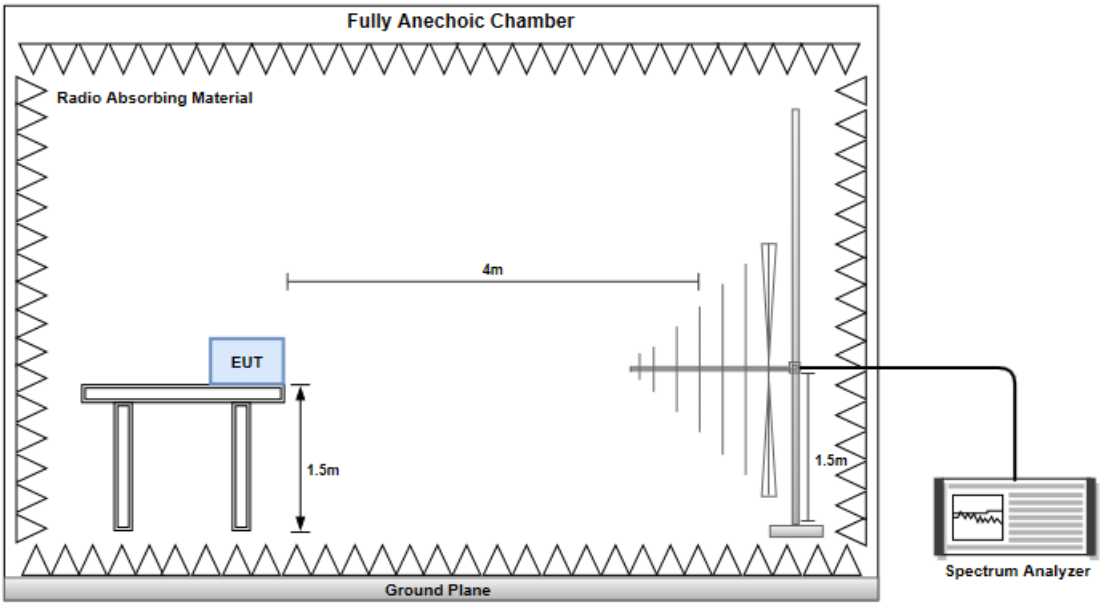
Frequency Range	Maximum power (dBm)	Measurement bandwidth (kHz)
30 MHz to 1 GHz	-57	100
Above 1 GHz to 12.75 GHz	-47	1000

4.1.2 Test Procedures

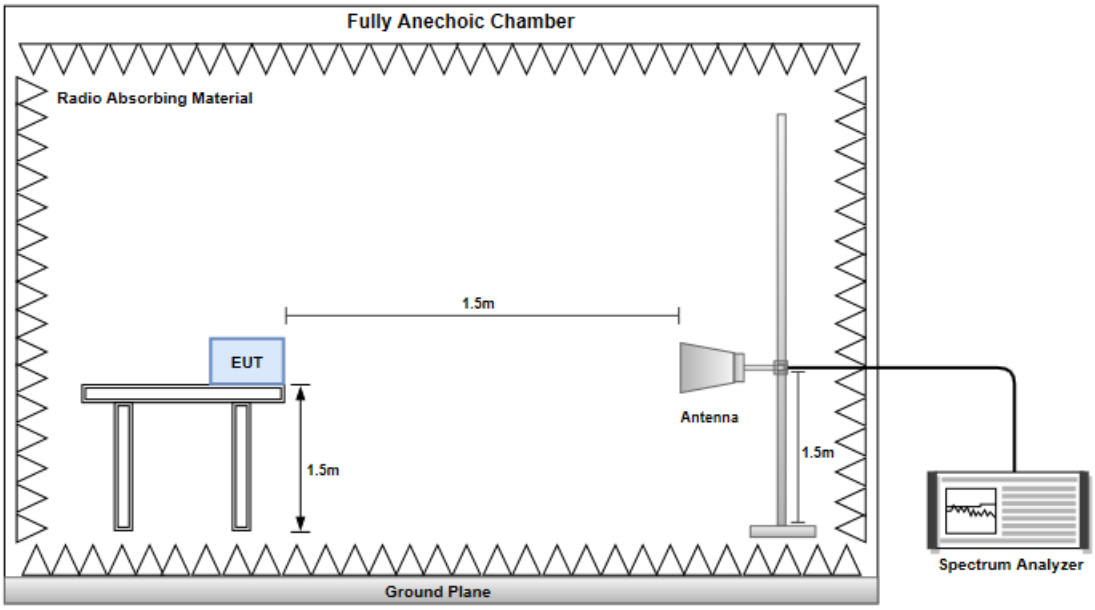
Reference to clause 5.4.10.2 of ETSI EN 300 328 V2.2.2 (2019-07).

4.1.3 Test Setup

Below 1GHz



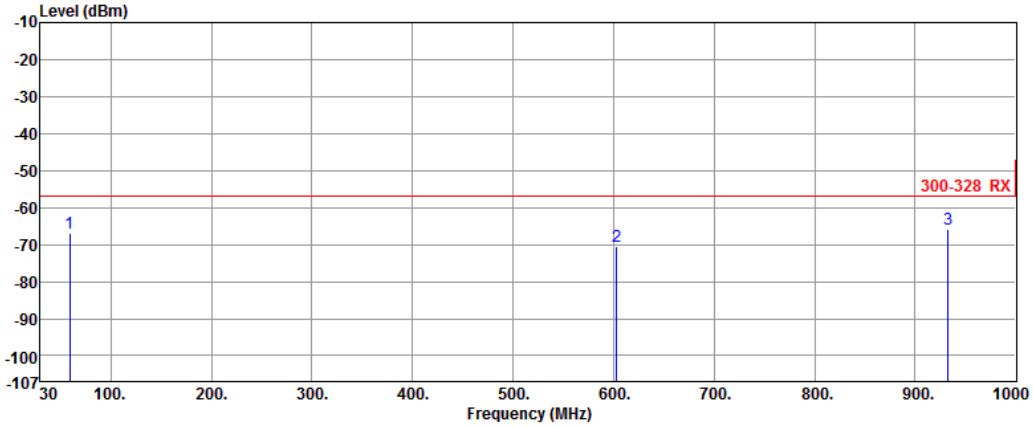
Above 1 GHz



Configuration 1 : Dipole Antenna

4.1.4 Receiver Radiated Unwanted Emissions (Below 1GHz)

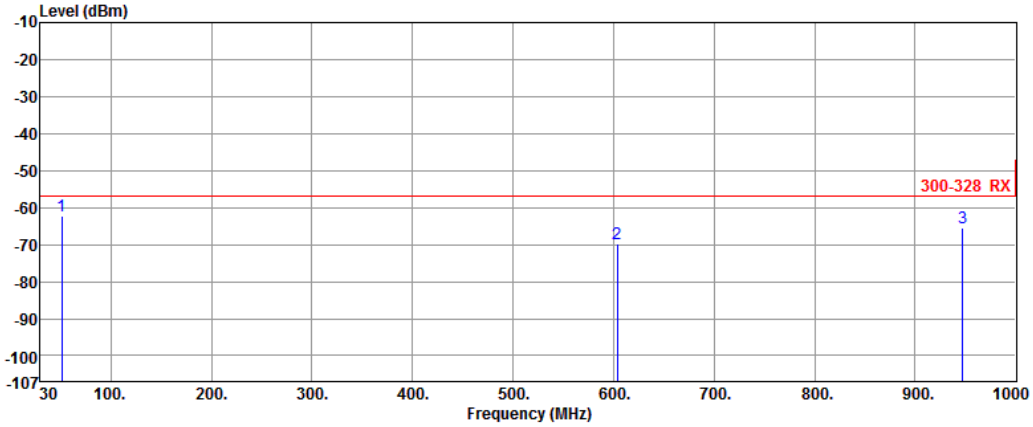
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.27	-66.94	-57.00	-9.94	-1.55	-65.39
2	603.34	-70.58	-57.00	-13.58	6.91	-77.49
3	932.39	-65.84	-57.00	-8.84	11.80	-77.64

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

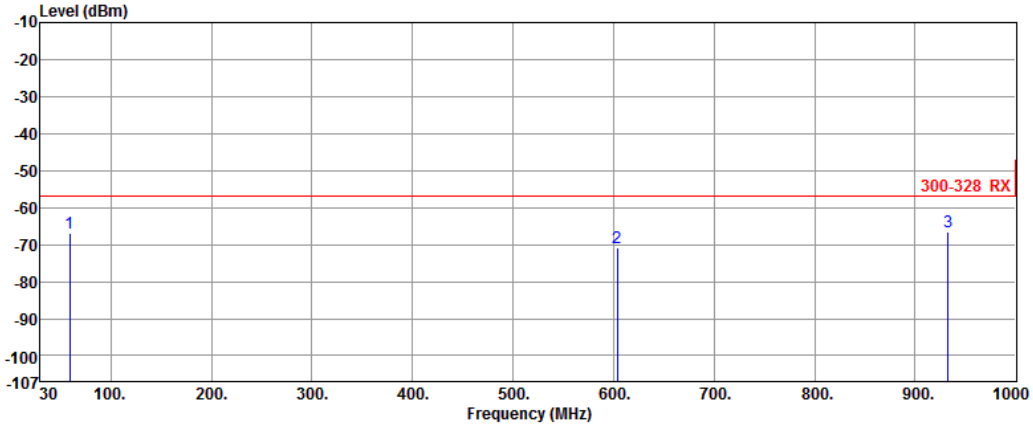
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.33	-62.30	-57.00	-5.30	-0.05	-62.25
2	603.37	-69.84	-57.00	-12.84	7.40	-77.24
3	946.98	-65.57	-57.00	-8.57	12.29	-77.86

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

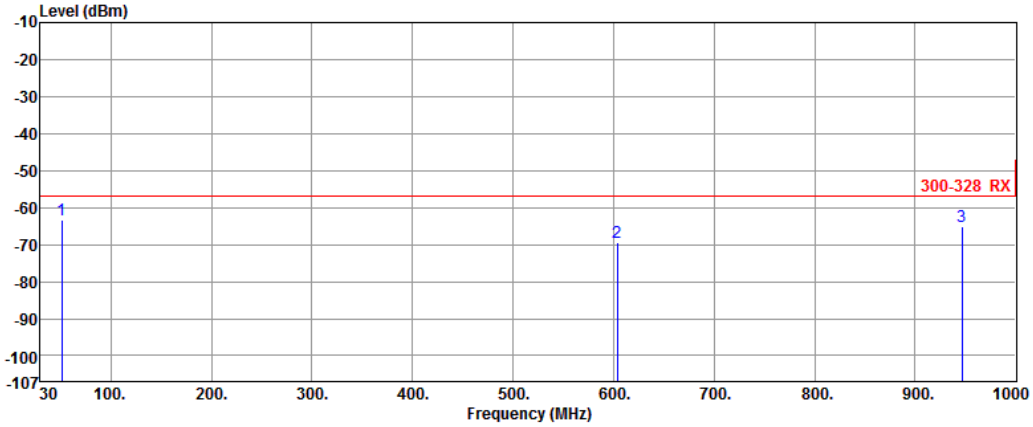
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.18	-66.74	-57.00	-9.74	-1.52	-65.22
2	603.67	-70.84	-57.00	-13.84	6.93	-77.77
3	932.55	-66.45	-57.00	-9.45	11.79	-78.24

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

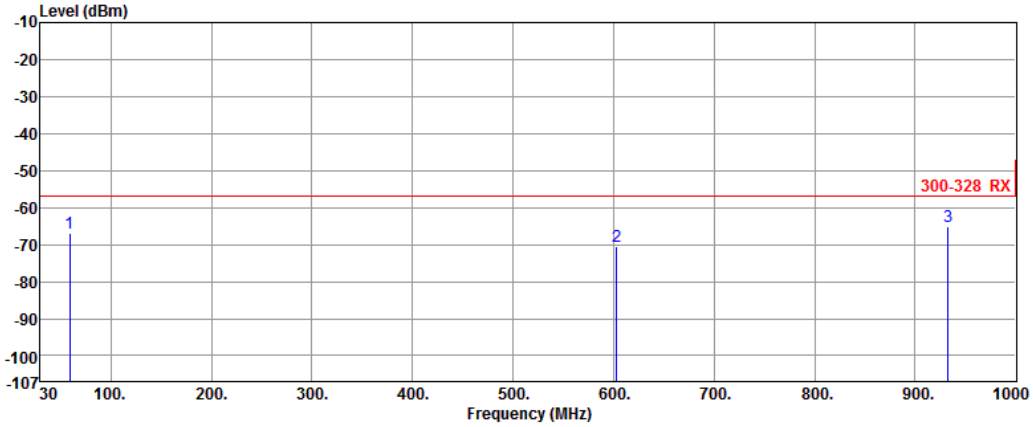
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.37	-63.25	-57.00	-6.25	-0.08	-63.17
2	603.40	-69.48	-57.00	-12.48	7.40	-76.88
3	946.65	-65.18	-57.00	-8.18	12.29	-77.47

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

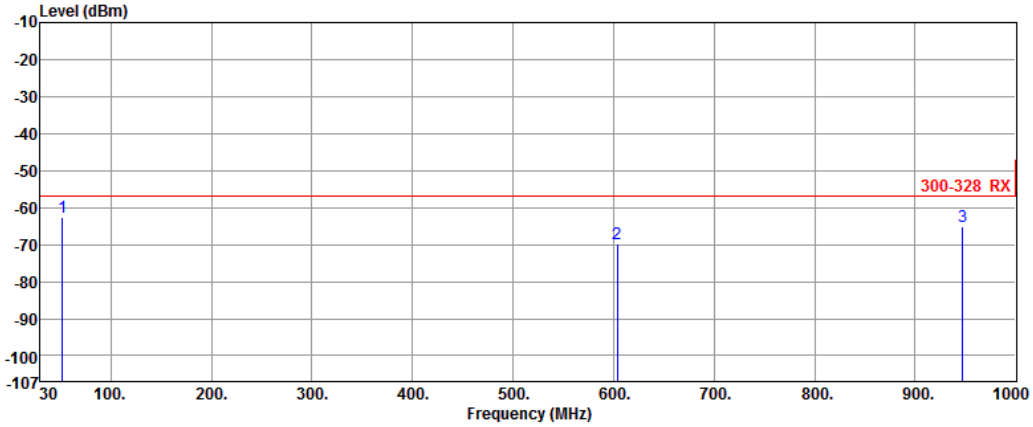
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.33	-66.97	-57.00	-9.97	-1.56	-65.41
2	603.25	-70.60	-57.00	-13.60	6.91	-77.51
3	932.72	-65.29	-57.00	-8.29	11.79	-77.08

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

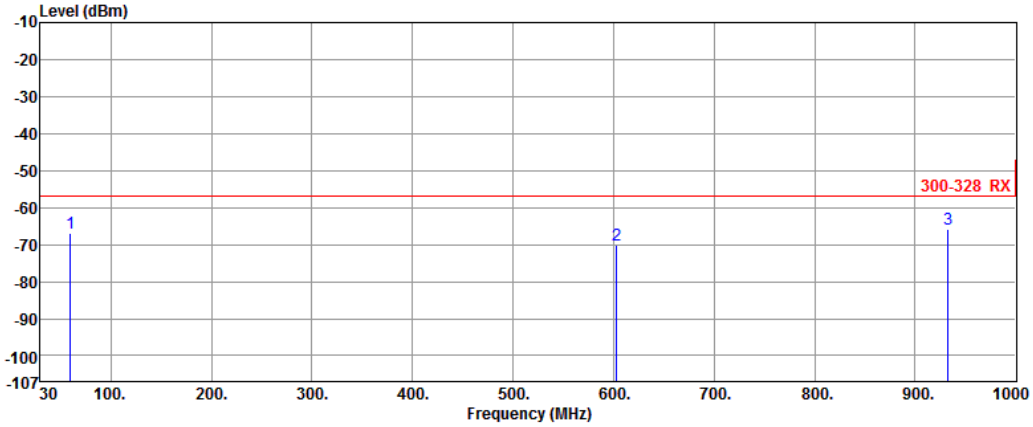
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.62	-62.54	-57.00	-5.54	-0.27	-62.27
2	603.43	-69.69	-57.00	-12.69	7.40	-77.09
3	946.95	-65.16	-57.00	-8.16	12.30	-77.46

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

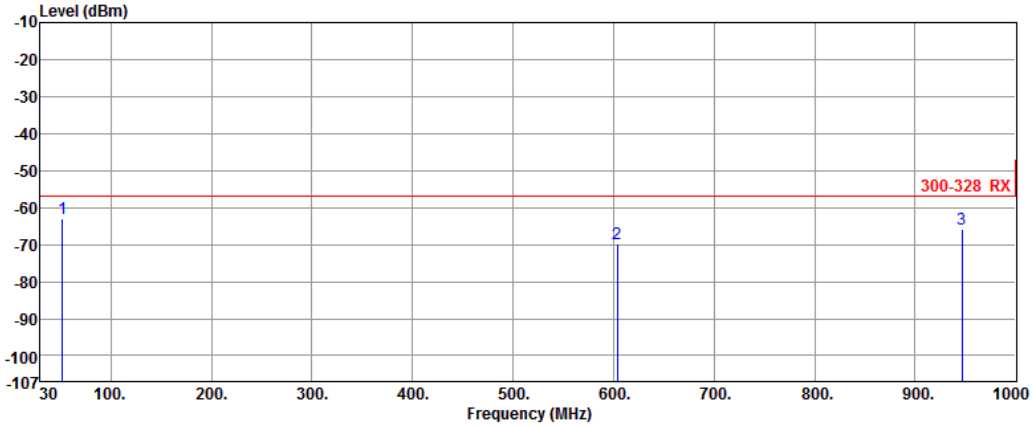
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.38	-66.95	-57.00	-9.95	-1.58	-65.37
2	603.28	-70.15	-57.00	-13.15	6.91	-77.06
3	932.73	-65.86	-57.00	-8.86	11.79	-77.65

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

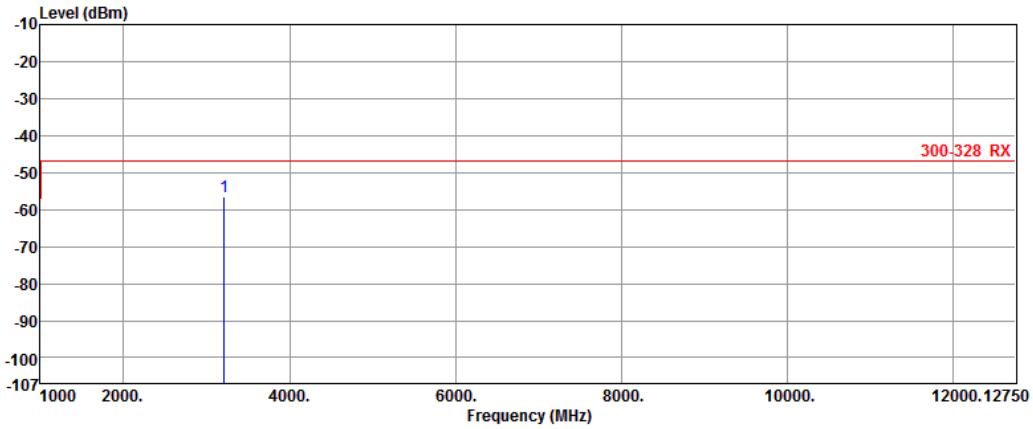


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.58	-62.93	-57.00	-5.93	-0.24	-62.69
2	603.45	-69.68	-57.00	-12.68	7.41	-77.09
3	946.55	-65.89	-57.00	-8.89	12.30	-78.19

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

4.1.5 Receiver Radiated Unwanted Emissions (Above 1GHz)

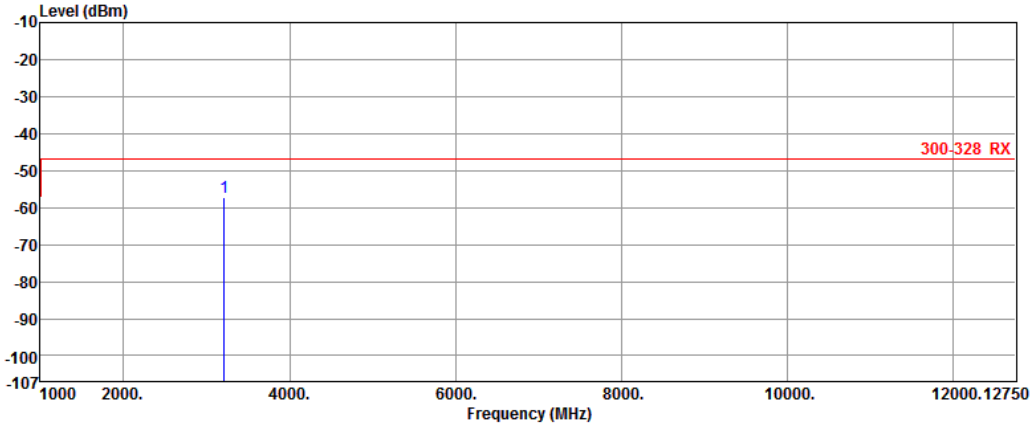
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3216.14	-56.62	-47.00	-9.62	6.91	-63.53

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

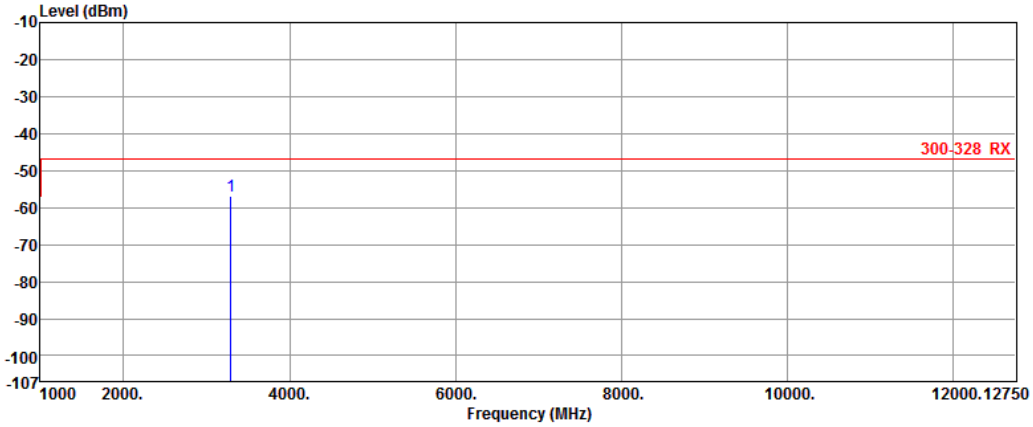
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3216.11	-57.27	-47.00	-10.27	6.66	-63.93

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

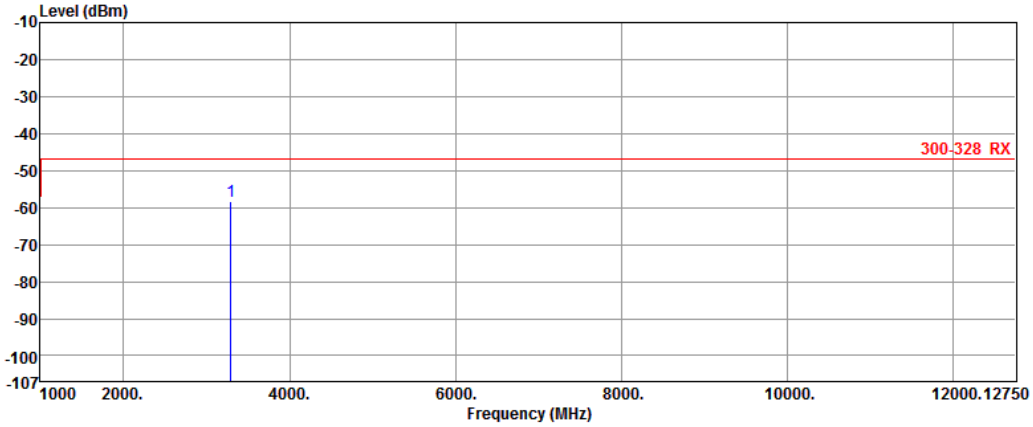
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3295.27	-56.93	-47.00	-9.93	7.48	-64.41

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

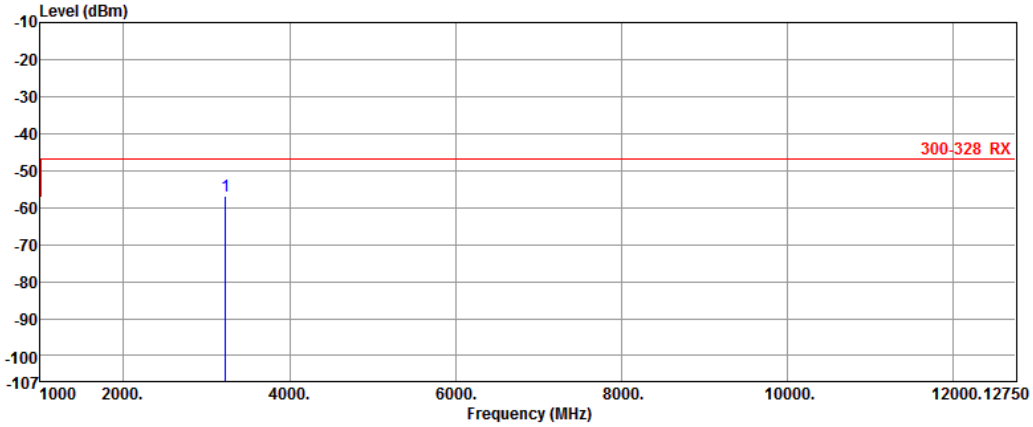
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3295.96	-58.45	-47.00	-11.45	5.68	-64.13

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

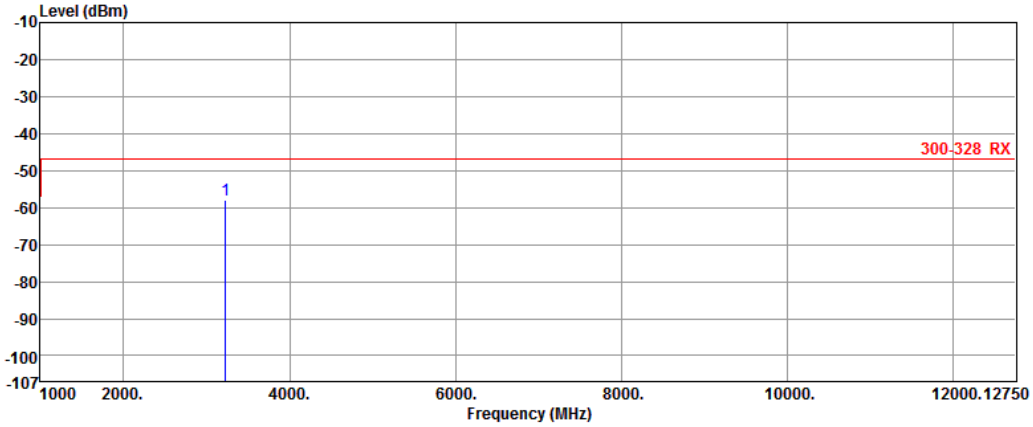
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3229.45	-56.74	-47.00	-9.74	7.01	-63.75

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

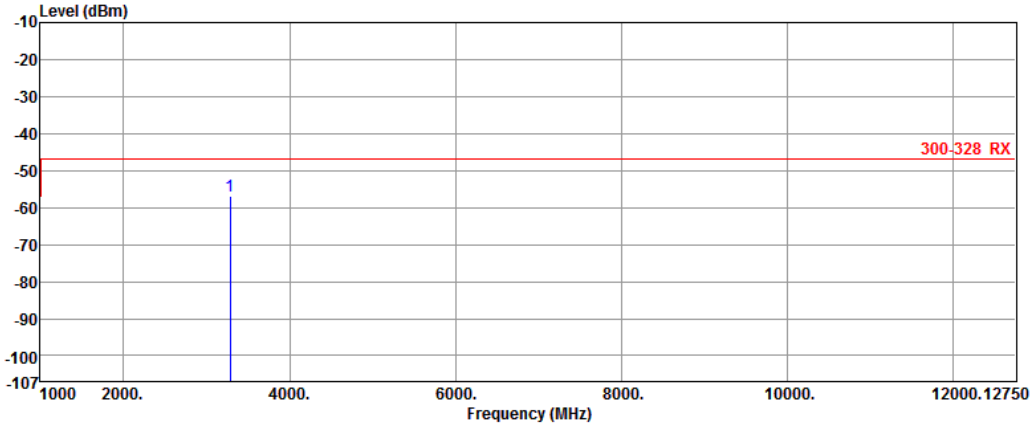
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3229.85	-57.88	-47.00	-10.88	6.49	-64.37

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

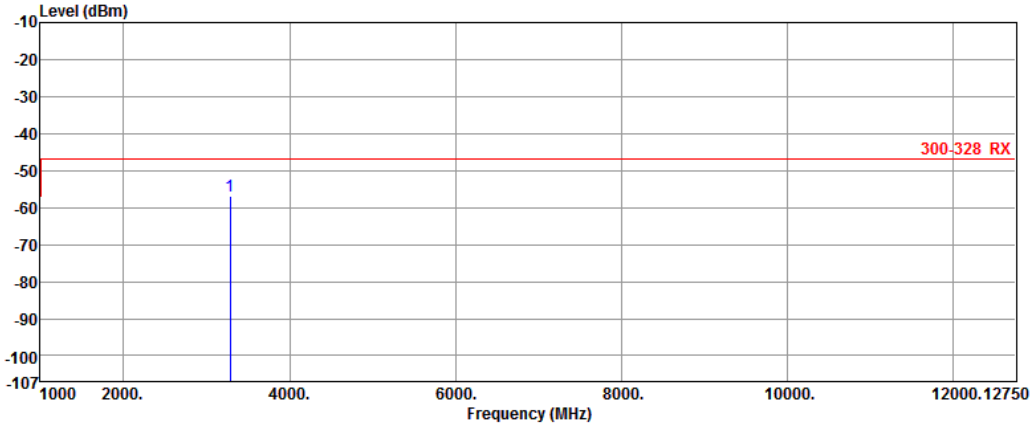
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3282.15	-56.79	-47.00	-9.79	7.39	-64.18

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



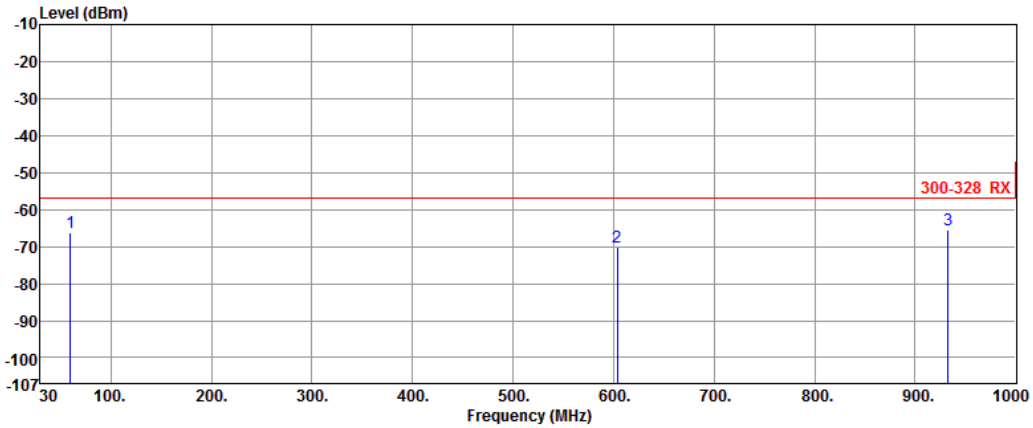
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3283.41	-56.88	-47.00	-9.88	5.84	-62.72

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Configuration 2 : PCB Dipole Antenna

4.1.6 Receiver Radiated Unwanted Emissions (Below 1GHz)

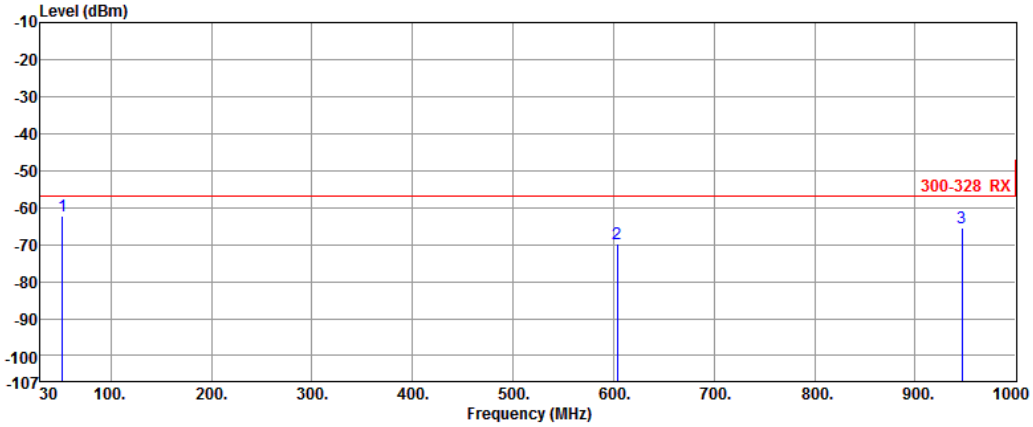
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.71	-66.24	-57.00	-9.24	-1.67	-64.57
2	603.36	-70.26	-57.00	-13.26	6.91	-77.17
3	932.71	-65.59	-57.00	-8.59	11.79	-77.38

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

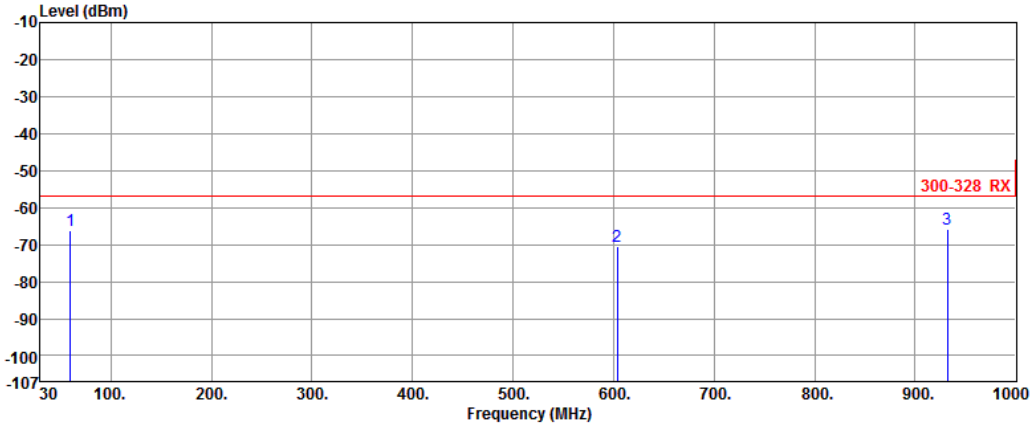
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.73	-62.41	-57.00	-5.41	-0.36	-62.05
2	603.72	-69.91	-57.00	-12.91	7.43	-77.34
3	946.79	-65.41	-57.00	-8.41	12.29	-77.70

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

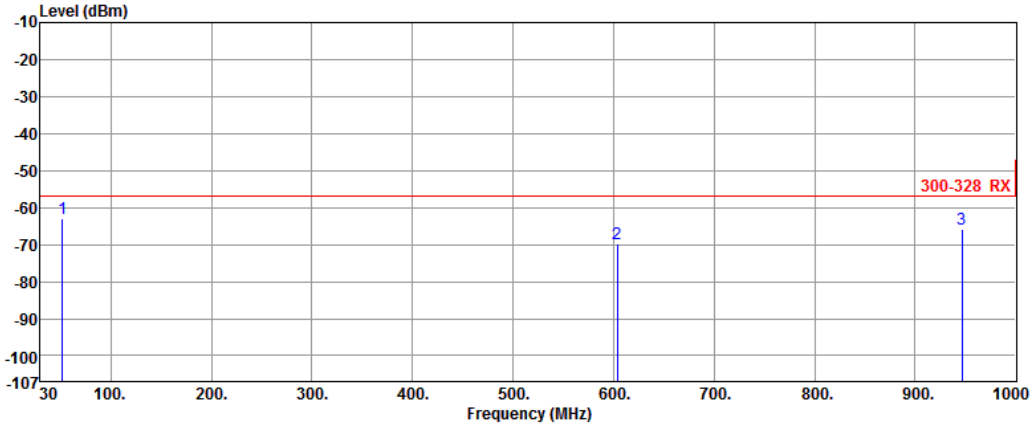
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.69	-66.26	-57.00	-9.26	-1.66	-64.60
2	603.57	-70.37	-57.00	-13.37	6.92	-77.29
3	932.26	-65.94	-57.00	-8.94	11.80	-77.74

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

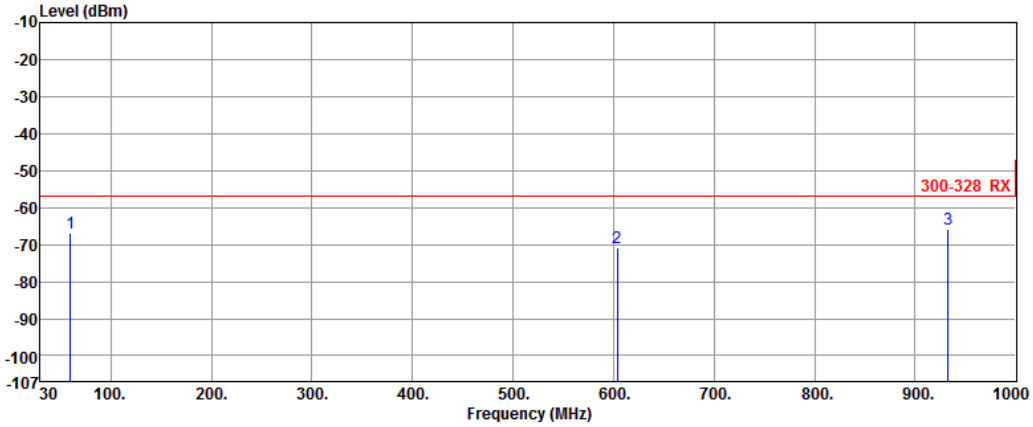
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.53	-62.84	-57.00	-5.84	-0.21	-62.63
2	603.76	-69.94	-57.00	-12.94	7.43	-77.37
3	946.37	-65.84	-57.00	-8.84	12.30	-78.14

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

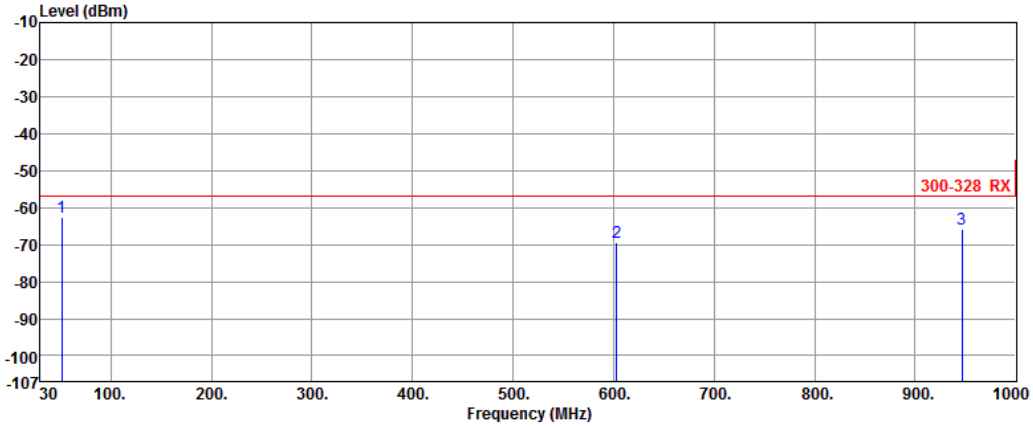
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.57	-66.86	-57.00	-9.86	-1.63	-65.23
2	603.67	-70.81	-57.00	-13.81	6.92	-77.73
3	932.92	-65.87	-57.00	-8.87	11.78	-77.65

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

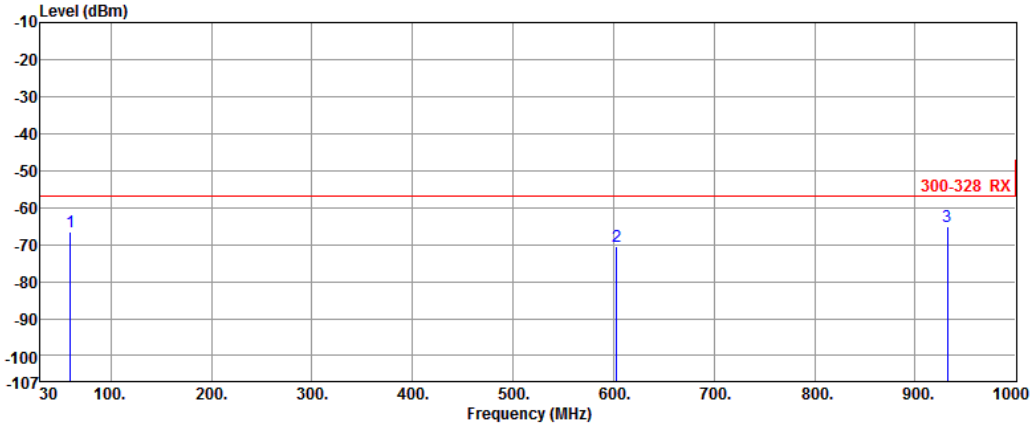
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.20	-62.71	-57.00	-5.71	0.05	-62.76
2	603.30	-69.57	-57.00	-12.57	7.39	-76.96
3	946.63	-65.84	-57.00	-8.84	12.29	-78.13

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

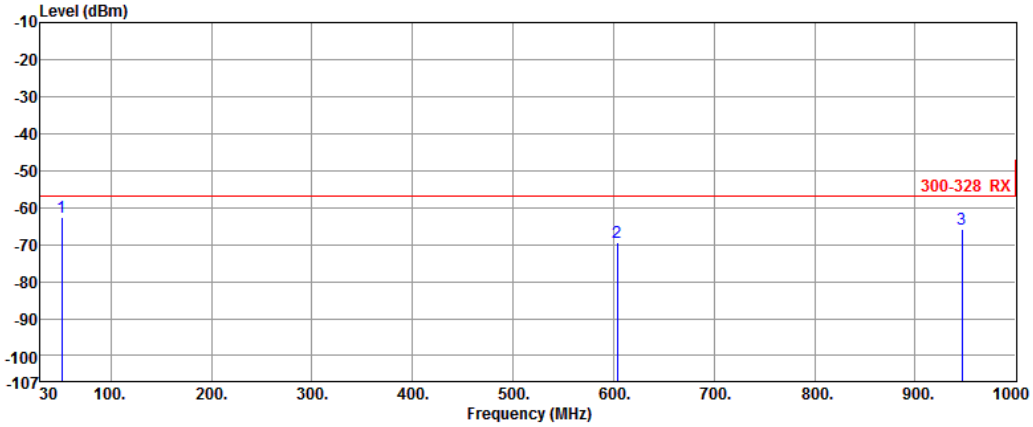
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.57	-66.54	-57.00	-9.54	-1.63	-64.91
2	603.27	-70.39	-57.00	-13.39	6.91	-77.30
3	932.15	-65.25	-57.00	-8.25	11.81	-77.06

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

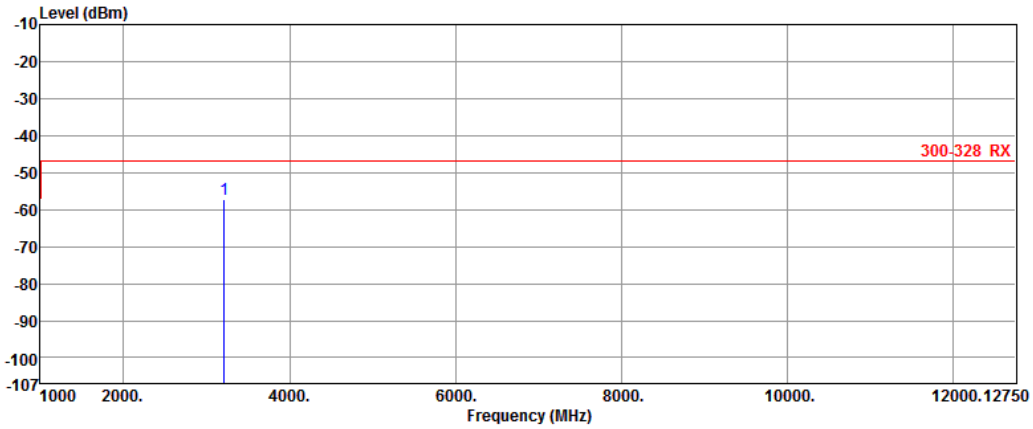


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.15	-62.59	-57.00	-5.59	0.09	-62.68
2	603.38	-69.58	-57.00	-12.58	7.40	-76.98
3	946.73	-65.68	-57.00	-8.68	12.29	-77.97

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

4.1.7 Receiver Radiated Unwanted Emissions (Above 1GHz)

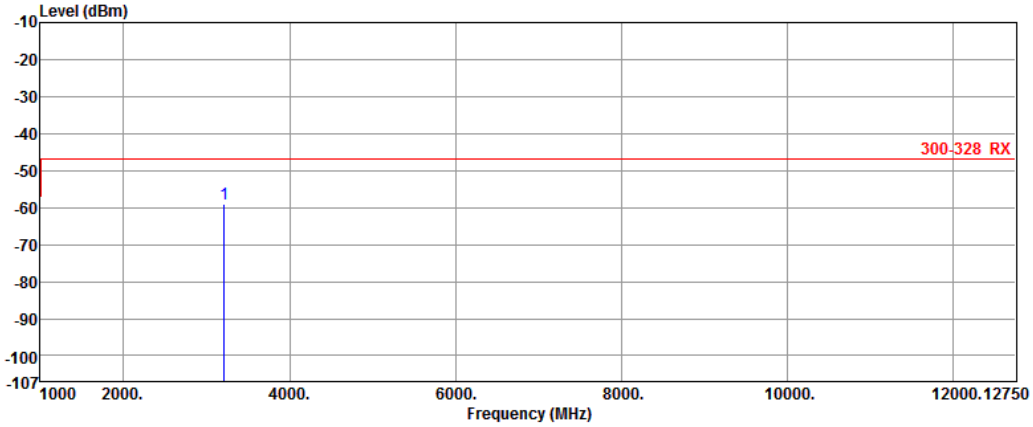
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3213.65	-57.12	-47.00	-10.12	6.90	-64.02

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

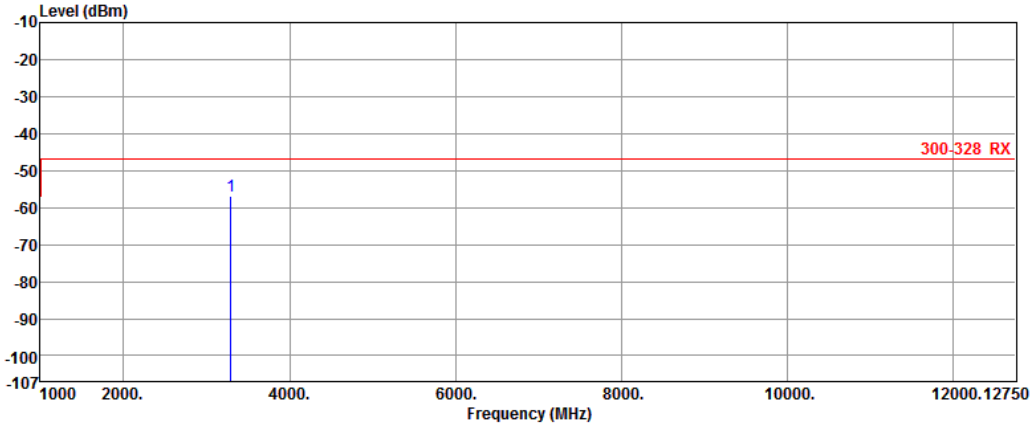
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3214.03	-58.97	-47.00	-11.97	6.69	-65.66

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

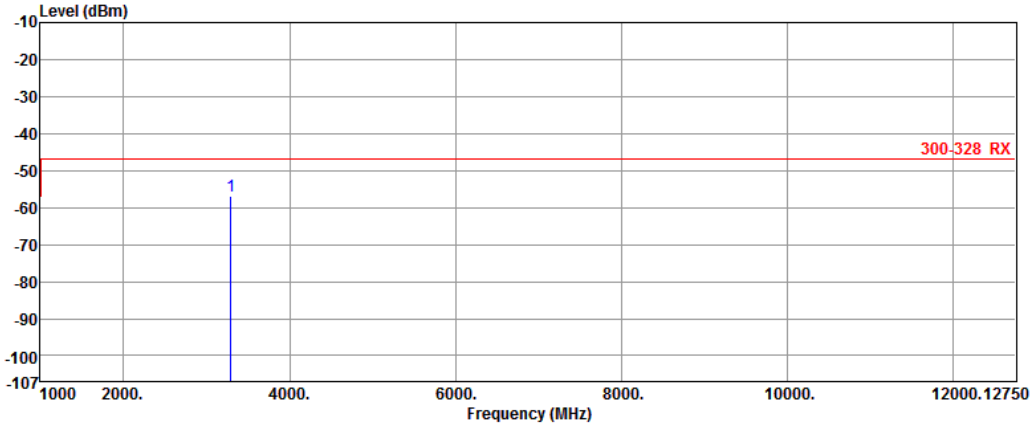
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3296.20	-56.73	-47.00	-9.73	7.49	-64.22

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

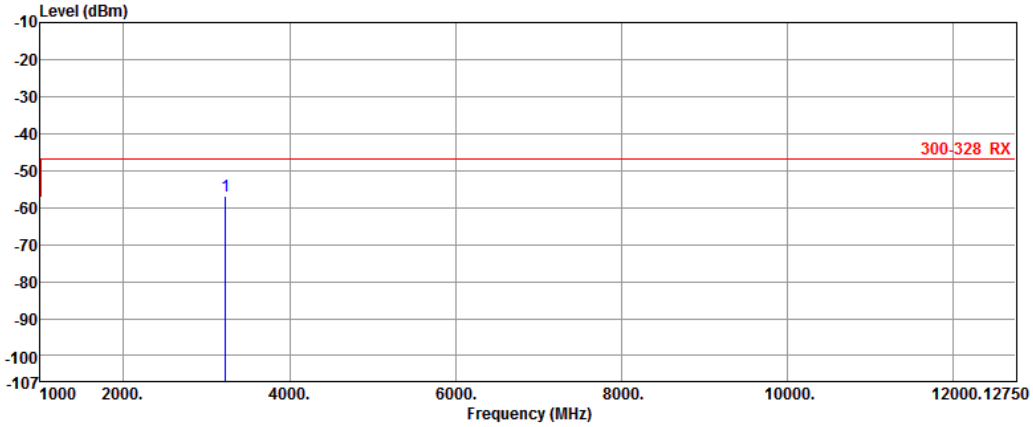
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3296.21	-57.04	-47.00	-10.04	5.68	-62.72

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

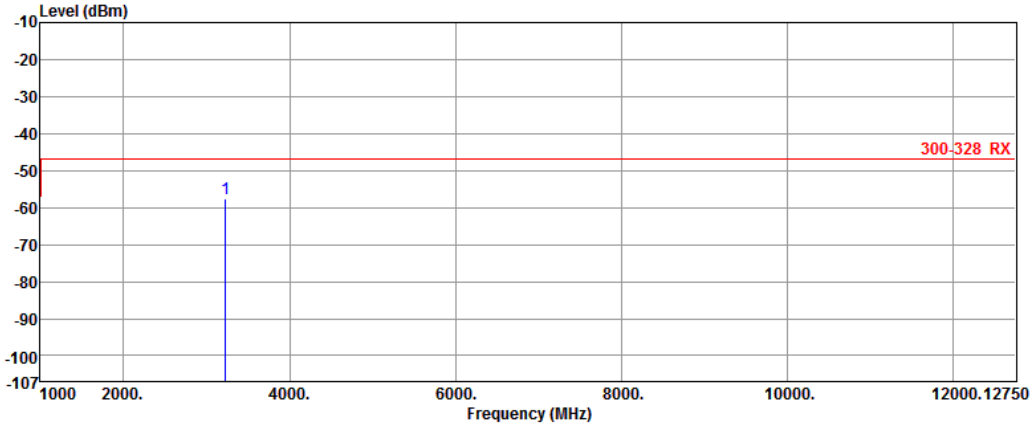
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3229.18	-56.95	-47.00	-9.95	7.00	-63.95

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

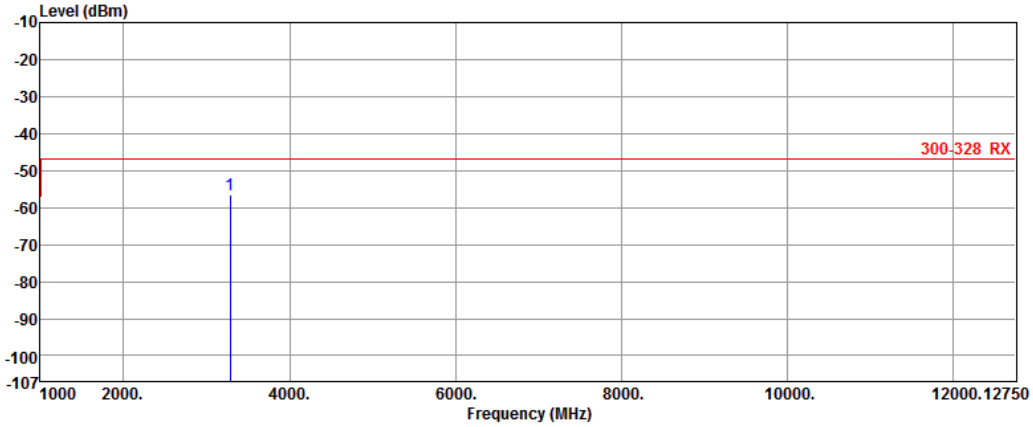
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3228.41	-57.59	-47.00	-10.59	6.51	-64.10

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

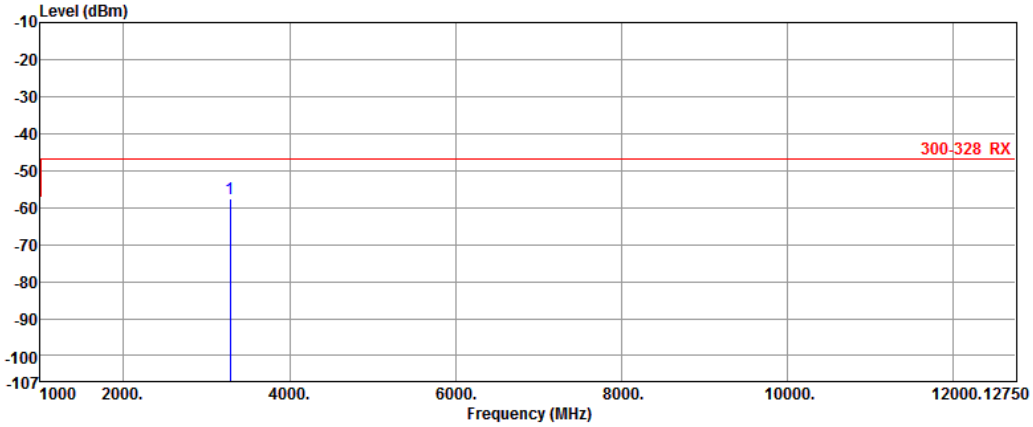
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3283.07	-56.51	-47.00	-9.51	7.39	-63.90

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



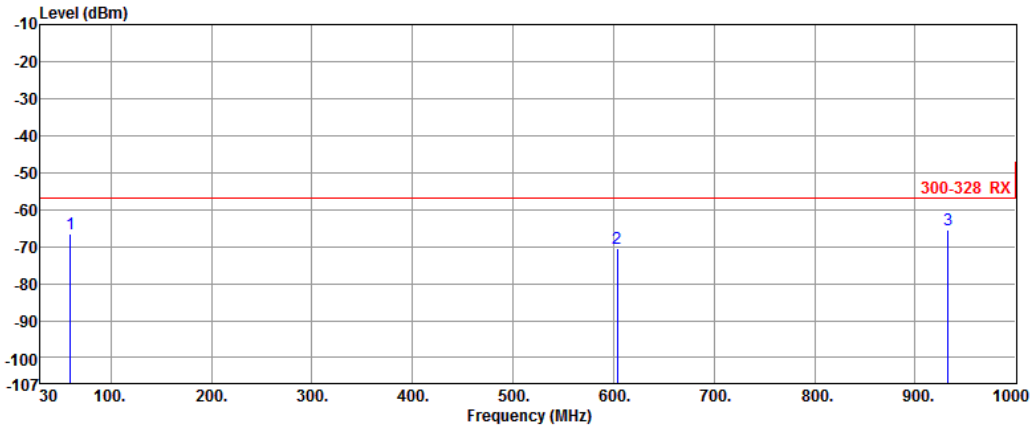
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3282.66	-57.74	-47.00	-10.74	5.85	-63.59

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Configuration 3 : PIFA Antenna

4.1.8 Receiver Radiated Unwanted Emissions (Below 1GHz)

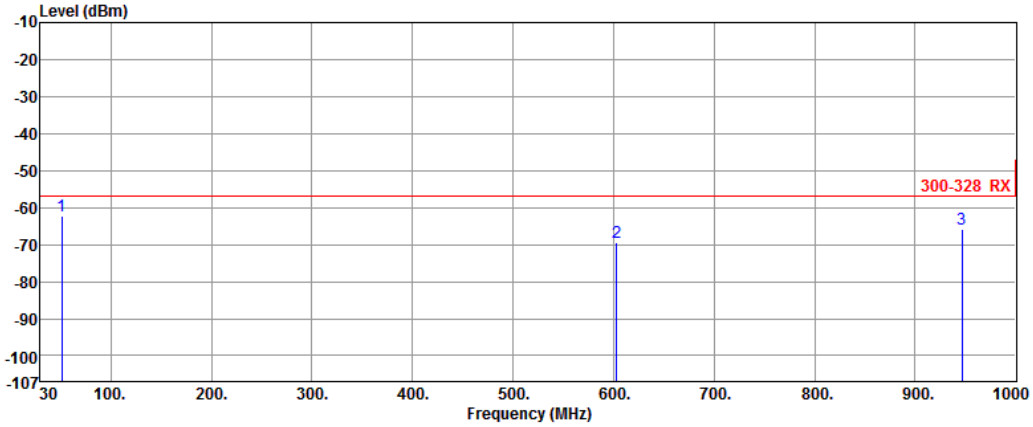
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.96	-66.38	-57.00	-9.38	-1.74	-64.64
2	603.43	-70.35	-57.00	-13.35	6.92	-77.27
3	932.87	-65.56	-57.00	-8.56	11.78	-77.34

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

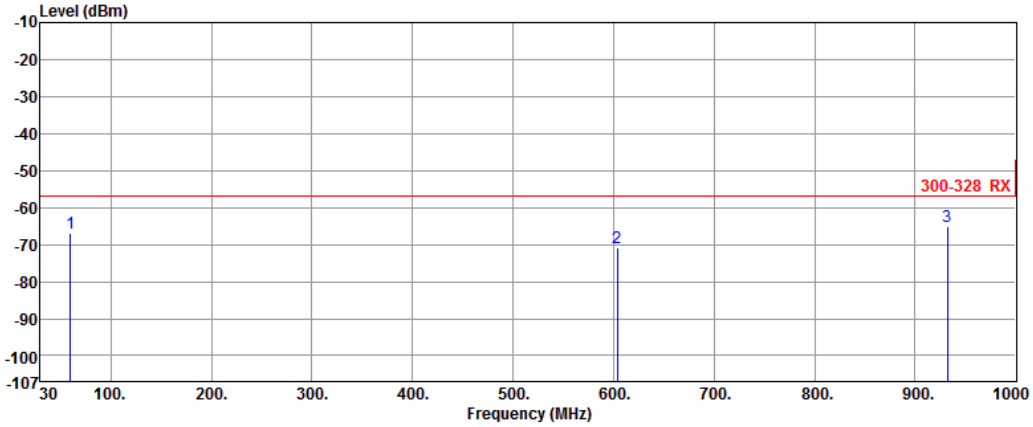
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.24	-62.19	-57.00	-5.19	0.02	-62.21
2	603.24	-69.50	-57.00	-12.50	7.39	-76.89
3	946.56	-65.85	-57.00	-8.85	12.30	-78.15

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

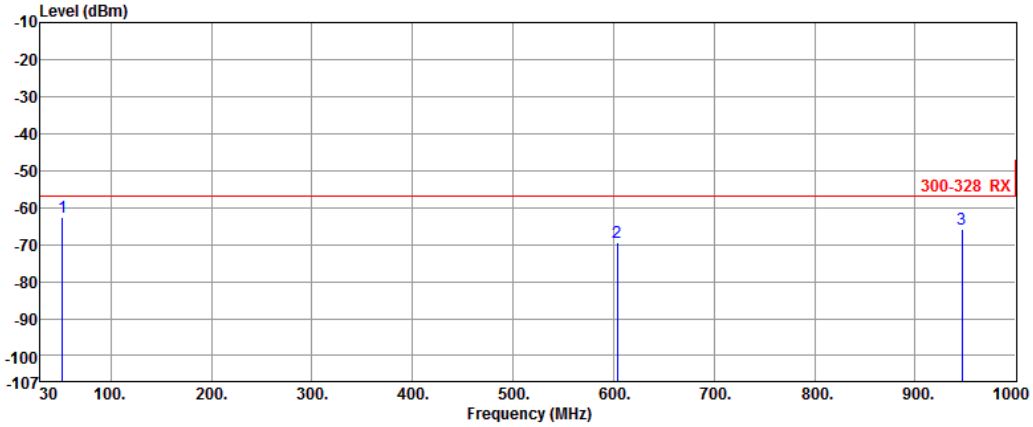
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.65	-66.76	-57.00	-9.76	-1.65	-65.11
2	603.40	-70.73	-57.00	-13.73	6.92	-77.65
3	932.29	-65.15	-57.00	-8.15	11.80	-76.95

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

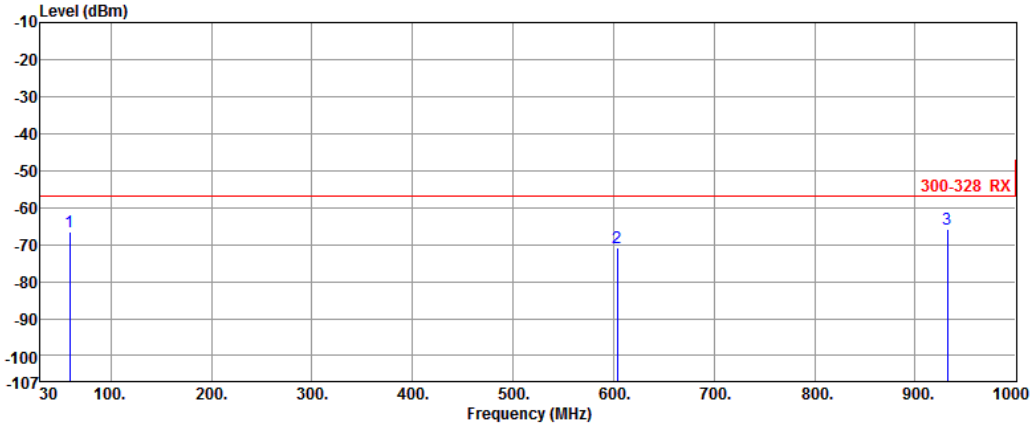
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.76	-62.65	-57.00	-5.65	-0.38	-62.27
2	603.53	-69.54	-57.00	-12.54	7.41	-76.95
3	946.72	-65.86	-57.00	-8.86	12.29	-78.15

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

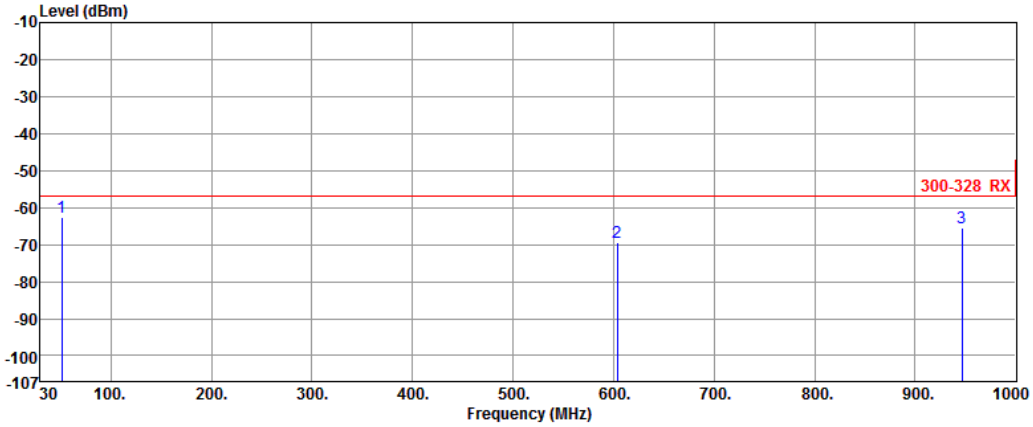
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.29	-66.48	-57.00	-9.48	-1.55	-64.93
2	603.66	-70.74	-57.00	-13.74	6.92	-77.66
3	932.33	-65.91	-57.00	-8.91	11.80	-77.71

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

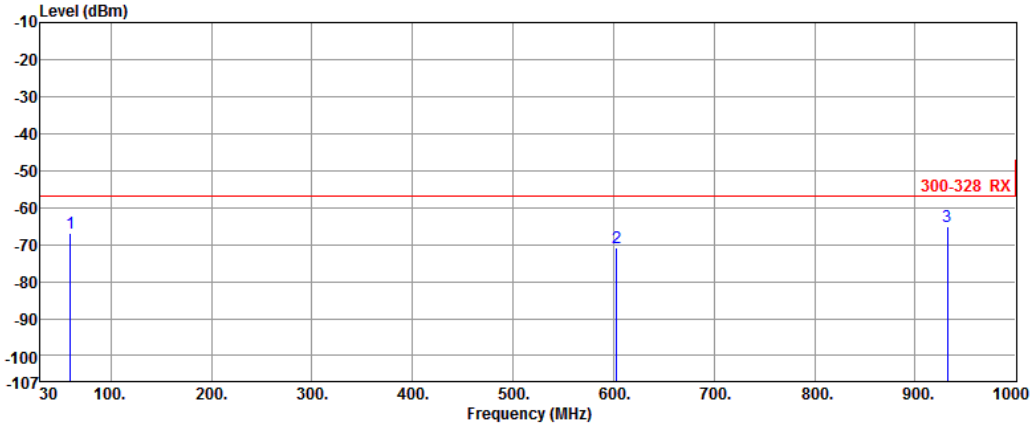
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.33	-62.66	-57.00	-5.66	-0.05	-62.61
2	603.97	-69.29	-57.00	-12.29	7.45	-76.74
3	946.49	-65.60	-57.00	-8.60	12.30	-77.90

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

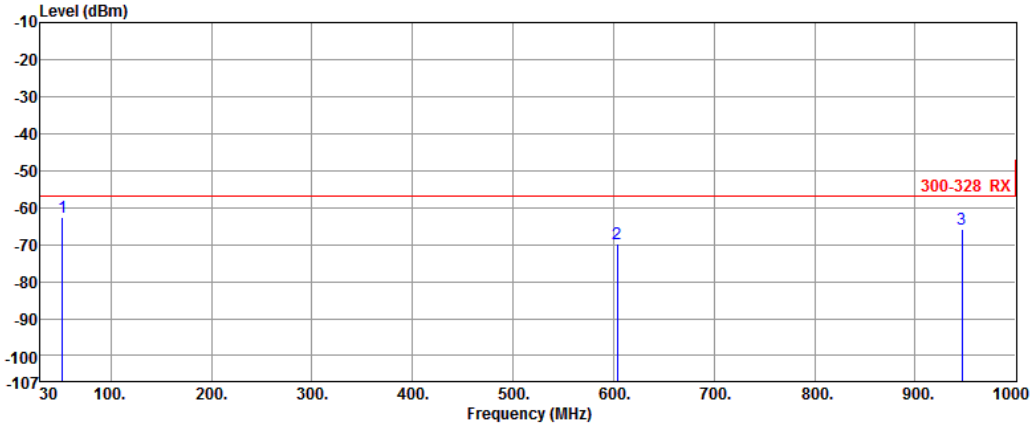
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.74	-66.83	-57.00	-9.83	-1.68	-65.15
2	603.25	-70.94	-57.00	-13.94	6.91	-77.85
3	932.32	-65.25	-57.00	-8.25	11.80	-77.05

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

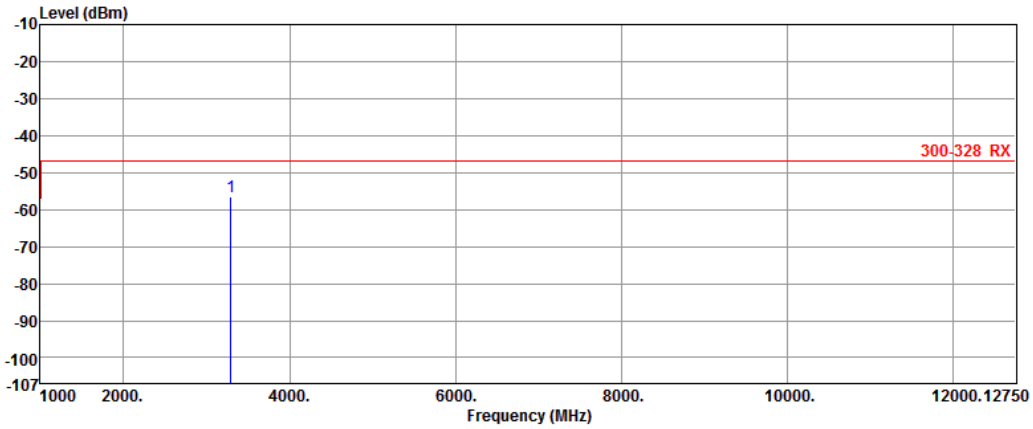


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.74	-62.62	-57.00	-5.62	-0.36	-62.26
2	603.46	-69.93	-57.00	-12.93	7.41	-77.34
3	946.35	-65.94	-57.00	-8.94	12.30	-78.24

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

4.1.9 Receiver Radiated Unwanted Emissions (Above 1GHz)

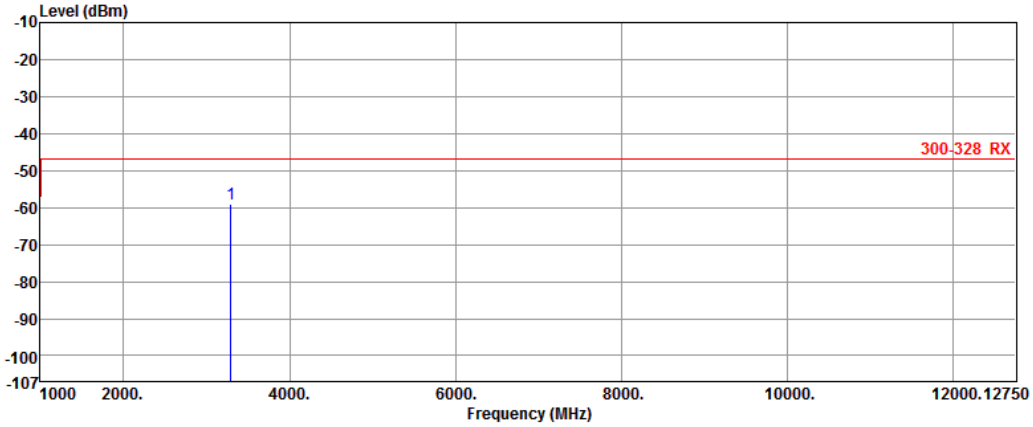
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3296.40	-56.61	-47.00	-9.61	7.49	-64.10

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

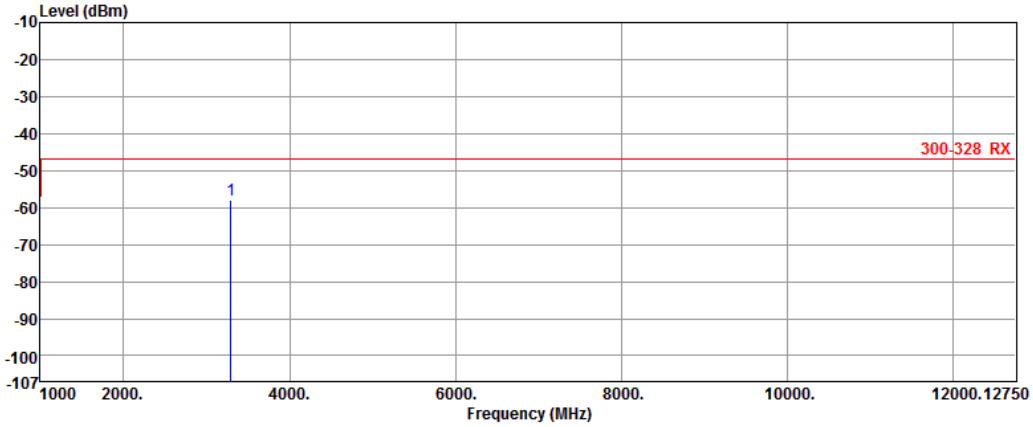
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3296.07	-59.02	-47.00	-12.02	5.68	-64.70

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

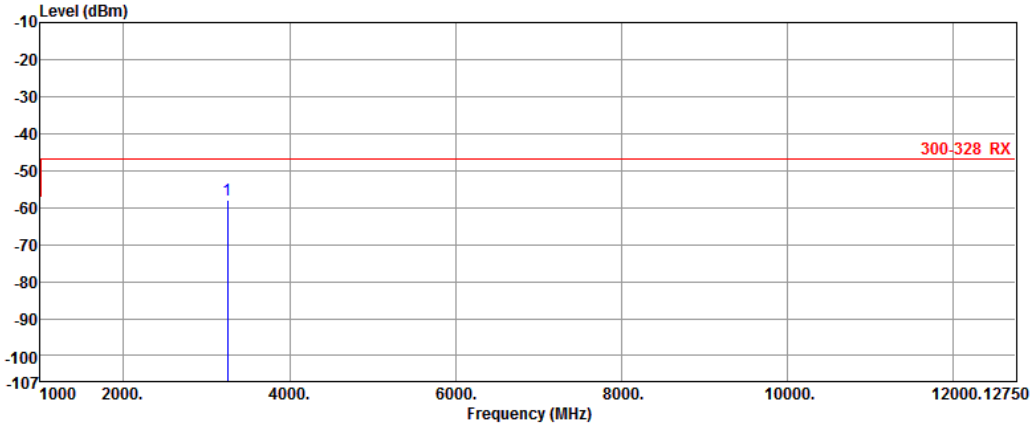
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3289.84	-57.87	-47.00	-10.87	7.44	-65.31

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

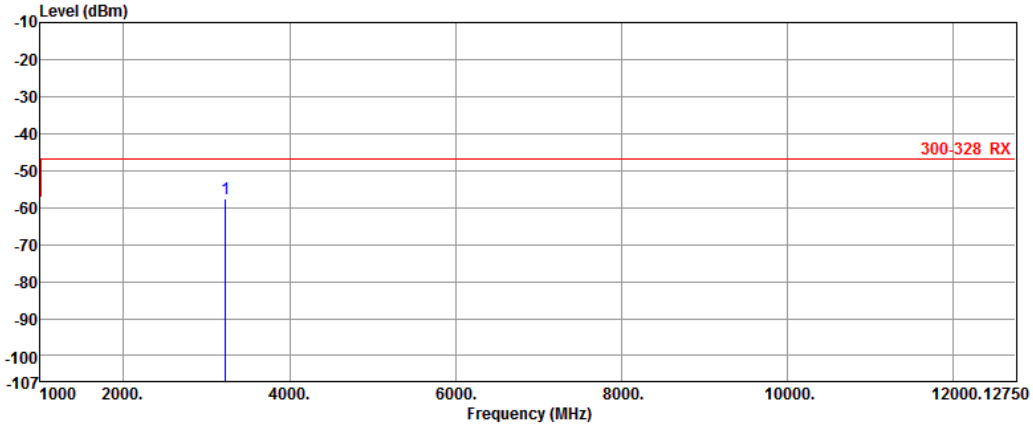
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3252.47	-57.80	-47.00	-10.80	6.21	-64.01

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

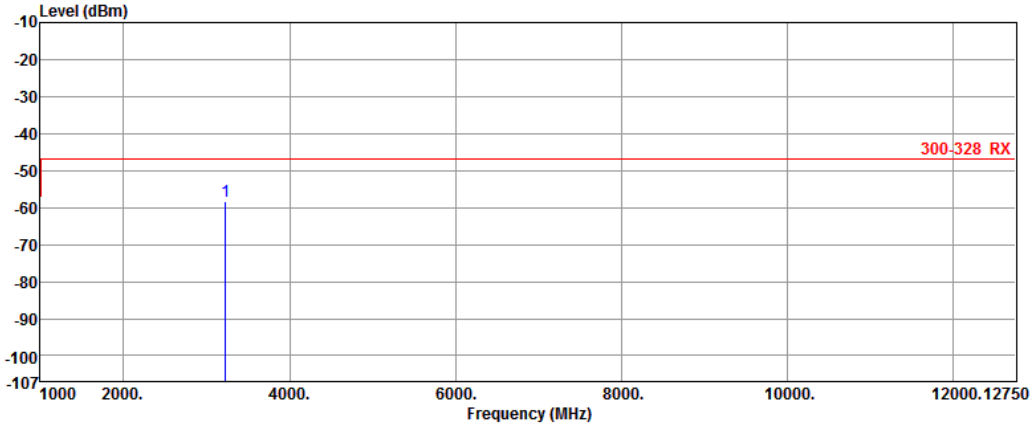
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3229.48	-57.72	-47.00	-10.72	7.01	-64.73

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

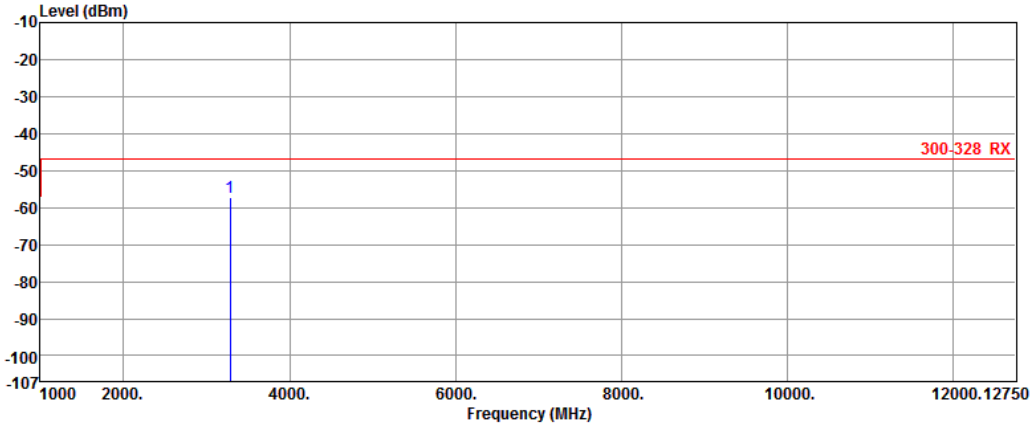
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3228.81	-58.22	-47.00	-11.22	6.50	-64.72

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

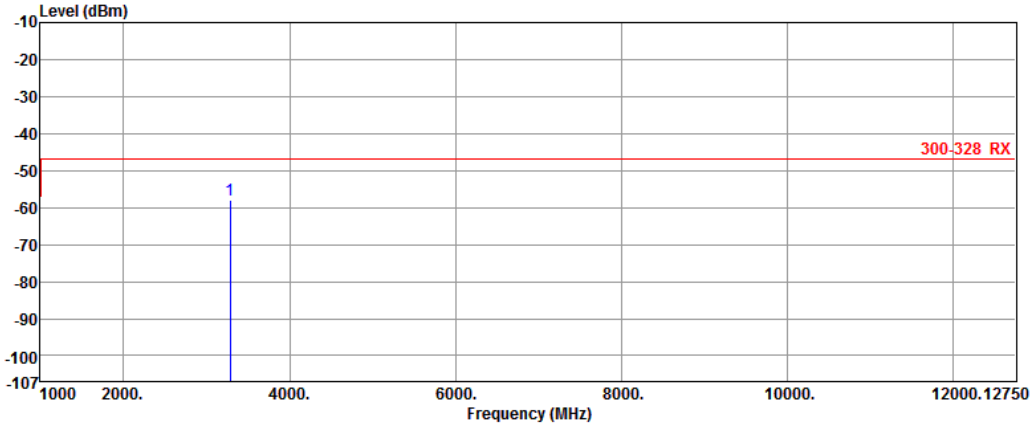
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3281.70	-57.33	-47.00	-10.33	7.38	-64.71

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



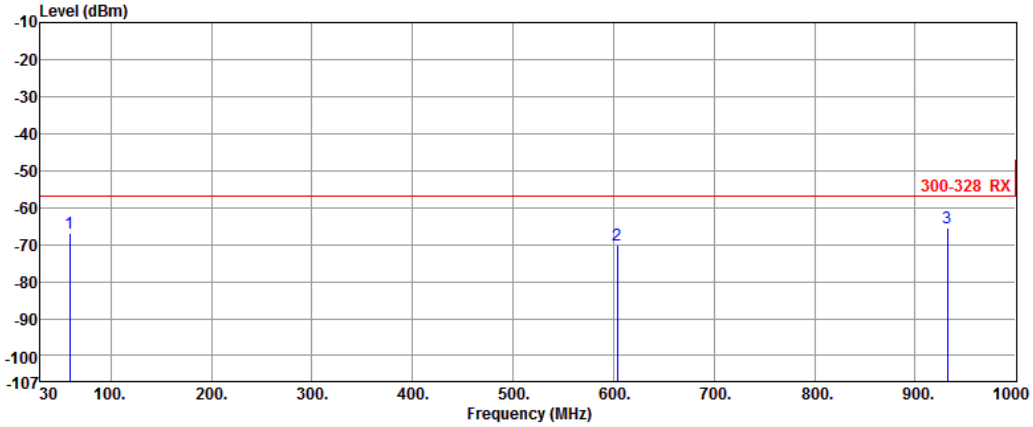
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3285.16	-58.01	-47.00	-11.01	5.81	-63.82

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Configuration 4: Isolated Magnetic Dipole Antenna

4.1.10 Receiver Radiated Unwanted Emissions (Below 1GHz)

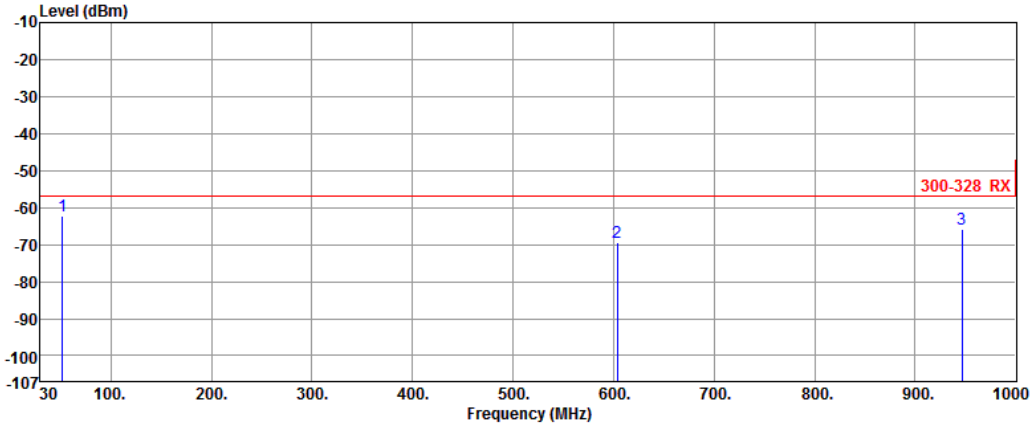
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.27	-66.98	-57.00	-9.98	-1.55	-65.43
2	603.37	-70.29	-57.00	-13.29	6.91	-77.20
3	932.30	-65.43	-57.00	-8.43	11.80	-77.23

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

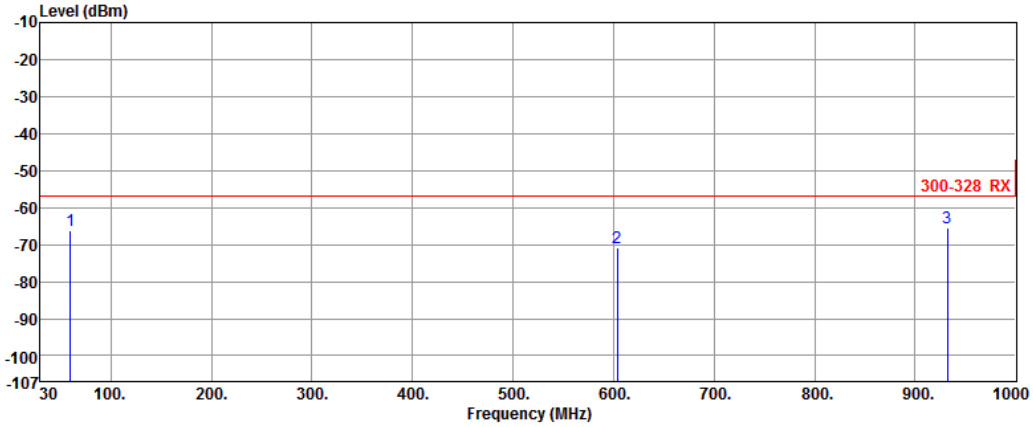
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.53	-62.27	-57.00	-5.27	-0.21	-62.06
2	603.67	-69.25	-57.00	-12.25	7.42	-76.67
3	946.35	-65.86	-57.00	-8.86	12.30	-78.16

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

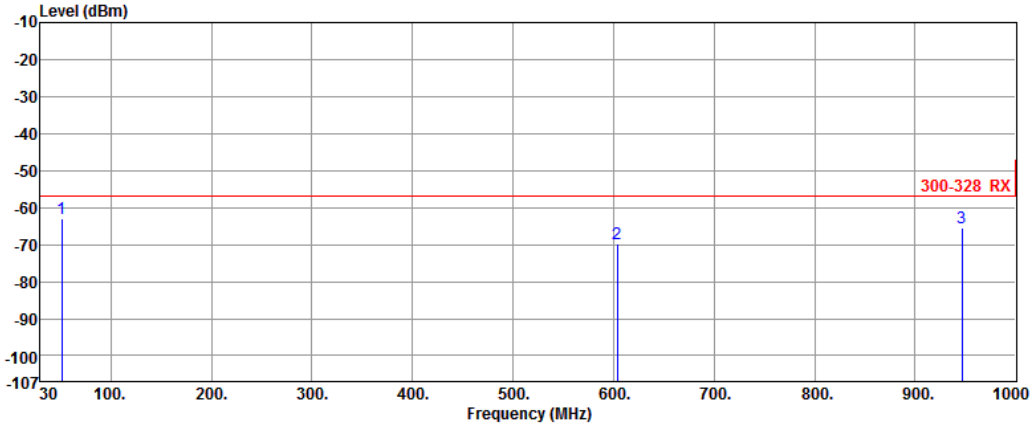
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.93	-66.13	-57.00	-9.13	-1.73	-64.40
2	603.53	-70.86	-57.00	-13.86	6.92	-77.78
3	932.37	-65.42	-57.00	-8.42	11.80	-77.22

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

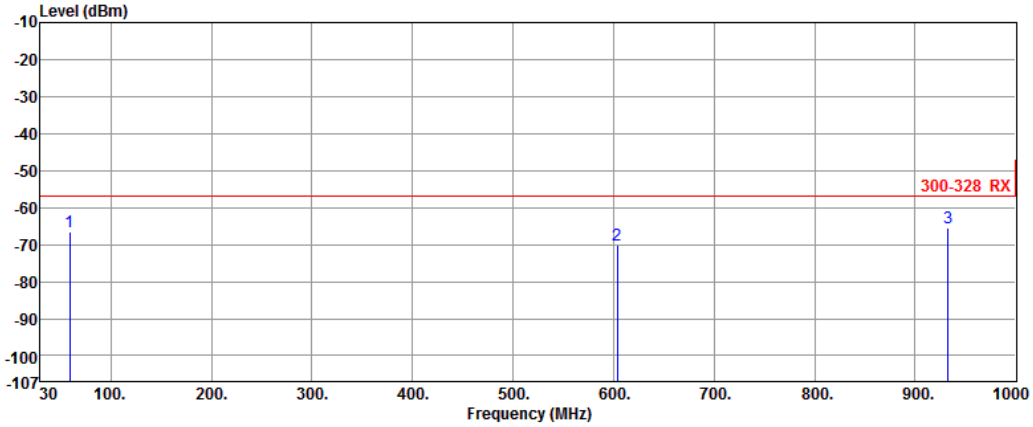
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.37	-62.95	-57.00	-5.95	-0.08	-62.87
2	603.74	-69.69	-57.00	-12.69	7.43	-77.12
3	946.27	-65.40	-57.00	-8.40	12.30	-77.70

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

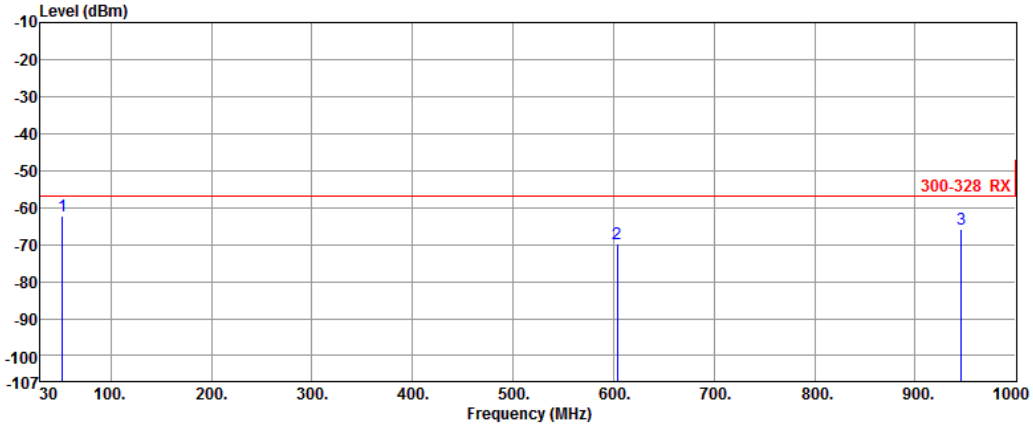
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.09	-66.54	-57.00	-9.54	-1.50	-65.04
2	603.81	-70.26	-57.00	-13.26	6.93	-77.19
3	932.96	-65.52	-57.00	-8.52	11.78	-77.30

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

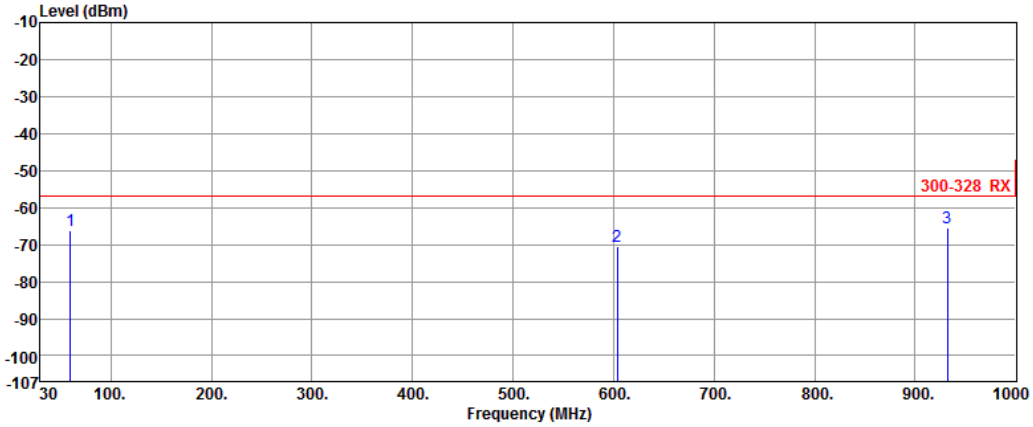
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.47	-62.40	-57.00	-5.40	-0.16	-62.24
2	603.54	-69.84	-57.00	-12.84	7.41	-77.25
3	946.12	-65.76	-57.00	-8.76	12.31	-78.07

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

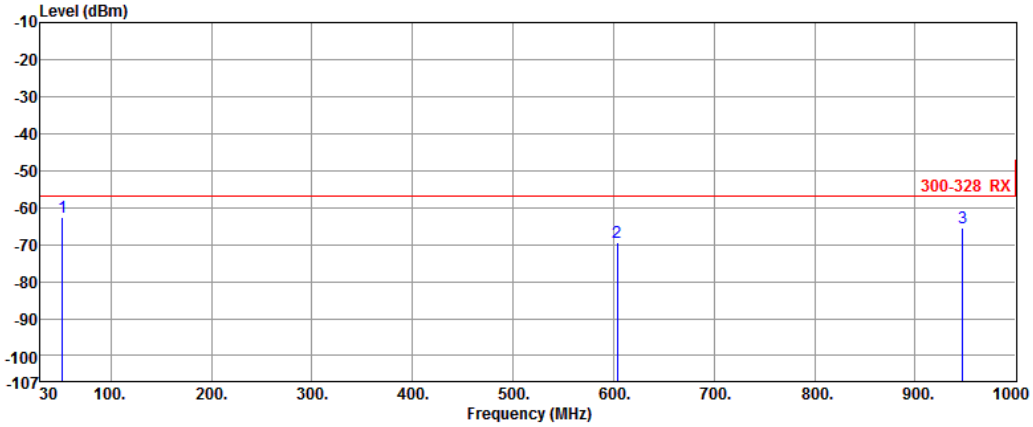
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	59.94	-66.13	-57.00	-9.13	-1.73	-64.40
2	603.67	-70.59	-57.00	-13.59	6.93	-77.52
3	932.18	-65.33	-57.00	-8.33	11.81	-77.14

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		

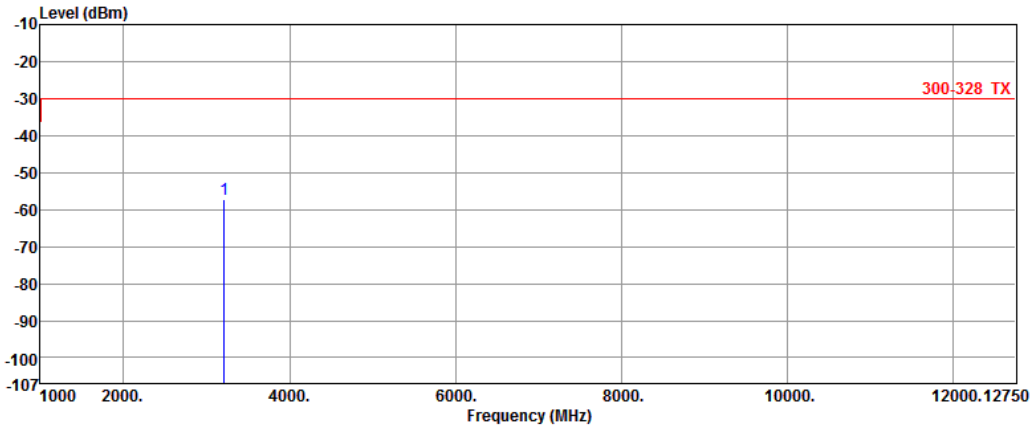


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	51.80	-62.52	-57.00	-5.52	-0.41	-62.11
2	603.81	-69.36	-57.00	-12.36	7.44	-76.80
3	946.91	-65.48	-57.00	-8.48	12.30	-77.78

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

4.1.11 Receiver Radiated Unwanted Emissions (Above 1GHz)

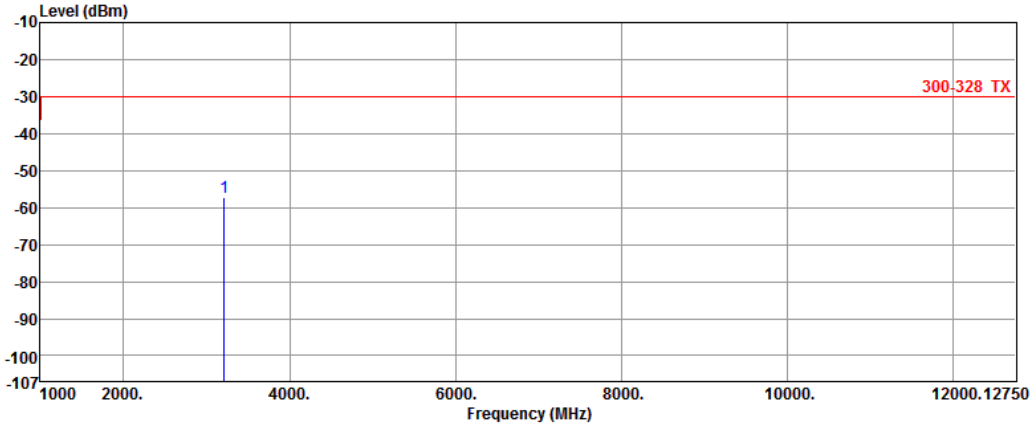
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3215.80	-57.39	-30.00	-27.39	6.91	-64.30

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

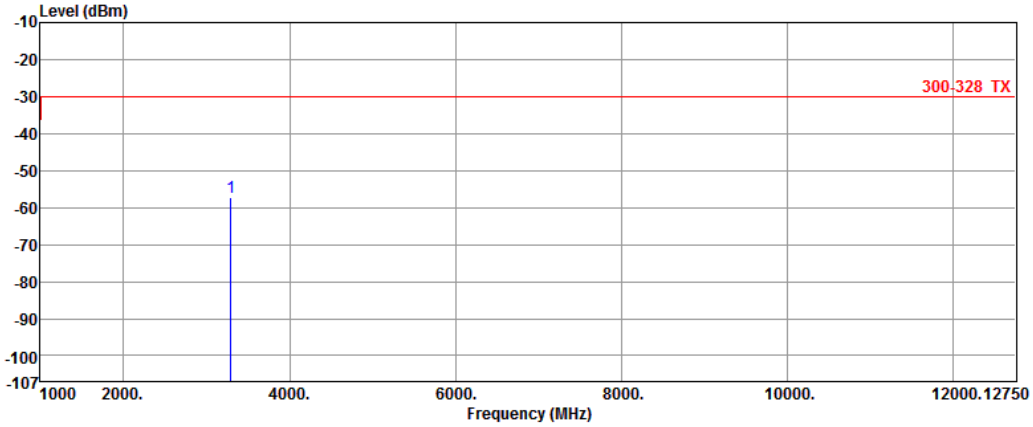
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3216.41	-57.34	-30.00	-27.34	6.66	-64.00

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

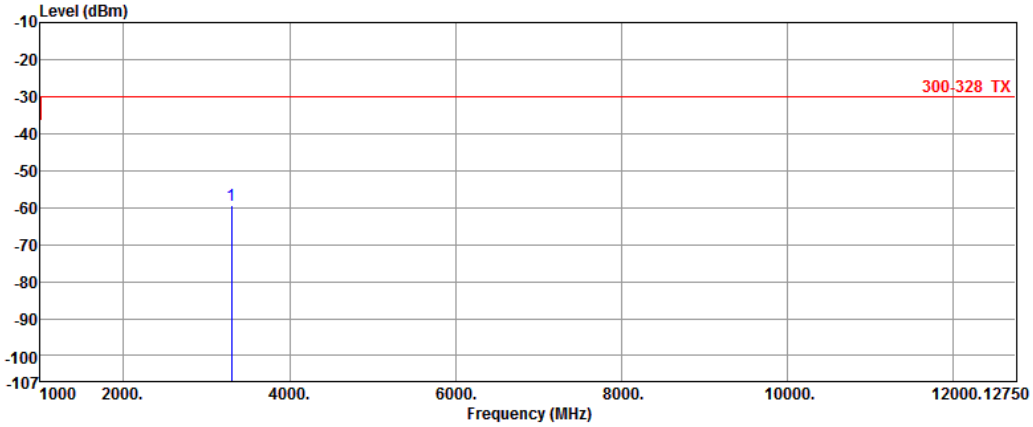
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3295.41	-57.13	-30.00	-27.13	7.48	-64.61

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

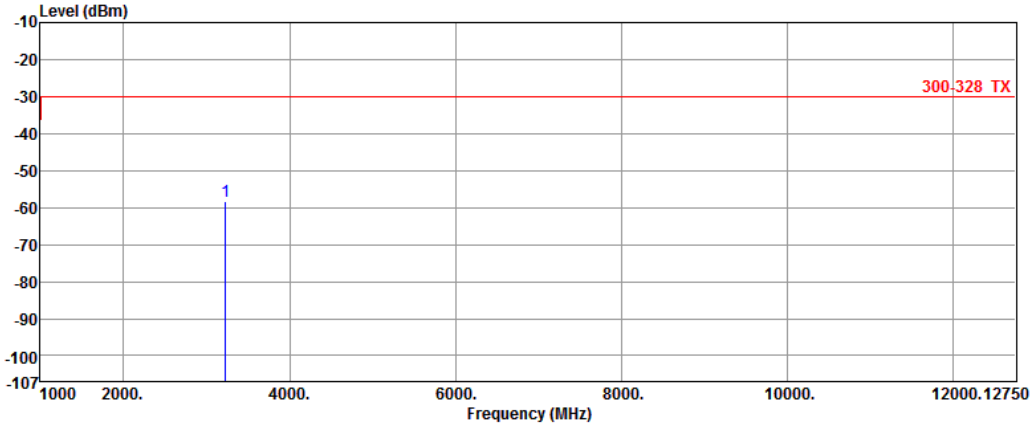
Modulation	11g	Test Freq. (MHz)	2472
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3297.09	-59.31	-30.00	-29.31	5.67	-64.98

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

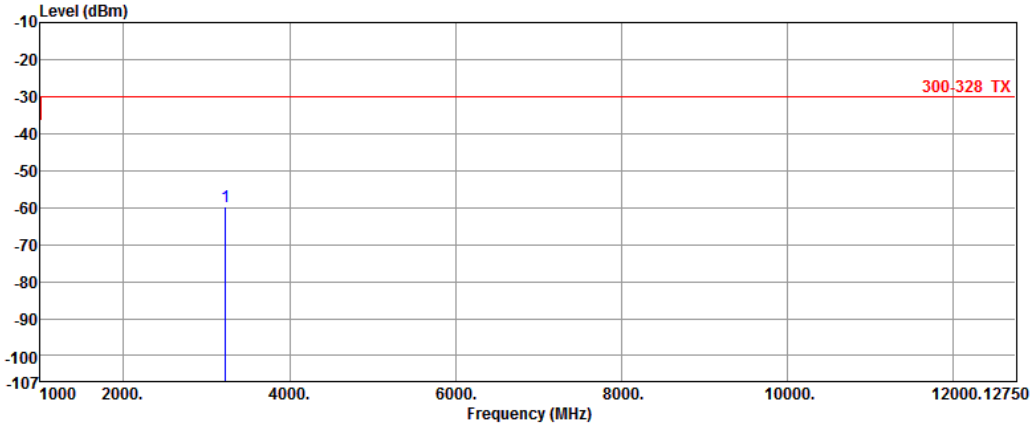
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3229.19	-58.19	-30.00	-28.19	7.00	-65.19

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

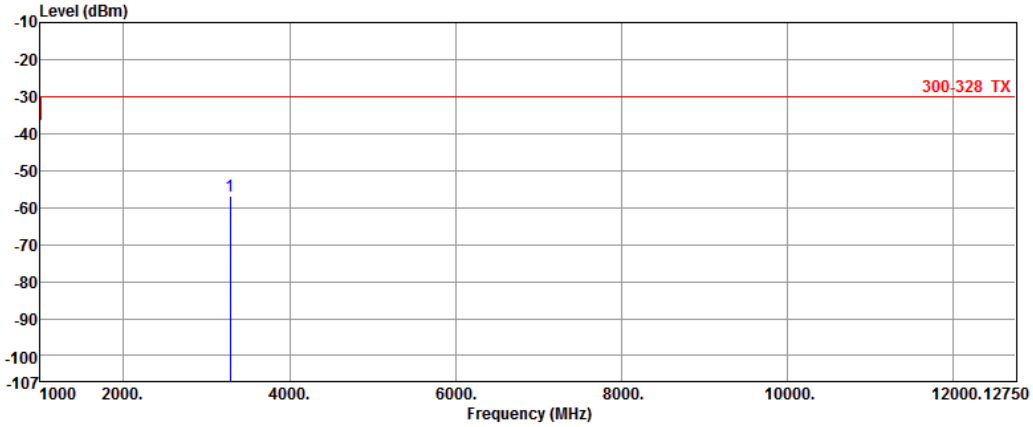
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3229.16	-59.62	-30.00	-29.62	6.50	-66.12

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

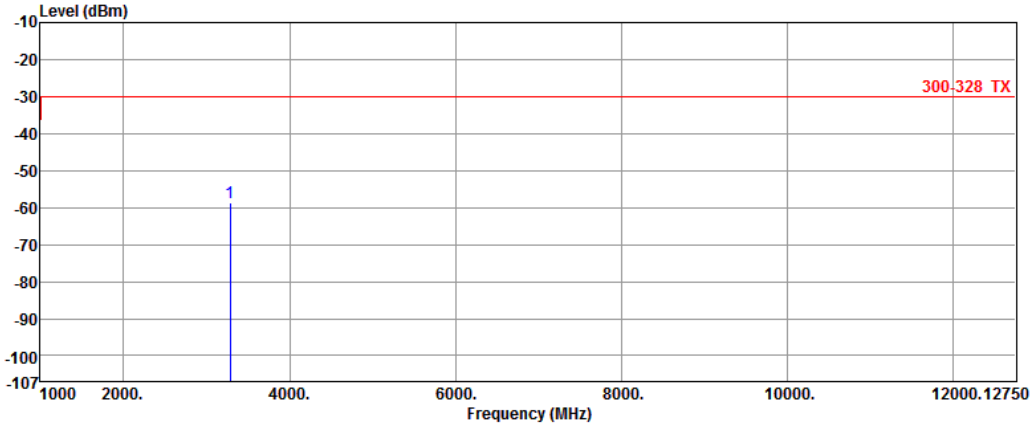
Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3284.81	-56.95	-30.00	-26.95	7.40	-64.35

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	HT40	Test Freq. (MHz)	2462
Polarization	Vertical		



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3284.29	-58.55	-30.00	-28.55	5.83	-64.38

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

5 Adaptivity Test Results

5.1 Adaptivity and Unwanted Signal Parameters

5.1.1 Limit of Adaptivity and Unwanted Signal Parameters

Adaptivity and Unwanted Signal Limit	
☒	Only for adaptive systems and RF Output Power > 10 dBm
☐	Non-LBT based Detect and Avoid: ◆ minimum remain unavailable = 1sec; ◆ minimum Idle Period time = 100us; ◆ maximum Channel Occupancy Time (COT) = 40ms ◆ detection threshold level = -70 dBm/MHz + 10 x $\log_{10}$(100mW / Pout) (Pout in mW e.i.r.p);
☐	LBT based Detect and Avoid (Frame Based Equipment): ◆ minimum Clear Channel Assessment (CCA) time = 18 us; ◆ COT = 1 ms to 10 ms ◆ Idle Period = 5% of COT ◆ detection threshold level = -70 dBm/MHz + 10 x $\log_{10}$(100mW / Pout) (Pout in mW e.i.r.p);
☒	LBT based Detect and Avoid (Load Based Equipment with spectrum sharing mechanism IEEE Std.): ◆ LBT based spectrum sharing mechanism may implement IEEE 802.11™-2012 [i.3] clause 9, clause 10, clause 16,clause 17, clause 19 and clause 20, or in IEEE 802.15.4™-2011 [i.4], clause 4, clause 5 and clause 8 ◆ detection threshold level = -70 dBm/MHz + 10 x $\log_{10}$(100mW / Pout) (Pout in mW e.i.r.p);
☒	Short Control Signalling Transmissions: ◆ Short Control Signalling Transmissions shall have a maximum duty cycle of 10 % within an observation period of 50 ms.

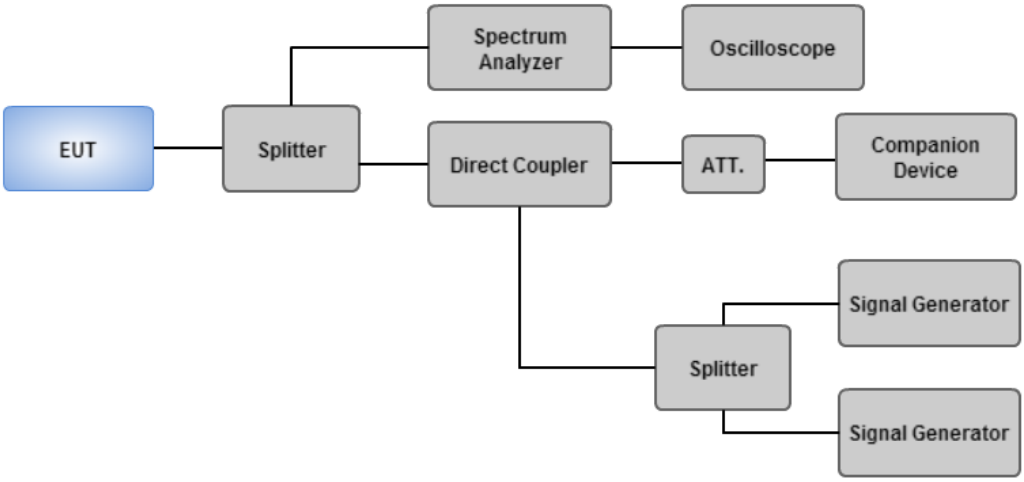
Unwanted Signal Parameters				
Equipment Type	**Wanted Signal Mean Power from Companion Device**	**Blocking Signal Frequency (MHz)**	**Blocking Signal Mean power (dBm)**	**Type of Interfering Signal**
LBT	sufficient to maintain the link (see note 2)	2395 or 2488,5 (see note 1)	-35 (see note 3)	CW
Non-LBT	-30 dBm			

Note 1: The highest frequency shall be used for testing operating channels within the range 2 400 MHz to 2 442 MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483,5 MHz.
Note 2: A typical value which can be used in most cases is -50 dBm/MHz.
Note 3: The level specified is the level in front of the UUT antenna. In case of conducted measurements, this level has to be corrected by the actual antenna assembly gain.

5.1.2 Test Procedures

Reference to clause 5.4.6.2 of ETSI EN 300 328 V2.2.2 (2019-07).

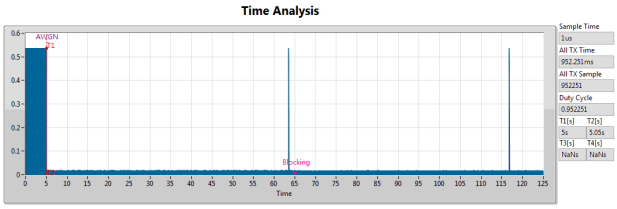
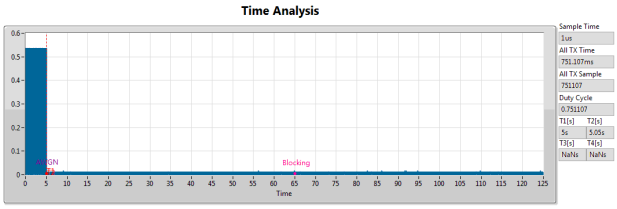
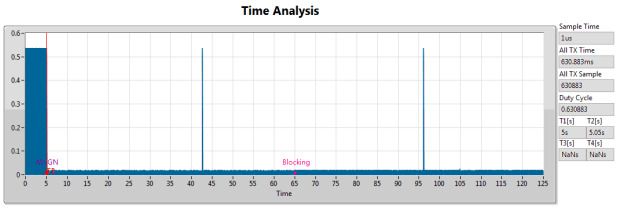
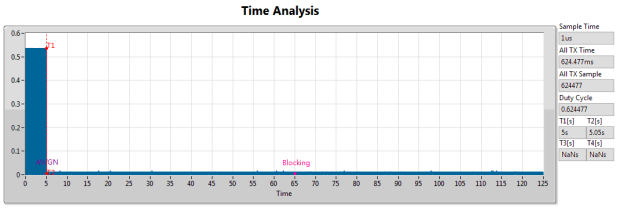
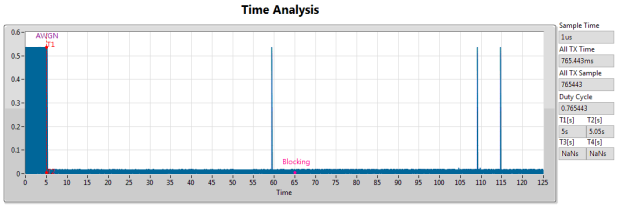
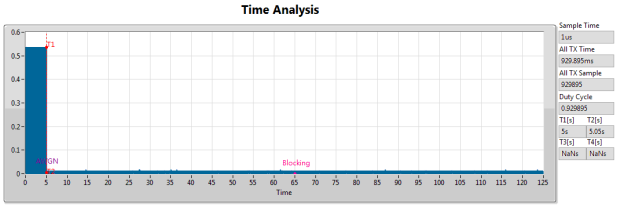
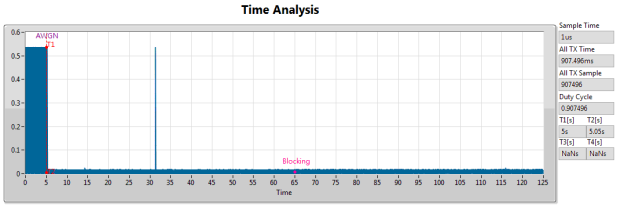
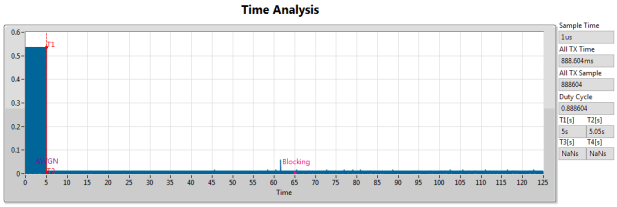
5.1.3 Test Setup



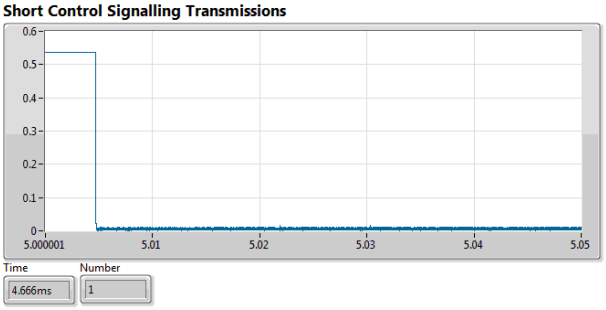
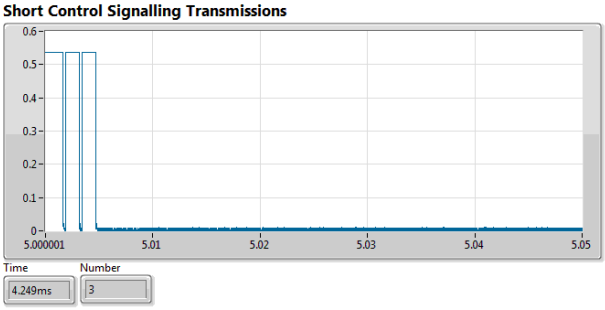
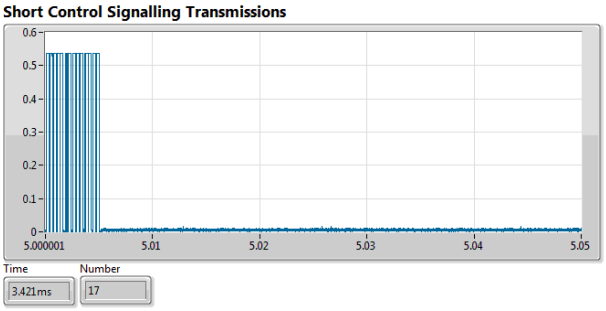
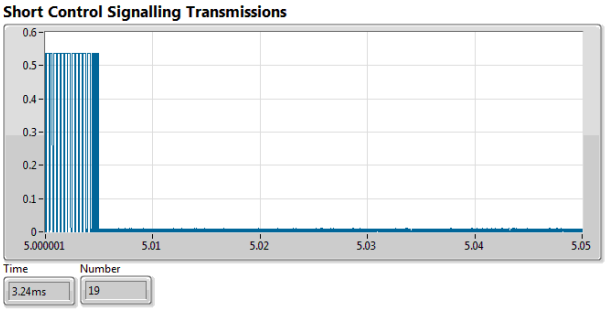
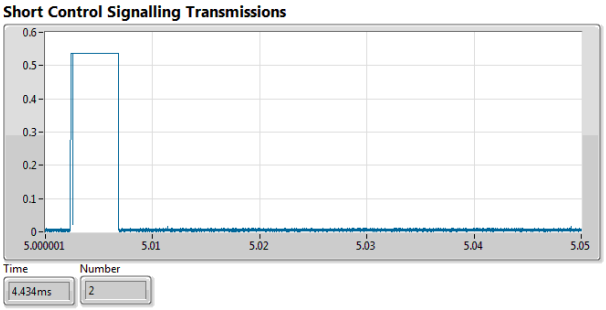
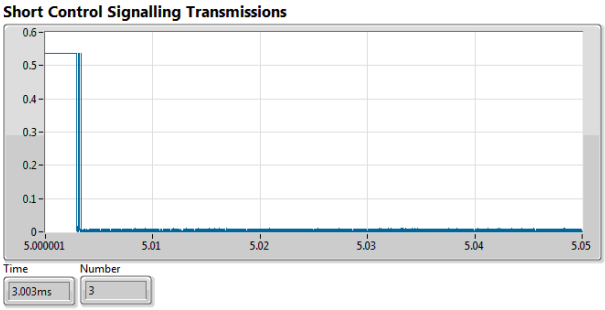
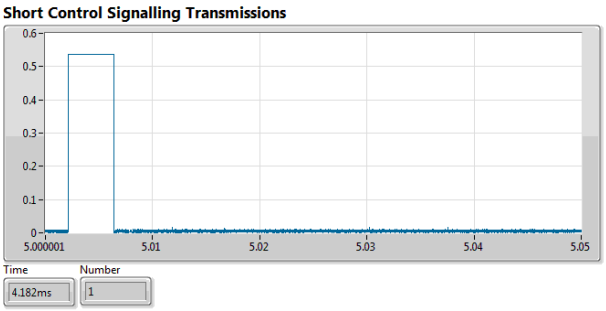
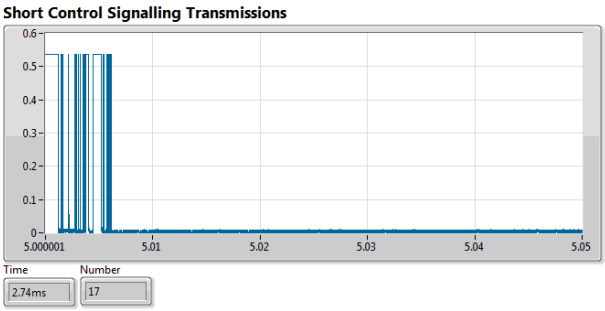
5.1.4 Test Result of Adaptivity、Unwanted Signal and Short Control Signalling Transmissions

Adaptivity and Unwanted Signal Result						
Adaptivity Detection Threshold Level (dBm)			-67.86			
Unwanted Signal Level (dBm)			-32.21			
Modulation Mode	Freq. (MHz)	Short Control Signalling Transmissions (ms)	Channel Occupancy Time (ms)	Idle Period Time (μs)	Adaptivity	Unwanted Signal Test Status
802.11b	2412	4.666	6.346	53	Pass	Pass
802.11b	2472	4.249	6.347	52		
802.11g	2412	3.421	12.498	39		
802.11g	2472	3.240	12.498	39		
802.11n (HT20)	2412	4.434	6.492	39		
802.11n (HT20)	2472	3.003	6.575	39		
802.11n (HT40)	2422	4.182	6.230	40		
802.11n (HT40)	2462	2.74	6.322	36		
Limit		< 5 ms	< 13 ms	>18μs		
Result		Complied				

5.1.5 Test Result of Adaptivity and Unwanted Signal Plots

Adaptivity & Unwanted Signal Result Plots	
Unwanted signal: 2488.5 MHz	**Unwanted signal: 2395 MHz**
802.11b - 2412MHz	**802.11b - 2472MHz**
	
802.11g - 2412MHz	**802.11g - 2472MHz**
	
802.11n (HT20) - 2412MHz	**802.11n (HT20) - 2472MHz**
	
802.11n (HT40) - 2422MHz	**802.11n (HT40) – 2462MHz**
	

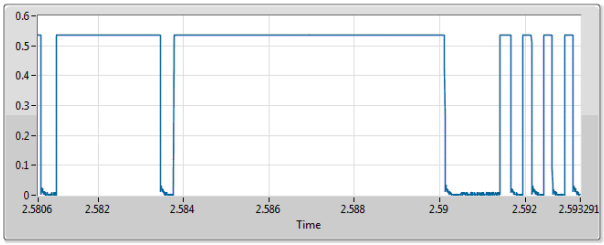
5.1.6 Test Result of Short Control Signalling Transmissions Plots

Short Control Signalling Transmissions Plots	
802.11b - 2412MHz	**802.11b - 2472MHz**
	
802.11g - 2412MHz	**802.11g - 2472MHz**
	
802.11n (HT20) - 2412MHz	**802.11n (HT20) - 2472MHz**
	
802.11n (HT40) - 2422MHz	**802.11n (HT40) – 2462MHz**
	

Channel Occupancy Time

802.11b - 2412MHz

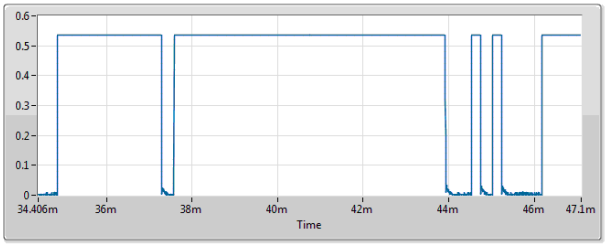
Max On Time



6.346ms

802.11b - 2472MHz

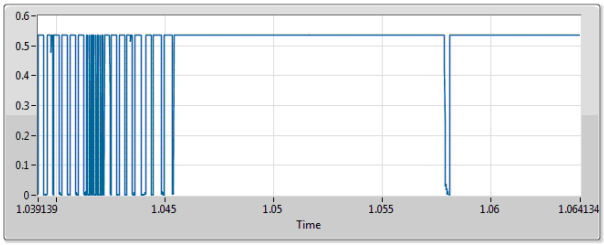
Max On Time



6.347ms

802.11g - 2412MHz

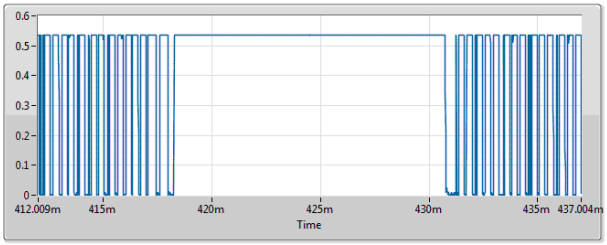
Max On Time



12.498ms

802.11g - 2472MHz

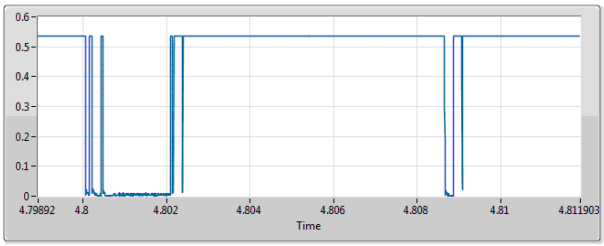
Max On Time



12.498ms

802.11n (HT20) - 2412MHz

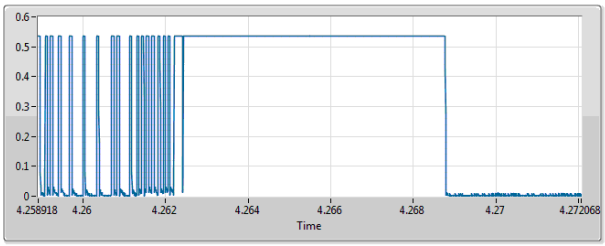
Max On Time



6.492ms

802.11n (HT20) - 2472MHz

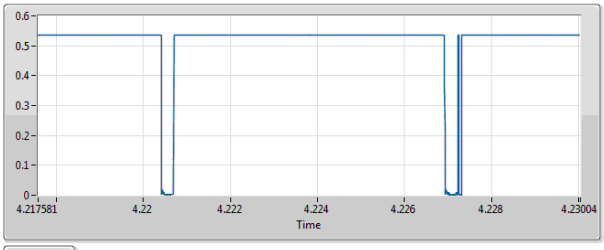
Max On Time



6.575ms

802.11n (HT40) - 2422MHz

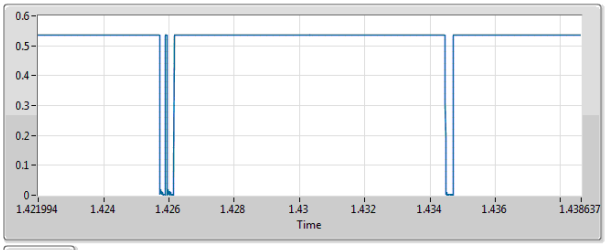
Max On Time



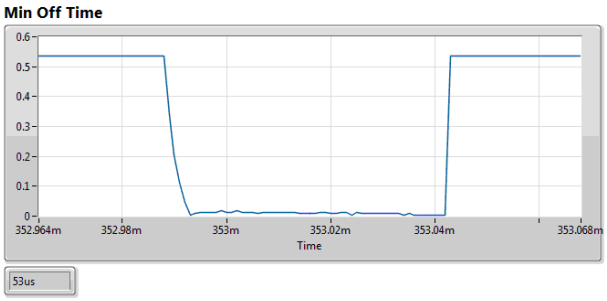
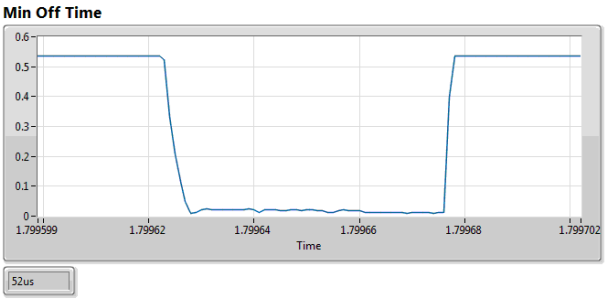
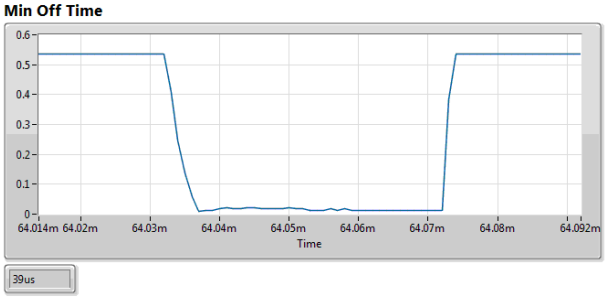
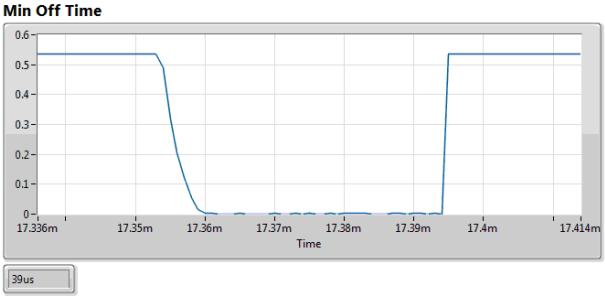
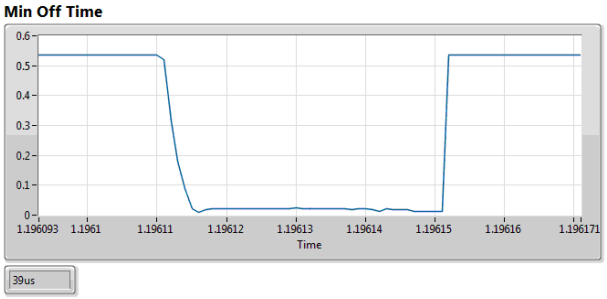
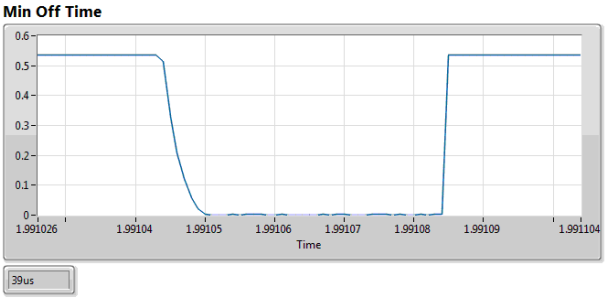
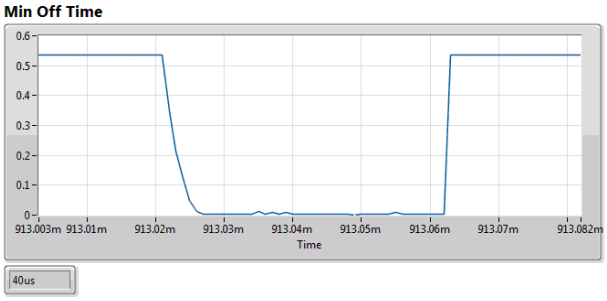
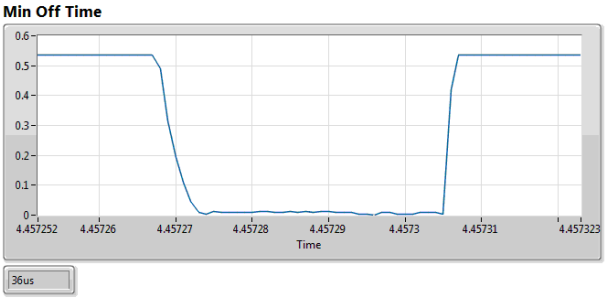
6.23ms

802.11n (HT40) – 2462MHz

Max On Time



6.322ms

Idle Period Time	
802.11b - 2412MHz	**802.11b - 2472MHz**
	
802.11g - 2412MHz	**802.11g - 2472MHz**
	
802.11n (HT20) - 2412MHz	**802.11n (HT20) - 2472MHz**
	
802.11n (HT40) - 2422MHz	**802.11n (HT40) – 2462MHz**
	

6 Receiver Blocking Test Results

6.1 Receiver Blocking

6.1.1 Limit of Receiver Blocking

Receiver Blocking Parameters for Receiver Category 1 Equipment Limit			
Wanted Signal Mean Power from Companion Device (dBm) (see notes 1 and 4)	**Blocking Signal Frequency (MHz)**	**Blocking Signal Power (dBm) (see note 4)**	**Type of Blocking Signal**
(-133 dBm + 10 × log10(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × log10(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

Note 1: OCBW is in Hz.
Note 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
Note 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
Note 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned.

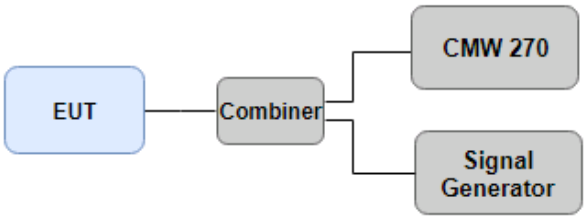
Receiver Blocking Parameters for Receiver Category 2 Equipment Limit			
Wanted Signal Mean Power from Companion Device (dBm) (see notes 1 and 3)	**Blocking Signal Frequency (MHz)**	**Blocking Signal Power (dBm) (see note 3)**	**Type of Blocking Signal**
(-139 dBm + 10 × log10(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
Note 1: OCBW is in Hz. Note 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. Note 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned.			

Receiver Blocking Parameters for Receiver Category 3 Equipment Limit			
Wanted Signal Mean Power from Companion Device (dBm) (see notes 1 and 3)	**Blocking Signal Frequency (MHz)**	**Blocking Signal Power (dBm) (see note 3)**	**Type of Blocking Signal**
(-139 dBm + 10 × log10(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less	2 380 2 504 2 300 2 584	-34	CW
Note 1: OCBW is in Hz. Note 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative the test may be performed using a wanted signal up to P_{min} + 30 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal Note 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned.			

6.1.2 Test Procedures

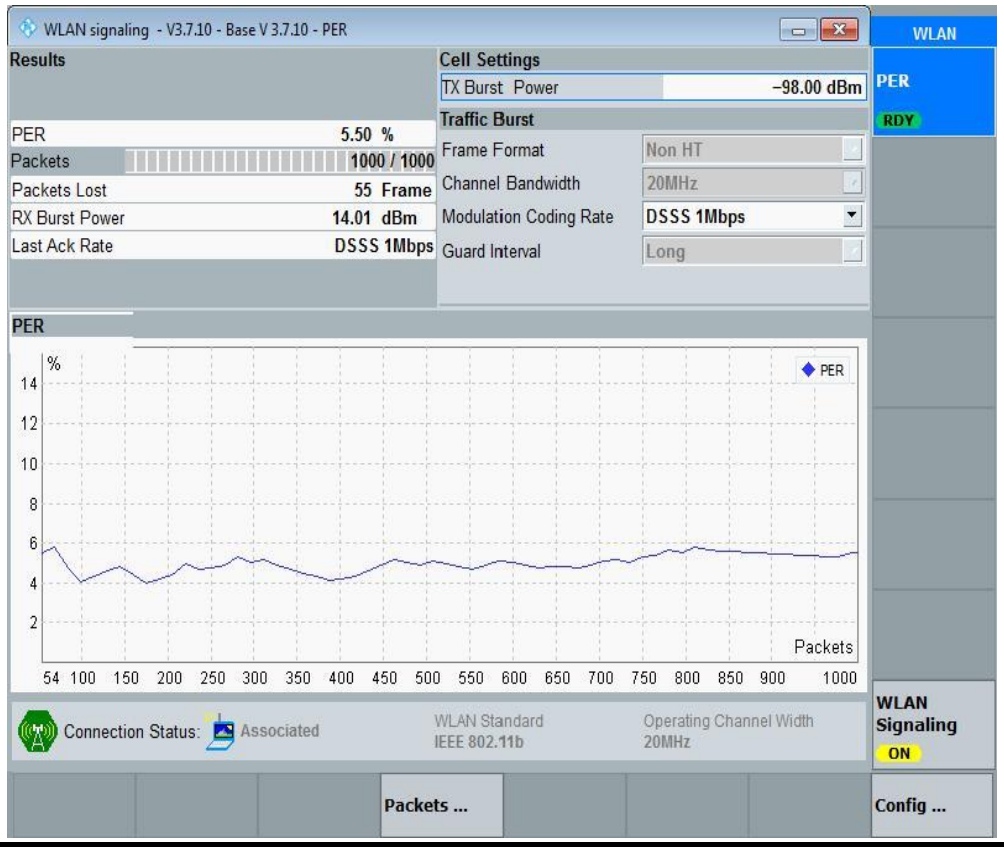
Reference to clause 5.4.11.2 of ETSI EN 300 328 V2.2.2 (2019-07).

6.1.3 Test Setup



6.1.4 Test Result of Receiver Blocking

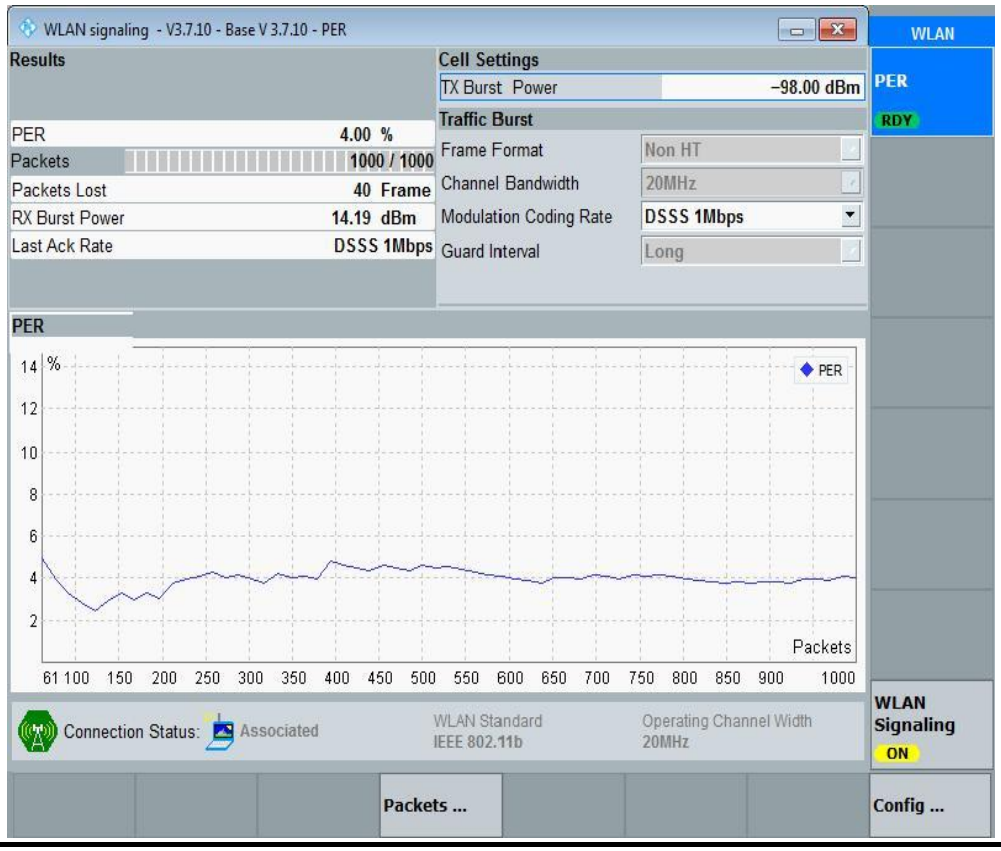
11b / 2412 MHz
Without Interference Signal Sensitivity Level



Receiver Category	1		
Performance Criteria Limit	PER ≤ 10 %		
Wanted Signal Mean Power from Companion Device (dBm)	Blocking Signal Frequency (MHz)	Blocking Signal Power (dBm)	Test Result
-65.21	2380	-31.21	Pass
-65.21	2504	-31.21	Pass
-71.21	2300	-31.21	Pass
-71.21	2330	-31.21	Pass
-71.21	2360	-31.21	Pass
-71.21	2524	-31.21	Pass
-71.21	2584	-31.21	Pass
-71.21	2674	-31.21	Pass

11b / 2472 MHz

Without Interference Signal Sensitivity Level

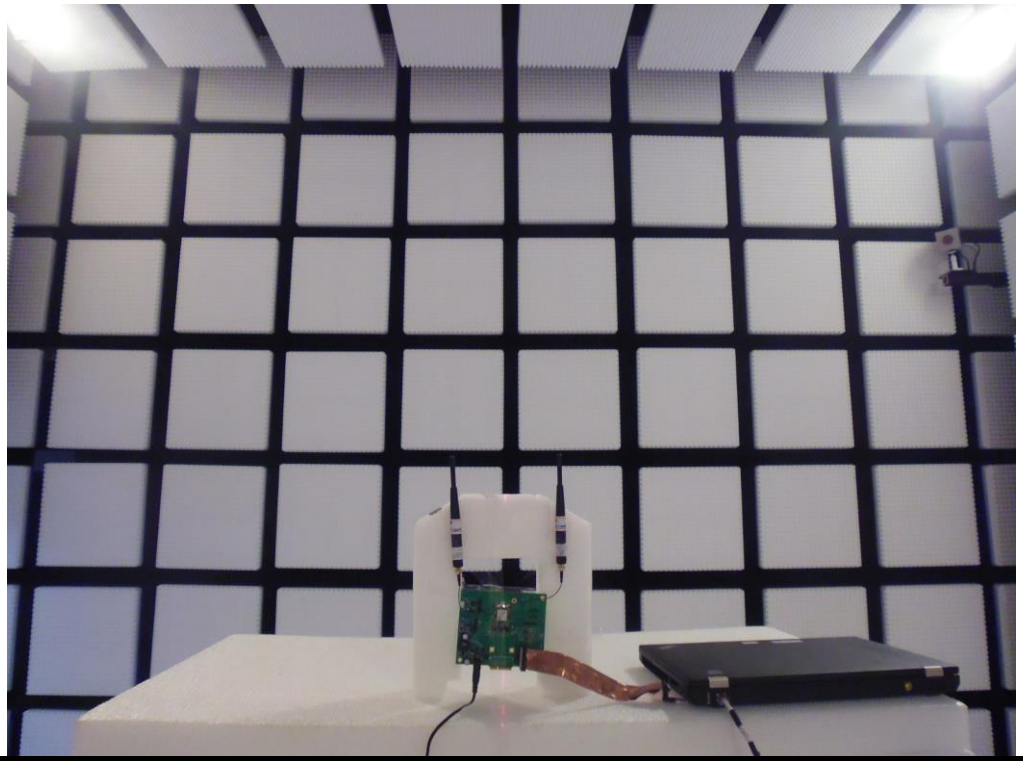


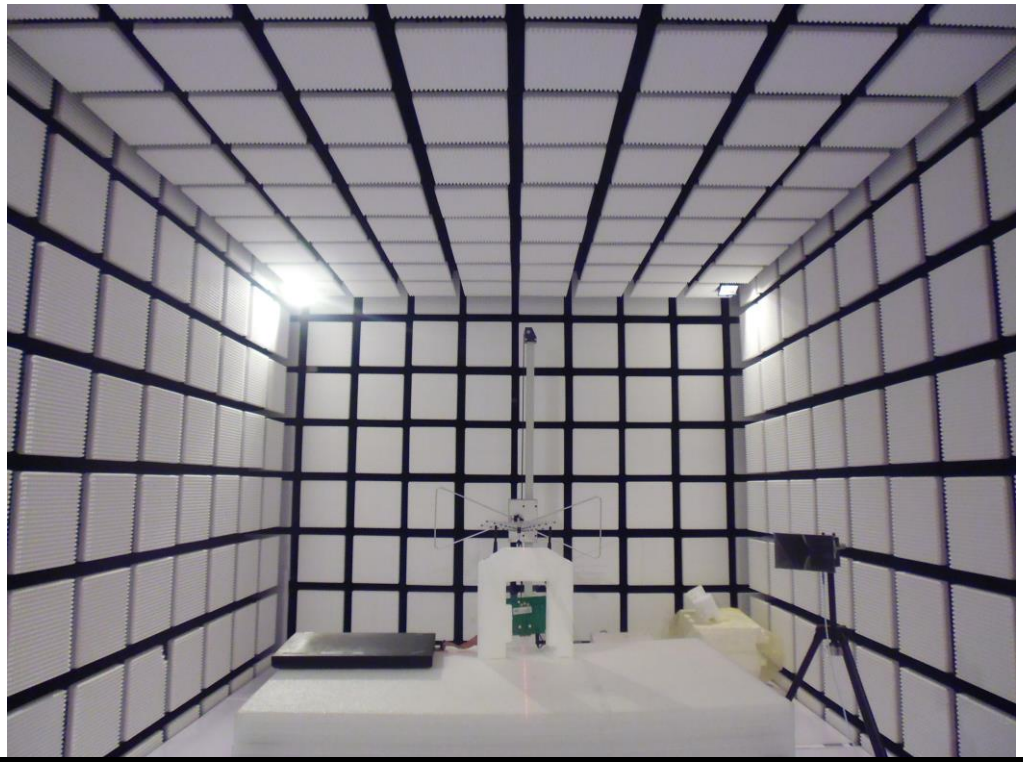
Receiver Category	1		
Performance Criteria Limit	PER ≤ 10 %		
Wanted Signal Mean Power from Companion Device (dBm)	**Blocking Signal Frequency (MHz)**	**Blocking Signal Power (dBm)**	**Test Result**
-65.21	2380	-31.21	Pass
-65.21	2504	-31.21	Pass
-71.21	2300	-31.21	Pass
-71.21	2330	-31.21	Pass
-71.21	2360	-31.21	Pass
-71.21	2524	-31.21	Pass
-71.21	2584	-31.21	Pass
-71.21	2674	-31.21	Pass

7 Photographs of the Test Configuration

Configuration 1 : Dipole Antenna

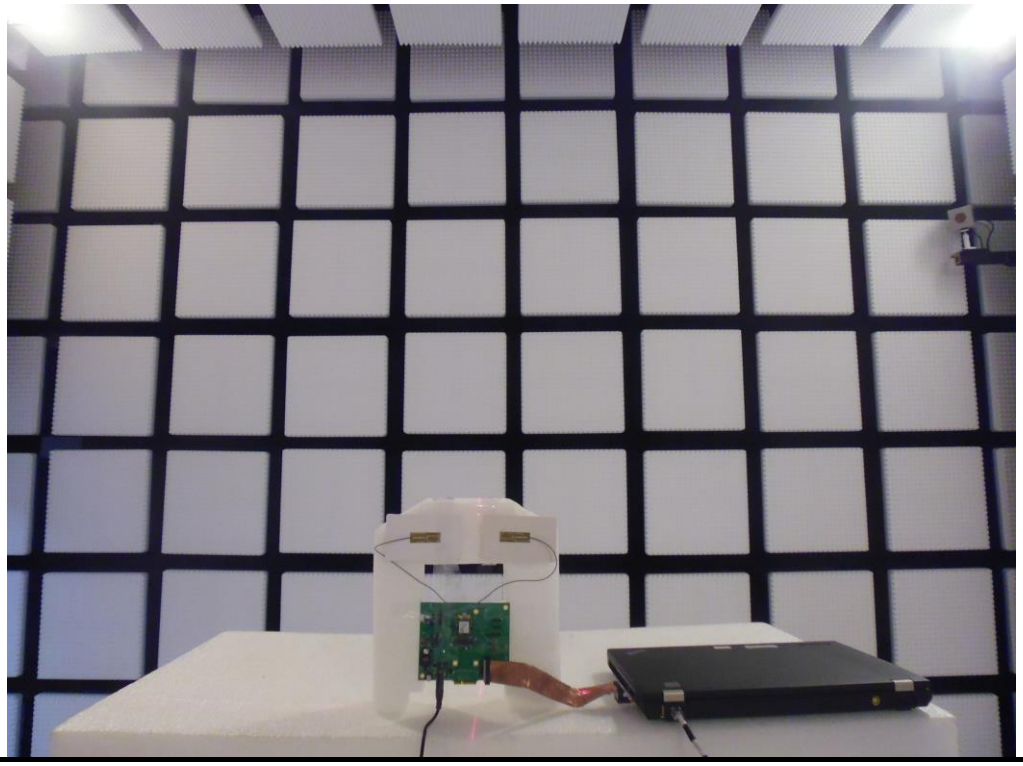
Spurious Emission Test

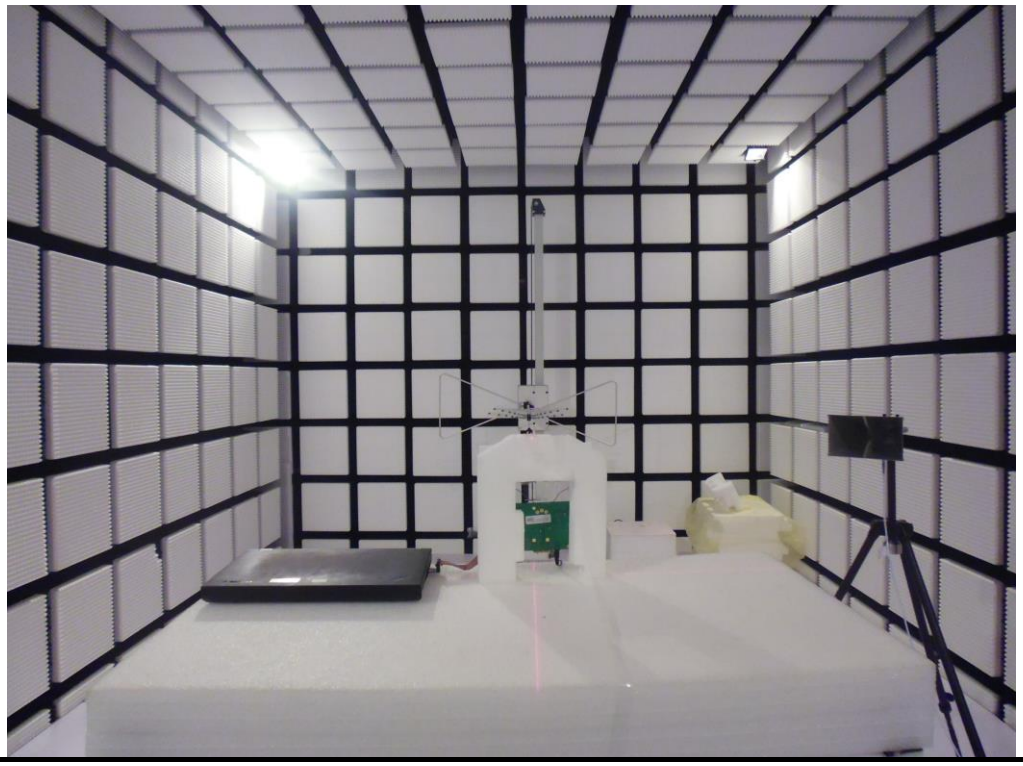




Configuration 2 : PCB Dipole Antenna

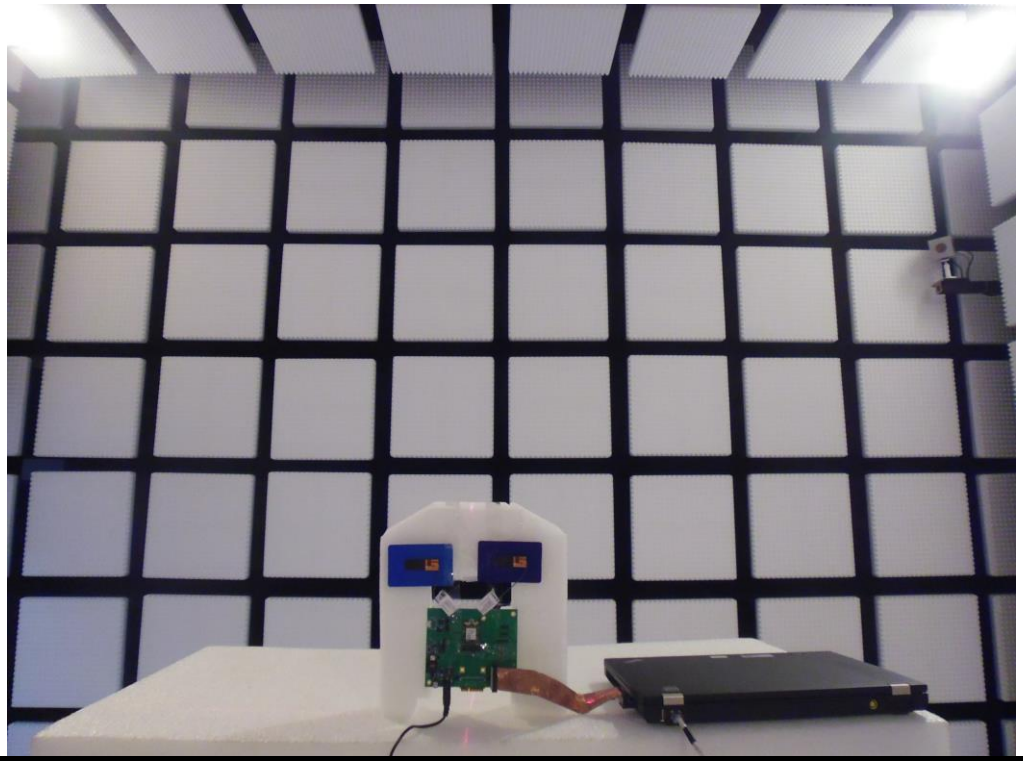
Spurious Emission Test

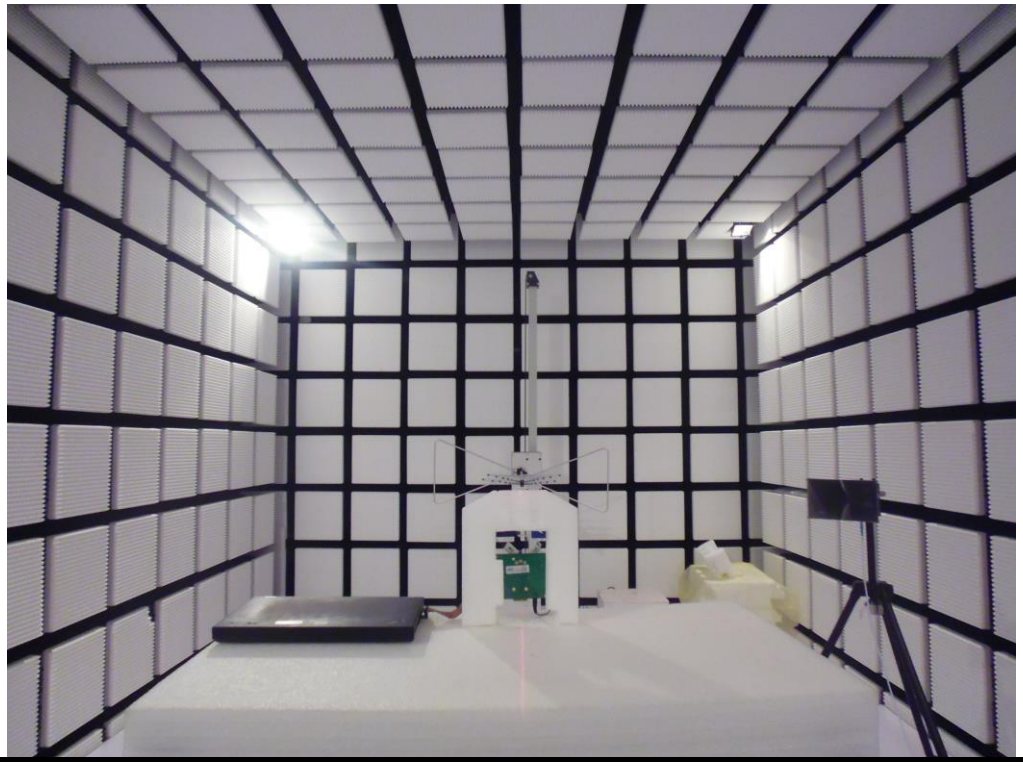




Configuration 3 : PIFA Antenna

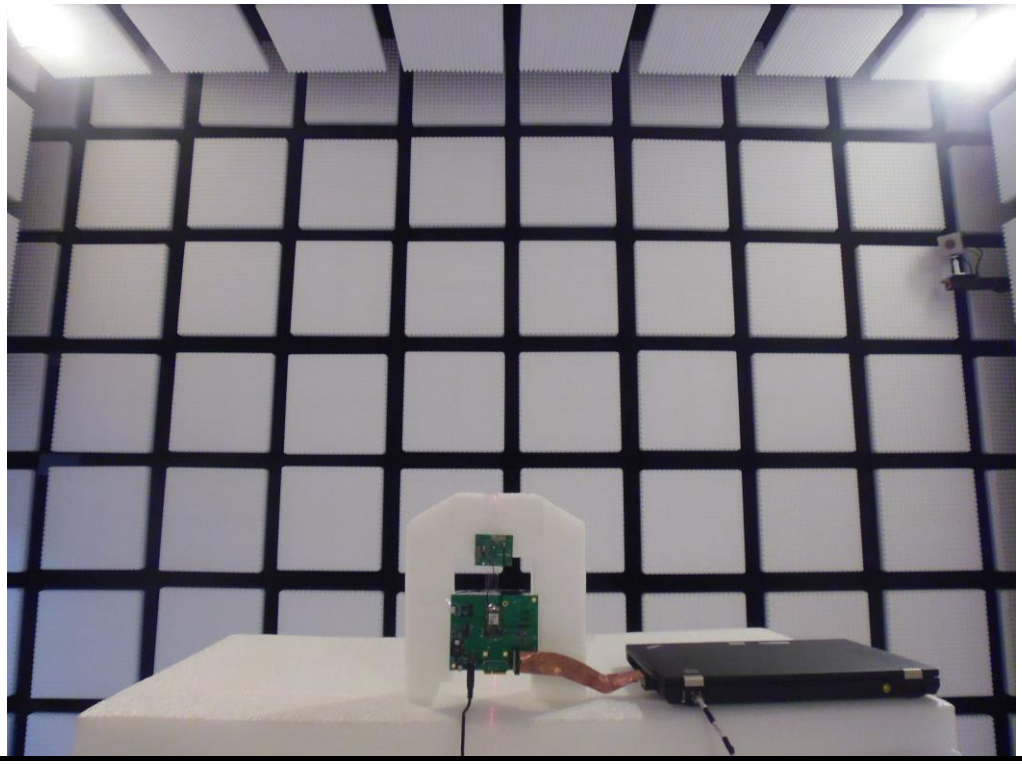
Spurious Emission Test

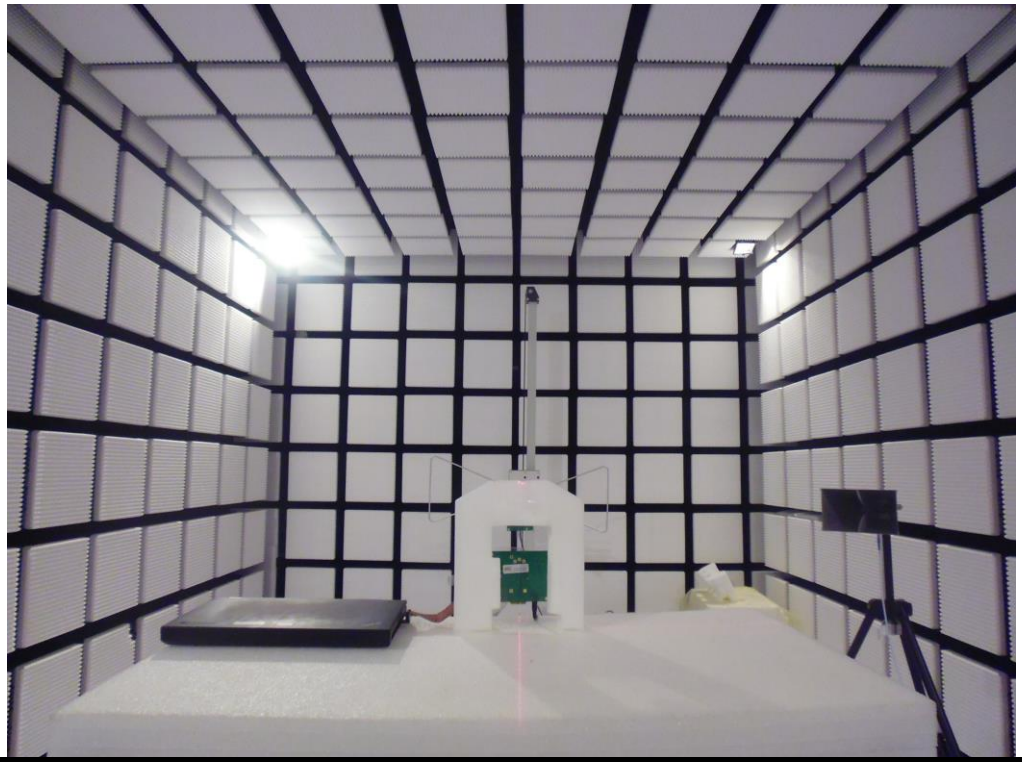




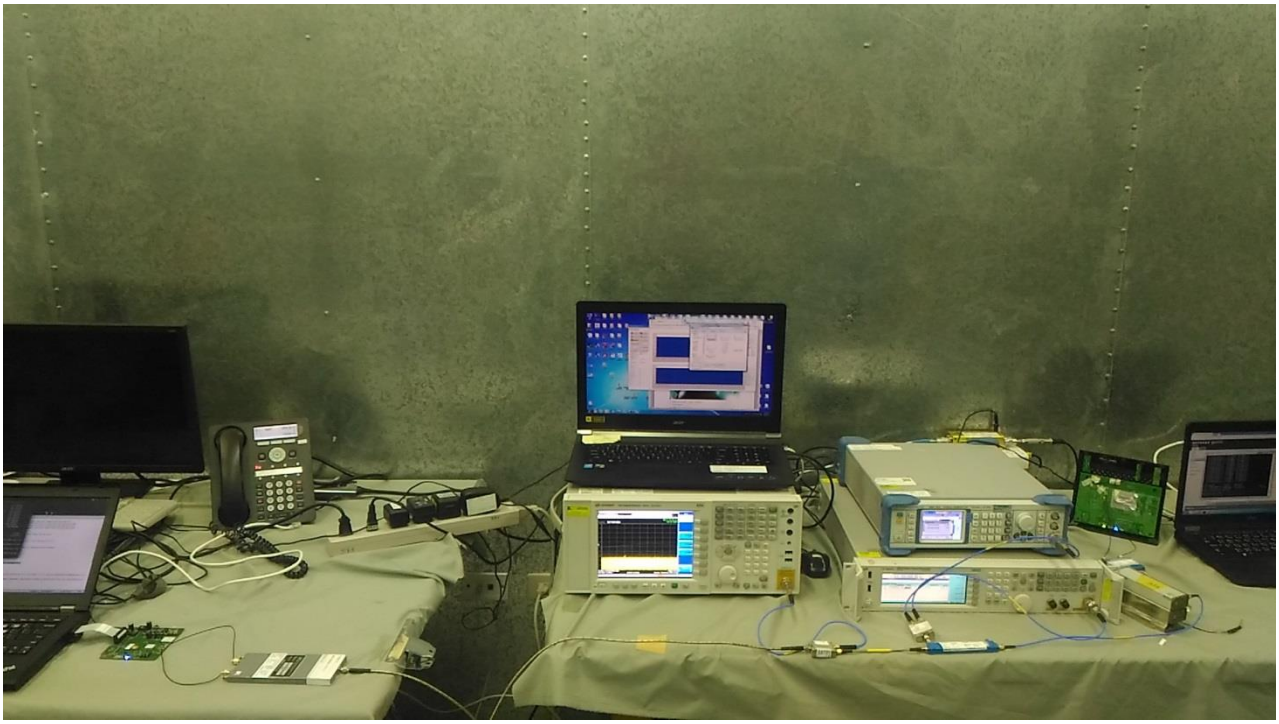
Configuration 4: Isolated Magnetic Dipole Antenna

Spurious Emission Test

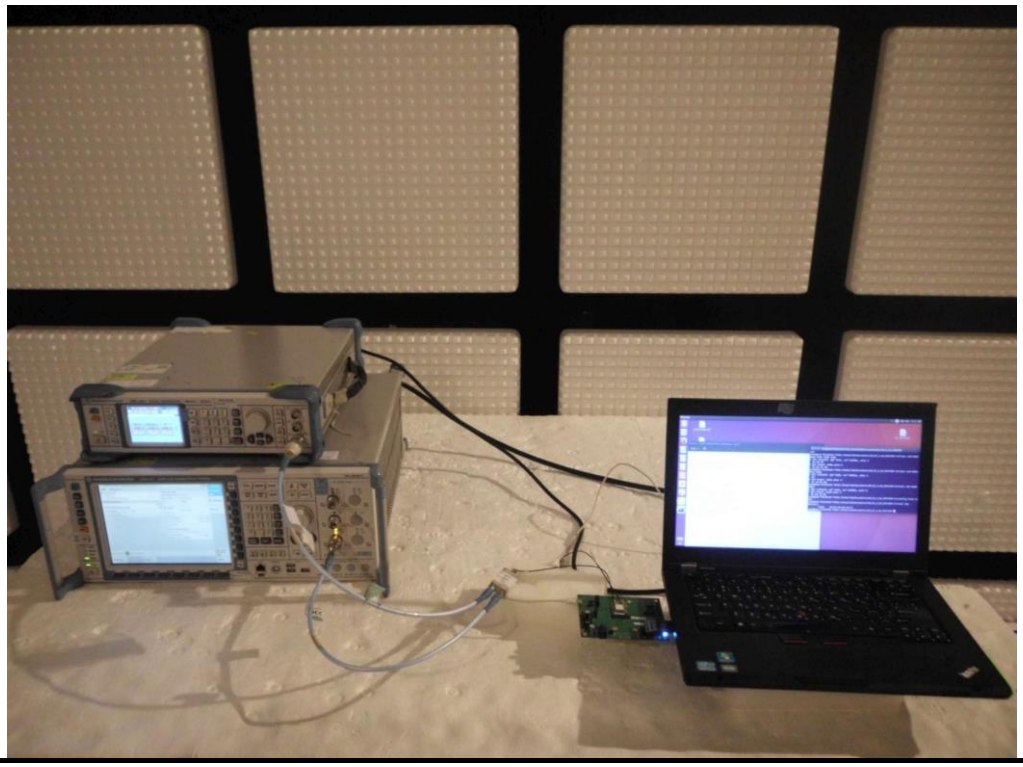




Adaptivity, Unwanted Signal and Short Control Signalling Transmissions Test



Receiver Blocking Test



8 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C..

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

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