CE Test Report

Equipment	:	**Sterling-LWB5+ WiFi 5 + Bluetooth 5.2 USB Adapter**
Model No.	:	**Sterling LWB5+**
Brand Name	:	**Laird Connectivity**
Applicant	:	**Laird Connectivity, LLC.**
Address	:	**W66N220 Commerce Court, Cedarburg, Wisconsin 53012, USA**
Standard	:	**EN 300 440 V2.1.1 (2017-03)**
Received Date	:	**Aug. 03, 2020**
Tested Date	:	**Aug. 20, 2020 ~ Jun. 18, 2021**

We, International Certification Corporation, 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
EQ061103-02	Rev. 01	Initial issue	Aug. 17, 2021

Summary of Test Results

Ref. Std. Clause	Test Items	Measured	Result
4.2.2	Equivalent Isotropically Radiated Power	10.22 dBm	Pass
4.2.3	Permitted Range of Operating Frequencies	Meet the requirement of limit.	Pass
4.2.4	Unwanted Emissions in the Spurious Domain	Meet the requirement of limit.	Pass
4.2.5.4	Duty Cycle	w/o test (No Restriction)	N/A
4.2.6	Additional Requirements for FHSS Equipment	N/A	N/A
4.3.3	Adjacent Channel Selectivity	Meet the requirement of limit.	Pass
4.3.4	Blocking or Desensitization	Meet the requirement of limit.	Pass
4.3.5	Receiver Spurious Radiation	Meet the requirement of limit.	Pass
4.4	Spectrum Access Techniques	N/A	N/A
4.6.4	GBSAR Antenna Pattern	N/A	N/A
ANNEX F	Limits for GBSAR	N/A	N/A

Note: N/A means not applicable.

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

Test results of RF Conducted measurement is referred to International Certification Corp. Report No. EQ061103.

1.1.1 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**
5725-5850	a	5745-5825	149-165 [5]	1	6-54 Mbps
5725-5850	n (HT20)	5745-5825	149-165 [5]	1	MCS 0-7
5725-5850	n (HT40)	5755-5795	151-159 [2]	1	MCS 0-7
5725-5850	ac (VHT20)	5745-5825	149-165 [5]	1	MCS 0-9
5725-5850	ac (VHT40)	5755-5795	151-159 [2]	1	MCS 0-9
5725-5850	ac (VHT80)	5775	155 [1]	1	MCS 0-9
Note: 802.11a/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

1.1.2 Antenna Details

Ant. No.	Manufacturer	Model	Laird Part Number	Type	Connector	Antenna Gain (dBi)
1	ACX	AD1608-A2455 AAT/LF	NA	Chip Antenna	N/A	4

1.1.3 EUT Operational Condition

Power Type	5 Vdc		
SW Version	N/A		
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (85°C)	☒ Tmin (-40°C)
Operational Voltage	☒ Vnom (5V)	☒ Vmax (5.5 V)	☒ Vmin (4.5V)

1.1.4 Accessories

N/A

1.1.5 Receiver Category

Receiver Category		Risk Assessment Of Receiver Performance
☒	1	Highly reliable SRD communication media; e.g. serving human life inherent systems (may result in a physical risk to a person).
☐	2	Medium reliable SRD communication media e.g. causing Inconvenience to persons, which cannot simply be overcome by other means.
☐	3	Standard reliable SRD communication media e.g. Inconvenience to persons, which can simply be overcome by other means (e.g. manual).

1.1.6 Channel List

Frequency band (MHz)		5725~5850	
802.11 a / n HT20 / ac VHT20		802.11n HT40 / ac VHT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
149	5745	151	5755
153	5765	159	5795
157	5785	802.11ac VHT80	
161	5805	155	5775
165	5825	---	---

1.1.7 Test Tool and Duty Cycle

Test Tool	TeraTerm, Version :4.103	
Modulation Mode	Duty Cycle Of Test Signal (%)	Duty Factor (dB)
a	97.85%	0.09
ac (VHT20)	97.65%	0.10
ac (VHT40)	94.20%	0.26
ac (VHT80)	88.50%	0.53

1.1.8 Power Index of Test Tool

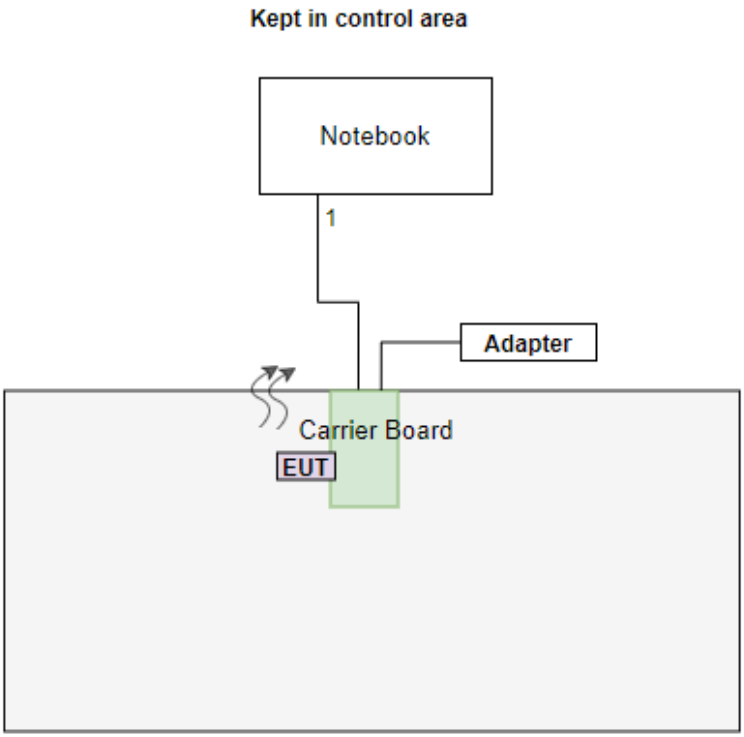
Modulation Mode	Test Frequency (MHz)					
	a / VHT20			VHT40		VHT80
	5745	5785	5825	5755	5795	5775
a	40	40	40	---	---	---
ac (VHT20)	40	40	40	---	---	---
ac (VHT40)	---	---	---	40	40	---
ac (VHT80)	---	---	--	---	---	40

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**S/N**	**Remarks**
1	Notebook	DELL	Latitude 5400	CXYCM33	---
2	Carrier Board	Laird	DVK-LWB5+	---	Provided by applicant.

1.3 Test Setup Chart

Test Setup Diagram



No.	Signal cable / Length (m)
1	USB, 0.5m shielded.

1.4 Test Equipment and Calibration Data

Test Item	Radiated Emissions				
Test Site	Fully-anechoic chamber 1 / (05CH01-WS)				
Test Date	Jun. 18, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
5m Fully-anechoic chamber	TDK	0	05CH01-WS	NA	NA
Spectrum Analyzer	Agilent	N9010A	MY54200247	Oct. 16, 2020	Oct. 15, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-524	Nov. 11, 2020	Nov. 10, 2021
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1094	Nov. 03, 2020	Nov. 02, 2021
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Dec. 31, 2020	Dec. 30, 2021
Preamplifier	Agilent	83017A	MY39501310	Nov. 30, 2020	Nov. 29, 2021
Preamplifier	EMC	EMC02325	980146	Nov. 16, 2020	Nov. 15, 2021
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY22626/4	Oct. 13, 2020	Oct. 12, 2021
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16609/4	Oct. 13, 2020	Oct. 12, 2021
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY15686/4	Oct. 13, 2020	Oct. 12, 2021
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-005	Oct. 13, 2020	Oct. 12, 2021
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-006	Oct. 13, 2020	Oct. 12, 2021
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)				
Test Date	Aug. 20, 2020				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101486	Feb. 10, 2020	Feb. 09, 2021
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Dec. 12, 2019	Dec. 11, 2020
Power Sensor	Agilent	U2021XA	MY53480019	Feb. 10, 2020	Feb. 09, 2021
Power Sensor	Agilent	U2021XA	MY53510003	Feb. 10, 2020	Feb. 09, 2021
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 02, 2019	Dec. 01, 2020
Combiner(1X2)	WOKEN	0120A02201801O	DOM2AEW1A23	Oct. 17, 2019	Oct. 16, 2020
Combiner(1X4)	WOKEN	4WAYDIV	0120A042011010	Oct. 16, 2019	Oct. 15, 2020
Measurement Software	Agilent	EN RF test	1.1501125	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Receiver Blocking				
Test Site	(05CH01-WS)				
Test Date	Jun. 18, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Wireless connectivity tester	R&S	CMW270	100856	Nov. 02, 2020	Nov. 01, 2021
Signal Generator	R&S	SMB100A	175727	Jan. 07, 2021	Jan. 06, 2022
RF cable-0.5M	HUBER+SUHNER	SUCOFLEX_104	500202/4	Oct. 15, 2020	Oct. 14, 2021
RF cable-0.5M	HUBER+SUHNER	SUCOFLEX_104	296088/4	Oct. 15, 2020	Oct. 14, 2021
RF cable-0.2M	HUBER+SUHNER	SUCOFLEX_104	329023/4	Oct. 15, 2020	Oct. 14, 2021
Combiner(1X2)	WOKEN	2WAYDIV	12101200003	Oct. 15, 2020	Oct. 14, 2021
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 300 440 V2.1.1 (2017-03)

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**
Radio Frequency	±0.059 x 10^{-7}	±1 × 10^{-7}
RF power (conducted)	±0.685 dB	±2,5 dB
Radiated emission of transmitter, valid up to 40 GHz	±3.40 dB	±8 dB
Radiated emission of receiver, valid up to 40 GHz	±3.40 dB	±8 dB
Temperature	±0.4 °C	±1 °C
Humidity	±3.3 %	±5 %
Voltage (DC)	±0.15 %	±1 %
Voltage (AC, < 10kHz)	±0.15 %	±2 %

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	TH01-WS, 05CH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Equivalent Isotropic Radiated Power Permitted Range of Operating Frequencies	11a VHT20 VHT40 VHT80	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795 5775	6 Mbps MCS 0 MCS 0 MCS 0	---
Transmitter Radiated Spurious Emissions≤1GHz Receiver Radiated Spurious Emissions≤1GHz	11a VHT20 VHT40 VHT80	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795 5775	6 Mbps MCS 0 MCS 0 MCS 0	---
Transmitter Radiated Spurious Emissions>1GHz Receiver Radiated Spurious Emissions>1GHz	11a VHT20 VHT40 VHT80	5745 / 5785 / 5825 5745 / 5785 / 5825 5755 / 5795 5775	6 Mbps MCS 0 MCS 0 MCS 0	---
Receiver Blocking Adjacent Channel Selectivity	11a	5745 / 5825	6 Mbps	---

NOTE:
1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** result was found as the worst case and was shown in this report.

3 Transmitter Test Results

3.1 Equivalent Isotropically Radiated Power (e.i.r.p.)

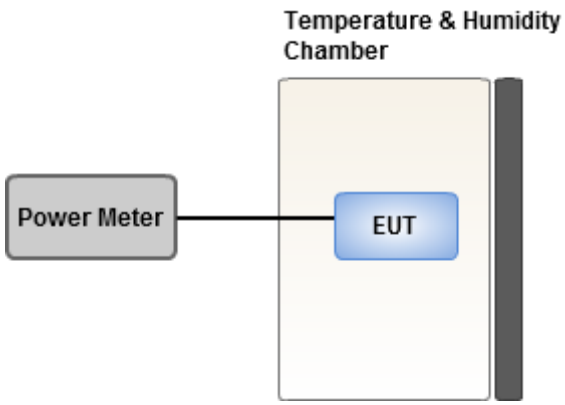
3.1.1 Limit of Equivalent Isotropically Radiated Power

Frequency Bands	Power	Applications
5 725 MHz to 5 875 MHz	25 mW (14dBm) e.i.r.p.	Non-specific short range devices

3.1.2 Test Procedures

Reference to clause 4.2.2.3 of EN 300 440 V2.1.1 (2017-03).

3.1.3 Test Setup



3.1.4 Test Result of Equivalent Isotropically Radiated Power

Ambient Condition	25°C / 64%	Tested By	Nai Xu

Maximum Transmit Power (dBm)				
Modulation Mode	11a			
Condition	**Freq. (MHz)**	**EIRP Power (dBm)**	**EIRP Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	5745	9.95	14	Pass
$T_{min}V_{max}$	5745	10.15	14	Pass
$T_{min}V_{min}$	5745	10.17	14	Pass
$T_{max}V_{max}$	5745	9.61	14	Pass
$T_{max}V_{min}$	5745	9.58	14	Pass
$T_{nom}V_{nom}$	5785	9.95	14	Pass
$T_{min}V_{max}$	5785	10.17	14	Pass
$T_{min}V_{min}$	5785	10.20	14	Pass
$T_{max}V_{max}$	5785	9.62	14	Pass
$T_{max}V_{min}$	5785	9.60	14	Pass
$T_{nom}V_{nom}$	5825	9.68	14	Pass
$T_{min}V_{max}$	5825	9.88	14	Pass
$T_{min}V_{min}$	5825	9.91	14	Pass
$T_{max}V_{max}$	5825	9.29	14	Pass
$T_{max}V_{min}$	5825	9.27	14	Pass

Note: EIRP = Measured conducted power + Antenna gain

Maximum Transmit Power (dBm)				
Modulation Mode	VHT20			
Condition	**Freq. (MHz)**	**EIRP Power (dBm)**	**EIRP Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	5745	9.92	14	Pass
$T_{min}V_{max}$	5745	10.12	14	Pass
$T_{min}V_{min}$	5745	10.14	14	Pass
$T_{max}V_{max}$	5745	9.57	14	Pass
$T_{max}V_{min}$	5745	9.55	14	Pass
$T_{nom}V_{nom}$	5785	9.82	14	Pass
$T_{min}V_{max}$	5785	10.05	14	Pass
$T_{min}V_{min}$	5785	10.07	14	Pass
$T_{max}V_{max}$	5785	9.42	14	Pass
$T_{max}V_{min}$	5785	9.40	14	Pass
$T_{nom}V_{nom}$	5825	9.60	14	Pass
$T_{min}V_{max}$	5825	9.83	14	Pass
$T_{min}V_{min}$	5825	9.85	14	Pass
$T_{max}V_{max}$	5825	9.22	14	Pass
$T_{max}V_{min}$	5825	9.20	14	Pass

Note: EIRP = Measured conducted power + Antenna gain

Maximum Transmit Power (dBm)				
Modulation Mode	VHT40			
Condition	**Freq. (MHz)**	**EIRP Power (dBm)**	**EIRP Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	5755	9.71	14	Pass
$T_{min}V_{max}$	5755	9.95	14	Pass
$T_{min}V_{min}$	5755	9.98	14	Pass
$T_{max}V_{max}$	5755	9.40	14	Pass
$T_{max}V_{min}$	5755	9.38	14	Pass
$T_{nom}V_{nom}$	5795	9.67	14	Pass
$T_{min}V_{max}$	5795	9.89	14	Pass
$T_{min}V_{min}$	5795	9.93	14	Pass
$T_{max}V_{max}$	5795	9.25	14	Pass
$T_{max}V_{min}$	5795	9.22	14	Pass

Note: EIRP = Measured conducted power + Antenna gain

Maximum Transmit Power (dBm)				
Modulation Mode	VHT80			
Condition	**Freq. (MHz)**	**EIRP Power (dBm)**	**EIRP Limit (dBm)**	**Results**
$T_{nom}V_{nom}$	5775	9.96	14	Pass
$T_{min}V_{max}$	5775	10.18	14	Pass
$T_{min}V_{min}$	5775	10.22	14	Pass
$T_{max}V_{max}$	5775	9.60	14	Pass
$T_{max}V_{min}$	5775	9.57	14	Pass

Note: EIRP = Measured conducted power + Antenna gain

3.2 Permitted Range of Operating Frequencies

3.2.1 Limit of Permitted Range of Operating Frequencies

The width of the power spectrum envelope is f_H -f_L for a given operating frequency. In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allowed band. The frequency range is determined by the lowest value of f_L and the highest value of f_H resulting from the adjustment of the equipment to the lowest and highest operating frequencies.

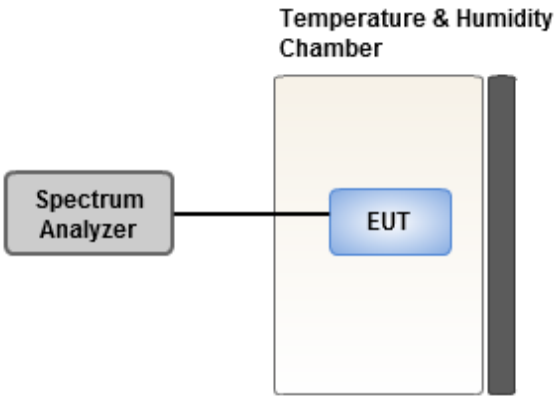
The occupied bandwidth (i.e. the bandwidth in which 99 % of the wanted emission is contained) and the necessary bandwidth of the transmitter shall fall within the assigned frequency band.

For all equipment the frequency range shall lie within the 5725 ~ 5875 MHz

3.2.2 Test Procedures

Reference to clause 4.2.3.3 of EN 300 440 V2.1.1 (2017-03).

3.2.3 Test Setup



3.2.4 Test Result of Permitted Range of Operating Frequencies

Ambient Condition	25°C / 64%	Tested By	Nai Xu

Frequency Range (MHz)				
Modulation Mode	11a			
Condition	**Freq. (MHz)**	**F_L and F_H (MHz)**	**Limit (MHz)**	**Results**
$T_{nom}V_{nom}$	5745	5736.45	5725	Pass
$T_{min}V_{max}$	5745	5736.41	5725	Pass
$T_{min}V_{min}$	5745	5736.41	5725	Pass
$T_{max}V_{max}$	5745	5736.50	5725	Pass
$T_{max}V_{min}$	5745	5736.50	5725	Pass
$T_{nom}V_{nom}$	5825	5833.37	5875	Pass
$T_{min}V_{max}$	5825	5833.46	5875	Pass
$T_{min}V_{min}$	5825	5833.46	5875	Pass
$T_{max}V_{max}$	5825	5833.36	5875	Pass
$T_{max}V_{min}$	5825	5833.36	5875	Pass

Frequency Range (MHz)				
Modulation Mode	VHT20			
Condition	**Freq. (MHz)**	**F_L and F_H (MHz)**	**Limit (MHz)**	**Results**
$T_{nom}V_{nom}$	5745	5735.78	5725	Pass
$T_{min}V_{max}$	5745	5735.73	5725	Pass
$T_{min}V_{min}$	5745	5735.73	5725	Pass
$T_{max}V_{max}$	5745	5735.79	5725	Pass
$T_{max}V_{min}$	5745	5735.79	5725	Pass
$T_{nom}V_{nom}$	5825	5834.06	5875	Pass
$T_{min}V_{max}$	5825	5834.10	5875	Pass
$T_{min}V_{min}$	5825	5834.10	5875	Pass
$T_{max}V_{max}$	5825	5834.04	5875	Pass
$T_{max}V_{min}$	5825	5834.04	5875	Pass

Frequency Range (MHz)				
Modulation Mode	VHT40			
Condition	**Freq. (MHz)**	**F_L and F_H (MHz)**	**Limit (MHz)**	**Results**
$T_{nom}V_{nom}$	5755	5736.62	5725	Pass
$T_{min}V_{max}$	5755	5736.61	5725	Pass
$T_{min}V_{min}$	5755	5736.61	5725	Pass
$T_{max}V_{max}$	5755	5736.65	5725	Pass
$T_{max}V_{min}$	5755	5736.65	5725	Pass
$T_{nom}V_{nom}$	5795	5813.24	5875	Pass
$T_{min}V_{max}$	5795	5813.26	5875	Pass
$T_{min}V_{min}$	5795	5813.26	5875	Pass
$T_{max}V_{max}$	5795	5813.22	5875	Pass
$T_{max}V_{min}$	5795	5813.22	5875	Pass

Frequency Range (MHz)				
Modulation Mode	VHT80			
Condition	**Freq. (MHz)**	**F_L and F_H (MHz)**	**Limit (MHz)**	**Results**
$T_{nom}V_{nom}$	5775	5736.67	5725	Pass
$T_{min}V_{max}$	5775	5736.63	5725	Pass
$T_{min}V_{min}$	5775	5736.63	5725	Pass
$T_{max}V_{max}$	5775	5736.70	5725	Pass
$T_{max}V_{min}$	5775	5736.70	5725	Pass

3.2.5 Occupied Bandwidth

Summary

Mode	OBW (Hz)	ITU-Code
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_1TX	16.486M	16M4D1D
802.11ac VHT20_Nss1,(MCS0)_1TX	17.716M	17M7D1D
802.11ac VHT40_Nss1,(MCS0)_1TX	36.251M	36M2D1D
802.11ac VHT80_Nss1,(MCS0)_1TX	75.701M	75M7D1D

OBW = Minimum 99% occupied bandwidth;

Result

Mode	Result	Limit (Hz)	fl-OBW (Hz)	fh-OBW (Hz)	OBW (Hz)	N dB (Hz)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-	-	-
5745MHz_TnomVnom	Pass	16M~20M	5.736692G	5.753178G	16.486M	16.56M
5825MHz_TnomVnom	Pass	16M~20M	5.816692G	5.833178G	16.486M	16.56M
802.11ac VHT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-
5745MHz_TnomVnom	Pass	16M~20M	5.736072G	5.753788G	17.716M	17.82M
5825MHz_TnomVnom	Pass	16M~20M	5.816072G	5.833788G	17.716M	17.83M
802.11ac VHT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-
5755MHz_TnomVnom	Pass	32M~40M	5.736805G	5.773055G	36.251M	36.52M
5795MHz_TnomVnom	Pass	32M~40M	5.776805G	5.813055G	36.251M	36.54M
802.11ac VHT80_Nss1,(MCS0)_1TX	-	-	-	-	-	-
5775MHz_TnomVnom	Pass	64M~80M	5.737089G	5.812791G	75.701M	76.48M

fl-OBW = fl lower edge 99% occupied bandwidth; **fh-OBW** = fh higher edge 99% occupied bandwidth; **OBW** = 99% occupied bandwidth;
N dB = 6dB down bandwidth;

3.3 Transmitter Unwanted Emissions in the Spurious Domain

3.3.1 Limit of Transmitter Unwanted Emissions in the Spurious Domain

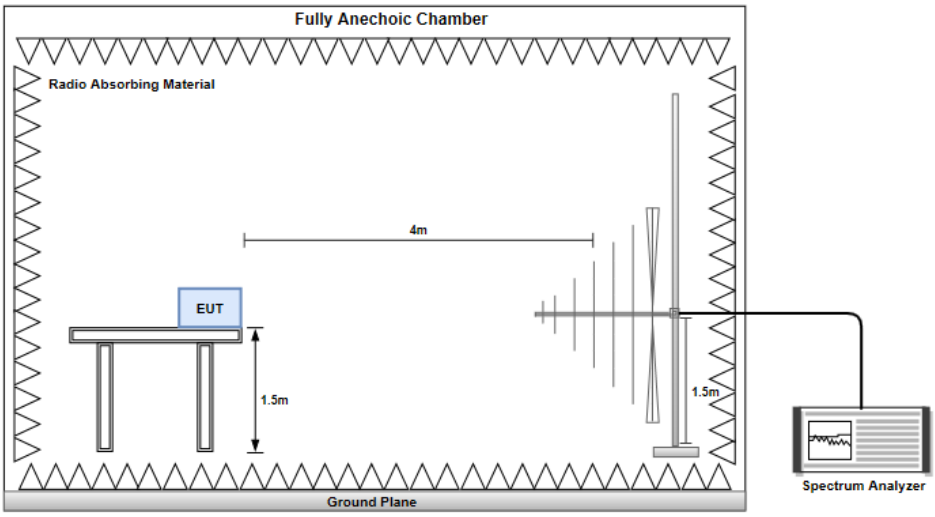
Frequency ranges / State	47 MHz to 74 MHz 87,5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤1 000 MHz	Frequencies > 1 000 MHz
Operating	4 nW (-54 dBm)	250 nW (-36 dBm)	1 μW (-30 dBm)
Standby	2 nW (-57 dBm)	2 nW (-57 dBm)	20 nW (-47 dBm)

3.3.2 Test Procedures

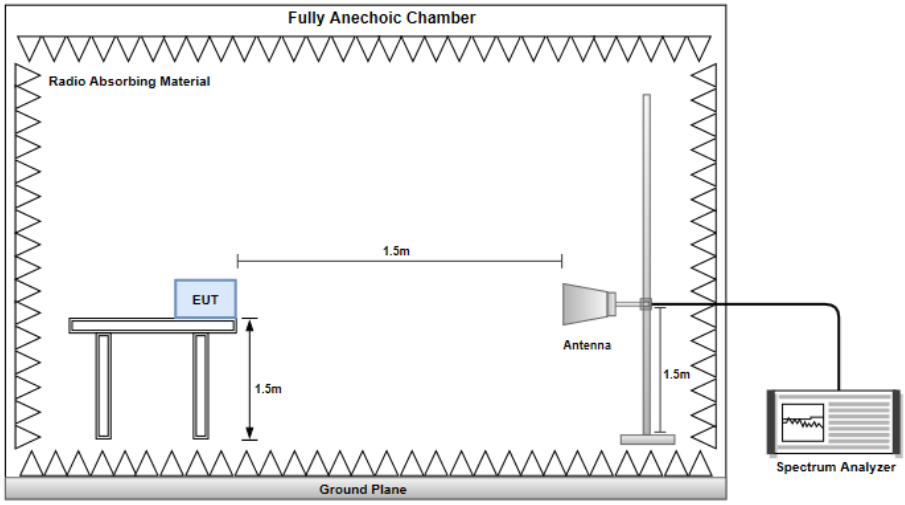
Reference to 4.2.4.3 of EN 300 440 V2.1.1 (2017-03).

3.3.3 Test Setup

Below 1GHz



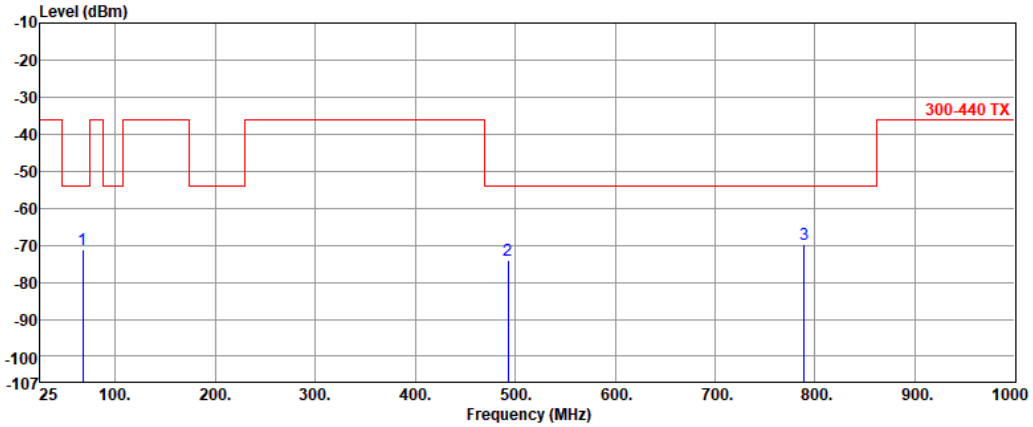
Above 1 GHz



3.3.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

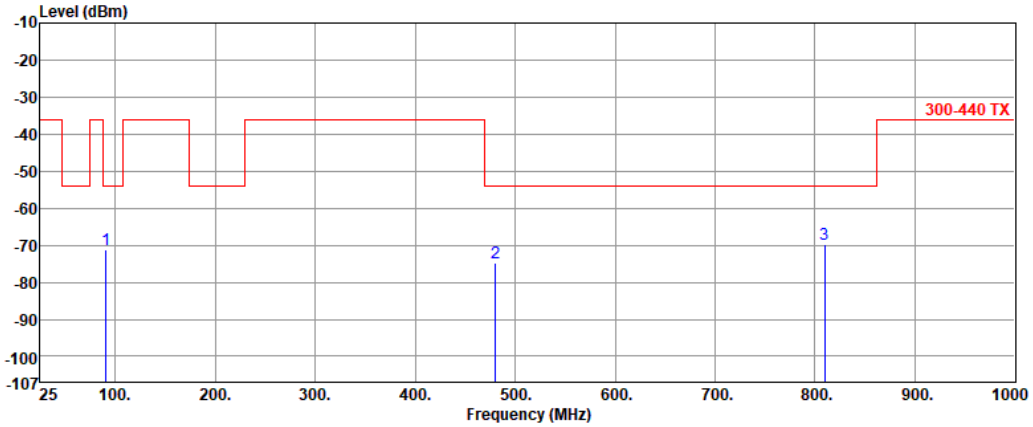


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.29	-71.36	-54.00	-17.36	-3.85	-67.51
2	492.95	-74.19	-54.00	-20.19	2.20	-76.39
3	789.32	-69.82	-54.00	-15.82	7.79	-77.61

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

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

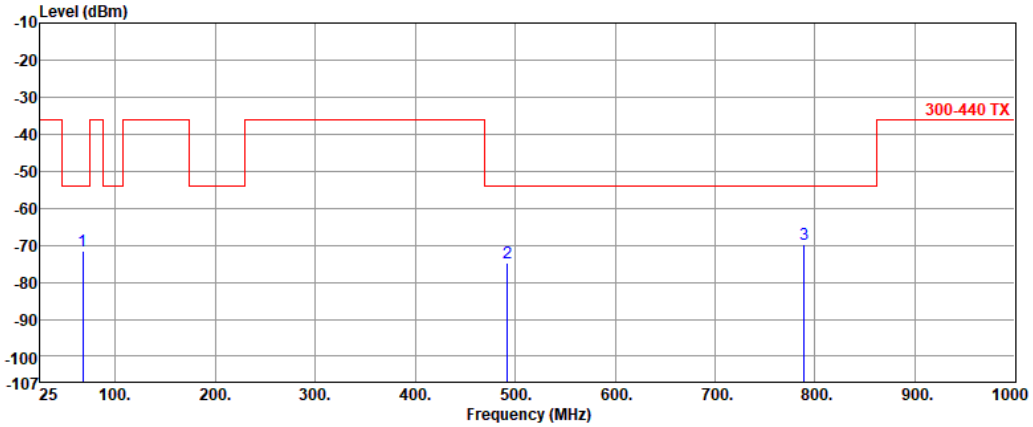


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.67	-71.09	-54.00	-17.09	-7.98	-63.11
2	480.59	-74.68	-54.00	-20.68	1.94	-76.62
3	809.96	-69.87	-54.00	-15.87	7.96	-77.83

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

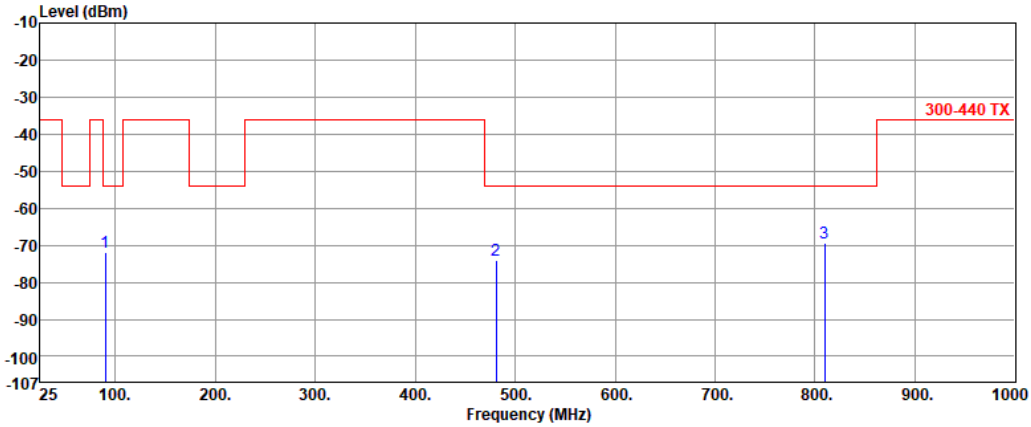


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.51	-71.40	-54.00	-17.40	-3.91	-67.49
2	492.57	-74.63	-54.00	-20.63	2.19	-76.82
3	789.28	-69.86	-54.00	-15.86	7.79	-77.65

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

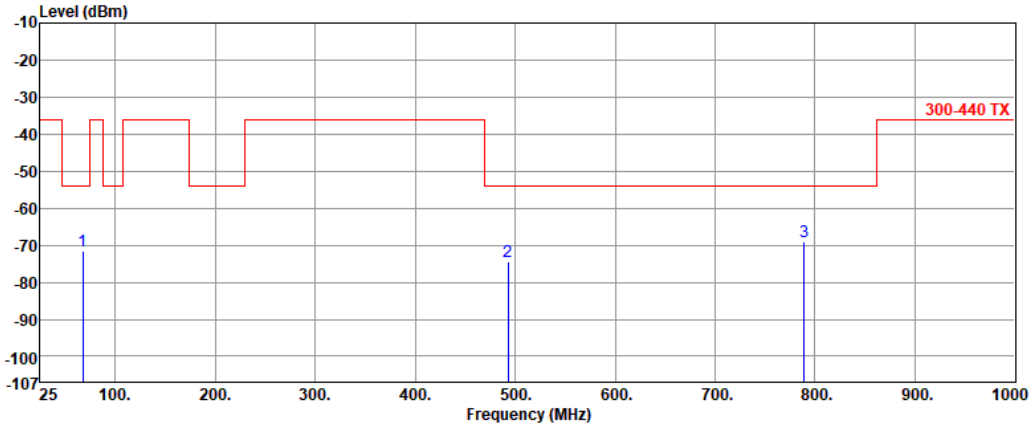


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.14	-71.96	-54.00	-17.96	-8.08	-63.88
2	480.83	-74.18	-54.00	-20.18	1.95	-76.13
3	809.94	-69.59	-54.00	-15.59	7.96	-77.55

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

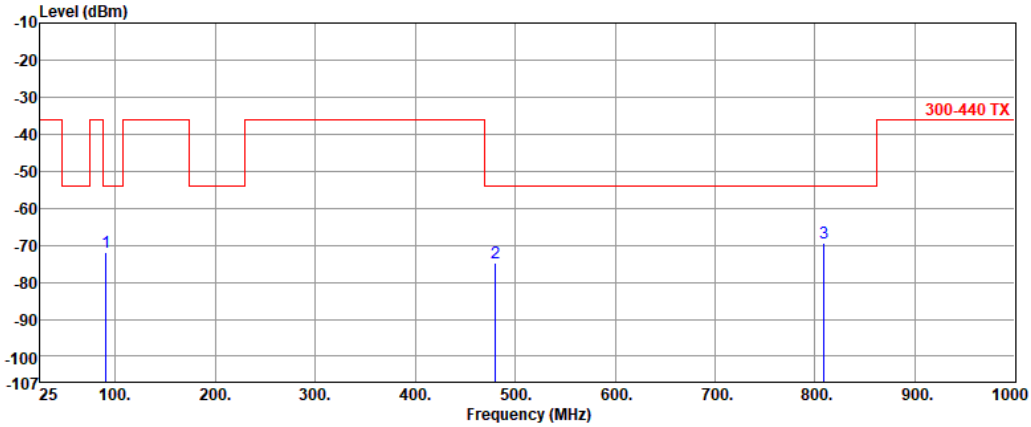


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.23	-71.47	-54.00	-17.47	-3.84	-67.63
2	492.90	-74.28	-54.00	-20.28	2.20	-76.48
3	789.52	-69.09	-54.00	-15.09	7.80	-76.89

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

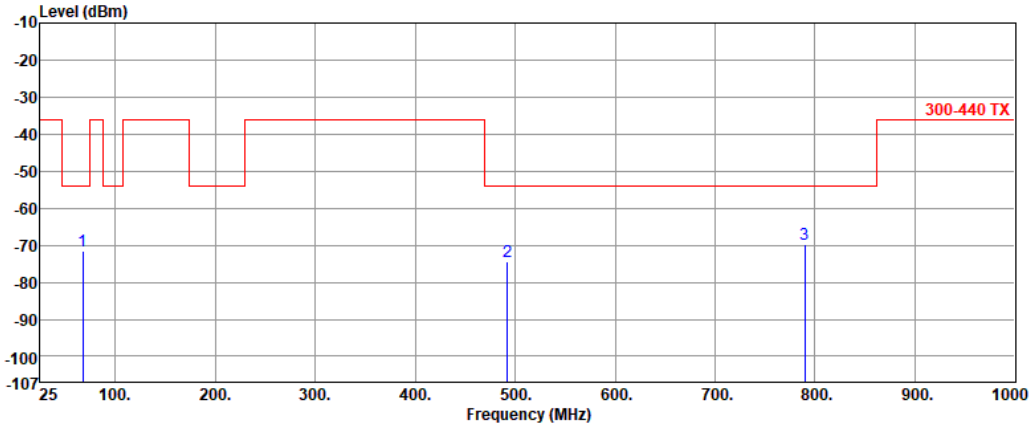


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.43	-71.85	-54.00	-17.85	-8.03	-63.82
2	480.06	-74.79	-54.00	-20.79	1.92	-76.71
3	809.19	-69.54	-54.00	-15.54	7.95	-77.49

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

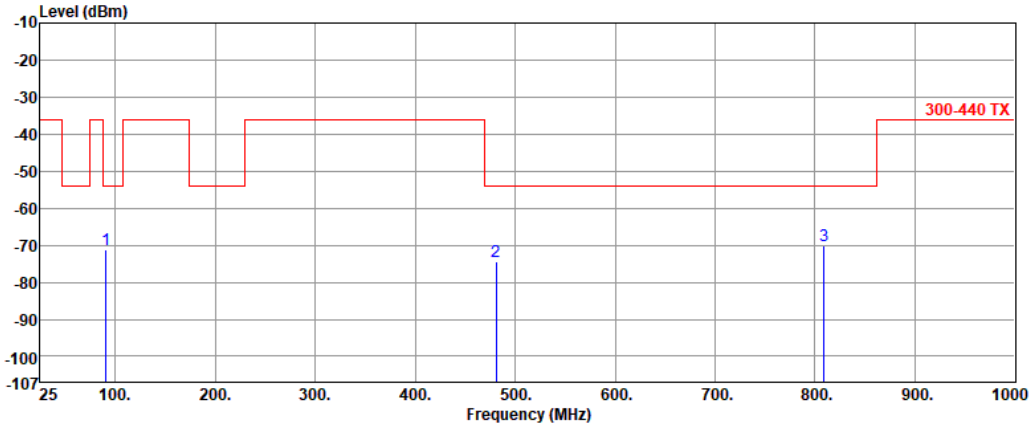


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.28	-71.50	-54.00	-17.50	-3.85	-67.65
2	492.20	-74.33	-54.00	-20.33	2.18	-76.51
3	789.82	-69.67	-54.00	-15.67	7.81	-77.48

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

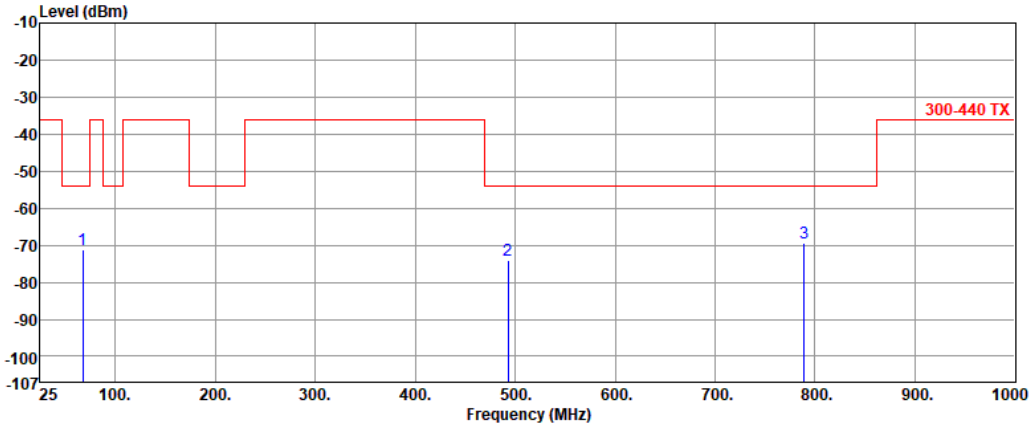


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.76	-71.26	-54.00	-17.26	-7.96	-63.30
2	480.76	-74.55	-54.00	-20.55	1.94	-76.49
3	809.16	-69.97	-54.00	-15.97	7.95	-77.92

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

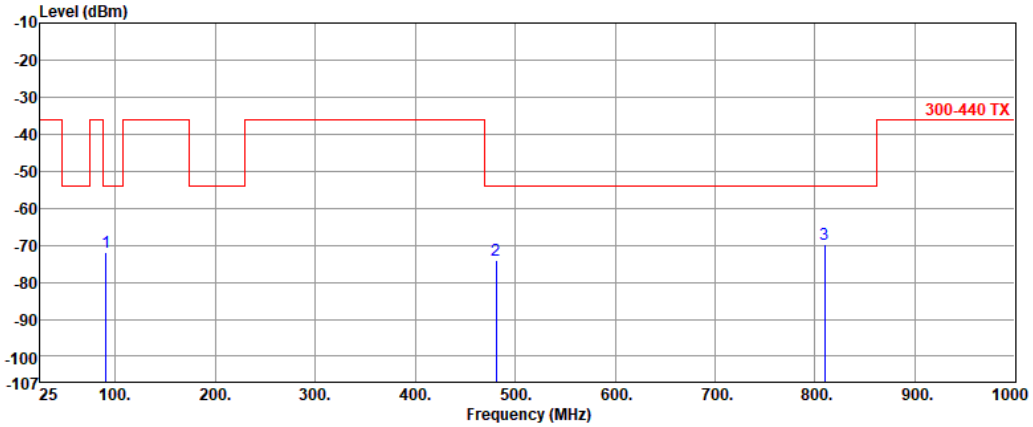


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.53	-71.22	-54.00	-17.22	-3.92	-67.30
2	492.98	-74.08	-54.00	-20.08	2.21	-76.29
3	789.31	-69.41	-54.00	-15.41	7.79	-77.20

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

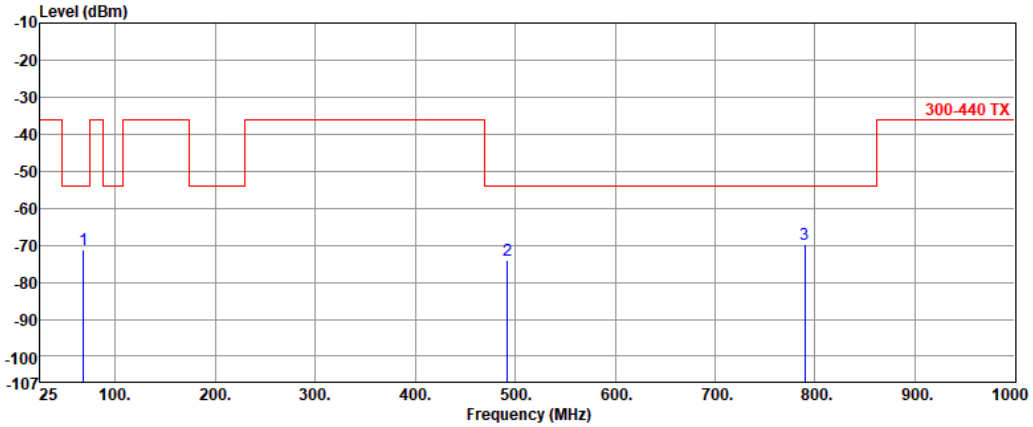


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.72	-71.83	-54.00	-17.83	-7.97	-63.86
2	480.69	-74.10	-54.00	-20.10	1.94	-76.04
3	809.54	-69.66	-54.00	-15.66	7.95	-77.61

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

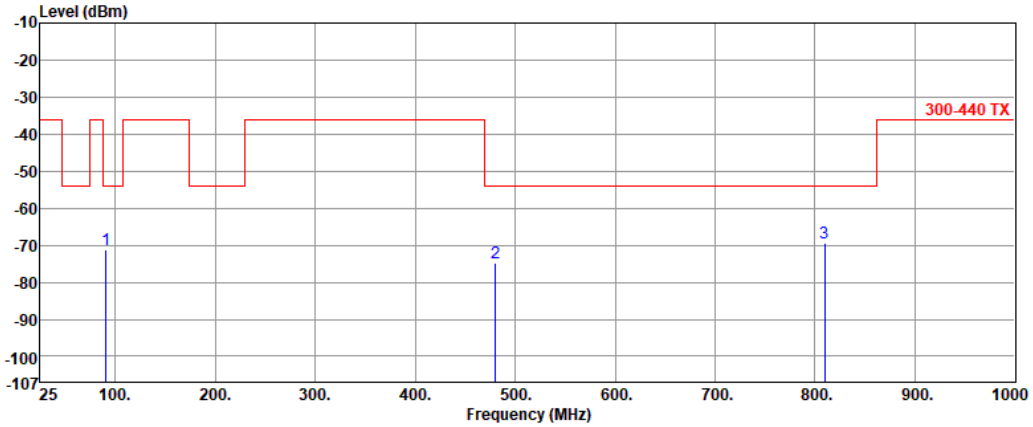


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.94	-71.38	-54.00	-17.38	-4.03	-67.35
2	492.11	-74.14	-54.00	-20.14	2.18	-76.32
3	789.86	-69.92	-54.00	-15.92	7.81	-77.73

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

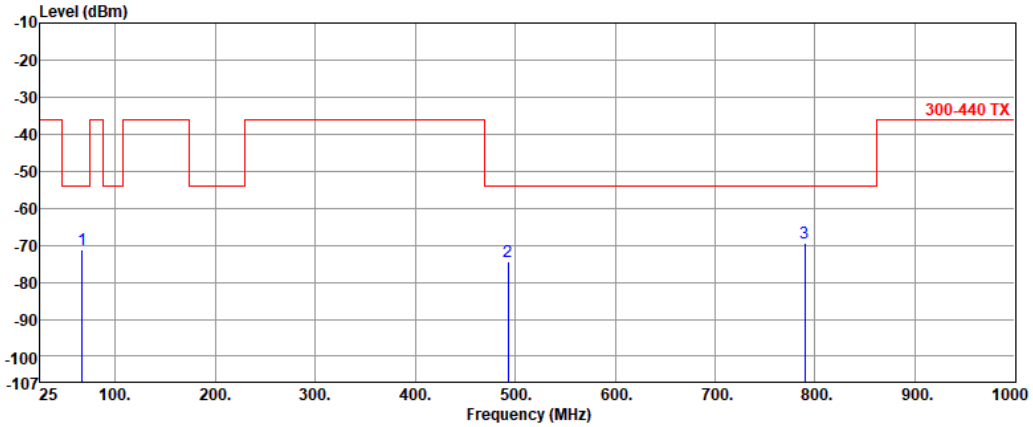


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.65	-71.13	-54.00	-17.13	-7.98	-63.15
2	480.09	-74.89	-54.00	-20.89	1.92	-76.81
3	809.86	-69.25	-54.00	-15.25	7.96	-77.21

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

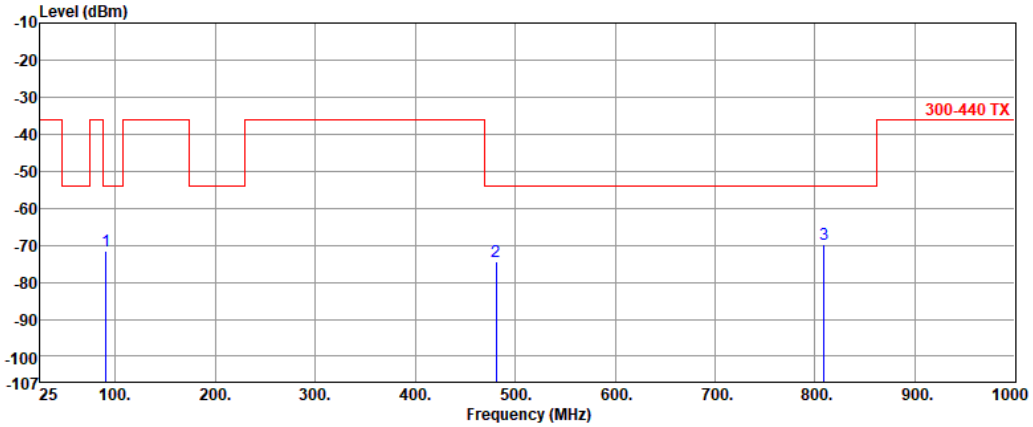


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.10	-71.22	-54.00	-17.22	-3.81	-67.41
2	492.67	-74.47	-54.00	-20.47	2.20	-76.67
3	789.70	-69.29	-54.00	-15.29	7.81	-77.10

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

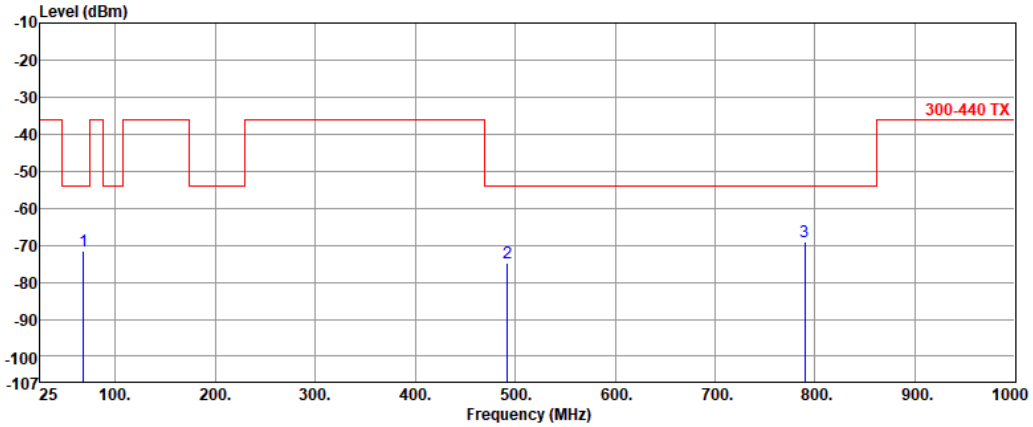


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.56	-71.43	-54.00	-17.43	-8.00	-63.43
2	480.97	-74.32	-54.00	-20.32	1.95	-76.27
3	809.16	-69.65	-54.00	-15.65	7.95	-77.60

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

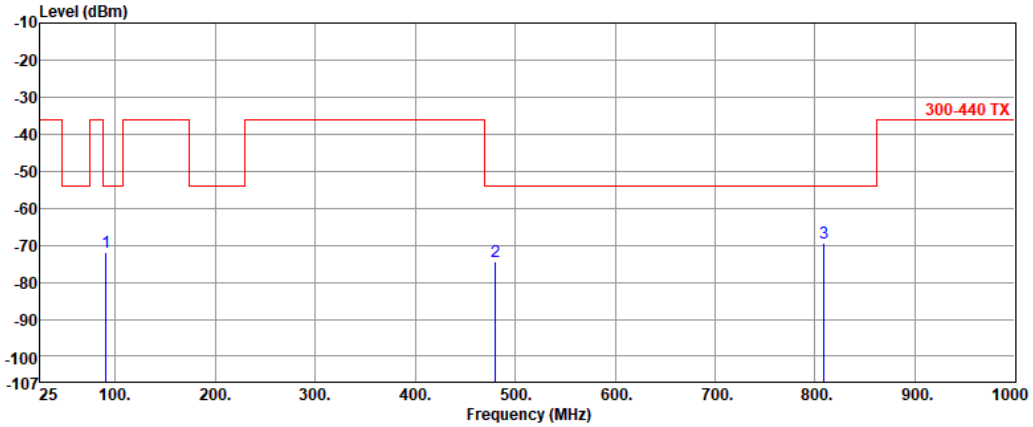


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.84	-71.71	-54.00	-17.71	-4.00	-67.71
2	492.32	-74.94	-54.00	-20.94	2.19	-77.13
3	789.77	-69.20	-54.00	-15.20	7.81	-77.01

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

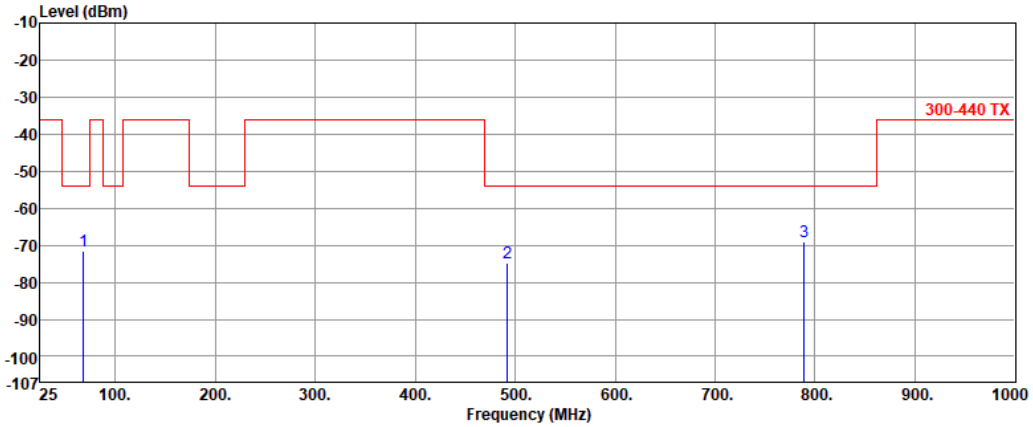


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.86	-71.75	-54.00	-17.75	-7.94	-63.81
2	480.56	-74.42	-54.00	-20.42	1.94	-76.36
3	809.18	-69.57	-54.00	-15.57	7.95	-77.52

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

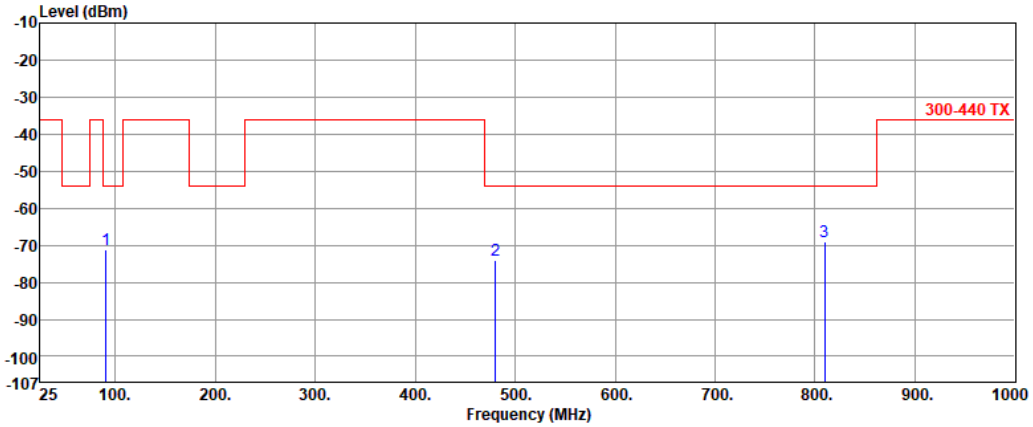


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	67.90	-71.52	-54.00	-17.52	-4.02	-67.50
2	492.03	-74.72	-54.00	-20.72	2.18	-76.90
3	789.40	-69.23	-54.00	-15.23	7.80	-77.03

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65



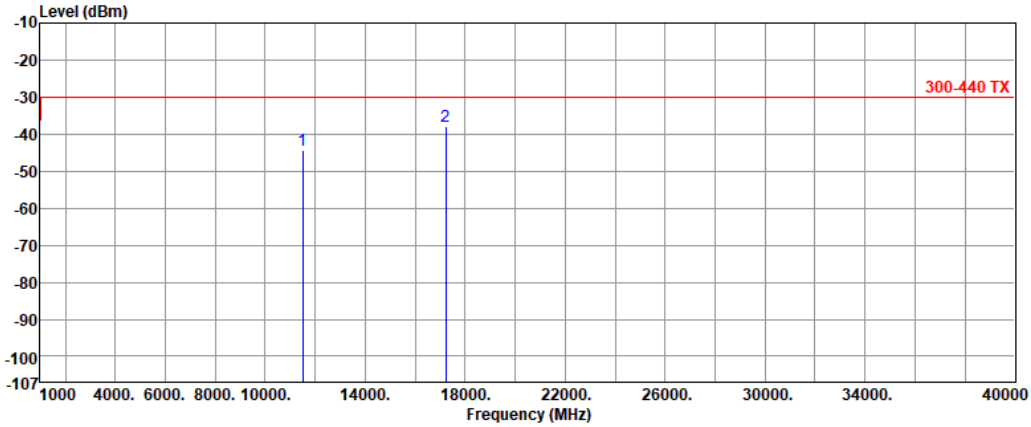
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	90.33	-71.24	-54.00	-17.24	-8.05	-63.19
2	480.33	-74.06	-54.00	-20.06	1.93	-75.99
3	809.88	-69.16	-54.00	-15.16	7.96	-77.12

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

3.3.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

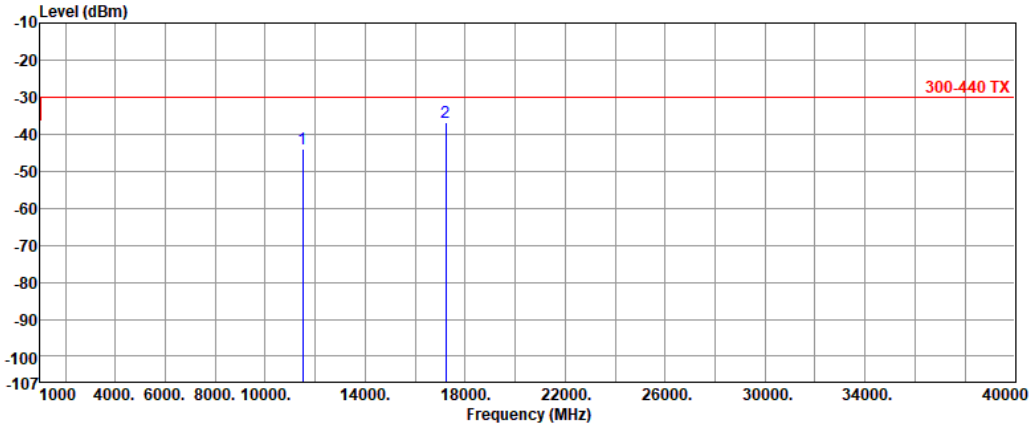


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11490.38	-44.38	-30.00	-14.38	18.28	-62.66
2	17235.43	-37.98	-30.00	-7.98	23.62	-61.60

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

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

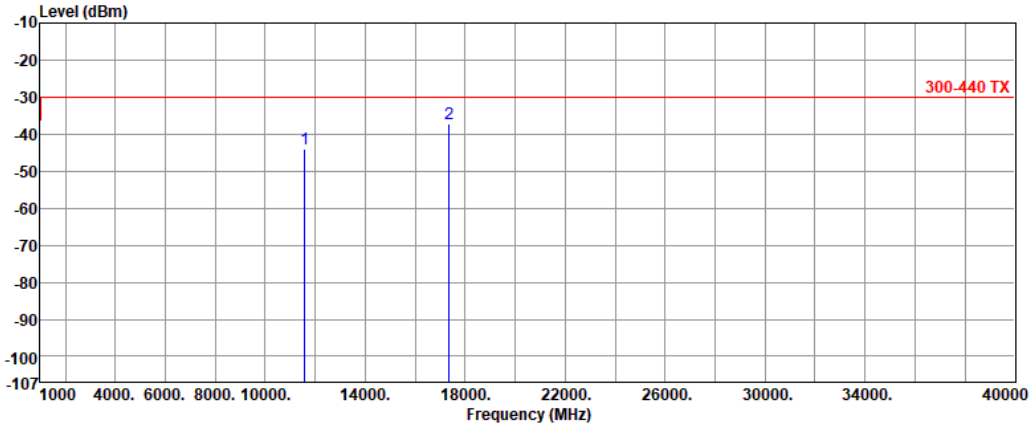


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11489.91	-43.99	-30.00	-13.99	18.36	-62.35
2	17235.34	-36.79	-30.00	-6.79	24.12	-60.91

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

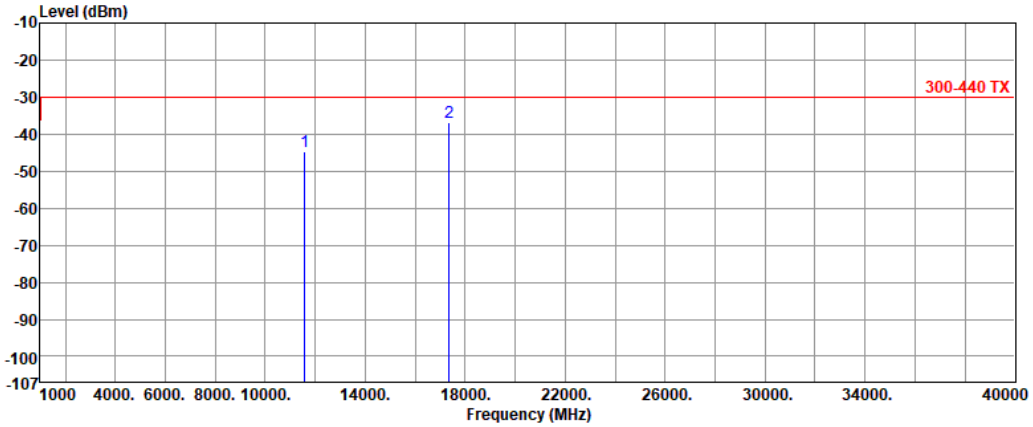


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11570.02	-44.01	-30.00	-14.01	17.97	-61.98
2	17355.19	-37.35	-30.00	-7.35	24.30	-61.65

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

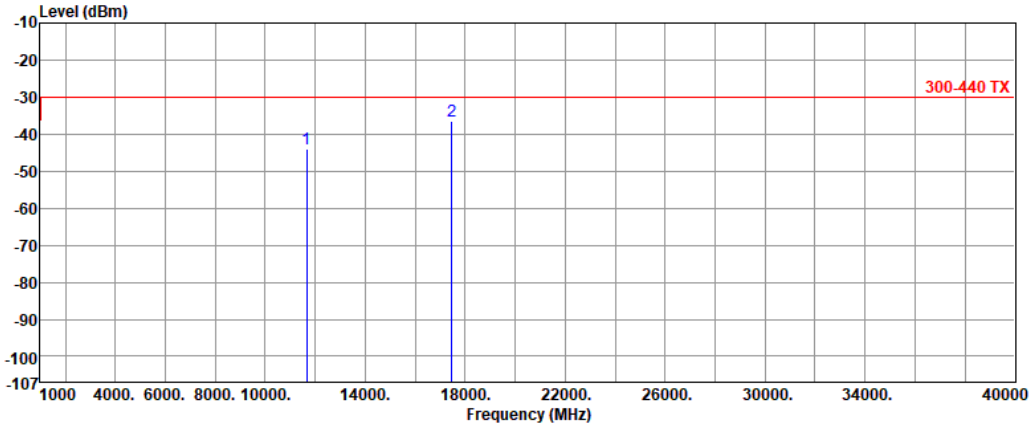


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11569.57	-44.87	-30.00	-14.87	17.94	-62.81
2	17355.45	-37.02	-30.00	-7.02	24.76	-61.78

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

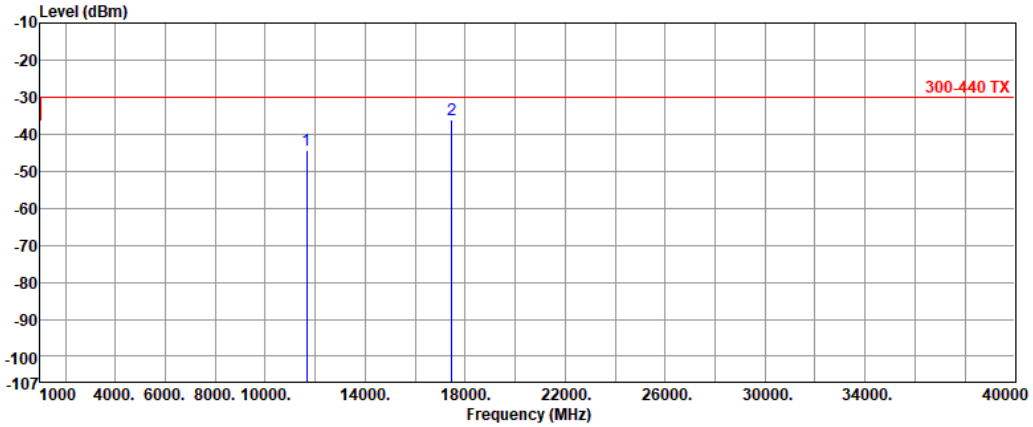


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11650.15	-43.97	-30.00	-13.97	17.87	-61.84
2	17474.60	-36.43	-30.00	-6.43	24.55	-60.98

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

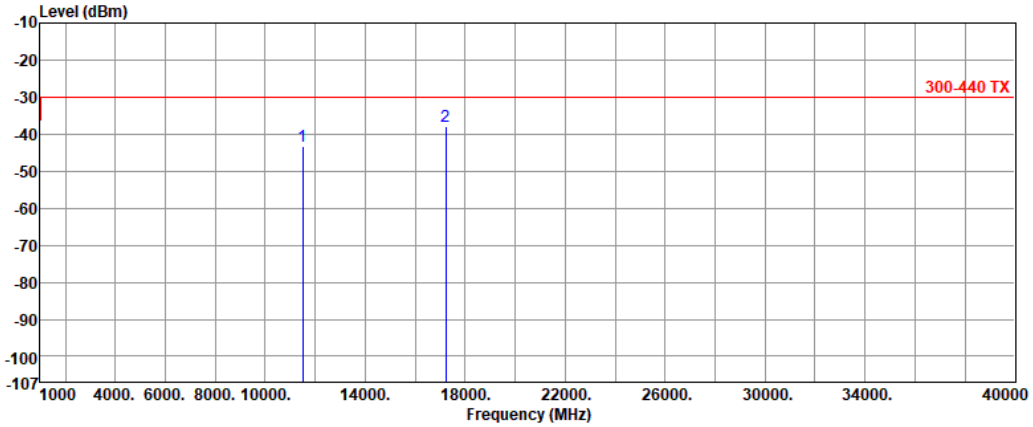


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11650.20	-44.46	-30.00	-14.46	17.57	-62.03
2	17475.45	-36.24	-30.00	-6.24	25.25	-61.49

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

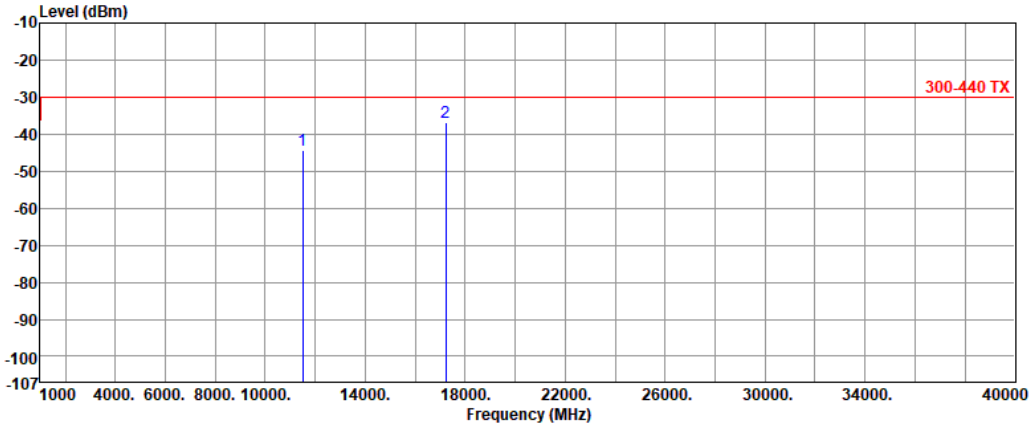


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11490.00	-43.32	-30.00	-13.32	18.29	-61.61
2	17235.30	-38.05	-30.00	-8.05	23.62	-61.67

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

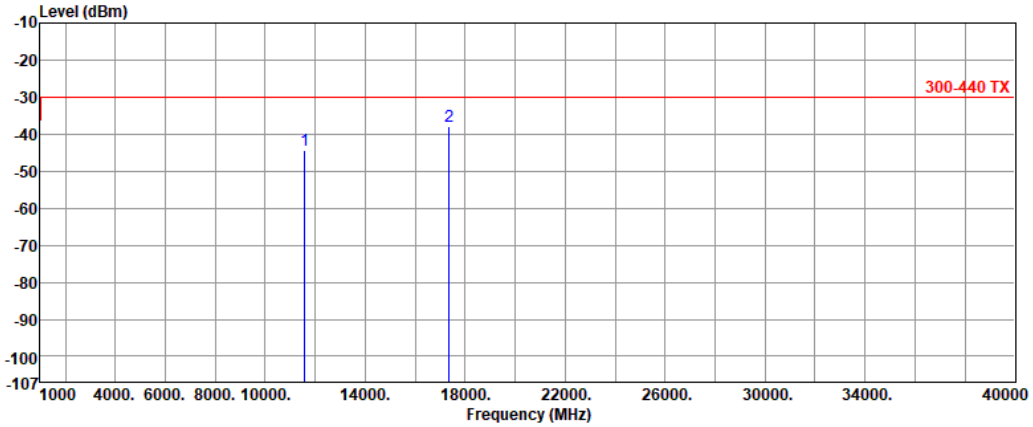


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11490.15	-44.52	-30.00	-14.52	18.36	-62.88
2	17235.35	-36.72	-30.00	-6.72	24.12	-60.84

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

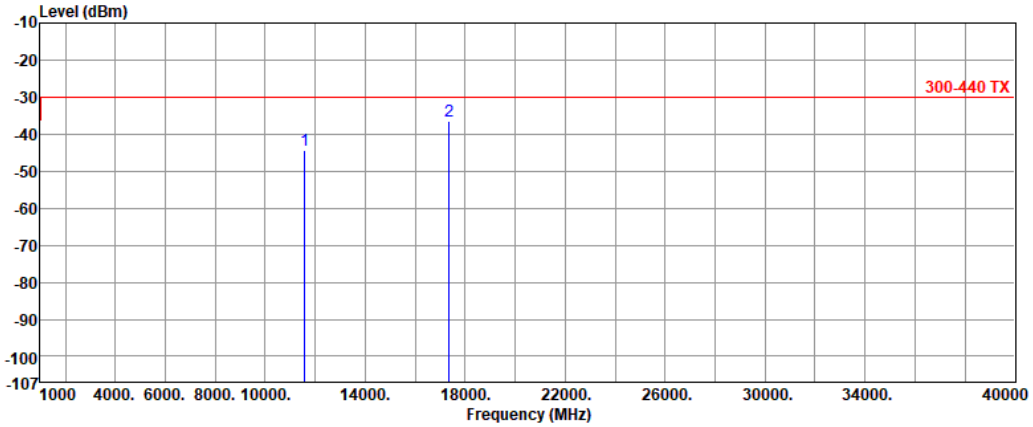


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11570.20	-44.43	-30.00	-14.43	17.97	-62.40
2	17355.25	-37.89	-30.00	-7.89	24.30	-62.19

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

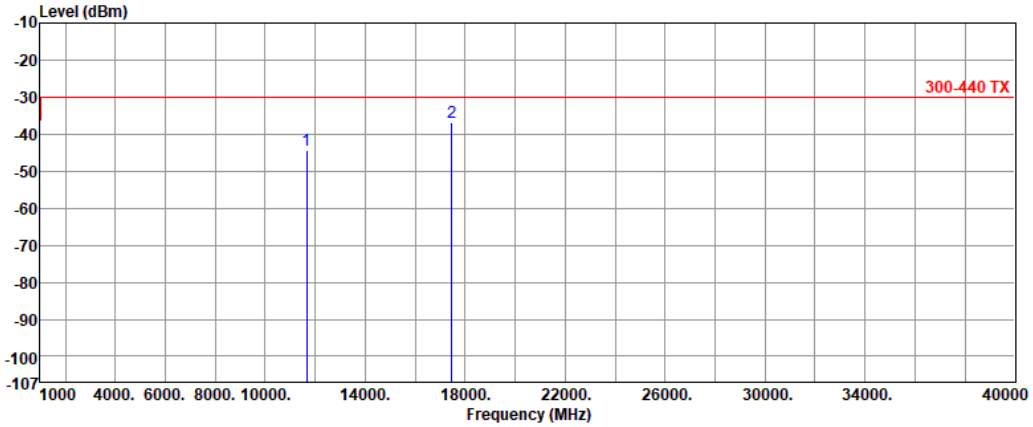


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11570.50	-44.29	-30.00	-14.29	17.94	-62.23
2	17355.55	-36.63	-30.00	-6.63	24.76	-61.39

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

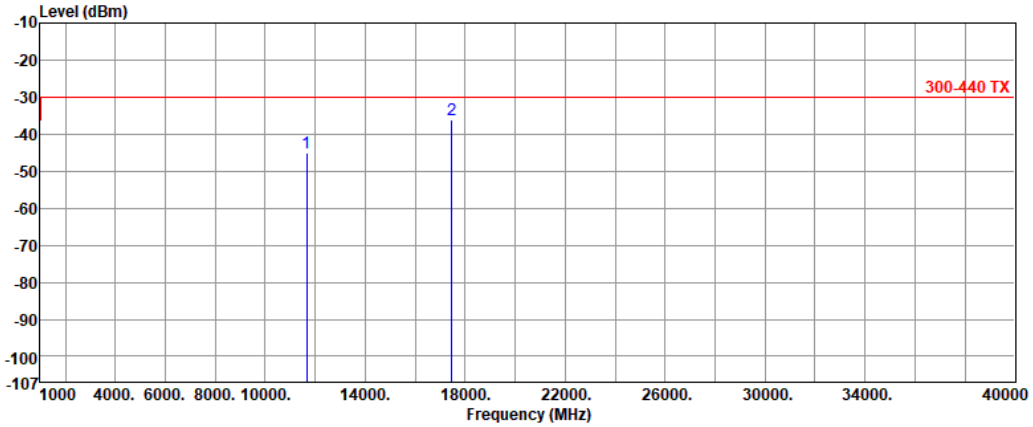


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11649.90	-44.43	-30.00	-14.43	17.87	-62.30
2	17475.25	-36.71	-30.00	-6.71	24.55	-61.26

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

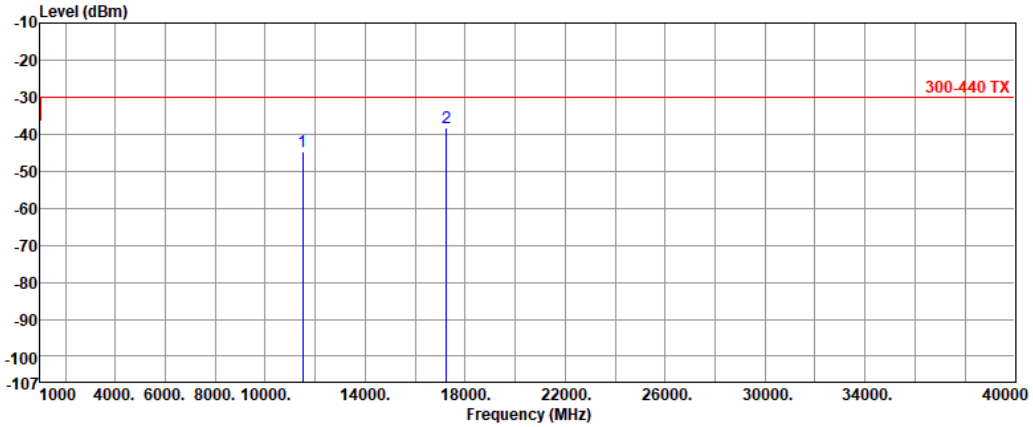


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11650.35	-45.20	-30.00	-15.20	17.57	-62.77
2	17475.20	-35.98	-30.00	-5.98	25.25	-61.23

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

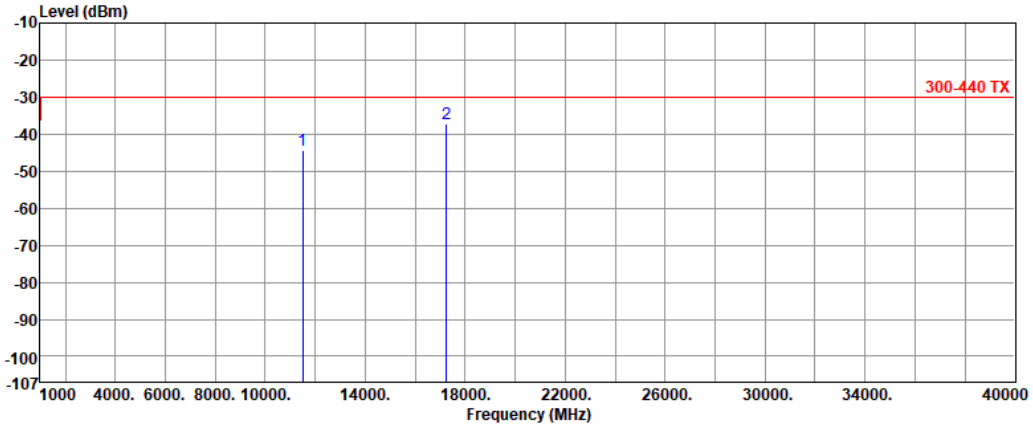


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11509.60	-44.80	-30.00	-14.80	18.18	-62.98
2	17264.70	-38.15	-30.00	-8.15	23.67	-61.82

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

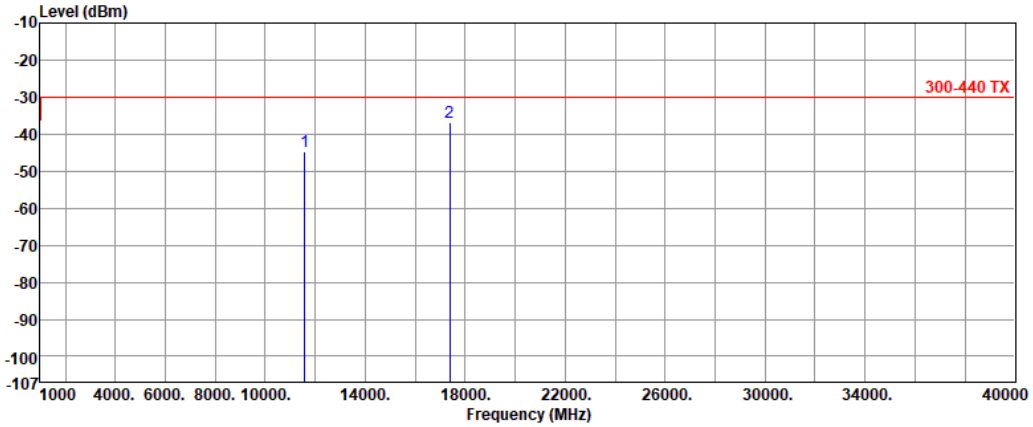


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11509.90	-44.42	-30.00	-14.42	18.27	-62.69
2	17265.10	-37.35	-30.00	-7.35	24.25	-61.60

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

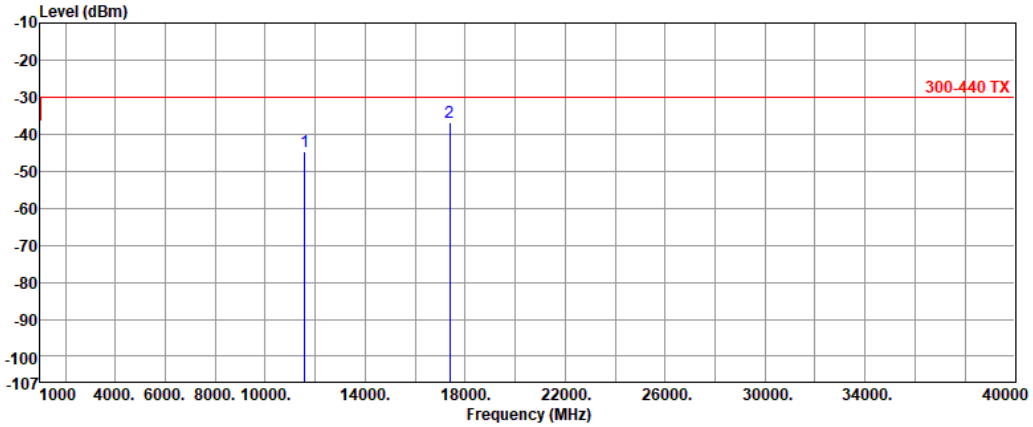


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11589.70	-44.61	-30.00	-14.61	17.91	-62.52
2	17384.90	-36.67	-30.00	-6.67	24.61	-61.28

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

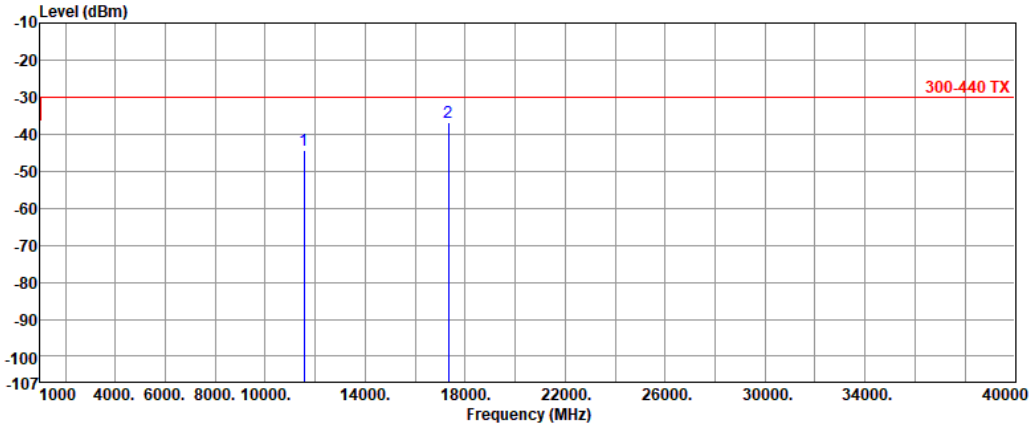


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11590.00	-44.72	-30.00	-14.72	17.83	-62.55
2	17385.40	-36.82	-30.00	-6.82	24.95	-61.77

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

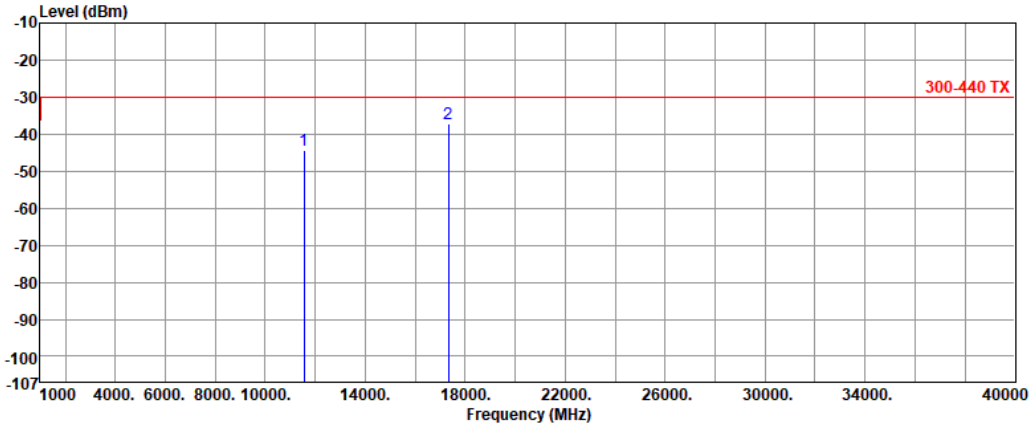


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11549.60	-44.30	-30.00	-14.30	18.04	-62.34
2	17324.70	-36.88	-30.00	-6.88	23.98	-60.86

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11549.70	-44.19	-30.00	-14.19	18.05	-62.24
2	17324.60	-37.32	-30.00	-7.32	24.55	-61.87

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

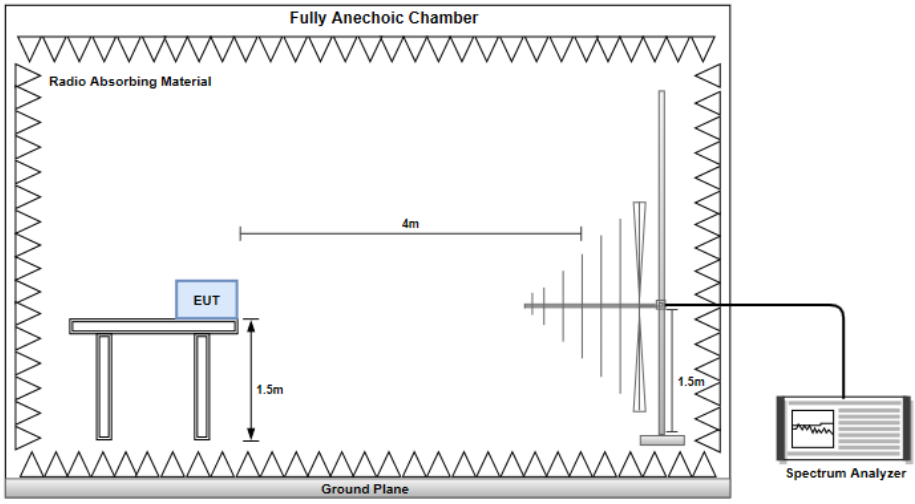
Frequency Range	Limit
25 MHz to 1 GHz	2 nW (-57 dBm)
Above 1 GHz	20 nW (-47 dBm)

4.1.2 Test Procedures

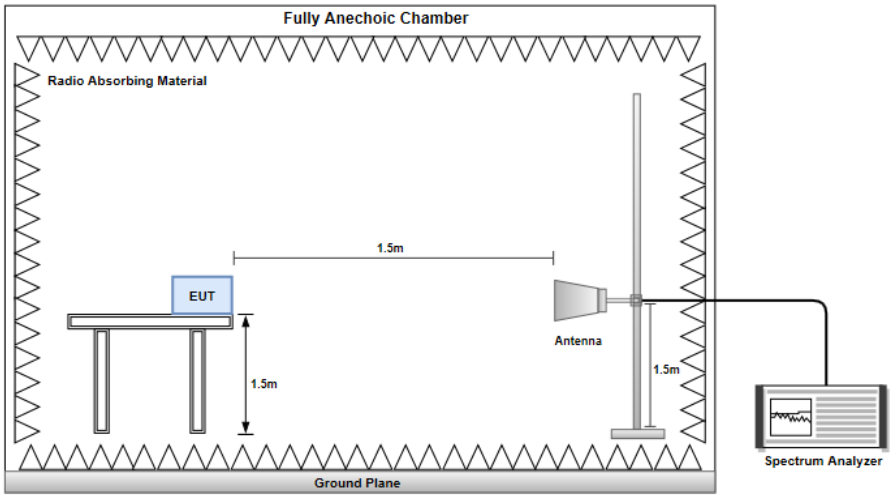
Reference to clause 4.3.5.3 of EN 300 440 V2.1.1 (2017-03).

4.1.3 Test Setup

Below 1GHz



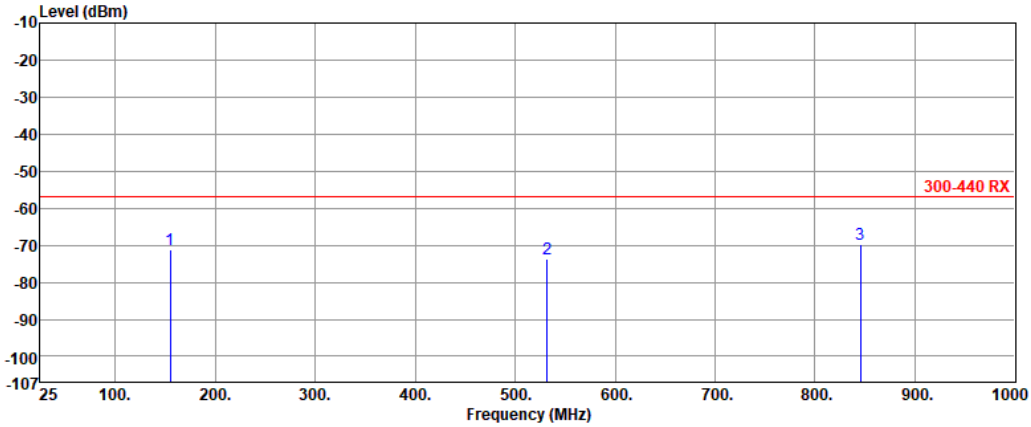
Above 1 GHz



4.1.4 Receiver Radiated Unwanted Emissions (Below 1GHz)

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

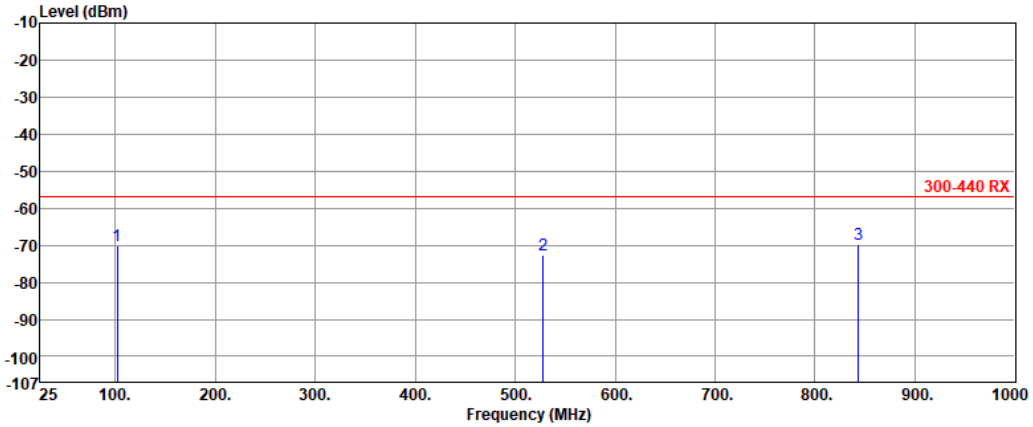


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.87	-71.29	-57.00	-14.29	-0.25	-71.04
2	532.16	-73.73	-57.00	-16.73	3.02	-76.75
3	845.54	-69.72	-57.00	-12.72	8.60	-78.32

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

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

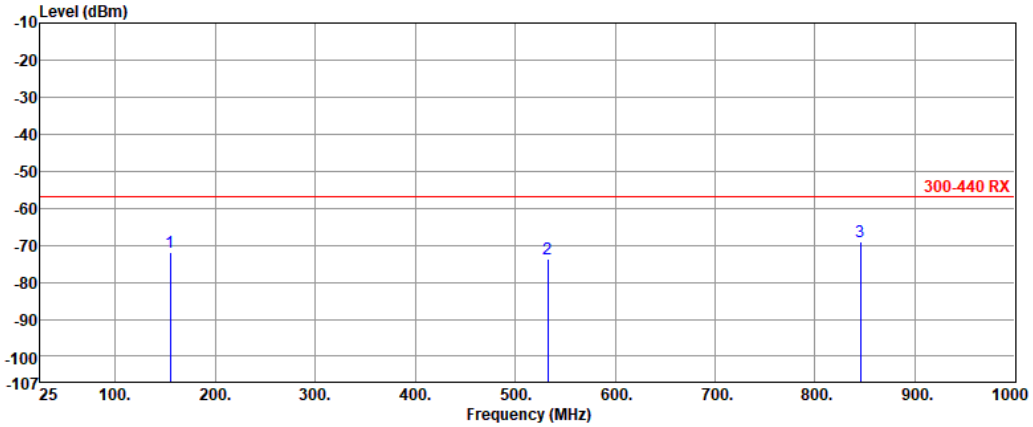


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.63	-70.21	-57.00	-13.21	-6.05	-64.16
2	528.39	-72.54	-57.00	-15.54	2.86	-75.40
3	843.72	-69.62	-57.00	-12.62	8.52	-78.14

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

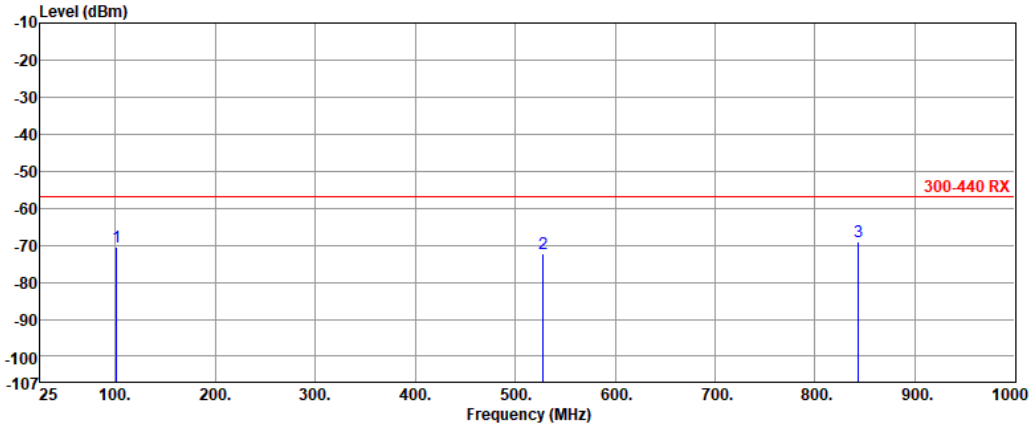


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.82	-71.91	-57.00	-14.91	-0.25	-71.66
2	532.46	-73.76	-57.00	-16.76	3.03	-76.79
3	845.33	-69.03	-57.00	-12.03	8.61	-77.64

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

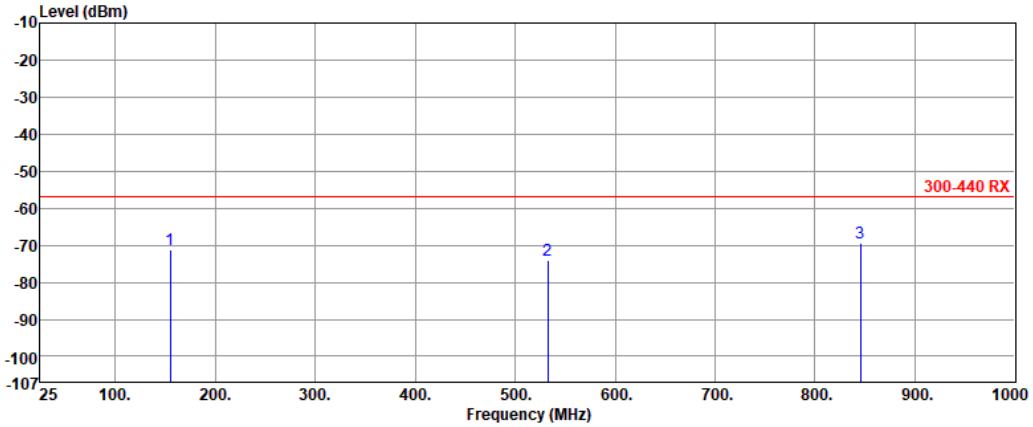


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.18	-70.48	-57.00	-13.48	-6.17	-64.31
2	528.34	-72.25	-57.00	-15.25	2.86	-75.11
3	843.51	-69.19	-57.00	-12.19	8.49	-77.68

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

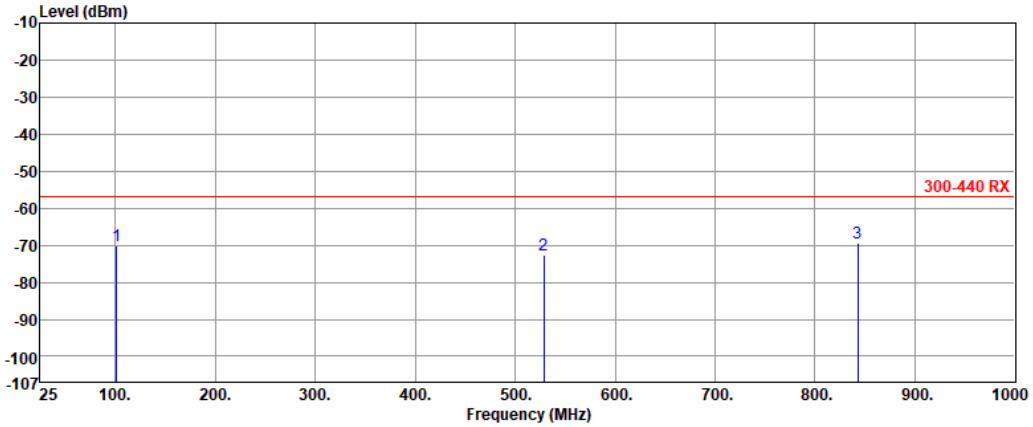


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.97	-71.12	-57.00	-14.12	-0.23	-70.89
2	532.71	-73.90	-57.00	-16.90	3.04	-76.94
3	845.69	-69.45	-57.00	-12.45	8.59	-78.04

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

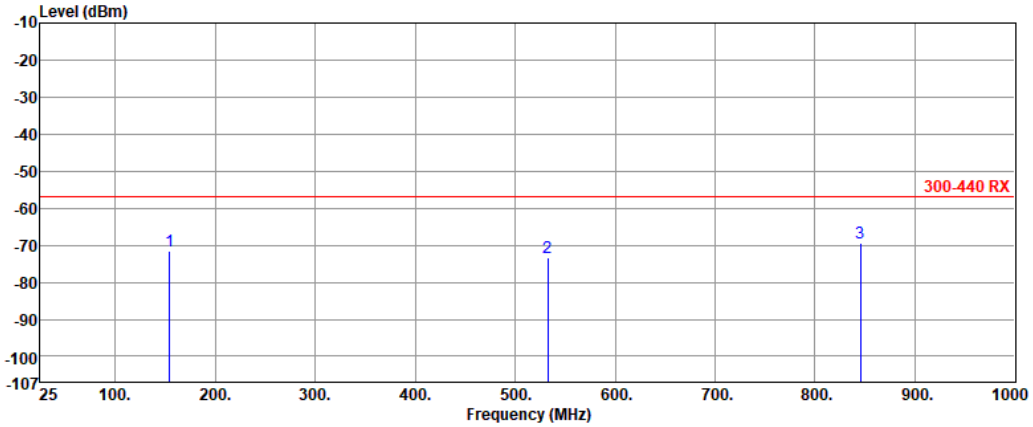


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.57	-70.23	-57.00	-13.23	-6.07	-64.16
2	528.94	-72.64	-57.00	-15.64	2.88	-75.52
3	843.18	-69.35	-57.00	-12.35	8.45	-77.80

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

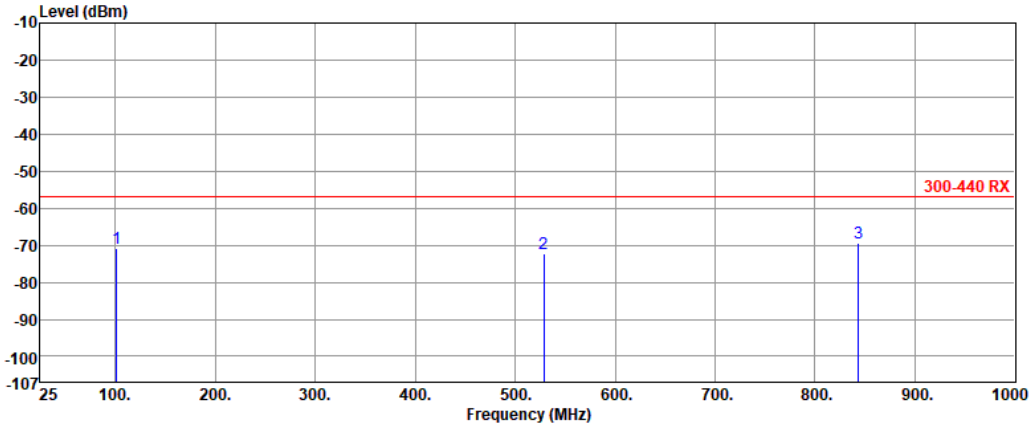


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.04	-71.61	-57.00	-14.61	-0.36	-71.25
2	532.74	-73.52	-57.00	-16.52	3.04	-76.56
3	845.27	-69.37	-57.00	-12.37	8.62	-77.99

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

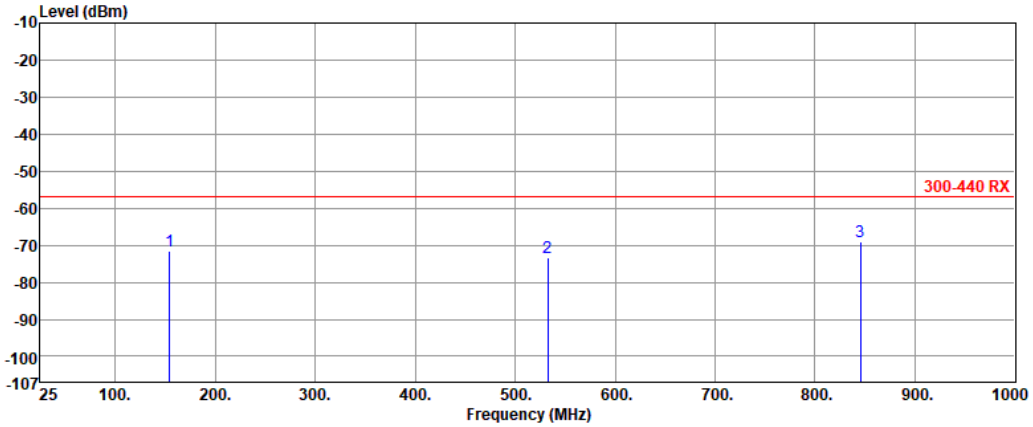


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.16	-70.89	-57.00	-13.89	-6.18	-64.71
2	528.45	-72.22	-57.00	-15.22	2.87	-75.09
3	843.83	-69.48	-57.00	-12.48	8.53	-78.01

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

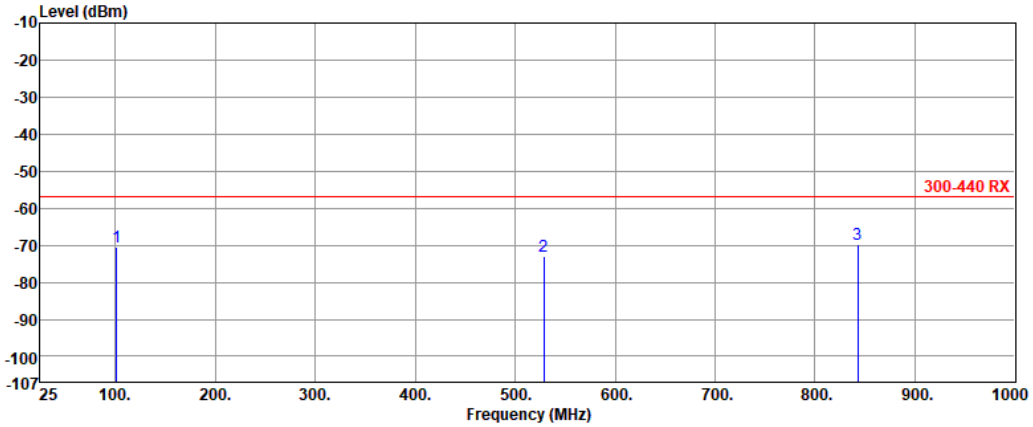


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.13	-71.65	-57.00	-14.65	-0.34	-71.31
2	532.46	-73.24	-57.00	-16.24	3.03	-76.27
3	845.38	-69.09	-57.00	-12.09	8.61	-77.70

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

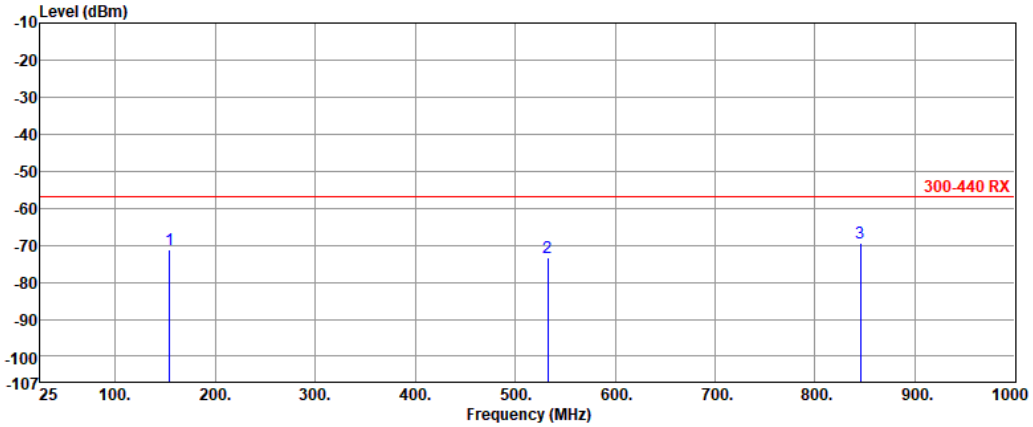


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.48	-70.54	-57.00	-13.54	-6.09	-64.45
2	528.77	-72.86	-57.00	-15.86	2.88	-75.74
3	843.12	-69.95	-57.00	-12.95	8.45	-78.40

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

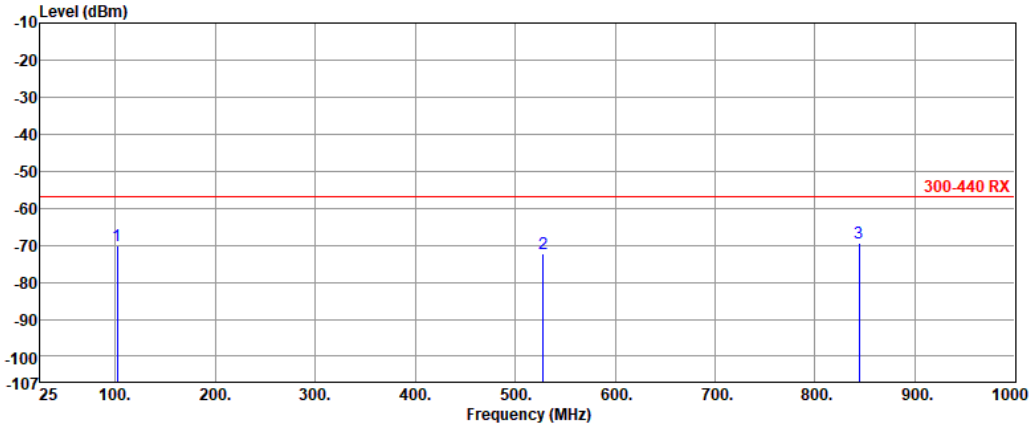


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.59	-71.35	-57.00	-14.35	-0.29	-71.06
2	532.88	-73.21	-57.00	-16.21	3.05	-76.26
3	845.69	-69.53	-57.00	-12.53	8.59	-78.12

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

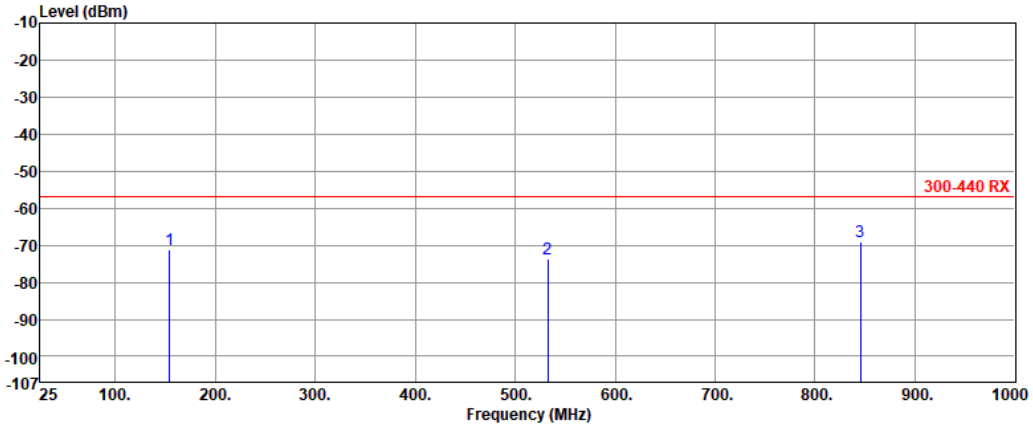


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.79	-70.06	-57.00	-13.06	-6.01	-64.05
2	528.12	-72.37	-57.00	-15.37	2.85	-75.22
3	843.97	-69.56	-57.00	-12.56	8.55	-78.11

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

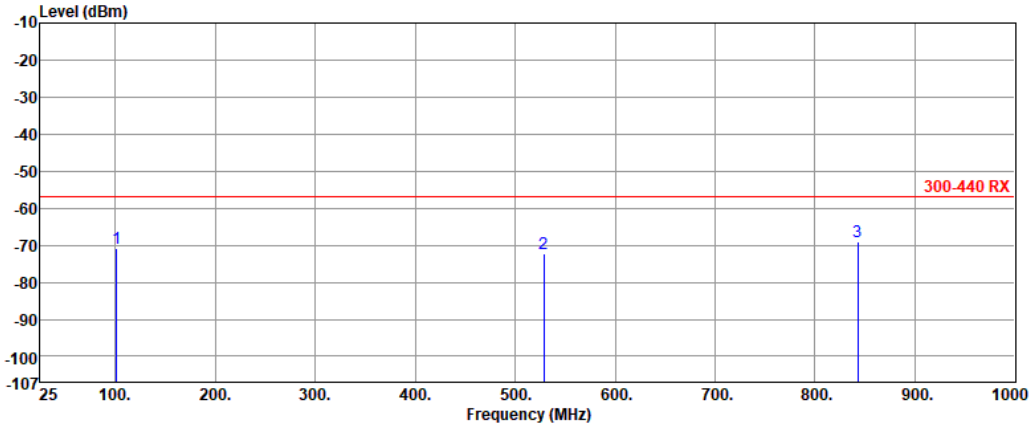


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.43	-71.29	-57.00	-14.29	-0.31	-70.98
2	532.58	-73.67	-57.00	-16.67	3.04	-76.71
3	845.28	-69.18	-57.00	-12.18	8.62	-77.80

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

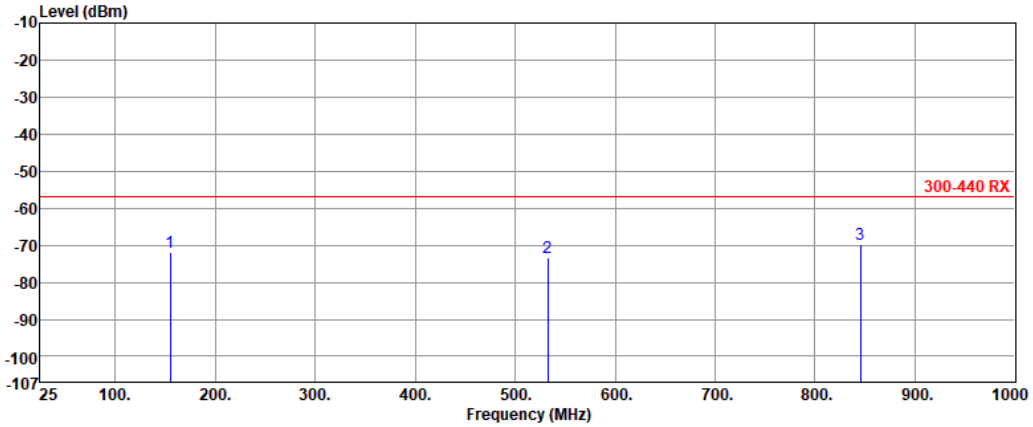


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.30	-70.88	-57.00	-13.88	-6.14	-64.74
2	528.54	-72.26	-57.00	-15.26	2.87	-75.13
3	843.18	-69.03	-57.00	-12.03	8.45	-77.48

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

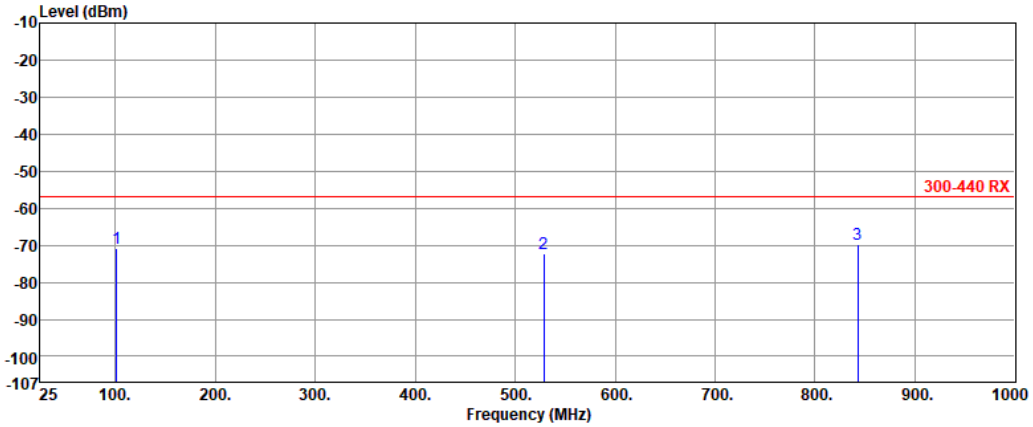


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.91	-71.81	-57.00	-14.81	-0.24	-71.57
2	532.41	-73.32	-57.00	-16.32	3.03	-76.35
3	845.51	-69.65	-57.00	-12.65	8.60	-78.25

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

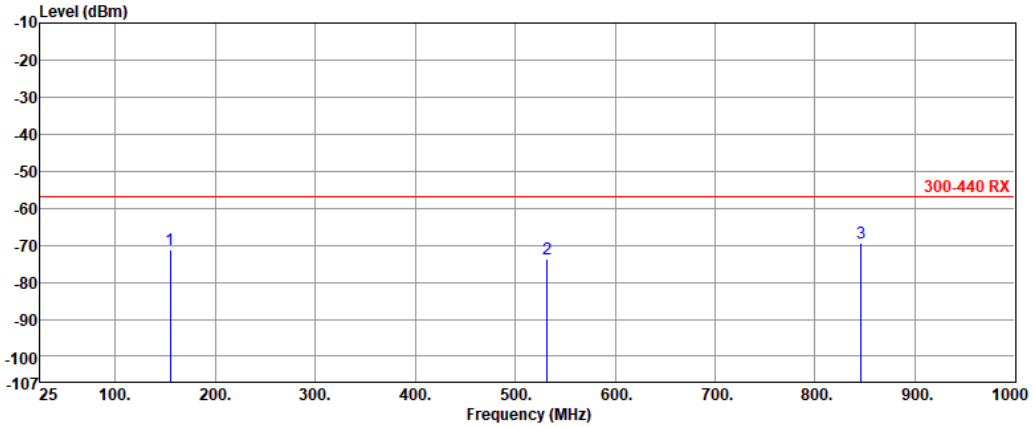


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.09	-70.97	-57.00	-13.97	-6.20	-64.77
2	528.82	-72.11	-57.00	-15.11	2.88	-74.99
3	843.21	-69.69	-57.00	-12.69	8.46	-78.15

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

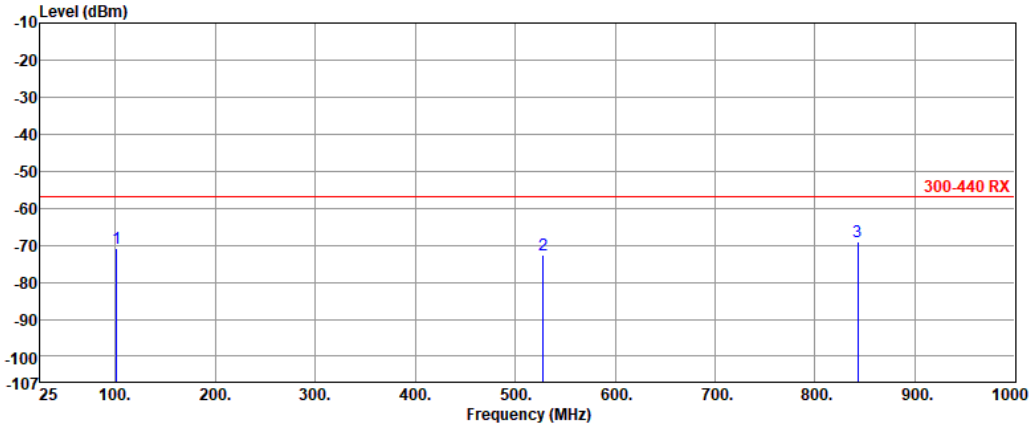


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	154.68	-71.08	-57.00	-14.08	-0.28	-70.80
2	532.00	-73.59	-57.00	-16.59	3.02	-76.61
3	845.95	-69.53	-57.00	-12.53	8.56	-78.09

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65



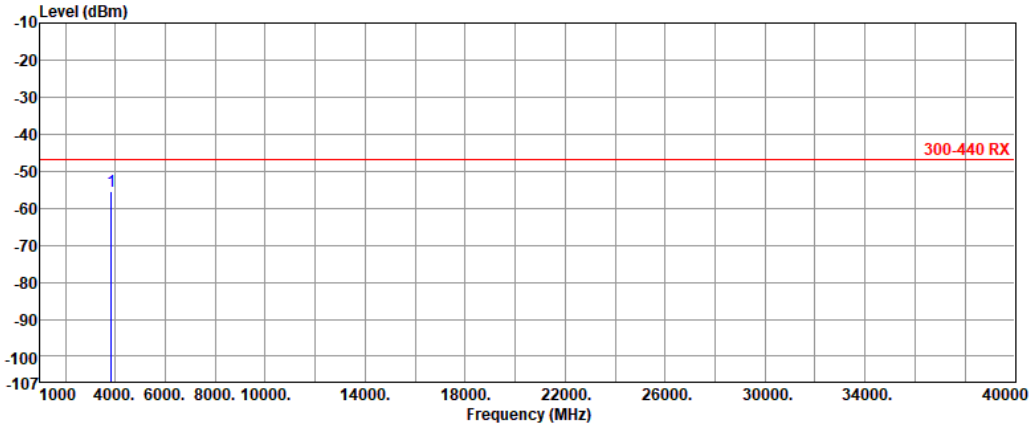
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	101.05	-70.87	-57.00	-13.87	-6.21	-64.66
2	528.10	-72.58	-57.00	-15.58	2.85	-75.43
3	843.03	-69.04	-57.00	-12.04	8.44	-77.48

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

4.1.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

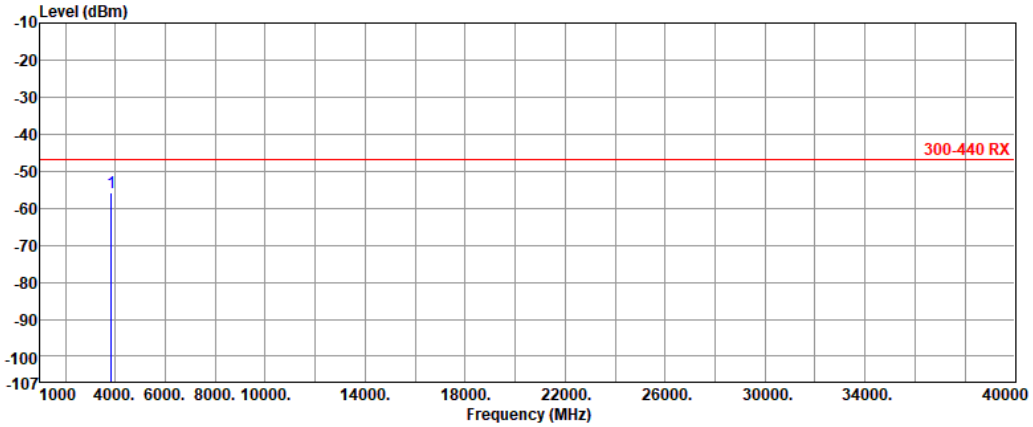


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3829.94	-55.44	-47.00	-8.44	6.35	-61.79

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

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

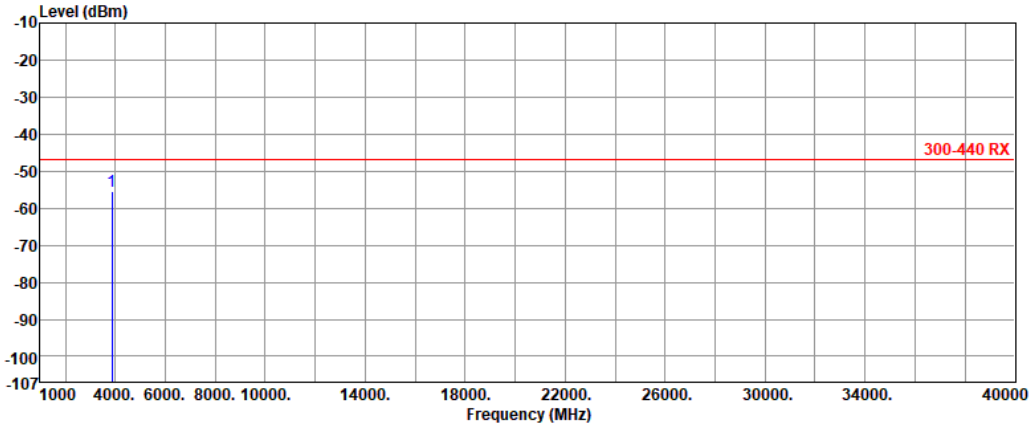


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3829.56	-55.90	-47.00	-8.90	6.05	-61.95

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

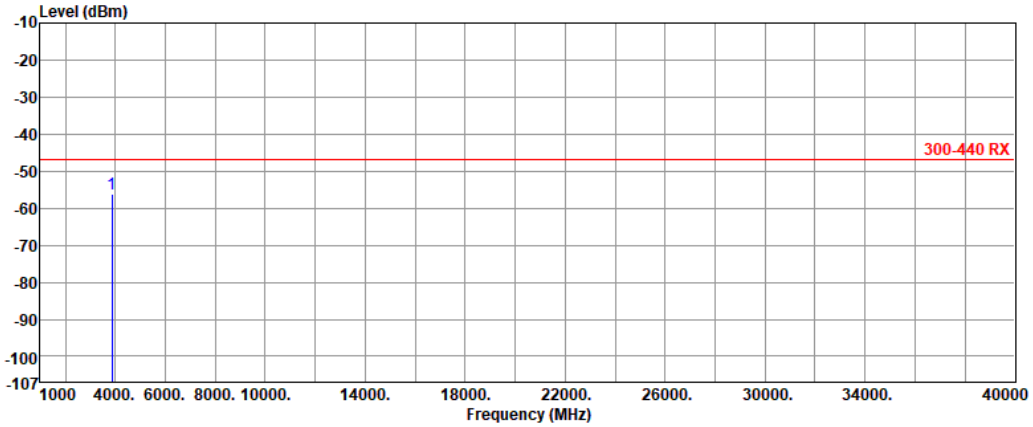


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3856.95	-55.34	-47.00	-8.34	6.37	-61.71

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

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

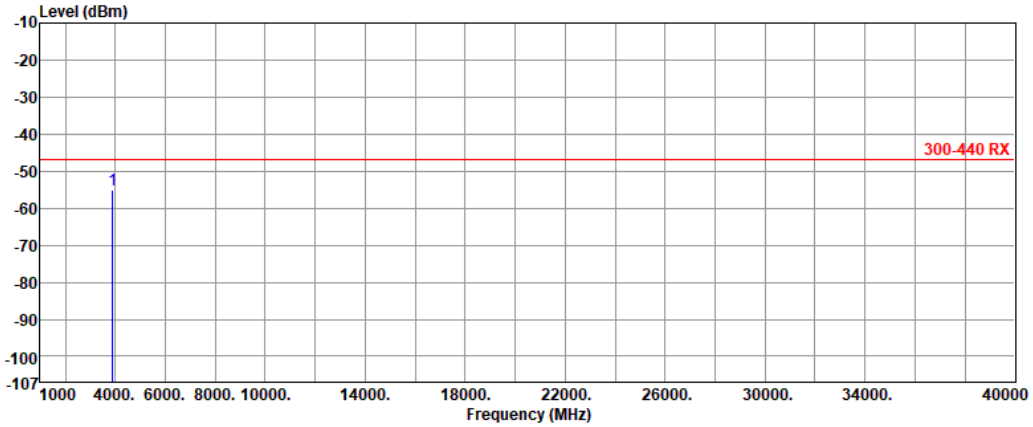


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3856.36	-56.26	-47.00	-9.26	6.05	-62.31

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

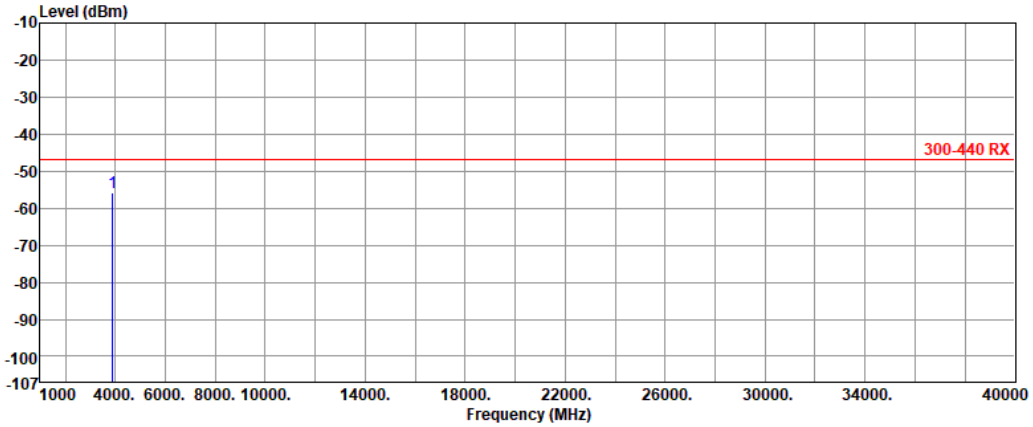


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3883.61	-55.00	-47.00	-8.00	6.39	-61.39

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

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

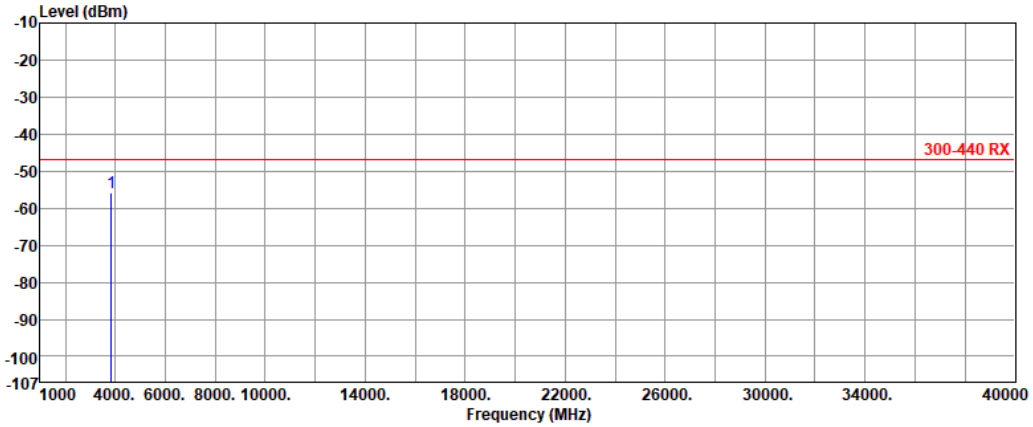


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3883.01	-55.65	-47.00	-8.65	6.04	-61.69

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

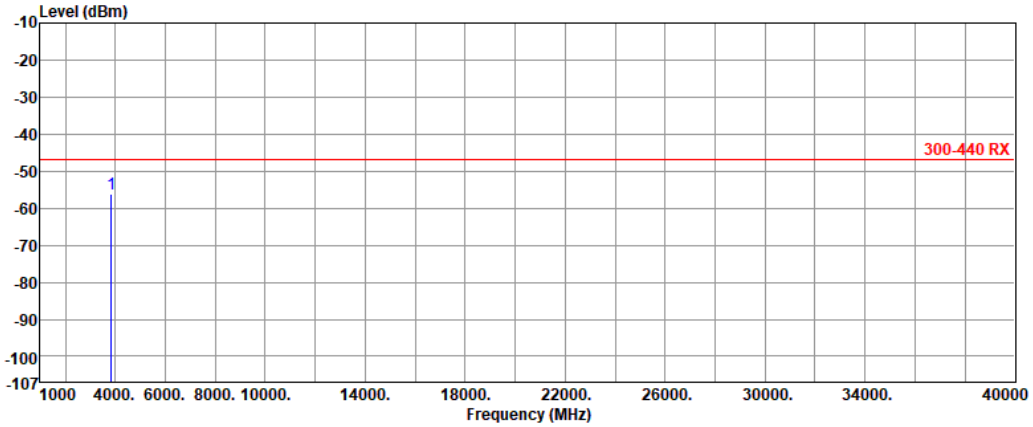


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3830.01	-55.84	-47.00	-8.84	6.35	-62.19

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

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

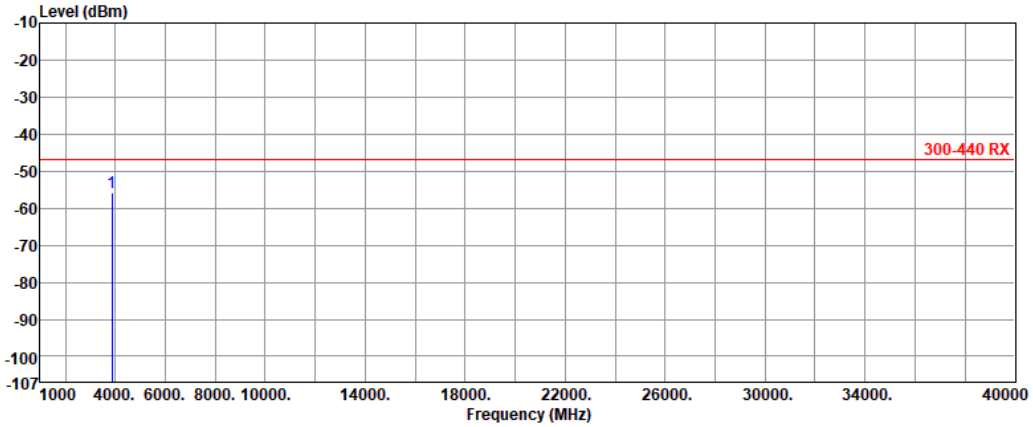


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3830.23	-56.28	-47.00	-9.28	6.05	-62.33

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

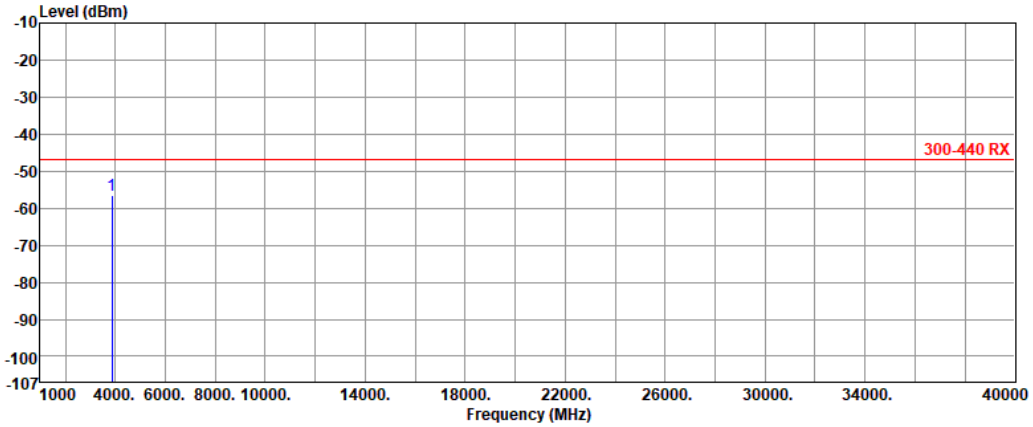


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3856.49	-55.80	-47.00	-8.80	6.37	-62.17

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

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

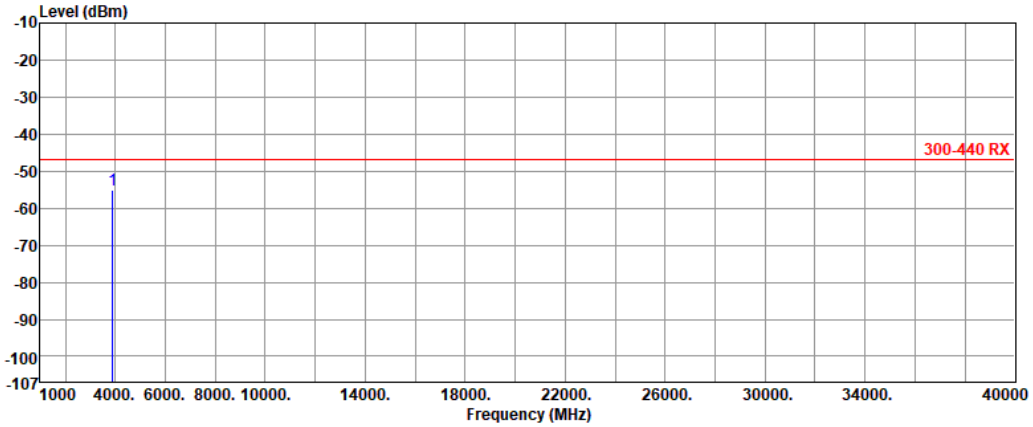


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3856.63	-56.42	-47.00	-9.42	6.05	-62.47

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

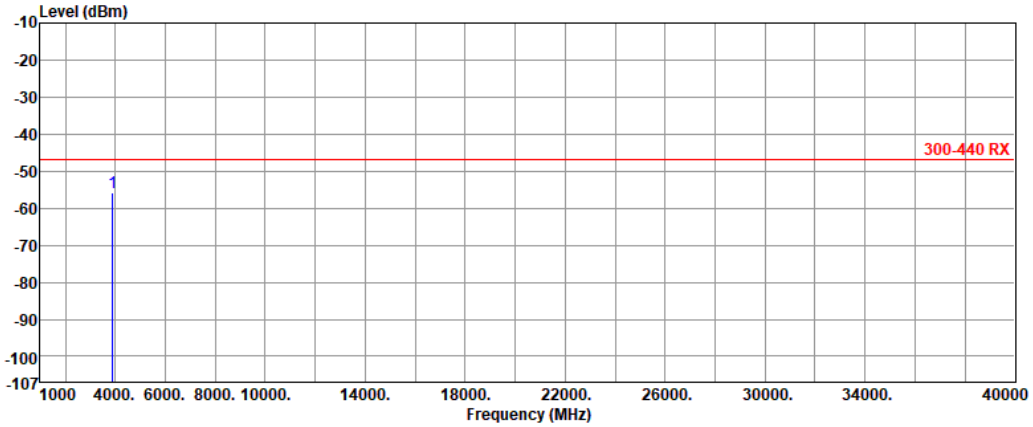


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3883.61	-55.12	-47.00	-8.12	6.39	-61.51

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

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

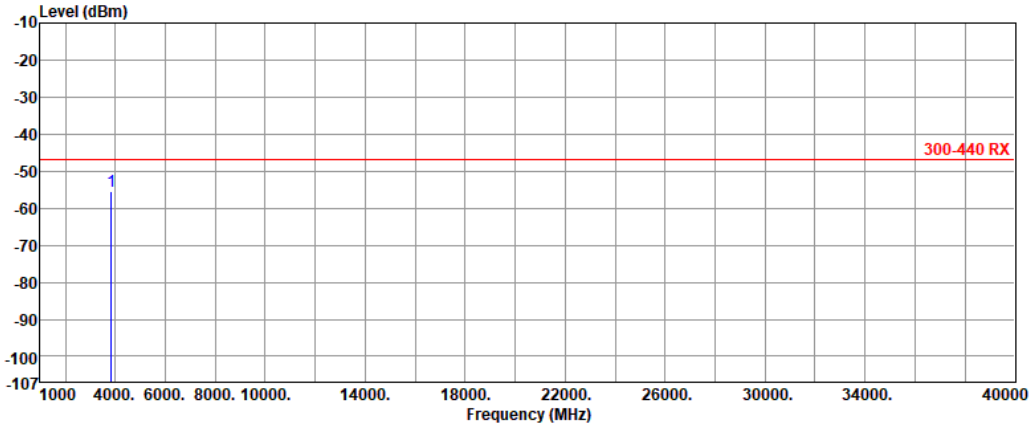


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3883.50	-55.70	-47.00	-8.70	6.04	-61.74

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

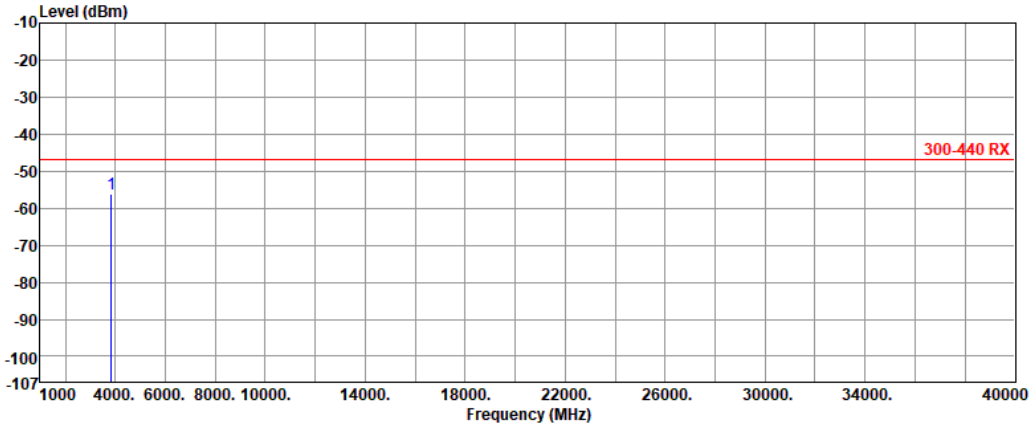


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3836.45	-55.48	-47.00	-8.48	6.35	-61.83

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

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

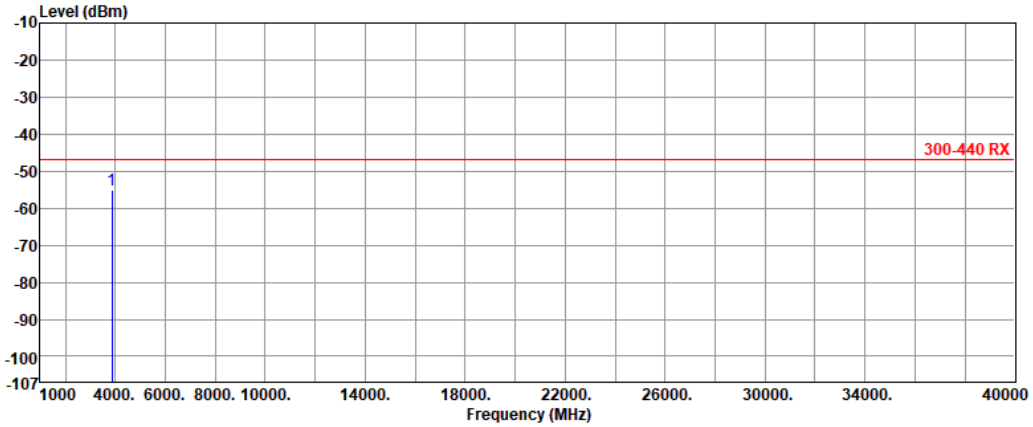


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3837.14	-56.05	-47.00	-9.05	6.04	-62.09

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

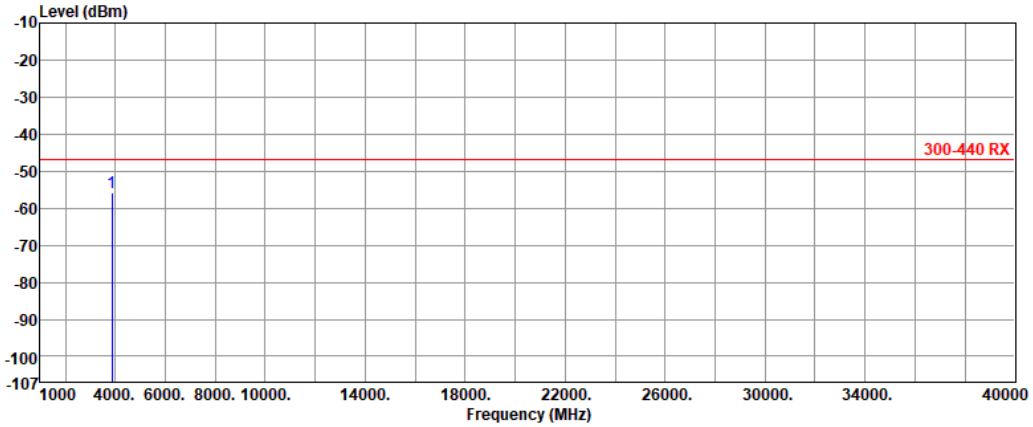


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3863.52	-55.14	-47.00	-8.14	6.38	-61.52

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

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65

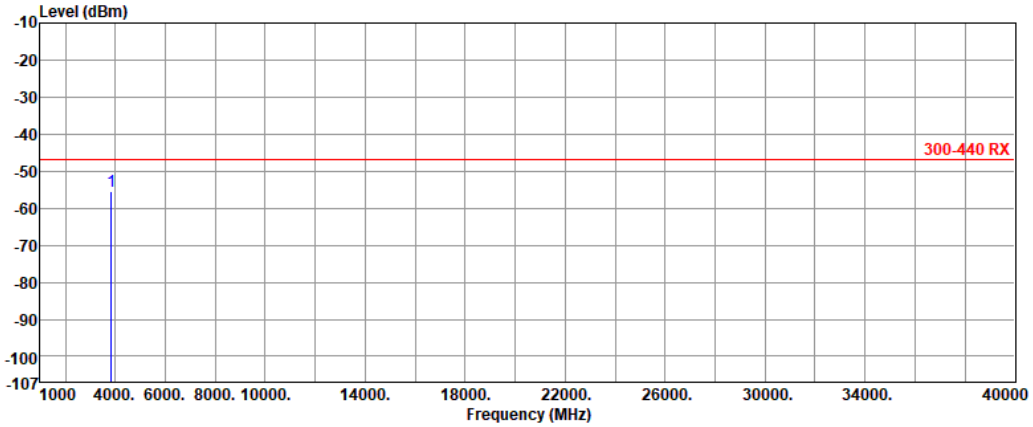


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3863.33	-55.96	-47.00	-8.96	6.05	-62.01

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Horizontal		

Test By :Alan Tang Temperature:24 Humidity(%):65

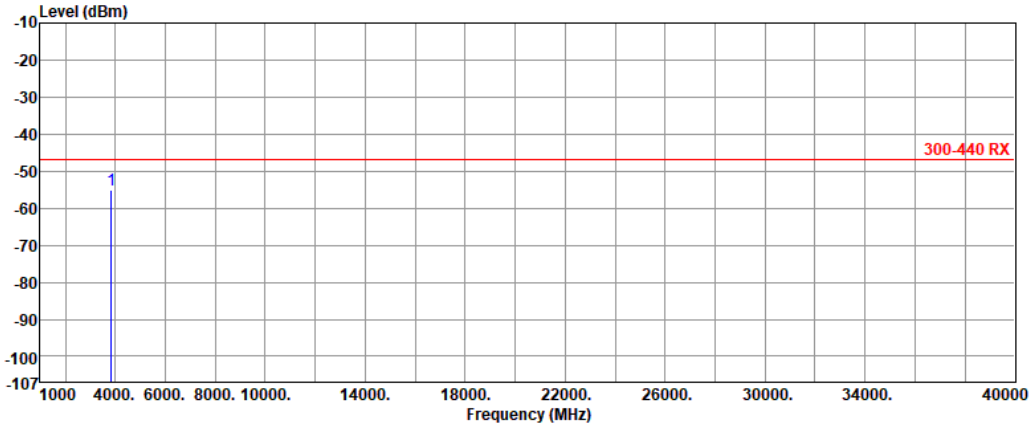


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3850.12	-55.53	-47.00	-8.53	6.37	-61.90

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

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Vertical		

Test By :Alan Tang Temperature:24 Humidity(%):65



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	3850.06	-55.08	-47.00	-8.08	6.05	-61.13

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

4.2 Adjacent Channel Selectivity

4.2.1 Limit of Adjacent Channel Selectivity

Receiver category	Limit
1	-30 dBm + k
2	No limit
3	No limit

The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

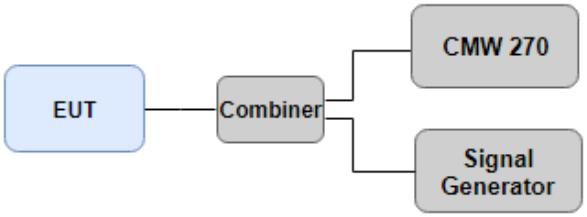
Where:
- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:
- $0 < k < 40$ dB.

4.2.2 Test Procedures

Reference to clause 4.3.3.3 of ETSI EN 300 440 V2.1.1 (2017-03).

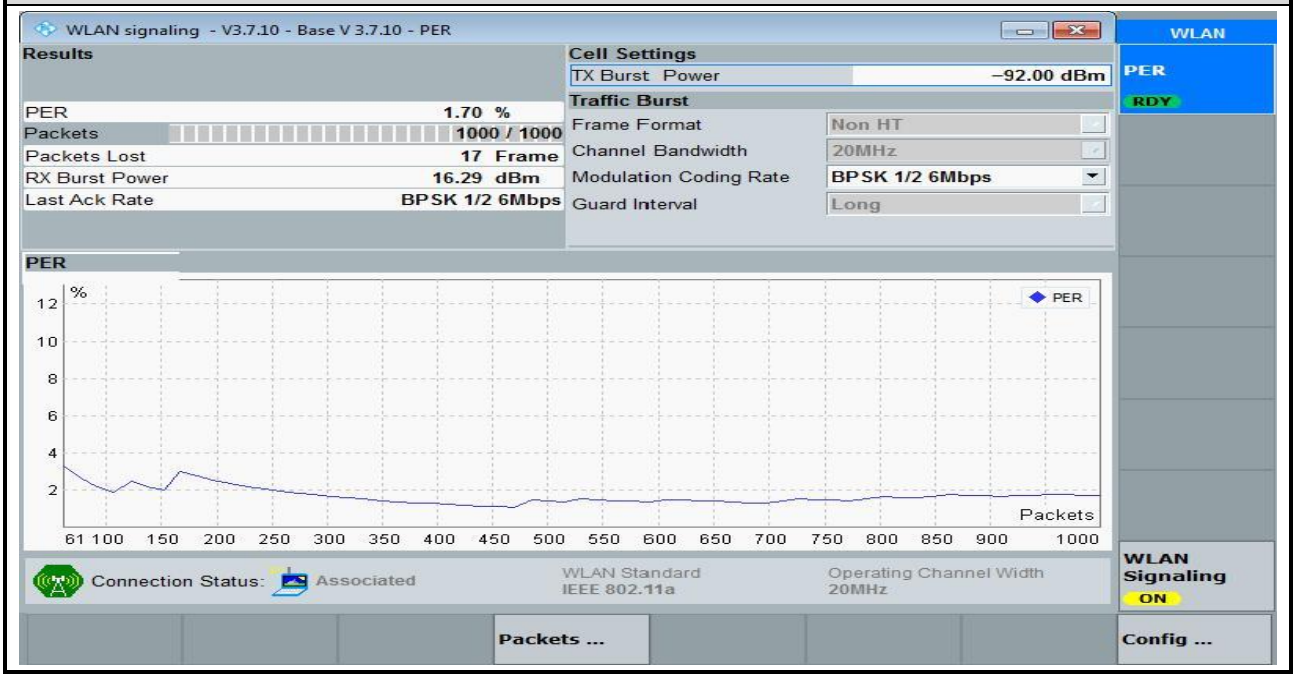
4.2.3 Test Setup



4.2.4 Test Result of Adjacent Channel Selectivity

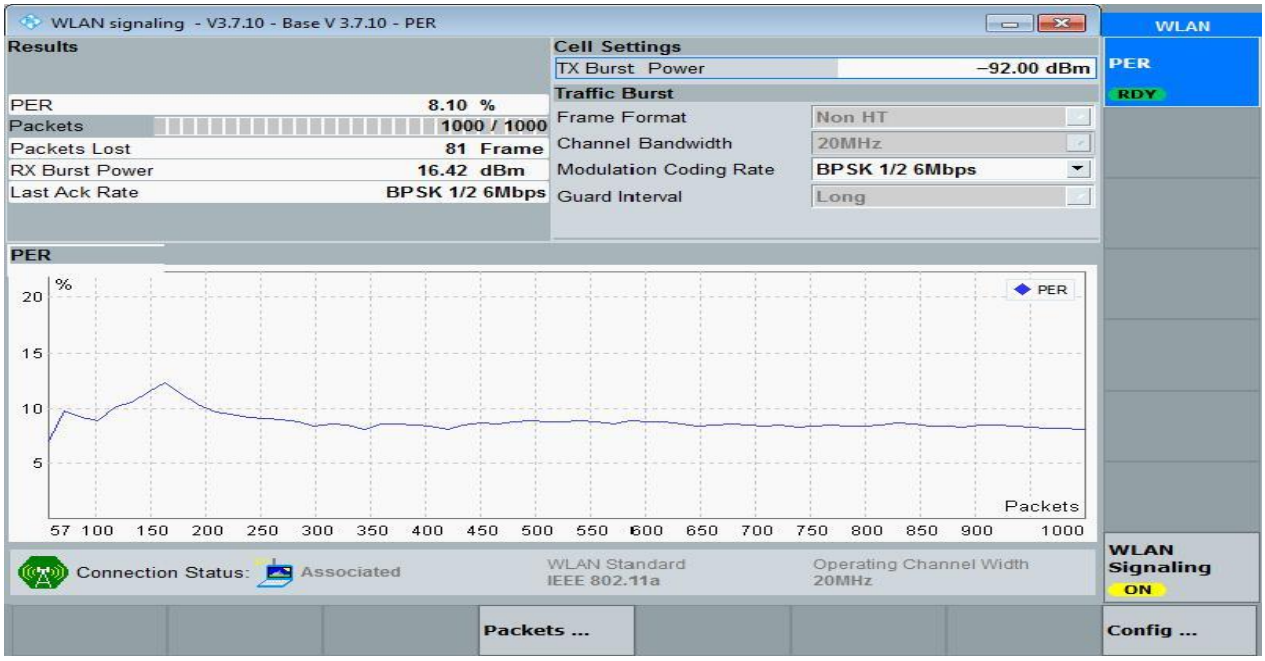
Ambient Condition	22.5°C / 64%	Tested By	Alan Tang

11a / 5745 MHz



Receiver Category	1			
Signal Generator (MHz)	**Communication Device (dBm)**	**Signal Generator (dBm)**	**Limit (dBm)**	**Test Result**
5765.00	-89.00	-39.80	-58.17	Pass

11a / 5825 MHz



Receiver Category	1			
Signal Generator (MHz)	**Communication Device (dBm)**	**Signal Generator (dBm)**	**Limit (dBm)**	**Test Result**
5805	-89.00	-40.00	-58.39	Pass

4.3 Receiver Blocking

4.3.1 Limit of Receiver Blocking

Receiver category	Limit
1	-30 dBm + k
2	-45 dBm + k
3	No limit

The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

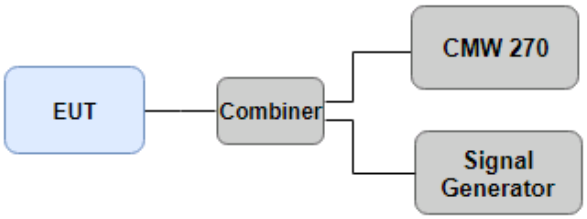
Where:
- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:
- $0 < k < 40$ dB.

4.3.2 Test Procedures

Reference to clause 4.3.4.3 of ETSI EN 300 440 V2.1.1 (2017-03).

4.3.3 Test Setup

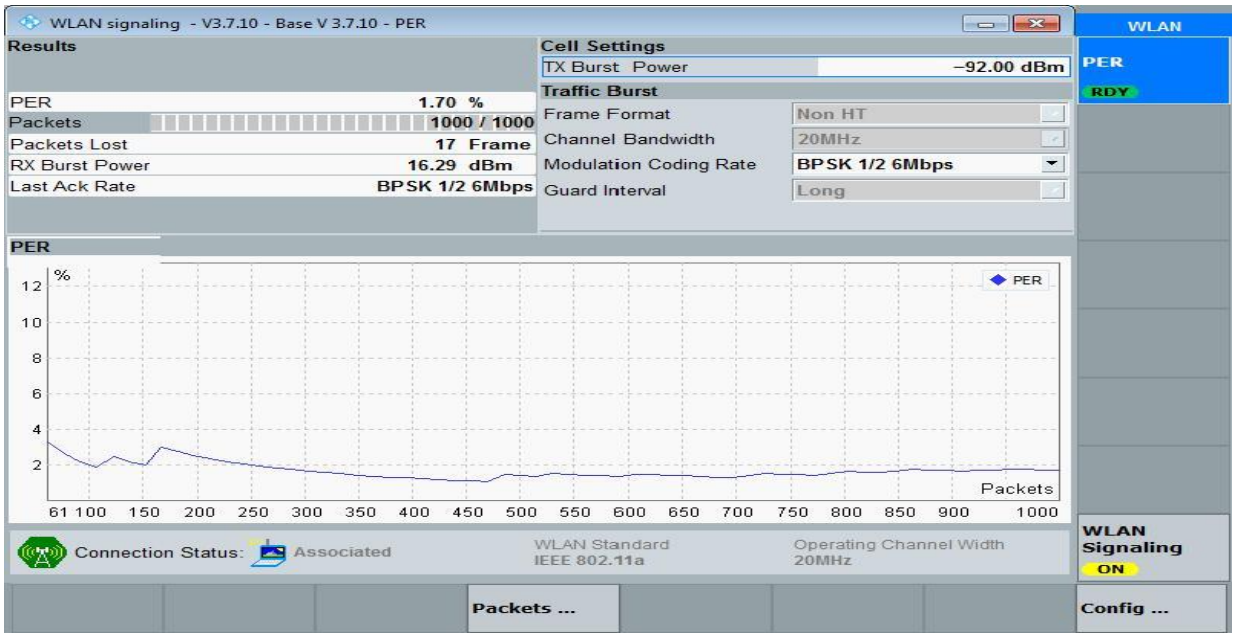


4.3.4 Test Result of Receiver Blocking

Ambient Condition	22.5°C / 64%	Tested By	Alan Tang

11a / 5745 MHz

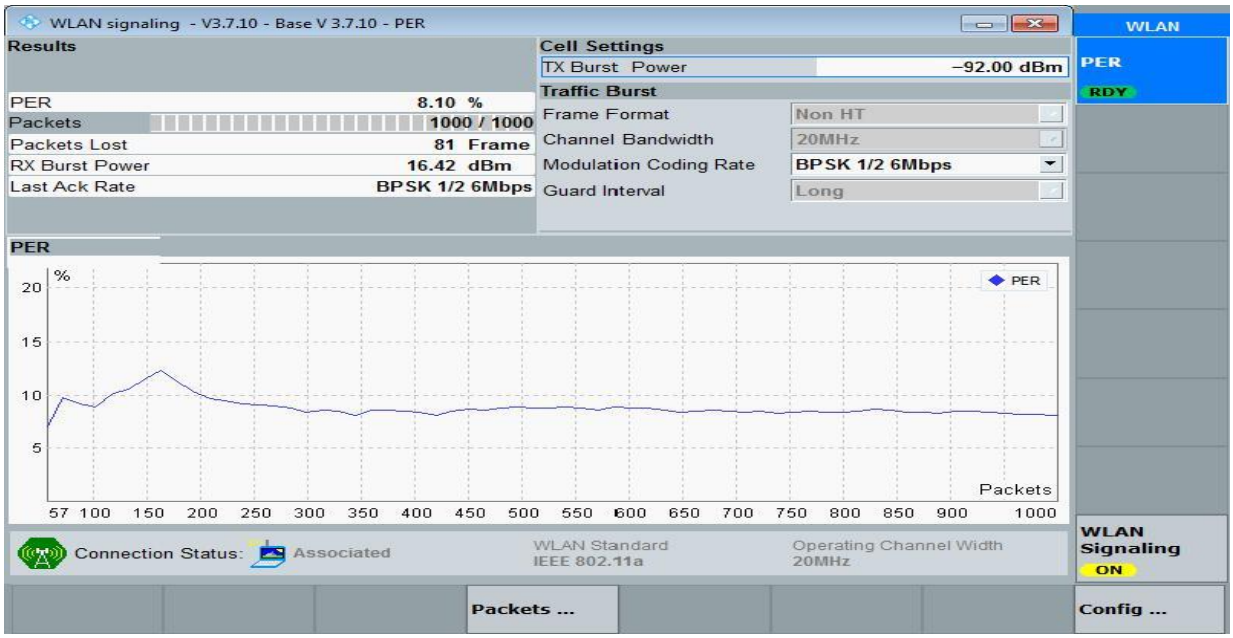
Without Interference Signal Sensitivity Level



Receiver Category	1			
Signal Generator (MHz)	**Communication Device (dBm)**	**Signal Generator (dBm)**	**Limit (dBm)**	**Test Result**
4725	-89.00	-12.40	-58.17	Pass
5345	-89.00	-18.90	-58.17	Pass
5545	-89.00	-19.00	-58.17	Pass

11a / 5825 MHz

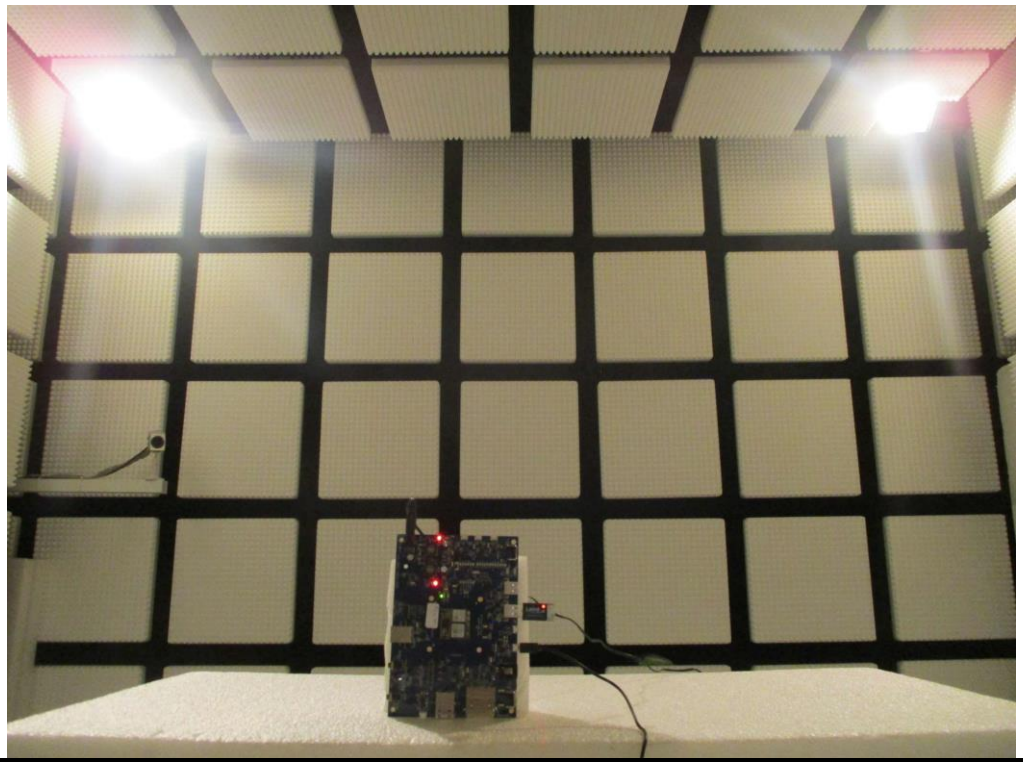
Without Interference Signal Sensitivity Level

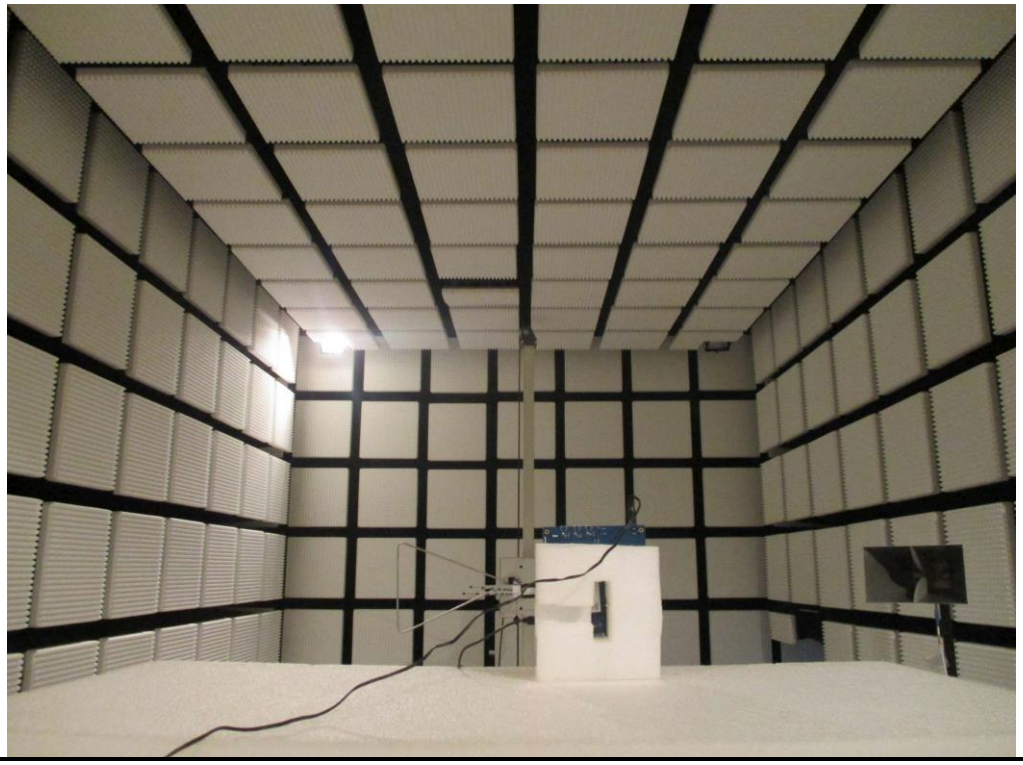


Receiver Category	1			
Signal Generator (MHz)	**Communication Device (dBm)**	**Signal Generator (dBm)**	**Limit (dBm)**	**Test Result**
6075	-89.00	-25.30	-58.39	Pass
6275	-89.00	-27.60	-58.39	Pass
6875	-89.00	-16.70	-58.39	Pass

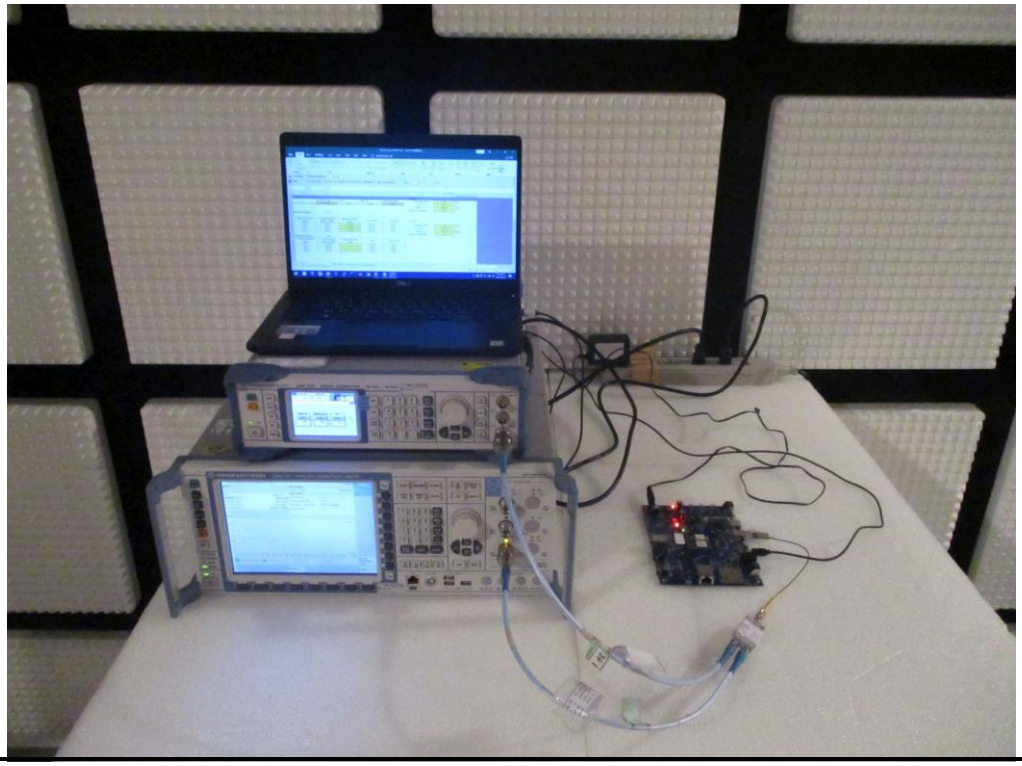
5 Photographs of the Test Configuration

Spurious Emission Test





Receiver Blocking Test



6 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 Corporation (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 Dist., Tao Yuan City 33381, Taiwan (R.O.C.) No.2-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., 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: 886-3-318-0345
Email: ICC_Service@icertifi.com.tw

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