RF Test Report

Applicant	:	EDIMAX TECHNOLOGY CO., LTD.
Product Name	:	11ac Wireless Dual-Band Selectable USB Adapter
Trade Name	:	EDIMAX
Model Name	:	EW-7822UNC, EW-7822ULC
Applicable Standard	:	ETSI EN 301 893 V2.1.1 (2017-05)
Receive Date	:	Jul. 27, 2016
Test Period	:	Aug. 04, 2016 ~ Jun. 04, 2017
Issue Date	:	Jul. 10, 2017

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Jun. 06, 2017	Initial Issue	Nina Lin
01	Jun. 26, 2017	Revised report information.	Snow Wang
02	Jul. 10, 2017	Revised report information.	Nina Lin

Verification of Compliance

Issued Date: Jul. 10, 2017

Applicant	:	EDIMAX TECHNOLOGY CO., LTD.
Product Type	:	11ac Wireless Dual-Band Selectable USB Adapter
Trade Name	:	EDIMAX
Model Number	:	EW-7822UNC, EW-7822ULC
EUT Rated Voltage	:	DC 5.0V
Test Voltage	:	DC 5.0V
Applicable Standard	:	ETSI EN 301 893 V2.1.1 (2017-05)
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C) Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

The above equipment has been tested by A Test Lab Techno Corp., and found compliance with the requirements set forth in the RED: Directive 2014/53/EU and technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By	:	Fly Lu	Reviewed By	: Eric Ou Yang
(Manager)		(Fly Lu)	(Testing Engineer)	(Eric Ou Yang)

TABLE OF CONTENTS

1 General Information 6
1.1. EUT Description 6
1.2. Product Information Specific to EN 301 893 7
1.3. Mode of Operation 16
1.4. EUT Exercise Software 16
1.5. Configuration of Test System Details 16
1.6. Test Site Environment 17
1.7. Measurement Uncertainty 17
1.8. Summary of Test Result 18
2 Centre Frequencies Test 19
2.1. Limit 19
2.2. Test Instruments 19
2.3. Test Setup 19
2.4. Test Procedure 20
2.5. Test Result 20
3 Nominal Channel Bandwidth and Occupied Channel Bandwidth Test 23
3.1. Limit 23
3.2. Test Instruments 23
3.3. Test Setup 23
3.4. Test Procedure 23
3.5. Test Result 24
3.6. Test Graphs 26
4 RF Output Power, Transmit Power Control (TPC) and Power Density Test 33
4.1. Limit 33
4.2. Test Instruments 34
4.3. Test Setup 34
4.4. Test Procedure 35
4.5. Test Result 36
5 Adaptivity (Channel Access Mechanism) Test 38
5.1. Limit 38
5.2. Test Instruments 39
5.3. Test Setup 40
5.4. Test Procedure 40
5.5. Test Result 40
5.6. Test Graphs 42

6 Receiver Blocking 48
6.1. Limit 48
6.2. Test Instruments 49
6.3. Test Setup 49
6.4. Test Procedure 49
6.5. Test Result 50
7 User Access Restrictions 51
7.1. Requirement 51
7.2. Declare 51
8 Geo-location capability 51
8.1. Requirement 51
8.2. Declare 51
9 Transmitter Unwanted Emissions outside the 5GHz RLAN Bands Test 52
9.1. Limit 52
9.2. Test Instruments 52
9.3. Test Setup 53
9.4. Test Procedure 54
9.5. Test Result 55
10 Transmitter Unwanted Emissions within the 5GHz RLAN Bands Test 74
10.1. Limit 74
10.2. Test Instruments 74
10.3. Test Setup 75
10.4. Test Procedure 75
10.5. Test Graphs 75
11 Receiver Spurious Emissions 82
11.1. Limit 82
11.2. Test Instruments 82
11.3. Test Setup 83
11.4. Test Procedure 84
11.5. Test Result 84
12 Test Setup Photograph 100
13 EUT Photograph 101

1 General Information

1.1. EUT Description

Applicant	EDIMAX TECHNOLOGY CO., LTD. No.278, Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan				
Manufacturer	EDIMAX TECHNOLOGY CO., LTD. No.278, Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan				
Product Type	11ac Wireless Dual-Band Selectable USB Adapter				
Trade Name	EDIMAX				
Model Number	EW-7822UNC, EW-7822ULC				
Models Different Description	Those model numbers differ from each other in selling region.				
Operate Freq. Band	Frequency Range (MHz)		Modulation	Channel Bandwidth	Data Rate
IEEE 802.11a	UNII Band I	5180 – 5240	OFDM	20MHz	Up to 54Mbps
IEEE 802.11n 5GHz 20MHz / IEEE 802.11ac 20MHz	UNII Band I	5180 – 5240	OFDM	20MHz	Up to 173.4Mbps
IEEE 802.11n 5GHz 40MHz / IEEE 802.11ac 40MHz	UNII Band I	5190 – 5230	OFDM	40MHz	Up to 400Mbps
IEEE 802.11ac 80MHz	UNII Band I	5210	OFDM	80MHz	Up to 866.6Mbps
Channel Control	Auto				
Antenna Delivery	see section 1.3				
Antenna information	Antenna	Model	Type	Max. Gain (dBi)	
	ANT-0 (Main)	GY197HT632-003	Monopole Antenna	1.71	
	ANT-1 (AUX)	GY197HT632-003	Monopole Antenna	-0.23	
Maximum e.i.r.p.	UNII Band I: 18.65 dBm Beamforming on UNII Band I: 22.23 dBm				
Temperature Range	0 ~ 40 ℃				

For 5.0GHz Band Channel List

IEEE 802.11a / IEEE 802.11n 5GHz 20MHz / IEEE 802.11ac 20MHz Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz	48	5240 MHz

IEEE 802.11n 5GHz 40MHz / IEEE 802.11ac 40MHz Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	---	---	---	---

IEEE 802.11ac 80MHz Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	---	---	---	---	---	---

1.2. Product Information Specific to EN 301 893

In accordance with ETSI EN 301 893 clause 5.4.1, the following information is provided by the manufacturer.

a) The Nominal Channel Bandwidth(s):

Nominal Channel Bandwidth 1: 20 MHz
Nominal Channel Bandwidth 2: 40 MHz
Nominal Channel Bandwidth 3: 80 MHz

The associated centre frequencies:

For Nominal Channel Bandwidth 1:
for the band 5150 - 5350 MHz: 5180MHz; 5200MHz; 5220MHz; 5240MHz

For Nominal Channel Bandwidth 2:
for the band 5150 - 5350 MHz: 5190MHz; 5230MHz;

For Nominal Channel Bandwidth 3:
for the band 5150 - 5350 MHz: 5210MHz

b) For Load Based Equipment that supports multi-channel operation:

☐ The LBE equipment supports Option 1 as described in clause 4.2.7.3.2.3
■ The LBE equipment supports Option 2 as described in clause 4.2.7.3.2.3
●The (maximum) number of channels used for multi-channel operation: .....
●These channels are adjacent channels:
■ Yes ☐ No
● In case of non-adjacent channels, whether or not these channels are in different sub-bands:
☐ Yes ■ No
● for LBE equipment implementing option 1 (see clause 4.2.7.3.2.3), the number of channels used for multi-multichannel operation when performing the test described in clause 5.4.9.3.2.3.1: ……

In case of multi-channel operation, further information defining the channels used for these simultaneous transmissions may be required.

c) The different transmit operating modes (see clause 5.3.3.2) (tick all that apply):

☐ Operating mode 1: Single Antenna Equipment

- ☐ a) Equipment with only 1 antenna
- ☐ b) Equipment with diversity antennas but only 1 antenna active at any moment in time
- ☐ c) Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used.

■ Operating mode 2: Smart Antenna Systems - Multiple Antennas without beamforming

- ■ a) Single spatial stream/Standard throughput
- ■ b) High Throughput (>1 spatial stream) using Nominal Channel Bandwidth 1
- ■ c) High Throughput (>1 spatial stream) using Nominal Channel Bandwidth 2
- ■ d) High Throughput (>1 spatial stream) using Nominal Channel Bandwidth 3

■ Operating mode 3: Smart Antenna Systems - Multiple Antennas with beamforming

- ■ a) Single spatial stream/Standard throughput
- ■ b) High Throughput (>1 spatial stream) using Nominal Channel Bandwidth 1
- ■ c) High Throughput (>1 spatial stream) using Nominal Channel Bandwidth 2
- ■ d) High Throughput (>1 spatial stream) using Nominal Channel Bandwidth 3

d) In case of Smart Antenna Systems or multiple antenna systems

- ●The number of Receive chains: 2
- ●The number of Transmit chains: 2
- ●Equal power distribution among the transmit chains: ■ Yes ☐ No
- ●In case of beamforming, the maximum (additional) beamforming gain: 2.28 dB

Note: Beamforming gain does not include the basic gain of a single antenna (assembly).

e) TPC feature available:

☐ Yes ■ No

f) For equipment with TPC range:

The lowest and highest power level (or lowest and highest e.i.r.p. level in case of integrated antenna equipment), intended antenna assemblies and corresponding operating frequency range for the TPC range (or for each of the TPC ranges if more than one is implemented).

TPC range 1: Applicable Frequency Range:

☐ 5150 MHz to 5350 MHz and 5470 MHz to 5725 MHz (Indoor)

Simultaneous transmissions in both sub-bands: ☐ Yes ☐ No

☐ 5470 MHz to 5725 MHz only (Outdoor only)

Indicate whether the power levels specified are Transmitter Output Power levels or e.i.r.p. levels in case of integrated antenna equipment.

Power levels are specified for:: ☐ Tx out ☐ e.i.r.p

If more than one transmit chain is present (e.g. in the case of smart antenna systems), the power levels below represent the power settings per active transmit chain (and per sub-band in case of simultaneous transmissions).

Table F.1: Power levels for TPC range 1

	Sub-band (MHz)	Operating Mode 1 (dBm)	Operating Mode 2 (dBm)	Operating Mode 3 (dBm)	Operating Mode 4 (dBm)
Lowest setting (P_{low})	5150 to 5350	---	---	---	---
	5470 to 5725	---	---	---	---
Highest setting (P_{high})	5150 to 5350	---	---	---	---
	5470 to 5725	---	---	---	---

Beamforming possible: ☐ Yes ☐ No

Intended Antenna Assemblies:

Table F.2: Intended Antenna Assemblies for TPC range 1

Antenna Assembly name	Antenna Gain (dBi)	Operating Mode	Sub-band (MHz)	Beam forming gain (dB)	e.i.r.p. for P_{low} (dBm)	e.i.r.p.for P_{high} (dBm)
<Antenna 1>	---	Mode 1	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
		Mode 2	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
		Mode 3	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
<Antenna 2>	---	Mode 1	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
		Mode 2	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
		Mode 3	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
<Antenna 3>	---	Mode 1	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
		Mode 2	5150 to 5350	---	---	---
			5470 to 5725	---	---	---
		Mode 3	5150 to 5350	---	---	---
			5470 to 5725	---	---	---

DFS Threshold level: -62 dBm ☐ at the antenna connector
☐ in front of the antenna

g) For equipment without a TPC range:

Power Setting 1: Applicable Frequency Range:

■ 5150 MHz to 5250 MHz

Simultaneous transmissions in both sub-bands: ☐ Yes ■ No

☐ 5470 MHz to 5725 MHz only (Outdoor only)

Indicate whether the power levels specified are Transmitter Output Power levels or e.i.r.p. levels in case of integrated antenna equipment.

Power levels are specified for: ☐ Tx out ■ e.i.r.p.

If more than one transmit chain is present (e.g. in the case of smart antenna systems), the power levels below represent the power settings per active transmit chain (and per sub-band in case of simultaneous transmissions).

Table F.5: Maximum Transmitter Output Power for Power Setting 1

Sub-band (MHz)	Operating Mode 1 (dBm)	Operating Mode 2 (dBm)	Operating Mode 3 (dBm)	Operating Mode 4 (dBm)
5150 to 5 250	12.08	18.65	22.23	---
5470 to 5725	---	---	---	---

Beamforming possible: ■ Yes ☐ No

Intended Antenna Assemblies:

Table F.6: Intended Antenna Assemblies for Power Setting 1

Antenna Assembly name	Antenna Gain (dBi)	Operating Mode	Sub-band (MHz)	Beam forming gain (dB)	e.i.r.p. for Plow (dBm)	e.i.r.p.for Phigh (dBm)
<Antenna 1>	1.71	Mode 1	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---
		Mode 2	5 150 to 5 250	---	14.77	18.65
			5 470 to 5 725	---	---	---
		Mode 3	5 150 to 5 250	2.28	21.25	22.23
			5 470 to 5 725	---	---	---
		Mode 4	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---
<Antenna 2>	-0.23	Mode 1	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---
		Mode 2	5 150 to 5 350	---	14.77	18.65
			5 470 to 5 725	---	---	---
		Mode 3	5 150 to 5 350	2.28	21.25	22.23
			5 470 to 5 725	---	---	---
		Mode 4	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---
<Antenna 3>	---	Mode 1	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---
		Mode 2	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---
		Mode 3	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---
		Mode 4	5 150 to 5 350	---	---	---
			5 470 to 5 725	---	---	---

DFS Threshold level: ..... dBm ☐ at the antenna connector
☐ in front of the antenna

h) The DFS related operating mode(s) of the equipment

☐ Master
☐ Slave with radar detection
☐ Slave without radar detection

If the equipment has more than one operating mode, tick all that apply.

i) User access restrictions (please check box below to confirm)

■ the equipment is constructed to comply with the requirements contained in clause 4.2.9 in ETSI EN 301 893 V2.1.1

j) For equipment with Off-Channel CAC functionality

The equipment has an *"Off-Channel CAC"* function: ☐ Yes ☐ No

If yes, specify the *"Off-Channel CAC Time"*

● For channels outside the 5600 MHz to 5650 MHz range: hours
● If applicable, for channels (partially) within the 5 600 MHz to 5 650 MHz range: hours

k) The equipment can operate in ad-hoc mode:

■ no ad-hoc operation
☐ ad-hoc operation in the frequency range 5150 MHz to 5250 MHz without DFS
☐ ad-hoc operation with DFS

If more than 1 is applicable, tick all that apply.

l) Operating Frequency Range(s):

☐Range 1: 5150 MHz to 5350 MHz and 5470 MHz to 5725 MHz
☐ Range 2: 5470 MHz to 5725 MHz only
☐ Range 3: 5150 MHz to 5250 MHz (ad-hoc without DFS)
■ Range 4: other, please specify: 5 150 MHz to 5 250 MHz

If the equipment has more than one Operating Frequency Range, tick all that apply.

m)The extreme operating temperature and supply voltage range that apply to the equipment:

☐ -20 °C to +55 °C (Outdoor & Indoor usage)
☐ 0 °C to +35 °C (Indoor usage only)
■ Other: 0 °C to 40 °C

The supply voltages of the stand-alone radio equipment or the supply voltages of the combined (host) equipment or test jig in case of plug-in devices:

Details provided are for the: ■ stand-alone equipment
☐ combined (or host) equipment
☐ test jig

Supply Voltage

☐ AC mains State AC voltage:
Minimum: 207V Nominal: 230V Maximum: 253V

■ DC State DC voltage:
Minimum: 4.5V Nominal: 5V Maximum: 5.5V

In case of DC, indicate the type of power source:

☐ Internal Power Supply
■ External Power Supply or AC/DC adapter
■ Battery

☐ Nickel Cadmium ■ Lithium-Ion
☐ Alkaline ☐ Lead acid (Vehicle regulated)
☐ Nickel-Metal Hydride ☐ Other .....

n) The test sequence/test software used (see also EN 301 893 (V1.8.1), clause 5.3.1.2)

EIRP first test and then measured the remaining test items. The test setup has been constructed as the normal use condition. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

o) Type of Equipment

■ Stand-alone
☐ Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment)
☐ Plug-in radio device (Equipment intended for a variety of host systems)
☐ Other .....

p) Adaptivity (Channel Access Mechanism)

☐ Frame Based Equipment
■ Load Based Equipment

q) With regards to Adaptivity for Frame Based Equipment

☐ The Frame Based Equipment operates as an Initiating Device

☐ The Frame Based Equipment operates as an Responding Device

☐ The Frame Based Equipment can operate as an Initiating Device and as a Responding Device

The Frame Based Equipment has implemented the following Fixed Frame Period(s):

……. Ms

……. Ms

……. Ms

r) With regards to Adaptivity for Load Based Equipment

☐ The Load Based Equipment operates as a Supervising Device

■ The Load Based Equipment operates as a Supervised Device

☐ The Load Based Equipment can operate as a Supervising and as a Supervised Device

☐ The Load Based Equipment makes use of note 1 in table 7 or note 1 in table 8 of ETSI EN 301 893 V2.1.1

☐ The Load Based Equipment , when operating as a Supervising Device, makes use of note 2 in table 7 of ETSI EN 301 893 V2.1.1

The Priority Classes implemented by the Load Based Equipment

●When operating as a Supervising Device

☐ Priority Class 4 (Highest priority)

☐ Priority Class 3

☐ Priority Class 2

☐ Priority Class 1 (Lowest priority)

●When operating as a Supervised Device

☐ Priority Class 4 (Highest priority)

■ Priority Class 3

☐ Priority Class 2

☐ Priority Class 1 (Lowest priority)

☐The Load Based Equipment operates as an Initiating Device

■The Load Based Equipment operates as an Responding Device

☐The Load Based Equipment can operate as an Initiating Device and as a Responding Device

With regard to Energy Detection Threshold, the Load Based Equipment has implemented either option 1 of clause 4.2.7.3.2.5 of ETSI EN 301 893 V2.1.1 or option 2 of clause 4.2.7.3.2.5 of ETSI EN 301 893 V2.1.1:

■ Option 1

☐ Option 2

Specify which protocol has been implemented: ■ IEEE 802.11™ ☐ Other: .....

s) The equipment supports a geo-location capability as defined in clause 4.2.10 of ETSI EN 301 893 V2.1.1:

■ Yes ☐ No

t) **The minimum performance criteria (see ETSI EN 301 893 V2.1.1, clause 4.2.8.3) that corresponds to the intended use of the equipment.**

A Mode 6Mbps : PER 10% P_{min}= -91dBm

u) **The theoretical maximum radio performance of the equipment (e.g. maximum throughput) (see ETSI EN 301 893 V2.1.1, clause 5.4.9.3.1)**

866.6Mbps

1.3. Mode of Operation

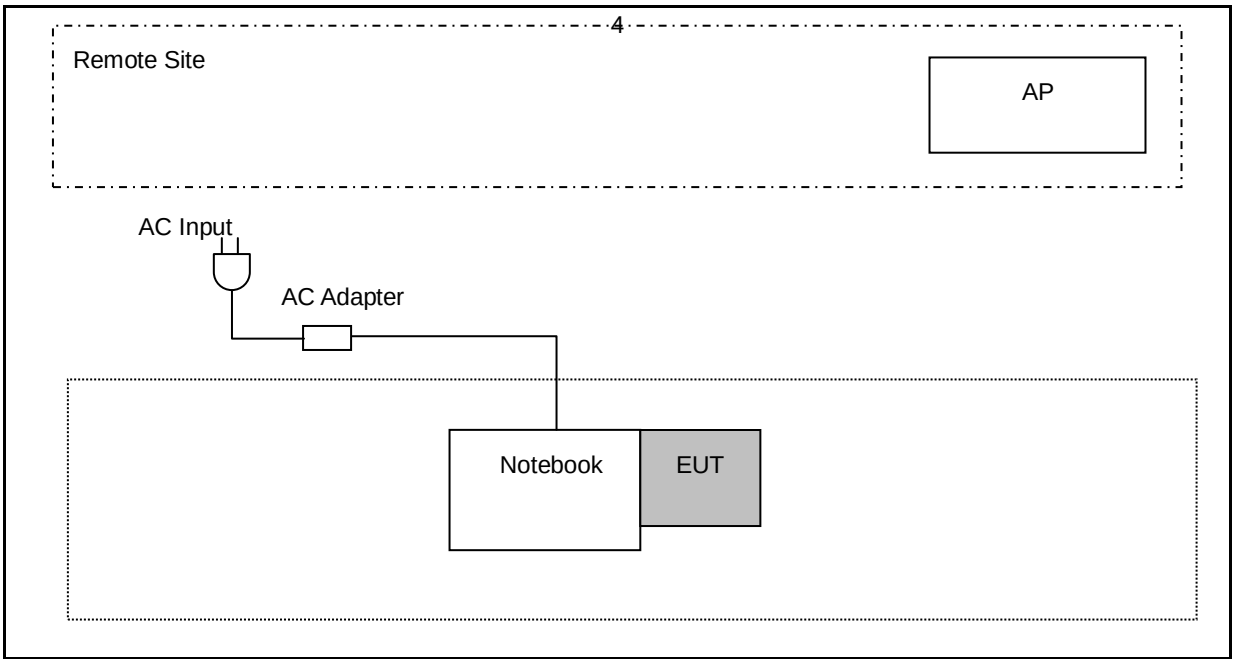
ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode	Antenna Delivery	Test Channel	Data Rate
Mode 1: IEEE 802.11a U-NII Band Link Mode	1TX / 1RX (ANT-0)	36,40, 48	6M
Mode 2: IEEE 802.11n 5GHz 20MHz U-NII Band Link Mode	2TX / 2RX (MIMO)	36,40, 48	13M
Mode 3: IEEE 802.11n 5GHz 40MHz U-NII Band Link Mode	2TX / 2RX (MIMO)	38, 46	27M
Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode	2TX / 2RX (MIMO)	42	58.6M

1.4. EUT Exercise Software

1.	Setup the EUT as shown on 1.5
2.	Turn on the power of all equipment.
3.	Turn on Wi-Fi function.
4.	EUT link Notebook run test program.

1.5. Configuration of Test System Details



1.6. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	20-75	60
Barometric pressure (mbar)	860-1060	950

1.7. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Parameter	Uncertainty
RF frequency	± $1.1*10^{-6}$
RF power conducted	± 1.017 dB
RF power radiated	± 2.5 dB
Spurious emissions, conducted	± 1.68 dB
Spurious emissions, radiated	± 5.5 dB
Humidity	± 4.5 %
Temperature	± 0.9 ℃
Time	± 3 %

1.8. Summary of Test Result

Transmitter Parameters			
Description	Clause	Result	Remark
Centre Frequencies	4.2.1	Pass	---
Nominal Channel Bandwidth and Occupied Channel Bandwidth	4.2.2	Pass	---
RF Output Power	4.2.3	Pass	---
Transmit Power Control (TPC)	4.2.3	Pass	---
Power Density	4.2.3	Pass	---
Adaptivity (Channel Access Mechanism)	4.2.7	Pass	---
User Access Restrictions	4.2.9	Pass	---
Transmitter unwanted emissions outside the 5GHz RLAN bands	4.2.4.1	Pass	---
Transmitter unwanted emissions within the 5GHz RLAN bands	4.2.4.2	Pass	---
Dynamic Frequency Selection (DFS)	4.2.6	N/A	---
Receiver Parameters			
Receiver Spurious Emissions	4.2.5	Pass	---
Receiver Blocking	4.2.8	Pass	---
Geo-location Capability	4.2.10	Meet requirement	Ref. section 8

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

2 Centre Frequencies Test

2.1. Limit

The *Nominal Centre Frequencies* (fc) for a *Nominal Channel Bandwidth* of 20 MHz are defined by equation (1). See also figure 3.

fc = 5 160 + (g × 20) MHz, where 0 ≤ g ≤ 9 or 16 ≤ g ≤ 27 and where g shall be an integer. (1)

A maximum offset of the *Nominal Centre Frequency* of ± 200 kHz is permitted. Where the manufacturer decides to make use of this frequency offset, the manufacturer shall declare the actual centre frequencies used by the equipment.

See clause 5.4.1, item a).

The actual centre frequency for any given channel shall be maintained within the range fc ± 20 ppm.

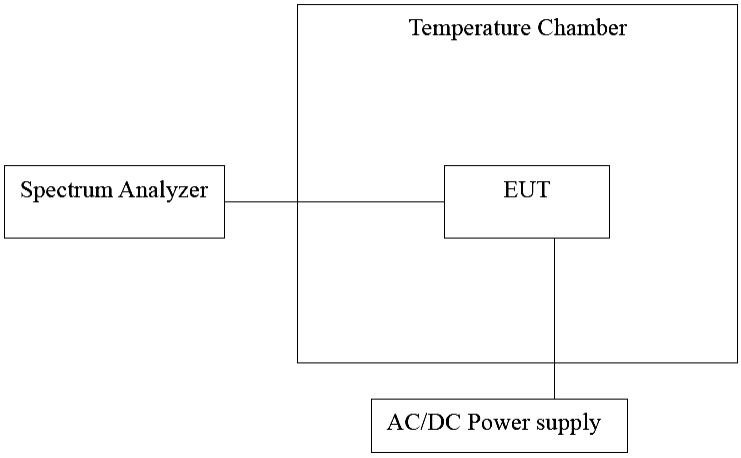
Equipment may have simultaneous transmissions on more than one *Operating Channel* with a *Nominal Channel Bandwidth* of 20 MHz.

2.2. Test Instruments

Equipment	Manufacturer	Model Name	Serial No.	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	04/18/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

2.3. Test Setup



2.4. Test Procedure

1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.2.1 for the test conditions.
2. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.2.2 for the test methods.

2.5. Test Result

Test Mode	Mode 1: IEEE 802.11a U-NII Band Link Mode				
DC Power Source					
Temperature	0°C	25°C	40°C	Measured maximum deviation (Hz)	Measured maximum deviation (ppm)
Test Conditions	5.0 Vdc	5.0 Vdc	5.0 Vdc		
5180 MHz	5180.0772	5180.0700	5180.0760	79800	15.41
5240 MHz	5240.0678	5240.0600	5240.0618	69600	13.28
Limit (ppm)					fc ± 20

Test Mode	Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode				
DC Power Source					
Temperature	0°C	25°C	40°C	Measured maximum deviation (Hz)	Measured maximum deviation (ppm)
Test Conditions	5.0 Vdc	5.0 Vdc	5.0 Vdc		
5180 MHz	5180.0609	5180.0600	5180.0607	68400	13.20
5240 MHz	5240.0831	5240.0800	5240.0891	89100	17.00
Limit (ppm)					fc ± 20

Test Mode	Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode				
DC Power Source					
Temperature	0°C	25°C	40°C	Measured maximum deviation (Hz)	Measured maximum deviation (ppm)
Test Conditions	5.0 Vdc	5.0 Vdc	5.0 Vdc		
5190 MHz	5190.0683	5190.0600	5190.0693	69400	13.37
5230 MHz	5230.0869	5230.0800	5230.0865	89800	17.17
Limit (ppm)					fc ± 20

Test Mode	Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode				
DC Power Source					
Temperature	0°C	25°C	40°C	Measured maximum deviation (Hz)	Measured maximum deviation (ppm)
Test Conditions	5.0 Vdc	5.0 Vdc	5.0 Vdc		
5210 MHz	5210.0163	5210.0100	5210.0157	18100	3.47
Limit (ppm)					fc ± 20

	Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode				
Beamforming on					
DC Power Source					
Temperature	0°C	25°C	40°C	Measured maximum deviation (Hz)	Measured maximum deviation (ppm)
Test Conditions	5.0 Vdc	5.0 Vdc	5.0 Vdc		
5180 MHz	5180.0609	5180.0600	5180.0607	68400	13.20
5240 MHz	5240.0831	5240.0800	5240.0891	89100	17.00
Limit (ppm)					fc ± 20

Test Mode	Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode				
Beamforming on					
DC Power Source					
Temperature	0°C	25°C	40°C	Measured maximum deviation (Hz)	Measured maximum deviation (ppm)
Test Conditions	5.0 Vdc	5.0 Vdc	5.0 Vdc		
5190 MHz	5190.0683	5190.0600	5190.0693	69400	13.37
5230 MHz	5230.0869	5230.0800	5230.0865	89800	17.17
Limit (ppm)					fc ± 20

Test Mode	Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode				
Beamforming on					
AC Power Source					
Temperature	0°C	25°C	40°C	Measured maximum deviation (Hz)	Measured maximum deviation (ppm)
Test Conditions	5.0 Vdc	5.0 Vdc	5.0 Vdc		
5210 MHz	5210.0163	5210.0100	5210.0157	18100	3.47
Limit (ppm)					fc ± 20

3 Nominal Channel Bandwidth and Occupied Channel Bandwidth Test

3.1. Limit

The *Nominal Channel Bandwidth* for a single *Operating Channel* shall be 20 MHz.

Alternatively, equipment may implement a lower *Nominal Channel Bandwidth* with a minimum of 5 MHz, providing they still comply with the *Nominal Centre Frequencies* defined in clause 4.2.1 (20 MHz raster).

The *Occupied Channel Bandwidth* shall be between 80 % and 100 % of the *Nominal Channel Bandwidth*. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement.

The *Occupied Channel Bandwidth* might change with time/payload.

During a *Channel Occupancy Time (COT)*, equipment may operate temporarily with an *Occupied Channel Bandwidth*

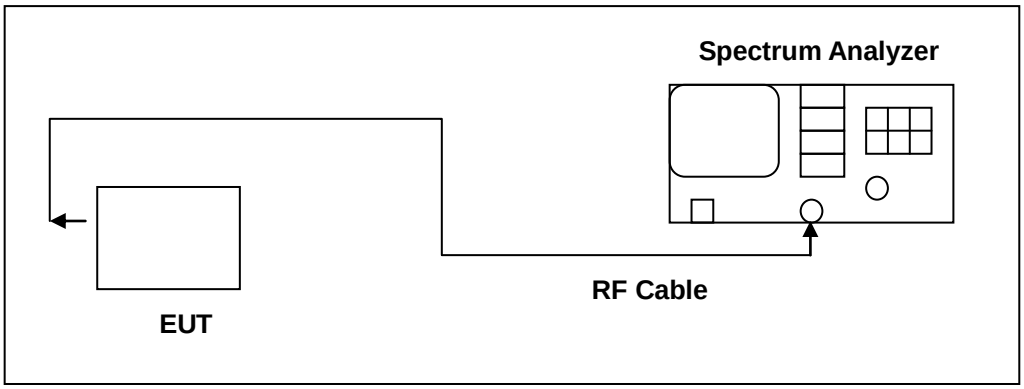
of less than 80 % of its *Nominal Channel Bandwidth* with a minimum of 2 MHz.

3.2. Test Instruments

Equipment	Manufacturer	Model Name	Serial No.	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

3.3. Test Setup



3.4. Test Procedure

1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.3.1 for the test conditions.
2. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.3.2 for the test method

3.5. Test Result

Test Mode	Mode 1: IEEE 802.11a U-NII Band Link Mode	
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
5180	16.549	16 ≦ f ≦ 20
5240	16.496	16 ≦ f ≦ 20

Test Mode	Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode	
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
5180	17.683	16 ≦ f ≦ 20
5240	17.675	16 ≦ f ≦ 20

Test Mode	Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode	
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
5190	36.291	32 ≦ f ≦ 40
5230	36.208	32 ≦ f ≦ 40

Test Mode	Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode	
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
5210	75.083	64 ≦ f ≦ 80

Test Mode	Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode	
Beamforming on		
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
5180	17.683	16 ≦ f ≦ 20
5240	17.675	16 ≦ f ≦ 20

Test Mode	Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode	
Beamforming on		
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
5190	36.291	32 ≦ f ≦ 40
5230	36.208	32 ≦ f ≦ 40

Test Mode	Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode	
Beamforming on		
Frequency (MHz)	Measurement (MHz)	Limit (MHz)
5210	75.083	64 ≦ f ≦ 80

3.6. Test Graphs

Mode 1: IEEE 802.11a U-NII Band Link Mode	
5180 MHz	
5240 MHz	

Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode	
5180 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode	
5190 MHz	
5230 MHz	

Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode	
5210 MHz	

Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode	
Beamforming on	
5180 MHz	
5240 MHz	

Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode	
Beamforming on	
5190 MHz	
5230 MHz	

Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode	
Beamforming on	
5210 MHz	

4 RF Output Power, Transmit Power Control (TPC) and Power Density Test

4.1. Limit

RF output power and power density at the highest power level

TPC is not required for channels whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz.

For devices with TPC, the RF output power and the Power Density when configured to operate at the highest stated power level (PH) of the TPC range shall not exceed the levels given in table 2.

Devices are allowed to operate without TPC. See table 2 for the applicable limits that shall apply in this case.

Table 1: Mean e.i.r.p. limits for RF output power and power density at the highest power level

Frequency Range (MHz)	Mean e.i.r.p. Limit (dBm)		Mean e.i.r.p. Density Limit (dBm/MHz)	
	with TPC	without TPC	with TPC	without TPC
5150 to 5350	23	20 / 23(see Note1)	10	7 / 10 (see Note2)
5470 to 5725	30 (see Note3)	27 (see Note3)	17 (see Note3)	14 (see Note3)

Note 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 23 dBm.

Note 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 10 dBm/MHz.

Note 3: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.

RF output power at the lowest power level of the TPC range

For devices using TPC, the *RF Output Power* during a transmission burst when configured to operate at the lowest stated power level (PL) of the TPC range shall not exceed the levels given in table 3. For devices without TPC, the limits in table 3 do not apply.Table 2: Mean e.i.r.p. limits for RF output power at the lowest power level of the TPC range

Frequency Range (MHz)	Mean e.i.r.p. Limit (dBm)
5250 to 5350	17
5470 to 5725	24 (see Note1)

Note 1: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.

4.2. Test Instruments

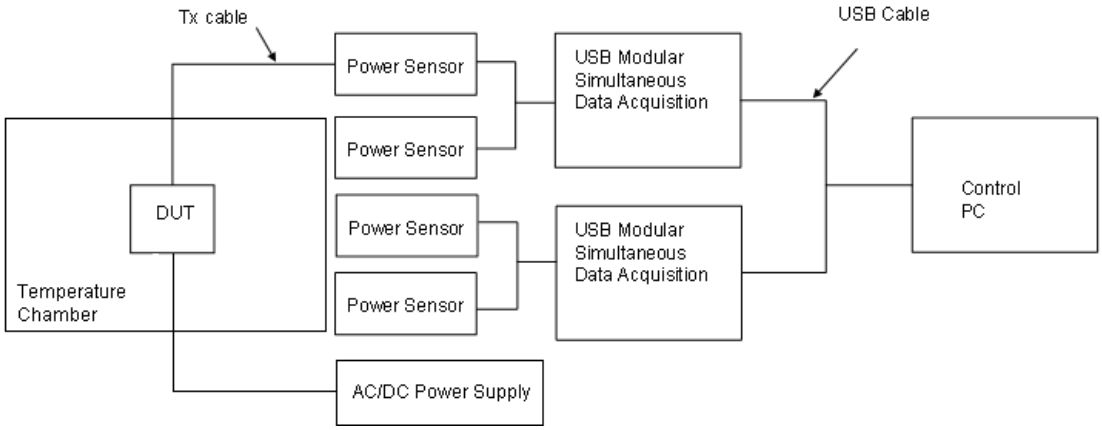
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Power Sensor	Agilent	U2021XA	MY53180015	05/20/2016	1 year
Power Sensor	Agilent	U2021XA	MY53260040	05/20/2016	1 year
Power Sensor	Agilent	U2021XA	MY53360002	05/27/2016	1 year
Power Sensor	Agilent	U2021XA	MY53360006	05/27/2016	1 year
USB Modular Simultaneous Data Acquisition	Agilent	U2531A	TW53353509	N.C.R.	-----
USB Modular Simultaneous Data Acquisition	Agilent	U2531A	TW53353511	N.C.R.	-----
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	04/18/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

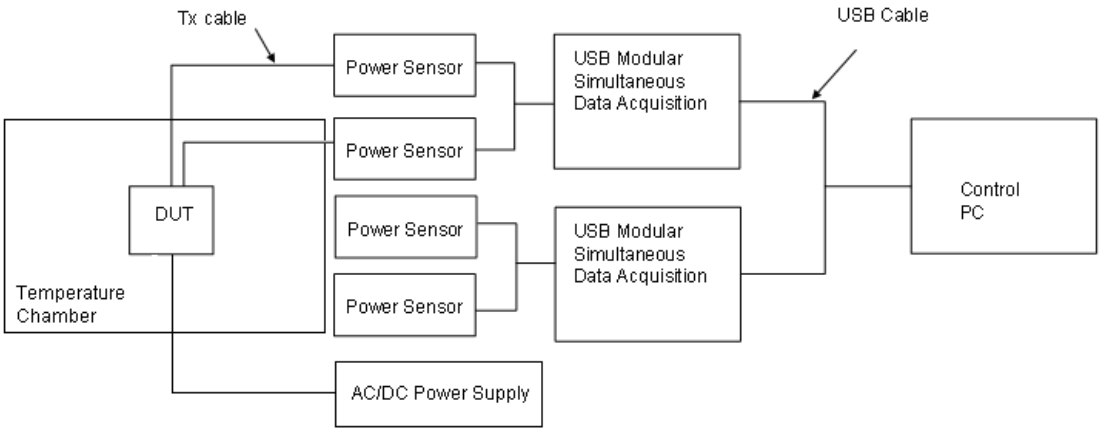
4.3. Test Setup

Temperature and Voltage Measurement (under normal and extreme test conditions)

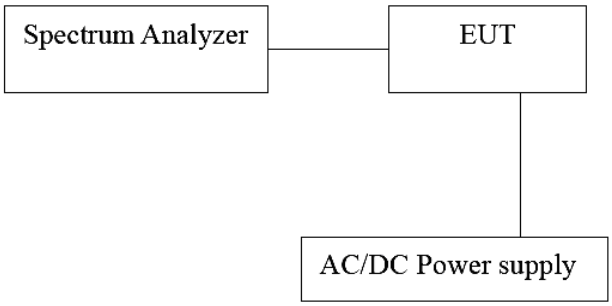
IEEE 802.11a



IEEE 802.11ac 20MHz /40MHz /80MHz



Power Density Test



4.4. Test Procedure

1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.4.1 for the test conditions.
2. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.4.2 for the test method

4.5. Test Result

■ RF output power (E.I.R.P) at the highest power level

Test Mode	Mode 1: IEEE 802.11a U-NII Band Link Mode Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode				
DC Power Source					
Temperature		0°C	25°C	40°C	Limit (dBm)
Test Conditions		5.0 Vdc	5.0 Vdc	5.0 Vdc	
Mode	Frequency	Measurement (dBm)			
Mode 1	5180 MHz	14.81	15.27	15.20	≤ 23
	5240 MHz	14.87	14.82	14.85	
Mode 2	5180 MHz	18.10	18.65	17.78	≤ 23
	5240 MHz	18.36	18.42	18.00	
Mode 3	5190 MHz	18.11	18.02	17.98	≤ 23
	5230 MHz	17.51	17.53	17.46	
Mode 4	5210 MHz	17.70	16.98	17.49	≤ 23

Note: Beamforming off: RF output power (E.I.R.P) = Output power + Antenna gain

■ E.I.R. Power Density at the highest power level

Test Mode	Mode 1: IEEE 802.11a U-NII Band Link Mode Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode		
Mode	Frequency	Measurement (dBm/MHz)	Limit (dBm/MHz)
Mode 1	5180 MHz	3.74	≤ 10
	5240 MHz	3.30	
Mode 2	5180 MHz	6.87	≤ 10
	5240 MHz	6.67	
Mode 3	5190 MHz	3.34	≤ 10
	5230 MHz	2.74	
Mode 4	5210 MHz	1.14	≤ 10

Note: Beamforming off: E.I.R. Power density = Power density + Antenna gain

■ RF output power at the highest power level

Test Mode	Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode				
Beamforming on					
DC Power Source					
Temperature		0°C	25°C	40°C	Limit (dBm)
Test Conditions		5.0 Vdc	5.0 Vdc	5.0 Vdc	
Mode	Frequency	Measurement (dBm)			
Mode 2	5180 MHz	21.74	21.60	21.58	≤ 23
	5240 MHz	21.73	21.47	21.59	
Mode 3	5190 MHz	22.21	21.74	21.99	≤ 23
	5230 MHz	21.32	21.77	21.28	
Mode 4	5210 MHz	21.38	21.62	21.54	≤ 23

Note: Beamforming off: RF output power (E.I.R.P) = Output power + Antenna gain

■ Power Density at the highest power level

Test Mode	Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode		
Beamforming on			
Mode	Frequency	Measurement (dBm/MHz)	Limit (dBm/MHz)
Mode 2	5180 MHz	9.73	≤ 10
	5240 MHz	9.65	
Mode 3	5190 MHz	7.01	≤ 10
	5230 MHz	7.21	
Mode 4	5210 MHz	5.85	≤ 10

Note: Beamforming off: E.I.R. Power density = Power density + Antenna gain

5 Adaptivity (Channel Access Mechanism) Test

5.1. Limit

This requirement applies to equipment. The manufacturer shall state whether the UUT is capable of operating as a Frame Based Equipment or Load Based Equipment. See tables for the applicability of adaptive requirements and limit for each of the operational modes.

Applicability of adaptive requirements and limit:

Requirement	Operational Mode		
	LBT based Detect and Avoid		
	Frame Based Equipment	Load Based Equipment	
	Initiating Device	Option A	Option B
Maximum Channel Occupancy (COT) Time	1 ms to 10 ms	(See Note 1)	manufacturer to declare
Idle Period	5% of COT(100 us)	>27us	manufacturer to declare
Short Control Signalling Transmissions	(see Note 2)		

Note1: Table 7 and table 8 each contain four different sets of Channel Access parameters for Supervising Devices and Supervised Devices respectively, resulting in different Priority Classes and different maximum Channel Occupancy Times.

Note2: The use of Short Control Signalling Transmissions is constrained as follows:

within an observation period of 50 ms, the number of Short Control Signalling Transmissions by the equipment shall be equal to or less than 50; and the total duration of the equipment's Short Control Signalling Transmissions shall be less than 2 500 μs within said observation period.

Table 7: Priority Class dependent Channel Access parameters for *Supervising Devices*

Class #	p0	CWmin	CWmax	Maximum Channel Occupancy Time (COT)
4	1	3	7	2 ms
3	1	7	15	4 ms
2	3	15	63	6 ms (see note 1 and note 2)
1	7	15	1023	6 ms (see note 1)

Note 1: The maximum Channel Occupancy Time (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 μs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time.

Note 2 The maximum Channel Occupancy Time (COT) of 6 ms may be increased to 10 ms by extending CW to CW × 2 + 1 when selecting the random number q for any backoff(s) that precede the Channel Occupancy that may exceed 6 ms or which follow the Channel Occupancy that exceeded 6 ms. The choice between preceding or following a Channel Occupancy shall remain unchanged during the operation time of the device.

Note 3: The values for p0, CWmin, CWmax are minimum values. Greater values are allowed.

Table 8: Priority Class dependent Channel Access parameters for *Supervised Devices*

Class #	p0	CWmin	CWmax	Maximum Channel Occupancy Time (COT)
4	2	3	7	2 ms
3	2	7	15	4 ms
2	3	15	1023	6 ms (see note 1)
1	7	15	1023	6 ms (see note 1)
Note 1:The maximum Channel Occupancy Time (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 µs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time. Note 2:The values for p0, CWmin, CWmax are minimum values. Greater values are allowed.				

Interference threshold level

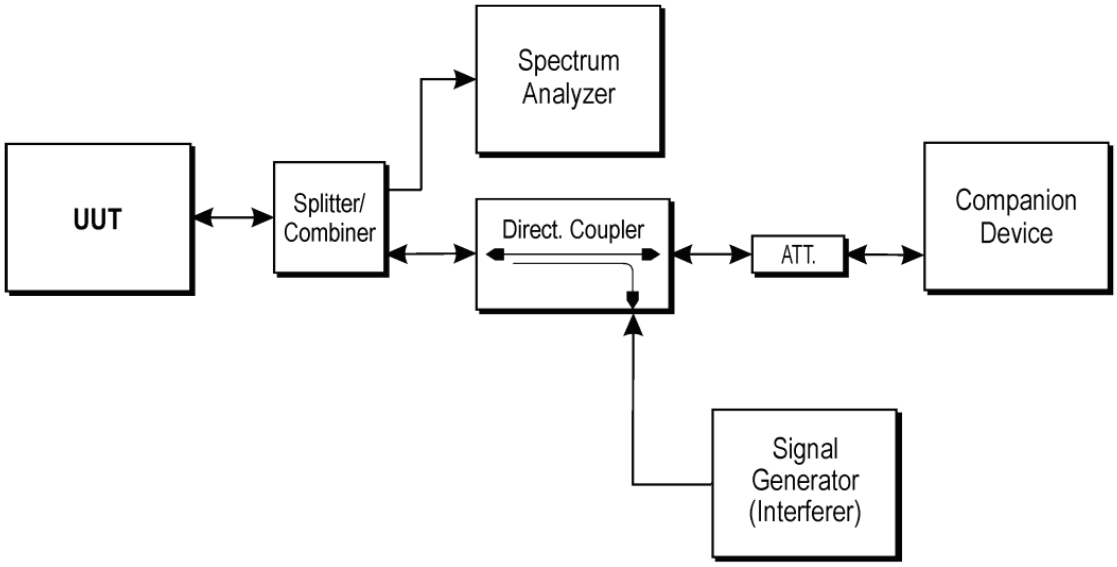
Channel Operating	Threshold level (TL) dBm / MHz
Low Channel	-73.29 (Option 1)
Note 1:Option 1 TL = -75 dBm/MHz Note 2:Option 2 For PH ≤ 13 dBm: TL = -75 dBm/MHz / For 13 dBm < PH < 23 dBm: TL = -85 dBm/MHz + (23 dBm - PH) / For PH ≥ 23 dBm: TL = -85 dBm/MHz	

5.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/22/2016	1 year
Signal Generator	Agilent	N5182A	MY47420962	05/13/2015	2 years
Signal Generator	Agilent	N5182B	MY53050382	05/20/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

5.3. Test Setup



5.4. Test Procedure

1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.9.1 for the test conditions
2. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.9.2 / 5.4.9.3 for the test method.

5.5. Test Result

UUT Operational Mode		
Frame Based Equipment	Load Based Equipment	
	Option A	Option B
	V	

Clause	Test Parameter	Remarks	Pass/Fail
4.9.2.1	Adaptive (Frame Based Equipment)	Not Applicable	N/A
4.9.2.2	Adaptive (Load Based Equipment)	Applicable	Pass
4.9.2.3	Short Control Signalling Transmissions	Applicable	Pass

■ Adaptive Result

Operating Frequency Bands and Mode of EUT

AWGN

Operational Mode	Low Channel Operating Frequency (MHz)
Mode 1	5180
Mode 3	5190
Test Result	PASS

OFDM

Operational Mode	Low Channel Operating Frequency (MHz)
Mode 1	5180
Test Result	PASS

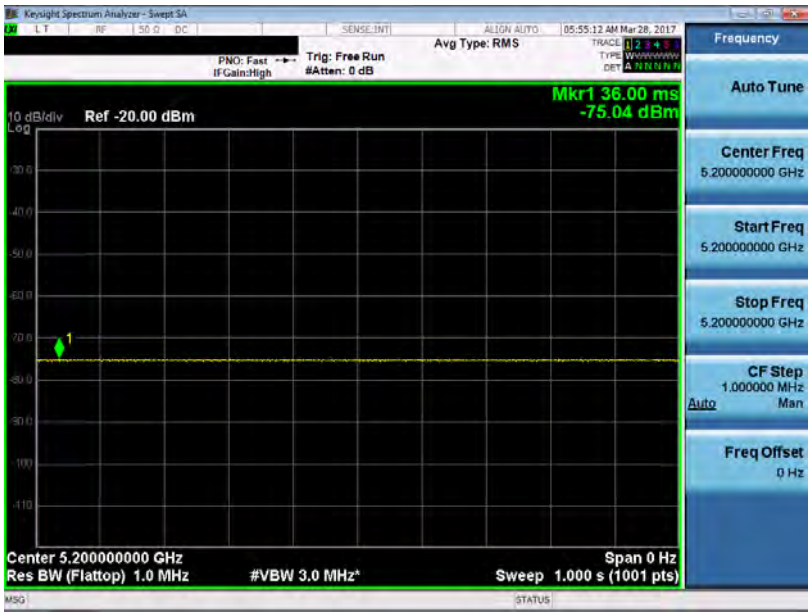
LTE

Operational Mode	Low Channel Operating Frequency (MHz)
Mode 1	5180
Test Result	PASS

5.6. Test Graphs

AWGN

Mode 1: IEEE 802.11a U-NII Band Link Mode_ Interference threshold level	
Low Channel	

Mode 3: IEEE 802.11n 5GHz 40MHz U-NII Band Link Mode_ Interference threshold level	
Low Channel	

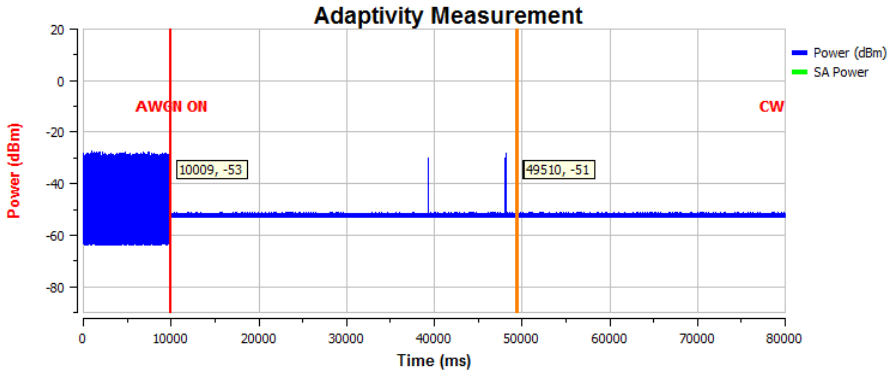
OFDM

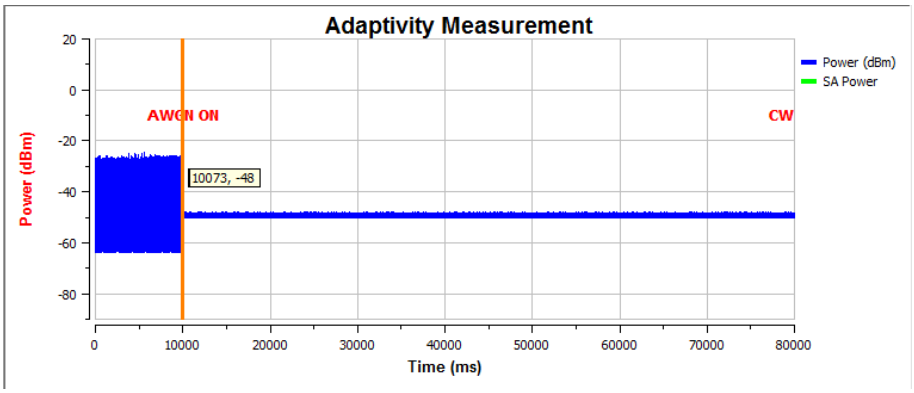
Mode 1: IEEE 802.11a U-NII Band Link Mode_ Interference threshold level	
Low Channel	

LTE

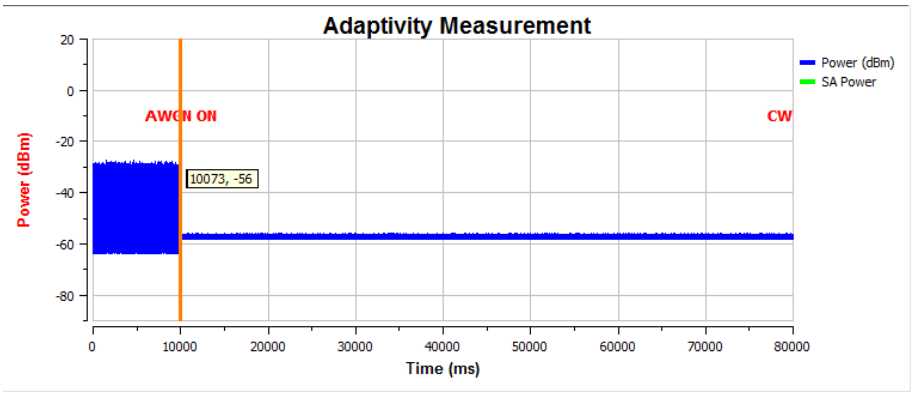
Mode 1: IEEE 802.11a U-NII Band Link Mode_ Interference threshold level	
Low Channel	

AWGN

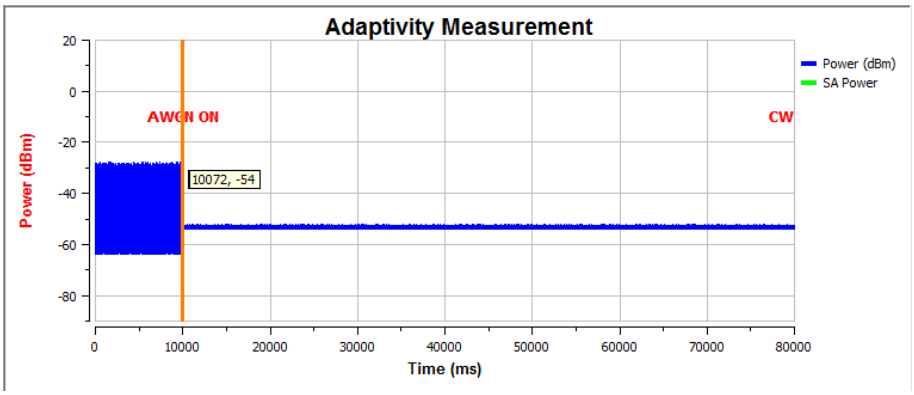
Mode 1: IEEE 802.11a U-NII Band Link Mode_ Adaptivity (Channel Access Mechanism)	
Low Channel	

Mode 3: IEEE 802.11n 5GHz 40MHz U-NII Band Link Mode_ Adaptivity (Channel Access Mechanism)	
Low Channel	

OFDM

Mode 1: IEEE 802.11a U-NII Band Link Mode_ Adaptivity (Channel Access Mechanism)	
Low Channel	

LTE

Mode 1: IEEE 802.11a U-NII Band Link Mode_ Adaptivity (Channel Access Mechanism)	
Low Channel	

■ Short Control Signalling Transmissions Result

AWGN

Operational Mode	Channel	Test Item	Results
Mode 1	Low	SCST on time (1)	1 ms
Mode 3	Low	SCST on time (1)	0 ms
SCST Duty cycle Limit			< 2.5 ms

OFDM

Operational Mode	Channel	Test Item	Results
Mode 1	Low	SCST on time (1)	0 ms
SCST Duty cycle Limit			< 2.5 ms

LTE

Operational Mode	Channel	Test Item	Results
Mode 1	Low	SCST on time (1)	0 ms
SCST Duty cycle Limit			< 2.5 ms

■ COT and Idle Time Result

AWGN

Operational Mode	Channel	Test Item	Results	Limit
Mode 1	Low	COT	2.08 ms	< 4 ms
		Idle	70 μ s	≥ 27 μ s
Mode 3	Low	COT	1.99 ms	< 4 ms
		Idle	80 μ s	≥ 27 μ s

OFDM

Operational Mode	Channel	Test Item	Results	Limit
Mode 1	Low	COT	2.07 ms	< 4 ms
		Idle	70 μ s	≥ 27 μ s

LTE

Operational Mode	Channel	Test Item	Results	Limit
Mode 1	Low	COT	2.07 ms	< 4 ms
		Idle	70 μ s	≥ 27 μ s

6 Receiver Blocking

6.1. Limit

While maintaining the minimum performance criteria as defined in clause 4.2.8.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined in table 9.Table 1: Mean e.i.r.p. limits for RF

Table 9: Receiver Blocking parameters

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)		Type of blocking signal
		Master or Slave with radar detection (see table D.2, note 2)	Slave without radar detection (see table D.2, note 2)	
Pmin + 6 dB	5 100	-53	-59	Continuous Wave
Pmin + 6 dB	4 900 5 000 5 975	-47	-53	Continuous Wave

Note 1: Pmin is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal.

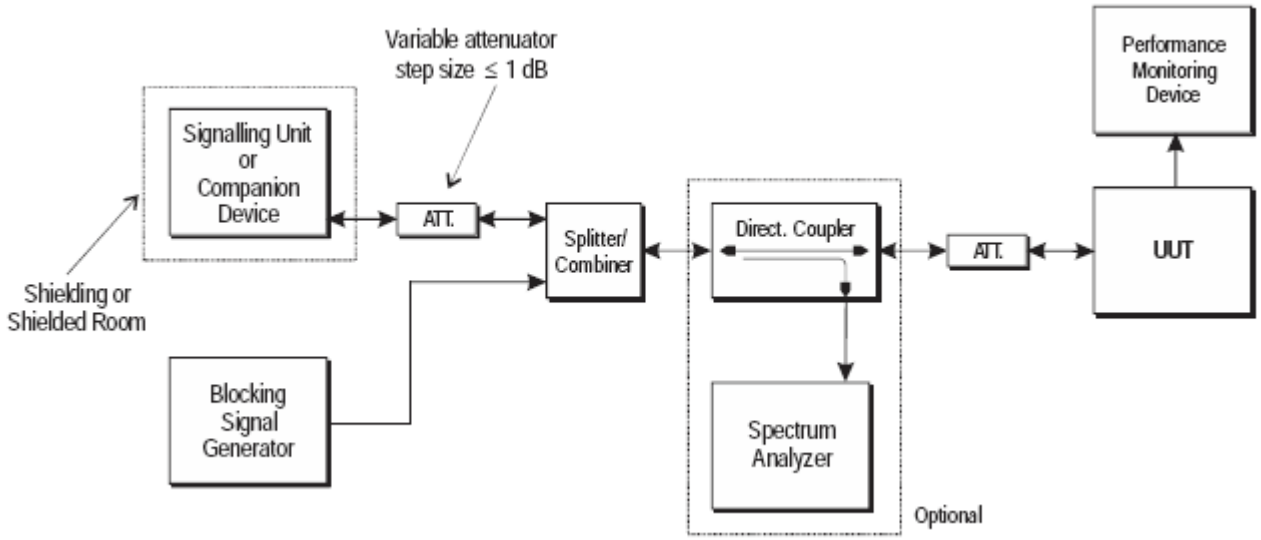
Note 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.

6.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Wlan Test Set	Anritsu	MT8860C	1227002	03/23/2017	1 year
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	04/17/2017	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

6.3. Test Setup



6.4. Test Procedure

1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.10.1 for the test conditions.
2. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.10.2 for the test method

6.5. Test Result

Test Mode	Mode 1: IEEE 802.11a U-NII Band Link Mode								
Pmin	-85dBm								
Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm)				Type of blocking signa	PER (%)	PER Limit (%)	Result
		Master or Slave signal with radar detection		Slave without radar detection					
Pmin + 6 dB	5100	☐	-53	■	-59	CW	2.200	≦10	Pass
Pmin + 6 dB	4900	☐	-47	■	-53	CW	1.800	≦10	Pass
	5000	☐		■			1.800		Pass
	5975	☐		■			2.400		Pass

7 User Access Restrictions

7.1. Requirement

User Access Restrictions are restraints implemented in the RLAN to restrict access for the user to certain hardware and/or software settings of the equipment.

7.2. Declare

Manufacturer provides declaration form to meet this requirement.

8 Geo-location capability

8.1. Requirement

The geographical location determined by the equipment as defined in ETSI EN 301 893 (V2.1.1) clause 4.2.10.2 shall not be accessible to the user.

8.2. Declare

The geo-location capability comply with ETSI EN 301 893 (V2.1.1) clause 4.2.10.2 requirement.

9 Transmitter Unwanted Emissions outside the 5GHz RLAN Bands Test

9.1. Limit

Transmitter limits for narrowband spurious emissions

Frequency Range (MHz)	Maximum power	Bandwidth
30 MHz to 47 MHz	-36	100 kHz
47 MHz to 74 MHz	-54	100 kHz
74 MHz to 87.5 MHz	-36	100 kHz
87.5 MHz to 118 MHz	-54	100 kHz
118 MHz to 174 MHz	-36	100 kHz
174 MHz to 230 MHz	-54	100 kHz
230 MHz to 470 MHz	-36	100 kHz
470 MHz to 862 MHz	-54	100 kHz
862 MHz to 1 GHz	-36	100 kHz
1 GHz to 5.15 GHz	-30	1 MHz
5.35 GHz to 5.47 GHz	-30	1 MHz
5.725 GHz to 26 GHz	-30	1 MHz

9.2. Test Instruments

Conducted

Equipment	Manufacturer	Model Name	Serial No.	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/22/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

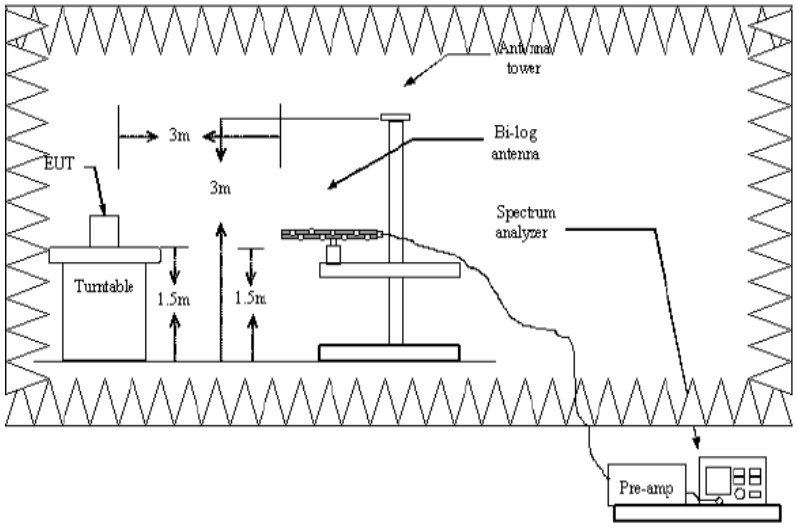
Radiated

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9020A	US47520902	09/21/2016	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Pre-Amplifier	Mini-Circuits	ZVA-213-S+	467900926	08/09/2016	1 year
Preamplifier	EMCI	EMC330N	980303	08/09/2016	1 year
Signal Generator	Agilent	E8257D	MY44320425	03/02/2017	1 year
Biconilong (Type4) Antenna	ETS-Lindgren	3142C	86484	06/04/2016	1 year
Horn Antenna	ETS-Lindgren	3115	00070475	05/12/2017	1 year
Test Site	ATL	TC03	TC03	N.C.R.	-----

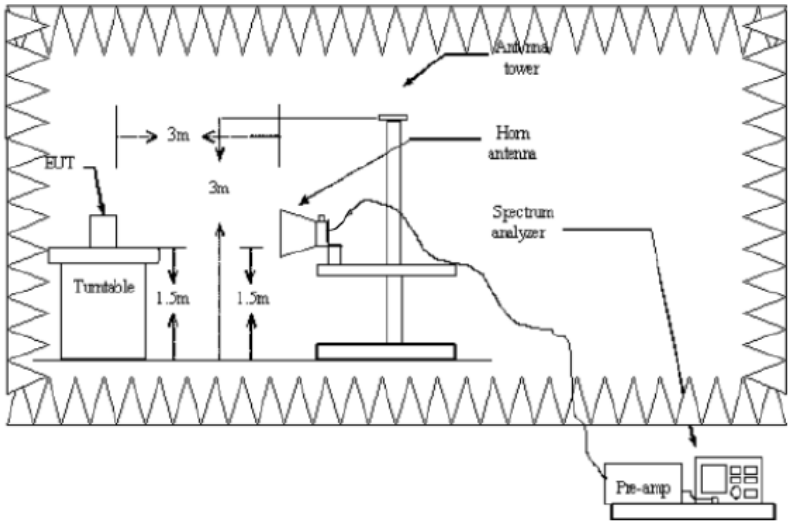
Note: N.C.R. = No Calibration Request.

9.3. Test Setup

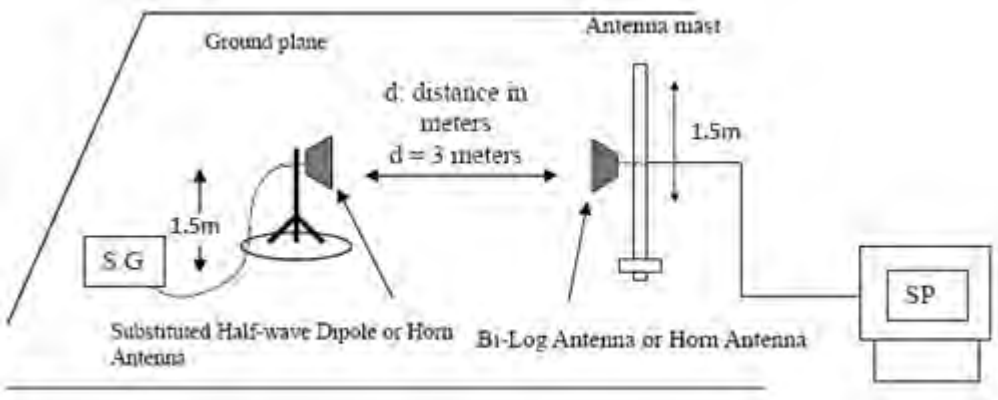
Below 1GHz



Above 1GHz



Substituted Method Test Set-up



9.4. Test Procedure

1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.5.1 for the test conditions
2. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.5.2 for the test method.

9.5. Test Result

Conducted

Mode:	Mode 1	Frequency:	5180MHz

Ant 1 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	542.700	-67.11	-54.00	-13.11	Pass
2	729.200	-66.19	-54.00	-12.19	Pass
3	799.100	-65.54	-54.00	-11.54	Pass
4	830.200	-66.86	-54.00	-12.86	Pass
5	855.900	-67.23	-54.00	-13.23	Pass
6	25408.000	-41.02	-30.00	-11.02	Pass
7	25805.000	-40.10	-30.00	-10.10	Pass
8	25866.000	-41.01	-30.00	-11.01	Pass
9	25961.000	-40.69	-30.00	-10.69	Pass
10	25983.000	-41.04	-30.00	-11.04	Pass

Mode:	Mode 2	Frequency:	5180MHz

Ant 1 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	566.600	-66.36	-57.01	-12.36	Pass
2	729.100	-66.15	-57.01	-12.15	Pass
3	764.900	-66.30	-57.01	-12.30	Pass
4	829.800	-65.99	-57.01	-11.99	Pass
5	854.600	-66.39	-57.01	-12.39	Pass
6	24072.000	-40.90	-33.01	-10.90	Pass
7	25796.000	-40.02	-33.01	-10.02	Pass
8	25822.000	-40.75	-33.01	-10.75	Pass
9	25849.000	-40.44	-33.01	-10.44	Pass
10	25871.000	-40.33	-33.01	-10.33	Pass

Mode:	Mode 2	Frequency:	5180MHz

Ant 2 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	719.500	-68.90	-57.01	-14.90	Pass
2	741.600	-69.02	-57.01	-15.02	Pass
3	770.900	-68.41	-57.01	-14.41	Pass
4	812.900	-68.63	-57.01	-14.63	Pass
5	856.200	-68.17	-57.01	-14.17	Pass
6	25790.000	-40.60	-33.01	-10.60	Pass
7	25837.000	-40.56	-33.01	-10.56	Pass
8	25862.000	-40.68	-33.01	-10.68	Pass
9	25883.000	-40.57	-33.01	-10.57	Pass
10	25925.000	-40.20	-33.01	-10.20	Pass

Mode:	Mode 3	Frequency:	5190MHz

Ant 1 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	675.500	-67.05	-57.01	-10.04	Pass
2	749.900	-67.07	-57.01	-10.06	Pass
3	781.700	-67.20	-57.01	-10.19	Pass
4	826.300	-67.12	-57.01	-10.11	Pass
5	859.500	-67.08	-57.01	-10.07	Pass
6	24602.000	-43.01	-33.01	-10.00	Pass
7	24923.000	-43.02	-33.01	-10.01	Pass
8	25245.000	-43.01	-33.01	-10.00	Pass
9	25587.000	-43.02	-33.01	-10.01	Pass
10	25890.000	-43.01	-33.01	-10.00	Pass

Mode:	Mode 3	Frequency:	5190MHz

Ant 2 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	606.200	-68.19	-57.01	-11.18	Pass
2	662.000	-68.75	-57.01	-11.74	Pass
3	734.400	-67.86	-57.01	-10.85	Pass
4	792.900	-68.26	-57.01	-11.25	Pass
5	831.100	-68.56	-57.01	-11.55	Pass
6	25050.000	-43.06	-33.01	-10.05	Pass
7	25717.000	-43.02	-33.01	-10.01	Pass
8	25781.000	-43.03	-33.01	-10.02	Pass
9	25821.000	-43.03	-33.01	-10.02	Pass
10	25969.000	-43.07	-33.01	-10.06	Pass

Mode:	Mode 4	Frequency:	5210MHz

Ant 1 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	533.500	-67.07	-57.01	-10.06	Pass
2	740.500	-67.14	-57.01	-10.13	Pass
3	775.000	-67.01	-57.01	-10.00	Pass
4	831.400	-67.04	-57.01	-10.03	Pass
5	859.900	-67.13	-57.01	-10.12	Pass
6	25133.000	-43.03	-33.01	-10.02	Pass
7	25261.000	-43.01	-33.01	-10.00	Pass
8	25342.000	-43.03	-33.01	-10.02	Pass
9	25707.000	-43.03	-33.01	-10.02	Pass
10	25810.000	-43.02	-33.01	-10.01	Pass

Mode:	Mode 4	Frequency:	5210MHz

Ant 2 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	60.000	-67.66	-57.01	-10.65	Pass
2	718.200	-68.18	-57.01	-11.17	Pass
3	751.100	-67.97	-57.01	-10.96	Pass
4	774.000	-67.92	-57.01	-10.91	Pass
5	807.300	-68.47	-57.01	-11.46	Pass
6	25774.000	-43.05	-33.01	-10.04	Pass
7	25806.000	-43.13	-33.01	-10.12	Pass
8	25830.000	-43.10	-33.01	-10.09	Pass
9	25904.000	-43.04	-33.01	-10.03	Pass
10	25930.000	-43.02	-33.01	-10.01	Pass

Beamforming on

Mode:	Mode 2	Frequency:	5180MHz

Ant 1 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	477.200	-66.33	-57.01	-12.33	Pass
2	624.200	-67.18	-57.01	-13.18	Pass
3	734.300	-66.54	-57.01	-12.54	Pass
4	810.000	-66.30	-57.01	-12.30	Pass
5	834.300	-66.48	-57.01	-12.48	Pass
6	25771.000	-40.80	-33.01	-10.80	Pass
7	25822.000	-40.64	-33.01	-10.64	Pass
8	25874.000	-40.59	-33.01	-10.59	Pass
9	25903.000	-40.07	-33.01	-10.07	Pass
10	25975.000	-40.88	-33.01	-10.88	Pass

Mode:	Mode 2	Frequency:	5180MHz

Ant 2 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	713.900	-68.00	-57.01	-14.00	Pass
2	737.600	-68.35	-57.01	-14.35	Pass
3	785.600	-67.92	-57.01	-13.92	Pass
4	832.400	-68.16	-57.01	-14.16	Pass
5	858.900	-68.21	-57.01	-14.21	Pass
6	25798.000	-41.21	-33.01	-11.21	Pass
7	25830.000	-40.94	-33.01	-10.94	Pass
8	25851.000	-40.82	-33.01	-10.82	Pass
9	25877.000	-41.02	-33.01	-11.02	Pass
10	25916.000	-40.48	-33.01	-10.48	Pass

Mode:	Mode 3	Frequency:	5190MHz

Ant 1 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	653.300	-67.24	-57.01	-10.23	Pass
2	745.600	-67.09	-57.01	-10.08	Pass
3	777.500	-67.22	-57.01	-10.21	Pass
4	815.700	-67.15	-57.01	-10.14	Pass
5	846.000	-67.02	-57.01	-10.01	Pass
6	25304.000	-43.01	-33.01	-10.00	Pass
7	25429.000	-43.01	-33.01	-10.00	Pass
8	25589.000	-43.01	-33.01	-10.00	Pass
9	25734.000	-43.02	-33.01	-10.01	Pass
10	25946.000	-43.01	-33.01	-10.00	Pass

Mode:	Mode 3	Frequency:	5190MHz

Ant 2 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	606.500	-68.84	-57.01	-11.83	Pass
2	697.000	-69.03	-57.01	-12.02	Pass
3	763.400	-68.76	-57.01	-11.75	Pass
4	810.500	-67.95	-57.01	-10.94	Pass
5	841.700	-68.59	-57.01	-11.58	Pass
6	25658.000	-43.06	-33.01	-10.05	Pass
7	25788.000	-43.05	-33.01	-10.04	Pass
8	25828.000	-43.07	-33.01	-10.06	Pass
9	25876.000	-43.06	-33.01	-10.05	Pass
10	25994.000	-43.02	-33.01	-10.01	Pass

Mode:	Mode 4	Frequency:	5210MHz

Ant 1 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	60.000	-67.07	-57.01	-10.06	Pass
2	472.500	-67.09	-57.01	-10.08	Pass
3	662.800	-67.05	-57.01	-10.04	Pass
4	719.300	-67.10	-57.01	-10.09	Pass
5	814.800	-67.05	-57.01	-10.04	Pass
6	24458.000	-43.02	-33.01	-10.01	Pass
7	25571.000	-43.02	-33.01	-10.01	Pass
8	25644.000	-43.03	-33.01	-10.02	Pass
9	25689.000	-43.01	-33.01	-10.00	Pass
10	25757.000	-43.02	-33.01	-10.01	Pass

Mode:	Mode 4	Frequency:	5210MHz

Ant 2 Detector: Peak

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	623.400	-68.74	-57.01	-11.73	Pass
2	669.500	-68.11	-57.01	-11.10	Pass
3	774.600	-68.16	-57.01	-11.15	Pass
4	795.800	-68.61	-57.01	-11.60	Pass
5	860.900	-68.60	-57.01	-11.59	Pass
6	25637.000	-43.03	-33.01	-10.02	Pass
7	25674.000	-43.03	-33.01	-10.02	Pass
8	25742.000	-43.03	-33.01	-10.02	Pass
9	25779.000	-43.02	-33.01	-10.01	Pass
10	25845.000	-43.03	-33.01	-10.02	Pass

Radiated

Mode:	Mode 1	Frequency:	5180MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	136.7000	-62.23	-9.52	-71.75	-36.00	-35.75	peak
2	333.1250	-67.04	-2.90	-69.94	-36.00	-33.94	peak
3	432.5500	-69.49	-1.18	-70.67	-36.00	-34.67	peak
4	677.4750	-74.77	3.29	-71.48	-54.00	-17.48	peak
5	810.8500	-73.79	4.84	-68.95	-54.00	-14.95	peak
6	949.0750	-73.35	6.31	-67.04	-36.00	-31.04	peak
7	7055.000	-55.73	3.67	-52.06	-30.00	-22.06	peak
8	10360.000	-48.45	7.39	-41.06	-30.00	-11.06	peak
9	15540.000	-53.79	11.57	-42.22	-30.00	-12.22	peak

Mode:	Mode 1	Frequency:	5180MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-64.25	-11.18	-75.43	-54.00	-21.43	peak
2	318.5750	-67.89	-3.45	-71.34	-36.00	-35.34	peak
3	476.2000	-71.35	0.65	-70.70	-54.00	-16.70	peak
4	662.9250	-71.26	2.72	-68.54	-54.00	-14.54	peak
5	767.2000	-73.33	4.10	-69.23	-54.00	-15.23	peak
6	946.6500	-73.74	6.29	-67.45	-36.00	-31.45	peak
7	7475.000	-52.85	3.94	-48.91	-30.00	-18.91	peak
8	10360.000	-50.86	7.39	-43.47	-30.00	-13.47	peak
9	15540.000	-57.65	11.57	-46.08	-30.00	-16.08	peak

Mode:	Mode 1	Frequency:	5240MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	110.0250	-65.17	-10.41	-75.58	-54.00	-21.58	peak
2	333.1250	-65.63	-2.90	-68.53	-36.00	-32.53	peak
3	432.5500	-70.55	-1.18	-71.73	-36.00	-35.73	peak
4	616.8500	-74.06	3.01	-71.05	-54.00	-17.05	peak
5	839.9500	-74.17	5.32	-68.85	-54.00	-14.85	peak
6	1000.0000	-74.53	6.47	-68.06	-36.00	-32.06	peak
7	3432.500	-57.29	-3.07	-60.36	-30.00	-30.36	peak
8	10480.000	-50.05	7.52	-42.53	-30.00	-12.53	peak
9	15720.000	-56.67	11.45	-45.22	-30.00	-15.22	peak

Mode:	Mode 1	Frequency:	5240MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	54.2500	-60.75	-8.40	-69.15	-54.00	-15.15	peak
2	284.6250	-65.87	-5.02	-70.89	-36.00	-34.89	peak
3	432.5500	-69.19	-1.18	-70.37	-36.00	-34.37	peak
4	662.9250	-70.79	2.72	-68.07	-54.00	-14.07	peak
5	839.9500	-70.18	5.32	-64.86	-54.00	-10.86	peak
6	941.8000	-74.35	6.24	-68.11	-36.00	-32.11	peak
7	4045.000	-56.69	-1.70	-58.39	-30.00	-28.39	peak
8	10480.000	-54.10	7.52	-46.58	-30.00	-16.58	peak
9	15720.000	-57.14	11.45	-45.69	-30.00	-15.69	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	80.9250	-65.49	-10.30	-75.79	-36.00	-39.79	peak
2	299.1750	-65.34	-4.16	-69.50	-36.00	-33.50	peak
3	432.5500	-69.13	-1.18	-70.31	-36.00	-34.31	peak
4	616.8500	-73.88	3.01	-70.87	-54.00	-16.87	peak
5	832.6750	-73.67	5.32	-68.35	-54.00	-14.35	peak
6	927.2500	-73.83	5.98	-67.85	-36.00	-31.85	peak
7	6985.000	-57.25	3.51	-53.74	-30.00	-23.74	peak
8	10360.000	-52.75	7.39	-45.36	-30.00	-15.36	peak
9	17950.000	-61.62	16.32	-45.30	-30.00	-15.30	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	95.4750	-62.95	-11.01	-73.96	-54.00	-19.96	peak
2	333.1250	-68.60	-2.90	-71.50	-36.00	-35.50	peak
3	493.1750	-70.56	0.57	-69.99	-54.00	-15.99	peak
4	665.3500	-70.77	2.80	-67.97	-54.00	-13.97	peak
5	839.9500	-70.78	5.32	-65.46	-54.00	-11.46	peak
6	946.6500	-74.30	6.29	-68.01	-36.00	-32.01	peak
7	7090.000	-57.00	3.77	-53.23	-30.00	-23.23	peak
8	10360.000	-55.01	7.39	-47.62	-30.00	-17.62	peak
9	17850.000	-61.36	16.02	-45.34	-30.00	-15.34	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	158.5250	-67.70	-7.29	-74.99	-36.00	-38.99	peak
2	333.1250	-66.40	-2.90	-69.30	-36.00	-33.30	peak
3	432.5500	-69.98	-1.18	-71.16	-36.00	-35.16	peak
4	655.6500	-73.23	2.57	-70.66	-54.00	-16.66	peak
5	839.9500	-73.92	5.32	-68.60	-54.00	-14.60	peak
6	995.1500	-73.80	6.41	-67.39	-36.00	-31.39	peak
7	2942.500	-57.41	-3.98	-61.39	-30.00	-31.39	peak
8	10480.000	-53.29	7.52	-45.77	-30.00	-15.77	peak
9	15720.000	-57.30	11.45	-45.85	-30.00	-15.85	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	136.7000	-61.88	-9.52	-71.40	-36.00	-35.40	peak
2	233.7000	-61.60	-4.43	-66.03	-36.00	-30.03	peak
3	488.3250	-70.69	0.62	-70.07	-54.00	-16.07	peak
4	665.3500	-71.48	2.80	-68.68	-54.00	-14.68	peak
5	839.9500	-70.90	5.32	-65.58	-54.00	-11.58	peak
6	898.1500	-74.61	5.37	-69.24	-36.00	-33.24	peak
7	2977.500	-57.69	-3.83	-61.52	-30.00	-31.52	peak
8	10480.000	-55.51	7.52	-47.99	-30.00	-17.99	peak
9	15720.000	-57.71	11.45	-46.26	-30.00	-16.26	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	136.7000	-60.72	-9.52	-70.24	-36.00	-34.24	peak
2	240.9750	-65.11	-4.31	-69.42	-36.00	-33.42	peak
3	432.5500	-70.60	-1.18	-71.78	-36.00	-35.78	peak
4	672.6250	-74.34	3.06	-71.28	-54.00	-17.28	peak
5	839.9500	-74.11	5.32	-68.79	-54.00	-14.79	peak
6	934.5250	-72.67	6.13	-66.54	-36.00	-30.54	peak
7	6582.500	-56.39	3.07	-53.32	-30.00	-23.32	peak
8	10380.000	-59.06	7.45	-51.61	-30.00	-21.61	peak
9	16775.000	-62.48	13.19	-49.29	-30.00	-19.29	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	233.7000	-61.49	-4.43	-65.92	-36.00	-29.92	peak
2	333.1250	-69.59	-2.90	-72.49	-36.00	-36.49	peak
3	493.1750	-70.31	0.57	-69.74	-54.00	-15.74	peak
4	662.9250	-71.20	2.72	-68.48	-54.00	-14.48	peak
5	839.9500	-69.89	5.32	-64.57	-54.00	-10.57	peak
6	949.0750	-74.64	6.31	-68.33	-36.00	-32.33	peak
7	7475.000	-52.72	3.94	-48.78	-30.00	-18.78	peak
8	10380.000	-59.25	7.12	-52.13	-30.00	-22.13	peak
9	17900.000	-61.65	16.18	-45.47	-30.00	-15.47	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	136.7000	-61.61	-9.52	-71.13	-36.00	-35.13	peak
2	240.9750	-65.46	-4.31	-69.77	-36.00	-33.77	peak
3	432.5500	-69.16	-1.18	-70.34	-36.00	-34.34	peak
4	679.9000	-72.85	3.41	-69.44	-54.00	-15.44	peak
5	839.9500	-71.72	5.32	-66.40	-54.00	-12.40	peak
6	995.1500	-74.03	6.41	-67.62	-36.00	-31.62	peak
7	7247.500	-56.59	3.81	-52.78	-30.00	-22.78	peak
8	10460.000	-53.90	7.52	-46.38	-30.00	-16.38	peak
9	13850.000	-61.62	10.61	-51.01	-30.00	-21.01	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	63.9500	-64.57	-10.39	-74.96	-54.00	-20.96	peak
2	299.1750	-64.51	-4.16	-68.67	-36.00	-32.67	peak
3	371.9250	-68.48	-0.77	-69.25	-36.00	-33.25	peak
4	662.9250	-69.50	2.72	-66.78	-54.00	-12.78	peak
5	839.9500	-69.78	5.32	-64.46	-54.00	-10.46	peak
6	953.9250	-74.55	6.34	-68.21	-36.00	-32.21	peak
7	7457.500	-57.97	3.97	-54.00	-30.00	-24.00	peak
8	10460.000	-56.25	7.52	-48.73	-30.00	-18.73	peak
9	14050.000	-62.52	10.68	-51.84	-30.00	-21.84	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	80.9250	-65.93	-10.30	-76.23	-36.00	-40.23	peak
2	250.6750	-65.29	-4.54	-69.83	-36.00	-33.83	peak
3	432.5500	-69.87	-1.18	-71.05	-36.00	-35.05	peak
4	619.2750	-73.90	3.01	-70.89	-54.00	-16.89	peak
5	839.9500	-73.46	5.32	-68.14	-54.00	-14.14	peak
6	1000.0000	-74.21	6.47	-67.74	-36.00	-31.74	peak
7	6565.000	-56.07	2.99	-53.08	-30.00	-23.08	peak
8	10420.000	-58.45	6.29	-52.16	-30.00	-22.16	peak
9	16525.000	-62.22	12.18	-50.04	-30.00	-20.04	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	73.6500	-64.03	-10.96	-74.99	-54.00	-20.99	peak
2	299.1750	-64.66	-4.16	-68.82	-36.00	-32.82	peak
3	432.5500	-68.88	-1.18	-70.06	-36.00	-34.06	peak
4	662.9250	-71.05	2.72	-68.33	-54.00	-14.33	peak
5	839.9500	-70.72	5.32	-65.40	-54.00	-11.40	peak
6	953.9250	-74.15	6.34	-67.81	-36.00	-31.81	peak
7	7475.000	-52.39	3.94	-48.45	-30.00	-18.45	peak
8	10420.000	-58.32	6.57	-51.75	-30.00	-21.75	peak
9	17300.000	-61.19	14.53	-46.66	-30.00	-16.66	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	165.8000	-67.53	-6.59	-74.12	-36.00	-38.12	peak
2	369.5000	-73.07	-0.82	-73.89	-36.00	-37.89	peak
3	485.9000	-72.51	0.67	-71.84	-54.00	-17.84	peak
4	706.5750	-74.60	4.13	-70.47	-54.00	-16.47	peak
5	861.7750	-74.25	5.28	-68.97	-54.00	-14.97	peak
6	966.0500	-74.63	6.45	-68.18	-36.00	-32.18	peak
7	6232.500	-56.68	2.08	-54.60	-30.00	-24.60	peak
8	10360.000	-52.23	7.39	-44.84	-30.00	-14.84	peak
9	17075.000	-61.16	14.02	-47.14	-30.00	-17.14	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	168.2250	-67.43	-6.35	-73.78	-36.00	-37.78	peak
2	299.1750	-64.10	-4.16	-68.26	-36.00	-32.26	peak
3	432.5500	-69.21	-1.18	-70.39	-36.00	-34.39	peak
4	619.2750	-73.52	3.01	-70.51	-54.00	-16.51	peak
5	745.3750	-73.66	4.08	-69.58	-54.00	-15.58	peak
6	898.1500	-74.39	5.37	-69.02	-36.00	-33.02	peak
7	5042.500	-55.45	-1.12	-56.57	-30.00	-26.57	peak
8	10360.000	-54.48	7.39	-47.09	-30.00	-17.09	peak
9	17250.000	-61.95	14.39	-47.56	-30.00	-17.56	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-64.84	-11.18	-76.02	-54.00	-22.02	peak
2	250.6750	-65.30	-4.54	-69.84	-36.00	-33.84	peak
3	379.2000	-72.46	-0.68	-73.14	-36.00	-37.14	peak
4	498.0250	-73.42	0.55	-72.87	-54.00	-18.87	peak
5	723.5500	-74.44	4.19	-70.25	-54.00	-16.25	peak
6	861.7750	-73.88	5.28	-68.60	-54.00	-14.60	peak
7	5847.500	-56.67	1.26	-55.41	-30.00	-25.41	peak
8	10480.000	-53.43	7.52	-45.91	-30.00	-15.91	peak
9	15720.000	-61.62	11.45	-50.17	-30.00	-20.17	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-63.71	-11.18	-74.89	-54.00	-20.89	peak
2	333.1250	-66.86	-2.90	-69.76	-36.00	-33.76	peak
3	432.5500	-69.17	-1.18	-70.35	-36.00	-34.35	peak
4	575.6250	-73.88	1.84	-72.04	-54.00	-18.04	peak
5	755.0750	-74.26	3.96	-70.30	-54.00	-16.30	peak
6	949.0750	-73.89	6.31	-67.58	-36.00	-31.58	peak
7	6617.500	-57.98	3.14	-54.84	-30.00	-24.84	peak
8	10480.000	-55.79	7.52	-48.27	-30.00	-18.27	peak
9	15720.000	-60.24	11.45	-48.79	-30.00	-18.79	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-64.33	-11.18	-75.51	-54.00	-21.51	peak
2	192.4750	-67.89	-5.42	-73.31	-54.00	-19.31	peak
3	333.1250	-68.08	-2.90	-70.98	-36.00	-34.98	peak
4	488.3250	-72.45	0.62	-71.83	-54.00	-17.83	peak
5	762.3500	-73.82	4.02	-69.80	-54.00	-15.80	peak
6	970.9000	-74.20	6.50	-67.70	-36.00	-31.70	peak
7	3187.500	-52.15	-3.45	-55.60	-30.00	-25.60	peak
8	10380.000	-59.54	7.46	-52.08	-30.00	-22.08	peak
9	17375.000	-63.87	14.70	-49.17	-30.00	-19.17	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	73.6500	-65.07	-10.96	-76.03	-54.00	-22.03	peak
2	160.9500	-67.39	-7.07	-74.46	-36.00	-38.46	peak
3	371.9250	-71.22	-0.77	-71.99	-36.00	-35.99	peak
4	575.6250	-74.62	1.84	-72.78	-54.00	-18.78	peak
5	747.8000	-73.88	4.01	-69.87	-54.00	-15.87	peak
6	898.1500	-74.24	5.37	-68.87	-36.00	-32.87	peak
7	1805.000	-50.64	-7.41	-58.05	-30.00	-28.05	peak
8	10380.000	-57.21	7.46	-49.75	-30.00	-19.75	peak
9	14725.000	-61.26	11.23	-50.03	-30.00	-20.03	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	80.9250	-65.77	-10.30	-76.07	-36.00	-40.07	peak
2	190.0500	-67.26	-5.38	-72.64	-54.00	-18.64	peak
3	371.9250	-72.47	-0.77	-73.24	-36.00	-37.24	peak
4	585.3250	-73.31	2.31	-71.00	-54.00	-17.00	peak
5	725.9750	-73.99	4.22	-69.77	-54.00	-15.77	peak
6	898.1500	-74.17	5.37	-68.80	-36.00	-32.80	peak
7	6372.500	-55.23	2.33	-52.90	-30.00	-22.90	peak
8	10460.000	-54.51	7.52	-46.99	-30.00	-16.99	peak
9	16725.000	-62.28	13.00	-49.28	-30.00	-19.28	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	168.2250	-68.06	-6.35	-74.41	-36.00	-38.41	peak
2	333.1250	-67.16	-2.90	-70.06	-36.00	-34.06	peak
3	488.3250	-71.32	0.62	-70.70	-54.00	-16.70	peak
4	636.2500	-74.67	2.50	-72.17	-54.00	-18.17	peak
5	776.9000	-74.04	4.29	-69.75	-54.00	-15.75	peak
6	919.9750	-71.94	5.81	-66.13	-36.00	-30.13	peak
7	6547.500	-56.60	2.91	-53.69	-30.00	-23.69	peak
8	10460.000	-56.45	7.52	-48.93	-30.00	-18.93	peak
9	15400.000	-61.16	11.83	-49.33	-30.00	-19.33	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Horizontal		
Beamforming on			

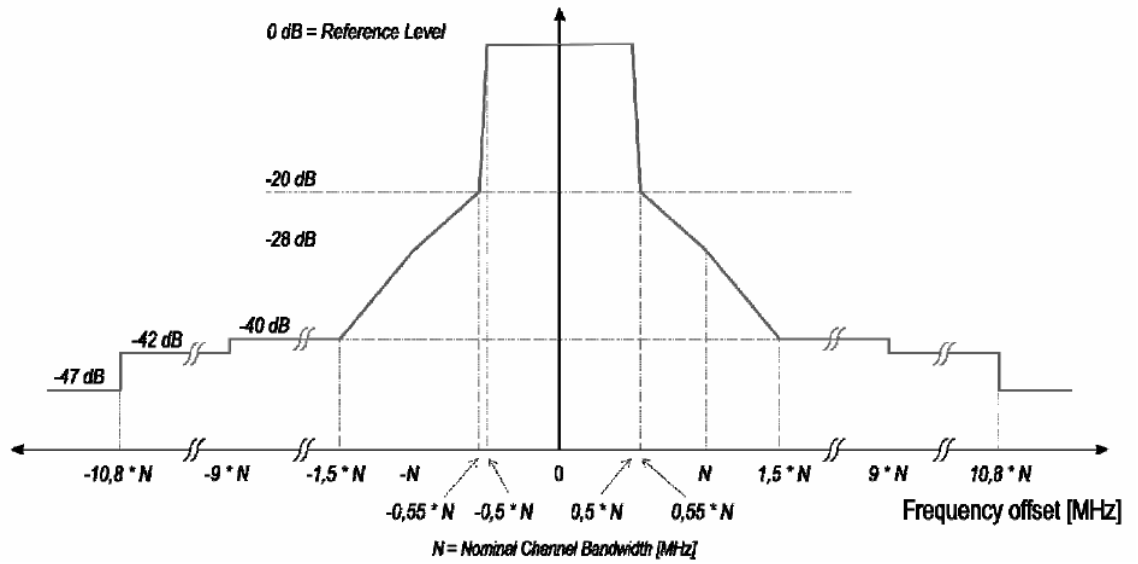
No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	46.9750	-69.52	-6.51	-76.03	-36.00	-40.03	peak
2	187.6250	-66.81	-5.41	-72.22	-54.00	-18.22	peak
3	299.1750	-65.94	-4.16	-70.10	-36.00	-34.10	peak
4	476.2000	-72.70	0.65	-72.05	-54.00	-18.05	peak
5	696.8750	-74.65	3.93	-70.72	-54.00	-16.72	peak
6	927.2500	-73.85	5.98	-67.87	-36.00	-31.87	peak
7	5392.500	-57.02	0.14	-56.88	-30.00	-26.88	peak
8	10420.000	-58.86	7.53	-51.33	-30.00	-21.33	peak
9	13700.000	-61.99	10.55	-51.44	-30.00	-21.44	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	114.8750	-64.64	-10.64	-75.28	-54.00	-21.28	peak
2	168.2250	-67.53	-6.35	-73.88	-36.00	-37.88	peak
3	376.7750	-71.31	-0.71	-72.02	-36.00	-36.02	peak
4	507.7250	-72.16	0.70	-71.46	-54.00	-17.46	peak
5	730.8250	-74.55	4.27	-70.28	-54.00	-16.28	peak
6	919.9750	-72.36	5.81	-66.55	-36.00	-30.55	peak
7	6932.500	-57.09	3.50	-53.59	-30.00	-23.59	peak
8	10420.000	-60.22	7.53	-52.69	-30.00	-22.69	peak
9	15825.000	-62.61	11.52	-51.09	-30.00	-21.09	peak

10 Transmitter Unwanted Emissions within the 5GHz RLAN Bands Test

10.1. Limit



Note: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

The mean Power Density (measured with a 1 MHz measurement bandwidth) of the transmitter unwanted emissions within the 5 GHz RLAN bands shall not exceed the limits of the mask provided in figure 1 or an absolute level of -30 dBm/MHz, whichever is greater. The limits in figure 1 are relative to the maximum Power Density of the RLAN device when measured with a reference bandwidth of 1 MHz.

The mask is only applicable within the band of operation. Beyond the band edges the requirements of clause 4.2.4.1apply.

In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet the limits provided in figure 1.

For transmitter unwanted emissions within the 5 GHz RLAN bands, simultaneous transmissions in adjacent channels

may be considered as one signal with an actual Nominal Channel Bandwidth of "n" times the individual Nominal Channel Bandwidth where "n" is the number of adjacent channels used simultaneously.

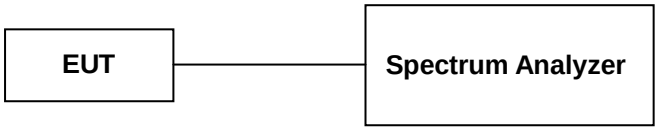
For simultaneous transmissions in multiple non-adjacent channels, the overall transmit spectral power mask is constructed in the following manner. First, a mask as provided in figure 1 is applied to each of the channels. Then, for each frequency point, the greatest value from the spectral masks of all the channels assessed shall be taken as the overall spectral mask requirement at that frequency.

10.2. Test Instruments

Equipment	Manufacturer	Model Name	Serial No.	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

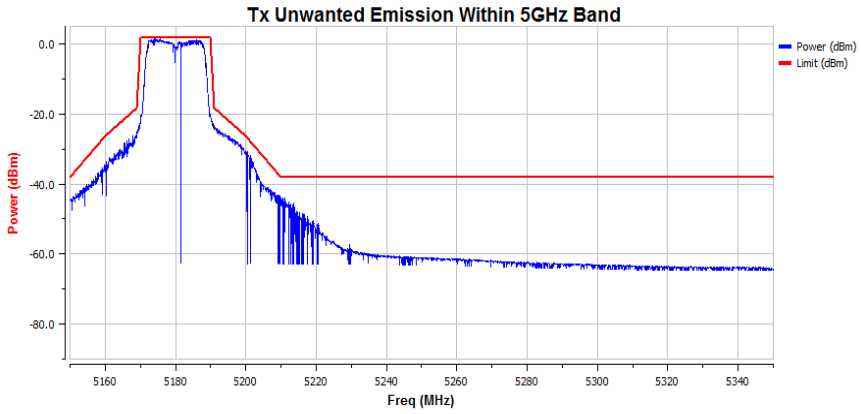
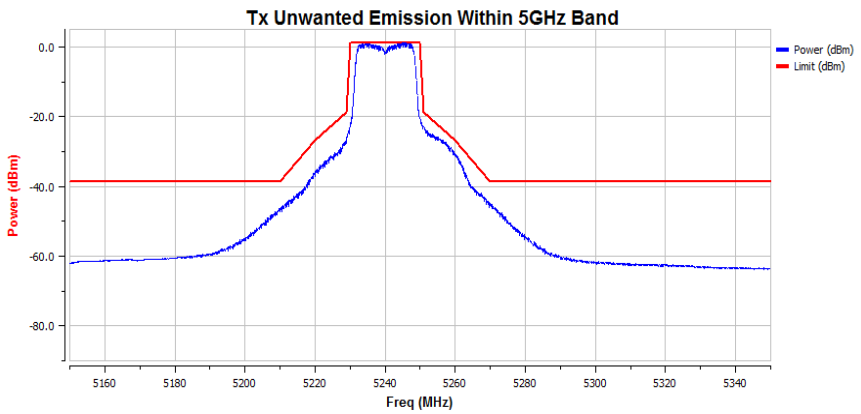
10.3. Test Setup

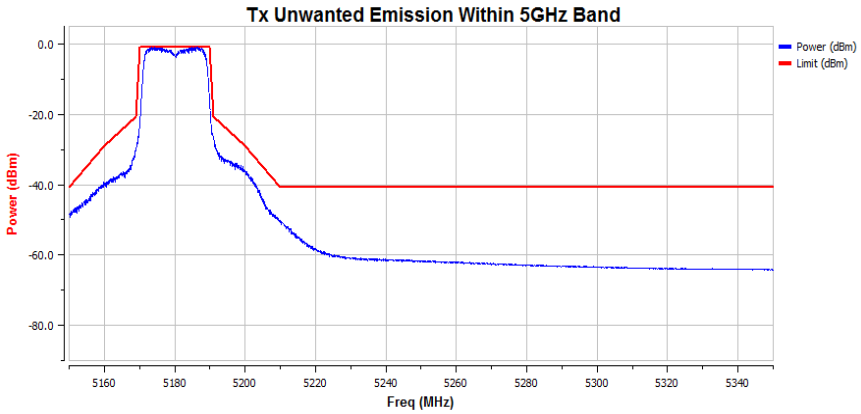
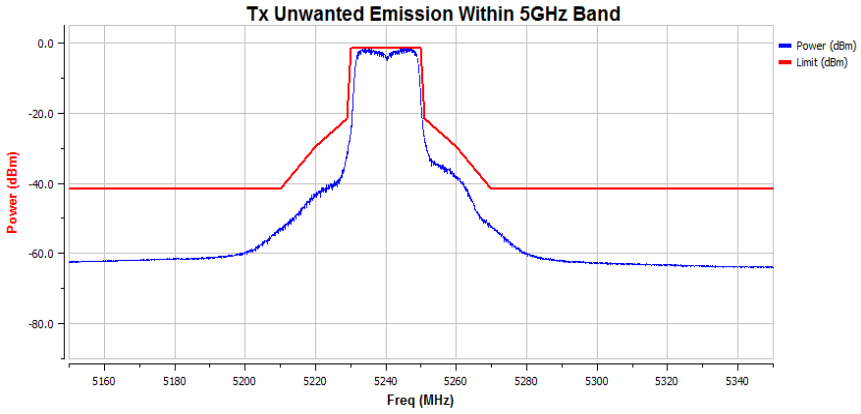


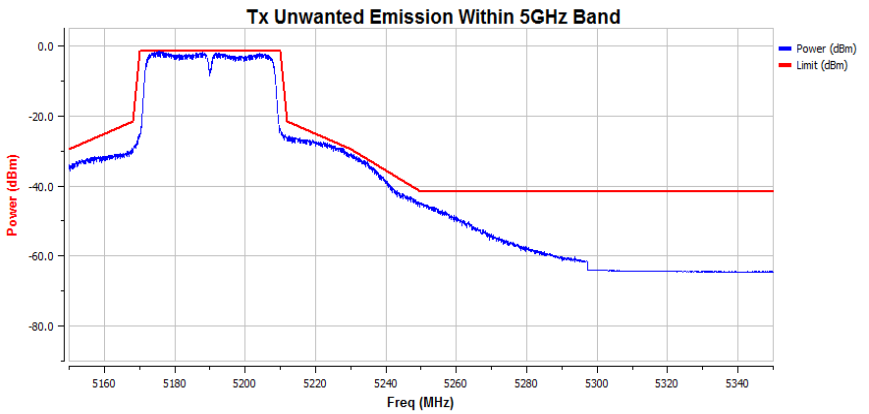
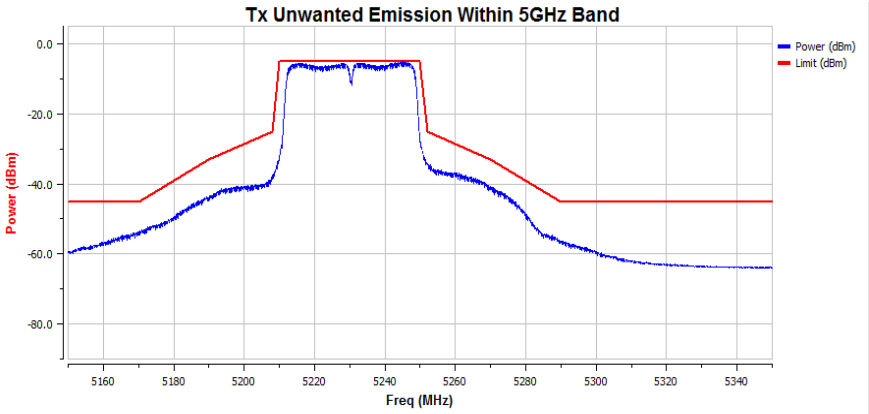
10.4. Test Procedure

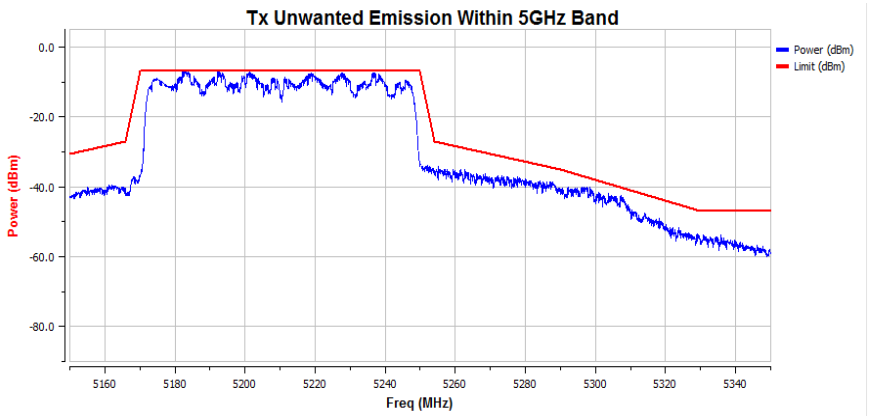
1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4. 6.1 for the test conditions
2. Please refer to ETSI EN 301 893 (V2.1.1)c lause 5.4.6.2 for the test method.

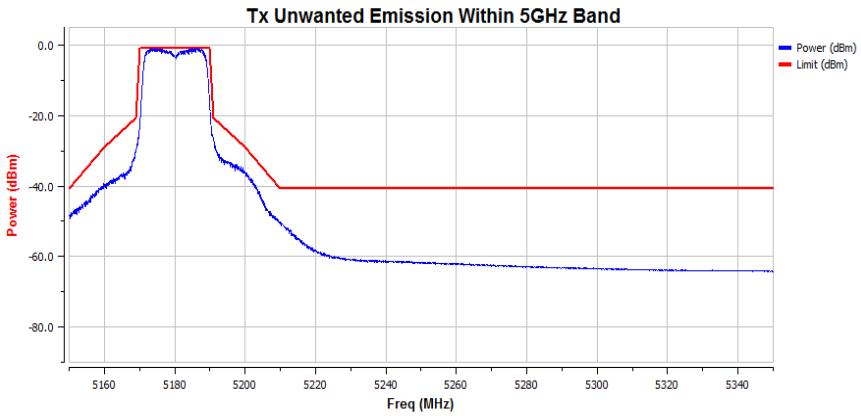
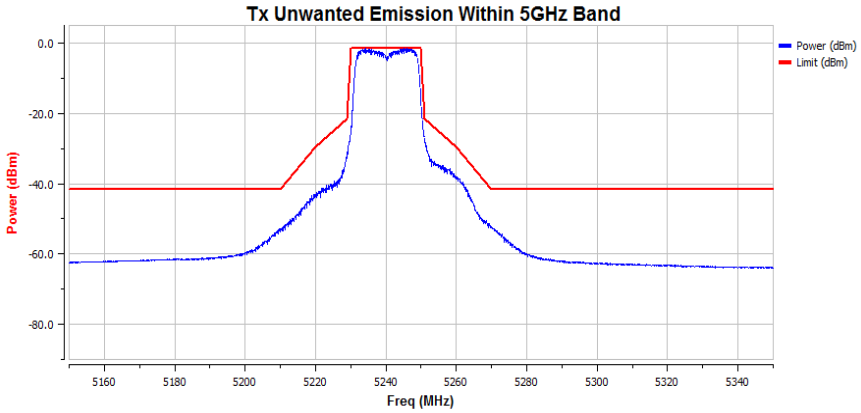
10.5. Test Graphs

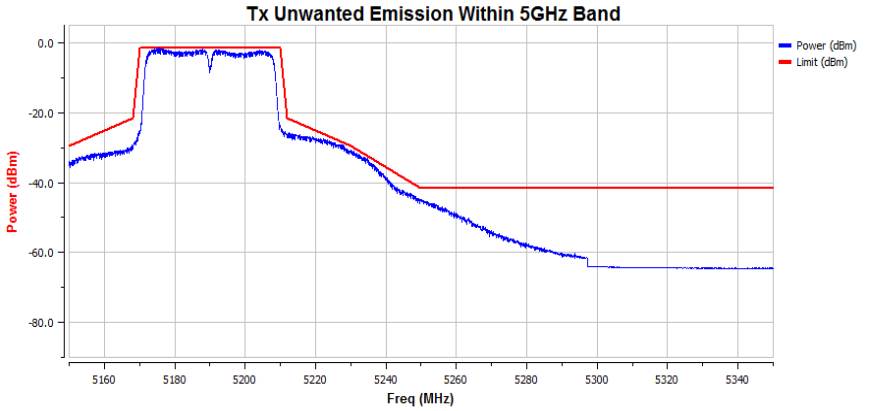
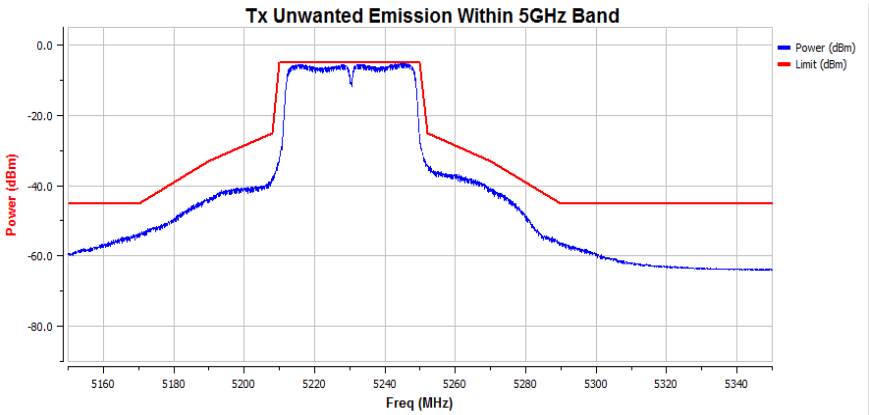
Mode 1: IEEE 802.11a U-NII Band Link Mode	
5180 MHz	 Test Condition **Test Result : Pass**
5240 MHz	 Test Condition **Test Result : Pass**

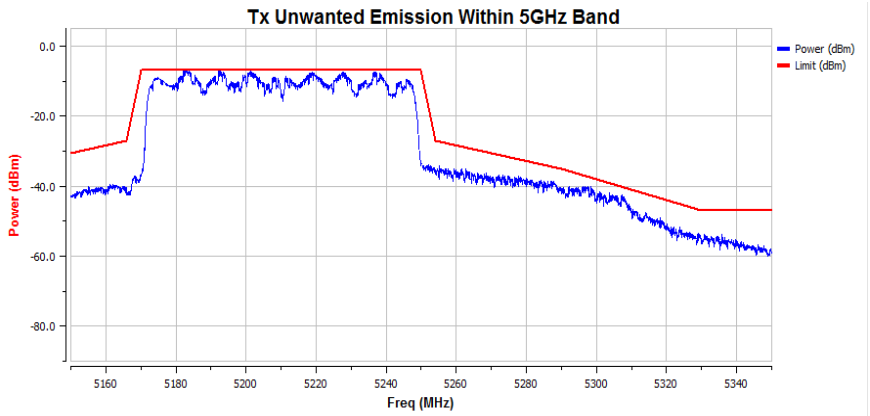
Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode	
5180 MHz	 Test Condition **Test Result : Pass**
5240 MHz	 Test Condition **Test Result : Pass**

Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode	
5190 MHz	 Test Condition **Test Result : Pass**
5230 MHz	 Test Condition **Test Result : Pass**

Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode	
5210 MHz	 Test Condition **Test Result : Pass**

Mode 2: IEEE 802.11ac 20MHz U-NII Band Link Mode	
Beamforming on	
5180 MHz	 Test Condition **Test Result : Pass**
5240 MHz	 Test Condition **Test Result : Pass**

Mode 3: IEEE 802.11ac 40MHz U-NII Band Link Mode	
Beamforming on	
5190 MHz	 Test Condition **Test Result : Pass**
5230 MHz	 Test Condition **Test Result : Pass**

Mode 4: IEEE 802.11ac 80MHz U-NII Band Link Mode	
Beamforming on	
5210 MHz	

11 Receiver Spurious Emissions

11.1. Limit

The spurious emissions of the receiver shall not exceed the limits given as follows.

Table 4: Spurious radiated emission limits

Frequency Range	Maximum power	Measurement Bandwidth
30 MHz to 1GHz	-57 dBm	100 kHz
1GHz to 26.5GHz	-47 dBm	1 MHz

11.2. Test Instruments

Conducted

Equipment	Manufacturer	Model Name	Serial No.	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/22/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

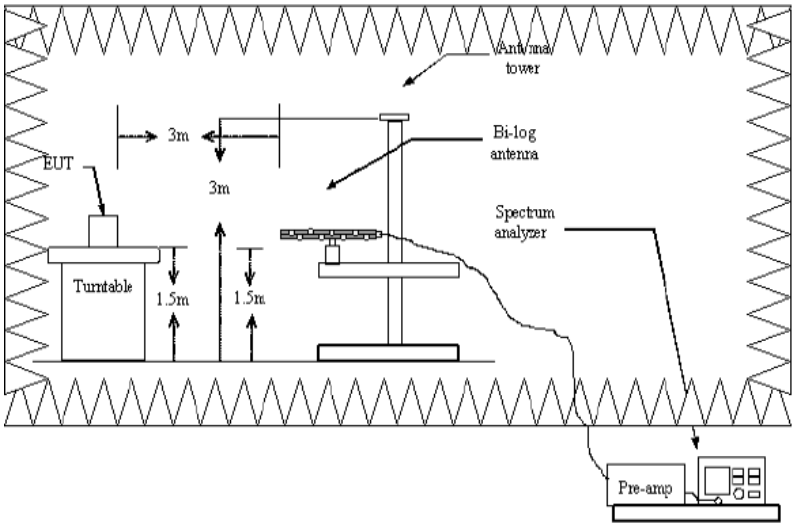
Radiated

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer	Agilent	N9020A	US47520902	09/21/2016	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Pre-Amplifier	Mini-Circuits	ZVA-213-S+	467900926	08/09/2016	1 year
Preamplifier	EMCI	EMC330N	980303	08/09/2016	1 year
Signal Generator	Agilent	E8257D	MY44320425	03/02/2017	1 year
Biconilong (Type4) Antenna	ETS-Lindgren	3142C	86484	06/04/2016	1 year
Horn Antenna	ETS-Lindgren	3115	00070475	05/12/2017	1 year
Test Site	ATL	TC03	TC03	N.C.R.	-----

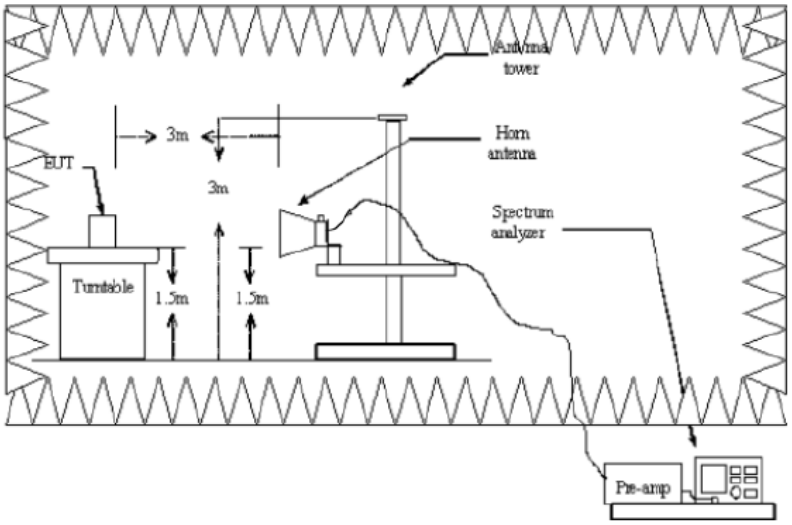
Note: N.C.R. = No Calibration Request.

11.3. Test Setup

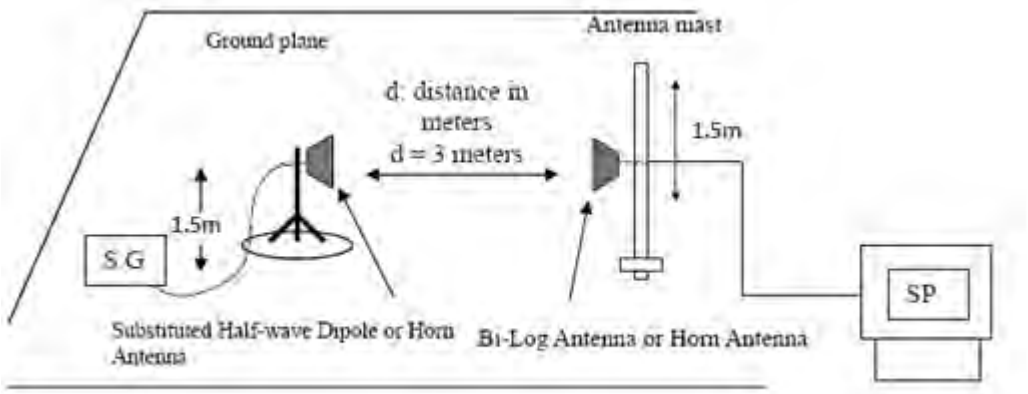
Below 1GHz



Above 1GHz



Substituted Method Test Set-up



11.4. Test Procedure

1. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.7.1 for the test conditions
2. Please refer to ETSI EN 301 893 (V2.1.1) clause 5.4.7.2 for the test method.

11.5. Test Result

Conducted

Mode:	Mode 1	Frequency:	5180MHz

Ant 1 Detector: RMS

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	24135.000	-61.00	-47.00	-14.00	Pass
2	25082.000	-60.71	-47.00	-13.71	Pass
3	25830.000	-59.20	-47.00	-12.20	Pass
4	25863.000	-59.25	-47.00	-12.25	Pass
5	25899.000	-59.53	-47.00	-12.53	Pass

Mode:	Mode 2	Frequency:	5180MHz

Ant 1+2 Detector: RMS

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	25744.000	-56.91	-47.00	-9.91	Pass
2	25772.000	-56.44	-47.00	-9.44	Pass
3	25789.000	-56.12	-47.00	-9.12	Pass
4	25813.000	-55.85	-47.00	-8.85	Pass
5	25814.000	-55.85	-47.00	-8.85	Pass
6	25846.000	-55.73	-47.00	-8.73	Pass
7	25894.000	-56.00	-47.00	-9.00	Pass
8	25950.000	-56.38	-47.00	-9.38	Pass
9	25953.000	-56.42	-47.00	-9.42	Pass

Mode:	Mode 3	Frequency:	5190MHz

Ant 1+2 Detector: RMS

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	25080.000	-58.12	-47.00	-11.12	Pass
2	25788.000	-56.01	-47.00	-9.01	Pass
3	25789.000	-55.99	-47.00	-8.99	Pass
4	25804.000	-55.77	-47.00	-8.77	Pass
5	25826.000	-55.67	-47.00	-8.67	Pass
6	25834.000	-55.65	-47.00	-8.65	Pass
7	25874.000	-55.79	-47.00	-8.79	Pass
8	25879.000	-55.84	-47.00	-8.84	Pass
9	25886.000	-55.92	-47.00	-8.92	Pass
10	25948.000	-56.37	-47.00	-9.37	Pass

Mode:	Mode 4	Frequency:	5210MHz

Ant 1+2 Detector: RMS

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	25657.000	-57.40	-47.00	-10.40	Pass
2	25773.000	-56.31	-47.00	-9.31	Pass
3	25816.000	-55.73	-47.00	-8.73	Pass
4	25831.000	-55.68	-47.00	-8.68	Pass
5	25832.000	-55.67	-47.00	-8.67	Pass
6	25859.000	-55.65	-47.00	-8.65	Pass
7	25873.000	-55.75	-47.00	-8.75	Pass
8	25874.000	-55.77	-47.00	-8.77	Pass
9	25899.000	-55.90	-47.00	-8.90	Pass
10	25959.000	-56.34	-47.00	-9.34	Pass

Beamforming on

Mode:	Mode 2	Frequency:	5180MHz

Ant 1+2 Detector: RMS

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	9648.000	-64.73	-47.00	-17.73	Pass
2	9649.000	-64.73	-47.00	-17.73	Pass
3	25589.000	-57.52	-47.00	-10.52	Pass
4	25756.000	-56.76	-47.00	-9.76	Pass
5	25757.000	-56.73	-47.00	-9.73	Pass
6	25785.000	-56.22	-47.00	-9.22	Pass
7	25797.000	-56.00	-47.00	-9.00	Pass
8	25826.000	-55.83	-47.00	-8.83	Pass
9	25863.000	-55.79	-47.00	-8.79	Pass
10	25871.000	-55.86	-47.00	-8.86	Pass

Mode:	Mode 3	Frequency:	5190MHz

Ant 1+2 Detector: RMS

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	25146.000	-58.09	-47.00	-11.09	Pass
2	25751.000	-56.75	-47.00	-9.75	Pass
3	25782.000	5.82	-47.00	52.82	Failed
4	25842.000	-55.61	-47.00	-8.61	Pass
5	25850.000	-55.62	-47.00	-8.62	Pass
6	25864.000	-55.70	-47.00	-8.70	Pass
7	25865.000	-55.70	-47.00	-8.70	Pass
8	25877.000	-55.81	-47.00	-8.81	Pass
9	25923.000	-56.25	-47.00	-9.25	Pass
10	25974.000	-56.57	-47.00	-9.57	Pass

Mode:	Mode 4	Frequency:	5210MHz

Ant 1+2 Detector: RMS

No.	Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Status
1	5176.000	-65.07	-47.00	-18.07	5176.000
2	5183.000	-64.80	-47.00	-17.80	5183.000
3	5186.000	-64.68	-47.00	-17.68	5186.000
4	25547.000	-57.50	-47.00	-10.50	25547.000
5	25796.000	-55.89	-47.00	-8.89	25796.000
6	25846.000	-55.64	-47.00	-8.64	25846.000
7	25869.000	-55.71	-47.00	-8.71	25869.000
8	25896.000	-55.89	-47.00	-8.89	25896.000
9	25963.000	-56.38	-47.00	-9.38	25963.000
10	25975.000	-56.49	-47.00	-9.49	25975.000

Radiated

Mode:	Mode 1	Frequency:	5180MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	153.6750	-67.96	-7.70	-75.66	-57.00	-18.66	peak
2	250.6750	-65.15	-4.54	-69.69	-57.00	-12.69	peak
3	371.9250	-66.56	-0.77	-67.33	-57.00	-10.33	peak
4	665.3500	-73.34	2.80	-70.54	-57.00	-13.54	peak
5	839.9500	-73.31	5.32	-67.99	-57.00	-10.99	peak
6	956.3500	-74.01	6.35	-67.66	-57.00	-10.66	peak
7	4815.000	-56.71	-0.98	-57.69	-47.00	-10.69	peak
8	9775.000	-58.14	-0.42	-58.56	-47.00	-11.56	peak
9	15700.000	-63.04	4.30	-58.74	-47.00	-11.74	peak

Mode:	Mode 1	Frequency:	5180MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	168.2250	-68.51	-6.35	-74.86	-57.00	-17.86	peak
2	233.7000	-61.90	-4.43	-66.33	-57.00	-9.33	peak
3	519.8500	-70.94	1.07	-69.87	-57.00	-12.87	peak
4	662.9250	-71.00	2.72	-68.28	-57.00	-11.28	peak
5	839.9500	-70.86	5.32	-65.54	-57.00	-8.54	peak
6	956.3500	-74.70	6.35	-68.35	-57.00	-11.35	peak
7	2942.500	-56.07	-3.98	-60.05	-47.00	-13.05	peak
8	11525.000	-58.90	0.31	-58.59	-47.00	-11.59	peak
9	15225.000	-63.45	4.44	-59.01	-47.00	-12.01	peak

Mode:	Mode 1	Frequency:	5240MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	153.6750	-67.95	-7.70	-75.65	-57.00	-18.65	peak
2	330.7000	-66.44	-2.97	-69.41	-57.00	-12.41	peak
3	481.0500	-68.79	0.77	-68.02	-57.00	-11.02	peak
4	662.9250	-73.53	2.72	-70.81	-57.00	-13.81	peak
5	813.2750	-73.84	4.93	-68.91	-57.00	-11.91	peak
6	985.4500	-73.99	6.40	-67.59	-57.00	-10.59	peak
7	4220.000	-56.30	-1.69	-57.99	-47.00	-10.99	peak
8	10675.000	-59.02	0.48	-58.54	-47.00	-11.54	peak
9	14800.000	-63.22	4.07	-59.15	-47.00	-12.15	peak

Mode:	Mode 1	Frequency:	5240MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	163.3750	-70.07	-6.83	-76.90	-57.00	-19.90	peak
2	231.2750	-62.34	-4.49	-66.83	-57.00	-9.83	peak
3	505.3000	-71.76	0.65	-71.11	-57.00	-14.11	peak
4	665.3500	-70.33	2.80	-67.53	-57.00	-10.53	peak
5	839.9500	-70.07	5.32	-64.75	-57.00	-7.75	peak
6	995.1500	-70.84	6.41	-64.43	-57.00	-7.43	peak
7	5375.000	-56.81	0.11	-56.70	-47.00	-9.70	peak
8	10650.000	-59.57	0.48	-59.09	-47.00	-12.09	peak
9	14400.000	-63.75	3.49	-60.26	-47.00	-13.26	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	182.7750	-66.75	-5.48	-72.23	-57.00	-15.23	peak
2	333.1250	-65.37	-2.90	-68.27	-57.00	-11.27	peak
3	481.0500	-69.30	0.77	-68.53	-57.00	-11.53	peak
4	658.0750	-73.59	2.61	-70.98	-57.00	-13.98	peak
5	813.2750	-74.30	4.93	-69.37	-57.00	-12.37	peak
6	995.1500	-73.11	6.41	-66.70	-57.00	-9.70	peak
7	4045.000	-57.24	-1.70	-58.94	-47.00	-11.94	peak
8	11600.000	-58.29	0.18	-58.11	-47.00	-11.11	peak
9	15175.000	-62.92	4.41	-58.51	-47.00	-11.51	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	85.7750	-63.13	-10.73	-73.86	-57.00	-16.86	peak
2	233.7000	-61.15	-4.43	-65.58	-57.00	-8.58	peak
3	517.4250	-71.07	0.99	-70.08	-57.00	-13.08	peak
4	665.3500	-69.58	2.80	-66.78	-57.00	-9.78	peak
5	839.9500	-70.38	5.32	-65.06	-57.00	-8.06	peak
6	946.6500	-74.33	6.29	-68.04	-57.00	-11.04	peak
7	5287.500	-57.04	-0.11	-57.15	-47.00	-10.15	peak
8	11650.000	-59.02	0.16	-58.86	-47.00	-11.86	peak
9	16825.000	-62.47	6.16	-56.31	-47.00	-9.31	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	136.7000	-60.61	-9.52	-70.13	-57.00	-13.13	peak
2	299.1750	-65.16	-4.16	-69.32	-57.00	-12.32	peak
3	481.0500	-70.41	0.77	-69.64	-57.00	-12.64	peak
4	665.3500	-73.78	2.80	-70.98	-57.00	-13.98	peak
5	839.9500	-73.27	5.32	-67.95	-57.00	-10.95	peak
6	1000.0000	-74.10	6.47	-67.63	-57.00	-10.63	peak
7	3065.000	-56.46	-3.73	-60.19	-47.00	-13.19	peak
8	10525.000	-59.33	0.39	-58.94	-47.00	-11.94	peak
9	16375.000	-63.13	4.52	-58.61	-47.00	-11.61	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	168.2250	-65.81	-6.35	-72.16	-57.00	-15.16	peak
2	231.2750	-61.03	-4.49	-65.52	-57.00	-8.52	peak
3	510.1500	-71.53	0.75	-70.78	-57.00	-13.78	peak
4	662.9250	-69.56	2.72	-66.84	-57.00	-9.84	peak
5	839.9500	-71.49	5.32	-66.17	-57.00	-9.17	peak
6	919.9750	-71.97	5.81	-66.16	-57.00	-9.16	peak
7	4395.000	-56.20	-1.66	-57.86	-47.00	-10.86	peak
8	10875.000	-59.31	0.36	-58.95	-47.00	-11.95	peak
9	15325.000	-62.72	4.53	-58.19	-47.00	-11.19	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	185.2000	-66.42	-5.45	-71.87	-57.00	-14.87	peak
2	333.1250	-66.05	-2.90	-68.95	-57.00	-11.95	peak
3	481.0500	-68.94	0.77	-68.17	-57.00	-11.17	peak
4	665.3500	-73.41	2.80	-70.61	-57.00	-13.61	peak
5	839.9500	-74.04	5.32	-68.72	-57.00	-11.72	peak
6	978.1750	-73.17	6.48	-66.69	-57.00	-9.69	peak
7	3432.500	-55.69	-3.07	-58.76	-47.00	-11.76	peak
8	11575.000	-59.19	0.23	-58.96	-47.00	-11.96	peak
9	15850.000	-62.57	4.43	-58.14	-47.00	-11.14	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-61.09	-11.18	-72.27	-57.00	-15.27	peak
2	233.7000	-62.30	-4.43	-66.73	-57.00	-9.73	peak
3	517.4250	-72.04	0.99	-71.05	-57.00	-14.05	peak
4	665.3500	-71.41	2.80	-68.61	-57.00	-11.61	peak
5	839.9500	-70.97	5.32	-65.65	-57.00	-8.65	peak
6	949.0750	-73.17	6.31	-66.86	-57.00	-9.86	peak
7	4202.500	-55.64	-1.68	-57.32	-47.00	-10.32	peak
8	11650.000	-59.29	0.16	-59.13	-47.00	-12.13	peak
9	15200.000	-62.82	4.43	-58.39	-47.00	-11.39	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	158.5250	-66.57	-7.29	-73.86	-57.00	-16.86	peak
2	333.1250	-66.50	-2.90	-69.40	-57.00	-12.40	peak
3	432.5500	-70.21	-1.18	-71.39	-57.00	-14.39	peak
4	612.0000	-73.58	3.00	-70.58	-57.00	-13.58	peak
5	825.4000	-74.09	5.26	-68.83	-57.00	-11.83	peak
6	995.1500	-73.52	6.41	-67.11	-57.00	-10.11	peak
7	3712.500	-56.81	-2.46	-59.27	-47.00	-12.27	peak
8	11750.000	-59.19	0.18	-59.01	-47.00	-12.01	peak
9	15225.000	-62.93	4.44	-58.49	-47.00	-11.49	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	73.6500	-63.99	-10.96	-74.95	-57.00	-17.95	peak
2	233.7000	-61.69	-4.43	-66.12	-57.00	-9.12	peak
3	333.1250	-67.63	-2.90	-70.53	-57.00	-13.53	peak
4	495.6000	-70.93	0.56	-70.37	-57.00	-13.37	peak
5	662.9250	-70.96	2.72	-68.24	-57.00	-11.24	peak
6	949.0750	-74.72	6.31	-68.41	-57.00	-11.41	peak
7	3975.000	-57.43	-1.77	-59.20	-47.00	-12.20	peak
8	11675.000	-58.44	0.16	-58.28	-47.00	-11.28	peak
9	16725.000	-63.33	5.85	-57.48	-47.00	-10.48	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	158.5250	-67.20	-7.29	-74.49	-57.00	-17.49	peak
2	299.1750	-65.16	-4.16	-69.32	-57.00	-12.32	peak
3	432.5500	-69.55	-1.18	-70.73	-57.00	-13.73	peak
4	662.9250	-73.39	2.72	-70.67	-57.00	-13.67	peak
5	839.9500	-73.56	5.32	-68.24	-57.00	-11.24	peak
6	1000.0000	-73.80	6.47	-67.33	-57.00	-10.33	peak
7	3590.000	-56.45	-2.92	-59.37	-47.00	-12.37	peak
8	11475.000	-59.49	0.35	-59.14	-47.00	-12.14	peak
9	16375.000	-63.73	4.52	-59.21	-47.00	-12.21	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	136.7000	-60.75	-9.52	-70.27	-57.00	-13.27	peak
2	284.6250	-64.81	-5.02	-69.83	-57.00	-12.83	peak
3	374.3500	-69.01	-0.74	-69.75	-57.00	-12.75	peak
4	665.3500	-70.00	2.80	-67.20	-57.00	-10.20	peak
5	781.7500	-74.48	4.38	-70.10	-57.00	-13.10	peak
6	956.3500	-74.30	6.35	-67.95	-57.00	-10.95	peak
7	4500.000	-57.09	-1.34	-58.43	-47.00	-11.43	peak
8	11550.000	-58.90	0.27	-58.63	-47.00	-11.63	peak
9	15300.000	-63.12	4.48	-58.64	-47.00	-11.64	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	63.9500	-63.74	-10.39	-74.13	-57.00	-17.13	peak
2	245.8250	-65.44	-4.42	-69.86	-57.00	-12.86	peak
3	432.5500	-70.29	-1.18	-71.47	-57.00	-14.47	peak
4	602.3000	-74.94	2.85	-72.09	-57.00	-15.09	peak
5	738.1000	-74.19	4.25	-69.94	-57.00	-12.94	peak
6	890.8750	-74.24	5.34	-68.90	-57.00	-11.90	peak
7	4255.000	-54.19	-1.70	-55.89	-47.00	-8.89	peak
8	10675.000	-58.53	0.48	-58.05	-47.00	-11.05	peak
9	14700.000	-62.44	4.08	-58.36	-47.00	-11.36	peak

Mode:	Mode 2	Frequency:	5180MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	168.2250	-68.20	-6.35	-74.55	-57.00	-17.55	peak
2	250.6750	-63.84	-4.54	-68.38	-57.00	-11.38	peak
3	386.4750	-70.30	-0.95	-71.25	-57.00	-14.25	peak
4	575.6250	-72.91	1.84	-71.07	-57.00	-14.07	peak
5	709.0000	-74.87	4.17	-70.70	-57.00	-13.70	peak
6	881.1750	-72.99	5.29	-67.70	-57.00	-10.70	peak
7	3642.500	-54.45	-2.75	-57.20	-47.00	-10.20	peak
8	11650.000	-58.70	0.16	-58.54	-47.00	-11.54	peak
9	14325.000	-61.52	3.41	-58.11	-47.00	-11.11	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-64.74	-11.18	-75.92	-57.00	-18.92	peak
2	182.7750	-66.37	-5.48	-71.85	-57.00	-14.85	peak
3	432.5500	-69.17	-1.18	-70.35	-57.00	-13.35	peak
4	597.4500	-74.73	2.73	-72.00	-57.00	-15.00	peak
5	769.6250	-73.84	4.13	-69.71	-57.00	-12.71	peak
6	941.8000	-74.51	6.24	-68.27	-57.00	-11.27	peak
7	4325.000	-55.78	-1.70	-57.48	-47.00	-10.48	peak
8	10425.000	-58.87	0.38	-58.49	-47.00	-11.49	peak
9	15075.000	-63.28	4.30	-58.98	-47.00	-11.98	peak

Mode:	Mode 2	Frequency:	5240MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	51.8250	-62.69	-7.84	-70.53	-57.00	-13.53	peak
2	279.7750	-65.86	-5.06	-70.92	-57.00	-13.92	peak
3	386.4750	-70.41	-0.95	-71.36	-57.00	-14.36	peak
4	602.3000	-73.18	2.85	-70.33	-57.00	-13.33	peak
5	745.3750	-73.66	4.08	-69.58	-57.00	-12.58	peak
6	881.1750	-73.49	5.29	-68.20	-57.00	-11.20	peak
7	3432.500	-57.47	-3.07	-60.54	-47.00	-13.54	peak
8	11550.000	-58.57	0.27	-58.30	-47.00	-11.30	peak
9	16125.000	-63.37	4.36	-59.01	-47.00	-12.01	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	63.9500	-66.15	-10.39	-76.54	-57.00	-19.54	peak
2	248.2500	-65.35	-4.47	-69.82	-57.00	-12.82	peak
3	432.5500	-69.18	-1.18	-70.36	-57.00	-13.36	peak
4	590.1750	-74.14	2.54	-71.60	-57.00	-14.60	peak
5	750.2250	-74.46	3.94	-70.52	-57.00	-13.52	peak
6	927.2500	-74.07	5.98	-68.09	-57.00	-11.09	peak
7	4412.500	-57.07	-1.62	-58.69	-47.00	-11.69	peak
8	11575.000	-59.06	0.23	-58.83	-47.00	-11.83	peak
9	14800.000	-62.61	4.07	-58.54	-47.00	-11.54	peak

Mode:	Mode 3	Frequency:	5190MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	136.7000	-58.92	-9.52	-68.44	-57.00	-11.44	peak
2	299.1750	-62.62	-4.16	-66.78	-57.00	-9.78	peak
3	432.5500	-70.64	-1.18	-71.82	-57.00	-14.82	peak
4	616.8500	-74.58	3.01	-71.57	-57.00	-14.57	peak
5	728.4000	-73.19	4.25	-68.94	-57.00	-11.94	peak
6	919.9750	-72.23	5.81	-66.42	-57.00	-9.42	peak
7	4062.500	-55.00	-1.71	-56.71	-47.00	-9.71	peak
8	11025.000	-59.24	0.33	-58.91	-47.00	-11.91	peak
9	15250.000	-62.37	4.46	-57.91	-47.00	-10.91	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-63.25	-11.18	-74.43	-57.00	-17.43	peak
2	253.1000	-65.11	-4.63	-69.74	-57.00	-12.74	peak
3	384.0500	-72.10	-0.85	-72.95	-57.00	-15.95	peak
4	507.7250	-72.37	0.70	-71.67	-57.00	-14.67	peak
5	750.2250	-74.03	3.94	-70.09	-57.00	-13.09	peak
6	915.1250	-73.73	5.70	-68.03	-57.00	-11.03	peak
7	4850.000	-57.83	-1.07	-58.90	-47.00	-11.90	peak
8	11500.000	-57.95	0.36	-57.59	-47.00	-10.59	peak
9	14550.000	-62.84	3.82	-59.02	-47.00	-12.02	peak

Mode:	Mode 3	Frequency:	5230MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	54.2500	-61.80	-8.40	-70.20	-57.00	-13.20	peak
2	168.2250	-67.63	-6.35	-73.98	-57.00	-16.98	peak
3	371.9250	-69.80	-0.77	-70.57	-57.00	-13.57	peak
4	522.2750	-73.66	1.12	-72.54	-57.00	-15.54	peak
5	733.2500	-74.81	4.26	-70.55	-57.00	-13.55	peak
6	919.9750	-71.76	5.81	-65.95	-57.00	-8.95	peak
7	4237.500	-54.12	-1.69	-55.81	-47.00	-8.81	peak
8	11600.000	-59.10	0.18	-58.92	-47.00	-11.92	peak
9	17875.000	-62.00	8.95	-53.05	-47.00	-6.05	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Horizontal		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	68.8000	-65.11	-11.18	-76.29	-57.00	-19.29	peak
2	233.7000	-65.86	-4.43	-70.29	-57.00	-13.29	peak
3	374.3500	-72.60	-0.74	-73.34	-57.00	-16.34	peak
4	568.3500	-74.22	1.58	-72.64	-57.00	-15.64	peak
5	776.9000	-73.96	4.29	-69.67	-57.00	-12.67	peak
6	963.6250	-74.39	6.42	-67.97	-57.00	-10.97	peak
7	4010.000	-56.98	-1.69	-58.67	-47.00	-11.67	peak
8	11625.000	-59.20	0.17	-59.03	-47.00	-12.03	peak
9	15025.000	-63.81	4.19	-59.62	-47.00	-12.62	peak

Mode:	Mode 4	Frequency:	5210MHz
Ant.Polar.:	Vertical		
Beamforming on			

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	66.3750	-63.27	-10.79	-74.06	-57.00	-17.06	peak
2	209.4500	-68.00	-5.28	-73.28	-57.00	-16.28	peak
3	432.5500	-70.06	-1.18	-71.24	-57.00	-14.24	peak
4	599.8750	-74.15	2.80	-71.35	-57.00	-14.35	peak
5	738.1000	-75.13	4.25	-70.88	-57.00	-13.88	peak
6	919.9750	-72.52	5.81	-66.71	-57.00	-9.71	peak
7	4307.500	-56.75	-1.71	-58.46	-47.00	-11.46	peak
8	11625.000	-59.22	0.17	-59.05	-47.00	-12.05	peak
9	16525.000	-63.07	5.03	-58.04	-47.00	-11.04	peak

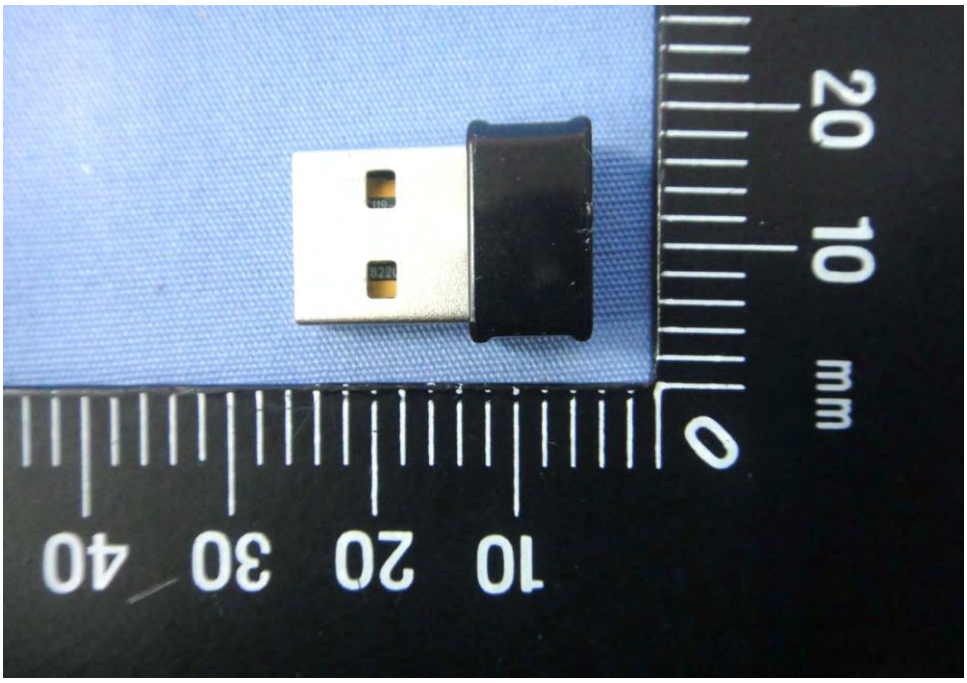
12 Test Setup Photograph

Description : EUT Setup Photo for Radiated Emissions _ Front View

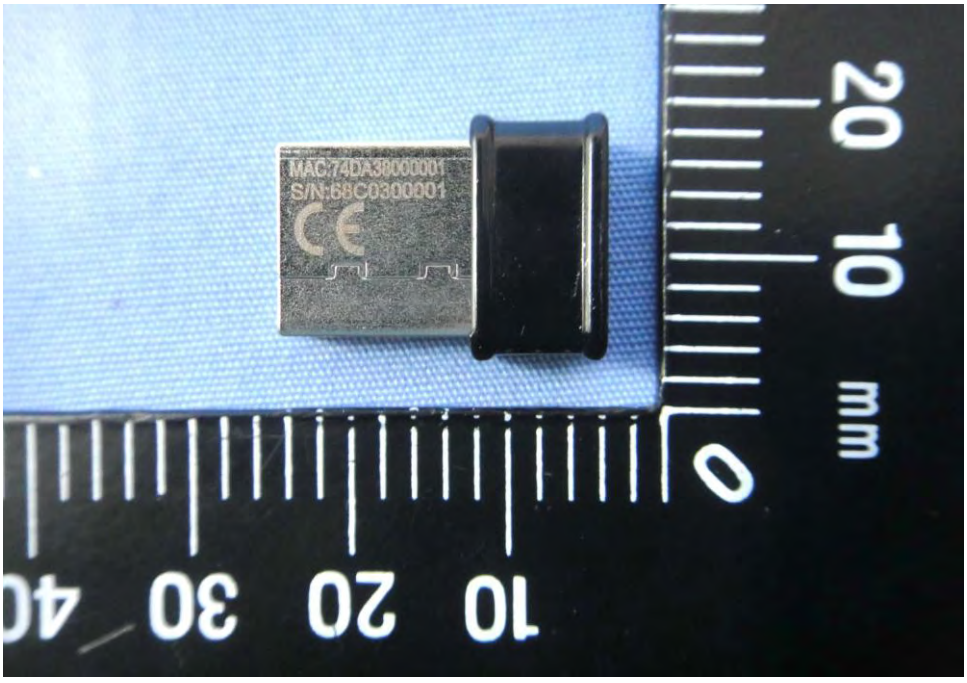
Description : EUT Setup Photo for Radiated Emissions _ Back View


13 EUT Photograph

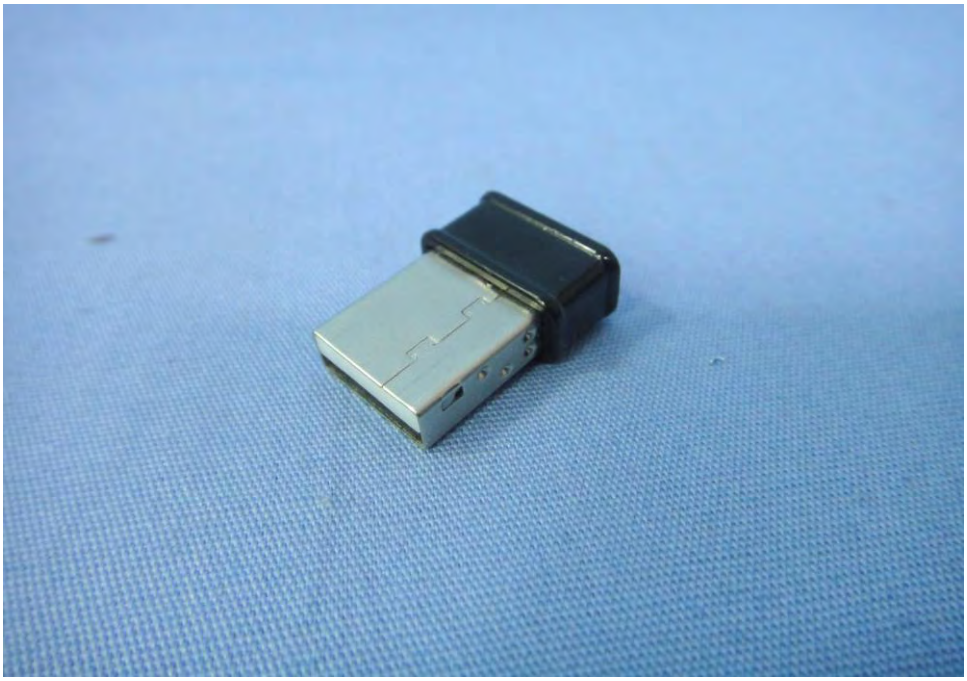
(1) EUT Photo



(2) EUT Photo



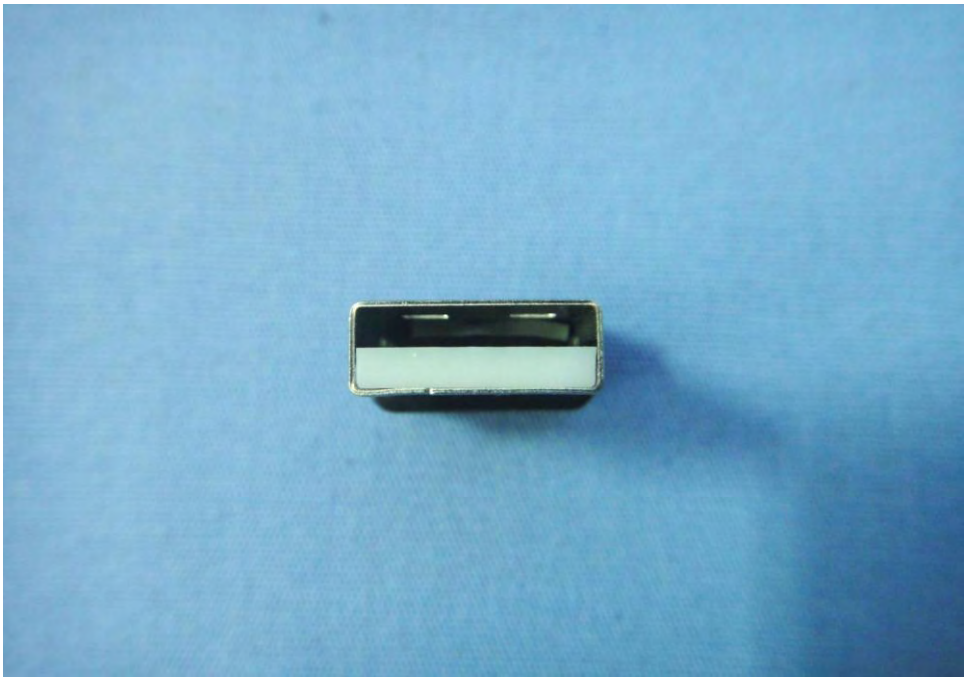
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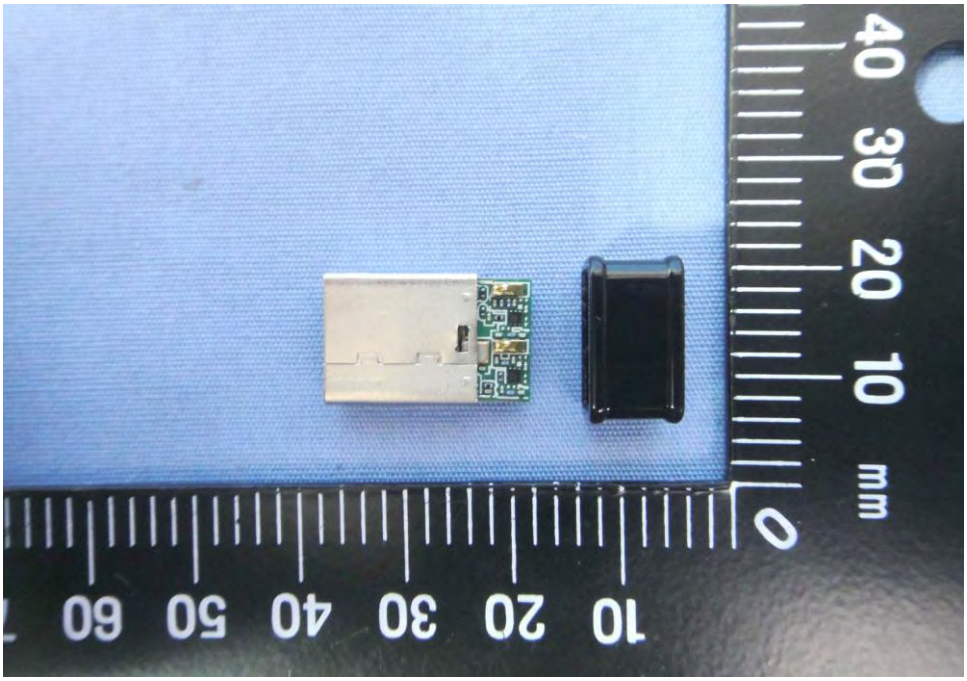
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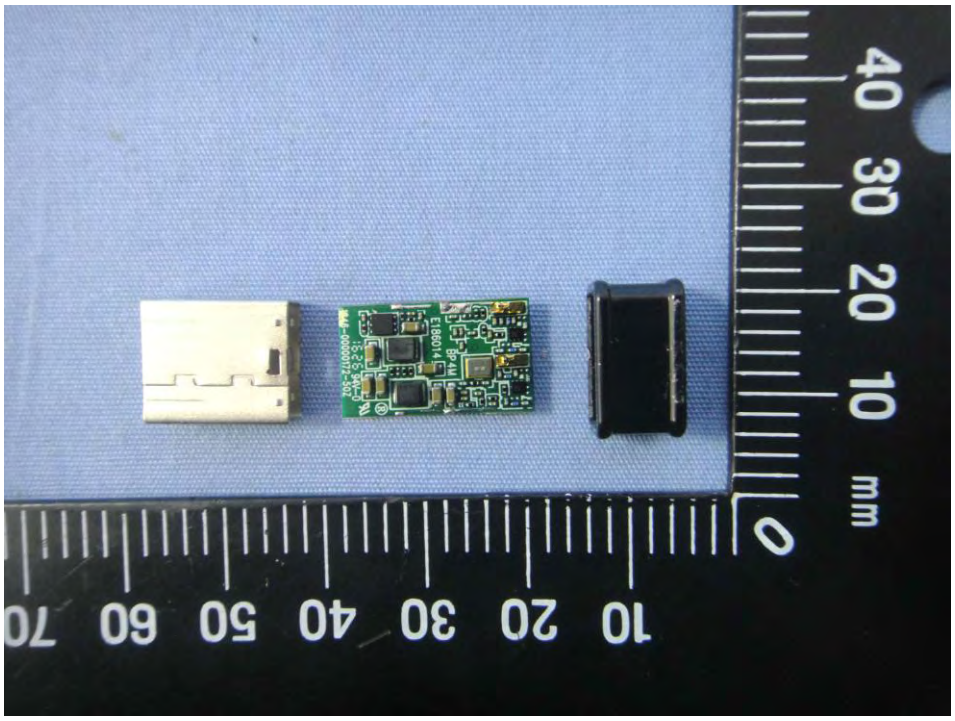
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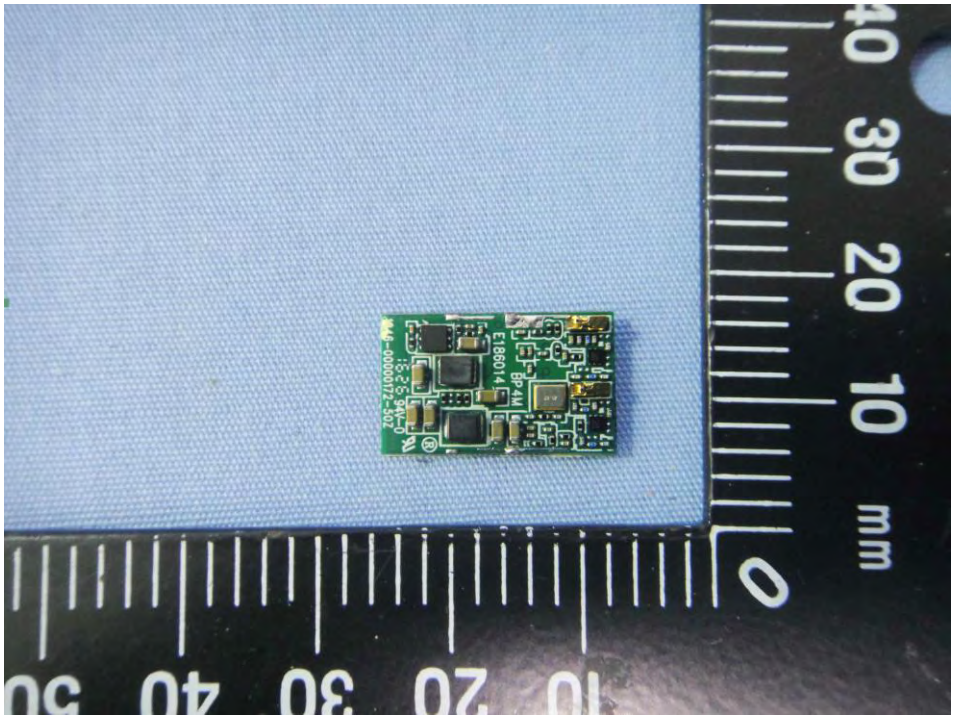
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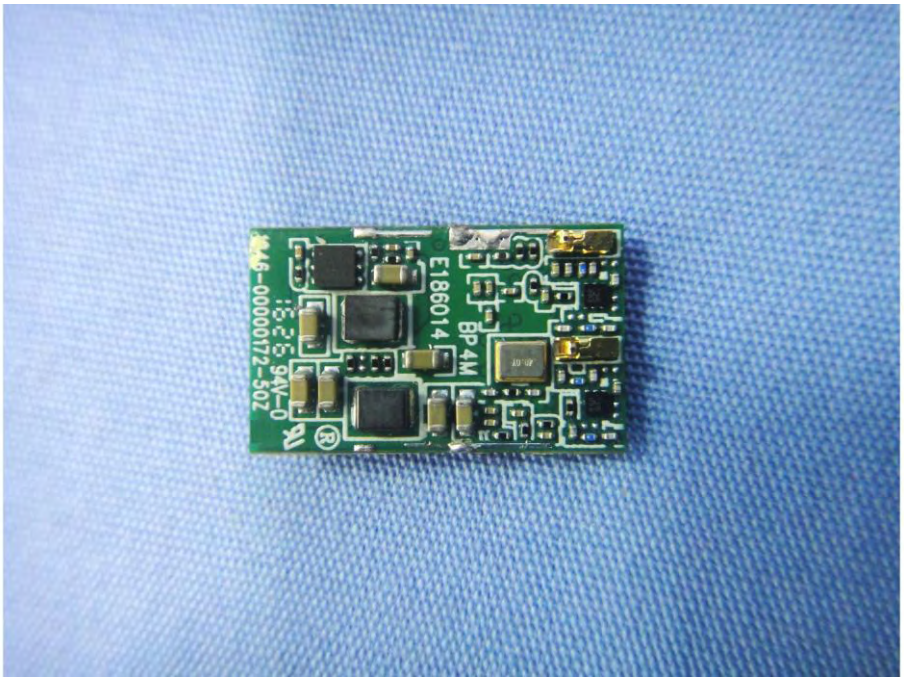
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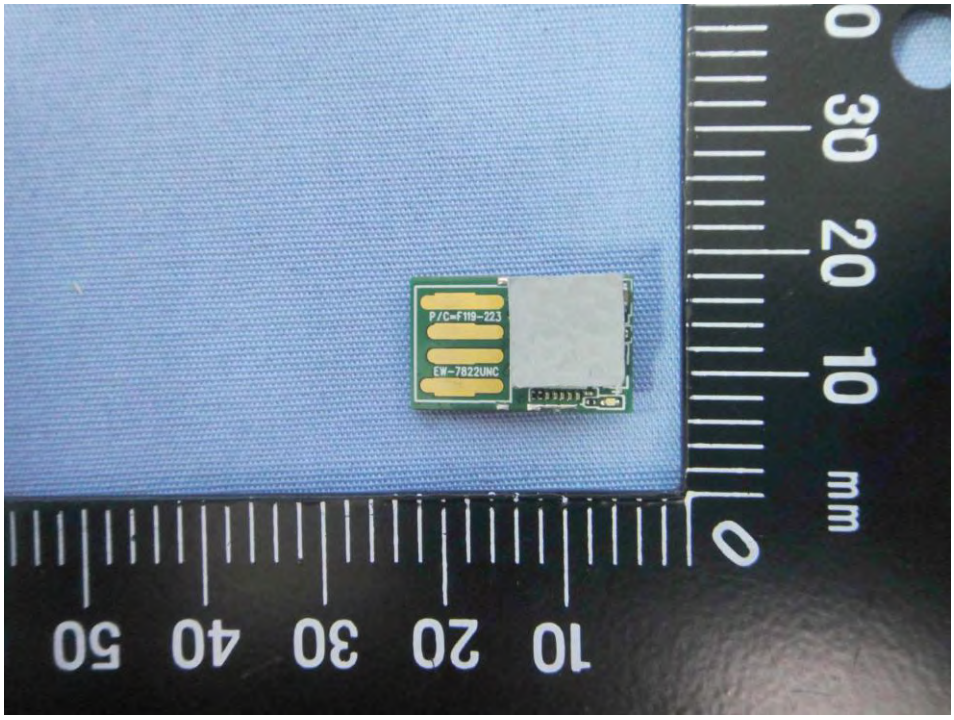
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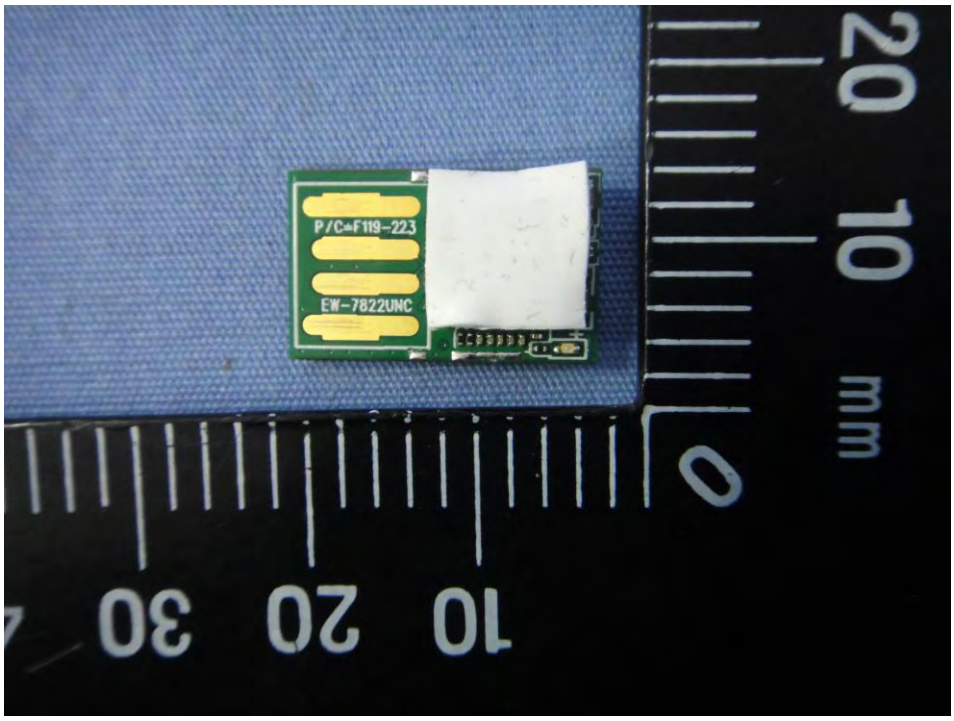
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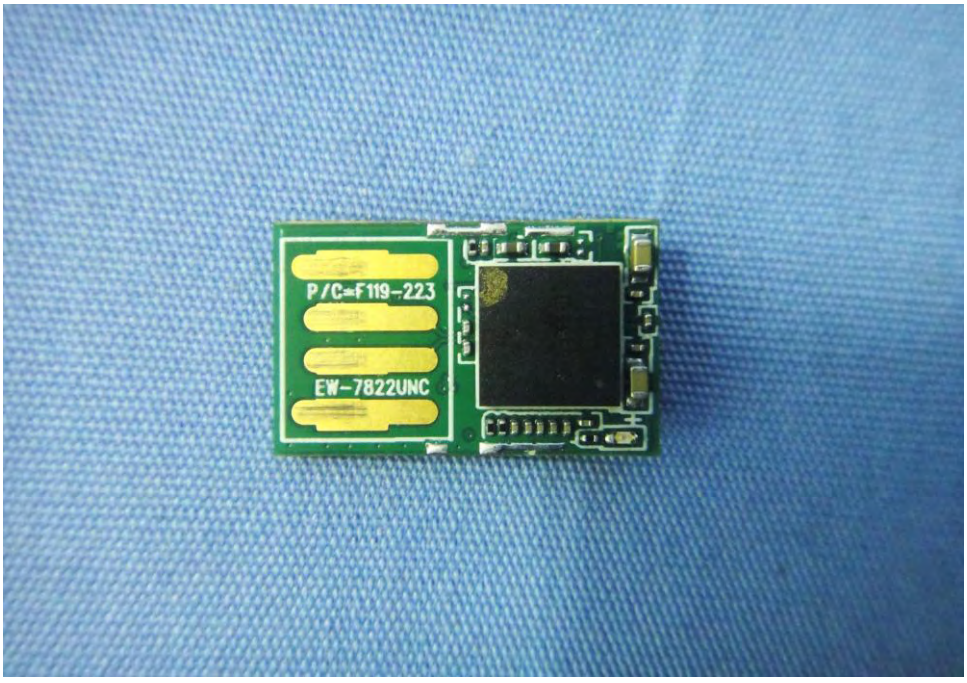
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(11)EUT Photo



(12)EUT Photo



(13)EUT Photo

