


RAPPORTO DI PROVA / TEST REPORT

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Scopo delle prove / Test object :	Prove di tipo in accordo alla Norma armonizzata / Type test according to Harmonized standards EN 300 328 V2.1.1 clause 5.3.10; 5.3.11	
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Marchio commerciale / Trademark :	 RELOC DESIGN & INTEGRATION	
Fabbricante / Manufacturer :	RELOC S.r.l.	
Prodotto / Product :	Wi-Fi Pmod Adapter based on ATWINC15x0 module	
Modello / Model :	PMOD.WM1A (PMOD-WM1A-ATWINC15X0)	
Data ricevimento campioni / Date of test samples receipt :	19/06/2017	
Campioni verificati / No. of tested samples	1	
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Esito delle valutazioni / Assessment results :	CONFORME / COMPLIANT	
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Approvato / Approved by :	Giacomo ARMELLINI Responsabile Laboratorio EMC e RADIO / EMC and RADIO Laboratory Manager	

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati./The test results reported in this test report shall refer only to the samples tested

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0 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
ETSTR_171302-0	Original release	23/06/2017

1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 EUT Identification

DESCRIPTION	Wi-Fi Pmod Adapter based on ATWINC15x0 module
MODEL NAME	PMOD.WM1A (PMOD-WM1A-ATWINC15X0)
SERIAL NO.	R17P06R1D0A
TRADEMARK	 RELOC DESIGN & INTEGRATION
MANUFACTURER	RELOC s.r.l.
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SUPPLY	DC power
WORKING VOLTAGE	3.0V to 4.2V
FREQUENCY RANGE	2.4 GHz ISM band (2.412 ÷ 2.472 MHz range)
CHANNEL NUMBER	1÷13
CHANNEL BANDWIDTH	22 MHz
CHANNEL SPACING	5 MHz
MODULATION TYPE	IEEE 802.11b DSSS-CCK IEEE 802.11g OFDM IEEE 802.11n HT modulations MCS0-7, 20MHz, 800 and 400ns guard interval
TRANSFER RATE:	Up to 72 Mbps
ADAPTIVE / NON ADAPTIVE:	Adaptive equipment without the possibility to switch to a non-adaptive mode
ANTENNA TYPE	Internal
ANTENNA GAIN	NA – Maximum system output power 17 dBm

1.1.1 Channel List

Channel	Frequency
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462
12	2467
13	2472

1.1.2 Antenna List

Antenna Type	Manufacturer	Model	Peak Gain (dBi)
#1: Internal	---	---	---

1.1.3 Firmware Settings

Test Mode	Firmware version	Power Control Level	Other Settings
TX continuous	---	---	---

1.1.4 EUT Classification

Equipment type	<input checked="" type="checkbox"/> radio equipment	<input checked="" type="checkbox"/> plug-in	<i>radio equipment module intended to be used with or within host, combined or multi-radio equipment, using their control functions and power supply</i>
		<input type="checkbox"/> stand-alone	<i>Radio equipment that is intended primarily as communications equipment and that is normally used on a stand-alone basis</i>
	<input type="checkbox"/> host equipment		<i>host equipment is any equipment which has complete user functionality when not connected to the radio equipment part and to which the radio equipment part provides additional functionality and to which connection is necessary for the radio equipment part to offer functionality</i>
	<input type="checkbox"/> combined equipment		<i>any combination of non-radio equipment that requires a plug-in radio device to offer full functionality</i>
	<input type="checkbox"/> multi-radio equipment		<i>radio, host or combined equipment using more than one radio transceiver</i>
	<input type="checkbox"/> Equipment using Frequency Hopping Spread Spectrum (FHSS) modulation		<i>spread spectrum technique in which the equipment occupies a number of frequencies in time, each for some period of time, referred to as the dwell time</i>
	<input checked="" type="checkbox"/> Equipment using other types of wide band modulation (see note 1)		<i>e.g. DSSS, OFDM, etc.</i>
	<input checked="" type="checkbox"/> Adaptive equipment		<i>equipment operating in an adaptive mode</i>
	<input type="checkbox"/> Not adaptive equipment		<i>equipment not operating in an adaptive mode</i>
Equipment use	<input checked="" type="checkbox"/> Fixed station		<i>equipment intended for use in a fixed location and fitted with one or more antennae</i>
	<input type="checkbox"/> Hand portable station		<i>equipment normally used on a stand-alone basis and to be carried by a person or held in the hand</i>
	<input type="checkbox"/> Mobile station		<i>equipment normally used in a vehicle or as a transportable station</i>

Note 1 : Bluetooth Low Energy (BLE) does not comply with a number of requirements which must be met in order to qualify as a FHSS transmitter so BLE is a transmitter using "other types of wide band modulation".

1.1.5 Ports identification

Port	Description	Connector	Max cable length
Enclosure	Port not present	----	----
AC mains input/output ports	Port not present	----	----
DC mains input/output ports	12Vdc	----	----
Signals / Control Ports	Port not present	----	----
Telecommunication port	Port not present	----	----

Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

1.1.6 Auxiliary equipment

- The RELOC PMOD.WM1A device provides attached host boards with Wi-Fi access through the Microchip® ATWINC15x0-MR210 Wi-Fi™ radio module. Users can communicate with the IEEE 802.11b/g/n compliant chip through SPI and achieve data rates up to 72 Mbps.

1.1.7 EUT Modifications

Modifications	Test Involved
None	None

1.2 Test conditions, power sources and ambient temperatures

1.2.1 Normal test conditions

Normal temperature and humidity

The normal temperature and humidity conditions for tests shall be any convenient combination of temperature and humidity within the following ranges:

- temperature +15 °C to +35 °C;
- relative humidity 20 % to 75 %.

When it is impracticable to carry out tests under these conditions, a note to this effect, stating the ambient temperature and relative humidity during the tests, shall be added to the test report.

Mains voltage

The normal test voltages for equipment to be connected to the mains source shall be the nominal mains voltage. The nominal voltage shall be the declared voltage, or any of the declared voltages, for which the equipment was designed.

Lead-acid battery power sources used on vehicles

When the radio equipment is intended for operation with the usual types of regulated lead-acid battery power source, the normal test voltage shall be 1,1 multiplied by the nominal voltage of the battery (e.g. 6 V, 12 V, etc.).

Other power sources

For operation from other power sources or types of battery (primary or secondary), the normal test voltage shall be that declared by the equipment provider and agreed by the test laboratory.

TEST POWER SOURCE	<input checked="" type="checkbox"/> External <input type="checkbox"/> Internal
POWER SUPPLY	External: DC power
NOMINAL VOLTAGE	12Vdc
NOMINAL POWER or MAX CURRENT	Not declared
TEMPERATURE	24°C
HUMIDITY	45%

1.2.2 Extreme test conditions

Extreme temperatures

For tests at extreme temperatures, measurements shall be made in accordance with the procedures specified in clause 5.3.4.3, at the upper and lower temperatures of the range as follows:

- temperature: -20°C to +55°C;

Where the manufacturer's stated operating range does not include the range of -20°C to +55°C, the equipment shall be tested over the following temperature ranges:

- a) 0°C to +35°C for equipment intended for indoor use only, or intended for use in areas where the temperature is controlled within this range;
- b) over the extremes of the operating temperature range(s) of the stated combination(s) or host equipment(s) in case of plug-in radio devices.

The frequency range as in clause 4.3.3.2 and the e.i.r.p. limit in clause 4.3.1.2 shall not be exceeded.

The temperature range used during testing shall be recorded and shall be stated in the user manual.

Extreme power source voltages

Tests at extreme power source voltages specified below are not required when the equipment under test is designed for operation as part of and powered by another system or piece of equipment. Where this is the case, the limit values of the host equipment or combined equipment shall apply. The appropriate limit values shall be stated by the manufacturer and recorded.

Mains voltage

The extreme test voltage for equipment to be connected to an AC mains source shall be the nominal mains voltage $\pm 10\%$.

Lead-acid battery power sources used on vehicles

When radio equipment is intended for operation from the usual type of alternator fed lead-acid battery power source used on vehicles, then extreme test voltage shall be 1,3 and 0,9 times the nominal voltage of the battery (6 V, 12 V, etc.).

Power sources using other type of batteries

The lower extreme test voltages for equipment with power sources using the following types of battery shall be:

- for the Leclanché or lithium type battery: 0,85 times the nominal voltage of the battery;
- for the mercury or nickel-cadmium type of battery: 0,9 times the nominal voltage of the battery.

In both cases, the upper extreme test voltage shall be 1,15 times the nominal voltage of the battery.

Other power sources

For equipment using other power sources, or capable of being operated from a variety of power sources (primary or secondary), the extreme test voltages shall be those stated by the manufacturer and shall be recorded.

Extreme temperature range :	Not applicable
Extreme test voltages:	Not applicable

1.3 Testing of host connected equipment and plug-in radio devices

For combined equipment and for radio parts for which connection to or integration with host equipment is required to offer functionality to the radio, different alternative test approaches are permitted.

Where more than one such combination is intended, testing shall not be repeated for combinations of the radio part and various host equipment where the latter are substantially similar.

Where more than one such combination is intended and the combinations are not substantially similar, one combination shall be tested against all requirements of the present document and all other combinations shall be tested separately for radiated spurious emissions only.

The use of a host or test jig for testing Plug-In radio devices

Where the radio part is a plug-in radio device which is intended to be used within a variety of combinations, a suitable test configuration consisting of either a test jig or a typical host equipment shall be used. This shall be representative for the range of combinations in which the device may be used. The test jig shall allow the radio equipment part to be powered and stimulated as if connected to or inserted into host or combined equipment. Measurements shall be made to all requirements of the present document.

Testing of combinations

Alternative A: General approach for combinations

Combined equipment or a combination of a plug-in radio device and a specific type of host equipment may be used for testing according to the full requirements of the present document.

Alternative B: For host equipment with a plug-in radio device

A combination of a plug-in radio device and a specific type of host equipment may be used for testing according to the full requirements of the present document.

For radiated emission tests the most appropriate standard shall be applied to the host equipment. The plug-in radio device shall meet the radiated emissions requirements as described in clauses 4.3.6 and 4.3.7.

Alternative C: For combined equipment with a plug-in radio device

Combined equipment may be used for testing according to the full requirements of the present document. For radiated emissions the requirements of the most appropriate harmonized EMC standard shall be applied to the non-radio equipment. The plug-in radio device shall meet the radiated emissions requirements as described in clauses 4.3.6 and 4.3.7. In the case where the plug-in radio device is totally integrated and cannot operate independently, radiated emissions for the combination shall be tested using the most appropriate harmonized standard with the radio part in receive and/or standby mode. If the frequency range is less than the one defined in the present document, additional measurements shall be performed to cover the remaining parts of the frequency range. With the radio in transmit mode, the radiated emissions requirements of the present document shall be applied.

Alternative D: For equipment with multiple radios

Multi-radio equipment, where at least one of the radio parts is within the scope of the present document, may be used for testing according to the full requirements of the present document. Additional requirements and limits for multi-radio equipment are set out in the relevant harmonized radio product standards applicable to the other radio parts. When measuring spurious emissions in the receive and/or standby mode, it is essential that none of the transmitters within the combined equipment are transmitting.

The spurious emissions from each radio can be identified

Where the spurious emissions from each radio can be identified, then the spurious emissions from each radio are assessed to the relevant harmonized radio standard.

The spurious emissions from each radio cannot be identified

Where the spurious emissions from each radio cannot be identified, then the combined equipment is assessed to the spurious emission requirements contained in all of the relevant harmonized radio standards applicable to the radios contained within the combined product.

Where the applicable harmonized radio standards contain different limits and measuring conditions, then the combined product is assessed to the harmonized radio standard that specifies the least stringent limits for the common part of the frequency measurement ranges. To assess the remaining parts of the frequency measurement ranges the limits from the relevant harmonized radio standard should be used.

Configurations

n°	Plug-in Radio Device	Host/Test Jig Device	Notes
1		EUT	----

Testing Approach

Alternative	Test Configuration	Notes
<input type="checkbox"/> A		
<input type="checkbox"/> B		
<input checked="" type="checkbox"/> C	EUT	---
<input type="checkbox"/> D		

2 HARMONIZED STANDARDS REQUIREMENTS AND CONFORMANCE TEST SPECIFICATIONS

Harmonized Standard ETSI EN 300 328						
The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive [1]						
Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
1	RF Output Power	4.3.1.2 or 4.3.2.2	U		E	5.3.2
2	Power Spectral Density	4.3.2.3	C	Only for modulations other than FHSS	E	5.3.3
3	Duty cycle, Tx-Sequence, Tx-gap	4.3.1.3 or 4.3.2.4	C	Only for non-adaptive equipment	E	5.3.2
4	Accumulated Transmit time, Frequency Occupation & Hopping Sequence	4.3.1.4	C	Only for FHSS	E	5.3.4
5	Hopping Frequency Separation	4.3.1.5	C	Only for FHSS	E	5.3.5
6	Medium Utilization	4.3.1.6 or 4.3.2.5	C	Only for non-adaptive equipment	E	5.3.2
7	Adaptivity	4.3.1.7 or 4.3.2.6	C	Only for adaptive equipment	E	5.3.7 (see note)
8	Occupied Channel Bandwidth	4.3.1.8 or 4.3.2.7	U		E	5.3.8
9	Transmitter unwanted emissions in the OOB domain	4.3.1.9 or 4.3.2.8	U		E	5.3.9
10	Transmitter unwanted emissions in the spurious domain	4.3.1.10 or 4.3.2.9	U		E	5.3.10
11	Receiver spurious emissions	4.3.1.11 or 4.3.2.10	U		E	5.3.11
12	Receiver Blocking	4.3.1.12 or 4.3.2.11	C	Only for adaptive equipment	E	5.3.7 (see note)
13	Geo-location capability	4.3.1.13 or 4.3.2.12	C	If implemented	X	

NOTE: Compliance with the Adaptivity and Receiver Blocking requirements is verified with a single test which is referred to in clause 5.3.7.

Key to columns:

Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement or its test specification.

Description A textual reference to the requirement.

Clause Number Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C Indicates whether the requirement is to be *unconditionally* applicable (U) or is *conditional* upon the manufacturers claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement shall or shall not be applicable for a requirement which is classified "conditional".

Test Specification:

E/O Indicates whether the test specification forms part of the Essential Radio Test Suite (E) or whether it is one of the Other Test Suite (O).

NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement. The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

Clause Number Identification of clause(s) defining the test specification in the present document unless

3 REFERENCE STANDARDS FOR PERFORMED TESTS

EN 300 328 V2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
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4 EUT OPERATING CONDITIONS

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item "Operating condition of the equipment under test"

Operating condition	Description
#1	Continuous transmission modulated, carrier

5 SUMMARY OF TEST RESULTS

TRANSMITTER PARAMETERS (TX)		
TEST	PERFORMED	RESULT
Transmitter unwanted emissions in the spurious domain	YES	WITHIN THE LIMITS
Note :NA = Non applicabile, NR = Non Richiesto dal cliente		
Abbreviations/Symbols : NA = Not Applicable, NR = Not Requested by the Client		

6 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
Occupied channel BW	±5%
RF Output Power, conducted	±1,5dB
Power spectral density, conducted	±3dB
All Emissions Radiated	±6dB
Temperature	±1°C
Humidity	±5%
DC Voltage	±3%
AC Voltage	±3%
Time	±5%

7 LIST OF INSTRUMENTS USED

Instrument	Mod	Calibration Interval
Emi Reciver / analyzer	R&S ESU 40	1 year
Antenna	Chase CBL6111	
Antenna	R&S HL050	
Semi-Anechoic Chamber	Siemens Matsushita	

8 MEASUREMENTS RESULTS

TRANSMITTER UNWANTED EMISSION IN THE SPURIOUS DOMAINS.....16



**TEST
1.**

**TRANSMITTER UNWANTED EMISSION IN THE SPURIOUS
DOMAINS**

- **TEST SETUP:** In according to reference standards
- **TEST LOCATION:** Semi-anechoic chamber with measure distance at 3 meters
- **TEST EQUIPMENT USED FOR TEST:**
 - EMI Receiver Rodhe&Schwarz mod. ESU40
 - Bilog antenna CHASE mod. CBL6111A
 - Bilog antenna Rodhe&Schwarz HBL050

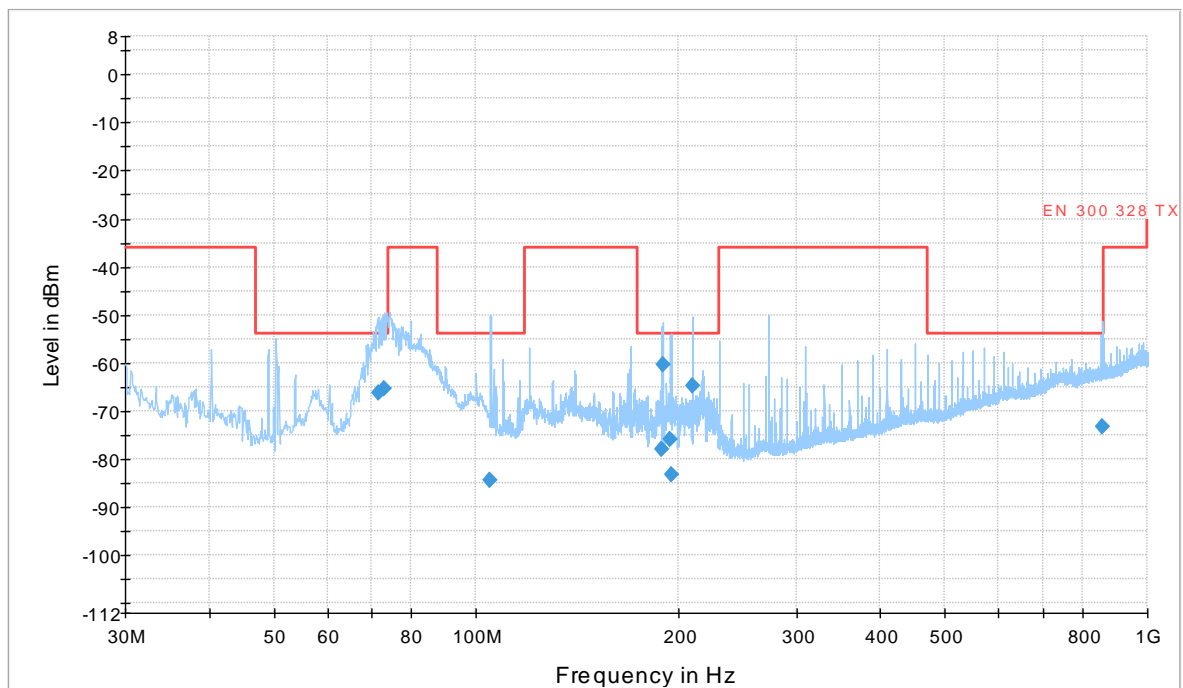
TEST CONDITIONS:		MEASURED
Ambient temperature :	23°C±5°C	24 °C
Ambient humidity :	25 – 75 %rH	45%
Pressure :	85 – 106 kPa (860 mbar – 1060 mbar)	960 mbar
Voltage :		12Vdc

OPERATING CONDITION (Rif. Section. 2) : #1

RESULT: WITHIN THE LIMITS

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	B
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	30MHz – 1GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

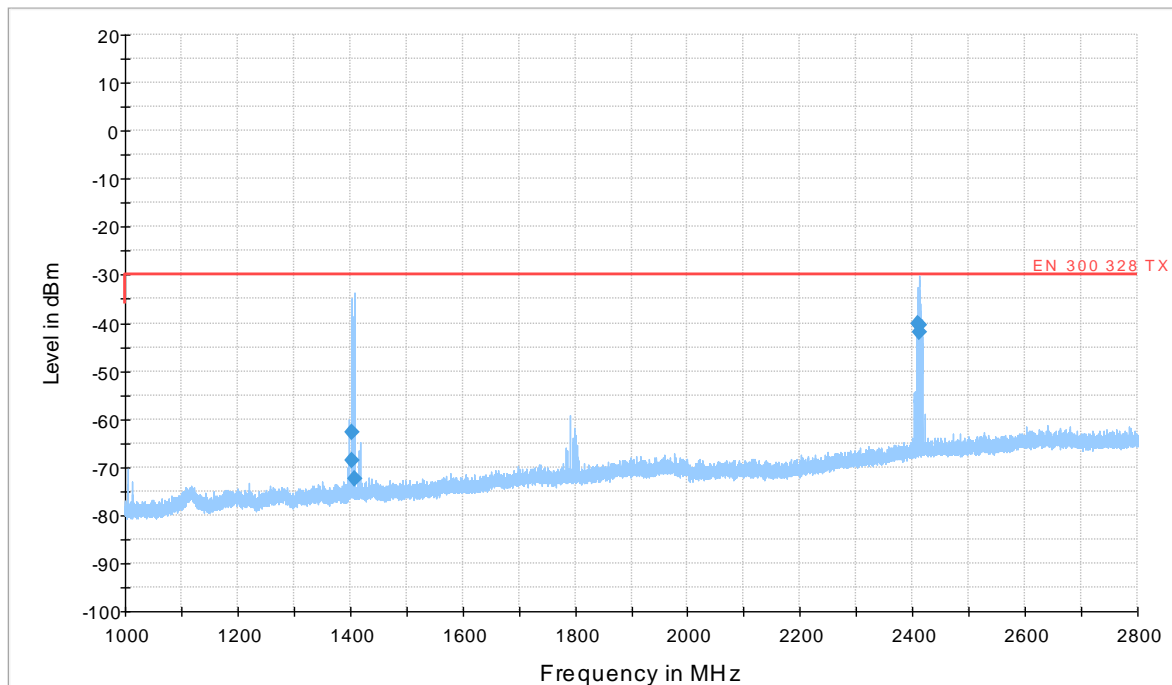


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)
71.419000	-66.2	100.0	V	269.0	12.2	-54.0
73.068000	-65.5	100.0	V	215.0	11.5	-54.0
104.981000	-84.6	135.0	V	135.0	30.6	-54.0
188.692000	-78.1	168.0	H	-15.0	24.1	-54.0
189.953000	-60.4	411.0	V	279.0	6.4	-54.0
194.706000	-75.9	411.0	V	251.0	21.9	-54.0
195.579000	-83.4	103.0	H	-2.0	29.4	-54.0
209.935000	-64.8	103.0	H	0.0	10.8	-54.0
858.186000	-73.2	356.0	H	292.0	19.2	-54.0

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	B
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	1GHz – 2,8GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

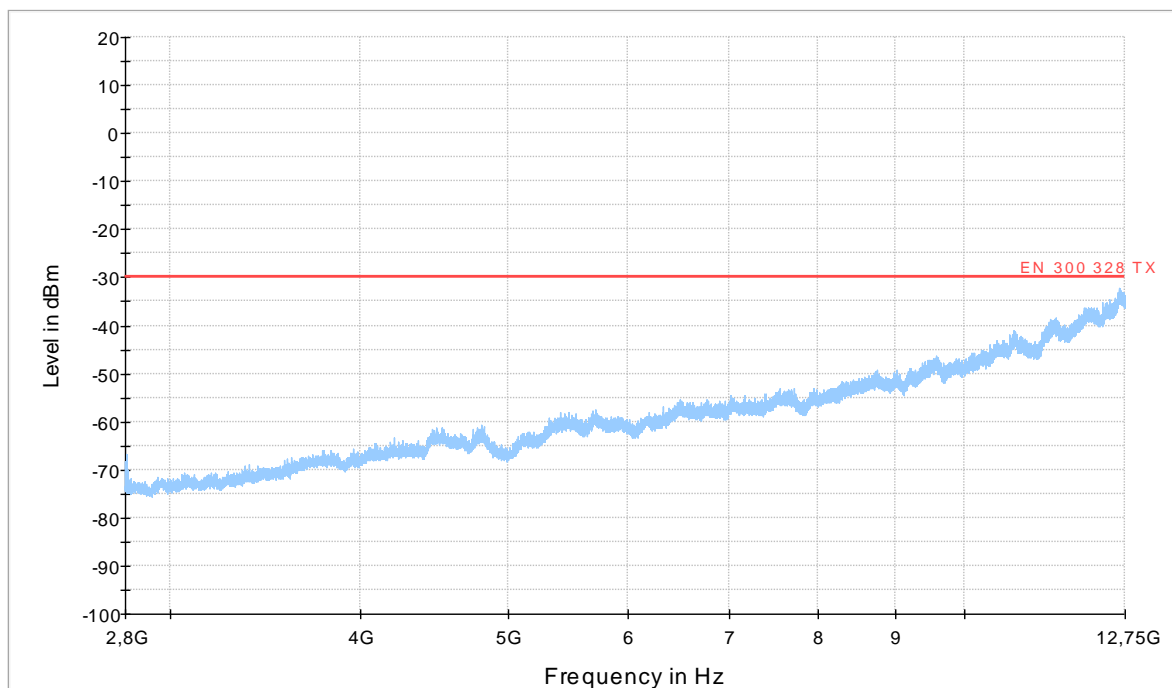


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)	Note
1401.940000	-68.5	117.0	H	139.0	38.5	-30.0	
1403.500000	-62.8	144.0	V	179.0	32.8	-30.0	
1407.160000	-72.3	100.0	V	278.0	42.3	-30.0	
2409.520000	-40.1	203.0	V	278.0	10.1	-30.0	Carrier
2411.200000	-41.8	202.0	V	315.0	11.8	-30.0	Carrier
2413.000000	-40.3	133.0	V	179.0	10.3	-30.0	Carrier

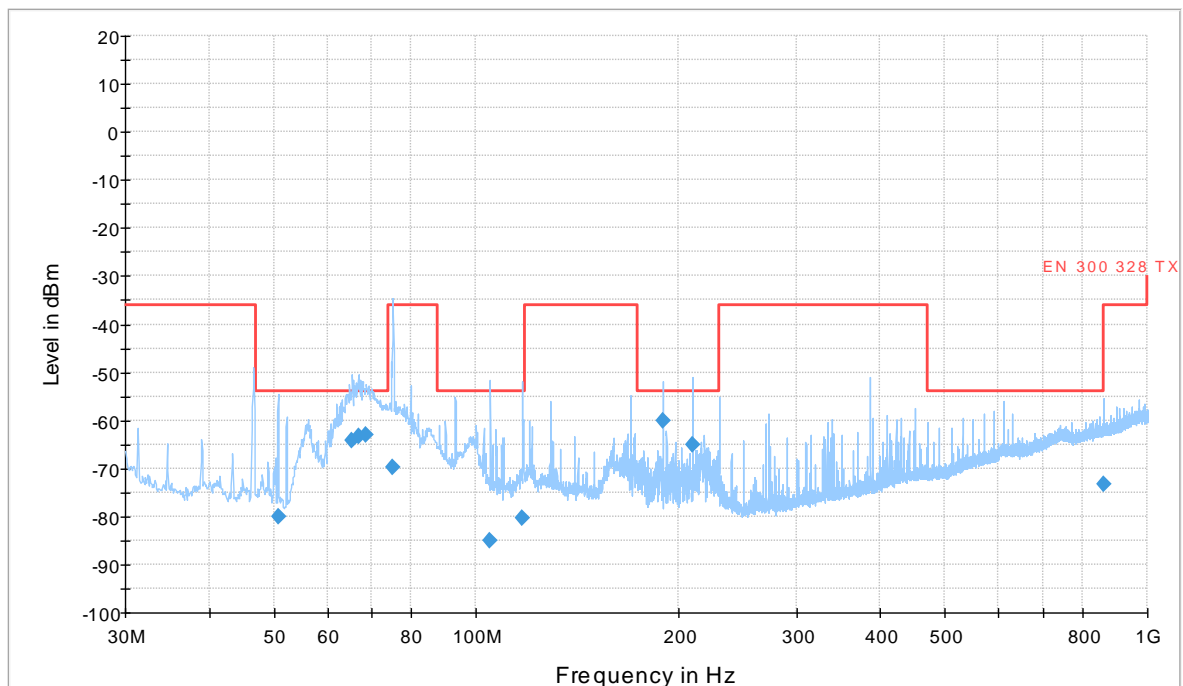
TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	B
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	2,8GHz – 12,75GHz
TEMPERATURE	24°C

EN300328_spurious_sweep



TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	B
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	30MHz – 1GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

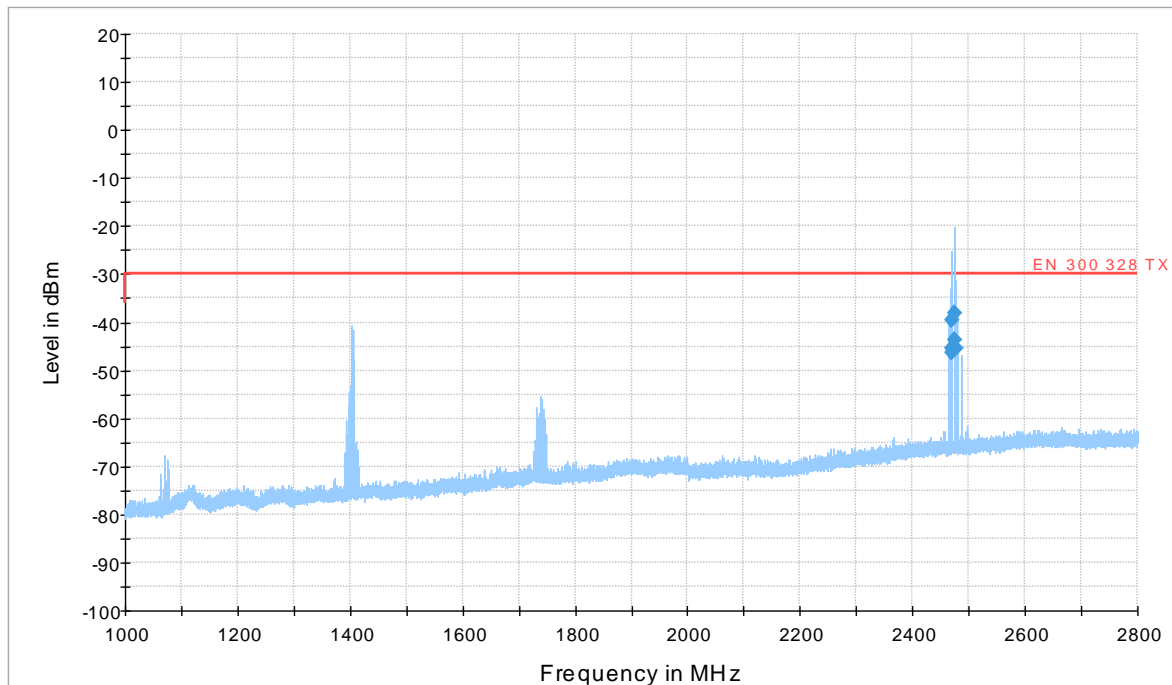


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)
50.758000	-80.2	358.0	H	268.0	26.2	-54.0
65.405000	-64.2	101.0	V	277.0	10.2	-54.0
66.763000	-63.3	100.0	V	237.0	9.3	-54.0
68.606000	-63.0	100.0	V	250.0	9.0	-54.0
75.105000	-69.7	130.0	V	202.0	33.7	-36.0
104.981000	-84.9	117.0	H	314.0	30.9	-54.0
117.106000	-80.4	101.0	V	-2.0	26.4	-54.0
189.953000	-60.0	101.0	H	99.0	6.0	-54.0
209.935000	-65.1	100.0	V	268.0	11.1	-54.0
860.805000	-73.2	101.0	H	225.0	19.2	-54.0

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	B
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	1GHz – 2,8GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

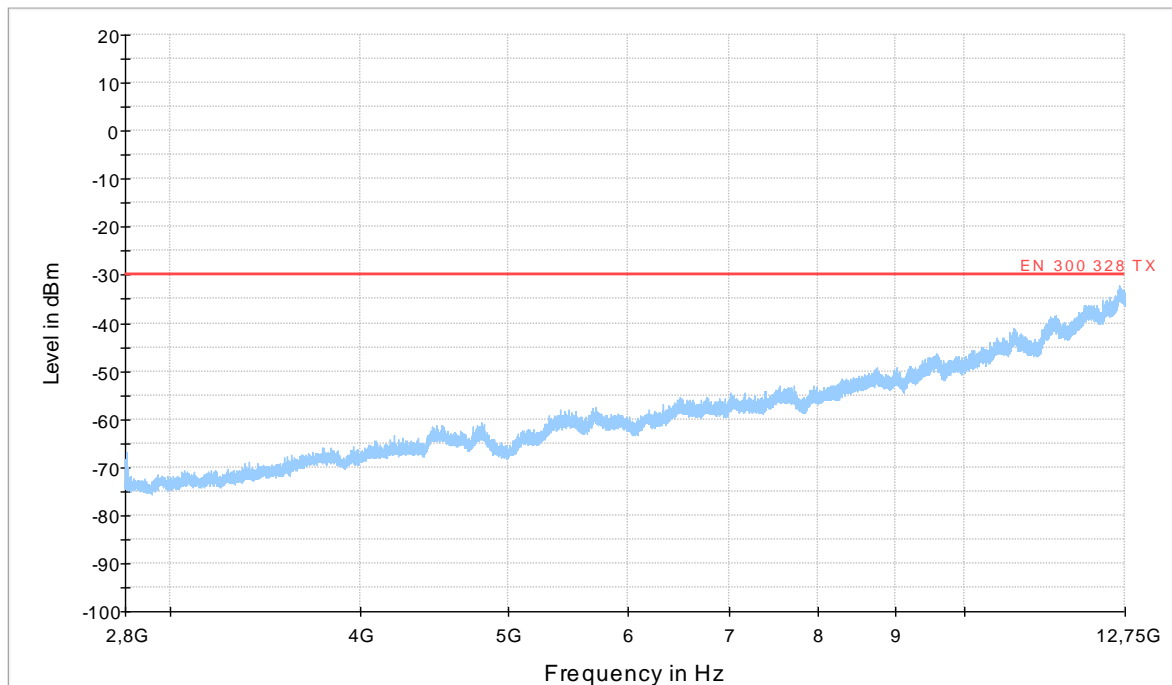


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)	Note
2468.980000	-46.3	184.0	H	90.0	16.3	-30.0	Carrier
2469.520000	-39.6	100.0	V	314.0	9.6	-30.0	Carrier
2470.300000	-45.5	135.0	V	134.0	15.5	-30.0	Carrier
2473.900000	-38.1	101.0	V	187.0	8.1	-30.0	Carrier
2474.680000	-43.6	177.0	H	90.0	13.6	-30.0	Carrier
2477.800000	-45.5	102.0	V	1.0	15.5	-30.0	Carrier

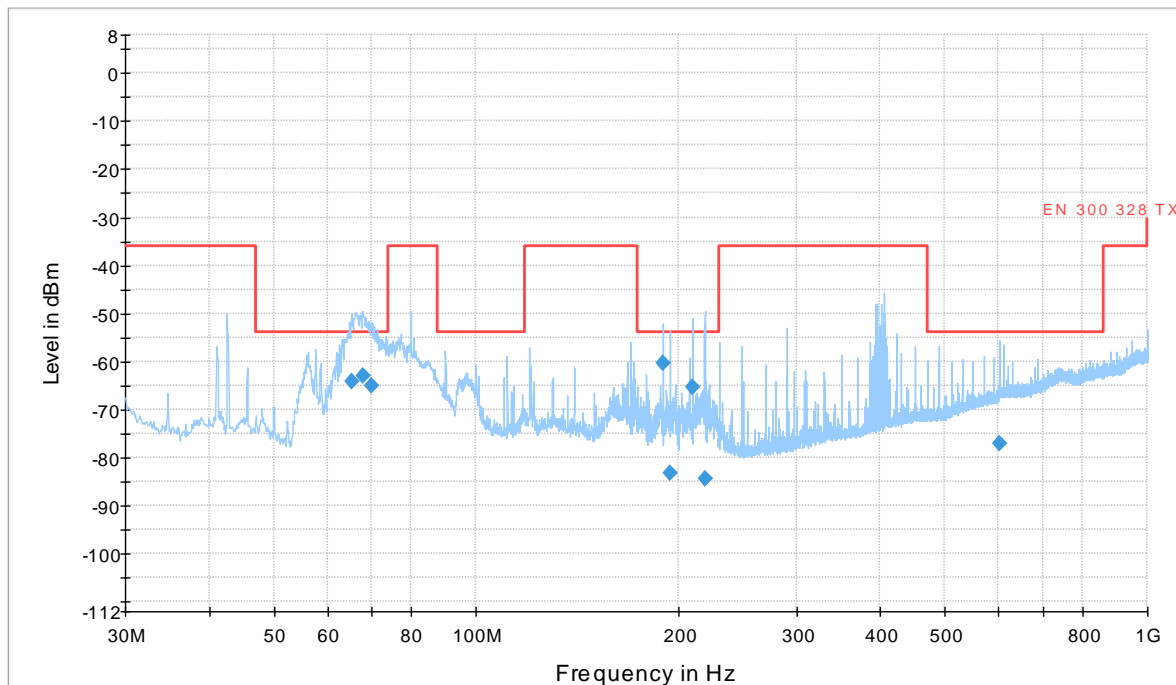
TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	B
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	2,8GHz – 12,75GHz
TEMPERATURE	24°C

EN300328_spurious_sweep



TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	G
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	30MHz – 1GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

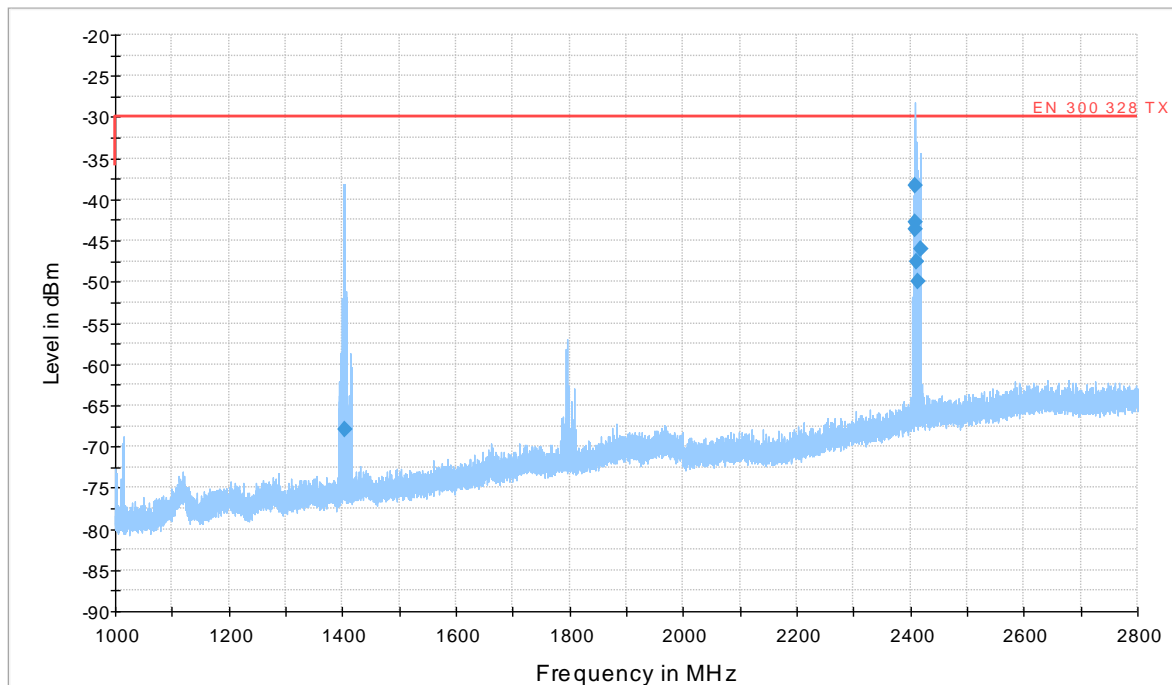


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)
65.211000	-64.3	100.0	V	237.0	10.3	-54.0
67.733000	-63.1	100.0	V	91.0	9.1	-54.0
69.964000	-65.0	100.0	V	201.0	11.0	-54.0
189.953000	-60.3	115.0	H	99.0	6.3	-54.0
194.221000	-83.4	163.0	H	-2.0	29.4	-54.0
209.935000	-65.3	116.0	V	269.0	11.3	-54.0
218.956000	-84.4	117.0	H	99.0	30.4	-54.0
602.979000	-77.1	116.0	V	202.0	23.1	-54.0

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	G
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	1GHz – 2,8GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

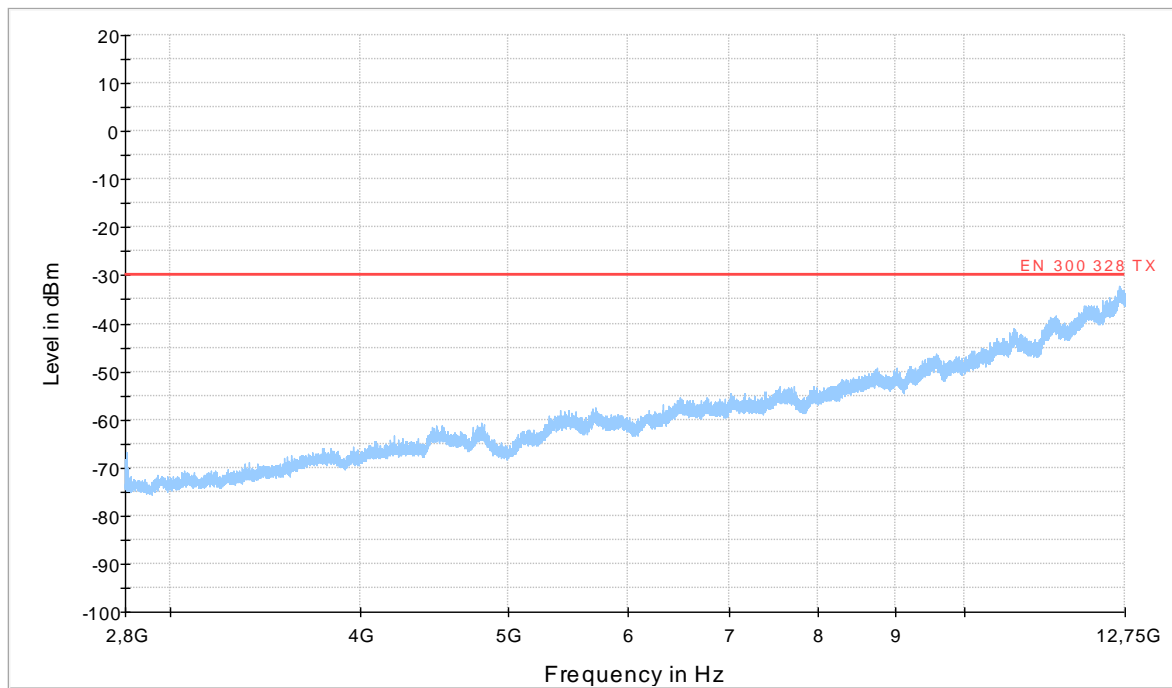


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)	Note
1404.940000	-67.8	129.0	H	179.0	37.8	-30.0	
2407.180000	-43.6	201.0	V	224.0	13.6	-30.0	Carrier
2407.960000	-42.7	201.0	V	45.0	12.7	-30.0	Carrier
2408.860000	-38.3	100.0	V	276.0	8.3	-30.0	Carrier
2411.440000	-47.6	134.0	H	98.0	17.6	-30.0	Carrier
2412.460000	-50.0	316.0	H	179.0	20.0	-30.0	Carrier
2418.760000	-46.1	100.0	V	23.0	16.1	-30.0	Carrier

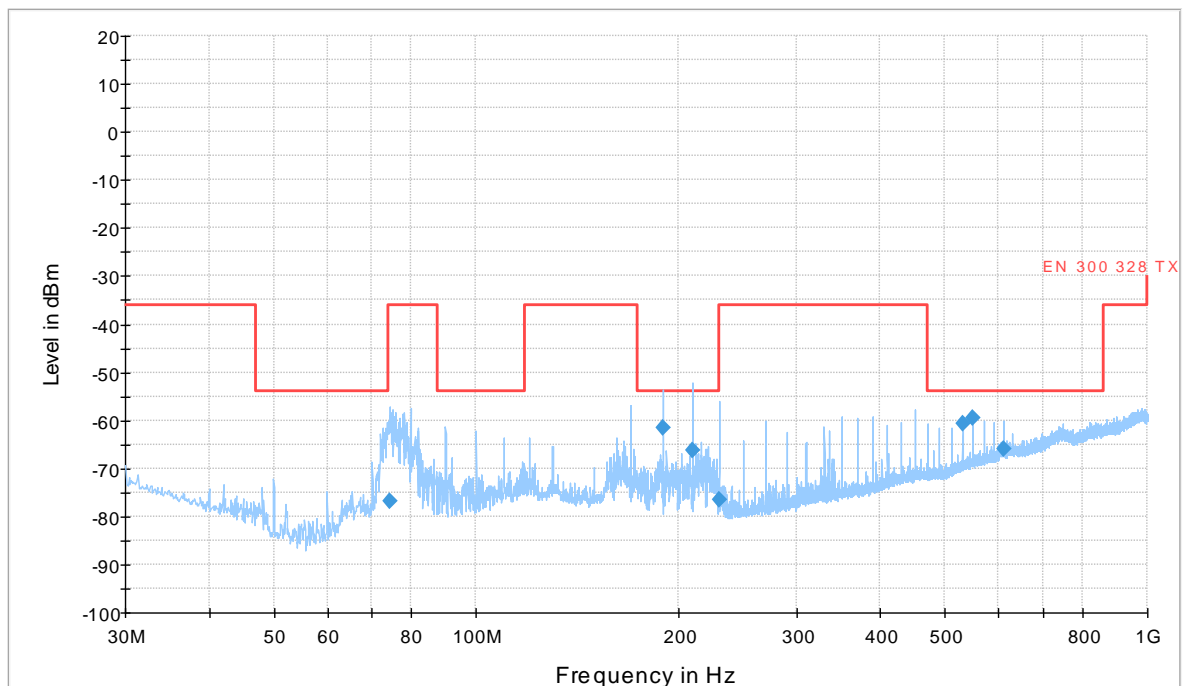
TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	G
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	2,8GHz – 12,75GHz
TEMPERATURE	24°C

EN300328_spurious_sweep



TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	G
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	30MHz – 1GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

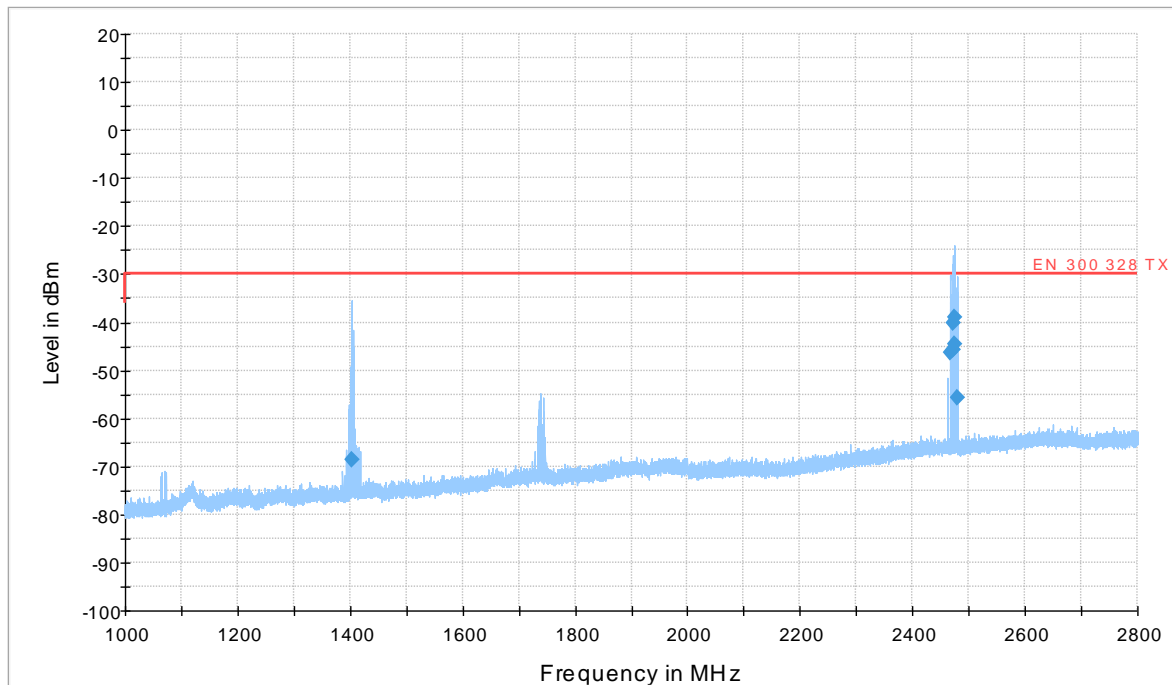


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)
74.329000	-76.7	129.0	V	187.0	40.7	-36.0
189.953000	-61.5	117.0	H	99.0	7.5	-54.0
209.935000	-66.1	115.0	V	269.0	12.1	-54.0
229.917000	-76.6	133.0	V	279.0	22.6	-54.0
530.035000	-60.7	115.0	V	174.0	6.7	-54.0
550.017000	-59.6	101.0	V	146.0	5.6	-54.0
610.060000	-65.9	100.0	V	160.0	11.9	-54.0

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	G
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	1GHz – 2,8GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

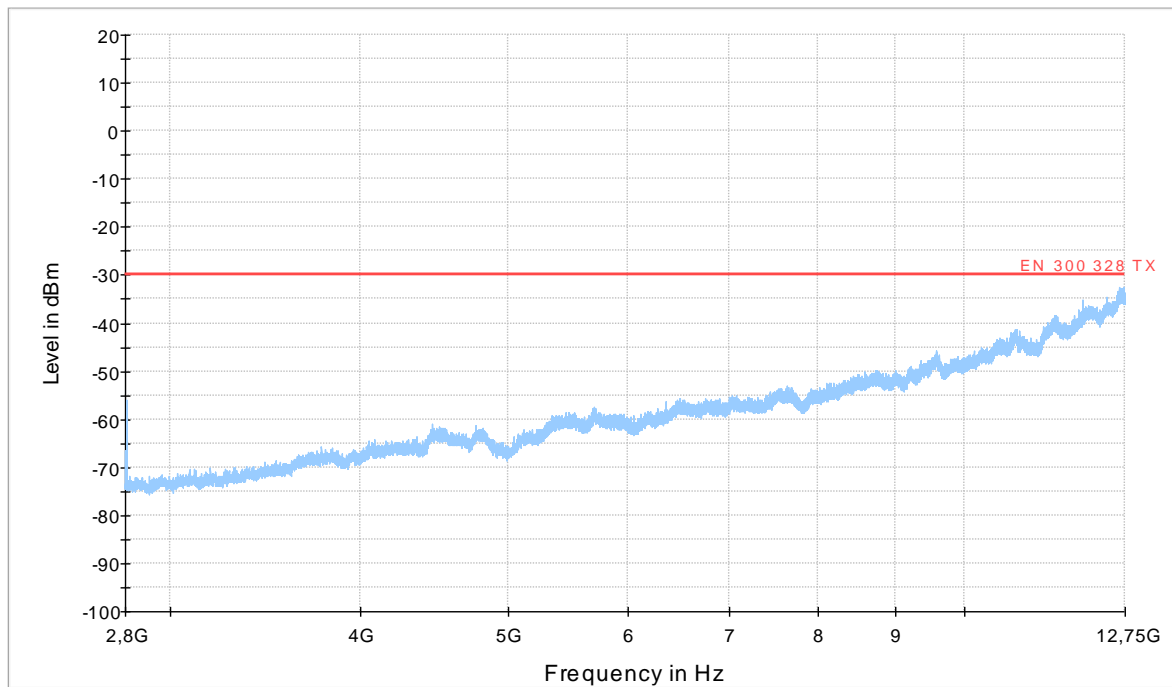


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)	Note
1404.040000	-68.5	160.0	V	83.0	38.5	-30.0	
2467.480000	-46.4	215.0	V	88.0	16.4	-30.0	Carrier
2471.200000	-40.2	100.0	V	37.0	10.2	-30.0	Carrier
2472.880000	-45.8	198.0	H	173.0	15.8	-30.0	Carrier
2474.920000	-39.0	100.0	V	179.0	9.0	-30.0	Carrier
2475.640000	-44.5	204.0	H	90.0	14.5	-30.0	Carrier
2479.840000	-55.7	214.0	V	136.0	25.7	-30.0	Carrier

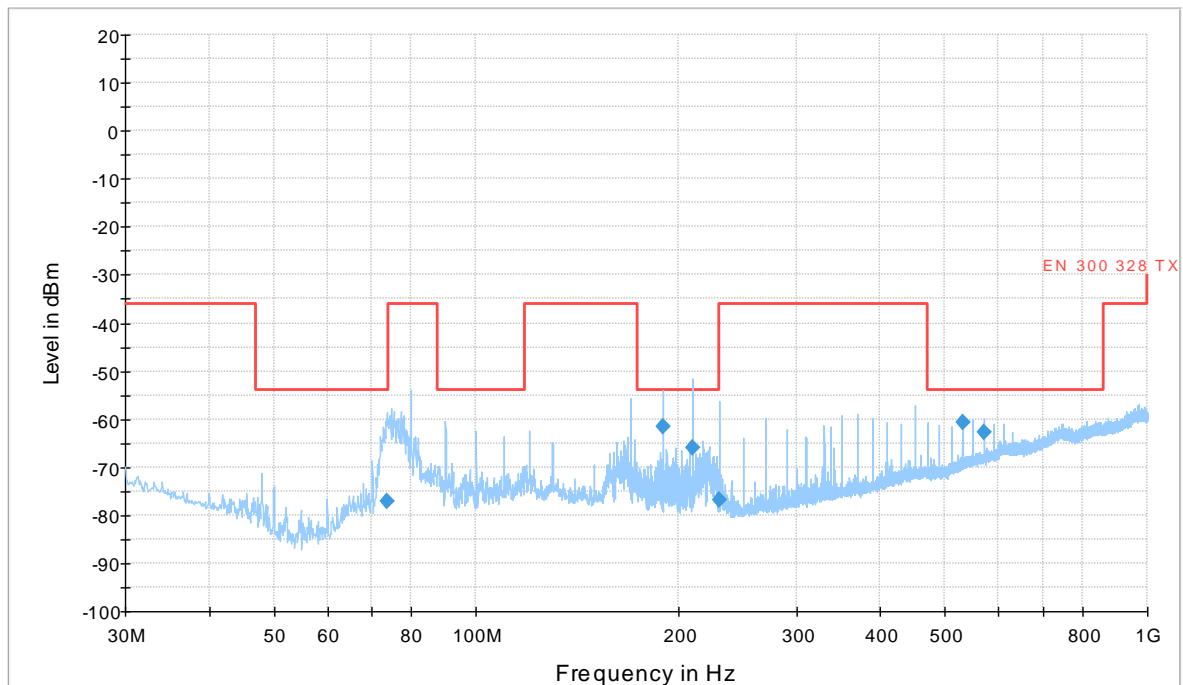
TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	G
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	2,8GHz – 12,75GHz
TEMPERATURE	24°C

EN300328_spurious_sweep



TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	N-20
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	30MHz – 1GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

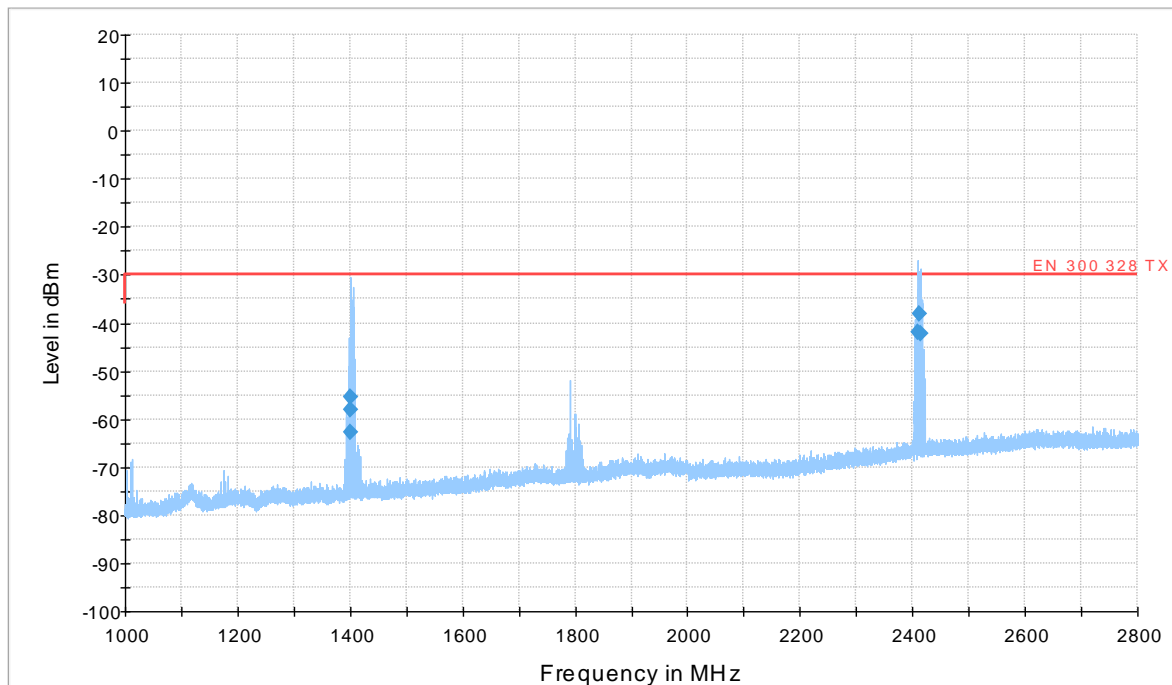


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)
73.650000	-77.0	133.0	V	188.0	23.0	-54.0
189.953000	-61.6	117.0	H	99.0	7.6	-54.0
209.935000	-65.9	127.0	V	269.0	11.9	-54.0
229.917000	-76.7	130.0	V	269.0	22.7	-54.0
530.035000	-60.8	117.0	V	174.0	6.8	-54.0
569.999000	-62.7	100.0	V	147.0	8.7	-54.0

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	N-20
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	1GHz – 2,8GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

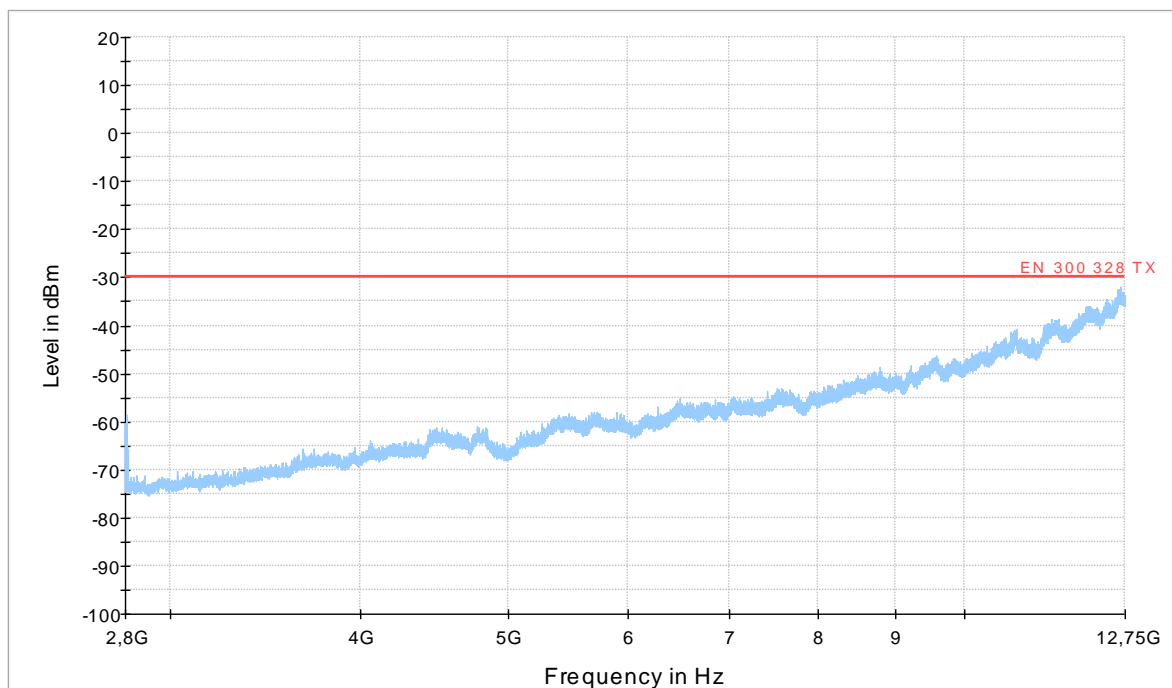


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)	Note
1399.660000	-62.6	334.0	H	83.0	32.6	-30.0	
1400.740000	-58.1	287.0	H	84.0	28.1	-30.0	
1401.100000	-55.3	292.0	H	1.0	25.3	-30.0	
2408.980000	-41.9	212.0	H	10.0	11.9	-30.0	Carrier
2413.060000	-38.2	204.0	V	97.0	8.2	-30.0	Carrier
2414.680000	-42.3	334.0	H	84.0	12.3	-30.0	Carrier

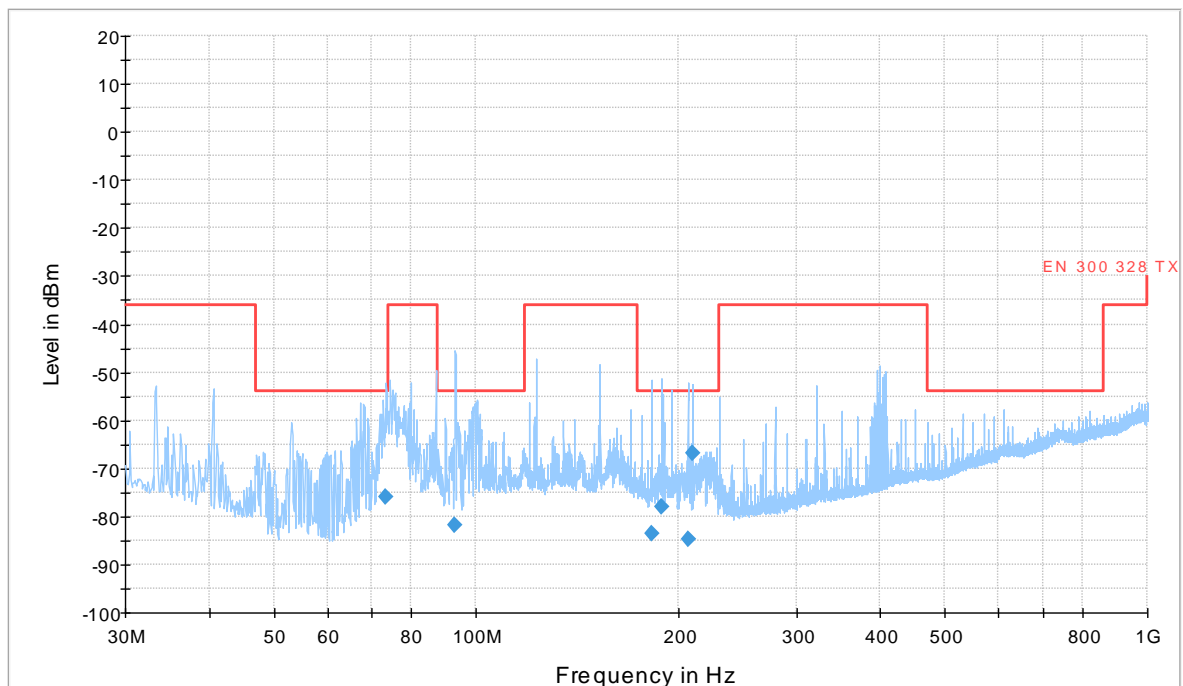
TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	1
MODE	N-20
CARRIER FREQUENCY	2412MHz
FREQUENCY RANGE	2,8GHz – 12,75GHz
TEMPERATURE	24°C

EN300328_spurious_sweep



TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	N-20
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	30MHz – 1GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

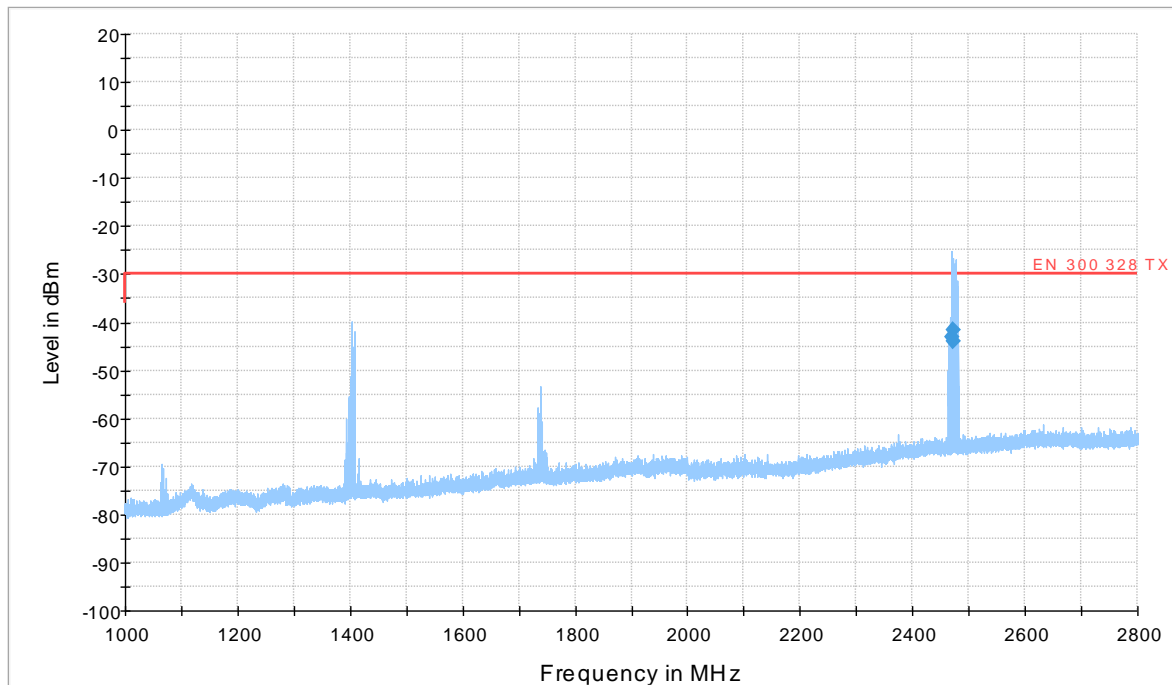


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)
73.456000	-75.8	131.0	V	225.0	21.8	-54.0
93.050000	-81.7	307.0	H	174.0	27.7	-54.0
182.678000	-83.6	117.0	H	90.0	29.6	-54.0
189.177000	-78.0	202.0	H	303.0	24.0	-54.0
206.734000	-84.6	100.0	V	270.0	30.6	-54.0
209.935000	-66.7	128.0	V	270.0	12.7	-54.0

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	N-20
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	1GHz – 2,8GHz
TEMPERATURE	24°C

EN300328_spurious_sweep

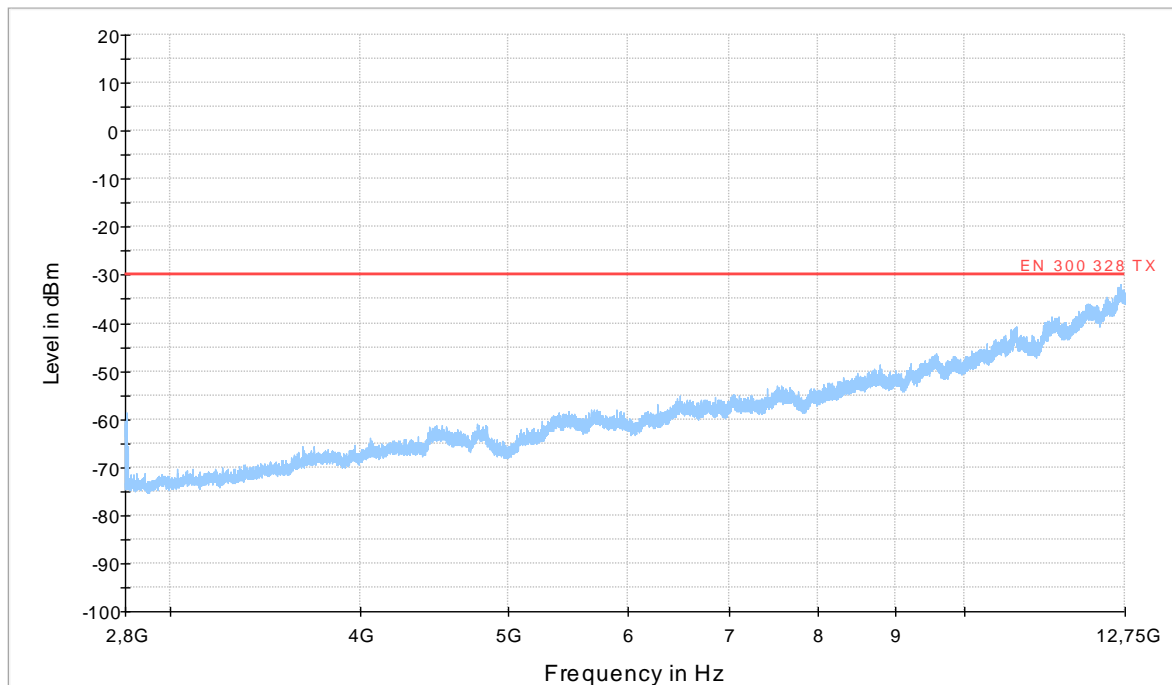


Final Result

Frequency (MHz)	RMS (dBm)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBm)	Note
2468.920000	-43.2	256.0	H	22.0	13.2	-30.0	Carrier
2471.440000	-44.1	261.0	H	224.0	14.1	-30.0	Carrier
2472.220000	-41.5	100.0	V	249.0	11.5	-30.0	Carrier

TYPE OF MEASUREMENT	RADIATED
TEST CONDITION	NORMAL
OPERATING CONDITION	#1
CHANNEL	13
MODE	N-20
CARRIER FREQUENCY	2472MHz
FREQUENCY RANGE	2,8GHz – 12,75GHz
TEMPERATURE	24°C

EN300328_spurious_sweep



9 PHOTOGRAPHIC DOCUMENTATION

PHOTO 1 – EUT IDENTIFICATION

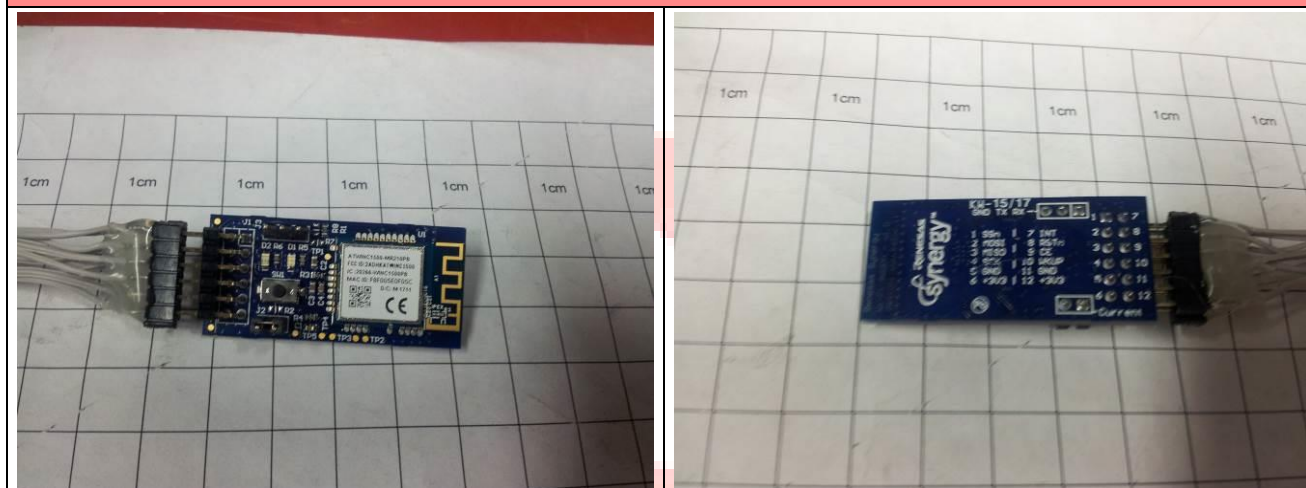


PHOTO 2 – RADIATED EMISSION

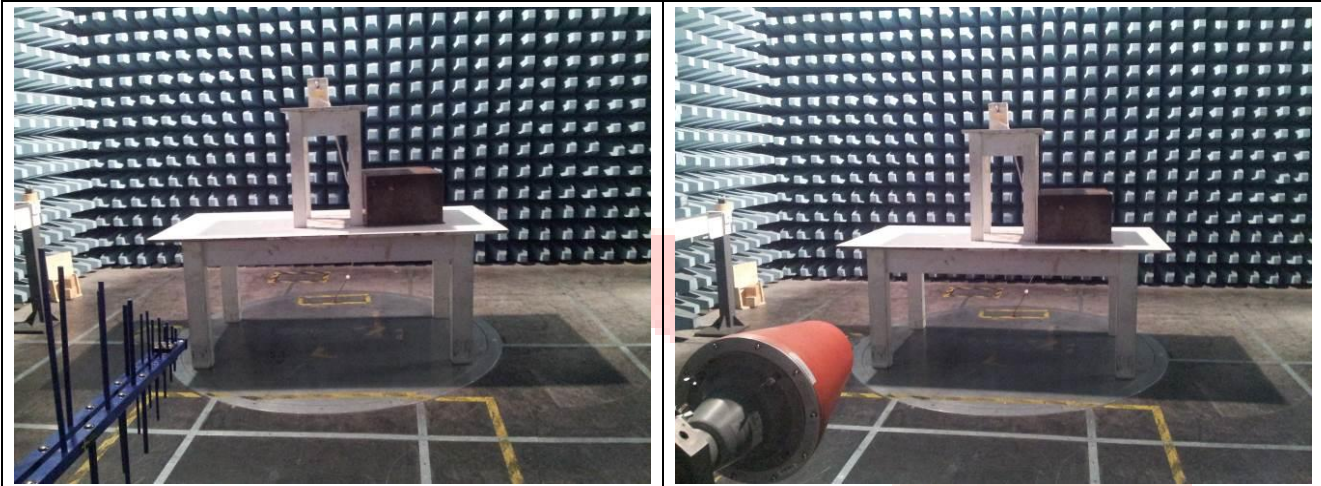


PHOTO 3 – AUXILIARY EQUIPMENT IDENTIFICATION

