

TEST REPORT

Product Name : DMX512APP
Model Number : GFC007

Prepared for : Shenzhen Greatfaronian Electronic CO., LTD
Address : 5F,Tongfuyu Industrial Park,Lezhujiao ,Zhoushi Road,
Baoan District, Shenzhen,China 518126

Prepared by : EMTEK(DONGGUAN) CO., LTD.
Address : Room 111&112, Building 8, -1&2/F., Office Building2, Zone
A, Zhongda Marine Biotechnology Research and
Development Base, No.9, Xincheng Avenue, Songshan
Lake High-Tech Industrial Development Zone, Dongguan,
Guangdong, China

Tel : +86-0769-22807078
Fax: +86-0769-22807079

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1. TEST RESULT CERTIFICATION

Applicant : Shenzhen Greatfavian Electronic CO., LTD
Address : 5F,Tongfuyu Industrial Park,Lezhujiao ,Zhoushi Road, Baoan District, Shenzhen,China 518126
Manufacturer : Shenzhen Greatfavian Electronic CO., LTD
Address : 5F,Tongfuyu Industrial Park,Lezhujiao ,Zhoushi Road, Baoan District, Shenzhen,China 518126
Factory : Shenzhen Greatfavian Electronic CO., LTD
Address : 5F,Tongfuyu Industrial Park,Lezhujiao ,Zhoushi Road, Baoan District, Shenzhen,China 518126
EUT : DMX512APP
Model : GFC007
Trademark : GFLAI


Measurement Procedure Used:


APPLICABLE STANDARDS		
STANDARD	METHODS OF MEASUREMENT	TEST RESULT
ETSI EN 300 220-2 V3.2.1(2018-06)	ETSI EN 300 220-1 V3.1.1(2017-02)	PASS


The device described above is tested by EMTEK (DONGGUAN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (DONGGUAN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the ETSI EN 300 220-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (DONGGUAN) CO., LTD.

Date of Test : Jul 04, 2024 to Oct 08, 2024

Prepared by : 
Jessica Zhang /Editor

Reviewer : 
Warren Deng /Supervisor

Approve & Authorized Signer : 
Sam Lv / Manager

2. EUT DESCRIPTION

Product:	DMX512APP
Model Number:	GFC007
Sample Number:	#1
Modulation:	ASK
Frequency Range:	Band H: 433.05-434.79MHz
Max Transmit Power:	-14.61dBm
Number of Channels:	1 channels
Antenna:	External Antenna
Antenna Gain:	2.62 dBi
Test Voltage:	DC 6.0 V from adapter
Date of Received:	Jul 04, 2024
Temperature Range:	-10°C to +55°C

Note: for more details, please refer to the User's manual of the EUT.

Modified Information

Version	Report No.	Revision Date	Summary
/	EDG2408190171E00403R	/	Original Report



3. SUMMARY OF TEST RESULT

All equipment conformance requirements			
Clause (EN 300 220-2)	Test Parameter	Verdict	Remark
4.2.1	Operating frequency	PASS	
4.2.2	Unwanted emissions in the spurious domain	PASS	
Transmitters conformance requirements			
Clause (EN 300 220-2)	Test Parameter	Verdict	Remark
4.3.1	Effective Radiated Power	PASS	
4.3.2	Maximum e.r.p. spectral density	N/A	Note 1
4.3.3	Duty Cycle	PASS	Note 2
4.3.4	Occupied Bandwidth	PASS	
4.3.5	Tx Out of Band Emissions	PASS	Note 3
4.3.6	Transient power	PASS	
4.3.7	Adjacent Channel Power	N/A	Note 4
4.3.8	TX behaviour under Low Voltage Conditions	PASS	Note 5
4.3.9	Adaptive Power Control	N/A	Note 6
4.3.10	FHSS equipment	N/A	Note 7
4.3.11	Short term behaviour	N/A	Note 8
Receivers conformance requirements			
Clause (EN 300 220-2)	Test Parameter	Verdict	Remark
4.4.1	RX sensitivity	N/A	Note 9
4.4.2	Blocking	PASS	
Polite spectrum access conformance requirement			
Clause (EN 300 220-2)	Test Parameter	Verdict	Remark
4.5.2	Clear Channel Assessment threshold	N/A	Note 10
4.5.3	Polite spectrum access timing parameters	N/A	Note 11
4.5.4	Adaptive Frequency Agility	N/A	Note 12
Note 0:	N/A (Not Applicable)		
Note 1:	Applies to EUT using annex B band I. Applies to EUT using DSSS or wideband techniques other than FHSS modulation, using annex C band W,AA or AC.		
Note 2:	Not applicable to EUT with polite spectrum access where permitted in annex B, table B.1.		
Note 3:	Applies to EUT with OCW > 25 kHz.		
Note 4:	Applies to EUT with OCW ≤ 25 kHz.		
Note 5:	Applies to battery powered EUT.		
Note 6:	Applies to EUT with adaptive power control using annex C band AF.		
Note 7:	Applies to FHSS EUT using the band 863 MHz to 870 MHz.		
Note 8:	Applies to EUT using annex C bands AD, AE, AF, AG, AH, or AI.		
Note 9:	Applies to EUT employing polite spectrum access.		
Note 10:	Applies to EUT employing polite spectrum access.		
Note 11:	Applies to EUT employing polite spectrum access.		
Note 12:	Applies to EUT with AFA.		

4. TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

ETSI EN 300 220-1 – Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz;
Part 1: Technical characteristics and methods of measurement

ETSI EN 300 220-2 –Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz;
Part 2: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
for non specific radio equipment

4.2 MEASUREMENT EQUIPMENT USED

For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCI	101415	2024/4/28	1Year
Signal Analyzer	R&S	FSV30	103039	2024/4/28	1 Year
Bi-log Hybrid Antenna	Schwarzbeck	VULB9163	141	2024/5/5	1Year
Pre-Amplifie	HP	8447F	OPTH64	2024/4/28	1 Year
Signal Analyzer	R&S	FSV30	103039	2024/4/28	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	1272	2024/5/5	1Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-567	2024/5/5	1Year
Pre-Amplifie	LUNAR EM	PM1-18-40	J10100000081	2024/4/28	1Year
Loop antenna	Schwarzbeck	FMZB1519	1519-012	2024/5/5	1Year
Test Software	Farad	Ver.RA-03A1	--	N/A	N/A

For other test items:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Wireless Connectivity Tester	R&S	CMW270	102543	2024/4/29	1Year
Automatic Control Unit	Tonscend	JS0806-2	21I8060480	2024/4/29	1Year
Signal Analyzer	KEYSIGHT	N9010B	MY60242456	2024/4/29	1Year
Analog Signal Generator	KEYSIGHT	N5173B	MY61252625	2024/4/29	1Year
UP/DOWN-Converter	R&S	CMW-Z800A	100274	2024/4/29	1Year
Vector Signal Generator	KEYSIGHT	N5182B	MY61252674	2024/4/29	1Year
Frequency Extender	KEYSIGHT	N5182BX07	MY59362541	2024/4/29	1Year
Temperature&Humidity test chamber	ESPEC	EL-02KA	12107166	2024/4/29	1 Year

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

The EUT has been tested under its typical operating condition. so those modulation and channel were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	433.92	/	/	/	/

Test Frequency and Channel list:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	433.92	/	/	/	/

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at EMTEK (DONGGUAN) CO., LTD.

Room 111&112, Building 8, -1&2/F., Office Building2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description
EMC Lab.

: Accredited by CNAS

The Certificate Registration Number is L6666.

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)

Designation by FCC

Designation Number: CN1302

Test Firm Registration Number: 436491

Accredited by A2LA

The certificate is valid until May 31, 2023

Accredited by Industry Canada

The Conformity Assessment Body Identifier is CN0114

Name of Firm
Site Location

: EMTEK (DONGGUAN) CO., LTD.

: Room 111&112, Building 8, -1&2/F., Office Building2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China

6. TEST SYSTEM UNCERTAINTY

Maximum measurement uncertainty of the test system

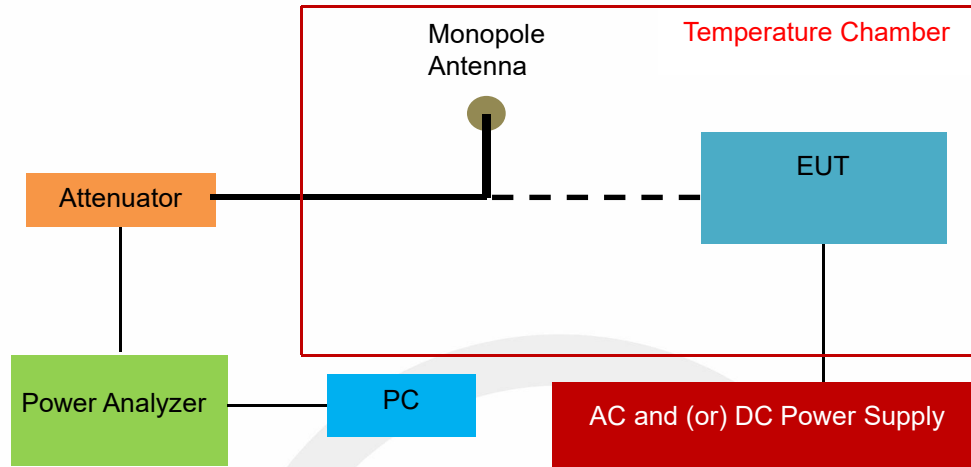
Test Parameter	Measurement Uncertainty
Radio frequency	± 0.5 ppm
RF power, conducted	± 1.5 dB
Conducted spurious emission of transmitter, valid up to 6 GHz	± 3 dB
Conducted emission of receivers	± 3 dB
Radiated emission of transmitter, valid up to 6 GHz	± 6 dB
Radiated emission of receiver, valid up to 6 GHz	± 6 dB
RF level uncertainty for a given BER	± 1.5 dB
Occupied BandWidth	± 5 %
Temperature	± 2.5 °C
Humidity	± 10 %



7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

Conducted measurements configuration of EUT shall be as follows:

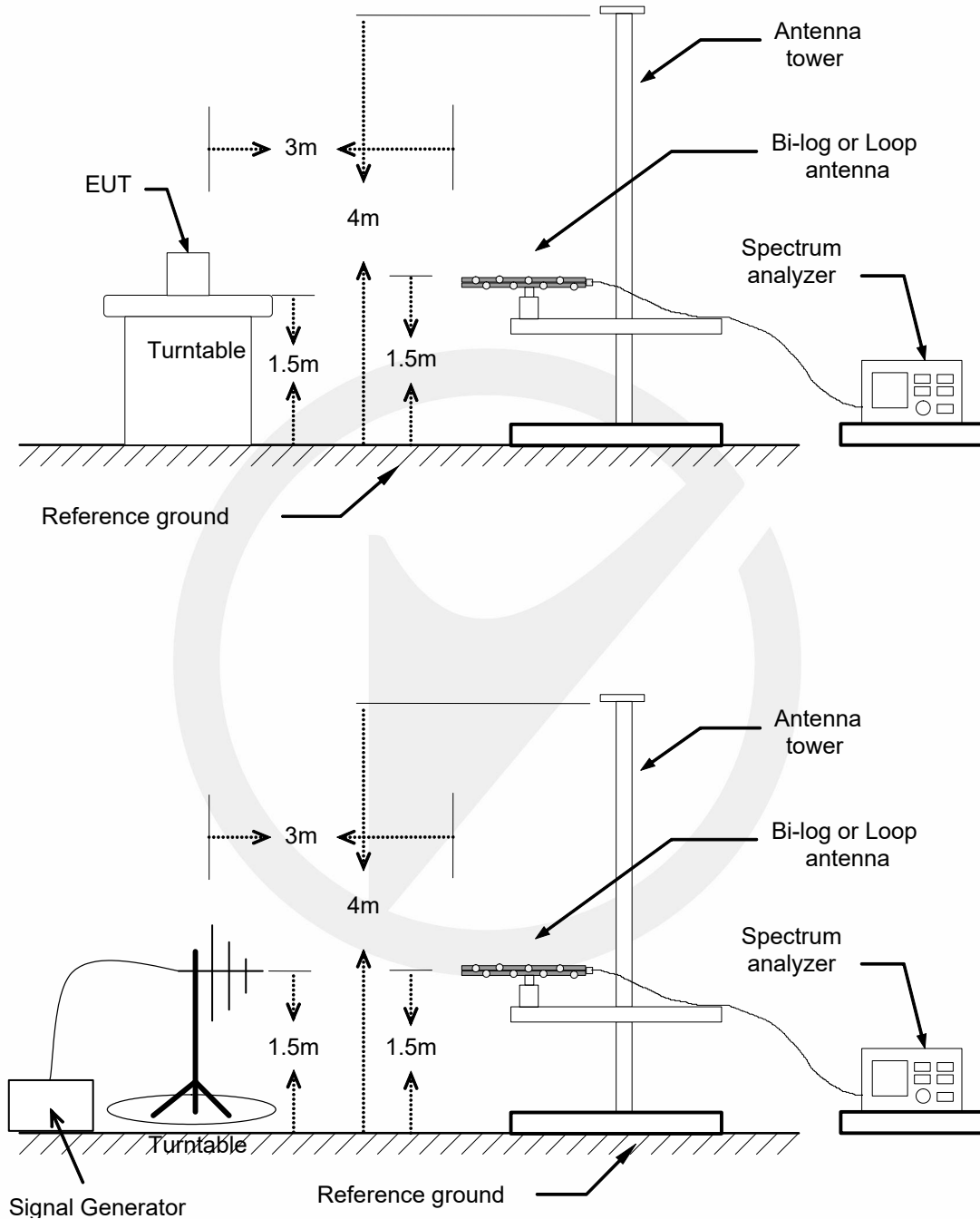


Remarks:

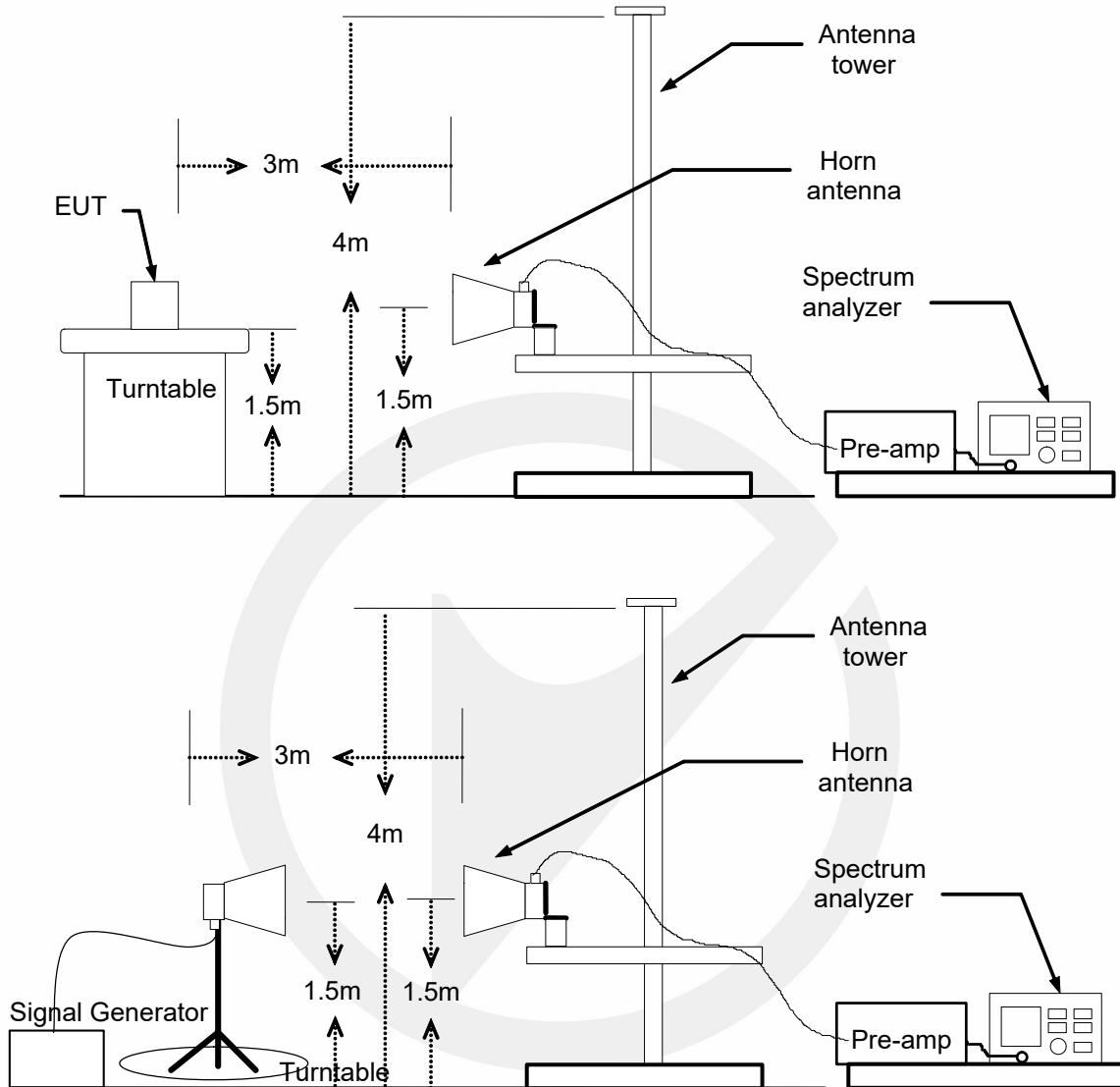
The Signal Analyzer could be connected to a monopole antenna or directly connected to the EUT, if the EUT has already employing an antenna connector.

Radiated measurements configuration of EUT shall be as follows:

Below 1GHz



Above 1GHz



7.2 SUPPORT EQUIPMENT

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
/	/	/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8. ALL EQUIPMENT CONFORMANCE REQUIREMENTS

8.1 OPERATING FREQUENCY

8.1.1 Applicable standard

EN 300 220-2 Clause 4.2.1

8.1.2 Conformance Limit

Declared by the manufacturer

8.1.3 Results

Value	Notes
Operational Frequency band or bands	433.05-434.79MHz
Nominal Operating Frequency or Frequencies	433.92 MHz
Operating Channel width(s) - OCW	64 kHz
Note: Declared by the manufacturer	

8.2 UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

8.2.1 Applicable standard

According to ETSI EN 300 220-2 clause 4.2.2

8.2.2 Conformance Limit

Frequency State	47MHz to 74MHz 87.5MHz to 118MHz 174MHz to 230MHz 470MHz to 790MHz	Other frequency below 1000MHz	Frequency above 1 000 MHz
TX mode	-54dBm	-36dBm	-30dBm
RX and all other modes	-57dBm	-57dBm	-47dBm

8.2.3 Test Configuration

The EUT shall be operated in a mode representative of normal operation.

For EUT without an external conventional 50 Ω coaxial antenna connector, the spurious emissions levels shall be established by the radiated measurement procedure.

For EUT with an external conventional 50 Ω coaxial antenna connector, the spurious emissions levels shall be established by the radiated and conducted measurement procedure.

8.2.4 Test Procedure

1. Please refer to ETSI EN 300 220-1 (V3.1.1) clause 5.9.3.1 for the test conditions.
2. Please refer to ETSI EN 300 220-1 (V3.1.1) clause 5.9.3.3 for the measurement method.

The test procedure shall be as follows:

■ Conducted measurement

The antenna port of the EUT shall be connected to the dummy load and the output of the dummy load connected to the measuring receiver.

The operation of the EUT shall be started.

The EUT shall be operated in a mode representative of normal operation.

The transmitter shall be performed on the lowest and the highest Operating Frequency declared by the manufacturer. Additional frequencies may be tested.

The measurement shall be performed with the EUT operating at its maximum operating power level, as declared by the manufacturer, and also with the EUT in powered-on stand-by mode.

The RBW of measuring receiver are shown in below.

Parameters for TX Spurious Radiations Measurement

Operating Mode	Frequency Range	RBW _{REF} (see note 2)
Transmit mode	$9\text{ kHz} \leq f < 150\text{ kHz}$	1 kHz
	$150\text{ kHz} \leq f < 30\text{ MHz}$	10 kHz
	$30\text{ MHz} \leq f < f_c - m$	100 kHz
	$f_c - m \leq f < f_c - n$	10 kHz
	$f_c - n \leq f < f_c - p$	1 kHz
	$f_c + p < f \leq f_c + n$	1 kHz
	$f_c + n < f \leq f_c + m$	10 kHz
	$f_c + m < f \leq 1\text{ GHz}$	100 kHz
	$1\text{ GHz} < f \leq 6\text{ GHz}$	1 MHz

NOTE 1: f is the measurement frequency.

f_c is the Operating Frequency.

m is 10 x OCW or 500 kHz, whichever is the greater.

n is 4 x OCW or 100 kHz, whichever is the greater.

p is 2,5 x OCW.

NOTE 2: If the value of RBW used for measurement is different from RBW_{REF}, use bandwidth correction from clause 4.3.10.1.

The measuring receiver shall be tuned over the frequency range shown in below.

Frequency Range
9 kHz to 6 GHz
NOTE: The measurements need only to be performed over the frequency range 4 GHz to 6 GHz if emissions are detected within 10 dB of the specified limit between 1,5 GHz and 4 GHz.

At each frequency at which a spurious component is detected, the power level shall be measured and noted.

■Radiated measurement

A suitable test site shall be selected from those described in clause C.1.

The EUT shall be connected to its normal operating antenna.

The output of the test antenna shall be connected to a measuring receiver. The measurements described shall be performed using appropriate radiated measurement methods described in clause C.5.1 (or clause C.5.2) depending on the test site, followed by clause C.5.3. The operation of the EUT shall be started.

For TX mode clause 5.9.3.1 applies.

The measuring receiver shall be tuned over the frequency range shown in Table 22(below).

Frequency Range
25 MHz to 6 GHz
NOTE: The measurements need only to be performed over the frequency range 4 GHz to 6 GHz if emissions are detected within 10 dB of the specified limit between 1,5 GHz and 4 GHz.

At each frequency at which a spurious component is detected within the frequency range in Table 22, the spurious emission power level shall be established using the procedures described in clause C.5 and noted in the report.

The maximum signal level detected by the measuring receiver for vertical and horizontal polarization shall be noted.

The radiated measurements in clause C.5.1 (or clause C.5.2) followed by the substitution measurement defined in clause C.5.3 shall be performed with the frequency of the calibrated signal generator set to the frequency of the spurious component detected and, if necessary, the input attenuator setting of the measuring receiver adjusted in order to increase the sensitivity of the measuring receiver.

The measure of the effective radiated power of the spurious component is the larger of the two power levels at the input to the substitution antenna increased by the substitution antenna gain corrected by the cable loss (values in dB).

The power measured shall be recorded in the test report for each spurious component.

8.2.5 Test Results

■ Radiated measurement

● unwanted emissions in the spurious domain below 1GHz.

Operation Mode: ☒ ASK

Operation frequency: ☒ 433.92MHz

Test mode: ☒ TX Mode ☐ RX Mode

Temperature: 24°C

Test Date: Sep 19, 2024

Humidity: 53 % RH

Tested by: Ccyf

Frequency (MHz)	Antenna Polarization	Emission level (dBm)	Limit (dBm)	Margin (dBm)	Verdict
39.91	<input checked="" type="checkbox"/> V	-56.64	-36	-20.64	PASS
69.94		-68.7	-54	-14.7	PASS
94.55		-71.53	-54	-17.53	PASS
263.74		-54.14	-36	-18.14	PASS
672.20		-62.96	-54	-8.96	PASS
883.40		-44.3	-36	-8.3	PASS
60.98	<input checked="" type="checkbox"/> H	-59.34	-54	-5.34	PASS
73.82		-71.7	-54	-17.7	PASS
122.89		-59.57	-36	-23.57	PASS
384.64		-45.33	-36	-9.33	PASS
681.87		-67.76	-54	-13.76	PASS
861.92		-76.67	-54	-22.67	PASS

● unwanted emissions in the spurious domain above 1GHz.

Operation Mode: ☒ ASK

Operation frequency: ☒ 433.92MHz

Test mode: ☒ TX Mode ☐ RX Mode

Temperature: 24°C

Test Date: Sep 19, 2024

Humidity: 53 % RH

Tested by: Ccyf

Frequency (MHz)	Antenna Polarization	Emission level (dBm)	Limit (dBm)	Margin (dB)	Verdict
3846.66	<input checked="" type="checkbox"/> V	-50.53	-30	-20.53	PASS
4951.69		-54.24	-30	-24.24	PASS
5574.61		-61.43	-30	-31.43	
8099.01		-50.04	-30	-20.04	PASS
9332.24		-44.22	-30	-14.22	PASS
11192.32		-48.38	-30	-18.38	PASS
3989.91	<input checked="" type="checkbox"/> H	-44.7	-30	-14.7	PASS
5283.72		-59.11	-30	-29.11	PASS
7471.75		-64.9	-30	-34.9	PASS
8146.02		-47.45	-30	-17.45	PASS
9080.74		-46.67	-30	-16.67	PASS
10810.07		-37.09	-30	-7.09	PASS

■ Radiated measurement

● unwanted emissions in the spurious domain below 1GHz.

Operation Mode: ☒ ASK

Operation frequency: ☒ 433.92MHz

Test mode: ☐ TX Mode ☒ RX Mode

Temperature: 24°C

Test Date: Sep 19, 2024

Humidity: 53 % RH

Tested by: Ccyf

Frequency (MHz)	Antenna Polarization	Emission level (dBm)	Limit (dBm)	Margin (dBm)	Verdict
40.20	<input checked="" type="checkbox"/> V	-67.46	-57	-21.73	PASS
46.71		-67.44	-57	-20.47	PASS
283.76		-62.28	-57	-7.34	PASS
444.38		-73.37	-57	-13.9	PASS
673.73		-64.2	-57	-7.96	PASS
786.81		-74.54	-57	-19.48	PASS
42.56	<input checked="" type="checkbox"/> H	-64.14	-57	-15.09	PASS
65.00		-77.06	-57	-14.1	PASS
125.98		-62.85	-57	-13.76	PASS
359.97		-67.48	-57	-14.41	PASS
660.25		-63.88	-57	-6	PASS
974.14		-77.23	-57	-12.51	PASS

● unwanted emissions in the spurious domain above 1GHz.

Operation Mode: ☒ ASK

Operation frequency: ☒ 433.92MHz

Test mode: ☐ TX Mode ☒ RX Mode

Temperature: 24°C

Test Date: Sep 19, 2024

Humidity: 53 % RH

Tested by: Ccyf

Frequency (MHz)	Antenna Polarization	Emission level (dBm)	Limit (dBm)	Margin (dBm)	Verdict
5532.71	<input checked="" type="checkbox"/> V	-60.91	-47	-10.54	PASS
6145.51		-55.39	-47	-15.09	PASS
7740.87		-55.75	-47	-21.78	PASS
9406.71		-55.92	-47	-15.51	PASS
10882.54		-62.91	-47	-20.54	PASS
12391.57		-57.95	-47	-15.74	PASS
5283.41	<input checked="" type="checkbox"/> H	-59.06	-47	-17.32	PASS
6678.75		-53.82	-47	-19.86	PASS
7511.51		-65.94	-47	-7.94	PASS
9343.08		-63.38	-47	-15.25	PASS
11132.09		-57.01	-47	-21.79	PASS
12510.25		-55.83	-47	-10.65	PASS

9. TRANSMITTERS CONFORMANCE REQUIREMENTS

9.1 EFFECTIVE RADIATED POWER

9.1.1 Applicable standard

ETSI EN 300 220-2 clause 4.3.1

9.1.2 Conformance Limit

The effective radiated power shall not be greater than the value allowed in annexes B or C for the chosen operational frequency band(s).

9.1.3 Test Configuration

Radiated measurements shall only be used for integral antenna equipment that does not have a temporary antenna connector(s) provided.

Conducted measurements shall be used for antenna equipment provided a temporary antenna connector(s).

9.1.4 TEST PROCEDURE

1. Please refer to ETSI EN 300 220-1 clause 5.2.2.1.1 and clause 5.2.2.2.1 for the test conditions.
2. Please refer to ETSI EN 300 220-1 clause 5.2.2.1.2 and clause 5.2.2.2.2 for the measurement method.

The test procedure shall be as follows:

■ Conducted measurement

The transmitter shall be connected to a dummy load as described in clause 4.3.7 and the conducted power delivered shall be measured with a measurement receiver according to clause 4.3.10.

In the case of non-constant envelope modulation, a peak detector shall be used.

The maximum gain of the antenna to be used together with the equipment shall be declared by the manufacturer and this shall be recorded in the test report.

Perp, the radiated power (e.r.p.) limit applies to the maximum measured conducted power ($P_{\text{conducted}}$) value adjusted by the antenna gain (relative to a dipole) ($\text{Perp} = P_{\text{conducted}} + \text{antenna gain}$).

■ Radiated measurement

A suitable test site shall be selected from those described in clause C.1 and the radiated power established using the procedures described in clause C.5.1 (or clause C.5.2) depending on the test site, followed by clause C.5.3.

In the case of non-constant envelope modulation, a peak detector shall be used.

The information shown in Table 8 shall be recorded in the test report.

9.1.5 Test Results

Test environment		<input checked="" type="checkbox"/> Normal operation		<input type="checkbox"/> Unmodulated carrier	
Operation frequency:		<input checked="" type="checkbox"/> 433.92MHz			
Temperature:		25°C		Test Date:	Sep 19, 2024
Humidity:		69 % RH		Tested by:	Ccyf
Frequency (MHz)	Antenna Polarization	Effective radiated power (dBm)	Limit (dBm)	Verdict	
433.92	<input checked="" type="checkbox"/> conducted	-17.23	10	PASS	



9.2 DUTY CYCLE

9.2.1 Applicable standard

ETSI EN 300 220-2 clause 4.3.3

9.2.2 Conformance Limit

The Duty Cycle at the operating frequency shall not be greater than values in annex B or C for the chosen operational frequency band(s).

9.2.3 Test Configuration

The EUT shall be operated in a mode representative of normal operation.

9.2.4 Test Procedure

1. Please refer to ETSI EN 300 220-1 clause 5.4 for the measurement method.

The test procedure shall be as follows:

An assessment of the overall Duty Cycle shall be made for a representative period of T_{obs} over the observation bandwidth F_{obs} . Unless otherwise specified, T_{obs} is 1 hour and the observation bandwidth F_{obs} is the operational frequency band.

The representative period shall be the most active one in normal use of the device. As a guide "Normal use" is considered as representing the behaviour of the device during transmission of 99 % of transmissions generated during its operational lifetime.

Procedures such as setup, commissioning and maintenance are not considered part of normal operation.

Where an acknowledgement is used, the additional transmitter on-time from a message responder shall be declared only once whether included in the message initiator Duty Cycle or in the message responder Duty Cycle.

NOTE: The intention of this rule is not to allow EUT to exceed the maximum duty cycle value.

9.2.5 Test Results

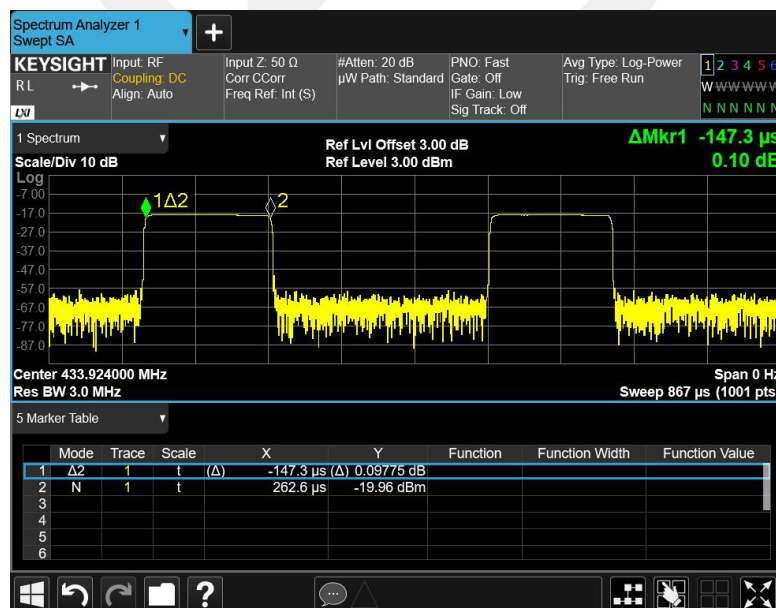
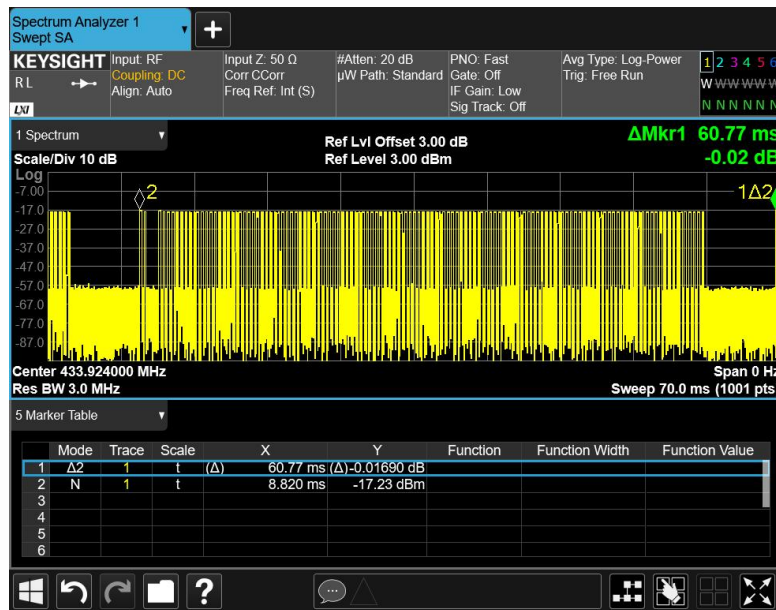
Duty Cycle	Limit	Result
5.4833%	10%	Complies

$T_{on} = 147.3\mu s \times 134 / 1000 = 19.74\text{ms}$

$DC = (T_{on} \times N) / 1\text{hour}$

$DC = (19.74 \times 10000) / 3600000 = 0.054833 = 5.4833\%$

Note: N represents the number of times the EUT is transmitter within 1 hour, The customer claims that the maximum number of launches in the 1 hour is 10000.



9.3 OCCUPIED BANDWIDTH

9.3.1 Applicable standard

ETSI EN 300 220-2 clause 4.3.4

9.3.2 Conformance Limit

The occupied bandwidth of the EUT according to ETSI EN 300 220-1 [1], clause 5.6.2 shall comply with the limits in annex B or C.

The Operating Channel shall be declared and shall reside entirely within the Operational Frequency Band.

The Maximum Occupied Bandwidth at 99 % shall reside entirely within the Operating Channel defined by F_{low} and F_{high} .

9.3.3 Test Configuration

The measurement shall be performed on the lowest and the highest Operating Frequencies declared by the manufacturer. Additional frequencies may be tested.

The measurement shall be performed with a spectrum analyser.

For devices with e.r.p. ≤ -30 dBm, OBW may be either measured or taken as equal to the OCW within the operational frequency band.

9.3.4 Test Procedure

1. Please refer to ETSI EN 300 220-1 clause 5.6.3.1 for the test conditions.

2. Please refer to ETSI EN 300 220-1 clause 5.6.3.4 for the measurement method.

■ Conducted measurement

The EUT shall be connected to an artificial antenna which shall be connect to the test equipment via an appropriate attenuator.

The measurements in clause 5.6.3.4 shall be performed.

■ Radiated measurement

A suitable test site shall be selected from those described in clause C.1 and the measurements in clause 5.6.3.4 shall be performed using corresponding radiated measurement methods described in clause C.5.

■ Measurement procedure

The spectrum analyser shall be configured as appropriate for the parameters shown in Table 12.

Setting	Value	Notes
Centre frequency	The nominal Operating Frequency	The highest or lowest Operating Frequency as declared by the manufacturer
RBW	1 % to 3 % of OCW without being below 100 Hz	
VBW	3 x RBW	Nearest available analyser setting to 3 x RBW
Span	At least 2 x Operating Channel width	Span should be large enough to include all major components of the signal and its side bands
Detector Mode	RMS	
Trace	Max hold	

If the equipment is capable of producing an unmodulated carrier and the test in clause 5.7 is performed, then the OBW measurements need only be performed under normal test conditions. Any required results for Maximum OBW under extreme conditions are obtained by addition and subtraction of the upper and lower frequency error results to each bandwidth measurement obtained in this test.

Step 1:

Operation of the EUT shall be started, on the highest operating frequency as declared by the manufacturer, with the appropriate test signal.

The signal attenuation shall be adjusted to ensure that the signal power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals on either side of the power

envelope being included in the measurement.

Step 2:

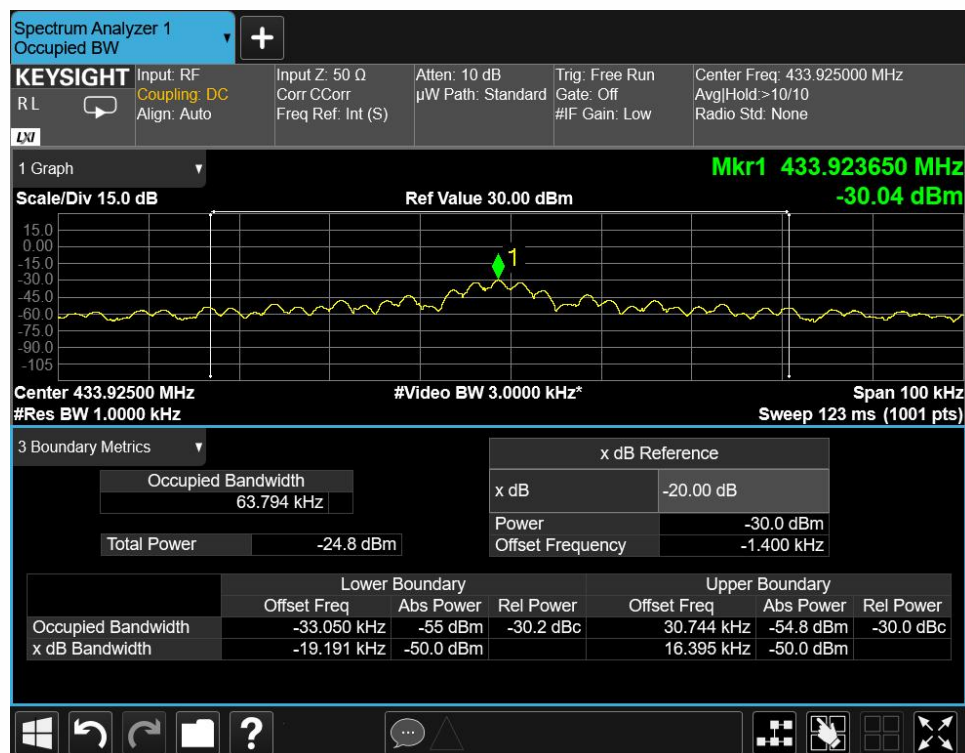
When the trace is completed the peak value of the trace shall be located and the analyser marker placed on this peak.

Step 3:

The 99 % occupied bandwidth function of the spectrum analyser shall be used to measure the occupied bandwidth of the signal.

9.3.5 Test Results

Channel number	99% BW(kHz)	Limit(MHz)
433.92 MHz	63.794	433,050 MHz-434,790 MHz



9.4 TX OUT OF BAND EMISSIONS

9.4.1 Applicable standard

ETSI EN 300 220-2 clause 4.3.5

9.4.2 Conformance Limit

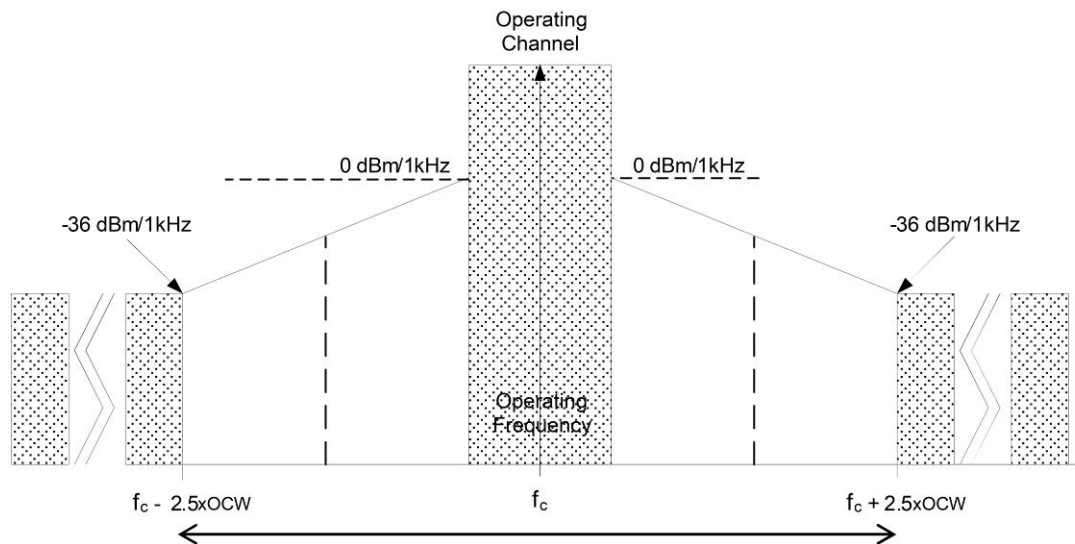


Figure 5: Out Of Band Domain for Operating Channel with reference BW

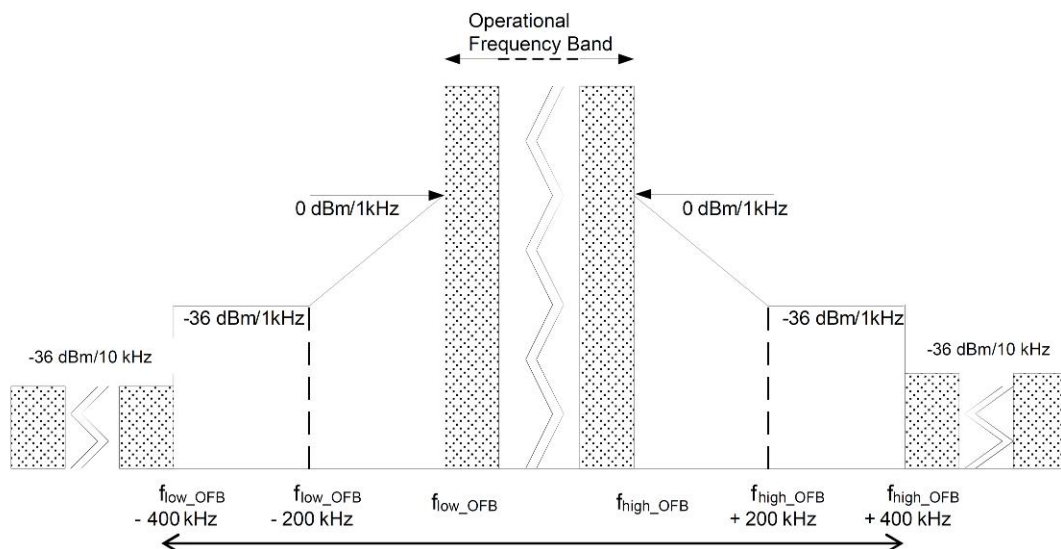


Figure 6: Out Of Band Domain for Operational Frequency Band with reference BW

9.4.3 Test Configuration

The EUT shall be operated in a mode representative of normal operation.

An EUT without a permanent or temporary antenna connector shall be tested according to conducted measurement procedure.

An EUT with a permanent or temporary antenna connector shall be tested according to radiated measurement procedure.

9.4.4 Test Procedure

1. Please refer to ETSI EN 300 220-2 clause 5.8.3.1 for the test conditions.
2. Please refer to ETSI EN 300 220-2 clause 5.8.3.4 for the measurement methods.

■ Conducted measurement

The EUT shall be connected to an artificial antenna which shall be connect to the test equipment via an appropriate attenuator.

The measurements in clause 5.8.3.4 shall be performed.

■ Radiated measurement

The EUT shall be connected to an artificial antenna which shall be connect to the test equipment via an appropriate attenuator.

The measurements in clause 5.8.3.4 shall be performed.

■ Measurement procedure

Table 16: Test Parameters for Out Of Band for Operating Channel Measurement

Spectrum Analyser Setting	Value	Notes
Centre frequency	Operating Frequency	
Span	6 x Operating Channel width	
RBW	1 kHz (see note)	Resolution bandwidth for Out Of Band domain measurements
Detector Function	RMS	
Trace Mode	Linear AVG	Applies only for EUT generating D-M2 test signal. An appropriate number of samples should be averaged to give a stable reading
	Max Hold	Applies only for EUT generating D-M2a or D-M3 test signal.
NOTE: If the value of RBW used is different from RBW_{REF} in clause 5.8.2, use the bandwidth correction in clause 4.3.10.1.		

The test equipment shall be configured as appropriate for the parameters shown in Table 16.

Step 1:

Operation of the EUT shall be started, on the highest operating frequency as declared by the manufacturer, with the appropriate test signal.

The signal shape is recorded when stable and shall be below the spectrum mask Out Of Band for operating channel.

Step 2:

The test equipment shall be reconfigured as appropriate for the parameter shown in Table 17.

Table 17: Test Parameter Setting for Lower Out Of Band Measurement

Spectrum Analyser Setting	Value	Notes
Centre frequency	$f_{c_{low}}$	The lowest Operating Frequency in the band
Span	$2 \times (500 \text{ kHz} + f_{c_{low}} - f_{low_OFB})$	Ensures that the left most mask specification remains within the span
NOTE: f_{low_OFB} is the lower edge of the Operational Frequency Band.		

Operation of the EUT is restarted, with the appropriate test signal, on the lowest operating frequency as declared by the manufacturer.

If the equipment is using only one operating Frequency in the operational Frequency Band, measurement shall be performed the nominal operating frequency.

The signal shape is recorded when stable; and shall be below the spectrum mask for operating channel and the spectrum mask for operational frequency band.

Step 3:

The test equipment shall be reconfigured as appropriate for the parameter shown in Table 18.

Table 18: Test Parameter Setting for upper Out Of Band Measurement

Spectrum Analyser Setting	Value	Notes
Centre frequency	f_{Chigh}	the highest Operating Frequency in the band
Span	$2 \times (500 \text{ kHz} + f_{\text{high_OFB}} - f_{\text{Chigh}})$	Ensures that the rightmost mask specification remains within the span

NOTE: $f_{\text{high_OFB}}$ is the higher edge of the operational frequency Band.

Operation of the EUT is restarted, with the appropriate test signal, on the highest Operating Frequency as declared by the manufacturer.

If the equipment is using only one Operating Frequency in the Operational Frequency Band, measurement shall be performed at the nominal Operating Frequency

The signal shape is recorded when stable and shall be below the spectrum mask for Out Of Band emissions for operating channel and for operational Frequency Band.

Step 4:

For frequency agile devices, the measurement shall be repeated in each Operational Frequency Band.

Step 5:

Where required (see clause 5.8.3.1 condition 1), the measurements in step 1 to step 5 shall be repeated under extreme test conditions.

Out Of Band -- Operating Channel							
Test mode	Test sequence	RBW(kHz)	Frequency Range	Measurement Frequency(MHz)	Reading(dBm)	Limit(dBm)	Verdict
Operating Channel	1	1	$f_c - 0.5 \times \text{OCW}$	433.8881	-22.3500	0	Pass
			$f_c + 0.5 \times \text{OCW}$	433.9519	-22.1600		Pass
	2	1	$f_c - 2.5 \times \text{OCW}$	433.7605	-62.3600	-36	Pass
			$f_c + 2.5 \times \text{OCW}$	434.0795	-62.8300		Pass

Out Of Band -- Operational Frequency Band							
Test mode	Test sequence	RBW(kHz)	Measurement Frequency(MHz)	Reading(dBm)	Limit Note	Limit(dBm)	Verdict
Operational Frequency Band	1	1	433.0500	-61.2200	$f_{\text{low_OFB}}$	0	Pass
			434.7900	-60.2700	$f_{\text{high_OFB}}$		Pass
	2	1	432.8500	-66.3800	$f_{\text{low_OFB}} - 200 \text{ kHz}$	-36	Pass
			434.9900	-65.2700	$f_{\text{high_OFB}} + 200 \text{ kHz}$		Pass
	3	10	432.6500	-66.8700	$f_{\text{low_OFB}} - 400 \text{ kHz}$	-36	Pass
			435.1900	-65.1900	$f_{\text{high_OFB}} + 400 \text{ kHz}$		Pass

9.5 ADJACENT CHANNEL POWER

9.5.1 Applicable standard

ETSI EN 300 220-2 clause 4.3.7

9.5.2 Conformance Limit

Table 26: Adjacent channel power limits for transmitters with OCW \leq 25 kHz

		Adjacent Channel power integrated over 0,7 x OCW	Alternate Adjacent Channel power integrated over 0,7 x OCW
OCW < 20 kHz	Normal test conditions	-20 dBm	-20 dBm
	Extreme test conditions	-15 dBm	-20 dBm
OCW \geq 20 kHz	Normal test conditions	-37 dBm	-40 dBm
	Extreme test conditions	-32 dBm	-37 dBm

Where the operating channel width is less than or equal to 25 kHz, the power in the adjacent channels shall not exceed the values given in Table 26.

9.5.3 Test Configuration

The EUT shall be operated in a mode representative of normal operation.

An EUT without a permanent or temporary antenna connector shall be tested according to conducted measurement procedure.

An EUT with a permanent or temporary antenna connector shall be tested according to radiated measurement procedure.

9.5.4 Test Procedure

1. Please refer to ETSI EN 300 220-2 clause 5.11.3.1 for the test conditions.
2. Please refer to ETSI EN 300 220-2 clause 5.11.3.4 for the measurement methods.

■ Conducted measurement

The EUT shall be connected to an artificial antenna which shall be connect to the test equipment via an appropriate attenuator.

The measurements in clause 5.11.3.4 shall be performed.

■ Radiated measurement

The EUT shall be connected to an artificial antenna which shall be connect to the test equipment via an appropriate attenuator.

The measurements in clause 5.11.3.4 shall be performed.

■ Measurement procedure

Table 16: Test Parameters for Out Of Band for Operating Channel Measurement

Spectrum Analyser Setting	Value	Notes
Centre frequency	The nominal Operating Frequency	
RBW	100 Hz	
VBW	$\geq 3 \times$ RBW	
Span	At least 5 x Operating Channel width	Span should be large enough to include Adjacent and Alternate Adjacent Channel
Detector Mode	RMS	
Trace mode	Linear Averaging	Applies only for EUT generating D-M2 test signal An appropriate number of samples should be averaged to give a stable reading
	Max hold	Applies only for EUT generating D-M2a or D-M3 test signal
NOTE: The highest and lowest operating frequencies are declared by the manufacturer.		

The test equipment shall be configured as appropriate for the parameters shown in Table 16.

Step 1:

Operation of the EUT shall be started, on the highest operating frequency as declared by the manufacturer, with the appropriate test signal.

The signal shape is recorded when stable and shall be below the spectrum mask Out Of Band for operating channel.

Step 2:

The test equipment shall be reconfigured as appropriate for the parameter shown in Table 27.

Table 28: Offset and RBWREF parameters

Measurement	Offset from centre frequency	RBWREF
Adjacent channel	$\pm \text{OCW}$	$0,7 \times \text{OCW}$
Alternate channel	$\pm 2 \times \text{OCW}$	$0,7 \times \text{OCW}$

For extreme test conditions, if the measurement is performed under normal conditions only, for EUT generating D-M1

test signal measurement can be performed with the following frequency offsets from centre frequency:

- $+\text{OCW} - |\text{Negative Frequency Error}|$ / $-\text{OCW} + |\text{Positive Frequency Error}|$ apply for the adjacent channel
- $+2 \times \text{OCW} - |\text{Negative Frequency Error}|$ / $-2 \times \text{OCW} + |\text{Positive Frequency Error}|$ apply for the alternate adjacent channel.

Take the higher power value from the positive and negative offsets at both the adjacent channel and alternate channel results.

Lin Averaging on the trace is an advanced SA feature. It antilogs the results averages them than takes the log again.

9.5.5 Test Results

Not applicable

9.6 TRANSIENT POWER

9.6.1 Applicable standard

ETSI EN 300 220-2 clause 4.3.6

9.6.2 Conformance Limit

Transmitter Transient Power limits

Absolute offset from centre frequency	RBW _{REF}	Peak power limit applicable at measurement points
≤ 400 kHz	1 kHz	0 dBm
> 400 kHz	1 kHz	-27 dBm

9.6.3 Test Configuration

The measurement shall be performed on the lowest and the highest operating Frequency declared by the manufacturer. Additional frequencies may be tested.

These measurements shall be performed at the highest power level at which the transmitter is intended to operate.

9.6.4 Test Procedure

1. Please refer to ETSI EN 300 220-1 clause 5.10.3.1 for the test conditions.
2. Please refer to ETSI EN 300 220-1 clause 5.10.3.2 for the measurement methods.

The test procedure shall be as follows:

The output of the EUT shall be connected to a spectrum analyser or equivalent measuring equipment.

The measurement shall be undertaken in zero span mode. The analyser's centre frequency shall be set to an offset from the operating centre frequency. These offset values and their corresponding RBW configurations are listed in Table 24.

Table 24: RBW for Transient Measurement

Measurement points: offset from centre frequency	Analyser RBW	RBW _{REF}
-0,5 x OCW - 3 kHz 0,5 x OCW + 3 kHz Not applicable for OCW < 25 kHz	1 kHz	1 kHz
$\pm 12,5$ kHz or \pm OCW whichever is the greater	Max (RBW pattern 1, 3, 10 kHz) \leq Offset frequency/6 (see note)	1 kHz
-0,5 x OCW - 400 kHz 0,5 x OCW + 400 kHz	100 kHz	1 kHz
-0,5 x OCW - 1 200 kHz 0,5 x OCW + 1 200 kHz	300 kHz	1 kHz
NOTE: Max (RBW pattern 1, 3, 10 kHz) means the maximum bandwidth that falls into the commonly implemented 1, 3, 10 kHz RBW filter bandwidth incremental pattern of spectrum analysers. EXAMPLE: If OCW is 25 kHz then the RBW value corresponding to one OCW offset frequency is 3 kHz. The rest of the analyser settings are listed in Table 25, and if OCW is 250 kHz then the RBW value corresponding to one OCW offset frequency is 30 kHz.		

Table 25: Parameters for Transient Measurement

Spectrum Analyser Setting	Value	Notes
VBW/RBW	10	At higher RBW values VBW may be clipped to its maximum value
Sweep time	500 ms	
RBW filter	Gaussian	
Trace Detector Function	RMS	
Trace Mode	Max hold	
Sweep points	501	
Measurement mode	Continuous sweep	

NOTE: The ratio between the number of sweep points and the sweep time shall be the same ratio as above if different number of sweep points is used.

The used modulation shall be D-M3. The analyser shall be set to the settings of Table 25 and a measurement shall be started for each offset frequency. The EUT shall transmit at least five D-M3 test signal. The peak value shall be recorded and the measurement shall be repeated at each offset frequency mentioned in Table 24.

The recorded power values shall be converted to power values measured in RBWREF by the formula in clause 4.3.10.1.

9.6.5 Test Results

Operation Mode: ☒ ASK

Operation frequency: ☒ 433.92MHz

Test mode: ☒ TX Mode ☐ RX Mode

Temperature: 20°C

Test Date:

Sep 19, 2024

Humidity: 60% RH

Tested by:

Ccyf

Measured frequency(MHz)	Power level (dBm)	Limit(dBm)	Result
433.8851	-65.498	-27	Pass
433.9549	-67.554	-27	Pass
433.8562	-69.692	0	Pass
433.9838	-68.709	0	Pass
433.4881	-69.693	0	Pass
434.3519	-69.842	0	Pass
432.6881	-71.075	-27	Pass
435.1519	-70.871	-27	Pass

9.7 TX BEHAVIOUR UNDER LOW VOLTAGE CONDITIONS

9.7.1 Applicable standard

ETSI EN 300 220-2 clause 4.3.8

9.7.2 Conformance Limit

The equipment shall either:

- a) remain in the Operating Channel OC without exceeding any applicable limits (e.g. Duty Cycle); or
- b) reduce its effective radiated power below the Spurious Emission limits without exceeding any applicable limits (e.g. Duty Cycle); or
- c) shut down, (ceasing function); as the voltage falls below the manufacturers declared operating voltage.

9.7.3 Test Configuration

The test shall be performed on Operating Frequency declared by the manufacturer.

9.7.4 Test Procedure

1. Please refer to ETSI EN 300 220-1 clause 5.12.3.1 for the test conditions.
2. Please refer to ETSI EN 300 220-1 clause 5.12.3.2 for the measurement method.

Measurement procedure

Step 1:

Operation of the EUT shall be started, on Operating Frequency as declared by the manufacturer, with the appropriate test signal and with the EUT operating at nominal operating voltage. The centre frequency of the transmitted signal shall be measured and noted.

Step 2:

The operating voltage shall be reduced by appropriate steps until the voltage reaches zero. The centre frequency of the transmitted signal shall be measured and noted. Any abnormal behaviour shall be noted.

9.7.5 Test Results

Operation Mode: <input checked="" type="checkbox"/> ASK		
Operation frequency: <input checked="" type="checkbox"/> 433.92MHz		
Test mode: <input checked="" type="checkbox"/> TX Mode <input type="checkbox"/> RX Mode		
Temperature: 24°C	Test Date:	Sep 19, 2024
Humidity: 64 % RH	Tested by:	Ccyf
Below lower extreme voltage (V)	Measured frequency (MHz)	Within assigned frequency
4.0	433.925	PASS
3.5	Stop Transmit	PASS
Notes: The manufacture declares that the lower extreme voltage is 4 V When the voltage below 3.5 V, the EUT stop to transmit.		



10. Receivers conformance requirements

10.1 BLOCKING

10.1.1 Applicable standard

ETSI EN 300 220-2 clause 4.4.2

10.1.2 Conformance Limit

Requirement	Limits
	Receiver category 3
Blocking at ± 2 MHz from OC edge f_{high} and f_{low}	≥ -80 dBm
Blocking at ± 10 MHz from OC edge f_{high} and f_{low}	≥ -60 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -60 dBm

Requirement	Limits
	Receiver category 2
Blocking at ± 2 MHz from OC edge f_{high} and f_{low}	≥ -69 dBm
Blocking at ± 10 MHz from OC edge f_{high} and f_{low}	≥ -44 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -44 dBm

Requirement	Limits
	Receiver category 1.5
Blocking at ± 2 MHz from OC edge f_{high} and f_{low}	≥ -43 dBm
Blocking at ± 10 MHz from OC edge f_{high} and f_{low}	≥ -33 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -33 dBm

Requirement	Limits
	Receiver category 1
Blocking at ± 2 MHz from OC edge f_{high} and f_{low}	≥ -20 dBm
Blocking at ± 10 MHz from OC edge f_{high} and f_{low}	≥ -20 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -20 dBm

10.1.3 Test Configuration

The measurement is performed at an operating frequency declared by the manufacturer.

An EUT without a permanent or temporary antenna connector shall be tested according to Radiated measurement

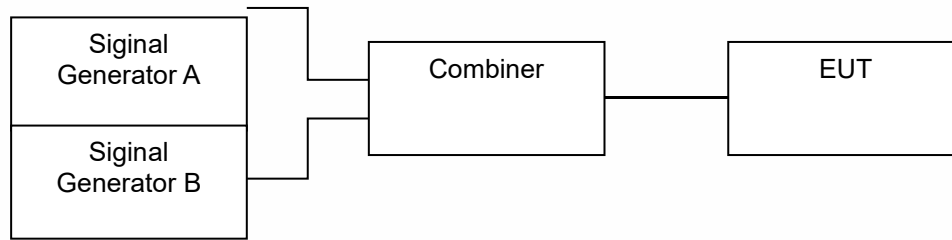
An EUT with a permanent or temporary antenna connector shall be tested according to Conducted measurement

10.1.4 Test Procedure

1. Please refer to ETSI EN 300 220-1 clause 5.18.6.1 for the test conditions.
2. Please refer to ETSI EN 300 220-1 clause 5.18.6.4 for the measurement method.

■ Conducted measurement

Two signal generators A and B shall be connected to the EUT via a combining network as shown in Figure 10.



■ Radiated measurements

A suitable test site shall be selected from those described in clause C.1.

Signal generators A and B together with the combiner, shown in Figure 10, shall be placed outside the test site.

The output of the combiner shall be connected to a transmit test antenna with the same antenna polarization as the EUT.

The transmit test antenna shall be placed in the test site.

The EUT shall be placed at the location of the turntable at the orientation of the most sensitive position.

The measurements in clause 5.18.6.4 shall be performed using appropriate radiated measurement methods described in clause C.5.4.

■ Measurement procedure

Signal generator A shall be set to an appropriate modulated test signal at the operating frequency of the EUT receiver.

Signal generator B shall be unmodulated.

Measurements shall be carried out at frequencies of the unwanted signal at approximately the frequency(ies) offset(s)

defined in technical requirement avoiding those frequencies at which spurious responses occur.

Additional

measurement points may be requested by technical requirements clause.

If several operational frequency bands are used by the equipment, at least one blocking measurement by bands has to be performed.

Step 1:

Signal generator B shall be powered off. Signal generator A shall be set to the minimum level which gives the wanted performance criterion of EUT or the reference level in Table 32, whichever is the higher. The output level of generator A shall then be increased by 3 dB unless otherwise specified in technical requirement.

Step 2:

Signal generator B is powered on and set to operate at the nominal operating frequency - offset frequency.

Signal generator B is then switched on and the signal amplitude is adjusted to the minimum level at which the wanted performance criterion is not achieved.

With signal generator B settings unchanged, the receiver shall be replaced with a suitable RF power measuring equipment. The power into the measuring equipment shall be measured and noted.

The blocking level is then the conducted power received from generator B at the EUT antenna connector.

This can either be measured on the antenna connector for conducted test or be calculated for radiated test (see clause C.5.4).

The blocking level shall be higher or equal to the blocking power level requested in the technical requirement clause.

Step 3:

The measurement in steps 1 to 3 shall be repeated with signal offsets at required frequencies.

Step 4:

The information shown in Table 44 shall be recorded in the test report for each measured signal level and unwanted signal offset.

For equipment using CCA whatever is the receiver category, steps 1 to 4 shall be repeated with signal generator A level adjusted +13 dB higher than in the measurements in clause 5.18.6.4.

10.1.5 Test Results

Receiver category

<input type="checkbox"/>	Receiver category 1	Category 1 is a high performance level of receiver. In particular to be used where the operation of a SRD may have inherent safety of human life implications.
<input type="checkbox"/>	Receiver category 1.5	Category 1.5 is an improved performance level of receiver category 2.
<input type="checkbox"/>	Receiver category 2	Category 2 is standard performance level of receiver.
<input checked="" type="checkbox"/>	Receiver category 3	Category 3 is a low performance level of receiver. Manufacturers have to be aware that category 3 receivers are not able to work properly in case of coexistence with some services such as a mobile radio service in adjacent bands. The manufacturer shall provide another mean to overcome the weakness of the radio link or accept the failure.

Operation Mode: ☒ ASK

Operation frequency: ☒ 433.92MHz

Test mode: ☐ TX Mode ☒ RX Mode

Temperature: 24°C

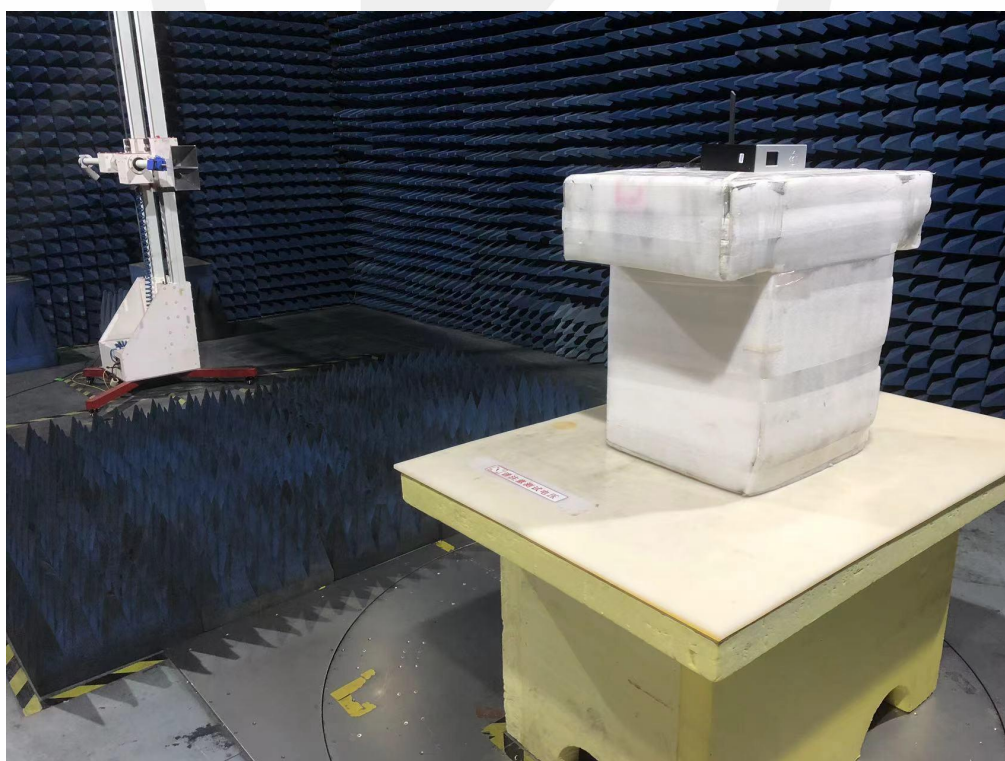
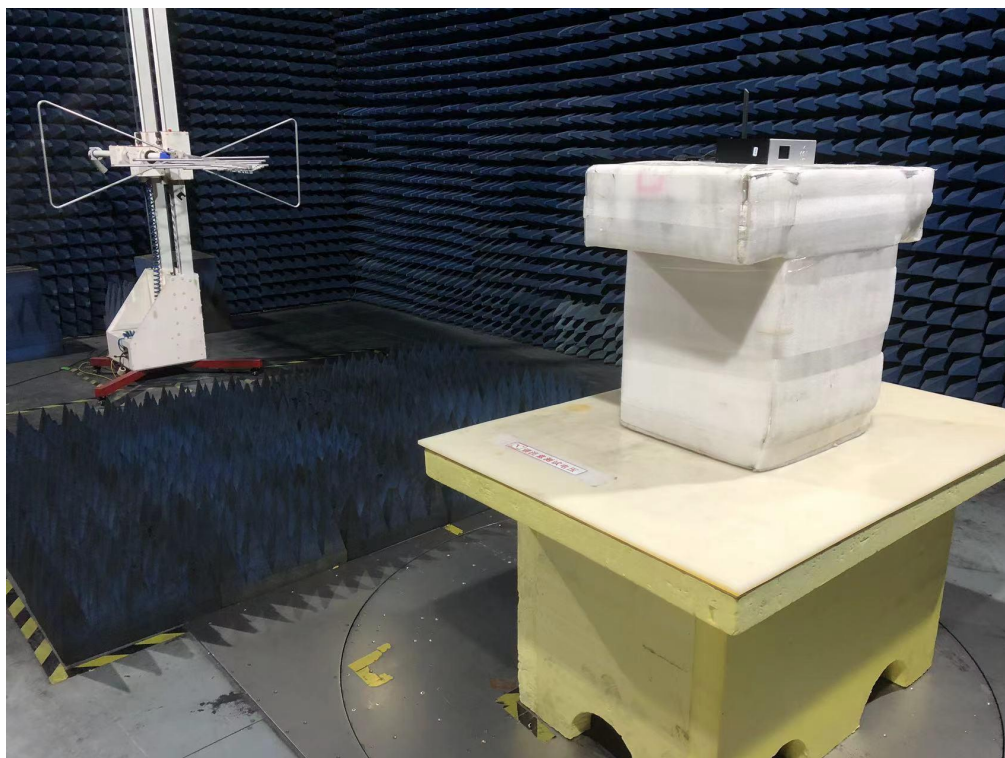
Test Date: Sep 19, 2024

Humidity: 56% RH

Tested by: Ccyf

Test frequency offset (MHz)	Different between unwanted emission level and wanted emission level observed(dB)		Limit (dB)	Result
±2MHz	Lower:431.92	-58.33	≥ -80 dBm	PASS
	Higher: 435.92	-58.42	≥ -80 dBm	PASS
±10MHz	Lower: 423.92	-62.91	≥ -60 dBm	PASS
	Higher: 443.92	-62.74	≥ -60 dBm	PASS
±5 % of Centre Frequency or 15 MHz	Lower:412.22	-66.27	≥ -60 dBm	PASS
	Higher:455.62	-65.36	≥ -60 dBm	PASS

11. APPENDIX I PHOTOGRAPHS OF TEST SETUP



*** End of Report ***

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