

**TEST REPORT****ETSI EN 300 220-1 V3.1.1 (2017-02) & ETSI EN 300 220-2 V3.2.1 (2018-06)**

Report Reference No.: HK2503261504-7ER

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Date of issue: 2025/05/15

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Address: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park,
Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China**Applicant's name** : EDA Technology Shanghai Co.,LtdAddress: Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road,
Jiading District, Shanghai, PRC**Test specification:**Standard : **ETSI EN 300 220-1 V3.1.1 (2017-02) &
ETSI EN 300 220-2 V3.2.1 (2018-06)**

TRF Originator : Shenzhen HUAKE Testing Technology Co., Ltd.

Master TRF : Dated 2017-05

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Product Name : Outdoor LoRa GatewayTrade Mark : 

Product Model : ED-GWL2110

Serial Model : N/A

Hardware Version : V1.1

Software Version : V2.0

Rating : DC 48V From POE Power

Result : **PASS**



TEST REPORT

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Date of issue

Product Name : Outdoor LoRa Gateway

Product Model : ED-GWL2110

Serial Model : N/A

Applicant : EDA Technology Shanghai Co.,Ltd

Address : Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road,
Jiading District, Shanghai, PRC

Manufacturer : EDA Technology Shanghai Co.,Ltd

Address : Building 29, Shengchuang Enterprise Park, No.1661 Jialuo Road,
Jiading District, Shanghai, PRC

Test Result

PASS

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2025/05/15	Jason Zhou



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1.1 TEST STANDARDS

The tests were performed according to following standards:

[ETSI EN 300 220-1 V3.1.1 \(2017-02\)](#)—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 V3.2.1 \(2018-06\)](#)—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

1.2 Test Description

Clause	Test Parameter	Condition	Result
All equipment conformance requirements			
4.2.1	Operating frequency	Apply to all equipment	PASS
4.2.2	Unwanted emissions in the spurious domain	Apply to all equipment	PASS
Transmitters conformance requirements			
4.3.1	Effective Radiated Power	Apply to transmitters	PASS
4.3.2	Maximum e.r.p. spectral density	Apply to transmitters using annex B bands I, L. Apply to transmitters using DSSS or wideband techniques other than FHSS modulation, in annex C band X.	PASS
4.3.3	Duty Cycle	Apply to all transmitters except EUT with polite spectrum access (described in clause 4.5) where permitted in annex B, table B.1 or annex C, table C.1 or any NRI.	PASS
4.3.4	Occupied Bandwidth	Apply to all transmitters.	PASS
4.3.5	Tx Out of Band Emissions	Apply to all transmitters with OCW > 25 kHz.	PASS
4.3.6	Transient power	Transient power applies to all transmitters.	PASS
4.3.7	Adjacent Channel Power	Apply to all transmitters with OCW ≤ 25 kHz.	N/A
4.3.8	TX behaviour under Low Voltage Conditions	Apply to battery powered EUT.	PASS
4.3.9	Adaptive Power Control	Apply to all EUT with adaptive power control using annex C band AA.	N/A
4.3.10	FHSS equipment	Apply to all FHSS equipment.	N/A
4.3.11	Short term behaviour	Apply to EUT for operation in bands where T_{on} or T_{off} limits are specified in annex C, table C.1 or NRI.	N/A
Receivers conformance requirements			
4.4.1	RX sensitivity	Apply to EUT with polite spectrum access instead of duty cycle where permitted by table B.1 in annex B, or table C.1 in annex C or any NRI.	N/A
4.4.2	Blocking	Apply to all receivers	PASS
Polite spectrum access conformance requirement			
4.5.2	Clear Channel Assessment threshold	Apply to EUT with polite spectrum access instead of duty cycle where permitted by table B.1 in annex B, or table C.1 in annex C or any NRI.	N/A
4.5.3	Polite spectrum access timing parameters	Apply to EUT with polite spectrum access instead of duty cycle where permitted by table B.1 in annex B, or table C.1 in annex C or any NRI.	N/A
4.5.4	Adaptive Frequency Agility	Apply to EUT with AFA.	N/A

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

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1.3 Test Facility

1.3.1 Information of the Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.

1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street,
Bao'an District, Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2014) and CISPR Publication 22.

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.

1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“and is documented in the Shenzhen HUAKE Testing Technology Co., Ltd. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen HUAKE Testing Technology Co., Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.90dB	(1)
Radiated Emission	Above 1GHz	4.26dB	(1)
Conducted Disturbance	0.15~30MHz	2.71dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



2 GENERAL INFORMATION

2.1 General Remarks

Date of receipt of test sample	:	2025/03/26
Testing commenced on	:	2025/03/26
Testing concluded on	:	2025/05/15

2.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature	NT: Normal Temperature	25°C
	HT: High Temperature	40°C
	LV: Low Temperature	-10°C
Voltage	NV: Normal Voltage	TX: DC 48V
	HV: High Voltage	TX: DC 52.8V
	LV: Low Voltage	TX: DC 43.2V
Other	Relative Humidity	55 %
	Air Pressure	101 kPa



2.3 General Description of EUT

Product Name:	Outdoor LoRa Gateway	
Model/Type reference:	ED-GWL2110	
List model	N/A	
Difference description	N/A	
Power supply:	DC 48V From POE Power	
Wireless technology		
Frequency band:	863.1 – 869.9MHz	
Operating frequency:	863.1 – 869.9MHz	
Modulation type:	FSK	
Operating channel width:	130.54KHz	
Maximum RF power:	6.18dBm	
Spread spectrum method:	<input checked="" type="checkbox"/> Duty cycle <input type="checkbox"/> Polite spectrum access	
Receiver category:	<input type="checkbox"/> 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"/> Category 1.5:	Category 1.5 is an improved performance level of receiver category 2.
	<input checked="" type="checkbox"/> Category 2:	Category 2 is standard performance level of receiver.
	<input type="checkbox"/> 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.
Antenna type:	External Antenna	
Note: Antenna gain Refer to the antenna specifications. The cable loss data is obtained from the supplier. The test results in the report only apply to the tested sample.		

Note: For more details, refer to the user's manual of the EUT.

2.4 Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The user can control the EUT for staying in continuous transmitting & receiving mode for testing.



2.5 Equipments Used during the Test

Effective radiated power & Spurious Emissions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Cal.Due
1	Spectrum analyzer	Agilent	N9020A	HKE-048	2025/02/19	2026/02/18
2	Receiver	R&S	ESR-7	HKE-010	2025/02/19	2026/02/18
3	Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	2024/02/21	2026/02/20
4	Horn antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2026/02/20
5	Spectrum analyzer	R&S	FSP40	HKE-025	2025/02/19	2026/02/18
6	Preamplifier	Schwarzbeck	EMC0518 45SE	HKE-015	2025/02/19	2026/02/18
7	Preamplifier	Agilent	83051A	HKE-016	2025/02/19	2026/02/18
8	Power meter	Agilent	E4419B	HKE-085	2025/02/19	2026/02/18
9	RF test software	Tonscend	JS1120-3 V3.5.39	HKE-083	/	/

Blocking						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Cal.Due
1	Spectrum Analyzer	Agilent	N9020	HKE-048	2025/02/19	2026/02/18
2	Wireless Communication Test Set	R&S	CMW500	HKE-027	2025/02/19	2026/02/18

PSD & TX Transient & OOB & OBW & Duty cycle & Adjacent channel power						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Cal.Due
1	Spectrum Analyzer	Agilent	N9020	HKE-048	2025/02/19	2026/02/18

TX behaviour under low voltage conditions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Cal.Due
1	Spectrum Analyzer	Agilent	N9020	HKE-048	2025/02/19	2026/02/18

2.6 Modifications

No modifications were implemented to meet testing criteria.



3 TEST CONDITIONS AND RESULTS

3.1 All equipment conformance requirements

3.1.1 Operating frequency

Limit

The manufacturer may declare either one or more operating frequencies and operating channels. Operating channel(s) shall be entirely within operational frequency bands allowed by annexes B, C or any NRI.

Manufacturer Declaration

Parameters	Value	Note
Operational Frequency band	868-868.6MHz (Refer to Annex B, K & L & Q)	Declared by the manufacturer
Nominal Operating Frequency	863.1-869.9MHz	Declared by the manufacturer
Operating Channel width	130.54KHz	Declared by the manufacturer

Frequency List

Frequency(MHz)	Frequency(MHz)	Frequency(MHz)	Frequency(MHz)	Frequency(MHz)
863.1	864.5	865.9	867.3	868.7
863.3	864.7	866.1	867.5	868.9
863.5	864.9	866.3	867.7	869.1
863.7	865.1	866.5	867.9	869.3
863.9	865.3	866.7	868.1	869.5
864.1	865.5	866.9	868.3	869.7
864.3	865.7	867.1	868.5	869.9



3.1.2 Unwanted emissions in the spurious domain

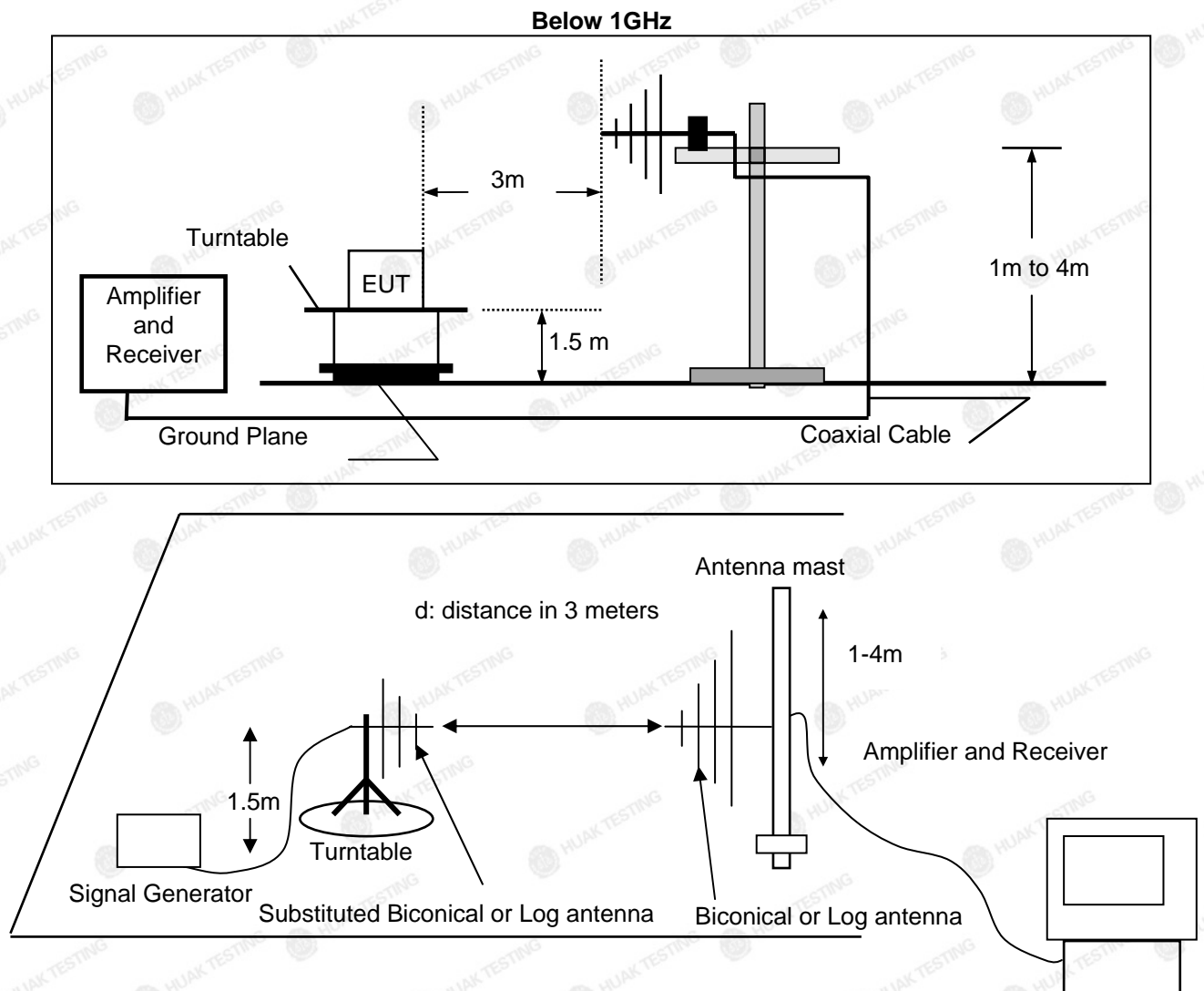
Limit

The power of any unwanted emission in the spurious domain shall not exceed the values given as bellow

Spurious domain emission limits

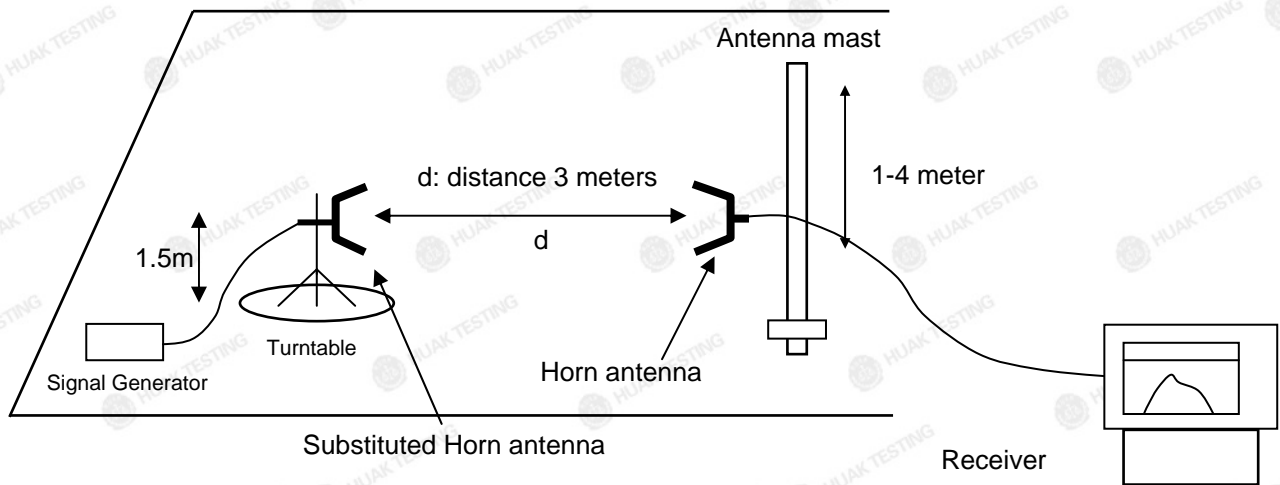
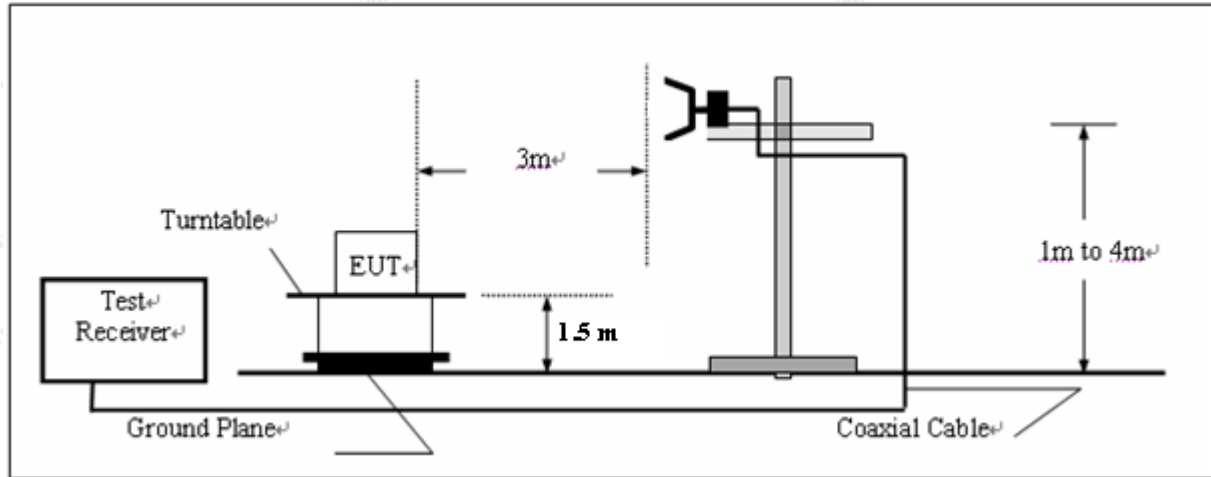
Frequency	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz	Other frequencies below 1 000 MHz	Frequencies above 1 000 MHz
State			
TX mode	-54 dBm	-36 dBm	-30 dBm
RX and all other modes	-57 dBm	-57 dBm	-47 dBm

Test Configuration





Above 1GHz



Test Procedure

1. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
2. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.9.3.3 for the measurement method.



Remark: Measurement frequency from 25MHz to 6GHz and recorded worst at below:

863.1MHz

TX mode

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
146.46	V	-70.87	-36	-34.87	PASS
272.81	V	-76.56	-36	-40.56	PASS
409.03	V	-71.88	-36	-35.88	PASS
447.74	V	-76.28	-36	-40.28	PASS
511.95	V	-74.01	-54	-20.01	PASS
853.36	V	-75.99	-54	-21.99	PASS
176.66	H	-76.20	-54	-22.20	PASS
230.52	H	-78.75	-54	-24.75	PASS
310.97	H	-73.61	-36	-37.61	PASS
448.24	H	-76.59	-36	-40.59	PASS
602.68	H	-77.18	-54	-23.18	PASS
812.70	H	-74.34	-54	-20.34	PASS
Note: 1.Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Above 1GHz:					
1188.71	V	-52.28	-30	-22.28	PASS
1461.75	V	-50.11	-30	-20.11	PASS
2590.98	V	-60.16	-30	-30.16	PASS
2415.11	V	-52.98	-30	-22.98	PASS
3590.41	V	-51.90	-30	-21.90	PASS
3893.50	V	-52.62	-30	-22.62	PASS
1329.63	H	-54.88	-30	-24.88	PASS
1674.14	H	-50.64	-30	-20.64	PASS
2408.60	H	-51.84	-30	-21.84	PASS
2730.73	H	-49.04	-30	-19.04	PASS
3697.24	H	-53.40	-30	-23.40	PASS
3831.44	H	-53.47	-30	-23.47	PASS
Note: 1.Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



RX mode

Fre. (MHz)	ANT. Pol.	EIRP (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
229.27	V	-75.94	-57	-18.94	PASS
246.63	V	-75.57	-57	-18.57	PASS
304.68	V	-72.44	-57	-15.44	PASS
411.64	V	-74.24	-57	-17.24	PASS
486.88	V	-74.72	-57	-17.72	PASS
849.45	V	-76.90	-57	-19.90	PASS
177.50	H	-77.14	-57	-20.14	PASS
288.35	H	-75.19	-57	-18.19	PASS
354.31	H	-76.69	-57	-19.69	PASS
441.02	H	-71.21	-57	-14.21	PASS
562.23	H	-78.27	-57	-21.27	PASS
817.85	H	-79.04	-57	-22.04	PASS
Note: 1.Cable loss and antenna gain was combined in the calculated result. 2.Other point of the measurements are below 20dB from the limit.					

Fre. (MHz)	ANT. Pol.	EIRP (dBm)	Limit	Margin	Conclusion
Above 1GHz:					
1836.68	H	-65.42	-47	-18.42	PASS
2176.02	V	-67.28	-47	-20.28	PASS
2996.76	H	-59.76	-47	-12.76	PASS
2984.43	V	-66.35	-47	-19.35	PASS
3386.26	H	-65.31	-47	-18.31	PASS
3291.38	V	-69.28	-47	-22.28	PASS
4025.02	H	-61.44	-47	-14.44	PASS
4066.11	V	-65.57	-47	-18.57	PASS
4597.88	H	-65.08	-47	-18.08	PASS
4718.82	V	-64.33	-47	-17.33	PASS
5790.00	H	-67.69	-47	-20.69	PASS
6133.34	V	-59.82	-47	-12.82	PASS

Note: "--Other emission levels were very low against the limit and not reported.



TX mode

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
148.11	V	-71.14	-36	-35.14	PASS
274.52	V	-77.15	-36	-41.15	PASS
405.15	V	-72.69	-36	-36.69	PASS
448.25	V	-75.39	-36	-39.39	PASS
512.34	V	-74.57	-54	-20.57	PASS
853.26	V	-76.20	-54	-22.20	PASS
173.99	H	-76.97	-54	-22.97	PASS
232.41	H	-78.53	-54	-24.53	PASS
308.83	H	-73.68	-36	-37.68	PASS
447.77	H	-76.02	-36	-40.02	PASS
605.85	H	-77.12	-54	-23.12	PASS
816.45	H	-73.93	-54	-19.93	PASS
Note: 1.Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
Above 1GHz:					
1220.35	V	-51.32	-30	-21.32	PASS
1475.36	V	-50.61	-30	-20.61	PASS
2580.48	V	-60.13	-30	-30.13	PASS
2369.18	V	-53.87	-30	-23.87	PASS
3610.25	V	-51.25	-30	-21.25	PASS
3920.90	V	-52.05	-30	-22.05	PASS
1369.24	H	-55.01	-30	-25.01	PASS
1702.89	H	-50.52	-30	-20.52	PASS
2449.34	H	-52.16	-30	-22.16	PASS
2777.99	H	-49.74	-30	-19.74	PASS
3742.93	H	-53.10	-30	-23.10	PASS
3807.14	H	-52.99	-30	-22.99	PASS
Note: 1.Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



RX mode

Fre. (MHz)	ANT. Pol.	EIRP (dBm)	Limit	Margin	Conclusion
Below 1GHz:					
226.92	V	-76.87	-57	-19.87	PASS
250.30	V	-75.05	-57	-18.05	PASS
307.19	V	-71.53	-57	-14.53	PASS
412.37	V	-75.07	-57	-18.07	PASS
483.24	V	-75.16	-57	-18.16	PASS
850.88	V	-76.22	-57	-19.22	PASS
174.61	H	-78.09	-57	-21.09	PASS
291.38	H	-75.97	-57	-18.97	PASS
351.87	H	-77.10	-57	-20.10	PASS
438.85	H	-70.62	-57	-13.62	PASS
560.82	H	-78.35	-57	-21.35	PASS
820.08	H	-80.03	-57	-23.03	PASS
Note: 1.Cable loss and antenna gain was combined in the calculated result. 2.Other point of the measurements are below 20dB from the limit.					

Fre. (MHz)	ANT. Pol.	EIRP (dBm)	Limit	Margin	Conclusion
Above 1GHz:					
1809.08	H	-65.49	-47	-18.49	PASS
2129.41	V	-66.84	-47	-19.84	PASS
2982.34	H	-59.80	-47	-12.80	PASS
3004.99	V	-66.06	-47	-19.06	PASS
3412.78	H	-64.98	-47	-17.98	PASS
3309.37	V	-70.19	-47	-23.19	PASS
4027.09	H	-61.24	-47	-14.24	PASS
4112.31	V	-65.57	-47	-18.57	PASS
4574.73	H	-64.34	-47	-17.34	PASS
4717.04	V	-65.15	-47	-18.15	PASS
5761.89	H	-67.66	-47	-20.66	PASS
6118.61	V	-59.93	-47	-12.93	PASS

Note: "--Other emission levels were very low against the limit and not reported.

3.2 Transmitters conformance requirements

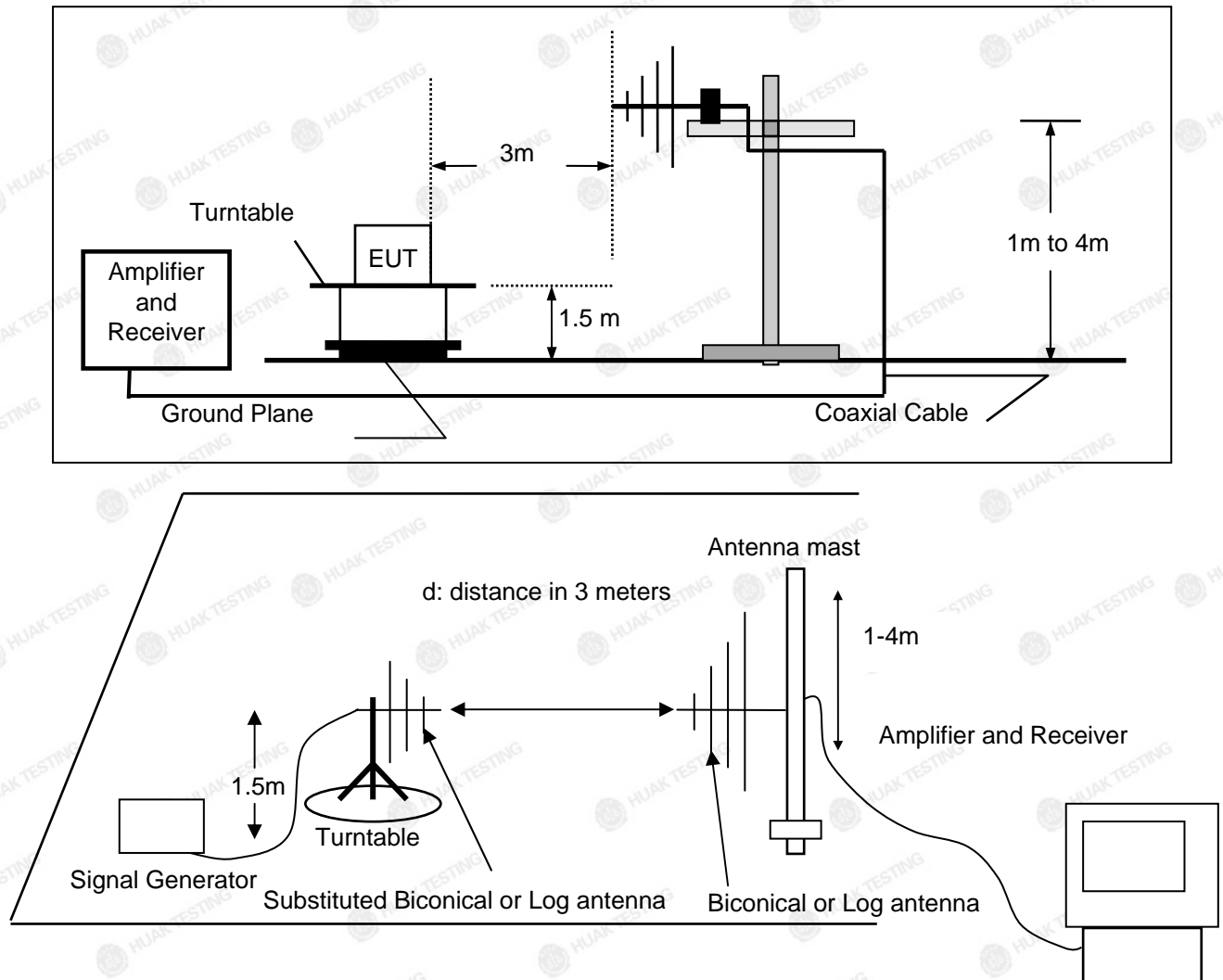
3.2.1 Effective Radiated Power

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):

Frequency range	Radiated powr, e.r.p
868-868.6MHz	25 mW

Test Configuration



Test Procedure

1. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
2. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.2.2.2 for the measurement method.

**Test Results**

863.1MHz

Tests	ERP (dBm)	Limit (mW/dBm)	Tem.	Vol.	Result
Measured radiated power (dBm)	6.18	25/13.98	TN	VN	Pass
	5.42	25/13.98	TL	VL	Pass
	5.15	25/13.98	TH	VH	Pass
	4.58	25/13.98	TL	VH	Pass
	5.11	25/13.98	TH	VL	Pass

866.5MHz

Tests	ERP (dBm)	Limit (mW/dBm)	Tem.	Vol.	Result
Measured radiated power (dBm)	6.08	25/13.98	TN	VN	Pass
	5.42	25/13.98	TL	VL	Pass
	5.57	25/13.98	TH	VH	Pass
	4.26	25/13.98	TL	VH	Pass
	5.15	25/13.98	TH	VL	Pass

869.9MHz

Tests	ERP (dBm)	Limit (mW/dBm)	Tem.	Vol.	Result
Measured radiated power (dBm)	5.98	25/13.98	TN	VN	Pass
	5.16	25/13.98	TL	VL	Pass
	5.72	25/13.98	TH	VH	Pass
	4.95	25/13.98	TL	VH	Pass
	5.16	25/13.98	TH	VL	Pass

3.2.2



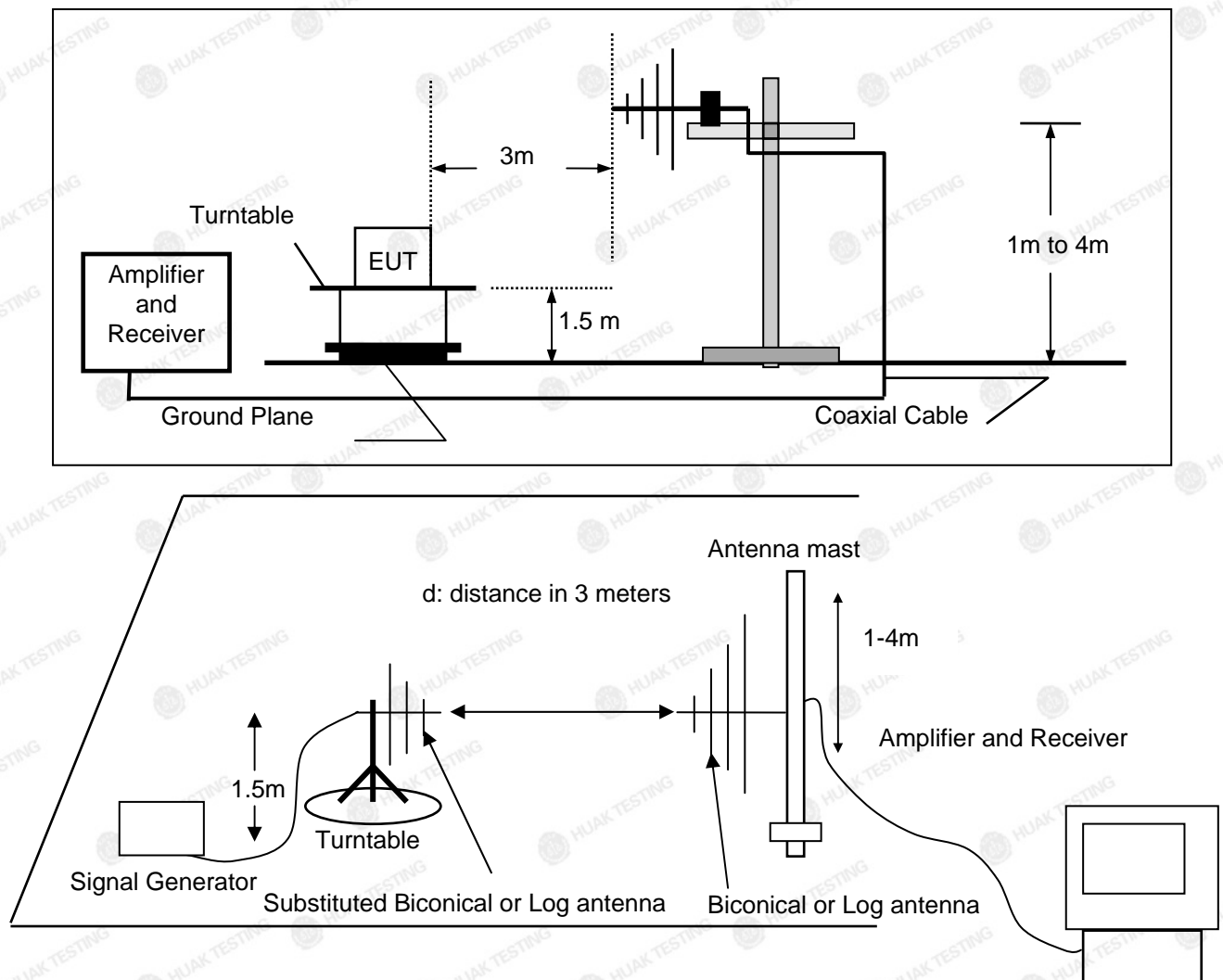
3.2.3 Maximum Effective Radiated Power spectral density

Limit

The Maximum e.r.p. spectral density shall not be greater than the value allowed in annexes B or C for the chosen operational frequency band(s):

Frequency range	Radiated powr, e.r.p
865-868MHz	Power density: -4,5 dBm/100 kHz The power density can be increased to +6,2 dBm/100 kHz if the band of operation is limited to 865 MHz to 868 MHz

Test Configuration



Test Procedure

3. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
4. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.2.2.2 for the measurement method.



Test Results

866.5MHz

Tests	ERP (dBm)	Limit (mW/dBm)	Tem.	Vol.	Result
Measured radiated power (dBm)	-3.48	6.2	TN	VN	Pass
	-3.72	6.2	TL	VL	Pass
	-3.69	6.2	TH	VH	Pass
	-3.56	6.2	TL	VH	Pass
	-3.91	6.2	TH	VL	Pass



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).

Frequency range	Duty cycle
868-868.6MHz	up to 100%

Test Results

N/A

Note: Since the duty cycle limit is up to 100% for the device, it is deemed to comply without testing



3.2.4 Occupied Bandwidth

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} .

Test Configuration



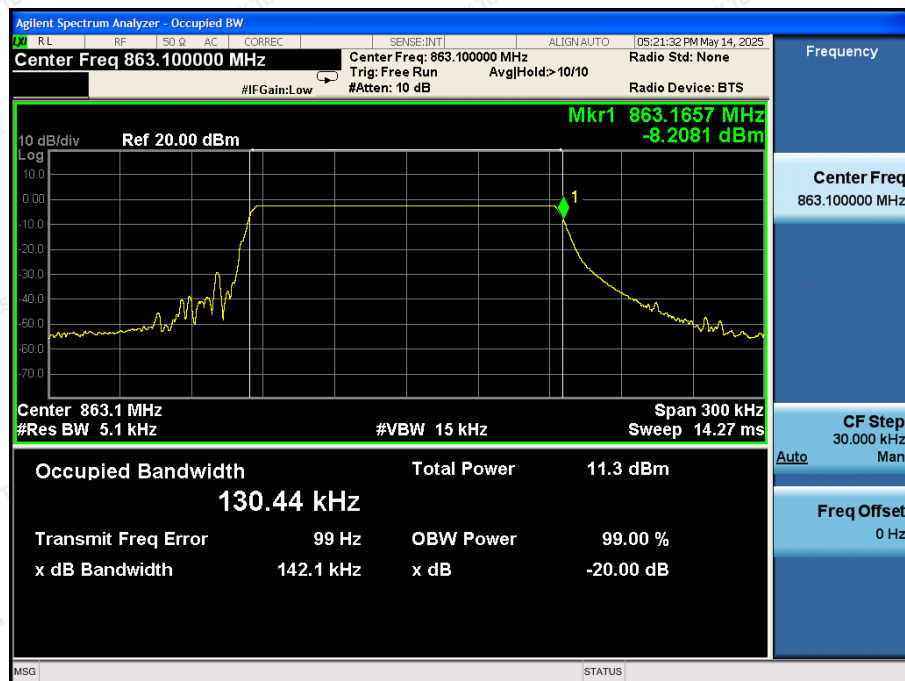
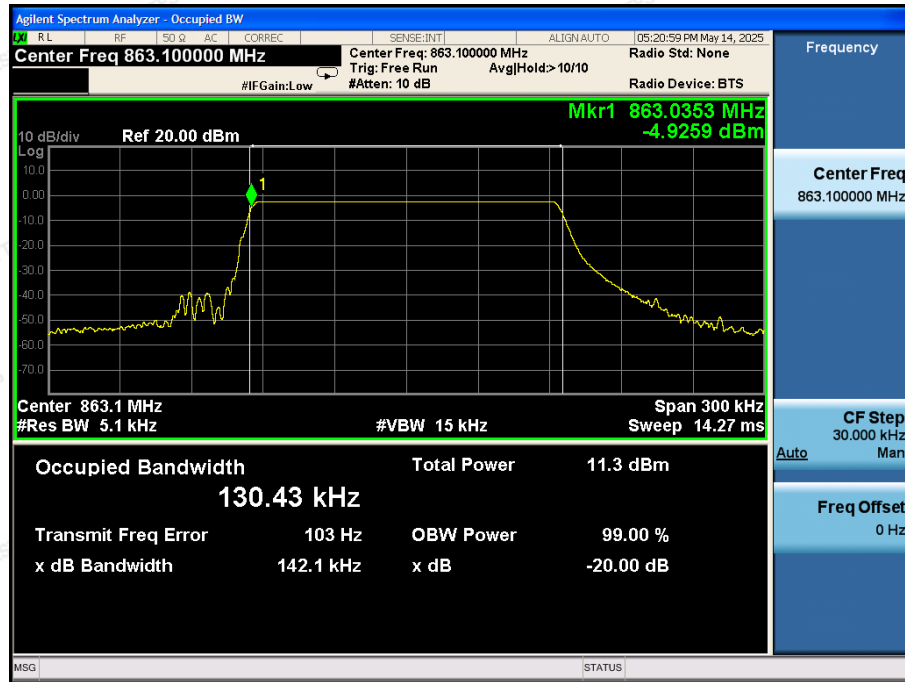
Test Procedure

1. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
2. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.6.3.4 for the measurement method.

Test Results

863.1MHz

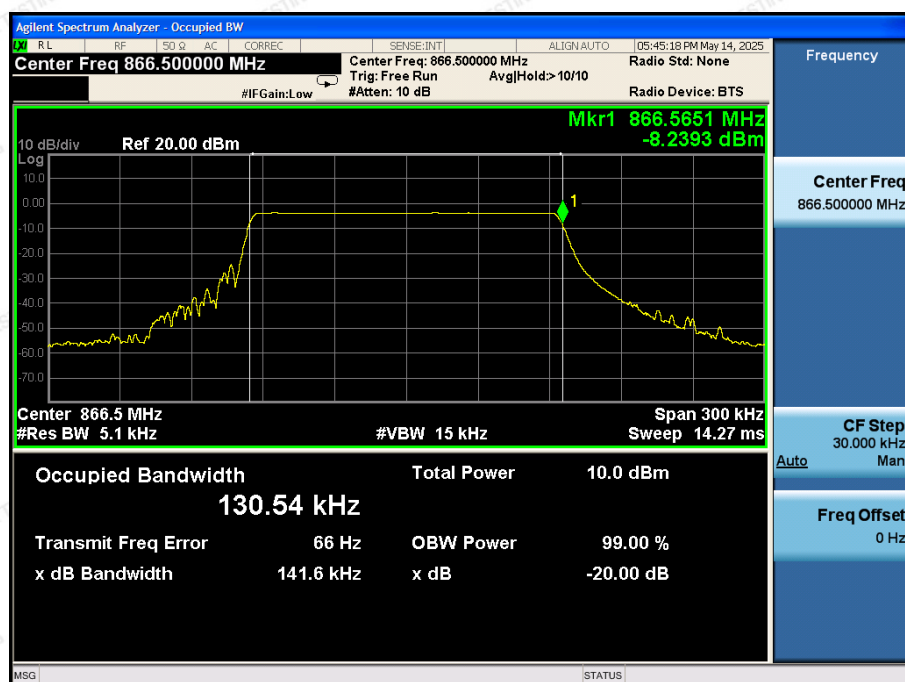
Test CONDITION		Frequency Range	
Temperature	Voltage	Low Frequency(MHz)	High Frequency(MHz)
25°C	DC 48V	863.0353	863.1657
-10°C	DC 52.8V	863.0337	863.1642
	DC 43.2V	863.0340	863.1645
40°C	DC 52.8V	863.0356	863.1675
	DC 43.2V	863.0373	863.1667
Messured freqeicies(Lowset and Highest)		863.0337	863.1675
Limit		FL>863	FH<865





866.5MHz

Test CONDITION		Frequency Range	
Temperature	Voltage	Low Frequency(MHz)	High Frequency(MHz)
25°C	DC 48V	866.4346	866.5651
-10°C	DC 52.8V	866.4340	866.5661
	DC 43.2V	866.4353	866.5646
40°C	DC 52.8V	866.4333	866.5665
	DC 43.2V	866.4343	866.5642
Measured frequencies(Lowset and Highest)		863.4333	866.5665
Limit		FL>865	FH<868



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869.9MHz

Test CONDITION		Frequency Range	
Temperature	Voltage	Low Frequency(MHz)	High Frequency(MHz)
25°C	DC 48V	869.8349	869.9657
-10°C	DC 52.8V	869.8366	869.9659
	DC 43.2V	869.8339	869.9664
40°C	DC 52.8V	869.8363	869.9660
	DC 43.2V	869.8344	869.9642
Messured frequcies(Lowset and Highest)		869.8339	869.9664
Limit		FL>869.7	FH<870



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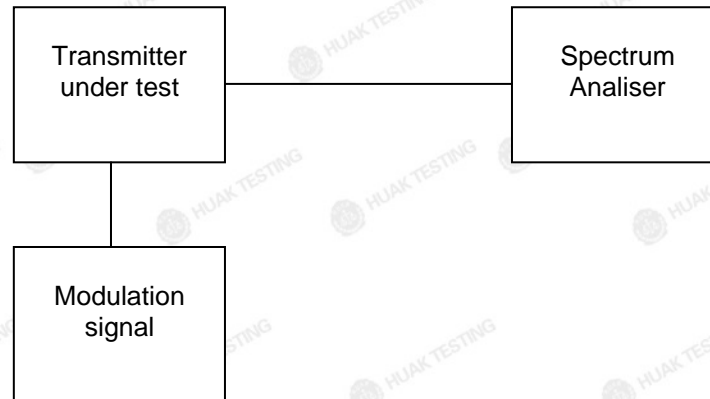
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**3.2.5 Transient power****Limit**

The transient power shall not exceed the values given in Table below:

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

Test Configuration**Test Procedure**

1. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
2. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.10.3.2 for the measurement method.

Test Results

863.1MHz

Measurement points	Measurement Power (dBm)	Limit	Test result
-0.5 x OCW - 3kHz	-4.65	0	PASS
0.5 x OCW + 3kHz	-6.17	0	PASS
-12.5 kHz or -OCW	-10.95	0	PASS
+12.5 kHz or +OCW	-10.67	0	PASS
-0.5 x OCW - 400kHz	-32.38	-27	PASS
0.5 x OCW + 400kHz	-31.73	-27	PASS
-0.5 x OCW -1200kHz	-43.55	-27	PASS
0.5 x OCW + 1200kHz	-37.48	-27	PASS

869.9MHz

Measurement points	Measurement Power (dBm)	Limit	Test result
-0.5 x OCW - 3kHz	-4.80	0	PASS
0.5 x OCW + 3kHz	-6.18	0	PASS
-12.5 kHz or -OCW	-11.05	0	PASS
+12.5 kHz or +OCW	-10.72	0	PASS
-0.5 x OCW - 400kHz	-32.30	-27	PASS
0.5 x OCW + 400kHz	-31.88	-27	PASS
-0.5 x OCW -1200kHz	-43.47	-27	PASS
0.5 x OCW + 1200kHz	-37.52	-27	PASS



3.2.6 Tx Out of Band Emissions

Limit

The EUT emissions level in OOB domains for the Operating Channel and the Operational Frequency Band shall be less or equal to Table 15 spectrum mask.

Table 15: Emission limits in the Out Of Band domains

Domain	Frequency Range	RBW _{REF}	Max power limit
OOB limits applicable to Operational Frequency Band (See Figure 6)	$f \leq f_{\text{low_OFB}} - 400 \text{ kHz}$	10 kHz	-36 dBm
	$F_{\text{low_OFB}} - 400 \text{ kHz} \leq f \leq f_{\text{low_OFB}} - 200 \text{ kHz}$	1 kHz	-36 dBm
	$f_{\text{low}} - 200 \text{ kHz} \leq f < f_{\text{low_OFB}}$	1 kHz	See Figure 6
	$f = f_{\text{low_OFB}}$	1 kHz	0 dBm
	$f = f_{\text{high_OFB}}$	1 kHz	0 dBm
	$F_{\text{high_OFB}} < f \leq f_{\text{high_OFB}} + 200 \text{ kHz}$	1 kHz	See Figure 6
	$F_{\text{high_OFB}} + 200 \text{ kHz} \leq f \leq f_{\text{high_OFB}} + 400 \text{ kHz}$	1 kHz	-36 dBm
	$F_{\text{high_OFB}} + 400 \text{ kHz} \leq f$	10 kHz	-36 dBm
OOB limits applicable to Operating Channel (See Figure 5)	$f = f_c - 2.5 \times \text{OCW}$	1 kHz	-36 dBm
	$f_c - 2.5 \times \text{OCW} \leq f \leq f_c - 0.5 \times \text{OCW}$	1 kHz	See Figure 5
	$f = f_c - 0.5 \times \text{OCW}$	1 kHz	0 dBm
	$f = f_c + 0.5 \times \text{OCW}$	1 kHz	0 dBm
	$f_c + 0.5 \times \text{OCW} \leq f \leq f_c + 2.5 \times \text{OCW}$	1 kHz	See Figure 5
	$f = f_c + 2.5 \times \text{OCW}$	1 kHz	-36 dBm

NOTE: f is the measurement frequency.
 f_c is the Operating Frequency.
 $F_{\text{low_OFB}}$ is the lower edge of the Operational Frequency Band.
 $F_{\text{high_OFB}}$ is the upper edge of the Operational Frequency Band.
OCW is the operating channel bandwidth.

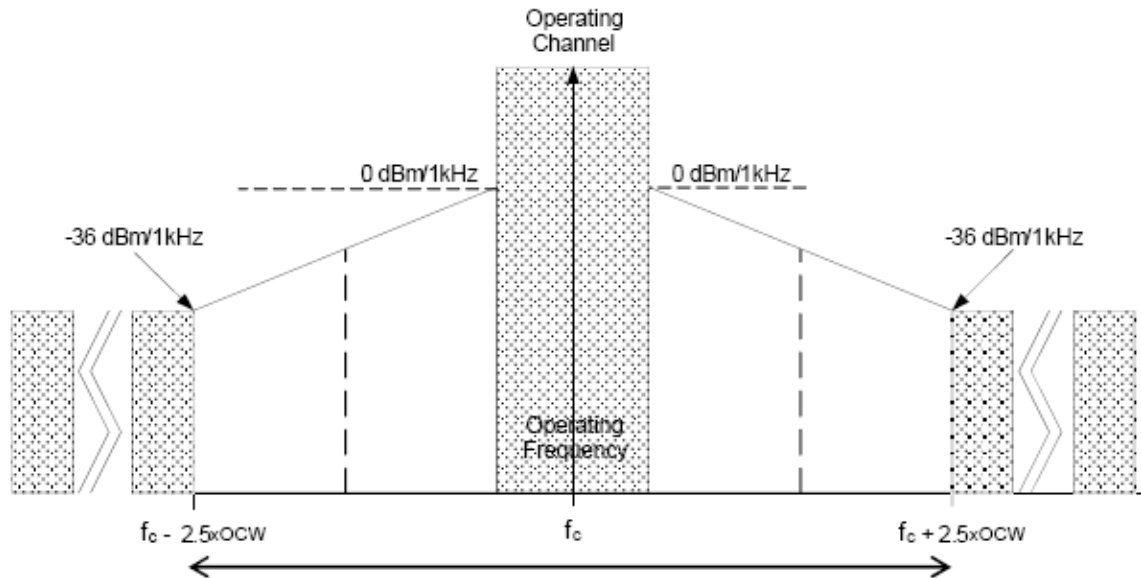


Figure 5: Out Of Band Domain for Operating Channel with reference BW

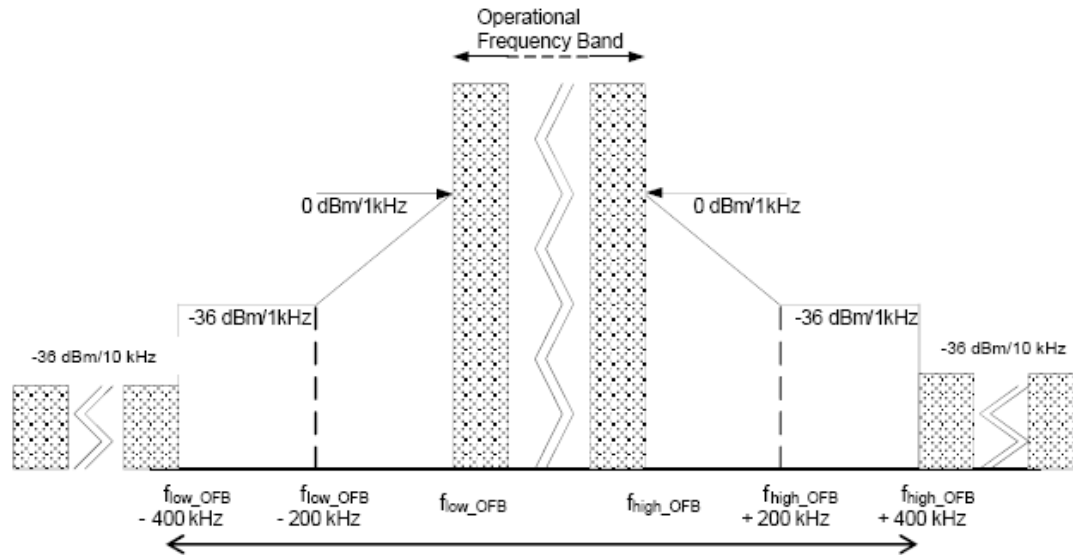


Figure 6: Out Of Band Domain for Operational Frequency Band with reference BW

Specific limits apply at frequencies immediately above and below the Operational Frequency Band as shown in Figure 6.

NOTE: f_{low_OFB} is the lower edge of the Operational Frequency Band.

f_{high_OFB} is the upper edge of the Operational Frequency Band.

Test Configuration



Test Procedure

1. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
2. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.11.3.2 for the measurement method.



863.1MHz

Voltage Supply(Vdc)	Measurement Frequency (MHz)	Limit
f-15kHz	-44.39	0
f+15kHz	-33.33	0
-0.5 x OCW - 400kHz	-66.56	-36
0.5 x OCW + 400kHz	-63.03	-36
-0.5 x OCW -1200kHz	-75.71	-36
0.5 x OCW + 1200kHz	-70.28	-36

869.9MHz

Voltage Supply(Vdc)	Measurement Frequency (MHz)	Limit
f-15kHz	-44.56	0
f+15kHz	-33.48	0
-0.5 x OCW - 400kHz	-66.67	-36
0.5 x OCW + 400kHz	-63.16	-36
-0.5 x OCW -1200kHz	-75.69	-36
0.5 x OCW + 1200kHz	-70.23	-36

**3.2.7 ADJACENT CHANNEL POWER****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

Test Configuration**Test Procedure**

- Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
- Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.11.3.2 for the measurement method.

Test Results

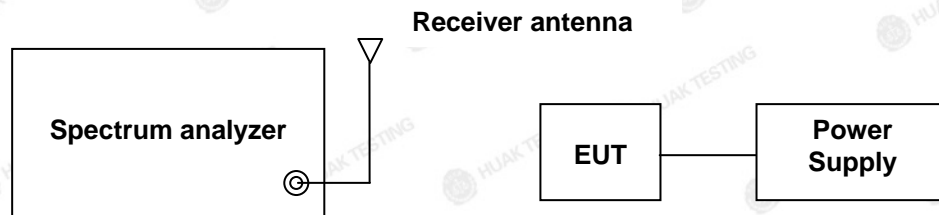
N/A

EUT OCB is more than 25KHz, so this test report is not applicable.

**3.2.8 TX behaviour under Low Voltage Conditions****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.

Test Configuration**Test Procedure**

- 5. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 4 for the test conditions.
- 6. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 5.12.3.2 for the measurement method.

Test Results

863.1MHz

Voltage Supply(Vdc)	Measurement Frequency(MHz)
48.0	863.1
52.8	863.0
43.2	No emission

866.5MHz

Voltage Supply(Vdc)	Measurement Frequency(MHz)
48.0	866.5
52.8	866.4
43.2	No emission

869.9MHz

Voltage Supply(Vdc)	Measurement Frequency(MHz)
48.0	869.9
52.8	869.8
43.2	No emission



3.3 Receivers conformance requirements

3.3.1 Blocking

Limit

The blocking levels at the specified frequency offsets shall be equal to or greater than the limits show in below tables for each receiver category.

Limits for receiver category 3

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

Limits for receiver category 2

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

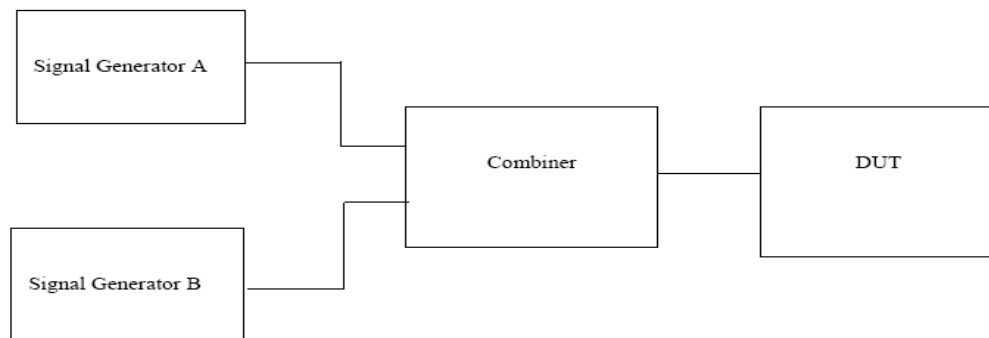
Limits for receiver category 1.5

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

Limits for receiver category 1

Requirement	Limits
	Receiver category 1
Blocking at ± 2 MHz from Centre Frequency	≥ -20 dBm
Blocking at ± 10 MHz from Centre Frequency	≥ -20 dBm
Blocking at ± 5 % of Centre Frequency or 15 MHz, whichever is the greater	≥ -20 dBm

Test Configuration





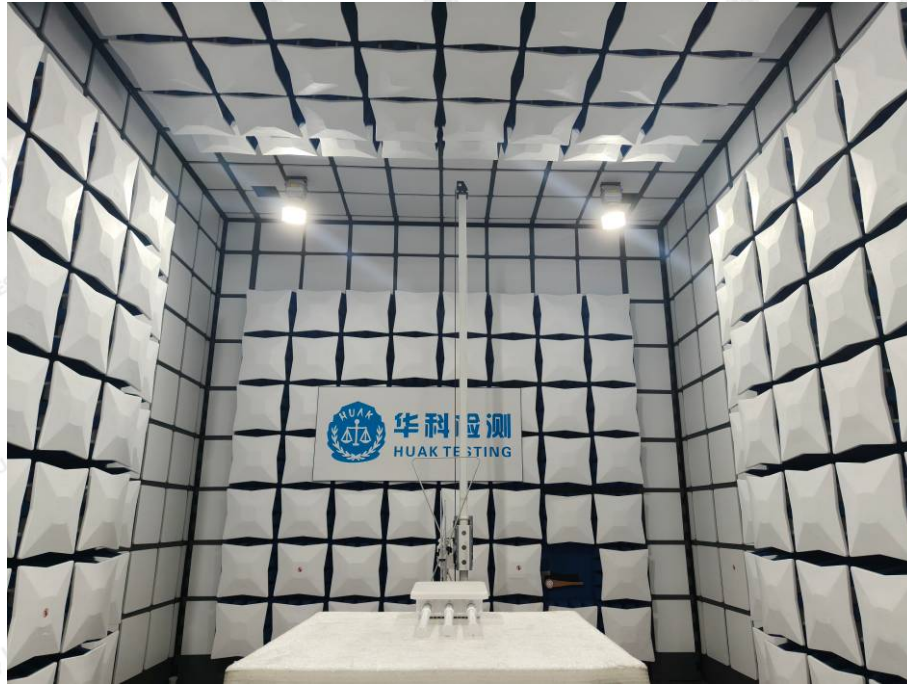
1. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 6 for the test conditions.
2. Please refer to ETSI EN 300 220-1 V3.1.1 (2017-02) Sub-clause 8.4.2 for the measurement method.

TEST RESULTS

Test Channel	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
Low	861.1	-53.86	-69	PASS
	853.1	-35.71	-44	PASS
	848.1	-29.79	-44	PASS
High	871.9	-25.51	-69	PASS
	879.9	-29.31	-44	PASS
	884.9	-28.49	-44	PASS



Test Setup Photos of the EUT



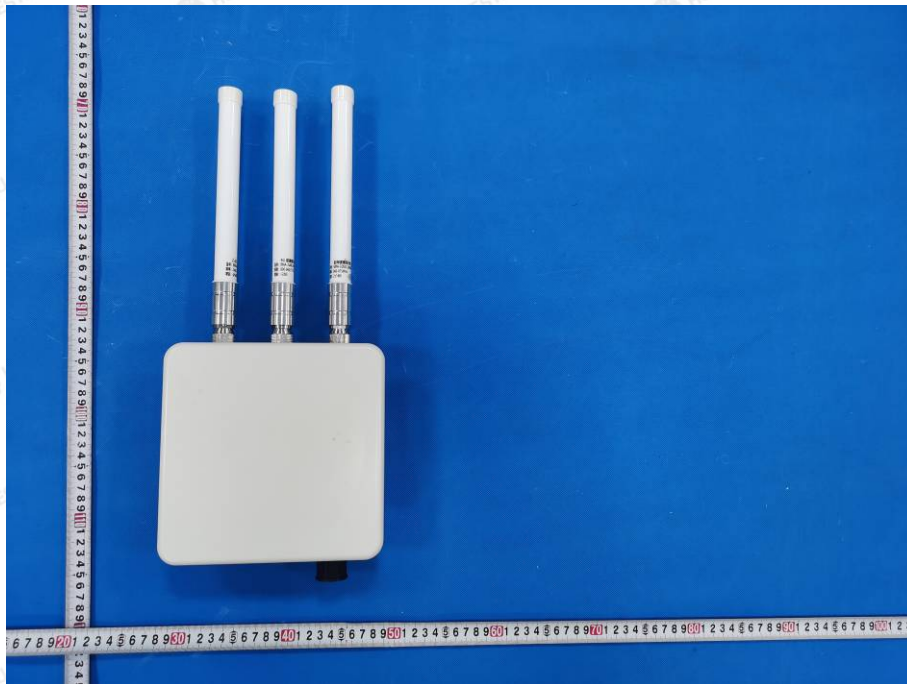
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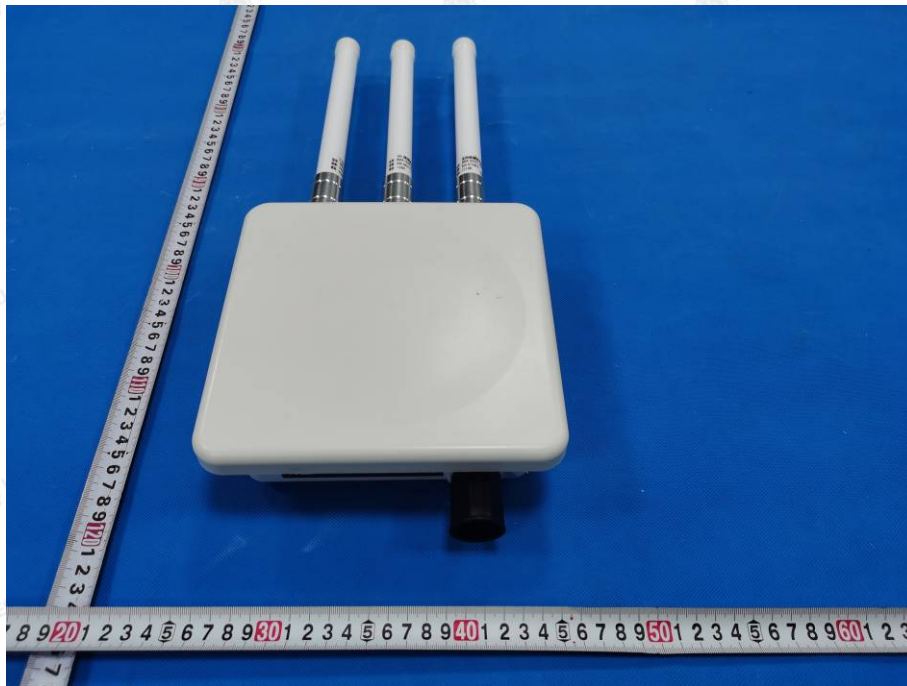
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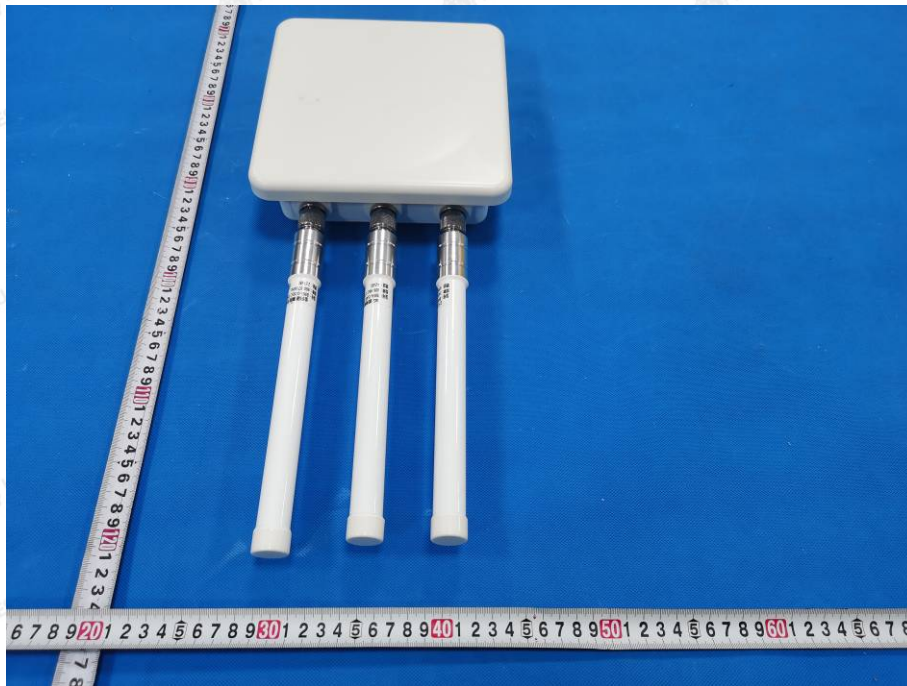
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4 External and Internal Photos of the EUT



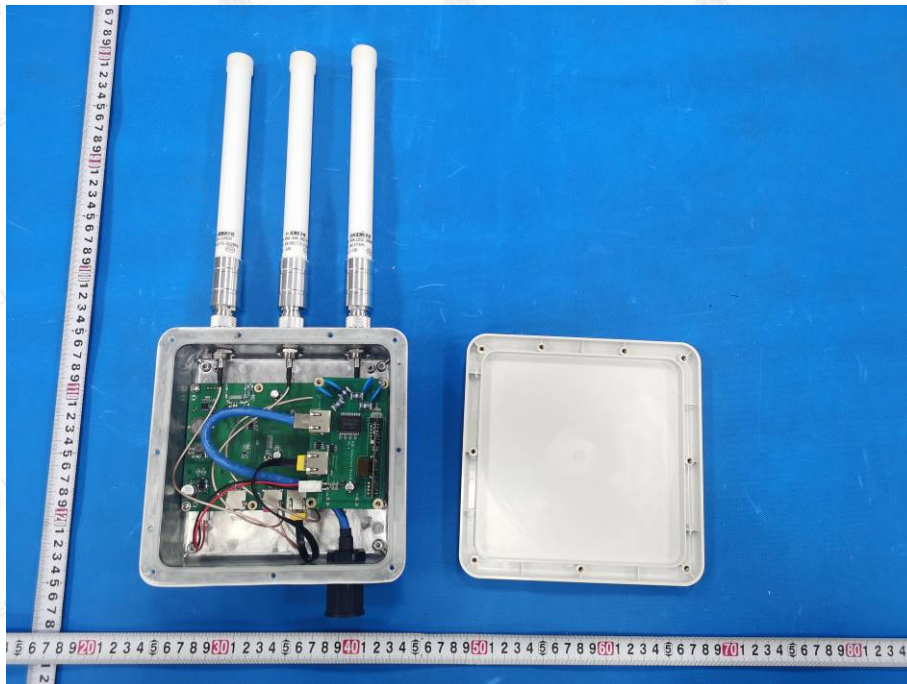


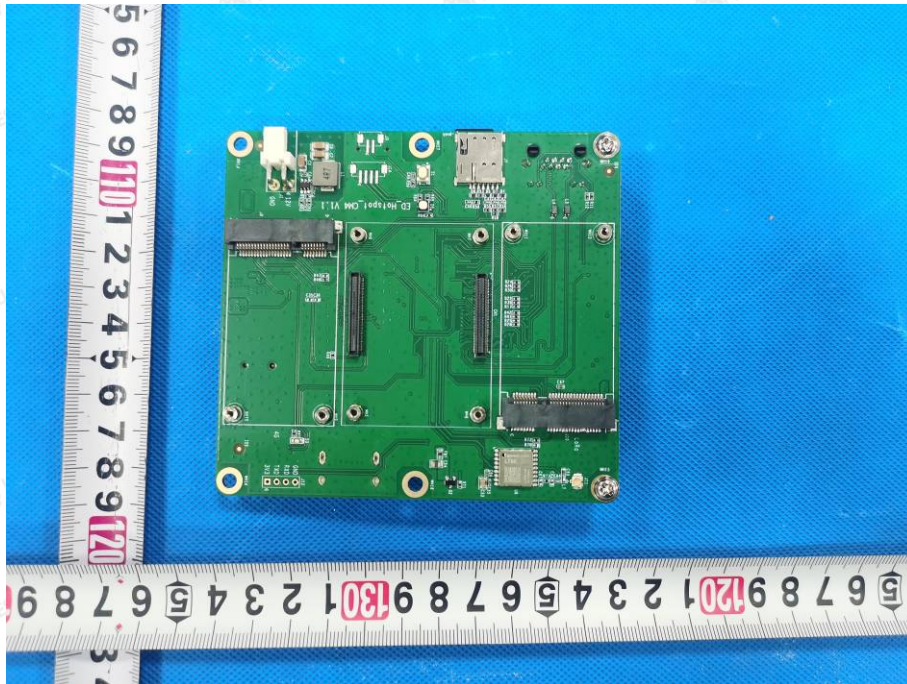
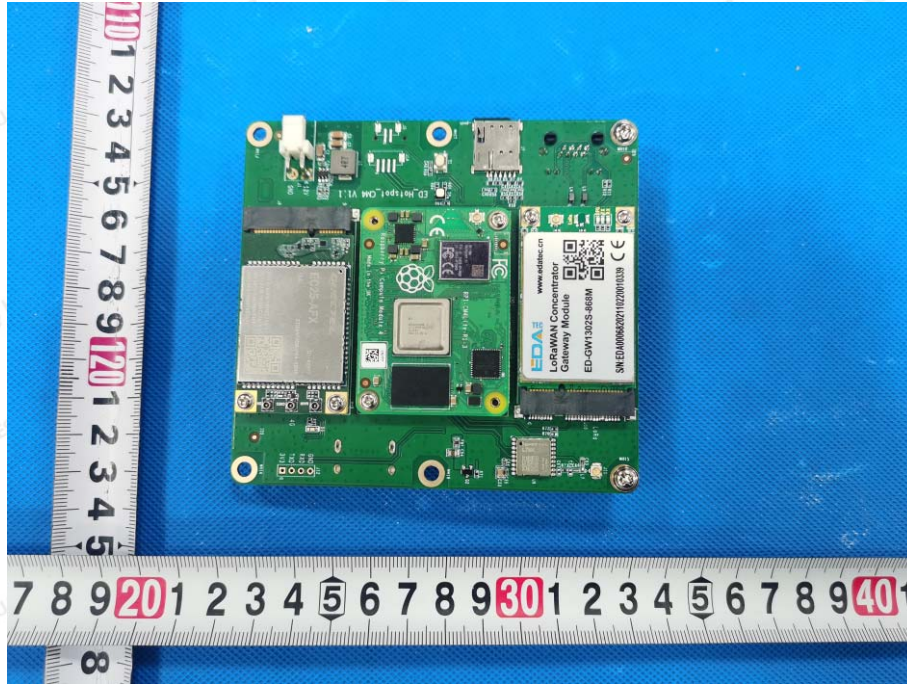


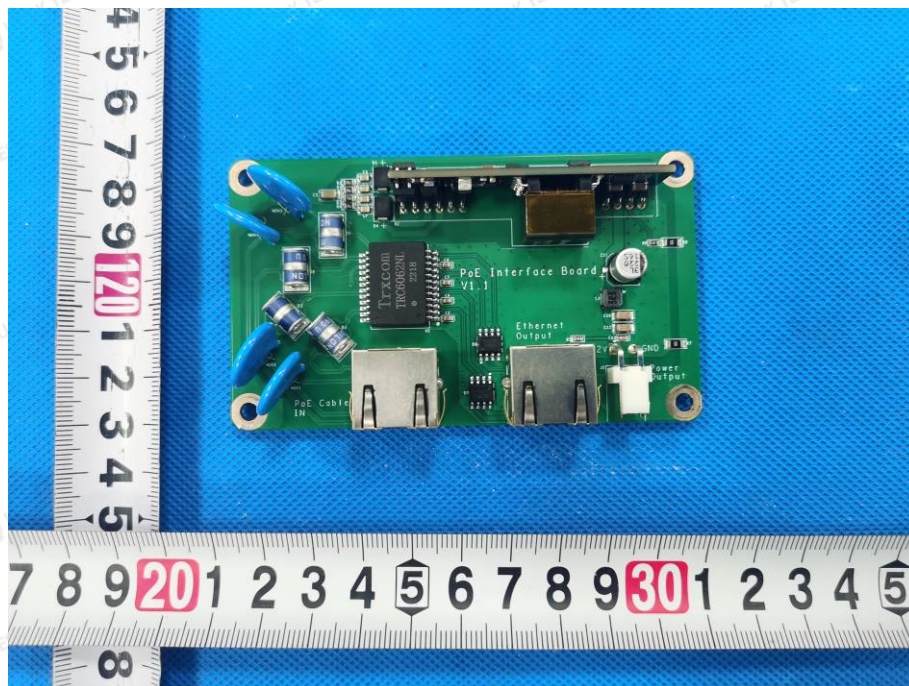
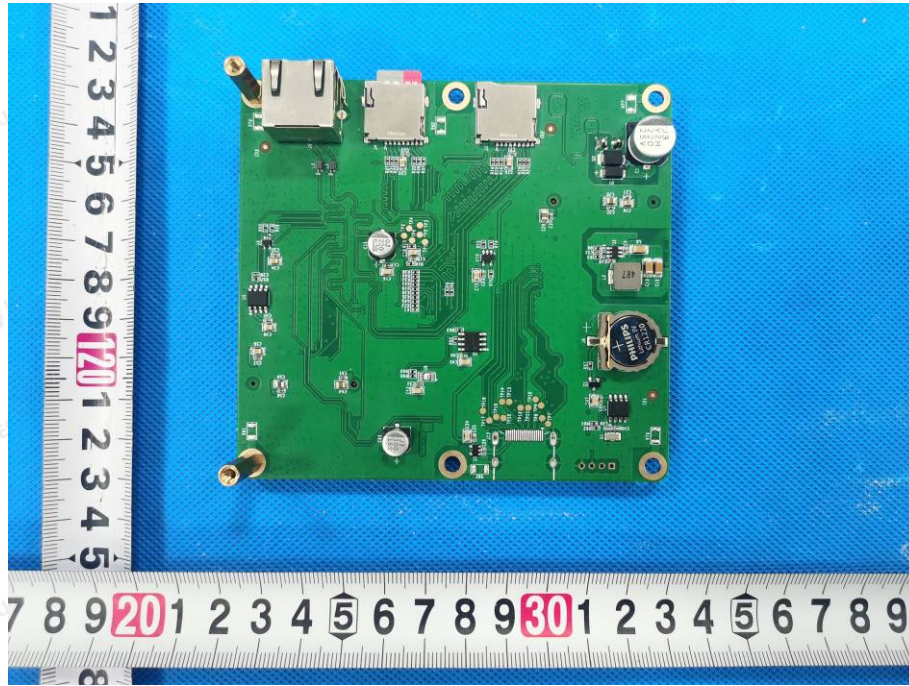
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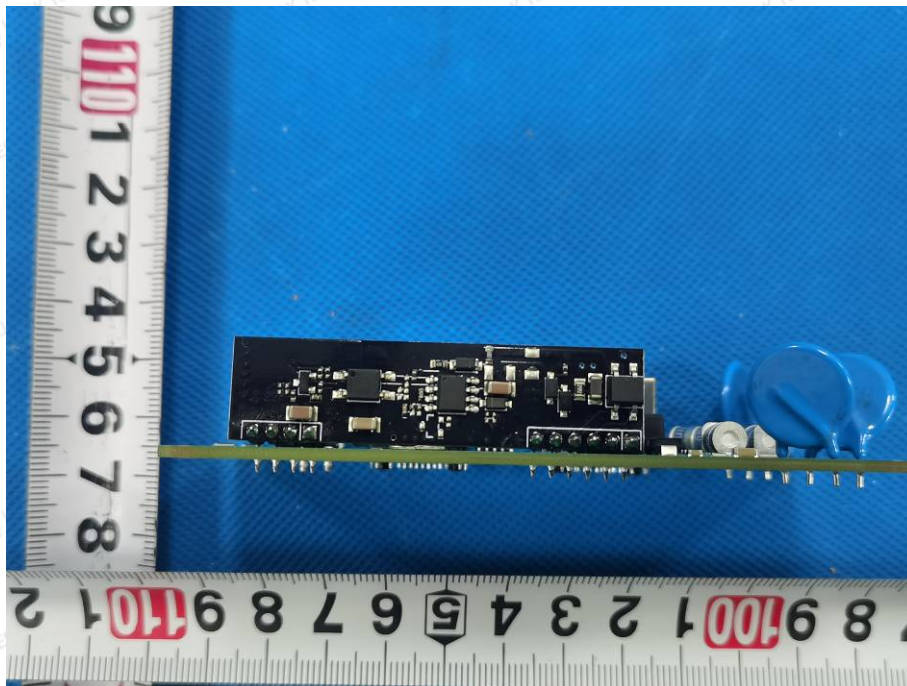
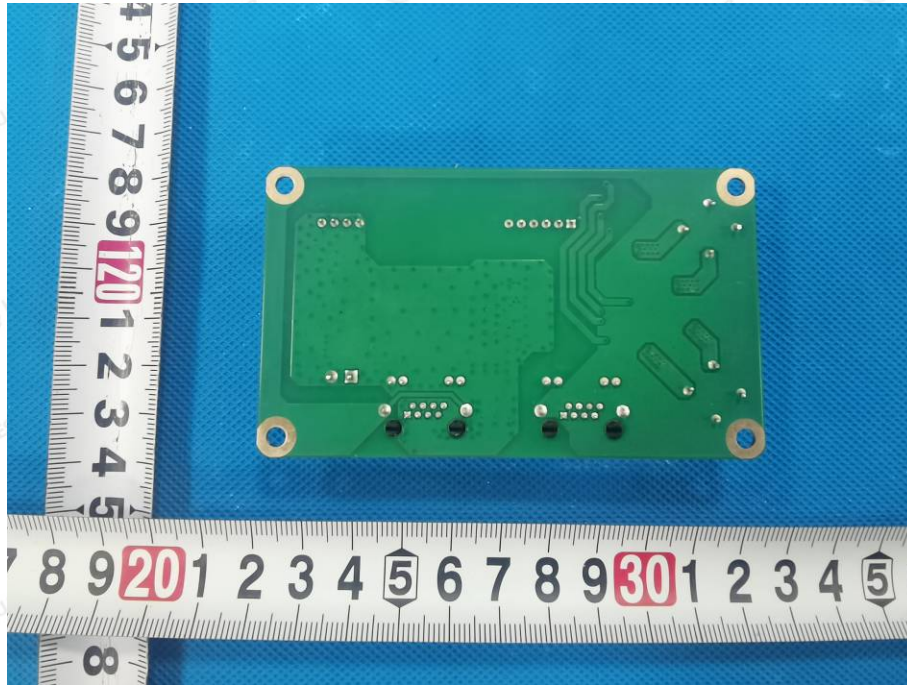
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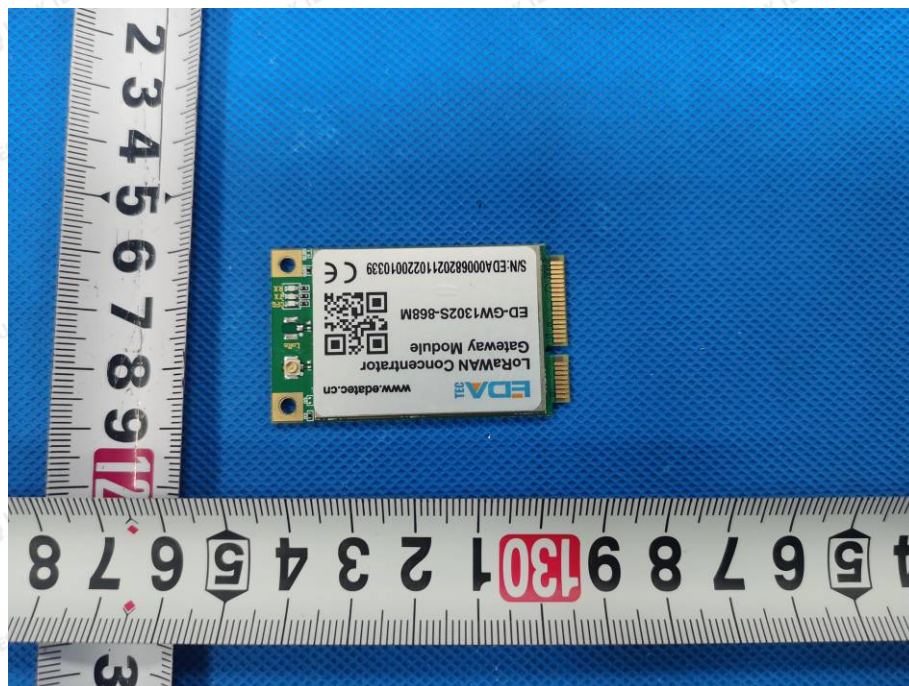
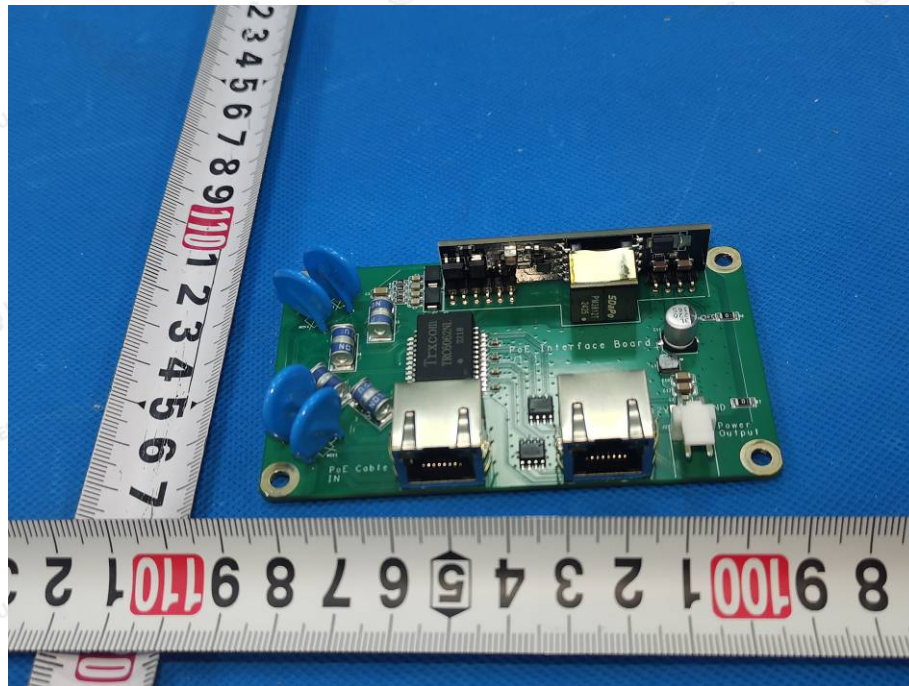
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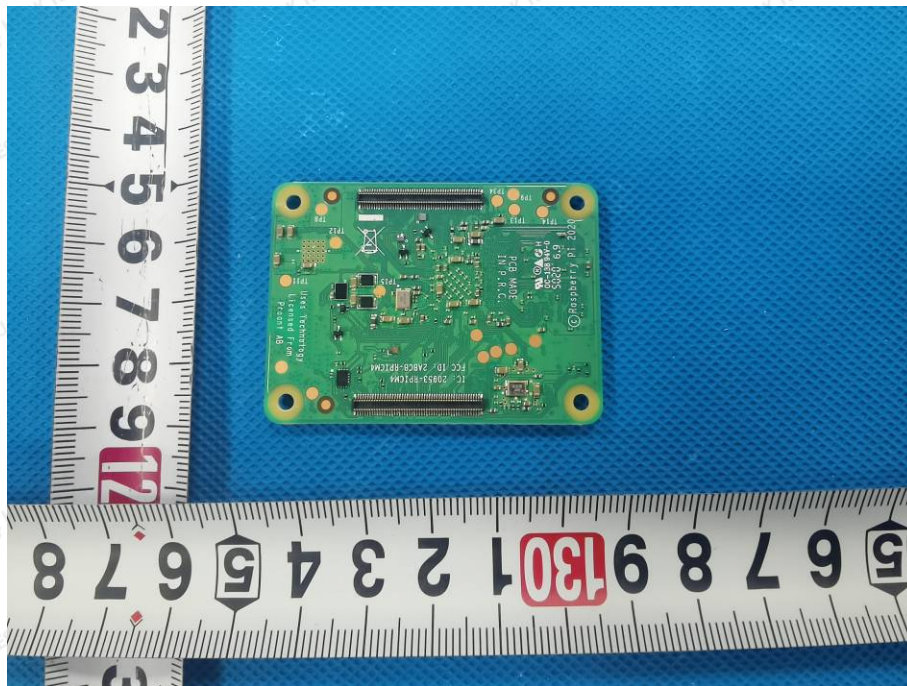








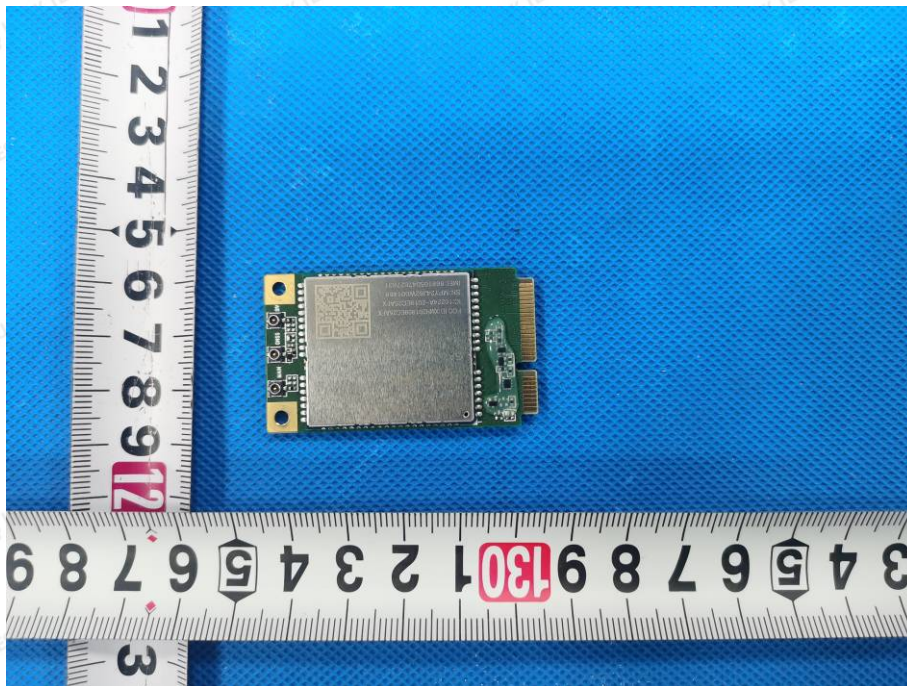
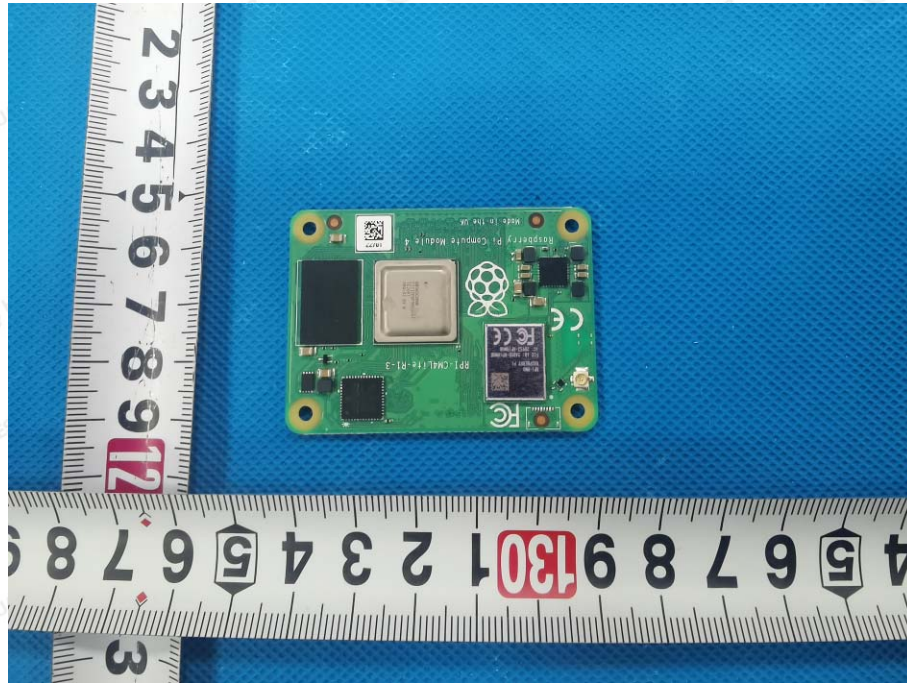




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