



# TEST REPORT

**Reference No.** ..... : WTD24D07175715W003  
**Manufacturer\*** ..... : Shenzhen EBELONG Technology Co., Ltd.  
**Address** ..... : 3th Floor, Building 2, Hengmingzhu Technology Industrial Park, Xinqiao  
Tongfuyu Industrial district, Gonghe community, Shajing subdistrict, Baoan,  
Shenzhen city, Guangdong, China.  
**Factory** ..... : Guang Dong EBELONG Intelligent Technology Co., Ltd  
**Address** ..... : 4th Floor, Building 2, Hengmingzhu Technology Industrial Park, Xinqiao  
Tongfuyu Industrial district, Gonghe community, Shajing subdistrict, Baoan,  
Shenzhen city, Guangdong, China.  
**Product** ..... : Refer to section 4.3.  
**Model(s)** ..... : Refer to section 4.3.  
**Standards** ..... : ETSI EN 300 220-1 V3.1.1 (2017-02)  
ETSI EN 300 220-2 V3.2.1 (2018-06)  
**Date of Receipt sample**.... : 2018-05-31  
**Date of Test** ..... : 2018-05-31 to 2018-06-09  
**Date of Issue** ..... : 2024-08-09  
**Test Result** ..... : **Pass**

**Remarks:**

1. The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.
2. “\*” **Manufacturer** means any natural or legal person who manufactures radio equipment or has radio equipment designed or manufactured, and markets that equipment under his name or trade mark.

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### 3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD24D07175715W003	2018-05-31	2018-05-31 to 2018-06-09	2024-08-09	Original	-	Valid

**Note:**

This test report (Ref. No.: WTD24D07175715W003) is only valid with the original test report (Waltek Services (Shenzhen) Co., Ltd. - Report Ref. No.: WTS18S05113117W).

This update only updates the standard version.

After technical evaluation, no additional testing is required.

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## 4 General Information

### 4.1 General Description of E.U.T.

Product:	Refer to section 4.3.
Model(s):	Refer to section 4.3.
Model Description:	Refer to section 4.3.
Hardware Version:	RX: ERC302, ERC602: V2.6 ERC303, ERC603: V1.3 ERC304, ERC604: V1.2 TX: N/A
Software Version:	RX: ERC302, ERC602: V1.5 ERC303, ERC603: V1.5 ERC304, ERC604: V1.5 TX: N/A

### 4.2 Details of E.U.T.

Frequency Range:	433.050 MHz to 434.790 MHz
Transmitted Power:	-8.09dBm ERP.
Type of Modulation:	ASK
Antenna installation:	Integrated Antenna

**Note:**

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTEK lab has not verified the authenticity of its information.

Receiver Category: 2

Ratings: Refer to section 4.3.



### 4.3 Model List

#### RX:

Product Name	Model	Description	Ratings
Wireless Receiving Controller	ERC302	Model: ERC302, ERC303, ERC304 and ERC602, ERC603, ERC604 just have different shapes.	Input: AC 100-240V 50/60Hz Load: Max 5A(LED 600W)
	ERC303		Input: AC 100-240V 50/60Hz Load: Max 5A*2CH(LED 600W)
	ERC304		Input: AC 100-240V 50/60Hz Load: Max 10A(LED 1000W)
	ERC602		Input: AC 100-240V 50/60Hz Load: Max 5A(LED 600W)
	ERC603		Input: AC 100-240V 50/60Hz Load: Max 5A*2CH(LED 600W)
	ERC604		Input: AC 100-240V 50/60Hz Load: Max 10A(LED 1000W)

#### TX:

	Model	Description
E1	EQ0114	Gold wire lattice one-key switch
	EQ0214	Gold wire lattice double key switch
	EQ0314	Gold wire grid three-key switch
	EQ0133	Rose black one-key switch
	EQ0233	Rose black double key switch
	EQ0333	Rose black three-key switch
	EQ0122	Wire silver one-key switch
	EQ0222	Draw silver double key switch
	EQ0322	Draw silver three-key switch
	EQ0143	Blue one-key switch
	EQ0243	Blue two-key switch
	EQ0343	Blue three-key switch
	EE0154	White one-key switch
	EE0254	White double key switch
	EE0354	White three-key switch
	EE0165	Gold one-key switch
	EE0265	Gold two-key switch
	EE0365	Gold three-key switch
	EE0187	Silver one-key switch
	EE0287	Silver two-key switch
	EE0387	Silver three-key switch
E3	EE3154	E3 series white one-key switch
	EE3254	E3 series white double key switches
	EE3165	E3 series gold one-key switch
	EE3265	E3 series gold 2-key switches



#### 4.4 Channel List

Channel	Frequency (MHz)
01	433.28MHz

#### 4.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

#### 4.6 Abnormalities from Standard Conditions

None.

#### 4.7 Additional Information

In accordance with ETSI EN 300 220-2, the following information provided by manufacturer.

- The name of the manufacturer or his trademark**  
...Shenzhen EBELONG Technology Co., Ltd.....
- The type equipment designation**  
Non-specific short-range devices
- The application(s) of the equipment**  
...Refer to section 4.3...
- The operating channel OC or channels**  
(nominal centre frequency,  $F_{low}$  and  $F_{high}$  of each OC)  
...433.28MHz...
- The operational frequency band(s)**  
...433.28MHz...
- The operating channel(s) width(s)**  
...312.96kHz...  
The operating channel is less than or equal to 25 kHz? ☐
- Maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates. Where multiple powers are possible, also state rated power for each level or range of levels**  
...-8.09dBm ERP.....
- Upper and lower temperatures of the operational profile**  
...-20 ~ 55°C.....
- Upper and lower extreme test voltages**  
...2.7~ 3.3VDC.....
- Antenna maximum gain if EUT has a permanent RF connector**



.....

**k) What is the spectrum access mechanism of the equipment?**

- ☒ Duty cycle  
☐ Polite spectrum access

**l) In case of polite spectrum access:**

The CCA time implemented by the equipment is..... ms.

The minimal unit of deferral period is: .....

The deadtime  $T_{DIS}$  is .....ms.

**m) Is the equipment battery powered?**

- ☒ Yes ☐ No

**n) Is the equipment frequency agile?**

- ☐ Yes ☒ No

**o) Is the equipment declared as FHSS?**

- ☐ Yes ☒ No

**p) In case of FHSS equipment:**

The declared hop channel bandwidth is .....kHz.

The number of non-overlapping channels or hopping positions separated by the declared hop channel bandwidth is.....

The dwell time per channel is ..... ms.

The return time to a hop channel is ..... ms.

Is CCA implemented in the equipment? ☐ Yes ☐ No



## 5 Test Summary

Test Item	Applicable Standard	Result
Operating frequency	EN 300 220-1/2	Pass
Unwanted emissions in the spurious domain	EN 300 220-1/2	Pass
TX Effective Radiated Power	EN 300 220-1/2	Pass
TX Maximum e.r.p. spectral density	EN 300 220-1/2	N/A
TX Duty Cycle	EN 300 220-1/2	Pass
TX Occupied Bandwidth	EN 300 220-1/2	Pass
Tx Out of Band Emissions	EN 300 220-1/2	Pass
TX Transient power	EN 300 220-1/2	Pass
TX Adjacent Channel Power	EN 300 220-1/2	N/A
TX behaviour under Low Voltage Conditions	EN 300 220-1/2	N/A
TX Short term behaviour	EN 300 220-1/2	N/A
Receiver Blocking	EN 300 220-1/2	Pass
Note: Pass=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable		



## 6 Equipment Used during Test

### 6.1 Equipments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	Spectrum Analyzer	Agilent	N9020A	MY49100060	2017-09-22	2018-09-21
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2017-09-12	2018-09-11
3.	Humidity Chamber	GF	GTH-225-40-1 P	IAA061213	2017-08-14	2018-08-13
4.	EXA Signal Analyzer	Keysight	N9010A	MY50520207 526B25MPB W7X	2018-04-06	2019-04-05
5.	ESG VECTOR SIGNAL GENERATOR	Keysight	4438C	MY45092536 005506601U NJ	2018-04-06	2019-04-05
6.	EXG Analog Signal Generator	Keysight	N5171B	MY53050845 503	2017-09-12	2018-09-11
7.	USB Wideband Power Sensor	Keysight	U2021XA	SG5440003	2018-04-06	2019-04-05
8.	Trilog Broadband Antenna	SCHWARZBEC K	VULB9163	336	2018-04-06	2019-04-05
ETSI Test software: Software name: ETSI family Software version: V2.1.1						

### 6.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
/	/	/	/



### 6.3 Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5\%$
RF output power, conducted	$\pm 1.5\text{dB}$
Power Spectral Density, conducted	$\pm 3\text{dB}$
Unwanted Emissions, conducted	$\pm 3\text{dB}$
All emissions, radiated	$\pm 6\text{dB}$
Time	$\pm 5\%$
Duty Cycle	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Radiated Emission(30MHz~1GHz)	$\pm 4.53\text{dB}$
Radiated Emission(1GHz~18GHz)	$\pm 5.03\text{dB}$

### 6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.



## 7 Test Conditions

### 7.1 Normal Test Conditions

Voltage, Temperature: 3.3 VDC, 20 °C

Relative humidity: 52.3 %

### 7.2 Extreme Test Conditions

Extreme Voltage: 2.7 ~ 3.3 V

Extreme Temperature: 0 ~ 50 °C

For tests at extreme temperatures, extreme voltage, measurements shall be made over the extremes of the operating temperature and voltage range as declared by the manufacturer.

Test Conditions	Normal	LTLV	LTHV	HTHV	HTLV
Temperature (°C)	20	-20	-20	55	55
Voltage (VDC)-Transmitter	3.0	2.7	3.3	3.3	2.7

### 7.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Test channel
Transmitting	433.28MHz
Receiving	433.28MHz



## 7.4 Standard Applicable

### **EN 300 220-2 Annex B (normative):**

#### **EU wide harmonised national radio interfaces from 25 MHz to 1 000 MHz.**

Table B.1 summarizes the harmonised frequency bands and their technical key parameters for non-specific short-range devices from EC Decision 2017/1483/EU [2].

### **EN 300 220-2 Annex C (informative):**

#### **National Radio Interfaces not EU wide harmonized**

In addition to EU wide harmonised radio interfaces listed in annex B, nations may implement NRIs with associated technical requirements to ensure spectrum compatibility. Usually these requirements come from CEPT/ERC/REC 70-03 [i.1] which sets out the general position on spectrum designations for Short Range Devices (SRDs) for countries within the CEPT. It is also used as a reference document by the CEPT member countries when preparing their national regulations in order to keep in line with the provisions of the Radio Equipment Directive [i.2]. Appendix 1 in CEPT/ERC/REC 70-03 [i.1] provides an indicative overview of the implementation status in European countries.

Table C.1 provides an indicative list of these NRIs which might be available in some EU countries. Manufacturers are advised to check the most recently published version of any given NRI.

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## 8 RF Requirements

### 8.1 Operating Frequency

#### 8.1.1 Description

The nominal Operating Frequency is the centre of a channel of width OCW.

#### 8.1.2 Limits

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 annex B or any NRI.

Value	Notes
Operational Frequency band or bands	Declared by the manufacturer
Nominal Operating Frequency or Frequencies	Declared by the manufacturer
Operating Channel width(s) - OCW	Declared by the manufacturer

#### 8.1.3 Measurement Record

Operating Frequency (MHz)	Operating Channel Width (kHz)	Operational Frequency band or bands (MHz)
433.28	312.96	433.050 to 434.790



## 8.2 Unwanted Emissions in the Spurious Domain

### 8.2.1 Description

Spurious emissions are unwanted emissions in the spurious domain at frequencies other than those of the Operating Channel and it's Out of Band Domain.

#### Unwanted emissions for all other modes

Spurious radiations from the EUT are components, at any frequency, radiated by the equipment and antenna.

### 8.2.2 Limit

Spurious domain emission limits

Frequency  State	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
TX mode	-54 dBm	-36 dBm	-30 dBm
RX and all other modes	-57 dBm	-57 dBm	-47 dBm

### 8.2.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.9.3.3.

### 8.2.4 Frequency range

Spurious Radiations radiated Measurement Frequency Range

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.

### 8.2.5 Test method

☐ Conducted measurement

☒ Radiated measurement



## 8.2.6 Measurement Record

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Test Condition: Normal		
			Height	Polar	SG Level	Cable	Antenna Gain	Absolute Level	Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
866.56	53.24	129	1.9	H	-41.74	0.22	0.00	-41.96	-36	-5.96
866.56	49.09	180	1.0	V	-45.83	0.22	0.00	-46.05	-36	-10.05
1299.84	48.87	267	1.3	H	-49.39	0.28	8.00	-41.67	-30	-11.67
1299.84	45.20	158	1.5	V	-48.25	0.28	8.00	-40.53	-30	-10.53
1733.12	44.54	92	1.8	H	-49.71	0.31	10.40	-39.62	-30	-9.62
1733.12	43.04	8	1.3	V	-50.53	0.31	10.40	-40.44	-30	-10.44

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### 8.3 TX Effective Radiated Power

#### 8.3.1 Description

The effective radiated power (e.r.p) is the power radiated in the direction of the maximum radiated power under specified conditions of measurements for any condition of modulation. For equipment with a permanent or temporary antenna connection it may be taken as the power delivered from that connector taking into account the antenna gain.

#### 8.3.2 Limit

Operational Frequency band (MHz)		Maximum effective radiated power	Channel access and occupation rules
H	433.050 to 434.790	10 mW (10dBm)	10 %

#### 8.3.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.2.2.1.

#### 8.3.4 Test method

☐ Conducted measurement

☒ Radiated measurement

#### 8.3.5 Measurement Record

Value	Notes
Test environment	Normal operation
Centre frequency	433.28MHz
Measure of Effective Radiated Power	-8.09dBm
NOTE: In case of a removable antenna the antenna gain (in dB, i.e. relative to a dipole) is declared by the manufacturer.	



## 8.4 Duty Cycle

### 8.4.1 Description

Duty cycle is the ratio expressed as a percentage, of the cumulative duration of transmissions  $T_{on\_cum}$  within an observation interval  $T_{obs}$ .  $DC = (T_{on\_cum} / T_{obs}) F_{obs}$  on an observation bandwidth  $F_{obs}$ .

Unless otherwise specified,  $T_{obs}$  is 1 hour and the observation bandwidth  $F_{obs}$  is the operational frequency band. Each transmission consists of an RF emission, or sequence of RF emissions separated by intervals  $< T_{Dis}$ .

An equipment may operate on several bands simultaneously (i.e. multi transmissions), Duty Cycle limit of each individual band applies to each transmission within that band.

In case of a multicarrier modulation in a band, the duty cycle applies to the whole signal used for a transmission (e.g. OFDM).

It has to be noted that on some bands Duty Cycle value may depend on the presence of a primary radio service.

Equipment may be triggered manually, by internal timing or by external stimulus. Depending on the method of triggering the timing may be predictable or random.

### 8.4.2 Limit

Operational Frequency band (MHz)		Maximum effective radiated power	Channel access and occupation rules
H	433.050 to 434.790	10 mW (10dBm)	10 %

### 8.4.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.4.2&5.5.2.2.

### 8.4.4 Test method

☐ Conducted measurement

☐ Radiated measurement

### 8.4.5 Measurement Record

The Duty cycle is declared by manufacturer.



## 8.5 TX Occupied Bandwidth

### 8.5.1 Description

The occupied bandwidth (OBW) is the Frequency Range in which 99 % of the total mean power of a given emission falls. The residual part of the total power being denoted as  $\beta$ , which, in cases of symmetrical spectra, splits up into  $\beta/2$  on each side of the spectrum. Unless otherwise specified,  $\beta/2$  is taken as 0,5 % as described in Figure 3.

The maximum occupied bandwidth includes all associated side bands above the appropriate emissions level and the frequency error or drift under extreme test conditions.

### 8.5.2 Limit

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  $F_{\text{low}}$  and  $F_{\text{high}}$ .

### 8.5.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.6.3.4.

### 8.5.4 Test method

☒ Conducted measurement

☐ Radiated measurement

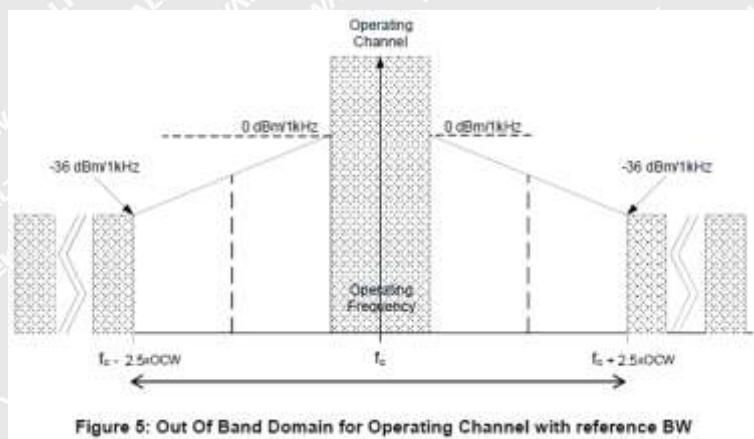
### 8.5.5 Measurement Record

Value	Notes
Test environment	Normal
Test signal	D-M2
Centre Frequency	433.28MHz
Occupied Bandwidth	312.96kHz

## 8.6 TX Out of Band Emissions

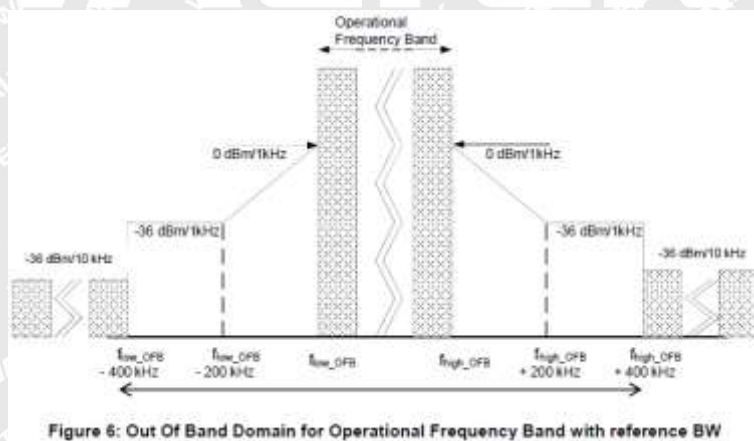
### 8.6.1 Description

Two OOB domains are defined, one for OC (see Figure 5) and one for Operational Frequency band (see Figure 6). The spectrum masks for these two OOB domains may overlap.



Unwanted emissions in the Out of Band domain are those falling in the frequency range immediately below the lower, and above the upper, frequency of the Operating Channel. The OOB domain includes both frequencies outside the Operating Channel within the Operational Frequency Band and frequencies outside the Operational Frequency Band.

The relevant Out of Band domain is shown in Figure 5 and applies within the Operational Frequency Band.



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.

### 8.6.2 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.

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

### 8.6.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.8.3.4.

### 8.6.4 Test method

☒ Conducted measurement

☐ Radiated measurement



### 8.6.5 Measurement Record

Domain	Frequency Range	RBW <sub>REF</sub>	Max power limit	Result
OOB limits applicable to Operational Frequency Band (See Figure 6)	$f \leq f_{\text{low\_OFB}} - 400 \text{ kHz}$	10KHz	-36 dBm	Compliance
	$F_{\text{low\_OFB}} - 400 \text{ kHz} \leq f \leq f_{\text{low\_OFB}} - 200 \text{ kHz}$	1KHz	-36 dBm	Compliance
	$f_{\text{low\_OFB}} - 200 \text{ kHz} \leq f < f_{\text{low\_OFB}}$	1KHz	See Figure 6	Compliance
	$f = f_{\text{low\_OFB}}$	1KHz	0 dBm	Compliance
	$f = f_{\text{high\_OFB}}$	1KHz	0 dBm	Compliance
	$F_{\text{high\_OFB}} < f \leq f_{\text{high\_OFB}} + 200 \text{ kHz}$	1KHz	See Figure 6	Compliance
	$F_{\text{high\_OFB}} + 200 \text{ kHz} \leq f \leq f_{\text{high\_OFB}} + 400 \text{ kHz}$	1KHz	-36 dBm	Compliance
	$F_{\text{high\_OFB}} + 400 \text{ kHz} \leq f$	10KHz	-36 dBm	Compliance
OOB limits applicable to Operating Channel (See Figure 5)	$f = f_c - 2.5 \times \text{OCW}$	1KHz	-36 dBm	Compliance
	$f_c - 2.5 \times \text{OCW} \leq f \leq f_c - 0.5 \times \text{OCW}$	1KHz	See Figure 5	Compliance
	$f = f_c - 0.5 \times \text{OCW}$	1KHz	0 dBm	Compliance
	$f = f_c + 0.5 \times \text{OCW}$	1KHz	0 dBm	Compliance
	$f_c + 0.5 \times \text{OCW} \leq f \leq f_c + 2.5 \times \text{OCW}$	1KHz	See Figure 5	Compliance
	$f = f_c + 2.5 \times \text{OCW}$	1KHz	-36 dBm	Compliance
<p>NOTE: f is the measurement frequency.  <math>f_c</math> is the Operating Frequency.  <math>F_{\text{low\_OFB}}</math> is the lower edge of the Operational Frequency Band.  <math>F_{\text{high\_OFB}}</math> is the upper edge of the Operational Frequency Band.  OCW is the operating channel bandwidth.</p>				



## 8.7 Transient Power

### 8.7.1 Description

Transmitter transient power is power falling into frequencies other than the operating channel as a result of the transmitter being switched on and off.

### 8.7.2 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.

Absolute offset from centre frequency	RBW <sub>REF</sub>	Peak power limit applicable at measurement points
≤ 400 kHz	1 kHz	0 dBm
> 400 kHz	1 kHz	-27 dBm

### 8.7.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.10.3.2.

### 8.7.4 Test method

☒ Conducted measurement

☐ Radiated measurement

### 8.7.5 Measurement Record

Absolute offset from centre frequency	RBW <sub>REF</sub>	Peak power limit applicable at measurement points	Result
≤ 400 kHz	1 kHz	0 dBm	Compliance
> 400 kHz	1 kHz	-27 dBm	Compliance



## 8.8 Adjacent Channel Power

### 8.8.1 Description

Adjacent channel power is power incidental to proper operation of a transmitter falling into the neighbouring channels.

### 8.8.2 Limit

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.

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

### 8.8.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.11.3.4.

### 8.8.4 Test method

☐ Conducted measurement

☐ Radiated measurement

### 8.8.5 Measurement Record

N/A

OCW is greater than 25kHz, this test is not applicable.



## 8.9 TX Behaviour under Low Voltage Conditions

### 8.9.1 Description

The TX behaviour under low voltage condition is the ability of the equipment to maintain its operating frequency and not produce emissions which exceed any relevant limit when the battery voltage falls below the lower extreme voltage level.

### 8.9.2 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.

### 8.9.3 Test 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.

### 8.9.4 Test method

☐ Conducted measurement

☐ Radiated measurement

### 8.9.5 Measurement Record

N/A



## 8.10 Blocking & RX Sensitivity

### 8.10.1 Description

Blocking is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of an unwanted input signal at any frequencies other than those of the spurious responses or the adjacent channels or bands.

The receiver sensitivity is the minimum signal power input to the receiver which produces the general performance criterion stated in clause 4.1. The test input signal is generated at the nominal operating frequency and modulated with normal modulation.

### 8.10.2 Limit

Requirement	Limits			
	Receiver category			
	3	2	1.5	1
Blocking at $\pm 2$ MHz from OC edge $f_{\text{high}}$ and $f_{\text{low}}$	$\geq -80$ dBm	$\geq -69$ dBm	$\geq -43$ dBm	$\geq -20$ dBm
Blocking at $\pm 10$ MHz from OC edge $f_{\text{high}}$ and $f_{\text{low}}$	$\geq -60$ dBm	$\geq -44$ dBm	$\geq -33$ dBm	$\geq -20$ dBm
Blocking at $\pm 5$ % of Centre Frequency or 15 MHz, whichever is the greater	$\geq -60$ dBm	$\geq -44$ dBm	$\geq -33$ dBm	$\geq -20$ dBm

The sensitivity for receivers shall be below or equal to Table 32 level.

**Table 32: Limits for Receiver sensitivity**

$S = 10\log RB_{\text{kHz}} - 4 \text{ dB}\mu\text{V emf; or}$ $S_p = 10\log RB_{\text{kHz}} - 117 \text{ dBm}$ <p>where:</p> <ul style="list-style-type: none"><li><math>S_p</math> is the sensitivity in dBm.</li><li>RB is the declared receiver bandwidth in</li></ul>
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### 8.10.3 Test Procedure

Refer to ETSI EN 300 220-1 clause 5.18.6.4.

### 8.10.4 Test method

☒ Conducted measurement

☐ Radiated measurement



### 8.10.5 Measurement Record

Value	Notes					
Operating Frequency	433.28MHz					
Signal generator A	-93.33dBm					
Blocking level	Blocking at $\pm 2$ MHz from OC edge fhigh and flow		Blocking at $\pm 10$ MHz from OC edge fhigh and flow		Blocking at $\pm 5$ % of Centre Frequency or 15 MHz, whichever is the greater	
	431.800MHz	432.040MHz	423.800MHz	440.040MHz	412.200MHz	455.620MHz
	-55.12	-51.35	-40.34	-42.24	-32.24	-32.93
Limits	$\geq -69$ dBm	$\geq -69$ dBm	$\geq -44$ dBm	$\geq -44$ dBm	$\geq -44$ dBm	$\geq -44$ dBm

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## 9 Photographs of Test Setup and EUT

Note: Please refer to appendix: Appendix-ERC302-Photos.

=====End of Report=====

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