RF TEST REPORT

Certificate No.	:	TB211029490
Applicant	:	Shenzhen King-Serry Electronics Co., Ltd
Equipment Under Test (EUT)		
EUT Name	:	Wireless Welcome Doorbell
Model No.	:	KS-SF20R, KS-WLS10
Series Model No.	:	KS-SF20R MP3, KS-SF30R, KS-WLS10Waterproof
Brand Name	:	----
Receipt Date	:	2021-10-13
Test Date	:	2021-10-13 to 2021-11-04
Issue Date	:	2021-11-04
Standards	:	ETSI EN 300 220-1 V3.1.1: 2017 ETSI EN 300 220-2 V3.2.1: 2018
Conclusions	:	**PASS** In the configuration tested, the EUT complied with the standards specified above. The EUT technically complies with the Council Directive 2014/53/EU relating to radio equipment.
Test/Witness Engineer	:	Camille Li
Engineer Supervisor		Ivan Su
Approved & Authorized	:	Ray Lai

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TB-RF184171	Rev.01	Initial issue of report	2021-11-04

1 General Information

1.1 Client Information

Applicant	:	Shenzhen King-Serry Electronics Co., Ltd
Address	:	502 Room, T Block, Nanlian Hengyu Science Park, NO.1 Ruiji Road, Longgang District, Shenzhen, CN
Manufacturer	:	Shenzhen King-Serry Electronics Co., Ltd
Address	:	502 Room, T Block, Nanlian Hengyu Science Park, NO.1 Ruiji Road, Longgang District, Shenzhen, CN

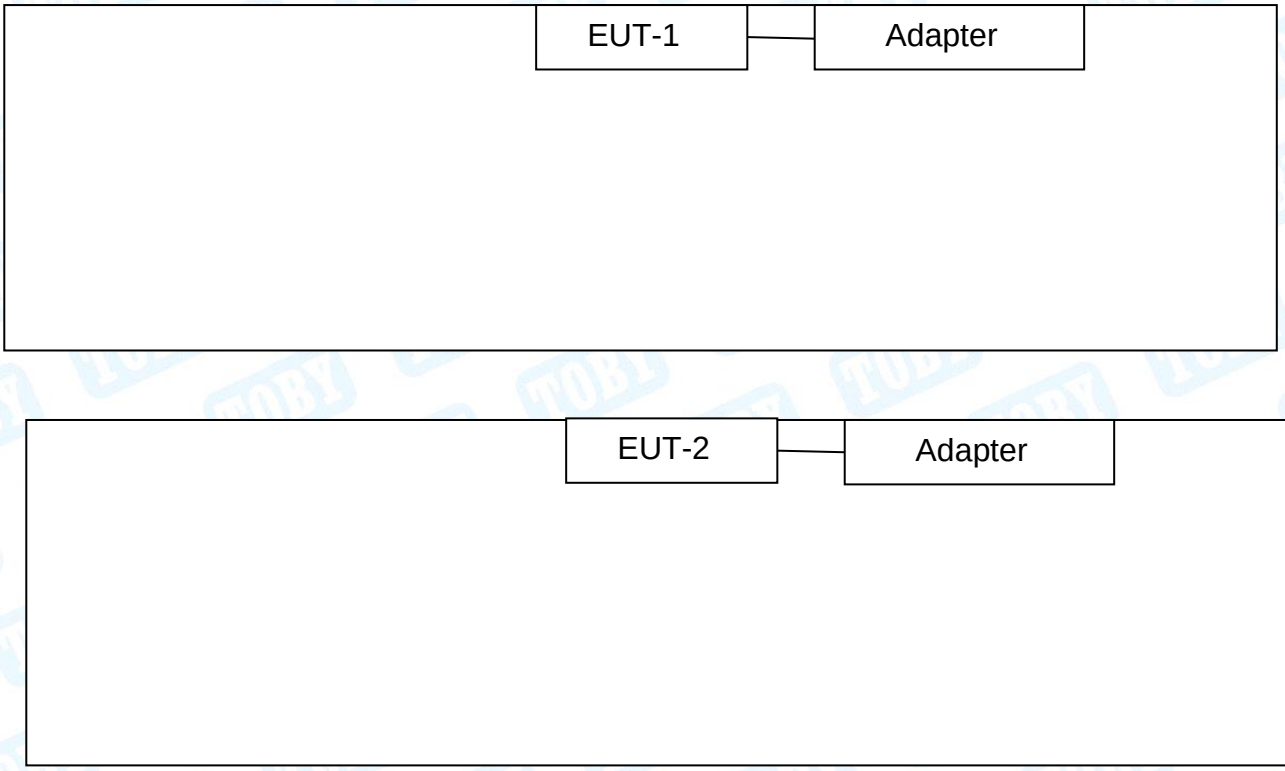
1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Wireless Welcome Doorbell	
Model No.	:	KS-SF20R, KS-WLS10, KS-SF20R MP3, KS-SF30R, KS-WLS10Waterproof	
Model Difference	:	All PCB boards and circuit diagrams are the same, the only difference is names are different.	
Product Description	:	Operation Frequency: 433.92MHz	
		Out Power: -6.256dBm	
		Antenna Type:	PCB Antenna
		Antenna Gain:	0dBi
		Modulation Type: OOK	
Power Rating	:	TX: by 3*AAA battery TX: Input: DC 5V RX: Input: DC 5V	
Software Version	:	N/A	
Hardware Version	:	N/A	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	The antenna gain provided by the applicant, the adapter and verified for the RF conduction test provided by TOBY test lab.	

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.3 Block Diagram Showing the Configuration of System Tested



EUT-1: RX
EUT-2: TX

1.4 Description of Support Units

The EUT has been tested as an independent unit.

1.5 Description of Operating Mode

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Items	Mode
Unwanted emissions in the spurious domain	Continuously transmitting Receive Mode
TX effective radiated power	Continuously transmitting
TX Occupied bandwidth	Continuously transmitting
TX out of band emissions	Continuously transmitting

TX Transient Power	Continuously transmitting
TX behaviour under low voltage conditions	Continuously transmitting

Note:

(1) The EUT is considered a portable unit, and it was pre-tested on the positioned of each 3 axis: X axis, Y axis and Z axis. The worst case was found positioned on Z-plane. There for only the test data of this Z-plane were used for radiated emission measurement test.

1.6 Description of Testing Condition

	Normal Test Conditions	Extreme Test Conditions
Temperature	15°C~35°C	-40°C~125°C
Humidity	20%~75%	N/A
Supply Voltage	DC 3V	DC 2.7V~DC 3.3V

Note :

(1)For tests at extreme temperatures, measurements shall be made in accordance with the procedures specified in clause 4.3.4.1.2(EN 300 220-1), at the upper and lower temperatures of the range as follows:

General	-25°C to +55°C
Portable	-10°C to +55°C
Normal indoor use	+5°C to +35°C
Automotive	-40°C to +125°C

(2) **Mains voltage:**

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

Regulated lead-acid or gel-cell type batteries:

When the radio equipment is intended for operation from the usual type of regulated lead-acid battery power sources, the extreme test voltages shall be 1,3 and 0,9 multiplied by the nominal voltage of the battery (6 V, 12 V, etc.).

For float charge applications using "gel-cell" type batteries, the extreme test voltages shall be 1,15 and 0,85 multiplied by the nominal voltage of the declared battery voltage.

Power sources using other types of batteries:

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

• For the Leclanché or lithium type battery: 0,85 times the nominal voltage of the battery;

• For the nickel-cadmium type of battery: 0,9 times the nominal voltage of the battery. In both cases, the upper extreme test voltage shall be 1,15 times the nominal voltage of the battery.

• For other types of batteries, the lower extreme test voltage for the discharged condition shall be declared by the equipment provider.

The nominal voltage is considered to be the upper extreme test voltage in this case.

1.7 Measurement Uncertainty

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %.

Test Item	Expanded Uncertainty (U_{Lab})
Conducted Emission	±3.10 dB
Radiated Emission (9kHz to 30 MHz)	±4.60 dB
RF Power-Conducted	±0.95 dB
Radiated Emission (30MHz to 1000 MHz)	±4.50 dB
Radiated Emission (Above 1000MHz)	±4.20 dB
Temperature	±0.6℃
Humidity	±4%
ERP (Radiated)	±3.84 dB
Conducted Spurious Emission	±2.72 dB
Frequency Error	±52.45Hz
Occupied Bandwidth	±3.8%
Power Density	±0.92 dB

1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F.,Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025：2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

2 Test Results Summary

Harmonised Standards EN 300 220-2					
Requirement			**Requirement Conditionality**		**Result**
No	**Description**	**Reference: Clause No**	**U/C**	**Condition**	**-**
1	Operating frequency	4.2.1	U	-	**PASS**
2	Unwanted emissions in the spurious domain	4.2.2	U	-	**PASS**
3	TX effective radiated power	4.3.1	U	-	**PASS**
4	TX Maximum e.r.p. spectral density	4.3.2	C	Applies to EUT using annex B bands I, L. Applies to EUT using DSSS or wideband techniques other than FHSS modulation, using annex C band X.	**N/A**
5	TX Duty cycle	4.3.3	C	Not applicable to EUT with polite spectrum access where permitted in annex B, table B.1 or annex C, table C.1 or any NRI.	**N/A**
6	TX Occupied bandwidth	4.3.4	U	-	**PASS**
7	TX out of band emissions	4.3.5	C	Applies to EUT with OCW > 25 kHz.	**PASS**
8	TX Transient Power	4.3.6	U	-	**PASS**
9	TX Adjacent channel power	4.3.7	C	Applies to EUT with OCW ⩽ 25 kHz.	**N/A**
10	TX behaviour under low voltage conditions	4.3.8	C	Applies to battery powered EUT.	**PASS**
11	TX Adaptive power control	4.3.9	C	Applies to EUT with adaptive power control using annex C band AA.	**N/A**
12	TX FHSS	4.3.10	C	Applies to FHSS EUT.	**N/A**
13	TX Short term behaviour	4.3.11	C	Applies to EUT using annex C bands Y, Z, AA, AB, AC, AD.	**N/A**
14	RX sensitivity	4.4.1	C	Applies to EUT with polite spectrum access.	**N/A**
15	Clear channel assessment threshold	4.5.2	C	Applies to EUT with polite spectrum access.	**N/A**
16	Polite spectrum access timing parameters	4.5.3	C	Applies to EUT with polite spectrum access.	**N/A**
17	RX Blocking	4.4.2	U	-	**PASS**
18	Adaptive Frequency Agility	4.5.4	C	Applies to EUT with AFA.	**N/A**

Note:
(1)“N/A” indicates test is not applicable in this Test Report.
(2) “U/C”: Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).

3 Test Equipment

Used Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Wideband Radio Comunication Tester	Rohde & Schwarz	CMW500	144382	Sep. 03, 2021	Sep. 02, 2022
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 03, 2021	Sep. 02, 2022
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 03, 2021	Sep. 02, 2022
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 03, 2021	Sep. 02, 2022
RF Power Sensor	DARE!! Instruments	RadiPowerRP R3006W	17I00015SNO26	Sep. 03, 2021	Sep. 02, 2022
	DARE!! Instruments	RadiPowerRP R3006W	17I00015SNO29	Sep. 03, 2021	Sep. 02, 2022
	DARE!! Instruments	RadiPowerRP R3006W	17I00015SNO31	Sep. 03, 2021	Sep. 02, 2022
	DARE!! Instruments	RadiPowerRP R3006W	17I00015SNO33	Sep. 03, 2021	Sep. 02, 2022
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 02, 2021	Jul. 01, 2022
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 02, 2021	Jul. 01, 2022
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar.01, 2020	Feb. 28, 2022
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.01, 2020	Feb. 28, 2022
Pre-amplifier	Sonoma	310N	185903	Mar.01, 2020	Feb. 28, 2022
Pre-amplifier	HP	8447B	3008A00849	Feb. 25, 2021	Feb. 24, 2022
Cable	HUBER+SUHNER	100	SUCOFLEX	Feb. 25, 2021	Feb. 24, 2022
Positioning Controller	ETS-LINDGREN	2090	N/A	Feb. 25, 2021	Feb. 24, 2022
Temp. &Humidity Chamber	ZHONG ZHI	CZ-A-225D	HW08053	N/A	N/A
DC Power Supply	MATRIX	MPS-3005L-3	D806050W	Jul. 02, 2021	Jul. 01, 2022
AC Power Supply	HengJie	HPC-1110	2010007	Jul. 02, 2021	Jul. 01, 2022

4 Unwanted Emissions In the Spurious Domain

4.1 Test Standard and Limit

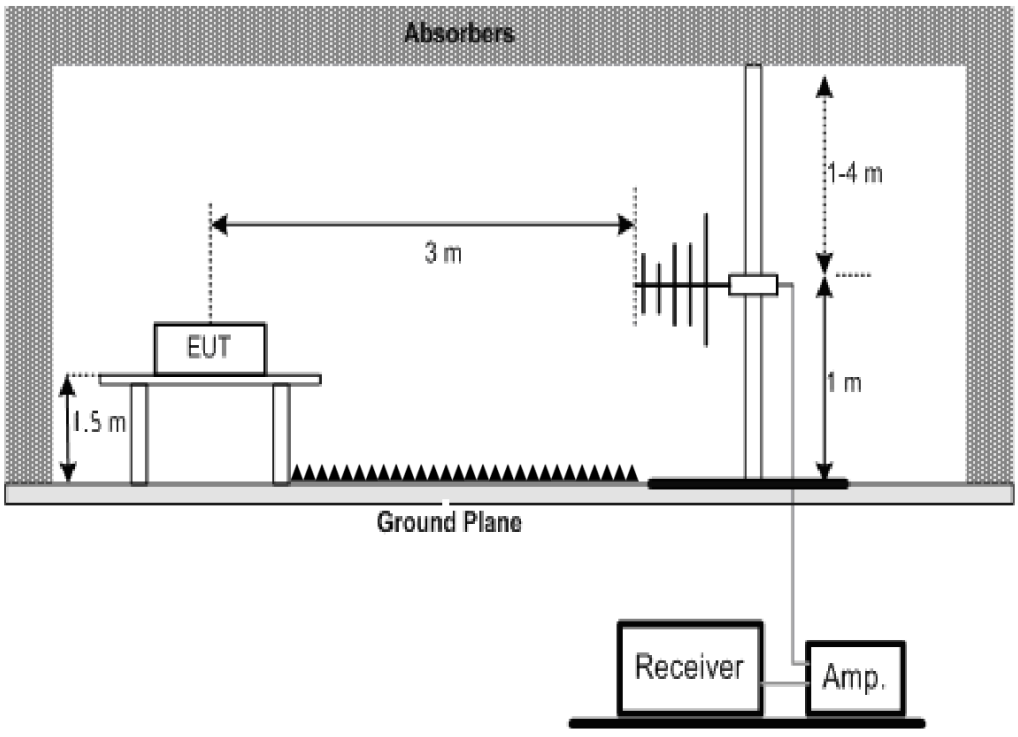
4.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1:2017 clause 5.9
ETSI EN 300 220-2 V3.2.1:2019 clause 4.2.2

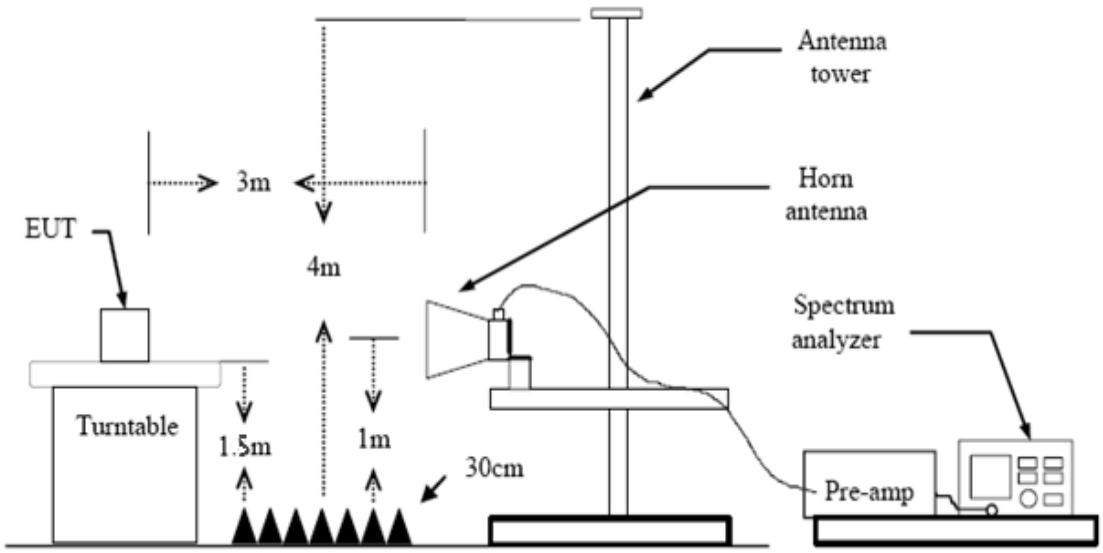
4.1.2 Test Limit

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

4.2 Test Setup

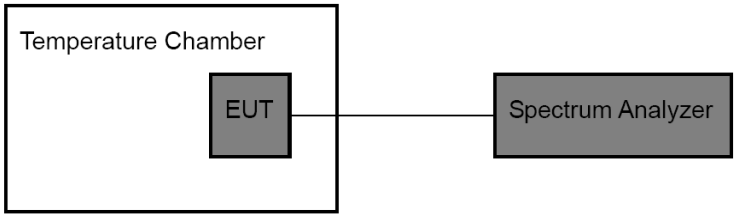


Below 1G



Above 1G

Extreme Condition:



4.3 Test Procedure

The conducted measurement procedure in clause 5.9.3.3.1 of ETSI EN 300 220-1 V3.1.1. The radiated measurement procedure in clause 5.9.3.3.2 of ETSI EN 300 220-1 V3.1.1, with the antenna port terminated in a dummy load.

4.4 EUT Operation During Test

The measurements shall be performed during continuously transmitting.

4.5 Deviation From Test Standard

No deviation

4.6 Test Data

Please refer to the Attachment A.

5 Effective Radiated Power

5.1 Test Standard and Limit

5.1.1 Test Standard

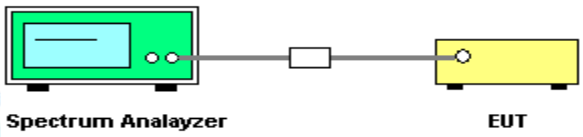
ETSI EN 300 220-1 V3.1.1:2017 clause 5.2
ETSI EN 300 220-2 V3.2.1:2019 clause 4.3.1

5.1.2 Limits

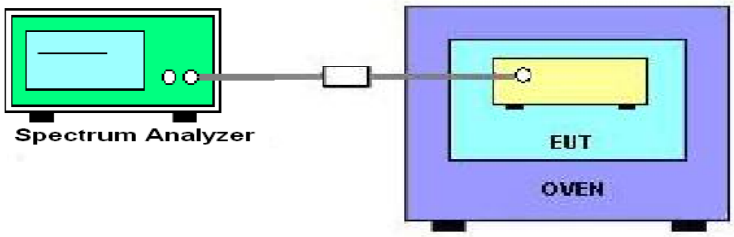
Frequency Band	Maximum effective radiated power
433.05MHz to 434.79MHz	1mW
865MHz to 868MHz	25mW
The effective radiated power shall not be greater than the value allowed in annexes B or C (EN 300 220-2) for the chosen operational frequency band(s).	

5.2 Test Setup

Normal Condition



Extreme Condition



5.3 Test Procedure

The conducted measurement procedure in clause 5.2.2.1 of ETSI EN 300 220-1 V3.1.1.

5.4 EUT Operation During Test

The measurements shall be performed during continuously transmitting.

5.5 Deviation From Test Standard

No deviation

5.6 Test Data

Please refer to the Attachment B.

6 Occupied Bandwidth

6.1 Test Standard and Limit

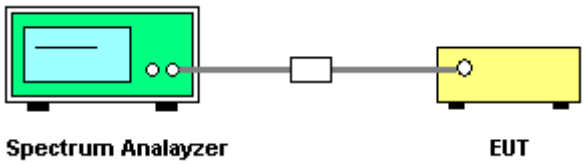
6.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1:2017 clause 5.6
ETSI EN 300 220-2 V3.2.1:2019 clause 3.1.1

6.1.2 Limits

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}.

6.2 Test Setup



6.3 Test Procedure

The conducted measurement procedure in clause 5.6.3.4 of ETSI EN 300 220-1 V3.1.1.

6.4 EUT Operation During Test

The measurements shall be performed during continuously transmitting.

6.5 Deviation From Test Standard

No deviation

6.6 Test Data

Please refer to the Attachment C.

7 Tx Out of Band Emissions

7.1 Test Standard and Limit

7.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1:2017 clause 5.8
ETSI EN 300 220-2 V3.2.1:2019 clause 4.3.5

7.1.2 Limits

Tx Out of Band Emissions

Domain	Frequency Range	RBW_{REF}	Max power limit
OOB limits applicable to Operational Frequency Band (See Figure 6)	$f \le f_{low\_OFB}$ - 400 kHz	10 kHz	-36 dBm
	F_{low_OFB} - 400 kHz ≤ f ≤ f_{low_OFB} - 200 kHz	1 kHz	-36 dBm
	f_{low} - 200 kHz ≤ f < f_{low_OFB}	1 kHz	See Figure 6
	$f = f_{low\_OFB}$	1 kHz	0 dBm
	$f = f_{high\_OFB}$	1 kHz	0 dBm
	F_{high_OFB} < f ≤ f_{high_OFB} + 200 kHz	1 kHz	See Figure 6
	F_{high_OFB} + 200 kHz ≤ f ≤ f_{high_OFB} + 400 kHz	1 kHz	-36 dBm
	F_{high_OFB} + 400 kHz ≤ f	10 kHz	-36 dBm
OOB limits applicable to Operating Channel (See Figure 5)	$f = f_c$ - 2.5 x OCW	1 kHz	-36 dBm
	f_c - 2,5 x OCW ≤ f ≤ f_c - 0,5 x OCW	1 kHz	See Figure 5
	$f = f_c$ - 0,5 x OCW	1 kHz	0 dBm
	$f = f_c$ + 0,5 x OCW	1 kHz	0 dBm
	f_c + 0,5 x OCW ≤ f ≤ f_c + 2,5 x OCW	1 kHz	See Figure 5
	$f = f_c$ + 2,5 x OCW	1 kHz	-36 dBm

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

7.2 Test Setup

7.3 Test Procedure

Please refer to chapter 5.8.3.3 of ETSI EN 300 220-1 V3.1.1

7.4 EUT Operation During Test

The measurements shall be performed during continuously transmitting.

7.5 Deviation From Test Standard

No deviation

7.6 Test Data

Please refer to the Attachment D.

8 Transient Power

8.1 Test Standard and Limit

8.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1:2017 clause 5.10
ETSI EN 300 220-2 V3.2.1:2019 clause 4.3.6

8.1.2 Limit

Transient power		
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

8.2 Test Setup

Spectrum Analayzer EUT

8.3 Test Procedure

Please refer to chapter 5.10.3.2 of ETSI EN 300 220-1 V3.1.1

8.4 EUT Operating Condition

The EUT was programmed to be in transmitting mode.

8.5 Deviation From Test Standard

No deviation

8.6 Test Data

Please refer to the Attachment E.

9 Adjacent Channel Power

9.1 Test Standard and Limit

9.1.1 Test Standard

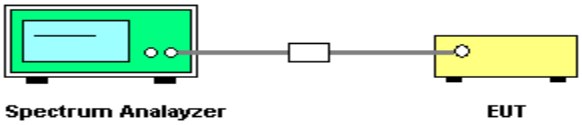
ETSI EN 300 220-1 V3.1.1:2017 clause 5.11
ETSI EN 300 220-2 V3.2.1:2019 clause 4.3.7

9.1.2 Limits

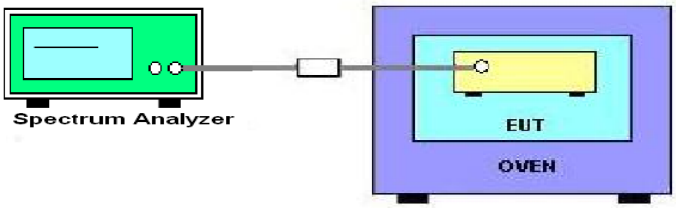
Adjacent Channel Power			
		Adjacent Channel power integrated over 0,7 x OCW	Alternate Adjacent Channel power integrated over 0,7 x OCW
OCW < 20 kHz	Normal test conditions	-20 dBm	-20 dBm
	Extreme test conditions	-15 dBm	-20 dBm
OCW ≥ 20 kHz	Normal test conditions	-37 dBm	-40 dBm
	Extreme test conditions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

9.2 Test Setup

Normal Condition



Extreme Condition



9.3 Test Procedure

Please refer to chapter 5.11.3.4 of ETSI EN 300 220-1 V3.1.1

9.4 EUT Operating Condition

The EUT was programmed to be in transmitting mode.

9.5 Deviation From Test Standard

No deviation

9.6 Test Data

No requirement for this test item

10 Tx Behaviour Under Low Voltage Conditions

10.1 Test Standard and Limit

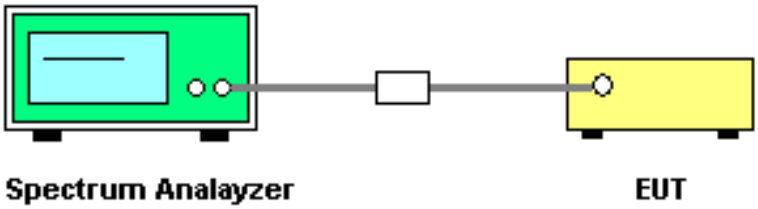
10.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1:2017 clause 5.12
ETSI EN 300 220-2 V3.2.1:2019 clause 4.3.8

10.1.2 Limits

TX behaviour under Low Voltage Conditions
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.

10.2 Test Setup



10.3 Test Procedure

Please refer to chapter 5.12.3.2 of ETSI EN 300 220-1 V3.1.1

10.4 EUT Operating Condition

The EUT was programmed to be in transmitting mode.

10.5 Deviation From Test Standard

No deviation

10.6 Test Data

Please refer to the Attachment F.

11 Blocking

11.1 Test Standard and Limit

11.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1:2017 clause 5.18
ETSI EN 300 220-2 V3.2.1:2019 clause 4.4.2

11.1.2 Limits

The blocking level shall not be less than the values given in bellow table, except at frequencies on which spurious responses are found.

Limits for receiver blocking

Table 40: Blocking level parameters for RX 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

Table 41: Blocking level parameters for RX 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

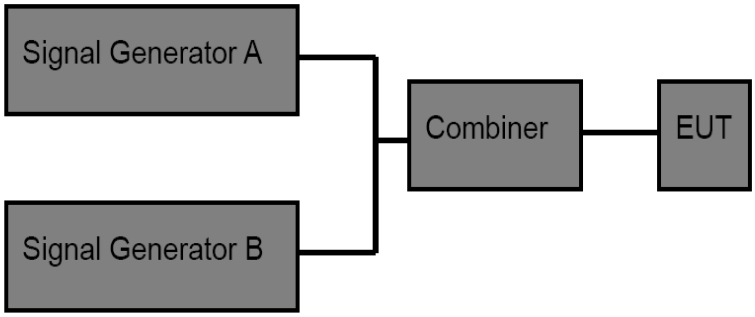
Table 42: Blocking level parameters for RX category 1.5

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

Table 43: Blocking level parameters for RX 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

11.2 Test Setup



11.3 Test Procedure

Please refer to chapter 5.18.6.4 of ETSI EN 300 220-1 V3.1.1

11.4 Deviation From Test Standard

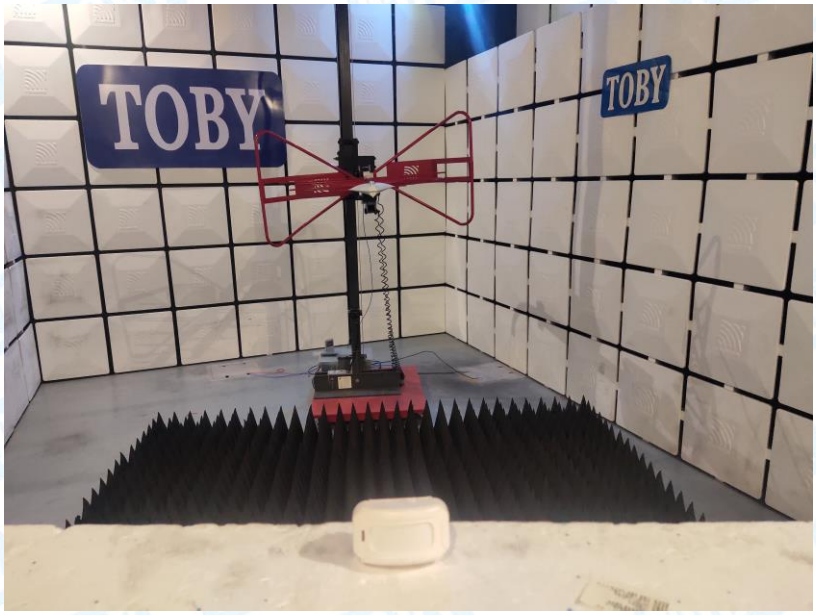
No deviation

11.5 Test Data

Please refer to the Attachment G.

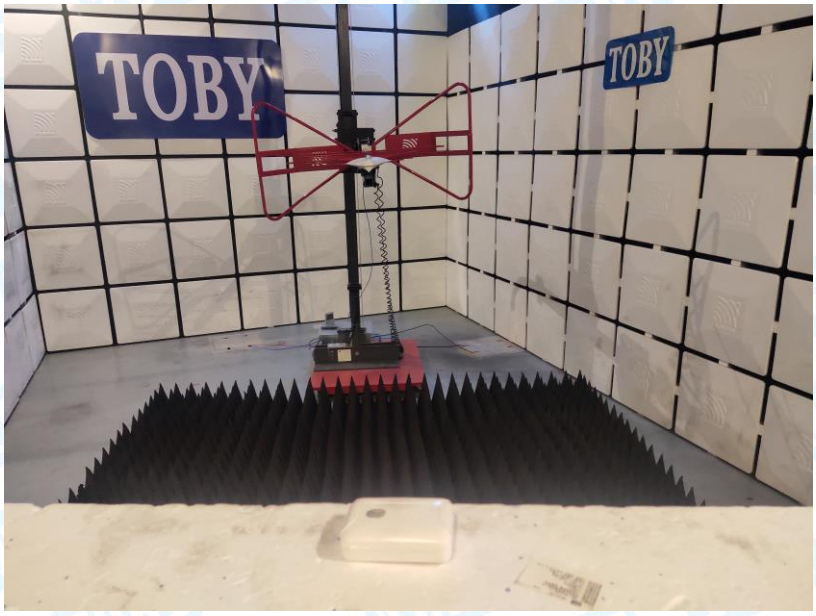
12 Photographs – Test Setup

Radiated Spurious Emission-TX (Below 1 GHz)



Radiated Spurious Emission-TX (Above 1 GHz)

Radiated Spurious Emission-RX (Below 1 GHz)



Radiated Spurious Emission-RX (Above 1 GHz)

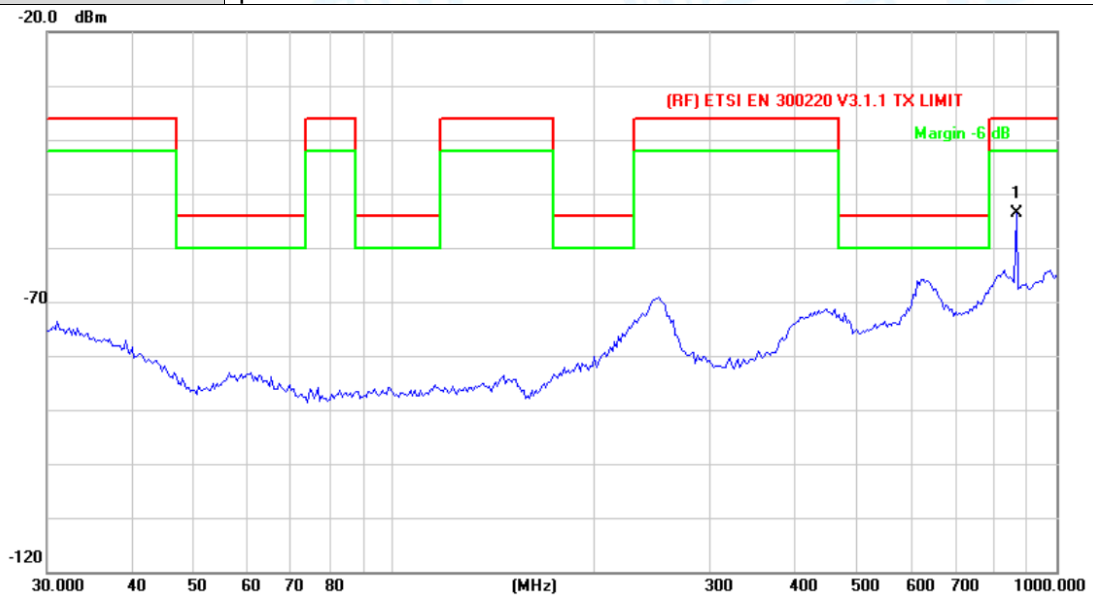
Attachment A-- Unwanted Emissions In the Spurious Domain

Test Mode:	TX Mode 433.92MHz
Spectrum Mask for Unwanted Emissions in the Spurious Domain with reference BW	

Frequency (MHz)	Antenna Polarization	S.G. (dBm)	Cable loss (dB)	Ant.Gain (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
635.33	V	-84.59	1.4	21.1	-64.89	-54	-10.89
1830.54	V	-68.83	2.79	24.4	-47.22	-30	-17.22
2745.30	V	-75.90	2.74	27.2	-51.44	-30	-21.44
3660.25	V	-78.41	2.86	28.7	-52.57	-30	-22.57
4575.62	V	-77.72	2.84	33.3	-47.26	-30	-17.26
629.76	H	-82.69	1.4	21.1	-62.99	-54	-8.99
1830.20	H	-67.72	2.79	24.4	-46.11	-30	-16.11
2745.64	H	-74.48	2.74	27.2	-50.02	-30	-20.02
3660.24	H	-77.31	2.86	28.7	-51.47	-30	-21.47
4575.69	H	-77.91	2.84	33.3	-47.45	-30	-17.45

Below 1G

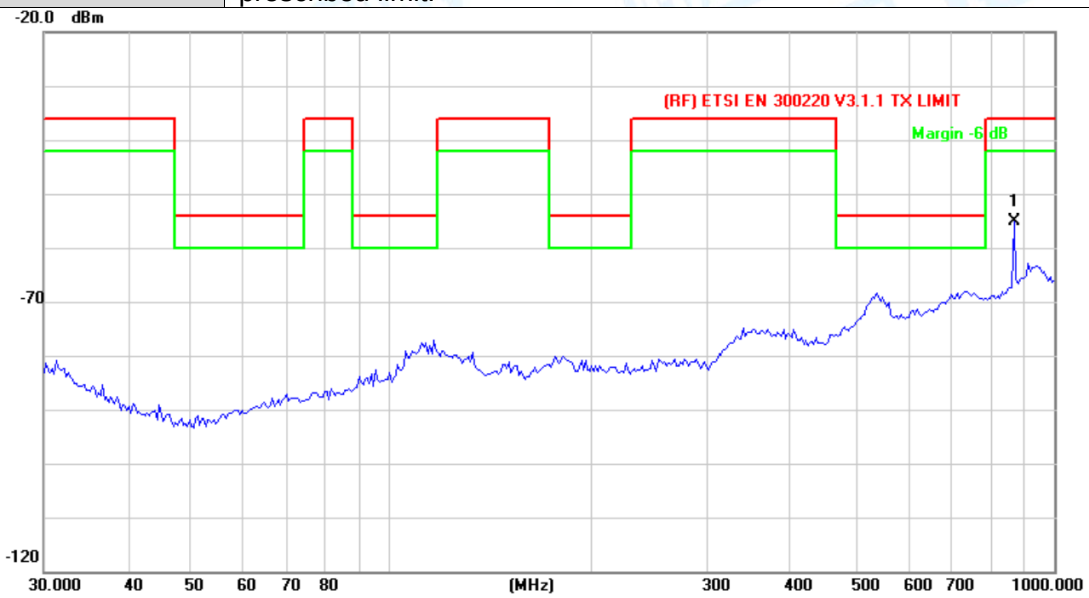
Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3V		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1	*	869.1302	-60.01	6.39	-53.62	-36.00	-17.62	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3V		
Ant. Pol.	Vertical		
Test Mode:	TX Mode		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1	*	869.1302	-62.16	6.93	-55.23	-36.00	-19.23	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3V		
Ant. Pol.	Horizontal		
Test Mode:	RX Mode		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1		135.5062	-74.78	-11.14	-85.92	-57.00	-28.92	peak
2		249.4250	-74.96	4.99	-69.97	-57.00	-12.97	peak
3		401.8385	-73.77	0.49	-73.28	-57.00	-16.28	peak
4		452.7197	-73.96	1.99	-71.97	-57.00	-14.97	peak
5		642.8613	-72.62	6.48	-66.14	-57.00	-9.14	peak
6	*	815.9678	-72.84	7.69	-65.15	-57.00	-8.15	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

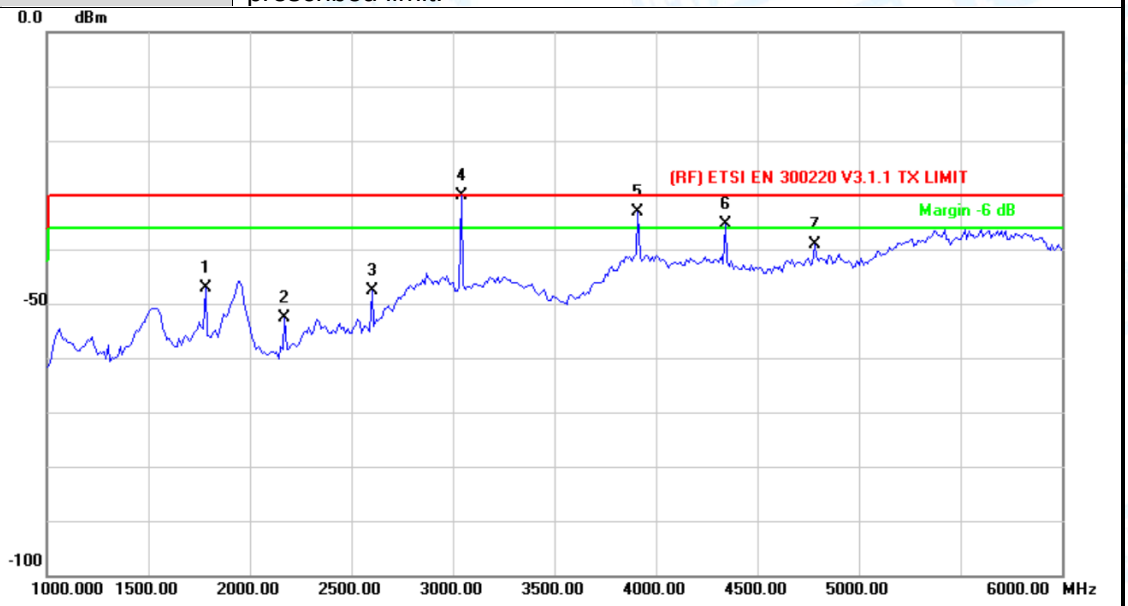
Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3V		
Ant. Pol.	Vertical		
Test Mode:	RX Mode		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1		112.1305	-74.39	-3.86	-78.25	-57.00	-21.25	peak
2		200.6881	-73.86	-7.79	-81.65	-57.00	-24.65	peak
3		379.9141	-74.33	-1.38	-75.71	-57.00	-18.71	peak
4		543.2742	-74.79	4.29	-70.50	-57.00	-13.50	peak
5		704.2261	-75.02	5.54	-69.48	-57.00	-12.48	peak
6	*	881.4067	-73.61	7.90	-65.71	-57.00	-8.71	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

Above 1G

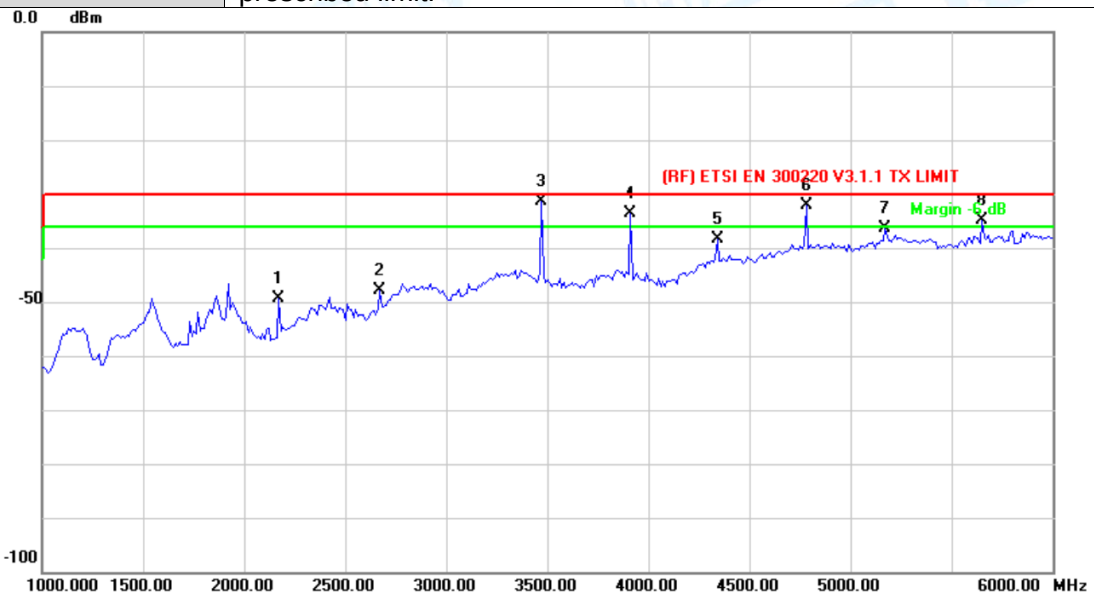
Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3V		
Ant. Pol.	Horizontal		
Test Mode:	TX Mode		
Remark:	No report for the emission which more than 20 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1		1780.000	-56.71	9.63	-47.08	-30.00	-17.08	peak
2		2170.000	-62.37	9.69	-52.68	-30.00	-22.68	peak
3		2600.000	-60.12	12.62	-47.50	-30.00	-17.50	peak
4	*	3040.000	-49.93	19.74	-30.19	-30.00	-0.19	peak
5	!	3910.000	-56.19	23.16	-33.03	-30.00	-3.03	peak
6	!	4340.000	-58.83	23.49	-35.34	-30.00	-5.34	peak
7		4780.000	-63.44	24.20	-39.24	-30.00	-9.24	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

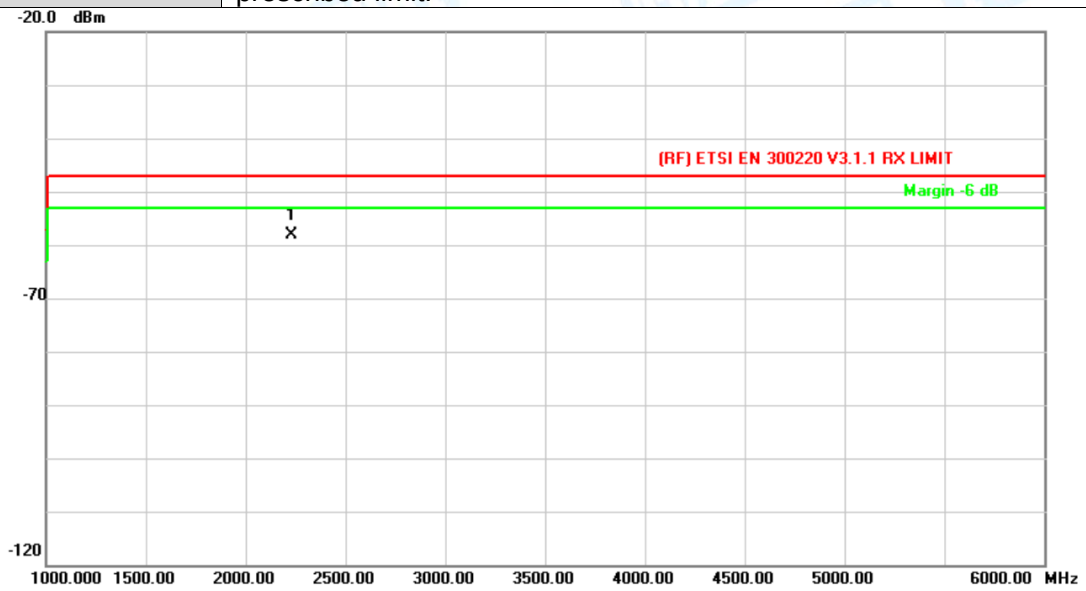
Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3V		
Ant. Pol.	Vertical		
Test Mode:	TX Mode		
Remark:	No report for the emission which more than 20 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1		2170.000	-60.15	10.66	-49.49	-30.00	-19.49	peak
2		2670.000	-62.44	14.52	-47.92	-30.00	-17.92	peak
3	*	3470.000	-51.17	19.82	-31.35	-30.00	-1.35	peak
4	!	3910.000	-53.64	20.12	-33.52	-30.00	-3.52	peak
5		4340.000	-61.55	23.23	-38.32	-30.00	-8.32	peak
6	!	4780.000	-58.29	26.20	-32.09	-30.00	-2.09	peak
7		5170.000	-64.15	27.73	-36.42	-30.00	-6.42	peak
8	!	5650.000	-63.27	28.47	-34.80	-30.00	-4.80	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

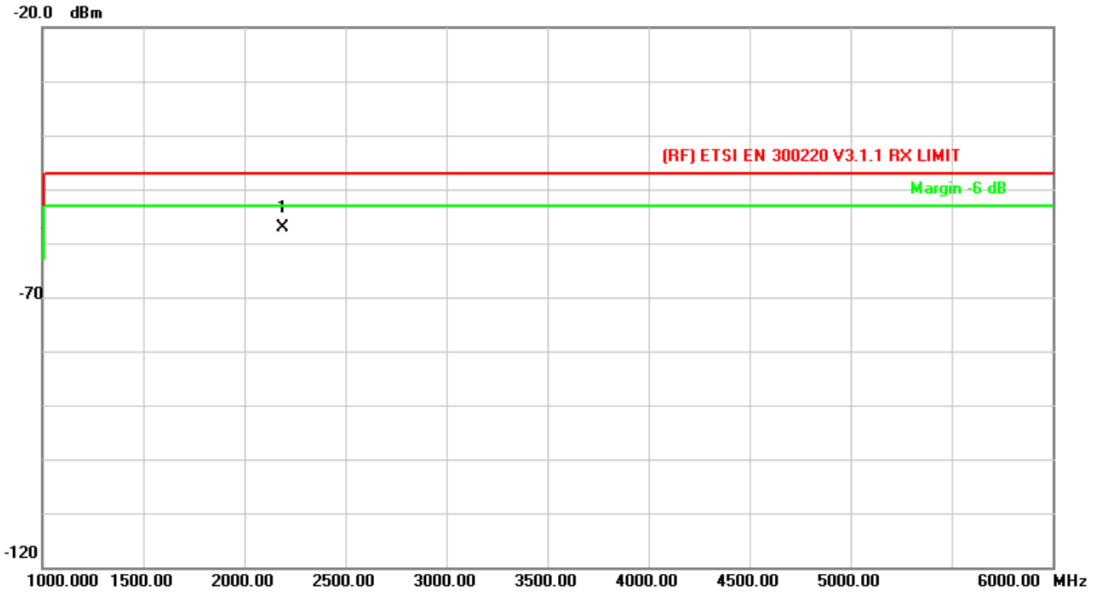
Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3V		
Ant. Pol.	Horizontal		
Test Mode:	RX Mode		
Remark:	No report for the emission which more than 20 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1	*	2231.576	-68.02	9.89	-58.13	-47.00	-11.13	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

Temperature:	23.4 ℃	**Relative Humidity:**	48%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		
Test Mode:	RX Mode		
Remark:	No report for the emission which more than 20 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1	*	2191.948	-67.94	10.80	-57.14	-47.00	-10.14	peak

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. Margin (dB) =Peak(dBm)-Limit (dBm)

Attachment B-- Effective Radiated Power

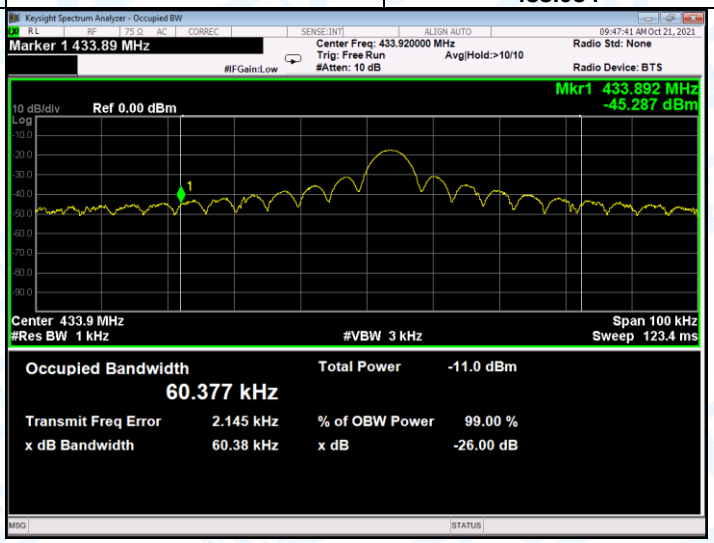
Test Mode :	TX Mode 433.92MHz
Test Conditions	**ERP Power (dBm)**
Tnom, Vnom	-6.256
Tmin, Vmin	-6.261
Tmin, Vmax	-6.258
Tmax, Vmin	-6.264
Tmax, Vmax	-6.267
Max Peak Power	-6.271
Limits	**1mW(0dBm)**
Result	**PASS**

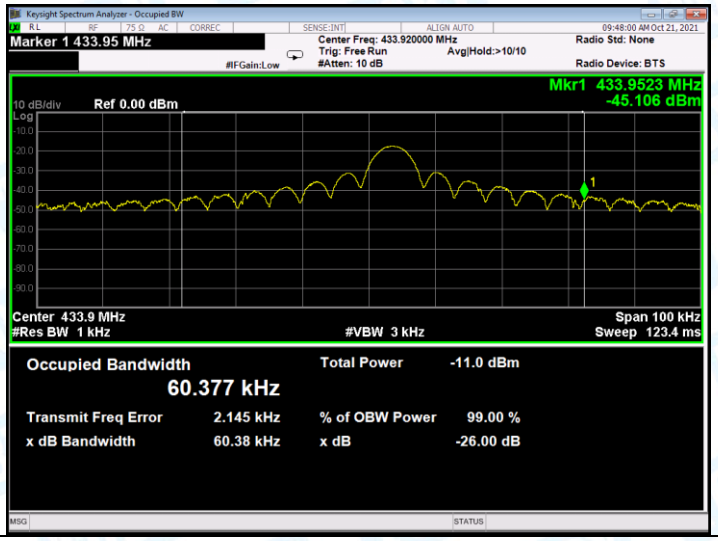
Attachment C-- Occupied Bandwidth

Test Mode:	TX Mode 433.92MHz

Modulated Signal Test

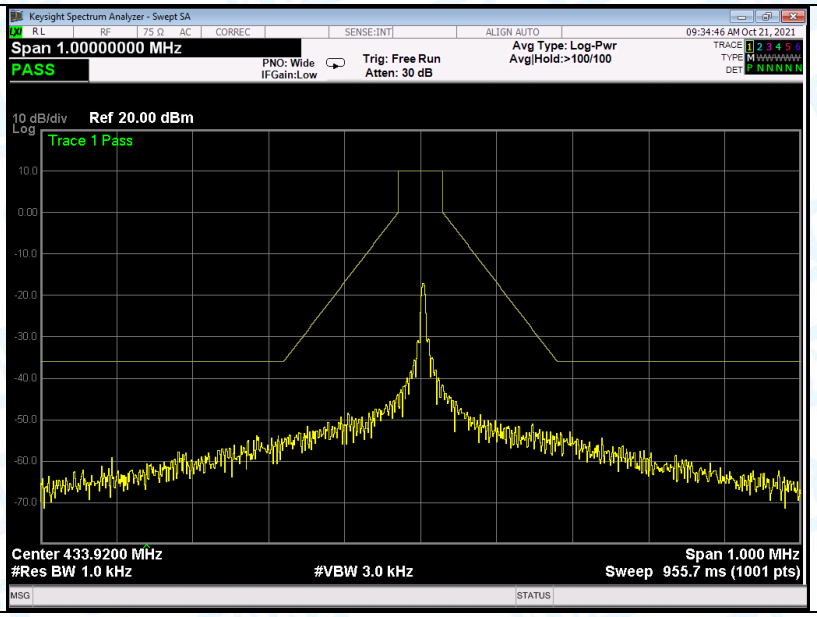
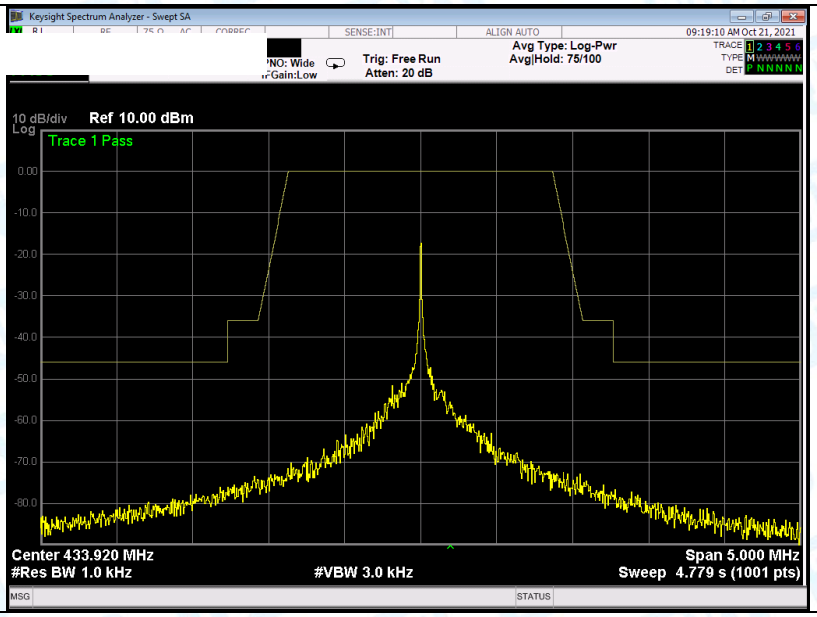
Test Conditions	Occupied Channel Bandwidth (MHz)	FL/FH Measured Frequency (MHz)	Limit (MHz)	Result
Tnom, Vnom	0.0604	433.892	>433.050	Pass
		433.952	<434.790	
Tmin, Vmin	0.0601	433.893	>433.050	
		433.951	<434.790	
Tmin, Vmax	0.0602	433.894	>433.050	
		433.950	<434.790	
Tmax, Vmin	0.0603	433.893	>433.050	
		433.953	<434.790	
Tmax, Vmax	0.0603	433.894	>433.050	
		433.954	<434.790	





Remark: the plot only show the worst case.

Attachment D--Tx Out of Band Emissions

Test Mode :	TX Mode 433.92MHz
Note: All test modes were carried out for all operation modes, the worst test data(TN TN) is record the report	
Operating Channel with reference BW	
Tnom, Vnom	
Operational Frequency Band with reference BW	
Tnom, Vnom	

Attachment E--Transient Power

Test Mode :	TX Mode 433.92MHz		
Transient Power			
Test points (MHz)	**Upper Max. Power(dBm)**	**Limit(dBm)**	**Result**
433.92+0.5*OCW+1200kHz	-53	-27	Pass
433.92+0.5*OCW+400kHz	-52	-27	
433.92+0.5*OCW	-51	-27	
433.92+0.5*OCW+3kHz	-21	0	
433.92-0.5*OCW-3kHz	-20	0	
433.92-0.5*OCW	-46	-27	
433.92-0.5*OCW-400kHz	-53	-27	
433.92-0.5*OCW-1200kHz	-58	-27	

Attachment F--Tx Behaviour Under Low Voltage Conditions

Test Mode:	TX Mode 433.92MHz		
Test Conditions			**Use condition Under Low Voltage**
N nom (°C)	25.0	DC 1.5V	Normal Function
N nom (°C)	25.0	DC 2.0V	Normal Function
N nom (°C)	25.0	DC 3.0V	Function Stop
Limit			Manufacturer declared operating Voltage DC 3V
Result			**PASS**

Attachment G-- Blocking

Temperature:	26°C	**Relative Humidity:**	60%
Pressure:	1010 hPa	**Test Voltage:**	DC 3V
Test Mode:	Receive Mode		

Blocking Signal Test (Category 2)			
Frequency offset	**Blocking Signal B-A (dB)**	**Limit (dB)**	**Result**
+2 MHz	-65.44	≥ -69	Pass
-2 MHz	-65.63	≥-69	Pass
+10 MHz	-34.61	≥-40	Pass
-10 MHz	-35.71	≥-40	Pass
+22 MHz	-27.52	≥ -40	Pass
-22 MHz	-23.71	≥-40	Pass
Note: When add the Blocking Signal TX and RX are not disconnected, Normal Function. Criteria for blocking: Unwanted signal injected and monitoring the EUT whether can still work as intended.			

-----END OF REPORT-----