

SPECTRUM REPORT

(BLE)

Applicant: 8devices

Address of Applicant: Antakalnio 17, Vilnius, LT-10312, Lithuania

Equipment Under Test (EUT)

Product Name: Broadband Digital Transmission System

Model No.: BLUE bean A, BLUE bean C, RED bean A, RED bean C

Applicable standards: ETSI EN 300 328 V2.1.1 (2016-11)

Date of sample receipt: 28 Mar, 2019

Date of Test: 29 Mar, to 26 May, 2019

Date of report issue: 27 May, 2019

Test Result: PASS*

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/53/EU are considered.



Bruce Zhang
Laboratory Manager



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 and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	27 May, 2019	Original

Tested by:

Mike.ou

Date:

27 May, 2019

Test Engineer

Reviewed by:

Wimer Zhang

Date:

27 May, 2019

Project Engineer

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4 Test Summary

Test Items	Test Requirement	Test method	Limit/Severity	Result
Radio Spectrum Matter (RSM) Part of Tx				
RF Output Power	Clause 4.3.2.2	Clause 5.4.2.2.1.2	Clause 4.3.2.2.3	PASS
Power Spectral Density	Clause 4.3.2.3	Clause 5.4.3	Clause 4.3.2.3.3	PASS
Duty Cycle, Tx-sequence, Tx-gap	Clause 4.3.2.4	Clause 5.4.2.2.1.3	Clause 4.3.2.4.3	N/A
Medium Utilisation (MU) factor	Clause 4.3.2.5	Clause 5.4.2.2.1.4	Clause 4.3.4.5.3	N/A
Adaptivity (Adaptive Equipment using Modulations Other Than FHSS)	Clause 4.3.2.6	Clause 5.4.6.2	Clause 4.3.2.6	N/A
Occupied Channel Bandwidth	Clause 4.3.2.7	Clause 5.4.7.2	Clause 4.3.2.7.3	PASS
Transmitter unwanted emissions in the out-of-band domain	Clause 4.3.2.8	Clause 5.4.8.2	Clause 4.3.2.8.3	PASS
Transmitter unwanted emissions in the spurious domain	Clause 4.3.2.9	Clause 5.4.9.2	Clause 4.3.2.9.3	PASS
Radio Spectrum Matter (RSM) Part of Rx				
Receiver spurious emissions	Clause 4.3.2.10	Clause 5.4.10.2	Clause 4.3.2.10.3	PASS
Receiver Blocking	Clause 4.3.2.11	Clause 5.4.11.2	Clause 4.3.2.11.4	PASS
<p><i>Remark:</i> <i>Tx: In this whole report Tx (or tx) means Transmitter.</i> <i>Rx: In this whole report Rx (or rx) means Receiver.</i> <i>Pass: Meet the requirement.</i> <i>N/A: Not Applicable for Non-adaptive equipment.</i></p>				

5 General Information

5.1 Client Information

Applicant:	8devices
Address:	Antakalnio 17, Vilnius, LT-10312, Lithuania
Manufacturer/Factory:	8devices
Address:	Antakalnio 17, Vilnius, LT-10312, Lithuania

5.2 General Description of E.U.T.

Product Name:	Broadband Digital Transmission System
Model No.:	BLUE bean A,BLUE bean C,RED bean A,RED bean C
Hardware version:	BLUE bean A: 8dev_3201_4, BLUE bean C: 8dev_3200_3, RED bean A: 8dev_3301_3, RED bean C: 8dev_3301_4
Software version:	4.5.20.037
Operation Frequency:	2402MHz ~ 2480MHz
Channel number:	40
Channel separation:	2MHz
Modulation type:	other forms of modulation
Equipment Type:	Adaptive equipment
Modulation Technology:	GFSK
Max. E.I.R.P Power:	2.05 dBm
Antenna Type:	Ceramic Antenna External antenna
Antenna gain:	Ceramic Antenna: 3.0 dBi External antenna A: 4.0 dBi External antenna B: 3.2 dBi
Power supply:	DC 3.3V
Remark:	<p>The No.: BLUE bean A and BLUE bean C, RED bean A and RED bean C identical inside, the electrical circuit design, layout, components used and internal wiring up to RF output. with only difference as follow:</p> <ol style="list-style-type: none"> 1. BLUE bean C and RED bean C RF output is connected to connector Murata HSC, BLUE bean A and RED bean A RF output is connected to connector Murata HSC and connected to antenna, to accommodate antenna PCB length is increased, antenna, antennas passive components and RF probe switch added to PCB. 2. Modules use different version of chip BLUE bean Qualcomm QCA9377-7 and RED bean Qualcomm QCA9377-3. 3. QCA9377-7 and QCA9377-3 only differs what interface it uses to connect to WIFI and BT. 4. BLUE bean QCA9377-7 uses USB2.0 for WIFI and USB1.1 for BT. 5. RED bean QCA9377-3 uses SDIO3.0 for WIFI and UART/PCM for BT. 6. Circuit design, layout components used and internal wiring for interface connection is different. 7. Pinout for module is different

5.3 Test environment and mode

Operating Environment:	
Temperature:	Normal: 15°C ~ 35°C, Extreme: -20°C ~ +55°C
Humidity:	52 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 3.3Vdc, Extreme: Low 2.97Vdc, High 3.63Vdc
Test mode:	
Transmitting mode:	Keep the EUT in continuously transmitting mode with modulation.
Receiving mode:	Keep the EUT in receiving mode.
We have verified the construction and function in typical operation. All the test items were carried out with the EUT in above test modes.	

5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
LENOVO	Laptop	SL510	2847A65	DoC
ULEFONE	Adapter	HJ-0503000K7-EU	N/A	N/A
baofeng	Test suite	Pi3B+SD	N/A	N/A

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Occupied Channel Bandwidth	±5%
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5%
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB

5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-18-2019	03-17-2020
Signal Generator	R&S	SMR20	1008100050	03-18-2019	03-17-2020
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		

Conducted method:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-10-2018	11-09- 2019
Vector Signal Generator	Agilent	N5182A	MY49060014	11-10-2018	11-09- 2019
Signal Generator	R&S	SMR20	1008100050	03-18-2019	03-17- 2020
Power Sensor	D.A.R.E	RPR3006W	15I00041SNO12	11-10-2018	11-09- 2019
Power Sensor	D.A.R.E	RPR3006W	15I00041SNO54	11-10-2018	11-09- 2019
Power Sensor	D.A.R.E	RPR3006W	17I00015SNO27	11-10-2018	11-09- 2019
Power Sensor	D.A.R.E	RPR3006W	17I00015SNO28	11-10-2018	11-09- 2019
RF Switch Unit	Ascentest	AT890-RFB	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS 8310	Version: 2.0.0.0		
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	11-10-2018	11-09- 2019
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	11-10-2018	11-09- 2019

6 Radio Technical Specification in ETSI EN 300 328

6.1 Justification

The EUT and test equipment were configured for testing according to ETSI EN 300 328 V2.1.1 (2016-11). The EUT was tested in the normal operating mode to represent worst-case results during the final qualification test.

6.2 Test Configuration of EUT

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

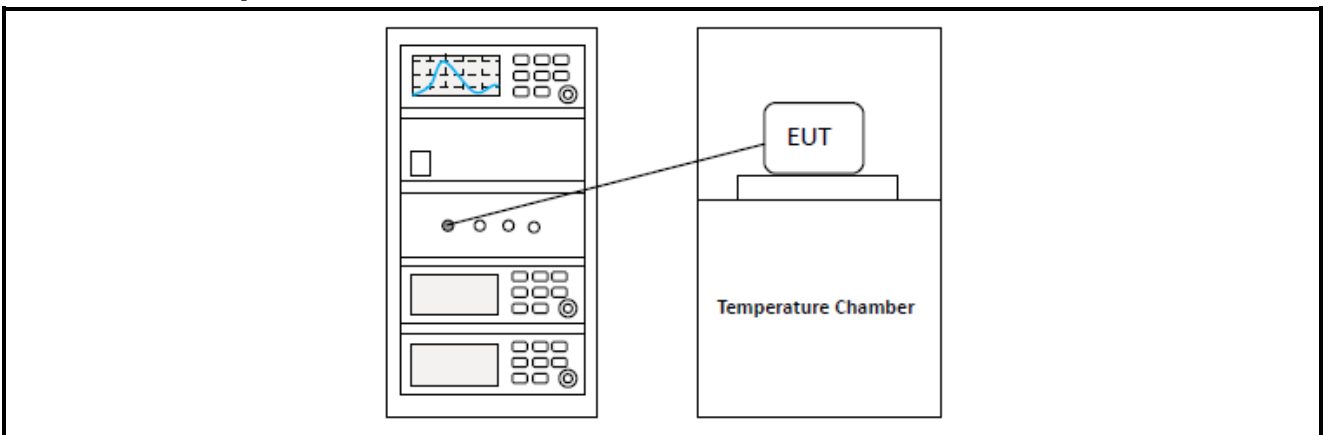
Remark: The EUT operation in above frequency list, and used test software to control the EUT for staying in continuous transmitting and receiving mode. Channel 0, 20 and 39 of BLE were chosen for testing.

Clause No.	Test Conditions			Test Channel			Modulation	Test mode		
	NVNT	NVLT	NVHT	Low	Middle	High	GFSK	Tx	Rx	Normal
4.3.2.2	√	√	√	√	√	√	√	√		
4.3.2.3	√			√	√	√	√	√		
4.3.2.4										
4.3.2.5										
4.3.2.6										
4.3.2.7	√			√		√	√	√		
4.3.2.8	√			√		√	√	√		
4.3.2.9	√			√		√	√	√		
4.3.2.10	√			√		√	√		√	
4.3.2.11	√			√		√	√		√	

Note:

1. "√" means that this configuration is chosen for test.
2. "NVNT" means Normal Voltage Normal Temperature, "NVLT" means Normal Voltage Low Temperature, "NVHT" means Normal Voltage High Temperature.

6.3 Test Setup Block



6.4 Test Results

6.4.1 Test Result Summary

Clause No.	Modulation	Test Condition	Test Data	Verdict
4.3.2.2	GFSK	NVNT	Appendix A – BLE	Pass
		NVLT		
		NVHT		
4.3.2.3	GFSK	NVNT	Appendix A – BLE	Pass
4.3.2.4	N/A	N/A	N/A	N/A
4.3.2.5	N/A	N/A	N/A	N/A
4.3.2.6	N/A	N/A	N/A	N/A
4.3.2.7	GFSK	NVNT	Appendix A – BLE	Pass
4.3.2.8	GFSK	NVNT	Appendix A – BLE	Pass
4.3.2.9	GFSK	NVNT	See Section 6.4.2	Pass
4.3.2.10	GFSK	NVNT	See Section 6.4.3	Pass
4.3.2.11	GFSK	NVNT	See Section 6.4.4	Pass

Note:

1. "NVNT" means Normal Voltage Normal Temperature, "NVLT" means Normal Voltage Low Temperature, "NVHT" means Normal Voltage High Temperature.
2. Clause No. 4.3.2.2, Clause No. 4.3.2.3, Clause No. 4.3.2.8, Clause No. 4.3.3.2.9 and Clause No. 4.3.3.2.9 test Ceramic Antenna, External antenna A and, External antenna B. others Test Items pre-scan all antenna, found External antenna A were worse case mode. so only reflects test data of worse case mode.

6.4.2 Transmitter unwanted emissions in the spurious domain

Ceramic Antenna:

The lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
106.01	Vertical	-64.3	-54.00	Pass
501.18	V	-64.86		
46.18	V	-56.42	-36.00	
154.28	V	-58.27		
4804.00	V	-49.13	-30.00	
55.03	Horizontal	-69.91	-54.00	
326.74	H	-57.38		
45.22	H	-62.89	-36.00	
326.74	H	-68.42		
4804.00	H	-49.11	-30.00	
GFSK: The highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
106.01	Vertical	-64.34	-54.00	Pass
501.18	V	-64.97		
46.18	V	-56.33	-36.00	
154.28	V	-58.28		
4960.00	V	-48.67	-30.00	
55.03	Horizontal	-69.29	-54.00	
326.74	H	-57.38		
45.22	H	-62.84	-36.00	
326.74	H	-68.26		
4960.00	H	-49.18	-30.00	

External Antenna A:

GFSK: The lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
106.01	Vertical	-64.72	-54.00	Pass
501.18	V	-64.93		
46.18	V	-56.64	-36.00	
154.28	V	-58.83		
4804.00	V	-48.97	-30.00	
55.03	Horizontal	-69.43	-54.00	
326.74	H	-57.86		
45.22	H	-62.93	-36.00	
326.74	H	-68.73		
4804.00	H	-49.19	-30.00	
GFSK: The highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
106.01	Vertical	-64.37	-54.00	Pass
501.18	V	-64.74		
46.18	V	-56.38	-36.00	
154.28	V	-58.32		
4960.00	V	-48.57	-30.00	
55.03	Horizontal	-69.26	-54.00	
326.74	H	-57.43		
45.22	H	-62.37	-36.00	
326.74	H	-68.32		
4960.00	H	-49.12	-30.00	

External Antenna B:

GFSK: The lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
106.01	Vertical	-64.86	-54.00	Pass
501.18	V	-64.89		
46.18	V	-56.67	-36.00	
154.28	V	-58.92		
4804.00	V	-48.98	-30.00	
55.03	Horizontal	-69.52	-54.00	
326.74	H	-57.74		
45.22	H	-62.87	-36.00	
326.74	H	-68.79		
4804.00	H	-49.23	-30.00	
GFSK: The highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
106.01	Vertical	-64.43	-54.00	Pass
501.18	V	-64.86		
46.18	V	-56.57	-36.00	
154.28	V	-58.38		
4960.00	V	-48.64	-30.00	
55.03	Horizontal	-69.39	-54.00	
326.74	H	-57.78		
45.22	H	-62.45	-36.00	
326.74	H	-68.33		
4960.00	H	-49.19	-30.00	

6.4.3 Receiver spurious emissions

Ceramic Antenna:

The lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
154.82	Vertical	-58.62	-57.00	Pass
250.30	V	-60.35		
4804.00	V	-58.99	-47.00	
54.84	Horizontal	-64.86	-57.00	
501.18	H	-59.74		
4804.00	H	-59.83	-47.00	
GFSK: The highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
154.82	Vertical	-58.92	-57.00	Pass
250.30	V	-60.37		
4960.00	V	-59.43	-47.00	
54.84	Horizontal	-64.84	-57.00	
501.18	H	-59.33		
4960.00	H	-59.86	-47.00	

External Antenna A:

The lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
154.82	Vertical	-58.68	-57.00	Pass
250.30	V	-60.39		
4804.00	V	-58.92	-47.00	
54.84	Horizontal	-64.84	-57.00	
501.18	H	-59.76		
4804.00	H	-59.97	-47.00	
GFSK: The highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
154.82	Vertical	-58.86	-57.00	Pass
250.30	V	-60.37		
4960.00	V	-59.49	-47.00	
54.84	Horizontal	-64.38	-57.00	
501.18	H	-59.46		
4960.00	H	-59.89	-47.00	

External Antenna B:

The lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
154.82	Vertical	-59.06	-57.00	Pass
250.30	V	-60.42		
4804.00	V	-58.96	-47.00	
54.84	Horizontal	-64.83	-57.00	
501.18	H	-59.87		
4804.00	H	-59.46	-47.00	
GFSK: The highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	Polarization	Level(dBm)		
154.82	Vertical	-58.92	-57.00	Pass
250.30	V	-60.38		
4960.00	V	-59.56	-47.00	
54.84	Horizontal	-64.43	-57.00	
501.18	H	-59.64		
4960.00	H	-59.87	-47.00	

6.4.4 Receiver Blocking

Lowest Channel					
Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power(dBm) CW	PER measurement level (%)	PER Limit (%)	Results
-81.00 (Pmin+6dBm)	2380	-57	4	10	Pass
	2503.5		2		
-81.00 (Pmin+6dBm)	2300	-47	4	10	Pass
	2583.5		3		

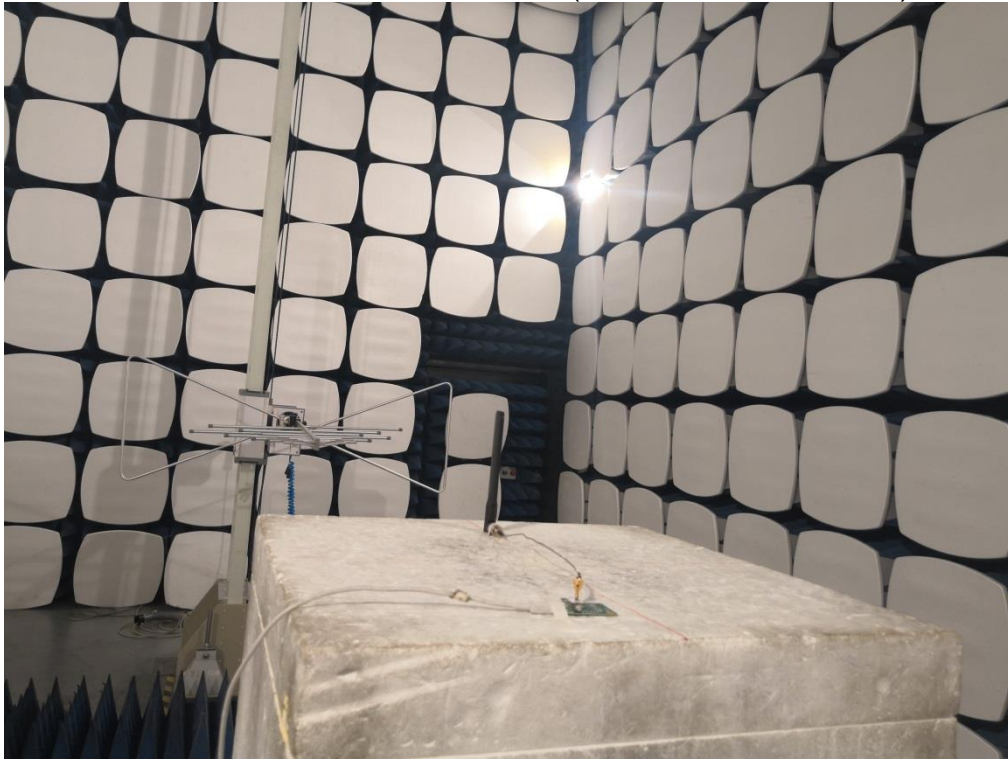
NOTE:
 (1) The minimum performance criterion shall be PER less than or equal to 10 %.
 (2) Manufacturer declared the sensitivity level is -87 dBm.
 (3) The EUT belongs to receiver category 2 equipment.

Highest Channel					
Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power(dBm) CW	PER measurement level (%)	PER Limit (%)	Results
-81.00 (Pmin+6dBm)	2380	-57	3	10	Pass
	2503.5		2		
-81.00 (Pmin+6dBm)	2300	-47	3	10	Pass
	2583.5		4		

NOTE:
 (1) The minimum performance criterion shall be PER less than or equal to 10 %.
 (2) Manufacturer declared the sensitivity level is -87 dBm.
 (3) The EUT belongs to receiver category 2 equipment.

7 Test setup photo

Radiated Emission Below 1GHz (for External antenna A)



Radiated Emission Above 1GHz (for External antenna A)



Radiated Emission Below 1GHz (for External antenna B)



Radiated Emission Above 1GHz (for External antenna B)



Radiated Emission Below 1GHz (for Ceramic Antenna)



Radiated Emission Above 1GHz (for Ceramic Antenna)



8 EUT Constructional Details

Reference to the test report No. CCISE190310301

ANNEX Application form for testing

In accordance with EN 300 328 V2.1.1, clause 5.4.1, the following information is provided by the supplier.

a) The type of modulation used by the equipment:

- FHSS
- Other forms of modulation

b) In case of FHSS modulation:

- In case of non-Adaptive Frequency Hopping equipment:
The number of Hopping Frequencies: ...
- In case of Adaptive Frequency Hopping Equipment:
The maximum number of Hopping Frequencies: ...
The minimum number of Hopping Frequencies: ...
- The Dwell Time: ...
- The Minimum Channel Occupation Time: ...

c) Adaptive / non-adaptive equipment:

- Non-adaptive Equipment
- Adaptive Equipment without the possibility to switch to a non-adaptive mode
- Adaptive Equipment which can also operate in a non-adaptive mode

d) In case of adaptive equipment:

The Channel Occupancy Time implemented by the equipment: ____ ms

- The equipment has implemented an LBT based DAA mechanism
 - In case of equipment using modulation different from FHSS:
 - The equipment is Frame Based equipment
 - The equipment is Load Based equipment
 - The equipment can switch dynamically between Frame Based and Load Based equipment
The CCA time implemented by the equipment: ____µs
The value q as referred to in clause 4.3.2.5.2.2.2:
- The equipment has implemented a non-LBT based DAA mechanism
- The equipment can operate in more than one adaptive mode

e) In case of non-adaptive Equipment:

The maximum RF Output Power (e.i.r.p.): ____dBm

The maximum (corresponding) Duty Cycle: ____ %

Equipment with dynamic behaviour, that behaviour is described here. (e.g. the different combinations of duty cycle and corresponding power levels to be declared):

f) The worst case operational mode for each of the following tests:

- RF Output Power GFSK
- Power Spectral Density GFSK
- Duty cycle, Tx-Sequence, Tx-gap ...
- Dwell time, Minimum Frequency Occupation & Hopping Sequence (only for FHSS equipment)
- ...
- Hopping Frequency Separation (only for FHSS equipment) ...
- Medium Utilisation ...
- Adaptivity & Receiver Blocking GFSK
- Occupied Channel Bandwidth GFSK
- Transmitter unwanted emissions in the OOB domain GFSK
- Transmitter unwanted emissions in the spurious domain GFSK
- Receiver spurious emissions GFSK

g) The different transmit operating modes (tick all that apply):

- Operating mode 1: Single Antenna Equipment
- Equipment with only 1 antenna
- Equipment with 2 diversity antennas but only 1 antenna active at any moment in time

Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used. (e.g. IEEE 802.11™ [i.3] legacy mode in smart antenna systems)

Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming

Single spatial stream / Standard throughput / (e.g. IEEE 802.11™ [i.3] legacy mode)

High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1

High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2

NOTE: Add more lines if more channel bandwidths are supported.

Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming

Single spatial stream / Standard throughput (e.g. IEEE 802.11™ [i.3] legacy mode)

High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1

High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2

NOTE: Add more lines if more channel bandwidths are supported.

h) In case of Smart Antenna Systems:

- The number of Receive chains:

- The number of Transmit chains:

- Symmetrical power distribution

- asymmetrical power distribution

In case of beam forming, the maximum beam forming gain:

NOTE: Beam forming gain does not include the basic gain of a single antenna.

i) Operating Frequency Range(s) of the equipment:

- Operating Frequency Range 1: 2402 MHz to 2480 MHz

- Operating Frequency Range 2: MHz to..... MHz

NOTE: Add more lines if more Frequency Ranges are supported.

j) Occupied Channel Bandwidth(s):

- Occupied Channel Bandwidth 1: 1.05 MHz

- Occupied Channel Bandwidth 2: MHz

NOTE: Add more lines if more channel bandwidths are supported.

k) Type of Equipment (stand-alone, combined, plug-in radio device, etc.):

Stand-alone

Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment)

Plug-in radio device (Equipment intended for a variety of host systems)

Other.....

l) The extreme operating conditions that apply to the equipment:

Operating temperature range: -20 ° C to +55° C

Operating voltage range: 2.97 V to 3.63 V AC DC

Details provided are for the: stand-alone equipment

combined (or host) equipment

test jig

m) The intended combination(s) of the radio equipment power settings and one or more antenna assemblies and their corresponding e.i.r.p levels:

- Antenna Type:

Integral Antenna

Ceramic Antenna Gain: 3.0 dBi

External Antenna Gain A: 4.0 dBi

External Antenna Gain B: 3.2 dBi

If applicable, additional beamforming gain (excluding basic antenna gain): ____dB

Temporary RF connector provided

No temporary RF connector provided

Dedicated Antennas (equipment with antenna connector)

Single power level with corresponding antenna(s)

Multiple power settings and corresponding antenna(s) Number of different

Power Levels: ...

Power Level 1: ___dBm

Power Level 2: ___dBm

Power Level 3: ___dBm

NOTE 1: Add more lines in case the equipment has more power levels.

NOTE 2: These power levels are conducted power levels (at antenna connector).

- For each of the Power Levels, provide the intended antenna assemblies, their corresponding gains (G) and the resulting e.i.r.p. levels also taking into account the beamforming gain (Y) if applicable

Power Level 1: ___dBm

Number of antenna assemblies provided for this power level:

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

Power Level 2: ___dBm

Number of antenna assemblies provided for this power level:

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

Power Level 3: ___dBm

Number of antenna assemblies provided for this power level:

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

n) The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test jig in case of plug-in devices:

- Details provided are for the: stand-alone equipment
 combined (or host) equipment
 test jig

Supply Voltage AC mains State AC voltage ___V
 DC State DC voltage 3.3 V

In case of DC, indicate the type of power source

- Internal Power Supply
 External Power Supply
 Battery
 Other:

o) Describe the test modes available which can facilitate testing:

Continuous transmitting mode control in engineer mode.

p) The equipment type (e.g. Bluetooth®, IEEE 802.11™ [i.3], proprietary, etc.): Bluetooth

Configuration for testing

From all combinations of conducted power settings and intended antenna assembly(ies) specified in clause 5.4.1 m), specify the combination resulting in the highest e.i.r.p. for the radio equipment.

Unless otherwise specified in EN 300 328, this power setting is to be used for testing against the requirements of EN 300 328. In case there is more than one such conducted power setting resulting in the same (highest) e.i.r.p. level, the highest power setting is to be used for testing. See also EN 300 328, clause 5.3.2.3.

Highest overall e.i.r.p. value: 2.05 dBm

Corresponding Antenna assembly gain: 4.0 dBi

Antenna Assembly #: 1

Corresponding conducted power setting: -1.95 dBm
(also the power level to be used for testing)

Listed as Power Setting #: 7

Additional information provided by the applicant

Modulation:

ITU Class(es) of emission: DSSS

Can the transmitter operate unmodulated? yes no

Duty Cycle

The transmitter is intended for: Continuous duty
 Intermittent duty
 Continuous operation possible for testing purposes

About the UUT

- The equipment submitted are representative production models
- If not, the equipment submitted are pre-production models?
- If pre-production equipment are submitted, the final production equipment will be identical in all respects with the equipment tested
- If not, supply full details
-
- The equipment submitted is CE marked
- In addition to the CE mark, the Class-II identifier (Alert Sign) is affixed.

Additional items and/or supporting equipment provided

- Spare batteries (e.g. for portable equipment)
- Battery charging device
- External Power Supply
- Test Jig or interface box
- RF test fixture (for equipment with integrated antennas)
- Host System Manufacturer:
Model #:
Model name:
- Combined equipment Manufacturer:
Model #:
Model name:
- User Manual
- Technical documentation (Handbook and circuit diagrams)

-----End of report-----