Test Report on

Model: NOTE-NBGL
HW Version: 1.5.0
SW Version: 1.5.0
SVN: 03
PTCRB Request#91042

Test Report Reference: MUS_BWIRELESS_2001_CON_Rev0

Date: 2020-10-02

Cert# 3699.02

Test Laboratory:
Bureau Veritas CPS Inc.
1293 Anvilwood Avenue
Sunnyvale, CA 94089
USA

Authorized Test Lab
Lab Code: 20131001- 00

Table of Contents

1 Administrative Data

1.1 Project Information

Project Name	MUS_BWIRELESS_2001
Responsible for Testing	Jenil Nathwani
Date of Report	2020-10-02
Testing Time Frame	2020-09-17 to 2020-09-30

1.2 Applicant Information

Company	Blues Wireless
Address	50 Harbor Street Manchester, MA 01944 United States
Contact Person	hello@blues.com
Phone	
Email	

1.3 Test Laboratory Information

The following list shows all Locations and Test Resources involved in the generation of test results:

Bureau Veritas, USA, CA, Milpitas

Company Name	Bureau Veritas Consumer Products Services, Inc.
Address	775 Montague Expy Milpitas, CA 95035 United States
Contact	Shuo Zhang
Phone	+1 (408) 526 1188
Email	Shuo.Zhang@bureauveritas.com
Laboratory accreditation no.	A2LA 2742.01

List of Test Resources

ID	Name	Responsible	Accreditation Info
1	Radiated Spurious Emissions	Marco Orantes	A2LA 2742.01

1.4 Signature of responsible for testing

jenil nathwani

Jenil Nathwani

1.5 Signature of responsible for accreditation scope

Eddie Parsons

Eddie Parsons

1.6 Revision History

Report version control			
Version	**Release date**	**Change Description**	**Version validity**
Initial	2020-10-02	Initial Release	Valid

2 Test Object Data

2.1 Object Under Test (OUT) Description(s)

The following section lists all Objects Under Test (OUTs) involved during testing.

Object Under Test: NOTE-NBGL

Type / Model	Model: NOTE-NBGL HW Version: 1.5.0 SW Version: 1.5.0 SVN: 03 PTCRB Request#91042
Normal Temperature	21°C
Normal Voltage	3.8V

Manufacturer:

Company	Blues Wireless
Address	50 Harbor Street Manchester, MA 01944 United States
Contact Person	hello@blues.com
Phone	
Email	

3 Results

3.1 General

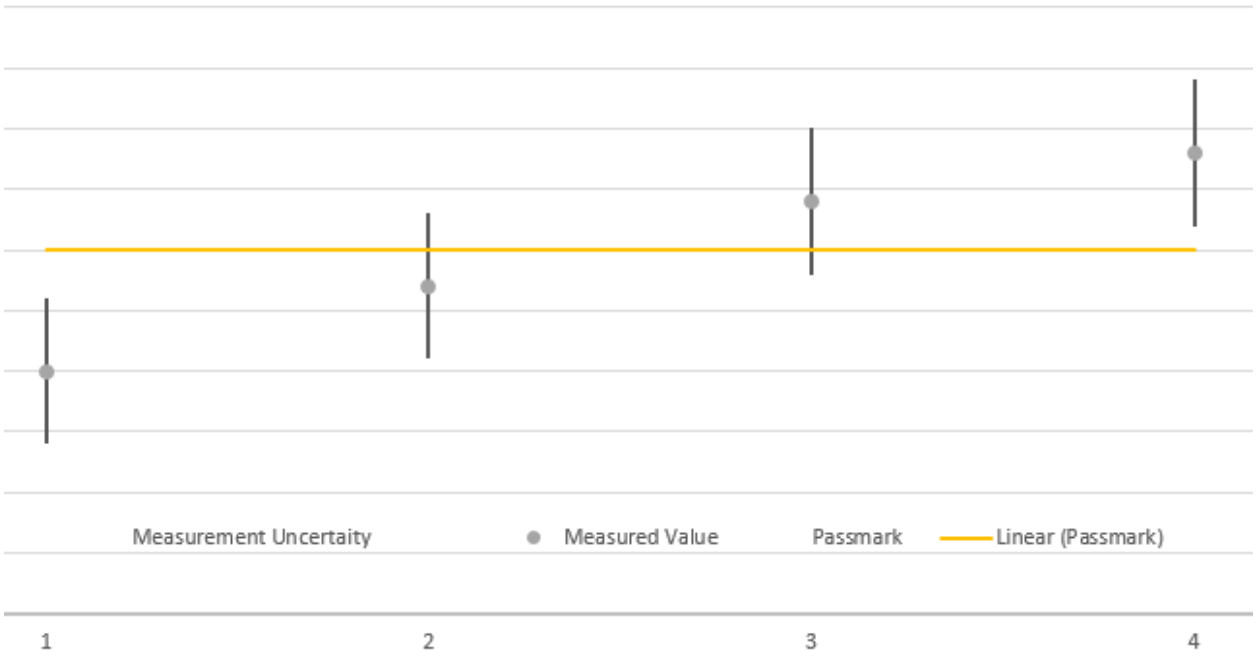
Documentation of tested devices	Available at the test laboratory.
Interpretation of the test results	The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device conforms to the applied standard. In cases where 'Declaration' is stated, the required documents are available in the manufacturer's product documentation. In cases where 'not applicable' is stated, the test case requirements are not relevant to the specific equipment implementation.
Notes	1. This report contains the abbreviated information content pertaining to services rendered. Supporting documentation not included herein is maintained and available at the test laboratory. 2. All tests are performed under environmental conditions within the requirements of the specifications. Environmental condition records are available at the test laboratory.
Project specific notes	1. This is a delta test report based on PTCRB modular approval guideline for a final product that integrates a Quectel BG95-M3 Module which has been approved by PTCRB (Request# 81968) according to NAPRD.03 v5.40 with HW version: R2.1 and SW version: BG95M3LAR02A03 (SVN03) on December 05, 2019.

3.2 Measurement Uncertainties

Parameter	Uncertainty
Occupied channel Bandwidth	± 2%
Radiated Emissions	30 MHz – 1 GHz: ± 2.4 dB 180 MHz – 18 GHz: ± 2.6 dB
Spurious emissions, conducted	0.22 – 1.82 dB (*)
Transmitter tests, conducted	0.33 – 0.8 dB (*)
Receiver tests, conducted	0.22 – 1.027 dB (*)
Frequency error, conducted	< 15 Hz (*)
Phase error, conducted	≤02 °RMS EVM: ≤ 2.5%
Temperature	± 1.0 °C
Humidity	± 3%
DC and low frequency voltages	± 0.05%
Time	0.28 ms
Duty Cycle	± 5%

(*) Depending on the used test resource and the performed test case the uncertainty is in the given range. Detailed documentation is available at Bureau Veritas Consumer Products Services, Inc.

The measurement uncertainties for all parameters are calculated with an expansion factor (coverage factor) k = 1.96. This means, that the true value is in the corresponding interval with a probability of 95 %.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.

3.3 Applicable Quality Policies

Quality Policy	Version	Expiration Date
NAPRD03	5.40	

3.4 Applicable Test Specification(s)

Test Specification	3GPP TS 36.124
Version	V16.1.0
Description	ElectroMagnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment (Release 16)

3.5 Result Statistics

Test Specification	Total	Result Verdict					Pass ratio
		Pass	Fail	Declaration	Blocked	Performed	
3GPP TS 36.124	18	18	0	0	0	0	100.00 %

Note: Pass, Declaration, Performed, Fail and Inconclusive results are regarded for the pass ratio calculation.
Pass, Performed and Declaration are summarized as Pass results. Fail and Inconclusive are summarized as Fail results. All are summarized as total count (Pass + Declaration + Performed + Fail + Inconclusive).
The pass ratio is calculated by the number of Pass results divided by the number of total results.
All other results like Error, Not Tested or Blocked are not regarded for the calculation.

3.6 Result Summary

3.6.1 Pass Results

Test Specification: 3GPP TS 36.124

Test Case Name / Description Test Condition	Category	Verdict	Date	Test Res. ID	Sample/Setup
8.2 / Radiated Emission					
Band = eFDD12, Part = traffic (CatM1)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD12, Part = traffic (NB-IoT)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD13, Part = traffic (CatM1)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD13, Part = traffic (NB-IoT)	A	Passed	2020-09-29	TR 1	AA01
Band = eFDD2, Part = traffic (CatM1)	A	Passed	2020-09-26	TR 1	AA01
Band = eFDD2, Part = traffic (NB-IoT)	A	Passed	2020-09-29	TR 1	AA01
Band = eFDD25, Part = traffic (CatM1)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD25, Part = traffic (NB-IoT)	A	Passed	2020-09-29	TR 1	AA01
Band = eFDD4, Part = idle (CatM1)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD4, Part = traffic (CatM1)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD4, Part = traffic (NB-IoT)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD5, Part = traffic (CatM1)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD5, Part = traffic (NB-IoT)	A	Passed	2020-09-29	TR 1	AA01
Band = eFDD66, Part = traffic (CatM1)	A	Passed	2020-09-17	TR 1	AA01
Band = eFDD66, Part = traffic (NB-IoT)	A	Passed	2020-09-29	TR 1	AA01
Band = eFDD71, Part = traffic (NB-IoT)	A	Passed	2020-09-29	TR 1	AA01
Band = eFDD85, Part = traffic (CatM1)	A	Passed	2020-09-25	TR 1	AA01
Band = eFDD85, Part = traffic (NB-IoT)	A	Passed	2020-09-30	TR 1	AA01

4 Test Equipment Details

4.1 List of Test Equipment

The information shown below is valid for the testing time frame of this test report.

Test Resource 1: Radiated Spurious Emissions
Description: Radiated Spurious Emissions Test System

Test System Radiated Spurious Emissions of Test Resource Radiated Spurious Emissions

Description: Radiated Spurious Emissions Test System
Manufacturer: Comtest Engineering
Serial Number: 5122.0387.02-100693-mq

Single Devices of Test System Radiated Spurious Emissions

Name	Serial Number	Manufacturer	
Broadband Bilog Antenna #1	A091504	Sunol Sciences Corporation	
Broadband Bilog Antenna #2	A082304	Sunol Sciences Corporation	
	Event	*Execution Date*	*Next Execution*
	Calibration	2018-01	2022-01

Name	Serial Number	Manufacturer	
CMW500	102333	Rohde & Schwarz Korea Ltd.	
CMW500	127723-eE	Rohde & Schwarz	
	Event	*Execution Date*	*Next Execution*
	Calibration	2020-02	2021-02
	Software Version	*Start Date*	*End Date*
	CMW Base 3.7.90	2019-02-13	

Name	Serial Number	Manufacturer	
CMW500	102333	Rohde & Schwarz Korea Ltd.	
Conical Log Spiral Antenna	00049087	ETS-Lindgren	
DC Power Supply	MY50270015	Agilent Technologies	
DRH-118	A070605	Sunol Sciences Corporation	
DRH-118	A060905-2	Sunol Sciences Corporation	
	Event	*Execution Date*	*Next Execution*
	Calibration	2018-01	2022-01

Name	Serial Number	Manufacturer	
DRH-118	A070605	Sunol Sciences Corporation	
DRH-118	A060905-2	Sunol Sciences Corporation	
	Event	*Execution Date*	*Next Execution*
	Calibration	2018-01	2022-01

Name	Serial Number	Manufacturer
FSU26	200522 (Model No: 1166.1660K26)	Rohde & Schwarz
Highpass Filter #7	S/N: 5	Wainwright Instruments GmbH
HP 6627A	US37350668	Agilent Technologies
OSP 130	1505.3009K03-100595-CN	Rohde & Schwarz

Name	Serial Number	Manufacturer	
Power Meter Sensor (Probe B)	102341	Rohde & Schwarz	
SMF 100A	101321	Rohde & Schwarz Messgerätebau GmbH	
	Event	*Execution Date*	*Next Execution*
	Calibration	2018-05	2021-05

Name	Serial Number	Manufacturer	
SMU200A (1)	102465	Rohde & Schwarz GmbH & Co. KG	
SMU200A (2)	102466	Rohde & Schwarz GmbH & Co. KG	
Test Bench 33	TB33		
Thermo-Hygrometer	191988635	Control Company	
	Event	*Execution Date*	*Next Execution*
	Calibration	2019-02	2021-02

Name	Serial Number	Manufacturer	
Thermo-Hygrometer	191988632	Control Company	
	Event	*Execution Date*	*Next Execution*
	Calibration	2019-02	2021-02

Name	Serial Number	Manufacturer	
Thermo-Hygrometer	191988635	Control Company	
	Event	*Execution Date*	*Next Execution*
	Calibration	2019-02	2021-02

Name	Serial Number	Manufacturer
Top Hat antenna -001	407078-0001	
Top Hat antenna -002	406713-0002	
TS-PR18	101623	
WHKS1.3/15G-6SS	S/N 6	Wainwright Instruments GmbH
WHKX2.7/18G-10SS	S/N 10	Wainwright Instruments GmbH
WW-NF18	S/N 56	Rohde & Schwarz
WW-NF19	S/N 44	Rohde & Schwarz
WW-NF85	S/N 25	Rohde & Schwarz
WW-NF9	S/N 22	Rohde & Schwarz

5 Annex

5.1 Object Under Test (OUT) Features

Supported Features for Object Under Test: NOTE-NBGL

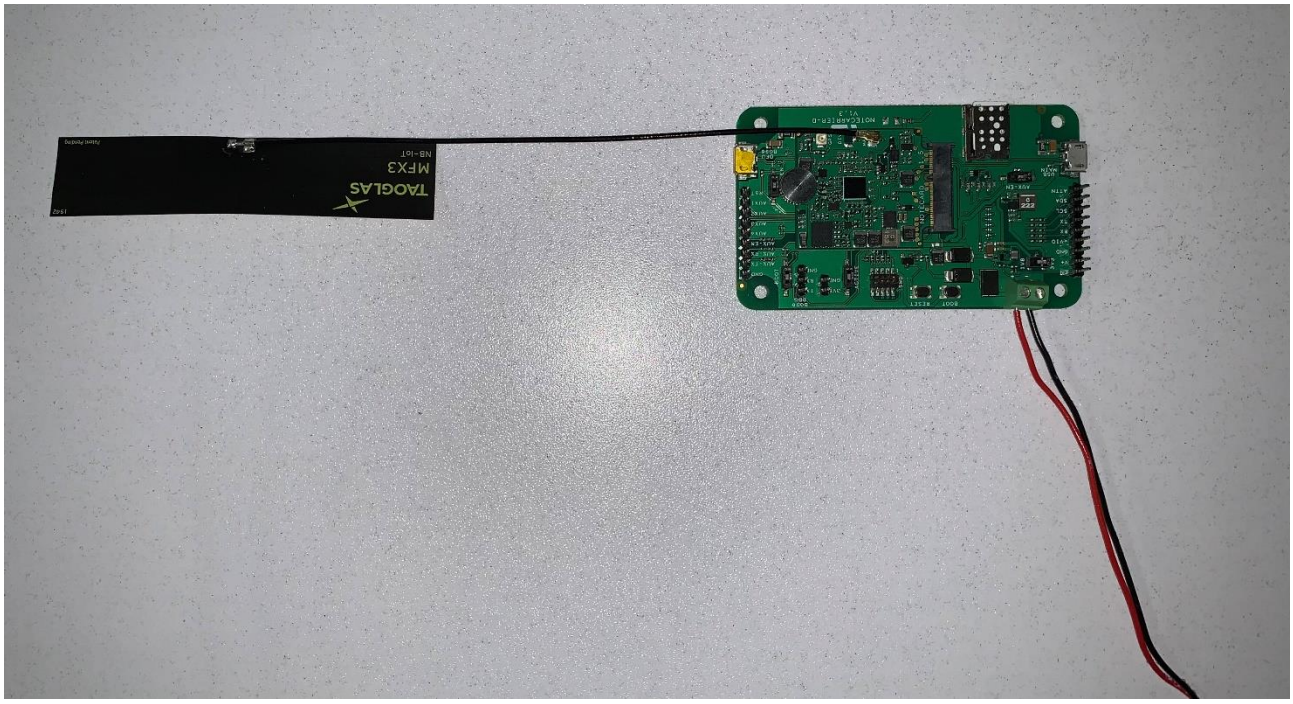
Name	Short Description
3GPP TS 36.523-2	
A.4.1-1/1	E-UTRA FDD
A.4.1-1/8	NB-IoT
A.4.3.1-1/1	eFDD1
A.4.3.1-1/2	eFDD2
A.4.3.1-1/3	eFDD3
A.4.3.1-1/4	eFDD4
A.4.3.1-1/5	eFDD5
A.4.3.1-1/8	eFDD8
A.4.3.1-1/12	eFDD12
A.4.3.1-1/13	eFDD13
A.4.3.1-1/18	eFDD18
A.4.3.1-1/19	eFDD19
A.4.3.1-1/20	eFDD20
A.4.3.1-1/25	eFDD25
A.4.3.1-1/26	eFDD26
A.4.3.1-1/28	eFDD28
A.4.3.1-1/34	eFDD66
A.4.3.1-1/39	eFDD71
A.4.3.1-1/85	eFDD85
ETSI TS 102 230-1	
A.1/5	Class C

5.2 Sample AA01

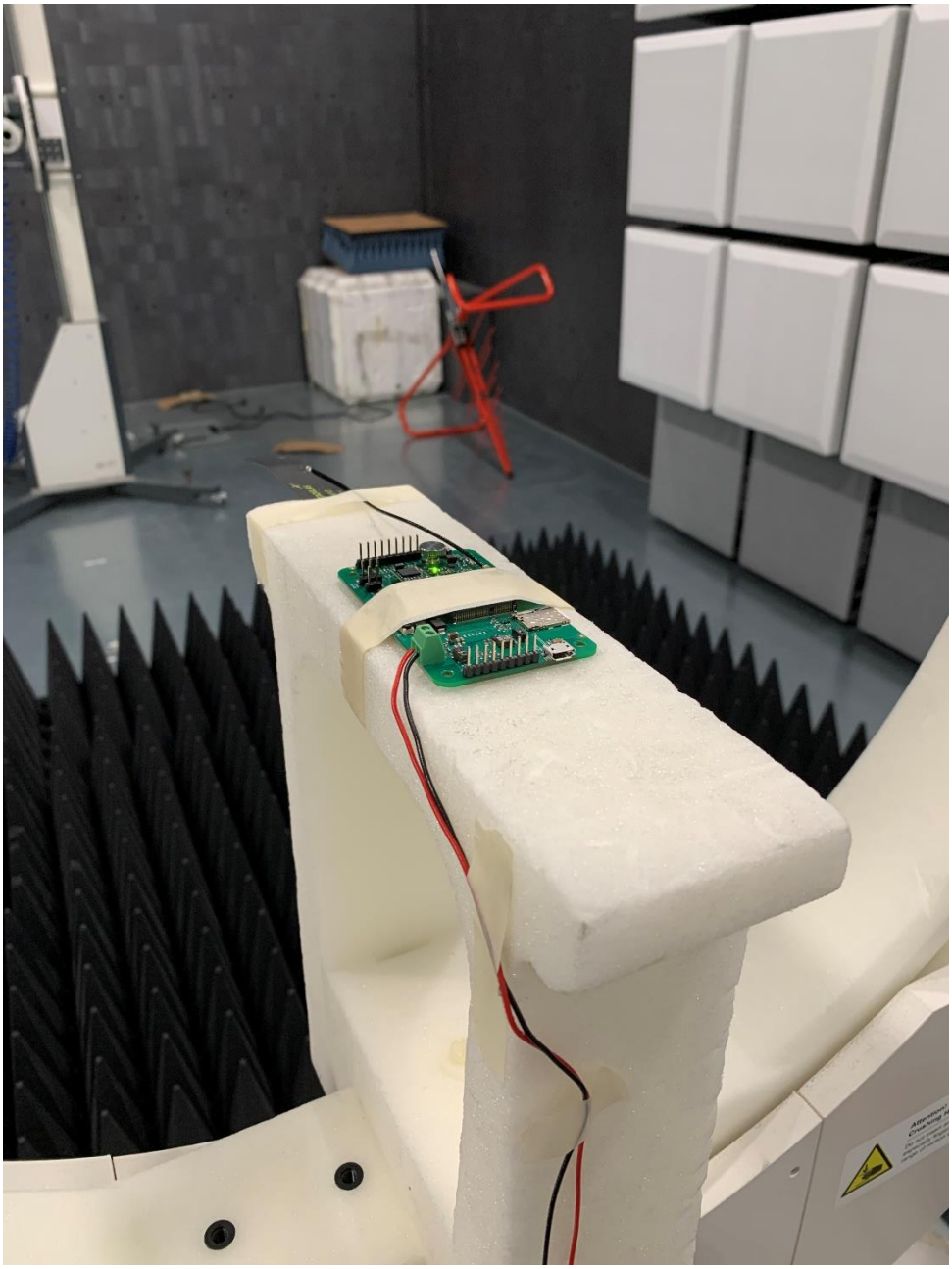
Sample Name: AA01	
Object Under Test	NOTE-NBGL
Description	Sample_AA01
Hardware Version	1.5.0
Software Version	1.5.0
Date of Receipt	2020-09-14

Parameter Name	Value
IMEI	864475040512195

6 APPENDIX A. EUT Set-up Photographs



Sample



Set-up

End of Test Report