TEST REPORT

Application No.:	GZCR2201000101AT
Applicant:	Delaval International AB
Address of Applicant:	Gustaf de Lavals vag 15, PO box 39 14637 Tumba, Sweden
Manufacturer:	Delaval International AB
Address of Manufacturer:	Gustaf de Lavals vag 15, P.O. box 39, Tumba 14637, Sweden
Factory:	Orbit One AB
Address of Factory:	Fridhemsvägen 15, SE-372 38 Ronneby, Sweden
Equipment Under Test (EUT):	
EUT Name:	Biosensors ear tag
Model No.:	BAT1
Trade Mark:	DeLaval
Standard(s) :	47 CFR Part 15 Subpart C 15.250
Date of Receipt:	2022-01-19
Date of Test:	2022-01-19 to 2022-01-28
Date of Issue:	2022-02-15
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		*2022-02-15*		*Original*

Authorized for issue by:				
		Curry Wu/Project Engineer		
		Ricky Liu/Reviewer		

2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15 Subpart C 15.250	N/A	47 CFR Part 15C Section 15.250(c), 15.203	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
EIRP	47 CFR Part 15 Subpart C 15.250	ANSI C63.10: 2013 section 10.3	47 CFR Part 15, Subpart C Section 15.250 (d)(1),(d)(3)	Pass
Spurious Emissions Below 1GHz		ANSI C63.10: 2013 section 10.2	47 CFR Part 15, Subpart C Section 15.250 (d)(4),15.209	Pass
Spurious Emissions Above 1GHz		ANSI C63.10: 2013 section 10.3	47 CFR Part 15, Subpart C Section 15.250 (d)(1),(d)(2)	Pass
UWB Bandwidth		ANSI C63.10:2013 section 10.1	47 CFR Part 15, Subpart C Section 15.250 (a)(b)	Pass
Frequency Stability		ANSI C63.10:2013 section 6.8	47 CFR Part 15, Subpart C Section 15.250 (a)	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

3 Contents

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center, EEC Laboratory.
No.198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86–20) 82155555 f (86–20) 82075058 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86–20) 82155555 f (86–20) 82075058 sgs.china@sgs.com

4 General Information

4.1 Details of E.U.T.

Power supply: DC3.6V by battery
Operating Frequency: 6489.6MHz
Modulation Type: PM
Number of Channels: 1
Sample Type: Hand Held Use
Antenna Type: Ceramic Chip Antenna
Antenna Gain: 4.16dBi

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
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The EUT has been tested as an independent unit.			

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
EIRP	5.08dB
Spurious Emissions Below 1GHz	5.14dB
Spurious Emissions Above 1GHz	5.08dB
UWB Bandwidth	± 3%
Frequency Stability	± 3%

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.5 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

EIRP					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2021-08-30	2022-08-29

Spurious Emissions Below 1GHz					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI Test Receiver(9kHz-3GHz)	Rohde & Schwarz	ESCI	EMC0056	2021-12-29	2022-12-28
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)-On Site	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	EMC2174	2019-08-08	2022-08-07
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Spurious Emissions Above 1GHz					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15

Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2021-08-30	2022-08-29

UWB Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01

Frequency Stability					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Temperature Chamber	GZ GongWen Co.Ltd.	GDJW-100	EMC0039	2021-07-04	2022-07-03
DC Power supply	Noiseken	BP4610	SEM050-15	2021-05-20	2022-05-19

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15C Section 15.250(c), 15.203

Limit:

15.203 Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of 15.211, 15.213, 15.217, 15.219, 15.221, or 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

15.250(c) requirement:

Operation on board an aircraft or a satellite is prohibited. Devices operating under this section may not be employed for the operation of toys. Except for operation onboard a ship or a terrestrial transportation vehicle, the use of a fixed outdoor infrastructure is prohibited. A fixed infrastructure includes antennas mounted on outdoor structures, e.g., antennas mounted on the outside of a building or on a telephone pole.

6.1.2 Conclusion

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 4.16dBi for 6489.6MHz.

Please refer to internal photos of EUT.

7 Radio Spectrum Matter Test Results

7.1 EIRP

Test Requirement 47 CFR Part 15, Subpart C Section 15.250 (d)(1),(d)(3)
Test Method: ANSI C63.10: 2013 section 10.3
Measurement Distance: 3m
Limit:

Frequency	Limit	Detector	Measurement distance (m)
960MHz-1610MHz	-75.3 dBm (EIRP, RBW=1MHz)	AV	3
1610MHz-1990MHz	-63.3 dBm (EIRP, RBW=1MHz)	AV	3
1990MHz-3100MHz	-61.3 dBm (EIRP, RBW=1MHz)	AV	3
3100MHz-5925MHz	-51.3 dBm (EIRP, RBW=1MHz)	AV	3
5925MHz-7250MHz	-41.3 dBm (EIRP, RBW=1MHz)	AV	3
7250MHz-10600MHz	-51.3 dBm (EIRP, RBW=1MHz)	AV	3
Above 10600MHz	-61.3 dBm (EIRP, RBW=1MHz)	AV	3
Fundamental	-15.92 dBm (EIRP, RBW=8MHz)	Peak	3

According to ANSI 63.10 Clause 10.3.9, the EIRP to field strength at a specified measurement distance of 3 m is below:

E (dBuV/m) = EIRP(dBm) + 95.3

Thus, the field strength limit for the test above 1GHz is below:

Frequency	Limit	Detector	Measurement Distance
	Field Strength (dBuV/m)		
960MHz-1610MHz	20.00	AV	3
1610MHz-1990MHz	32.00	AV	3
1990MHz-3100MHz	34.00	AV	3
3100MHz-5925MHz	44.00	AV	3
5925MHz-7250MHz	54.00	AV	3
7250MHz-10600MHz	44.00	AV	3
Above 10600MHz	34.00	AV	3
Fundamental	79.38	Peak	3

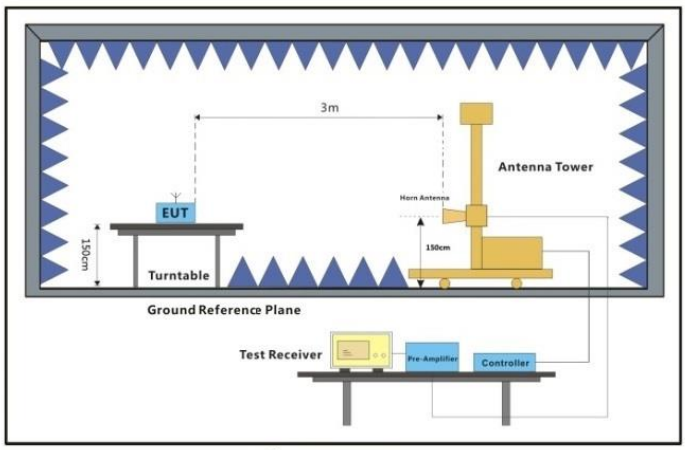
7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 21.5 °C Humidity: 45.5 % RH Atmospheric Pressure: 1003 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Continuous Tx Mode: Keep the EUT Transmitting with Modulation

7.1.3 Test Setup Diagram



Above 1GHz

7.1.4 Measurement Procedure and Data

1) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5) The test-receiver system was set to Peak detector with Maximum Hold Mode for Max Peak EIRP measurement and AV detector for Average EIRP measurement.

7) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.

8) Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Peak Field Strength for fundamental @ RBW=8MHz								
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	Polarization
6492.325	33.96	5.85	37.01	76.2	79	79.38	0.38	Horizontal
6491.323	33.96	5.85	37.01	70.84	73.64	79.38	5.74	Vertical

Average Field Strength for fundamental @ RBW=1MHz								
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)	Polarization
6522.467	34.03	5.84	37.02	49.88	52.73	54.00	1.27	Horizontal
6471.309	33.92	5.86	37.00	72.78	47.80	54.00	6.20	Vertical

7.2 Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C Section 15.250 (d)(4),15.209

Test Method: ANSI C63.10: 2013 section 10.2

Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1000MHz	-	20	RMS/AV	3

7.2.1 E.U.T. Operation

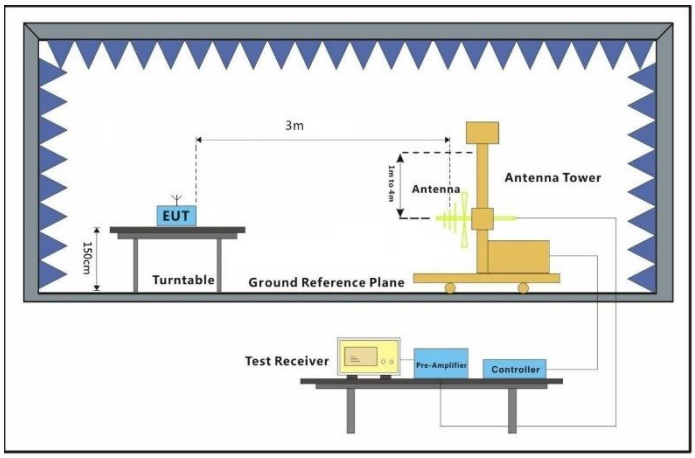
Operating Environment:

Temperature: 20.5 °C Humidity: 48.5 % RH Atmospheric Pressure: 1003 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Continuous Tx Mode: Keep the EUT Transmitting with Modulation

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

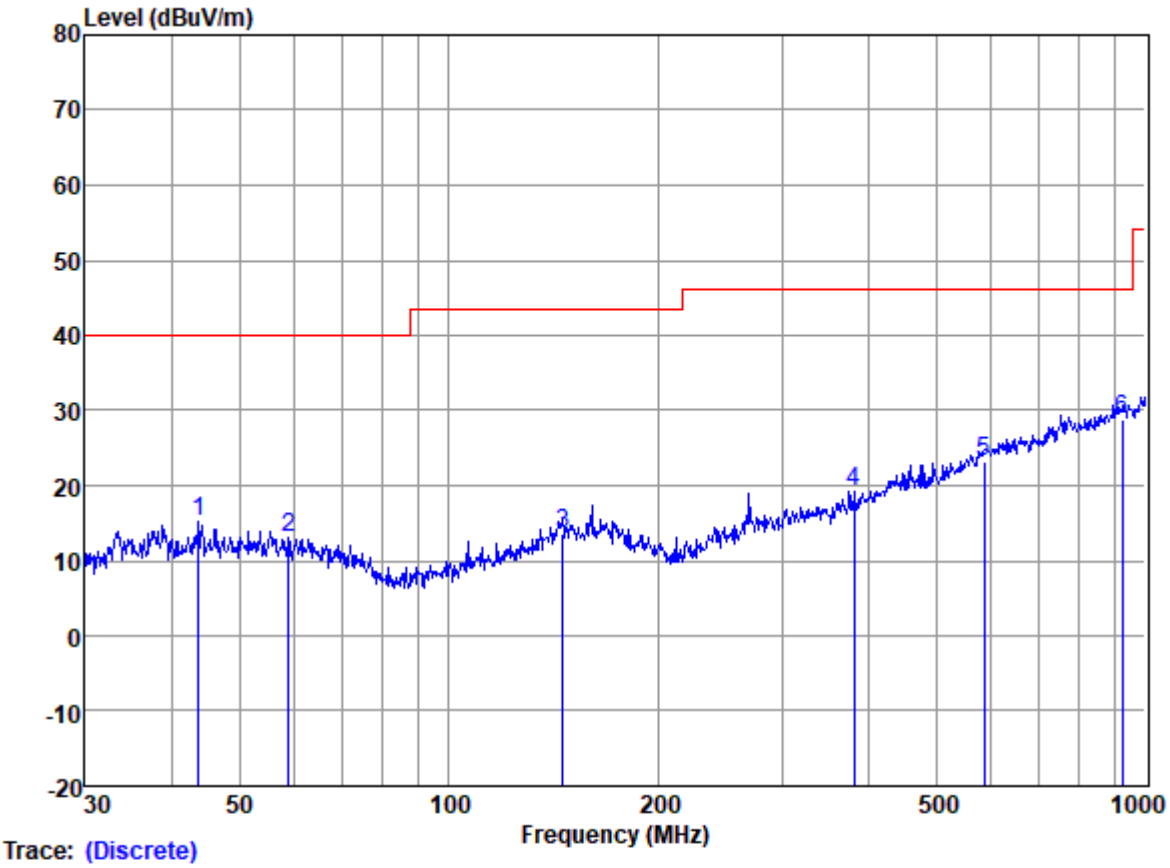
5) The test-receiver system was set to Peak detector with Maximum Hold Mode. And use Quasi-Peak to measure the six highest frequencies.

6) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.

7) Repeat above procedures until all frequencies measured was complete

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Test Mode: 00; Polarity: Horizontal

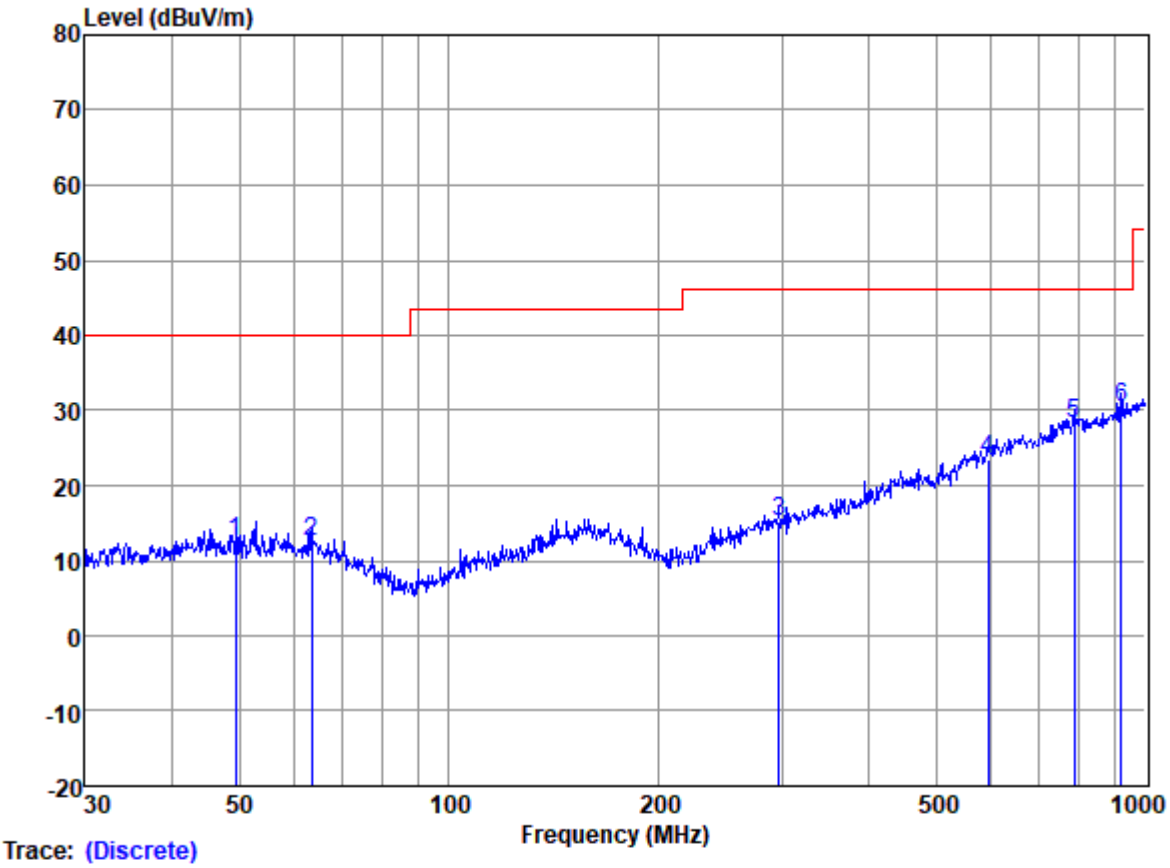


Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	43.66	27.39	13.79	1.12	27.17	15.13	40.00	-24.87	HORIZONTAL	QP
2	58.82	25.55	13.52	1.24	27.16	13.15	40.00	-26.85	HORIZONTAL	QP
3	145.35	24.63	13.68	2.18	26.86	13.63	43.50	-29.87	HORIZONTAL	QP
4	381.25	27.20	15.50	3.84	27.26	19.28	46.00	-26.72	HORIZONTAL	QP
5	586.84	26.86	19.35	5.06	28.19	23.08	46.00	-22.92	HORIZONTAL	QP
6	925.76	25.92	23.73	7.01	27.81	28.85	46.00	-17.15	HORIZONTAL	QP

Test Mode: 00; Polarity: Vertical



Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode :

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	49.36	24.59	13.93	1.14	27.17	12.49	40.00	-27.51	VERTICAL	QP
2	63.54	25.34	12.95	1.32	27.15	12.46	40.00	-27.54	VERTICAL	QP
3	297.22	25.09	13.55	3.16	26.55	15.25	46.00	-30.75	VERTICAL	QP
4	593.05	26.90	19.60	5.10	28.20	23.40	46.00	-22.60	VERTICAL	QP
5	790.62	27.59	22.50	6.14	28.04	28.19	46.00	-17.81	VERTICAL	QP
6	922.52	27.65	23.67	7.01	27.82	30.51	46.00	-15.49	VERTICAL	QP

7.3 Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C Section 15.250 (d)(1),(d)(2)

Test Method: ANSI C63.10: 2013 section 10.3

Limit:

Frequency	Limit (dBuV/m) @3m	RBW	Detector	Measurement distance (m)
1000MHz-1610MHz	20.00	1MHz	AV	0.5
1610MHz-1990MHz	32.00	1MHz	AV	0.5
1990MHz-3100MHz	34.00	1MHz	AV	0.5
3100MHz-5925MHz	44.00	1MHz	AV	0.5
5925MHz-7250MHz	54.00	1MHz	AV	0.5
7250MHz-10600MHz	44.00	1MHz	AV	0.5
Above 10600MHz	34.00	1MHz	AV	0.5
1164MHz-1240MHz	10.0	1KHz	AV	3
1559MHz-1610MHz	10.0	1KHz	AV	3

7.3.1 E.U.T. Operation

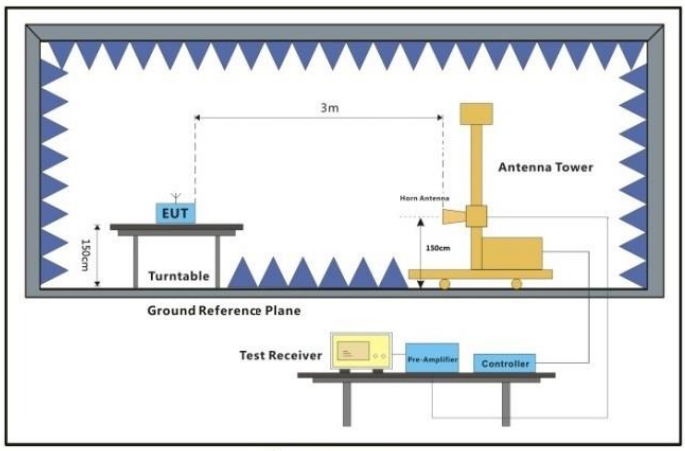
Operating Environment:

Temperature: 21.5 °C Humidity: 45.5 % RH Atmospheric Pressure: 1003 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Continuous Tx Mode: Keep the EUT Transmitting with Modulation

7.3.3 Test Setup Diagram



Above 1GHz

7.3.4 Measurement Procedure and Data

1) Tthe EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meters semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

2) The EUT was set 0.5meters / 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5) The test-receiver system was set to AV detector with Maximum Hold Mode.

6) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.

7) Repeat above procedures until all frequencies measured was complete

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor+ Distance Factor - Preamp Factor

Distance factor = 20*log(0.5/3) = -15.56dB

Average Field Strength within 1164-1240MHz & 1559-1610MHz @ RBW=1KHz								
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)	Polarization
1236.476	24.93	2.30	38.37	13.36	2.22	10.00	7.78	Horizontal
1608.342	25.59	2.80	37.98	11.06	1.47	10.00	8.53	Horizontal
1239.608	24.96	2.30	38.35	13.48	2.39	10.00	7.61	Vertical
1585.417	25.56	2.80	38.00	10.57	0.93	10.00	9.07	Vertical

Average Field Strength out of 1164-1240MHz & 1559-1610MHz @ RBW=1MHz									
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Distance factor (dBuV)	Read Level (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)	Polarization
1300.858	25.20	2.60	38.31	-15.56	39.91	13.84	20.00	6.16	Horizontal
1798.127	25.94	3.00	37.81	-15.56	40.34	15.91	32.00	16.09	Horizontal
4157.664	26.80	4.60	36.80	-15.56	45.62	24.66	44.00	19.34	Horizontal
15577.900	38.99	9.88	35.39	-15.56	30.36	28.28	34.00	5.72	Horizontal
1300.399	25.22	2.60	38.31	-15.56	39.75	13.70	20.00	6.3	Vertical
2478.310	27.47	3.60	37.57	-15.56	40.42	18.36	32.00	13.64	Vertical
4653.771	31.04	5.40	36.82	-15.56	39.91	23.97	44.00	20.03	Vertical
16221.190	38.95	9.65	35.39	-15.56	29.86	27.51	34.00	6.49	Vertical

7.4 UWB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C Section 15.250 (a)(b)

Test Method: ANSI C63.10:2013 section 10.1

Limit:

≥50MHz

FL≥5925MHz, FH≤7250MHz

7.4.1 E.U.T. Operation

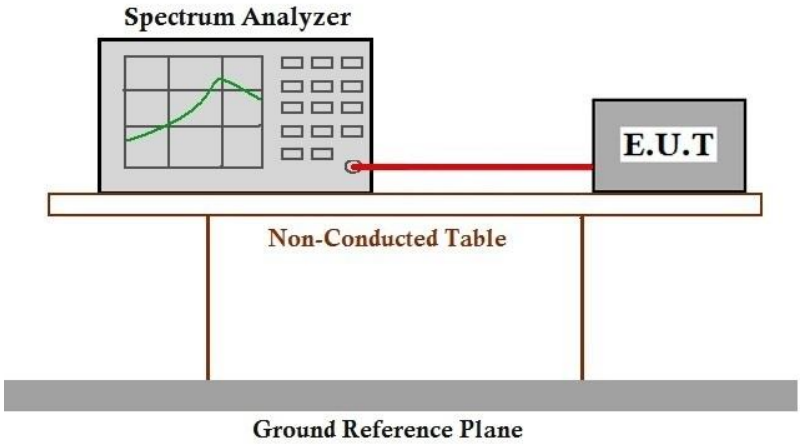
Operating Environment:

Temperature: 21 °C Humidity: 46 % RH Atmospheric Pressure: 1003 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Continuous Tx Mode: Keep the EUT Transmitting with Modulation

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

The frequency at which the maximum power level is measured with the peak detector is designated fM. The peak power measurements shall be made using a spectrum analyzer or EMI receiver with a 1 MHz resolution bandwidth and a video bandwidth of 1 MHz or greater. The instrument shall be set to peak detection using the maximum-hold trace mode. The outermost 1 MHz segments above and below fM, where the peak power falls by 10 dB relative to the level at fM, are designated as fH and fL, respectively:

a) For the lowest frequency bound fL, the emission is searched from a frequency lower than fM that has, by inspection, a peak power much lower than 10 dB less than the power at fM and increased toward fM until the peak power indicates 10 dB less than the power at fM. The frequency of that segment is recorded.

b) This process is repeated for the highest frequency bound fH, beginning at a frequency higher than fM that has, by inspection, a peak power much lower than 10 dB below the power at fM. The frequency of that segment is recorded.

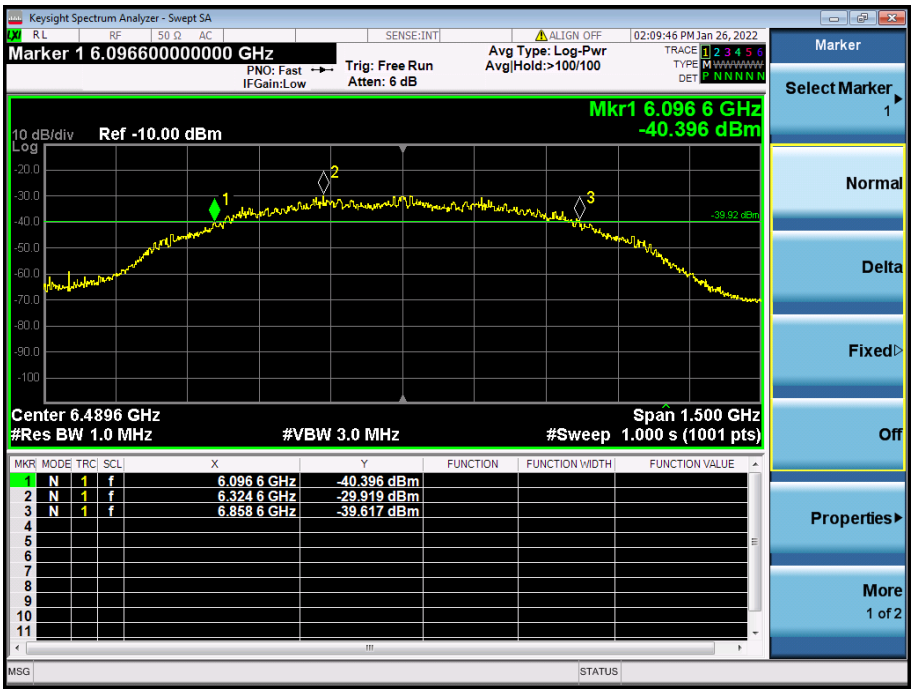
c) The two recorded frequencies represent the highest fH and lowest fL bounds of the UWB transmission, and the 10 dB bandwidth (B - 10) is defined as (fH - fL). The center frequency (fc) is mathematically determined from (fH - fL) / 2.

d) The fractional bandwidth is defined as 2(fH - fL) / (fH + fL).

e) Determine whether the -10 dB bandwidth (fH - fL) is ⩾50 MHz

Test Frequency (MHz)	FM(MHz)	FL (MHz)	FH (MHz)	10dB bandwidth (MHz)	Limit (MHz)			Results
					Bandwidth	FL	FH	
6489.6	6324.6	6096.6	6858.6	762	⩾50	⩾5925	⩽7250	Pass

10dBc bandwidth



7.5 Frequency Stability

Test Requirement 47 CFR Part 15, Subpart C Section 15.250 (a)

Test Method: ANSI C63.10:2013 section 6.8

Limit:

FL≥5925MHz, FH≤7250MHz

7.5.1 E.U.T. Operation

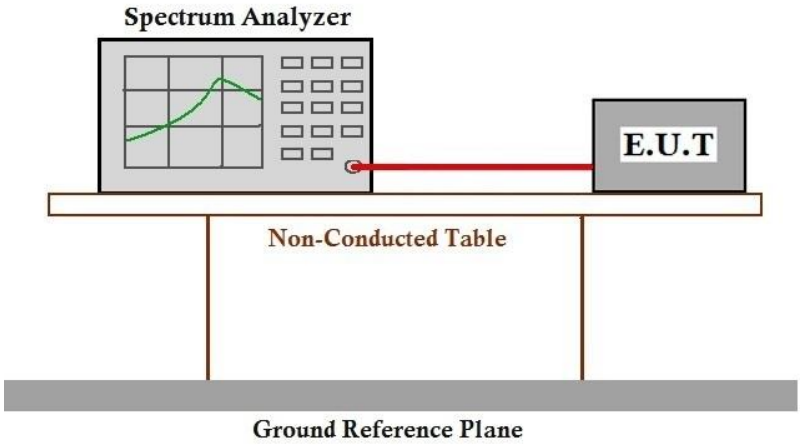
Operating Environment:

Temperature: 21 °C Humidity: 46 % RH Atmospheric Pressure: 1003 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Continuous Tx Mode: Keep the EUT Transmitting with Modulation

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

The frequency at which the maximum power level is measured with the peak detector is designated fM. The peak power measurements shall be made using a spectrum analyzer or EMI receiver with a 1 MHz resolution bandwidth and a video bandwidth of 1 MHz or greater. The instrument shall be set to peak detection using the maximum-hold trace mode. The outermost 1 MHz segments above and below fM, where the peak power falls by 10 dB relative to the level at fM, are designated as fH and fL, respectively:

a) For the lowest frequency bound fL, the emission is searched from a frequency lower than fM that has, by inspection, a peak power much lower than 10 dB less than the power at fM and increased toward fM until the peak power indicates 10 dB less than the power at fM. The frequency of that segment is recorded.

b) This process is repeated for the highest frequency bound fH, beginning at a frequency higher than fM that has, by inspection, a peak power much lower than 10 dB below the power at fM. The frequency of that segment is recorded.

c) The two recorded frequencies represent the highest fH and lowest fL bounds of the UWB transmission, and the 10 dB bandwidth (B - 10) is defined as (fH - fL). The center frequency (fc) is mathematically determined from (fH - fL) / 2.

d) The fractional bandwidth is defined as 2(fH - fL) / (fH + fL).

e) Determine whether the -10 dB bandwidth frequency range is within 5925MHz – 7250MHz.

f) Repeat the -10 dB bandwidth frequency range measurement at each temperature and power supply.

Voltage (Vdc)	Temperature (℃)	FL (MHz)	FH (MHz)	Limit (MHz)		Results
				FL	FH	
4.14	0	6096.3	6859.4	≥5925	≤7250	Pass
	10	6095.8	6860.9	≥5925	≤7250	Pass
	20	6095.3	6861.8	≥5925	≤7250	Pass
	30	6096.6	6858.9	≥5925	≤7250	Pass
	40	6097.7	6861.7	≥5925	≤7250	Pass
	50	6100.3	6863.4	≥5925	≤7250	Pass
	55	6102.5	6860.5	≥5925	≤7250	Pass
3.6	0	6099.7	6859.6	≥5925	≤7250	Pass
	10	6098.6	6858.7	≥5925	≤7250	Pass
	20	6099.8	6859.3	≥5925	≤7250	Pass
	30	6096.8	6858.4	≥5925	≤7250	Pass
	40	6096	6858.7	≥5925	≤7250	Pass
	50	6095.5	6857.4	≥5925	≤7250	Pass
	55	6095.2	6857	≥5925	≤7250	Pass
3.06	0	6097.4	6854.7	≥5925	≤7250	Pass
	10	6097.2	6855.7	≥5925	≤7250	Pass
	20	6097.2	6857.3	≥5925	≤7250	Pass
	30	6096.6	6856.2	≥5925	≤7250	Pass
	40	6096.5	6856.1	≥5925	≤7250	Pass
	50	6094.4	6856.9	≥5925	≤7250	Pass
	55	6096.6	6859.4	≥5925	≤7250	Pass

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for GZCR2201000101AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for GZCR2201000101AT

- End of the Report -

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