
EMC Test Report

Report No.: AGC10232210502EE01

PRODUCT DESIGNATION : Open-Source Sensor Beacon
BRAND NAME : Ruuvi
MODEL NAME : RuuviTag
APPLICANT : Ruuvi Innovations Ltd (Oy)
DATE OF ISSUE : Jun. 07, 2021
STANDARD(S) : ETSI EN 301 489-1 V2.2.3 (2019-11)
: ETSI EN 301 489-3 V2.1.1 (2019-03)
: ETSI EN 301 489-17 V3.2.4 (2020-09)
REPORT VERSION : V1.0



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 07, 2021	Valid	Initial release

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TABLE OF CONTENTS

1. TEST REPORT CERTIFICATION.....	5
2. GENERAL INFORMATION	6
2.1. DESCRIPTION OF EUT	6
2.2. OBJECTIVE	7
2.3. TEST STANDARDS AND RESULTS.....	7
2.4. TEST ITEMS AND THE RESULTS.....	7
2.5. ENVIRONMENTAL CONDITIONS.....	8
3. TEST MODE DESCRIPTION	9
4. MEASUREMENT UNCERTAINTY	10
5. SUPPORT EQUIPMENT	10
6. IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION.....	11
7. RADIATED DISTURBANCE MEASUREMENT	12
7.1. LIMITS OF RADIATED DISTURBANCES	12
7.2. TEST PROCEDURE	12
7.3. BLOCK DIAGRAM OF TEST SETUP.....	13
7.4. TEST RESULT	14
8. IMMUNITY TEST.....	18
8.1. DESCRIPTION OF PERFORMANCE CRITERIA.....	18
8.2. GENERAL PERFORMANCE CRITERIA	18
9. ELECTROSTATIC DISCHARGE IMMUNITY TEST.....	21
9.1 TEST SPECIFICATION	21
9.2 TEST PROCEDURE	21
9.3 TEST SETUP	22
9.4 TEST RESULT	22
9.5 PERFORMANCE	24
10. RADIATED, RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY TEST.....	25
10.1. TEST SPECIFICATION	25
10.2. TEST PROCEDURE	25
10.3. TEST SETUP.....	26

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10.4. TEST RESULT 27

10.5. PERFORMANCE 28

APPENDIX A: PHOTOGRAPHS OF TEST SETUP..... 29

APPENDIX B: PHOTOGRAPHS OF EUT 29

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1. TEST REPORT CERTIFICATION

Applicant	Ruuvi Innovations Ltd (Oy)
Address	Hämeenkatu 10 B 132, 11100 RIIHIMÄKI, FINLAND
Manufacturer	Ruuvi Innovations Ltd (Oy)
Address	Hämeenkatu 10 B 132, 11100 RIIHIMÄKI, FINLAND
Factory	Ruuvi Innovations Ltd (Oy)
Address	Hämeenkatu 10 B 132, 11100 RIIHIMÄKI, FINLAND
Product Designation	Open-Source Sensor Beacon
Brand Name	Ruuvi
Test Model	RuuviTag
Date of test	May 31, 2021 to Jun. 05, 2021
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-EC-EMC

We, Attestation of Global Compliance (Shenzhen) Co., Ltd., hereby certify that the submitted samples of the above item, as detailed in chapter 2.1 of this report, has been tested in our facility. The test record, data evaluation and test configuration represented herein are true and accurate accounts of measurements of the sample's EMC characteristics under the conditions herein specified.

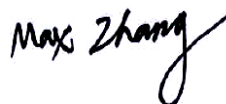
Prepared By



Cool Cheng
Project Engineer

Jun. 05, 2021

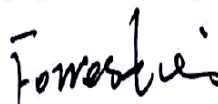
Reviewed By



Max Zhang
Reviewer

Jun. 07, 2021

Approved By



Forrest Lei
Authorized Officer

Jun. 07, 2021

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2. GENERAL INFORMATION

2.1. DESCRIPTION OF EUT

The EUT is a short range, lower power, Bluetooth device.

It is designed by way of FHSS modulation achieves the system operating.

Details of technical specification refer to the description in follows:

Transmitter/Receiver (TX/RX)

Operating Frequency	BT:2.402 GHz to 2.480GHz NFC:13.56MHz
Bluetooth Version	V5.0
Modulation	BR <input type="checkbox"/> GFSK, EDR <input type="checkbox"/> π /4-DQPSK, <input type="checkbox"/> 8DPSK BLE <input checked="" type="checkbox"/> GFSK 1Mbps <input type="checkbox"/> GFSK 2Mbps
Hardware Version	B8
Software Version	B8
Antenna designation	<input checked="" type="checkbox"/> PCB Antenna(Temporary RF connector provided by manufacturer) <input type="checkbox"/> Dedicated Antenna
Number of channels	40 for BLE 1 for NFC
Antenna Gain	4.99dBi
Power Supply	DC 3V by battery

Note: The EUT doesn't support BR/EDR.

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2.2. OBJECTIVE

Perform Electro Magnetic Interference (EMI) and Electro Magnetic Susceptibility (EMS) tests for CE Marking.

2.3. TEST STANDARDS AND RESULTS

The EUT has been tested according to ETSI EN 301 489-1 V2.2.3 (2019-11), ETSI EN 301 489-3 V2.1.1 (2019-03) and ETSI EN 301 489-17 V3.2.4 (2020-09).

ETSI EN 301 489-1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility.
ETSI EN 301 489-3	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz;
ETSI EN 301 489-17	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility

2.4. TEST ITEMS AND THE RESULTS

No.	Basic Standard	Test Type	Result
EMISSION (EN 301 489-1 §7.1)			
1	EN 55032	Radiated emission	PASS
2	EN 55032	Conducted emission, AC ports	N/A
3	EN 55032	Conducted emission, Telecom ports	N/A
4	EN 61000-3-2	Harmonic current emissions	N/A
5	EN 61000-3-3	Voltage fluctuations & flicker	N/A
IMMUNITY (EN 301 489-1 §7.2)			
6	EN 61000-4-2	Electrostatic discharge immunity	PASS
7	EN 61000-4-3	Radiated RF electromagnetic field immunity	PASS
8	EN 61000-4-4	Electrical fast transient/burst immunity	N/A
9	ISO 7637-1, -2	Transients and surges, DC ports	N/A
10	EN 61000-4-5	Surge immunity, AC ports, Telecom ports	N/A
11	EN 61000-4-6	Immunity to conducted disturbances induced by RF fields	N/A
12	EN 61000-4-11	Voltage dips and short interruptions immunity	N/A

Note: 1. N/A- Not Applicable.

2. The latest versions of basic standards are applied.

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2.5. ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35°C
- Relative humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

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3. TEST MODE DESCRIPTION

TEST MODE DESCRIPTION		
NO.	EMI TEST MODE DESCRIPTION	WORST
1	BT mode	V
2	Standby mode	--
3	NFC mode	
NO.	EMS TEST MODE DESCRIPTION	WORST
1	BT mode	V
2	Standby mode	--
3	NFC mode	

Note: 1. V means EMI worst mode.
2. All modes have been tested and only the worst mode test data recorded in the test report.

I/O Port Information (Applicable Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
Flexible flat cable	1	--	1

Note: All the above "--" means that EUT has no cable.

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4. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Radiated Emission, $U_c = \pm 3.1 \text{ dB}$
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 4.0 \text{ dB}$
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8 \text{ dB}$

5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Data Cable
Mobile phone	TCL	J326T	--

- Note: 1. “--” means no any support device during testing.
2. All the cables were provided by AGC Lab.

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6. IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	May 15, 2021	May 14, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08,2021	Jan. 07,2023
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec.06, 2021

TEST EQUIPMENT OF ESD TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	EM Test	NSG 438	782	Jan. 08, 2021	Jan. 07, 2022

TEST EQUIPMENT OF RS IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	R&S	E4421B	MY43351603	Jun. 08, 2020	Jun. 07, 2022
POWER SENSOR	R&S	URV5-Z4	100124	May 22, 2020	May 21, 2022
POWER METER	R&S	NRVD	8323781027	May 22, 2020	May 21, 2022
POWER AMPLIFIER	KALMUS	7100LC	04-02/17-06-001	N/A	N/A
RF AMPLIFIER	Milmega	AS0104-55_55	1004793	N/A	N/A
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08,2021	Jan. 07,2023

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7. RADIATED DISTURBANCE MEASUREMENT

7.1. LIMITS OF RADIATED DISTURBANCES

Limits for radiated disturbance 30M to 1 GHz at a measurement distance of 3 m

Frequency range (MHz)	Quasi peak limits(dBuV/m), for Class B ITE, at 3m measurement distance
30 - 230	40
230 - 1000	47

Limits for radiated disturbance above 1 GHz at a measurement distance of 3 m

Frequency range (MHz)	Limits (dBuV/m), Class B ITE	
	Peak	Average
1000-3000MHz	70	50
3000-6000MHz	74	54

Note: 1. The lower limit shall apply at the transition frequency.

2. Additional provisions may be required for cases where interference occurs.

7.2. TEST PROCEDURE

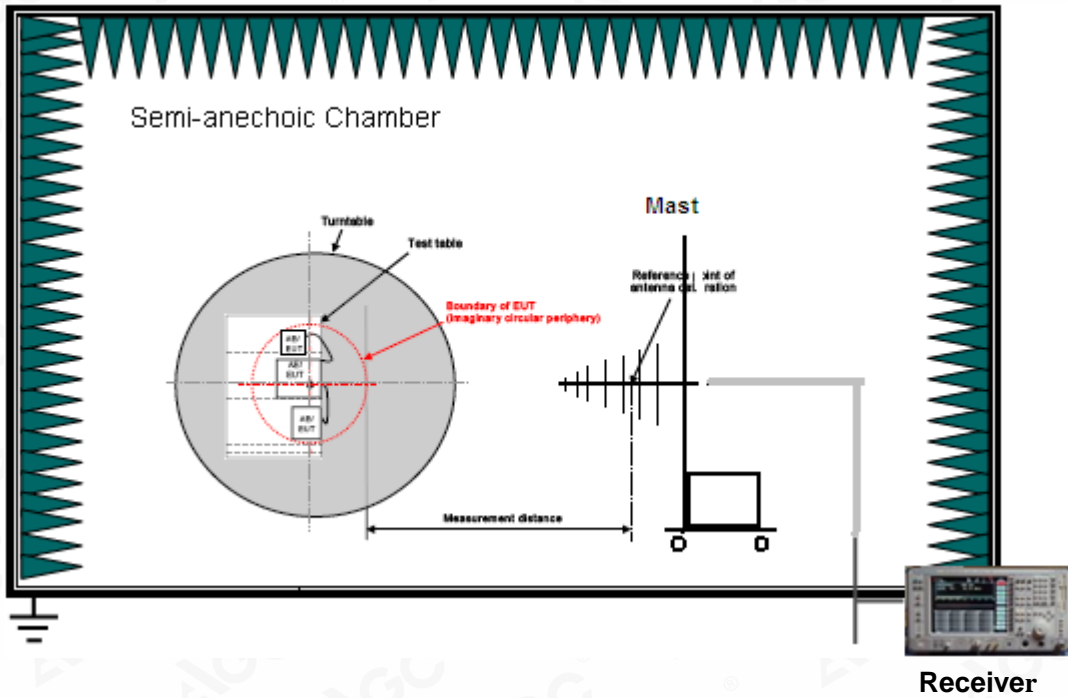
- (1). The EUT was placed on the top of an insulating table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2). The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- (3). The antenna is a broadband antenna, and its height is varied from 1 to 4 meter 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 the heights from 1 to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

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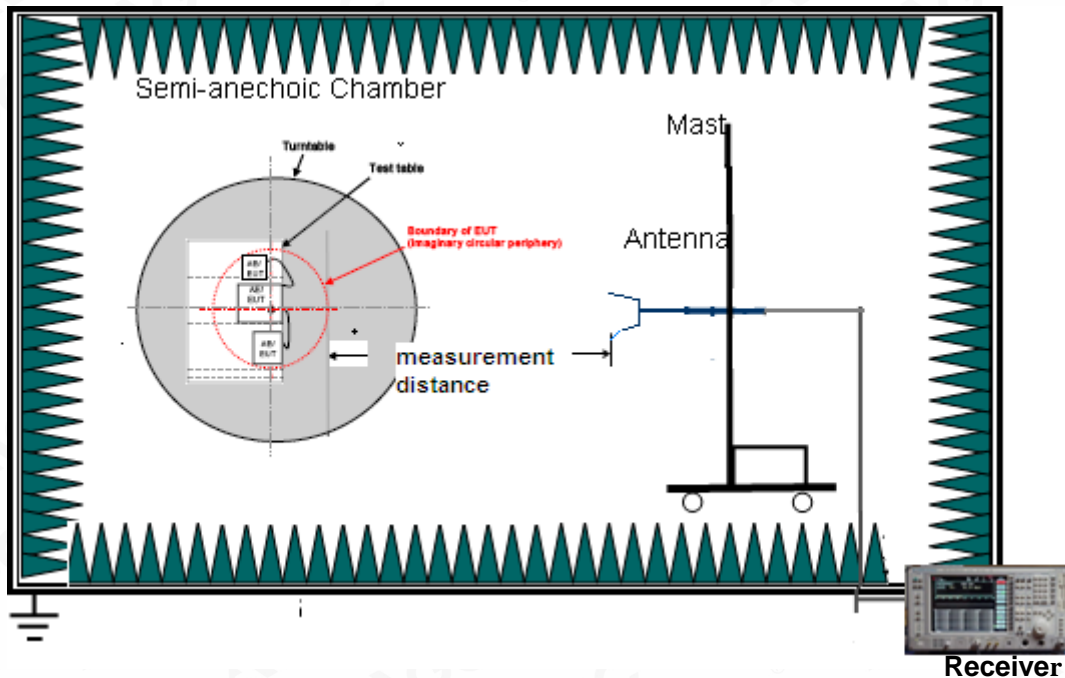


7.3. BLOCK DIAGRAM OF TEST SETUP

Radiated Disturbance below 1 GHz



Radiated Disturbance above 1 GHz



For the actual test configuration, please refer to the related item-Photographs of the Test Configuration.

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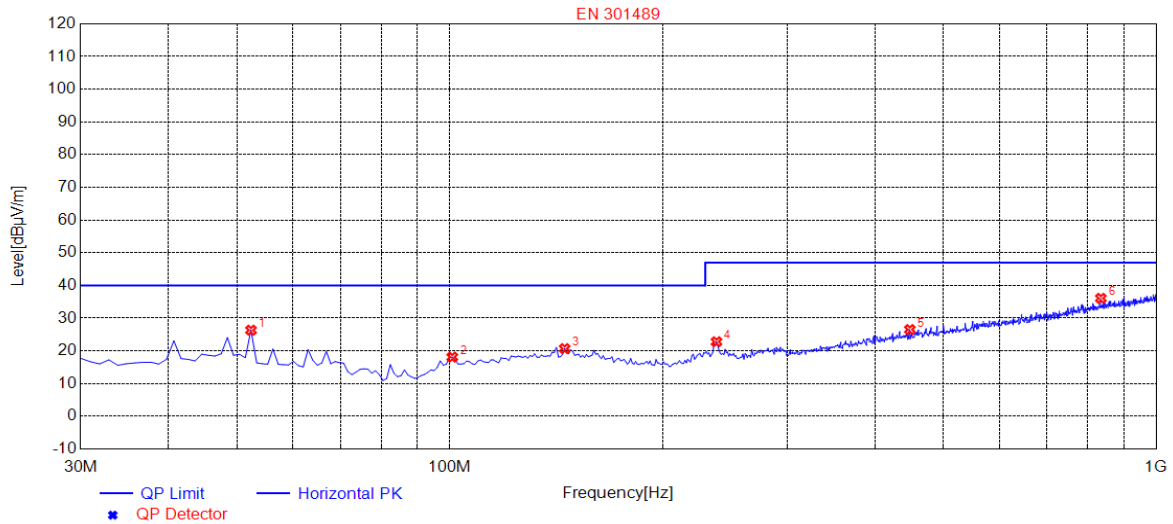


7.4. TEST RESULT

The test modes were carried out for all modes.

The worst test mode of the EUT was Mode 1, and its test data was showed as the follow:

RADIATED EMISSION BELOW 1GHz– HORIZONTAL



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	26.34	11.49	40.00	13.66	100	359	Horizontal
2	100.8100	18.11	11.46	40.00	21.89	100	182	Horizontal
3	145.4300	20.71	14.88	40.00	19.29	100	311	Horizontal
4	238.5500	22.81	14.73	47.00	24.19	100	101	Horizontal
5	448.0700	26.53	20.95	47.00	20.47	100	291	Horizontal
6	835.1000	36.09	29.04	47.00	10.91	100	359	Horizontal

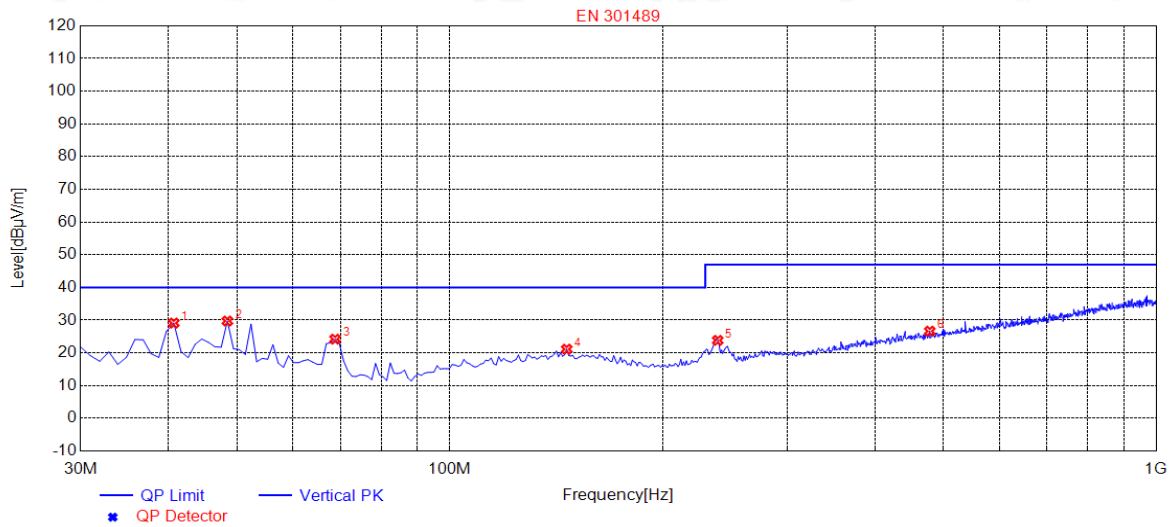
RESULT: PASS

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RADIATED EMISSION BELOW 1GHz- VERTICAL



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6700	29.12	11.91	40.00	10.88	100	113	Vertical
2	48.4300	29.75	11.71	40.00	10.25	100	207	Vertical
3	68.8000	24.21	9.43	40.00	15.79	100	324	Vertical
4	146.4000	21.14	14.88	40.00	18.86	100	49	Vertical
5	239.5200	23.84	14.81	47.00	23.16	100	251	Vertical
6	478.1400	26.65	21.65	47.00	20.35	100	134	Vertical

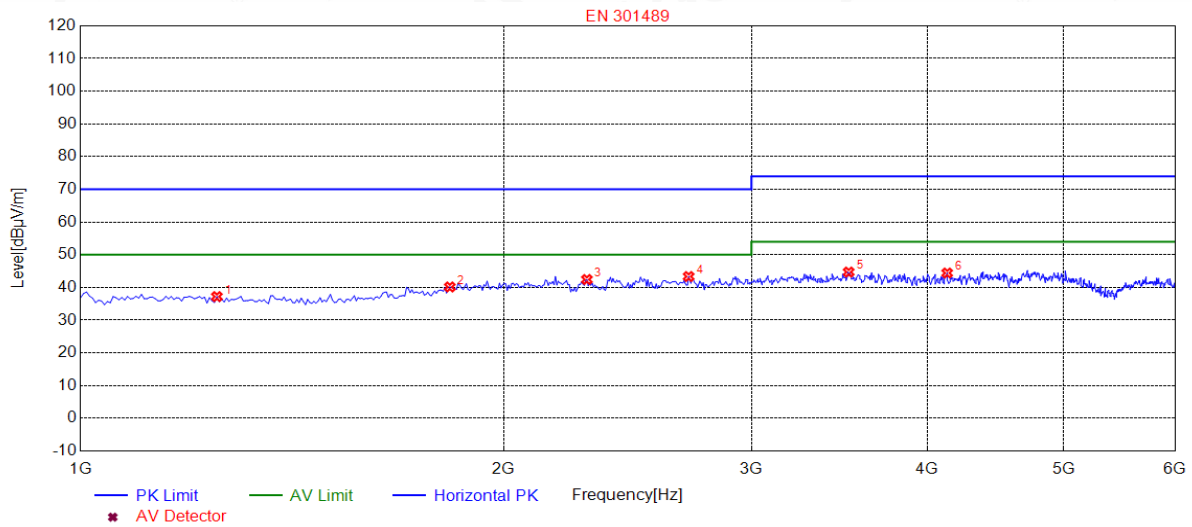
RESULT: PASS

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RADIATED EMISSION ABOVE 1GHz- HORIZONTAL



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1250.2503	37.22	-16.89	70.00	32.78	100	10	Horizontal
2	1830.8308	40.17	-13.62	70.00	29.83	100	280	Horizontal
3	2291.2913	42.44	-10.60	70.00	27.56	100	140	Horizontal
4	2706.7067	43.36	-9.56	70.00	26.64	100	160	Horizontal
5	3517.5175	44.72	-7.56	74.00	29.28	100	150	Horizontal
6	4133.1331	44.43	-6.15	74.00	29.57	100	60	Horizontal

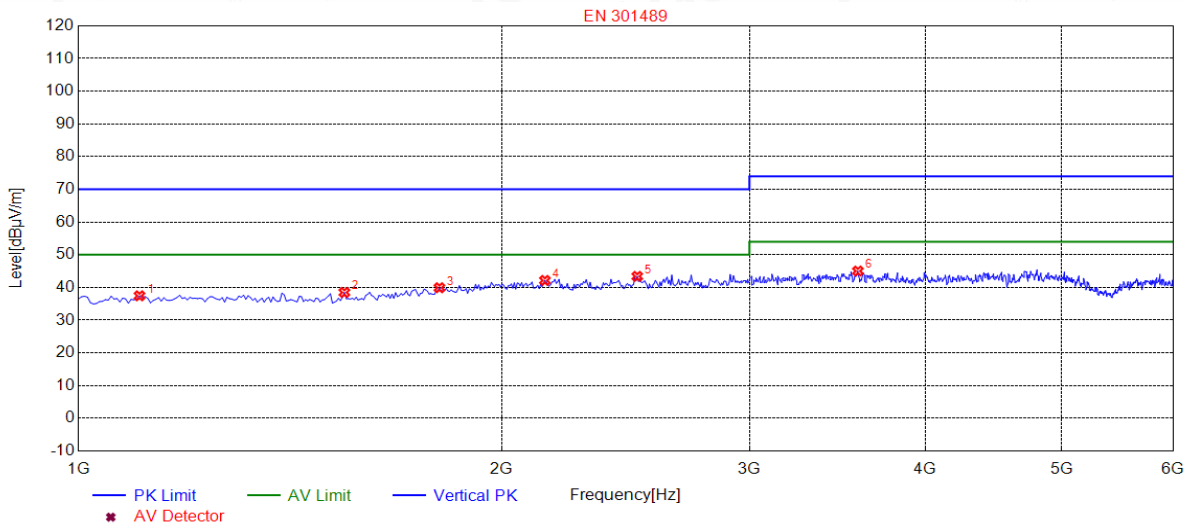
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RADIATED EMISSION ABOVE 1GHz- VERTICAL



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1105.1051	37.46	-16.74	70.00	32.54	100	260	Vertical
2	1545.5455	38.49	-16.65	70.00	31.51	100	230	Vertical
3	1805.8058	39.92	-13.88	70.00	30.08	100	280	Vertical
4	2146.1461	42.16	-11.21	70.00	27.84	100	270	Vertical
5	2496.4965	43.41	-9.73	70.00	26.59	100	330	Vertical
6	3582.5826	45.03	-7.42	74.00	28.97	100	280	Vertical

RESULT: PASS

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Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd
Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Web: http://cn.agc-cert.com/



8. IMMUNITY TEST

8.1. DESCRIPTION OF PERFORMANCE CRITERIA

The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests.

For the purpose of the present document two categories of performance criteria apply:

- Performance criteria for continuous phenomena.
- Performance criteria for transient phenomena.

8.2. GENERAL PERFORMANCE CRITERIA

1. Performance criteria for continuous phenomena

During the test, the equipment shall:

- continue to operate as intended;
- not unintentionally transmit;
- not unintentionally change its operating state;
- not unintentionally change critical stored data.

2. Performance criteria for transient phenomena

For all ports and transient phenomena with the exception described below, the following applies:

- The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data.
- After application of the transient phenomena, the equipment shall operate as intended.

For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:

- For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

For a 0 % residual voltage dip tests the following performance criteria apply:

- The performance criteria for transient phenomena shall apply.

For a 70 % residual voltage dip and voltage interruption tests, the following performance criteria apply:

- in the case where the equipment is fitted with or connected to a battery back-up, the performance criteria for transient phenomena shall apply;

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- in the case where the equipment is powered solely from the AC mains supply (without the use of a parallel battery back-up) volatile user data may have been lost and if applicable the communication link need not to be maintained and lost functions should be recoverable by user or operator;
- no unintentional responses shall occur at the end of the test, when the voltage is restored to nominal;
- in the event of loss of function(s) or in the event of loss of user stored data, this fact shall be recorded.

3. Performance Table

EN 301 489-17 Performance criteria		
Criteria	During Test	After Test (i.e. as a result of the application of the test)
A	Shall operate as intended. (see note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
<p>The performance criteria A shall apply for continuous phenomena. The performance criteria B shall apply for transient phenomena, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Where the EUT is a transmitter in standby mode or receive mode, unintentional transmission shall not occur during the test.</p>		
<p>Note: Operate as intended during the test allows a level of degradation in accordance with the Minimum performance level.</p>		
Minimum performance level		
<p>For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %. For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.</p>		

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EN 301 489-3 Performance criteria		
Criteria	During Test	After Test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions
<ul style="list-style-type: none"> • performance criterion A applies for immunity tests with phenomena of a continuous nature; • performance criterion B applies for immunity tests with phenomena of a transient nature. 		
<p>Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in EN 301 489-3 clause 5.</p> <p>Where the EUT has more than one mode of operation, an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.</p>		

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9. ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-2
Discharge Impedance	330Ω / 150 pF
Discharge Voltage	Air Discharge –8 kV, Contact Discharge – 4 kV
Polarity	Positive / Negative
Number of Discharge	Minimum 20 times at each test point
Discharge Mode	Single discharge
Discharge Period	1-second minimum

12.2 TEST PROCEDURE

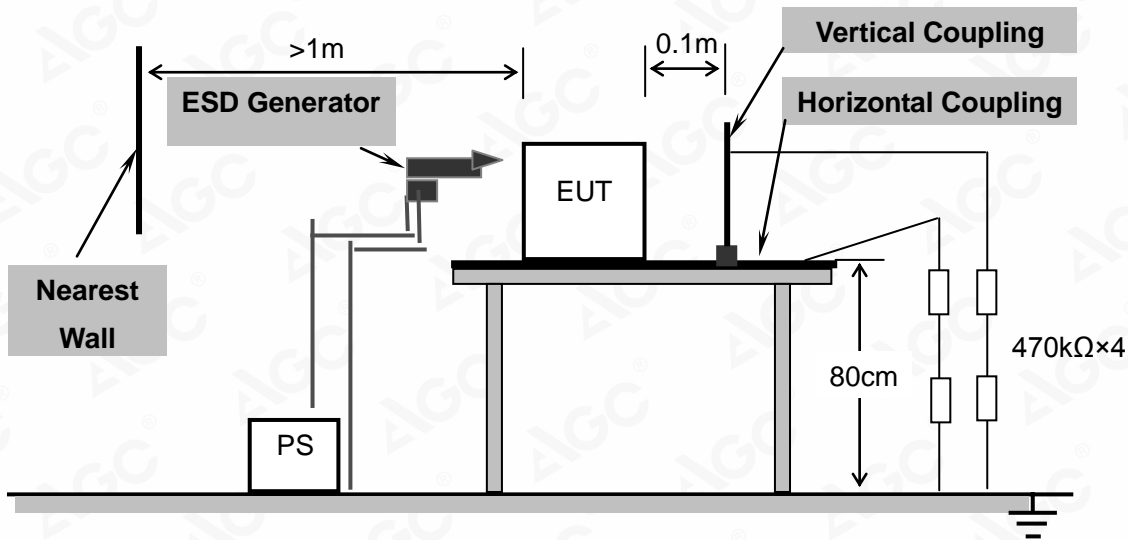
The test procedure was in accordance with EN 61000-4-2:

- a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were completed.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

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9.3 TEST SETUP



For the actual test configuration, please refer to Appendix A: Photographs of the Test Configuration.

9.4 TEST RESULT

DESCRIPTION OF THE ELECTROSTATIC DISCHARGES (ESD)

Times of Discharge	Voltage	Coupling	Test Mode	Performance criteria
Mini 25 / Point	±2kV; ±4kV	No Contact discharge	N/A	N/A
Mini 25 / Point	±2kV; ±4kV; ±8kV	Air Discharge	Mode 1/2/3	A
Mini 25 / Point	±4kV	Indirect Discharge HCP	Mode 1/2/3	A
Mini 25 / Point	±4kV	Indirect Discharge VCP	Mode 1/2/3	A

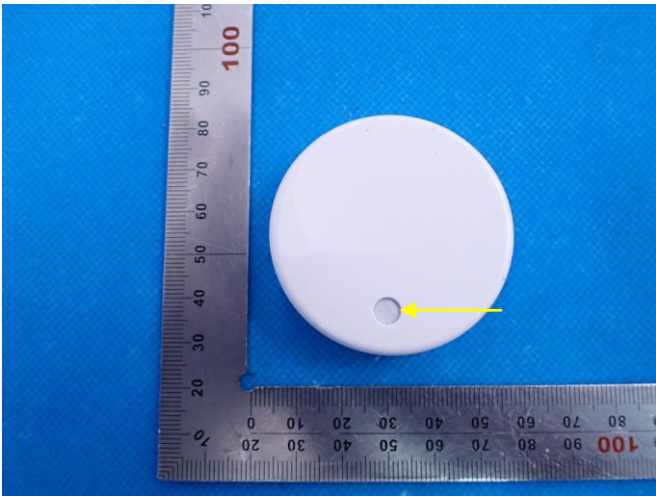
A: No degradation in the performance of the EUT was observed.

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ESD location:
Red line: Contact discharge



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9.5 PERFORMANCE

<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

PASS

 FAIL

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10. RADIATED, RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY TEST

10.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-3
Frequency Range	80 MHz – 6000MHz
Field Strength	3V/m
Modulation	1 kHz sine wave, 80%, AM modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3m
Antenna Height	1.55m
Dwell Time	3 seconds

10.2. TEST PROCEDURE

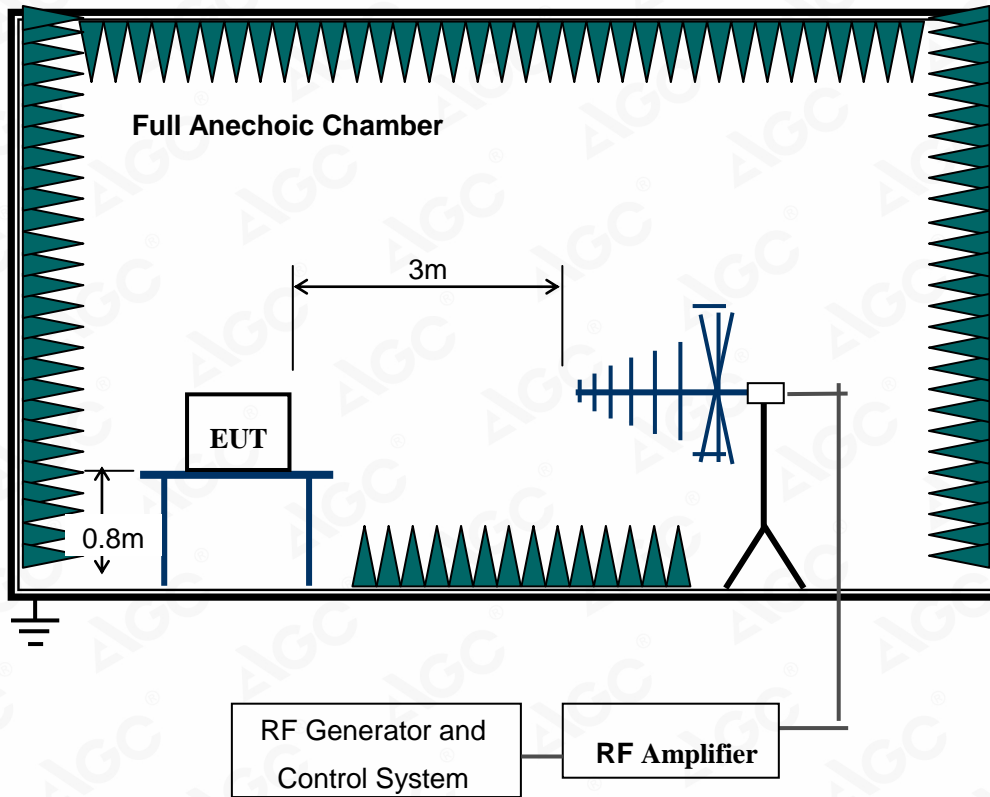
The test procedure was in accordance with EN 61000-4-3.

- The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- The test signal was 80% amplitude modulated with a 1 kHz sine wave.
- The frequency range was swept from 80 MHz to 6000MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The field strength level was 3V/m.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

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10.3. TEST SETUP



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10.4. TEST RESULT

Performance criteria for EN 301 489-3 immunity tests

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Test Mode	Performance criteria
80-6000	3V/m	Yes	H	Front	Mode 3	A
80-6000	3V/m	Yes	H	Back	Mode 3	A
80-6000	3V/m	Yes	H	Left	Mode 3	A
80-6000	3V/m	Yes	H	Right	Mode 3	A
80-6000	3V/m	Yes	V	Front	Mode 3	A
80-6000	3V/m	Yes	V	Back	Mode 3	A
80-6000	3V/m	Yes	V	Left	Mode 3	A
80-6000	3V/m	Yes	V	Right	Mode 3	A

A: No degradation in the performance of the EUT was observed.

Performance criteria for EN 301 489-17 immunity tests

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Test Mode	Performance criteria
80-6000	3V/m	Yes	H	Front	Mode 1/2	A
80-6000	3V/m	Yes	H	Back	Mode 1/2	A
80-6000	3V/m	Yes	H	Left	Mode 1/2	A
80-6000	3V/m	Yes	H	Right	Mode 1/2	A
80-6000	3V/m	Yes	V	Front	Mode 1/2	A
80-6000	3V/m	Yes	V	Back	Mode 1/2	A
80-6000	3V/m	Yes	V	Left	Mode 1/2	A
80-6000	3V/m	Yes	V	Right	Mode 1/2	A

A: No degradation or PER < 10% in the performance of the EUT was observed.

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10.5. PERFORMANCE

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<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

PASS

 FAIL

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to Attached file (Appendix I)

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to Attached file (Appendix I)

----END OF REPORT----

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2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.
5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
8. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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