

# **FCC Test Report**

Report No.: AGC01741230307FE08A

FCC ID : 2AYT3-AC60

**APPLICATION PURPOSE**: Class II Permissive Change

**PRODUCT DESIGNATION**: Portable Power Station

**BRAND NAME** : BLUETTI

MODEL NAME : AC60

**APPLICANT**: SHENZHEN POWEROAK NEWENER CO., LTD

**DATE OF ISSUE** : Oct. 19, 2023

**STANDARD(S)** : FCC Part 15 Subpart C §15.247

**REPORT VERSION**: V1.0

Attestation Of Global Conclude (Shenzhen) Co., Ltd



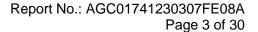
Page 2 of 30

# Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 19, 2023	Valid	Initial Release

Note: The original test report Ref. No AGC01741230307FE08 (dated Apr. 21, 2023, tested Mar. 16, 2023 to Apr. 21, 2023), was modified on Oct. 19, 2023 to include the following changes and additions for:

- Optimize the wiring of the IC peripheral circuits for LED light boards and PV charging,
- Add magnetic rings to the AC input and LED optical and communication cables for optimization For above described change(s), Updated Radiated Spurious Emission and Line Conducted Emission Test.





# **Table of Contents**

1. General Information	4
2. Product Information	5
2.1 Product Technical Description	5
2.2 Test Frequency List	5
2.3 Related Submittal(S) / Grant (S)	6
2.4 Test Methodology	6
2.5 Special Accessories	6
2.6 Equipment Modifications	6
2.7 Antenna Requirement	6
3. Test Environment	7
3.1 Address of the Test Laboratory	7
3.2 Test Facility	7
3.3 Environmental Conditions	8
3.4 Measurement Uncertainty	8
3.5 List of Equipment Use	9
4.System Test Configuration	11
4.1 EUT Configuration	11
4.2 EUT Exercise	11
4.3 Configuration of Tested System	11
4.4 Equipment Used In Tested System	11
4.5 Summary of Test Results	12
5. Description of Test Modes	13
6. Radiated Spurious Emission	14
6.1 Measurement Limit	14
6.2 Measurement Procedure	14
6.3 Measurement Setup (Block Diagram of Configuration)	17
6.4 Measurement Result	18
7. AC Power Line Conducted Emission Test	26
7.1 Measurement Limit	26
7.2 Measurement Setup (Block Diagram of Configuration)	26
7.3 Preliminary Procedure of Line Conducted Emission Test	27
7.4 Final Procedure of Line Conducted Emission Test	27
7.5 Measurement Results	27
Appendix I: Photographs of Test Setup	30
Appendix II: Photographs of Test EUT	30



Page 4 of 30

# 1. General Information

Applicant	SHENZHEN POWEROAK NEWENER CO., LTD
Address	F19, BLD No.1, Kaidaer Tongsha Rd No.168, Xili Street, Nanshan, Shenzhen, China
Manufacturer	SHENZHEN POWEROAK NEWENER CO., LTD
Address	F19, BLD No.1, Kaidaer Tongsha Rd No.168, Xili Street, Nanshan, Shenzhen, China
Factory	Huizhou PowerOak Innovation Co., Ltd
Address	(No.1 Workshop) Longsheng 5th Road, Laoshe Village, Dayawan West Zone, Huizhou, Guangdong, China
Product Designation	Portable Power Station
Brand Name	BLUETTI
Test Model	AC60
Date of receipt of test item	Oct. 07, 2023
Date of Test	Oct. 07, 2023~Oct. 19, 2023
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-BLE-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Alan Duan
(Project Engineer)

Calvin Liu
(Reviewer)

Approved By

Max Zhang
Authorized Officer

Oct. 19, 2023

Oct. 19, 2023



Page 5 of 30

# 2. Product Information

# 2.1 Product Technical Description

Frequency Band	2400MHz-2483.5MHz		
Operation Frequency Range	2402MHz-2480MHz		
Bluetooth Version	V5.0		
Modulation Type	BLE ⊠GFSK 1Mbps ⊠GFSK 2Mbps		
Number of channels	40		
Carrier Frequency of Each Channel	40 Channel (37 hopping + 3 advertising channel)		
Channel Separation	2 MHz		
Hardware Version	AC60_U2 V4.0		
Software Version	V2073		
Antenna Designation	PCB Antenna		
Antenna Gain	-2.31dBi		
Input Rating	<ul> <li>AC: 120V~50/60Hz, 10A Max</li> <li>DC/PV:12V-28V-8A, 200W Max</li> </ul>		
Output Rating	<ul> <li>AC: 120V~50/60Hz, 600W Max.</li> <li>USB-A: 5V=3A</li> <li>USB-C: 5/9/12/15/20V=3A; 20V=5A(E-Marker chip built-in)</li> <li>Wireless Charge: 5/7.5/10/15W</li> <li>Cigarette Lighter Socket: 12V=10A</li> <li>AC and DC output: 600W Total</li> <li>Battery Expansion: 22.4V=30A Total</li> </ul>		

# 2.2 Test Frequency List

Frequency Band	Channel Number	Frequency			
	0	2402 MHz			
	1	2404 MHz			
2400~2483.5MHz	:	:			
	19	2440MHz			
	:	:			
	38	2478 MHz			
	39	2480 MHz			
Note: f = 2402 + 2*k MHz, k = 0,, 39 f is the operating frequency (MHz) k is the operating channel.					



Page 6 of 30

# 2.3 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: **2AYT3-AC60**, filing to comply with Part 15 of the Federal Communication Commission rules.

# 2.4 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title			
1	FCC 47 CFR Part 15	Radio Frequency Devices			
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices			

#### 2.5 Special Accessories

Not available for this EUT intended for grant.

# 2.6 Equipment Modifications

Not available for this EUT intended for grant.

# 2.7 Antenna Requirement

# Standard Requirement

# 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, 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.

#### 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

#### **EUT Antenna:**

The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is-2.31dBi.



Page 7 of 30

#### 3. Test Environment

# 3.1 Address of the Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

#### 3.2 Test Facility

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

# CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

# A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

# IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.



Page 8 of 30

# 3.3 Environmental Conditions

	Normal Conditions
Temperature range (℃)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106
Power supply	AC120V

# 3.4 Measurement Uncertainty

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

uncertainty multiplied by a coverage factor of k=2, pro	widing a level of confidence of approximately 95%.		
Item	Measurement Uncertainty		
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 2.9 \text{ dB}$		
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$		
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$		
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$		
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$		
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$		
Uncertainty of Occupied Channel Bandwidth	U <sub>c</sub> = ±2 %		



Page 9 of 30

# 3.5 List of Equipment Use

• R	RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)	
	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2023-06-01	2024-05-31	
	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2023-03-03	2024-03-02	
	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2023-03-03	2024-03-02	
	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08	
	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2023-06-01	2024-05-31	
	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A	
	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A	

• F	Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)	
$\boxtimes$	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2023-02-18	2024-02-17	
	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023-06-03	2024-06-02	
	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31	
	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2022-03-12	2024-03-11	
$\boxtimes$	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10	
	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-03-23	2024-03-22	
	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2021-10-31	2023-10-30	
	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03	
	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2023-06-01	2024-05-31	
$\boxtimes$	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08	
	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08	

• A	AC Power Line Conducted Emission								
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)		
$\boxtimes$	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023/06/03	2024/06/02		
	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2024-06-08		
$\boxtimes$	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023/06/03	2024/06/02		



Page 10 of 30

• Tes	● Test Software								
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information				
$\boxtimes$	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71				
$\boxtimes$	AGC-EM-S003	RE Test System	FARA	EZ-EMC	VRA-03A				
	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0				



Report No.: AGC01741230307FE08A Page 11 of 30

# 4. System Test Configuration

# 4.1 EUT Configuration

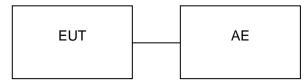
The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### 4.2 EUT Exercise

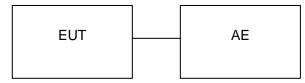
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

# 4.3 Configuration of Tested System

Radiated Emission Configure:



Conducted Emission Configure:



# 4.4 Equipment Used In Tested System

The following peripheral devices and interface cables were connected during the measurement:

- ☐ Test Accessories Come From The Laboratory
- ☐ Test Accessories Come From The Manufacturer

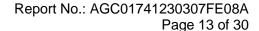
No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	wireless charging load	N/A	Huawei	Support 5W,7.5W,10W,15W	



Page 12 of 30

# 4.5 Summary of Test Results

Item	m FCC Rules Description of Test		Result
1	§15.209	Radiated Emission& Band Edge	Pass
2	§15.207	AC Power Line Conducted Emission	Pass



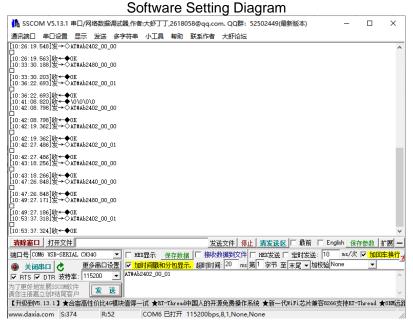


# 5. Description of Test Modes

Summary Table of Test Cases						
Test Item	Data Rate / Modulation					
rest item	Bluetooth – LE(1Mbps/2Mbps) / GFSK					
	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps(Battery powered or AC/DC adapter)					
	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps(Battery powered or AC/DC adapter)					
Radiated & Conducted	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps(Battery powered or AC/DC adapter)					
Test Cases	Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps(Battery powered or AC/DC adapter)					
	Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps(Battery powered or AC/DC adapter)					
	Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps(Battery powered or AC/DC adapter)					
AC Conducted Emission	Mode 1: Bluetooth Link + Battery + AC Power (Charging from AC Adapter)					

#### Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 2. The battery is full-charged during the test.
- 3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 4. For Conducted Test method, a temporary antenna connector is provided by the manufacture.





Page 14 of 30

# 6. Radiated Spurious Emission

#### **6.1 Measurement Limit**

FCC Part 15.209 Limit in the below table to be followed

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

#### **6.2 Measurement Procedure**

- The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.



Page 15 of 30

- pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting	
Start ~Stop Frequency	9kHz~150kHz/RB 200Hz for QP	
Start ~Stop Frequency	150kHz~30MHz/RB 9kHz for QP	
Start ~Stop Frequency	30MHz~1000MHz/RB 120kHz for QP	
Start ~Stop Frequency	1GHz~26.5GHz	
Start Stop Frequency	1MHz/3MHz for Peak, 1MHz/3MHz for Average	

Receiver Parameter	Setting	
Start ~Stop Frequency	9kHz~150kHz/RB 200Hz for QP	
Start ~Stop Frequency	150kHz~30MHz/RB 9kHz for QP	
Start ~Stop Frequency	30MHz~1000MHz/RB 120kHz for QP	



Report No.: AGC01741230307FE08A Page 16 of 30

# Quasi-Peak Measurements below 1GHz

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. Span was set greater than 1MHz
- 3. RBW = as shown in the table above
- 4. Detector = CISPR quasi-peak
- 5. Sweep time = auto couple
- 6. Trace was allowed to stabilize

#### Peak Measurements above 1GHz

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

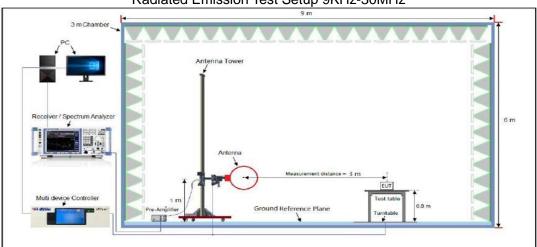
# Average Measurements above 1GHz (Method VB)

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW setting requirements are as follows:
- 4. If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10 Hz.
- 5. If the EUT duty cycle is < 98%, set VBW  $\ge 1/T$ . T is the minimum transmission duration.
- 6. Detector = Peak
- 7. Sweep time = auto
- 8. Trace mode = max hold
- 8. Trace was allowed to stabilize

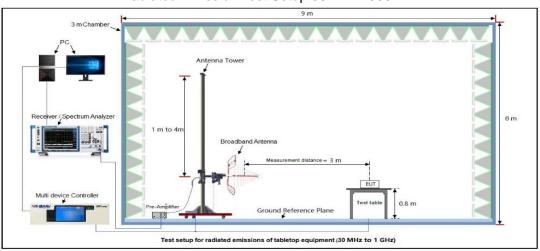


# 6.3 Measurement Setup (Block Diagram of Configuration)

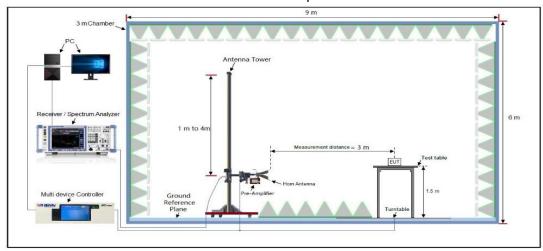
Radiated Emission Test Setup 9KHz-30MHz



# Radiated Emission Test Setup 30MHz-1000MHz

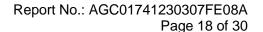


# Radiated Emission Test Setup Above 1000MHz



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



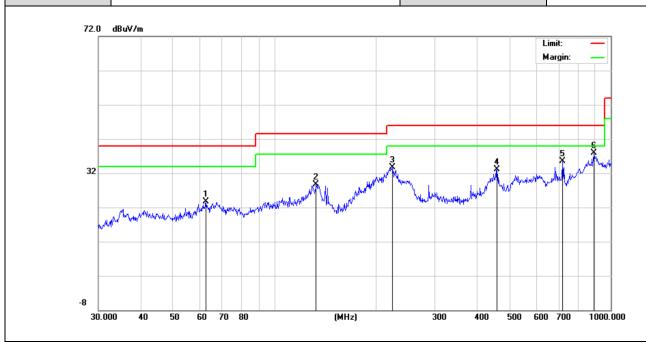


#### 6.4 Measurement Result

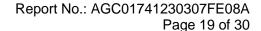
# **Radiated Emission Below 30MHz**

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

Radiated Emission Test Results at 30MHz-1GHz							
EUT Name Portable Power Station Model Name AC60							
Temperature	23.3℃	Relative Humidity	60.7%				
Pressure	960hPa	Test Voltage	AC 120V				
Test Mode	Mode 1	Antenna Polarity	Horizontal				

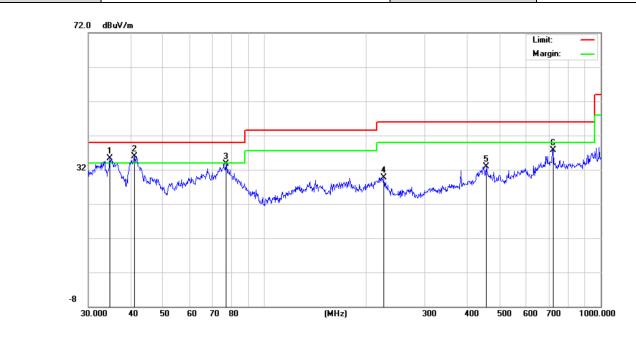


Final I	Final Data List							
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	62.6507	23.78	12.58	40.00	16.22	100	200	Horizontal
2	133.1511	28.79	15.61	43.50	14.71	100	110	Horizontal
3	224.5193	33.61	14.63	46.00	12.39	100	80	Horizontal
4	459.1144	33.12	24.43	46.00	12.88	100	100	Horizontal
5	719.1995	35.48	24.77	46.00	10.52	100	180	Horizontal
6	890.7278	37.82	30.64	46.00	8.18	100	160	Horizontal





Radiated Emission Test Results at 30MHz-1GHz						
EUT Name Portable Power Station Model Name AC60						
Temperature	23.3℃	Relative Humidity	60.7%			
Pressure	960hPa	Test Voltage	AC 120V			
Test Mode	Mode 1	Antenna Polarity	Vertical			



#### **Final Data List** Freq. Level Factor Limit Margin Height Angle NO. Polarity [MHz] [dBµV/m] [dB] $[dB\mu V/m]$ [dB] [°] [cm] 4.66 1 34.7602 35.34 15.17 40.00 100 160 Vertical 2 41.1320 35.97 16.91 40.00 4.03 100 170 Vertical 76.7808 6.31 3 33.69 16.93 40.00 100 90 Vertical 29.71 16.34 46.00 16.29 4 226.8936 100 220 Vertical 455.9058 32.94 25.38 5 46.00 13.06 100 160 Vertical 6 721.7259 37.75 28.64 46.00 8.25 100 140 Vertical

# **RESULT: Pass**

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. All test modes had been pre-tested. The mode 1 is the worst case and recorded in the report.



Page 20 of 30

# Radiated Emissions Test Results for Above 1GHz

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 1	Antenna Polarity	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type	
4804.011	50.12	0.08	50.20	74.00	-23.80	peak	
4804.011	42.03	0.08	42.11	54.00	-11.89	AVG	
7206.022	46.56	2.21	48.77	74.00	-25.23	peak	
7206.022	40.11	2.21	42.32	54.00	-11.68	AVG	
Remark:	Remark:						

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 1	Antenna Polarity	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type	
4804.011	49.63	0.08	49.71	74.00	-24.29	peak	
4804.011	41.22	0.08	41.30	54.00	-12.70	AVG	
7206.022	48.06	2.21	50.27	74.00	-23.73	peak	
7206.022	38.74	2.21	40.95	54.00	-13.05	AVG	
Remark:						ļ	
Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

# **RESULT: Pass**



Page 21 of 30

# Radiated Emissions Test Results for Above 1GHz

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 2	Antenna Polarity	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4880.000	49.51	0.14	49.65	74.00	-24.35	peak
4880.000	42.33	0.14	42.47	54.00	-11.53	AVG
7320.000	46.15	2.36	48.51	74.00	-25.49	peak
7320.000	40.52	2.36	42.88	54.00	-11.12	AVG
Remark:						

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 2	Antenna Polarity	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4880.000	50.23	0.14	50.37	74.00	-23.63	peak
4880.000	43.56	0.14	43.70	54.00	-10.30	AVG
7320.000	47.50	2.36	49.86	74.00	-24.14	peak
7320.000	41.11	2.36	43.47	54.00	-10.53	AVG
temark:						

# **RESULT: Pass**



Page 22 of 30

# Radiated Emissions Test Results for Above 1GHz

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 3	Antenna Polarity	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.012	50.11	0.22	50.33	74.00	-23.67	peak
4960.012	40.26	0.22	40.48	54.00	-13.52	AVG
7440.027	46.32	2.64	48.96	74.00	-25.04	peak
7440.027	38.52	2.64	41.16	54.00	-12.84	AVG
Remark:						

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 3	Antenna Polarity	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.013	49.14	0.22	49.36	74	-24.64	peak
4960.013	41.15	0.22	41.37	54	-12.63	AVG
7440.027	46.33	2.64	48.97	74	-25.03	peak
7440.027	38.52	2.64	41.16	54	-12.84	AVG
Remark:	<del>-</del>			•		-
actor = Anter	nna Factor + Cable	Loss – Pre-	-amplifier.			

# **RESULT: Pass**



Page 23 of 30

# Radiated Emissions Test Results for Above 1GHz

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 4	Antenna Polarity	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.011	48.74	0.08	48.82	74.00	-25.18	peak
4804.011	42.01	0.08	42.09	54.00	-11.91	AVG
7206.022	46.37	2.21	48.58	74.00	-25.42	peak
7206.022	38.28	2.21	40.49	54.00	-13.51	AVG
Remark:						

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 4	Antenna Polarity	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type		
4804.011	50.26	0.08	50.34	74.00	-23.66	peak		
4804.011	41.33	0.08	41.41	54.00	-12.59	AVG		
7206.022	46.28	2.21	48.49	74.00	-25.51	peak		
7206.022	39.77	2.21	41.98	54.00	-12.02	AVG		
Remark:								

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

# **RESULT: Pass**



Page 24 of 30

# Radiated Emissions Test Results for Above 1GHz

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 5	Antenna Polarity	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type		
4880.005	49.63	0.14	49.77	74.00	-24.23	peak		
4880.005	42.02	0.14	42.16	54.00	-11.84	AVG		
7320.140	46.16	2.36	48.52	74.00	-25.48	peak		
7320.140	40.28	2.36	42.64	54.00	-11.36	AVG		
Remark:								

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 5	Antenna Polarity	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4880.050	48.75	0.14	48.89	74.00	-25.12	peak
4880.050	41.95	0.14	42.09	54.00	-11.91	AVG
7320.080	48.33	2.36	50.69	74.00	-23.31	peak
7320.080 39.70		2.36 42.06		54.00	-11.94	AVG
emark:						

# **RESULT: Pass**



Page 25 of 30

# Radiated Emissions Test Results for Above 1GHz

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 6	Antenna Polarity	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type		
4960.012	48.89	0.22	49.11	74.00	-24.89	peak		
4960.012	38.77	0.22	38.99	54.00	-15.01	AVG		
7440.027	46.85	2.64	49.49	74.00	-24.51	peak		
7440.027	38.00	2.64	40.64	54.00	-13.36	AVG		
Remark:								

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

EUT Name	Portable Power Station	Model Name	AC60
Temperature	25℃	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	AC 120V
Test Mode	Mode 6	Antenna Polarity	Vertical

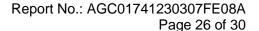
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.013	49.96	0.22	50.18	74	-23.82	peak
4960.013	42.03	0.22	42.25	54	-11.75	AVG
7440.027	48.05	2.64	50.69	74	-23.31	peak
7440.027	38.17	2.64	40.81	54	-13.19	AVG
emark:						

|Factor = Antenna Factor + Cable Loss – Pre-amplifier.

# **RESULT: Pass**

# Note:

- The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.
- 2. Factor = Antenna Factor + Cable loss – Pre-amplifier gain, Margin = Emission Level-Limit.
- The "Factor" value can be calculated automatically by software of measurement system.





# 7. AC Power Line Conducted Emission Test

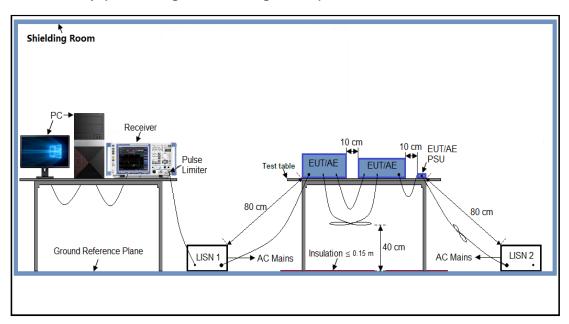
# 7.1 Measurement Limit

Francisco	Maximum RF Line Voltage				
Frequency	Q.P. (dBμV)	Average (dBμV)			
150kHz~500kHz	66-56	56-46			
500kHz~5MHz	56	46			
5MHz~30MHz	60	50			

#### Note:

- 1. The lower limit shall apply at the transition frequency.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

# 7.2 Measurement Setup (Block Diagram of Configuration)





Page 27 of 30

# 7.3 Preliminary Procedure of Line Conducted Emission Test

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipment received AC120V/60Hz power from a LISN, if any.
- 5. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 6. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 7. During the above scans, the emissions were maximized by cable manipulation.
- 8. The test mode(s) were scanned during the preliminary test.

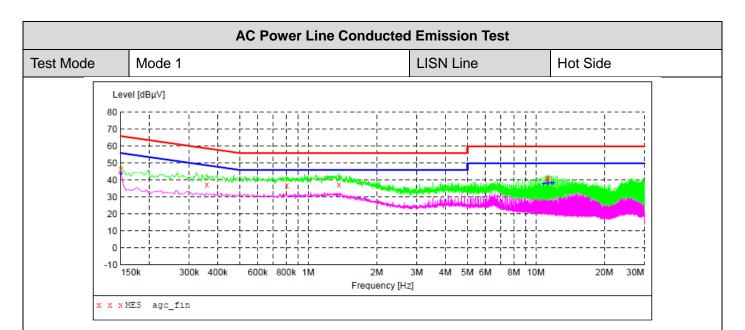
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

#### 7.4 Final Procedure of Line Conducted Emission Test

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less 2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.

# 7.5 Measurement Results





# MEASUREMENT RESULT: "agc fin"

2023/10/10 9:48

_	020/10/10 3.	10					
	Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
	0.150000	46.70	6.1	66	19.3	QP	L1
	0.358000	37.60	6.1	59	21.2	QP	L1
	0.806000	37.20	6.2	56	18.8	QP	L1
	1.362000	37.30	6.2	56	18.7	QP	L1
	11.186000	40.90	6.7	60	19.1	QP	L1
	11.362000	41.20	6.7	60	18.8	QP	L1

# MEASUREMENT RESULT: "agc fin2"

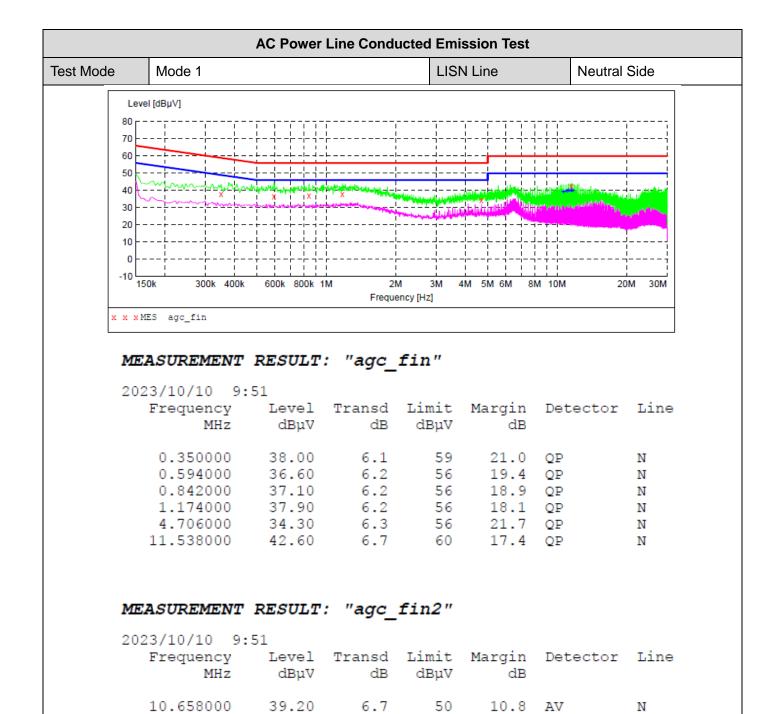
2023/10/10 9:48

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000 10.834000 11.186000 11.362000 11.714000 11.890000	44.00 37.90 38.40 38.50 38.40 38.20	6.1 6.7 6.7 6.7 6.7	56 50 50 50 50 50	12.0 12.1 11.6 11.5 11.6	AV AV AV	L1 L1 L1 L1 L1

RESULT: Pass
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results the test report is a submitted to AGC within 15days after the issuance of the test report. presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report.  $Further\ enquiry\ of\ validity\ or\ verification\ of\ the\ test\ report\ should\ be\ addressed\ to\ AGC\ by\ agc 01@agccert.com.$ 

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/





#### **RESULT: PASS**

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

6.7

6.7

6.7

6.7

6.7

50

50

50

50

50

10.3

10.1

10.0

10.0

10.1

ΑV

ΑV

ΑV

ΑV

ΑV

Ν

Ν

Ν

Ν

Ν

39.70

39.90

40.00

40.00

39.90

11.010000

11.186000

11.362000

11.538000

11.714000



Page 30 of 30

# **Appendix I: Photographs of Test Setup**

Refer to the Report No.: AGC01741230307AP02A

**Appendix II: Photographs of Test EUT** 

Refer to the Report No.: AGC01741230307AP03A

----End of Report----



# Conditions of Issuance of Test Reports

- 1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
- 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. 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.
- 5. 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.
- 6. 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.
- 7.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.
- 8. 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.
- 9. 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.