FCC Test Report

Report No.: AGC09966200501FE06

FCC ID	:	2AVSK-620
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Smart Phone
BRAND NAME	:	ClearCellular
MODEL NAME	:	ClearPHONE 620
APPLICANT	:	ClearCellular Limited.
DATE OF ISSUE	:	Jun. 18, 2020
STANDARD(S)	:	FCC Rules and Regulations Part 15 Subpart C Section 15.225, RSS-210 issue 9 Annex B.6 ANSI C63.10: 2013
REPORT VERSION	:	V1.0

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 18, 2020	Valid	Initial Release

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1. GENERAL INFORMATION

1.1. GENERAL DESCRIPTION OF EUT

Applicant	ClearCellular, Limited.
Address	107 Richmond Street Lower Hutt state New Zealand
Manufacturer	COOSEA GROUP (HK) COMPANY LIMITED
Address	UNIT 5-6 16F MULTIFIELD PLAZA 3-7A PRAT AVENUE TSIM SHA TSUI KL HONGKONG
Factory	ClearCellular, Limited.
Address	107 Richmond Street Lower Hutt state New Zealand
Product Designation	Smart Phone
Brand Name	ClearCellular
Test Model	ClearPHONE 620
Date of test	May 15, 2020~Jun. 18, 2020
Operating Frequency(NFC)	13.56MHz
Modulation(NFC)	ASK
Antenna Type(NFC)	Integral antenna
Antenna Gain(NFC)	1.0dBi
Hardware Version	K7011Q-01
Software Version	K7011.GB.HD J.Q0.ANASAPA9DATJDFTL.0402_1614.V2.1
Power Supply:	DC 3.85V
Test Result	Pass

Prepared By

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(Project Engineer)
Jun. 18, 2020

Reviewed By

Max Zhang
(Reviewer)
Jun. 18, 2020

Approved By

Forrest Lei
(Authorized Officer)
Jun. 18, 2020

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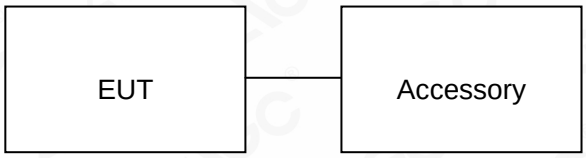
1.2. OPERATION OF EUT DURING TESTING

NO.	TEST MODE DESCRIPTION
1	Transmitting
Note: 1. All the test had been tested with full charging, only the result of the worst case was recorded in the report, if no other cases. 2.For Radiated Emission, 3axis were chosen for testing for each applicable mode.	

1.3. DESCRIPTION OF TEST SETUP

Configure :



Item	Equipment	Model No.	ID or Specification	Remark
1	Smart Phone	ClearPHONE 620	2AVSK-620	EUT
2	Adapter	HJ-FC017K7-US	Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 9V, 2A	AE
3	Battery	BL-A5CT	DC3.85V 4900mAh	AE
4	USB Cable	N/A	N/A	AE

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1.4. MEASUREMENT INSTRUMENTS LIST

NAME OF EQUIPMENT	MANUFACTURER	MODEL	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2022
Amplifier	Schwarzbeck	BBV 9718	9718-205	June 10,2020	June 09,2021
WIDEBAND REQUENCY ANTENNA	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 09, 2019	Jan. 08, 2021
WIDEBAND REQUENCY ANTENNA	SCHWARZBECK	VULB9168	VULB9168-D69250	Sep. 20, 2019	Sep. 19, 2020
LOOP ANTENNA	A.H	SAS-562B	/	Feb.27, 2020	Feb.26, 2022

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3. RADIATED EMISSION

3.1. TEST LIMIT

Within the 13.110MHz-14.010MHz band

Frequencies (MHz)	Field Strength at 30m (microvolts/meter)	Field Strength at 30m (dBuV/m)	Field Strength at 3m (dBuV/m)
13.553~13.567	15.848	84	124
13.410~13.553 13.567~13.710	334	50.5	90.5
13.110~13.410 13.710~14.010	106	40.5	80.5

According to 15.35, on any frequency or frequencies below or equal to 1000 MHz, the limits Shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test.

Outside of the 13.110MHz-14.010MHz band

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μ V/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level dB μ V = 20 log Emission level μ V/m
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

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3.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 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 emissions, 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.
5. 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 VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
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. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the 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.

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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 1MHz/1MHz for Peak, 1MHz/10Hz 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

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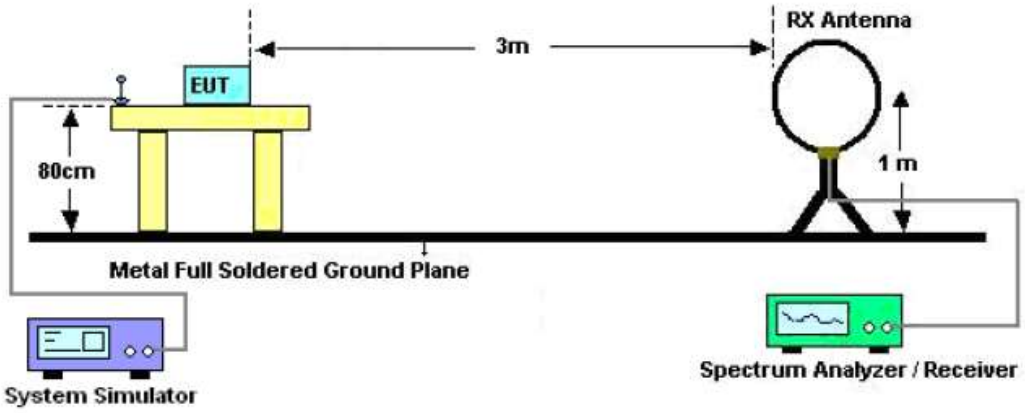
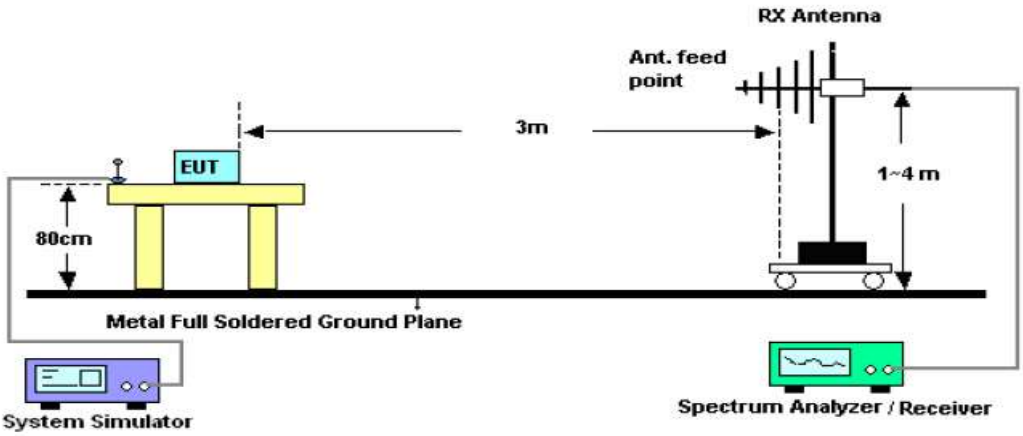
3.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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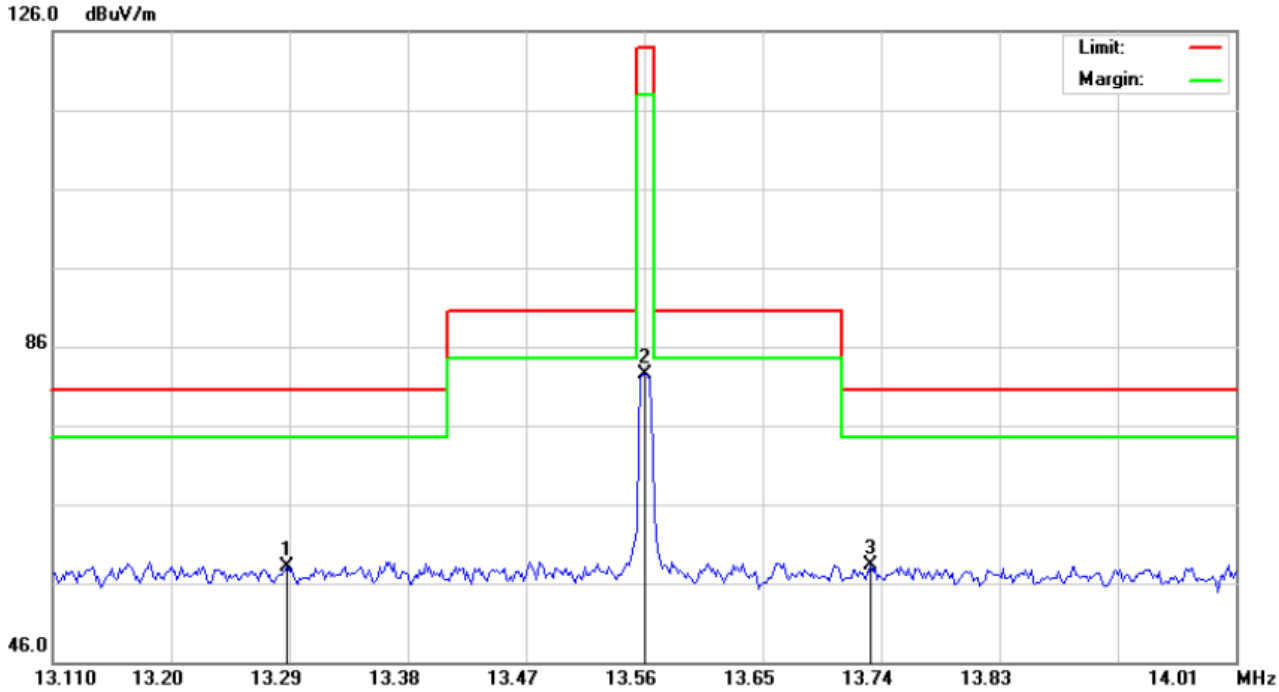
3.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

EUT：	Smart Phone	Model Name	ClearPHONE 620
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Face



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		13.2882	-6.81	65.00	58.19	80.50	-22.31	peak			
2		13.5600	17.57	65.00	82.57	124.00	-41.43	peak			
3	*	13.7320	-6.61	65.00	58.39	80.50	-22.11	peak			

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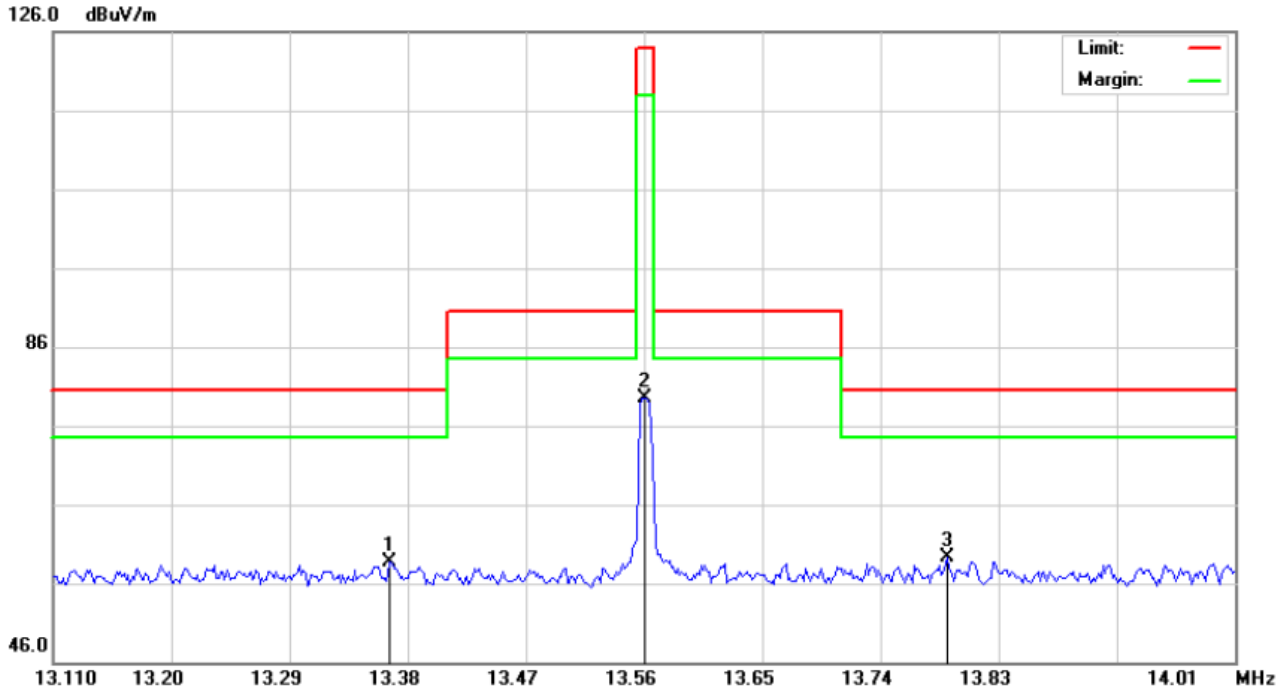
EUT：	Smart Phone	Model Name	ClearPHONE 620
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010 hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Side



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		13.3662	-6.38	65.00	58.62	80.50	-21.88	peak			
2		13.5600	14.57	65.00	79.57	124.00	-44.43	peak			
3	*	13.7910	-5.63	65.00	59.37	80.50	-21.13	peak			

Note: Other emissions from 9 kHz to 30 MHz are considered as ambient noise. No recording in the test report.

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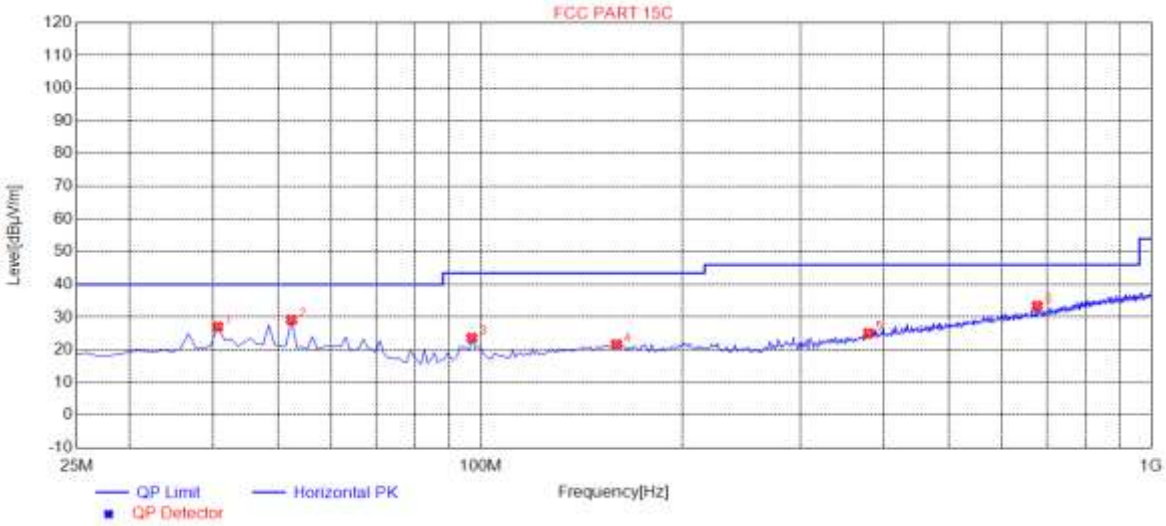
RADIATED EMISSION 30MHz- 1GHZ

EUT：	Smart Phone	Model Name	ClearPHONE 620
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010 hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6000	27.06	14.92	40.00	12.94	100	121	Horizontal
2	52.3000	29.18	14.50	40.00	10.82	100	176	Horizontal
3	97.1500	23.65	11.06	43.50	19.85	200	319	Horizontal
4	159.5500	21.69	14.94	43.50	21.81	100	358	Horizontal
5	378.9250	25.08	18.99	46.00	20.92	200	287	Horizontal
6	676.3000	33.45	25.57	46.00	12.55	200	231	Horizontal

RESULT: PASS

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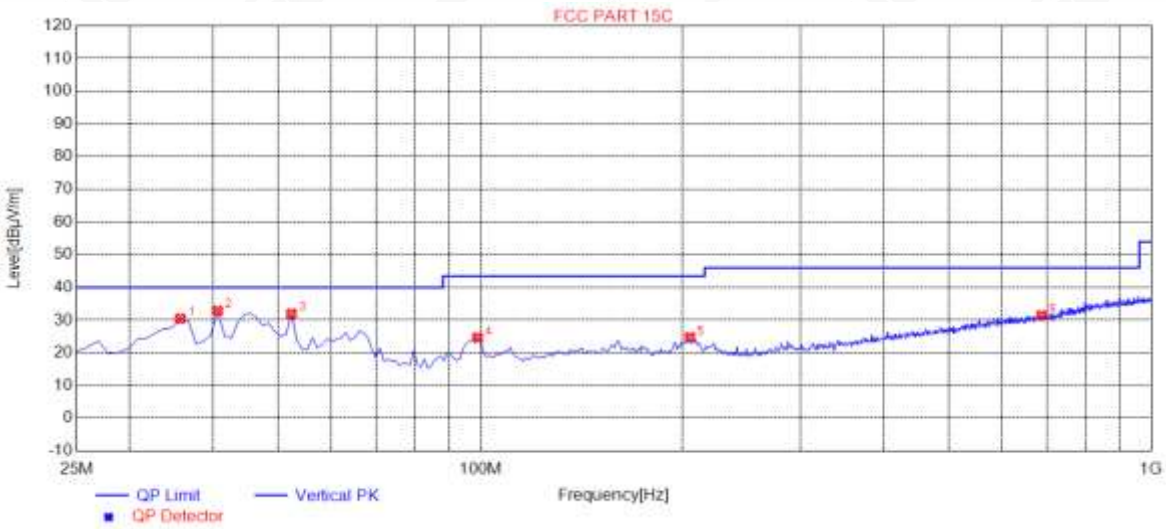
EUT：	Smart Phone	Model Name	ClearPHONE 620
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010 hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Vertical



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.7250	30.46	13.90	40.00	9.54	100	248	Vertical
2	40.6000	32.82	14.92	40.00	7.18	100	9	Vertical
3	52.3000	31.99	14.50	40.00	8.01	100	320	Vertical
4	99.1000	24.66	11.27	43.50	18.84	100	123	Vertical
5	205.3750	24.76	12.40	43.50	18.74	100	358	Vertical
6	687.0250	31.46	25.76	46.00	14.54	100	246	Vertical

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin=Result-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

The mode 1 is the worst case, and only the data of the worst case recorded in this test report.

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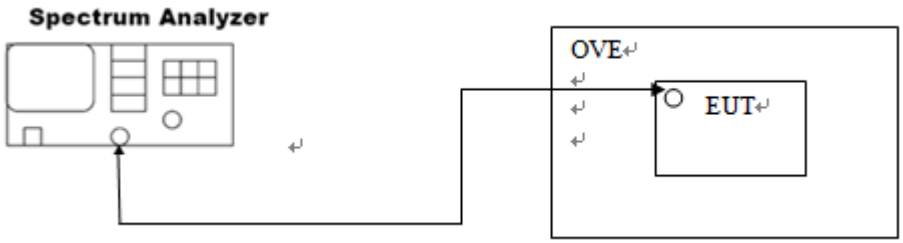
4. FREQUENCY STABILITY

4.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 1 KHz, VBW⩾3×RBW.
4. Set SPA Trace 1 Max hold, then View.
5. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
6. Extreme temperature rule is -20°C~40°C.

4.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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4.3. MEASUREMENT RESULTS

Operating frequency: 13.56MHz

Voltage vs. Frequency Stability (Test Temperature: 20℃)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit(MHz)	Conclusion
3.85	13.56079	0.00083	0.001356	PASS
3.27	13.56083			
4.40	13.56082			

Temperature vs. Frequency Stability (Test Voltage: 3.85V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit(MHz)	Conclusion
- 20℃	13.56085	0.00087	0.001356	PASS
-10℃	13.56087			
0℃	13.56082			
10℃	13.56083			
20℃	13.56080			
30℃	13.56082			
40℃	13.56085			

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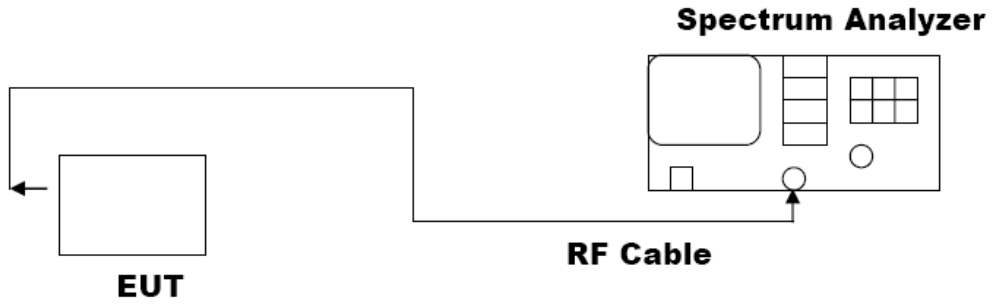
5. BANDWIDTH

5.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 10 KHz, VBW⩾3×RBW.
4. Set SPA Trace 1 Max hold, then View.

5.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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5.3. MEASUREMENT RESULTS

TEST ITEM	BANDWIDTH
TEST MODE	Mode1

Test Data (kHz)		Criteria
Occupied Bandwidth	23.566	PASS
-20dB Bandwidth	27.03	PASS

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6. LINE CONDUCTED EMISSION TEST

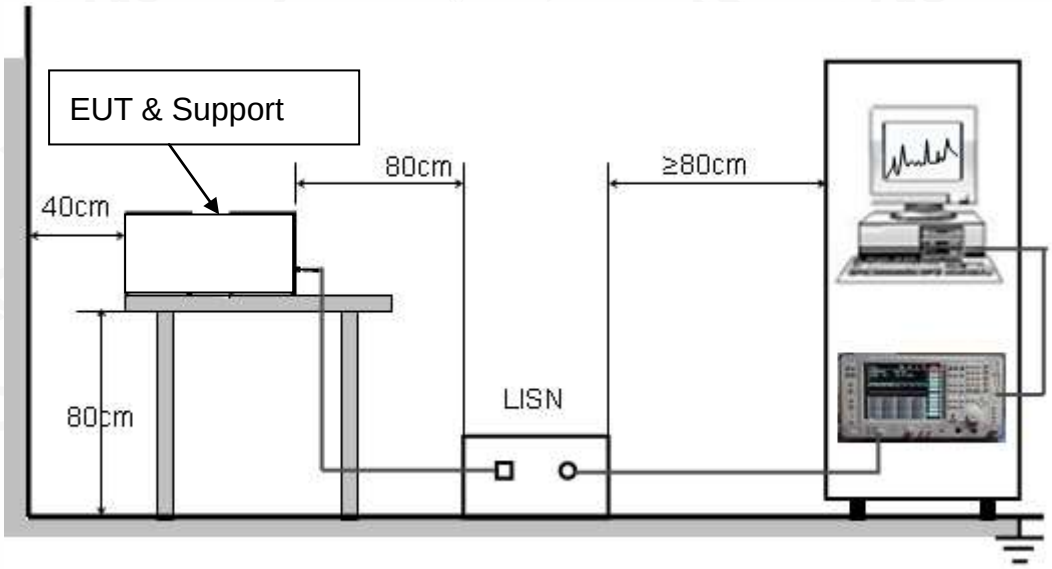
6.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
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.

6.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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6.3. 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 equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN..
6. 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.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. 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.

6.4. 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.

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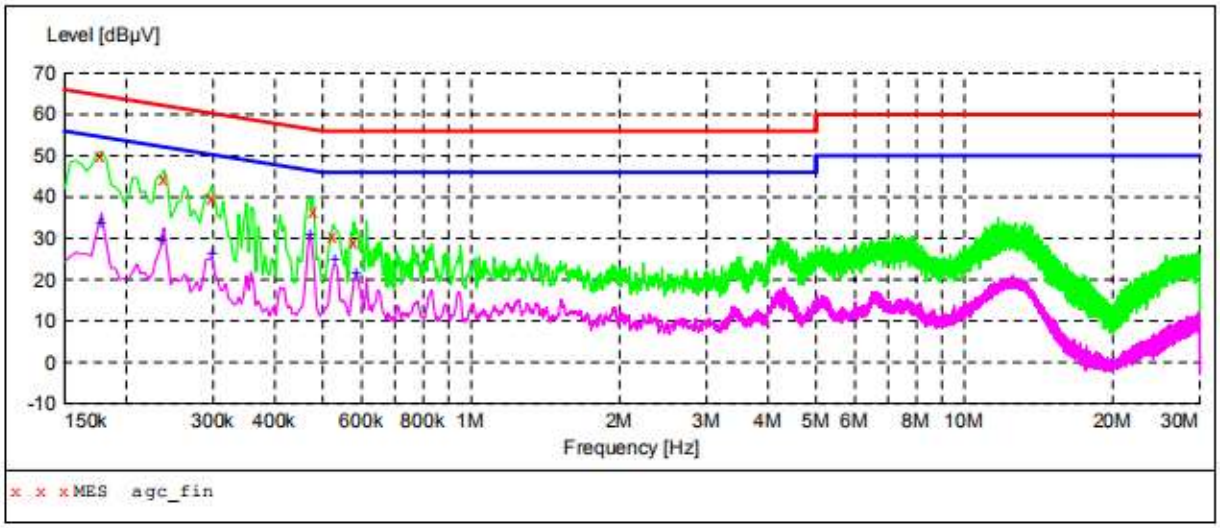
6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST LINE 1-L



MEASUREMENT RESULT: "agc_fin"

2020/5/22 22:42

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	49.90	10.3	65	14.7	QP	L1	GND
0.238000	44.60	10.3	62	17.6	QP	L1	GND
0.298000	39.90	10.3	60	20.4	QP	L1	GND
0.478000	36.40	10.3	56	20.0	QP	L1	GND
0.526000	30.70	10.3	56	25.3	QP	L1	GND
0.578000	29.10	10.3	56	26.9	QP	L1	GND

MEASUREMENT RESULT: "agc_fin2"

2020/5/22 22:42

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	33.80	10.3	55	20.8	AV	L1	GND
0.238000	29.50	10.3	52	22.7	AV	L1	GND
0.298000	26.10	10.3	50	24.2	AV	L1	GND
0.474000	31.10	10.3	46	15.3	AV	L1	GND
0.530000	24.80	10.3	46	21.2	AV	L1	GND
0.586000	21.70	10.3	46	24.3	AV	L1	GND

RESULT: PASS

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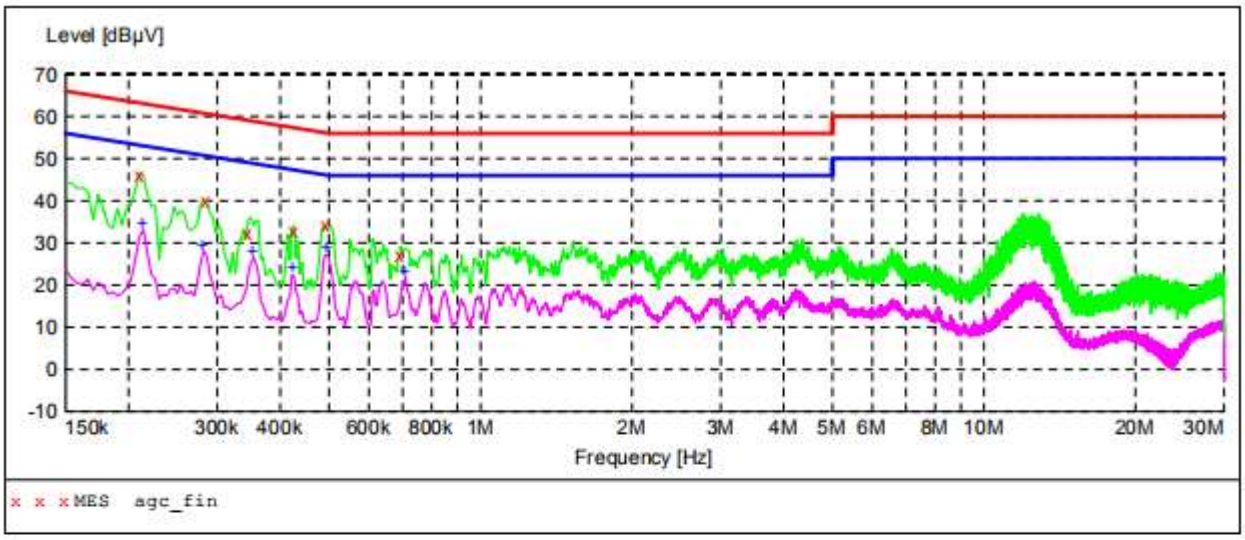
Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "agc_fin"

2020/5/22 22:52

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.210000	46.20	10.3	63	17.0	QP	N	GND
0.286000	39.80	10.3	61	20.8	QP	N	GND
0.346000	32.30	10.3	59	26.8	QP	N	GND
0.426000	32.60	10.3	57	24.7	QP	N	GND
0.494000	34.10	10.3	56	22.0	QP	N	GND
0.694000	27.10	10.3	56	28.9	QP	N	GND

MEASUREMENT RESULT: "agc_fin2"

2020/5/22 22:54

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.214000	34.70	10.3	53	18.3	AV	N	GND
0.282000	29.40	10.3	51	21.4	AV	N	GND
0.354000	28.10	10.3	49	20.8	AV	N	GND
0.426000	24.10	10.3	47	23.2	AV	N	GND
0.494000	28.80	10.3	46	17.3	AV	N	GND
0.710000	23.10	10.3	46	22.9	AV	N	GND

RESULT: PASS

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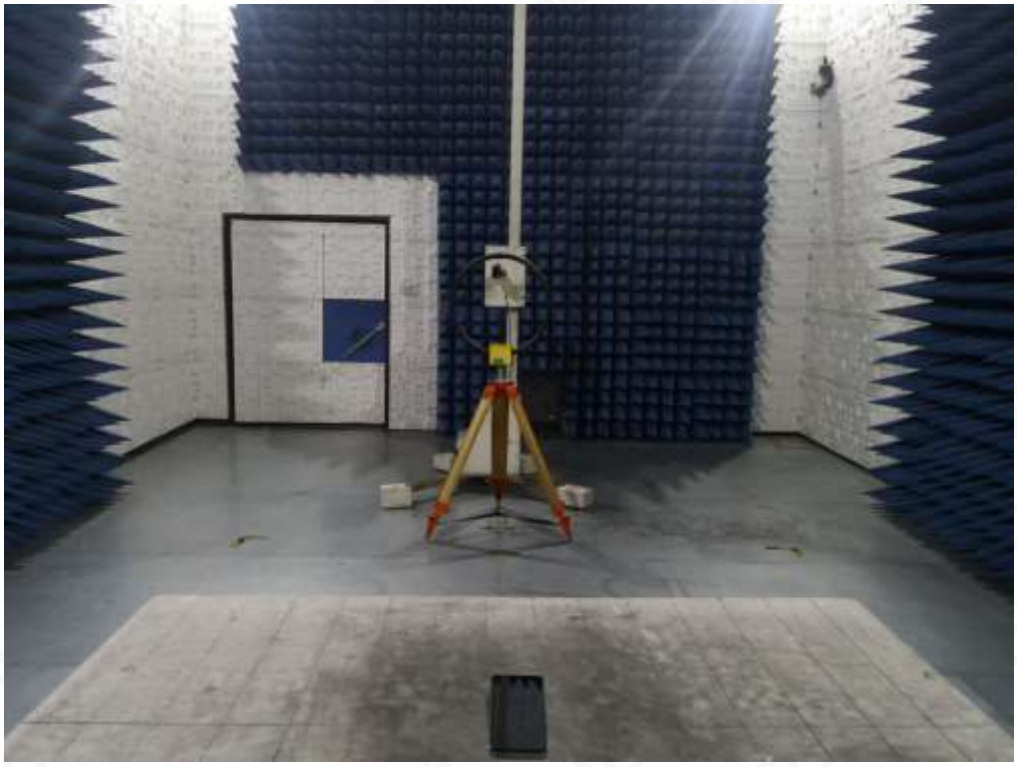
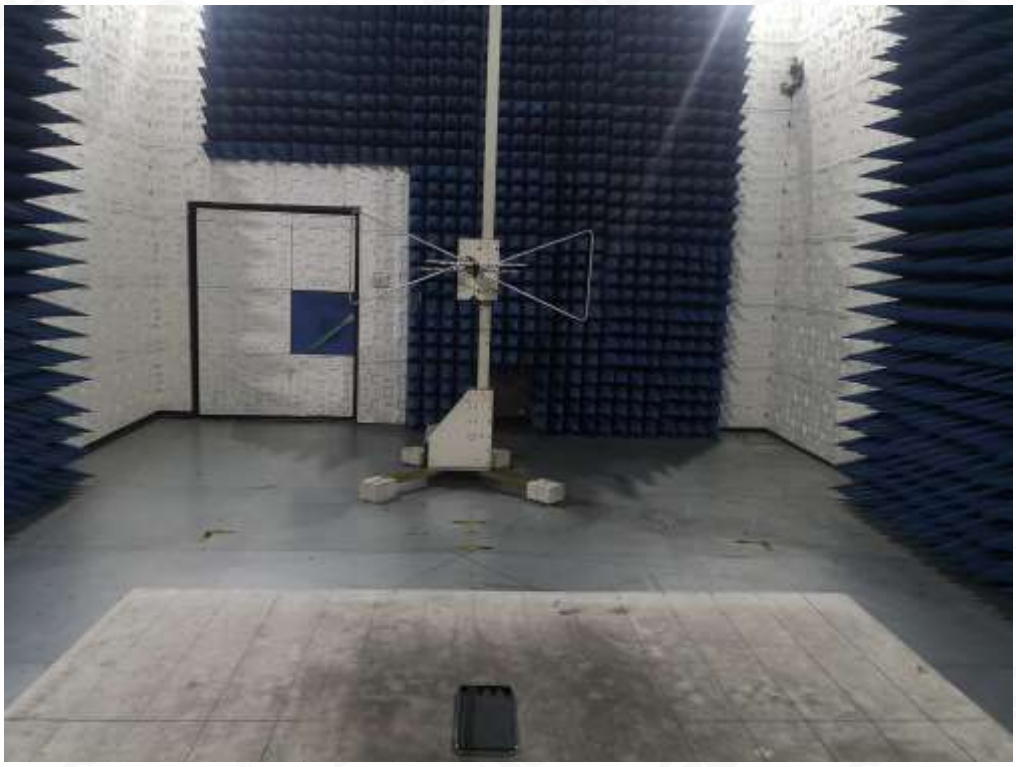
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 1GHz





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FCC LINE CONDUCTED EMISSION TEST SETUP

----END OF REPORT----

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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. 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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