

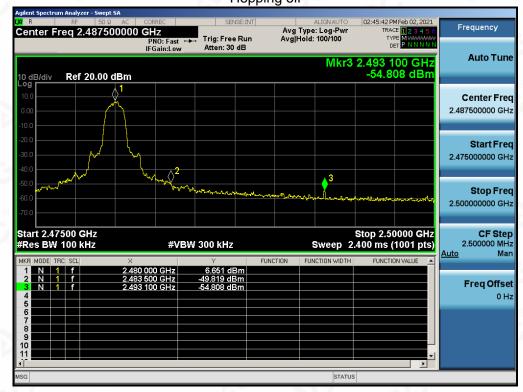
# $\pi$ /4-DQPSK MODULATION IN LOW CHANNEL

Hopping on



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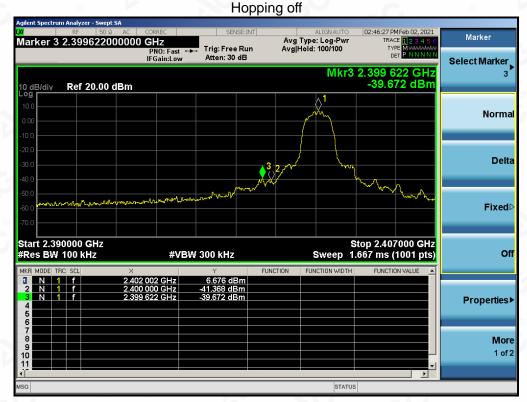
#### $\pi$ /4-DQPSK MODULATION IN HIGH CHANNEL Hopping off

Hopping on



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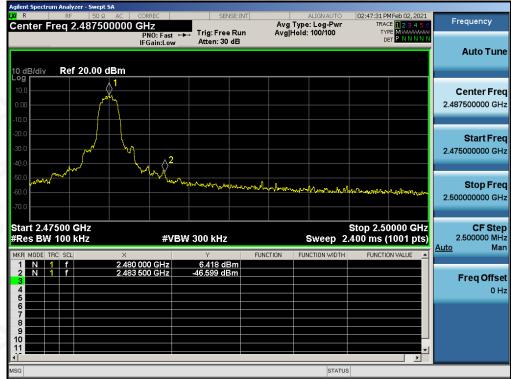
# 8-DPSK MODULATION IN LOW CHANNEL

Hopping on



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## 8-DPSK MODULATION IN HIGH CHANNEL

Hopping off

Hopping on



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#### **10. RADIATED EMISSION**

#### **10.1. MEASUREMENT PROCEDURE**

- 1. 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.
- 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 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. 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/3MHz for Peak, 1MHz/3MHz for Average

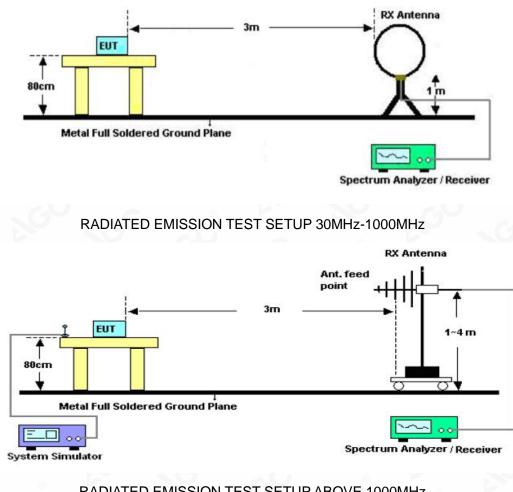
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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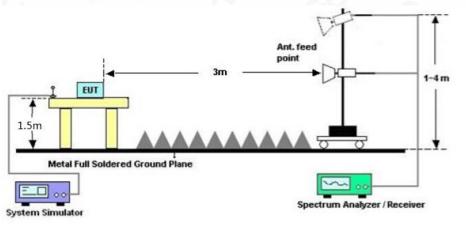
Report No.: AGC02390210103FE03 Page 42 of 69

#### **10.2. TEST SETUP**



Radiated Emission Test-Setup Frequency Below 30MHz

#### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



Dedicated Fest Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Dedicated Feature 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 AGE a/Inspection 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 15d Bf the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.

Attestation of Global Compliance(Shenzhen)Co., Ltd 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/

#### **10.3. LIMITS AND MEASUREMENT RESULT**

#### 15.209 Limit in the below table has 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.

#### **10.4. TEST RESULT**

#### **RADIATED EMISSION BELOW 30MHz**

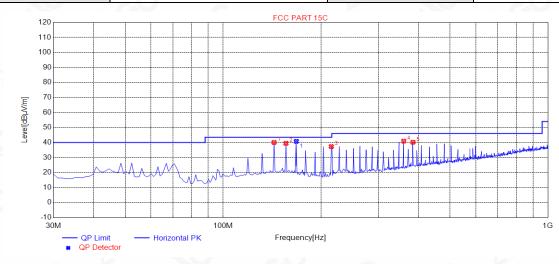
The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the stand in the report is not permitted without the written authorization of AGE in 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 15day authorize for the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc~cert.com.



EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

#### **RADIATED EMISSION BELOW 1GHz**



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	143.4900	40.04	14.88	43.50	3.46	200	213	Horizontal
2	156.1000	39.45	14.93	43.50	4.05	200	44	Horizontal
3	215.2700	37.33	12.98	43.50	6.17	100	177	Horizontal
4	359.8000	40.90	18.20	46.00	5.10	100	44	Horizontal
5	384.0500	40.18	19.23	46.00	5.82	100	44	Horizontal

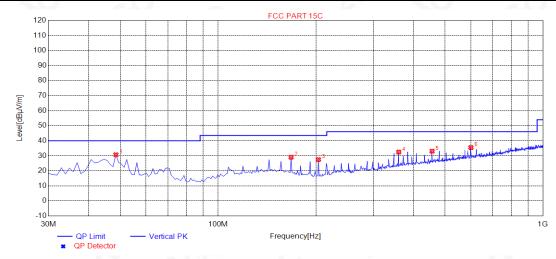
Final	Data List							
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	168.0184	14.14	40.78	43.50	2.72	140	290	Horizon tal

**RESULT: PASS** 

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EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical



	NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
ſ	1	48.4300	30.71	11.71	40.00	9.29	100	98	Vertical
ſ	2	167.7400	29.06	14.17	43.50	14.44	100	138	Vertical
ſ	3	203.6300	27.50	12.29	43.50	16.00	100	287	Vertical
ſ	4	359.8000	32.51	18.20	46.00	13.49	100	135	Vertical
	5	455.8300	33.08	21.10	46.00	12.92	100	340	Vertical
	6	600.3600	35.50	24.33	46.00	10.50	100	118	Vertical

#### **RESULT: PASS**

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

2. All test modes had been pre-tested. The mode 9 is the worst case and recorded in the report.

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EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	Mode 7	Antenna	Horizontal	

#### **RADIATED EMISSION ABOVE 1GHz**

Frequency	Meter Reading	Factor	<b>Emission Level</b>	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	65.46	0.08	65.54	74	-8.46	peak
4804.000	49.14	0.08	49.22	54	-4.78	AVG
7206.000	47.58	2.21	49.79	74	-24.21	peak
7206.000	37.46	2.21	39.67	54	-14.33	AVG
-,0						0
emark:		5			<u> </u>	0.0

EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type	
4804.000	64.94	0.08	65.02	74	-8.98	peak	
4804.000	49.27	0.08	49.35	54	-4.65	AVG	
7206.000	48.23	2.21	50.44	74	-23.56	peak	
7206.000	38.05	2.21	40.26	54	-13.74	AVG	
0.5	8			90	G		
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#### Report No.: AGC02390210103FE03 Page 47 of 69

EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 8	Antenna	Horizontal

-		=				
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.000	65.48	0.14	65.62	74	-8.38	peak
4882.000	49.19	0.14	49.33	54	-4.67	AVG
7323.000	41.56	2.36	43.92	74	-30.08	peak
7323.000	34.27	2.36	36.63	54	-17.37	AVG
0				()		
					2	

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

EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 8	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Value Type
4882.000	65.75	0.14	65.89	74	-8.11	peak
4882.000	49.34	0.14	49.48	54	-4.52	AVG
7323.000	40.89	2.36	43.25	74	-30.75	peak
7323.000	33.72	2.36	36.08	54	-17.92	AVG
3	() ()		G	.0	0	
mark:	©				<u>.</u>	

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

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#### Report No.: AGC02390210103FE03 Page 48 of 69

EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

Frequency M						
	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	65.86	0.22	66.08	74	-7.92	peak
4960.000	49.72	0.22	49.94	54	-4.06	AVG
7440.000	41.63	2.64	44.27	74	-29.73	peak
7440.000	32.11	2.64	34.75	54	-19.25	AVG
8		(		. 0		
	8			C.		

EUT **Model Name** BDE-BDM209 Bluetooth 5.1 Dual Mode Module Temperature 25°C **Relative Humidity** 55.4% Pressure 960hPa **Test Voltage** Normal Voltage **Test Mode** Mode 9 Vertical Antenna

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	65.41	0.22	65.63	74	-8.37	peak
4960.000	49.22	0.22	49.44	54	-4.56	AVG
7440.000	41.34	2.64	43.98	74	-30.02	peak
7440.000	33.79	2.64	36.43	54	-17.57	AVG
	6	<u> </u>	®			
				0		

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.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

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

All test modes had been tested. The 8DPSK modulation is the worst case and recorded in the report.

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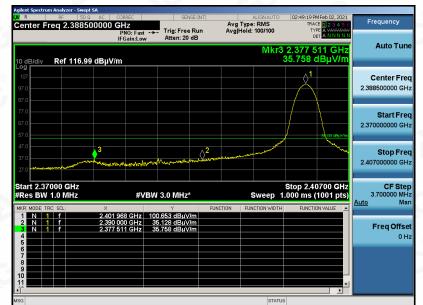
EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209		
Temperature	25°C	Relative Humidity	55.4%		
Pressure	960hPa	Test Voltage	Normal Voltage		
Test Mode	Mode 7	Antenna	Horizontal		

#### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

PK



AV



#### **RESULT: PASS**

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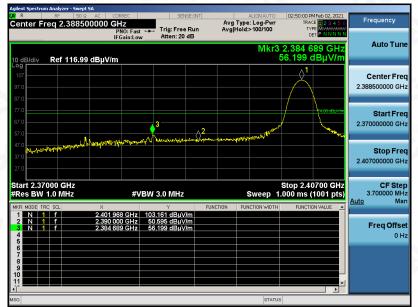
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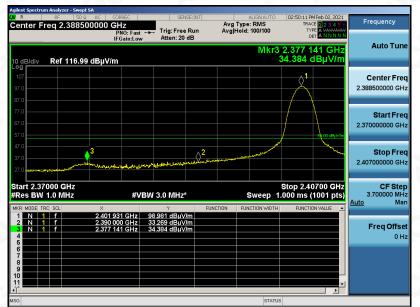
#### Report No.: AGC02390210103FE03 Page 50 of 69

EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 7	Antenna	Vertical

PK



AV



**RESULT: PASS** 

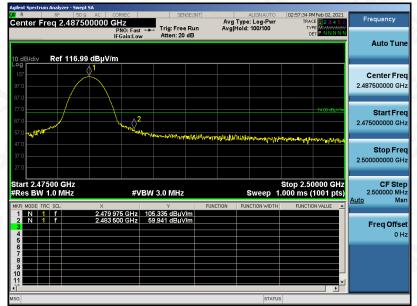
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#### Report No.: AGC02390210103FE03 Page 51 of 69

EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Horizontal

PK



AV



**RESULT: PASS** 

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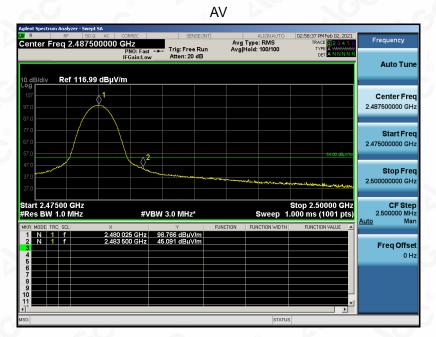


#### Report No.: AGC02390210103FE03 Page 52 of 69

EUT	Bluetooth 5.1 Dual Mode Module	Model Name	BDE-BDM209
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 9	Antenna	Vertical



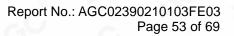
PK



## RESULT: PASS

**Note**: The factor had been edited in the "Input Correction" of the Spectrum Analyzer. The 8DPSK modulation is the worst case and recorded in the report.

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#### **11. NUMBER OF HOPPING FREQUENCY**

#### **11.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.

2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.

3. VBW  $\geq$  RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.

4. Allow the trace to stabilize.

#### **11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)**

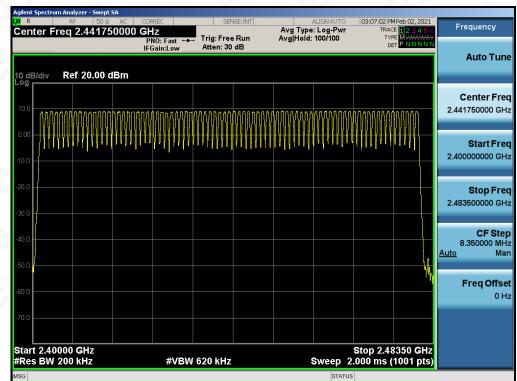
Same as described in section 8.2

#### **11.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6

#### **11.4. LIMITS AND MEASUREMENT RESULT**

TOTAL NO. OF HOPPING CHANNELLIMIT (NO. OF CH)>=15	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	>=15	79	PASS



TEST PLOT FOR NO. OF TOTAL CHANNELS

#### Note: The GFSK modulation is the worst case and recorded in the report.

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## 12. TIME OF OCCUPANCY (DWELL TIME)

#### **12.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Zero span, centered on a hopping channel.

2. RBW shall be  $\leq$  channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.

3. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.

4. Detector function: Peak. Trace: Max hold.

5. Use the marker-delta function to determine the transmit time per hop.

6. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer)  $\times$  (period specified in the requirements / analyzer sweep time)

7. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

#### 12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

#### 12.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

#### **12.4. LIMITS AND MEASUREMENT RESULT**

Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Sweep Time (ms)	Limit (ms)	
Low	2.890	30*4	346.800	400	
Middle	2.890	30*4	346.800	400	
High	2.890	29*4	335.240	400	

Note: The GFSK modulation is the worst case and recorded in the report.

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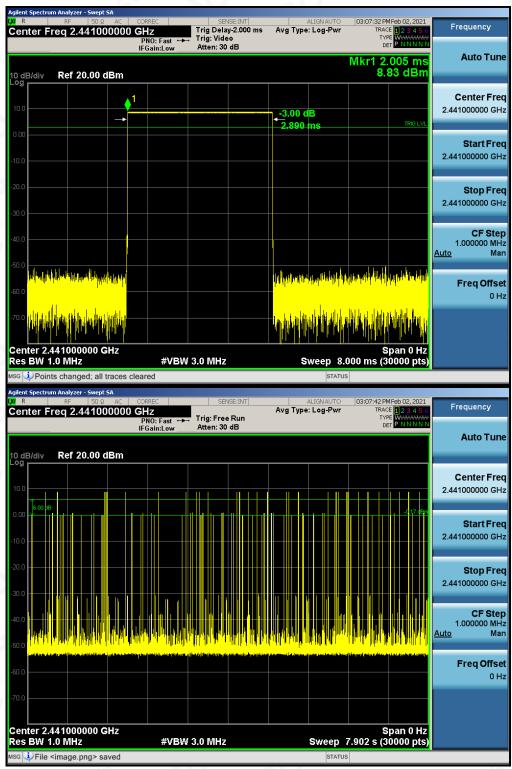


#### 03:07:12 PM Feb 02, 2021 Frequency Trig Delay-2.000 ms Trig: Video Atten: 30 dB Center Freq 2.402000000 GHz Avg Type: Log-Pwr PNO: Fast IFGain:Low Auto Tune 2.006 ms 8.81 dBm Mkr1 Ref 20.00 dBm 10 dB/div **Center Freq** 2.402000000 GHz -3.00 dE 2.890 ms Start Fred 2.40200000 GHz Stop Freq 2.402000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man لا استعال أحيط ألله والمتحاصل والمراجع والمناطقة والتراجي والمتكر والمكر والمتحاف والمتحاف والمتحاف والمتحاف والمحافظ Freq Offset 0 Hz Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 8.000 ms (30000 pts) #VBW 3.0 MHz G iPoints changed; all traces cleared TATUS 03:07:22 PM Feb 02, 2021 Center Freq 2.402000000 GHz Fast IFGain:Low Frequency Avg Type: Log-Pwr TRACE Trig: Free Run Atten: 30 dB DET P Auto Tune 10 dB/div Ref 20.00 dBm Center Frea 2.402000000 GHz Start Freq 2.402000000 GHz Stop Freq 2.40200000 GHz CF Step 1.000000 MHz Auto Mar **Freq Offset** 0 Hz Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 7.902 s (30000 pts) #VBW 3.0 MHz File <image.png> saved

#### TEST PLOT OF LOW CHANNEL

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#### TEST PLOT OF MIDDLE CHANNEL

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#### 52 PM Feb 02, 2021 Trig Delay-2.000 ms Trig: Video Atten: 30 dB Frequency Center Freq 2.480000000 GHz Avg Type: Log-Pwr PNO: Fast IFGain:Low Auto Tune Mkr1 2.006 8.99 dBm 10 dB/div Ref 20.00 dBm **Center Freq** 2.48000000 GHz -3.00 dB 2.890 ms Start Fred 2.48000000 GHz Stop Freq 2.48000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man a dala serie da la constana da la c . A shi ka mada ka shi ka s Freq Offset 0 Hz Center 2.480000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 8.000 ms (30000 pts) #VBW 3.0 MHz G iPoints changed; all traces cleared TATUS 03:08:02 PM Feb 02, 2021 Frequency Center Freq 2.480000000 GHz Avg Type: Log-Pwr TRACE Trig: Free Run Atten: 30 dB TYPE DET PNO: Fast IFGain:Lov Auto Tune 10 dB/div Ref 20.00 dBm Center Frea 2.480000000 GHz Start Freq 2.480000000 GHz Stop Freq 2.480000000 GHz CF Step 1.000000 MHz <u>Auto</u> Mar **Freq Offset** 0 Hz Span 0 Hz Sweep 7.902 s (30000 pts) Center 2.480000000 GHz Res BW 1.0 MHz #VBW 3.0 MHz File <image.png> saved

#### TEST PLOT OF HIGH CHANNEL

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#### **13. FREQUENCY SEPARATION**

#### **13.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Wide enough to capture the peaks of two adjacent channels.

2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

3. Video (or average) bandwidth (VBW)  $\geq$  RBW.

4. Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

#### **13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)**

Same as described in section 6.2

#### **13.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6.3

#### 13.4. LIMITS AND MEASUREMENT RESULT

TEST MODE	CHANNEL SEPARATION	LIMIT	RESULT		
	MHz		Dava		
Hopping Mode	1.000	>= 2/3 20 dB BW	Pass		

#### 03:10:05 PM Feb 02, 2021 Peak Search Marker 2 2.411152000000 GHz Avg Type: Log-Pw Avg|Hold>100/100 Trig: Free Run Atten: 40 dB PNO: Fast IFGain:Lov Next Peak Mkr2 2.411 152 GH 8.752 dBm Ref 30.00 dBm Next Pk Right Next Pk Left Marker Delta Center 2.411000 GHz #Res BW 300 kHz Span 4.000 MHz Sweep 1.000 ms (1001 pts) #VBW 300 kHz Mkr→CF 2.410 152 GHz 2.411 152 GHz 8.799 dBm 8.752 dBm Mkr→RefLvl More 1 of 2

#### Note: The GFSK modulation is the worst case and recorded in the report.

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 Tel: +86-755 2523 4088
 E-mail: agc@agc-cert.com

#### TEST PLOT FOR FREQUENCY SEPARATION

### 14. FCC LINE CONDUCTED EMISSION TEST

#### 14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

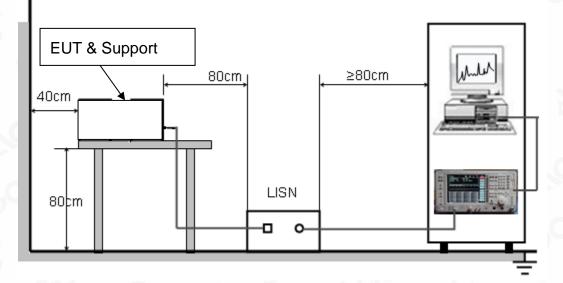
Francisco	Maximum RF Line Voltage					
Frequency	Q.P. (dBµV)	Average (dBµV)				
150kHz~500kHz	66-56	56-46				
500kHz~5MHz	56	46				
5MHz~30MHz	60	50				

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.

#### 14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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#### 14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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 EUT received DC 5V power from adapter which received AC120V/60Hz power from 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.

#### 14.4. 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.
- 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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# 

Line Conducted Emission Test Line 1-L

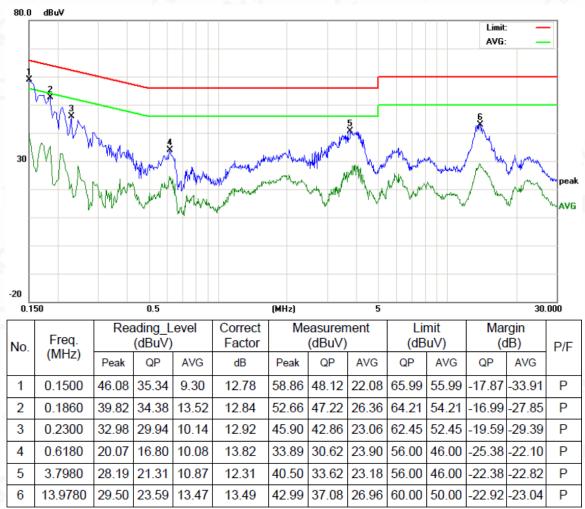
#### 14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

No. Freq. (MHz)	Reading_Level (dBuV)		Correct Factor	Measurement (dBuV)		Limit (dBuV)		Margin (dB)		P/F			
	(IVIHZ)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG	
1	0.1660	46.30	39.52	23.12	12.81	59.11	52.33	35.93	65.15	55.15	-12.82	-19.22	Р
2	0.2180	39.07	33.57	19.10	12.90	51.97	46.47	32.00	62.89	52.89	-16.42	-20.89	Р
3	0.2779	33.09	24.80	7.81	12.98	46.07	37.78	20.79	60.88	50.88	-23.10	-30.09	Р
4	0.3339	27.89	20.12	8.59	13.17	41.06	33.29	21.76	59.35	49.35	-26.06	-27.59	Р
5	4.0820	28.54	20.76	11.17	11.82	40.36	32.58	22.99	56.00	46.00	-23.42	-23.01	Р
6	13.7780	33.97	28.18	21.72	13.48	47.45	41.66	35.20	60.00	50.00	-18.34	-14.80	Р

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Line Conducted Emission Test Line 2-N

#### **RESULT: PASS**

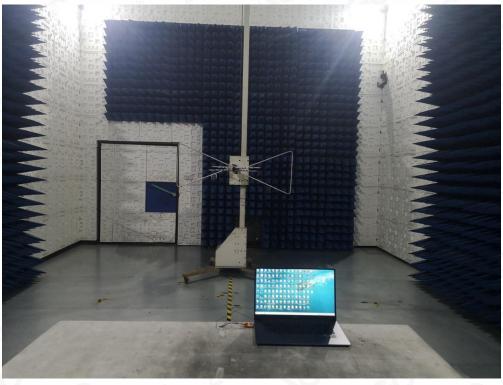
Note: All the test modes had been tested, the mode 9 was the worst case. Only the data of the worst case would be record in this test report.

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## APPENDIX A: PHOTOGRAPHS OF TEST SETUP RADIATED EMISSION TEST SETUP BELOW 1GHz



RADIATED EMISSION TEST SETUP ABOVE 1GHz



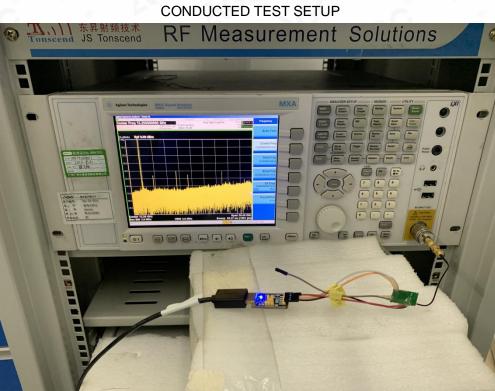
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CONDUCTED EMISSION TEST SETUP

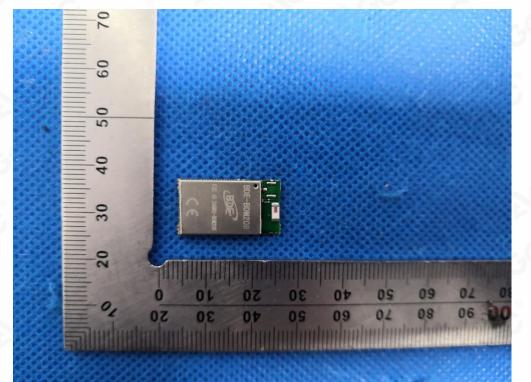


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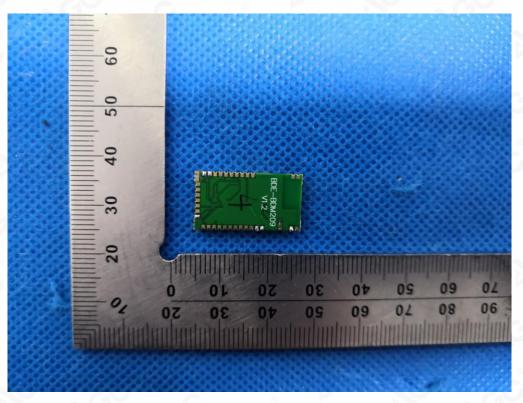


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#### APPENDIX B: PHOTOGRAPHS OF EUT EXTERNAL VIEW-1 OF EUT

**EXTERNAL VIEW-2 OF EUT** 

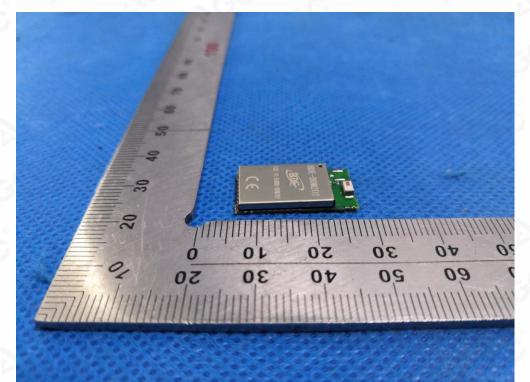


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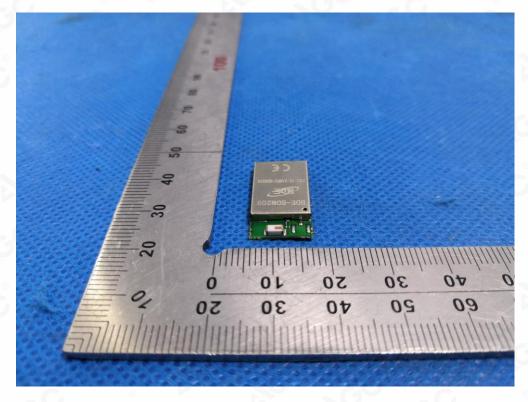


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#### **EXTERNAL VIEW-3 OF EUT**



**EXTERNAL VIEW-4 OF EUT** 

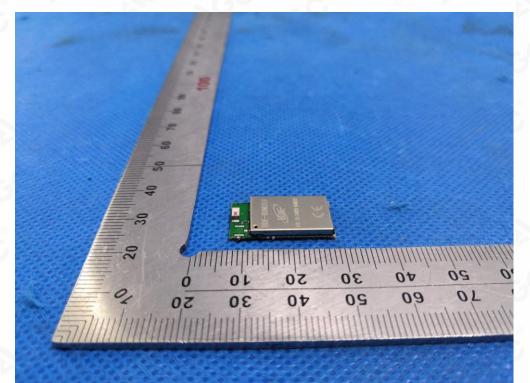


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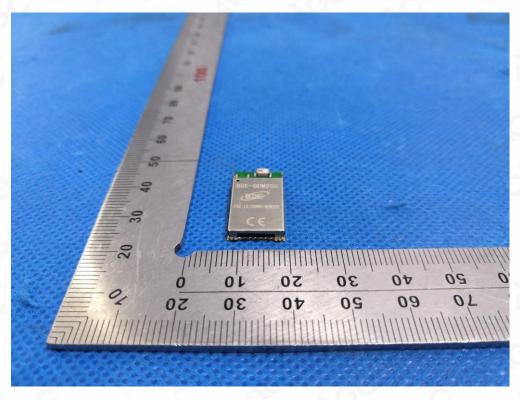


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#### **EXTERNAL VIEW-5 OF EUT**



**EXTERNAL VIEW-6 OF EUT** 

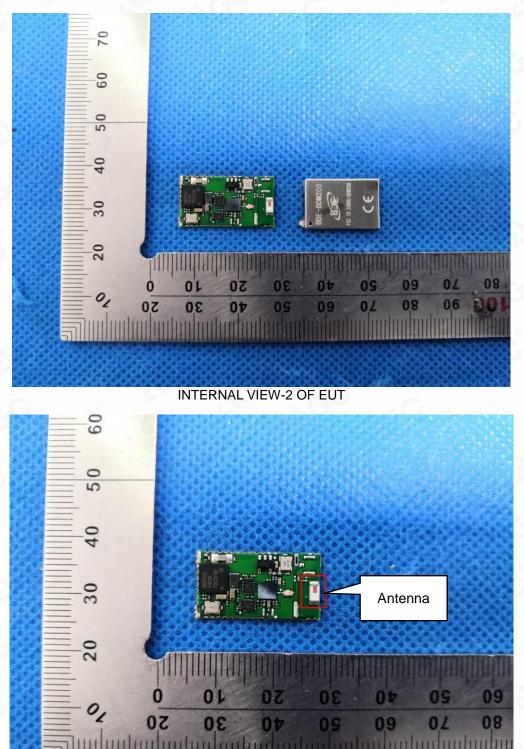


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#### **INTERNAL VIEW-1 OF EUT**



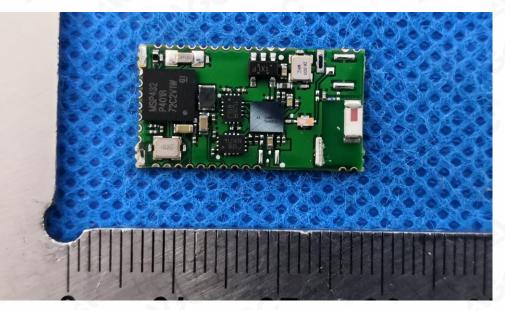
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INTERNAL VIEW-3 OF EUT



----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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