

FCC Test Report

Report No.: AGC04914171101FE03

FCC ID : DVU-PXE-0850S
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : External Bluetooth
BRAND NAME : ALPINE
MODEL NAME : PXE-0850P-BT
CLIENT : Alpine Electronics of America Inc
DATE OF ISSUE : Jan. 19, 2018
STANDARD(S) : FCC Part 15 Subpart C Section 15.249
TEST PROCEDURE(S)
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

CAUTION:

This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 19, 2018	Valid	Initial release

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY	4
2. GENERAL INFORMATION	5
2.1. PRODUCT DESCRIPTION	5
2.2. TABLE OF CARRIER FREQUENCIES	5
3. MEASUREMENT UNCERTAINTY	7
4. DESCRIPTION OF TEST MODES	7
5. SYSTEM TEST CONFIGURATION	9
5.1. CONFIGURATION OF EUT SYSTEM	9
5.2. EQUIPMENT USED IN EUT SYSTEM	9
5.3. SUMMARY OF TEST RESULTS	10
6. TEST FACILITY	11
7. TEST METHOD	12
8. TEST EQUIPMENT LIST	12
9. RADIATED EMISSION	13
9.1 TEST LIMIT	13
9.2. MEASUREMENT PROCEDURE	14
9.3. TEST SETUP	16
9.4. TEST RESULT	18
10. BAND EDGE EMISSION	46
10.1. MEASUREMENT PROCEDURE	46
10.2 TEST SETUP	46
10.3 RADIATED TEST RESULT	47
11. 20DB BANDWIDTH	55
11.1. MEASUREMENT PROCEDURE	55
11.2. TEST SET-UP	55
11.3. LIMITS AND MEASUREMENT RESULTS	55
12. FCC LINE CONDUCTED EMISSION TEST	64
12.1. LIMITS OF LINE CONDUCTED EMISSION TEST	64
12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	64
12.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	65
12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	65
12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	65
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	66
APPENDIX B: PHOTOGRAPHS OF EUT	68

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

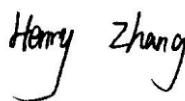
1. VERIFICATION OF CONFORMITY

Applicant	Alpine Electronics of America Inc
Address	19145 Gramercy Place, Torrance, CA 90501 USA
Manufacturer	Alpine Electronics of America Inc
Address	19145 Gramercy Place, Torrance, CA 90501 USA
Product Designation	External Bluetooth
Brand Name	ALPINE
Test Model	PXE-0850P-BT
Date of test	Jan. 06, 2018 to Jan. 16, 2018
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.249. The test results of this report relate only to the tested sample identified in this report.

Tested By



Henry Zhang(Zhang Zhuorui) Jan. 16, 2018

Reviewed By



Forrest Lei(Lei Yonggang) Jan. 19, 2018

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz
RF Output Power (for BR/EDR)	2.18dBm(Max EIRP Power=Max radiation field-95.2)
RF Output Power (for BLE)	1.86dBm(Max EIRP Power=Max radiation field-95.2)
Bluetooth Version	V4.0
Modulation	BR ☒ GFSK, EDR ☒ $\pi/4$ -DQPSK, ☒ 8DPSK BLE ☒ GFSK
Number of channels	79 for BR/EDR, 40 for BLE
Hardware Version	CH-WJ-LANYA-CW1
Software Version	V1.1.2
Antenna Designation	PCB Antenna
Antenna Gain	0dBi
Power Supply	DC 3.7V

2.2. TABLE OF CARRIER FREQUENCIES

BR/EDR channel List

Frequency Band	Channel Number	Frequency
2400~2483.5MHz	0	2402MHz
	1	2403MHz
	:	:
	38	2440 MHz
	39	2441 MHz
	40	2442 MHz
	:	:
	77	2479 MHz
	78	2480 MHz

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

BLE Channel List

Frequency Band	Channel Number	Frequency
2400~2483.5MHz	0	2402MHz
	1	2404MHz
	:	:
	38	2478 MHz
	39	2480 MHz

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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 of Conducted Emission, $U_c = \pm 3.2$ dB
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9$ dB
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8$ dB

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	Low channel $\pi/4$ -DQPSK
5	Middle channel $\pi/4$ -DQPSK
6	High channel $\pi/4$ -DQPSK
7	Low channel 8DPSK
8	Middle channel 8DPSK
9	High channel 8DPSK
10	BT Link

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

Software Setting

BlueTest3

Test Mode

PAUSE
RADIO STATUS
RADIO STATUS FULL

TXSTART
TXDATA1
TXDATA2
TXDATA3
TXDATA4

RXSTART1
RXSTART2
RXDATA1

Test Arguments

LD Freq. (MHz)

2441

Power (Ext, Int)

50

50

Test Results

☐ Save to file

Browse for file

Display : ☒ Standard ☐ Bit Error

.\logfile.txt

```

Opening USB SPI (600384).
Transport active.
BC7 (Hardware ID 0x332) firmware version 8648.
Sent Command Varid 5004, parameters: 0004, 0989, 3232, 0000, 0000, 0000.
Radio Test TXDATA1 successful
Sent Command Varid 5004, parameters: 0004, 0989, 3232, 0000, 0000, 0000.
Radio Test TXDATA1 successful
Sent Command Varid 5004, parameters: 0004, 0989, 3232, 0000, 0000, 0000.
Radio Test TXDATA1 successful

```

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

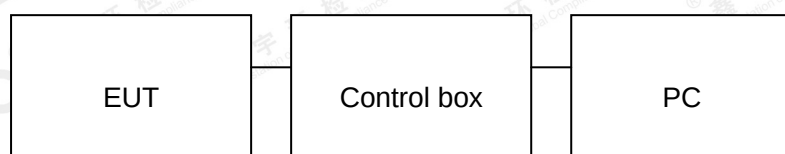
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1: (Normal hopping)



Configure 2: (Control continuous TX)



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	External Bluetooth	ALPINE	PXE-0850P-BT	EUT
2	PC	APPLE	A1465	A.E
3	Control box	CSR	USB_SPI_TOOLS	A.E
4	USB Cable	N/A	1m unshielded	A.E
5	Battery	SAIL	12V 60Ah 356A	A.E
6	Advanced Wireless Digital Sound Processor	ALPINE	PXE-0850S	A.E

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249(a) §15.209	Radiated Emission	Compliant
§15.249(d)	Band Edges	Compliant
§15.207	Conduction Emission	N/A
§15.215	Bandwidth	Compliant

Note: N/A means it's not applicable to this item.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, Baoan Bldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012
NVLAP Lab Code	600153-0
Designation Number	CN5028
FCC Test Firm Registration Number	682566
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

7. TEST METHOD

All measurements contained in this report were conducted with ANSI C63.10-2013

8. TEST EQUIPMENT LIST

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun.20, 2017	Jun.19, 2018
LISN	R&S	ESH2-Z5	100086	Aug.21, 2017	Aug.20, 2018

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.20, 2017	Jun.19, 2018
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.08, 2017	Dec.07, 2018
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.20, 2017	Sep.19, 2018
preamplifier	ChengYi	EMC184045SE	980508	Sep.15, 2017	Sep.14, 2018
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 18, 2017	May 17, 2019
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun.20, 2017	Jun.19, 2018
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2018
Loop Antenna	A.H.Systems,Inc	SAS-562B	--	Mar. 01, 2016	Feb. 28, 2018

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

9. RADIATED EMISSION

9.1 TEST LIMIT

Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		$\mu V/m$	$dB(\mu V)/m$
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 $dB(\mu V)/m$ (Peak) 54.0 $dB(\mu V)/m$ (Average)	

Remark:

- (1) Emission level $dB\mu V = 20 \log$ Emission level $\mu V/m$
- (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.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

9.2. MEASUREMENT PROCEDURE

1. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Below 1GHz)
2. The measuring distance of 3m shall used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Above 1GHz)
3. The height of the test antenna shall vary between 1m to 4m.Both horizontal and vertical polarization Of the antenna are set to make the measurement.
4. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
5. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform(Below 1GHz)
6. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform.(Above 1GHz)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

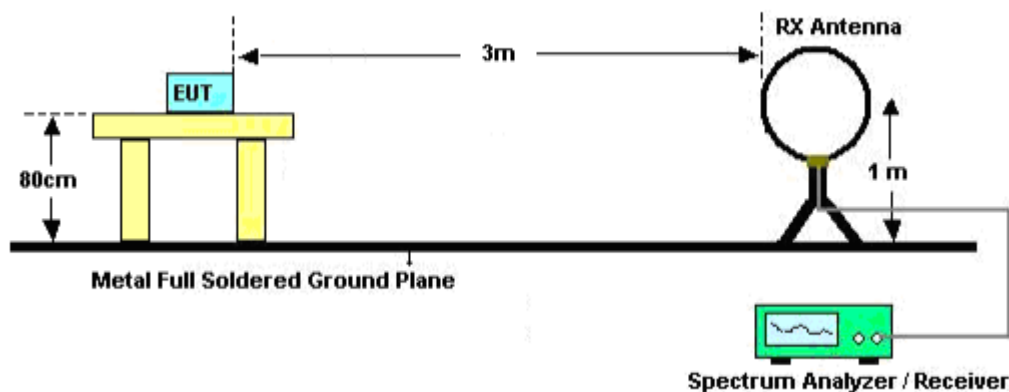
The following table is the setting of spectrum analyzer and receiver.

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 RBW 2MHz/ VBW 6MHz for Peak, RBW 1.5MHz/ VBW 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

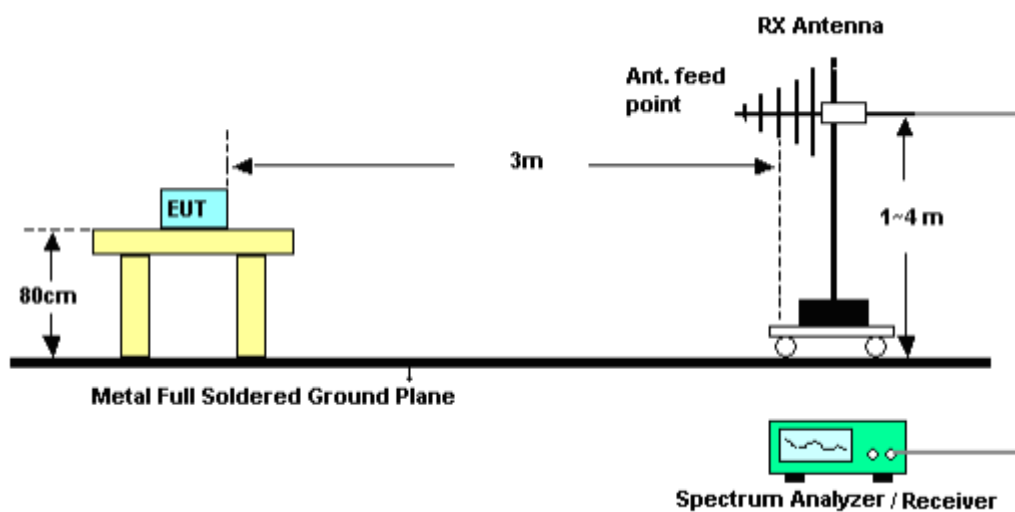
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

9.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz

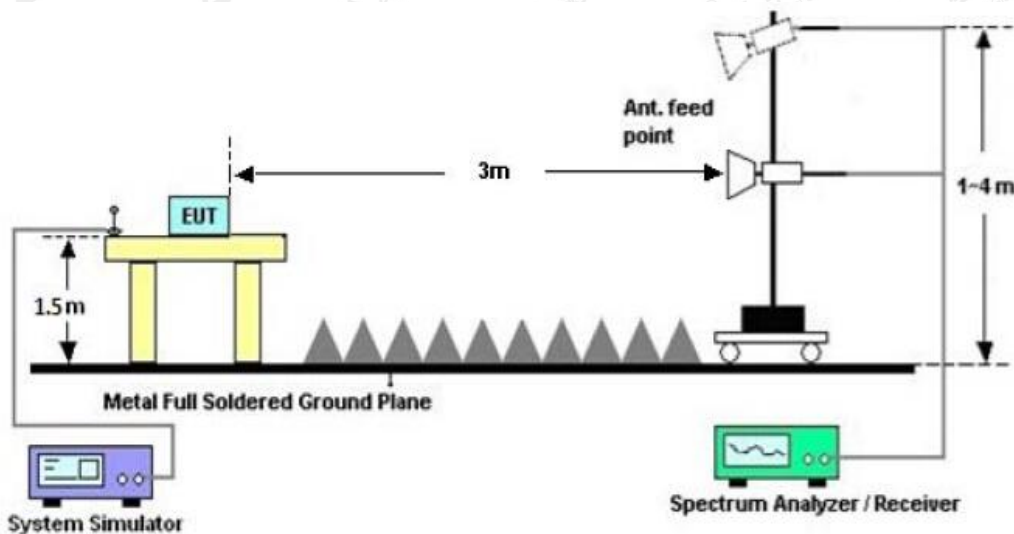


RADIATED EMISSION TEST SETUP 30MHz-1000MHz



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST SETUP ABOVE 1000MHz



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

9.4. TEST RESULT

(Worst modulation: GFSK)

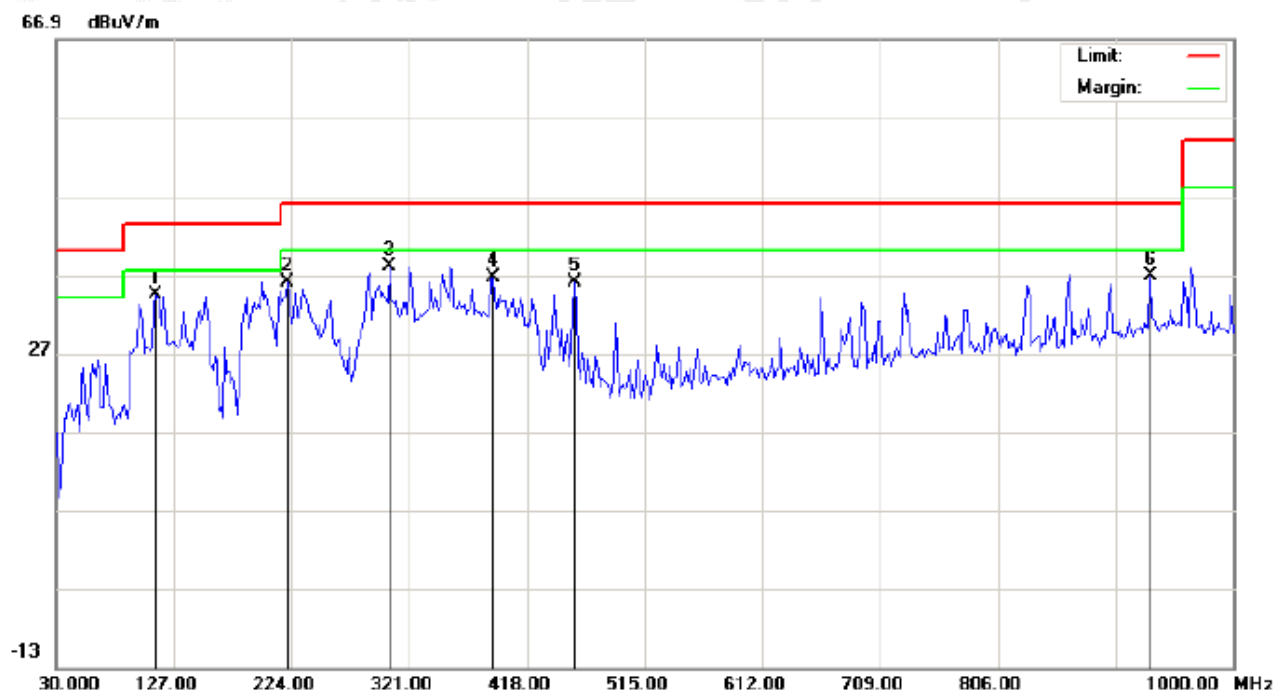
FOR BR/EDR

RADIATED EMISSION BELOW 30MHz

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHz

RADIATED EMISSION TEST- (30MHz-1GHz)-LOW CHANNEL-HORIZONTAL

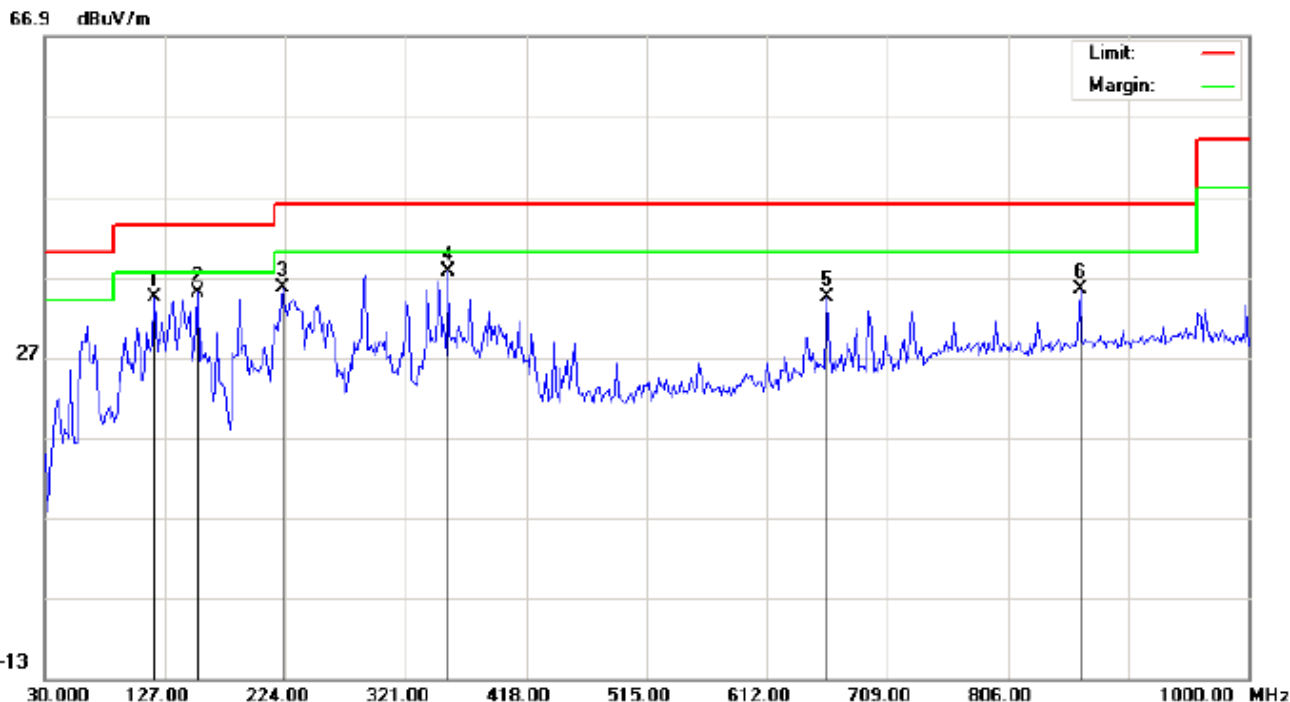


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		112.4500	26.81	7.60	34.41	43.50	-9.09	peak			
2		220.7667	26.19	9.88	36.07	46.00	-9.93	peak			
3	*	304.8333	22.37	15.73	38.10	46.00	-7.90	peak			
4		390.5167	17.55	19.01	36.56	46.00	-9.44	peak			
5		456.8000	15.31	20.66	35.97	46.00	-10.03	peak			
6		932.1000	7.33	29.50	36.83	46.00	-9.17	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHZ-1GHZ)-LOW CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		118.9167	28.16	6.32	34.48	43.50	-9.02	peak			
2		152.8667	19.70	15.28	34.98	43.50	-8.52	peak			
3		222.3833	24.48	11.19	35.67	46.00	-10.33	peak			
4	*	354.9500	18.75	18.77	37.52	46.00	-8.48	peak			
5		660.5000	10.18	24.13	34.31	46.00	-11.69	peak			
6		864.2000	7.68	27.68	35.36	46.00	-10.64	peak			

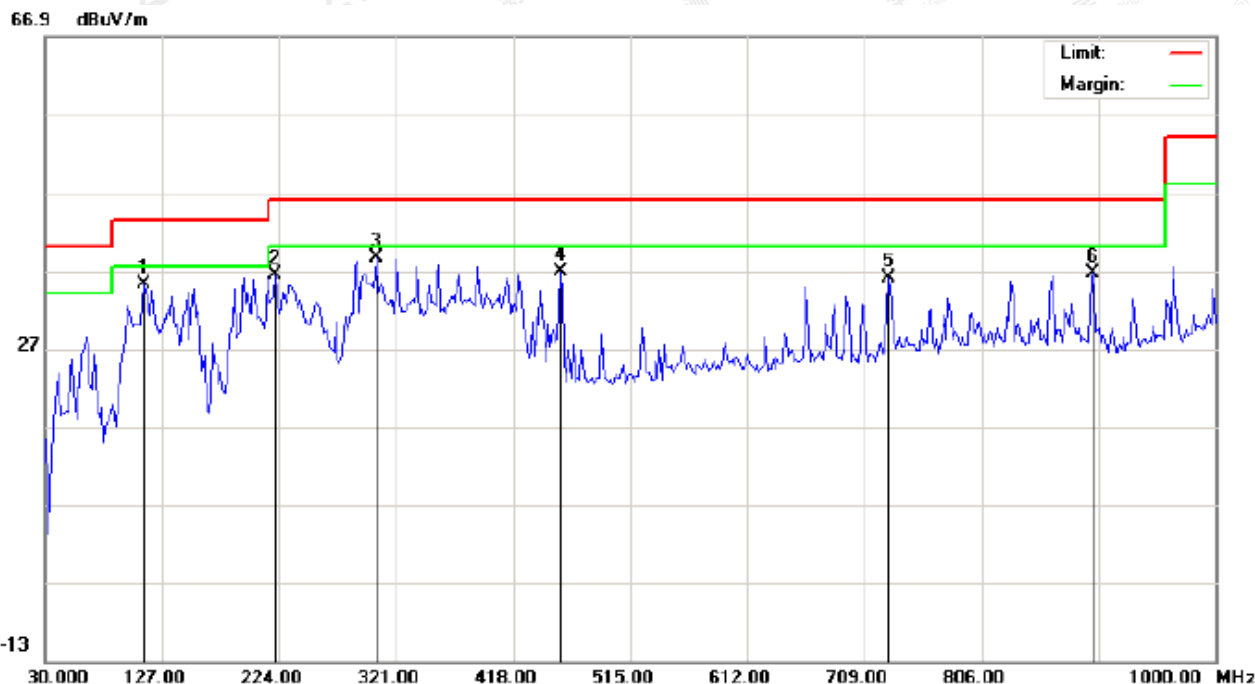
RESULT: PASS

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

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHZ-1GHZ)-MIDDLE CHANNEL-HORIZONTAL

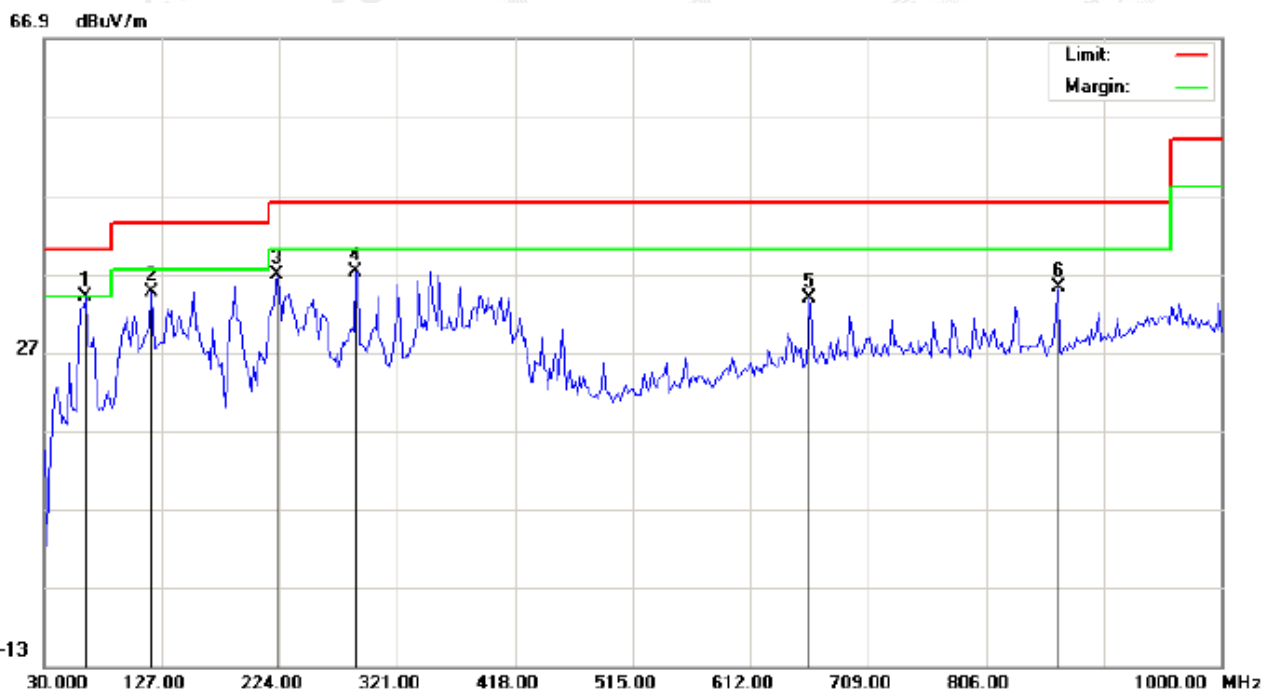


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		112.4500	27.56	7.60	35.16	43.50	-8.34	peak			
2		220.7667	26.44	9.88	36.32	46.00	-9.68	peak			
3	*	304.8333	22.81	15.73	38.54	46.00	-7.46	peak			
4		456.8000	16.06	20.66	36.72	46.00	-9.28	peak			
5		728.4000	10.07	26.02	36.09	46.00	-9.91	peak			
6		898.1500	8.14	28.56	36.70	46.00	-9.30	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHz-1GHz)- MIDDLE CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	63.9500	27.48	6.61	34.09	40.00	-5.91	peak			
2		118.9167	28.37	6.32	34.69	43.50	-8.81	peak			
3		222.3833	25.55	11.19	36.74	46.00	-9.26	peak			
4		287.0500	22.26	15.02	37.28	46.00	-8.72	peak			
5		660.5000	9.58	24.13	33.71	46.00	-12.29	peak			
6		865.8167	7.56	27.72	35.28	46.00	-10.72	peak			

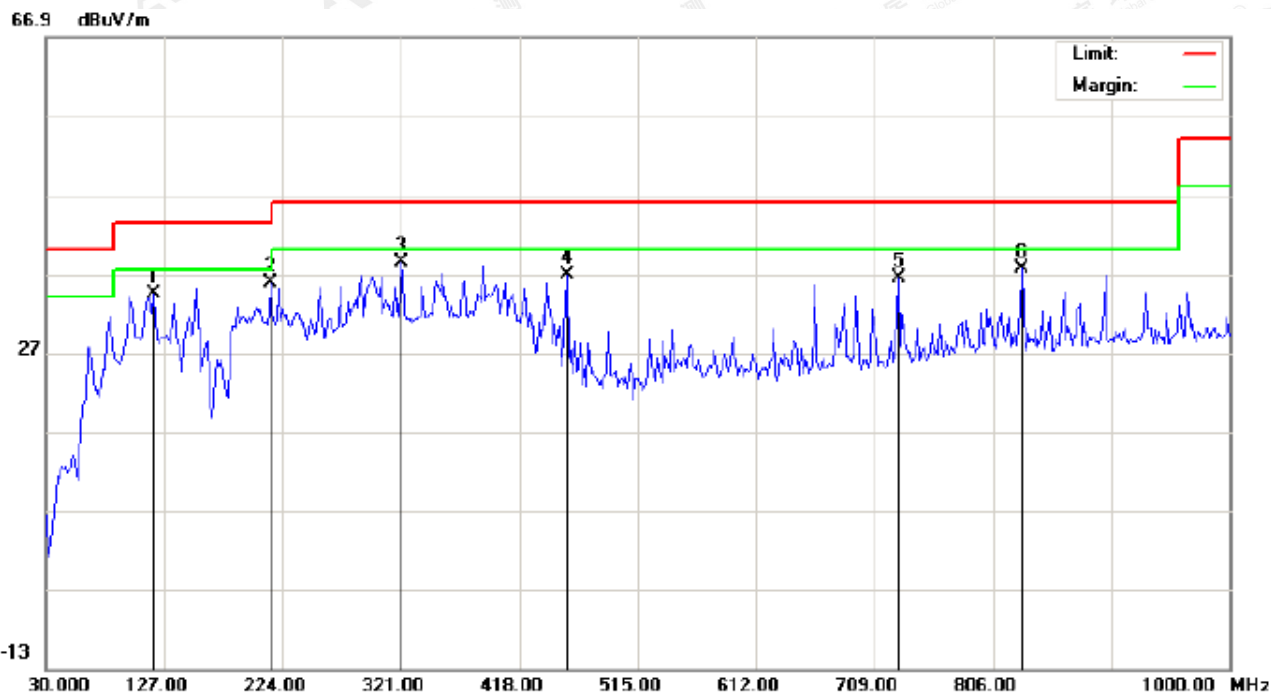
RESULT: PASS

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

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHz-1GHz)-HIGH CHANNEL-HORIZONTAL

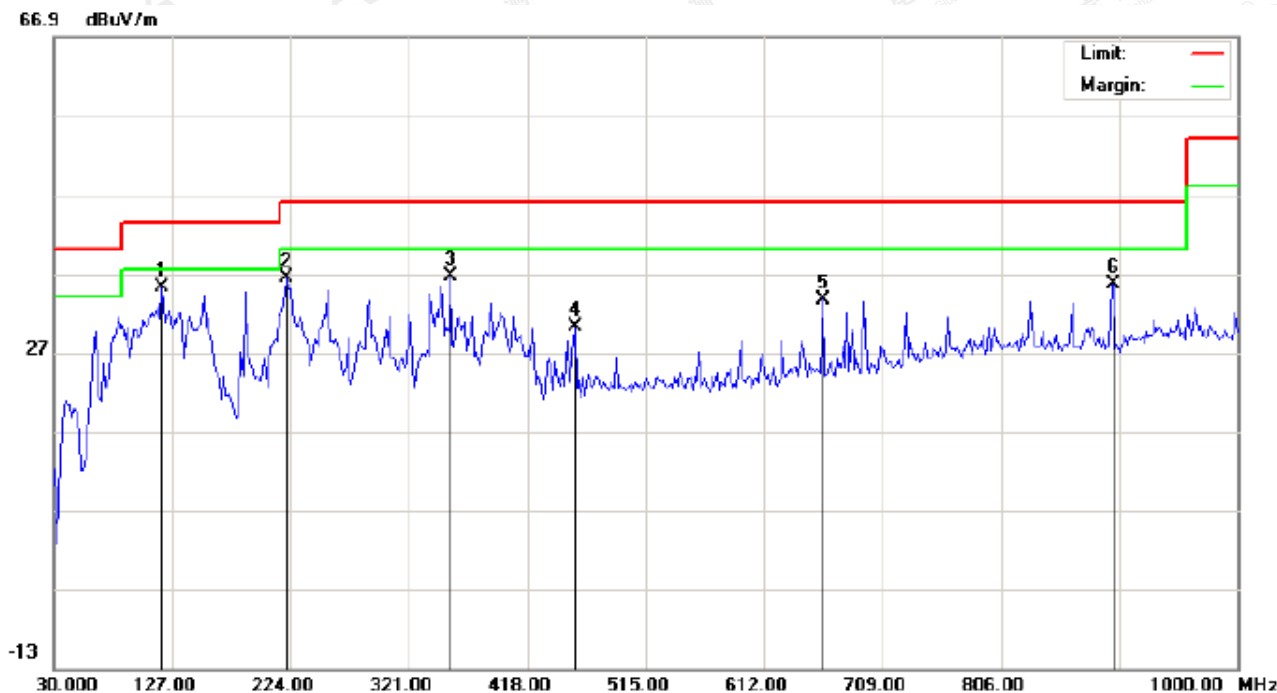


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		118.9167	28.30	6.11	34.41	43.50	-9.09	peak			
2		214.3000	25.18	10.54	35.72	43.50	-7.78	peak			
3	*	321.0000	21.55	16.81	38.36	46.00	-7.64	peak			
4		456.8000	16.21	20.66	36.87	46.00	-9.13	peak			
5		728.4000	10.30	26.02	36.32	46.00	-9.68	peak			
6		830.2500	10.27	27.31	37.58	46.00	-8.42	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHz-1GHz)-HIGH CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	118.9167	28.82	6.32	35.14	43.50	-8.36	peak			
2		220.7667	25.30	11.04	36.34	46.00	-9.66	peak			
3		354.9500	17.84	18.77	36.61	46.00	-9.39	peak			
4		456.8000	9.49	20.66	30.15	46.00	-15.85	peak			
5		660.5000	9.57	24.13	33.70	46.00	-12.30	peak			
6		898.1500	7.12	28.56	35.68	46.00	-10.32	peak			

RESULT: PASS

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

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

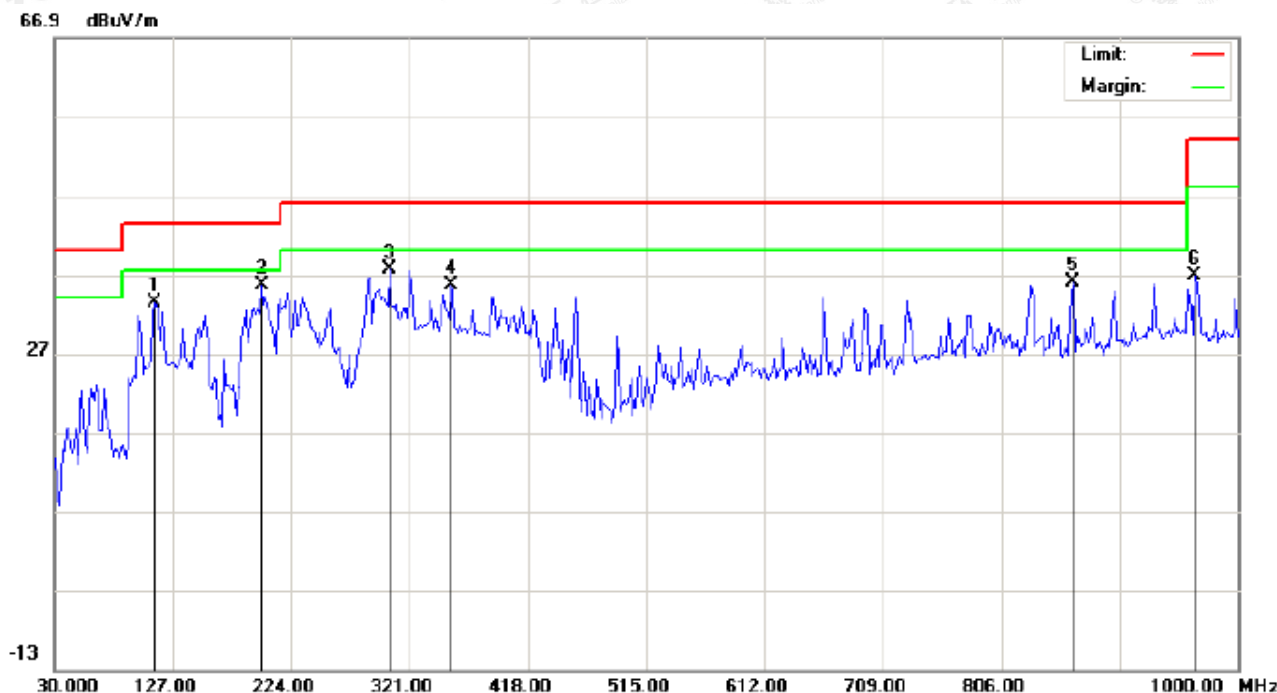
FOR BLE

RADIATED EMISSION BELOW 30MHz

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHz

RADIATED EMISSION TEST- (30MHz-1GHz)-LOW CHANNEL-HORIZONTAL

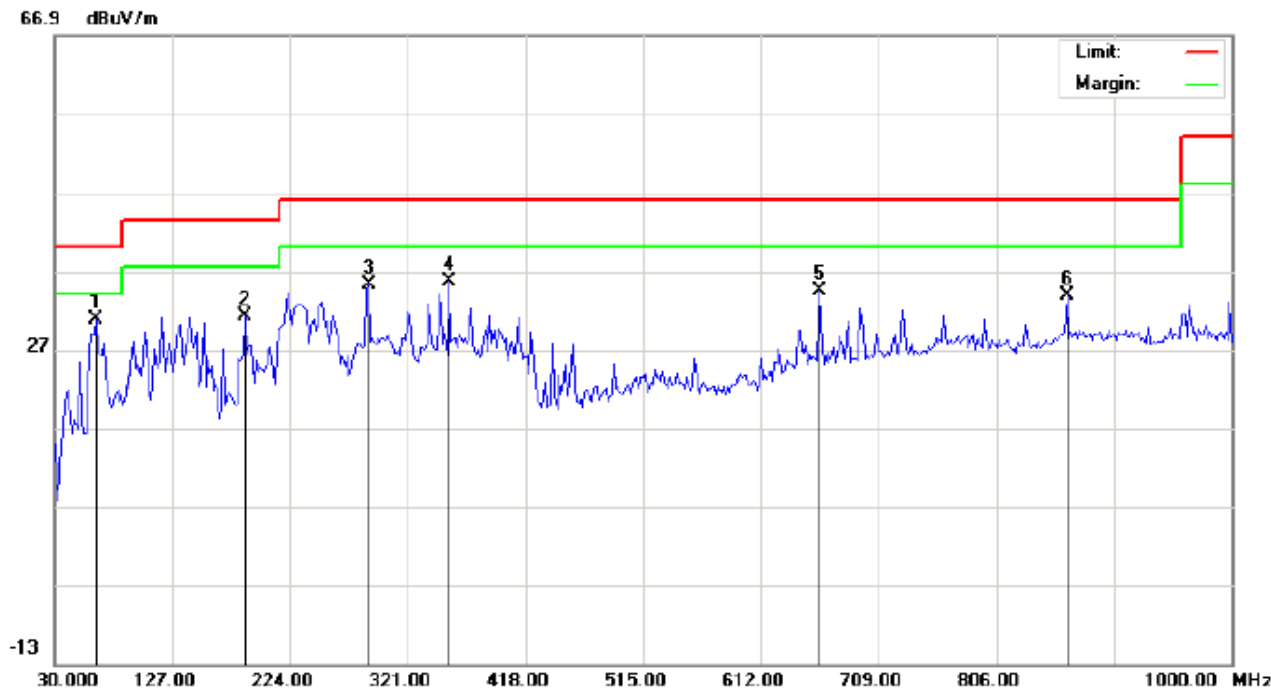


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		112.4500	25.81	7.60	33.41	43.50	-10.09	peak			
2	*	199.7500	23.52	11.99	35.51	43.50	-7.99	peak			
3		304.8333	21.87	15.73	37.60	46.00	-8.40	peak			
4		354.9500	16.79	18.77	35.56	46.00	-10.44	peak			
5		864.2000	8.27	27.68	35.95	46.00	-10.05	peak			
6		964.4333	7.01	29.86	36.87	54.00	-17.13	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHz-1GHz)-LOW CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	63.9500	24.23	6.61	30.84	40.00	-9.16	peak			
2		186.8167	18.93	12.34	31.27	43.50	-12.23	peak			
3		288.6667	20.18	15.07	35.25	46.00	-10.75	peak			
4		354.9500	16.75	18.77	35.52	46.00	-10.48	peak			
5		660.5000	10.18	24.13	34.31	46.00	-11.69	peak			
6		864.2000	6.18	27.68	33.86	46.00	-12.14	peak			

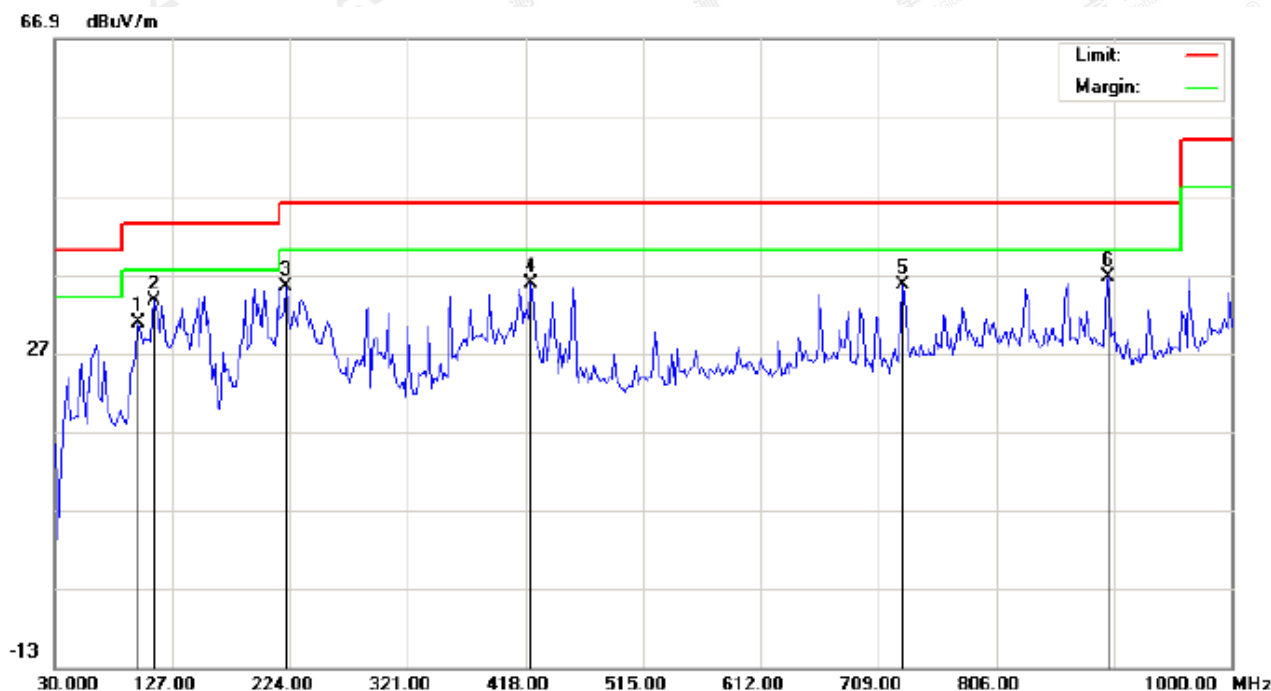
RESULT: PASS

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

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHZ-1GHZ)-MIDDLE CHANNEL-HORIZONTAL

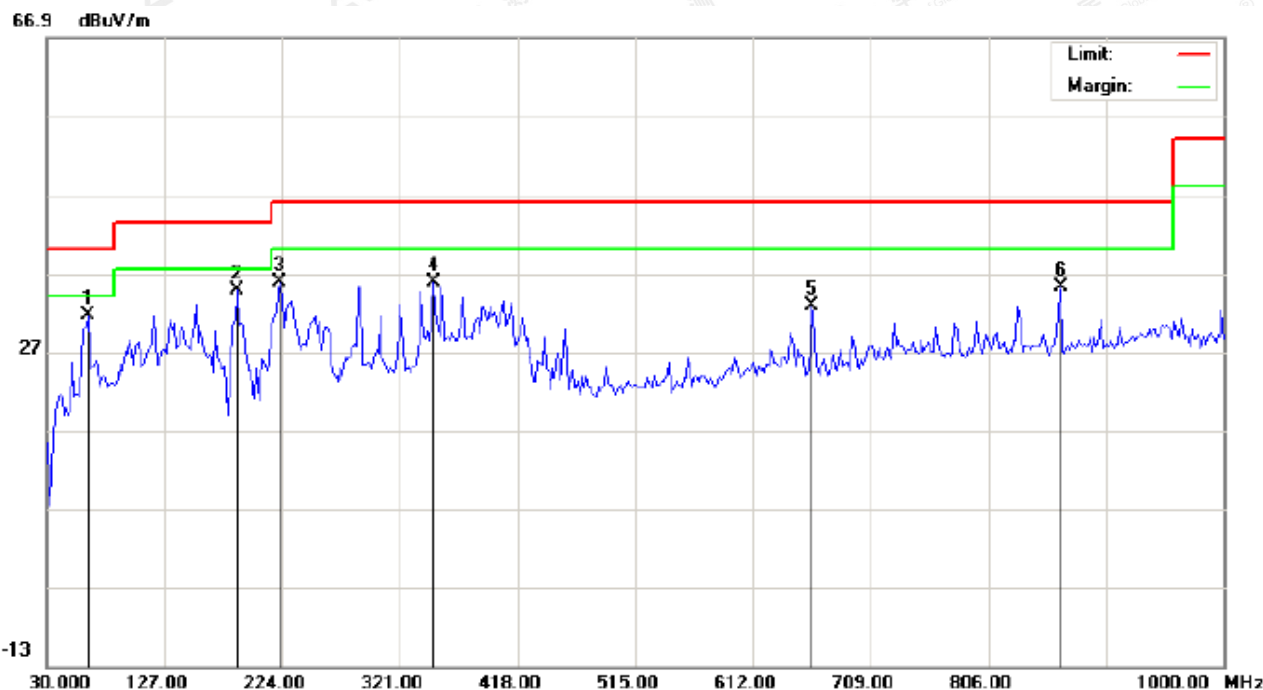


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		99.5167	20.86	10.00	30.86	43.50	-12.64	peak			
2		112.4500	26.06	7.60	33.66	43.50	-9.84	peak			
3		220.7667	25.44	9.88	35.32	46.00	-10.68	peak			
4		422.8500	16.09	19.76	35.85	46.00	-10.15	peak			
5		728.4000	9.57	26.02	35.59	46.00	-10.41	peak			
6	*	898.1500	8.14	28.56	36.70	46.00	-9.30	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHz-1GHz)- MIDDLE CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	63.9500	24.98	6.61	31.59	40.00	-8.41	peak			
2		186.8167	22.48	12.34	34.82	43.50	-8.68	peak			
3		222.3833	24.55	11.19	35.74	46.00	-10.26	peak			
4		348.4833	17.13	18.64	35.77	46.00	-10.23	peak			
5		660.5000	8.58	24.13	32.71	46.00	-13.29	peak			
6		865.8167	7.56	27.72	35.28	46.00	-10.72	peak			

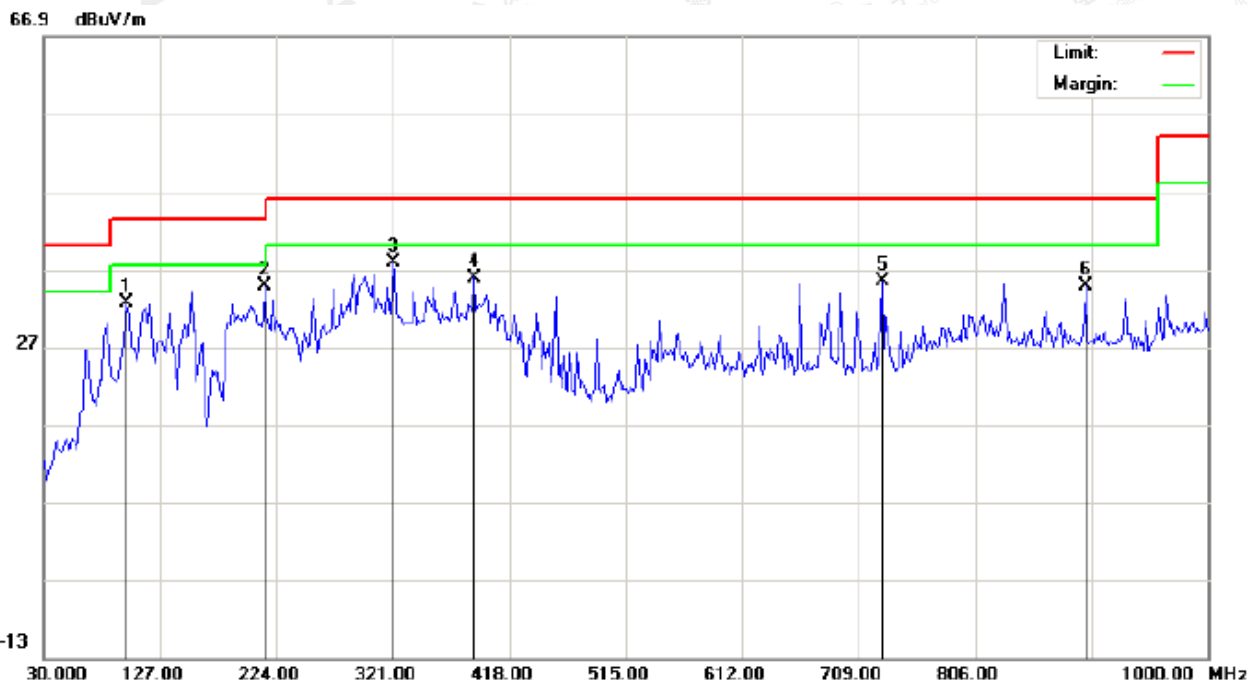
RESULT: PASS

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

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHz-1GHz)-HIGH CHANNEL-HORIZONTAL

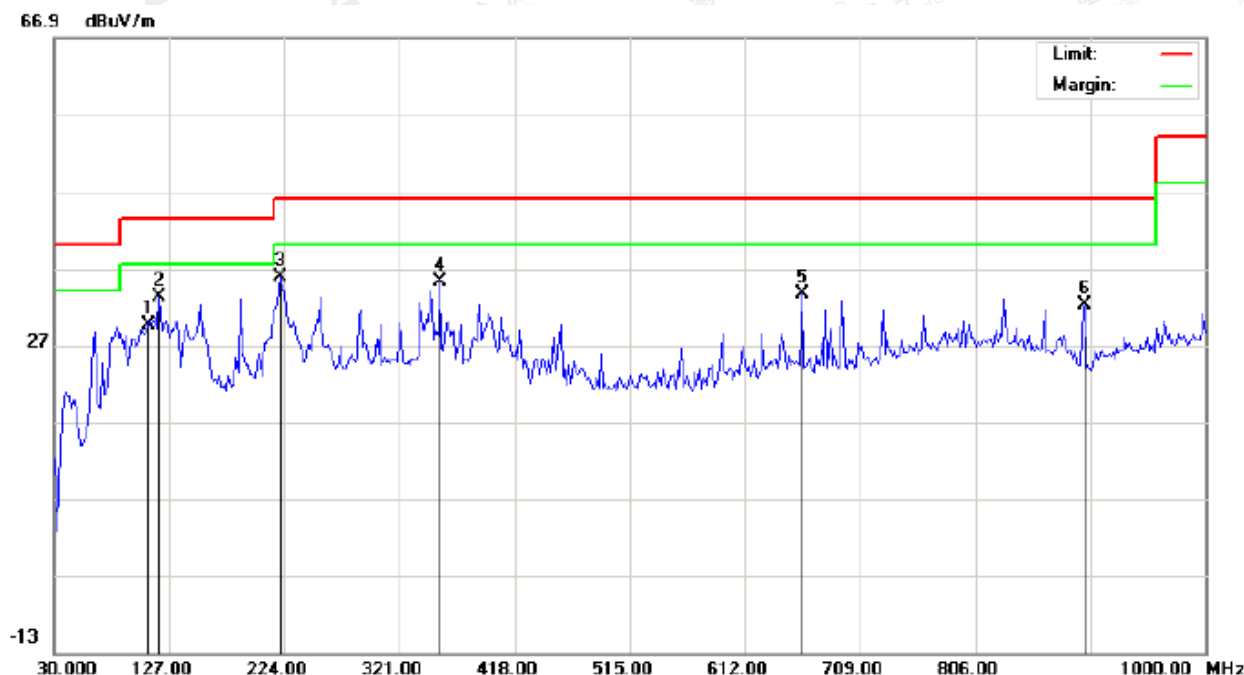


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		99.5167	22.54	10.00	32.54	43.50	-10.96	peak			
2		214.3000	24.18	10.54	34.72	43.50	-8.78	peak			
3	*	321.0000	21.05	16.81	37.86	46.00	-8.14	peak			
4		388.9000	16.90	19.00	35.90	46.00	-10.10	peak			
5		728.4000	9.30	26.02	35.32	46.00	-10.68	peak			
6		898.1500	6.28	28.56	34.84	46.00	-11.16	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (30MHz-1GHz)-HIGH CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		109.2167	28.09	1.49	29.58	43.50	-13.92	peak			
2		118.9167	26.82	6.32	33.14	43.50	-10.36	peak			
3	*	220.7667	24.80	11.04	35.84	46.00	-10.16	peak			
4		354.9500	16.34	18.77	35.11	46.00	-10.89	peak			
5		660.5000	9.57	24.13	33.70	46.00	-12.30	peak			
6		898.1500	3.62	28.56	32.18	46.00	-13.82	peak			

RESULT: PASS

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

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

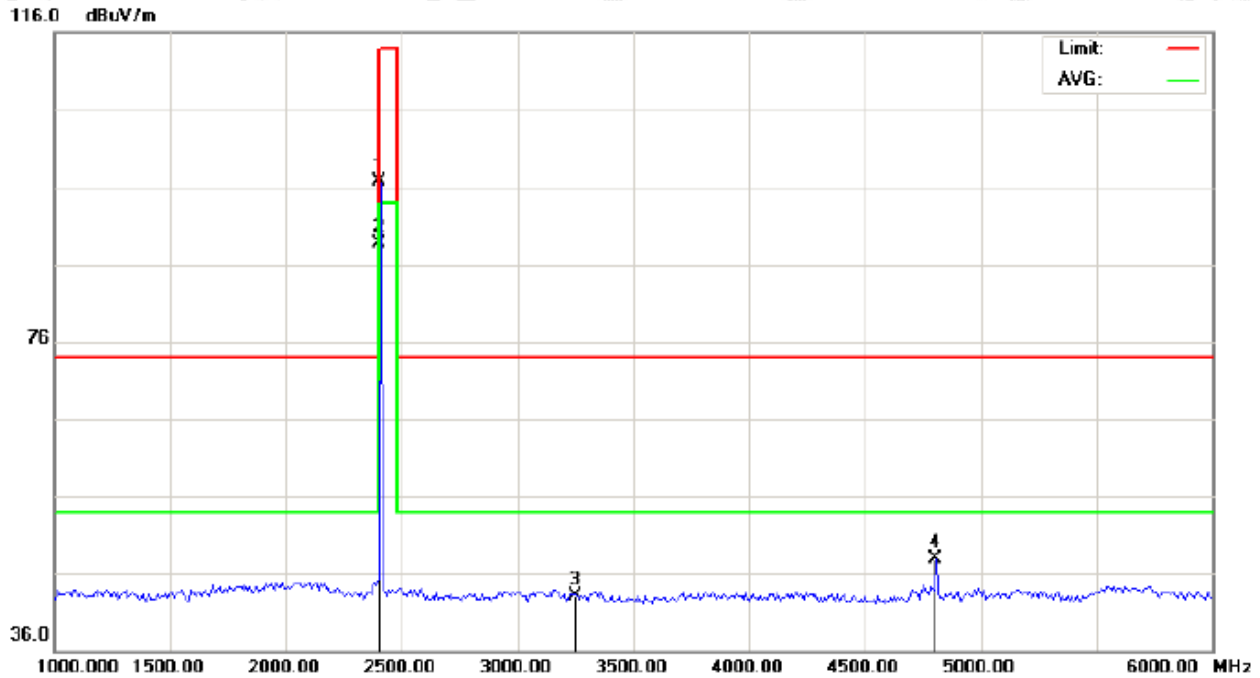
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION ABOVE 1GHz

(Worst modulation: GFSK)

FOR BR/EDR

RADIATED EMISSION TEST- (ABOVE 1GHz)-LOW CHANNEL-HORIZONTAL

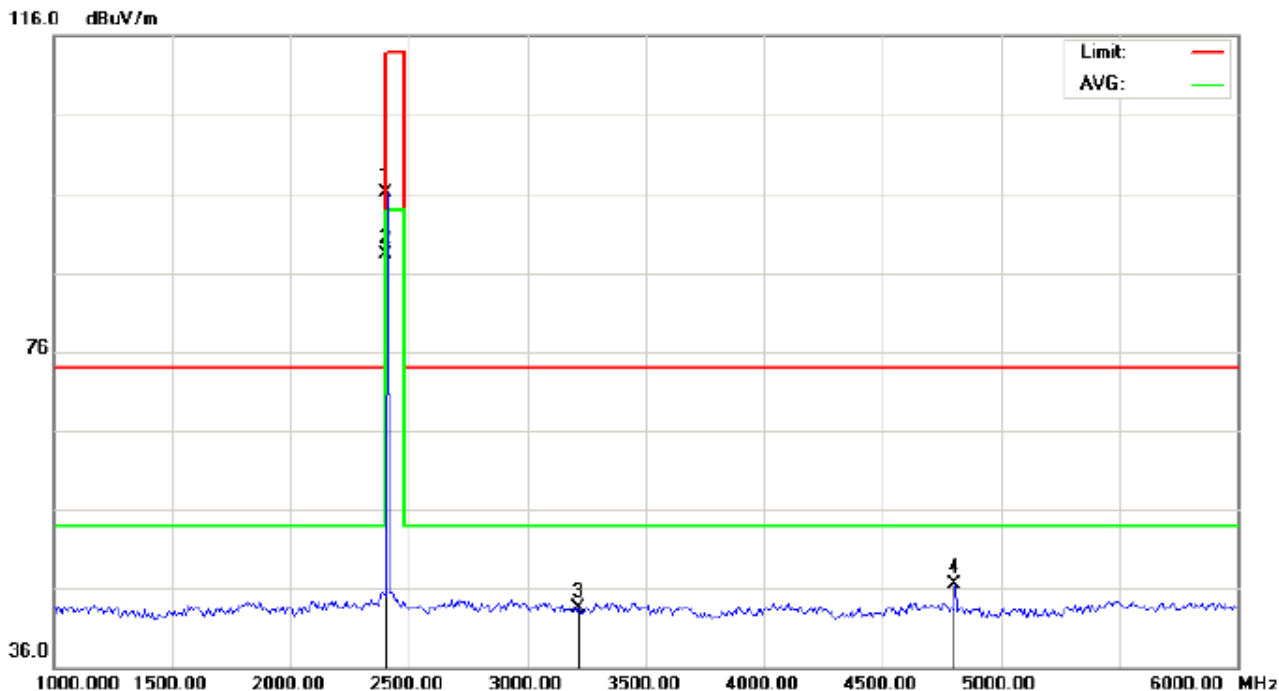


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2402.000	86.35	10.32	96.67	114.00	-17.33	peak			
2	*	2402.000	78.33	10.32	88.65	94.00	-5.35	AVG	100	15	
3		3251.000	31.22	11.88	43.10	74.00	-30.90	peak			
4		4804.000	40.24	7.69	47.93	74.00	-26.07	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-LOW CHANNEL- VERTICAL

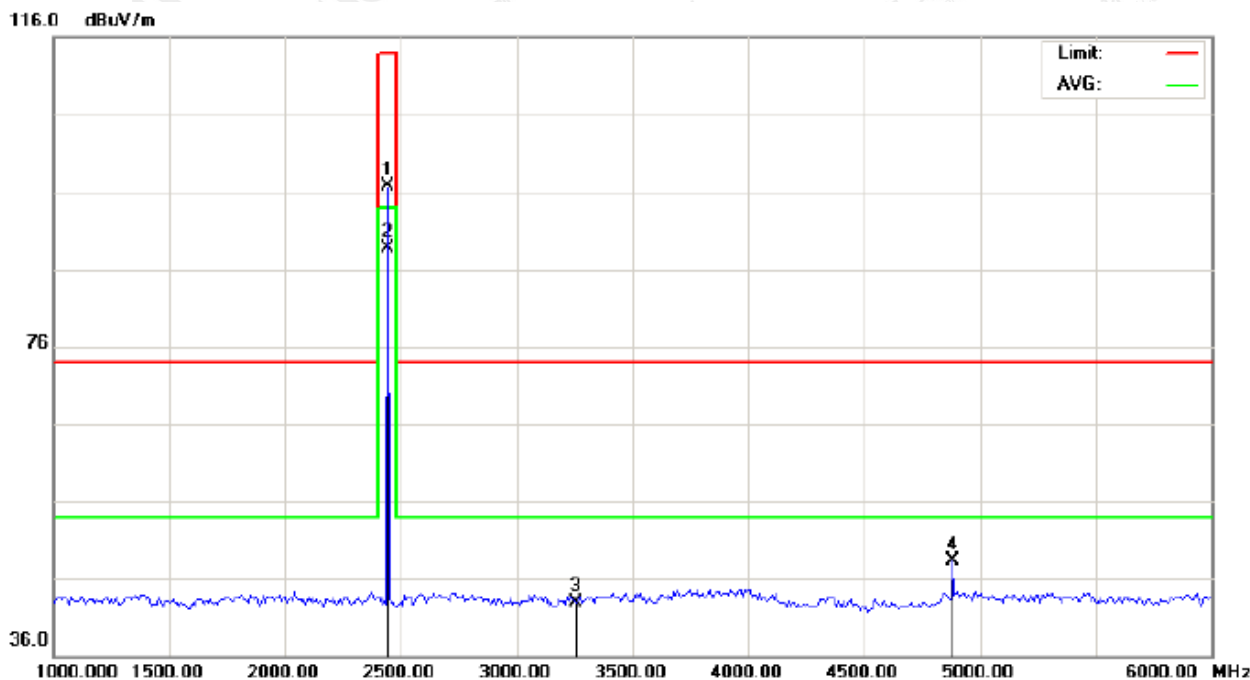


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2402.000	85.85	10.32	96.17	114.00	-17.83	peak			
2	*	2402.000	78.00	10.32	88.32	94.00	-5.68	AVG	100		
3		3214.000	31.57	11.84	43.41	74.00	-30.59	peak			
4		4804.000	38.88	7.69	46.57	74.00	-27.43	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-MIDDLE CHANNEL-HORIZONTAL

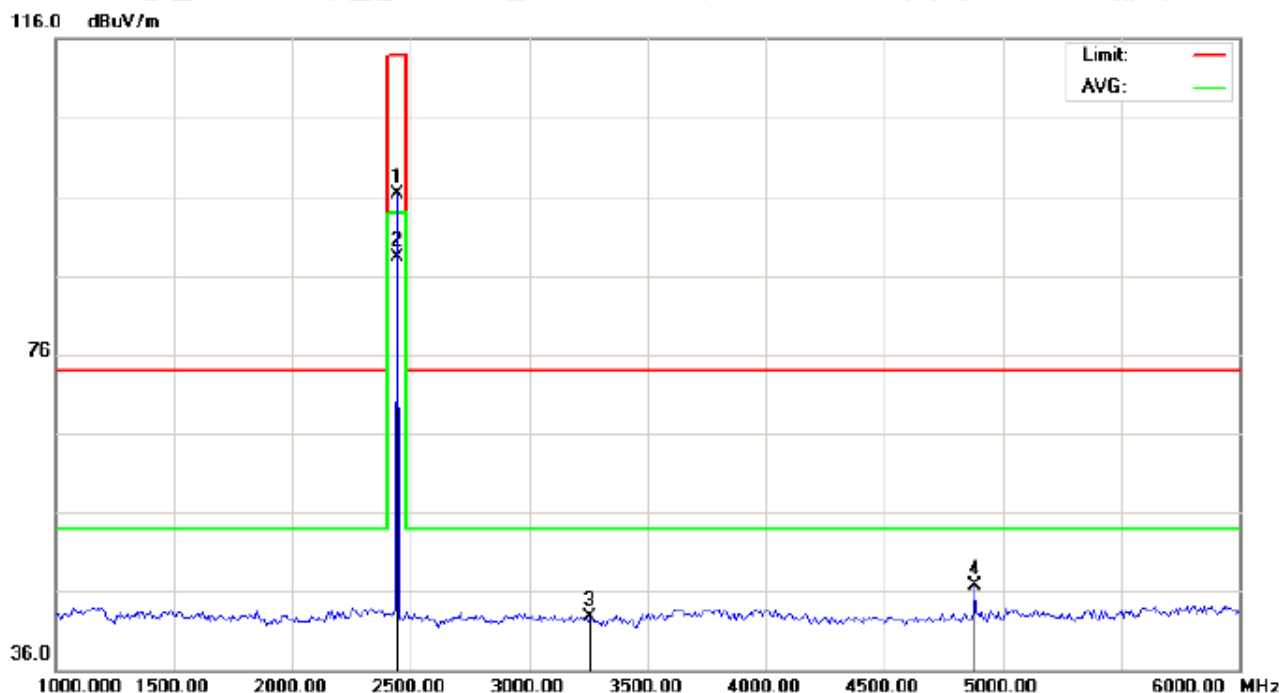


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2441.000	86.35	10.36	96.71	114.00	-17.29	peak			
2	*	2441.000	78.37	10.36	88.73	94.00	-5.27	AVG	100	25	
3		3258.000	31.07	11.88	42.95	74.00	-31.05	peak			
4		4882.000	40.38	7.89	48.27	74.00	-25.73	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-MIDDLE CHANNEL- VERTICAL

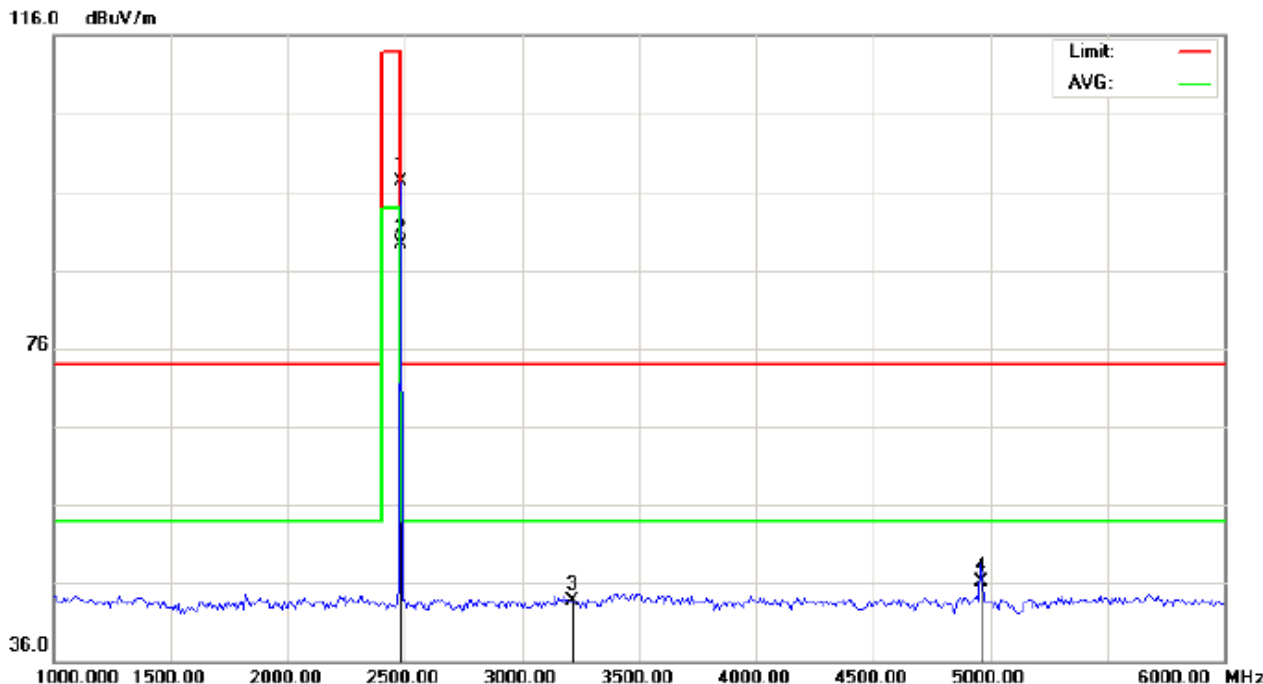


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2441.000	85.99	10.36	96.35	114.00	-17.65	peak			
2	*	2441.000	77.88	10.36	88.24	94.00	-5.76	AVG	100	43	
3		3254.000	30.89	11.88	42.77	74.00	-31.23	peak			
4		4882.000	38.81	7.89	46.70	74.00	-27.30	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-HIGH CHANNEL-HORIZONTAL

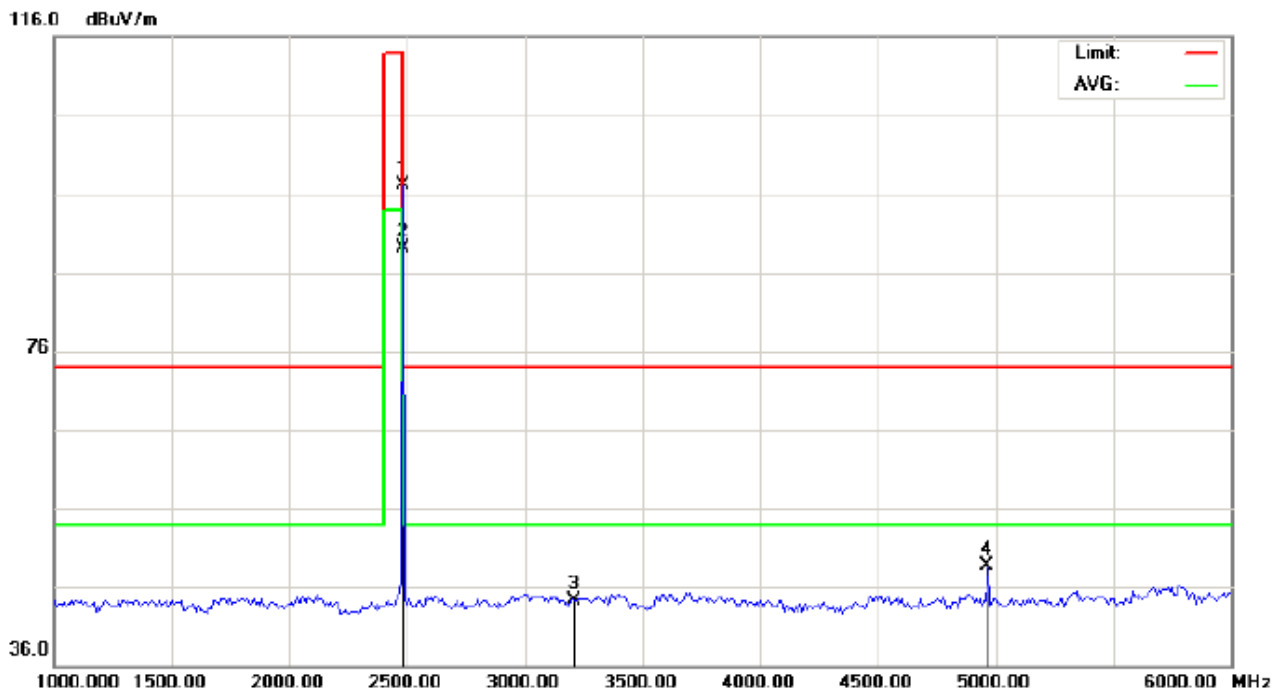


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2480.000	86.97	10.41	97.38	114.00	-16.62	peak			
2	*	2480.000	78.88	10.41	89.29	94.00	-4.71	AVG	100	32	
3		3214.000	31.92	11.84	43.76	74.00	-30.24	peak			
4		4960.000	38.01	8.09	46.10	74.00	-27.90	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-HIGH CHANNEL- VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2480.000	86.69	10.41	97.10	114.00	-16.90	peak			
2	*	2480.000	78.71	10.41	89.12	94.00	-4.88	AVG	100	40	
3		3213.000	32.53	11.84	44.37	74.00	-29.63	peak			
4		4960.000	40.66	8.09	48.75	74.00	-25.25	peak			

RESULT: PASS

Note: 6~25GHz at least have 20dB margin. No recording in the test report.

Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

Field strength of the fundamental signal

1Mbps Result:

Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	86.35	10.32	96.67	114	-17.33	Horizontal
2402	85.85	10.32	96.17	114	-17.83	Vertical
2441	86.35	10.36	96.71	114	-17.29	Horizontal
2441	85.99	10.36	96.35	114	-17.65	Vertical
2480	86.97	10.41	97.38	114	-16.62	Horizontal
2480	86.69	10.41	97.10	114	-16.90	Vertical

Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	78.33	10.32	88.65	94	-5.35	Horizontal
2402	78.00	10.32	88.32	94	-5.68	Vertical
2441	78.37	10.36	88.73	94	-5.27	Horizontal
2441	77.88	10.36	88.24	94	-5.76	Vertical
2480	78.88	10.41	89.29	94	-4.71	Horizontal
2480	78.71	10.41	89.12	94	-4.88	Vertical

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

2Mbps Result:
Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	85.81	10.32	96.13	114	-17.87	Horizontal
2402	85.44	10.32	95.76	114	-18.24	Vertical
2441	85.85	10.36	96.21	114	-17.79	Horizontal
2441	85.50	10.36	95.86	114	-18.14	Vertical
2480	86.57	10.41	96.98	114	-17.02	Horizontal
2480	86.34	10.41	96.75	114	-17.25	Vertical

Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	77.87	10.32	88.19	94	-5.81	Horizontal
2402	77.69	10.32	88.01	94	-5.99	Vertical
2441	77.87	10.36	88.23	94	-5.77	Horizontal
2441	77.53	10.36	87.89	94	-6.11	Vertical
2480	78.45	10.41	88.86	94	-5.14	Horizontal
2480	78.24	10.41	88.65	94	-5.35	Vertical

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

3Mbps Result:
Peak value

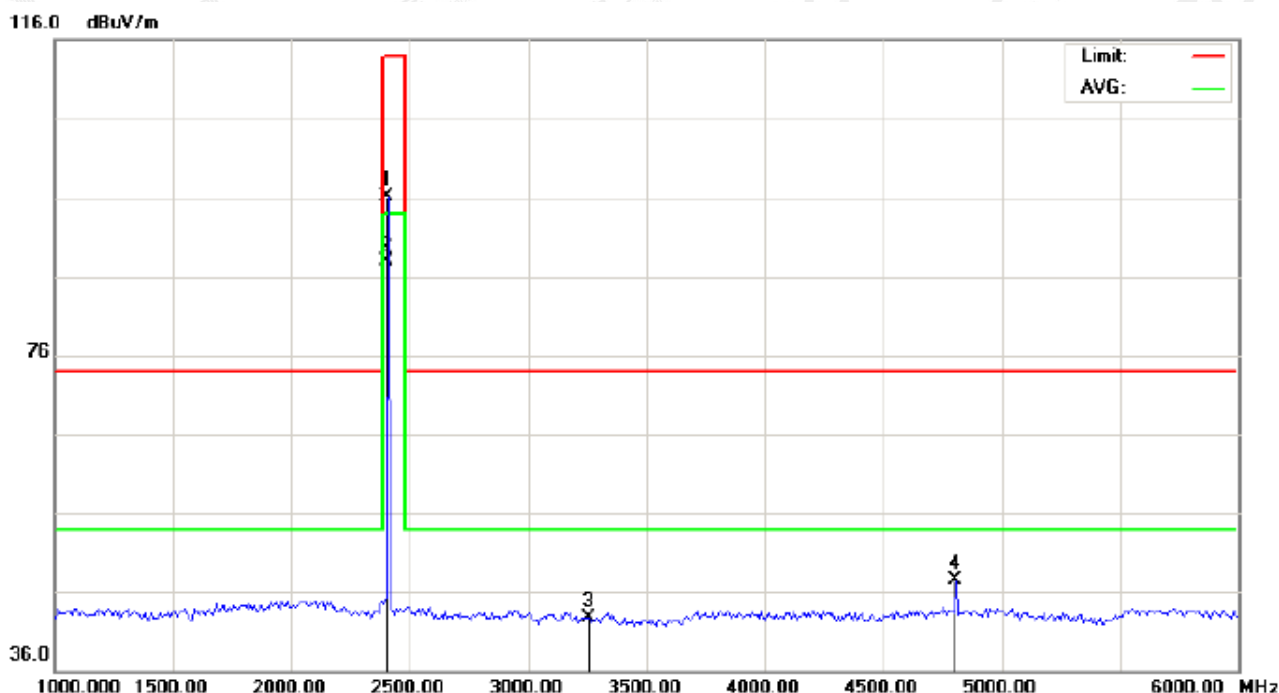
Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	85.69	10.32	96.01	114	-17.99	Horizontal
2402	85.33	10.32	95.65	114	-18.35	Vertical
2441	85.77	10.36	96.13	114	-17.87	Horizontal
2441	85.42	10.36	95.78	114	-18.22	Vertical
2480	86.43	10.41	96.84	114	-17.16	Horizontal
2480	86.22	10.41	96.63	114	-17.37	Vertical

Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	77.80	10.32	88.12	94	-5.88	Horizontal
2402	77.60	10.32	87.92	94	-6.08	Vertical
2441	77.78	10.36	88.14	94	-5.86	Horizontal
2441	77.45	10.36	87.81	94	-6.19	Vertical
2480	78.28	10.41	88.69	94	-5.31	Horizontal
2480	78.12	10.41	88.53	94	-5.47	Vertical

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

FOR BLE
RADIATED EMISSION TEST- (ABOVE 1GHz)-LOW CHANNEL-HORIZONTAL

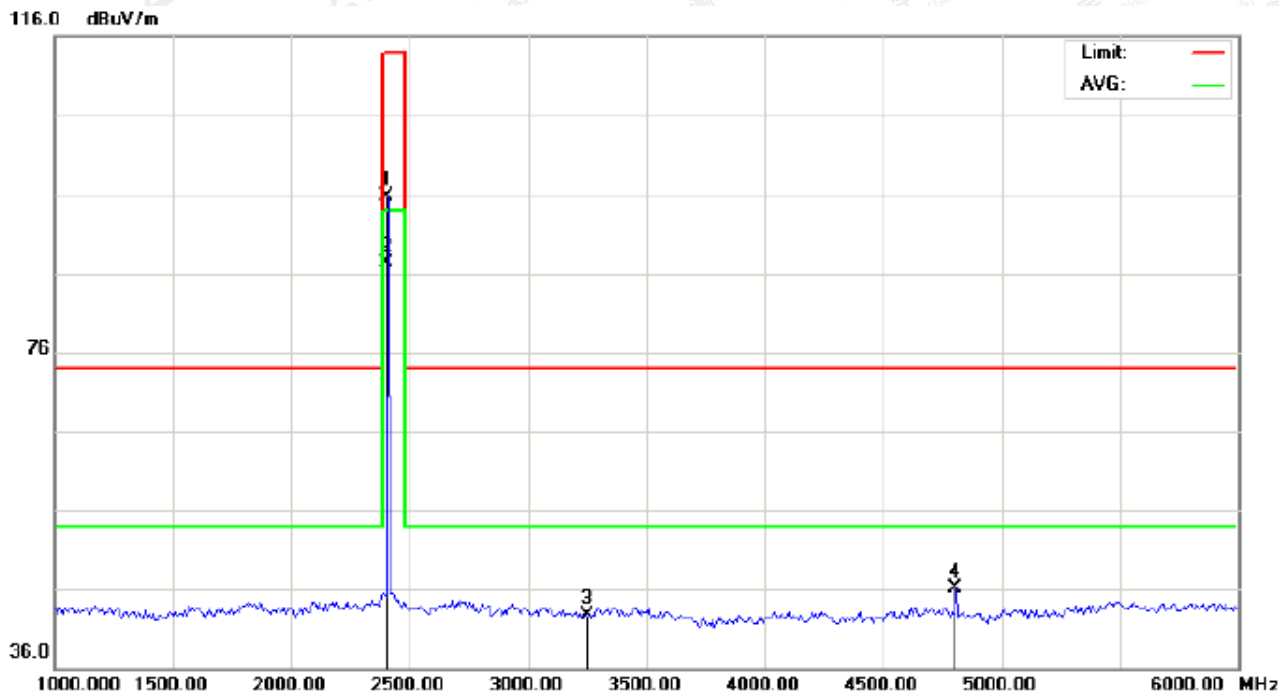


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2402.000	85.77	10.32	96.09	114.00	-17.91	peak			
2	*	2402.000	77.87	10.32	88.19	94.00	-5.81	AVG	100	17	
3		3256.000	30.72	11.88	42.60	74.00	-31.40	peak			
4		4804.000	39.74	7.69	47.43	74.00	-26.57	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-LOW CHANNEL- VERTICAL

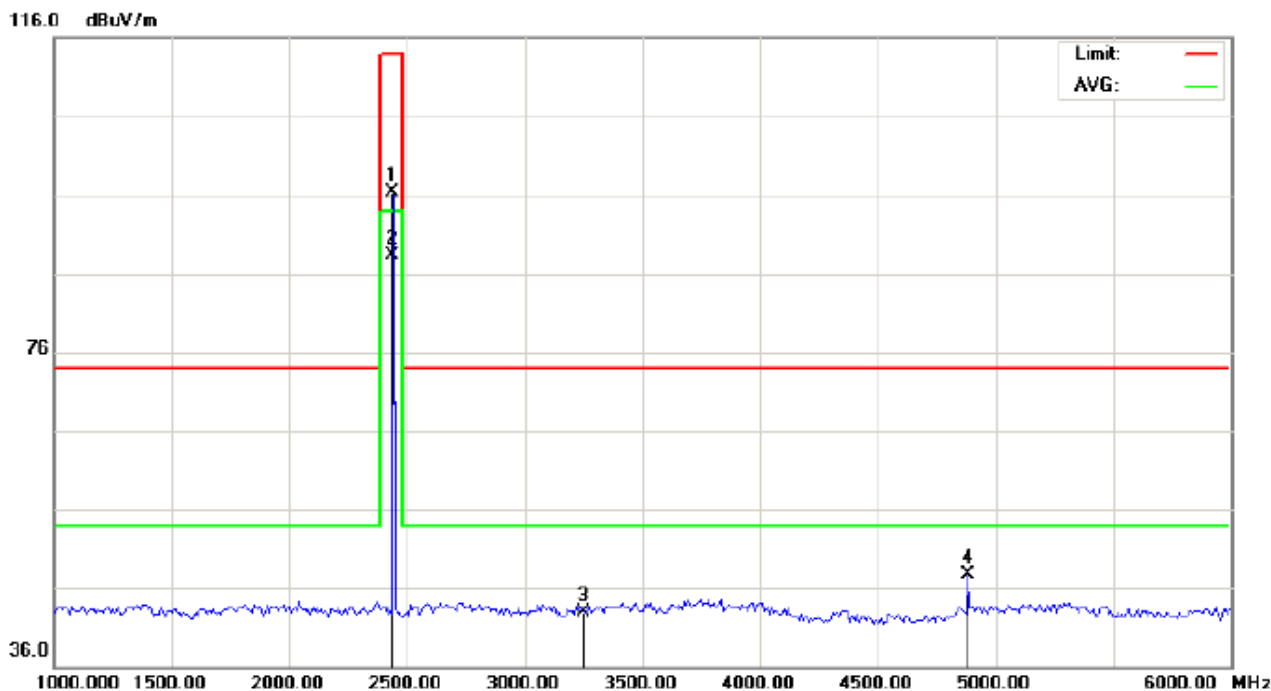


No.	Mk	Freq. MHz	Reading dBuV	Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		2402.000	85.30	10.32	95.62	114.00	-18.38	peak			
2	*	2402.000	77.00	10.32	87.32	94.00	-6.68	AVG	100	47	
3		3251.000	30.90	11.88	42.78	74.00	-31.22	peak			
4		4804.000	38.38	7.69	46.07	74.00	-27.93	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-MIDDLE CHANNEL-HORIZONTAL

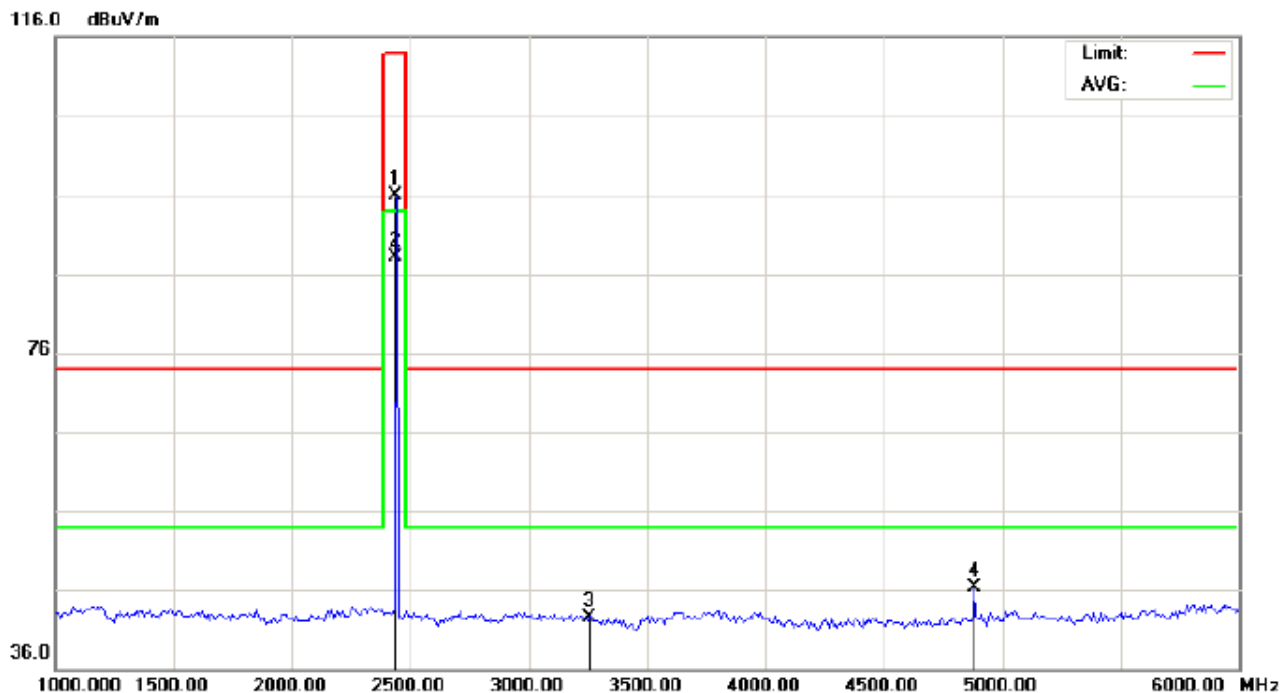


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2440.000	86.00	10.36	96.36	114.00	-17.64	peak			
2	*	2440.000	78.03	10.36	88.39	94.00	-5.61	AVG	100	49	
3		3251.000	31.07	11.88	42.95	74.00	-31.05	peak			
4		4880.000	39.88	7.89	47.77	74.00	-26.23	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-MIDDLE CHANNEL- VERTICAL

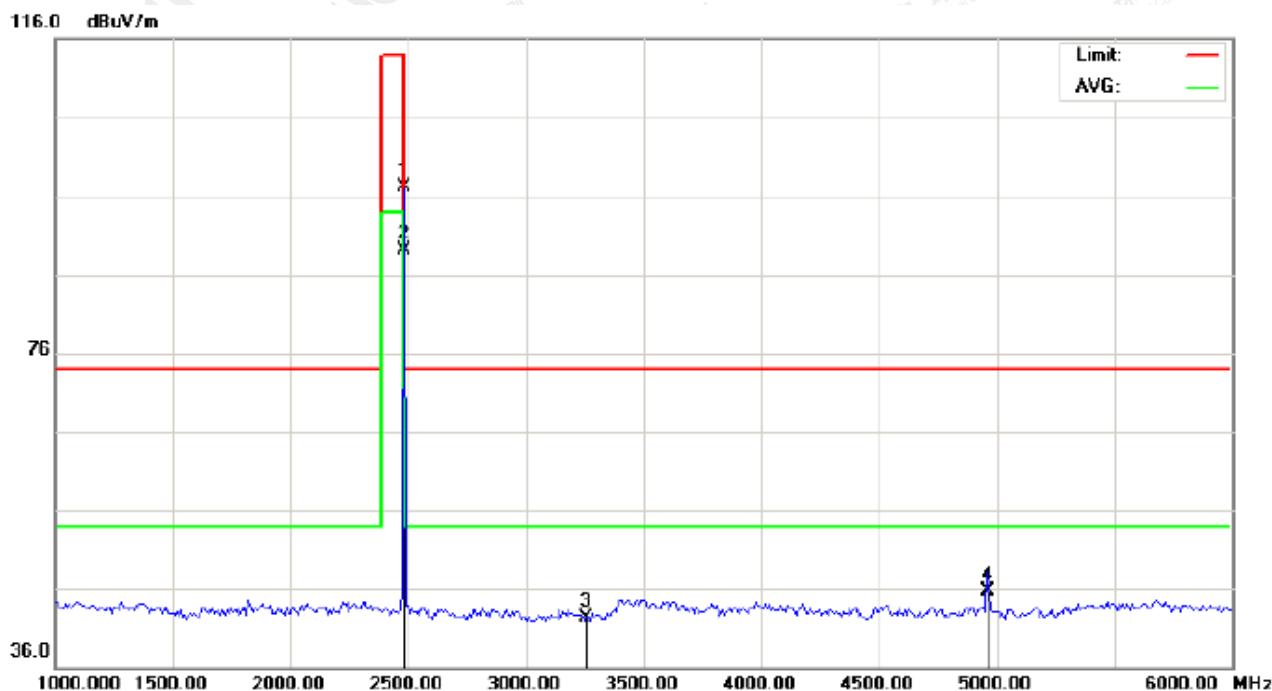


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2440.000	85.49	10.36	95.85	114.00	-18.15	peak			
2	*	2440.000	77.76	10.36	88.12	94.00	-5.88	AVG	100	49	
3		3259.000	30.63	11.88	42.51	74.00	-31.49	peak			
4		4880.000	38.31	7.89	46.20	74.00	-27.80	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-HIGH CHANNEL-HORIZONTAL

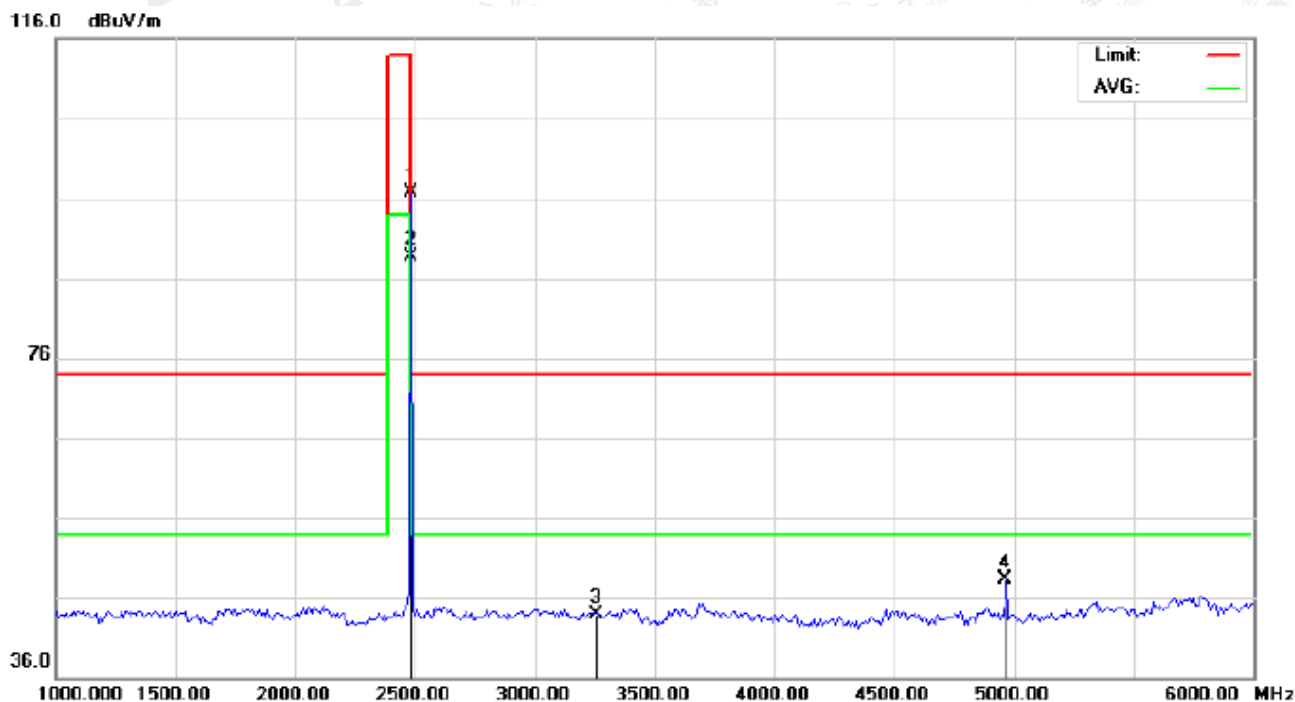


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2480.000	86.65	10.41	97.06	114.00	-16.94	peak			
2	*	2480.000	78.68	10.41	89.09	94.00	-4.91	AVG	100	17	
3		3259.000	30.42	11.88	42.30	74.00	-31.70	peak			
4		4960.000	37.51	8.09	45.60	74.00	-28.40	peak			

RESULT: PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

RADIATED EMISSION TEST- (ABOVE 1GHz)-HIGH CHANNEL- VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2480.000	86.22	10.41	96.63	114.00	-17.37	peak			
2	*	2480.000	78.38	10.41	88.79	94.00	-5.21	AVG	100	49	
3		3259.000	32.07	11.88	43.95	74.00	-30.05	peak			
4		4960.000	40.16	8.09	48.25	74.00	-25.75	peak			

RESULT: PASS

Note: 6~25GHz at least have 20dB margin. No recording in the test report.

Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

Field strength of the fundamental signal
1Mbps Result:
Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	85.77	10.32	96.09	114	-17.91	Horizontal
2402	85.30	10.32	95.62	114	-18.38	Vertical
2440	86.00	10.36	96.36	114	-17.64	Horizontal
2440	85.49	10.36	95.85	114	-18.15	Vertical
2480	86.65	10.41	97.06	114	-16.94	Horizontal
2480	86.22	10.41	96.63	114	-17.37	Vertical

Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	77.87	10.32	88.19	94	-5.81	Horizontal
2402	77.00	10.32	87.32	94	-6.68	Vertical
2440	78.03	10.36	88.39	94	-5.61	Horizontal
2440	77.76	10.36	88.12	94	-5.88	Vertical
2480	78.68	10.41	89.09	94	-4.91	Horizontal
2480	78.38	10.41	88.79	94	-5.21	Vertical

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

10. BAND EDGE EMISSION

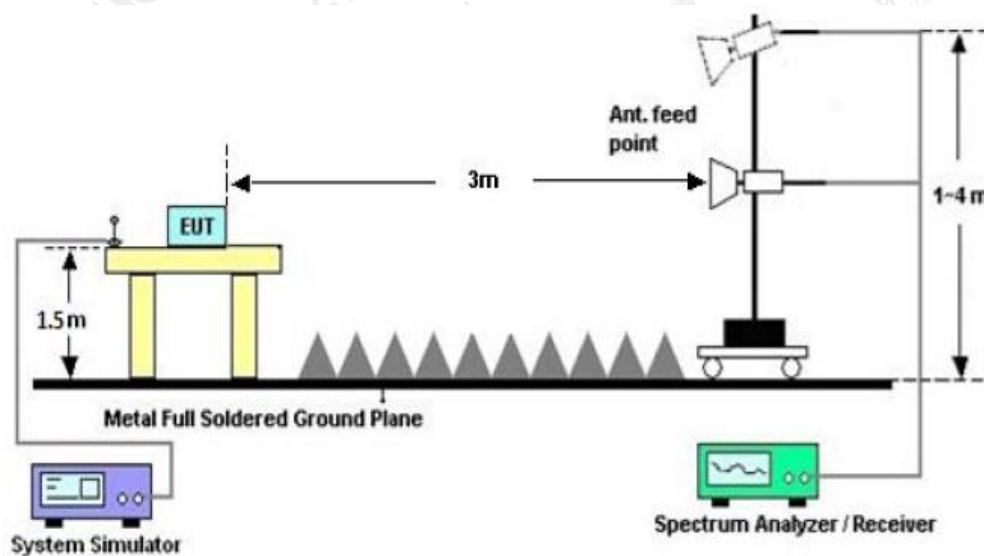
10.1. MEASUREMENT PROCEDURE

1. The EUT operates at hopping-off test mode. The lowest or highest channels are tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.
2. Max hold the trace of the setup 1, and the EUT operates at hopping-on test mode to verify the largest spurious emissions power.
3. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission.

Start frequency(MHz)	Stop frequency(MHz)
2200	2405
2478	2500

10.2 TEST SETUP

RADIATED EMISSION TEST SETUP



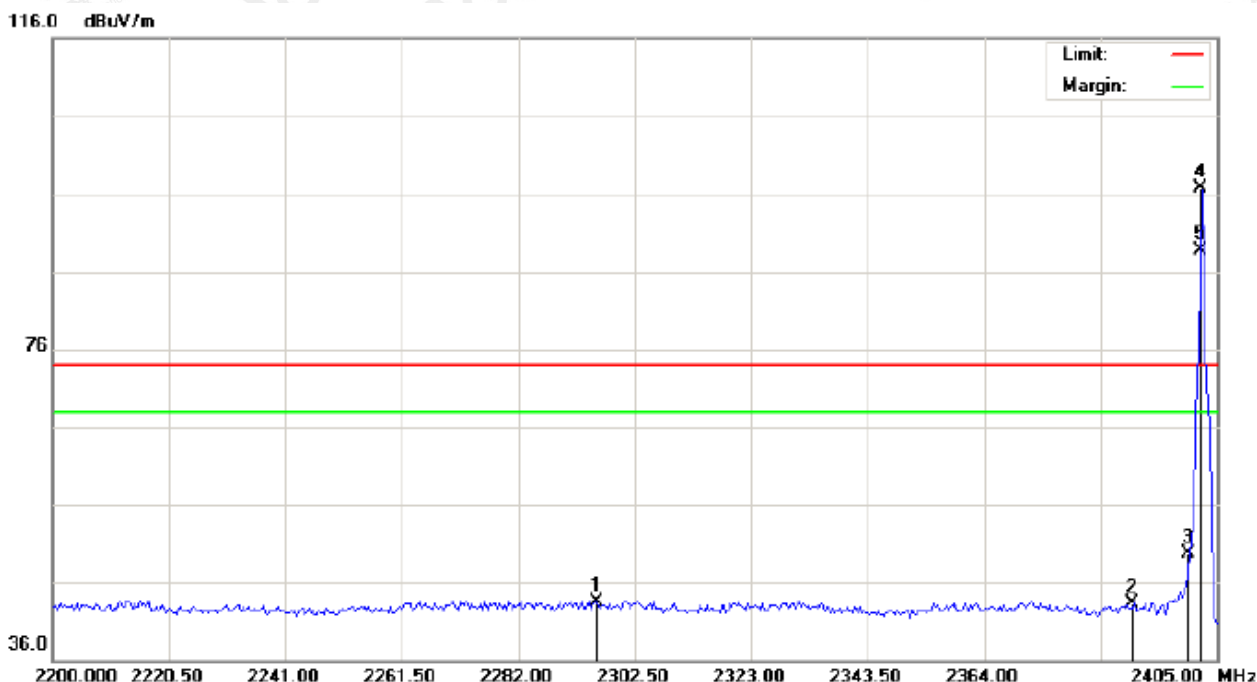
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

10.3 RADIATED TEST RESULT

(Worst modulation: GFSK)

FOR BR/EDR

TEST PLOT OF BAND EDGE FOR LOW CHANNEL-Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2295.667	33.26	10.21	43.47	74.00	-30.53	peak			
2		2390.000	33.00	10.31	43.31	74.00	-30.69	peak			
3		2400.000	39.47	10.32	49.79	74.00	-24.21	peak			
4	*	2402.000	86.33	10.32	96.65	74.00	22.65	peak			
5	X	2402.000	78.32	10.32	88.64	74.00	14.64	AVG	100	18	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

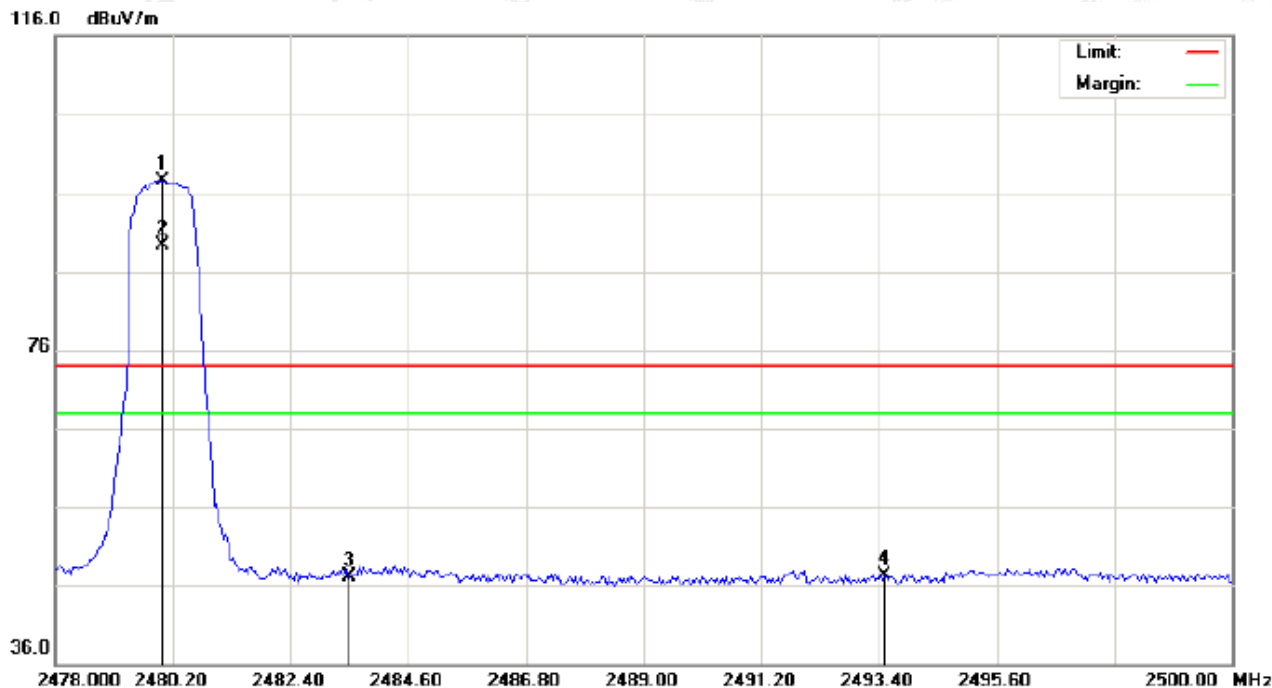
TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2297.375	32.92	10.21	43.13	74.00	-30.87	peak			
2		2390.000	32.21	10.31	42.52	74.00	-31.48	peak			
3		2400.000	37.56	10.32	47.88	74.00	-26.12	peak			
4	*	2402.000	86.09	10.32	96.41	74.00	22.41	peak			
5	X	2402.000	78.17	10.32	88.49	74.00	14.49	AVG	100	43	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

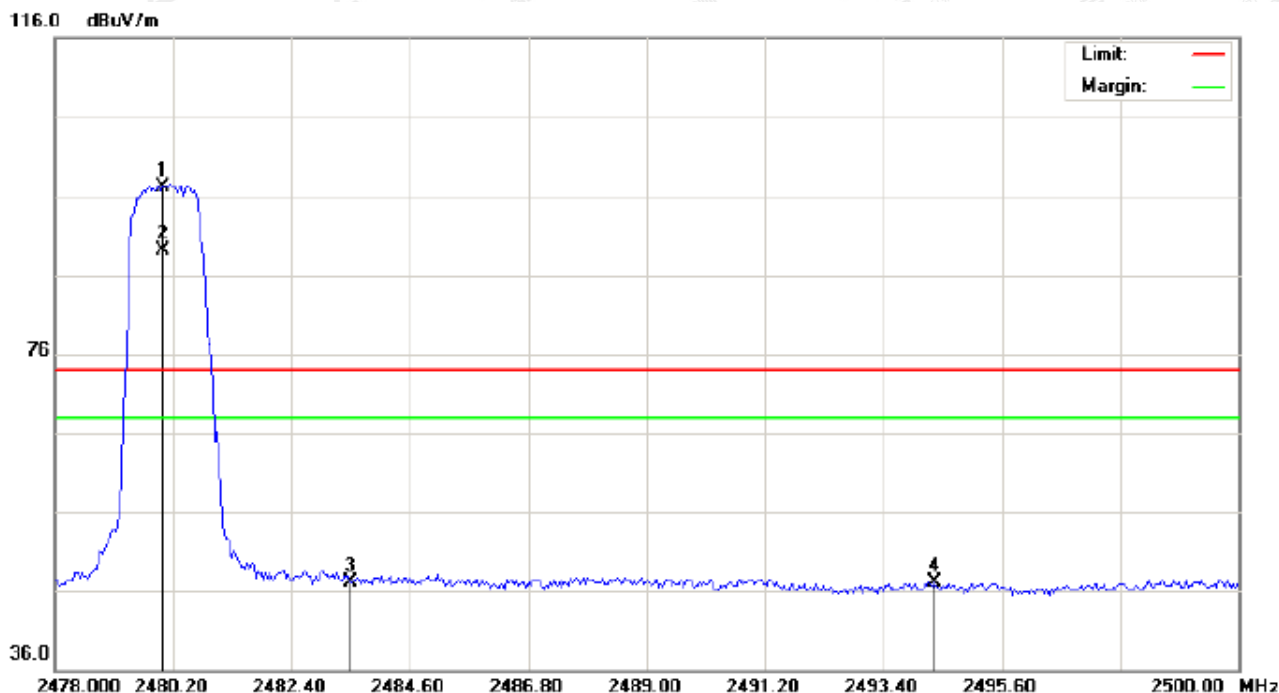
TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	87.05	10.41	97.46	74.00	23.46	peak			
2	X	2480.000	78.96	10.41	89.37	74.00	15.37	AVG	100	20	
3		2483.500	36.69	10.41	47.10	74.00	-26.90	peak			
4		2493.510	36.87	10.42	47.29	74.00	-26.71	peak			

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

TEST PLOT OF BAND EDGE FOR HIGH CHANNEL-Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	86.78	10.41	97.19	74.00	23.19	peak			
2	X	2480.000	78.76	10.41	89.17	74.00	15.17	AVG	100	46	
3		2483.500	36.76	10.41	47.17	74.00	-26.83	peak			
4		2494.353	36.71	10.42	47.13	74.00	-26.87	peak			

RESULT: PASS

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

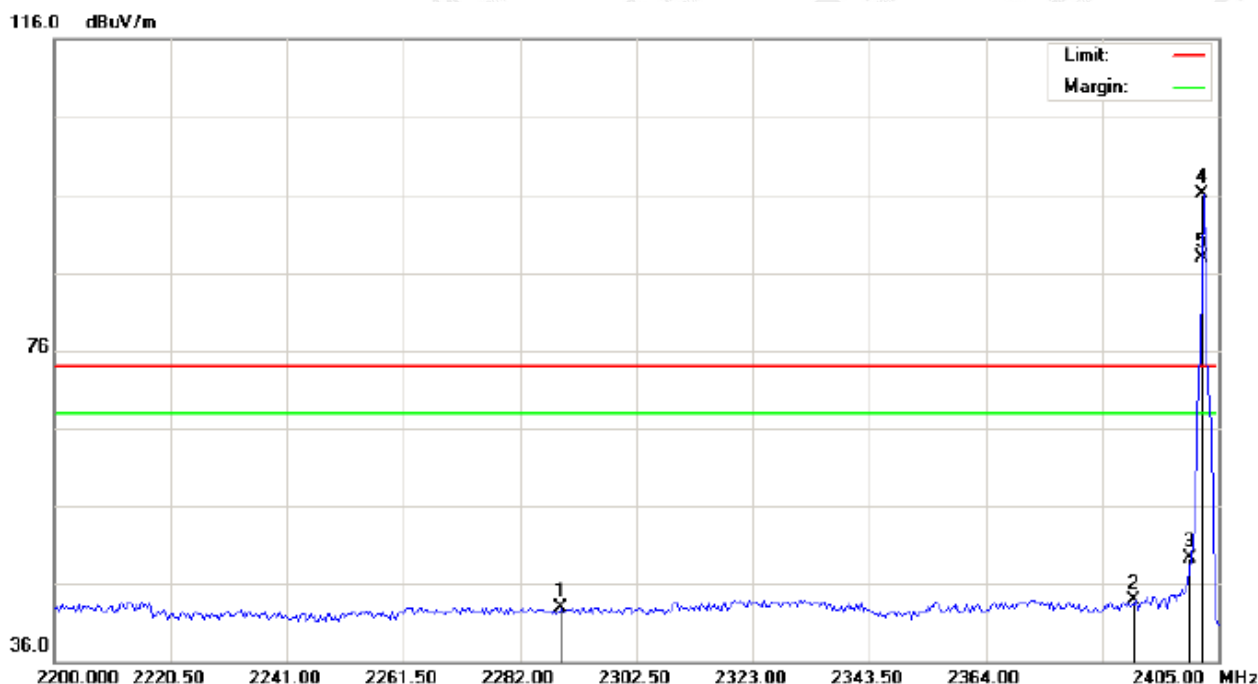
The "Factor" value can be calculated automatically by software of measurement system.

Hopping on mode and Hopping off mode have been tested, but only worst case reported.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

FOR BLE

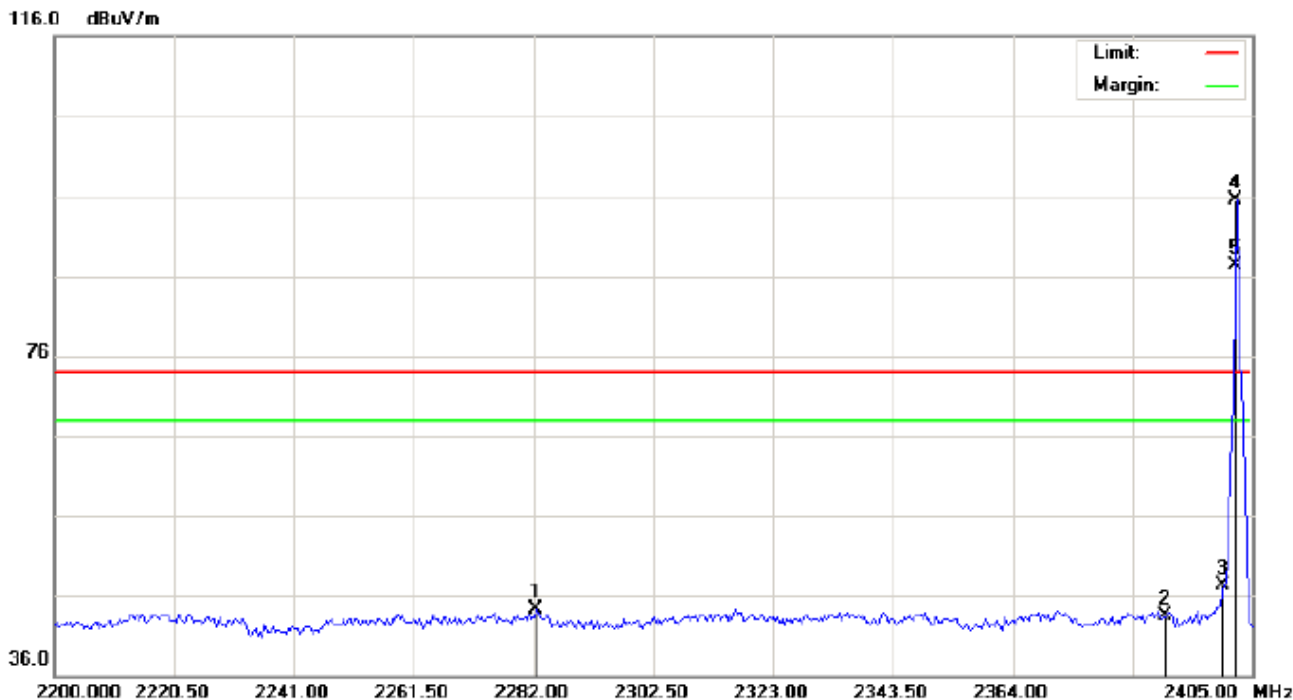
TEST PLOT OF BAND EDGE FOR LOW CHANNEL-Horizontal



No.	Mk	Freq. MHz	Reading dBuV	Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		2289.175	32.80	10.20	43.00	74.00	-31.00	peak			
2		2390.000	33.50	10.31	43.81	74.00	-30.19	peak			
3		2400.000	38.97	10.32	49.29	74.00	-24.71	peak			
4	*	2402.000	85.74	10.32	96.06	74.00	22.06	peak			
5	X	2402.000	77.66	10.32	87.98	74.00	13.98	AVG	100	19	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

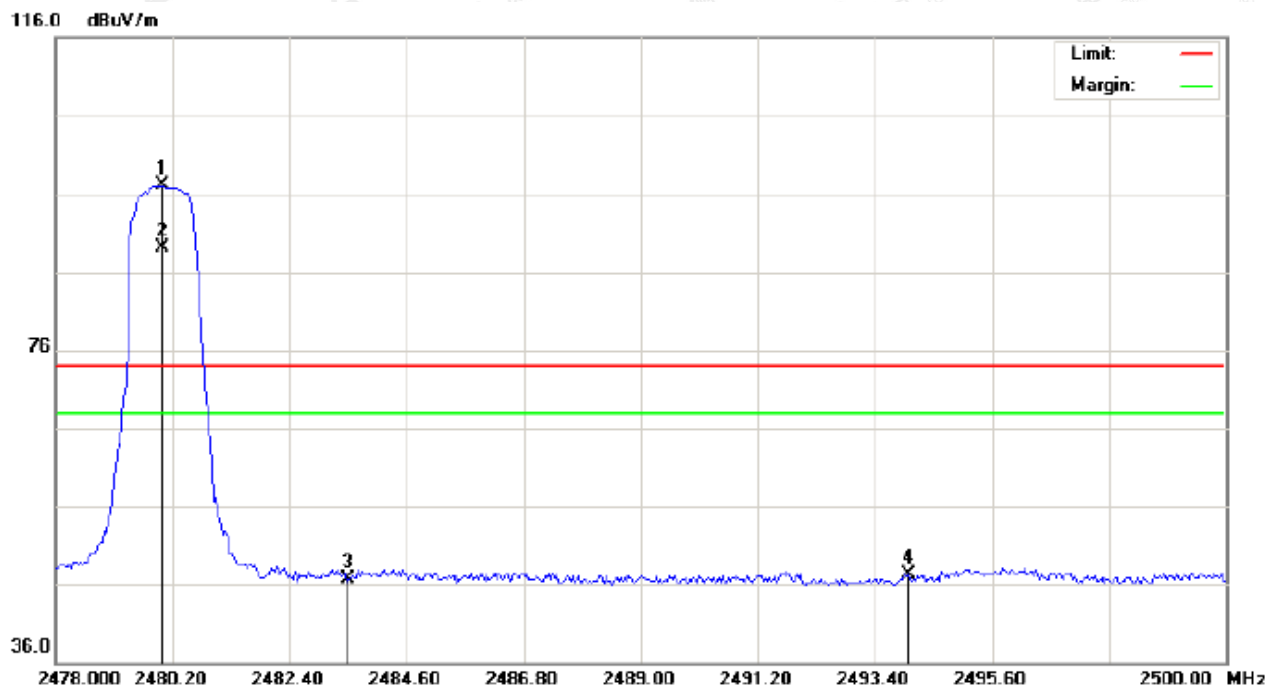
TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2282.341	34.20	10.19	44.39	74.00	-29.61	peak			
2		2390.000	33.21	10.31	43.52	74.00	-30.48	peak			
3		2400.000	37.06	10.32	47.38	74.00	-26.62	peak			
4	*	2402.000	85.21	10.32	95.53	74.00	21.53	peak			
5	X	2402.000	77.03	10.32	87.35	74.00	13.35	AVG	100	45	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

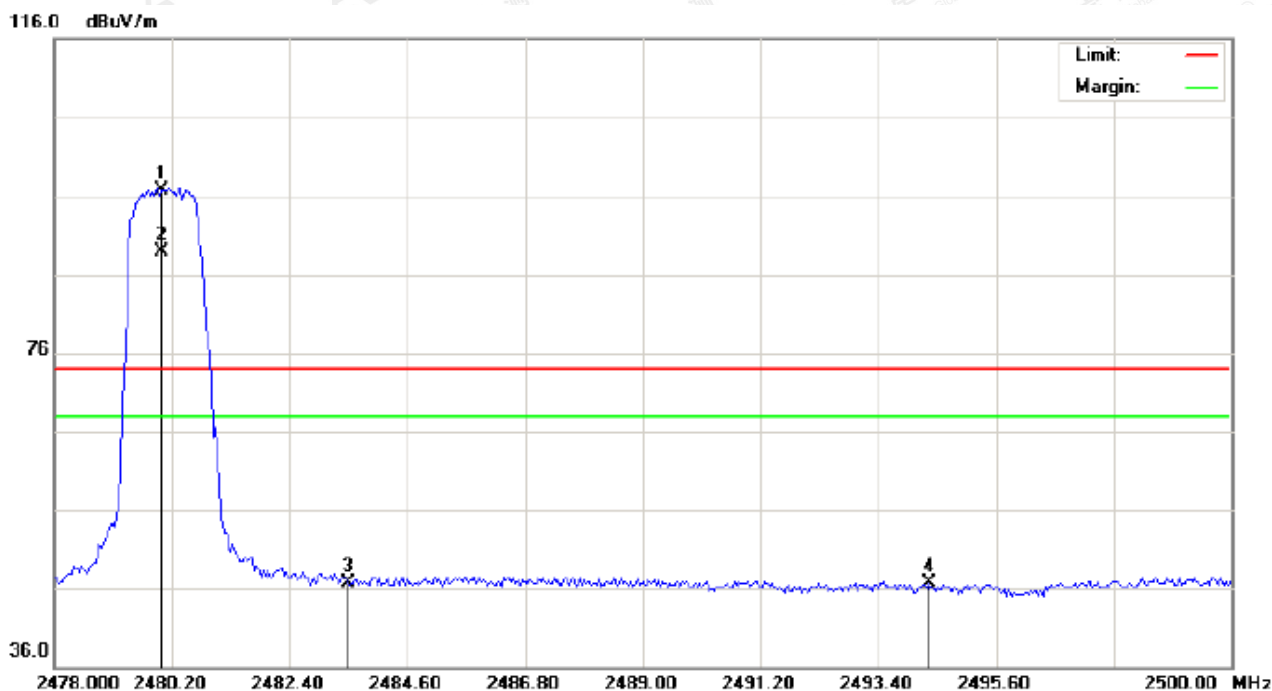
TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	86.60	10.41	97.01	74.00	23.01	peak			
2	X	2480.000	78.65	10.41	89.06	74.00	15.06	AVG	100	20	
3		2483.500	36.19	10.41	46.60	74.00	-27.40	peak			
4		2494.023	36.85	10.42	47.27	74.00	-26.73	peak			

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

TEST PLOT OF BAND EDGE FOR HIGH CHANNEL-Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	86.31	10.41	96.72	74.00	22.72	peak			
2	X	2480.000	78.42	10.41	88.83	74.00	14.83	AVG	100	47	
3		2483.500	36.26	10.41	46.67	74.00	-27.33	peak			
4		2494.353	36.21	10.42	46.63	74.00	-27.37	peak			

RESULT: PASS

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

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

Hopping on mode and Hopping off mode have been tested, but only worst case reported.

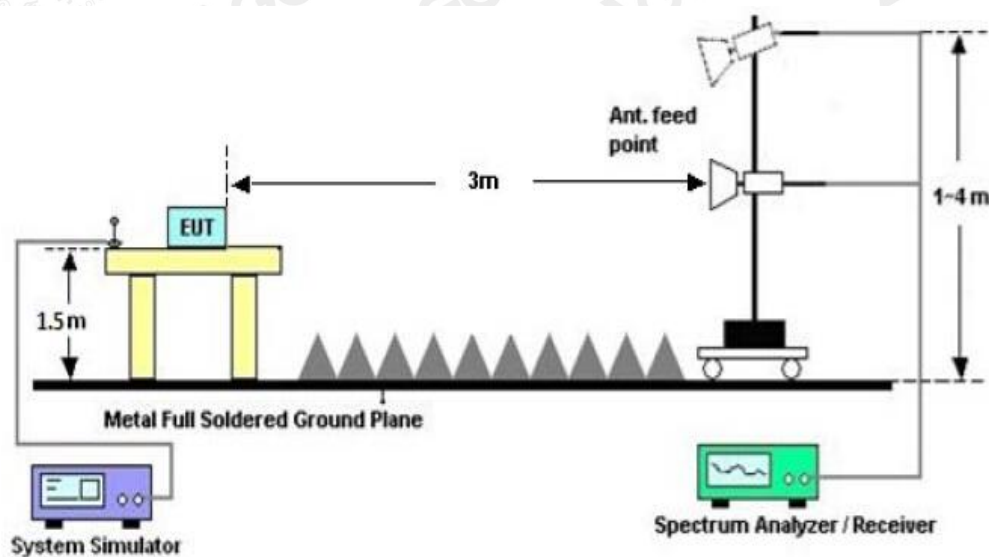
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

11. 20DB BANDWIDTH

11.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
2. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW $\geq$ 1% of the 20 dB bandwidth, VBW $\geq$ 3RBW; Sweep = auto; Detector function = peak
3. Set SPA Trace 1 Max hold, then View.

11.2. TEST SET-UP



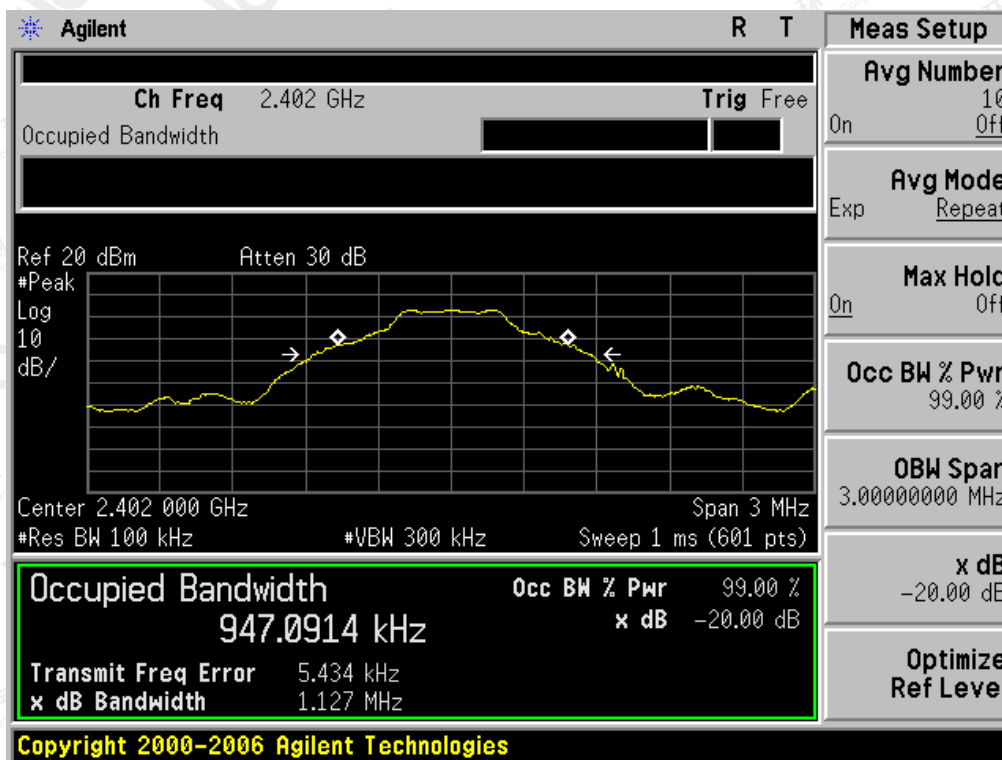
11.3. LIMITS AND MEASUREMENT RESULTS

FOR BR/EDR

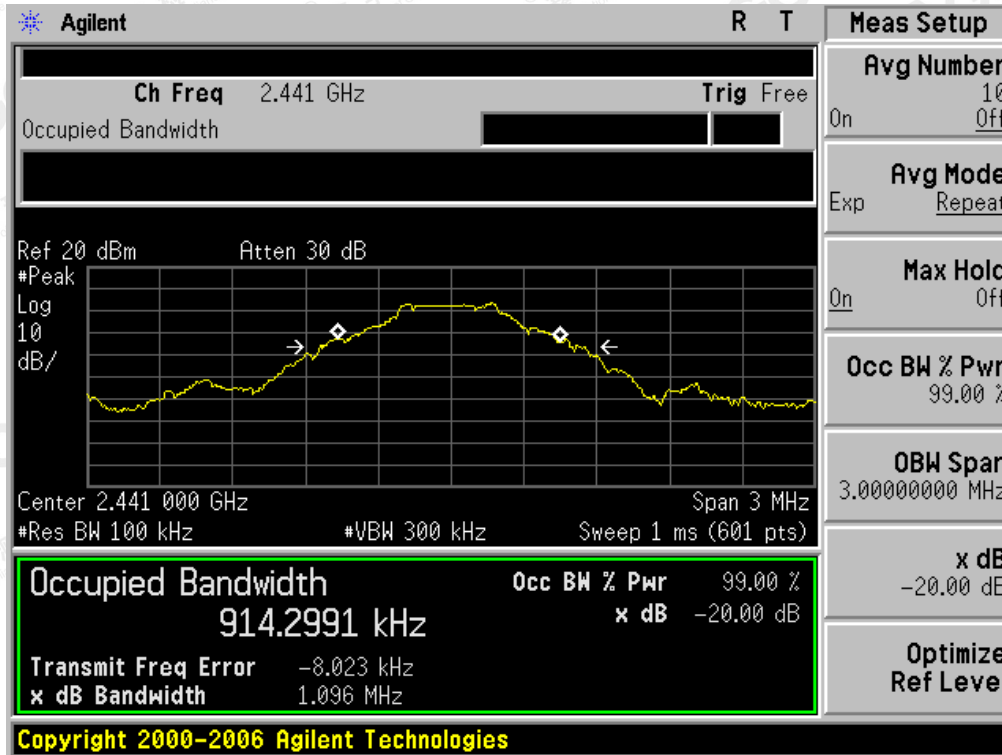
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESULT				
Applicable Limits	Measurement Result			
	Test Data (MHz)			Result
		99%OBW (MHz)	-20dB BW(MHz)	
N/A	Low Channel	0.947	1.127	PASS
	Middle Channel	0.914	1.096	PASS
	High Channel	0.918	1.087	PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

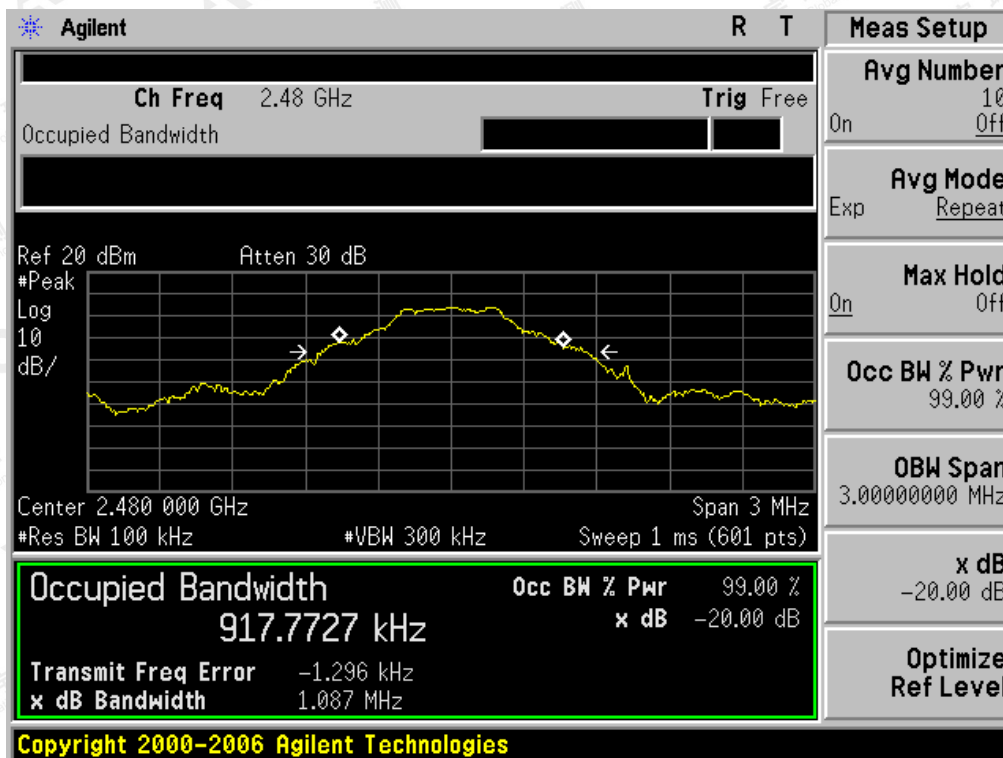


TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

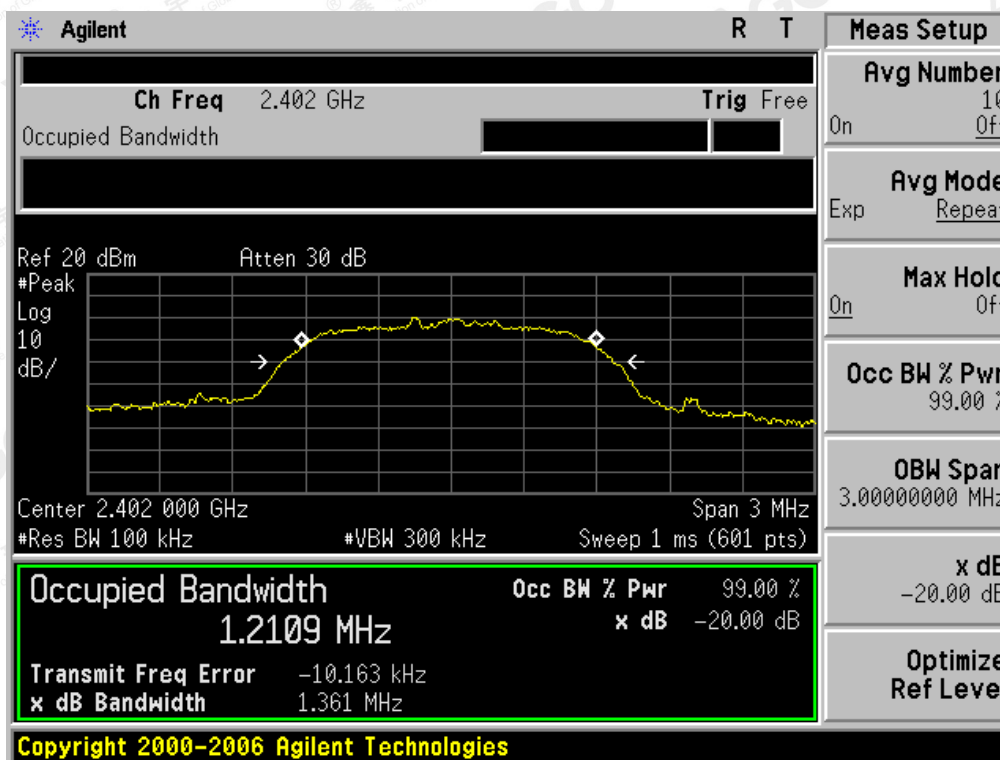
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

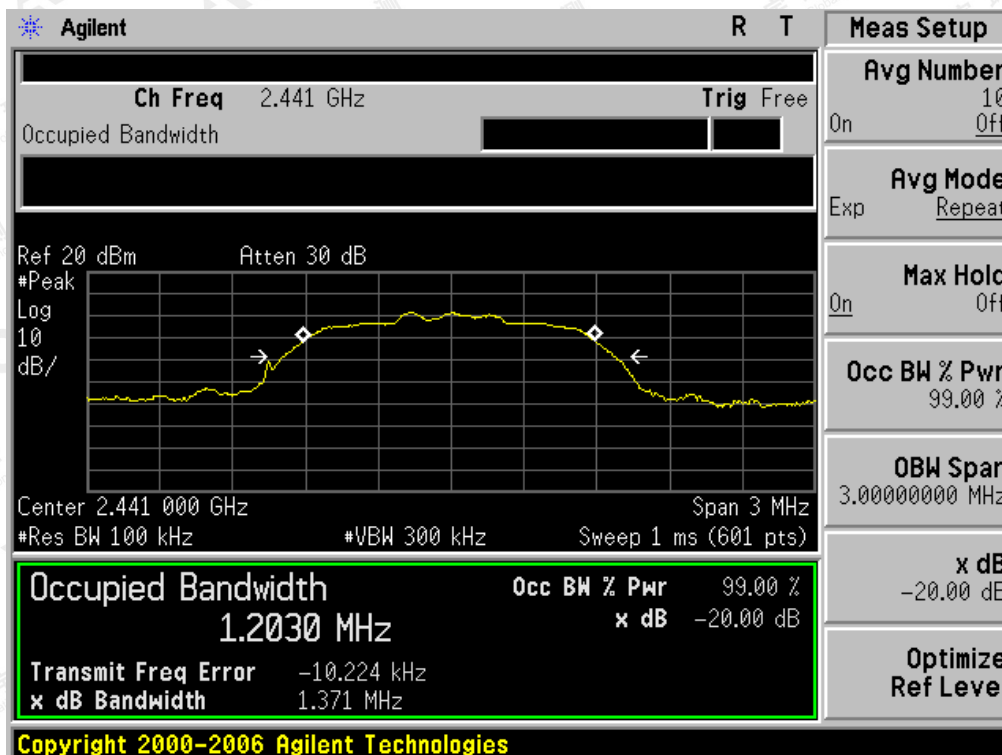
BLUETOOTH 2MBPS LIMITS AND MEASUREMENT RESULT				
Applicable Limits	Measurement Result			
	Test Data (MHz)			Result
		99%OBW (MHz)	-20dB BW(MHz)	
N/A	Low Channel	1.211	1.361	PASS
	Middle Channel	1.203	1.371	PASS
	High Channel	1.221	1.378	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

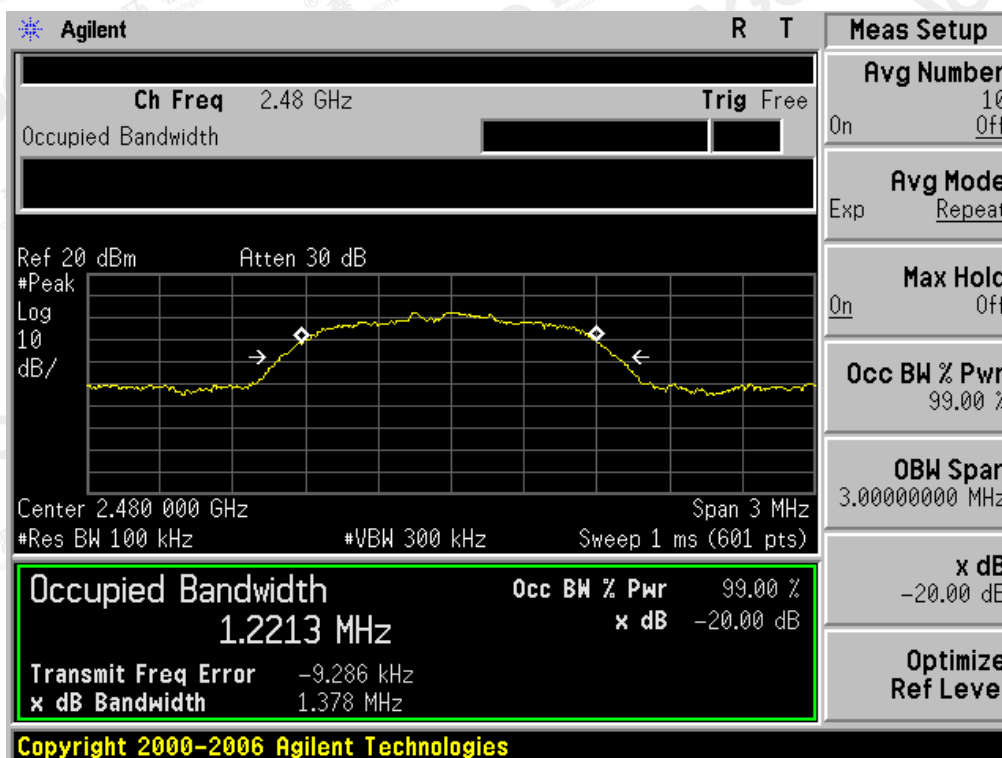


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



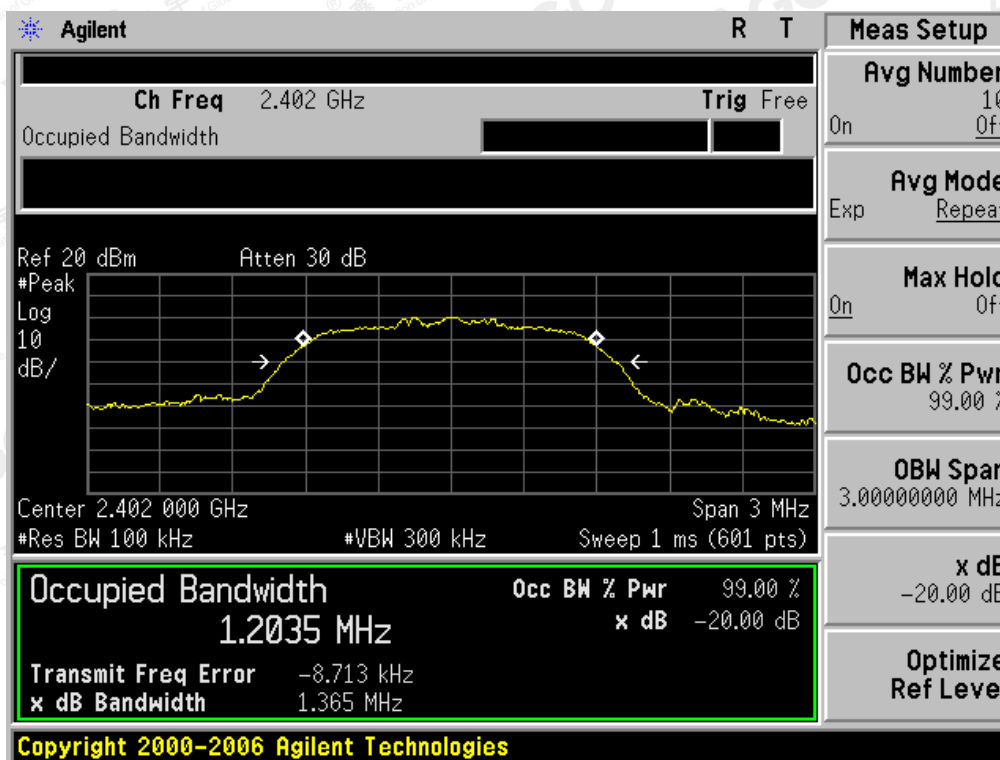
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

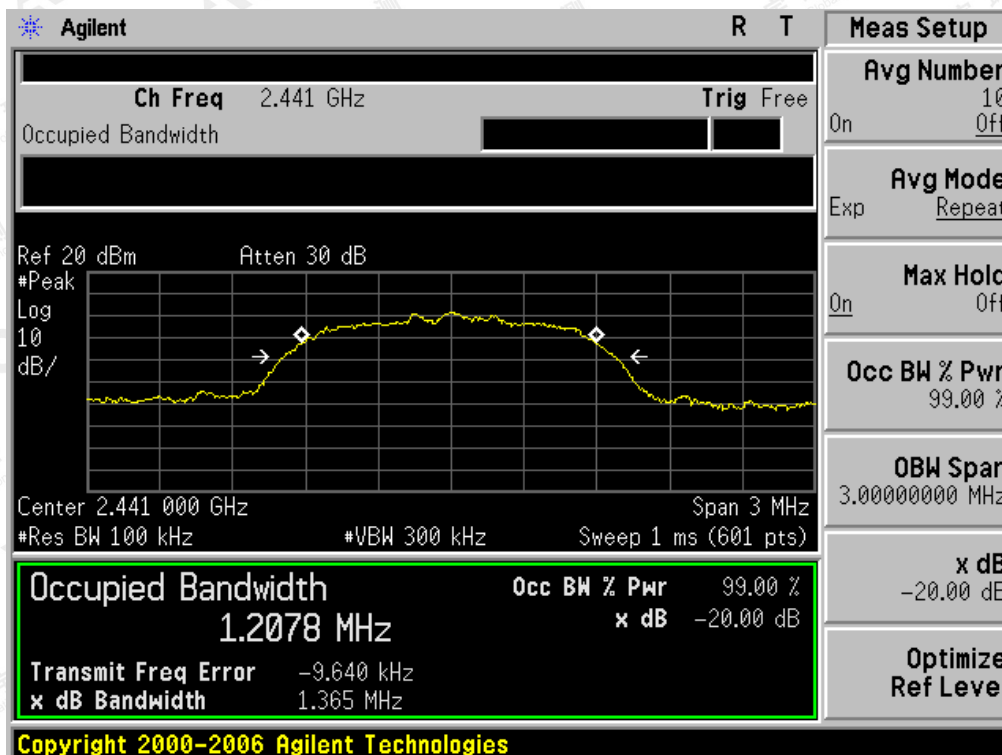
BLUETOOTH 3MBPS LIMITS AND MEASUREMENT RESULT				
Applicable Limits	Measurement Result			
	Test Data (MHz)			Result
		99%OBW (MHz)	-20dB BW(MHz)	
N/A	Low Channel	1.204	1.365	PASS
	Middle Channel	1.208	1.365	PASS
	High Channel	1.227	1.378	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

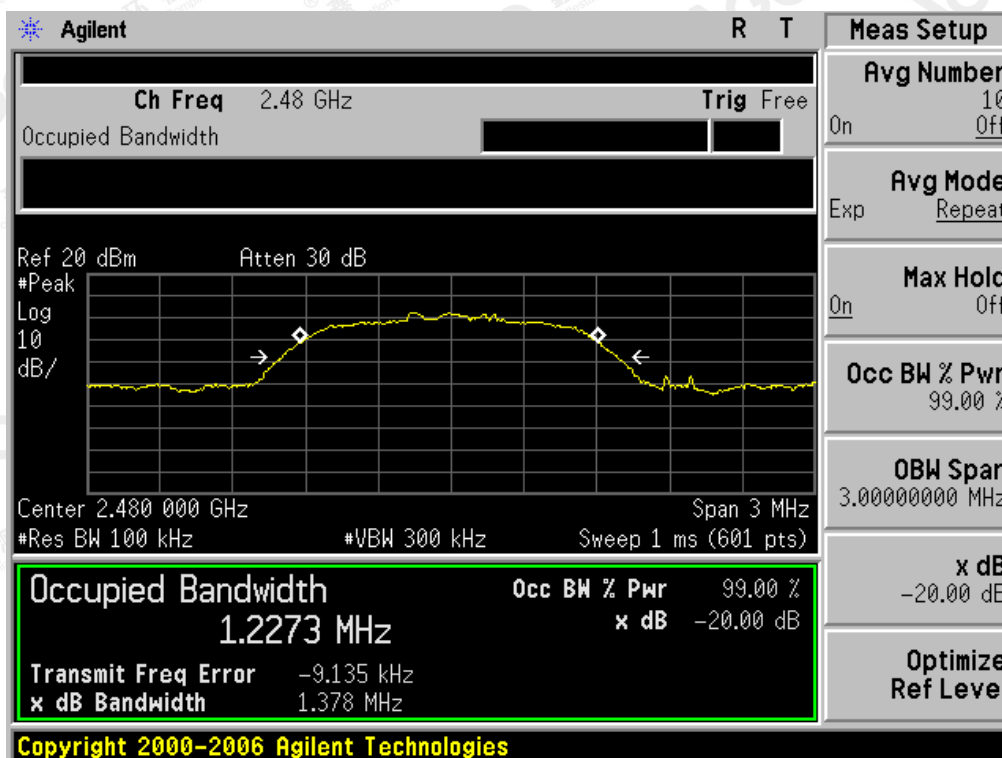


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

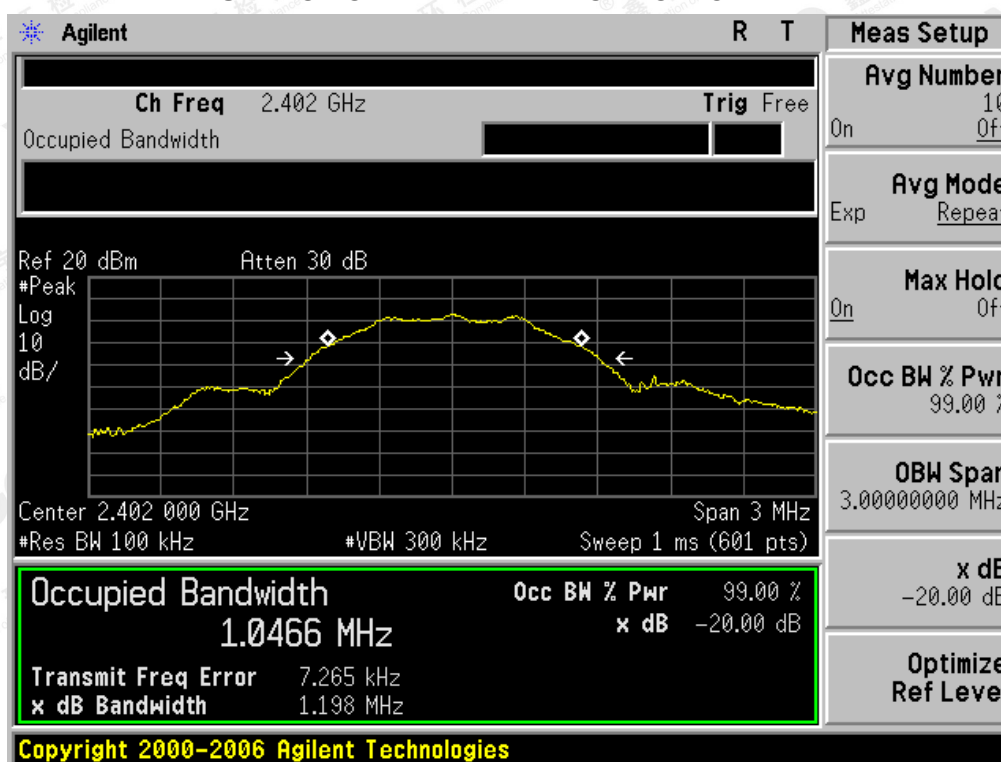


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

FOR BLE

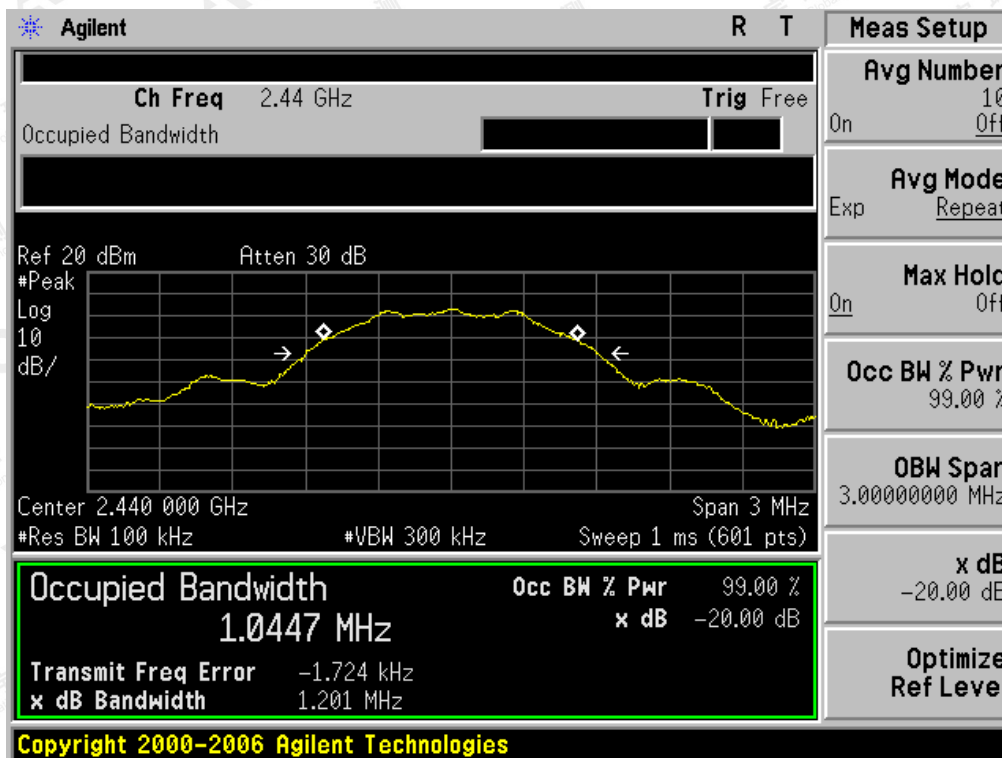
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESULT				
Applicable Limits	Measurement Result			
	Test Data (MHz)			Result
		99%OBW (MHz)	-20dB BW(MHz)	
N/A	Low Channel	1.047	1.198	PASS
	Middle Channel	1.045	1.201	PASS
	High Channel	1.047	1.195	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

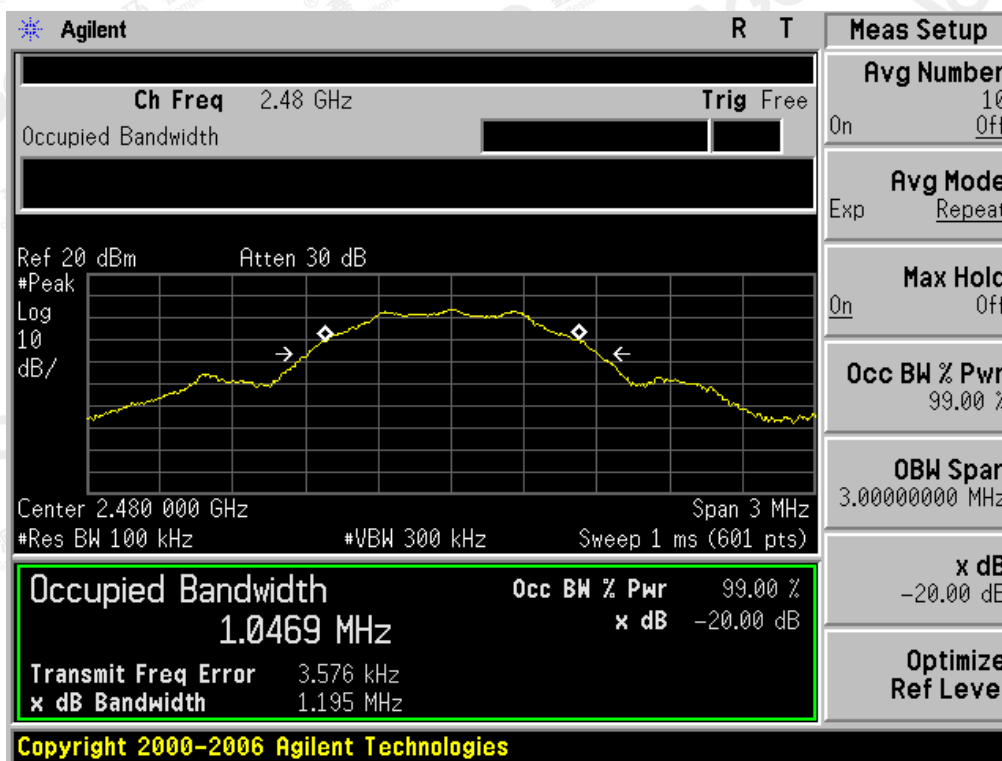


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

12. FCC LINE CONDUCTED EMISSION TEST

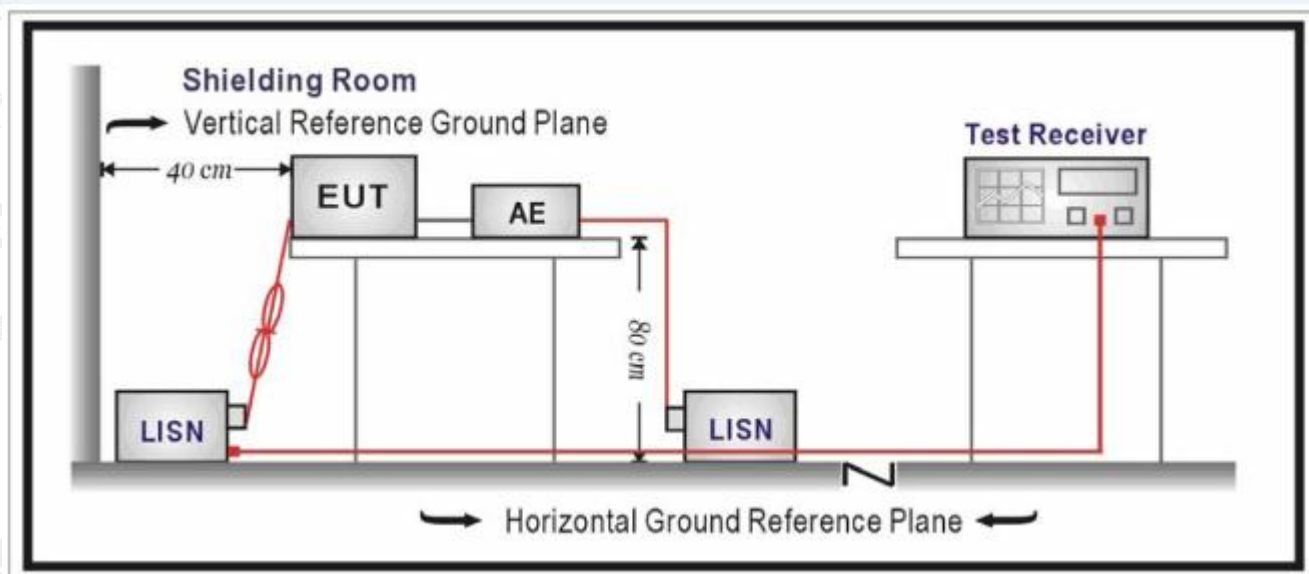
12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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.

12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

12.3. 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 DC voltage by adapter or PC which received 120V/60Hz power 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.

12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

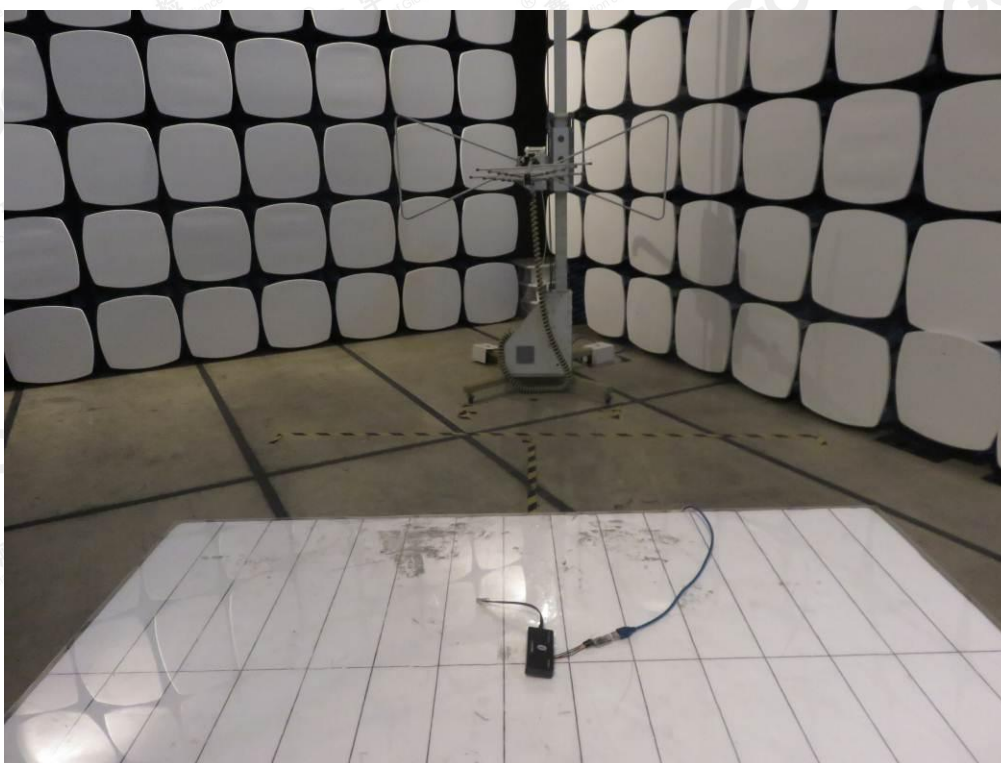
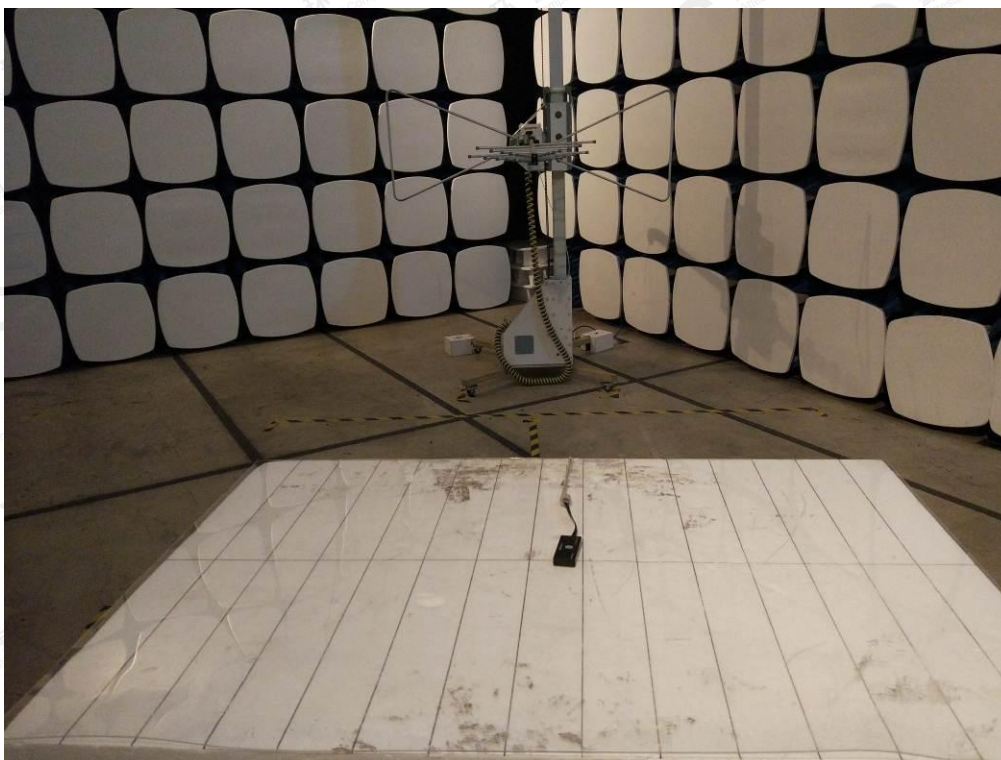
1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used 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.

12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

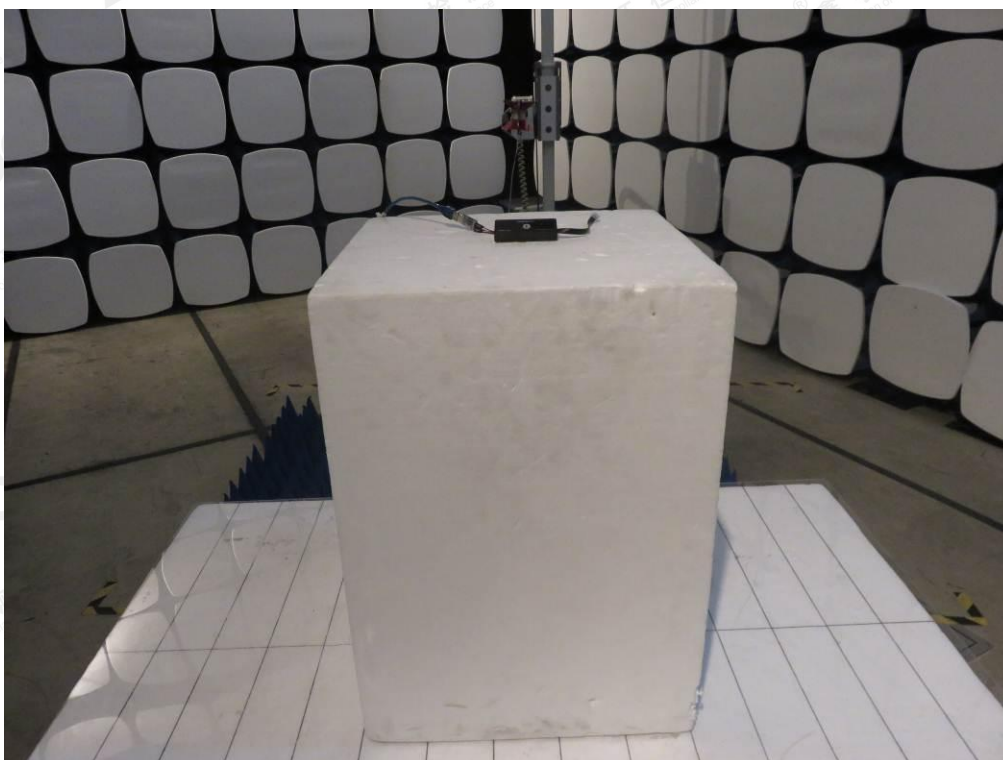
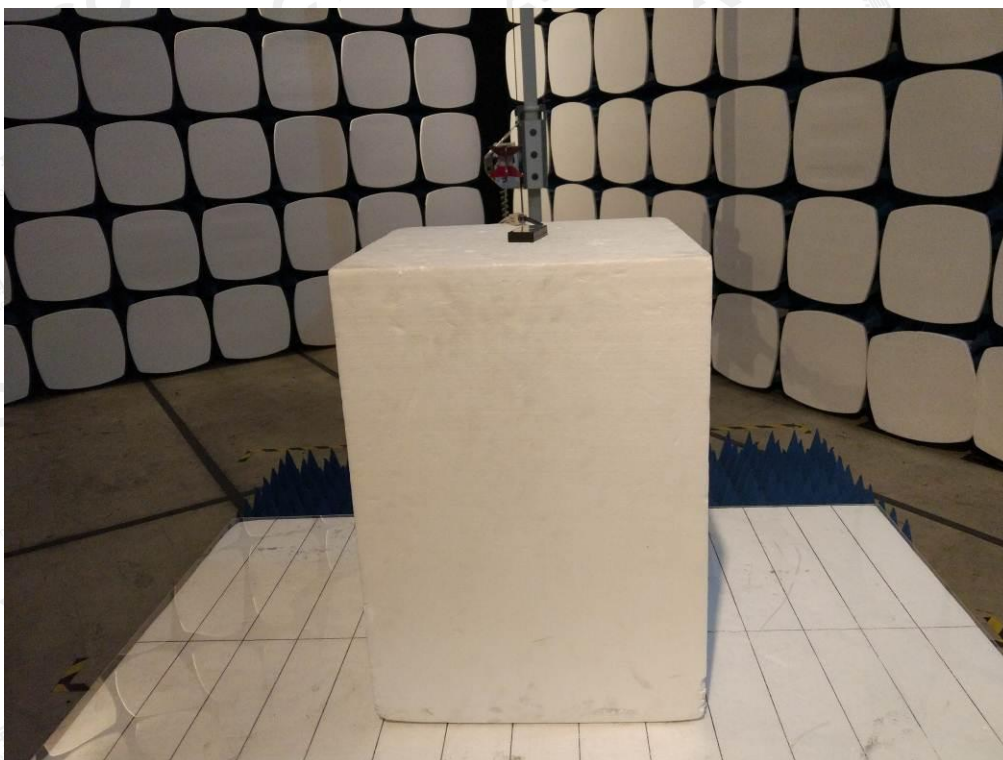
N/A

Note: Owing to the device is exclusively used for the main unit fixed installed within transportation vehicles does and the main unit was supplied by DC source, so it's not applicable.

APPENDIX A: PHOTOGRAPHS OF TEST SETUP
FCC RADIATED EMISSION TEST SETUP

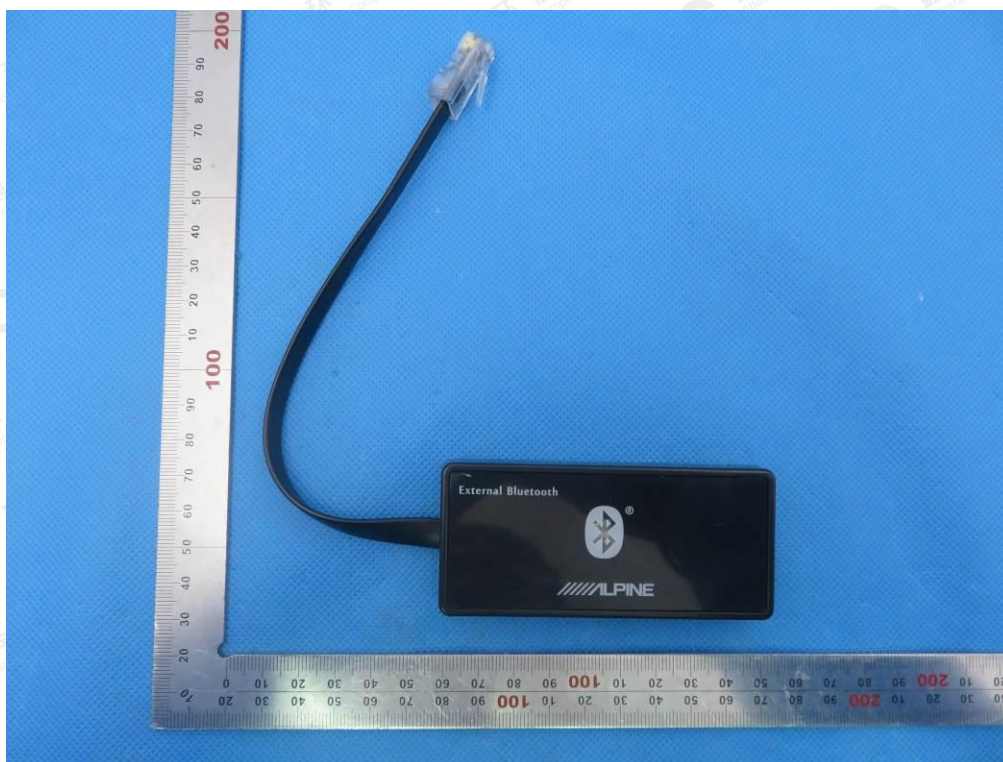


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

APPENDIX B: PHOTOGRAPHS OF EUT
TOP VIEW OF EUT



BOTTOM VIEW OF EUT



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

FRONT VIEW OF EUT



BACK VIEW OF EUT

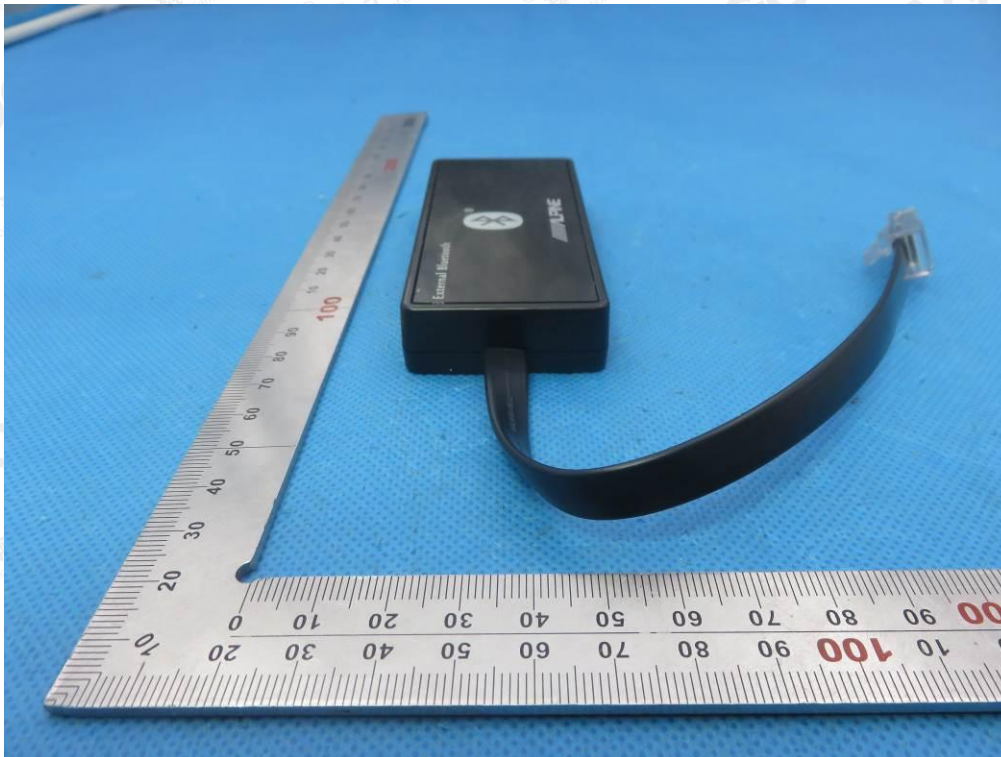


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

LEFT VIEW OF EUT



RIGHT VIEW OF EUT

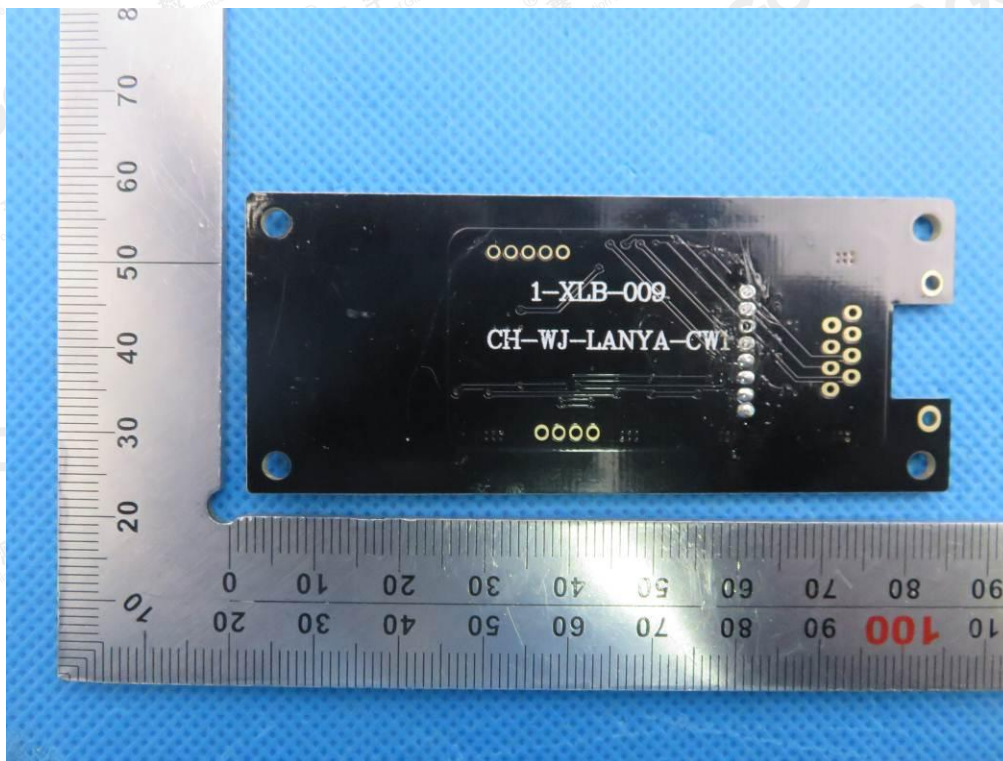


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

OPEN VIEW OF EUT

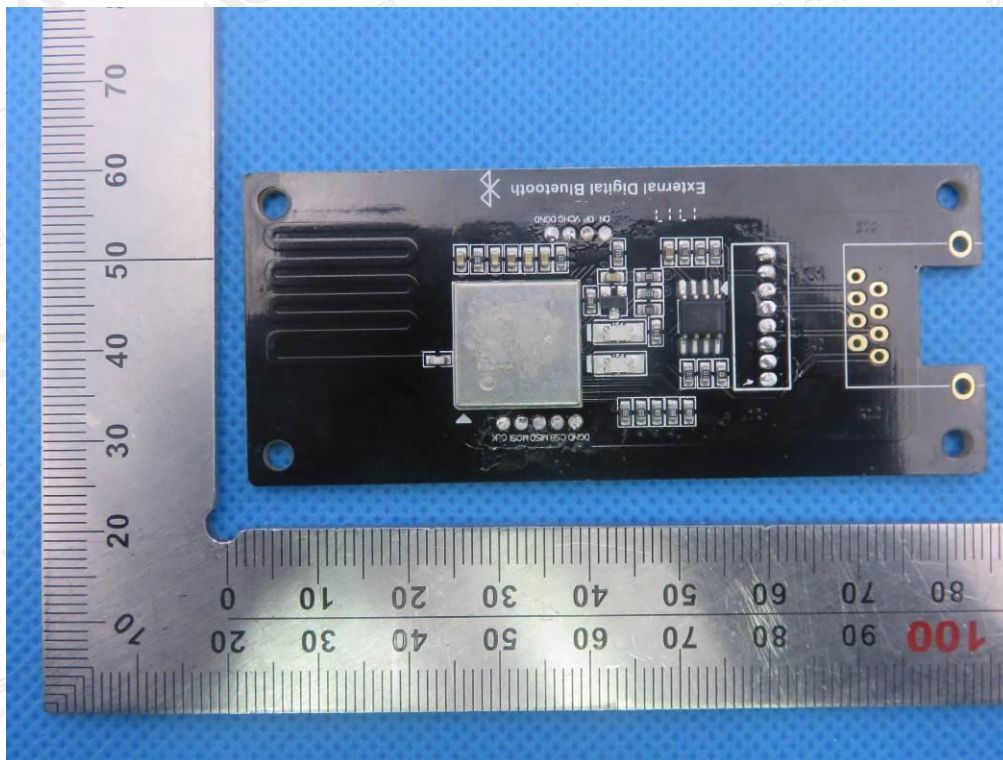


INTERNAL VIEW OF EUT-1

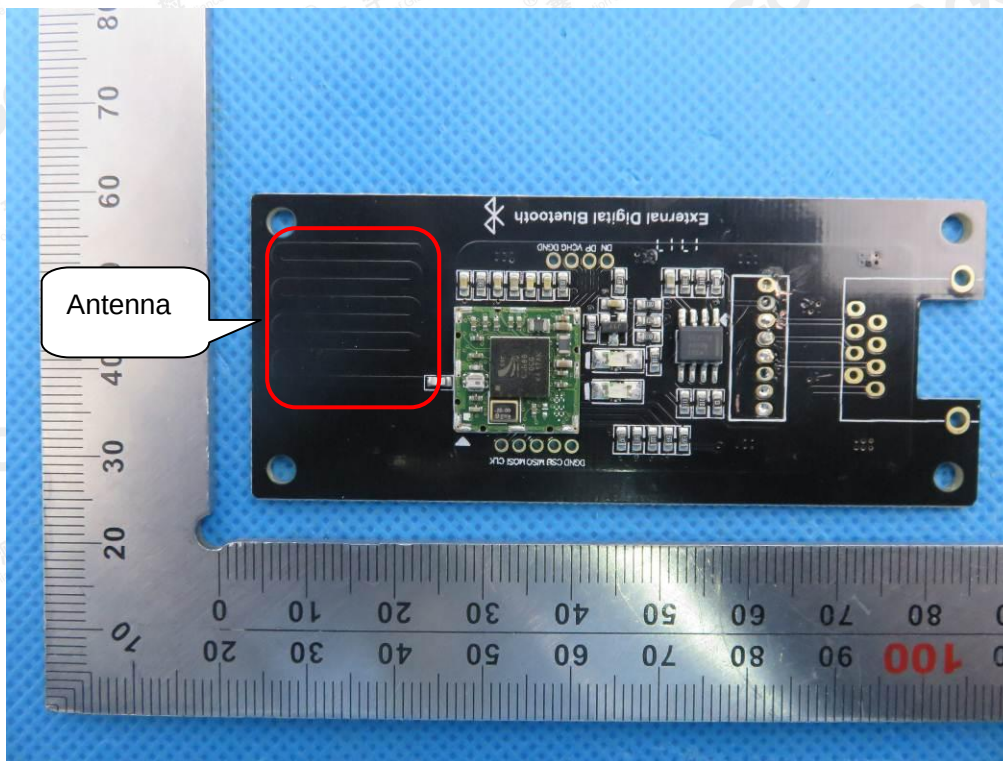


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

INTERNAL VIEW OF EUT-4



-----END OF REPORT-----

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.