FCC Test Report

Report No.: AGC02039150903FE03

FCC ID : WTDS015

APPLICATION PURPOSE: Original Equipment

PRODUCT DESIGNATION: Mono Bluetooth Headset

BRAND NAME : DACOM

MODEL NAME : S015, AngLink S015, K65, U31

CLIENT: Shenzhen Sande Dacom Electronics Co., Ltd

DATE OF ISSUE : Sep.24,2015

STANDARD(S)

TEST PROCEDURE(S) : FCC Part 15 Rules

REPORT VERSION: V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	1	Sep.24,2015	Valid	Original Report

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1. VERIFICATION OF CONFORMITY

Applicant	Shenzhen Sande Dacom Electronics Co., Ltd
Address	Building E, East District No.8, Shangxue Technolog ShenZhen,China
Manufacturer	Shenzhen Sande Dacom Electronics Co., Ltd
Address	Building E, East District No.8, Shangxue Technolog ShenZhen,China
Product Designation	Mono Bluetooth Headset
Brand Name	DACOM
Test Model	S015
Series Model	AngLink S015, K65, U31
Different Description	All the same except for the model name
Date of test	Sep.21,2015 to Sep.22,2015
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Compliance Certification Service(Shenzhen) Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.249.

Tested By	Tringe Unang	
	Time Huang(Huang Nanhui)	Sep.24,2015
Reviewed By	Forest cei	
	Forrest Lei(Lei Yonggang)	Sep.24,2015
Approved By	golga shong	
	Solger Zhang(Zhang Hongyi) Authorized Officer	Sep.24,2015

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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 -6.38dBm(Max)			
Bluetooth Version V4.1			
Modulation GFSK, π /4-DQPSK, 8DPSK			
Number of channels 79 for BR/EDR, 40 for BLE			
Hardware Version V4			
Software Version V1			
Antenna Designation PCB Antenna (Met 15.203 Antenna requirement)			
Antenna Gain 0.5dBi			
Power Supply DC 3.7V by battery			
Note: The USB port only used for charging and can't be used to transfer data with PC.			

Note. The USB port only used for charging and carry be used to transfer data with PC

The BT does not work when charging

2.2. TABLE OF CARRIER FREQUENCYS

BR/EDR channel List

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

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BLE Channel List

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

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3. MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	±3.18dB
2	All emissions,radiated	±3.91dB
3	Temperature	±0.5°C
4	Humidity	±2%

4. DESCRIPTION OF TEST MODES

1 Low channel GFSK 2 Middle channel GFSK 3 High channel GFSK 4 Low channel π /4-DQPSK 5 Middle channel π /4-DQPSK 6 High channel π /4-DQPSK 7 Low channel 8DPSK 8 Middle channel 8DPSK	NO.	TEST MODE DESCRIPTION
3 High channel GFSK 4 Low channel π /4-DQPSK 5 Middle channel π /4-DQPSK 6 High channel π /4-DQPSK 7 Low channel 8DPSK 8 Middle channel 8DPSK	1	Low channel GFSK
4 Low channel π /4-DQPSK 5 Middle channel π /4-DQPSK 6 High channel π /4-DQPSK 7 Low channel 8DPSK 8 Middle channel 8DPSK	2	Middle channel GFSK
 Middle channel π /4-DQPSK High channel π /4-DQPSK Low channel 8DPSK Middle channel 8DPSK 	3	High channel GFSK
6 High channel π /4-DQPSK 7 Low channel 8DPSK 8 Middle channel 8DPSK	4	Low channel π /4-DQPSK
7 Low channel 8DPSK 8 Middle channel 8DPSK	5	Middle channel π /4-DQPSK
8 Middle channel 8DPSK	6	High channel π /4-DQPSK
	7	Low channel 8DPSK
0 High shannel 9DDSK	8	Middle channel 8DPSK
a night channel odpok	9	High channel 8DPSK
10 BT Link	10	BT Link

Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 3. The EUT used fully-charged battery when tested.

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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	Model No.	ID or Specification	Remark
1	Mono Bluetooth Headset	DACOM	S015	EUT
2	PC	Lenovo	SL410K	A.E
3	Control box	N/A	N/A	A.E

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.207	Conduction Emission	N/A
N/A	BANDWIDTH	Compliant

Note: N/A means not applicable

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6. TEST FACILITY

Site Compliance Certification Service(Shenzhen) Inc.	
Location	No.10-1 Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan Town,Baoan Distr
FCC Registration No.	441872
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009.

7 ALL TEST EQUIPMENT LIST

Radiated Emission Test Site 966(2)						
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration	
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2015	03/01/2016	
EMI TEST RECEIVER	ROHDE&SCHWAR Z	ESCI	100783	03/09/2015	03/08/2016	
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2015	03/17/2016	
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2015	03/17/2016	
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2015	07/09/2016	
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2015	03/01/2016	
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2015	03/01/2016	
Loop Antenna	COM-POWER	AL-130	121044	09/27/2014	09/26/2015	
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R	
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R	
Controller	СТ	N/A	N/A	N.C.R	N.C.R	
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2015	02/27/2016	
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R	
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2				

Conducted Emission Test Site						
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration	
EMI TEST RECEIVER	ROHDE&SCHWA RZ	ESCI	100783	03/09/2015	03/08/2016	
LISN(EUT)	ROHDE&SCHWA RZ	ENV216	101543-WX	03/09/2015	03/08/2016	
LISN	EMCO	3825/2	8901-1459	03/09/2015	03/08/2016	
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	03/04/2015	03/03/2016	
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE				

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8. RADIATED EMISSION

8.1TEST LIMIT

Standard FCC15.249

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

Remark:

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

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8.2. MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.

- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1.5MHz VBW and RBW for peak reading. Then 1.5MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

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

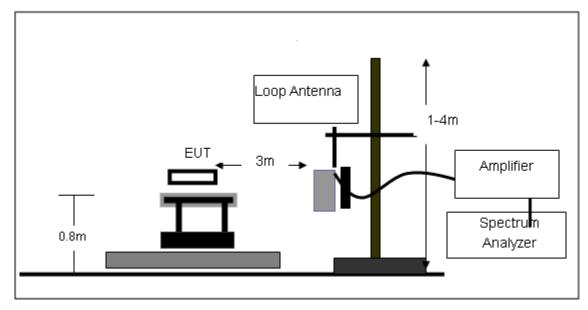
Spectrum Parameter	Setting			
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP			
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP			
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP			
Start ~Stop Frequency	1GHz~26.5GHz 1.5MHz/1.5MHz for Peak, 1.5MHz/10Hz for Average			

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

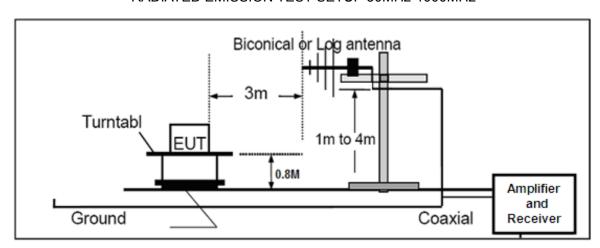
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8.3. TEST SETUP

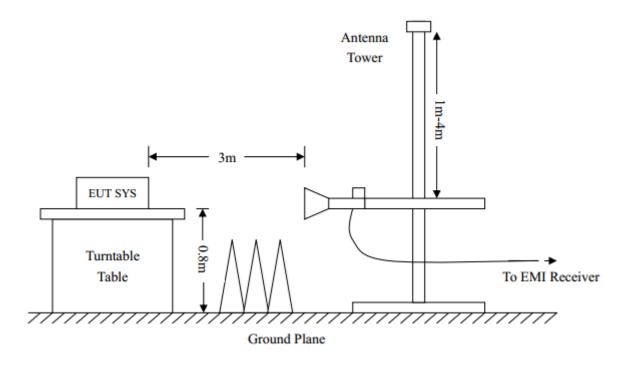
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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8.4. TEST RESULT

(Worst modulation:GFSK)

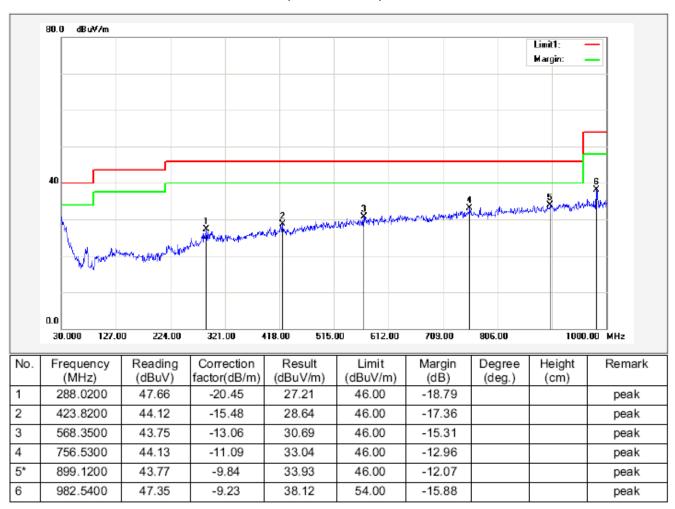
FOR BR/EDR

RADIATED EMISSION BELOW 30MHZ

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

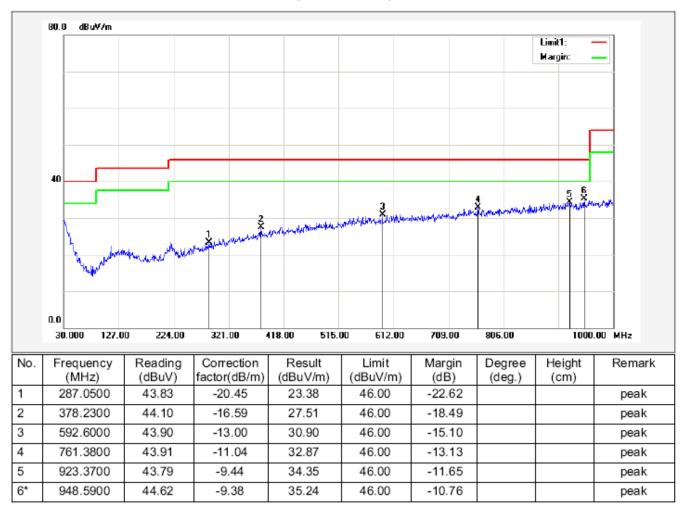
RADIATED EMISSION BELOW 1GHZ

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



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



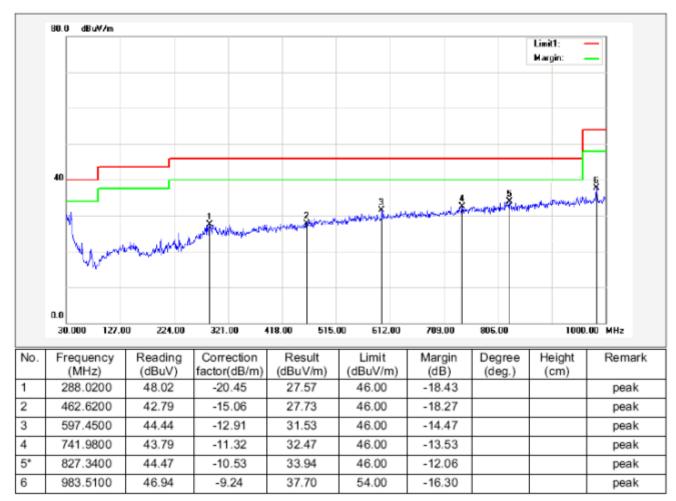
RESULT: PASS

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

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

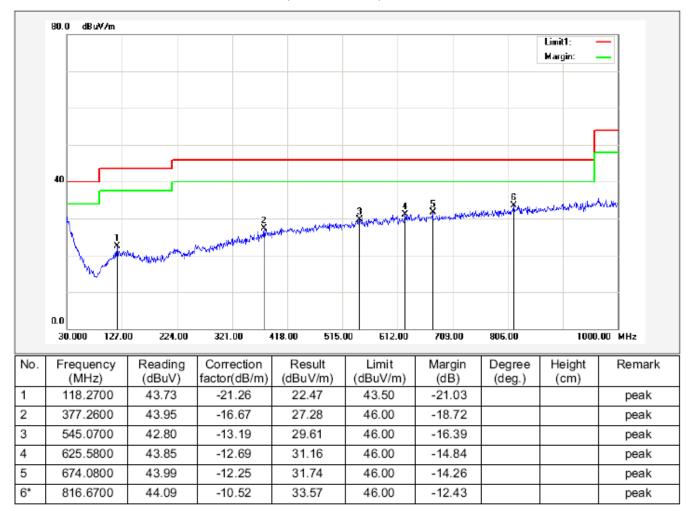
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RADIATED EMISSION TEST- (30MHZ-1GHZ)-MIDDLE CHANNEL-HORIZONTAL



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



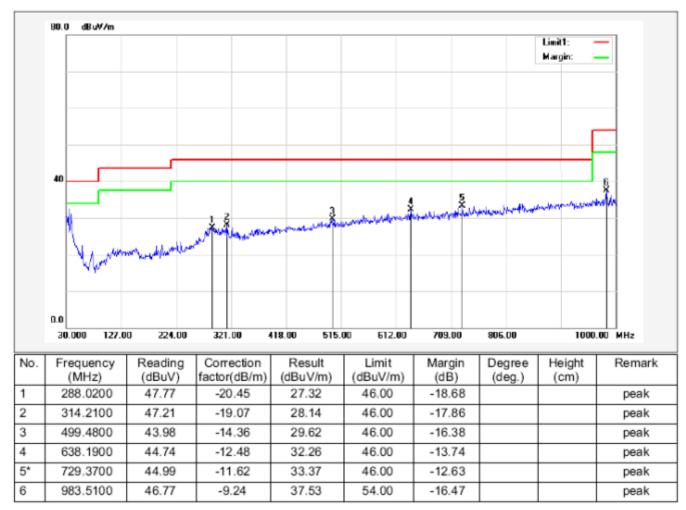
RESULT: PASS

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

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

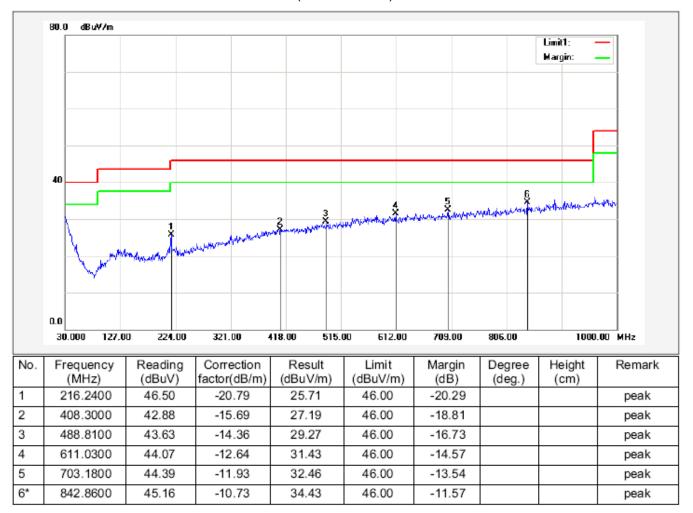
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RADIATED EMISSION TEST- (30MHZ-1GHZ)-HIGH CHANNEL-HORIZONTAL



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



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.

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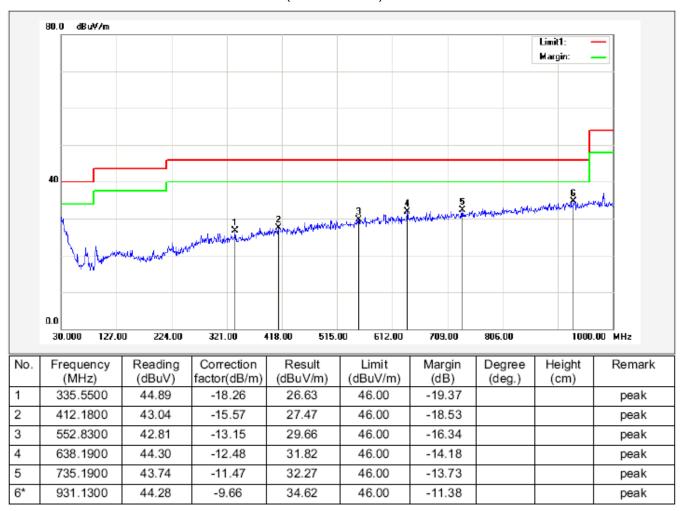
FOR BLE

RADIATED EMISSION BELOW 30MHZ

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

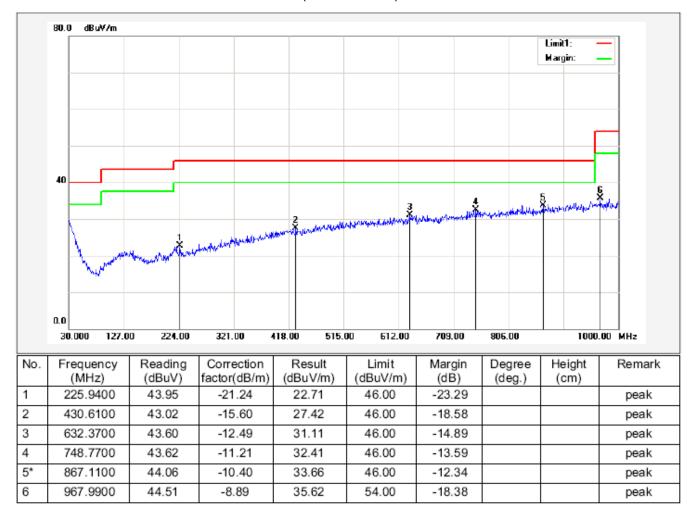
RADIATED EMISSION BELOW 1GHZ

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



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



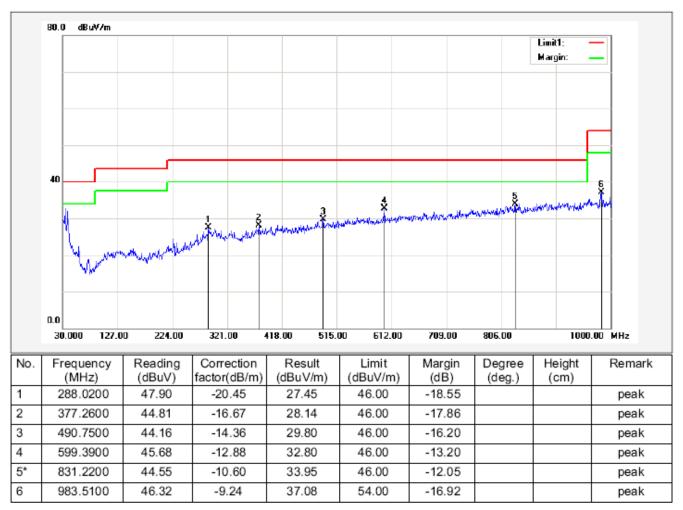
RESULT: PASS

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

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

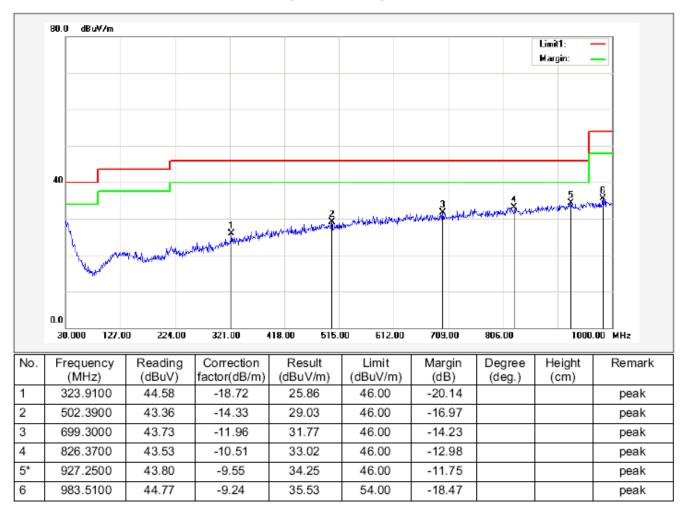
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RADIATED EMISSION TEST- (30MHZ-1GHZ)-MIDDLE CHANNEL-HORIZONTAL



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



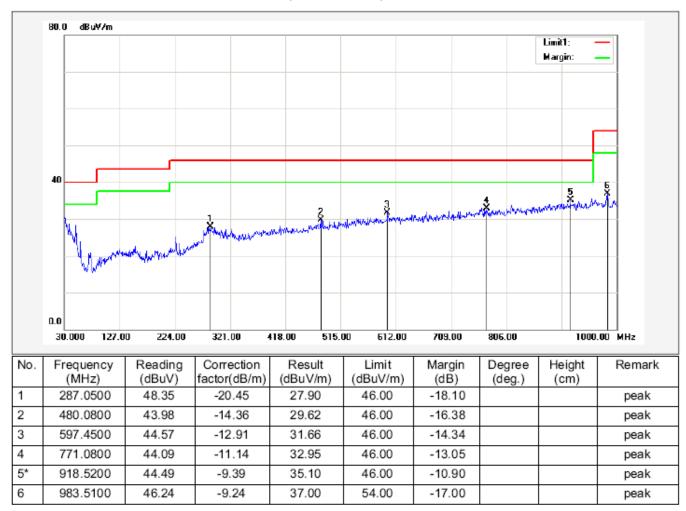
RESULT: PASS

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

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

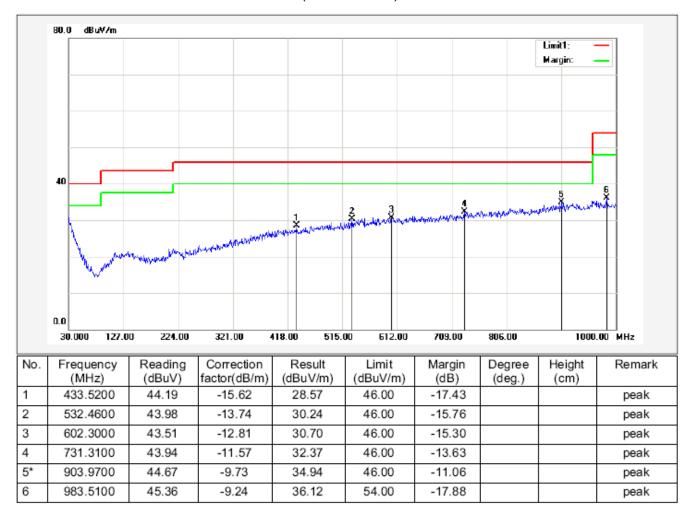
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RADIATED EMISSION TEST- (30MHZ-1GHZ)-HIGH CHANNEL-HORIZONTAL



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



RESULT: PASS

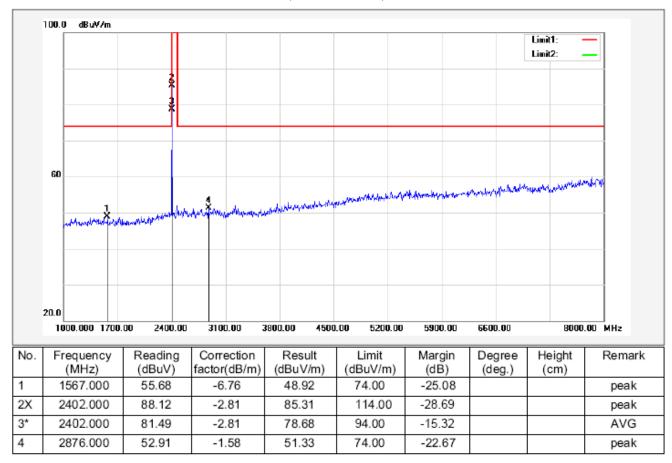
Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

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

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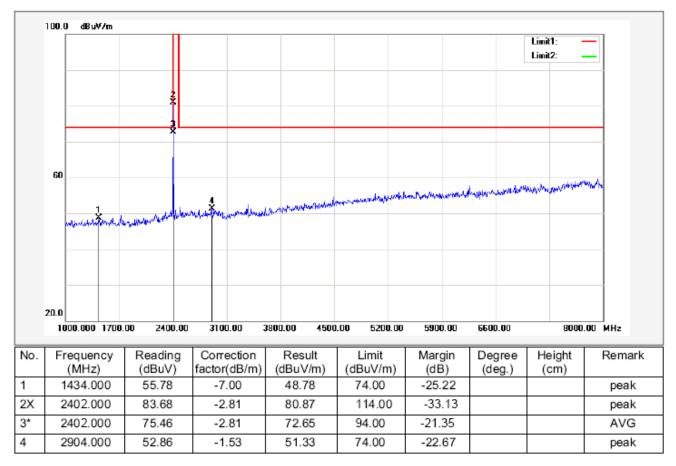
RADIATED EMISSION ABOVE 1GHZ FOR BR/EDR

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



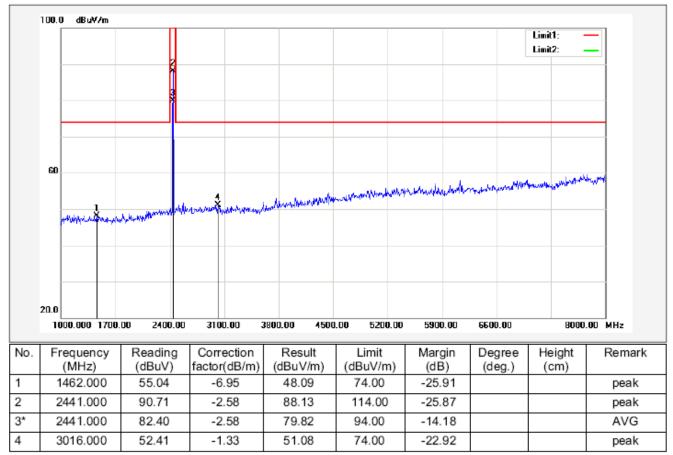
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RADIATED EMISSION TEST- (ABOVE 1GHZ)-LOW CHANNEL- VERTICAL



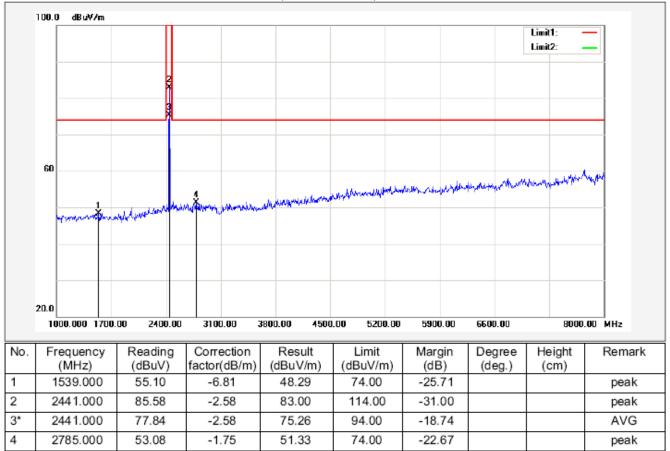
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RADIATED EMISSION TEST- (ABOVE 1GHZ)-MIDDLE CHANNEL-HORIZONTAL



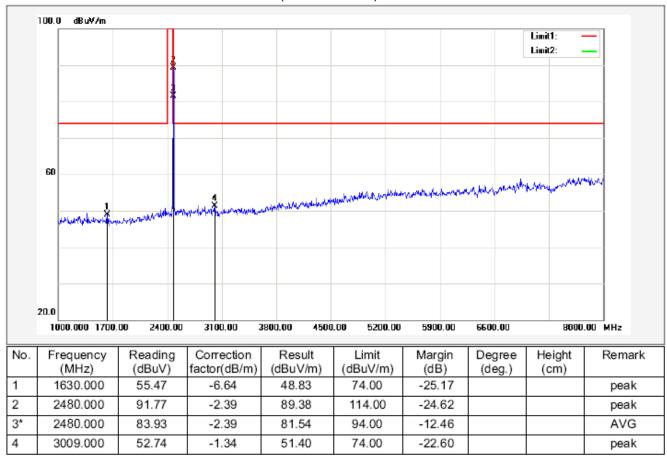
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RADIATED EMISSION TEST- (ABOVE 1GHZ)-MIDDLE CHANNEL- VERTICAL



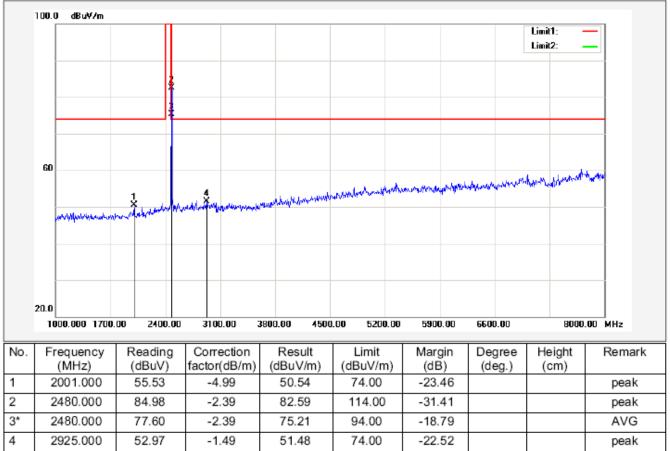
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RADIATED EMISSION TEST- (ABOVE 1GHZ)-HIGH CHANNEL-HORIZONTAL



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



RESULT: PASS

Note: 8~25GHz 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.

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Field strength of the fundamental signal

Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	88.12	-2.81	85.31	114	-28.69	Horizontal
2402	83.68	-2.81	80.87	114	-33.13	Vertical
2441	90.71	-2.58	88.13	114	-25.87	Horizontal
2441	85.58	-2.58	83.00	114	-31.00	Vertical
2480	91.77	-2.39	89.38	114	-24.62	Horizontal
2480	84.98	-2.39	82.59	114	-31.41	Vertical

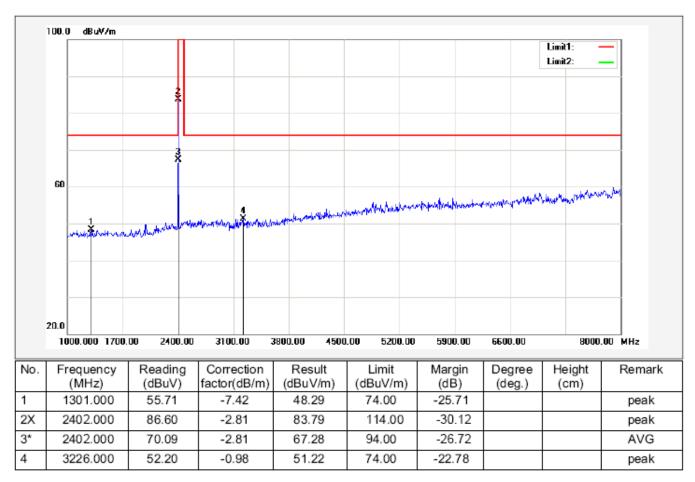
Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	81.49	-2.81	78.68	94	-15.32	Horizontal
2402	75.46	-2.81	72.65	94	-21.35	Vertical
2441	82.40	-2.58	79.82	94	-14.18	Horizontal
2441	77.84	-2.58	75.26	94	-18.74	Vertical
2480	83.93	-2.39	81.54	94	-12.46	Horizontal
2480	77.60	-2.39	75.21	94	-18.79	Vertical

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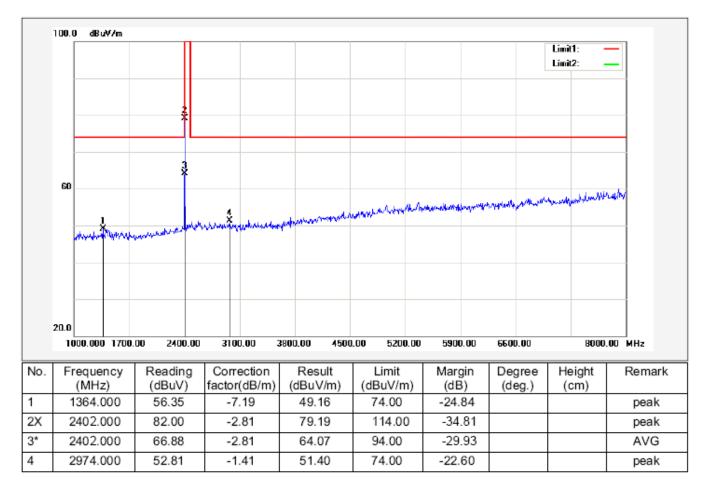
FOR BLE

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



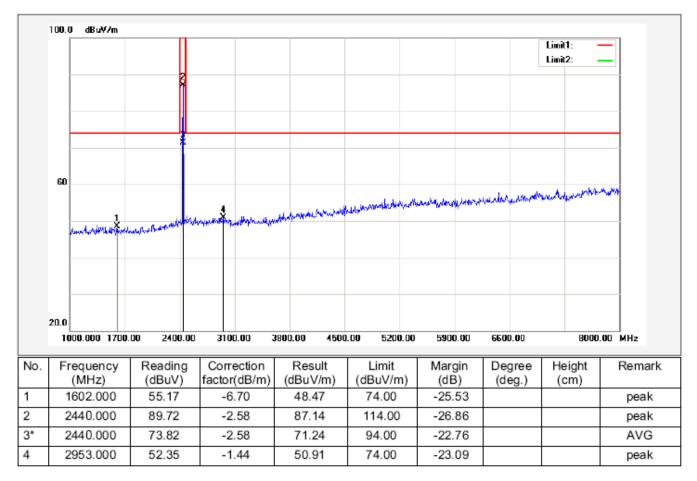
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RADIATED EMISSION TEST- (ABOVE 1GHZ)-LOW CHANNEL- VERTICAL



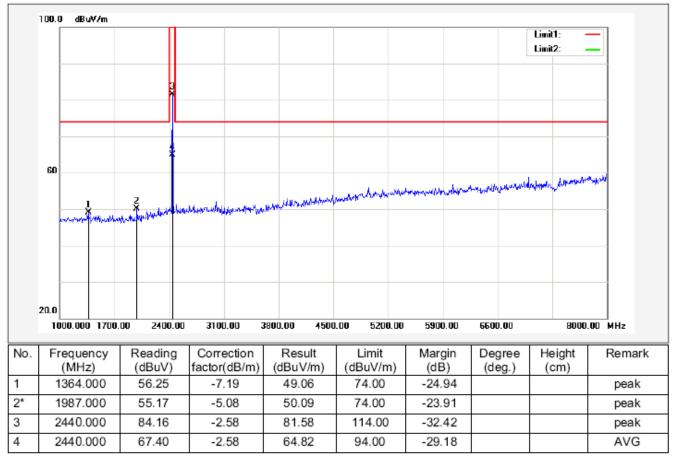
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RADIATED EMISSION TEST- (ABOVE 1GHZ)-MIDDLE CHANNEL-HORIZONTAL



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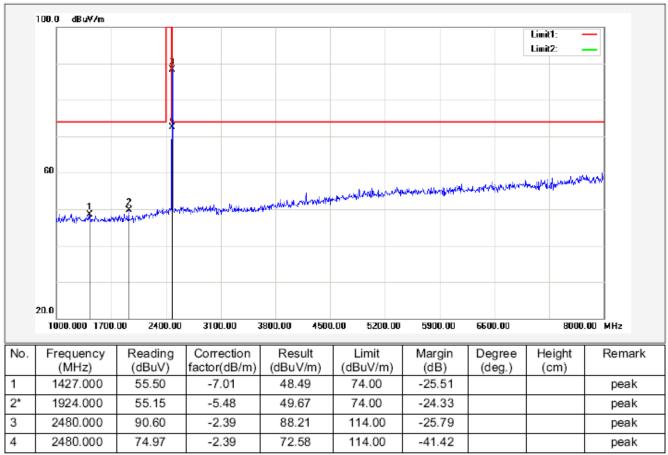
RADIATED EMISSION TEST- (ABOVE 1GHZ)-MIDDLE CHANNEL- VERTICAL



RESULT: PASS

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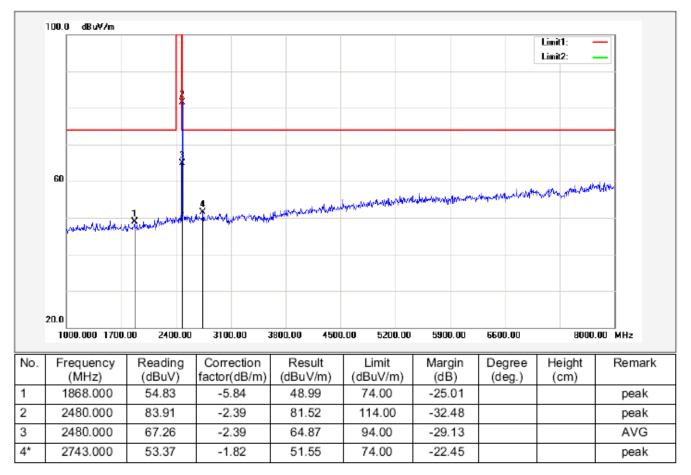
RADIATED EMISSION TEST- (ABOVE 1GHZ)-HIGH CHANNEL-HORIZONTAL



RESULT: PASS

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



RESULT: PASS

Note: 8~25GHz 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.

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Field strength of the fundamental signal

Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	86.60	-2.81	83.79	114	-30.12	Horizontal
2402	82.00	-2.81	79.19	114	-34.81	Vertical
2440	89.72	-2.58	87.14	114	-26.86	Horizontal
2440	84.16	-2.58	81.58	114	-32.42	Vertical
2480	90.60	-2.39	88.21	114	-25.79	Horizontal
2480	83.91	-2.93	81.52	114	-32.48	Vertical

Average value

71101 ago 1 ana 0						
Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	70.09	-2.81	67.28	94	-26.72	Horizontal
2402	66.88	-2.81	64.07	94	-29.93	Vertical
2440	73.82	-2.58	71.24	94	-22.76	Horizontal
2440	67.40	-2.58	64.82	94	-29.18	Vertical
2480	74.97	-2.39	72.58	94	-41.42	Horizontal
2480	67.26	-2.39	64.87	94	-29.13	Vertical

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9. BAND EDGE EMISSION

9.1. MEASUREMENT PROCEDURE

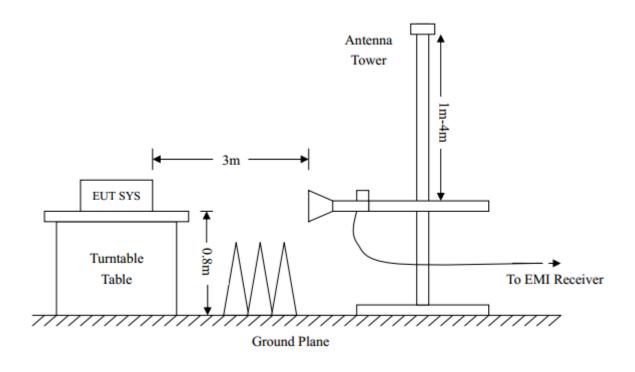
1The EUT operates at hopping-off test mode. The lowest or highest channels are tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

2Max hold the trace of the setp 1,and the EUT operates at hopping-on test mode to verify the largest spurious emissions power.

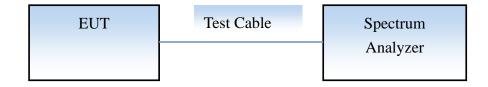
3Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=VBW=1.5MHz / Sweep=AUTO

9.2 TEST SETUP

RADIATED EMISSION TEST SETUP



CONDUCTED TEST SETUP



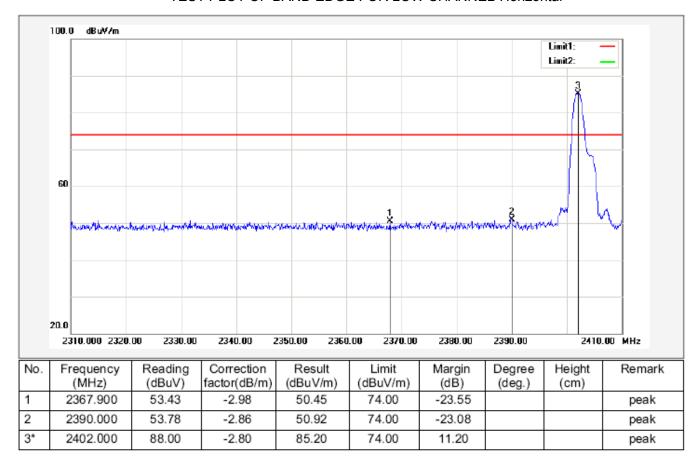
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9.3 RADIATED TEST RESULT

(Worst modulation:GFSK)

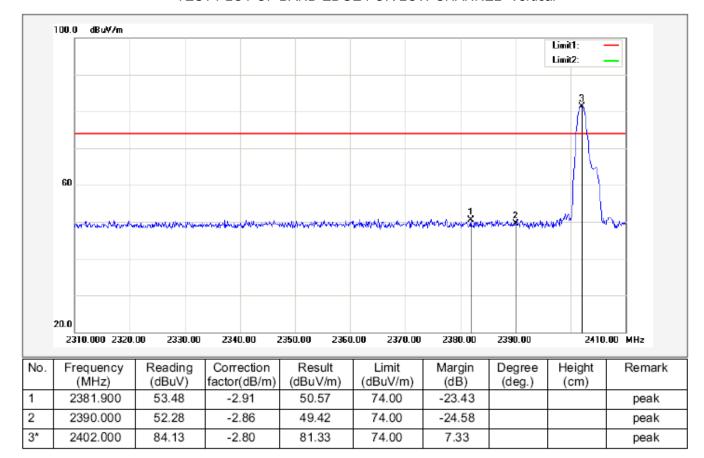
FOR BR/EDR

TEST PLOT OF BAND EDGE FOR LOW CHANNEL-Horizontal



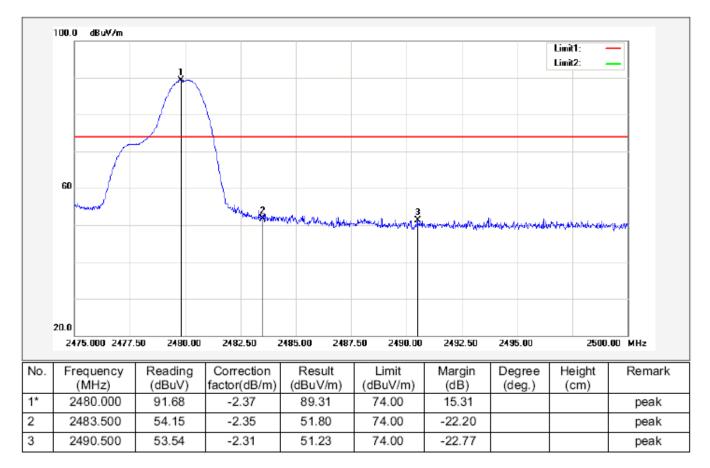
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TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Vertical



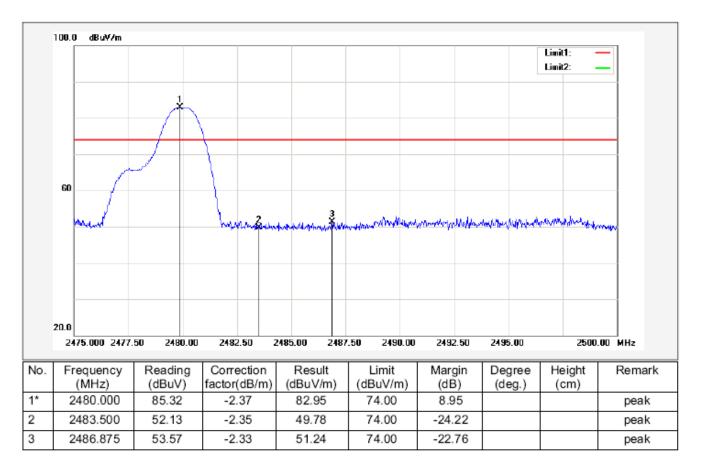
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TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Horizontal



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TEST PLOT OF BAND EDGE FOR HIGH CHANNEL-Vertical



RESULT: PASS

Note: The other modes radiation emission have enough 20dB margin.

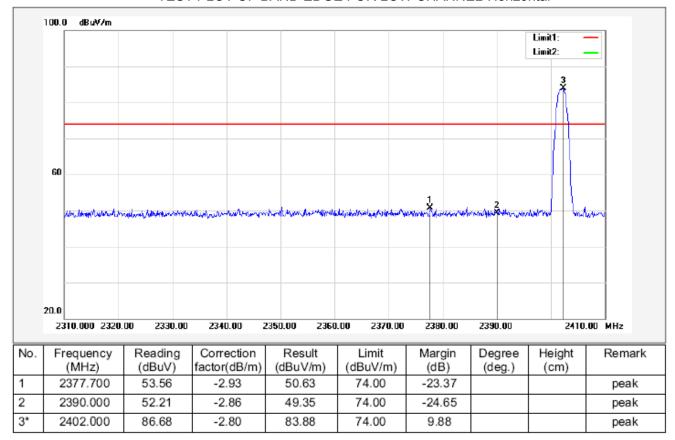
Factor=Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

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

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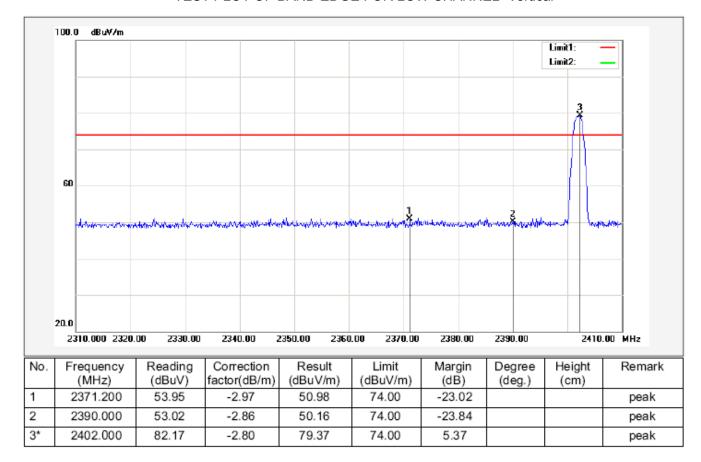
FOR BLE

TEST PLOT OF BAND EDGE FOR LOW CHANNEL-Horizontal



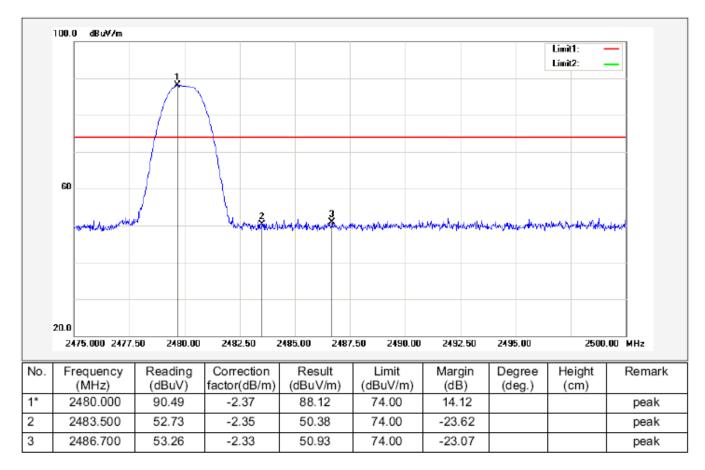
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TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Vertical



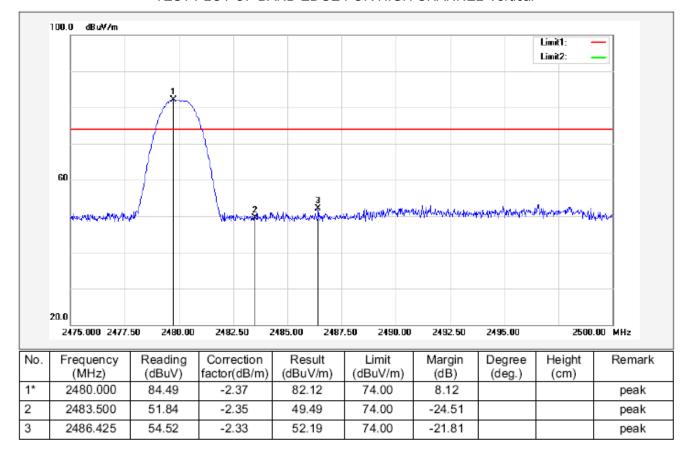
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TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Horizontal



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TEST PLOT OF BAND EDGE FOR HIGH CHANNEL-Vertical



RESULT: PASS

Note: The other modes radiation emission have enough 20dB margin.

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

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

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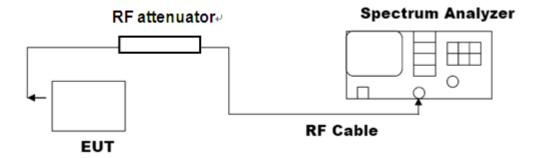
10. 20DB BANDWIDTH

10.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hoping channel RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

10.2. TEST SET-UP

(BLOCK DIAGRAM OF CONFIGURATION)



10.3. LIMITS AND MEASUREMENT RESULTS

FOR BR/EDR

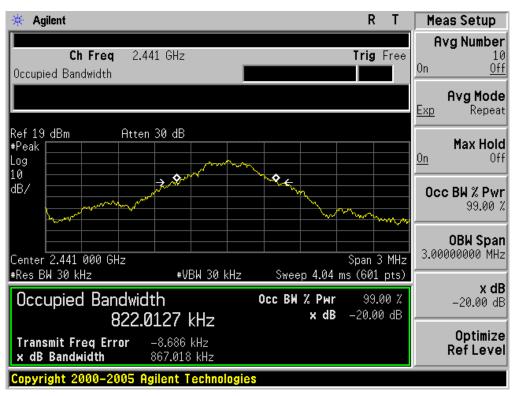
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESUL				
Measurement Result				
Applicable Limits	Test Data (MHz)		Criteria	
	Low Channel	0.954	PASS	
N/A	Middle Channel	0.867	PASS	
	High Channel	0.845	PASS	

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TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

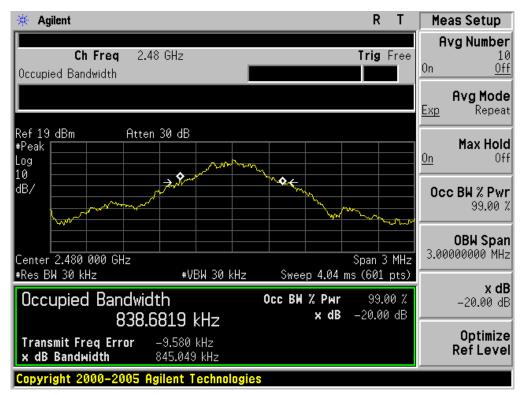


TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



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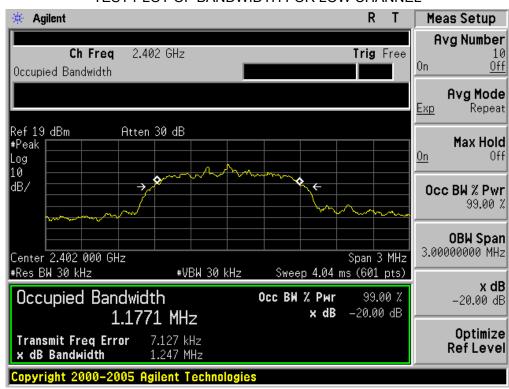
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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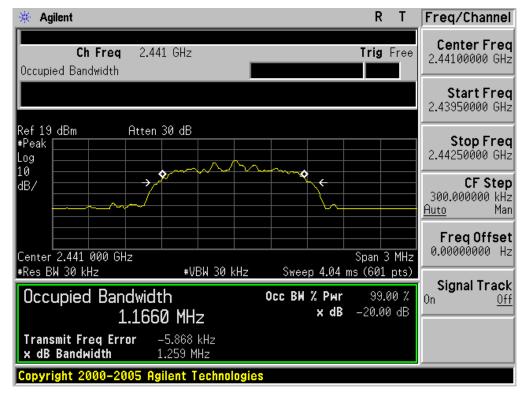
BLUETOOTH 2MBPS LIMITS AND MEASUREMENT RESUL				
Measurement Result				
Applicable Limits	Test Data (MHz)		Criteria	
	Low Channel	1.247	PASS	
N/A	Middle Channel	1.259	PASS	
	High Channel	1.259	PASS	

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

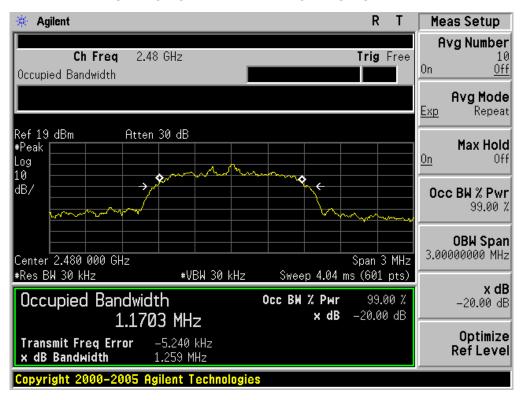


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TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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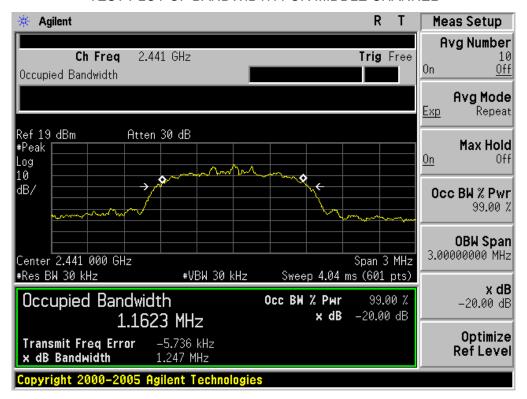
BLUETOOTH 3MBPS LIMITS AND MEASUREMENT RESUL				
Measurement Result				
Applicable Limits	Test Da	ita (MHz)	Criteria	
	Low Channel	1.302	PASS	
N/A	Middle Channel	1.247	PASS	
	High Channel	1.265	PASS	

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

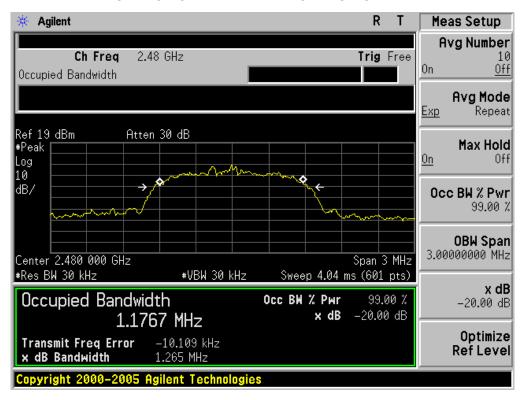


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TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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FOR BLE

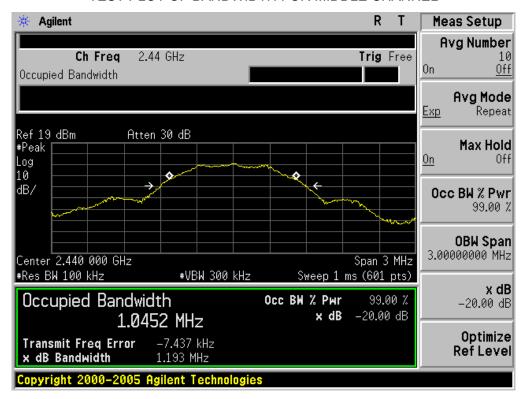
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESUL				
Measurement Result				
Applicable Limits	Test Data (MHz)		Criteria	
	Low Channel	1.209	PASS	
N/A	Middle Channel	1.193	PASS	
	High Channel	1.210	PASS	

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

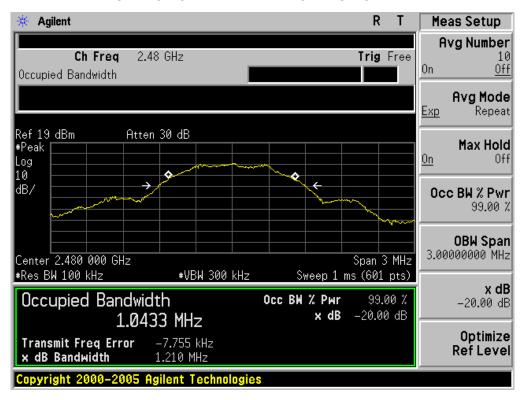


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TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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11. FCC LINE CONDUCTED EMISSION TEST

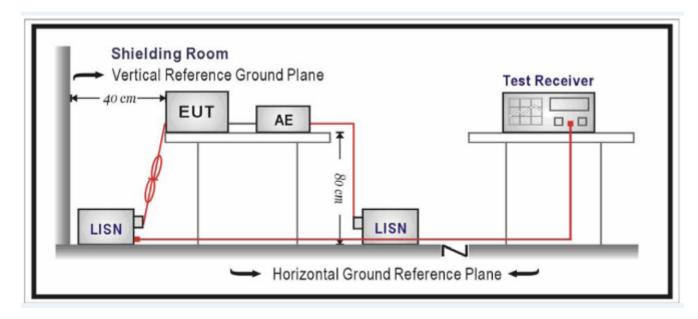
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Francisco	Maximum RF Line Voltage		
Frequency	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.

11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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11.3. 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 C63.4 (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 C63.4.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4. All support equipments received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC charging voltage by PC which received 120V/60Hzpower by a LISN..
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

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

11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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.

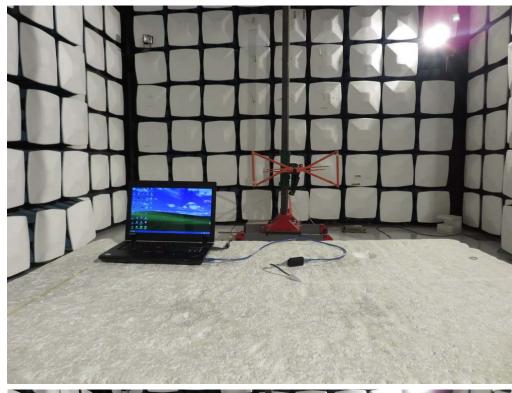
11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

N/A

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP





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APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



BOTTOM VIEW OF EUT



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FRONT VIEW OF EUT



BACK VIEW OF EUT



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LEFT VIEW OF EUT



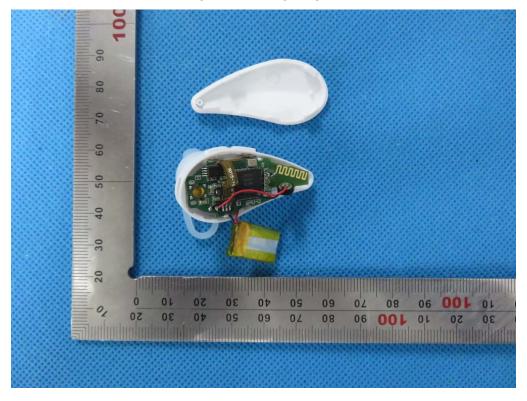
RIGHT VIEW OF EUT



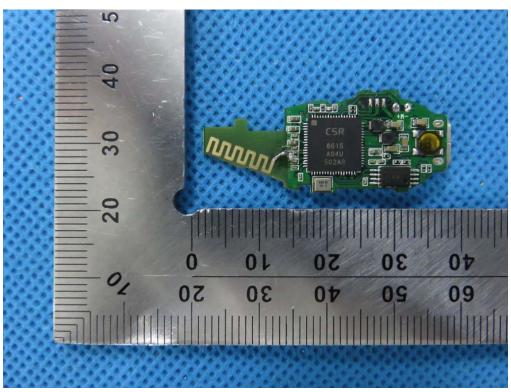
VIEW OF EUT (PORT)



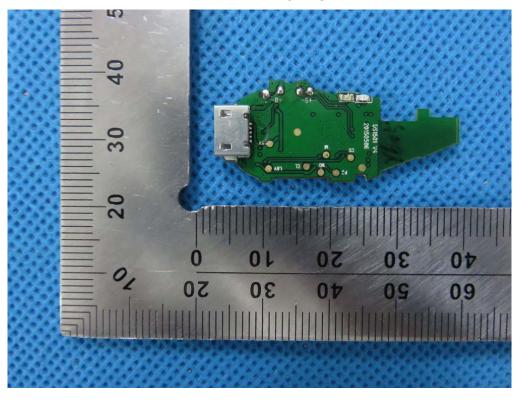
OPEN VIEW OF EUT



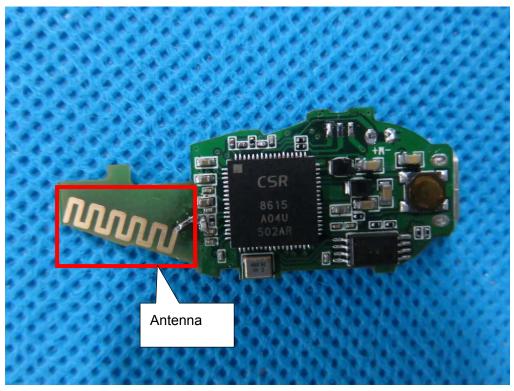
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



----END OF REPORT----