
FCC Test Report

Report No.: AGC00608150901FE03

FCC ID : 2ABM9T2

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : TURNTABLE STEREO SYSTEM

BRAND NAME : SIGN, SHARPER IMAGE, Polaroid

MODEL NAME : T2, SBT4001, PBT4001

CLIENT : Shenzhen Tongke Electronics Co., Ltd

DATE OF ISSUE : Oct.13,2015

STANDARD(S) : FCC Part 15 Rules

TEST PROCEDURE(S)

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	/	Oct.13,2015	Valid	Original Report

TABLE OF CONTENTS

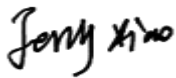
1. VERIFICATION OF CONFORMITY	4
2. GENERAL INFORMATION	5
2.1. PRODUCT DESCRIPTION	5
2.2. TABLE OF CARRIER FREQUENCIES.....	5
3. MEASUREMENT UNCERTAINTY.....	6
4. DESCRIPTION OF TEST MODES.....	6
5. SYSTEM TEST CONFIGURATION	7
5.1. CONFIGURATION OF EUT SYSTEM.....	7
5.2. EQUIPMENT USED IN EUT SYSTEM.....	7
5.3. SUMMARY OF TEST RESULTS.....	7
6. TEST FACILITY	8
7 ALL TEST EQUIPMENT LIST	8
8. RADIATED EMISSION	9
8.1TEST LIMIT.....	9
8.2. MEASUREMENT PROCEDURE.....	10
8.3. TEST SETUP	12
8.4. TEST RESULT	14
9. BAND EDGE EMISSION	27
9.1. MEASUREMENT PROCEDURE.....	27
9.2 TEST SETUP	27
9.3 RADIATED TEST RESULT	28
10. 20DB BANDWIDTH.....	32
10.1. MEASUREMENT PROCEDURE.....	32
10.2. TEST SET-UP	32
10.3. LIMITS AND MEASUREMENT RESULTS.....	32
11. FCC LINE CONDUCTED EMISSION TEST	39
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST	39
11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	39
11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	40
11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	40
11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	41
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	43
APPENDIX B: PHOTOGRAPHS OF EUT	45

1. VERIFICATION OF CONFORMITY

Applicant	Shenzhen Tongke Electronics Co., Ltd
Address	The Second Industrial Zone, Phoenix Village, Fuyong Town, Shenzhen, China
Manufacturer	Shenzhen Tongke Electronics Co., Ltd
Address	The Second Industrial Zone, Phoenix Village, Fuyong Town, Shenzhen, China
Product Designation	TURNTABLE STEREO SYSTEM
Brand Name	SIGN, SHARPER IMAGE, Polaroid
Test Model	T2
Series Model	SBT4001,PBT4001
Difference description	All the same except for the model name
Date of test	Sep. 29,2015 and Oct. 09,2015
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. 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 
Jerry Xiao(Xiao Wang) Oct.13,2015

Reviewed By 
Forrest Lei(Lei Yonggang) Oct.13,2015

Approved By 
Solger Zhang(Zhang Hongyi)
Authorized Officer Oct.13,2015

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	2.94dBm(Max)
Bluetooth Version	V2.1+EDR
Modulation	GFSK, π /4-DQPSK, 8DPSK
Number of channels	79
Hardware Version	HY-TK_T2-V02
Software Version	V1.2
Antenna Designation	PCB Antenna (Met 15.203 Antenna requirement)
Antenna Gain	0dBi
Power Supply	Adapter Input:100-240V~50/60Hz 0.4A Output: 5V—2.0A

2.2. TABLE OF CARRIER FREQUENCIES

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

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 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 3.18\text{dB}$
2	All emissions, radiated	$\pm 3.91\text{dB}$
3	Temperature	$\pm 0.5^\circ\text{C}$
4	Humidity	$\pm 2\%$

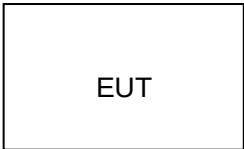
4. DESCRIPTION OF TEST MODES

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

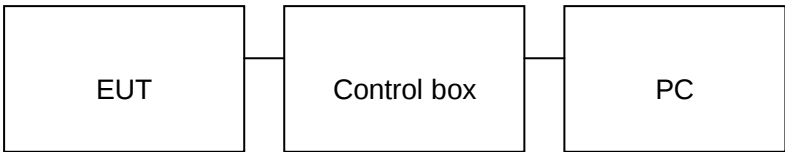
5. SYSTEM TEST CONFIGURATION

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	TURNTABLE STEREO SYSTEM	SIGN, SHARPER IMAGE, Polaroid	T2, SBT4001,PBT4001	EUT
2	PC	Lenovo	SL410K	A.E
3	Control box	N/A	N/A	A.E
4	Audio Cable 1	N/A	1.3m, unshielded	A.E
5	Audio Cable 2	N/A	1.3m, unshielded	A.E
6	SWITCHING ADAPTER	N/A	SJ-0502001	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	Compliant
N/A	BANDWIDTH	Compliant

6. TEST FACILITY

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,
FCC Registration No.	371540
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
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 11, 2015	July 10, 2016
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 7, 2015	July 6, 2016
RF Cable	SCHWARZBECK	AK9515H	96220	July 8, 2015	July 7, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170	9170-181	June 6, 2015	June 5, 2016
Power Probe	R&S	NRP-Z23	100323	July 25,2015	July 24,2016
RF attenuator	N/A	RFA20db	68	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 11, 2015	July 10, 2016
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9718			

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Artificial Mains Network	Narda	L2-16B	000WX31025	July 8, 2015	July 7, 2016
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 8, 2015	July 7, 2016
RF Cable	SCHWARZBECK	AK9515E	96222	July 4, 2015	July 3, 2016
Shielded Room	CHENGYU	843			

8. RADIATED EMISSION

8.1 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	
		μ V/m	dB(μ 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(μ V)/m (Peak) 54.0 dB(μ V)/m (Average)	

Remark:

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

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.

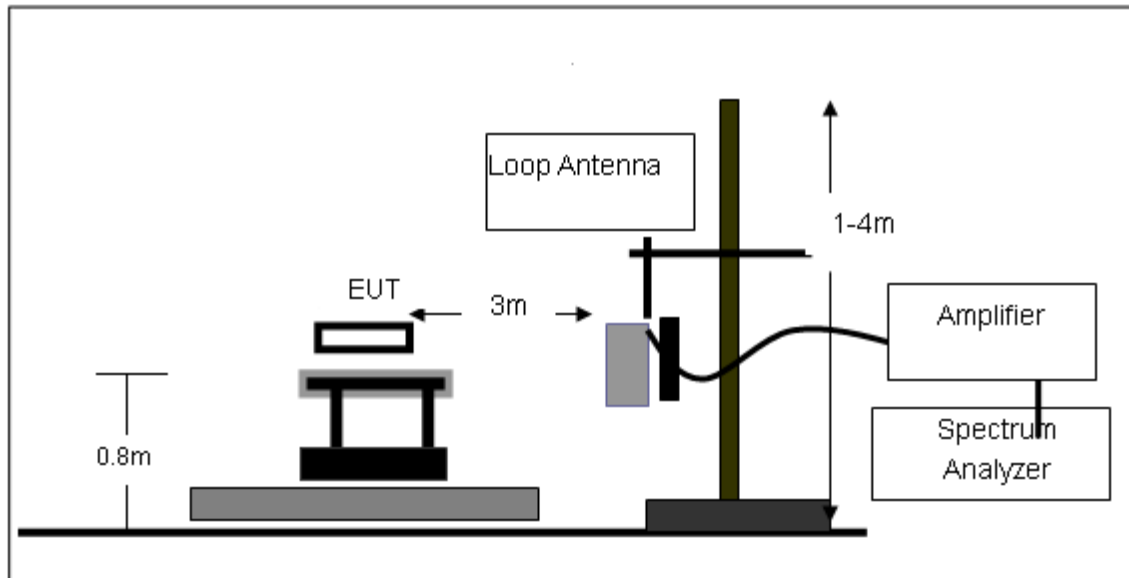
The following table is the setting of spectrum analyzer and receiver.

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

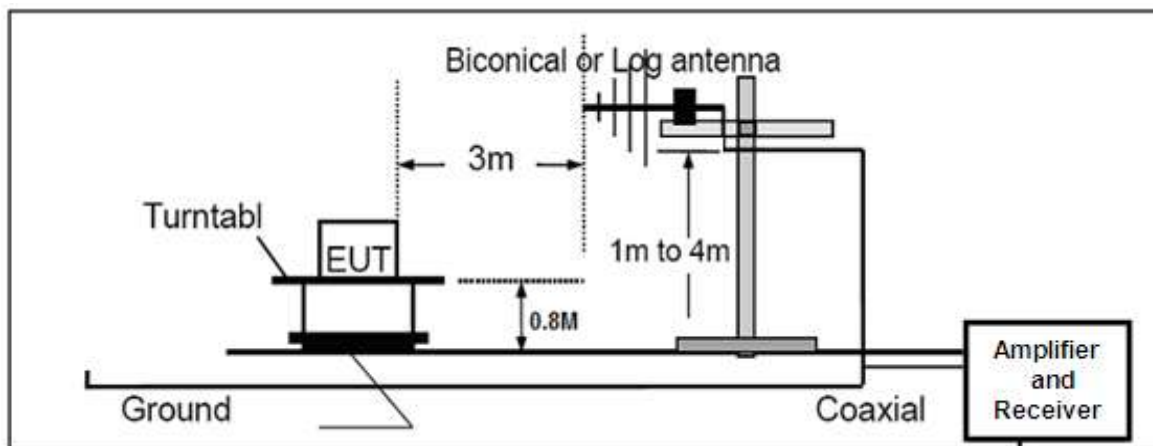
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

8.3. TEST SETUP

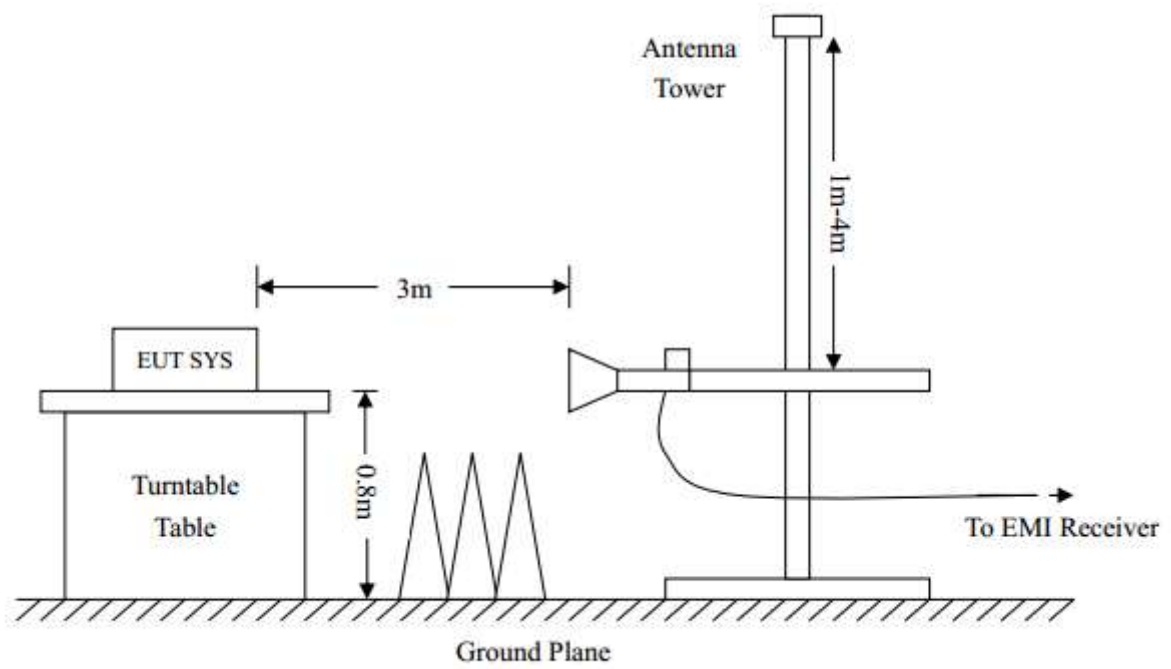
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



8.4. TEST RESULT

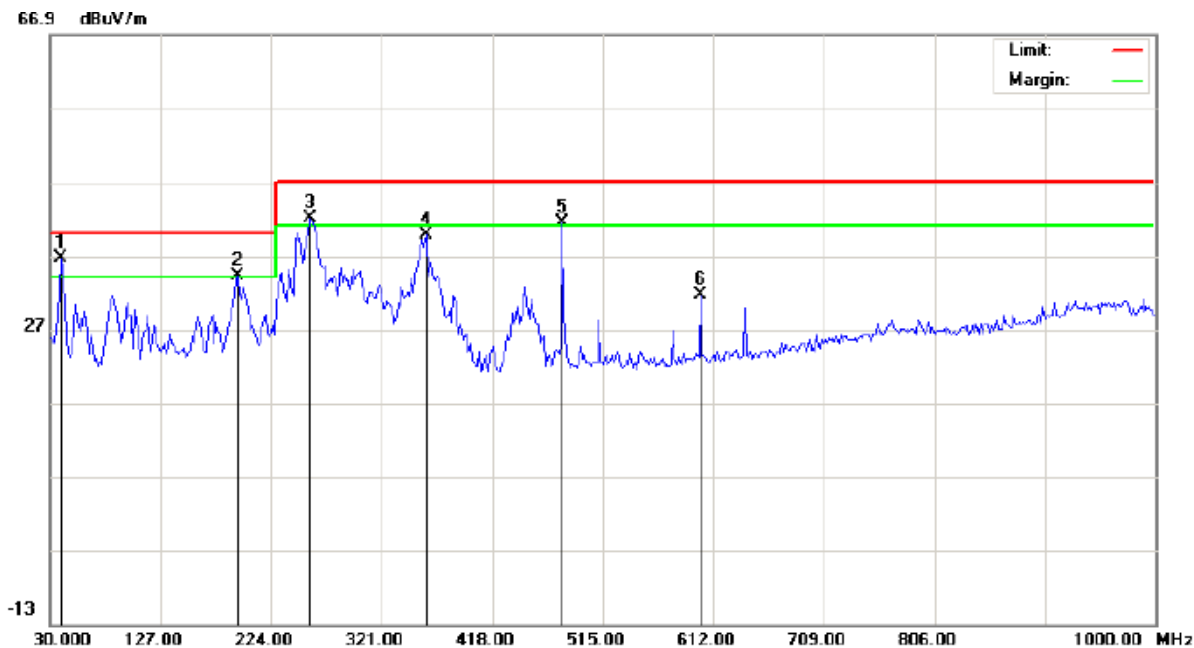
(Worst modulation:GFSK)

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

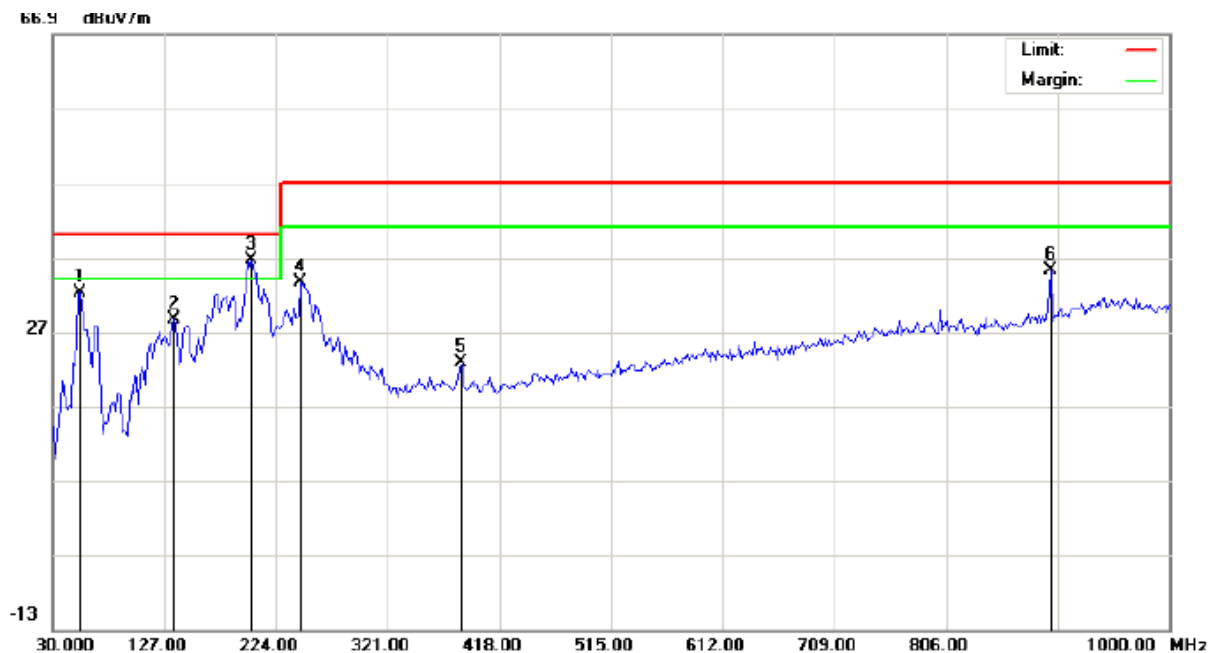


Site: site #1	Polarization: <i>Horizontal</i>	Temperature: 23.5
Limit: EN55022 ClassB 3M Radiation	Power:	Humidity: 54.6 %
EUT: TURNTABLE STEREO SYSTEM	Distance: 3m	
M/N: T2		
Mode: Low Channel TX		
Note:		

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	*	39.7000	25.01	11.51	36.52	40.00	-3.48	peak			
2	!	194.9000	22.38	11.76	34.14	40.00	-5.86	peak			
3	!	257.9499	27.86	14.14	42.00	47.00	-5.00	peak			
4		359.8000	20.97	18.80	39.77	47.00	-7.23	peak			
5	!	479.4331	20.58	20.91	41.49	47.00	-5.51	peak			
6		600.6833	7.88	23.73	31.61	47.00	-15.39	peak			

RESULT: PASS

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



Site: site #1
Limit: EN55022 ClassB 3M Radiation
EUT: TURNTABLE STEREO SYSTEM
M/N: T2
Mode: Low Channel TX
Note:

Polarization: **Vertical**
Power:
Distance: 3m

Temperature: 23.5
Humidity: 54.6 %

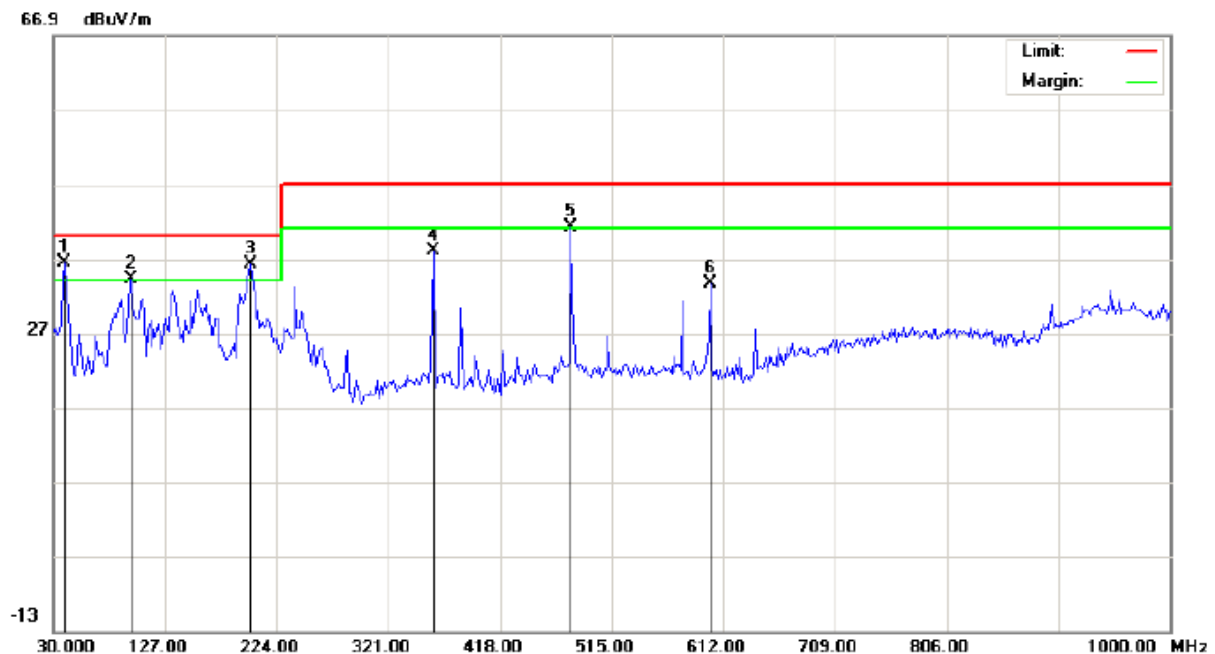
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		54.2500	20.96	11.20	32.16	40.00	-7.84	peak			
2		135.0833	14.28	14.38	28.66	40.00	-11.34	peak			
3	*	202.9832	24.44	12.11	36.55	40.00	-3.45	peak			
4		245.0166	19.83	13.71	33.54	47.00	-13.46	peak			
5		385.6666	3.83	18.98	22.81	47.00	-24.19	peak			
6		896.5333	6.77	28.52	35.29	47.00	-11.71	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.

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

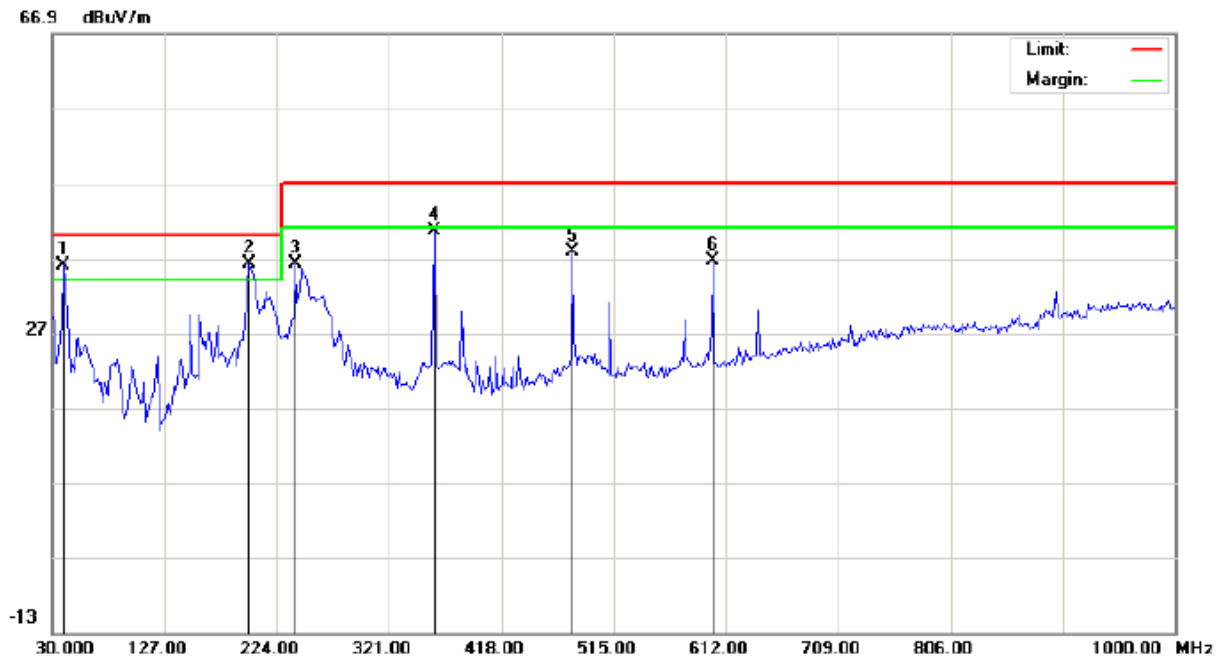


Site: site #1	Polarization: Horizontal	Temperature: 23.5
Limit: EN55022 ClassB 3M Radiation	Power:	Humidity: 54.6 %
EUT: TURNTABLE STEREO SYSTEM	Distance: 3m	
M/N: T2		
Mode: Middle Channel TX		
Note:		

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	*	39.7000	24.94	11.51	36.45	40.00	-3.55	peak			
2	!	97.9000	24.02	10.25	34.27	40.00	-5.73	peak			
3	!	201.3667	24.16	12.05	36.21	40.00	-3.79	peak			
4		359.8000	19.28	18.80	38.08	47.00	-8.92	peak			
5	!	479.4332	20.20	20.91	41.11	47.00	-5.89	peak			
6		600.6833	9.85	23.73	33.58	47.00	-13.42	peak			

RESULT: PASS

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



Site: site #1	Polarization: Vertical	Temperature: 23.5
Limit: EN55022 ClassB 3M Radiation	Power:	Humidity: 54.6 %
EUT: TURNTABLE STEREO SYSTEM	Distance: 3m	
M/N: T2		
Mode: Middle Channel TX		
Note:		

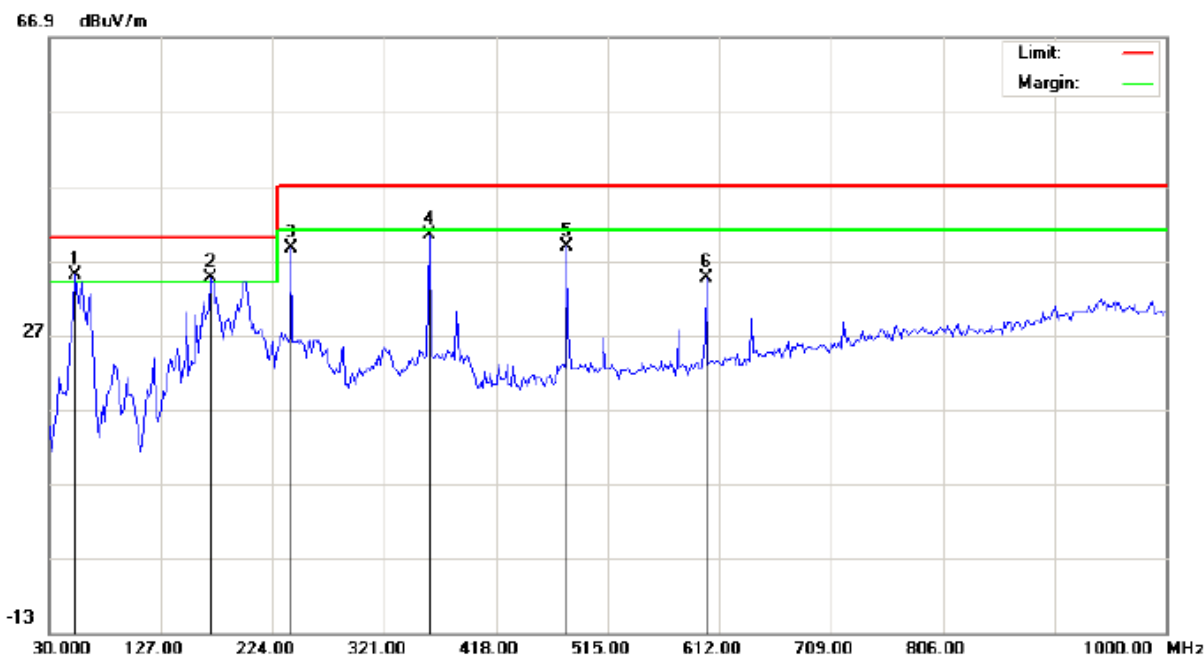
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	39.7000	24.59	11.51	36.10	40.00	-3.90	peak			
2	*	199.7500	24.13	11.99	36.12	40.00	-3.88	peak			
3		240.1666	22.58	13.53	36.11	47.00	-10.89	peak			
4		359.8000	21.76	18.80	40.56	47.00	-6.44	peak			
5		479.4332	16.86	20.91	37.77	47.00	-9.23	peak			
6		600.6833	12.94	23.73	36.67	47.00	-10.33	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.

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

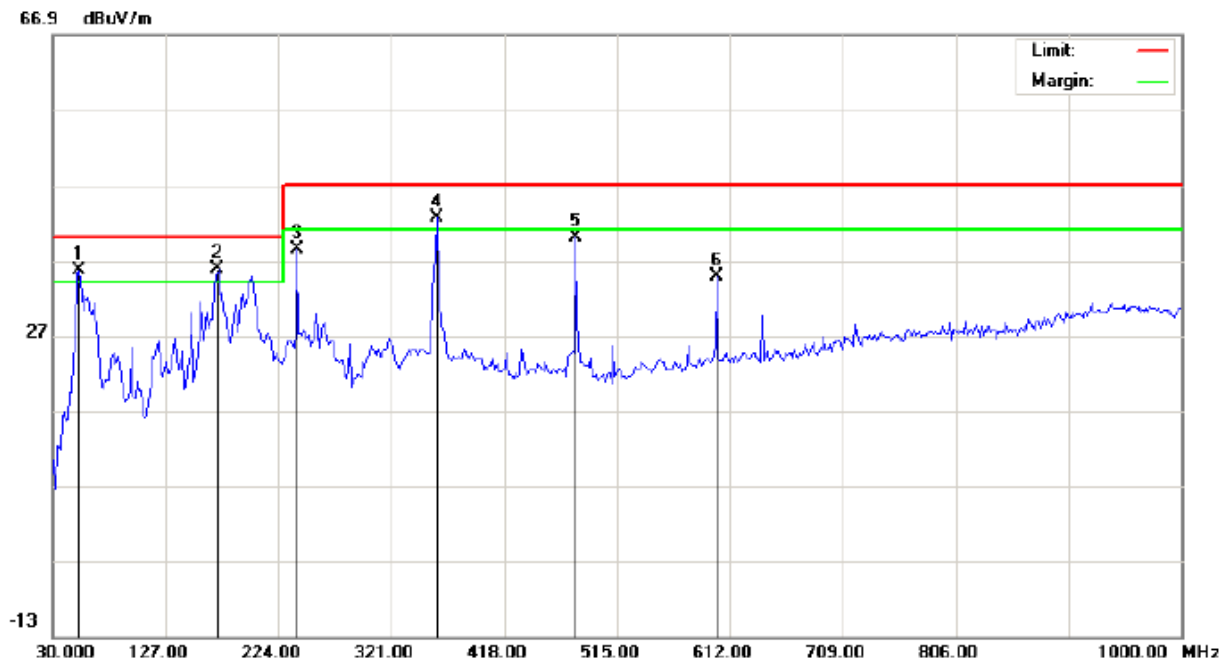


Site: site #1 Polarization: *Horizontal* Temperature: 23.5
Limit: EN55022 ClassB 3M Radiation Power: Humidity: 54.6 %
EUT: TURNTABLE STEREO SYSTEM Distance: 3m
M/N: T2
Mode: High Channel TX
Note:

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	*	52.6332	23.87	11.22	35.09	40.00	-4.91	peak			
2	!	170.6500	21.50	13.06	34.56	40.00	-5.44	peak			
3		240.1666	25.09	13.53	38.62	47.00	-8.38	peak			
4		359.8000	21.53	18.80	40.33	47.00	-6.67	peak			
5		479.4332	17.80	20.91	38.71	47.00	-8.29	peak			
6		600.6833	10.80	23.73	34.53	47.00	-12.47	peak			

RESULT: PASS

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



Site: site #1 Polarization: **Vertical** Temperature: 23.5
Limit: EN55022 ClassB 3M Radiation Power: Humidity: 54.6 %
EUT: TURNTABLE STEREO SYSTEM Distance: 3m
M/N: T2
Mode: High Channel TX
Note:

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	!	52.6332	24.31	11.22	35.53	40.00	-4.47	peak			
2	*	172.2666	23.05	12.72	35.77	40.00	-4.23	peak			
3		240.1666	24.85	13.53	38.38	47.00	-8.62	peak			
4	!	359.8000	23.89	18.80	42.69	47.00	-4.31	peak			
5		479.4332	19.09	20.91	40.00	47.00	-7.00	peak			
6		600.6833	11.13	23.73	34.86	47.00	-12.14	peak			

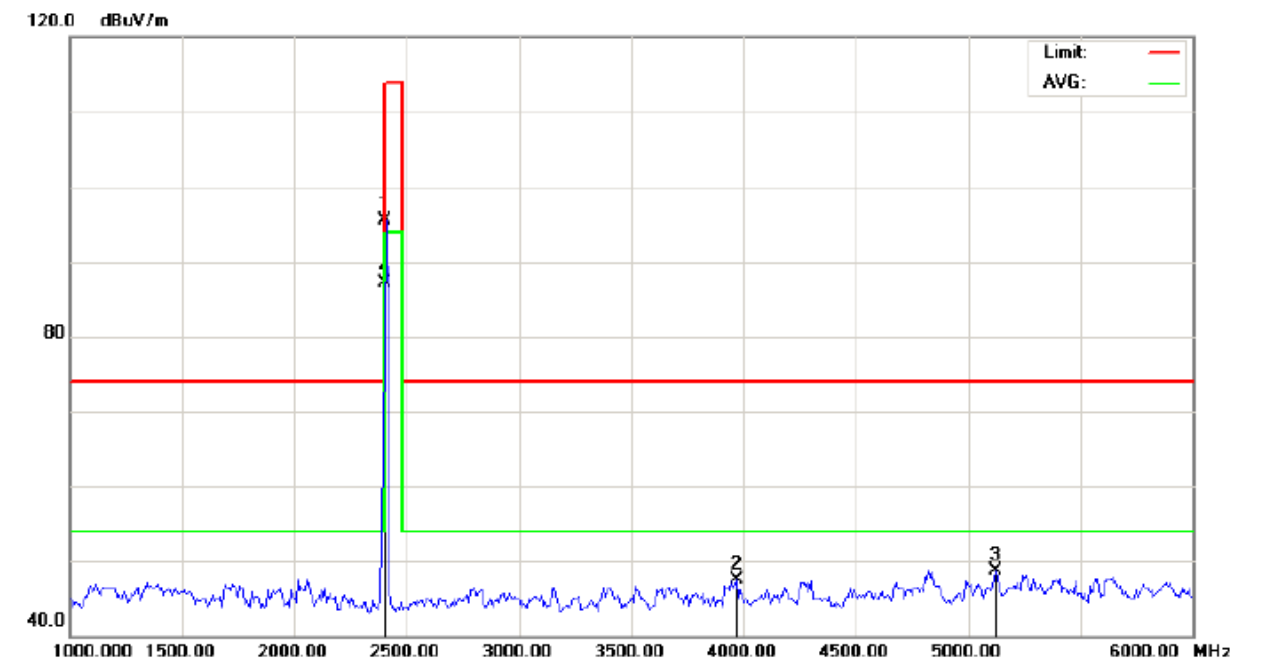
RESULT: PASS

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

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

RADIATED EMISSION ABOVE 1GHZ

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

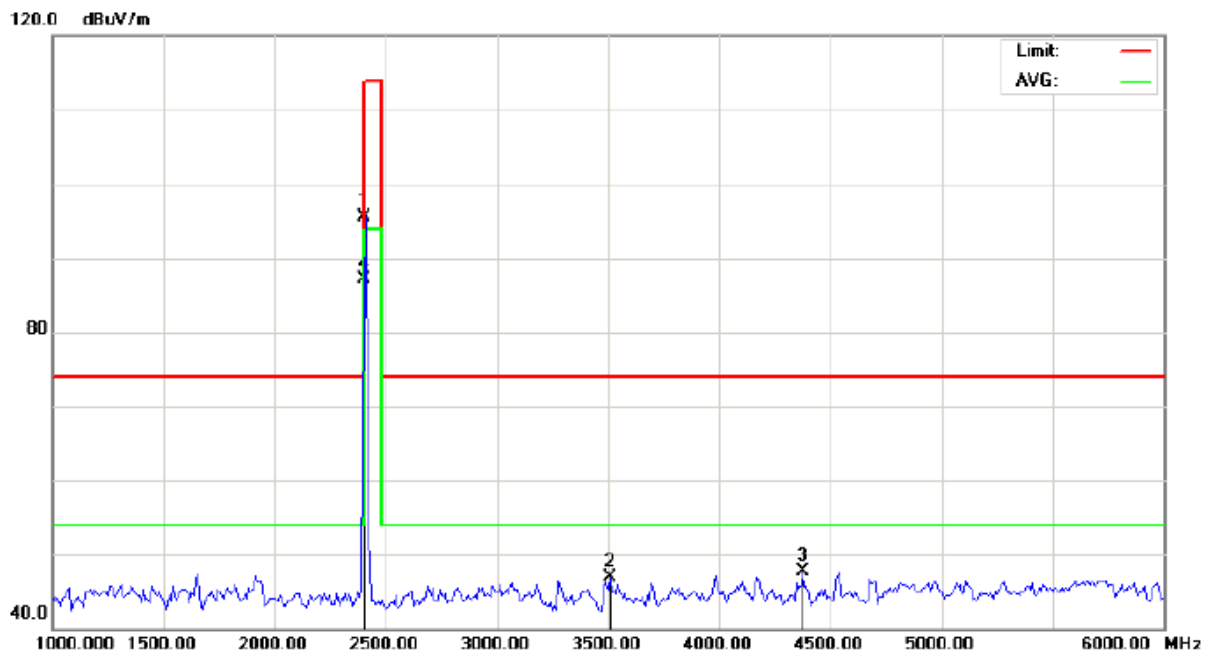


Site: site #1	Polarization: <i>Horizontal</i>	Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK)-	Power:	Humidity: 60 %
EUT: TURNTABLE STEREO SYSTEM	Distance: 3m	
M/N: T2		
Mode: Low Channel TX		
Note:		

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	105.23	-9.68	95.55	114.00	-18.45	peak			
2		3966.667	52.50	-5.02	47.48	74.00	-26.52	peak			
3		5125.000	50.60	-1.80	48.80	74.00	-25.20	peak			
4	*	2402.000	96.85	-9.68	87.17	94.00	-6.83	AVG	150	143	

RESULT: PASS

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

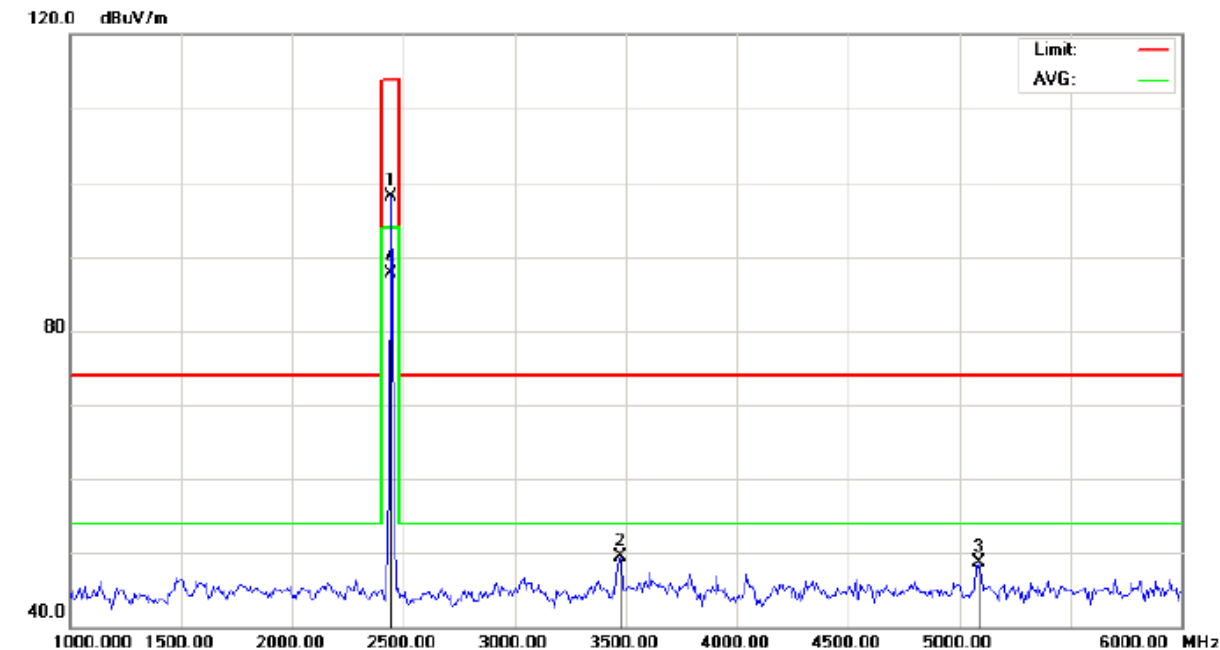


Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 60 %
EUT: TURNTABLE STEREO SYSTEM Distance: 3m
M/N: T2
Mode: Low Channel TX
Note:

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	105.25	-9.68	95.57	114.00	-18.43	peak			
2		3508.333	54.76	-7.84	46.92	74.00	-27.08	peak			
3		4375.000	51.20	-3.53	47.67	74.00	-26.33	peak			
4	*	2402.000	96.69	-9.68	87.01	94.00	-6.99	AVG	150	173	

RESULT: PASS

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

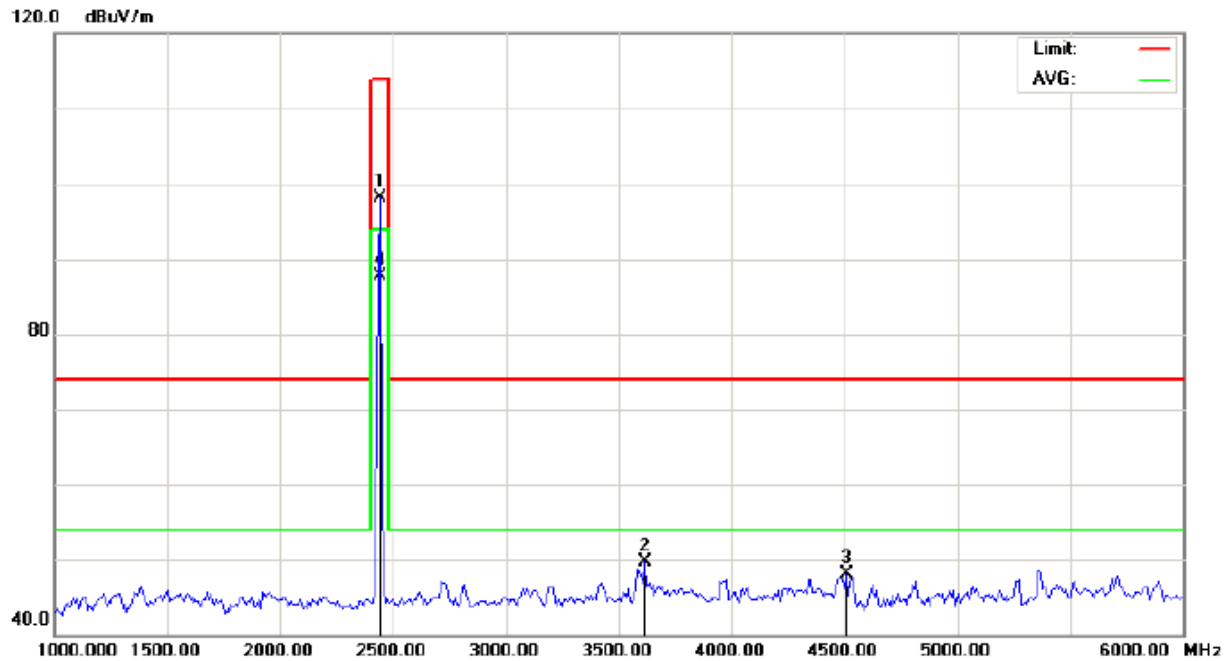


Site: site #1 Polarization: *Horizontal* Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 60 %
EUT: TURNTABLE STEREO SYSTEM Distance: 3m
M/N: T2
Mode: Middle Channel TX
Note:

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	107.79	-9.63	98.16	114.00	-15.84	peak			
2		3475.000	57.34	-7.91	49.43	74.00	-24.57	peak			
3		5091.667	50.48	-1.80	48.68	74.00	-25.32	peak			
4	*	2441.000	97.38	-9.63	87.75	94.00	-6.25	AVG	150	188	

RESULT: PASS

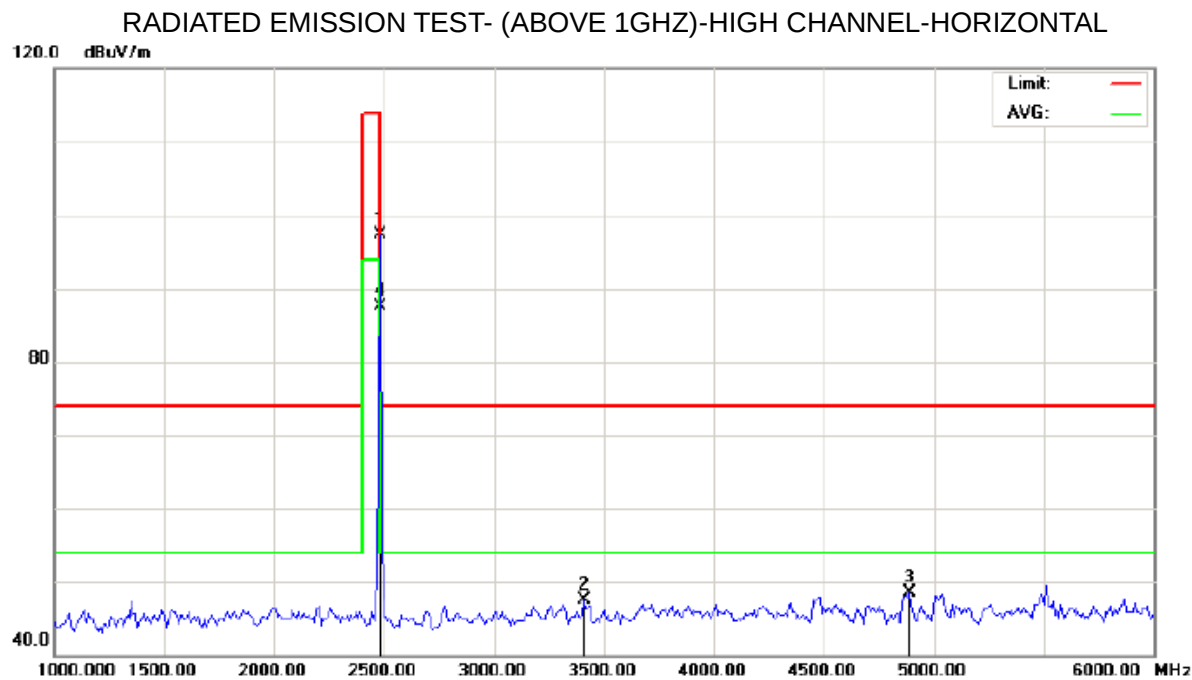
RADIATED EMISSION TEST- (ABOVE 1GHZ)-MIDDLE CHANNEL- VERTICAL



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 60 %
EUT: TURNTABLE STEREO SYSTEM Distance: 3m
M/N: T2
Mode: Middle Channel TX
Note:

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	107.73	-9.63	98.10	114.00	-15.90	peak			
2		3616.667	56.80	-7.17	49.63	74.00	-24.37	peak			
3		4508.333	51.14	-3.09	48.05	74.00	-25.95	peak			
4	*	2441.000	97.25	-9.63	87.62	94.00	-6.38	AVG	150	305	

RESULT: PASS



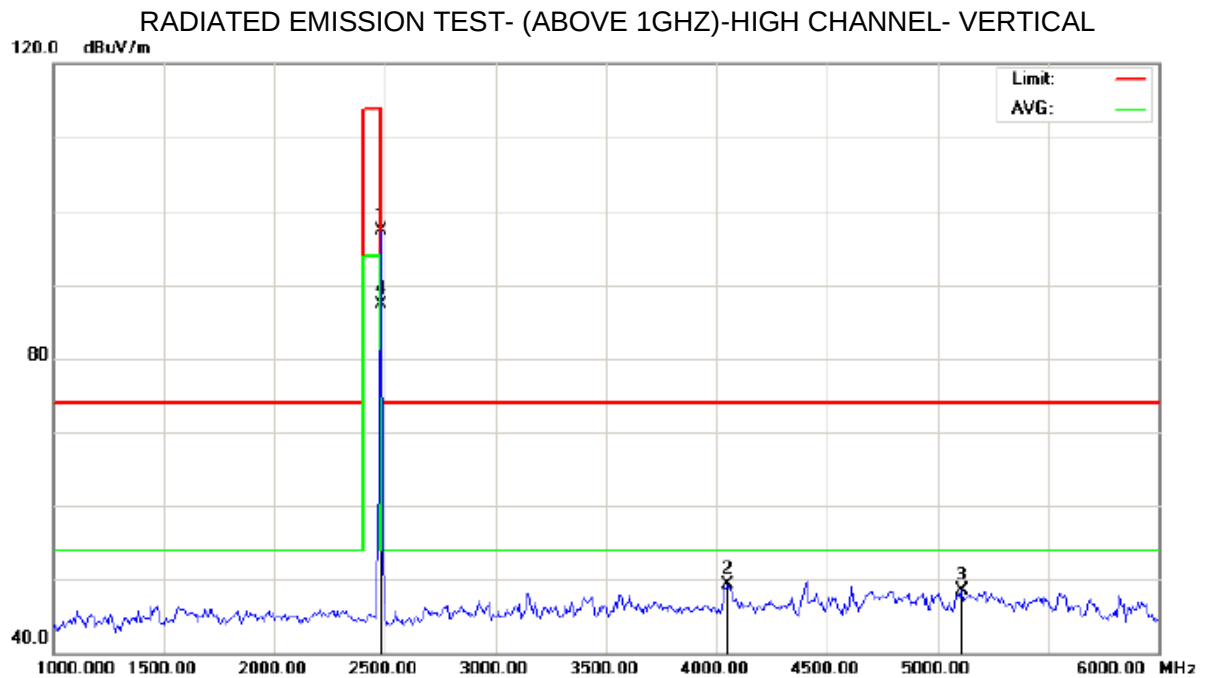
Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)-
EUT: TURNTABLE STEREO SYSTEM
M/N: T2
Mode: High Channel TX
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

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	106.87	-9.59	97.28	114.00	-16.72	peak			
2		3408.333	55.58	-7.98	47.60	74.00	-26.40	peak			
3		4891.667	50.53	-2.08	48.45	74.00	-25.55	peak			
4	*	2480.000	97.15	-9.59	87.56	94.00	-6.44	AVG	100	52	

RESULT: PASS



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 60 %
EUT: TURNTABLE STEREO SYSTEM Distance: 3m
M/N: T2
Mode: High Channel TX
Note:

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	106.91	-9.59	97.32	114.00	-16.68	peak			
2		4050.000	53.92	-4.64	49.28	74.00	-24.72	peak			
3		5108.333	50.39	-1.80	48.59	74.00	-25.41	peak			
4	*	2480.000	96.98	-9.59	87.39	94.00	-6.61	AVG	100	0	

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.

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	105.23	-9.68	95.55	114	-18.45	Horizontal
2402	105.25	-9.68	95.57	114	-18.43	Vertical
2441	107.79	-9.63	98.16	114	-15.84	Horizontal
2441	107.73	-9.63	98.10	114	-15.90	Vertical
2480	106.87	-9.59	97.28	114	-16.72	Horizontal
2480	106.91	-9.59	87.39	114	-6.61	Vertical

Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	96.85	-9.68	87.17	94	-6.83	Horizontal
2402	96.69	-9.68	87.01	94	-6.99	Vertical
2441	97.38	-9.63	87.75	94	-6.25	Horizontal
2441	97.25	-9.63	87.62	94	-6.38	Vertical
2480	97.15	-9.59	87.56	94	-6.44	Horizontal
2480	96.98	-9.59	87.39	94	-6.61	Vertical

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.

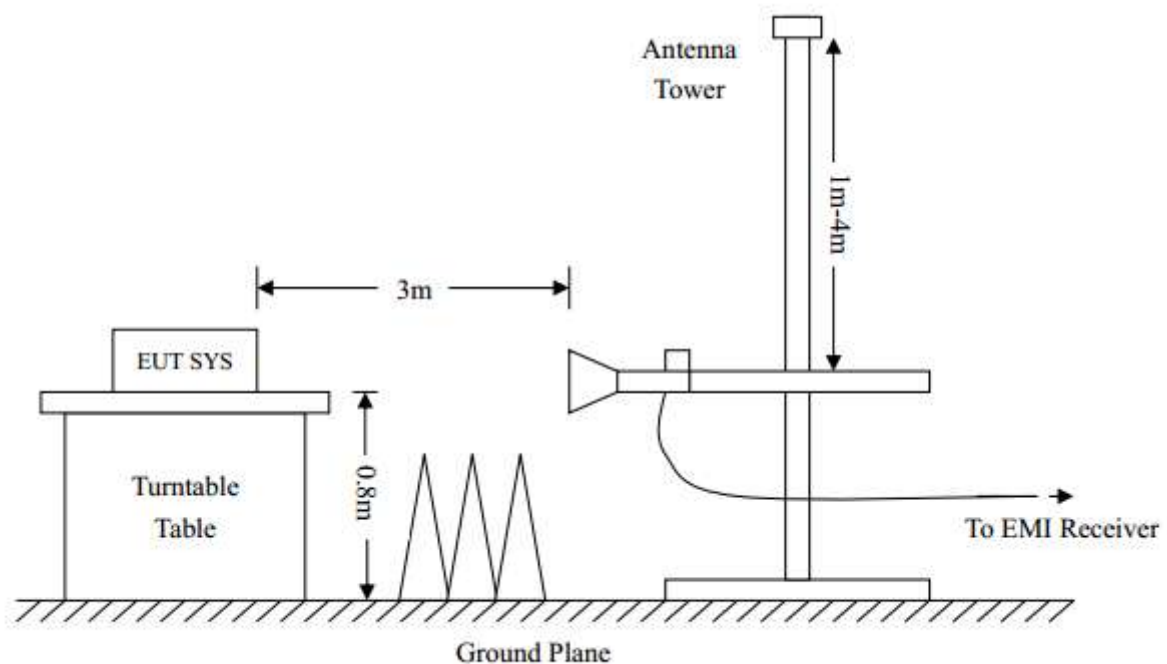
2Max hold the trace of the setp 1,and the EUT operates at hopping-on test mode to verify the largest spurious emissions power.

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

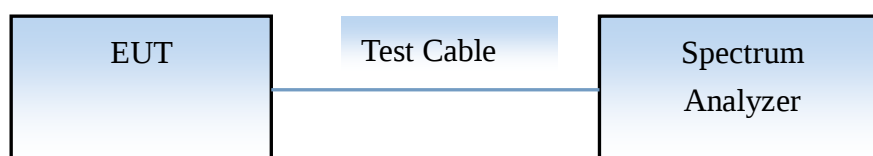
(b) AVERAGE: RBW=1.5MHz ; VBW=1/on time(1KHz) / Sweep=AUTO

9.2 TEST SETUP

RADIATED EMISSION TEST SETUP



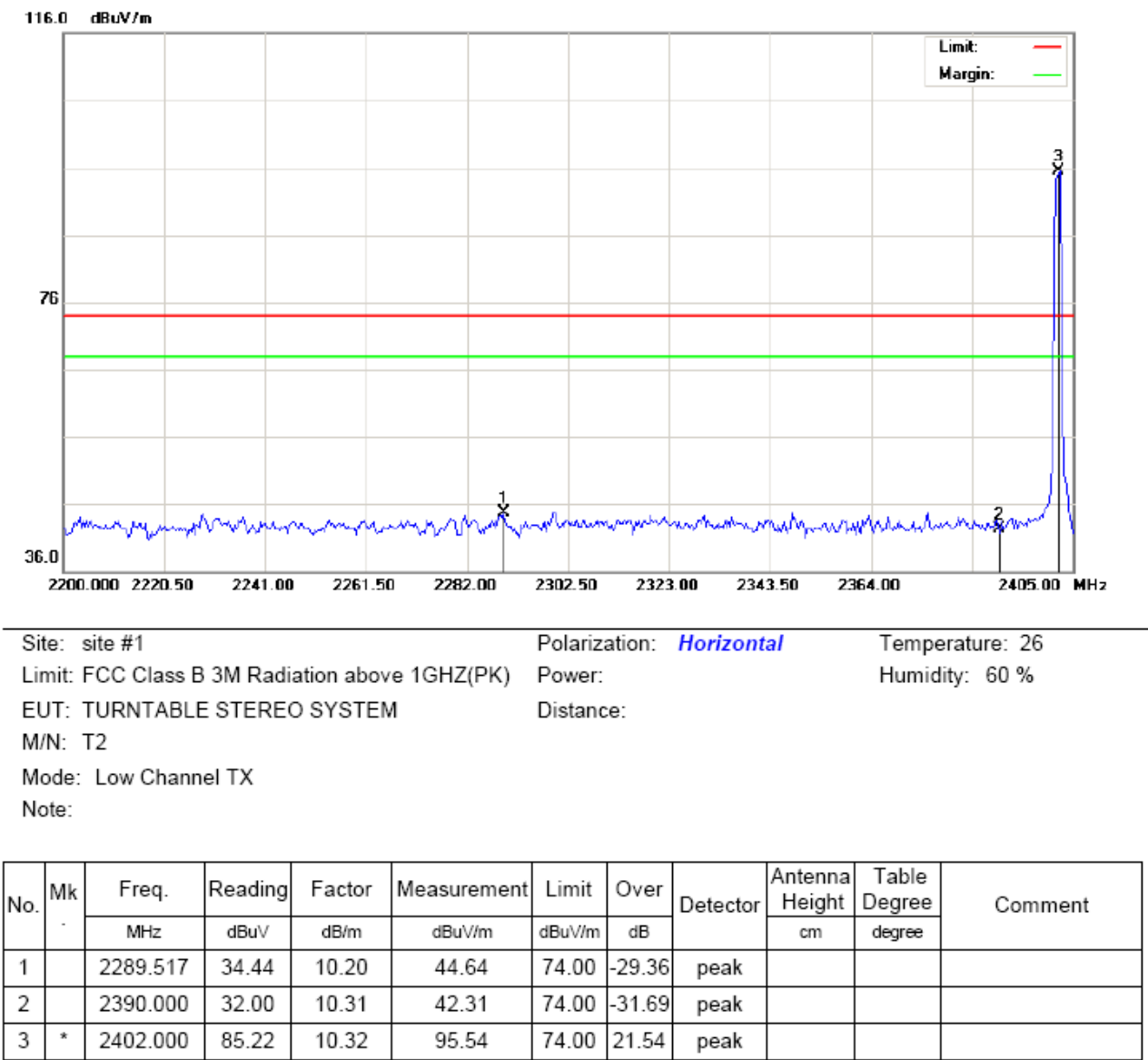
CONDUCTED TEST SETUP



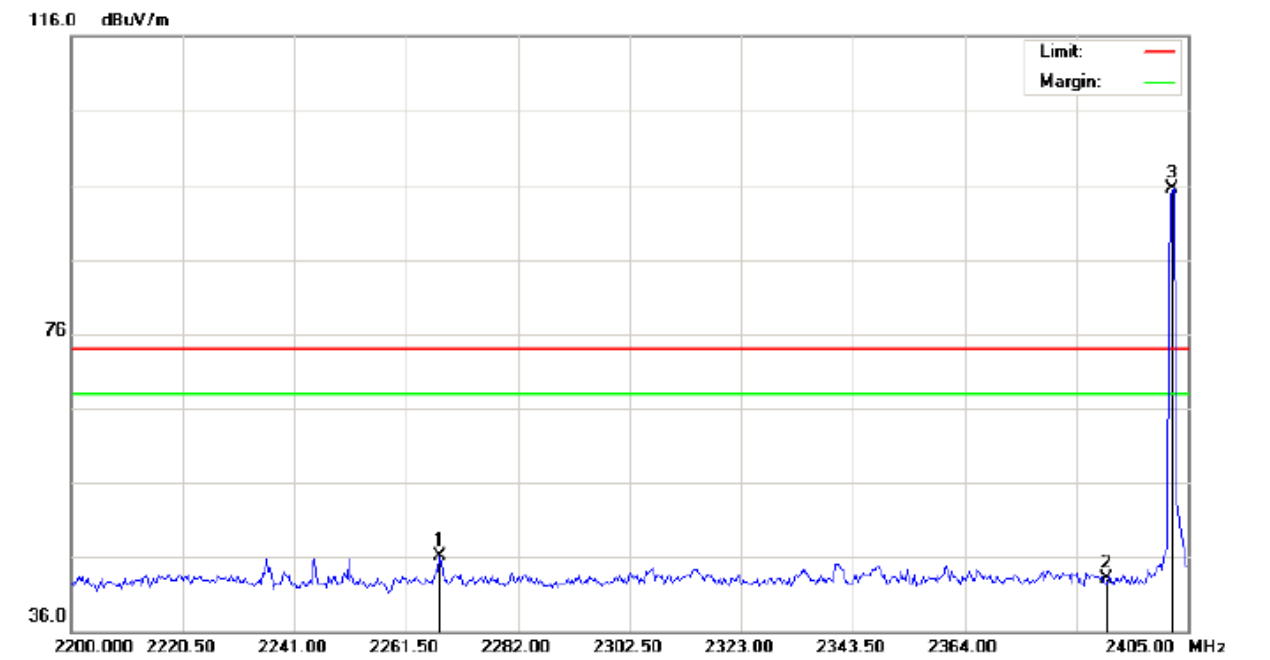
9.3 RADIATED TEST RESULT

(Worst modulation: GFSK)

TEST PLOT OF BAND EDGE FOR LOW CHANNEL-Horizontal



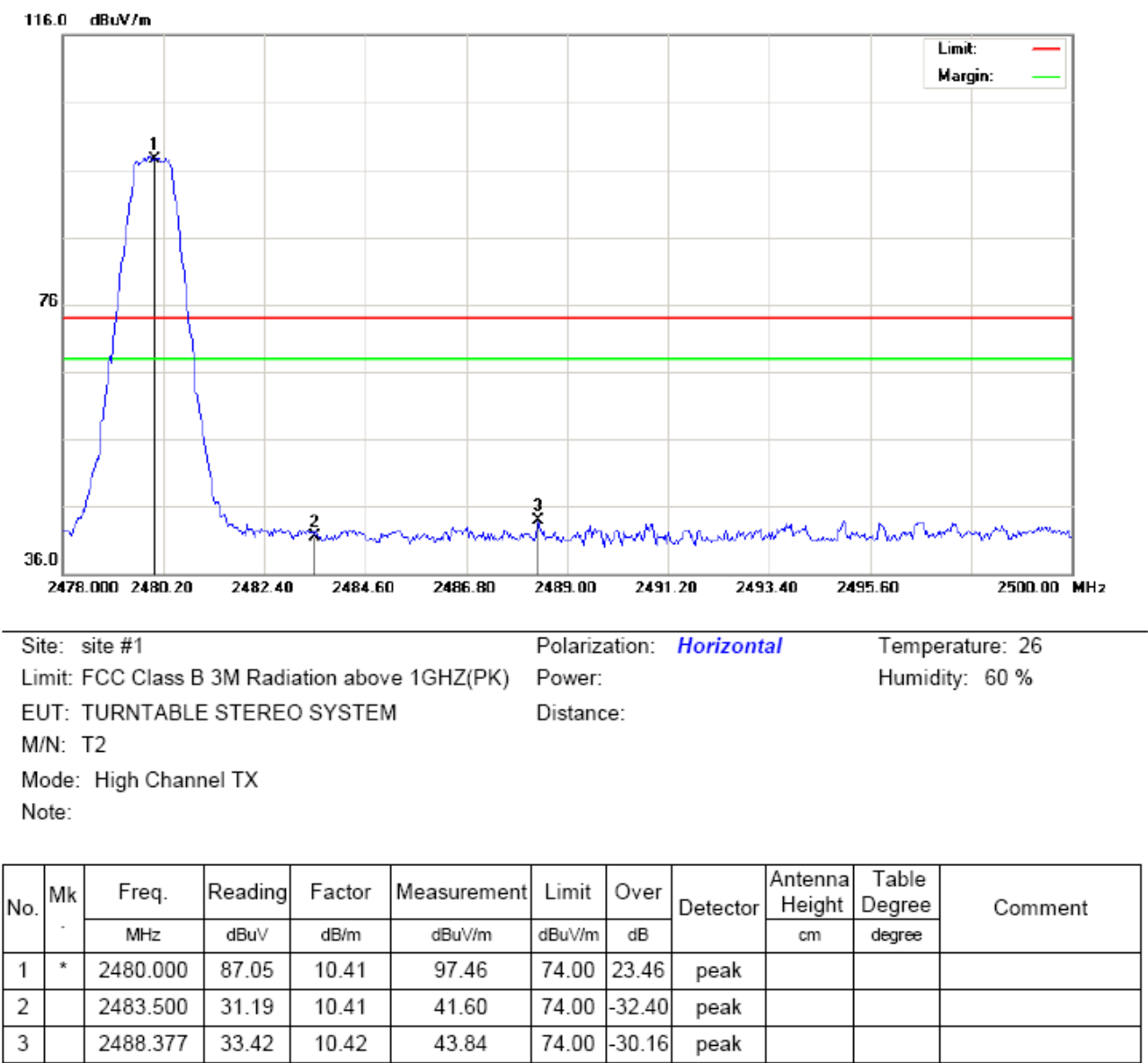
TEST PLOT OF BAND EDGE FOR LOW CHANNEL –Vertical



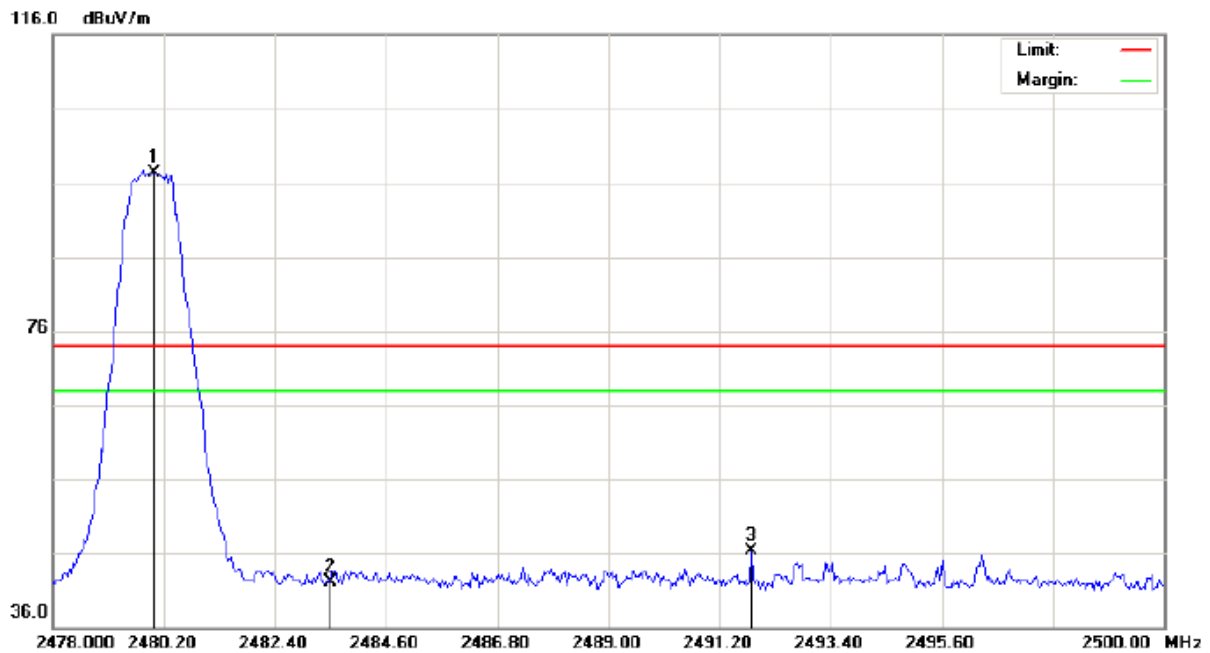
Site: site #1	Polarization: Vertical	Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK)	Power:	Humidity: 60 %
EUT: TURNTABLE STEREO SYSTEM	Distance:	
M/N: T2		
Mode: Low Channel TX		
Note:		

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		2267.650	35.86	10.17	46.03	74.00	-27.97	peak			
2		2390.000	32.71	10.31	43.02	74.00	-30.98	peak			
3	*	2402.000	85.09	10.32	95.41	74.00	21.41	peak			

TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Horizontal



TEST PLOT OF BAND EDGE FOR HIGH CHANNEL-Vertical



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: TURNTABLE STEREO SYSTEM Distance:
M/N: T2
Mode: High Channel TX
Note:

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	86.82	10.41	97.23	74.00	23.23	peak			
2		2483.500	31.76	10.41	42.17	74.00	-31.83	peak			
3		2491.823	35.84	10.42	46.26	74.00	-27.74	peak			

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.

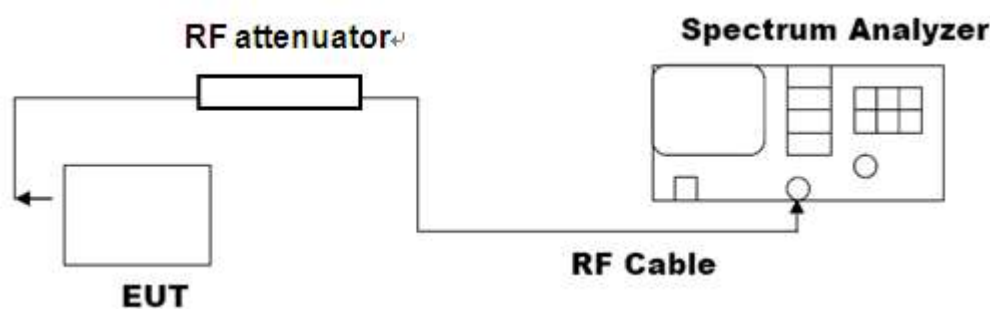
10. 20DB BANDWIDTH

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 hopping 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

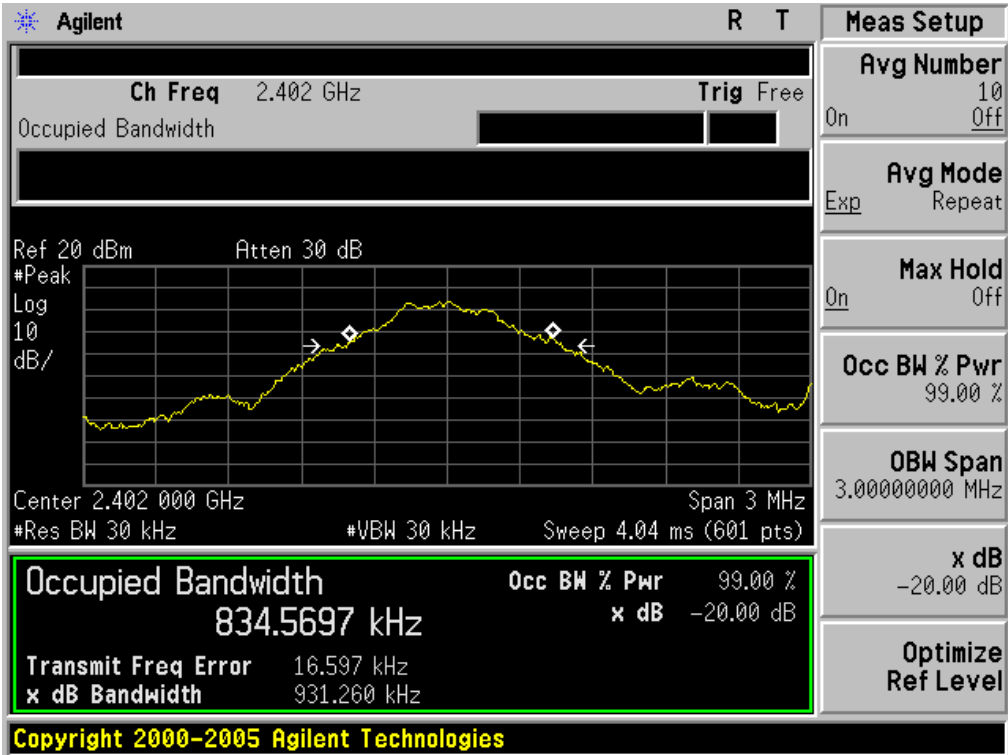
(BLOCK DIAGRAM OF CONFIGURATION)



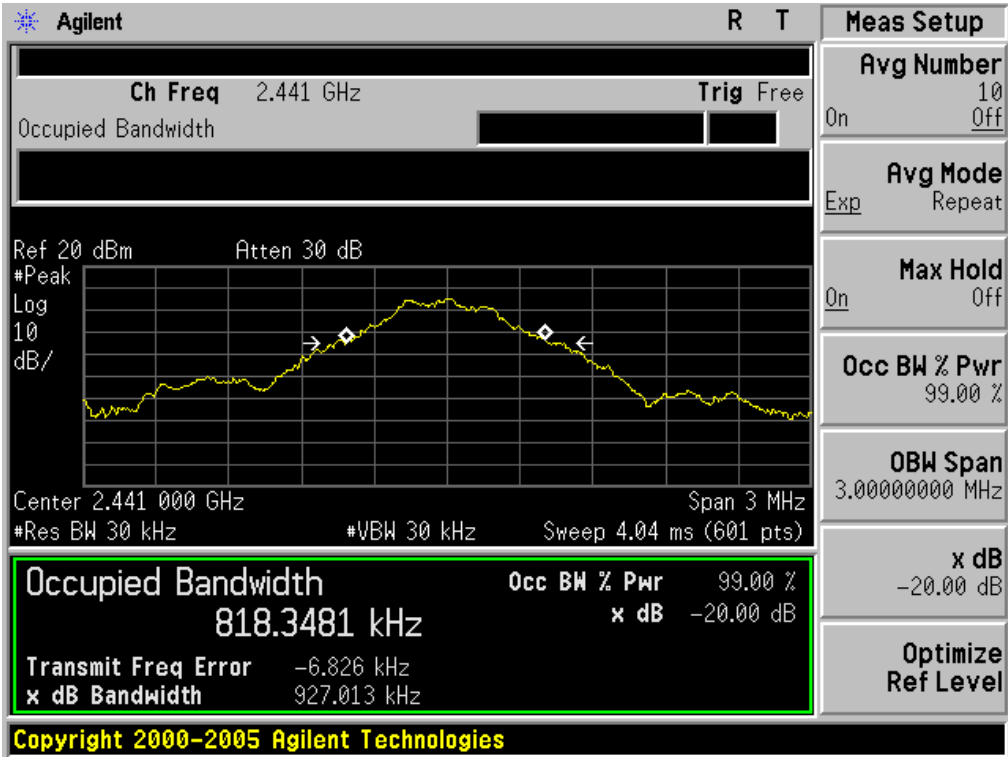
10.3. LIMITS AND MEASUREMENT RESULTS

BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESUL			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
N/A	Low Channel	0.931	PASS
	Middle Channel	0.927	PASS
	High Channel	0.943	PASS

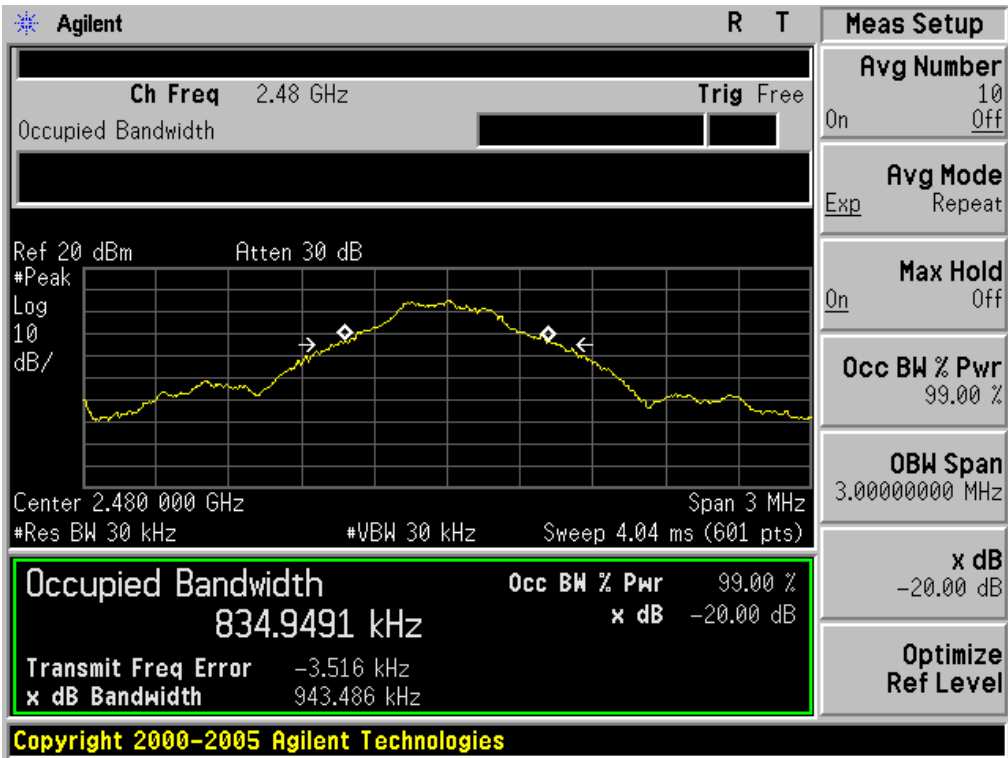
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

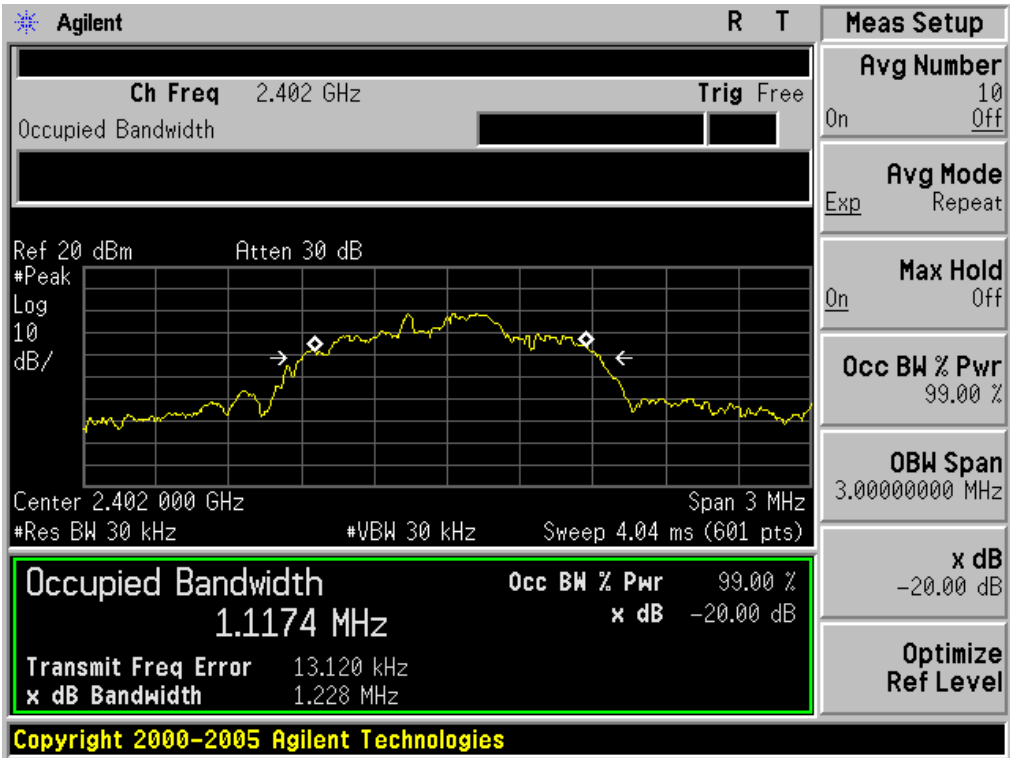


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

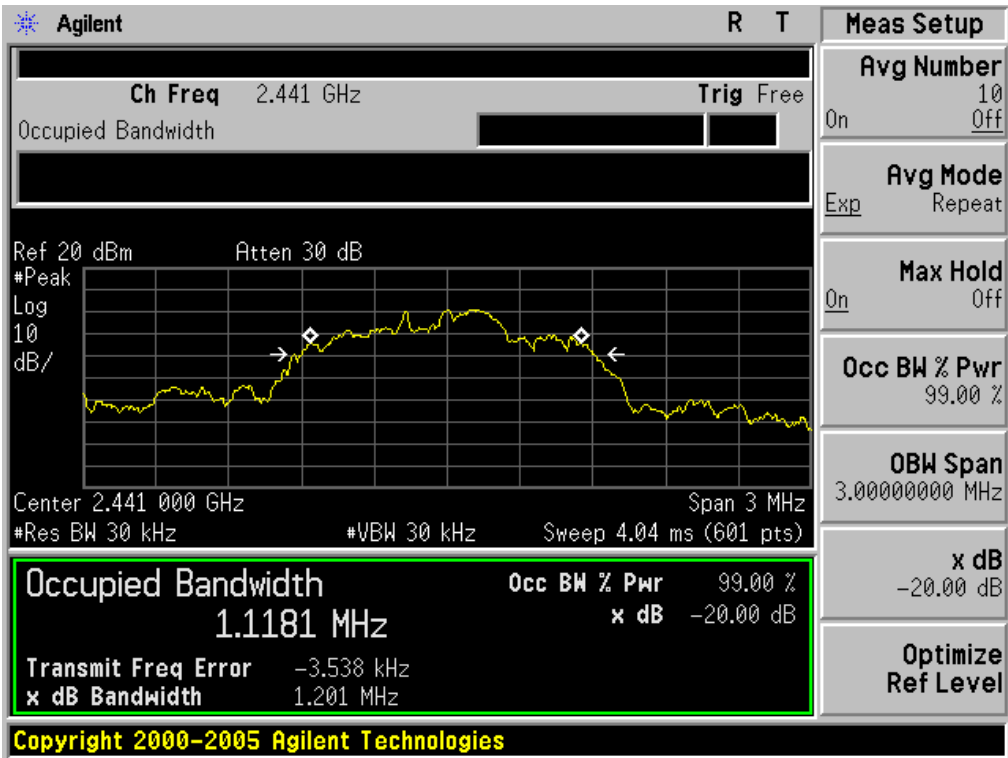


BLUETOOTH 2Mbps LIMITS AND MEASUREMENT RESUL			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
N/A	Low Channel	1.228	PASS
	Middle Channel	1.201	PASS
	High Channel	1.178	PASS

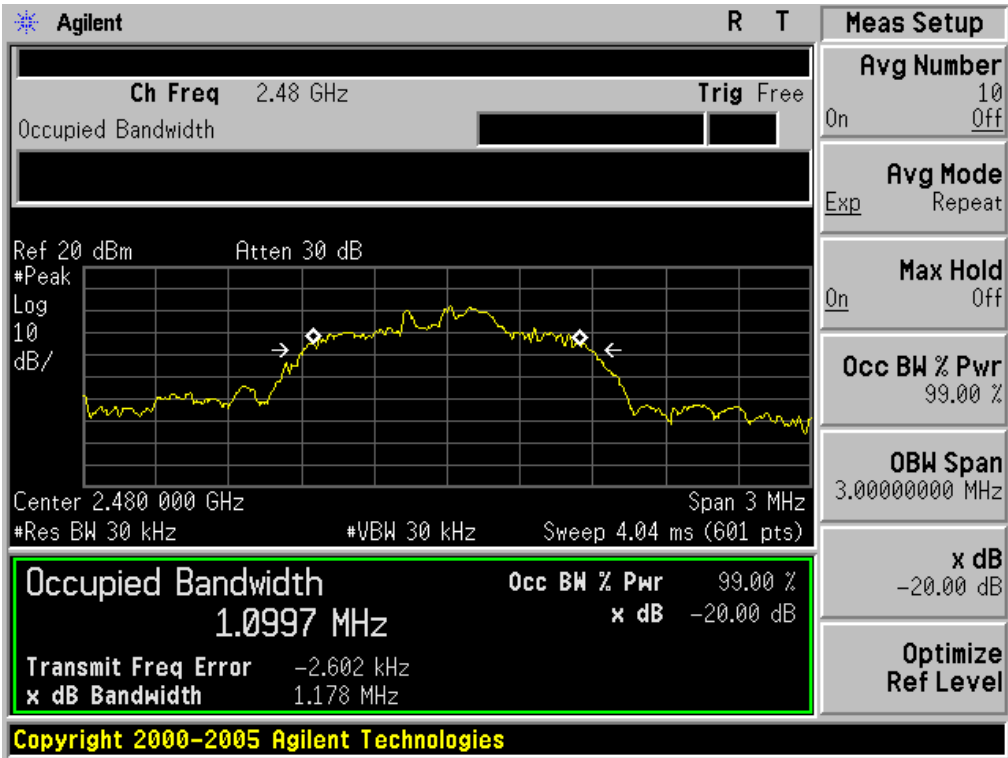
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

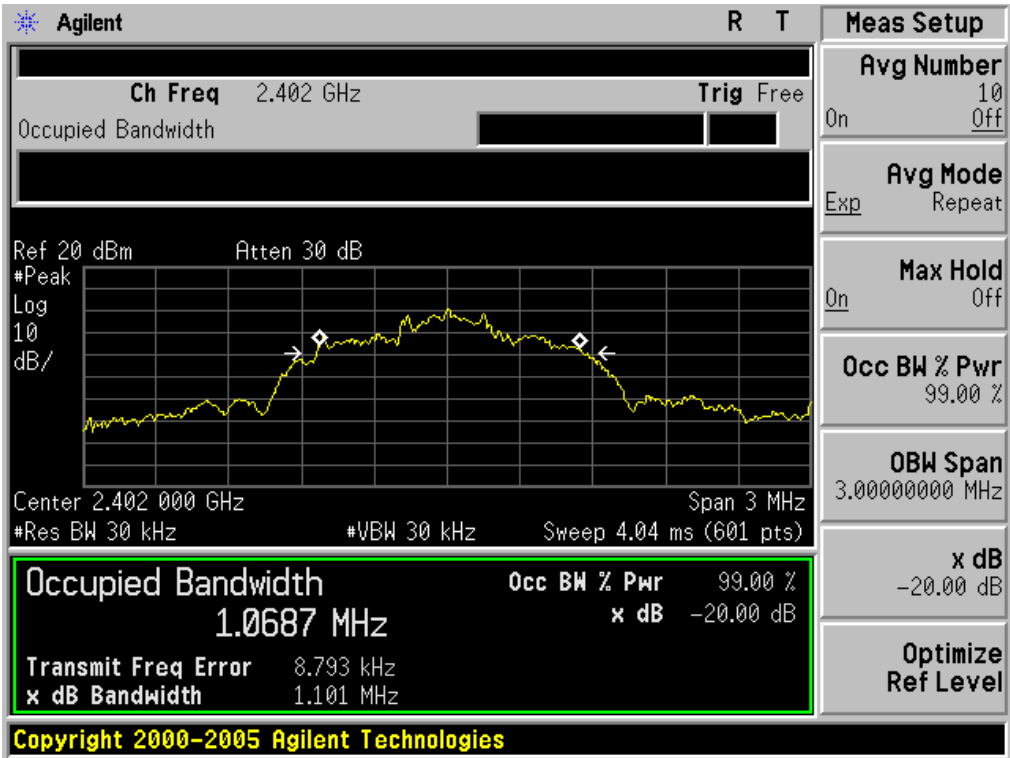


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



BLUETOOTH 3MBPS LIMITS AND MEASUREMENT RESUL			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
N/A	Low Channel	1.101	PASS
	Middle Channel	1.167	PASS
	High Channel	1.167	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



11. FCC LINE CONDUCTED EMISSION TEST

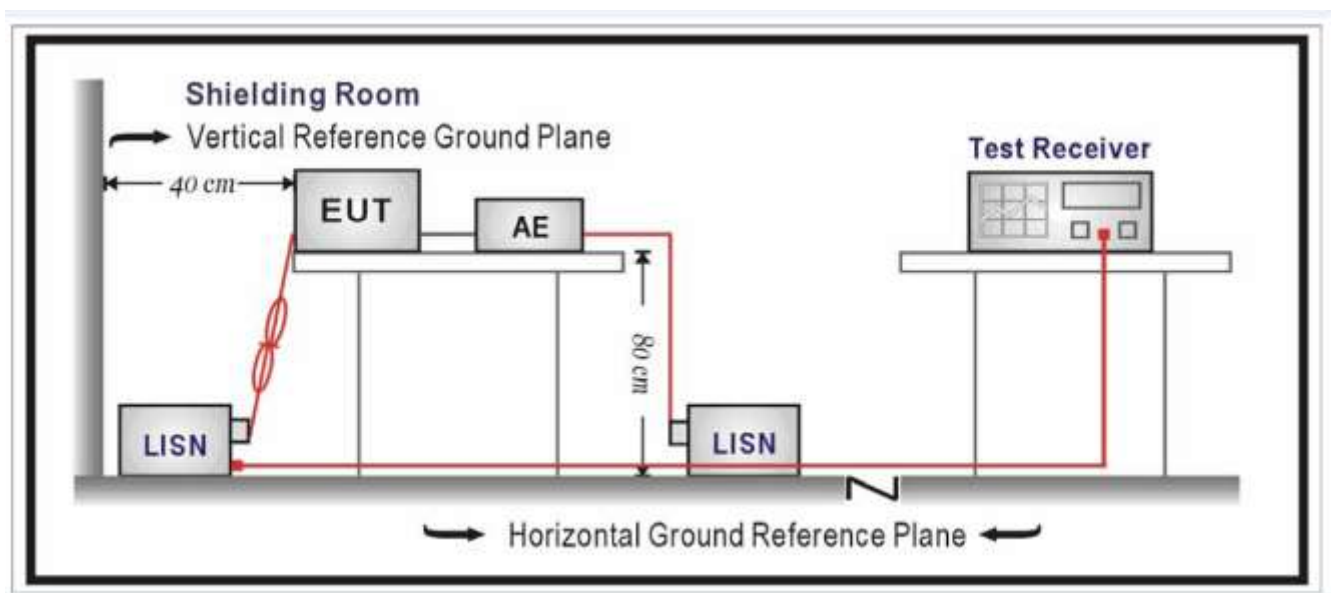
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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.

11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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 voltage by adapter 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.

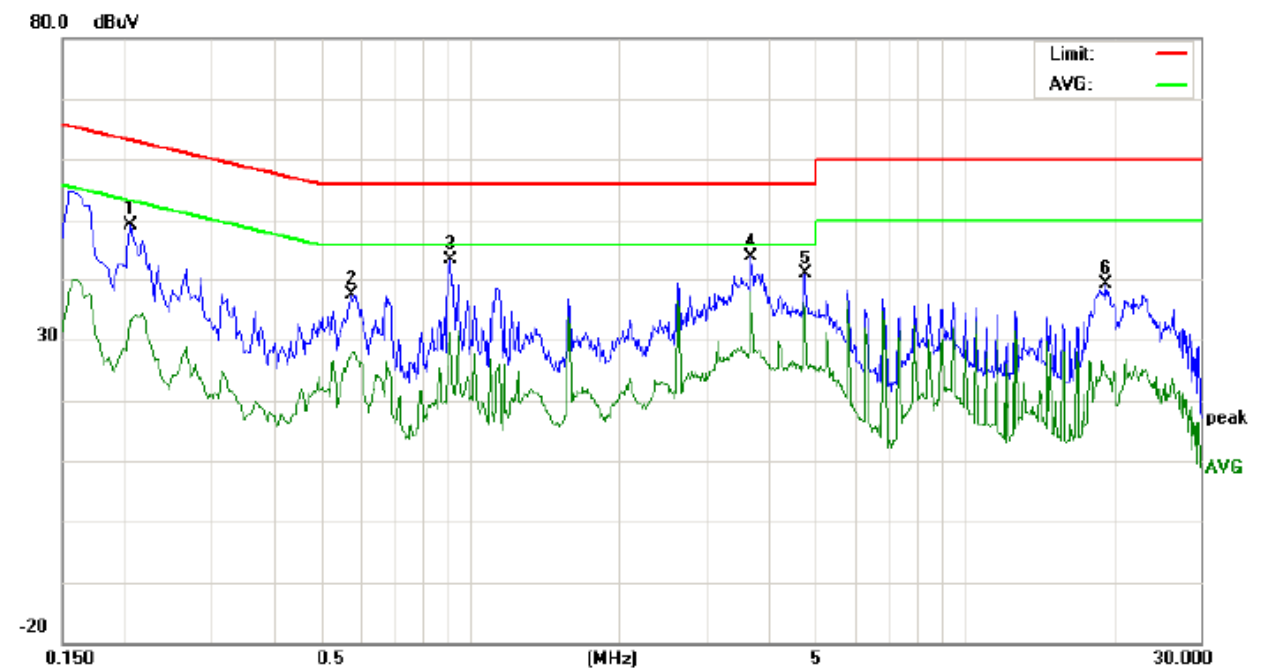
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

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

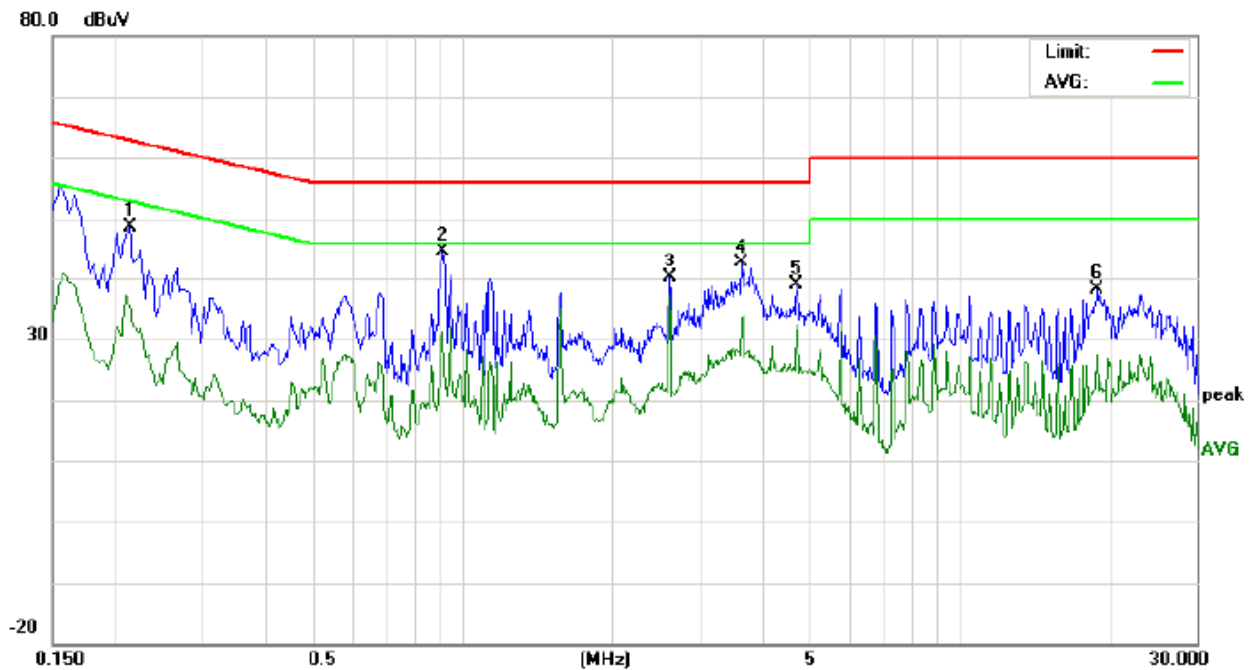
Line Conducted Emission Test Line 1-L



Site: Conduction	Phase: L1	Temperature: 23.5
Limit: FCC Class B Conduction(QP)	Power:	Humidity: 56.1 %
EUT: TURNTABLE STEREO SYSTEM		
M/N: T2		
Mode: BT Link		
Note:		

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2059	38.81		22.88	10.22	49.03		33.10	63.37	53.37	-14.34	-20.27	P	
2	0.5779	27.03		17.05	10.33	37.36		27.38	56.00	46.00	-18.64	-18.62	P	
3	0.9140	32.93		20.65	10.40	43.33		31.05	56.00	46.00	-12.67	-14.95	P	
4	3.6979	33.30		27.36	10.48	43.78		37.84	56.00	46.00	-12.22	-8.16	P	
5	4.7538	30.68		24.83	10.23	40.91		35.06	56.00	46.00	-15.09	-10.94	P	
6	19.2739	28.91		14.01	10.12	39.03		24.13	60.00	50.00	-20.97	-25.87	P	

Line Conducted Emission Test Line 2-N



Site: Conduction Phase: **N** Temperature: 23.5
Limit: FCC Class B Conduction(QP) Power: Humidity: 56.1 %
EUT: TURNTABLE STEREO SYSTEM
M/N: T2
Mode: BT Link
Note:

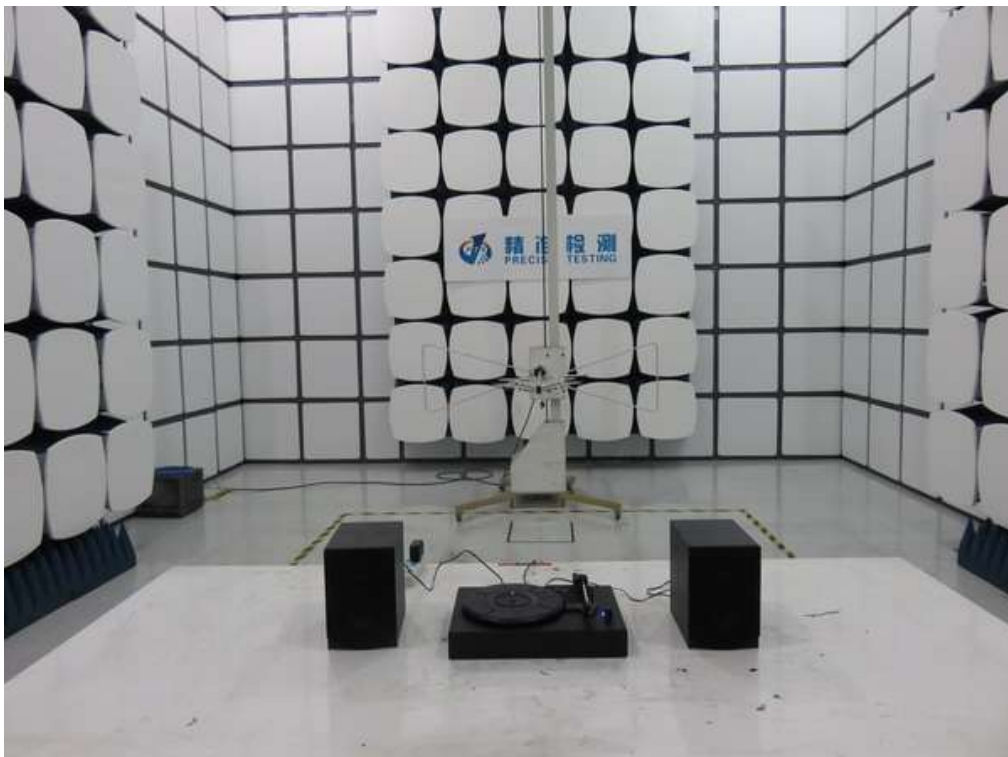
No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2139	38.28		25.47	10.23	48.51		35.70	63.05	53.05	-14.54	-17.35	P	
2	0.9140	34.20		20.63	10.40	44.60		31.03	56.00	46.00	-11.40	-14.97	P	
3	2.6139	29.77		26.55	10.46	40.23		37.01	56.00	46.00	-15.77	-8.99	P	
4	3.6579	32.04		22.41	10.48	42.52		32.89	56.00	46.00	-13.48	-13.11	P	
5	4.7057	28.68		22.27	10.22	38.90		32.49	56.00	46.00	-17.10	-13.51	P	
6	19.0017	28.04		17.03	10.12	38.16		27.15	60.00	50.00	-21.84	-22.85	P	

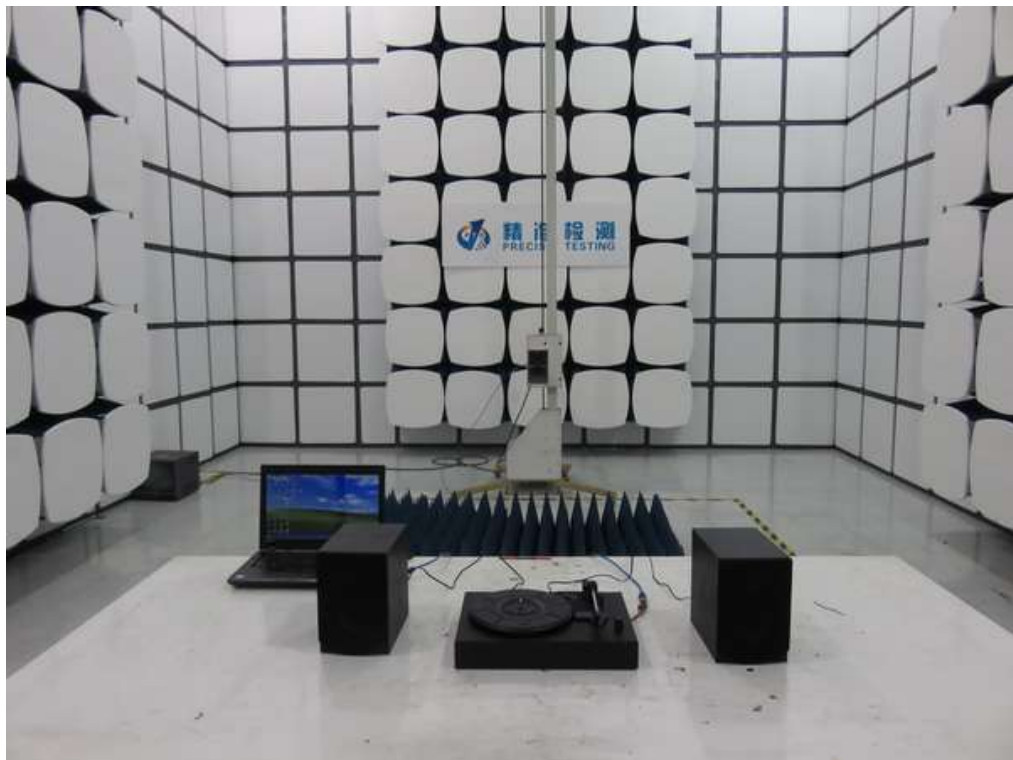
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP





APPENDIX B: PHOTOGRAPHS OF EUT

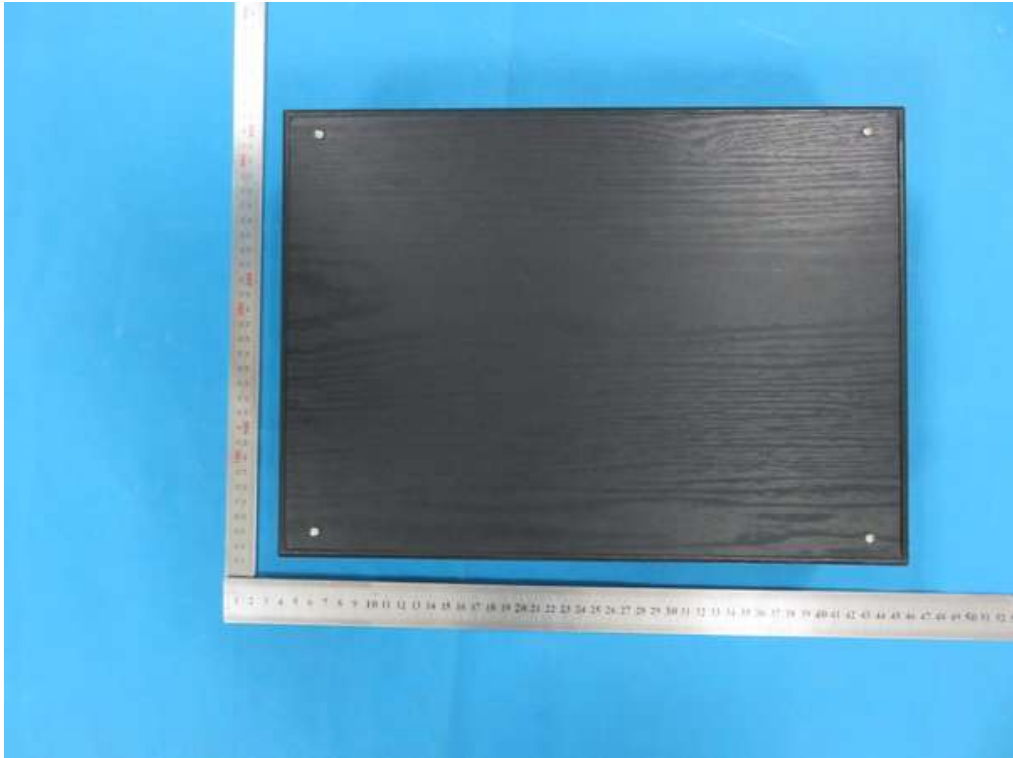
All VIEW OF EUT



TOP VIEW OF EUT



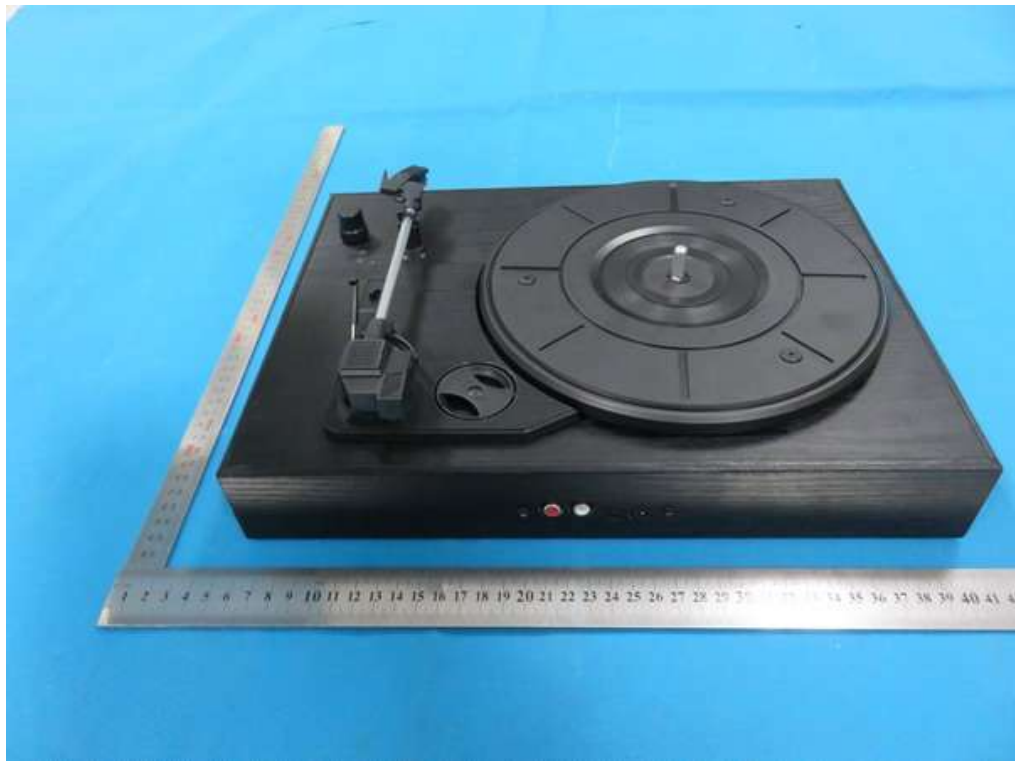
BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



VIEW OF EUT (PORT)



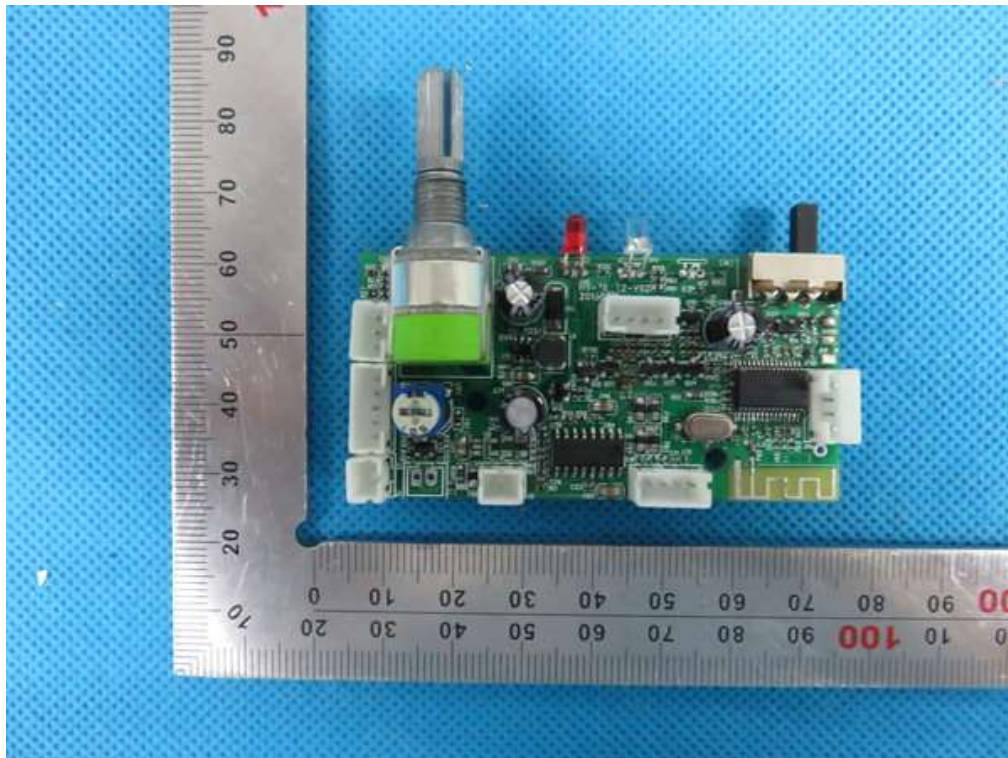
OPEN VIEW OF EUT



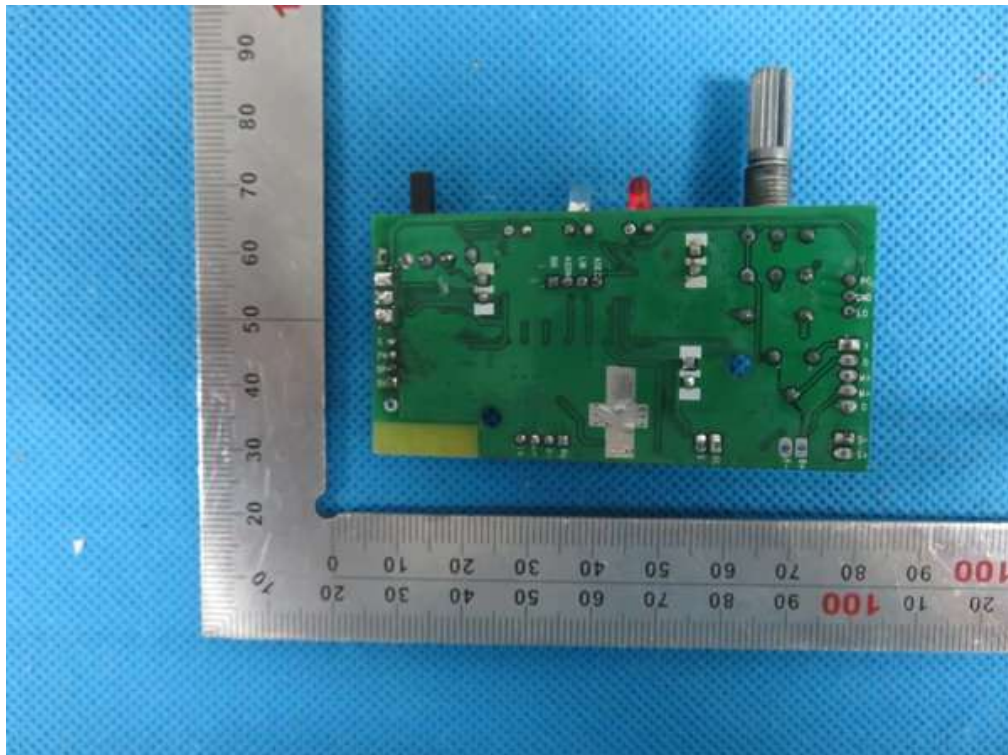
THE PHOTO OF ADAPTER



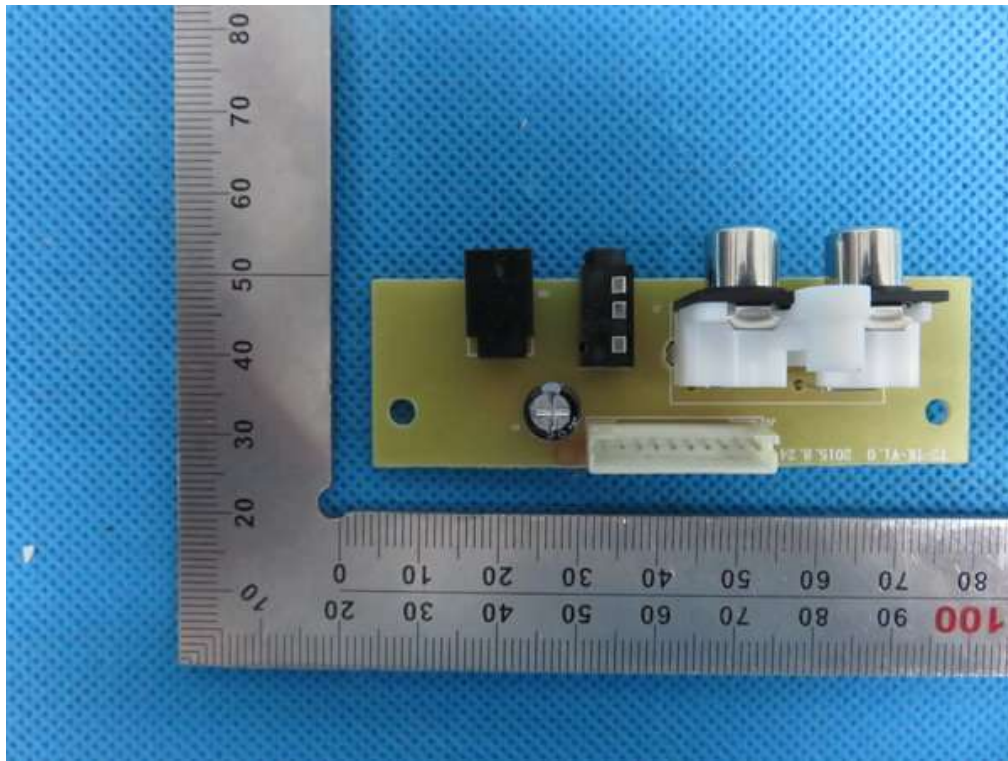
INTERNAL VIEW OF EUT-1



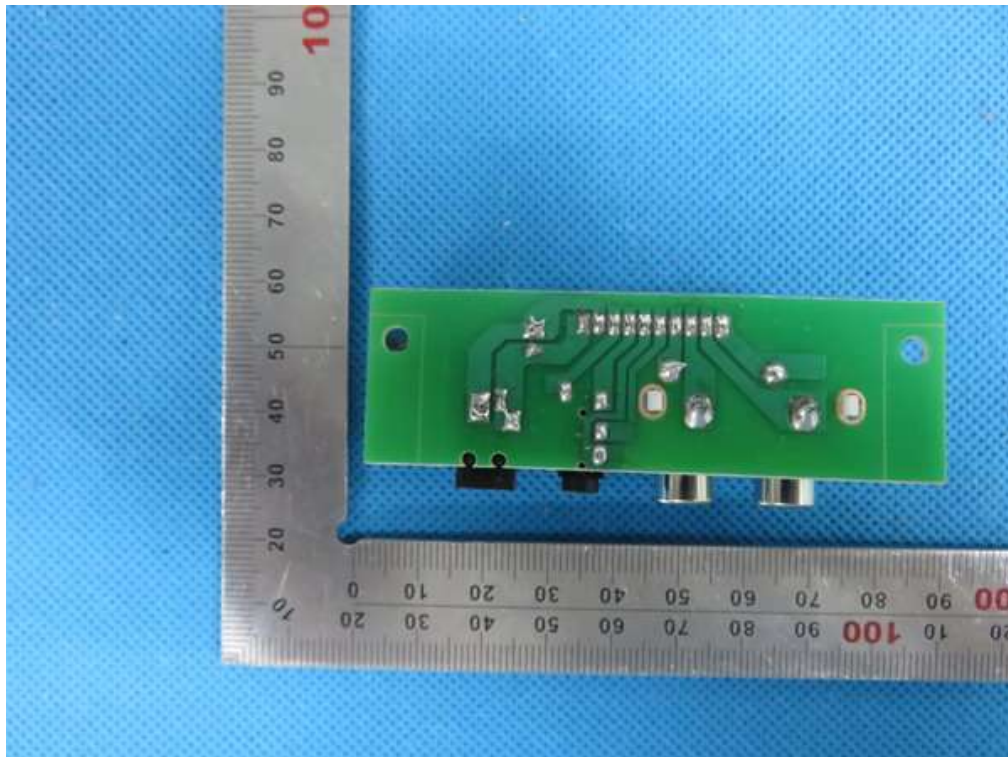
INTERNAL VIEW OF EUT-2



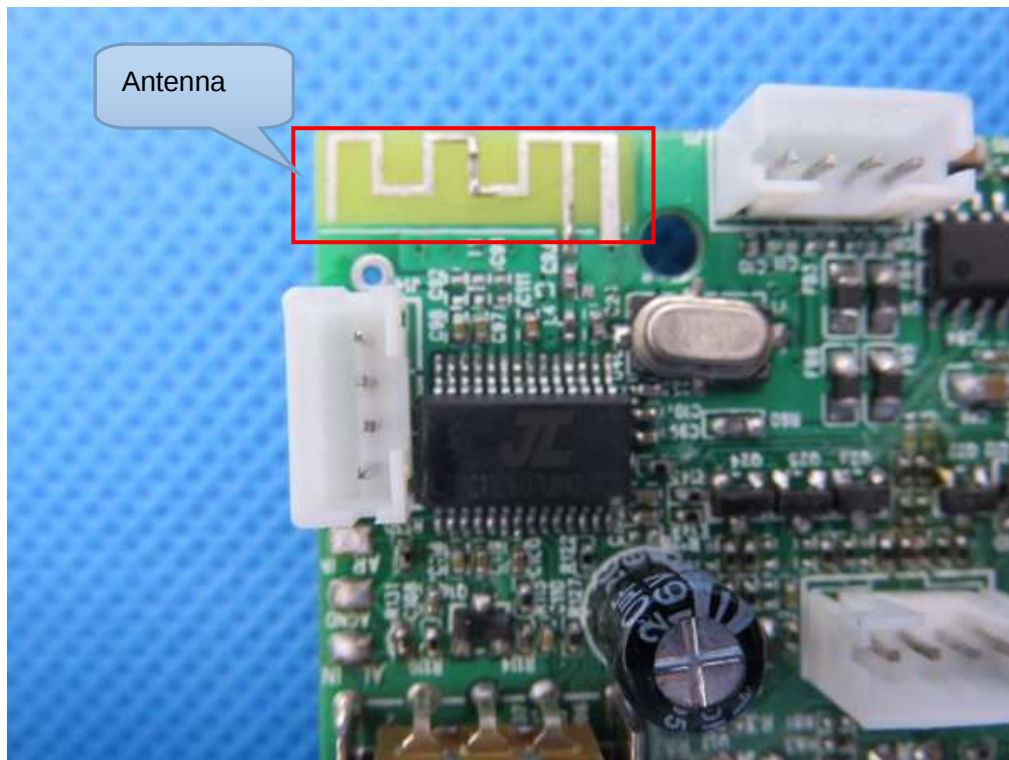
INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



INTERNAL VIEW OF EUT-5



----END OF REPORT----