FCC Radio TEST Report

FCC ID: ZS5SPZ210-SB

This report concerns (check one): ■ **Original Grant** □ **Class II Change**

Issued Date	:	Jul. 20, 2011
Project No.	:	1106C214
Equipment	:	2.1 wireless sound bar speaker
Model Name	:	SPZ210-Sound bar
Applicant	:	Hui Yang EasternAsia Electronics CO.,LTD
Address	:	Dong Fong District,Xinxu,Hui-Yang Dist.Huizhou, Guang Dong China. Post Code: 516226

Tested by:

Neutron Engineering Inc. EMC Laboratory

Date of Receipt: Jun. 22, 2011

Date of Test:

Jun. 22, 2011 ~Jul. 18, 2011

Testing Engineer: _____ (Ivan Cao)

Technical Manager: _____ (Leo Hung)

Authorized Signatory: _____ (Steven Lu)

Neutron Engineering Inc.

No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.
TEL : (0769) 8318-3000 FAX : (0769) 8319-6000

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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1. CERTIFICATION

Equipment: 2.1 wireless sound bar speaker
Brand Name : AVC
Model Name: SPZ210-Sound bar
Applicant: Hui Yang EasternAsia Electronics CO.,LTD
Factory: Eastech Electronics(Hui Yang) CO.,LTD
Address: Dong Fong District Xinxu,Hui Yang Hui Zhou city, Guangdong, P R China
Date of Test: Jun. 22, 2011 ~Jul. 18, 2011
Test Item: ENGINEERING SAMPLE
Standards: FCC Part15, Subpart C(15.249)/ ANSI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1106C214) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249)			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209	Radiated Emission	PASS	
15.249	Radiated Spurious Emission	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03**at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792
Neutron's test firm number is 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The reported uncertainty of measurement **y** ± **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** %。

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
DG-CB03	CISPR	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	2.1 wireless sound bar speaker
Brand Name	AVC
Model Name.	SPZ210-Sound bar
OEM Brand/Model Name	N/A
Model Difference	N/A
Product Description	The EUT is a 2.1 wireless sound bar speaker. Product Type: Low Power Communication Device Operation Frequency: 2404~2479 MHz Modulation Type: GFSK Date rate: 2Mbps Number Of Channel: 16CH .Please see note 2. Antenna Designation: Integral antenna Antenna Gain(Peak): 2.4dBi Output Power: 74.51dBuV/m (AV Max.) Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification. Please refer to the User's Manual.
Power Source	DC Voltage supplied from AC adapter Brand/Model name: meikai/ PDN-60-19A
Power Rating	I/P: 100-240V 47-63HZ 1.3A O/P: 20V 3.0A
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel List			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2404	**08**	2444
01	2409	09	2449
02	2414	10	2454
03	2419	11	2459
04	2424	12	2464
05	2429	13	2469
06	2434	14	2474
07	2439	**15**	2479

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	MyAntenna	MAT-2417-A	Integral	N/A	2.4

3.2 DESCRIPTION OF TEST MODES

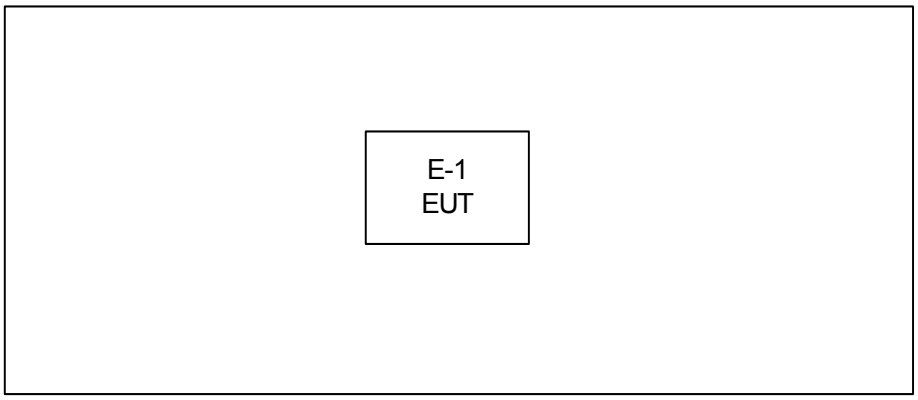
To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	AUX IN 1
Mode 2	AUX IN 2
Mode 3	Optical
Mode 4	CH Lower - 2404MHz
Mode 5	CH Middle - 2444MHz
Mode 6	CH Highest -2479MHz

For Conducted Test	
Final Test Mode	Description
Mode 1	AUX IN 1
Mode 2	AUX IN 2
Mode 3	Optical

For Radiated Test	
Final Test Mode	Description
Mode 4	CH Lower - 2404MHz
Mode 5	CH Middle - 2444MHz
Mode 6	CH Highest -2479MHz

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	2.1 wireless sound bar speaker	AVC	SPZ210-Sound bar	ZS5SPZ210-SB	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in m in 『Length』 column.

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	May.26.2012
2	LISN	R&S	ENV216	100087	May.26.2012
3	Test Cable	N/A	C_17	N/A	Mar.30.2012
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	May.26.2012
5	50Ω Terminator	SHX	TF2-3G-A	08122902	May.26.2012

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

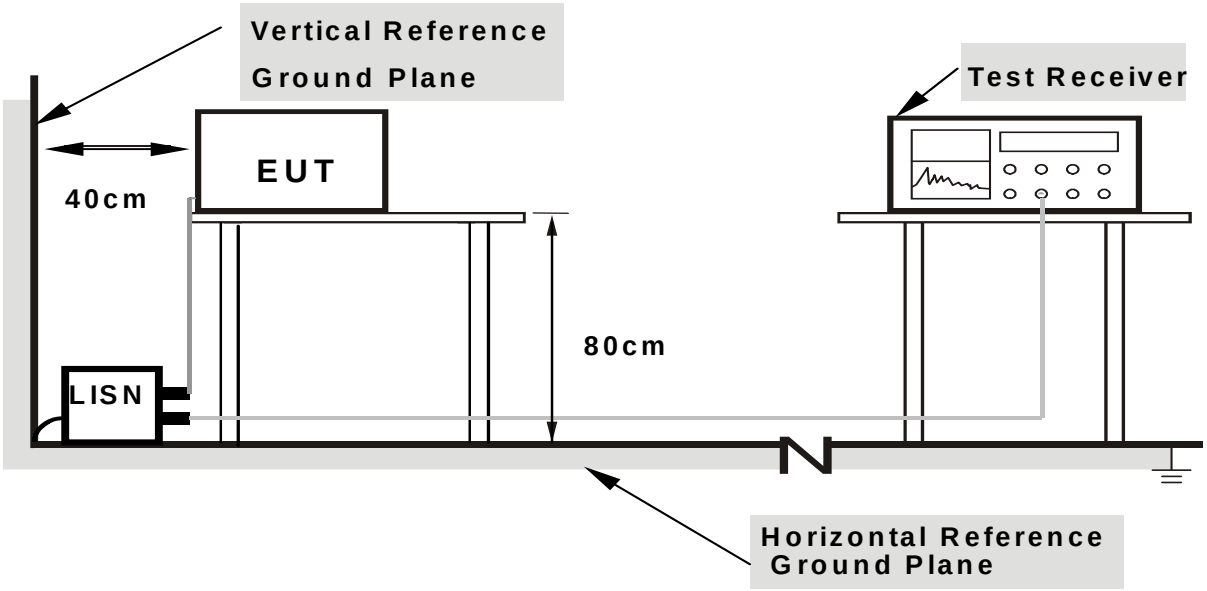
4.1.3 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.
The EUT was programmed to be in continuously transmitting mode.

4.1.7 TEST RESULTS

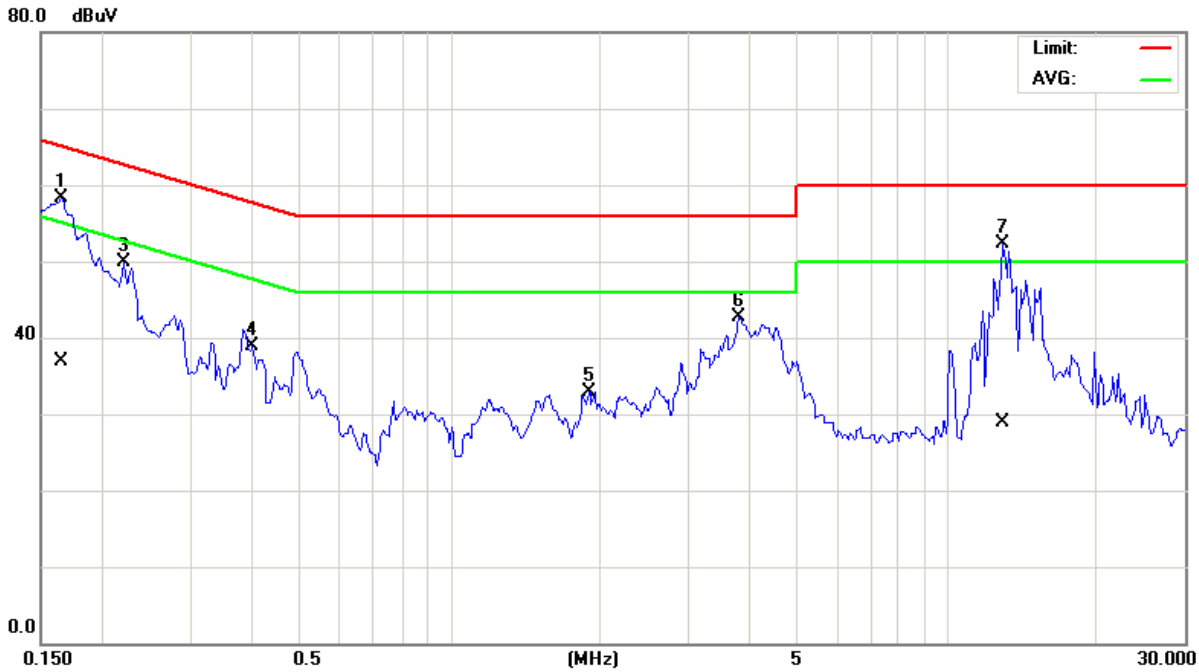
EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	AUX IN 1		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	Line	58.25	36.99	65.18	55.18	-6.93	(QP)
0.22	Line	49.84	*	62.81	52.81	-12.97	(QP)
0.40	Line	38.82	*	57.85	47.85	-19.03	(QP)
1.91	Line	32.89	*	56.00	46.00	-23.11	(QP)
3.81	Line	42.63	*	56.00	46.00	-13.37	(QP)
12.91	Line	52.39	28.87	60.00	50.00	-7.61	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150KHz to 30MHz.



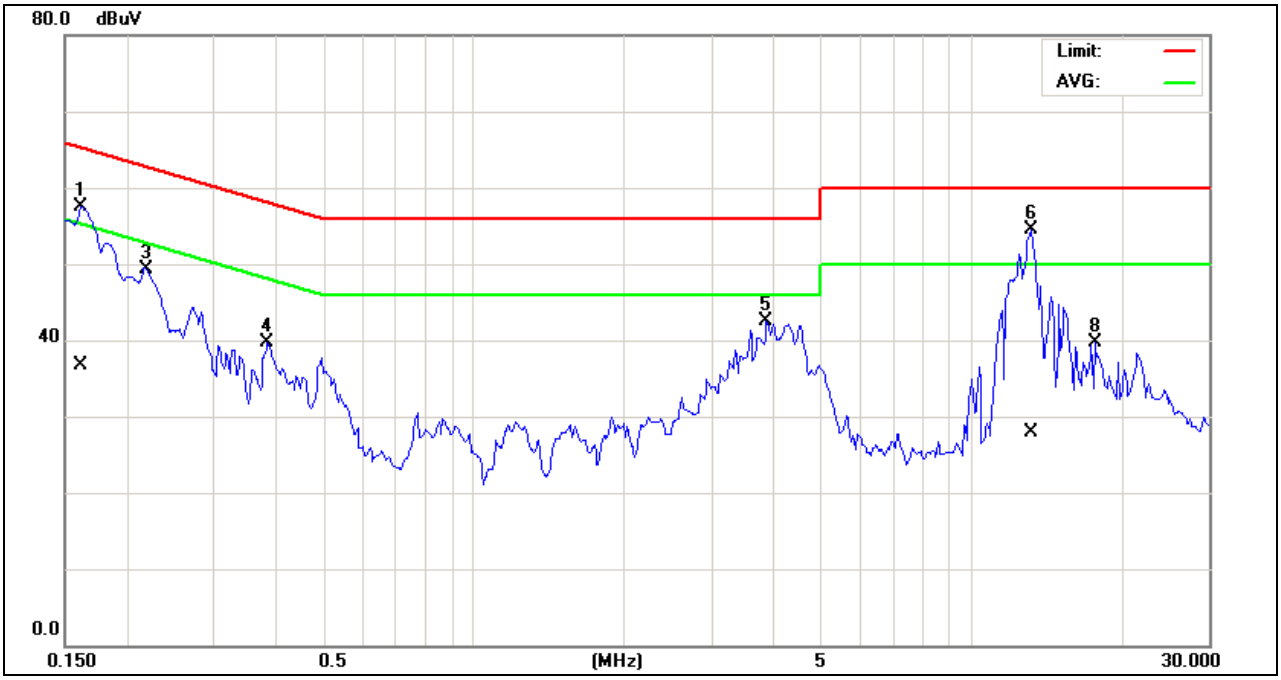
EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	AUX IN 1		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.16	Neutral	57.58	36.69	65.38	55.38	-7.80	(QP)
0.22	Neutral	49.33	*	62.88	52.88	-13.55	(QP)
0.38	Neutral	39.78	*	58.18	48.18	-18.40	(QP)
3.87	Neutral	42.50	*	56.00	46.00	-13.50	(QP)
13.18	Neutral	54.59	27.99	60.00	50.00	-5.41	(QP)
17.69	Neutral	39.63	*	60.00	50.00	-20.37	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150KHz to 30MHz。



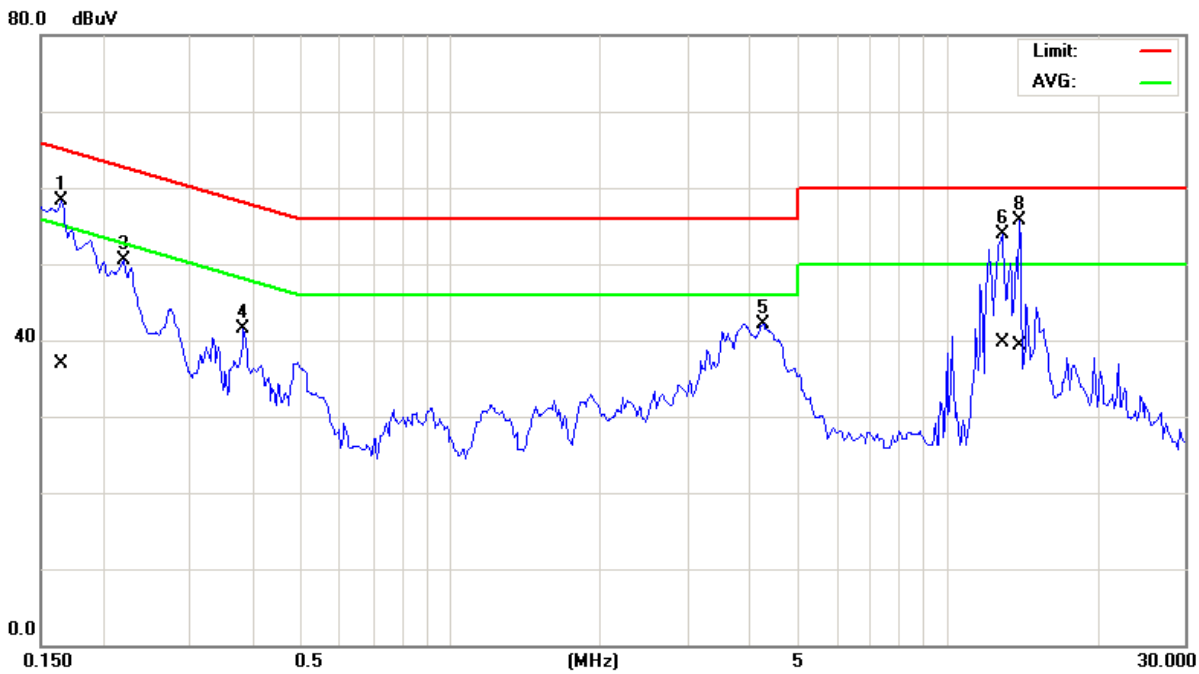
EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	AUX IN 2		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	Line	58.25	36.89	65.18	55.18	-6.93	(QP)
0.22	Line	50.43	*	62.81	52.81	-12.38	(QP)
0.38	Line	41.55	*	58.18	48.18	-16.63	(QP)
4.27	Line	42.17	*	56.00	46.00	-13.83	(QP)
12.86	Line	53.95	39.67	60.00	50.00	-6.05	(QP)
13.95	Line	55.75	39.34	60.00	50.00	-4.25	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150KHz to 30MHz.



EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	AUX IN 2		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	Neutral	57.54	36.09	65.18	55.18	-7.64	(QP)
0.28	Neutral	45.32	*	60.97	50.97	-15.65	(QP)
0.38	Neutral	40.18	*	58.18	48.18	-18.00	(QP)
2.21	Neutral	29.80	*	56.00	46.00	-26.20	(QP)
4.31	Neutral	43.11	*	56.00	46.00	-12.89	(QP)
12.90	Neutral	49.74	31.27	60.00	50.00	-10.26	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150KHz to 30MHz。

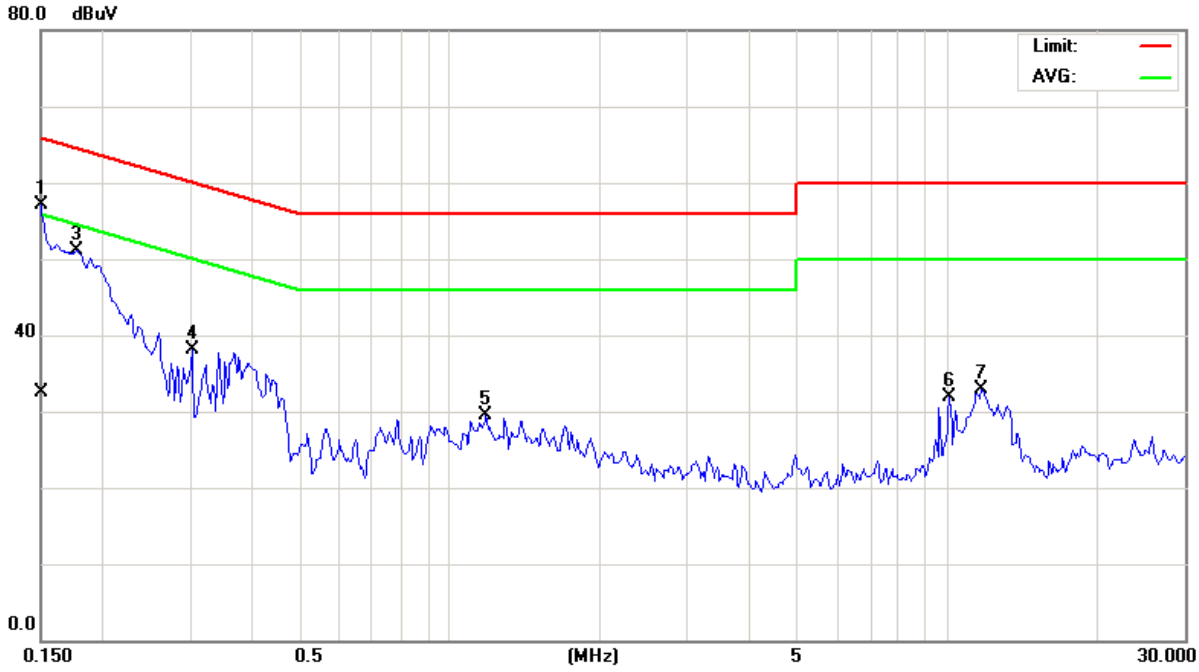
EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	Optical		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Line	57.10	32.59	66.00	56.00	-8.90	(QP)
0.18	Line	51.13	*	64.61	54.61	-13.48	(QP)
0.30	Line	38.11	*	60.18	50.18	-22.07	(QP)
1.18	Line	29.41	*	56.00	46.00	-26.59	(QP)
10.09	Line	31.83	*	60.00	50.00	-28.17	(QP)
11.71	Line	32.84	*	60.00	50.00	-27.16	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150KHz to 30MHz.



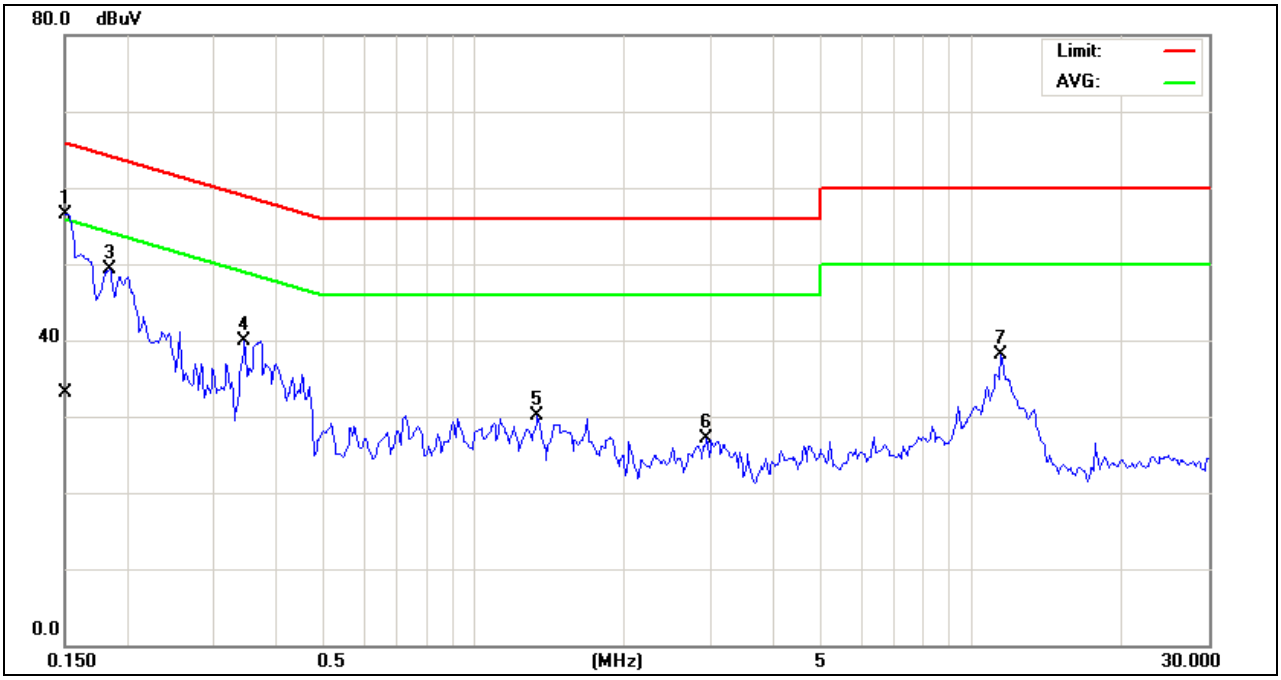
EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	Optical		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Neutral	56.53	33.19	66.00	56.00	-9.47	(QP)
0.19	Neutral	49.24	*	64.25	54.25	-15.01	(QP)
0.35	Neutral	39.84	*	59.07	49.07	-19.23	(QP)
1.34	Neutral	30.16	*	56.00	46.00	-25.84	(QP)
2.94	Neutral	27.08	*	56.00	46.00	-28.92	(QP)
11.45	Neutral	38.10	*	60.00	50.00	-21.90	(QP)

Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(2) Measuring frequency range from 150KHz to 30MHz。



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range (MHz)
Field strength of fundamental 50000 μV/m (94 dBμV/m) @ 3 m	2400-2483.5
Field strength of harmonics 500 μV/m (54 dBμV/m) @ 3 m	Above 2483.5

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Triple Loop Antenna	R&S	HFH2-Z2	830749/020	May.26.2012
2	Bi-log Antenna	Schwarbeck	VULB9160	9160-3232	May.25.2012
3	Horn Antenna	ETS	3115	00075789	May.13.2012
4	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170340	Dec.15.2011
5	Amplifier	HP	8447D	2944A09673	May.25.2012
6	Amplifier	Agilent	8449B	3008A02274	May.25.2012
7	Amplifier	EMC	EMC2654045	980039	Aug.12.2011
8	Test Receiver	R&S	ESCI	100895	May.25.2012
9	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011
10	Test Cable	N/A	C-01_CB03	N/A	Jul.04.2012
11	Test Cable	HUBER+SUHNER	SUCOFLEX_8m	313794/4	Apr.11.2012
12	Controller	CT	SC100	N/A	N/A

Remark: ” N/A” denotes No Model Name. / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
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

4.2.3 TEST PROCEDURE

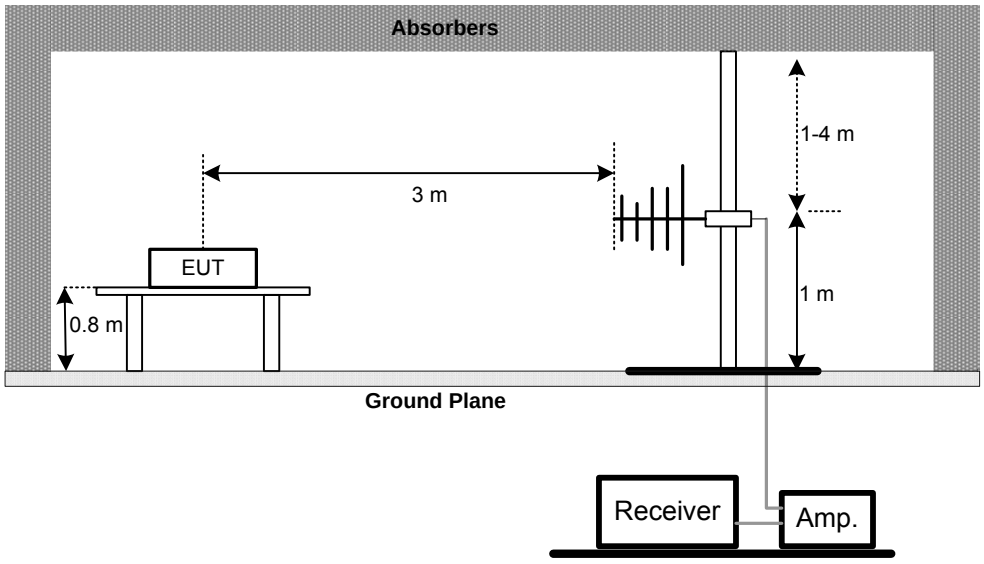
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.4 DEVIATION FROM TEST STANDARD

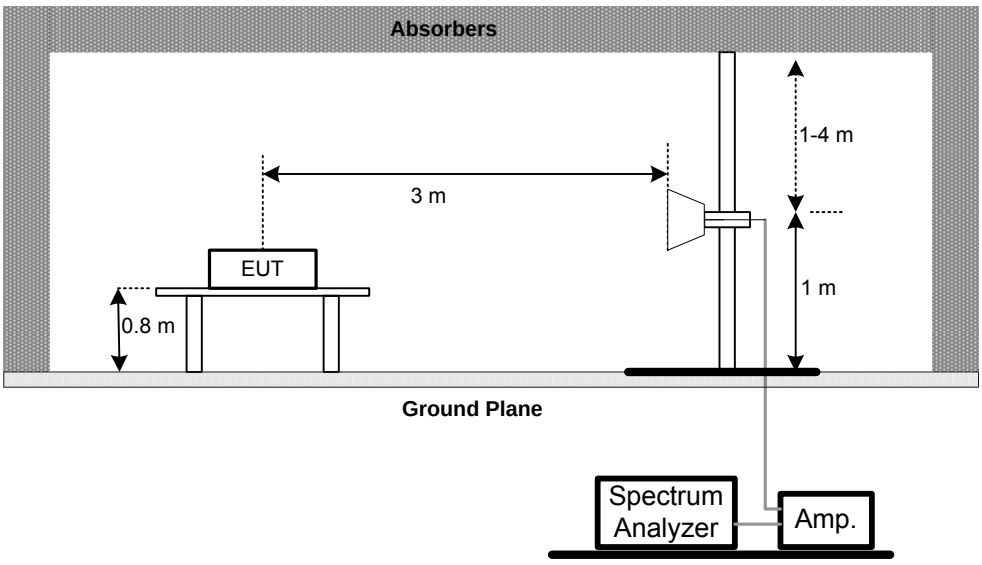
No deviation

4.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.7 TEST RESULTS (BETWEEN 30 – 1000 MHz)

EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2404MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
57.62	V	40.86	-13.13	27.73	40.00	- 12.27	
86.32	V	46.12	-18.31	27.81	40.00	- 12.19	
149.27	V	38.37	-13.17	25.20	43.50	- 18.30	
209.37	V	44.84	-15.85	28.99	43.50	- 14.51	
283.62	V	44.67	-12.92	31.75	46.00	- 14.25	
348.24	V	39.18	-11.32	27.86	46.00	- 18.14	

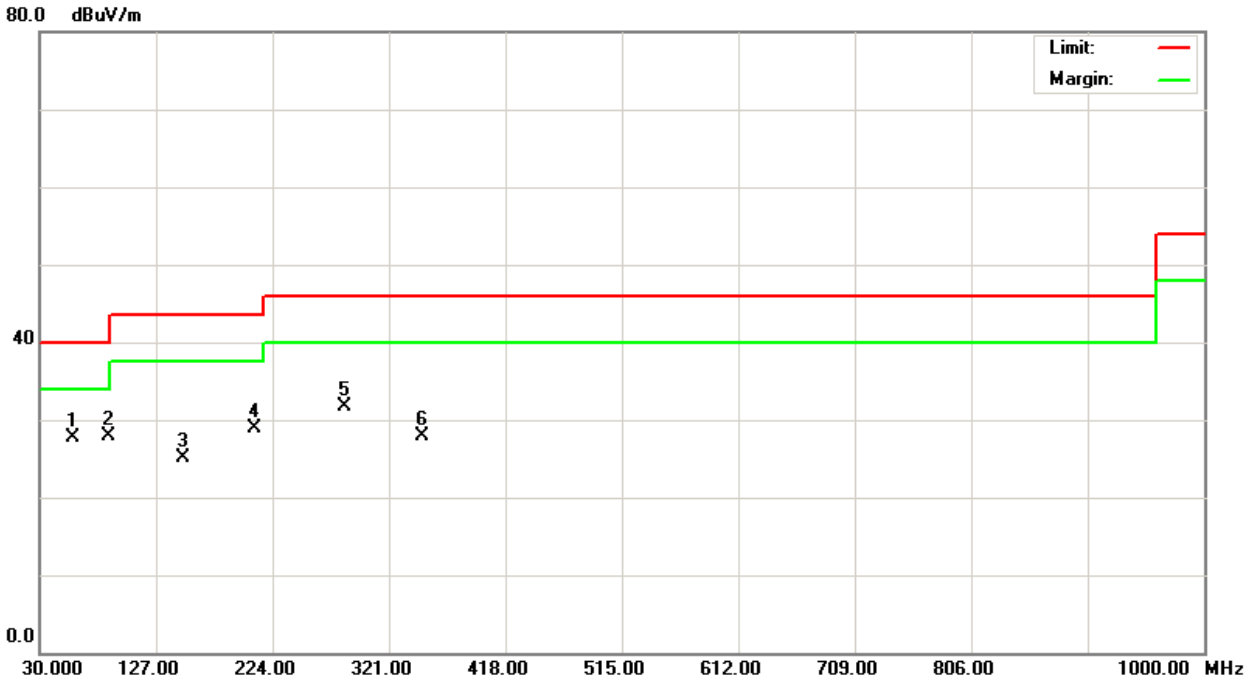
Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。

(4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2404MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
121.34	H	43.08	-14.83	28.25	43.50	- 15.25	
168.27	H	42.44	-13.41	29.03	43.50	- 14.47	
258.16	H	45.00	-13.98	31.02	46.00	- 14.98	
357.71	H	39.12	-11.09	28.03	46.00	- 17.97	
466.28	H	42.01	-8.34	33.67	46.00	- 12.33	
537.60	H	41.32	-7.20	34.12	46.00	- 11.88	

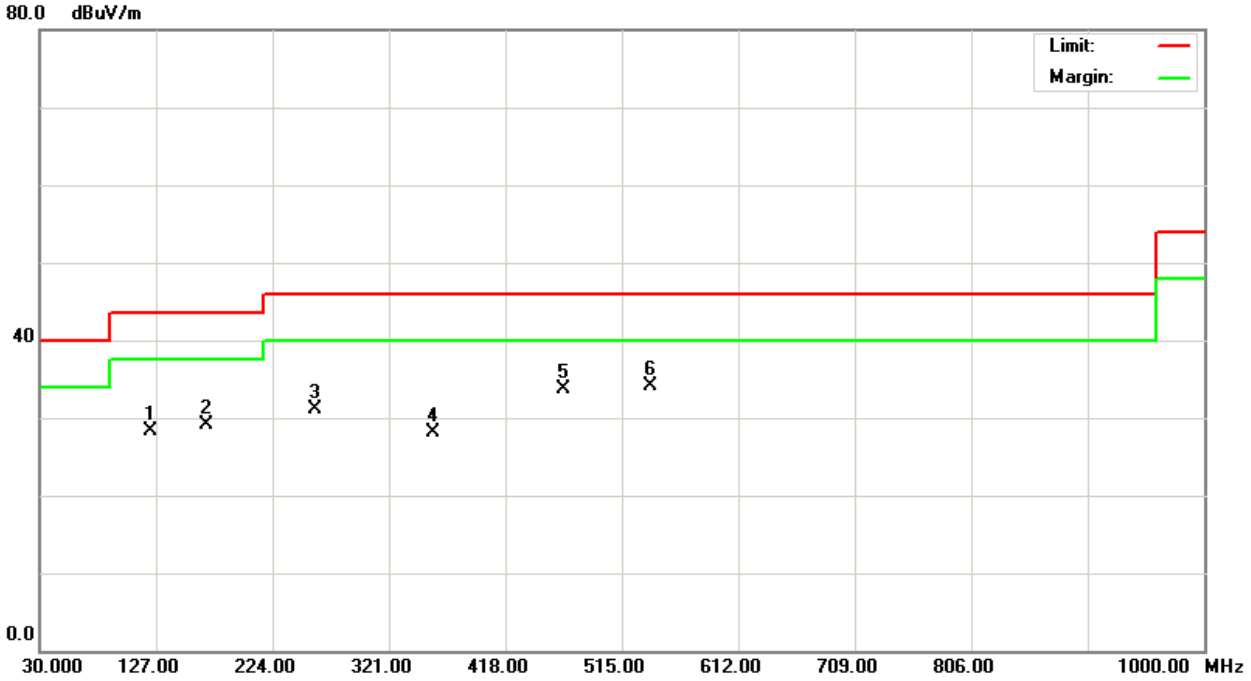
Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。

(4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



4.2.8 TEST RESULTS (ABOVE 1000 MHz)

EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2404MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	28.87	5.06	31.61	60.48	36.67	74.00	54.00	X/E
2404.00	**V**	**65.36**	**41.55**	**31.60**	**96.96**	**73.15**	**114.00**	**94.00**	**X/F**
4808.19	V	46.72	22.91	5.20	51.92	28.11	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

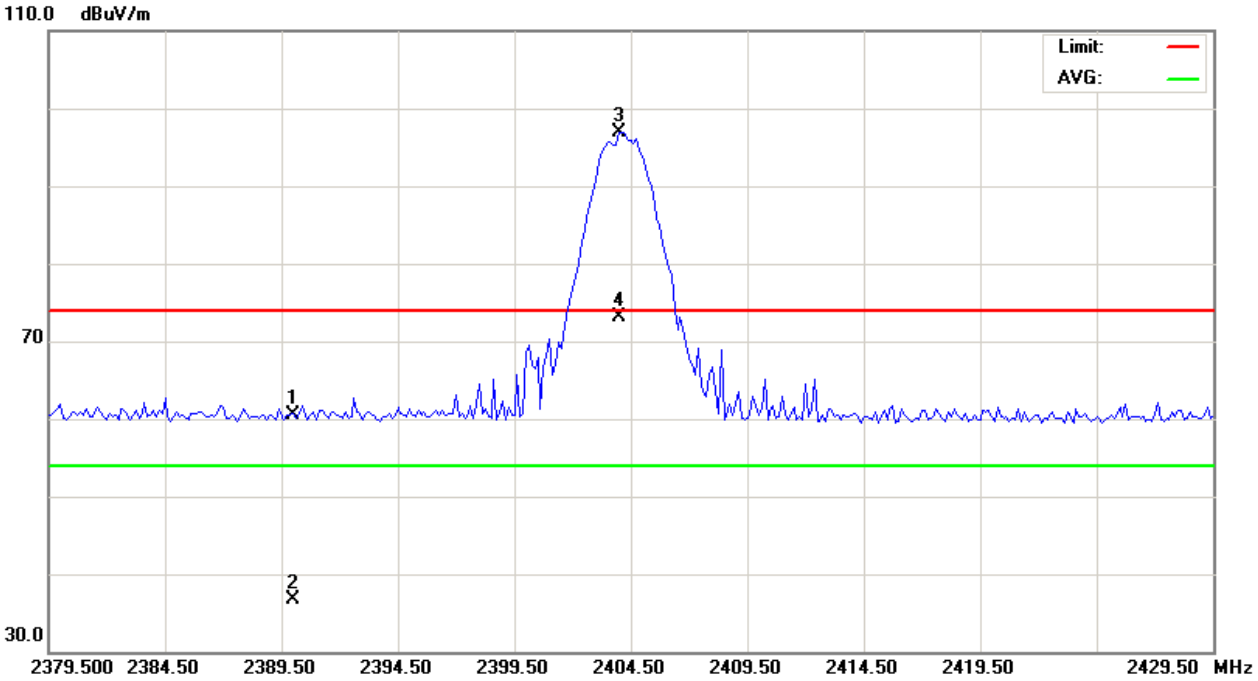
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

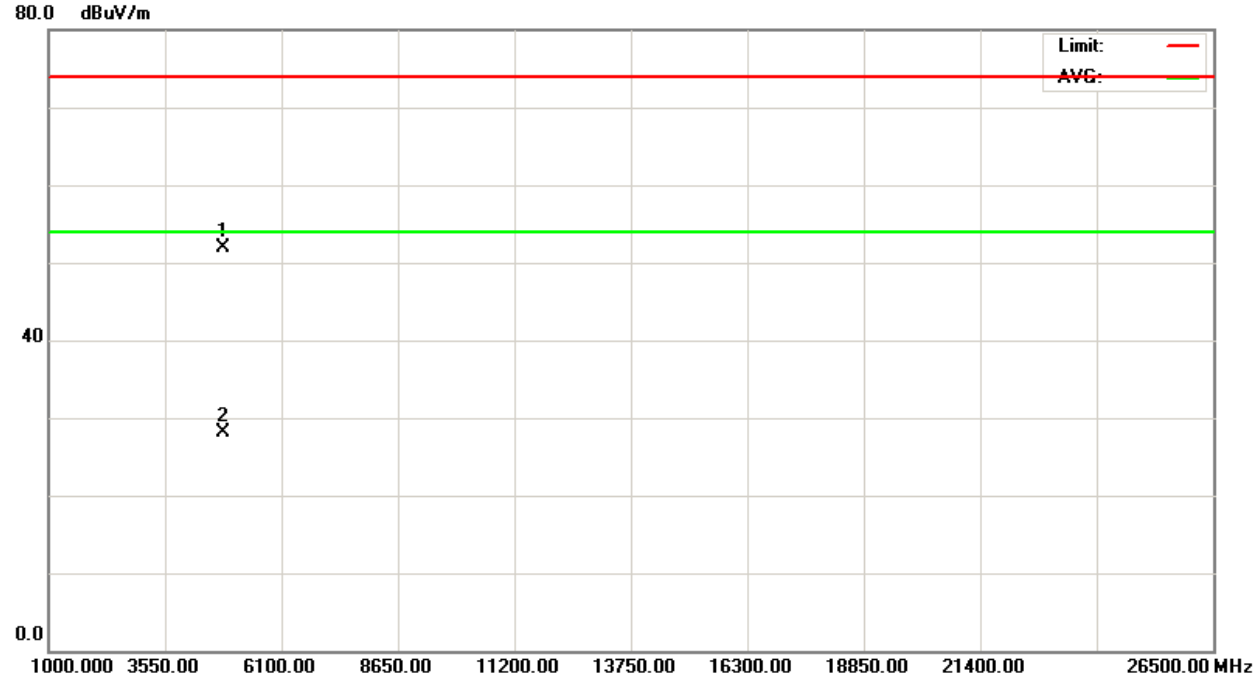
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2404MHz (Above 1000 MHz, Vertical)





EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2404MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	H	29.54	5.73	31.61	61.15	37.34	74.00	54.00	X/E
2404.50	**H**	**58.99**	**35.18**	**31.60**	**90.59**	**66.78**	**114.00**	**94.00**	**X/F**
4808.74	H	45.89	22.08	5.20	51.09	27.28	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

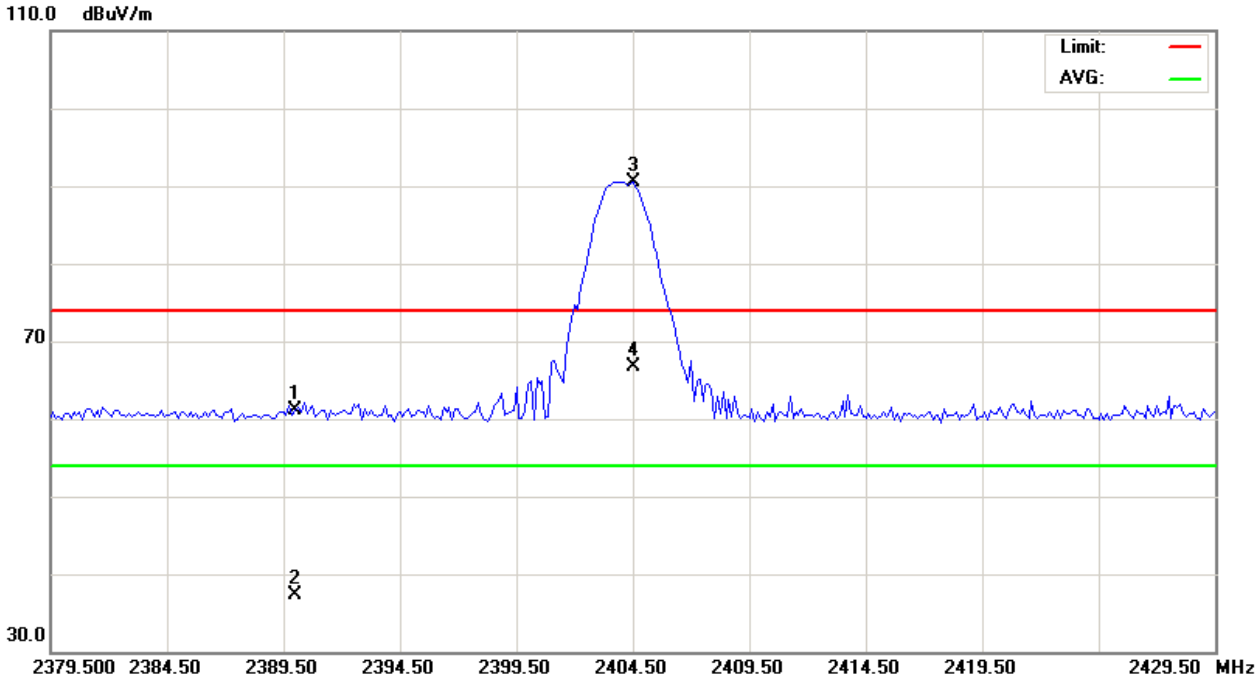
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

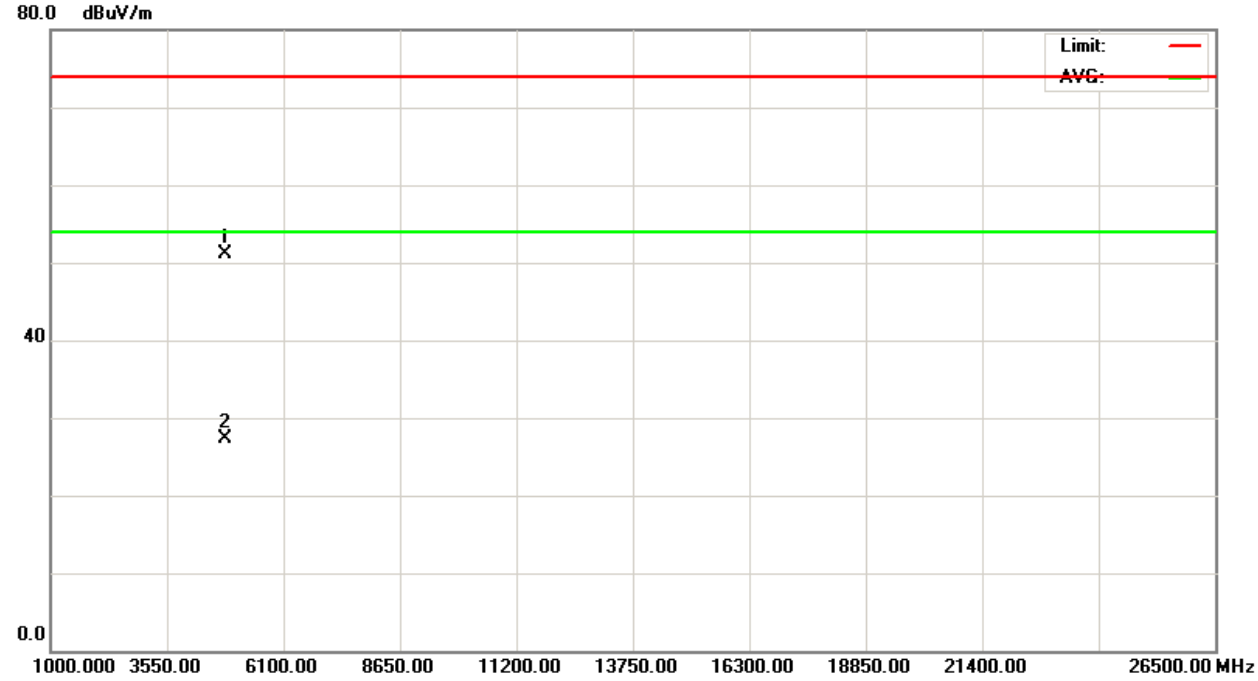
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2404MHz (Above 1000 MHz, Horizontal)





EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2444MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2443.63	**V**	**66.77**	**42.96**	**31.55**	**98.32**	**74.51**	**114.00**	**94.00**	**X/F**
4889.15	V	48.06	24.25	5.59	53.65	29.84	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

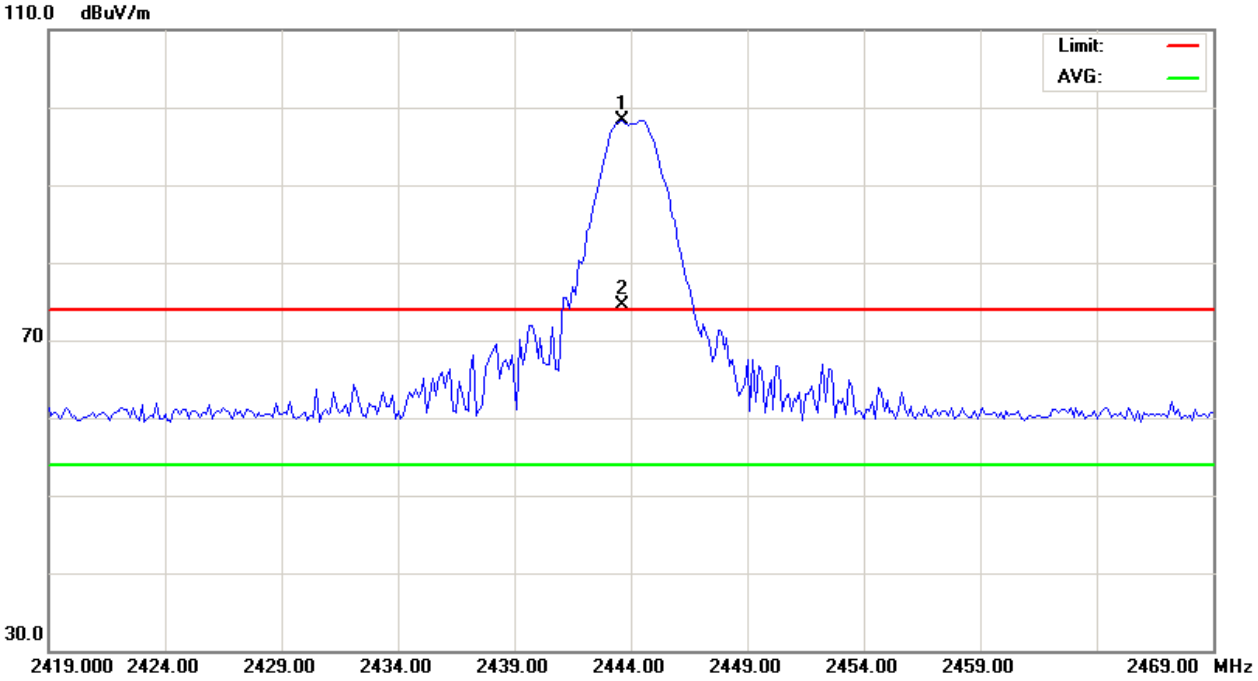
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

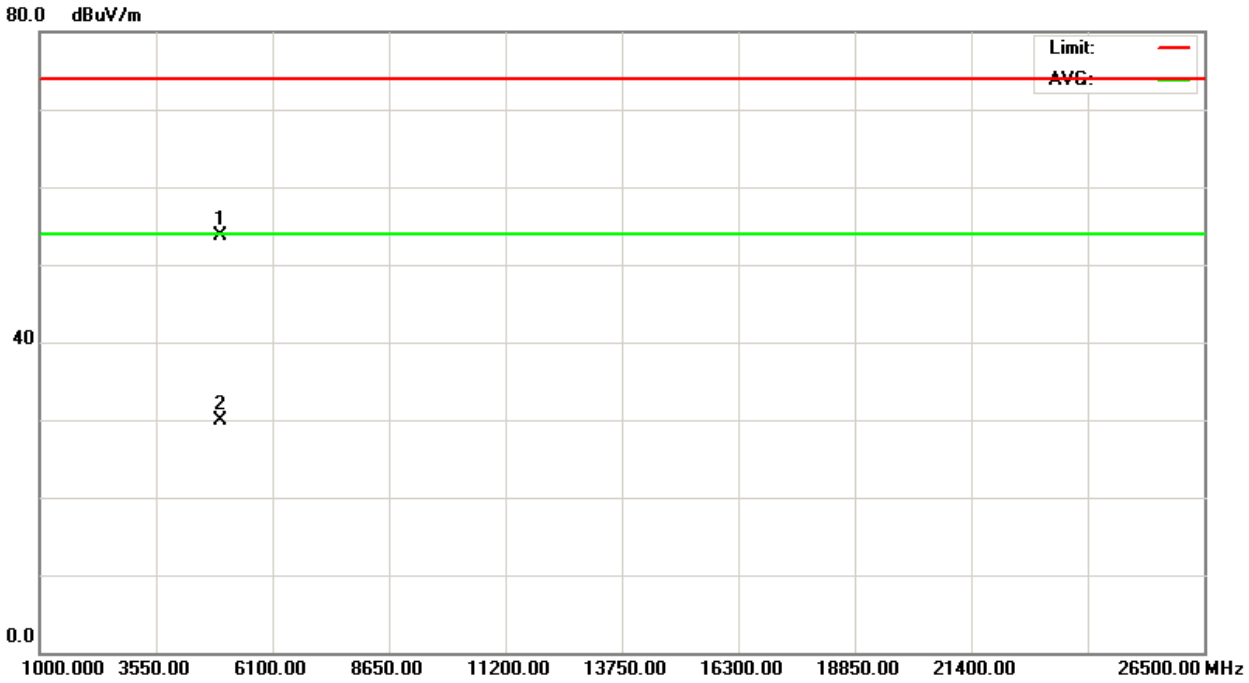
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2444 MHz (Above 1000 MHz, Vertical)





EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2444MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2444.00	**H**	**60.90**	**37.09**	**31.55**	**92.45**	**68.64**	**114.00**	**94.00**	**X/F**
4888.09	H	47.11	23.30	5.59	52.70	28.89	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

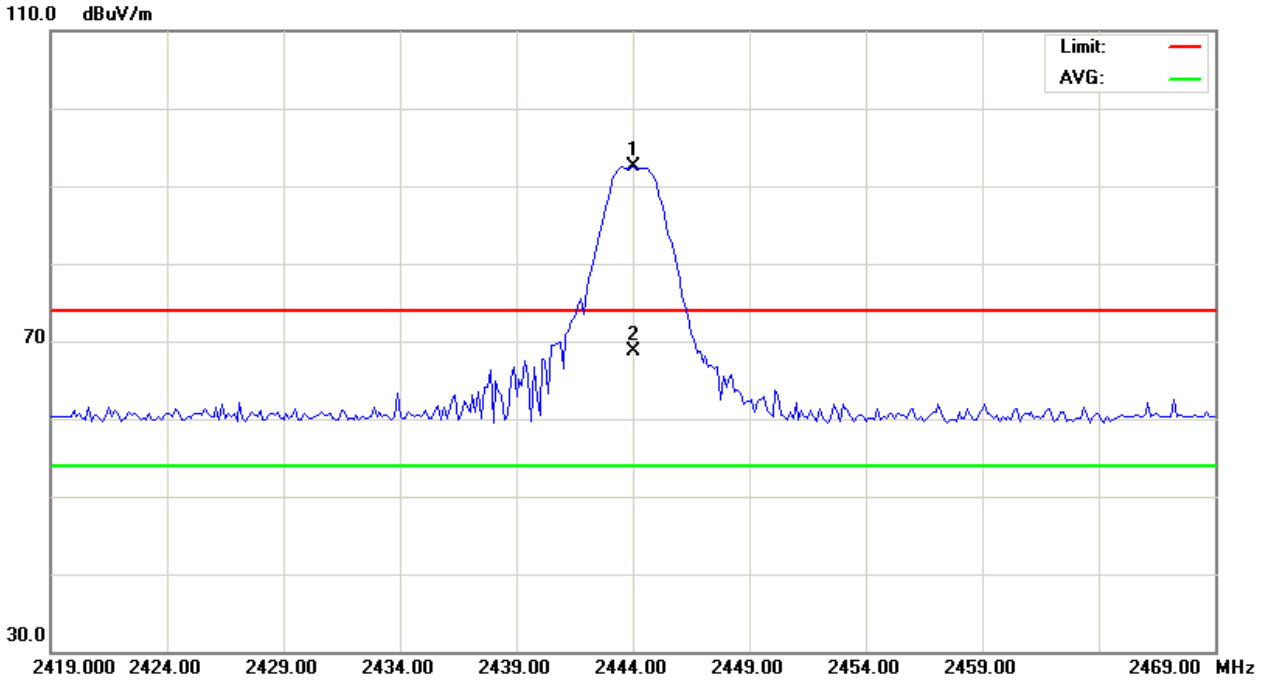
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

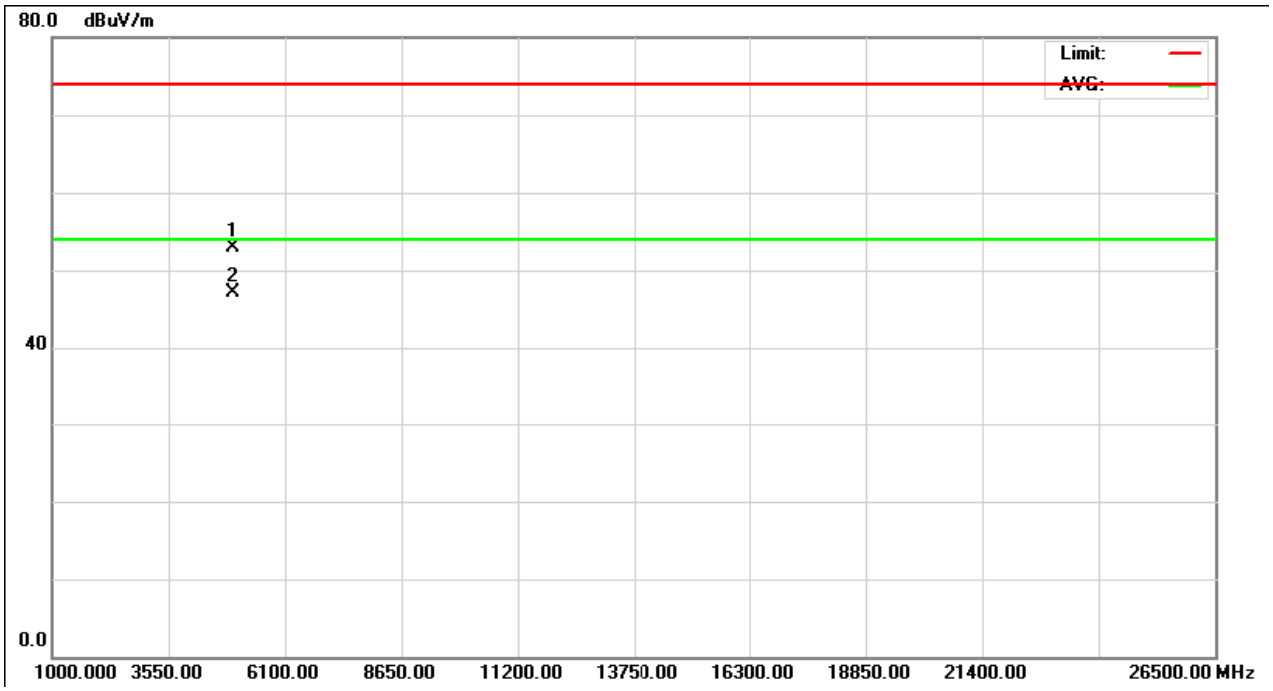
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2444MHz (Above 1000 MHz, Horizontal)





EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX 2479MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2479.00	**V**	**65.37**	**41.56**	**31.50**	**96.87**	**73.06**	**114.00**	**94.00**	**X/F**
2483.50	V	36.96	13.15	31.50	68.46	44.65	74.00	54.00	X/E
4958.16	V	49.60	25.79	5.93	55.53	31.72	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

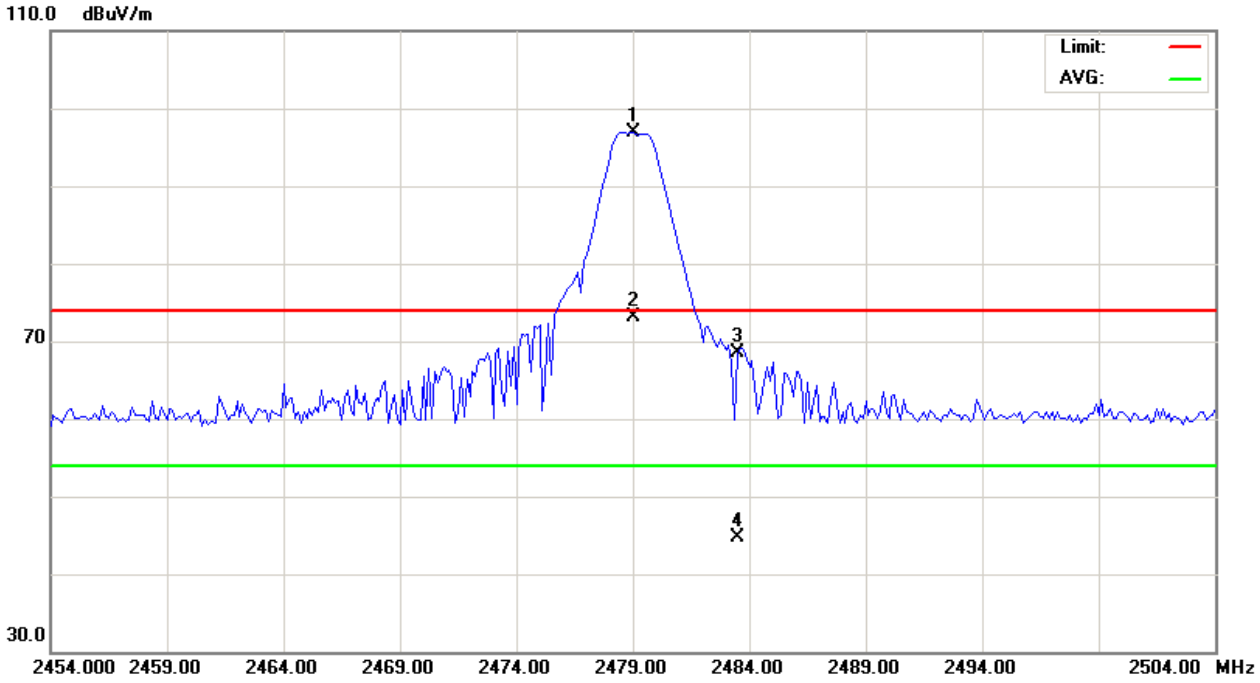
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

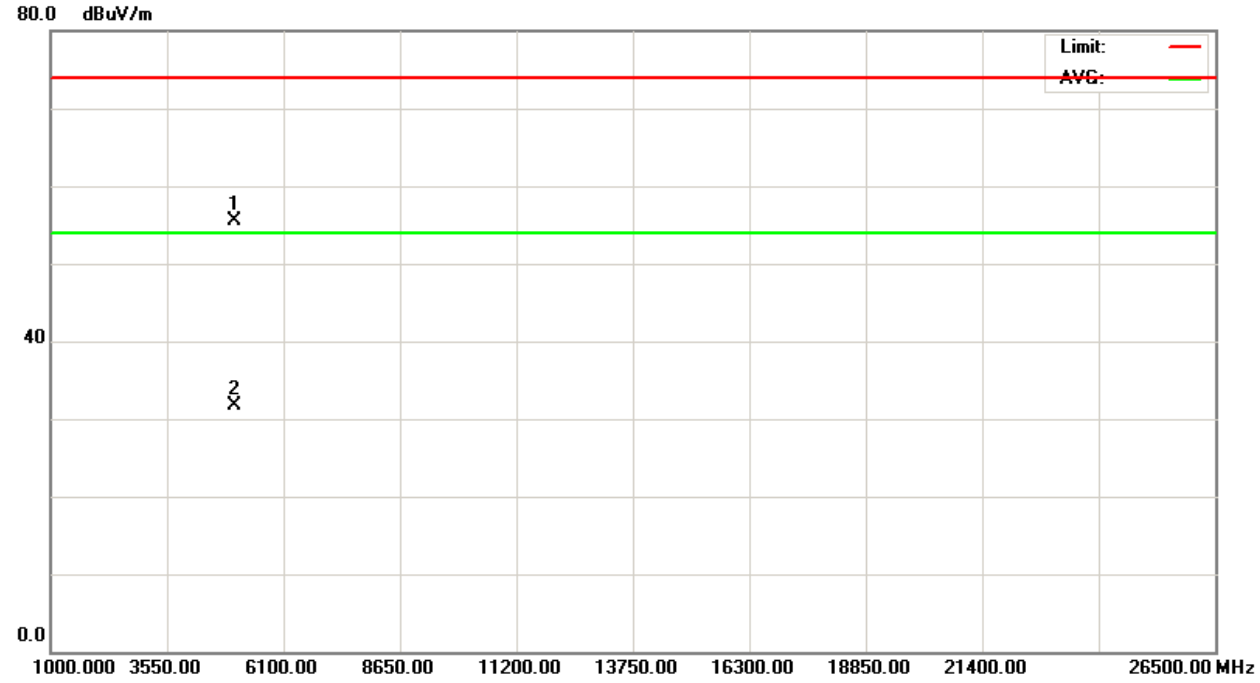
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2479MHz (Above 1000 MHz, Vertical)





EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	1010 hPa	1010 hPa
Test Mode ：	TX 2479MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2478.63	**H**	**61.63**	**37.82**	**31.50**	**23.81**	**69.32**	**114.00**	**94.00**	**X/F**
2483.50	H	30.62	6.81	31.50	23.81	38.31	74.00	54.00	X/E
4957.99	H	43.94	20.13	5.93	23.81	26.06	74.00	54.00	X/H

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

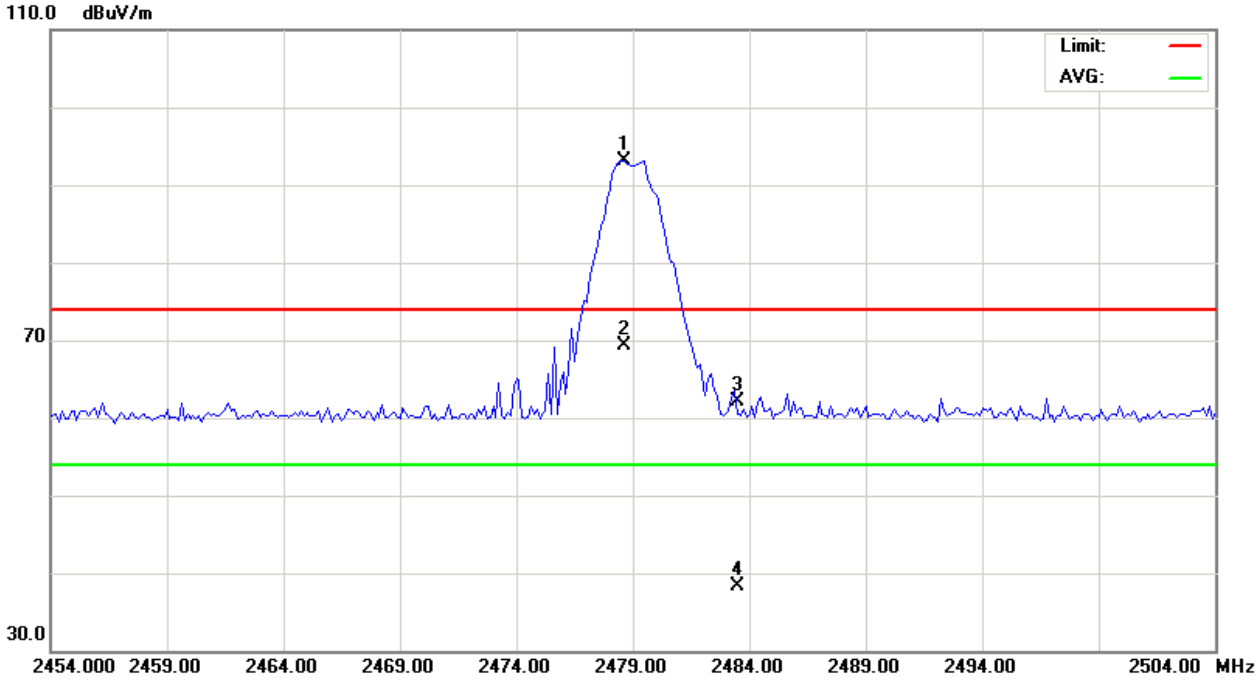
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

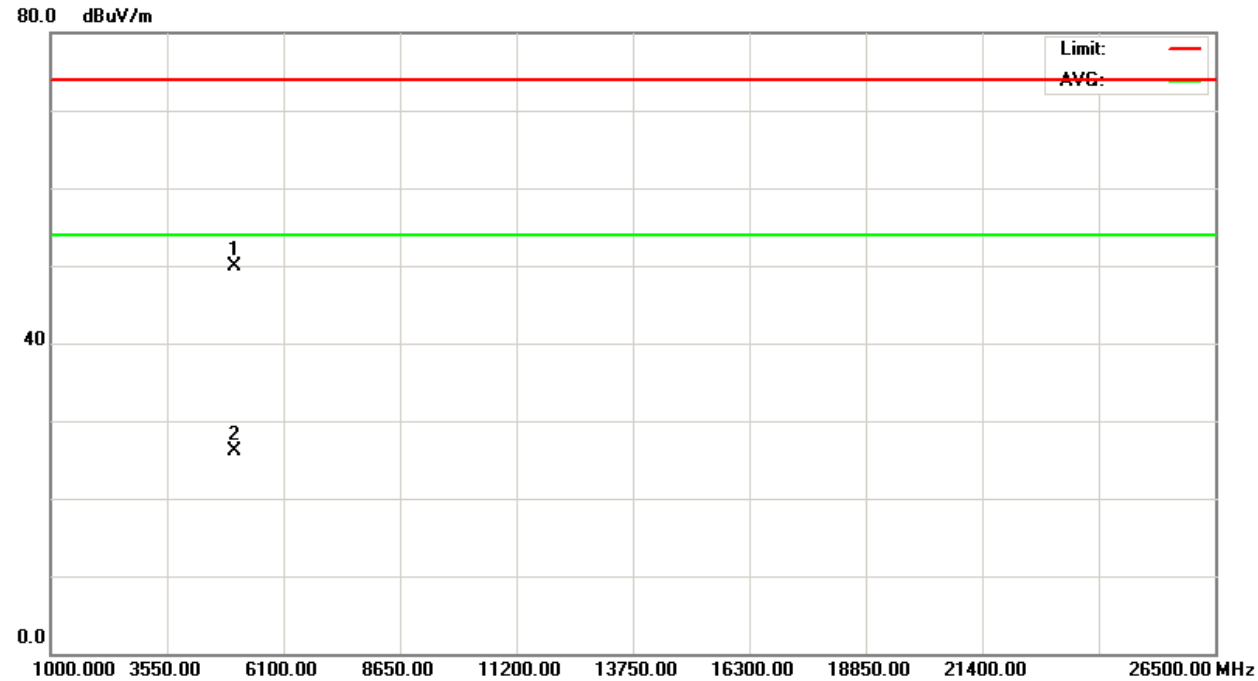
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Orthogonal Axis：X
TX 2479MHz (Above 1000 MHz, Horizontal)





4.2.9 TEST RESULTS (2404 – 2479 MHz)

EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH 2404MHz/2444MHz/2479MHz		

		Peak	AV		Peak	AV	Peak	AV	
Freq.	Ant.Pol.	Reading		Ant./CL/	Actual FS		Limit3m		
(MHz)	(H/V)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	NOTE
2404.00	V	65.36	41.55	31.60	96.96	73.15	114.00	94.00	CH01
2404.50	H	58.99	35.18	31.60	90.59	66.78	114.00	94.00	CH01
2443.63	V	66.77	42.96	31.55	98.32	74.51	114.00	94.00	CH09
2444.00	H	60.90	37.09	31.55	92.45	68.64	114.00	94.00	CH09
2479.00	V	65.37	41.56	31.50	96.87	73.06	114.00	94.00	CH16
2478.63	H	61.63	37.82	31.50	93.13	69.32	114.00	94.00	CH16

Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

(3) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(4) EUT Orthogonal Axis：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

5. BANDWIDTH TEST

5.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

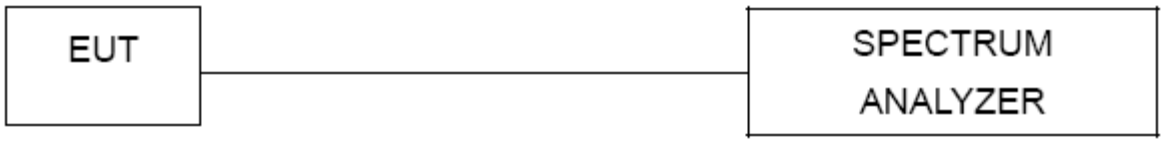
5.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 2.5 ms.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

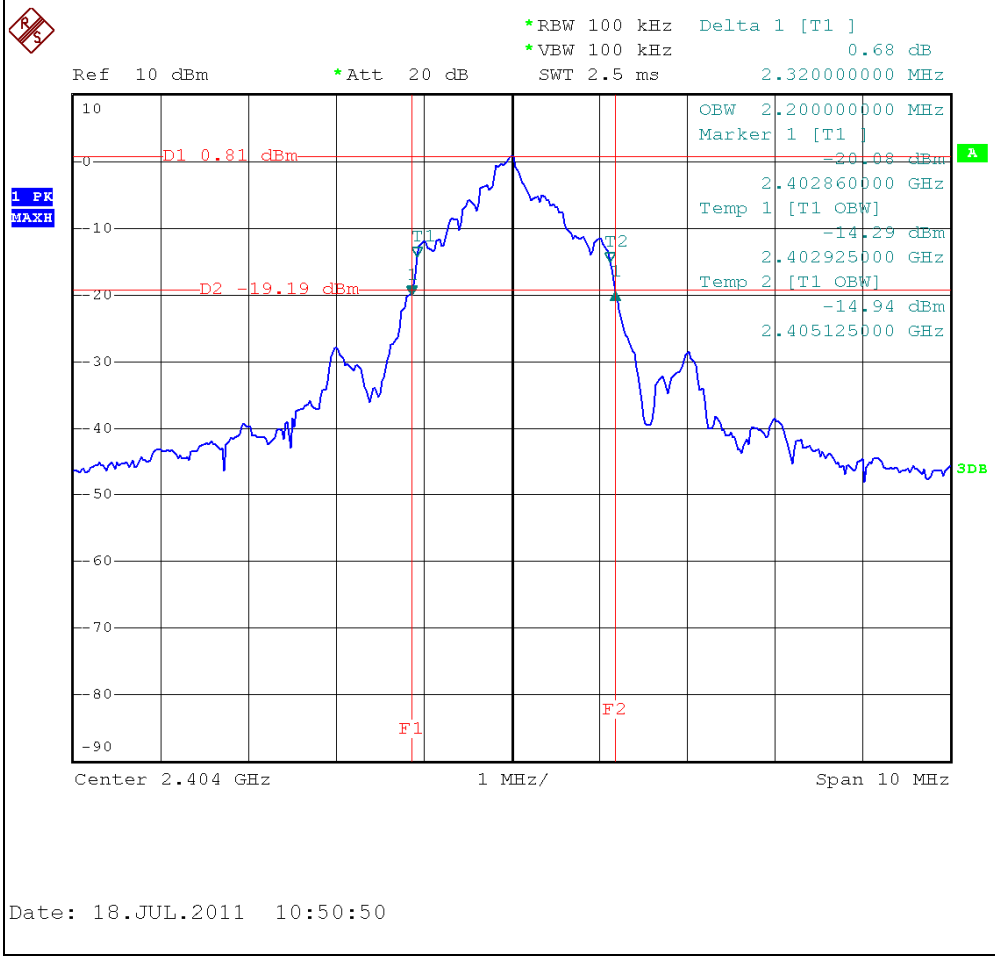
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

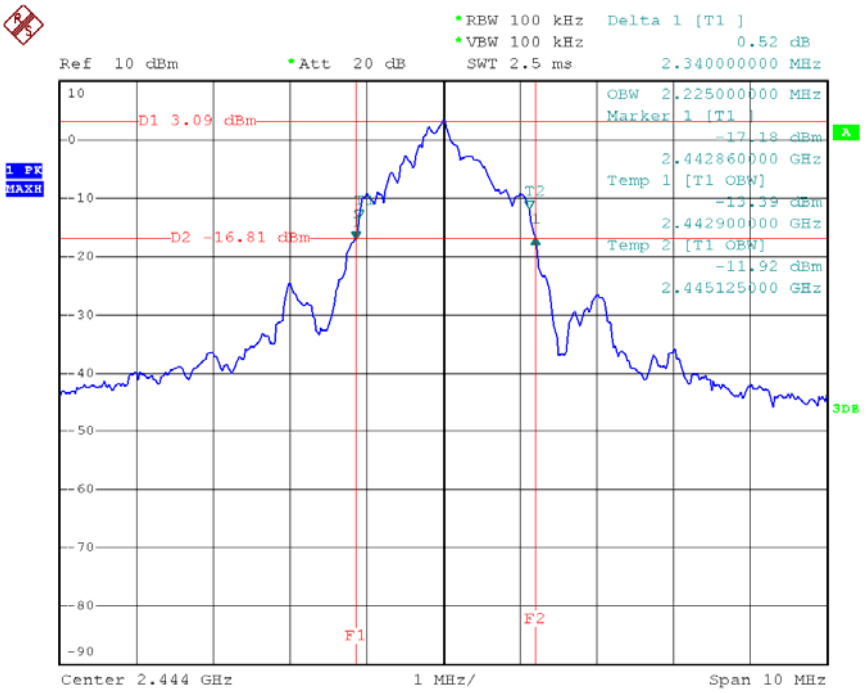
EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH 01/09/16		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)
CH01	2402	2.32
CH09	2448	2.34
CH16	2480	2.36

TX CH01

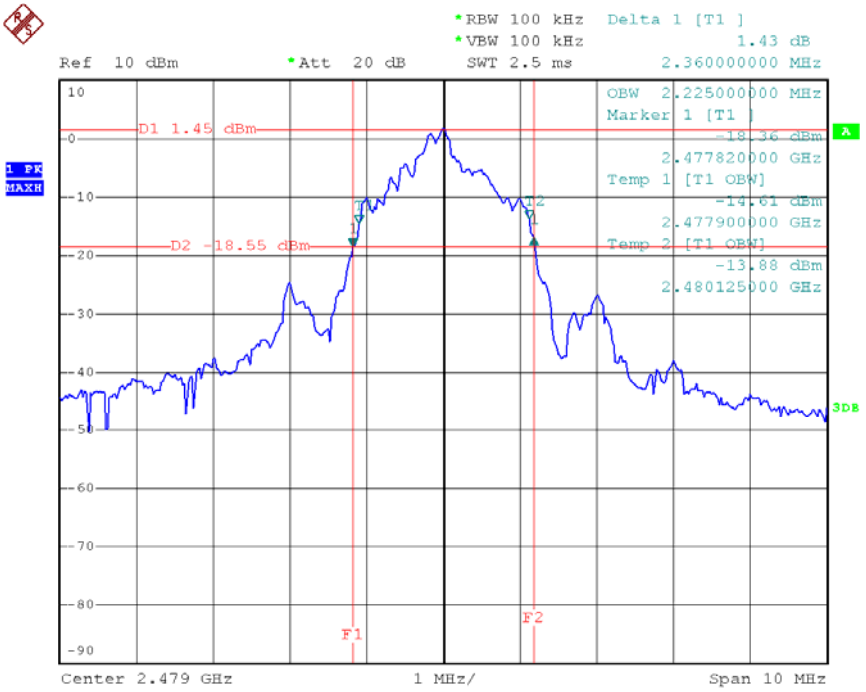


TX CH 09



Date: 18.JUL.2011 10:56:15

TX CH 16



Date: 18.JUL.2011 11:00:21

6. ANTENNA CONDUCTED SPURIOUS EMISSION

6.1 APPLIED PROCEDURES / LIMIT

50dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: ” N/A” denotes No Model Name. , Serial No. or No Calibration specified.

6.1.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 10 ms.

6.1.3 DEVIATION FROM STANDARD

No deviation.

6.1.4 TEST SETUP

6.1.5 EUT OPERATION CONDITIONS

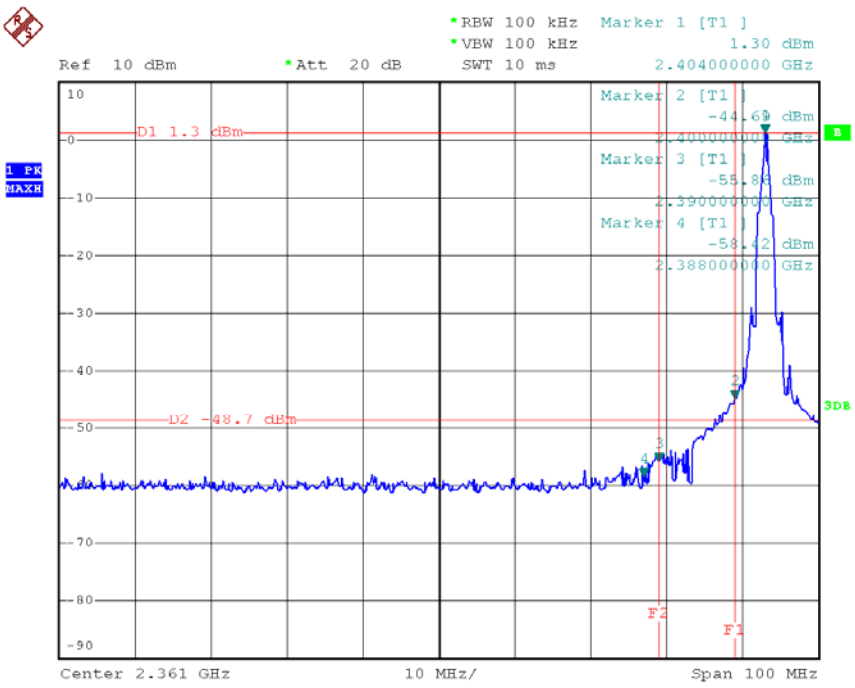
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.6 TEST RESULTS

EUT：	2.1 wireless sound bar speaker	Model Name. ：	SPZ210-Sound bar
Temperature：	25℃	Relative Humidity：	58 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH01, CH09, CH16		

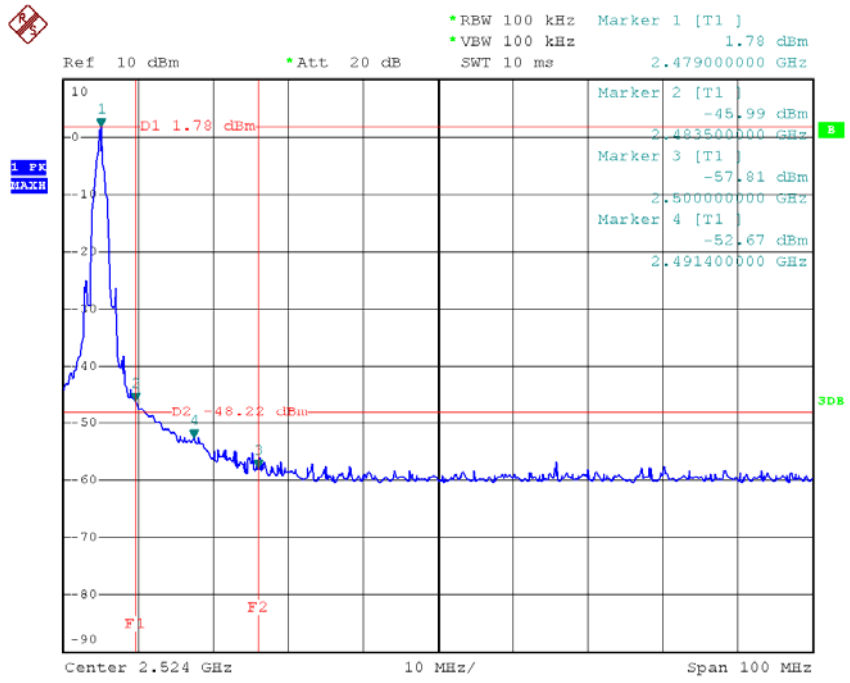
Channel of Worst Data: CH16			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2390.00	-55.86	2483.50	-45.99
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 50dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

TX CH01 for bandedge



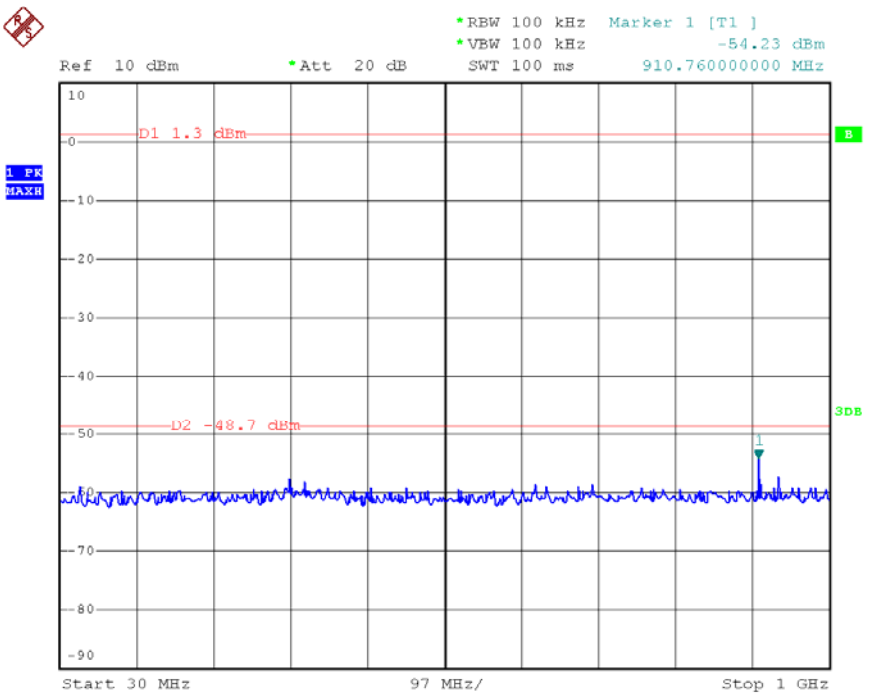
Date: 18.JUL.2011 10:52:49

TX CH16 for bandage



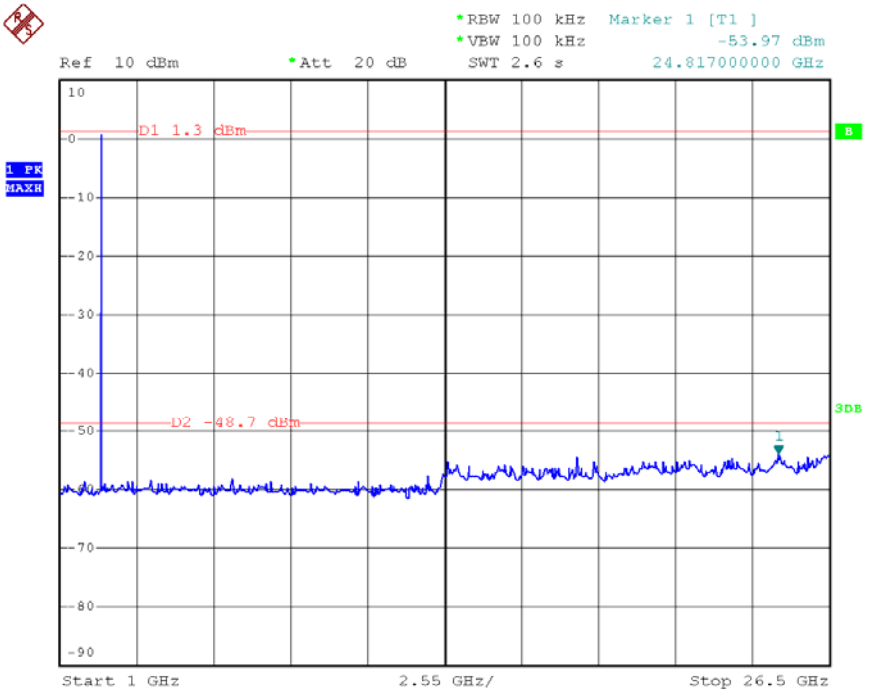
Date: 18.JUL.2011 11:03:10

TX CH01 (30MHz~1GHz)



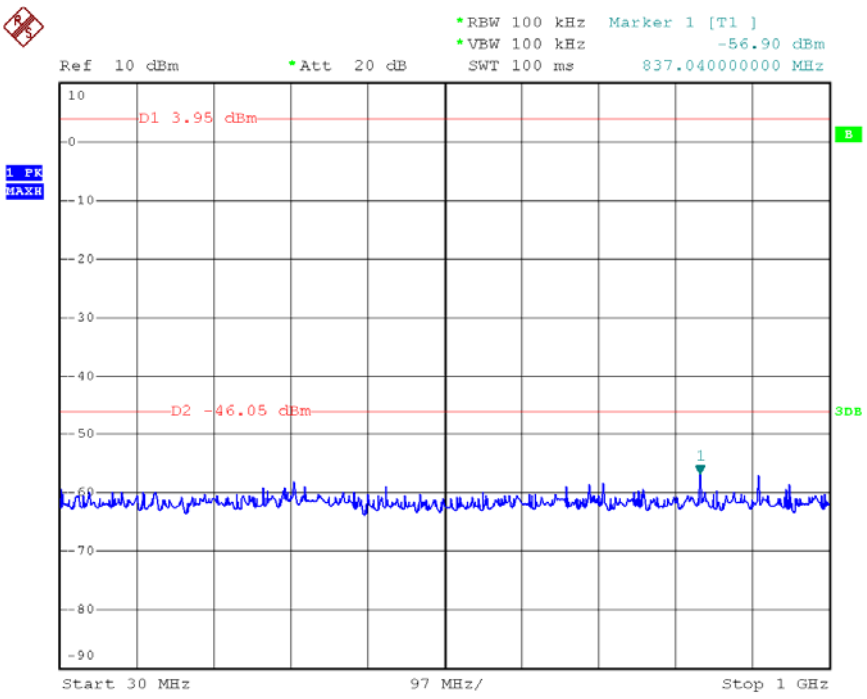
Date: 18.JUL.2011 10:53:22

TX CH01(1GHz～10th Harmonic)



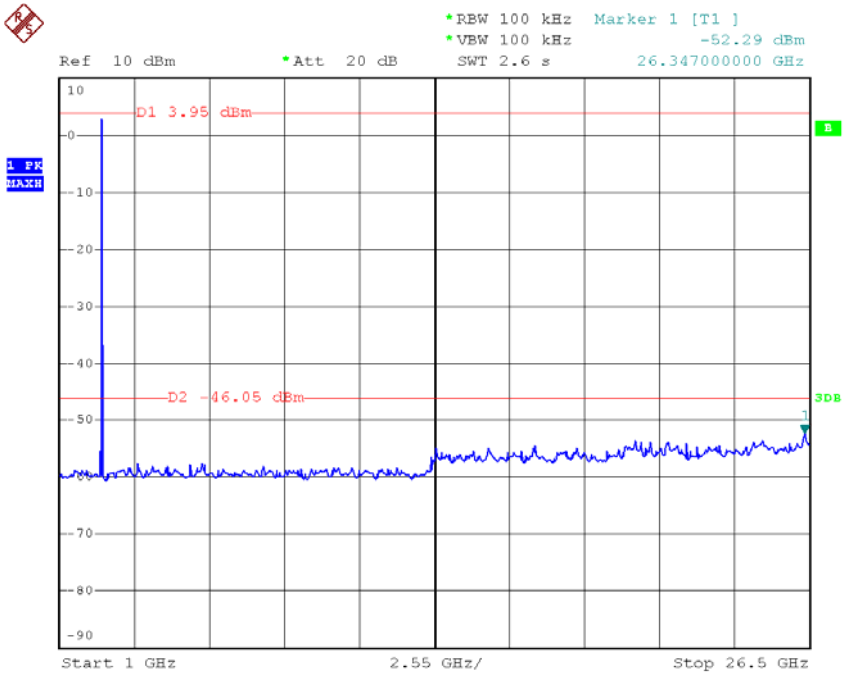
Date: 18.JUL.2011 10:53:47

TX CH09 (30MHz~1GHz)



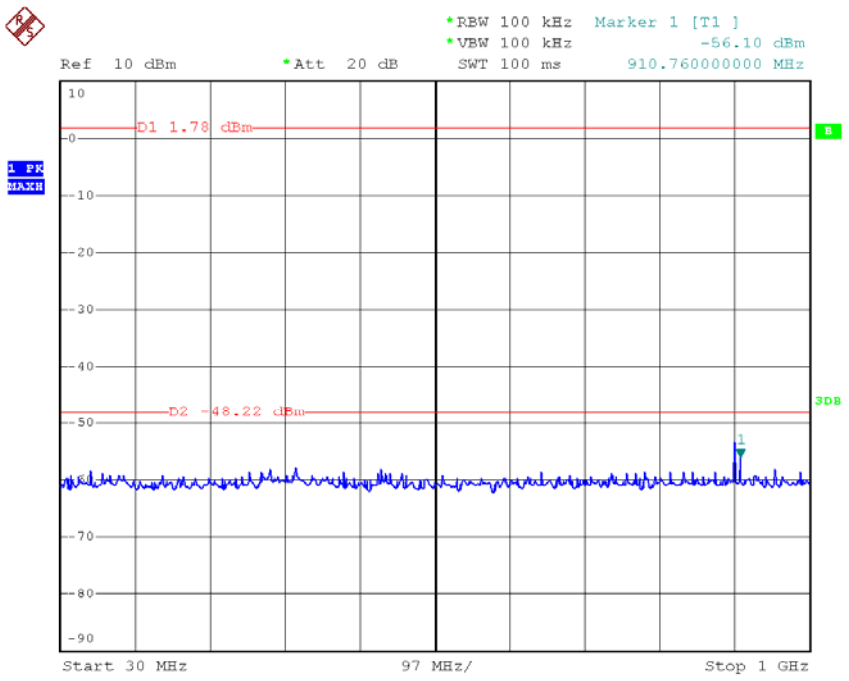
Date: 18.JUL.2011 10:57:18

TX CH09(1GHz～10th Harmonic)



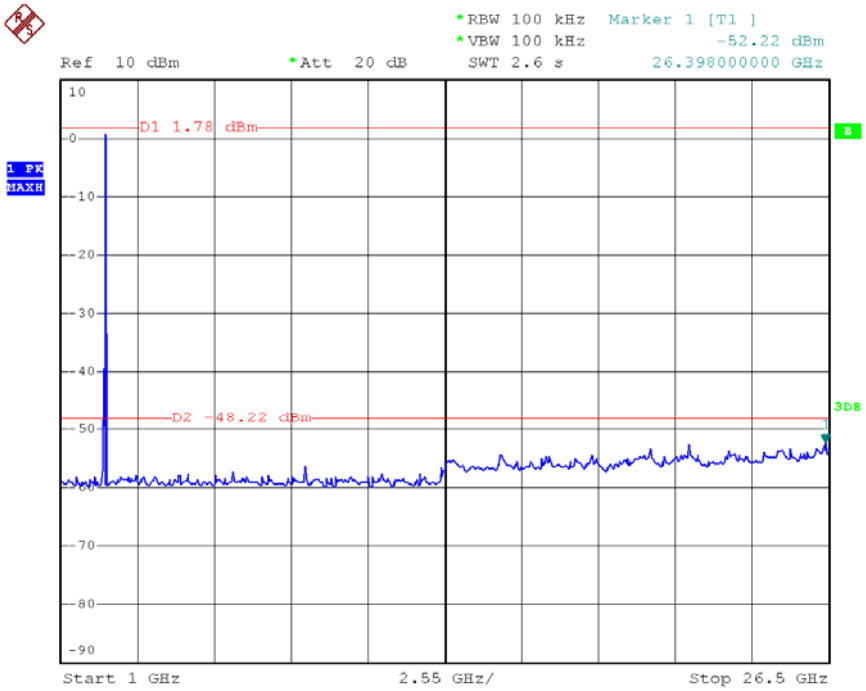
Date: 18.JUL.2011 10:58:21

TX CH16(30MHz~1GHz)



Date: 18.JUL.2011 11:03:58

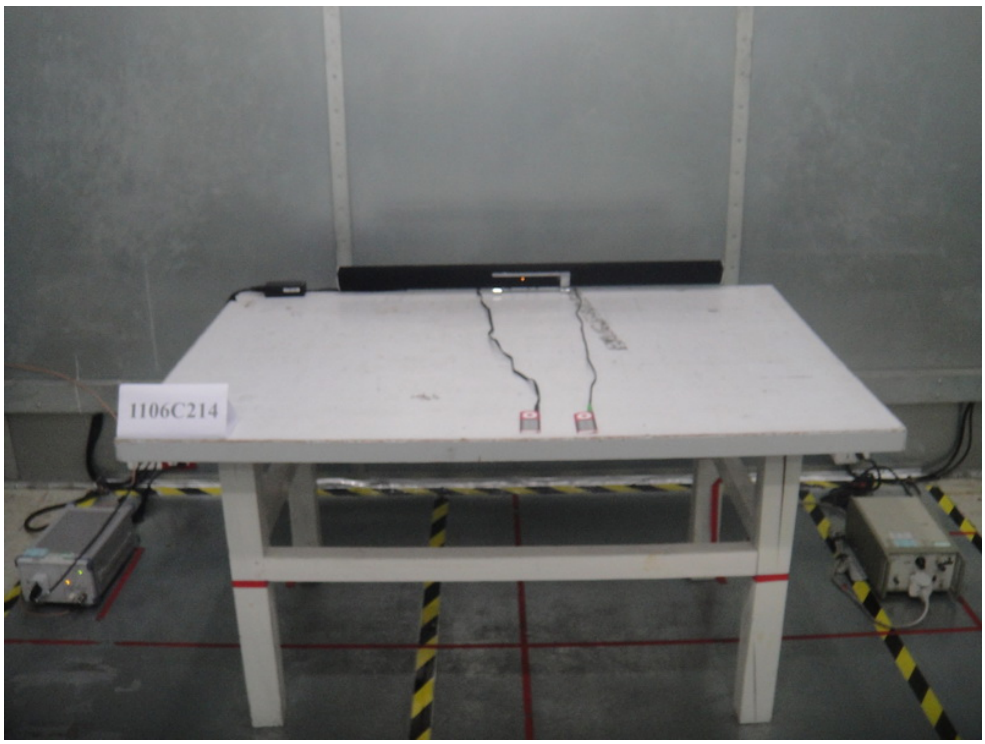
TX CH 16(1GHz～10th Harmonic)

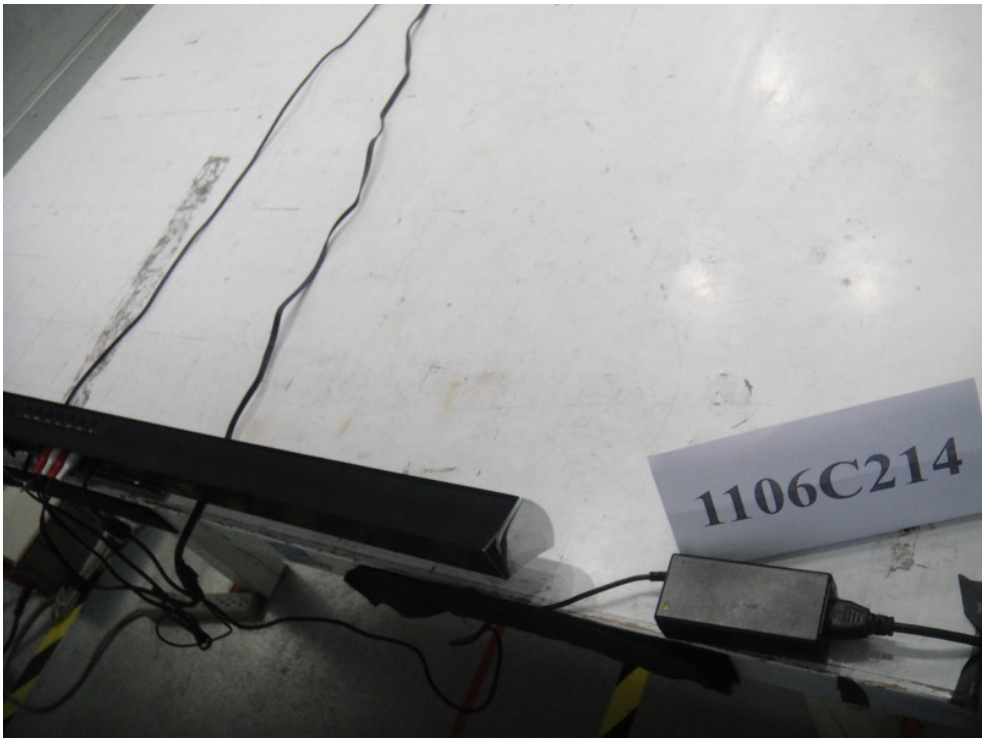


Date: 18.JUL.2011 11:06:16

7. EUT TEST PHOTO

Conducted Measurement Photos





Radiated Measurement Photos