Radio Test Report

FCC ID: WLQSB9500BTTXX

This report concerns (check one) : ☒ **Original Grant** ☐ **Class II Change**

Issued Date : Aug. 30, 2013
Project No. : 1308143
Equipment : SURROUNDBAR 9500BT
Model Name : SURROUNDBAR 9500BT SPEAKER

Applicant : Polk Audio, Inc.
Address : 5601 Metro Drive Baltimore, MD21215

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Aug. 27, 2013
Date of Test: Aug. 27, 2013 ~ Aug. 29, 2013

Testing Engineer : Gary Chou
(Gary Chou)

Technical Manager : Jeff Yang
(Jeff Yang)

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Testing Laboratory
0659

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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REPORT ISSUED HISTORY

Revised Version No.	Description	Issued Date
-	Initial Issue.	Aug. 30, 2013

1 CERTIFICATION

Equipment	: SURROUNDBAR 9500BT
Brand Name	: Polk
Model Name	: SURROUNDBAR 9500BT SPEAKER
Applicant	: Polk Audio, Inc.
Date of Test	: Aug. 27, 2013 ~ Aug. 29, 2013
Standards	: FCC Part 15, Subpart C: 2012 ANSI C63.4: 2009

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-2-1308143) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Standard Clause	Test Item	Result
15.207	Conducted Emission	**PASS**
15.247 (c)	Antenna conducted Spurious Emission	**PASS**
15.247 (a)(1)	Hopping Channel Separation	**PASS**
15.247 (b)	Maximum Peak Conducted Output Power	**PASS**
15.247 (c)	Radiated Spurious Emission	**PASS**
15.247 (b)(1)	Number of Hopping Frequency	**PASS**
15.247 (a)(1)	Average time of occupancy	**PASS**
15.205	Restricted Bands	**PASS**
15.203	Antenna Requirement	**PASS**
1.1307 1.1310 2.1091 2.1093	RF Exposure Compliance	**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:

Conducted emission Test:

C01: (VCCI RN: C-2918; FCC RN: 95335; FCC DN: TW1010)
No.132-1, Ln. 329, Sec. 2, Balian Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Below 1 GHz):

CB08: (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC rules and for reference only.

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**%.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

Test Site	Measurement Frequency Range	U，(dB)	NOTE
C01	150 kHz ~ 30 MHz	1.94	

B. Radiated emission test:

Test Site	Item	Measurement Frequency Range		Uncertainty	NOTE
CB08	Radiated emission at 3m	Horizontal Polarization	30 - 200MHz	3.35 dB	
			200 - 1000MHz	3.11 dB	
			1 - 18GHz	3.97 dB	
			18 - 40GHz	4.01 dB	
		Vertical Polarization	30 - 200MHz	3.22 dB	
			200 - 1000MHz	3.24 dB	
			1 - 18GHz	4.05 dB	
			18 - 40GHz	4.04 dB	

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR}, as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR}.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	SURROUNDBAR 9500BT
Brand Name	Polk
Model Name	SURROUNDBAR 9500BT SPEAKER
OEM Brand/Model Name	N/A
Model Difference	N/A
Product Description	The EUT is a SURROUNDBAR 9500BT. Operation Frequency: 2403.5 MHz ~ 2477.3 MHz Modulation Type: FSK Bit Rate of Transmitter: 2 Mbps Number Of Channel: Please refer to the Note 2. Antenna Designation: Please refer to the Note 3. Antenna Gain(Peak): Please refer to the Note 3. Maximum Conducted Output Power: 20.42 dBm More details of EUT technical specification, please refer to the User's Manual.
Power Source	DC Voltage supplied from External Power Supply.
Power Rating	1. EUT: I/P: DC 24V 5A 2. External Power Supply: I/P: AC 100-240V 50/60Hz 2000mA / O/P: DC 24V 5000mA
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	1 * Bluetooth Module 1 * RF Module 1 * SWITCHING POWER SUPPLY: polk, S150BP2400500 1 * Power Cable 1 * Remote Control 2 * Optical Cable 2 * Audio Cable 1 * 3.5mm Audio to Dual RCA Cable
EUT Modification(s)	N/A

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)	Channel	Frequency (MHz)
01	2403.5	18	2429.7	35	2455.8
02	2405.1	19	2431.2	36	2457.3
03	2406.6	20	2432.7	37	2458.9
04	2408.1	21	2434.3	38	2460.4
05	2409.7	22	2435.8	39	2461.9
06	2411.2	23	2437.4	40	2463.5
07	2412.8	24	2438.9	41	2465.0
08	2414.3	25	2440.4	42	2466.6
09	2415.8	26	2442.0	43	2468.1
10	2417.4	27	2443.5	44	2469.6
11	2418.9	28	2445.0	45	2471.2
12	2420.4	29	2446.6	46	2472.7
13	2422.0	30	2448.1	47	2474.2
14	2423.5	31	2449.6	48	2475.8
15	2425.1	32	2451.2	49	2477.3
16	2426.6	33	2452.7		
17	2428.1	34	2454.3		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Printed	N/A	3.30

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base 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.

Test Items	Mode	Data Rate	Tested Channel/Mode
Conducted Emission	FSK	2 Mbps	2440.4 MHz
Antenna conducted Spurious Emission	FSK	2 Mbps	2403.5 MHz, 2440.4 MHz, 2477.3 MHz
Hopping Channel Separation	FSK	2 Mbps	2403.5 MHz, 2440.4 MHz, 2477.3 MHz
Maximum Peak Conducted Output Power	FSK	2 Mbps	2403.5 MHz, 2440.4 MHz, 2477.3 MHz
Radiated Spurious Emission (30 MHz to 1 GHz)	FSK	2 Mbps	2440.4 MHz
Radiated Spurious Emission (above 1 GHz)	FSK	2 Mbps	2403.5 MHz, 2440.4 MHz, 2477.3 MHz
Number of Hopping Frequency	FSK	2 Mbps	2403.5 MHz, 2440.4 MHz, 2477.3 MHz
Average time of occupancy	FSK	2 Mbps	2403.5 MHz, 2440.4 MHz, 2477.3 MHz
Restricted Bands	FSK	2 Mbps	2403.5 MHz, 2440.4 MHz, 2477.3 MHz
Antenna Requirement	FSK	---	---
RF Exposure Compliance	FSK	---	---

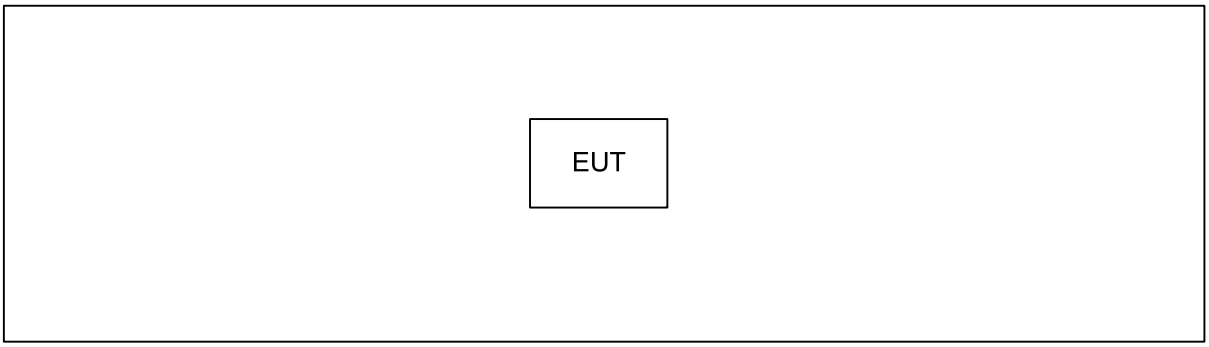
NOTE: The measurements are performed at the highest, middle, lowest available channels.

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Data Rate	2 Mbps		
Test software Version	N/A		
Frequency	2403.5 MHz	2440.4 MHz	2477.3 MHz
Parameter	DEF	DEF	DEF

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 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	SURROUNDBAR 9500BT	Polk	SURROUNDBAR 9500BT	WLQSB9500BTTXX	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
N/A	-	-	-	-

NOTE: The support equipment was authorized by Declaration of Conformity (DOC).

4 CONDUCTED EMISSION

4.1 LIMIT

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

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.
3. The test result calculated as following:
   Measurement Value = Reading Level + Correct Factor
   Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
   Margin Level = Measurement Value – Limit Value

4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Apr. 22, 2014
2	Test Cable	TIMES	CFD300-NL	C01	Jun. 16, 2014
3	EMI Test Receiver	R&S	ESCI	100082	Mar. 21, 2014
4	Measurement Software	EZ	EZ_EMC (Version NB-02A)	N/A	N/A

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

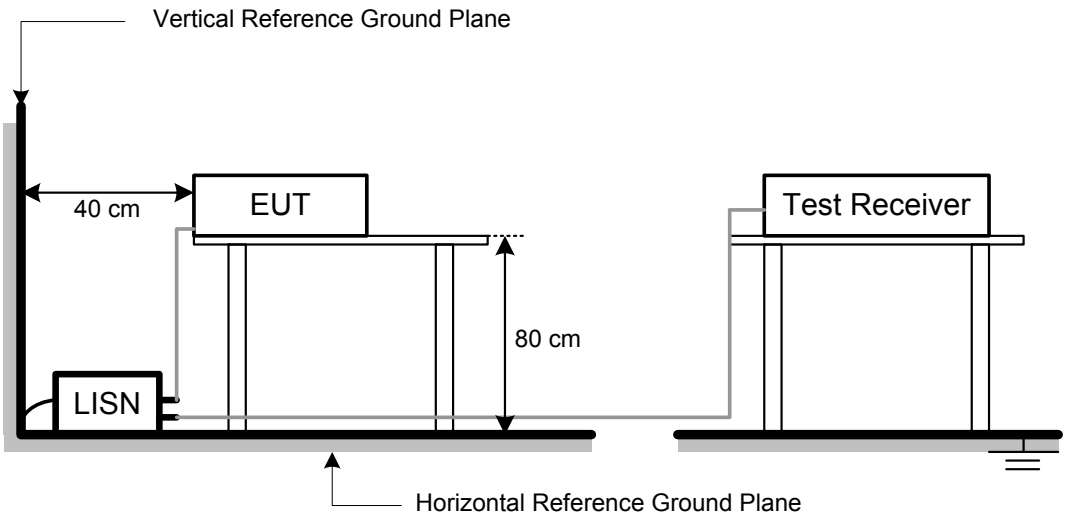
4.3 TEST PROCEDURES

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.

NOTE:

a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn‘t perform.

4.4 TEST SETUP LAYOUT



4.5 DEVIATION FROM TEST STANDARD

No deviation

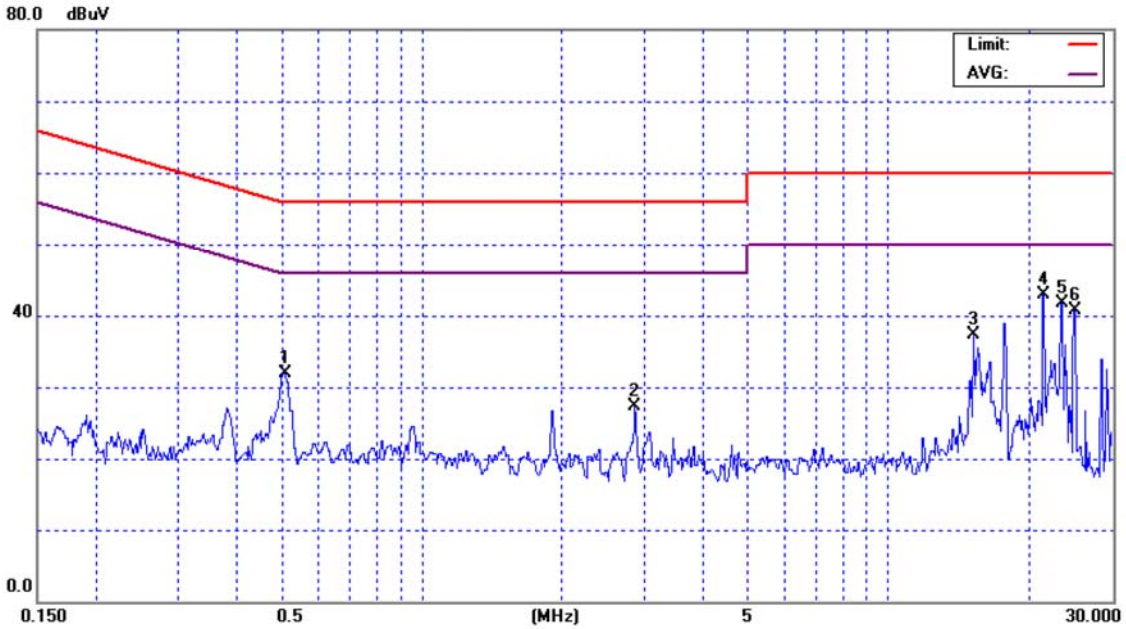
4.6 EUT OPERATING CONDITIONS

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.

4.7 TEST RESULTS

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	24°C	Relative Humidity	48%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

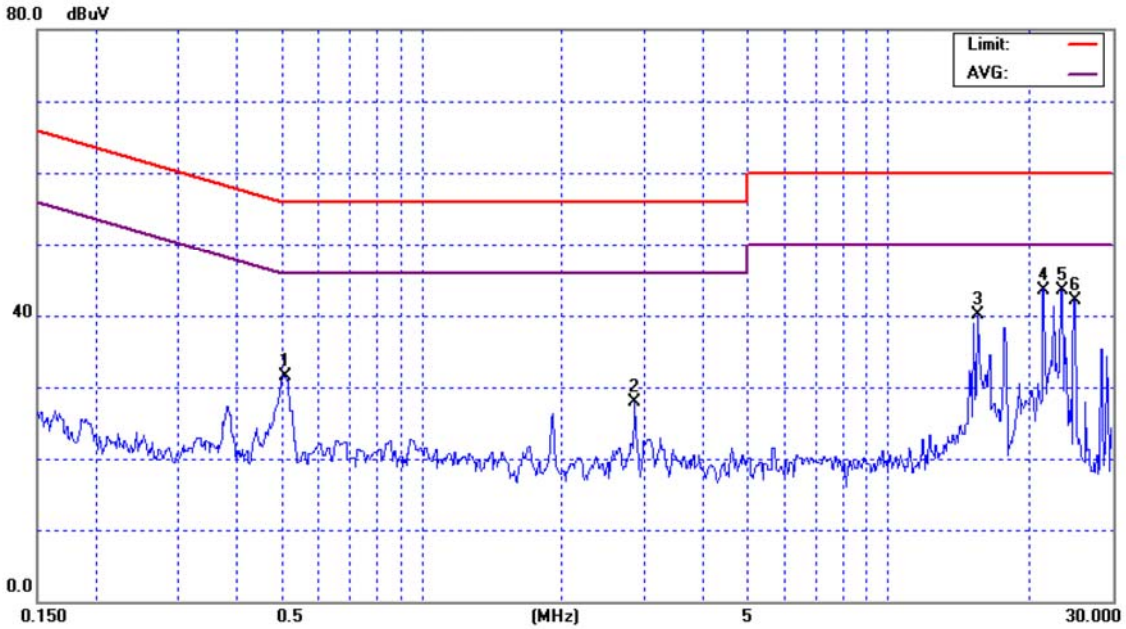
Phase: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5090	22.27	9.61	31.88	56.00	-24.12	peak	
2		2.8670	17.53	9.71	27.24	56.00	-28.76	peak	
3		15.2500	27.38	9.85	37.23	60.00	-22.77	peak	
4	*	21.5000	33.03	9.93	42.96	60.00	-17.04	peak	
5		23.5500	31.83	9.89	41.72	60.00	-18.28	peak	
6		25.1000	30.86	9.87	40.73	60.00	-19.27	peak	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	24°C	Relative Humidity	48%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

Phase: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5090	21.91	9.59	31.50	56.00	-24.50	peak	
2		2.8670	18.17	9.69	27.86	56.00	-28.14	peak	
3		15.6000	30.20	9.83	40.03	60.00	-19.97	peak	
4	*	21.5000	33.70	9.90	43.60	60.00	-16.40	peak	
5		23.5500	33.65	9.87	43.52	60.00	-16.48	peak	
6		25.1000	32.33	9.84	42.17	60.00	-17.83	peak	

5 ANTENNA CONDUCTED SPURIOUS EMISSION

5.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Antenna conducted Spurious Emission	30-25000	20 dB less than the peak value of fundamental frequency

5.2 MEASUREMENT INSTRUMENTS LIST

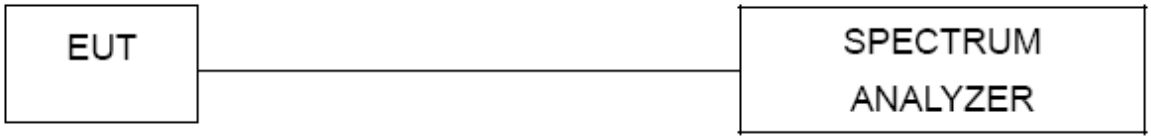
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

5.3 TEST PROCEDURES

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 = Auto.

5.4 TEST SETUP LAYOUT



5.5 DEVIATION FROM TEST STANDARD

No deviation

5.6 EUT OPERATING CONDITIONS

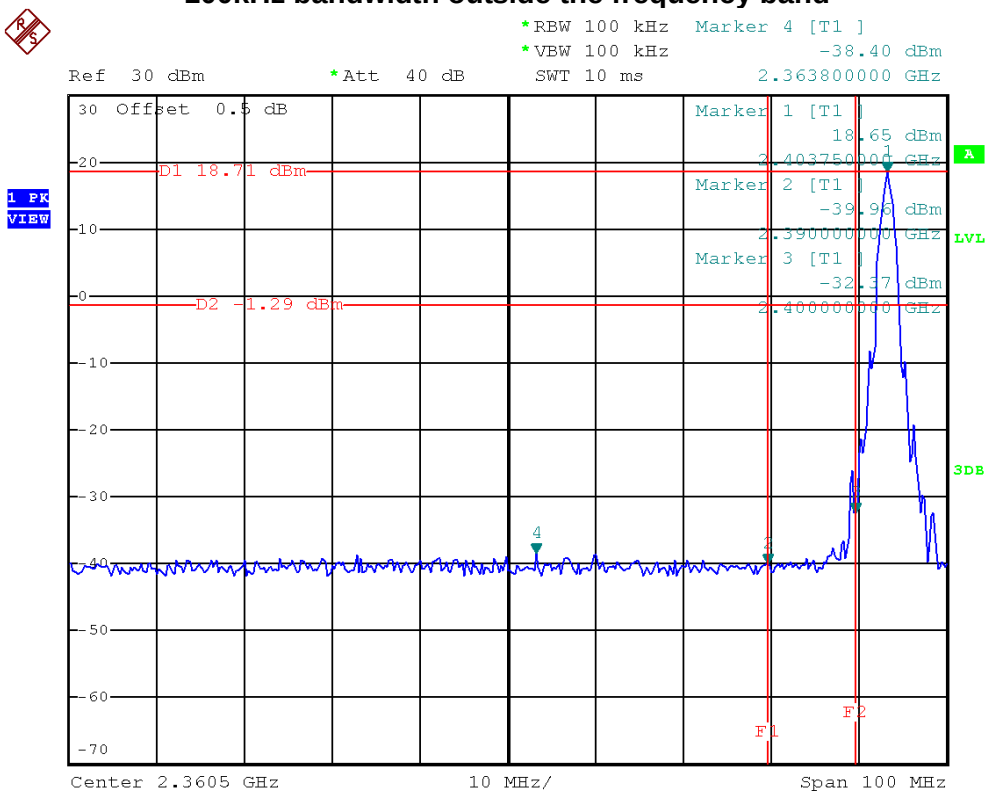
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

5.7 TEST RESULTS

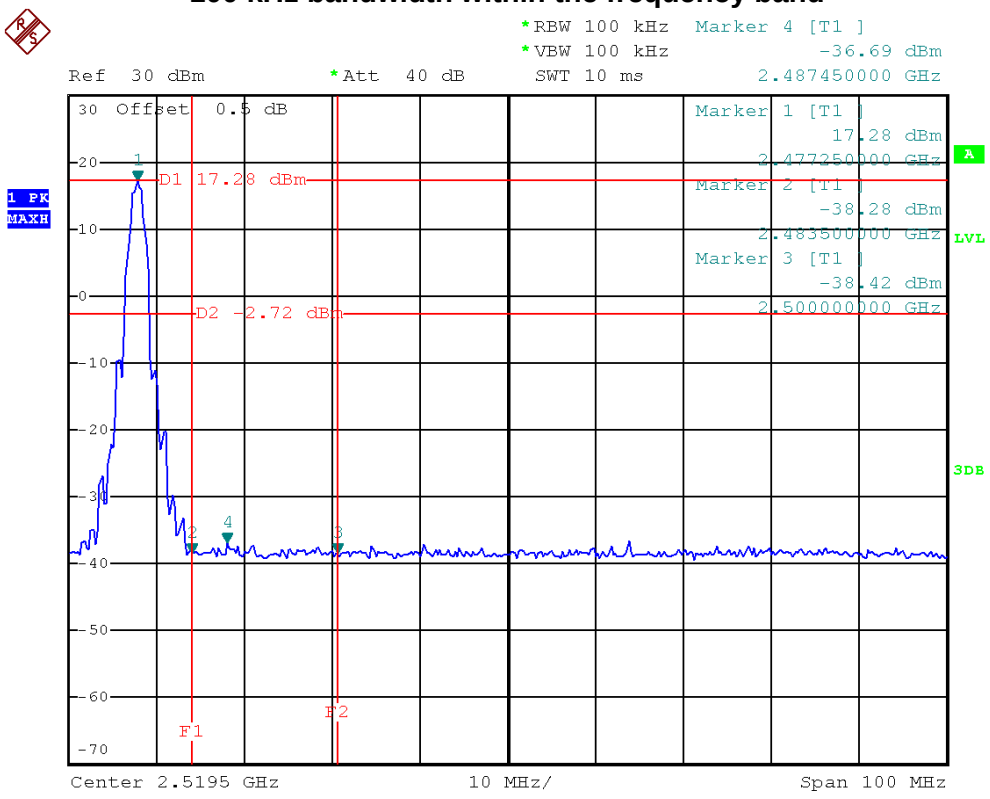
EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz, 2440.4 MHz, 2477.3 MHz		

Channel of Worst Data			
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)
2363.80	-38.40	2487.45	-36.69
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

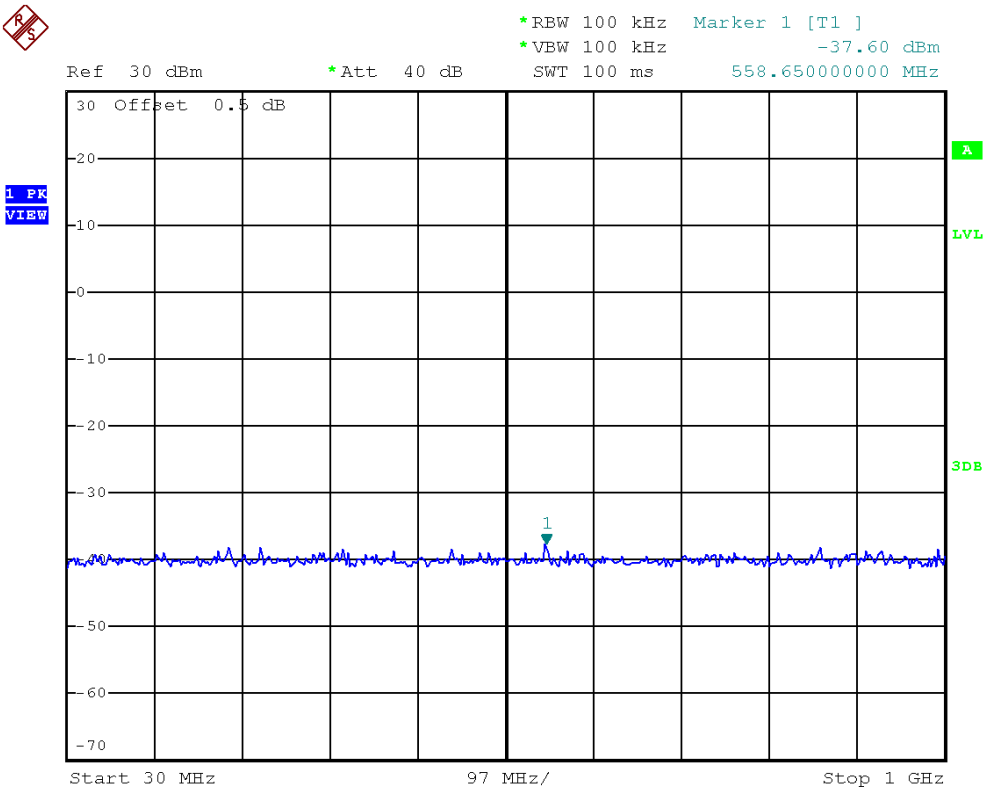
The max. radio frequency power in any 100kHz bandwidth outside the frequency band



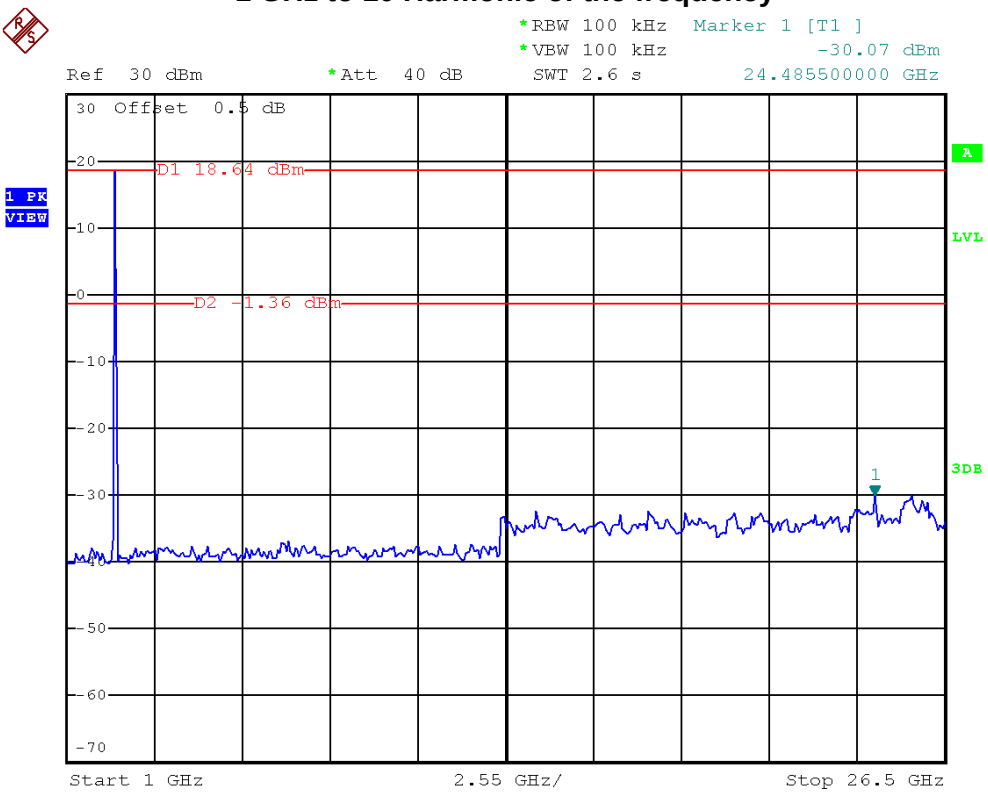
The max. radio frequency power in any 100 kHz bandwidth within the frequency band



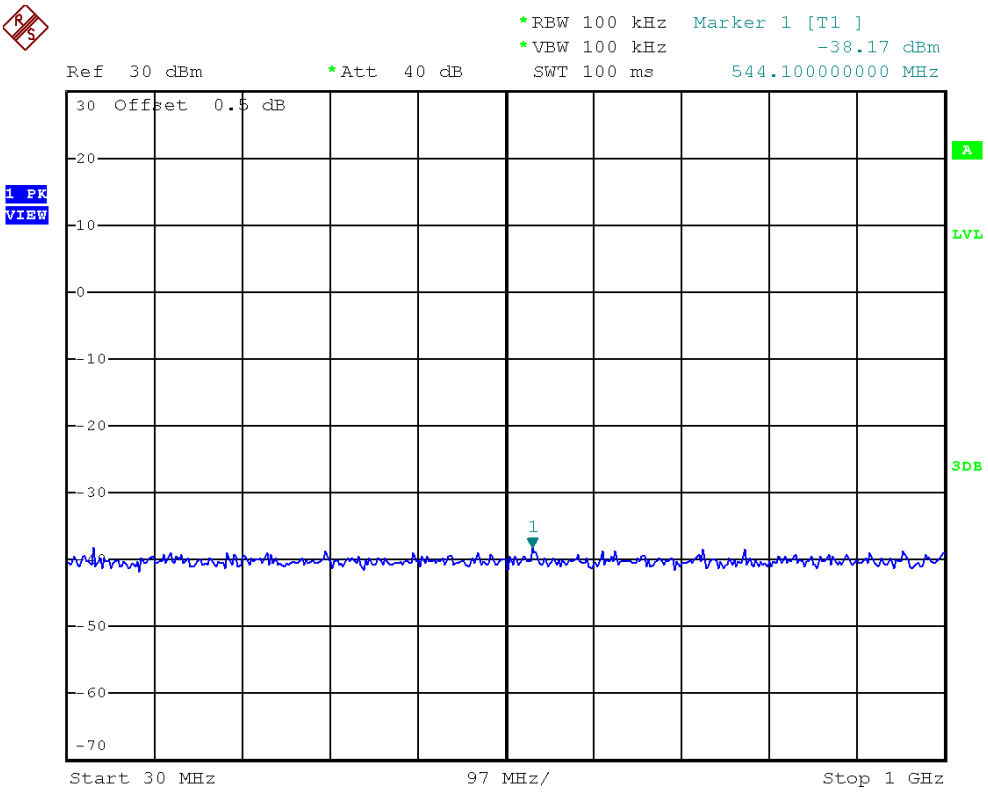
2403.5 MHz/10 Harmonic of the frequency
30 MHz to 1 GHz



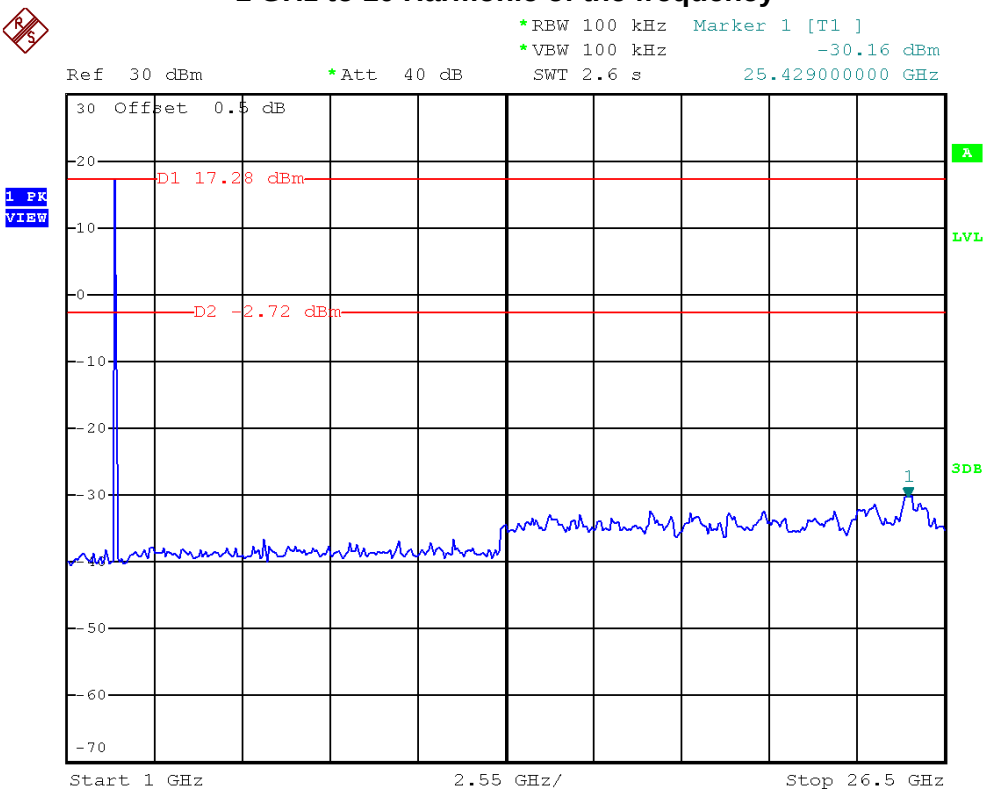
1 GHz to 10 Harmonic of the frequency



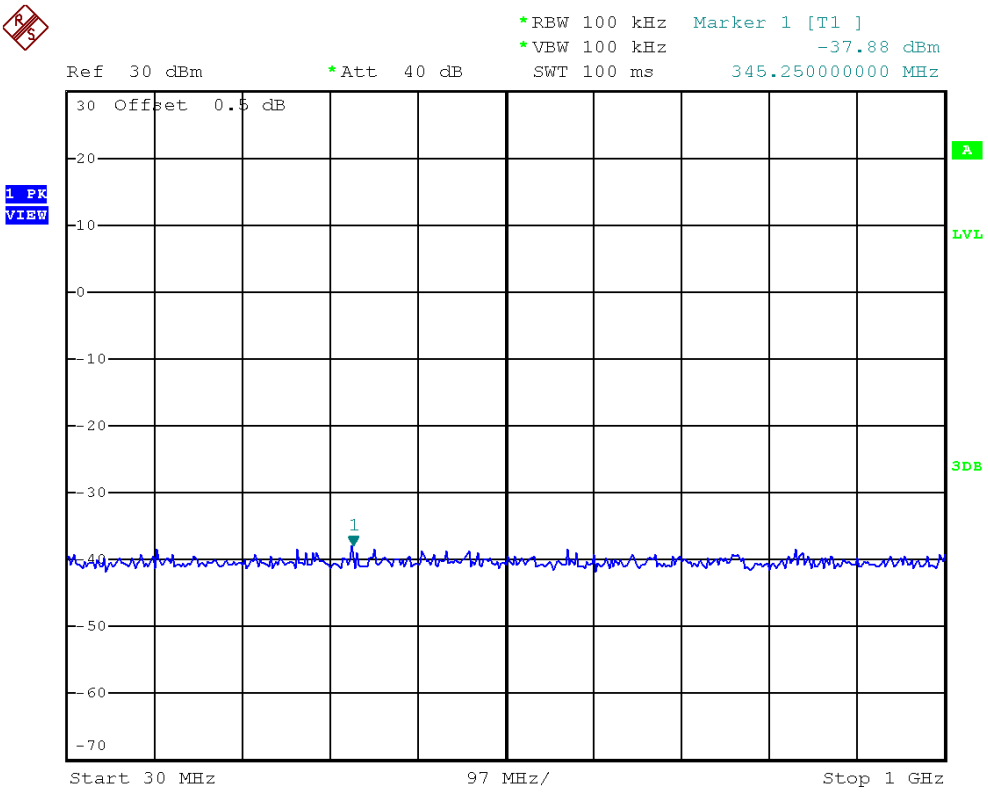
2440.4 MHz/10 Harmonic of the frequency
30 MHz to 1 GHz



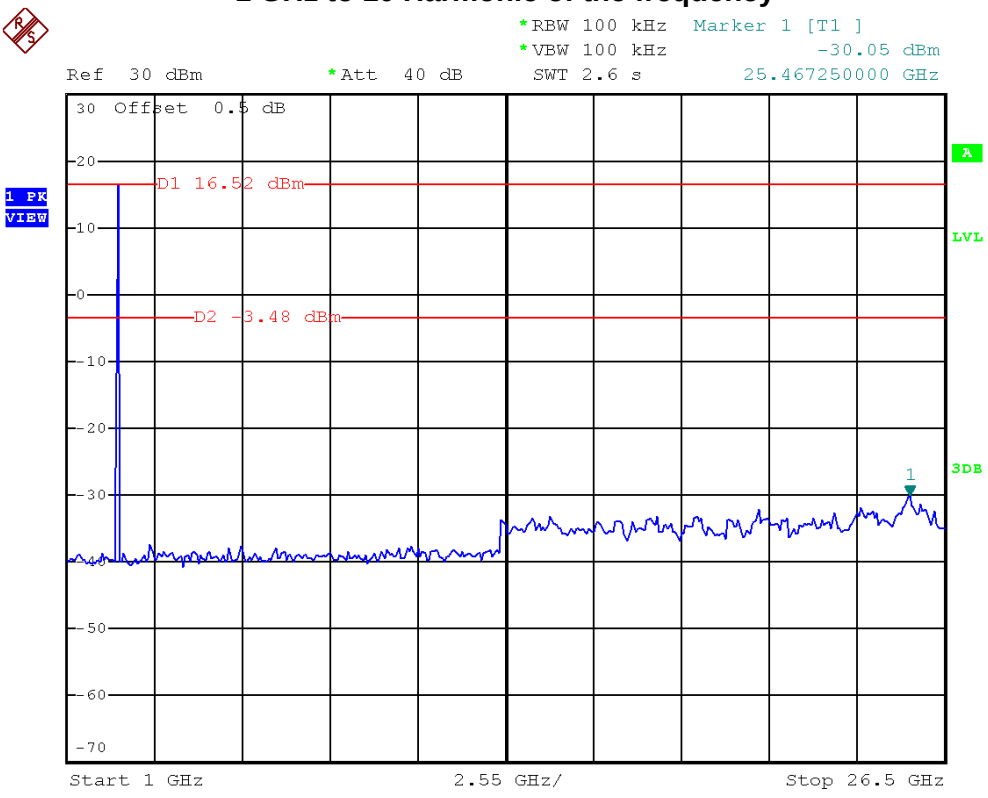
1 GHz to 10 Harmonic of the frequency



2477.3 MHz/10 Harmonic of the frequency
30 MHz to 1 GHz



1 GHz to 10 Harmonic of the frequency



6 HOPPING CHANNEL SEPARATION

6.1 LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

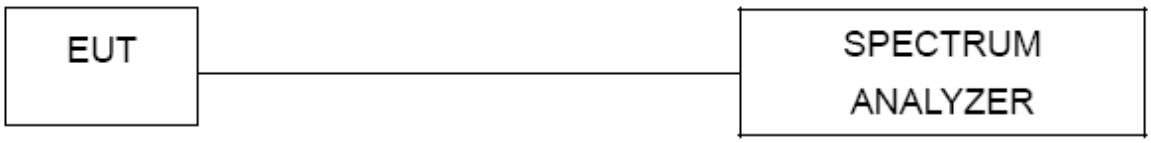
6.3 MEASURING INSTRUMENTS SETTING

EMI Test Receiver	Parameter Setting
Attenuation	Auto
Span Frequency	> Measurement Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.4 TEST PROCEDURES

a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

6.5 TEST SETUP LAYOUT



6.6 DEVIATION FROM TEST STANDARD

No deviation

6.7 EUT OPERATING CONDITIONS

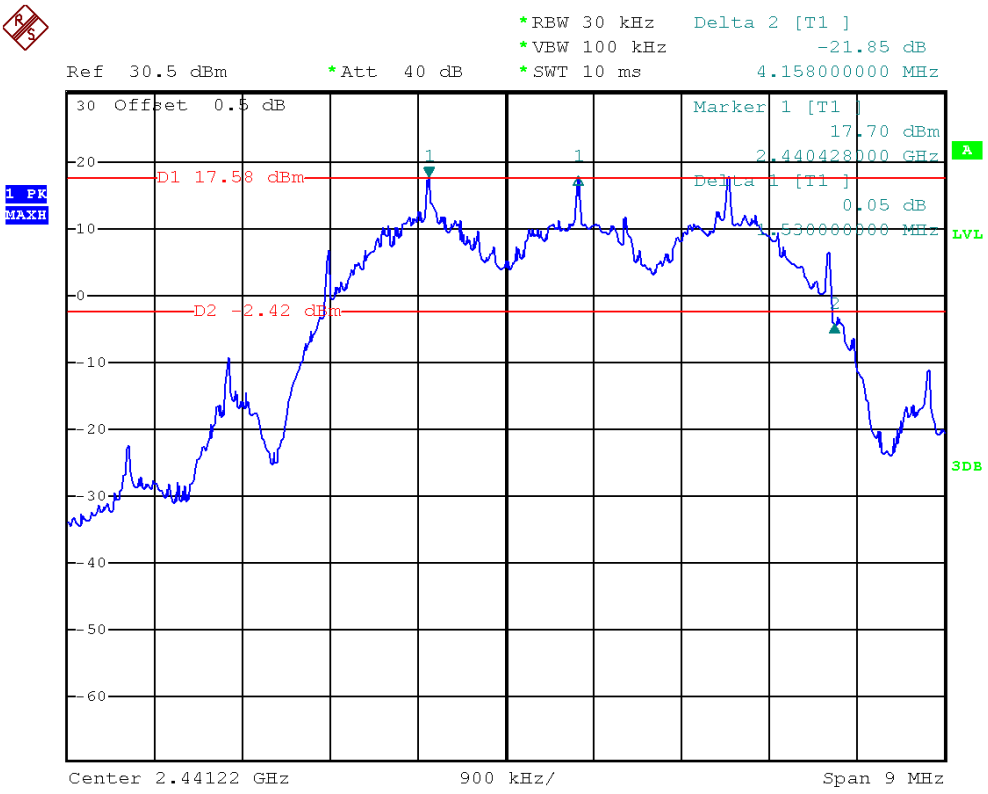
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

6.8 TEST RESULTS

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

Frequency	Channel Separation (MHz)	20 dB Bandwidth (MHz)	Two-thirds of the 20 dB Bandwidth	Result
2440.4 MHz	1.53	2.300	1.53	PASS

NOTE: Ch. Separation Limits: >25 KHz or >2/3 of 20dB bandwidth



7 BANDWIDTH

7.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Bandwidth	2400-2483.5	≤ 1 MHz (20 dB bandwidth)

7.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

7.3 MEASURING INSTRUMENTS SETTING

EMI Test Receiver	Parameter Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.4 TEST PROCEDURES

a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.

7.5 TEST SETUP LAYOUT

7.6 DEVIATION FROM TEST STANDARD

No deviation

7.7 EUT OPERATING CONDITIONS

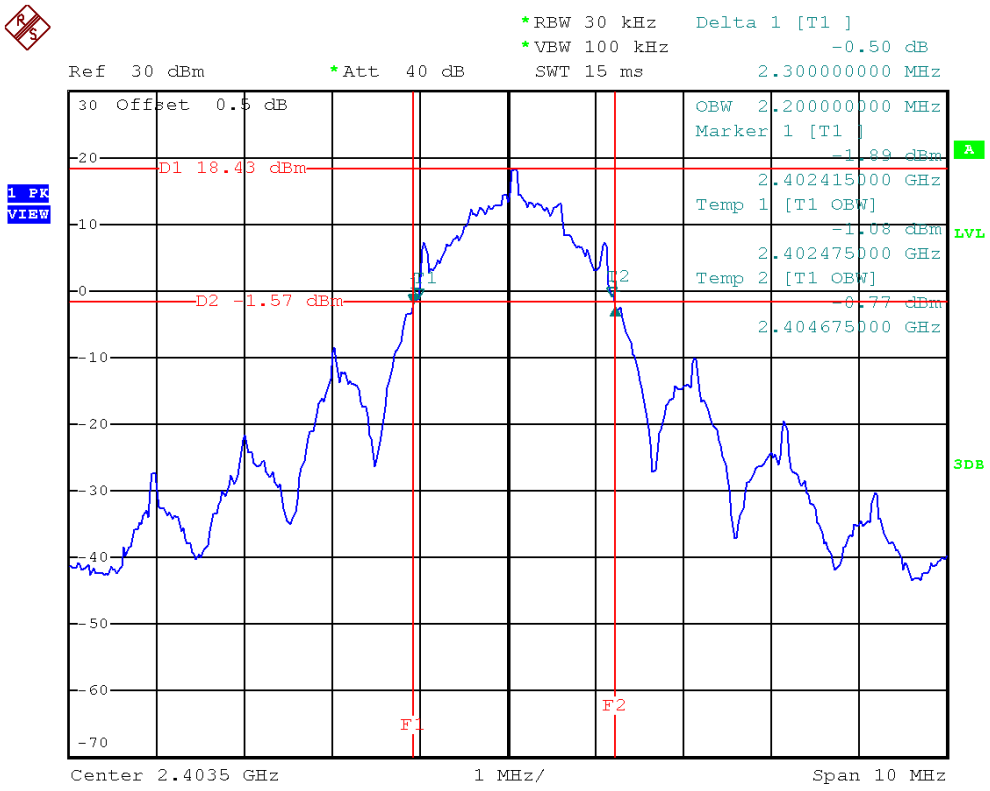
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

7.8 TEST RESULTS

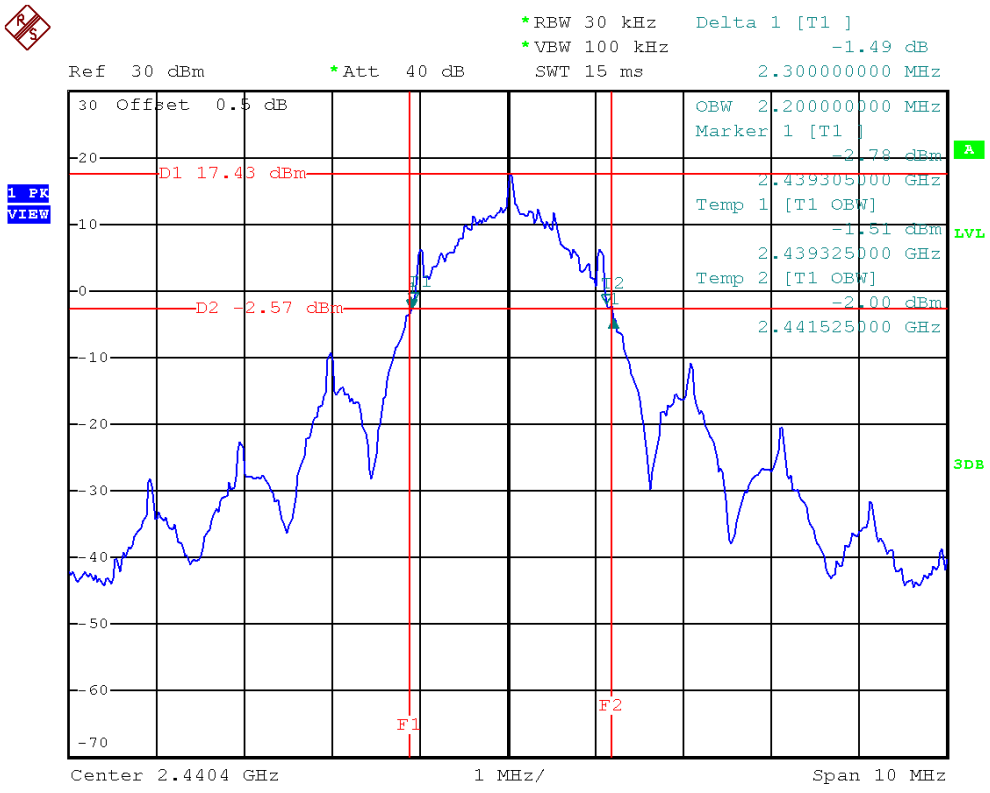
EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz, 2440.4 MHz, 2477.3 MHz		

Frequency	20 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Result
2403.5 MHz	2.300	2.200	PASS
2440.4 MHz	2.300	2.200	PASS
2477.3 MHz	2.280	2.200	PASS

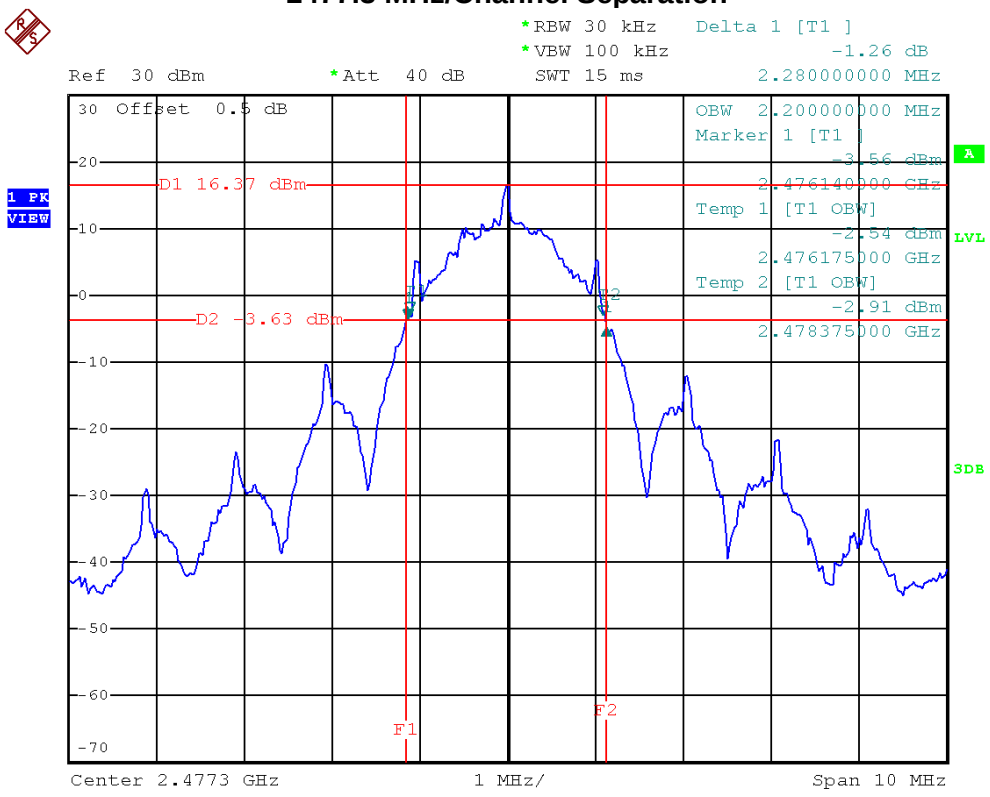
2403.5 MHz/20dB Bandwidth



2440.4 MHz/20dB Bandwidth



2477.3 MHz/Channel Separation



8 MAXIMUM PEAK CONDUCTED OUTPUT POWER

8.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Maximum Peak Conducted Output Power	2400-2483.5	0.125 watt or 21 dBm

8.2 MEASUREMENT INSTRUMENTS LIST

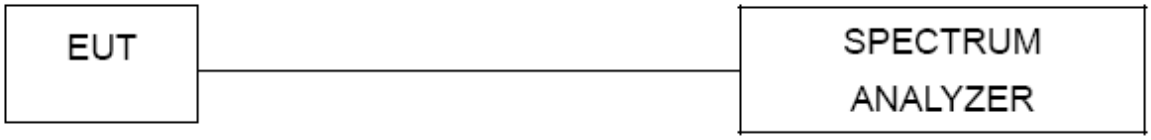
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

8.3 TEST PROCEDURES

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= 3 MHz, VBW= 3 MHz, Sweep time = Auto.

8.4 TEST SETUP LAYOUT



8.5 DEVIATION FROM TEST STANDARD

No deviation

8.6 EUT OPERATING CONDITIONS

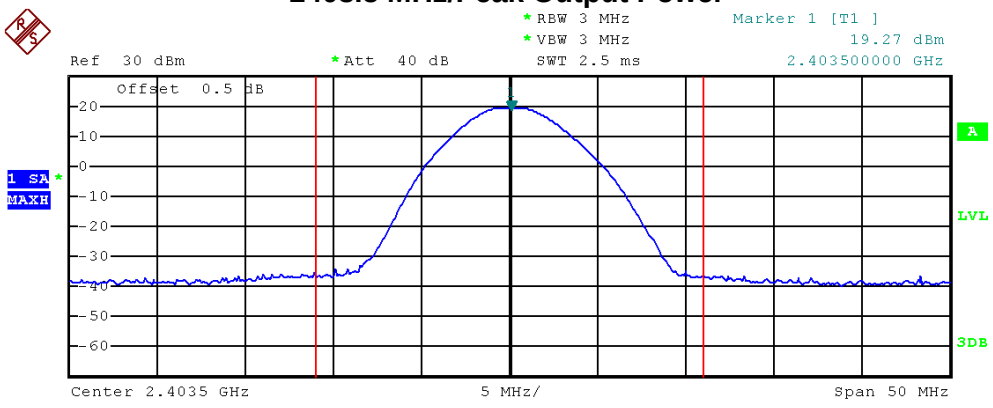
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.7 TEST RESULTS

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz, 2440.4 MHz, 2477.3 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2403.5 MHz	20.4200	21.00	PASS
2440.4 MHz	19.6300	21.00	PASS
2477.3 MHz	18.7700	21.00	PASS

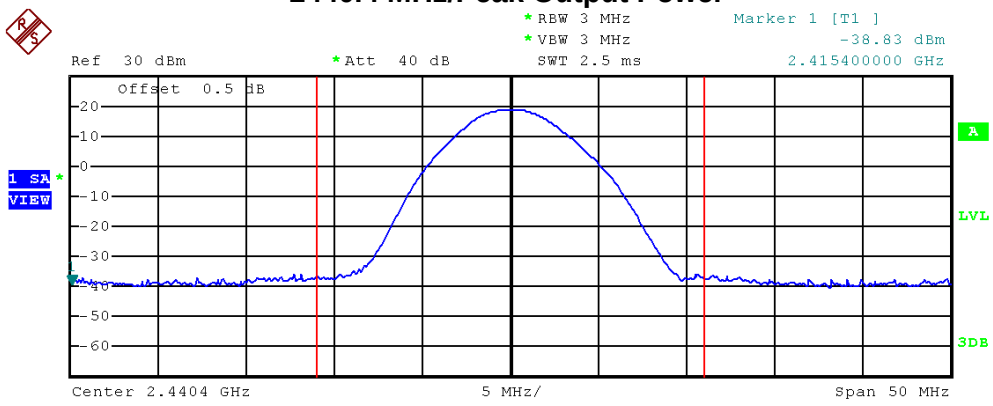
2403.5 MHz/Peak Output Power



Tx Channel

Bandwidth	22 MHz	Power	20.42 dBm

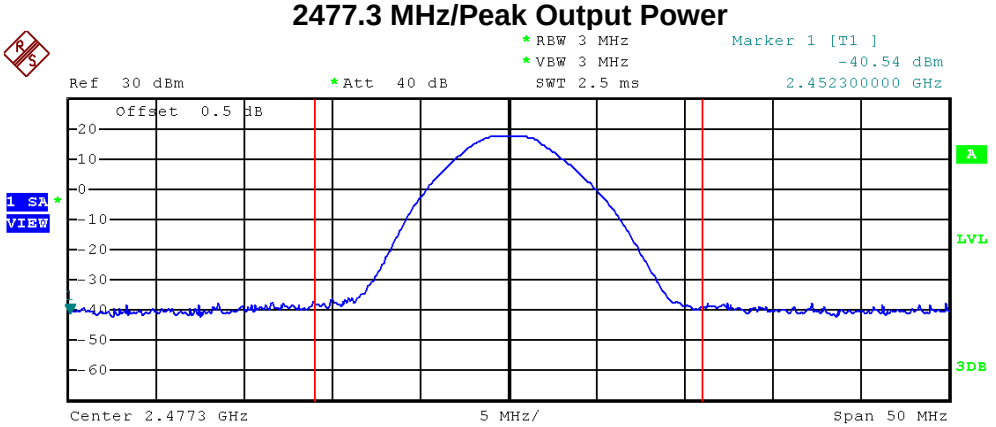
2440.4 MHz/Peak Output Power



Tx Channel

Bandwidth	22 MHz	Power	19.63 dBm

2477.3 MHz/Peak Output Power



Tx Channel

Bandwidth	22 MHz	Power	18.77 dBm

9 RADIATED SPURIOUS EMISSION (9 KHZ TO 1 GHZ)

9.1 LIMIT

20 dB 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.

Frequency Range: 9 kHz to 1 GHz		
FREQUENCY (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

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

(1) The limit for radiated test was performed according to FCC PART 15B.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).
(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
Margin Level = Measurement Value – Limit Value

9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 15, 2014
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 16, 2014
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 13, 2014
5	Microflex Cable	EMC	S104-SMA	8m	May. 13, 2014
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 13, 2014
7	Test Cable	LMR	LMR-400	12m	May. 14, 2014
8	Test Cable	LMR	LMR-400	3m	May. 14, 2014
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 18, 2014
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 11, 2014
11	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 18, 2014
12	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 24, 2013

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

9.3 MEASURING INSTRUMENTS SETTING

EMI Test Receiver	Parameter Setting
Attenuation	Auto
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

9.4 TEST PROCEDURES

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz. For frequencies above 1 GHz, 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 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.
g. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

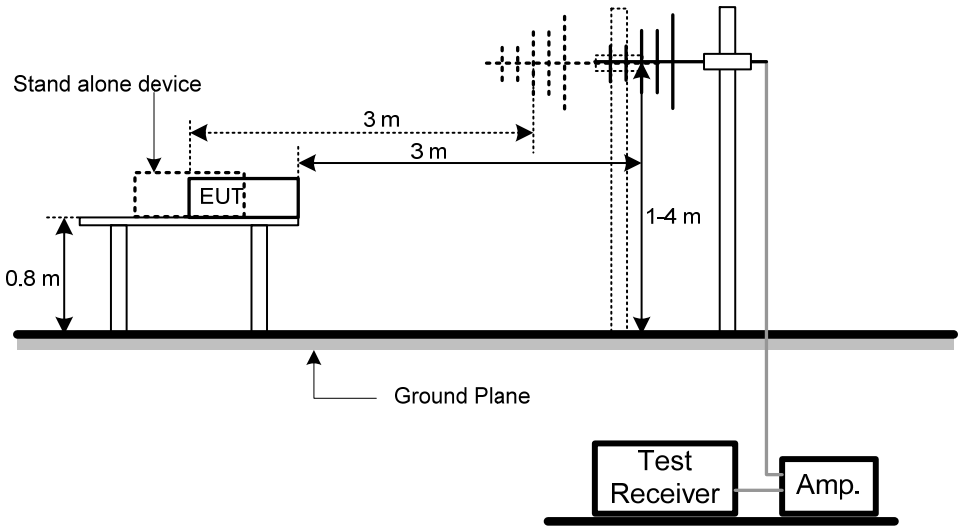
NOTE:

a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz; SPA setting in RBW=100 kHz, VBW =100 kHz, Swp. Time = 0.3 sec./ MHz.
b. 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.

9.5 DEVIATION FROM TEST STANDARD

No deviation

9.6 TEST SETUP LAYOUT



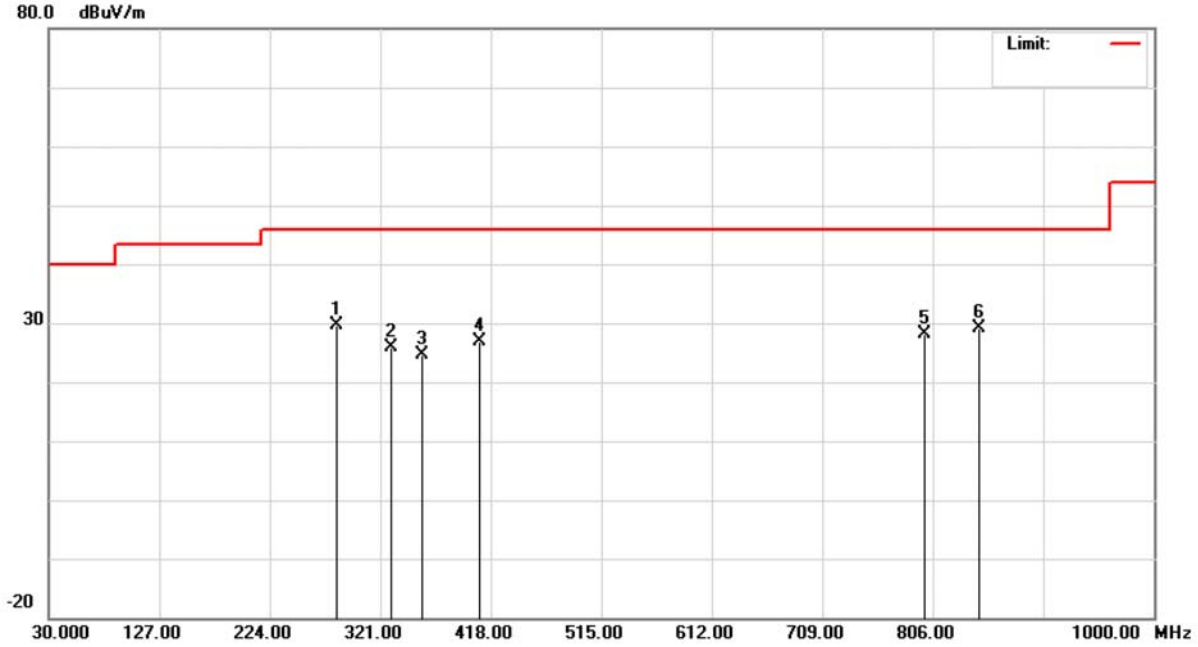
9.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

9.8 TEST RESULTS

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

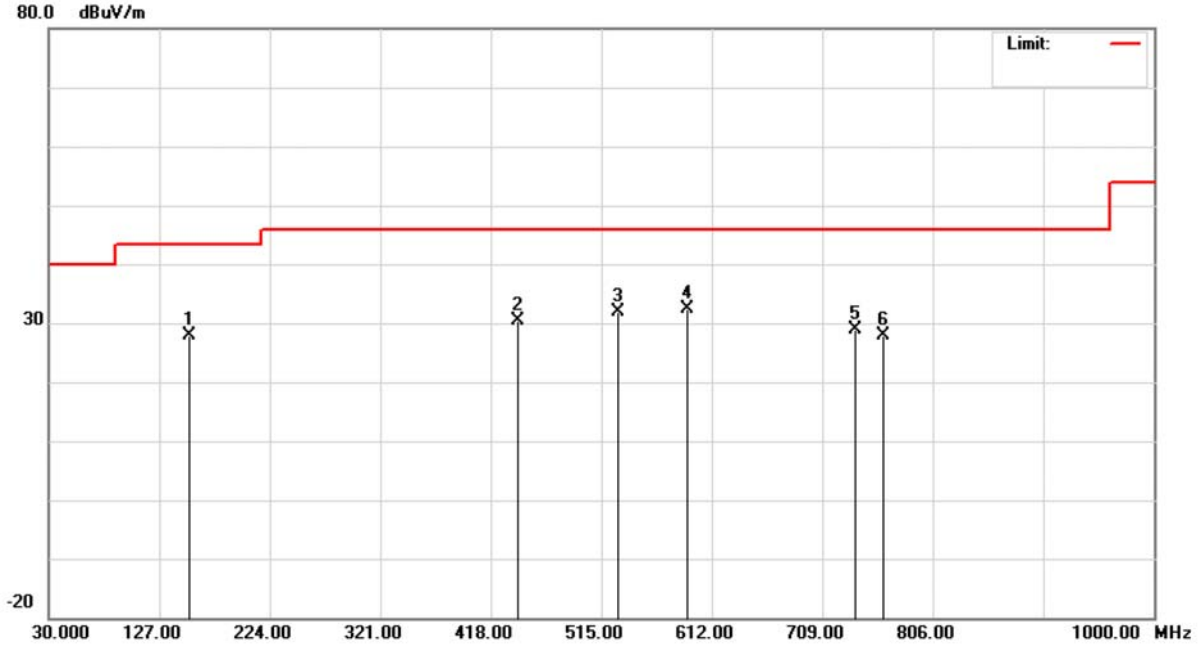
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	282.2000	43.89	-14.30	29.59	46.00	-16.41	peak	
2		330.7000	38.70	-12.85	25.85	46.00	-20.15	peak	
3		357.3750	36.95	-12.40	24.55	46.00	-21.45	peak	
4		408.2998	37.81	-10.95	26.86	46.00	-19.14	peak	
5		798.7249	32.94	-4.85	28.09	46.00	-17.91	peak	
6		847.2249	33.31	-4.07	29.24	46.00	-16.76	peak	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		153.6750	42.02	-14.21	27.81	43.50	-15.69	peak	
2		442.2500	40.36	-9.98	30.38	46.00	-15.62	peak	
3		529.5499	40.68	-8.74	31.94	46.00	-14.06	peak	
4	*	590.1749	39.41	-7.05	32.36	46.00	-13.64	peak	
5		738.0999	34.52	-5.62	28.90	46.00	-17.10	peak	
6		762.3499	32.98	-5.22	27.76	46.00	-18.24	peak	

10 RADIATED SPURIOUS EMISSION (ABOVE 1 GHZ)

10.1LIMIT

20dBc 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.

Frequency Range: 9 kHz to 1 GHz		
FREQUENCY (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

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

(1) The limit for radiated test was performed according to FCC PART 15B.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).
(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
Margin Level = Measurement Value – Limit Value

10.2MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 15, 2014
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 16, 2014
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 13, 2014
5	Microflex Cable	EMC	S104-SMA	8m	May. 13, 2014
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 13, 2014
7	Test Cable	LMR	LMR-400	12m	May. 14, 2014
8	Test Cable	LMR	LMR-400	3m	May. 14, 2014
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 18, 2014
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 11, 2014
11	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 18, 2014
12	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 24, 2013

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

10.3MEASURING INSTRUMENTS SETTING

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

10.4TEST PROCEDURES

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz. For frequencies above 1 GHz, 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 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.
g. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

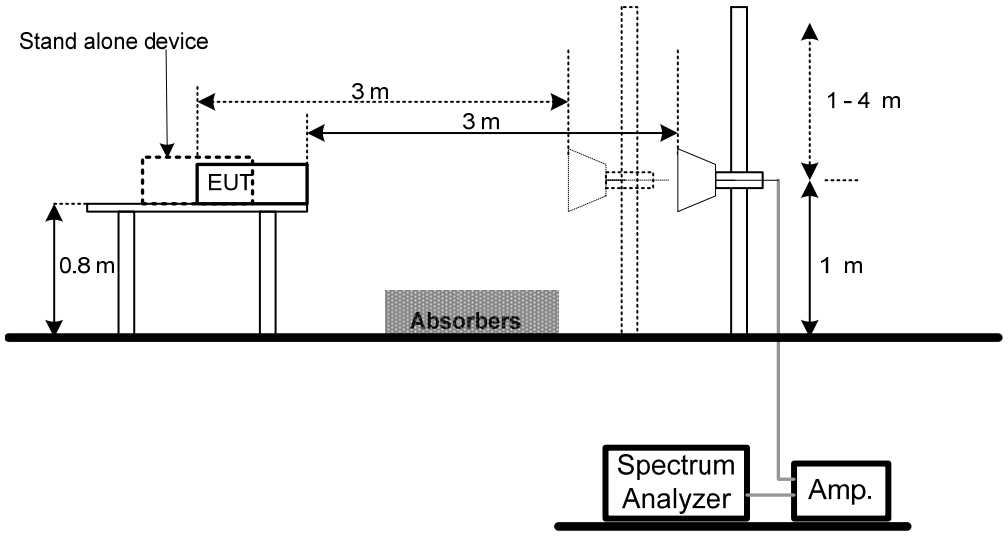
NOTE:

a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform.

10.5DEVIATION FROM TEST STANDARD

No deviation

10.6TEST SETUP LAYOUT



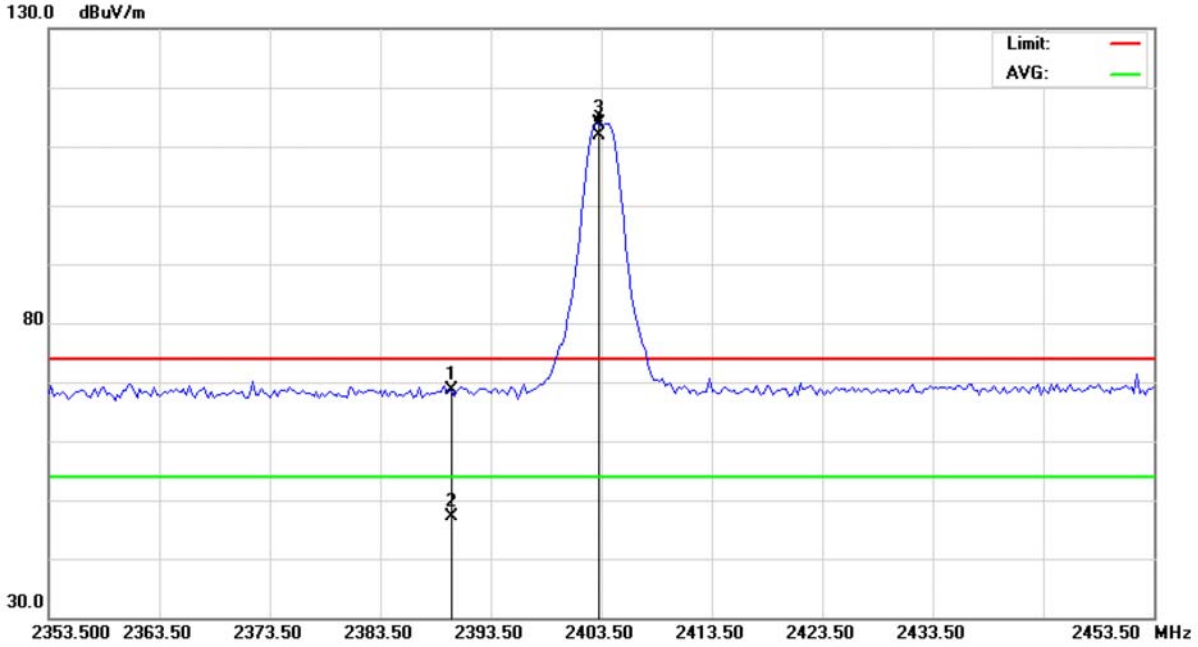
10.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

10.8TEST RESULTS

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz		

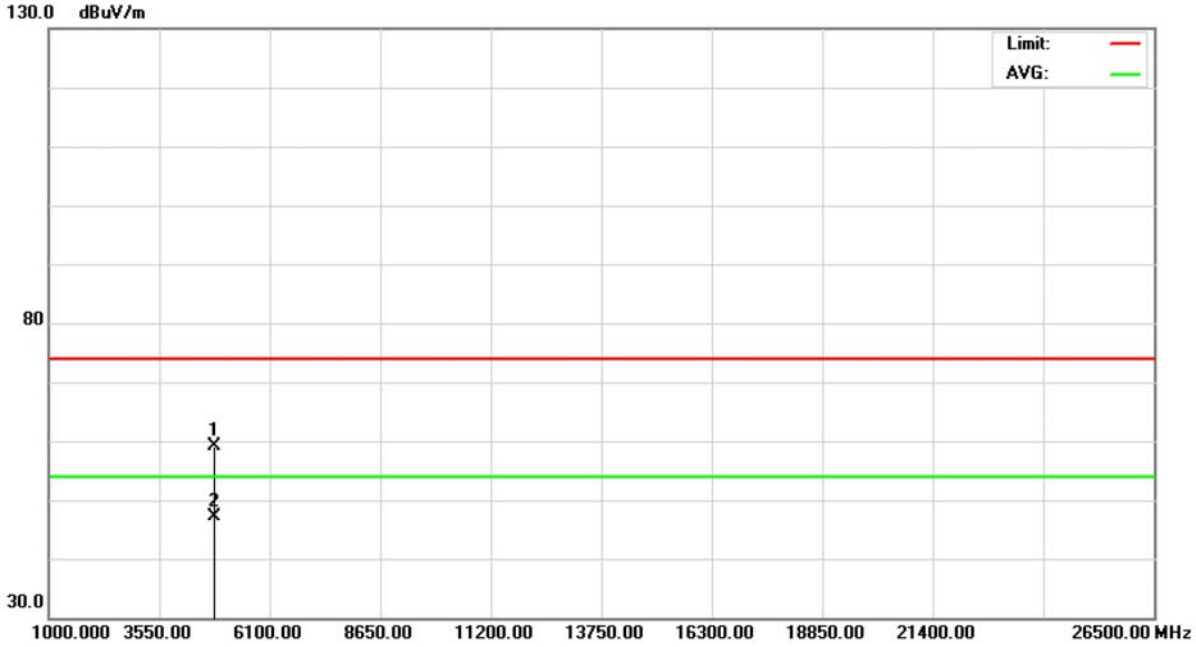
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	36.30	32.27	68.57	74.00	-5.43	peak	
2		2390.000	14.74	32.27	47.01	54.00	-6.99	AVG	
3	X	2403.250	81.59	32.33	113.92	74.00	39.92	peak	
4	*	2403.250	79.63	32.33	111.96	54.00	57.96	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz		

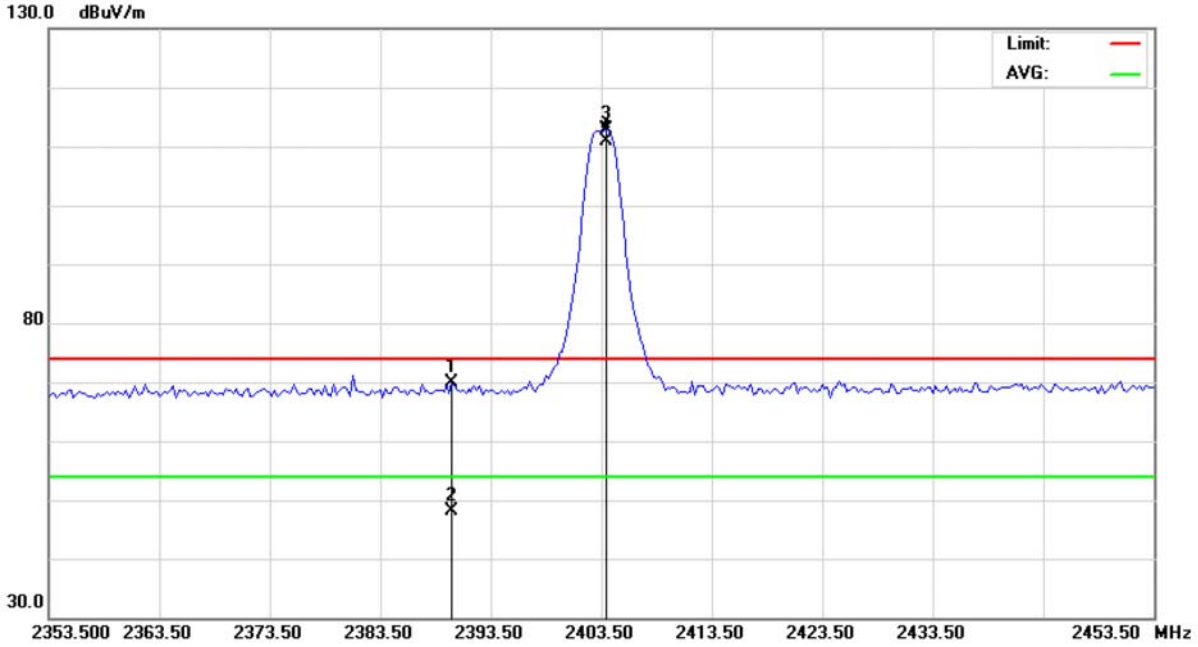
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4807.000	53.47	5.69	59.16	74.00	-14.84	peak	
2	*	4807.000	41.42	5.69	47.11	54.00	-6.89	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz		

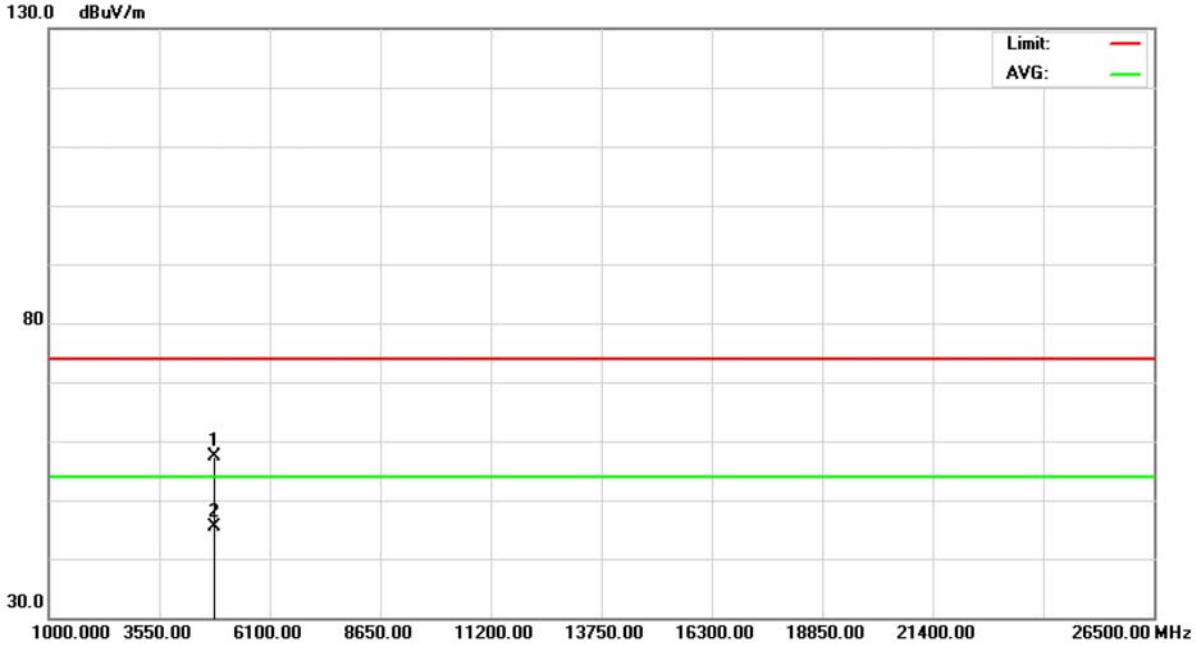
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	37.50	32.27	69.77	74.00	-4.23	peak	
2		2390.000	15.94	32.27	48.21	54.00	-5.79	AVG	
3	X	2404.000	80.44	32.33	112.77	74.00	38.77	peak	
4	*	2404.000	78.48	32.33	110.81	54.00	56.81	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz		

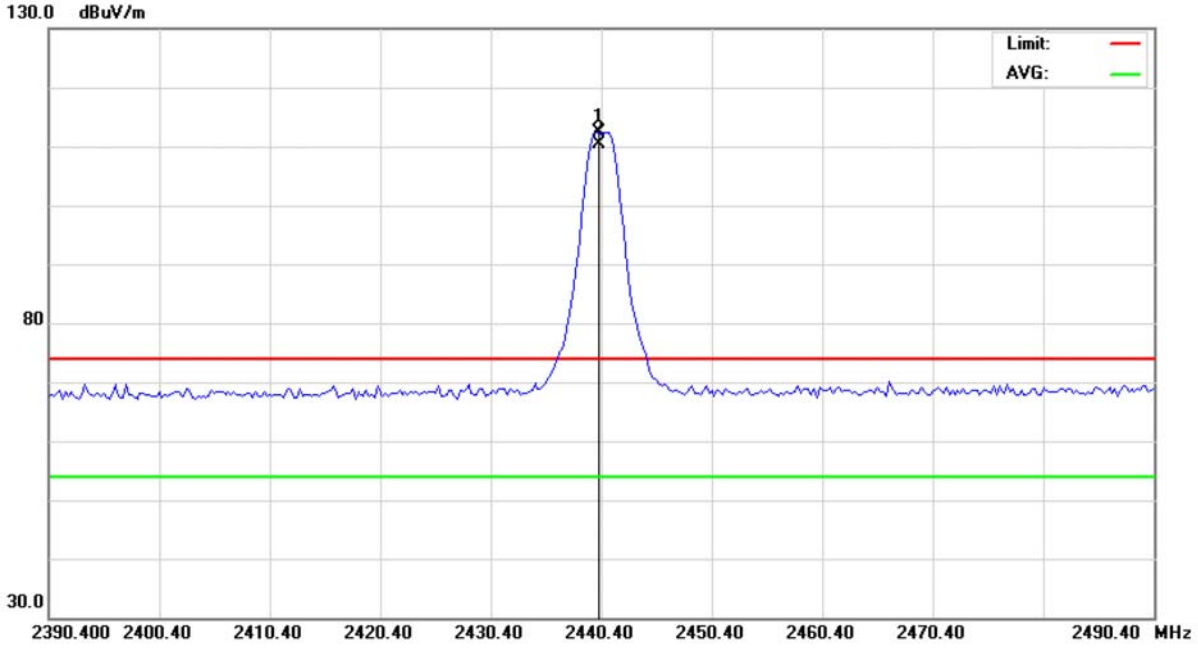
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4806.350	51.68	5.69	57.37	74.00	-16.63	peak	
2	*	4806.350	39.63	5.69	45.32	54.00	-8.68	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

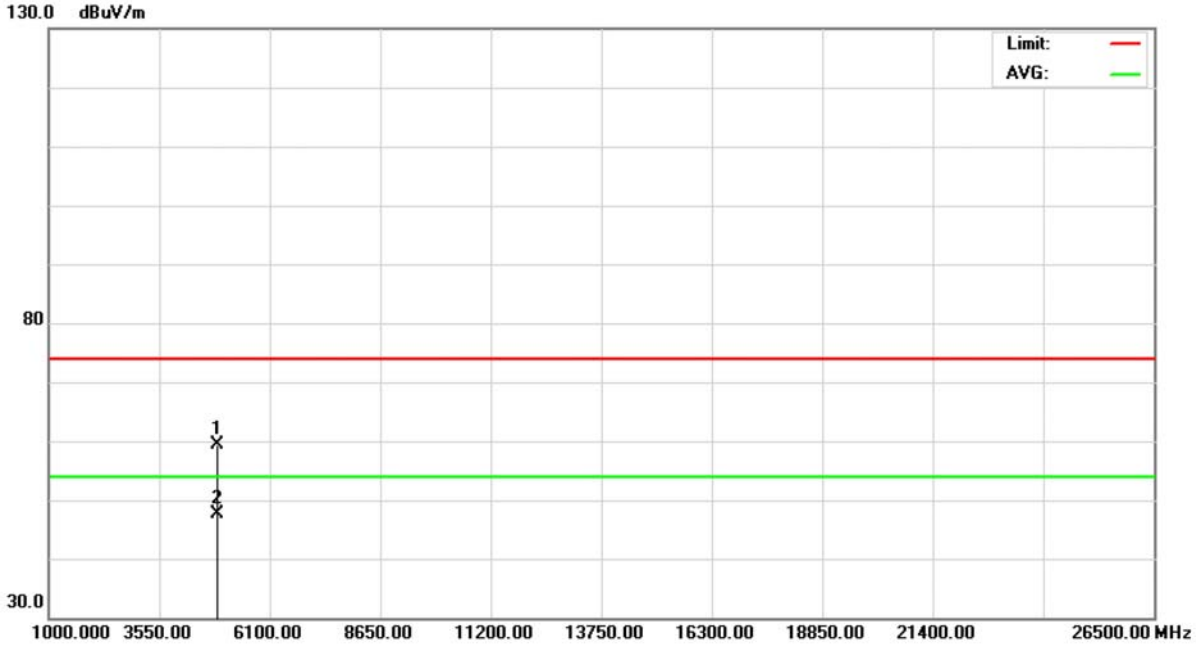
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2440.000	80.49	31.89	112.38	74.00	38.38	peak	
2	*	2440.000	78.53	31.89	110.42	54.00	56.42	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

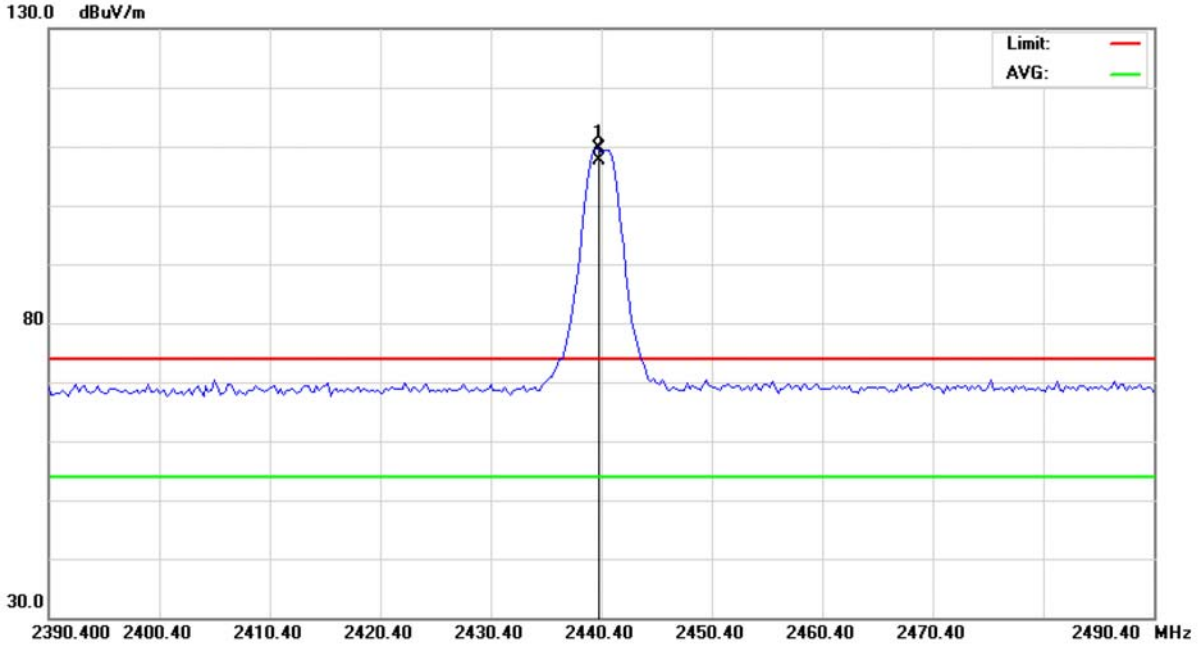
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4880.800	53.67	5.79	59.46	74.00	-14.54	peak	
2	*	4880.800	41.73	5.79	47.52	54.00	-6.48	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

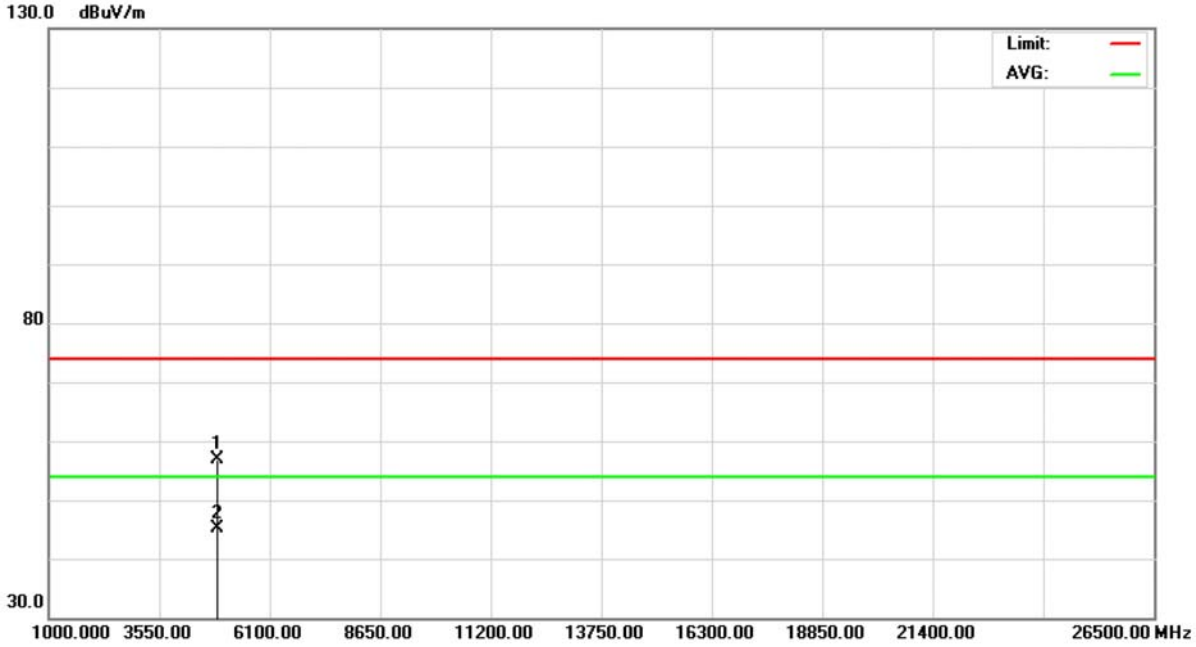
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2440.000	77.63	31.89	109.52	74.00	35.52	peak	
2	*	2440.000	75.67	31.89	107.56	54.00	53.56	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

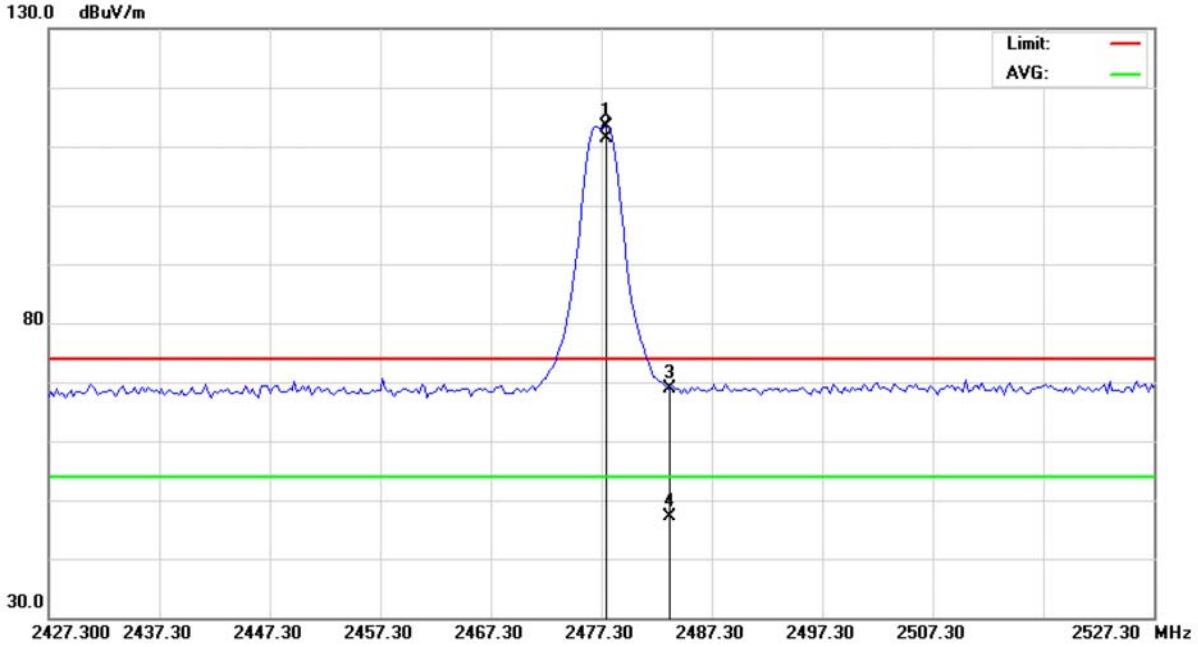
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4880.800	51.03	5.79	56.82	74.00	-17.18	peak	
2	*	4880.800	39.27	5.79	45.06	54.00	-8.94	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2477.3 MHz		

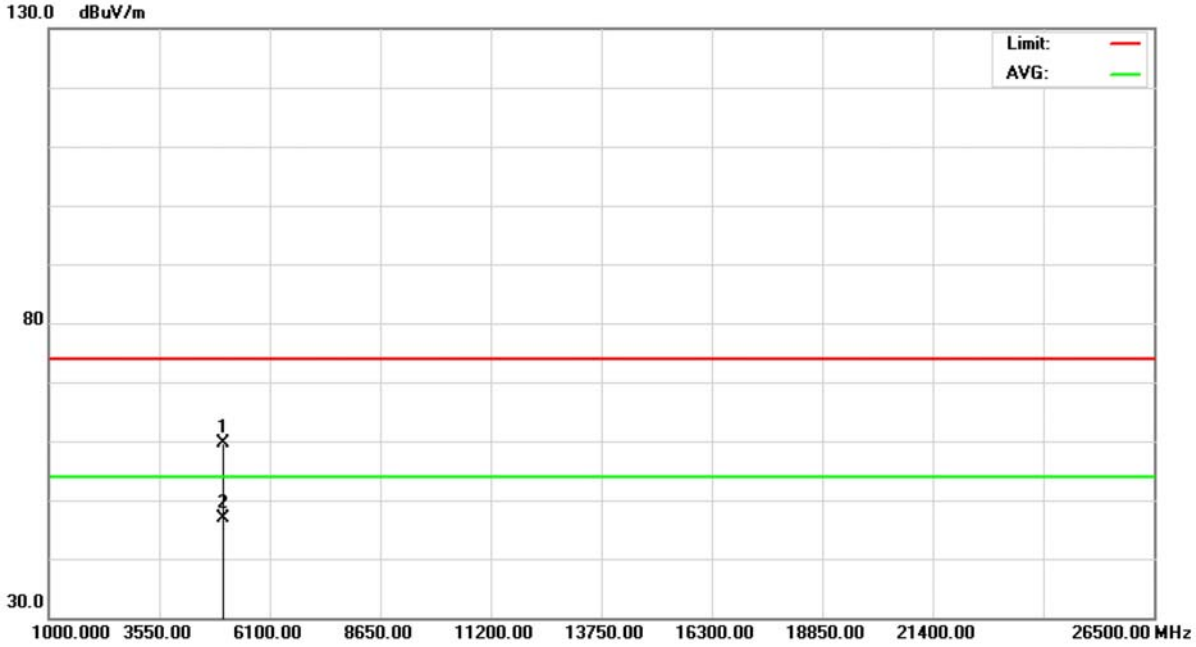
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2477.700	81.21	32.06	113.27	74.00	39.27	peak	
2	*	2477.700	79.25	32.06	111.31	54.00	57.31	AVG	
3		2483.500	36.67	32.09	68.76	74.00	-5.24	peak	
4		2483.500	15.11	32.09	47.20	54.00	-6.80	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2477.3 MHz		

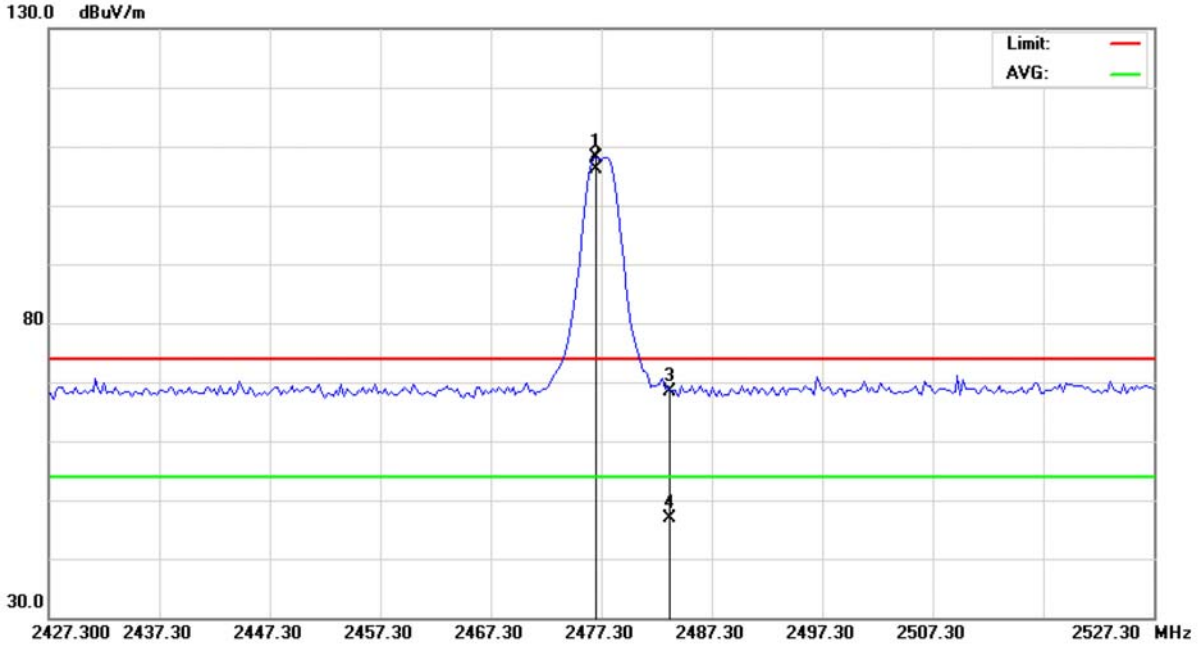
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4954.600	53.81	5.88	59.69	74.00	-14.31	peak	
2	*	4954.600	41.02	5.88	46.90	54.00	-7.10	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2477.3 MHz		

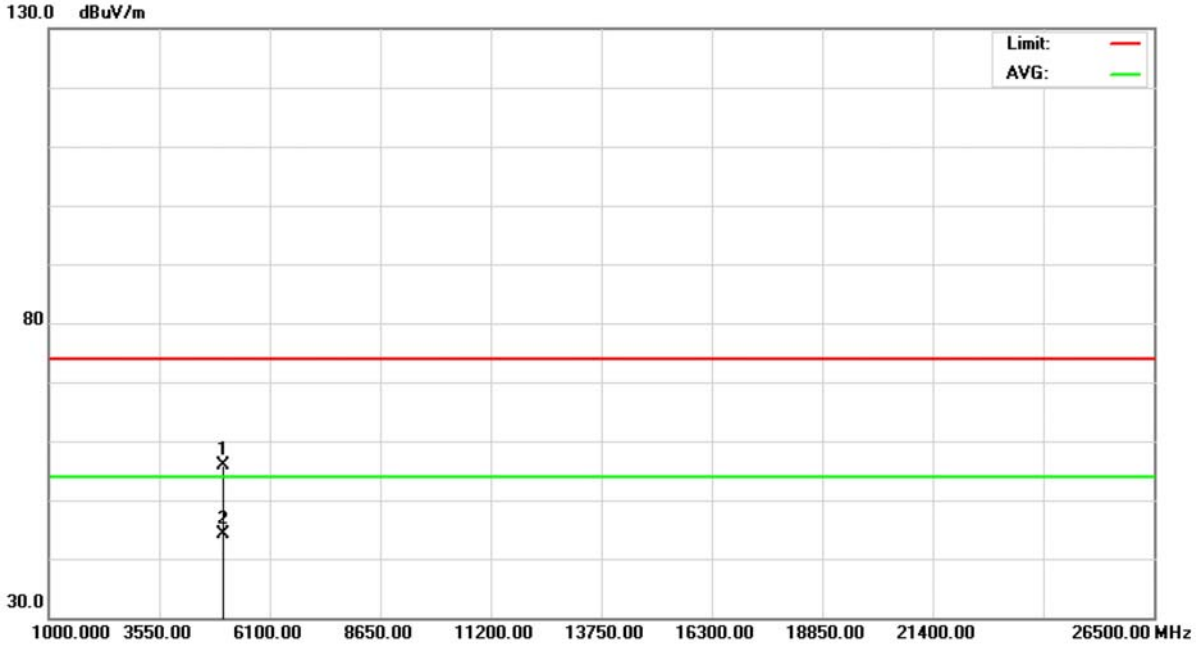
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2476.800	76.08	32.06	108.14	74.00	34.14	peak	
2	*	2476.800	74.12	32.06	106.18	54.00	52.18	AVG	
3		2483.500	36.25	32.09	68.34	74.00	-5.66	peak	
4		2483.500	14.69	32.09	46.78	54.00	-7.22	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	2477.3 MHz		

Polarization: Horizontal

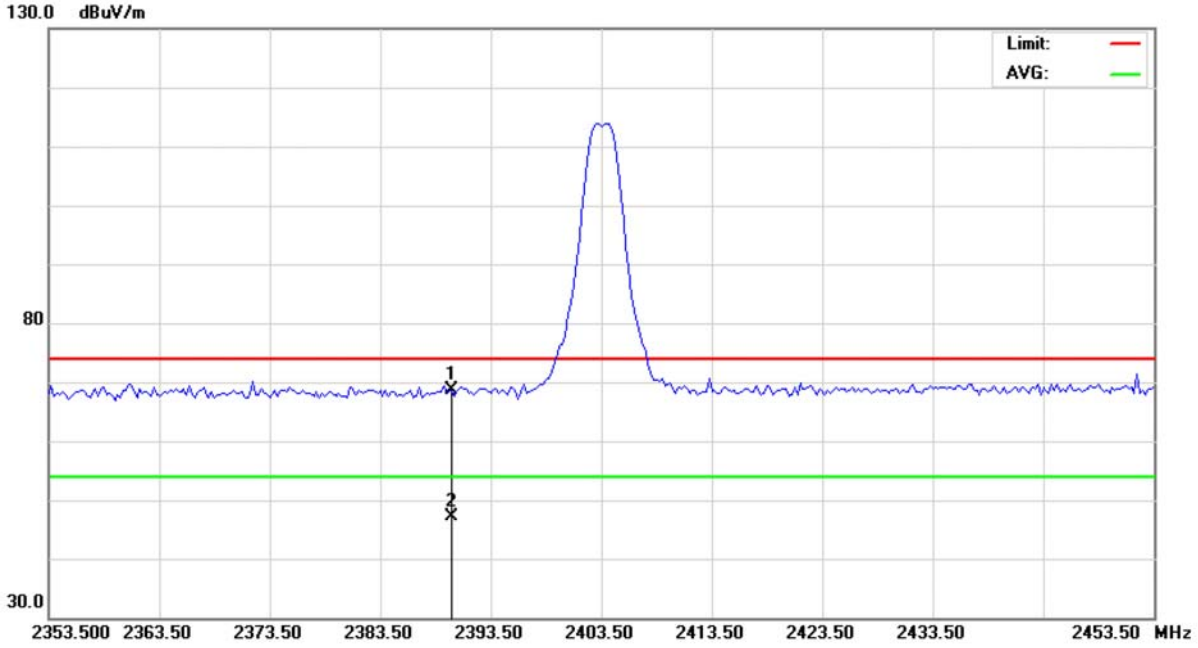


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4954.600	50.06	5.88	55.94	74.00	-18.06	peak	
2	*	4954.600	38.24	5.88	44.12	54.00	-9.88	AVG	

10.9TEST RESULTS (RESTRICTED BANDS)

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

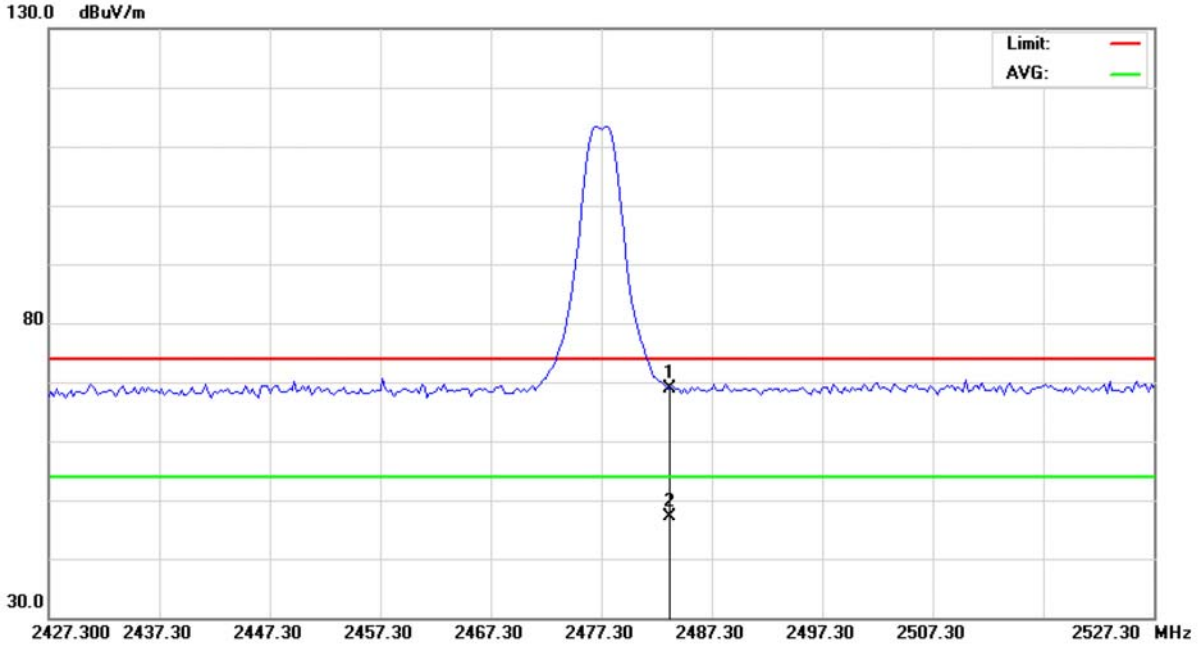
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2390.000	36.30	32.27	68.57	74.00	-5.43	peak	
2		2390.000	14.74	32.27	47.01	54.00	-6.99	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2477.3 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

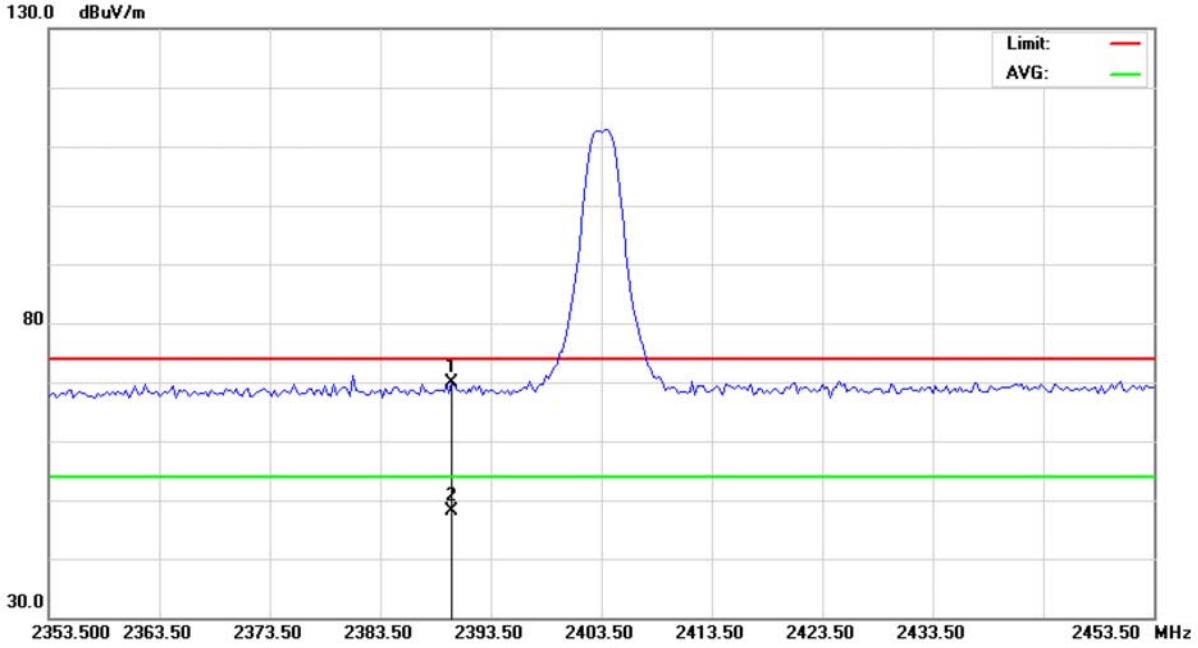
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	36.67	32.09	68.76	74.00	-5.24	peak	
2		2483.500	15.11	32.09	47.20	54.00	-6.80	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

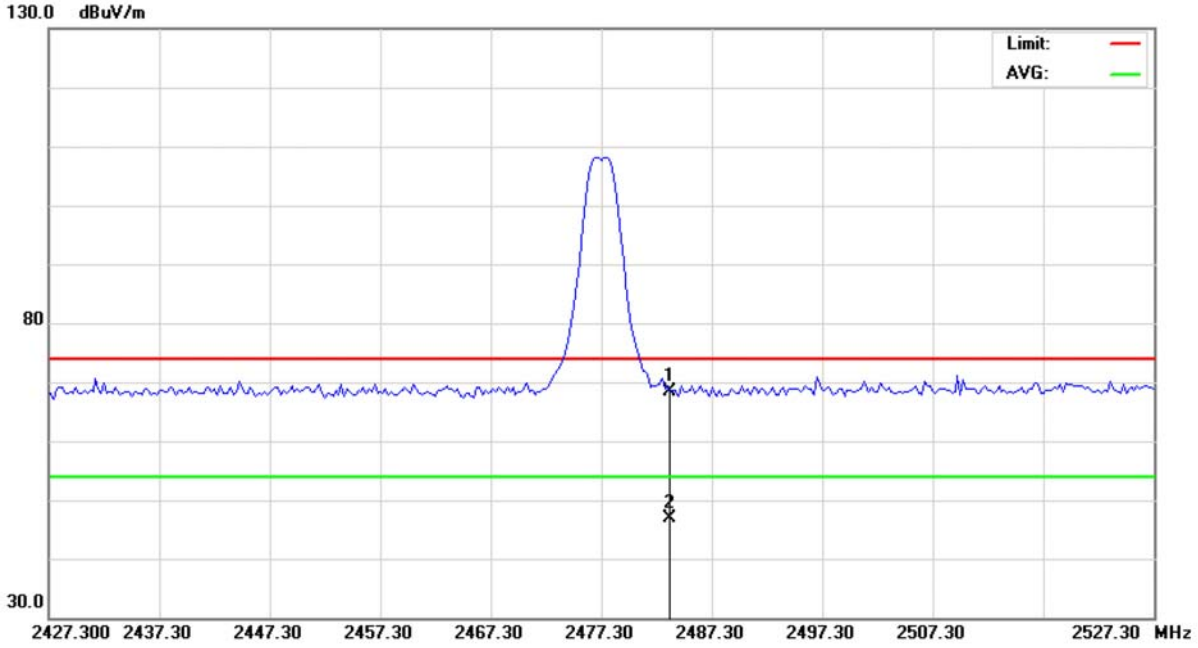
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2390.000	37.50	32.27	69.77	74.00	-4.23	peak	
2		2390.000	15.94	32.27	48.21	54.00	-5.79	AVG	

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2477.3 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	36.25	32.09	68.34	74.00	-5.66	peak	
2		2483.500	14.69	32.09	46.78	54.00	-7.22	AVG	

11 NUMBER OF HOPPING FREQUENCY

11.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Number of Hopping Channel	2400-2483.5	shall use at least 15 channels

11.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

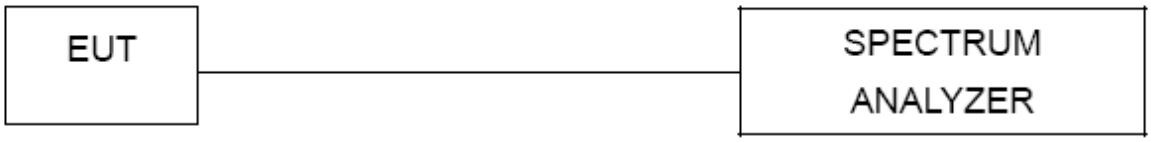
11.3 MEASURING INSTRUMENTS SETTING

Spectrum Analyzer	Parameter Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

11.4 TEST PROCEDURES

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= 100 kHz, VBW=100 kHz, Sweep time = Auto.

11.5 TEST SETUP LAYOUT



11.6 DEVIATION FROM TEST STANDARD

No deviation

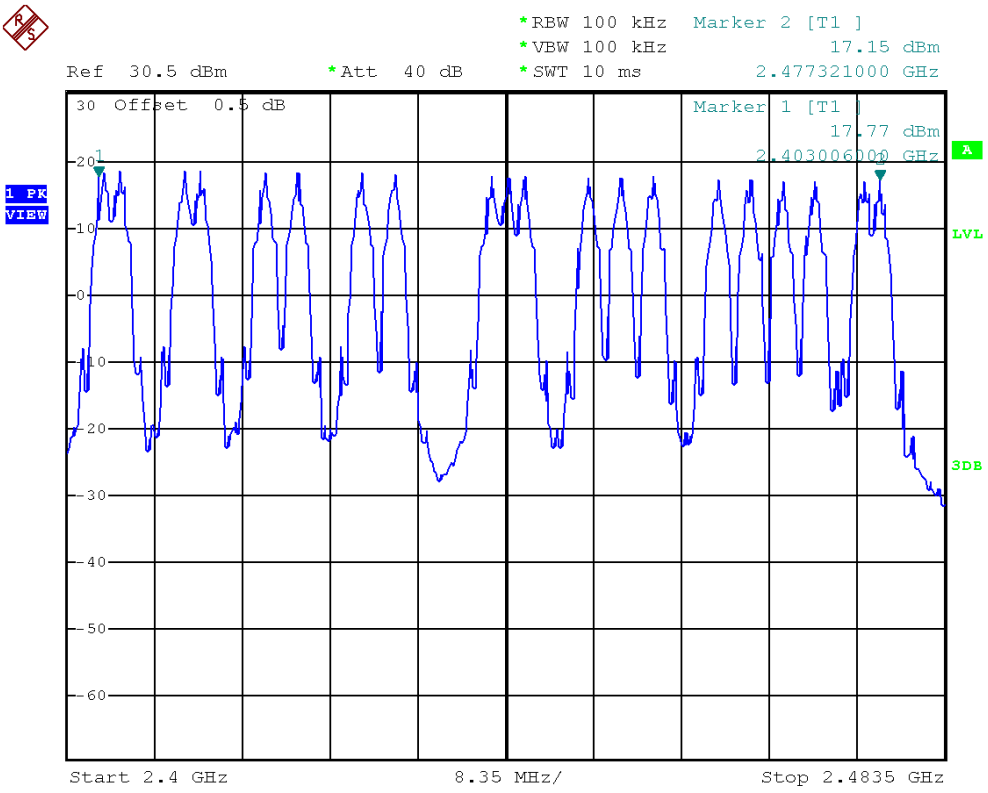
11.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

11.8TEST RESULTS

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	Hopping mode		

Number of Hopping Channel	Limit	Result
20	15	Pass



12 AVERAGE TIME OF OCCUPANCY

12.1LIMIT

Test Item	Frequency Range (MHz)	Limit
Average time of occupancy	2400-2483.5	shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

12.2MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

12.3TEST PROCEDURES

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 100 kHz and VBW to 100 kHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
i. DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds.
j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds.
k. DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds.

12.4TEST SETUP LAYOUT

12.5DEVIATION FROM TEST STANDARD

No deviation

12.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

12.7TEST RESULTS

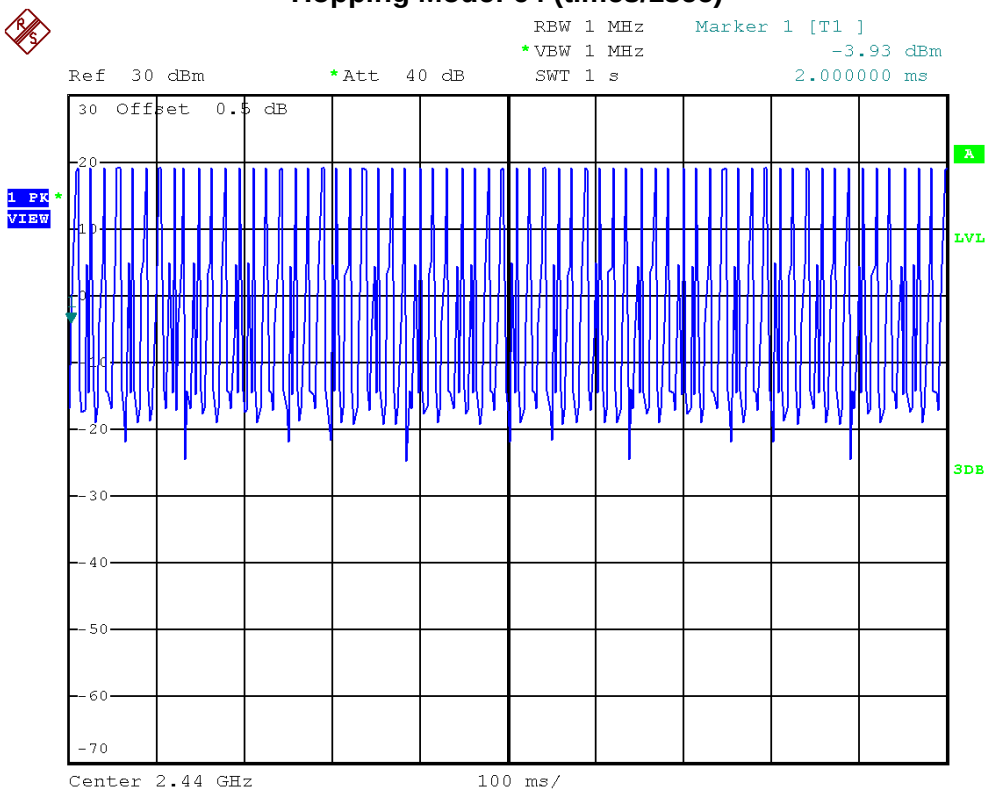
EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2440.4 MHz		

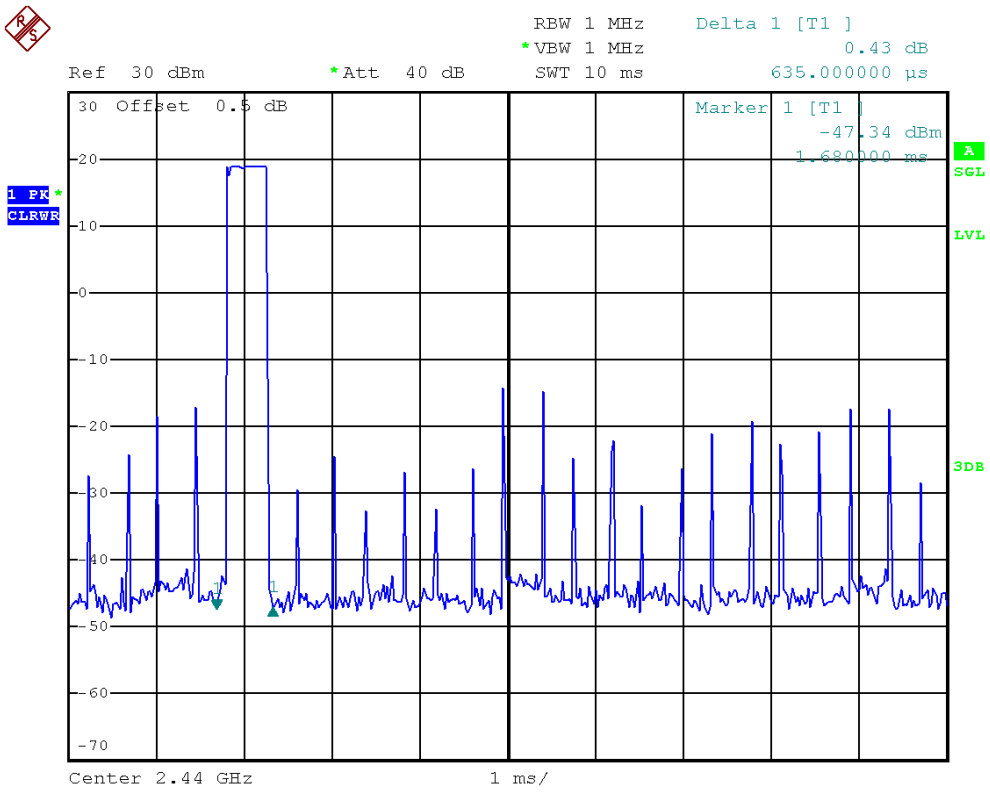
Frequency	Number of transmission in a 8.0 (20 Hopping*0.4)	Length of transmission time (ms)	Result (ms)	Limit (ms)	Judgement
2440.4 MHz	(64/1)*8=512 times (Note1)	0.635	325.12	400	PASS

Note1: 64 times of occupied channels per 1 second

	Results
Measured cycle (sec)	20 CH*0.4=7.2
The total number of frequency-hopping per second	((64/1)*20)=1280
The number of occupied channels per second	1280/64=20(number/sec)
occupied time for each channel(1)	0.635 ms
The total number of channels occupied within onecycle (2)	(64/1)*8=512 times
The average time of occupancy within one cycle(1)*(2)	323.12msec
LIMIT (msec)	400msec

Hopping Mode: 64 (times/1sec)





13 RF EXPOSURE COMPLIANCE

13.1 LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

NOTE: f = frequency in MHz ; *Plane-wave equivalent power density.

13.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Jul. 22, 2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Jul. 22, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

13.3 MPE CALCULATION METHOD

E (V/m) $= \frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) $= \frac{E^2}{377}$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

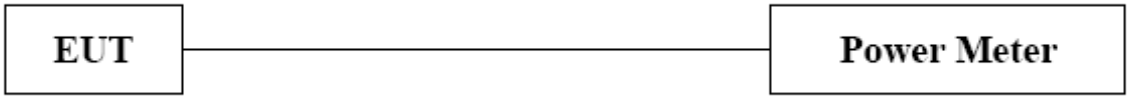
d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd $= \frac{30 \times P \times G}{377 \times d^2}$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

13.4TEST SETUP LAYOUT



13.5DEVIATION FROM TEST STANDARD

No deviation

13.6EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

13.7TEST RESULTS

EUT	SURROUNDBAR 9500BT	Model Name	SURROUNDBAR 9500BT
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	2403.5 MHz, 2440.4 MHz, 2477.3 MHz		

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Result
2403.5 MHz	3.30	2.1380	20.4200	110.1539	0.046876	1	PASS
2440.4 MHz	3.30	2.1380	19.6300	91.8333	0.039080	1	PASS
2477.3 MHz	3.30	2.1380	18.7700	75.3356	0.032059	1	PASS