Radio Test Report

FCC ID: H4IDG9086

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

Project No.	:	1301016B
Equipment	:	2.4GHz Dongle
Model Name	:	SD-9086
Applicant	:	LITE-ON TECHNOLOGY CORP.
Address	:	16F, 392 , Ruey Kuang Road, Neihu, Taipei 11492, Taiwan, R.O.C

Date of Receipt	:	Jan. 08, 2013 Nov. 21, 2014
Date of Test	:	Jan. 08, 2013 ~ Jan. 17, 2013 Nov. 21, 2014 ~ Dec. 04, 2014
Issued Date	:	Dec. 05, 2014
Tested by	:	BTL Inc.

Testing Engineer : (Rush Kao)

Technical Manager : (Jeff Yang)

Authorized Signatory : (Andy Chiu)

B T L I N C .

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TEL: +886-2-2657-3299 FAX: +886-2-2657-3331

Declaration

BTL 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.**

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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

Issued No.	Description	Issued Date
NEI-FCCP-1-1301016	Initial Issue.	Jan. 24, 2013
BTL-FCCP-1-1301016B	Compared with the previous report (NEI-FCCP-1-1301016), the manufacturer and brand for antenna are changed, the antenna type is unchanged. The radiated emission test results are updated, the rests are remained.	Dec. 05, 2014

1 CERTIFICATION

Equipment	:	2.4GHz Dongle
Brand Name	:	acer
Model Name	:	SD-9086
Applicant	:	LITE-ON TECHNOLOGY CORP.
Date of Test	:	Jan. 08, 2013 ~ Jan. 17, 2013 Nov. 21, 2014 ~ Dec. 04, 2014
Standards	:	FCC Part15, Subpart C: 2013(15.249) ANSI C63.4: 2009

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc. .
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1301016B) 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

FCC Part15 (15.249) , Subpart C: 2013		
Standard Clause	**Test Item**	**Result**
15.207	Conducted Emission	**PASS**
15.249(d) or 15.209	Radiated Spurious Emission	**PASS**
15.205	Restricted Bands	**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:

C02: (VCCI RN: C-3477; FCC RN: 614388; FCC DN: TW1054)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, 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
C02	150 kHz ~ 30 MHz	2.59	

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}.

If U_{lab} is less than or equal to U_{CISPR}, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{CISPR}, then:

- compliance is deemed to occur if no measured disturbance level, increased by (U_{lab} - U_{CISPR}), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} - U_{CISPR}), exceeds the disturbance limit.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>2.4GHz Dongle</td></tr>
<tr><td>Brand Name</td><td>acer</td></tr>
<tr><td>Model Name</td><td>SD-9086</td></tr>
<tr><td>OEM Brand/Model Name</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>
<table>
<tr><td>Operation Frequency</td><td>2403 MHz to 2480 MHz</td></tr>
<tr><td>Modulation Type</td><td>GFSK</td></tr>
<tr><td>Bit Rate of Transmitter</td><td>2 Mbps</td></tr>
<tr><td>Number Of Channel</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Antenna Designation</td><td>Please refer to the Note 3.</td></tr>
<tr><td>Antenna Gain(Peak)</td><td>Please refer to the Note 3.</td></tr>
<tr><td>Field strength</td><td>88.36dBuV@3m</td></tr>
</table>
More details of EUT technical specification please refer to the User's Manual.
</td></tr>
<tr><td>Power Source</td><td>Supplied from PC USB port.</td></tr>
<tr><td>Power Rating</td><td>I/P: DC 5V</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
<tr><td>Products Covered</td><td>N/A</td></tr>
<tr><td>EUT Modification(s)</td><td>N/A</td></tr>
</table>

NOT
E:

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	27	2429	53	2455
02	2404	28	2430	54	2456
03	2405	29	2431	55	2457
04	2406	30	2432	56	2458
05	2407	31	2433	57	2459
06	2408	32	2434	58	2460
07	2409	33	2435	59	2461
08	2410	34	2436	60	2462
09	2411	35	2437	61	2463
10	2412	36	2438	62	2464
11	2413	37	2439	63	2465
12	2414	38	2440	64	2466
13	2415	39	2441	65	2467
14	2416	40	2442	66	2468
15	2417	41	2443	67	2469
16	2418	42	2444	68	2470
17	2419	43	2445	69	2471
18	2420	44	2446	70	2472
19	2421	45	2447	71	2473
20	2422	46	2448	72	2474
21	2423	47	2449	73	2475
22	2424	48	2450	74	2476
23	2425	49	2451	75	2477
24	2426	50	2452	76	2478
25	2427	51	2453	77	2479
26	2428	52	2454	78	2480

3. Table for Filed Antenna

Ant.	Manufacturer	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Walsin Technology Corporation	WALSIN	ASC_RFANT3216120A5T	CHIP	N/A	2.12

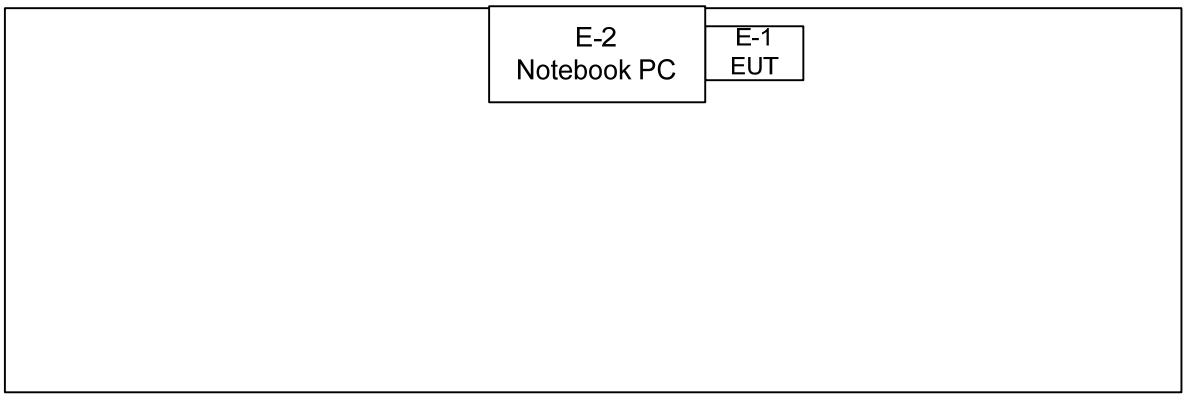
3.2 DESCRIPTION OF TEST MODES

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	Channel	Note
Conducted Emission	GFSK	2 Mbps	2403 MHz / 2441 MHz / 2480 MHz	
Radiated Spurious Emission (30 MHz to 1 GHz)	GFSK	2 Mbps	2441 MHz	
Radiated Spurious Emission (above 1 GHz)	GFSK	2 Mbps	2403 MHz / 2441 MHz / 2480 MHz	
Restricted Bands	GFSK	2 Mbps	2403 MHz / 2441 MHz / 2480 MHz	

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

3.3 BLOCK DIAGRAM 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	2.4GHz Dongle	acer	SD-9086	H4IDG9086	N/A	EUT
E-2	Notebook PC	DELL	D620	DOC	7T390 A03	

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. 24, 2013
2	LISN	EMCO	3816/2	00066528	Mar. 26, 2013
3	Test Cable	TIMES	CFD300-NL	130	Jun. 14, 2013
4	EMI Test Receiver	Agilent	N9038A	MY51210215	Jan. 26, 2013
5	Measurement Software	EZ	EZ_EMC (Version NB-03A)	N/A	N/A

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

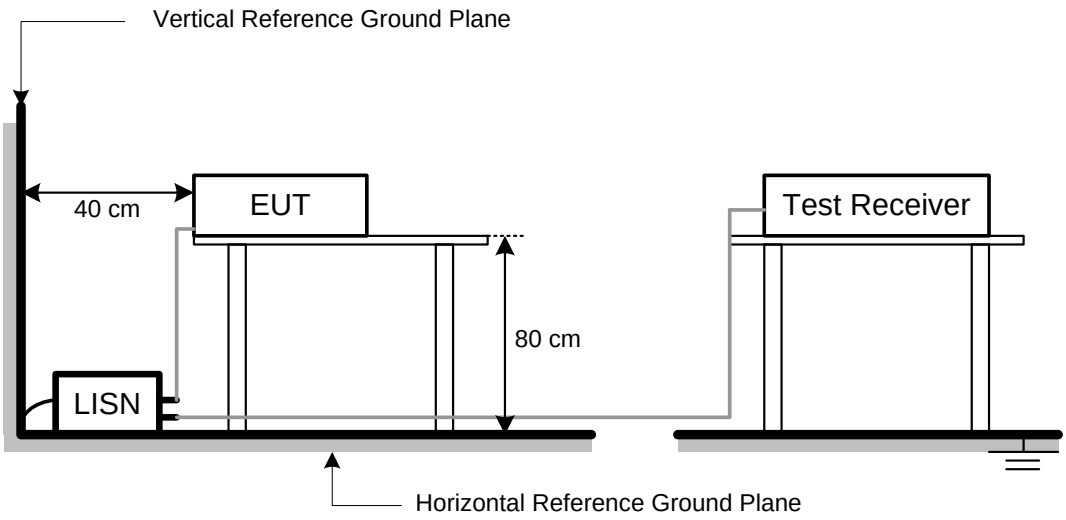
4.3 TEST PROCEDURES

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 (20 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

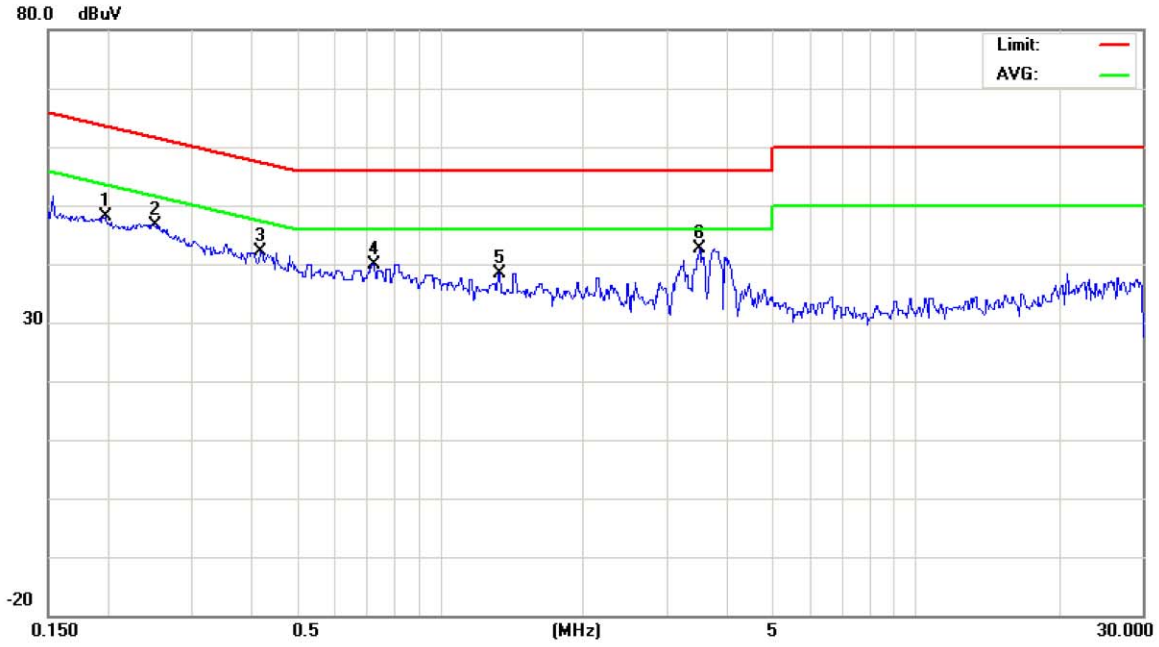
4.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.7 TEST RESULTS

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 MHz		

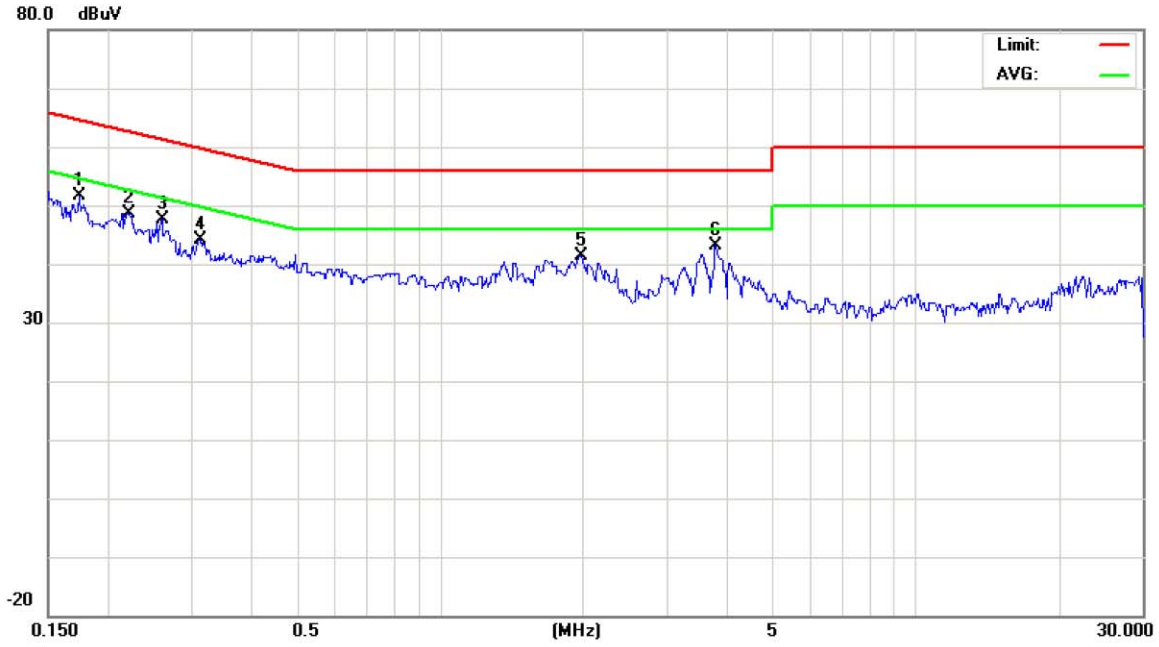
Phase: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1981	38.30	9.75	48.05	63.69	-15.64	peak	
2		0.2514	36.99	9.74	46.73	61.71	-14.98	peak	
3		0.4186	32.36	9.71	42.07	57.48	-15.41	peak	
4		0.7250	30.25	9.71	39.96	56.00	-16.04	peak	
5		1.3325	28.71	9.70	38.41	56.00	-17.59	peak	
6	*	3.5037	32.97	9.74	42.71	56.00	-13.29	peak	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 MHz		

Phase: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1744	41.88	9.76	51.64	64.75	-13.11	peak	
2		0.2217	38.85	9.74	48.59	62.75	-14.16	peak	
3		0.2593	37.82	9.73	47.55	61.45	-13.90	peak	
4		0.3118	34.29	9.72	44.01	59.92	-15.91	peak	
5		1.9737	31.61	9.67	41.28	56.00	-14.72	peak	
6	*	3.7850	33.30	9.74	43.04	56.00	-12.96	peak	

5 RADIATED SPURIOUS EMISSION (9 KHZ TO 1 GHZ)

5.1 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

FCC Part15, Subpart C (15.249)	
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

5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Oct. 26, 2015
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Jun. 14, 2015
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 15, 2015
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 12, 2015
5	Microflex Cable	EMC	S104-SMA	8m	May. 14, 2015
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 12, 2015
7	Test Cable	LMR	LMR-400	12m	May. 13, 2015
8	Test Cable	LMR	LMR-400	3m	May. 13, 2015
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 17, 2015
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	July. 10, 2015

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

5.3 MEASURING INSTRUMENTS SETTING

EMI Test 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

DUTY CYCLE: TX 2403 MHz (2 Mbps)

Dwell time = ON/ON+OFF

ON: 0.15 msec

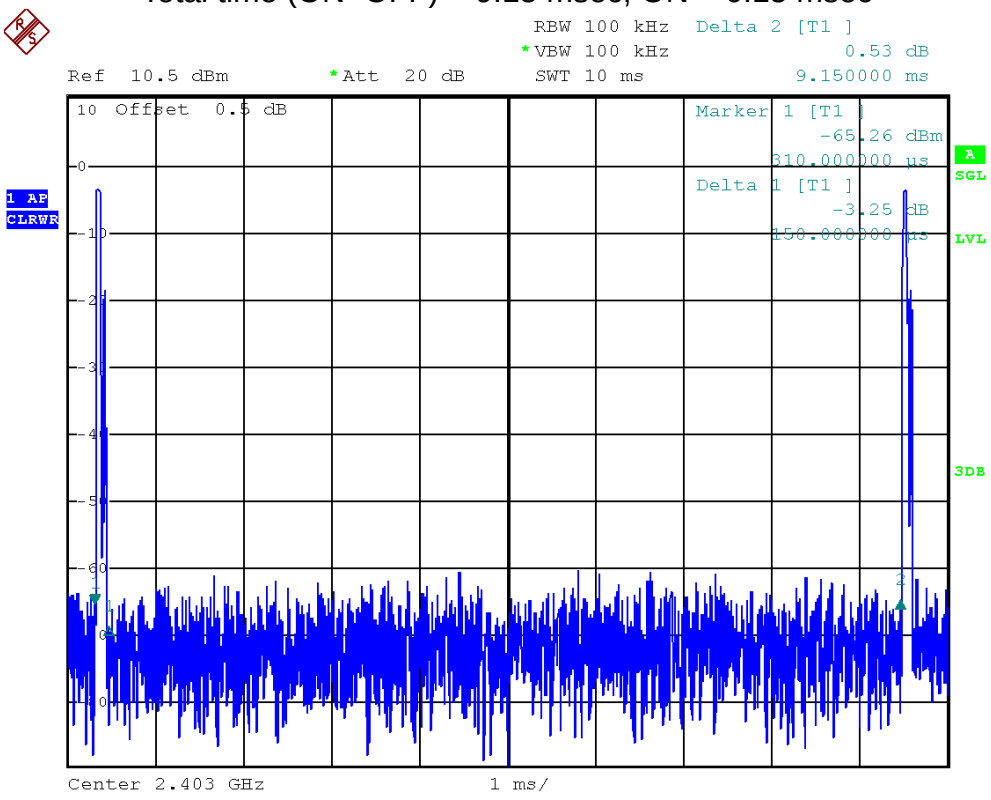
ON+OFF (total time): 9.15 msec

Dwell time: 1.64%

AV = PK + 20 log(Dwell time)

AV = PK – 35.71

Total time (ON+OFF) = 9.15 msec; ON = 0.15 msec



5.4 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.

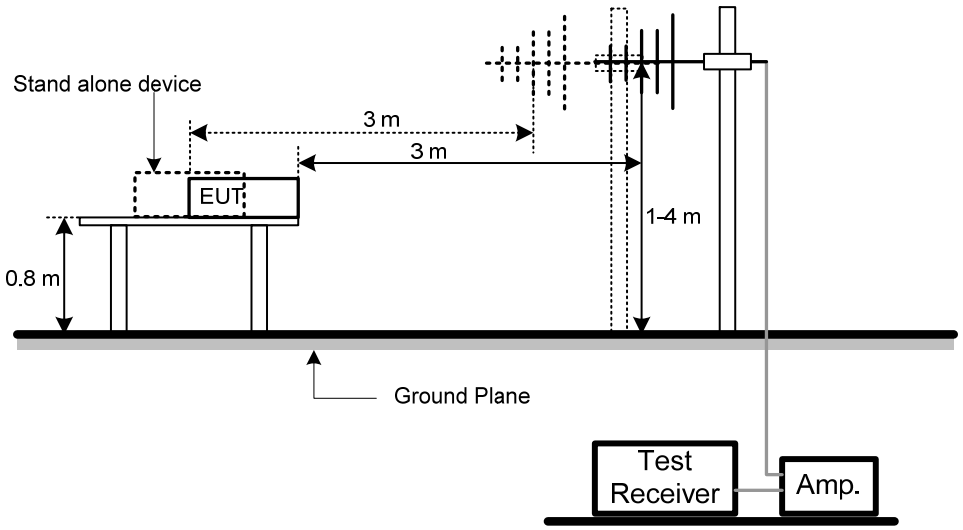
NOTE:

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.

5.5 DEVIATION FROM TEST STANDARD

No deviation

5.6 TEST SETUP LAYOUT



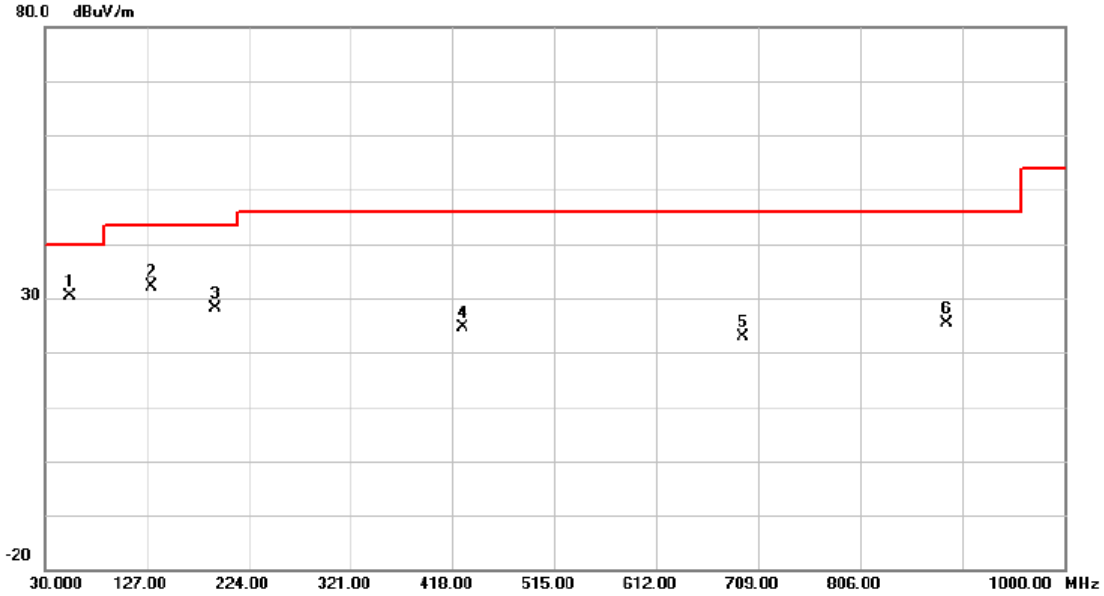
5.7 EUT OPERATING CONDITIONS

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.

5.8 TEST RESULTS

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 MHz		

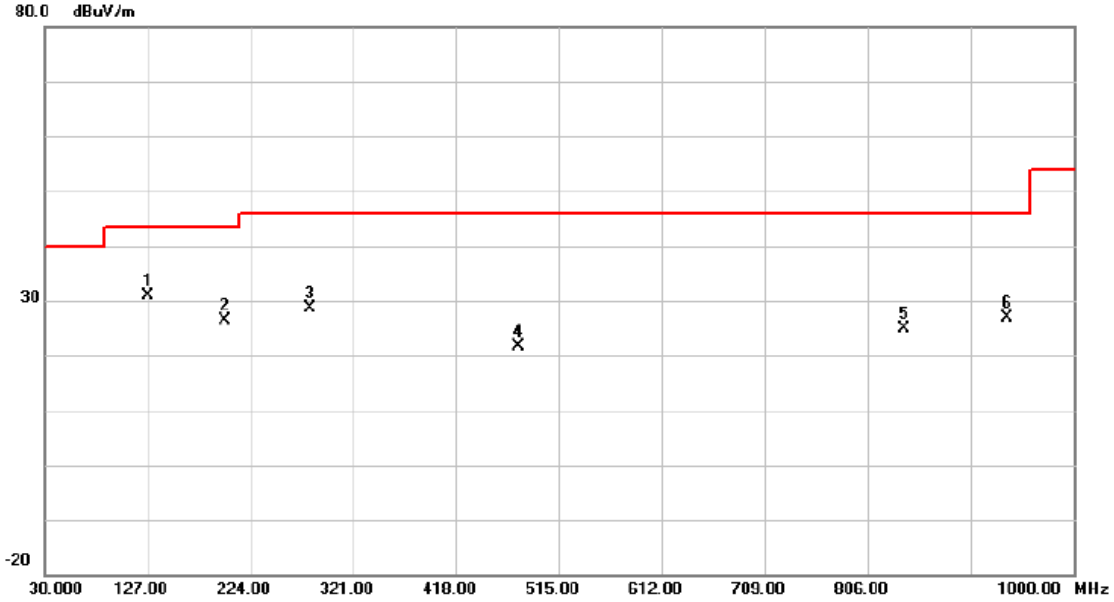
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	54.2500	44.57	-14.14	30.43	40.00	-9.57	peak	
2		131.8500	47.16	-15.14	32.02	43.50	-11.48	peak	
3		192.4750	44.85	-16.68	28.17	43.50	-15.33	peak	
4		427.7000	34.85	-10.30	24.55	46.00	-21.45	peak	
5		694.4500	28.36	-5.59	22.77	46.00	-23.23	peak	
6		888.4500	28.55	-3.06	25.49	46.00	-20.51	peak	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 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	*	127.0000	46.57	-15.58	30.99	43.50	-12.51	peak	
2		199.7500	43.05	-16.72	26.33	43.50	-17.17	peak	
3		279.7750	42.72	-13.97	28.75	46.00	-17.25	peak	
4		476.2000	31.10	-9.48	21.62	46.00	-24.38	peak	
5		839.9500	28.80	-4.02	24.78	46.00	-21.22	peak	
6		936.9500	28.82	-2.03	26.79	46.00	-19.21	peak	

6 RADIATED SPURIOUS EMISSION (ABOVE 1 GHZ)

6.1 LIMIT

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

6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-30	100854	Oct. 26, 2015
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Jun. 14, 2015
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 15, 2015
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 12, 2015
5	Microflex Cable	EMC	S104-SMA	8m	May. 14, 2015
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 12, 2015
7	Test Cable	LMR	LMR-400	12m	May. 13, 2015
8	Test Cable	LMR	LMR-400	3m	May. 13, 2015
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 17, 2015
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	July. 10, 2015

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

6.3 MEASURING 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

6.4 TEST PROCEDURES

a. 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.
b. 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.
c. 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.
d. 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.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.
f. 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.

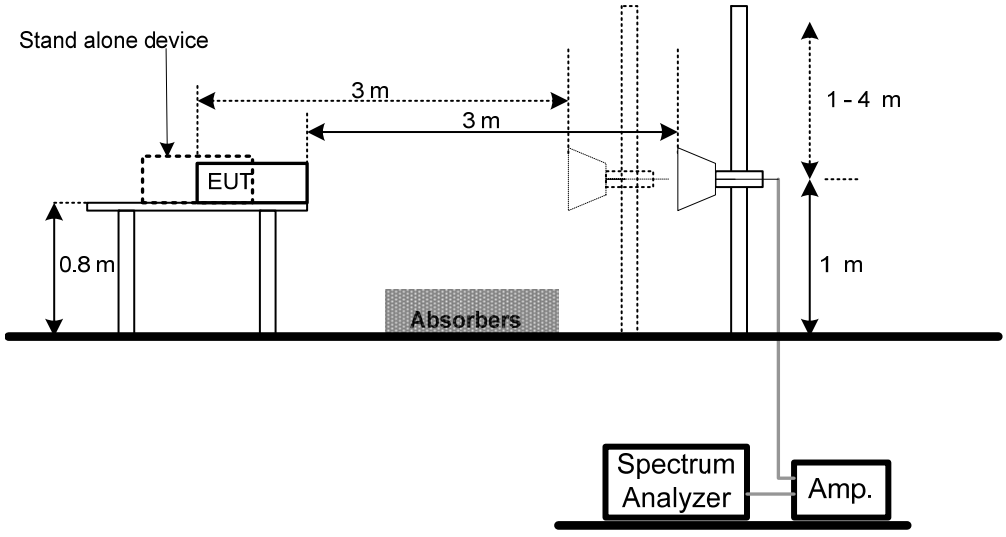
NOTE:

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.

6.5 DEVIATION FROM TEST STANDARD

No deviation

6.6 TEST SETUP LAYOUT



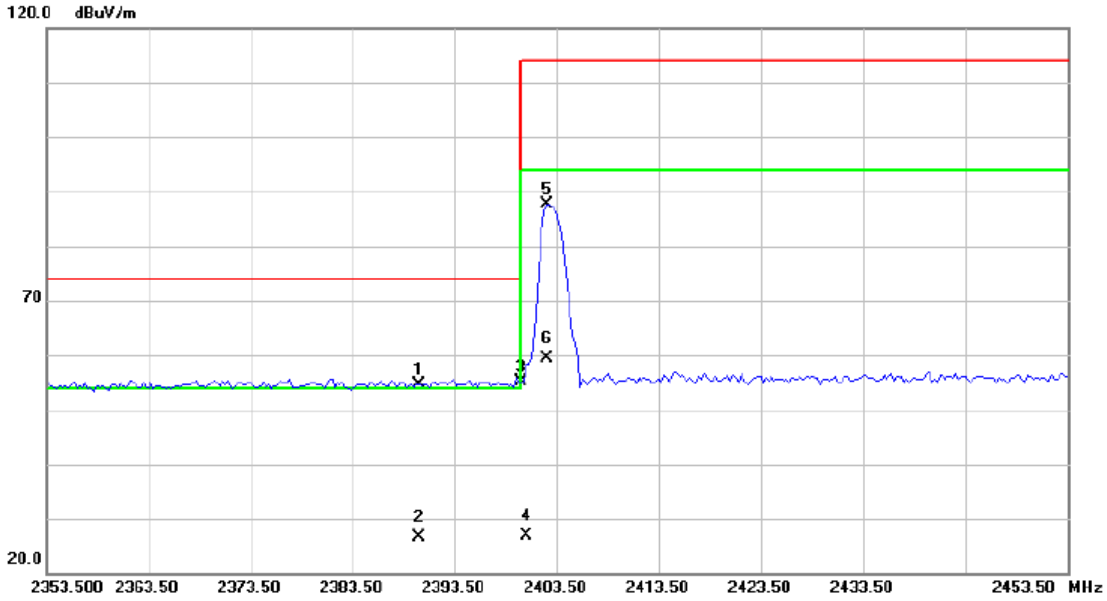
6.7 EUT OPERATING CONDITIONS

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.

6.8 TEST RESULTS

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2403 MHz		

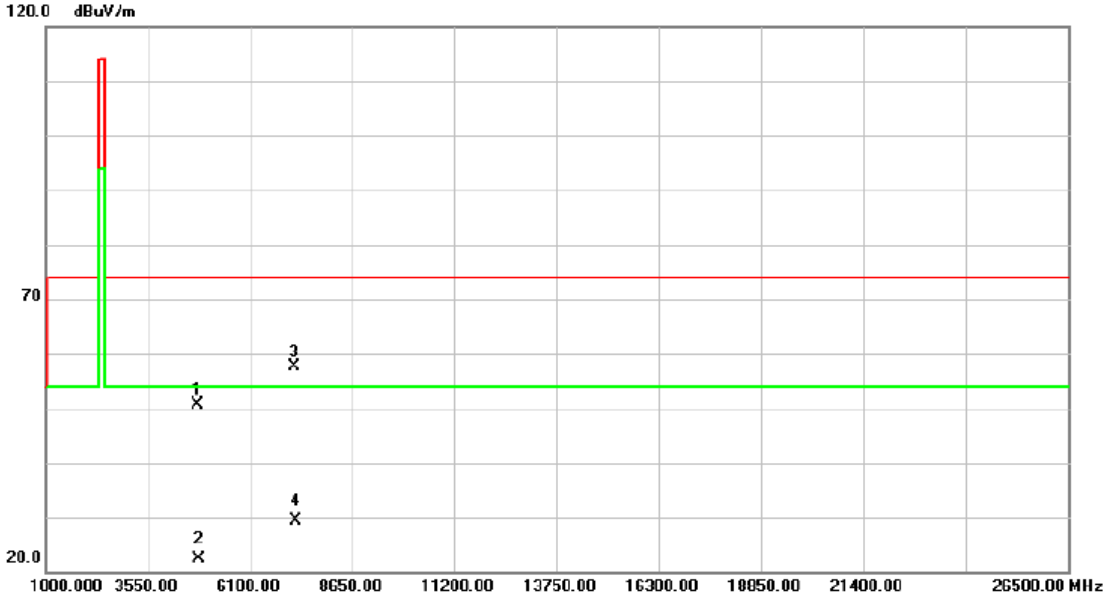
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.71	31.02	54.73	74.00	-19.27	peak	
2		2390.000	-4.48	31.02	26.54	54.00	-27.46	AVG	
3	*	2400.000	24.05	31.07	55.12	74.00	-18.88	peak	No Limit
4		2400.000	-4.14	31.07	26.93	54.00	-27.07	AVG	No Limit
5		2402.500	56.50	31.08	87.58	114.0	-26.42	peak	
6		2402.500	28.31	31.08	59.39	94.00	-34.61	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2403 MHz		

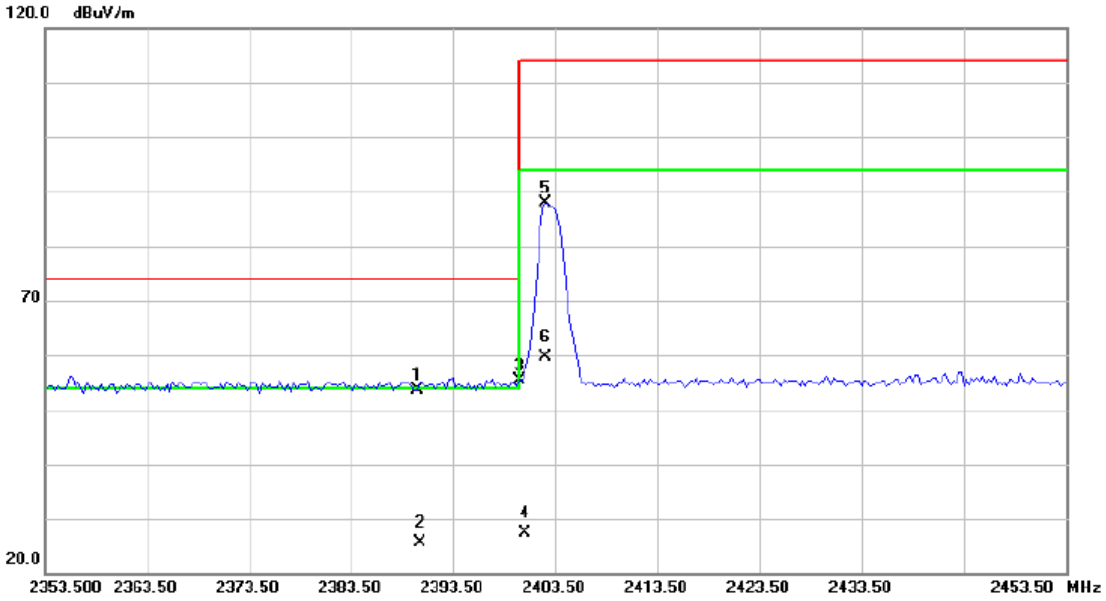
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4806.290	43.82	6.78	50.60	74.00	-23.40	peak	
2		4806.290	15.63	6.78	22.41	54.00	-31.59	AVG	
3	*	7209.020	42.61	15.03	57.64	74.00	-16.36	peak	
4		7209.020	14.42	15.03	29.45	54.00	-24.55	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2403 MHz		

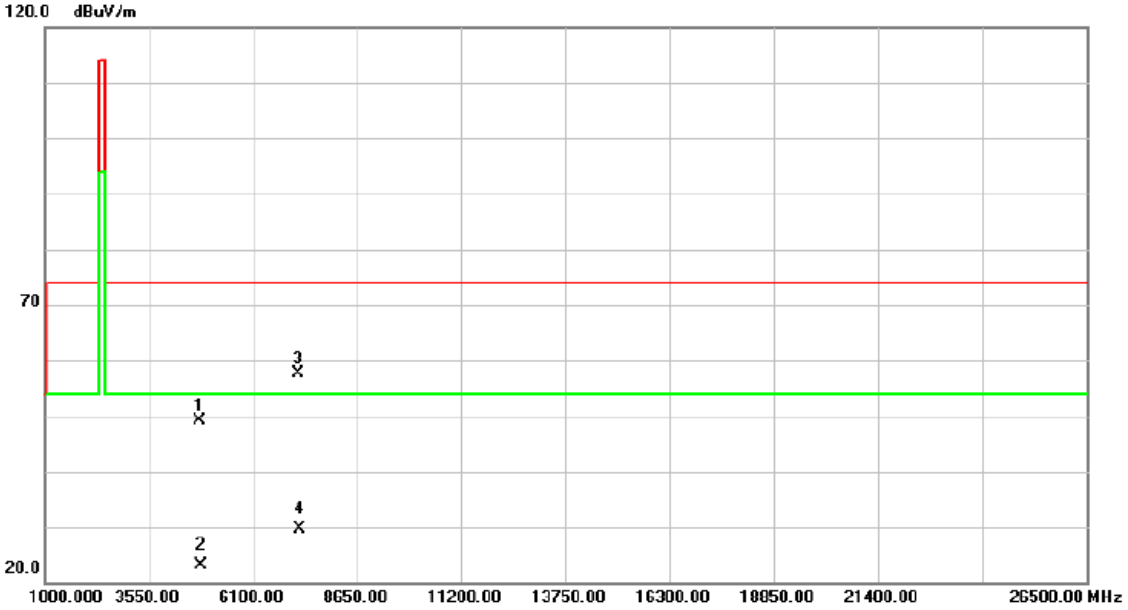
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.69	31.02	53.71	74.00	-20.29	peak	
2		2390.000	-5.50	31.02	25.52	54.00	-28.48	AVG	
3	*	2400.000	24.43	31.07	55.50	74.00	-18.50	peak	No Limit
4		2400.000	-3.76	31.07	27.31	54.00	-26.69	AVG	No Limit
5		2402.500	56.83	31.08	87.91	114.0	-26.09	peak	
6		2402.500	28.64	31.08	59.72	94.00	-34.28	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2403 MHz		

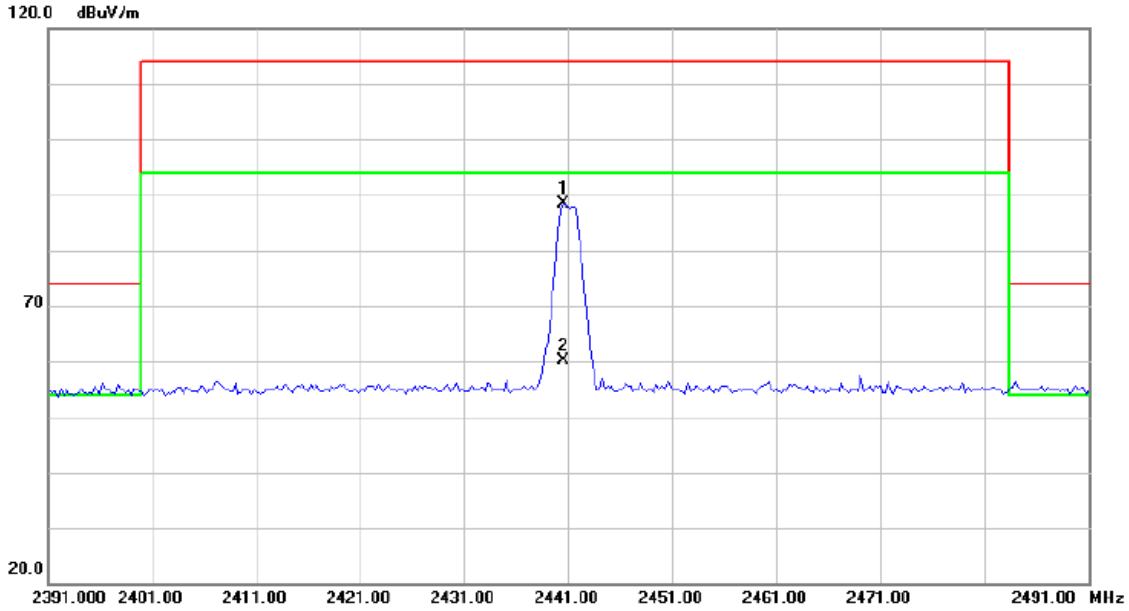
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4806.020	42.47	6.78	49.25	74.00	-24.75	peak	
2		4806.020	16.28	6.78	23.06	54.00	-30.94	AVG	
3	*	7209.035	42.71	15.03	57.74	74.00	-16.26	peak	
4		7209.035	14.52	15.03	29.55	54.00	-24.45	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 MHz		

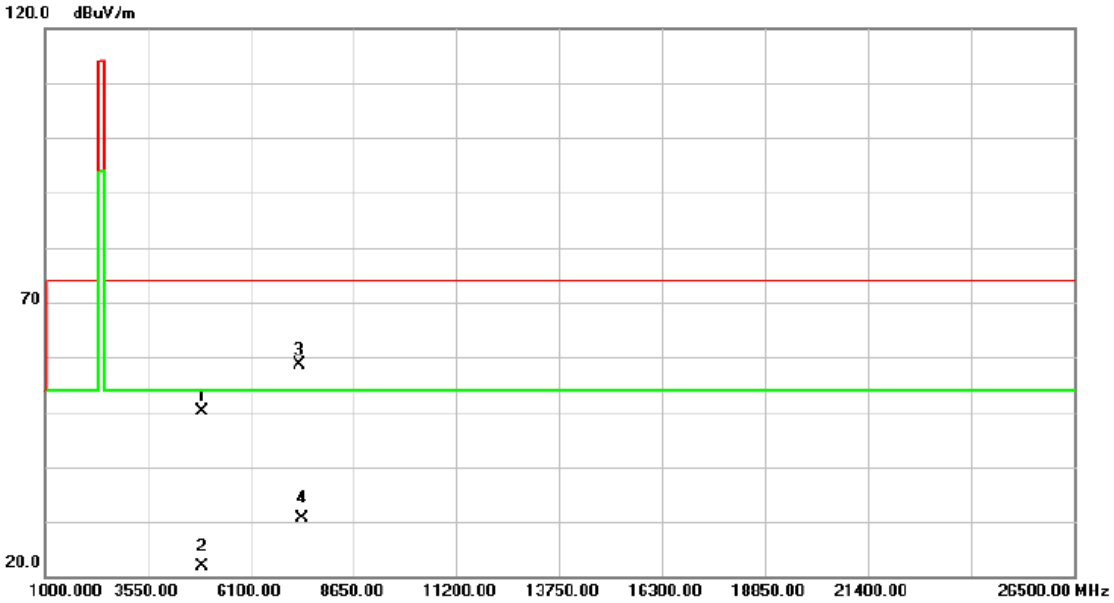
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2440.500	57.10	31.26	88.36	114.0	-25.64	peak	No Limit
2		2440.500	28.93	31.26	60.19	114.0	-53.81	peak	No Limit

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 MHz		

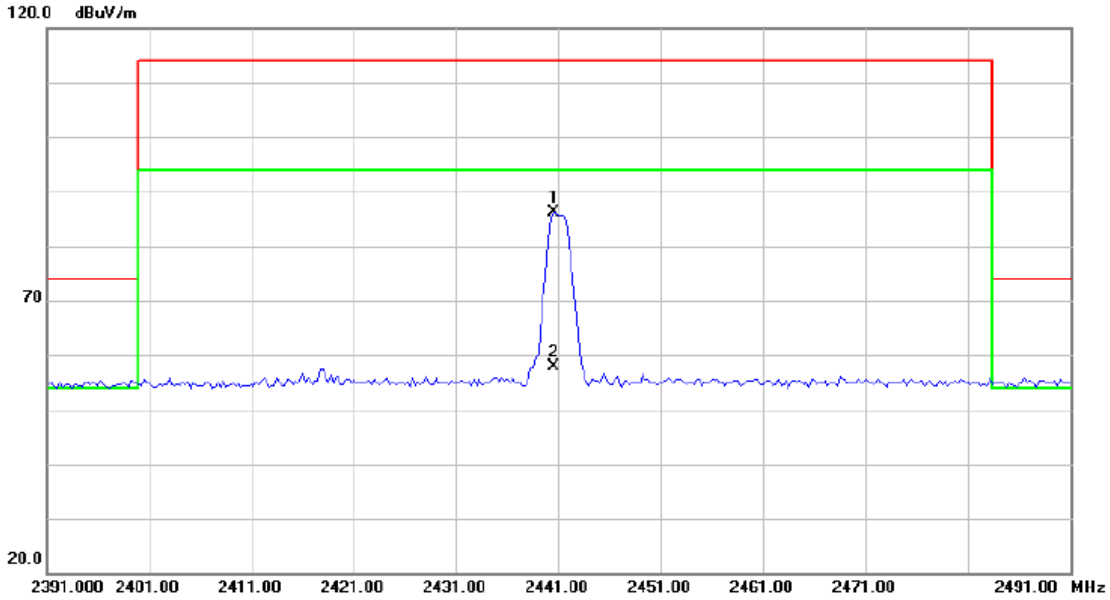
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4881.680	43.26	6.77	50.03	74.00	-23.97	peak	
2		4881.680	15.07	6.77	21.84	54.00	-32.16	AVG	
3	*	7322.665	43.06	15.65	58.71	74.00	-15.29	peak	
4		7322.665	14.87	15.65	30.52	54.00	-23.48	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 MHz		

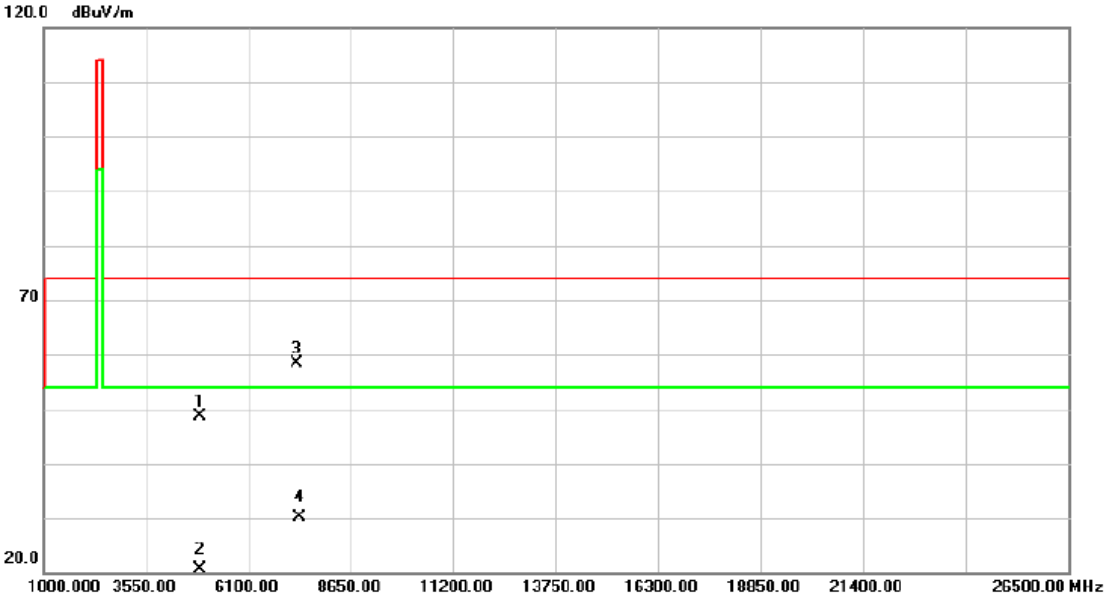
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2440.500	54.91	31.26	86.17	114.0	-27.83	peak	No Limit
2		2440.500	26.72	31.26	57.98	114.0	-56.02	peak	No Limit

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2441 MHz		

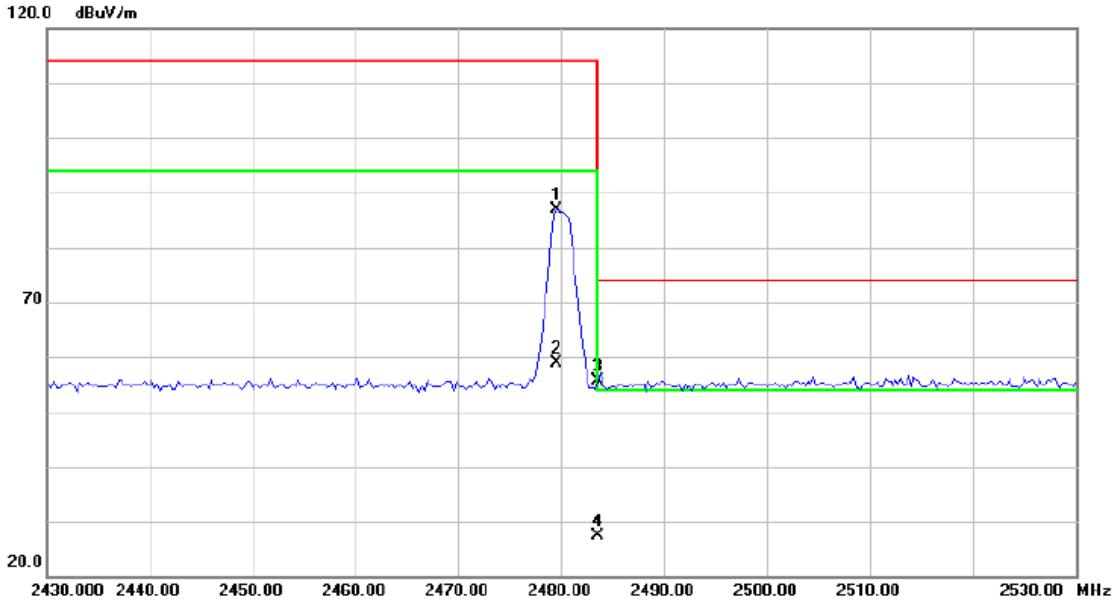
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4881.975	41.78	6.77	48.55	74.00	-25.45	peak	
2		4881.975	13.96	6.77	20.73	54.00	-33.27	AVG	
3	*	7323.120	42.66	15.65	58.31	74.00	-15.69	peak	
4		7323.120	14.47	15.65	30.12	54.00	-23.88	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2480 MHz		

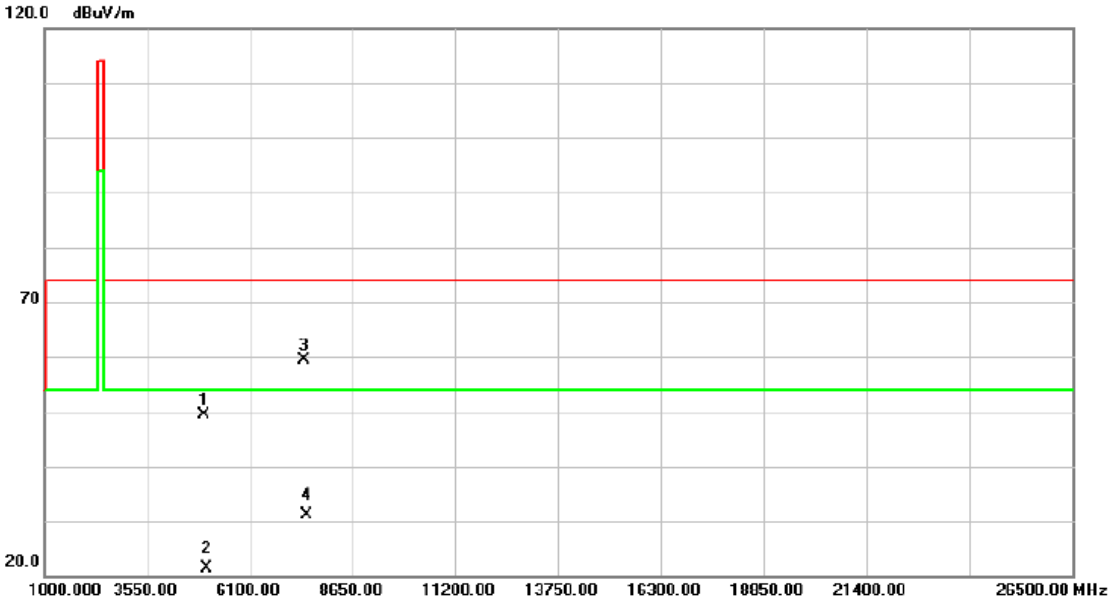
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2479.500	55.51	31.44	86.95	114.0	-27.05	peak	No Limit
2		2479.500	27.32	31.44	58.76	114.0	-55.24	peak	No Limit
3	*	2483.500	24.09	31.46	55.55	74.00	-18.45	peak	
4		2483.500	-4.10	31.46	27.36	74.00	-46.64	peak	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2480 MHz		

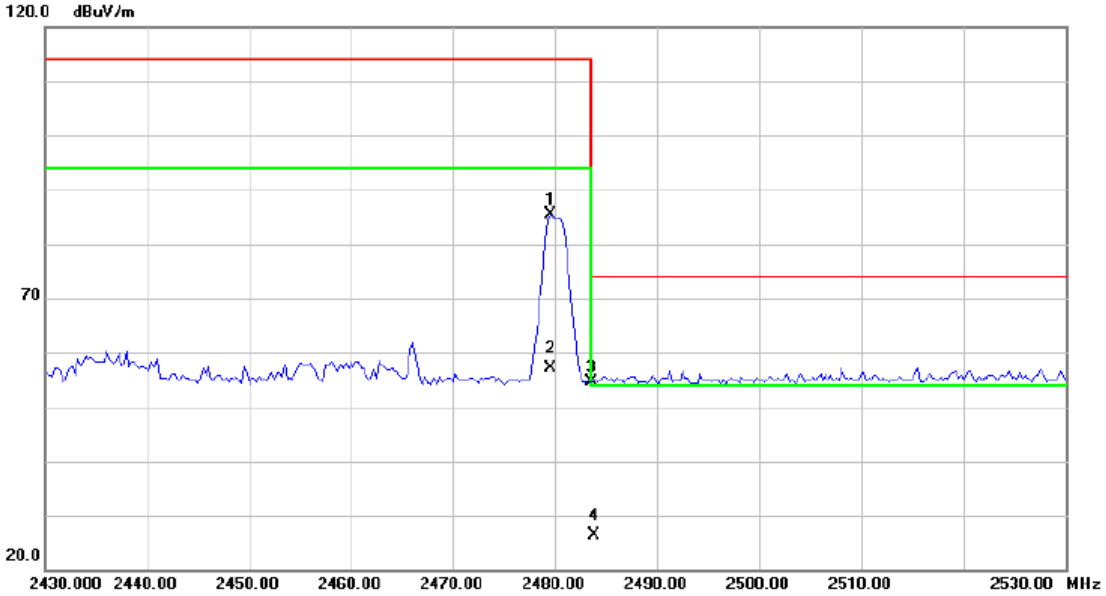
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.005	42.74	6.76	49.50	74.00	-24.50	peak	
2		4960.005	14.55	6.76	21.31	54.00	-32.69	AVG	
3	*	7440.005	43.08	16.28	59.36	74.00	-14.64	peak	
4		7440.005	14.89	16.28	31.17	54.00	-22.83	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2480 MHz		

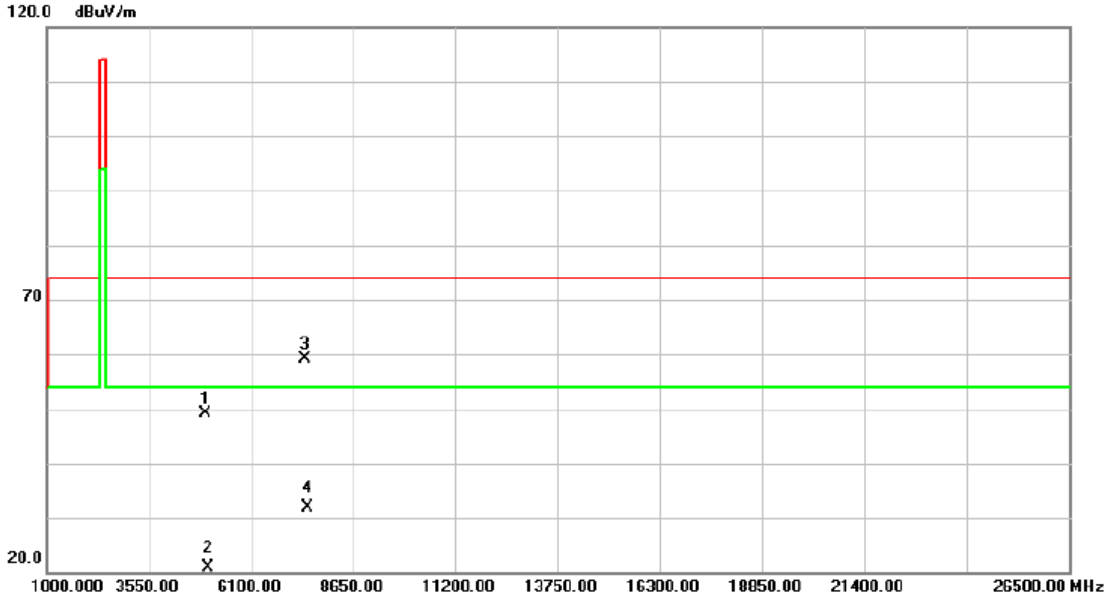
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2479.500	53.91	31.44	85.35	114.0	-28.65	peak	No Limit
2		2479.500	25.71	31.44	57.15	94.00	-36.85	AVG	No Limit
3	*	2483.500	23.07	31.46	54.53	74.00	-19.47	peak	
4		2483.500	-5.11	31.46	26.35	54.00	-27.65	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2480 MHz		

Polarization: Horizontal

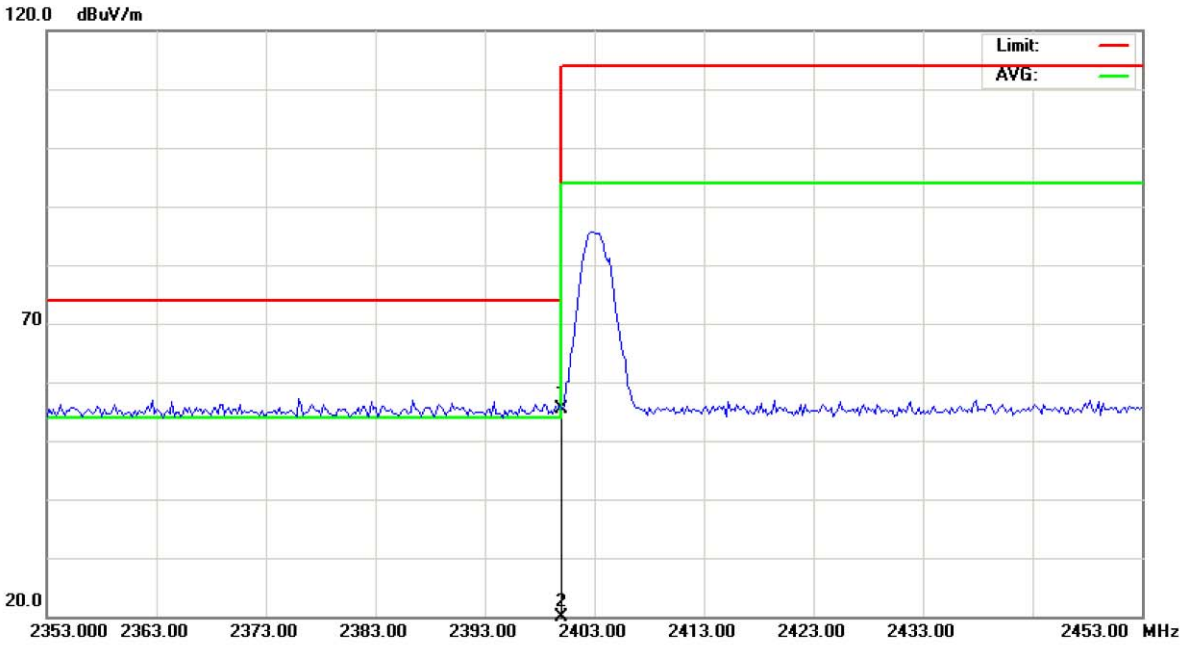


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.060	42.46	6.76	49.22	74.00	-24.78	peak	
2		4960.060	14.04	6.76	20.80	54.00	-33.20	AVG	
3	*	7439.980	42.75	16.28	59.03	74.00	-14.97	peak	
4		7439.980	15.56	16.28	31.84	54.00	-22.16	AVG	

6.9 TEST RESULTS (RESTRICTED BANDS)

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2403 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

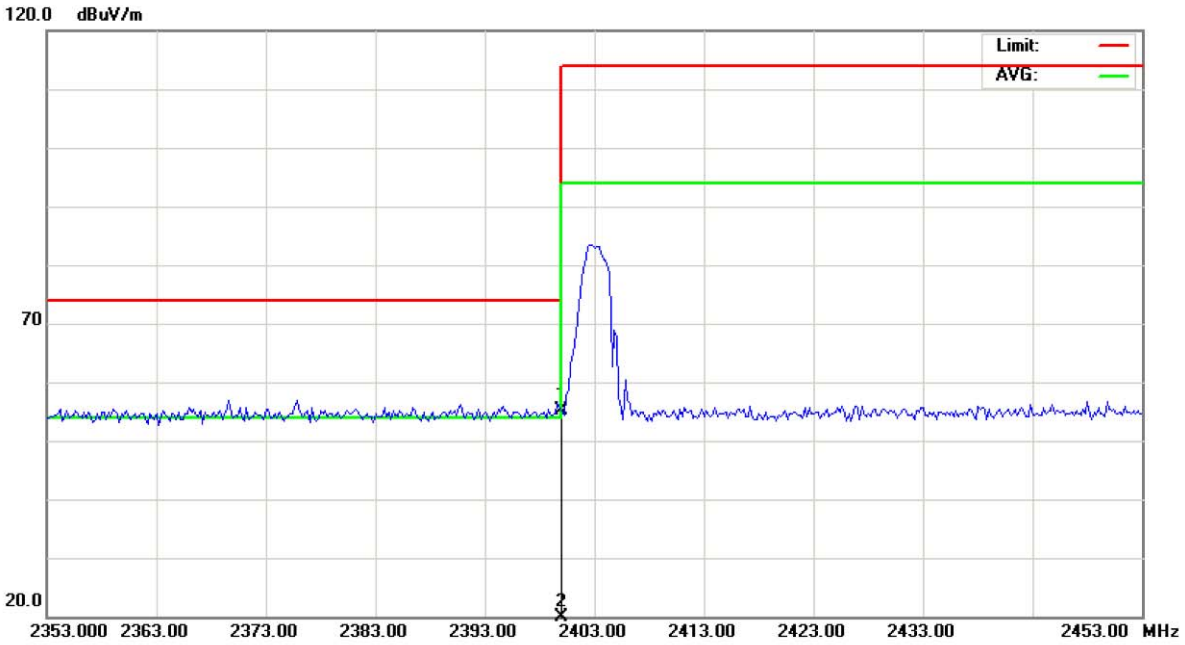
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2400.000	22.21	33.05	55.26	74.00	-18.74	peak	
2		2400.000	-13.50	33.05	19.55	54.00	-34.45	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2403 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

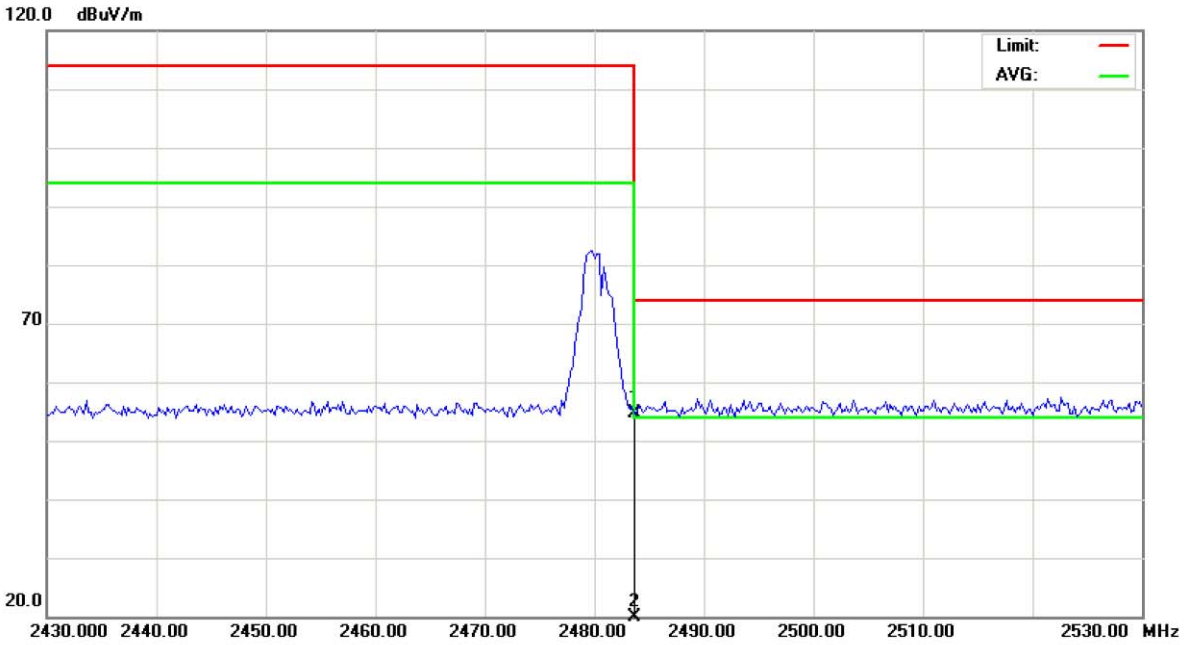
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2400.000	22.01	33.05	55.06	74.00	-18.94	peak	
2		2400.000	-13.70	33.05	19.35	54.00	-34.65	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2480 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

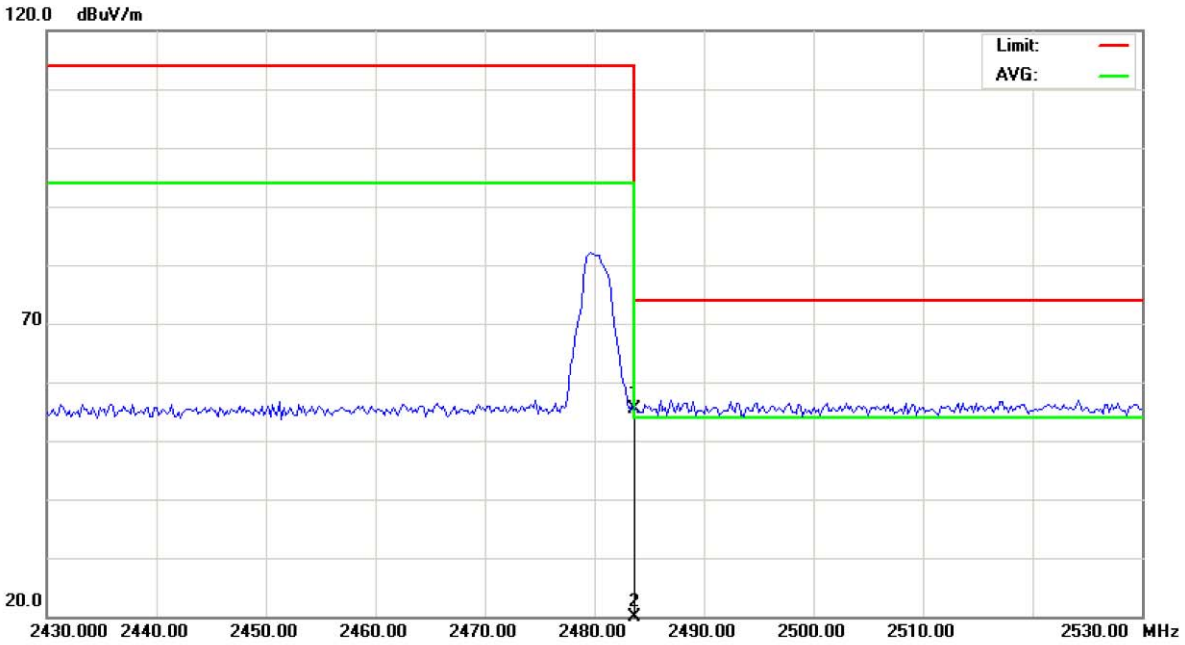
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	21.10	33.50	54.60	74.00	-19.40	peak	
2		2483.500	-14.71	33.50	18.79	54.00	-35.21	AVG	

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2480 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

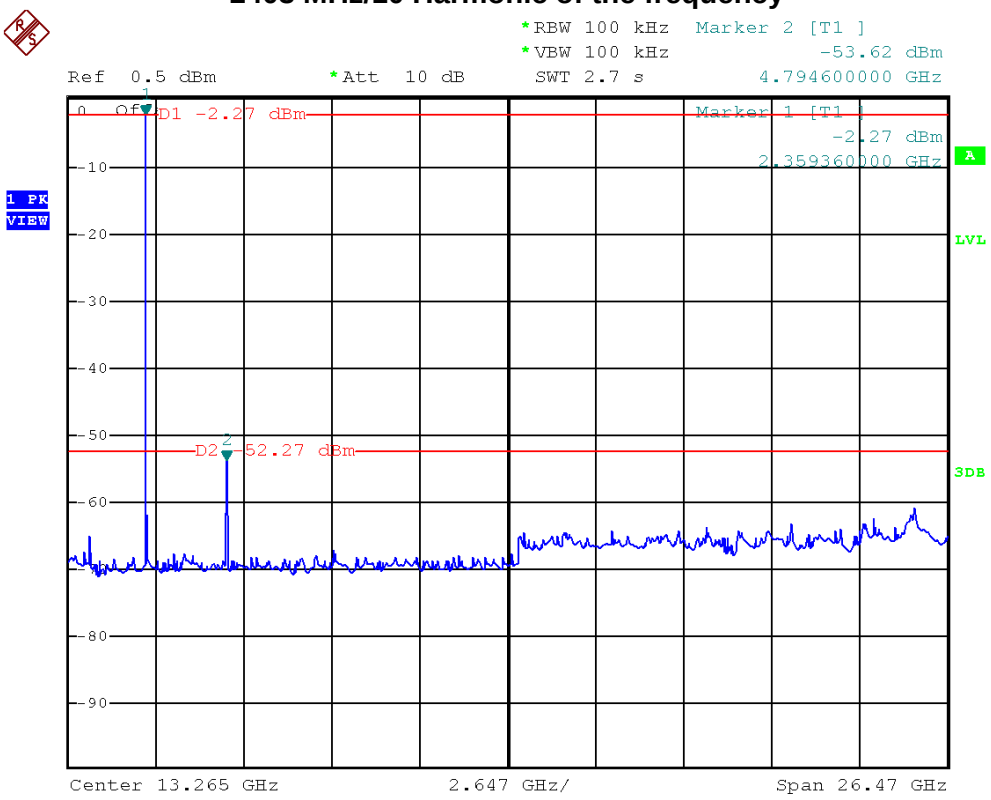


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2483.500	21.84	33.50	55.34	74.00	-18.66	peak	
2		2483.500	-13.87	33.50	19.63	54.00	-34.37	AVG	

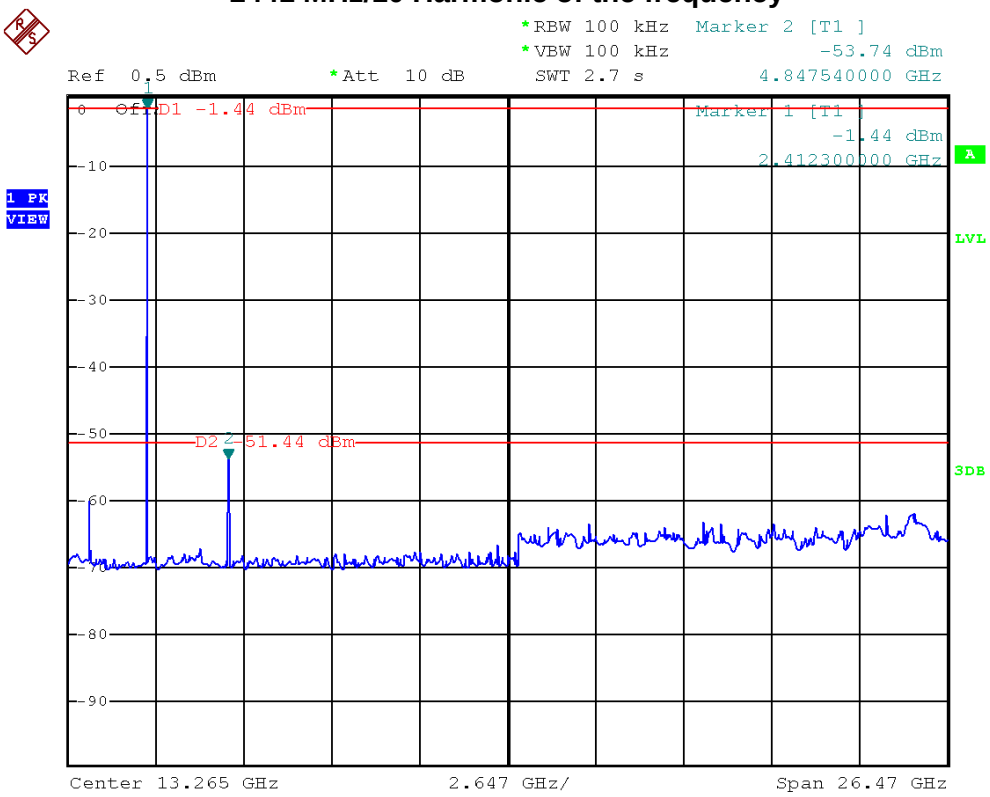
6.10TEST RESULTS - THE TENTH HARMONIC

E.U.T	2.4GHz Dongle	Model Name	SD-9086
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz (System)		
Test Mode	2407 MHz/2441 MHz/2473 MHz		

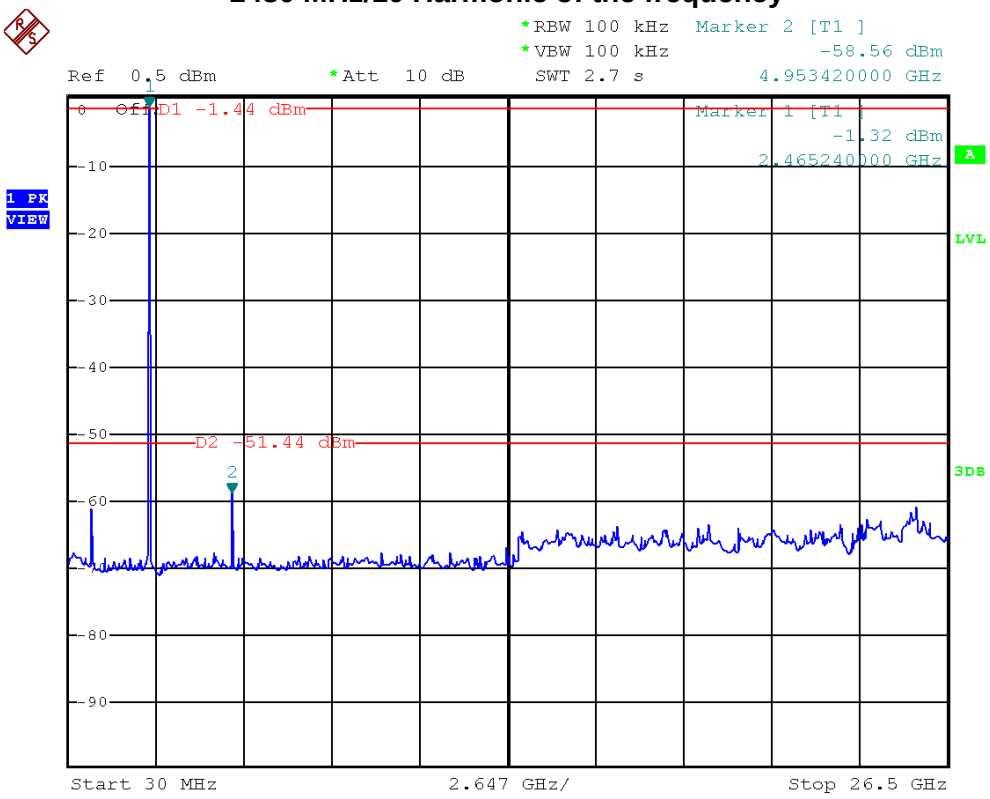
2403 MHz/10 Harmonic of the frequency



2441 MHz/10 Harmonic of the frequency

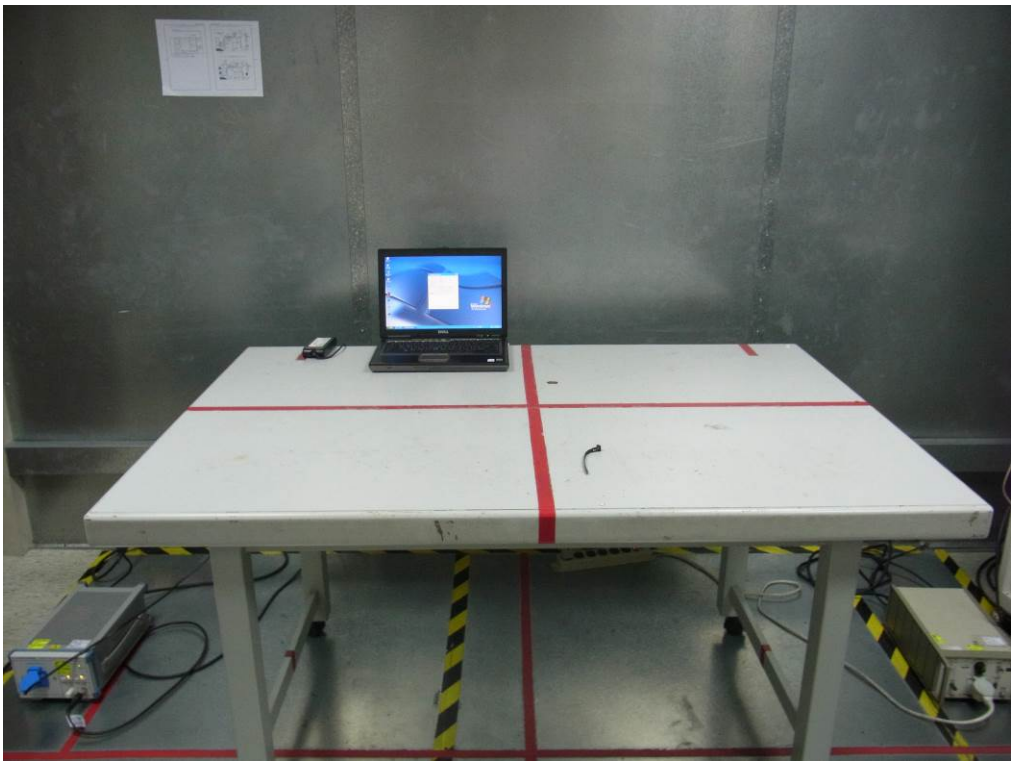


2480 MHz/10 Harmonic of the frequency

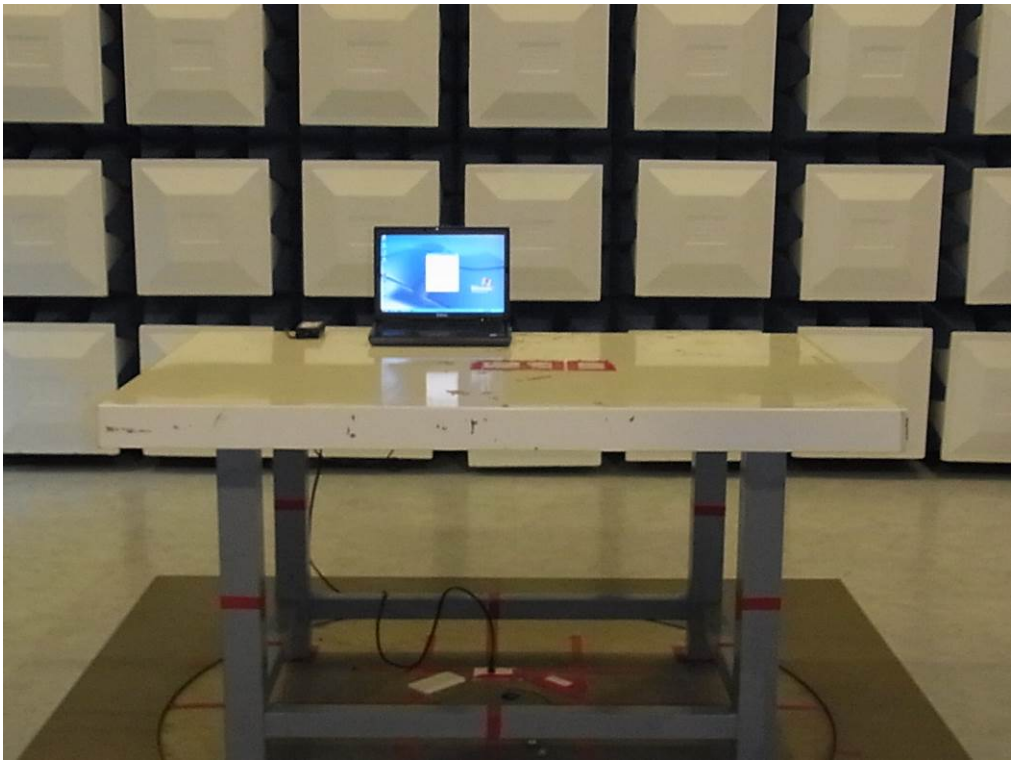


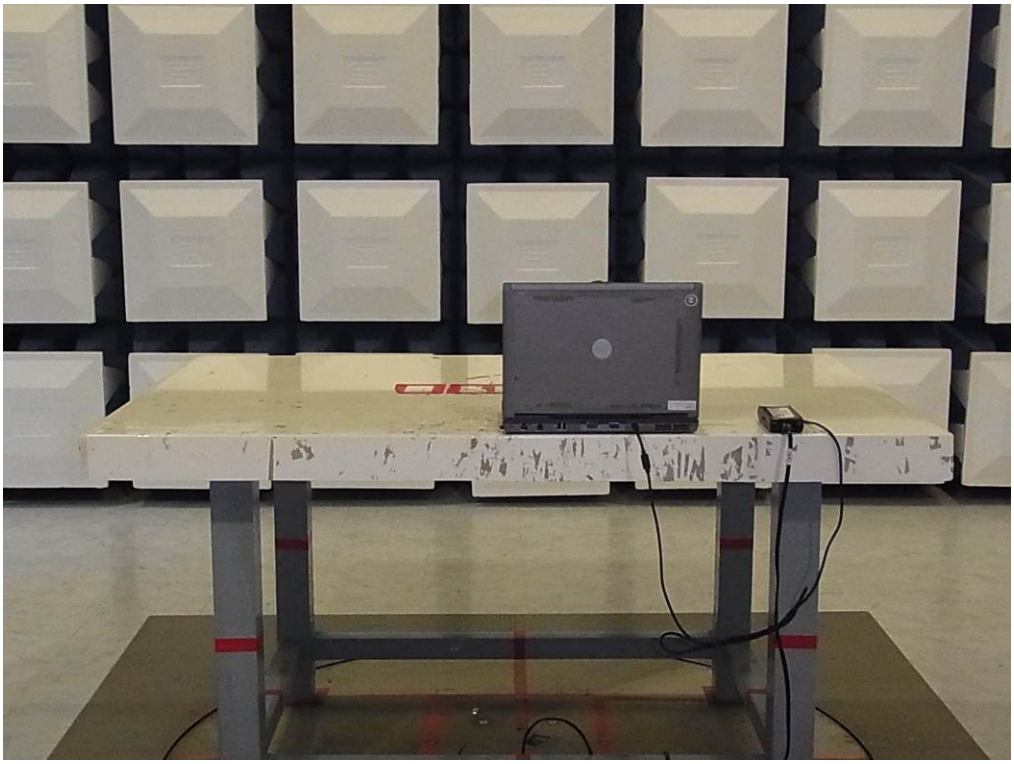
7 EUT TEST PHOTO

Conducted emission test photos



Radiated spurious emission test photos





Radiated spurious emission test photos