

FCC Test Report

Client Information:

Applicant: Aurum Electronics Corp.
Applicant add.: No.160, Dayong Rd., Tainan Hsien Yongkang City, Taiwan

EUT Information:

EUT Name: THE INTELLIGENT MOTION SENSOR TRACKING LIGHT
Model No.: AEC-9336CU
Brand Name: N/A

Prepared By:

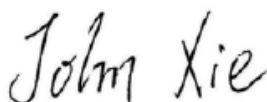
Asia Institute Technology (Dongguan) Limited
Add. : No.6 Binhe Road, Tianxin Village, Huangjiang,
Dongguan, Guangdong, China.
Date of Receipt: Sep. 20, 2009 Date of Test: Nov. 10 ~ 15, 2009
Date of Issue: Nov. 16, 2009 Test Result: **Pass**

Test procedure used: ANSI C63.4-2003

This device described above has been tested by Asia Institute Technology (Dongguan) Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

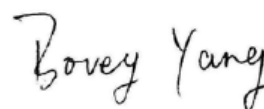
*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Reviewed by:



Test director

Approved by:



Technical director

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2 Test Summary

2.1 Compliance with FCC Part 15 subpart C

Test	Test Requirement	Standard Paragraph	Result
Antenna requirement	FCC Part 15 C:2008	Section 15.203	PASS
Conduction Emissions	FCC Part 15 C:2008	Section 15.249	N/A
Radiated Emissions	FCC Part 15 C:2008	Section 15.249(a) Section 15.249(d)	PASS
Band edges	FCC Part 15 C:2008	Section 15.249(d)	PASS
Occupied Bandwidth	FCC Part 15 C:2008	Section 15.215	PASS

2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, The following measurements uncertainty Level have estimated based on ANSI C63.4:2003, the maximum value of the uncertainty as below

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	Radiated Emission Test	$\pm 3.57\text{dB}$

3 Test Facility

The test facility is recognized, certified or accredited by the following organizations:

.FCC- Registration No: 248337

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dong guan) Limited have been registered by Federal Communications Commission (FCC) on Dec.07, 2006.

.Industry Canada(IC)-Registration No: IC6819A-1 & IC6819A-2

The 3m Semi-Anechoic Chamber and 3m/10m Open Area Test Site of Asia Institute Technology (Dongguan) Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Nov.07, 2006.

.VCCI- Registration No: R-2482 & C-2730

The 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dongguan) Limited have been registered by Voluntary Control Council for Interference on Jan.24, 2007.

.TUV Rhineland

Asia Institute Technology (Dongguan) Limited has been assessed on Jan.16, 2007 that it can carry out EMC tests by order and under supervision of TUV Rhineland.

.ITS- Registration No: TMPSHA031

Asia Institute Technology (Dongguan) Limited has been assessed and included in Intertek Shanghai TMP Program regarding Laboratory facilities and test equipment on Nov.10, 2006.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

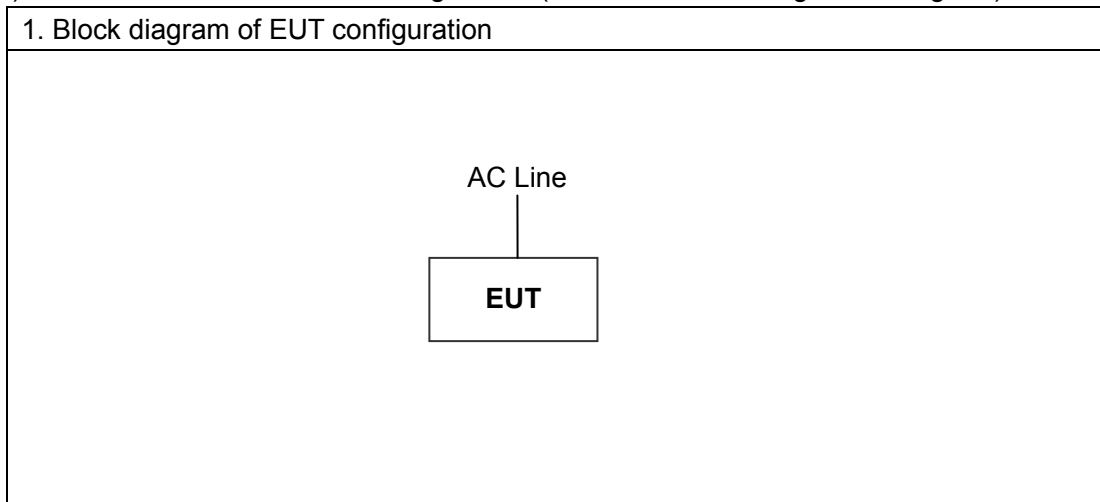
4 General Information

4.1 General Description of EUT

Manufacturer:		Aurum(HK) CO., LTD.					
Manufacturer Address:		4th industrial area, Her-Shoei-Kou, Gong-Ming Street, Guangming Xin District, Shenzhen City, Guangdong Province, China					
EUT Name:		THE INTELLIGENT MOTION SENSOR TRACKING LIGHT					
Model No:		AEC-9336CU					
Operation frequency:		2402 MHz to 2478MHz					
Channel Number:		N/A					
Modulation Technology:		GFSK					
Antenna Type:		extended wire lay on PCB					
Brand Name:		N/A					
Serial No:		N/A					
Power Supply Range:		AC 120V/ 60Hz					
Power Supply:		AC 120V/ 60Hz					
Power Cord:		N/A					
Model description: N/A							
Description of Channel:							
channel	Frequency (MHz)	channel	Frequency (MHz)	channel	Frequency (MHz)	channel	Frequency (MHz)
1	2402	11	2422	21	2442	31	2462
2	2404	12	2424	22	2444	32	2464
3	2406	13	2426	23	2446	33	2466
4	2408	14	2428	24	2448	34	2468
5	2410	15	2430	25	2450	35	2470
6	2412	16	2432	26	2452	36	2472
7	2414	17	2434	27	2454	37	2474
8	2416	18	2436	28	2456	38	2476
9	2418	19	2438	29	2458	39	2478
10	2420	20	2440	30	2460		

4.2 Description of Test conditions

- (1) EUT was tested in normal configuration (Please See following Block diagram)



- (2) E.U.T. test conditions:

15.31(e): For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

- (3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required. Reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

- (4) Frequency range of radiated measurements:

According to the 15.33, the test range will be up to the tenth harmonic of the highest fundamental frequency

4.3 Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A

5 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2009.04.17	2010.04.16
2	EMI Measuring Receiver	Schaffner	SCR3501	235	2009.04.08	2010.04.07
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2009.09.08	2010.03.07
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2009.04.08	2010.04.07
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2009.07.15	2010.07.14
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120A	451	2009.07.15	2010.07.14
7	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2009.09.08	2010.03.07
8	EMI Test Receiver	R&S	ESCI	100124	2008.12.29	2009.12.28
9	LISN	Kyoritsu	KNW-242	8-837-4	2009.04.08	2010.04.07
10	LISN	Kyoritsu	KNW-407	8-1789-3	2009.04.08	2010.04.07
11	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2009.09.08	2010.03.07

6 Test Result

6.1 Antenna requirement

6.1.1 Standard requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

6.1.2 EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement.

6.2 Conduction Emissions Measurement

6.2.1 limit

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency.

6.2.2 Test procedure

EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

6.2.3 Test result

Cause the EUT only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices

6.3 Radiated Emissions Measurement

6.3.1 Limit

Fcc part15.249 (a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency of Emission (MHz)	Field Strength of fundamental (dB μ V/m)	Field Strength of Harmonics(dB μ V/m)
902-928	94	54
2400-2483.5	94	54
5725-5875	94	54
24000-24250	108	68

Note: Field strength limits are specified at a distance of 3 meters. the above field strength limits in paragraphs of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Fcc part15.249 (d)Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Frequency of Emission (MHz)	Field Strength		Measurement Distance (meters)
	μ V/m	dB μ V/m	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

6.3.2 Test procedure

EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

6.3.3 Test Result

Test Data: 2009-11-10

Frequency Range: 30MHz to 1GHz

RBW/VBW: 100KHz/300KHz for spectrum, RBW=120KHz for receiver

Measurement Distance: 3 m

Operating Environment: 25.3°C, 58% RH, 102 Kpa

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBUV)	Measure Level (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Detector Type
124.090	14.690	16.958	31.648	-11.852	43.500	QUASIPeAK
256.980	15.680	12.334	28.014	-17.986	46.000	QUASIPeAK
375.320	19.170	10.733	29.903	-16.097	46.000	QUASIPeAK
431.580	20.750	10.891	31.641	-14.359	46.000	QUASIPeAK
*450.010	21.230	13.706	34.936	-11.064	46.000	QUASIPeAK
975.750	30.160	11.522	41.682	-12.318	54.000	QUASIPeAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBUV)	Measure Level (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Detector Type
*78.500	11.000	18.701	29.701	-10.299	40.000	QUASIPeAK
119.240	14.320	13.373	27.693	-15.807	43.500	QUASIPeAK
450.010	21.230	9.581	30.811	-15.189	46.000	QUASIPeAK
524.700	22.740	6.442	29.182	-16.818	46.000	QUASIPeAK
675.050	25.840	3.140	28.980	-17.020	46.000	QUASIPeAK
975.750	30.160	10.037	40.197	-13.803	54.000	QUASIPeAK

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Test Data: 2009-11-15

Frequency Range: 1GHz to 25GHz

RBW/VBW: 1MHz/1MHz for Peak, 1MHz/10Hz for Average

Measurement Distance: 3 m

Operating Environment: 20.5°C, 58% RH, 102 Kpa

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1201.000	29.280	28.075	57.355	-16.645	74.000	PEAK
*1201.000	29.284	13.293	42.577	-11.423	54.000	AVERAGE
1580.000	29.923	16.379	46.302	-27.698	74.000	PEAK
1725.000	30.651	12.703	43.354	-30.646	74.000	PEAK
2025.000	31.822	18.260	50.082	-23.918	74.000	PEAK
2402.000	33.897	66.450	100.347	-13.653	114.000	PEAK
2402.000	33.903	47.152	81.055	-12.945	94.000	AVERAGE
2995.000	35.795	11.496	47.291	-26.709	74.000	PEAK
4945.000	40.255	5.583	45.838	-28.162	74.000	PEAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1201.000	29.280	28.309	57.589	-16.411	74.000	PEAK
*1201.000	29.284	15.783	45.067	-8.933	54.000	AVERAGE
1580.000	29.923	15.356	45.279	-28.721	74.000	PEAK
1875.000	31.318	13.949	45.267	-28.733	74.000	PEAK
2025.000	31.822	20.190	52.012	-21.988	74.000	PEAK
2402.000	33.897	66.130	100.027	-13.973	114.000	PEAK
2402.000	33.903	47.372	81.275	-12.725	94.000	AVERAGE
4804.000	40.010	2.318	42.328	-31.672	74.000	PEAK

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor = Ant Factor + Cable Loss

Low Channel: 2402 MHz

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1220.000	29.329	31.090	60.419	-13.581	74.000	PEAK
1220.000	29.337	22.530	51.867	-2.133	54.000	AVERAGE
1495.000	29.915	19.007	48.922	-25.078	74.000	PEAK
1905.000	31.398	20.293	51.691	-22.309	74.000	PEAK
2055.000	31.997	26.197	58.194	-15.806	74.000	PEAK
*2058.000	32.013	20.099	52.112	-1.888	54.000	AVERAGE
2440.000	34.010	73.559	107.569	-6.431	114.000	PEAK
2440.000	34.010	55.200	89.210	-4.790	94.000	AVERAGE
4880.000	40.137	3.055	43.192	-30.808	74.000	PEAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1220.000	29.337	28.612	57.949	-16.051	74.000	PEAK
*1220.000	29.337	16.050	45.387	-8.613	54.000	AVERAGE
1750.000	30.810	13.872	44.682	-29.318	74.000	PEAK
2055.000	31.997	19.057	51.054	-22.946	74.000	PEAK
2210.000	32.903	20.244	53.147	-20.853	74.000	PEAK
2440.000	34.010	66.130	100.140	-13.860	114.000	PEAK
2440.000	34.010	47.250	81.260	-12.740	94.000	AVERAGE
4880.000	40.137	2.649	42.786	-31.214	74.000	PEAK

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Middle Channel :2440 MHz

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1239.000	29.392	28.807	58.199	-15.801	74.000	PEAK
*1239.000	29.406	19.178	48.584	-5.416	54.000	AVERAGE
1380.000	29.863	14.292	44.155	-29.845	74.000	PEAK
1580.000	29.923	15.668	45.591	-28.409	74.000	PEAK
2090.000	32.203	17.411	49.614	-24.386	74.000	PEAK
2478.000	34.107	66.643	100.750	-13.250	114.000	PEAK
2478.000	34.117	47.212	81.329	-12.671	94.000	AVERAGE
2995.000	35.795	11.597	47.392	-26.608	74.000	PEAK
4956.000	40.273	4.729	45.002	-28.998	74.000	PEAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1239.000	29.392	30.517	59.909	-14.091	74.000	PEAK
*1239.000	29.406	21.898	51.304	-2.696	54.000	AVERAGE
1495.000	29.915	18.523	48.438	-25.562	74.000	PEAK
1935.000	31.487	20.161	51.648	-22.352	74.000	PEAK
2478.000	34.107	74.159	108.266	-5.734	114.000	PEAK
2478.000	34.117	56.812	90.929	-3.071	94.000	AVERAGE
2990.000	35.795	12.353	48.148	-25.852	74.000	PEAK
4955.000	40.272	6.528	46.800	-27.200	74.000	PEAK

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

High Channel :2478 MHz

6.4 Band edges

6.4.1 Limit

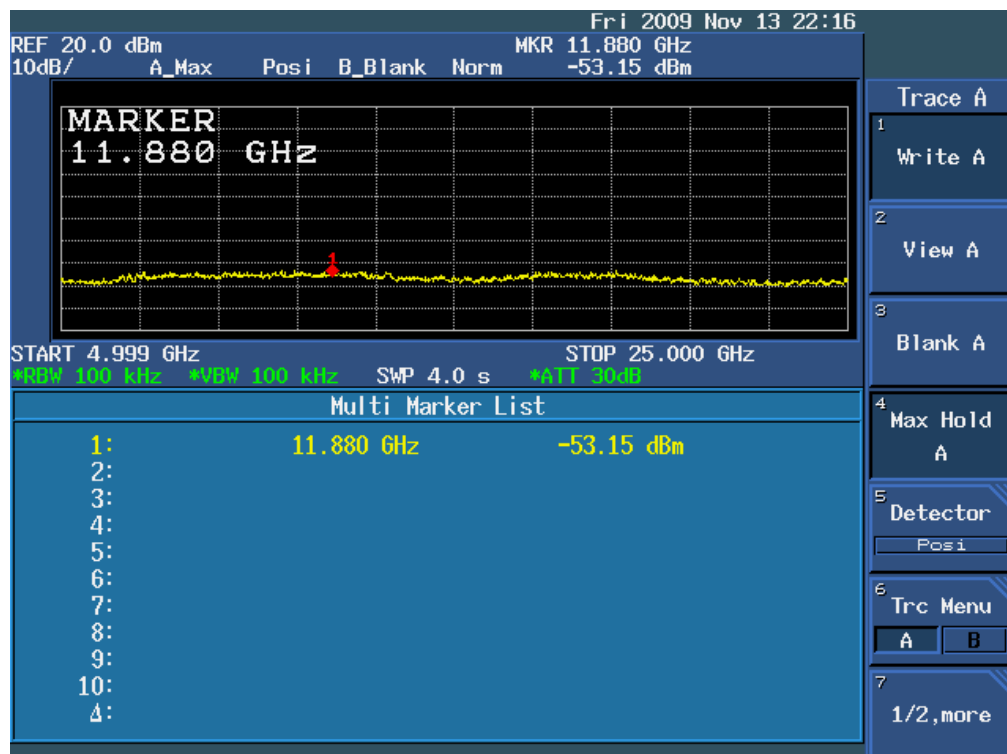
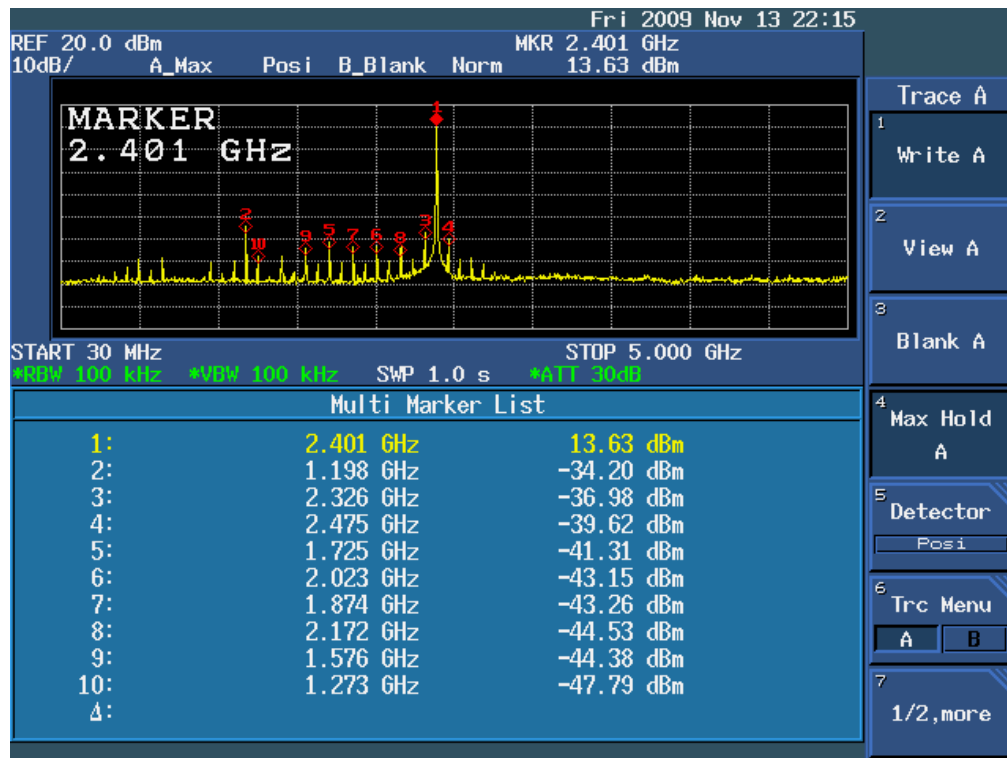
Fcc part15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

6.4.2 Test procedure

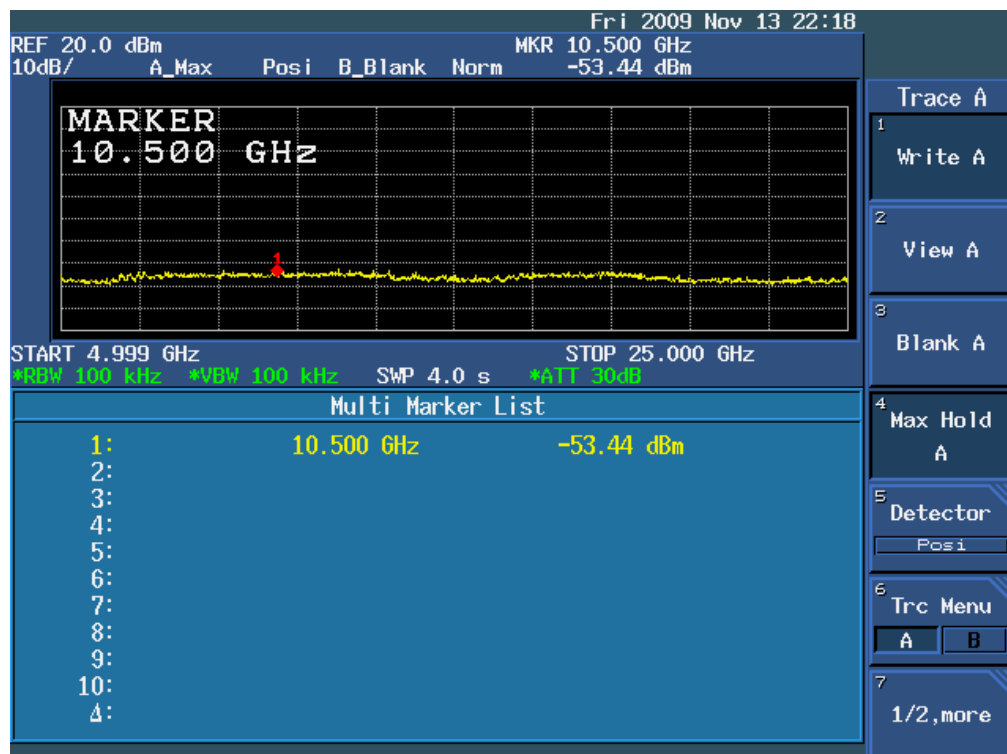
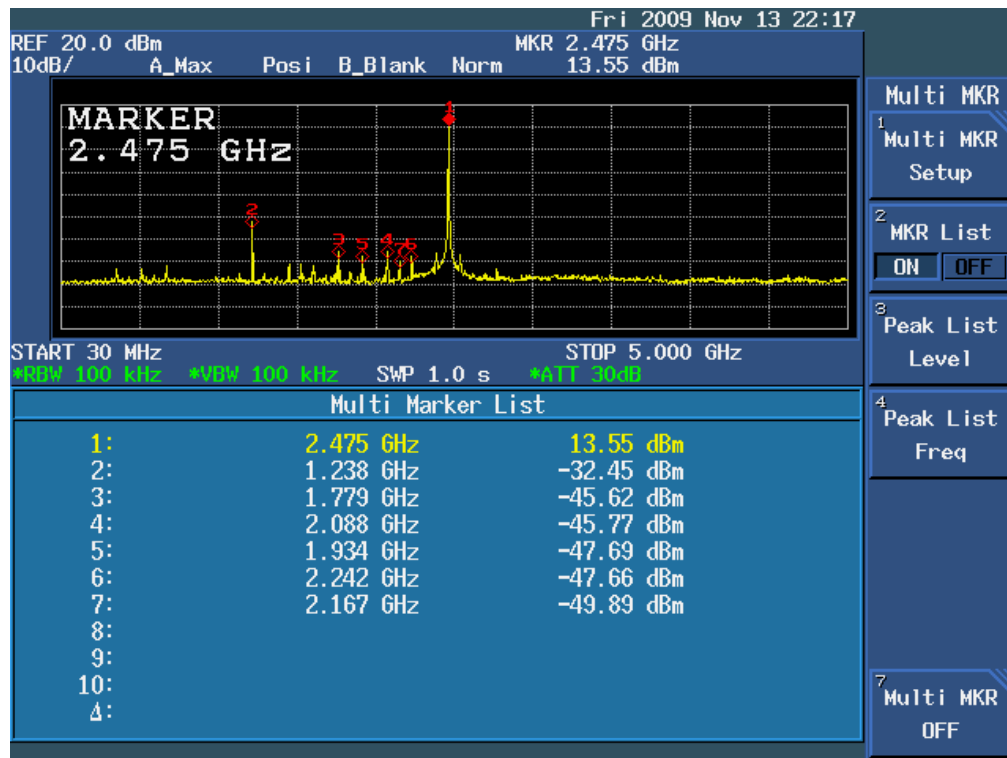
- (1) Connected the antenna port to the Spectrum Analyzer, set the Spectrum Analyzer as RBW=100KHz, VBW \geq RBW, Sweep time=Auto, Detector Function=Peak
- (2) The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.
- (3) The above procedure shall be repeated at the lowest, and the highest frequency of the stated frequency range.

6.4.3 Test Result

(1) Low Channel : 2.402GHz



(2) Highest Channel : 2.478 GHz



6.5 Occupied Bandwidth

6.5.1 Limit

Fcc part15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

6.5.2 Test procedure

- (1) Connected the antenna port to the Spectrum Analyzer , set the Spectrum Analyzer as RBW=100kHz,VBW \geq RBW,Sweep time=Auto, Detector Function=Peak
- (2) The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission.
- (3) The above procedure shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range with modulated mode. also shall be performed at different modes of operation

6.5.3 Test Result

channel	Channel frequency (MHz)	20dB bandwidth (MHz)	Limit (MHz)	Conclusion
Low	2402	2.97	N/A	Pass
Mid	2440	3.30	N/A	Pass
High	2478	2.36	N/A	Pass

(1) Low: 2402MHz



(2) Mid: 2440MHz



(3) High: 2478MHz

