Test Report

Product Name ： Seecode Vision

Model No. ： HF-920

FCC ID ： VUMVISION

Applicant ： Seecode Technology Ltd & Co KG

Address ： Rosrather Str. 333, 51107 Koln, Germany

Date of Receipt ： 2008/06/23

Issued Date ： 2008/07/31

Report No. ： 087S024-RF-US-P06V01

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by CNLA, NVLAP or any agency of the Government.

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Test Report Certification

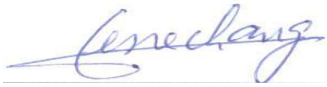
Issued Date : 2008/07/31
Report No. : 087S024-RF-US-P06V01

QuieTek

Product Name	:	Seecode Vision
Applicant	:	Seecode Technology Ltd & Co KG
Address	:	Rosrather Str. 333, 51107 Koln, Germany
Manufacturer	:	Shanghai Flaircomm Technologies Inc.
Address	:	No. 5, Bibo Road, Keyuan Building 4F, Zhangjiang Hi-Tech Park, Shanghai 201203 P.R. China
Model No.	:	HF-920
FCC ID	:	VUMVISION
EUT Voltage	:	DC 3.7V
Trade Name	:	Seecode
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C: 2007 ANSI C63.4: 2003
Test Result	:	Complied
Performed Location	:	SuZhou EMC laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392

Documented By : 
(Any Liu)

Reviewed By : 
(Dream Cao)

Approved By : 
(Gene Chang)

Laboratory Information

We , **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited by the following accreditation Bodies in compliance with ISO 17025, EN 45001 and Guide 25:

Taiwan R.O.C.	**:**	**BSMI, DGT, CNLA**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : http://tw.quietek.com/modules/myalbum/
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :
No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

NVLAP Lab Code : 200347-0
1313

LinKou Testing Laboratory :
No. 5, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
TEL : +886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

NVLAP Lab Code: 200533-0
0914

Suzhou Testing Laboratory :
No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

NVLAP Lab Code : 200743-0
1596

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1. General Information

1.1. EUT Description

Product Name	Seecode Vision
Trade Name	Seecode
Model No.	HF-920
FCC ID	VUMVISION
Working Voltage	DC 3.7V
Frequency Range	2402 - 2480 MHz
Channel Number	79
Type of Modulation	FHSS
Data Rate	723 kbps
Channel Control	Auto
Antenna Type	Trace Antenna
Antenna Gain	Refer to the “Antenna List”

Component	
Car Charger	Manufacturer: Shanghai Flaircomm Technologies Inc M/N: TTX-GC-196C Input: 12~24VDC Output: 5.0VDC, 500mA
USB Cable	Manufacturer: MORETHANALL(CHANGZHOU)ELECTRONICS CO.,LTD M/N: YK-C008-USB002

Bluetooth Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz	03	2405 MHz
04	2406 MHz	05	2407 MHz	06	2408 MHz	07	2409 MHz
08	2410 MHz	09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz	15	2417 MHz
16	2418 MHz	17	2419 MHz	18	2420 MHz	19	2421 MHz
20	2422 MHz	21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz	27	2429 MHz
28	2430 MHz	29	2431 MHz	30	2432 MHz	31	2433 MHz
32	2434 MHz	33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz	39	2441 MHz
40	2442 MHz	41	2443 MHz	42	2444 MHz	43	2445 MHz
44	2446 MHz	45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz	51	2453 MHz
52	2454 MHz	53	2455 MHz	54	2456 MHz	55	2457 MHz
56	2458 MHz	57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz	63	2465 MHz
64	2466 MHz	65	2467 MHz	66	2468 MHz	67	2469 MHz
68	2470 MHz	69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz	75	2477 MHz
76	2478 MHz	77	2479 MHz	78	2480 MHz	N/A	N/A

Antenna List

Antenna	Manufacturer	Model No.	Peak Gain
Bluetooth Antenna	Flaircomm Technologies Inc	BTHF920	0.54dBi for 2.4GHz

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

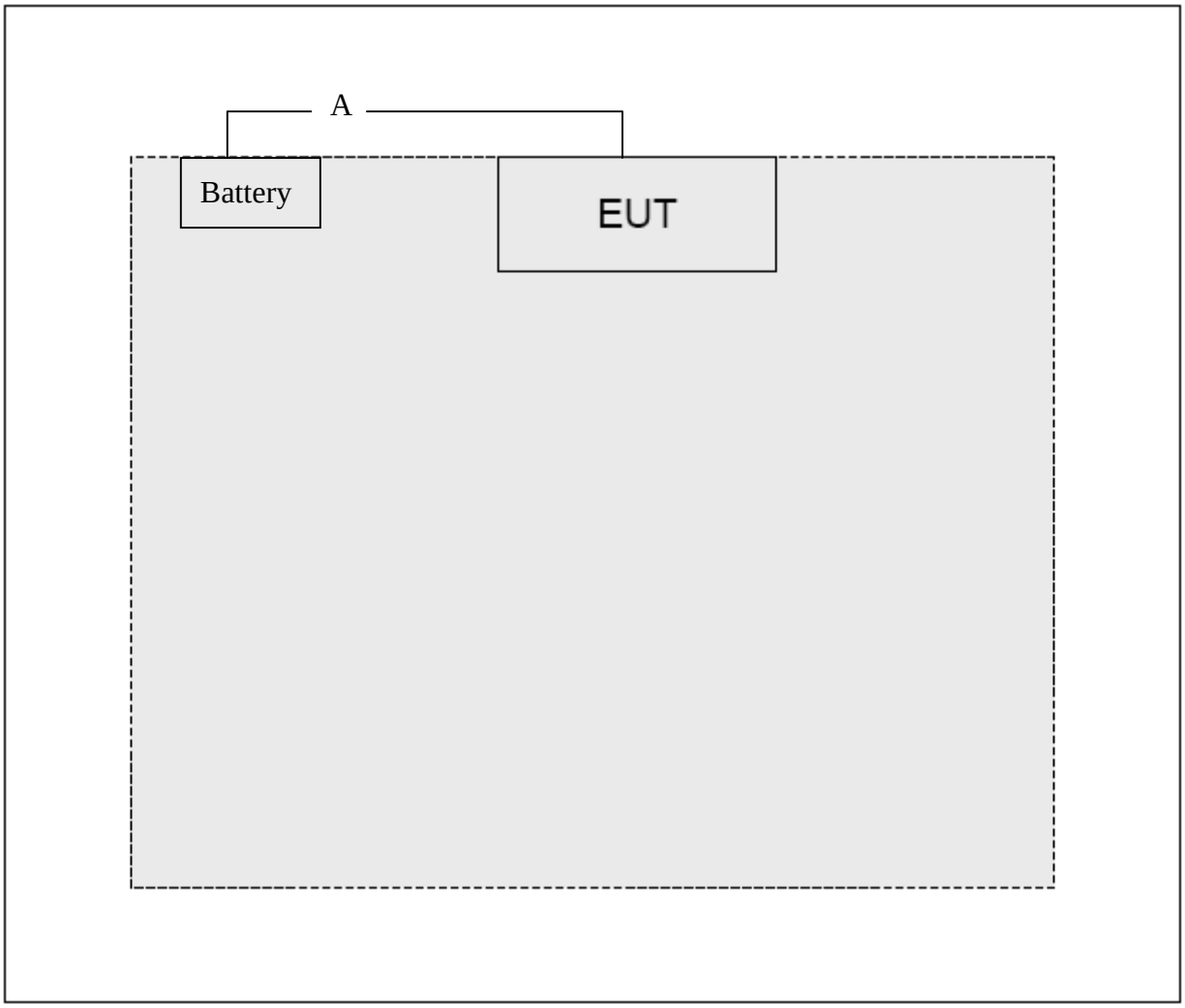
Test Mode
Mode 1: Transmit

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	N/A	N/A	N/A	N/A	N/A

1.4. Configuration of Tested System

Connection Diagram


Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 1.6m

1.5. EUT Exercise Software

1	Setup the EUT and simulator as shown on above
2	Turn on the power of EUT.
3	Making EUT working on continuously transmission mode using bluetest V2.0 software.

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.207	N/A	N/A
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.209	Yes	No
20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)	Yes	No
Carrier Frequency Separation	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)	Yes	No
Number of Hopping Frequencies	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)(iii)	Yes	No
Time of Occupancy (Dwell Time)	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(a)(1)(iii)	Yes	No
Peak Output Power	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.247(b)(1)	Yes	No
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.215(c), 15.247(d)	Yes	No
Spurious RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2007 15.247(d)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2007 15.247(d)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

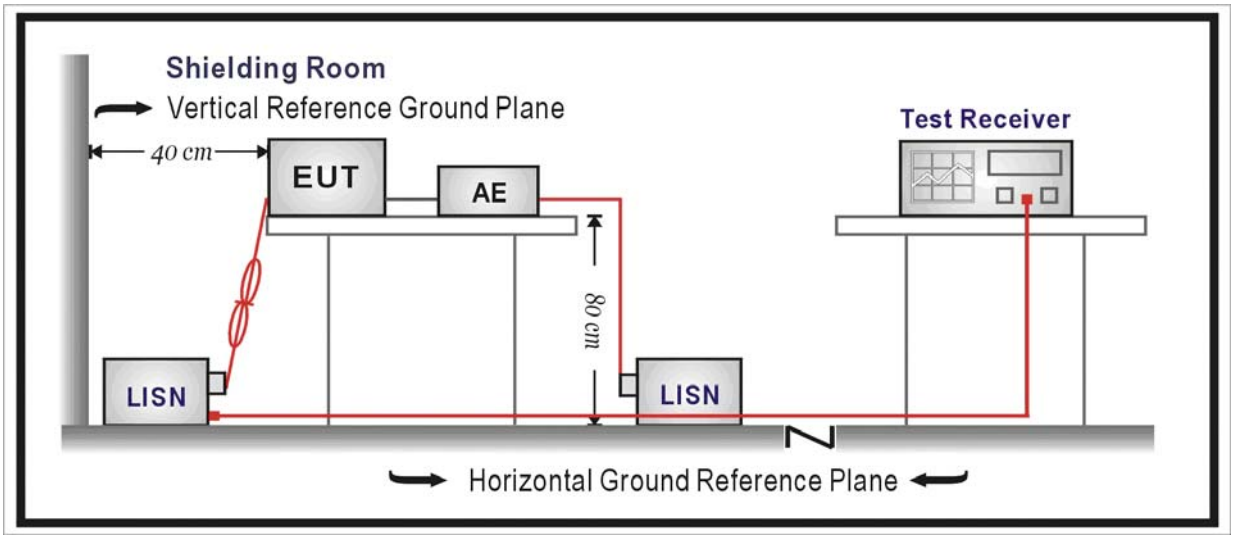
3.1. Test Equipment

Conducted Emission / SR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100726	2008/02/07
Two-Line V-Network	R&S	ENV216	100013	2007/11/15
Two-Line V-Network	R&S	ENV216	100014	2007/11/15
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2007/11/25
50ohm Termination	SHX	TF2	07081401	2007/10/19
Coaxial Cable	Luthi	RG214	519358	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH004	2008/03/31

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

This EUT is used for Vehicular, so this test item needn’t perform.

4. Radiated Emission

4.1. Test Equipment

☐Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2007/11/12
EMI Test Receiver	R&S	ESCI	100573	2008/05/10
Preamplifier	Quietek	AP-025C	QT-AP003	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112B	2932	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2007/11/25
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2008/03/03
Band Reject Filter	Wainwright	WRCG2400/2485-2375/2510-60/11SS	SN9	2008/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2008/03/03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2008/03/03
50ohm Coaxial Switch	Anritsu	MP59B	6200447304	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	04	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH002	2008/03/31

☒Radiated Emission / AC-3

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2008/04/24
EMI Test Receiver	R&S	ESCI	100176	2007/11/15
Preamplifier	Quietek	AP-025C	QT-AP004	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112D	22254	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2007/11/25
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2008/03/03
Band Reject Filter	Wainwright	WRCG2400/2485-2375/2510-60/11SS	SN9	2008/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2008/03/03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2008/03/03
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	05	2007/11/25

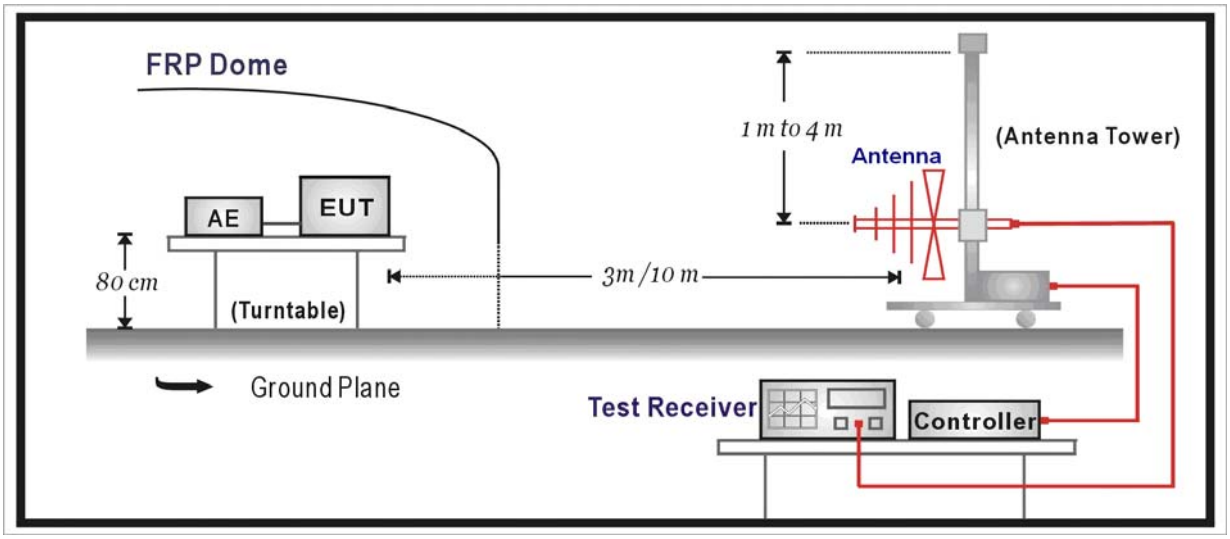
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2008/03/31

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

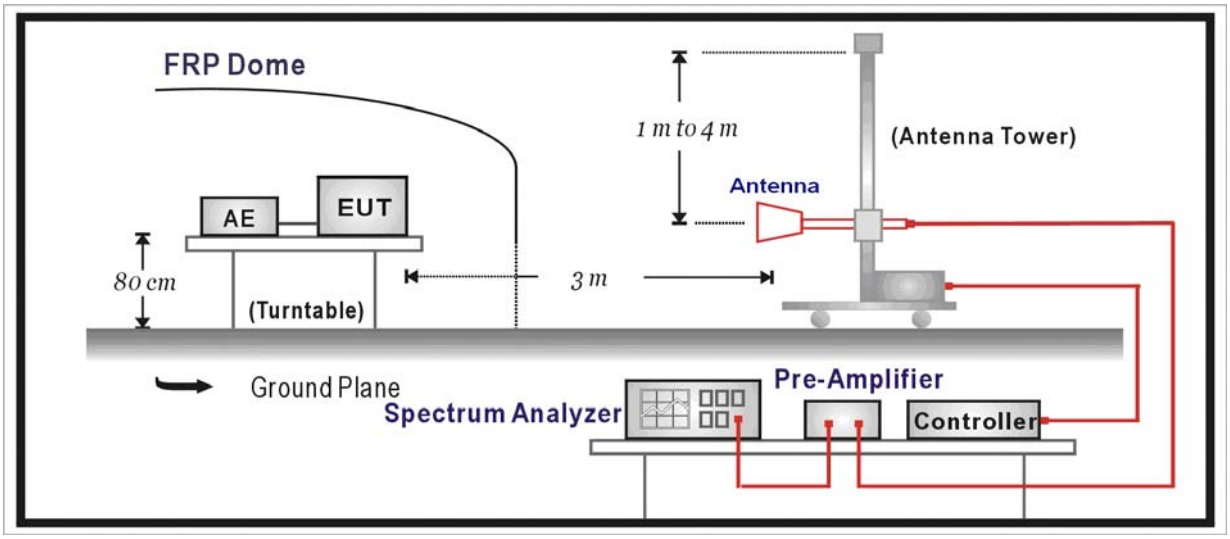
Note 2: The test instruments marked with “X” are used to measure the final test results.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

Note: When measurement above 1GHz, the horn antenna will bend down a little (as horn antenna have the narrow beamwidth) in order to find the maximum emission of EUT.

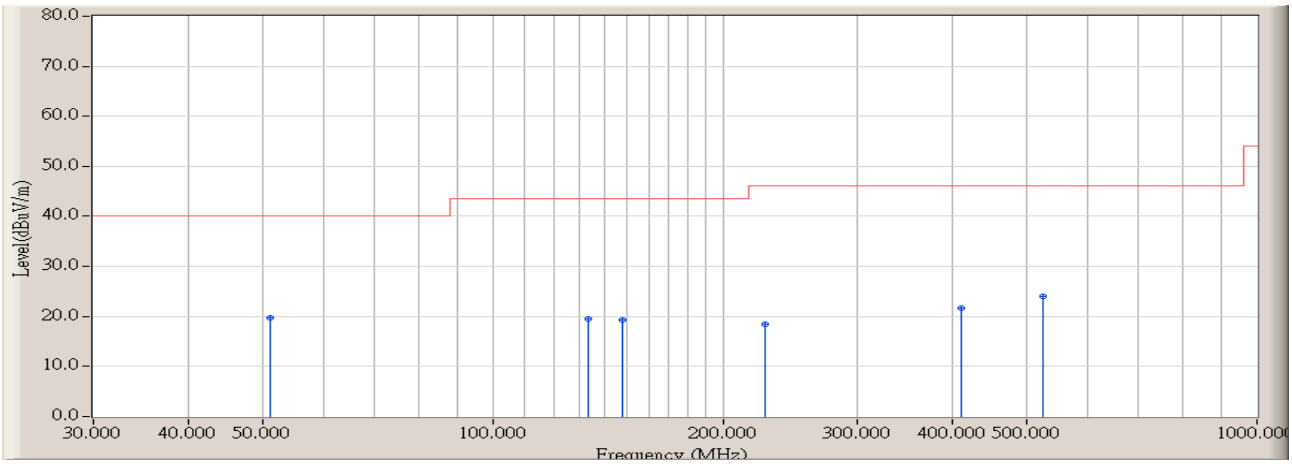
4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

below 1G is defined as ± 3.8 dB

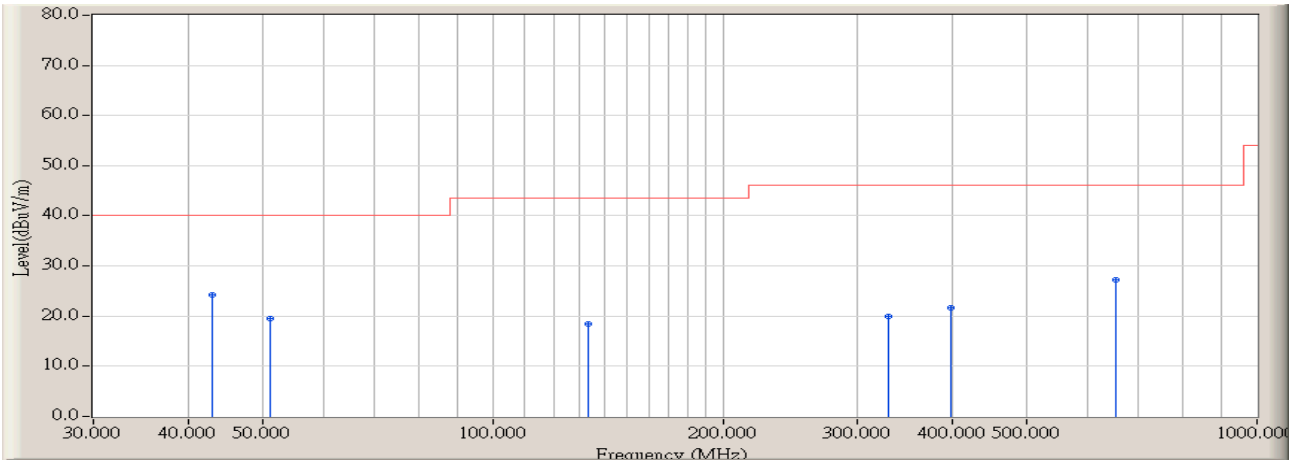
4.6. Test Result

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 10:02**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Seecode Vision	**Probe : CBL6112D_22254(30-2000MHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



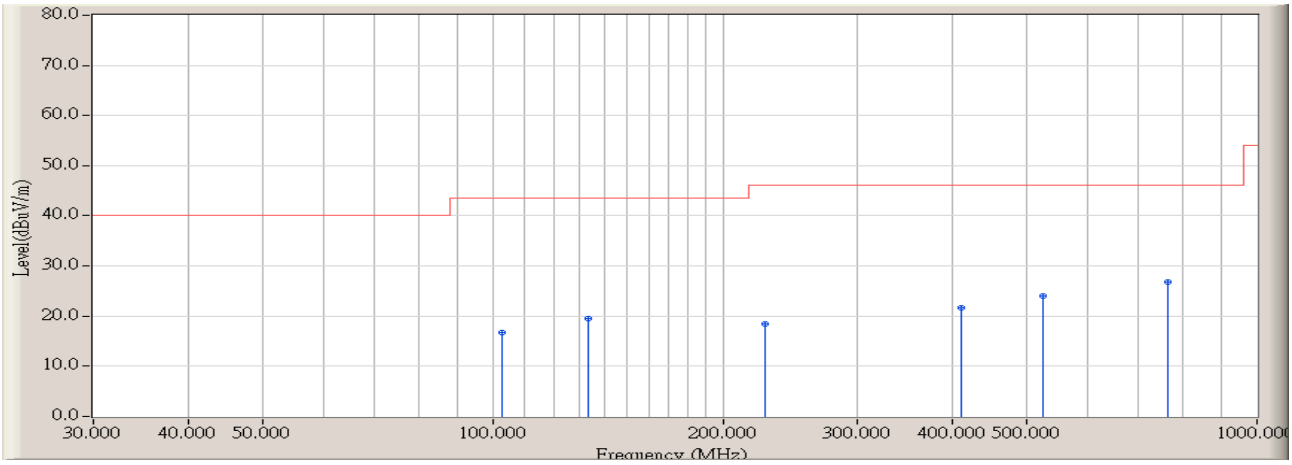
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	51.017	-8.752	28.456	19.704	-20.296	40.000	QUASIPEAK	100.000	118.500
2		133.467	-9.432	28.897	19.466	-24.054	43.520	QUASIPEAK	114.600	45.800
3		148.017	-9.346	28.542	19.196	-24.324	43.520	QUASIPEAK	100.000	315.000
4		227.233	-8.954	27.318	18.363	-27.657	46.020	QUASIPEAK	100.000	188.000
5		409.917	-4.519	26.209	21.690	-24.330	46.020	QUASIPEAK	105.600	325.000
6		524.700	-3.180	27.103	23.923	-22.097	46.020	QUASIPEAK	100.000	156.500

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 10:02**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Seecode Vision	**Probe : CBL6112D_22254(30-2000MHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



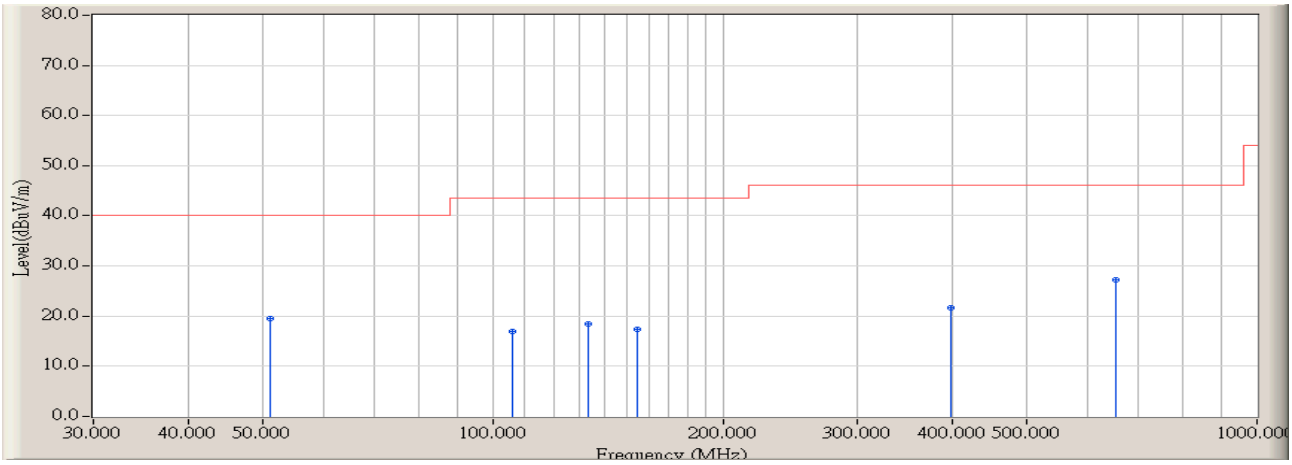
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	*	42.933	-4.863	29.079	24.216	-15.784	40.000	QUASIPEAK	100.000	185.000
2		51.017	-8.752	28.286	19.534	-20.466	40.000	QUASIPEAK	120.000	163.000
3		133.467	-9.432	27.839	18.408	-25.112	43.520	QUASIPEAK	113.600	154.000
4		329.083	-6.693	26.591	19.898	-26.122	46.020	QUASIPEAK	122.500	96.500
5		396.983	-5.043	26.604	21.561	-24.459	46.020	QUASIPEAK	100.000	85.900
6		652.417	-0.117	27.253	27.136	-18.884	46.020	QUASIPEAK	105.200	93.500

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 10:03**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Seecode Vision	**Probe : CBL6112D_22254(30-2000MHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2441MHz**



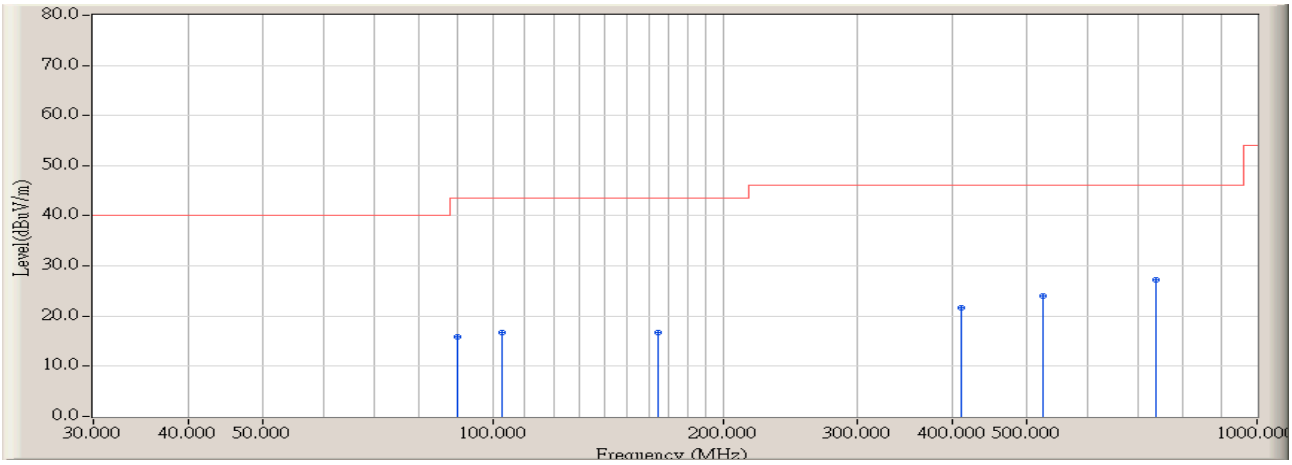
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		102.750	-11.204	28.014	16.810	-26.710	43.520	QUASIPEAK	100.000	163.000
2		133.467	-9.432	28.897	19.466	-24.054	43.520	QUASIPEAK	100.000	193.000
3		227.233	-8.954	27.318	18.363	-27.657	46.020	QUASIPEAK	143.600	55.800
4		409.917	-4.519	26.209	21.690	-24.330	46.020	QUASIPEAK	100.000	136.000
5		524.700	-3.180	27.103	23.923	-22.097	46.020	QUASIPEAK	106.500	95.800
6	*	765.583	1.470	25.390	26.859	-19.161	46.020	QUASIPEAK	112.600	82.900

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 10:03**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Seecode Vision	**Probe : CBL6112D_22254(30-2000MHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2441MHz**



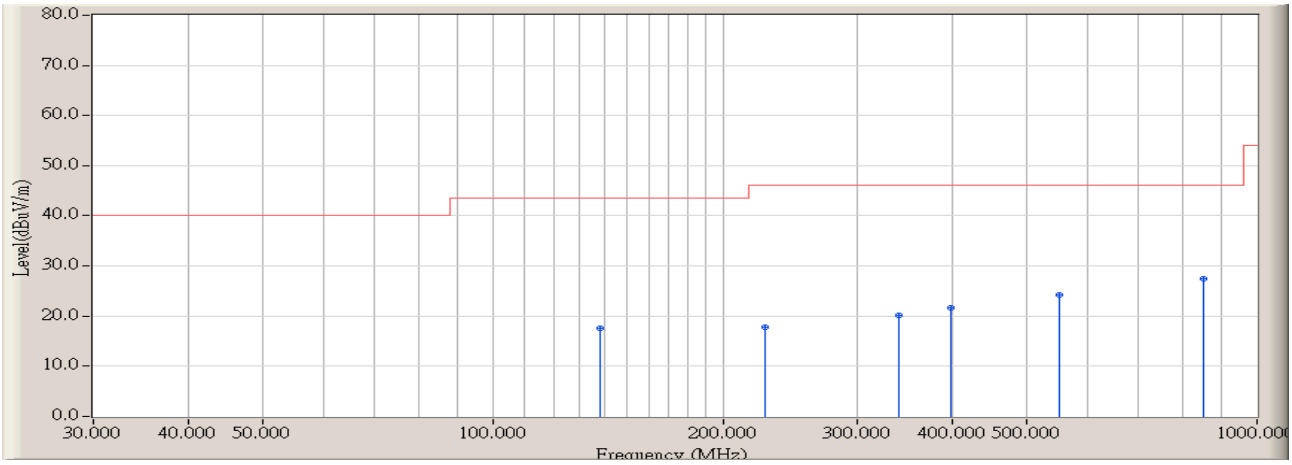
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		51.017	-8.752	28.286	19.534	-20.466	40.000	QUASIPEAK	112.500	93.500
2		105.983	-10.876	27.719	16.843	-26.677	43.520	QUASIPEAK	100.000	188.000
3		133.467	-9.432	27.839	18.408	-25.112	43.520	QUASIPEAK	105.600	325.000
4		154.483	-9.554	26.841	17.287	-26.233	43.520	QUASIPEAK	105.600	174.800
5		396.983	-5.043	26.604	21.561	-24.459	46.020	QUASIPEAK	100.000	185.000
6	*	652.417	-0.117	27.253	27.136	-18.884	46.020	QUASIPEAK	110.600	193.500

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 10:04**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Seecode Vision	**Probe : CBL6112D_22254(30-2000MHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



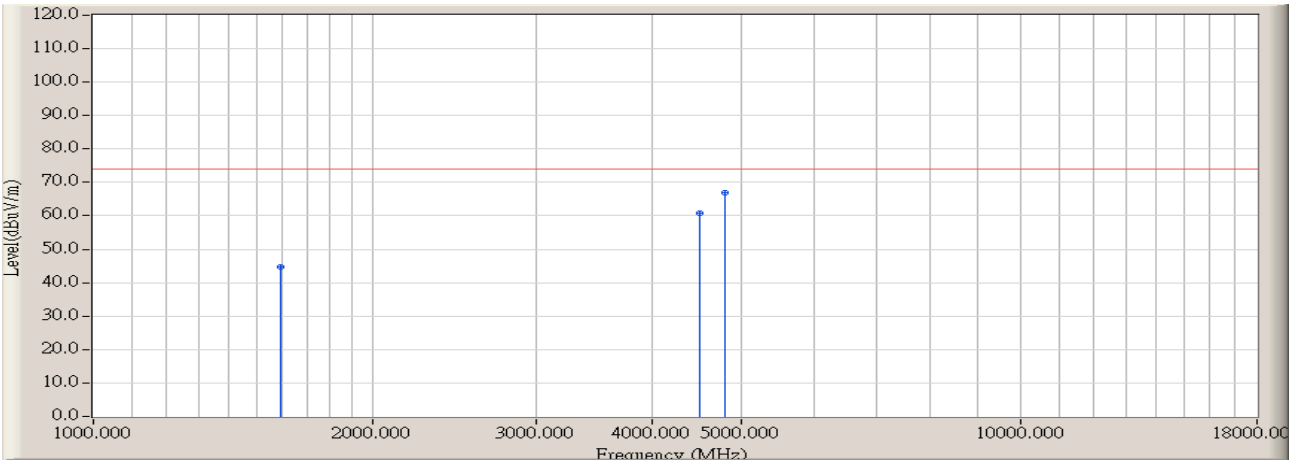
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		89.817	-12.646	28.463	15.817	-27.703	43.520	QUASIPEAK	135.000	221.400
2		102.750	-11.204	28.014	16.810	-26.710	43.520	QUASIPEAK	100.000	165.000
3		164.183	-10.202	26.826	16.623	-26.897	43.520	QUASIPEAK	106.000	179.500
4		409.917	-4.519	26.209	21.690	-24.330	46.020	QUASIPEAK	100.000	139.000
5		524.700	-3.180	27.103	23.923	-22.097	46.020	QUASIPEAK	114.000	208.000
6	*	738.100	1.293	25.882	27.175	-18.845	46.020	QUASIPEAK	215.000	266.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 10:04**
Limit : FCC_SpartC_15.209_03M_QP	**Margin : 0**
EUT : Seecode Vision	**Probe : CBL6112D_22254(30-2000MHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



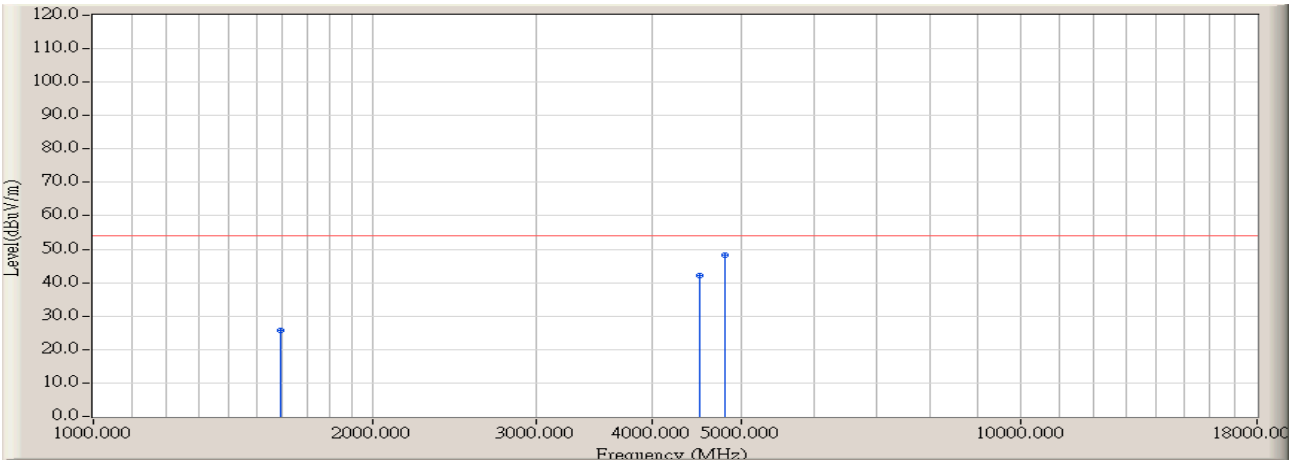
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		138.317	-9.381	27.018	17.637	-25.883	43.520	QUASIPEAK	100.000	78.400
2		227.233	-8.954	26.783	17.828	-28.192	46.020	QUASIPEAK	100.000	133.800
3		340.400	-6.367	26.583	20.216	-25.804	46.020	QUASIPEAK	108.500	227.000
4		396.983	-5.043	26.604	21.561	-24.459	46.020	QUASIPEAK	100.000	185.500
5		552.183	-1.899	26.061	24.162	-21.858	46.020	QUASIPEAK	100.000	298.000
6	*	849.650	2.309	25.226	27.535	-18.485	46.020	QUASIPEAK	104.200	236.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



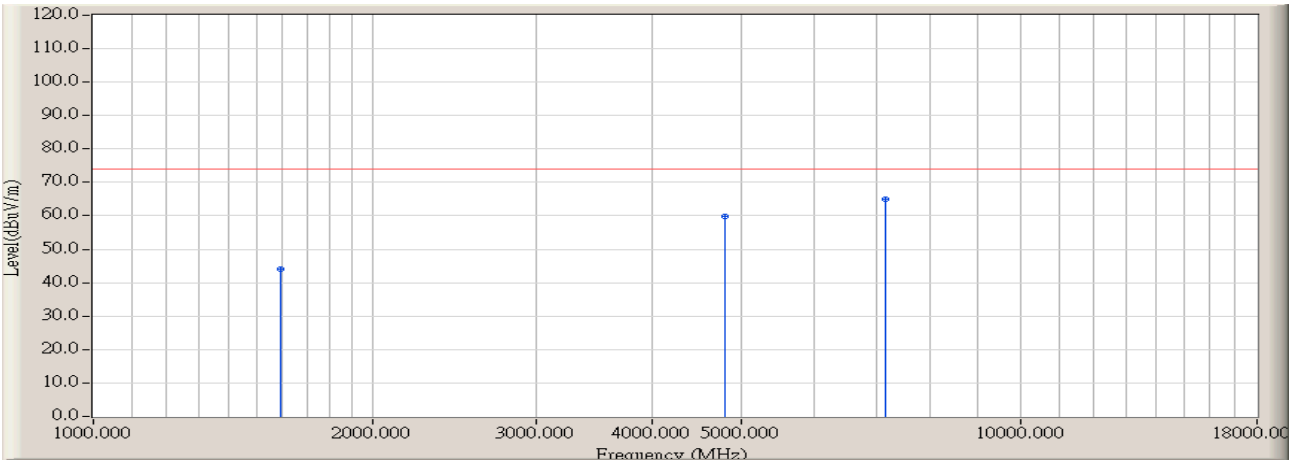
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1595.000	-7.060	51.772	44.712	-29.258	73.970	PEAK	105.100	65.800
2		4513.333	2.547	58.330	60.877	-13.093	73.970	PEAK	100.000	253.400
3	*	4796.667	3.490	63.389	66.879	-7.091	73.970	PEAK	100.000	185.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



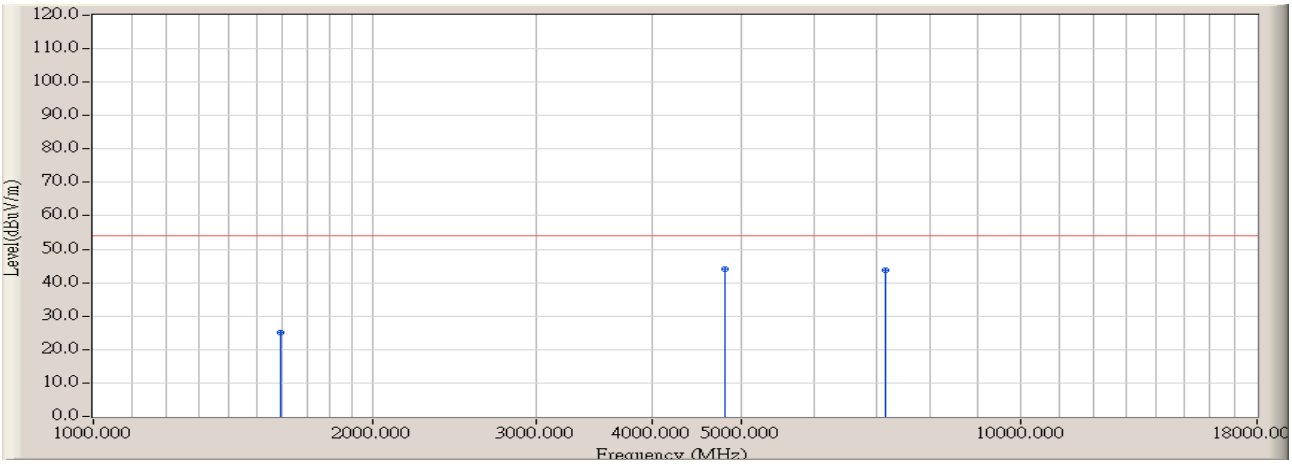
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1595.000	-7.060	32.700	25.640	-28.330	53.970	AVERAGE	105.100	65.800
2		4513.333	2.547	39.500	42.047	-11.923	53.970	AVERAGE	100.000	253.400
3	*	4796.667	3.490	44.800	48.290	-5.680	53.970	AVERAGE	100.000	185.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



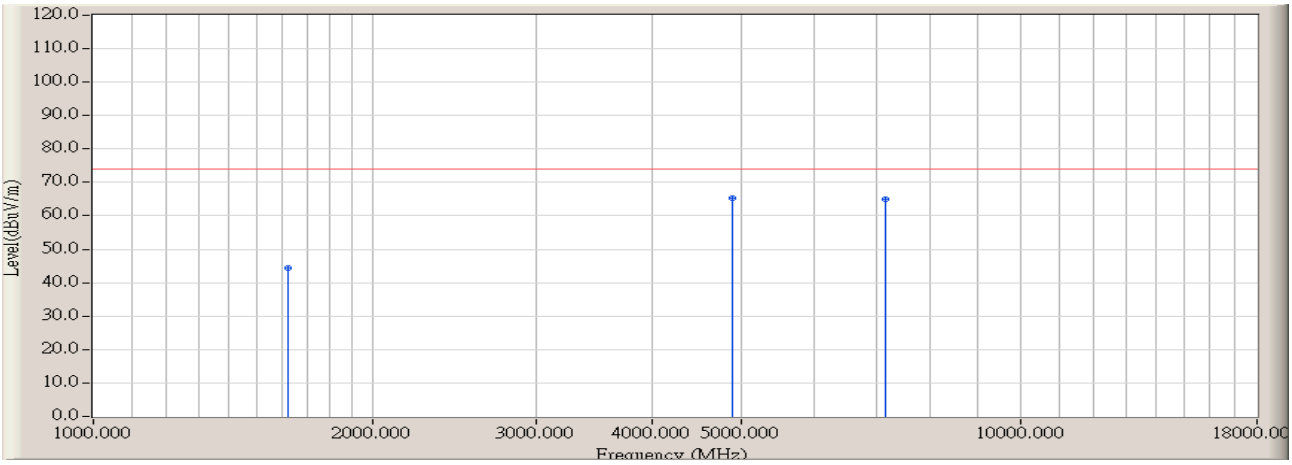
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1595.000	-7.060	51.120	44.060	-29.910	73.970	PEAK	100.000	152.000
2		4796.667	3.490	56.440	59.930	-14.040	73.970	PEAK	107.400	185.000
3	*	7148.333	13.013	51.861	64.874	-9.096	73.970	PEAK	106.400	82.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



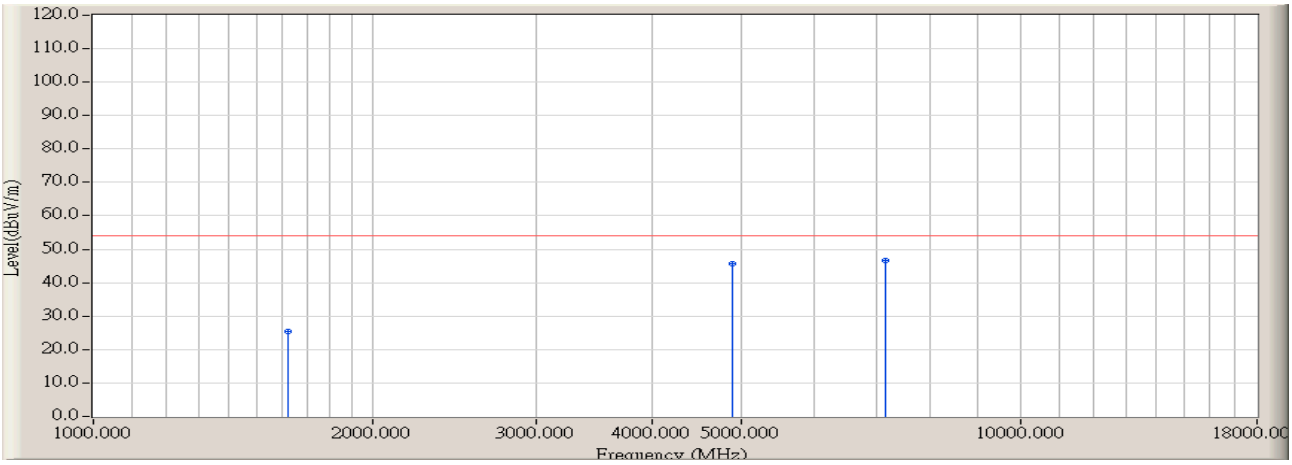
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1595.000	-7.060	32.200	25.140	-28.830	53.970	AVERAGE	100.000	152.000
2	*	4796.667	3.490	40.600	44.090	-9.880	53.970	AVERAGE	107.400	185.000
3		7148.333	13.013	30.800	43.813	-10.157	53.970	AVERAGE	106.400	82.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2441MHz**



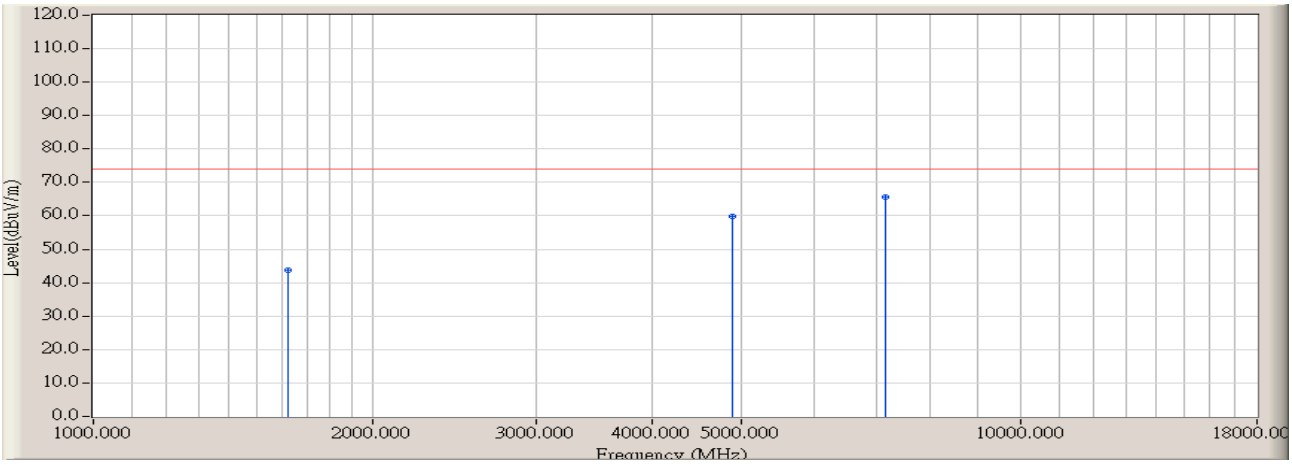
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1623.333	-7.067	51.490	44.423	-29.547	73.970	PEAK	105.400	284.000
2	*	4881.667	3.633	61.610	65.243	-8.727	73.970	PEAK	100.000	76.700
3		7148.333	13.013	51.916	64.929	-9.041	73.970	PEAK	100.000	85.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2441MHz**



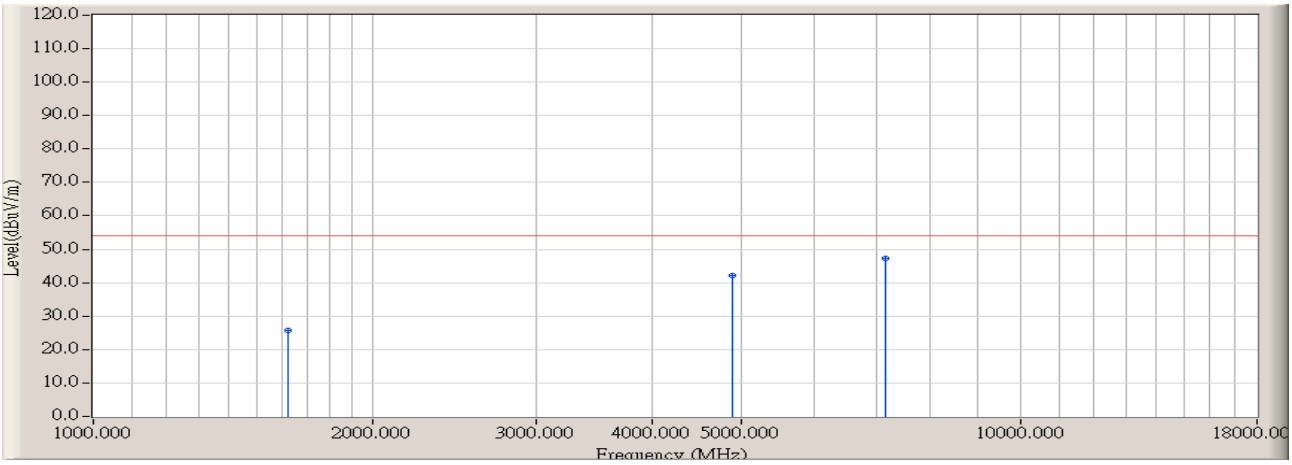
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1623.333	-7.067	32.500	25.433	-28.537	53.970	AVERAGE	105.400	284.000
2		4881.667	3.633	42.100	45.733	-8.237	53.970	AVERAGE	100.000	76.700
3	*	7148.333	13.013	33.600	46.613	-7.357	53.970	AVERAGE	100.000	85.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2441MHz**



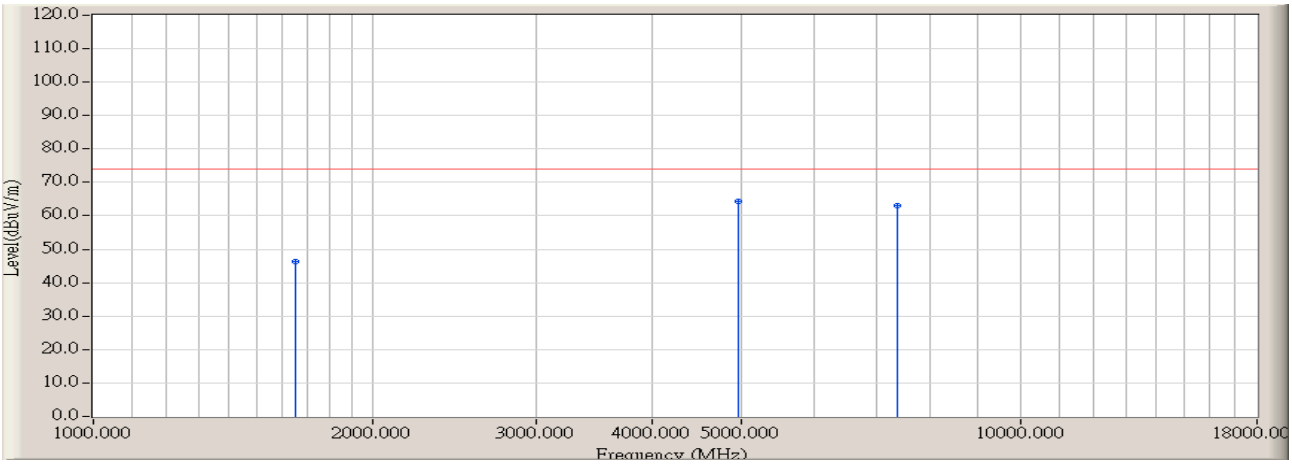
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1623.333	-7.067	50.819	43.752	-30.218	73.970	PEAK	100.000	163.500
2		4881.667	3.633	56.328	59.961	-14.009	73.970	PEAK	104.800	98.100
3	*	7148.333	13.013	52.497	65.510	-8.460	73.970	PEAK	105.000	168.500

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2441MHz**



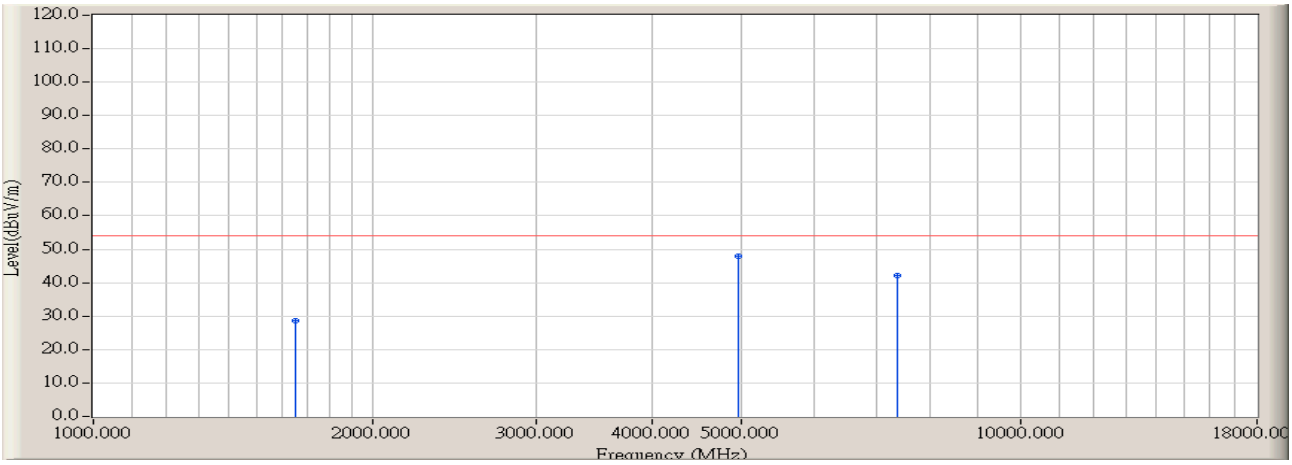
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1623.333	-7.067	32.800	25.733	-28.237	53.970	AVERAGE	100.000	163.500
2		4881.667	3.633	38.600	42.233	-11.737	53.970	AVERAGE	104.800	98.100
3	*	7148.333	13.013	34.200	47.213	-6.757	53.970	AVERAGE	105.000	168.500

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



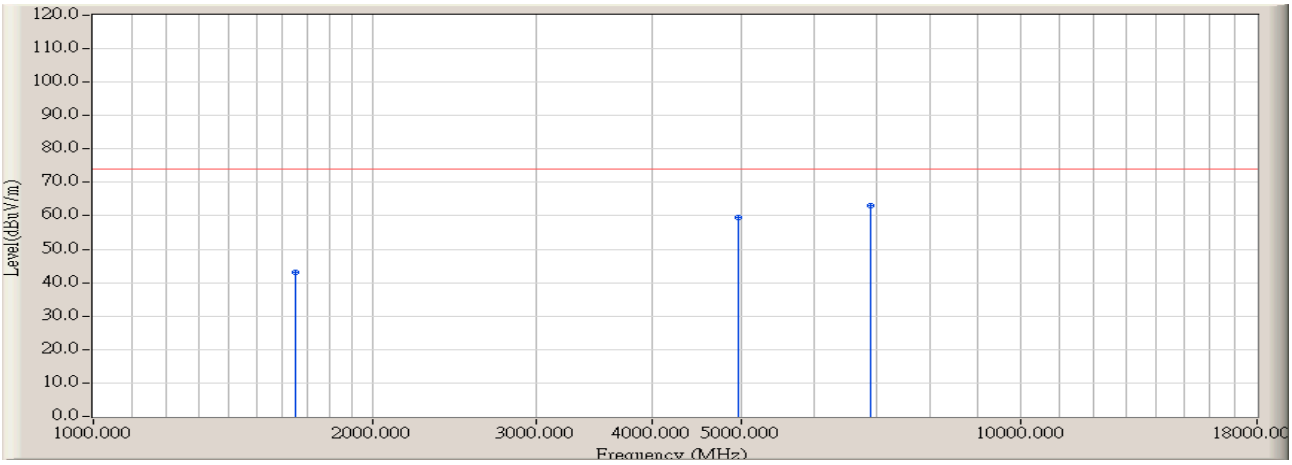
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1651.667	-7.080	53.370	46.290	-27.680	73.970	PEAK	113.400	152.000
2	*	4966.667	4.073	60.399	64.472	-9.498	73.970	PEAK	100.000	57.800
3		7375.000	11.650	51.499	63.149	-10.821	73.970	PEAK	103.500	165.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



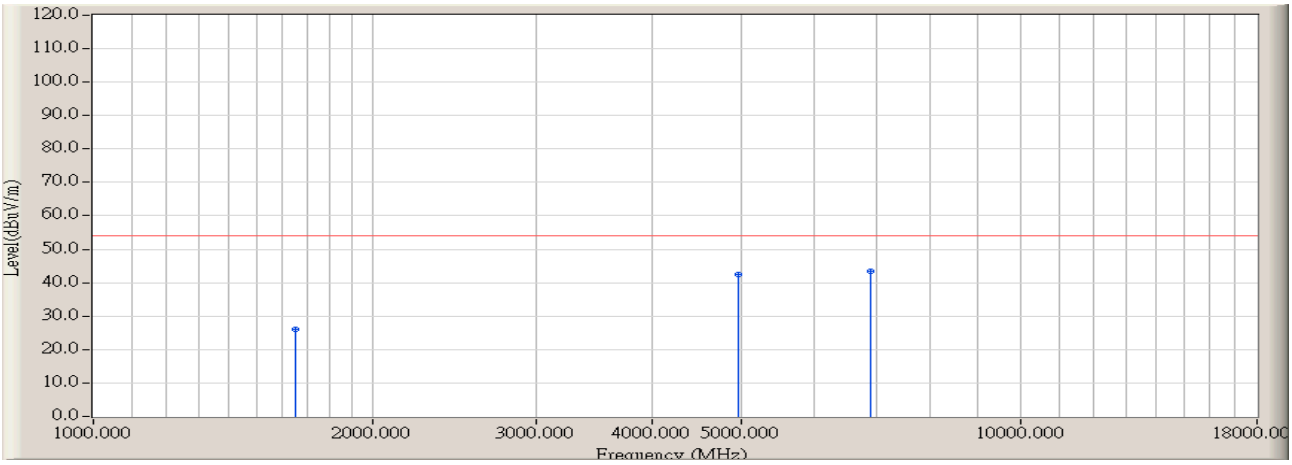
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1651.667	-7.080	35.700	28.620	-25.350	53.970	AVERAGE	113.400	152.000
2	*	4966.667	4.073	43.900	47.973	-5.997	53.970	AVERAGE	100.000	57.800
3		7375.000	11.650	30.600	42.250	-11.720	53.970	AVERAGE	103.500	165.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1651.667	-7.080	50.031	42.951	-31.019	73.970	PEAK	102.500	152.000
2		4966.667	4.073	55.291	59.364	-14.606	73.970	PEAK	100.000	184.000
3	*	6893.333	11.087	51.822	62.909	-11.061	73.970	PEAK	106.200	206.000

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/30 - 09:28**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		1651.667	-7.080	33.100	26.020	-27.950	53.970	AVERAGE	102.500	152.000
2		4966.667	4.073	38.400	42.473	-11.497	53.970	AVERAGE	100.000	184.000
3	*	6893.333	11.087	32.200	43.287	-10.683	53.970	AVERAGE	106.200	206.000

5. 20dB Bandwidth

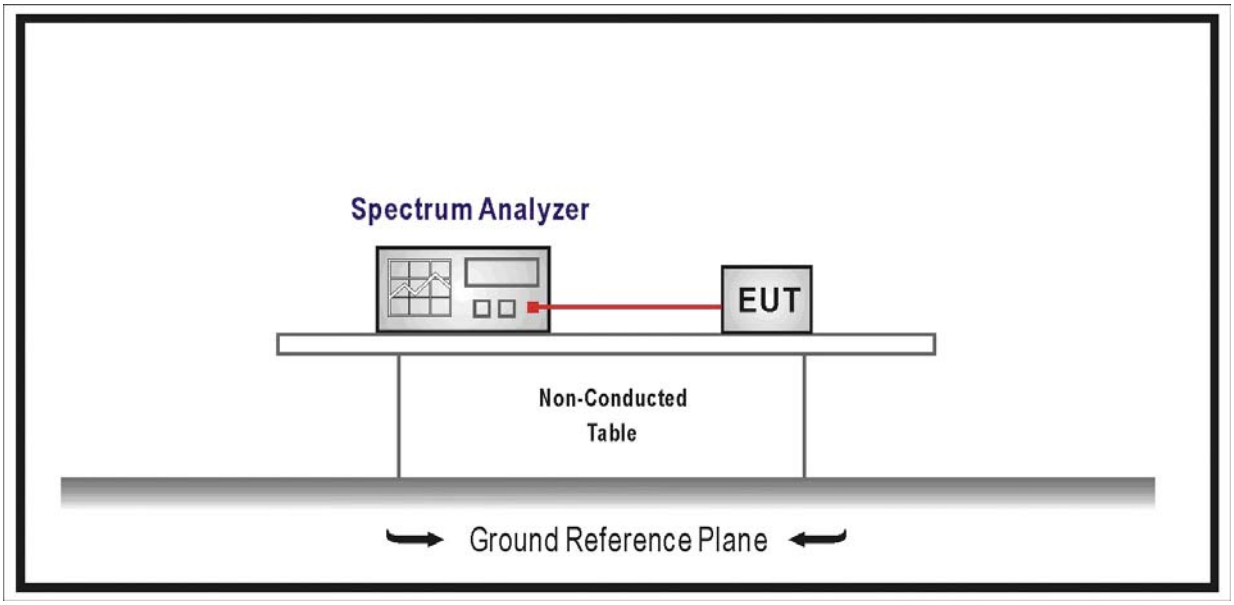
5.1. Test Equipment

20dB Bandwidth / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/07/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

- For frequency hopping systems operating in 2400-2483.5 MHz band, no limitation.
- For frequency hopping systems operating in 902-928 MHz band, the maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- For frequency hopping systems operating in 5725-5850 MHz band, the maximum 20 dB bandwidth of the hopping channel is 1 MHz.

5.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel
RBW ≧ 1% of the 20dB bandwidth
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
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. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

5.5. Uncertainty

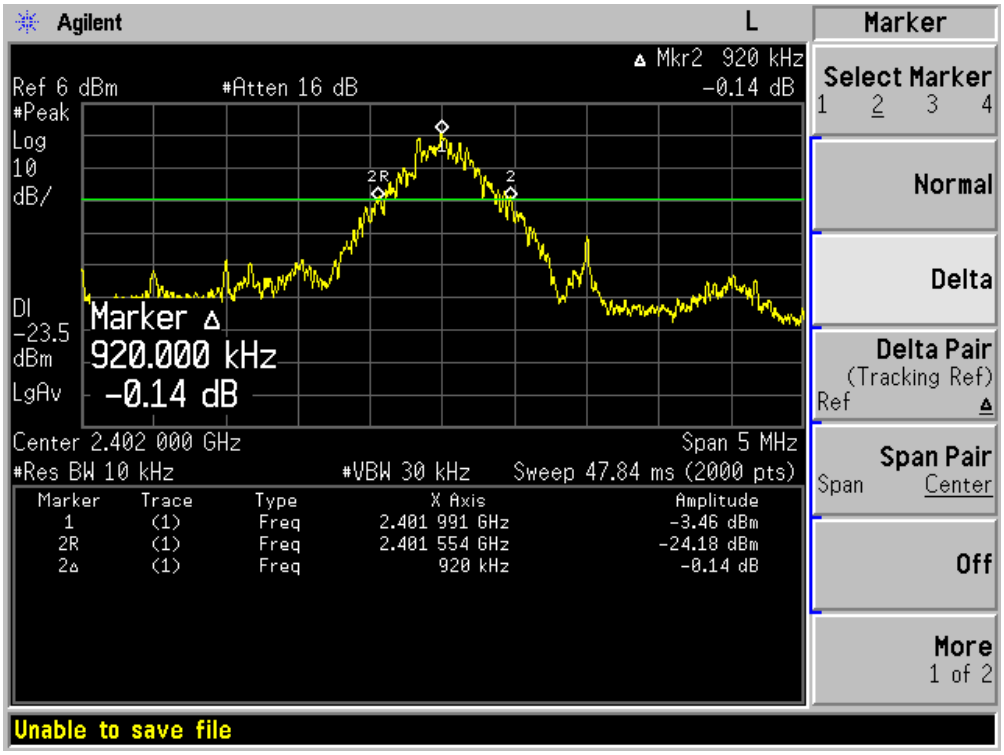
The measurement uncertainty is defined as ± 1 kHz

5.6. Test Result

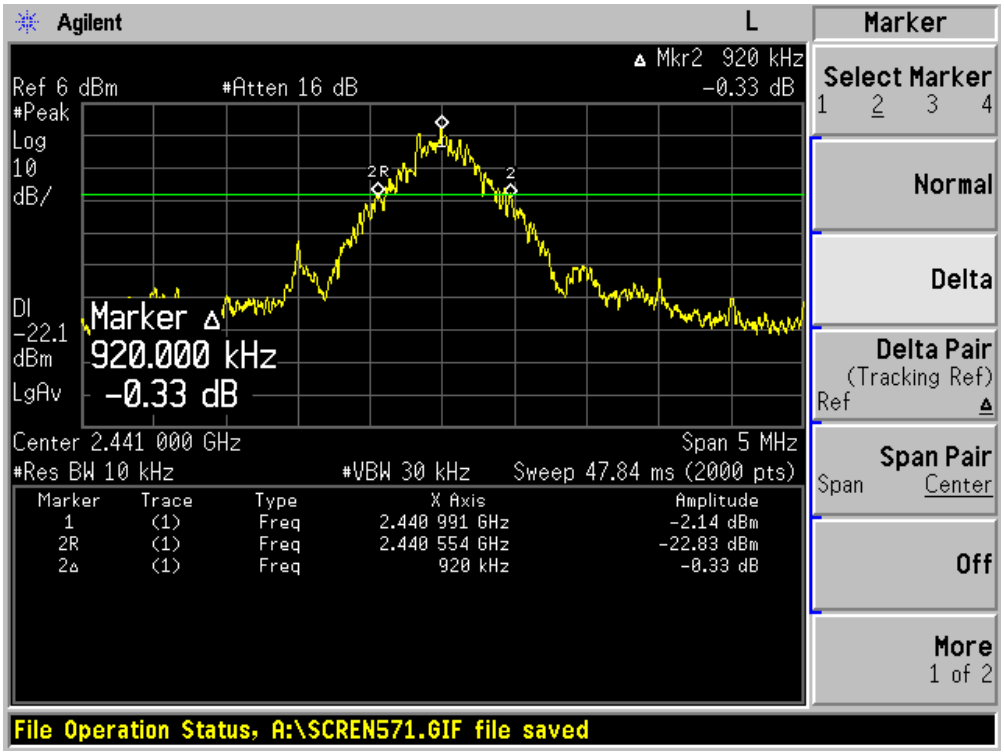
Product	:	Seecode Vision
Test Item	:	20dB Bandwidth
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
00	2402	920	N/A	Pass
39	2441	920	N/A	Pass
78	2480	920	N/A	Pass

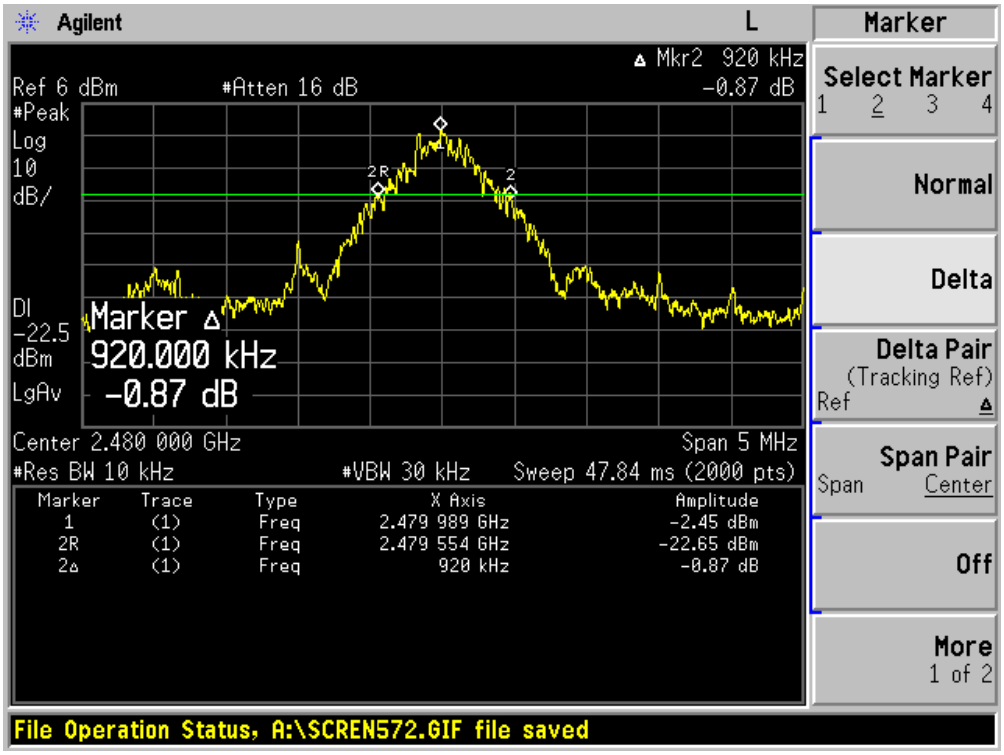
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



6. Carrier Frequency Separation

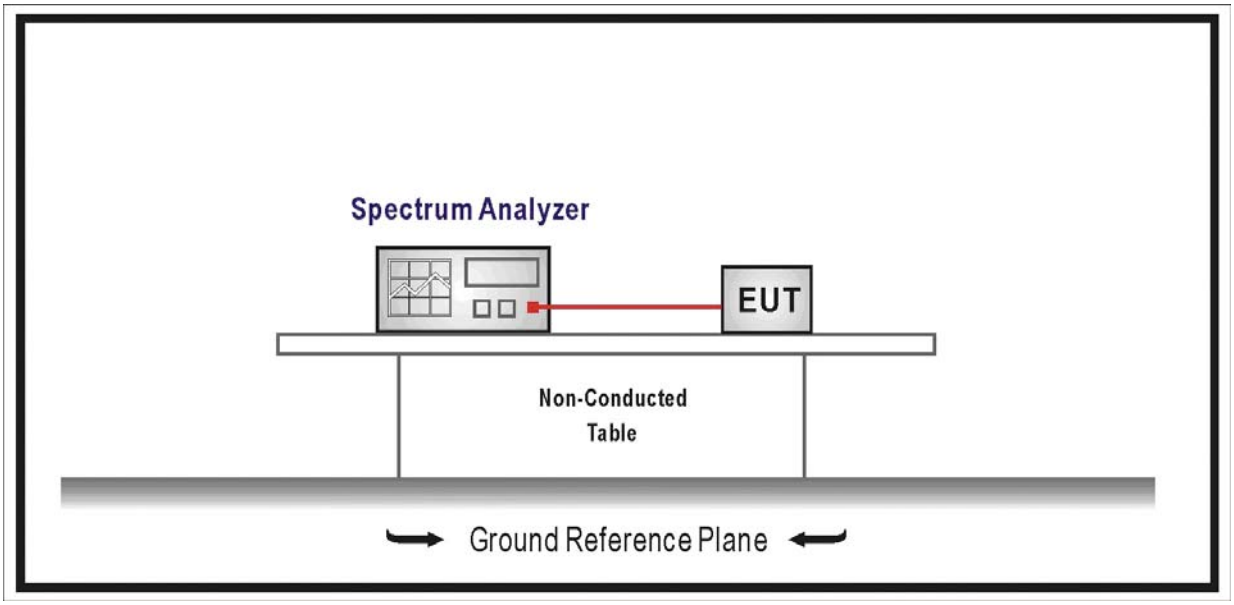
6.1. Test Equipment

Carrier Frequency Separation / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

- Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, 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, provided the systems operate with an output power no greater than 125mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each

transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less then 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

6.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≧ 1% of the span
Video (or Average) Bandwidth VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

6.5. Uncertainty

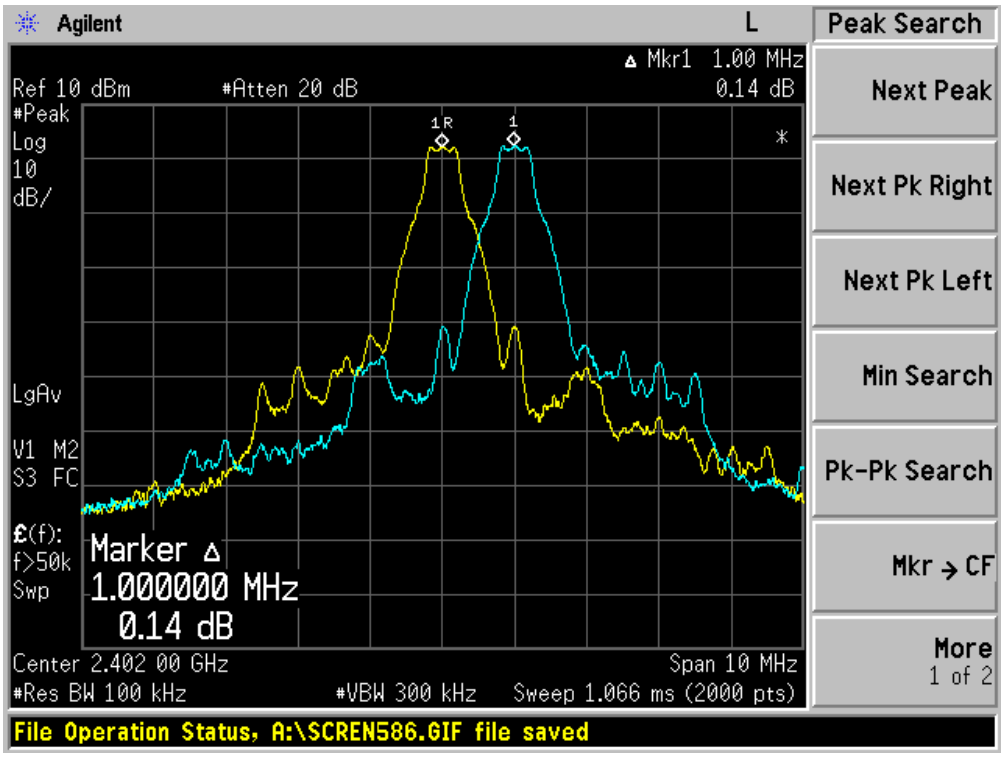
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

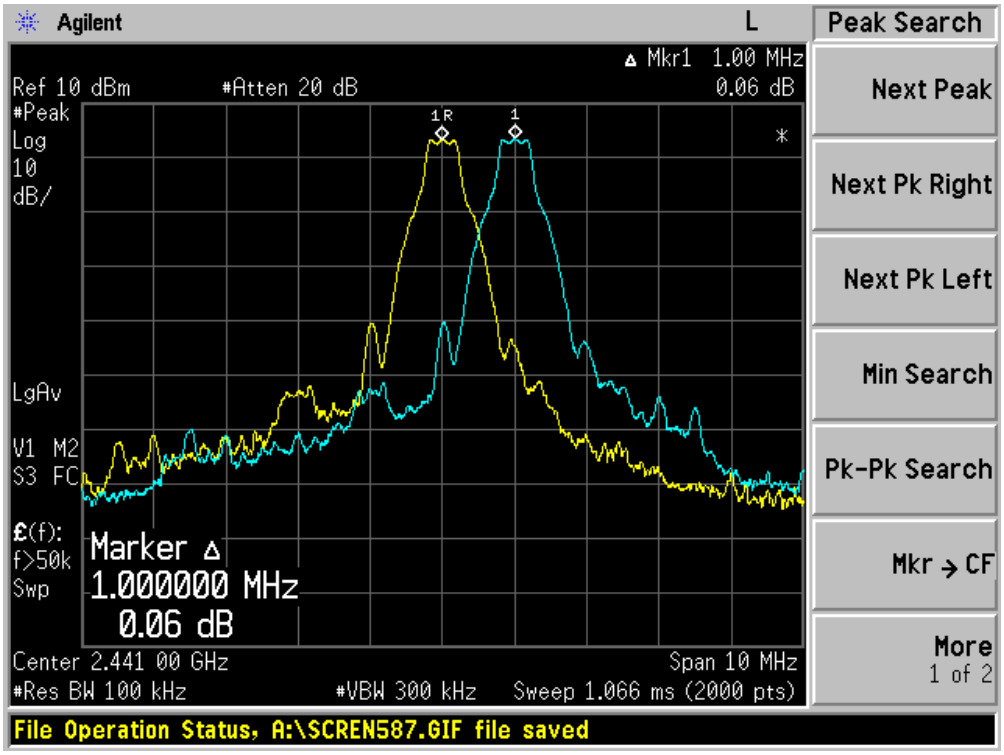
Product	:	Seecode Vision
Test Item	:	Carrier Frequency Separation
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

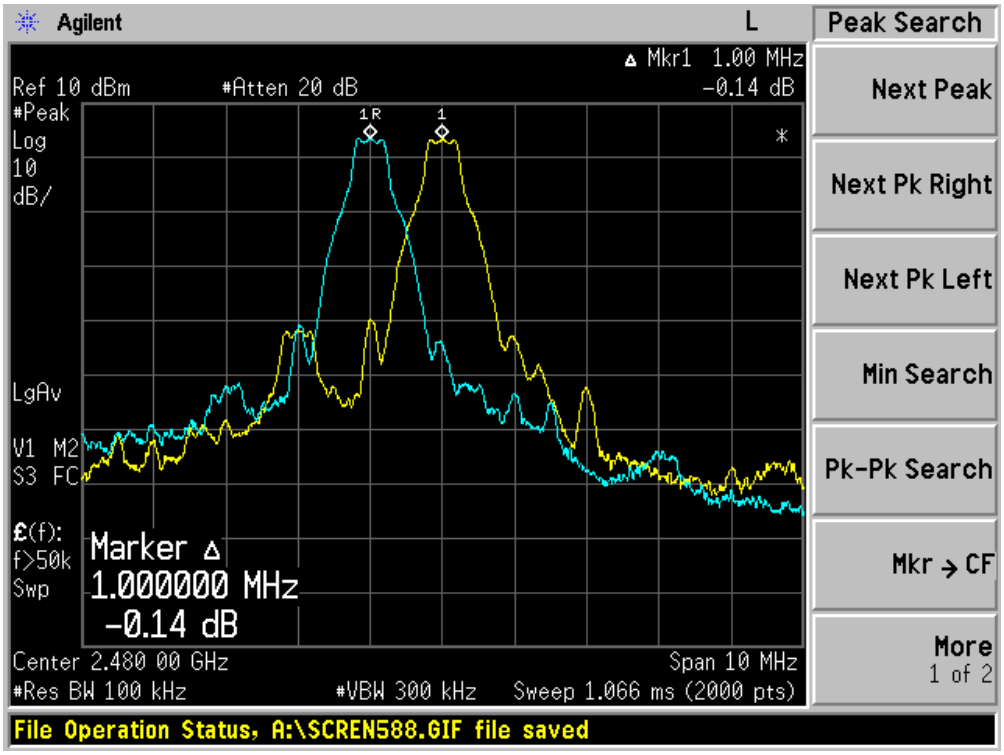
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



7. Number of Hopping Frequencies

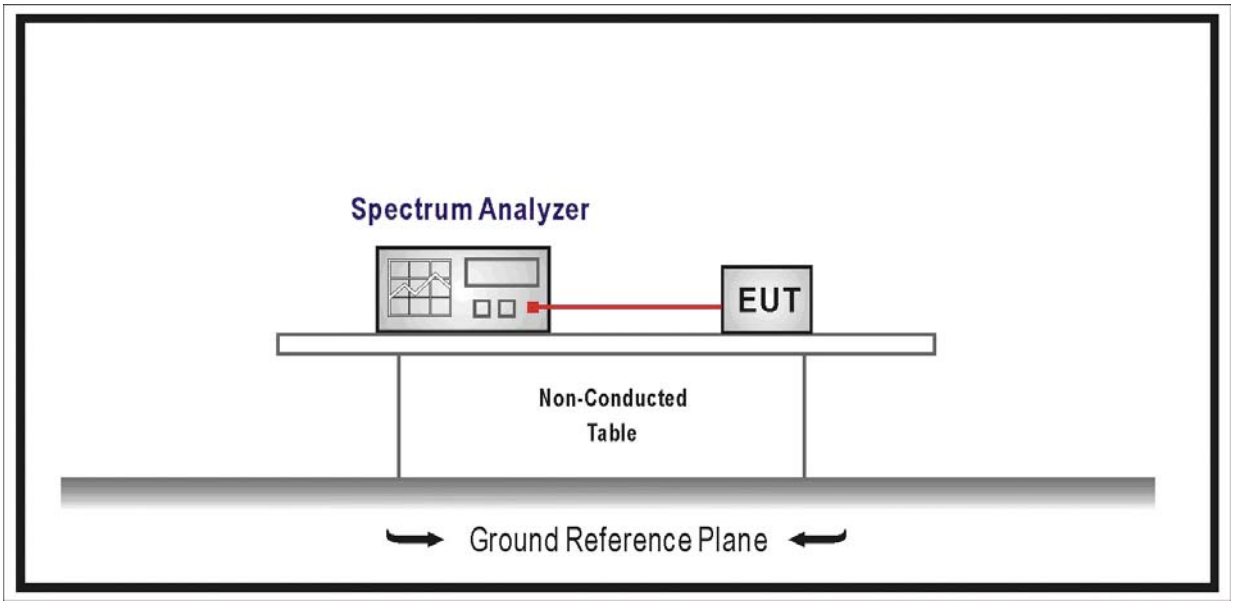
7.1. Test Equipment

Number of Hopping Frequencies / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies.
- For frequency hopping systems operating in 902-928 MHz band shall use at least 50 hopping frequencies.
- For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

7.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation
RBW ≧ 1% of the span
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. It may prove necessary to bread the span up to sections, in order to clearly show all of the hopping frequencies.

7.5. Uncertainty

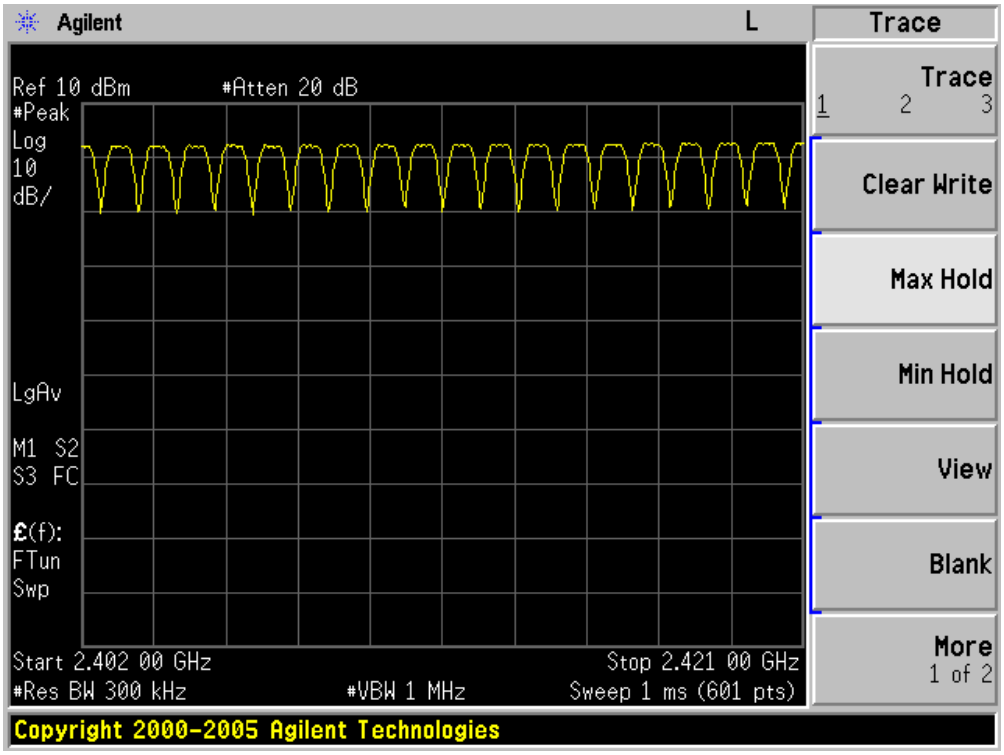
The measurement uncertainty is defined as ± 1 kHz

7.6. Test Result

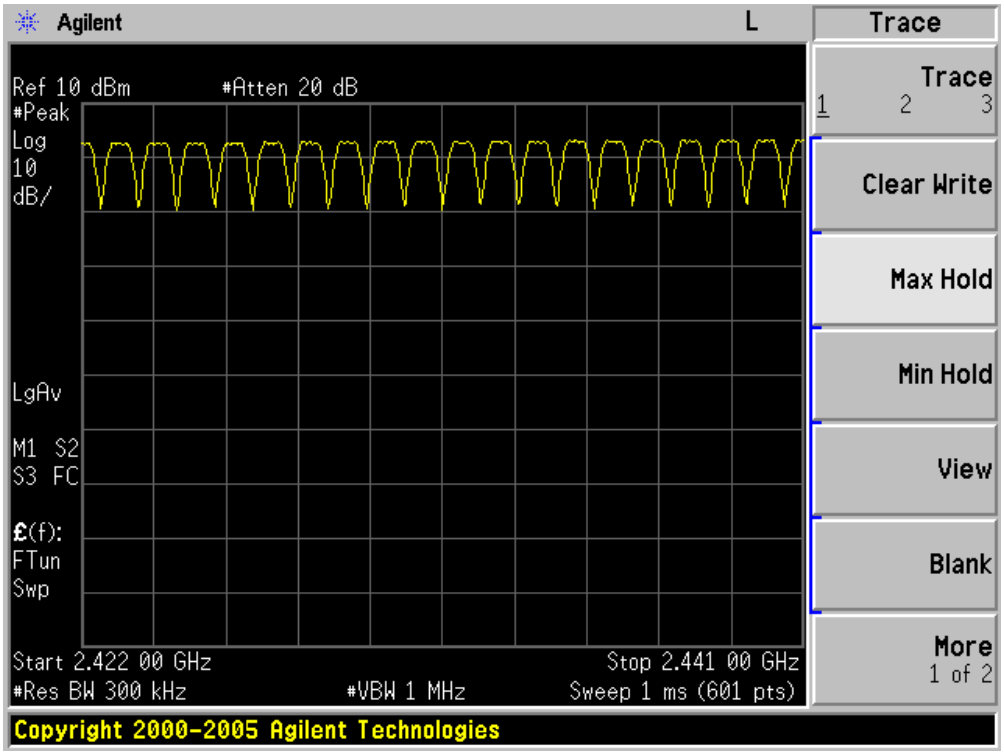
Product	:	Seecode Vision
Test Item	:	Number of Hopping Frequencies
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

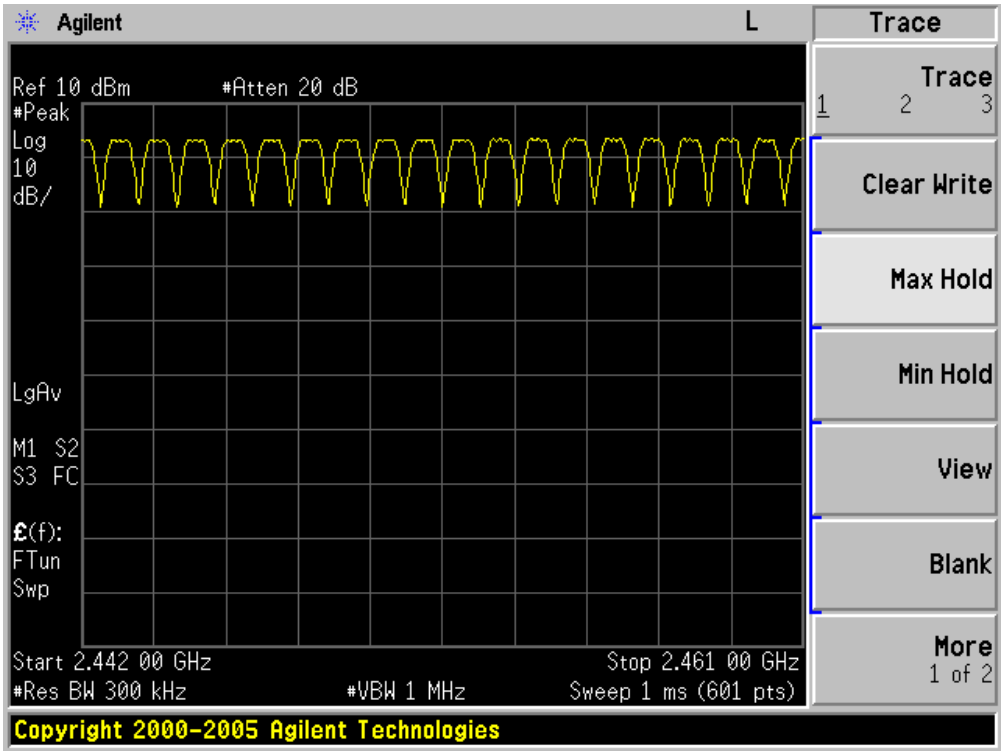
2402 - 2421 MHz



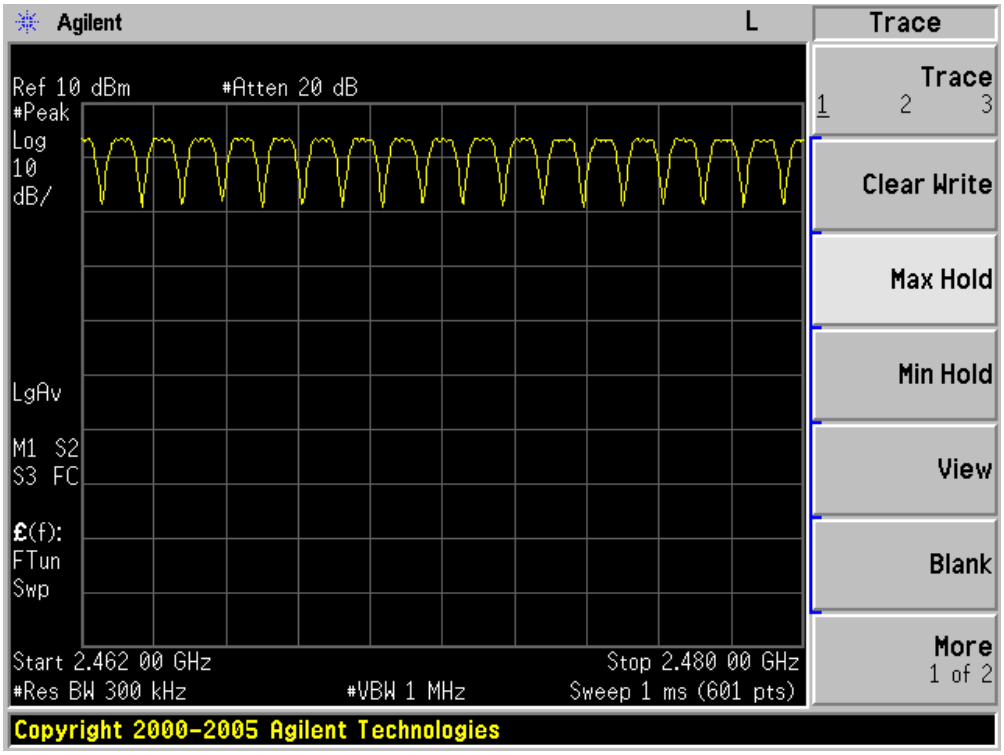
2422 - 2441 MHz



2442 - 2461 MHz



2462 - 2480 MHz



8. Time of Occupancy (Dwell Time)

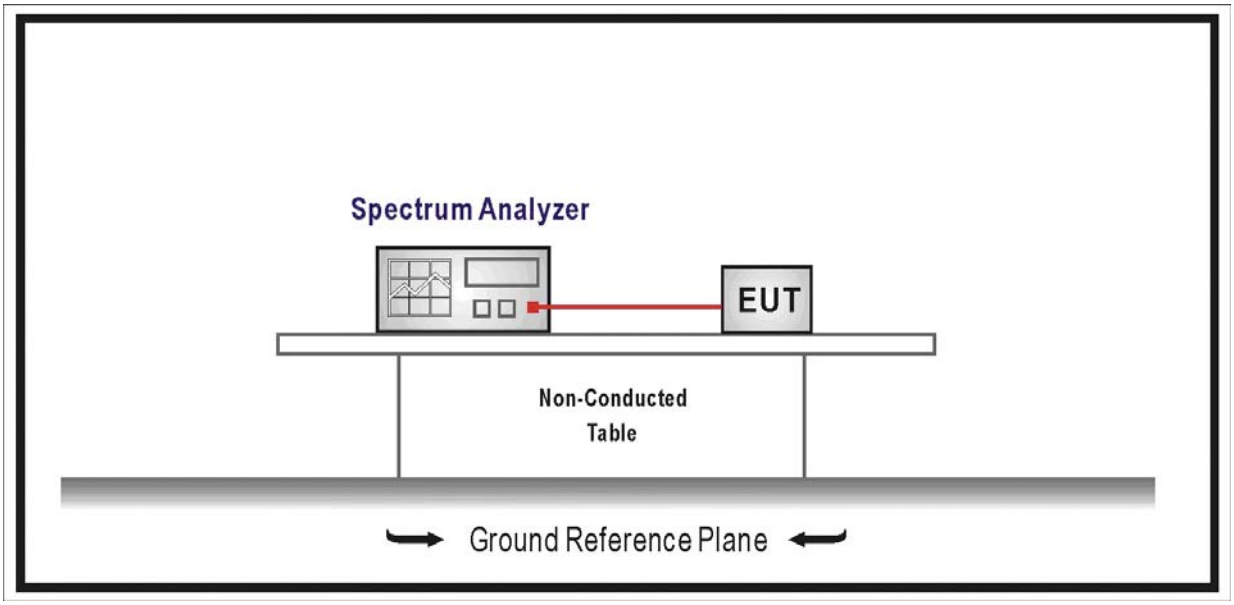
8.1. Test Equipment

Time of Occupancy (Dwell Time) / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less then 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.
- Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater then 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = zero span, centered on a hopping channel
RBW = 1MHz
VBW ≧ RBW
Sweep = as necessary to capture the entire dwell time per hopping channel
Detector function = peak
Trace = max hold
If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

8.5. Uncertainty

The measurement uncertainty is defined as ± 0.1 us

8.6. Test Result

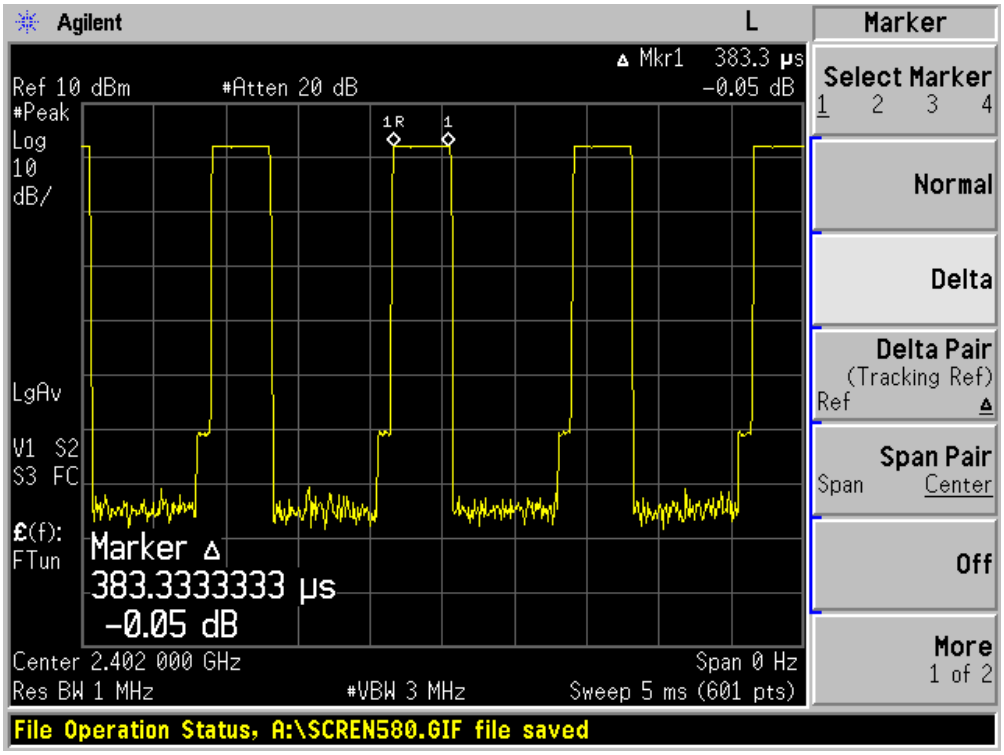
Product	:	Seecode Vision
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

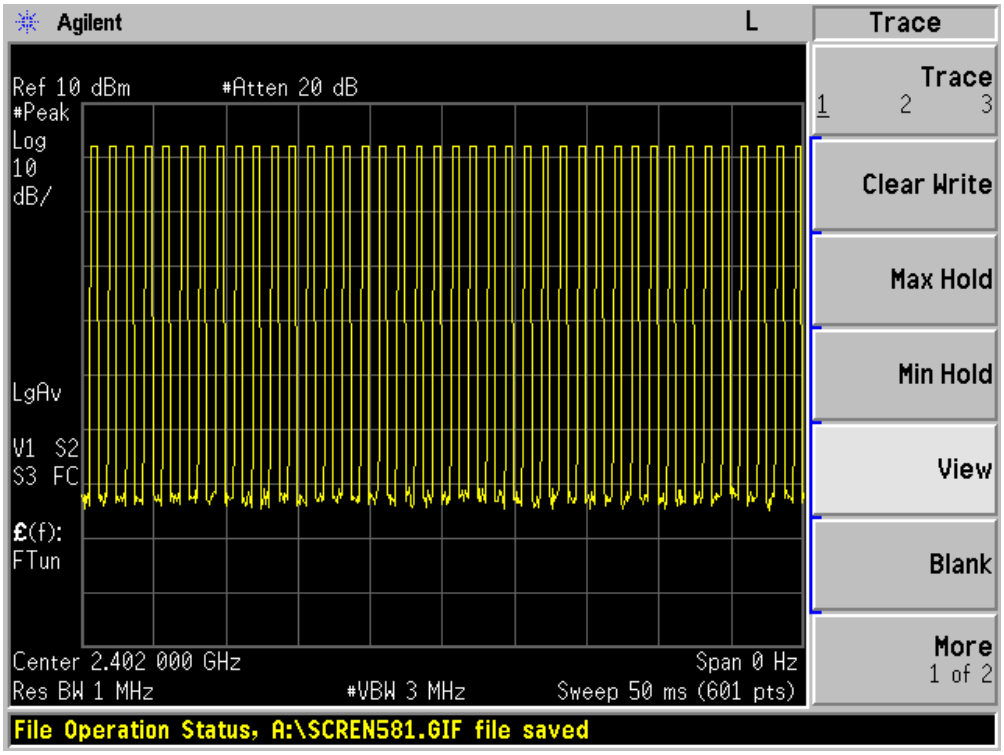
Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
00	2402	125.344	< 400	Pass
39	2441	125.344	< 400	Pass
78	2480	125.344	< 400	Pass

Test Time Period: 0.4*79=31.6sec, Hopping Times Within 1sec: 40/50msec=800 hops/sec.

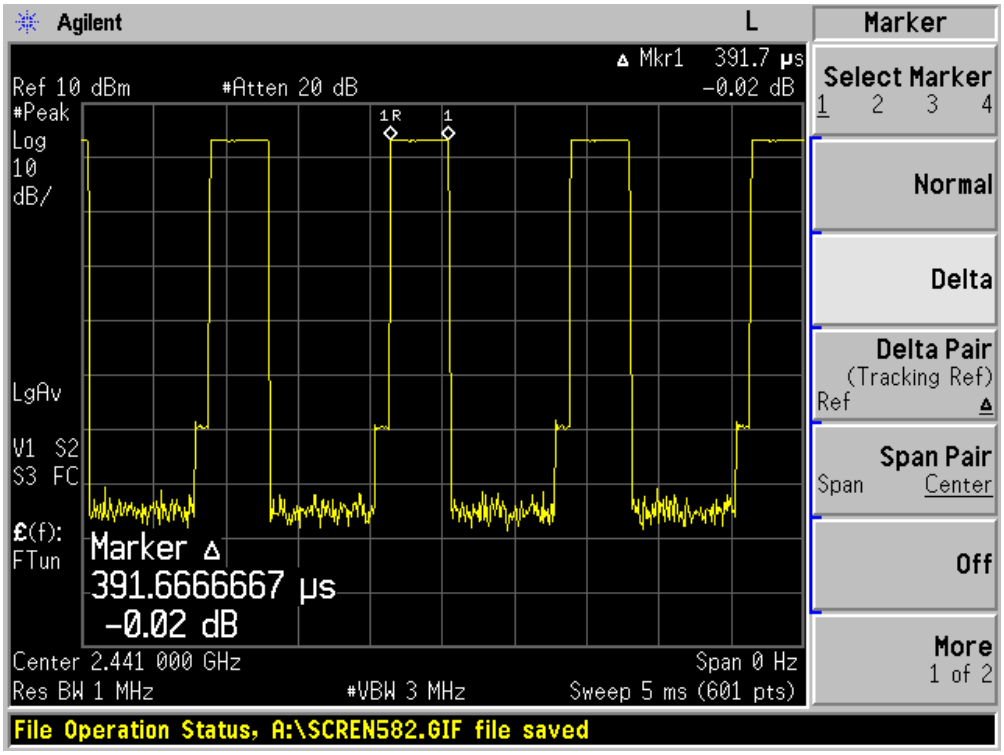
- 2402MHz, The Maximum Occupancy Time Within 31.6sec: (391.7 μs*800)/79*31.6= 125.344msec
- 2441MHz, The Maximum Occupancy Time Within 31.6sec: (391.7 μs*800)/79*31.6= 125.344msec
- 2480MHz, The Maximum Occupancy Time Within 31.6sec: (391.7 μs*800)/79*31.6= 125.344msec

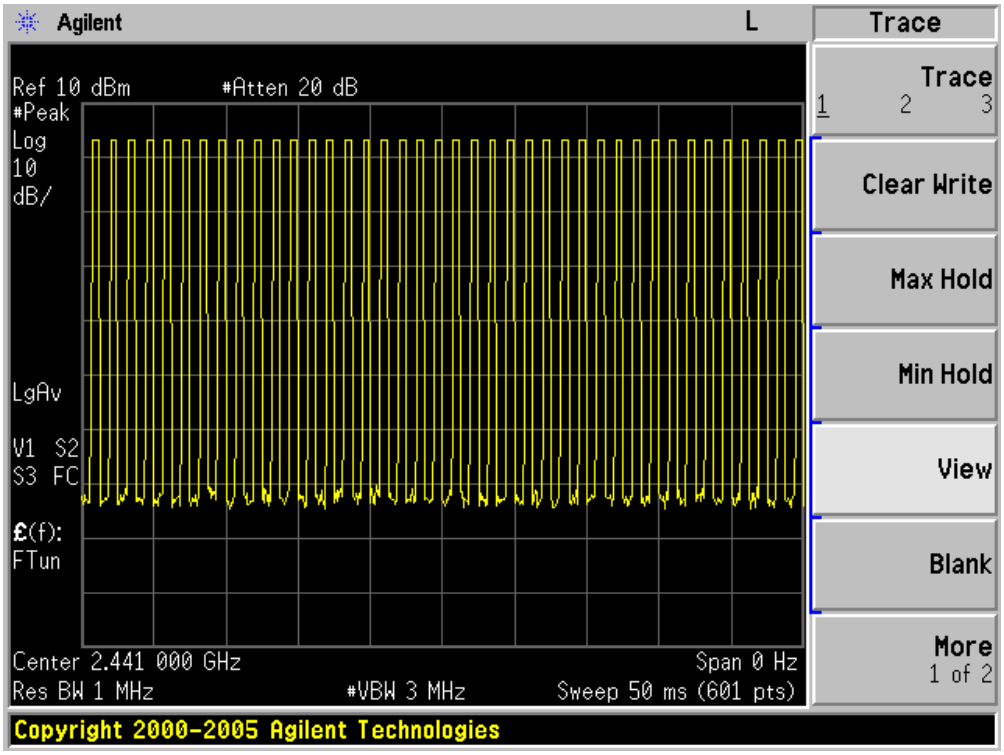
Channel 00 (2402MHz)



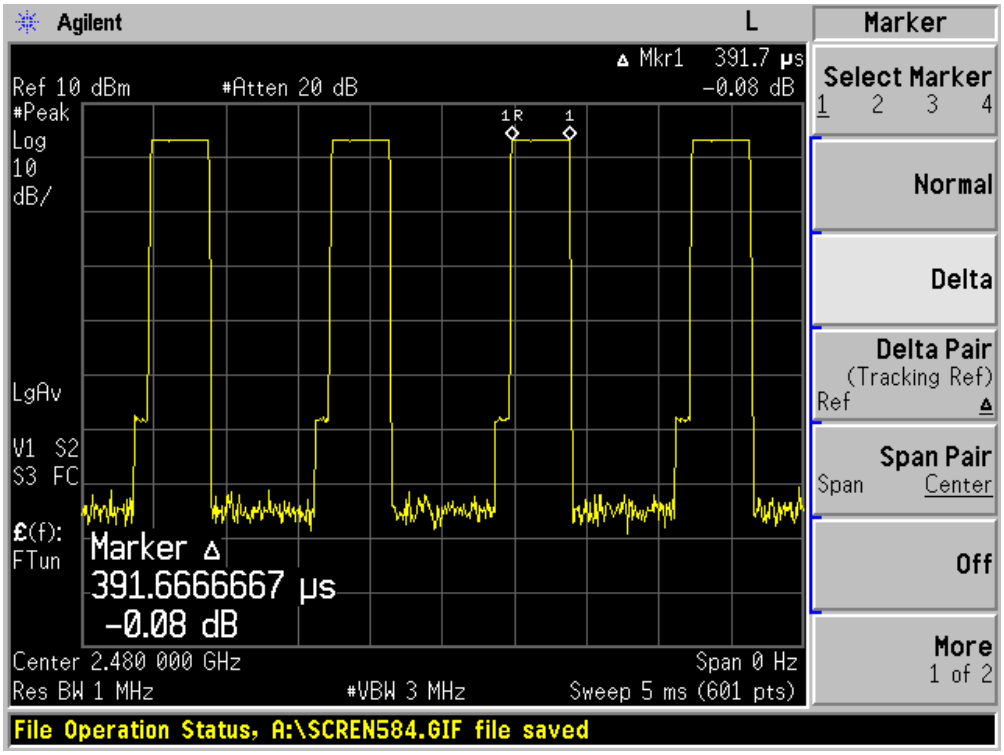


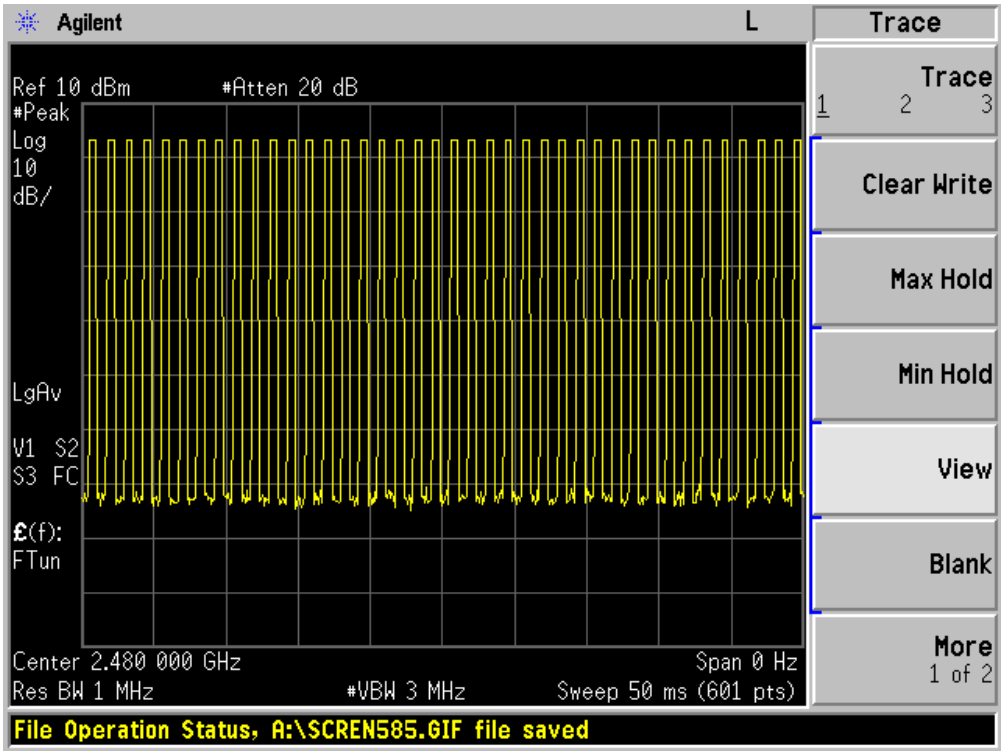
Channel 39 (2441MHz)





Channel 78 (2480MHz)





9. Peak Output Power

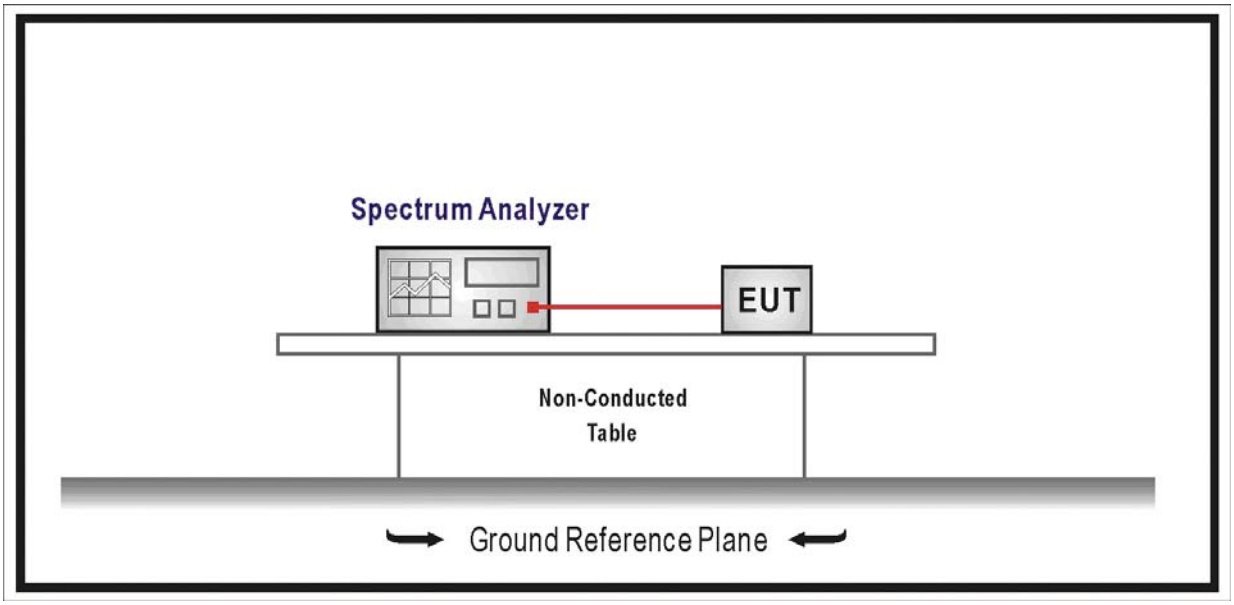
9.1. Test Equipment

Peak Output Power / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. Limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
- For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels.

Note: the conducted output power limit specified above is based on the use the antennas with directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

9.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
Use the following spectrum analyzer settings:
Span = approximately 5 times the 20dB bandwidth, centered on a hopping channel
RBW ＞ the 20 dB bandwidth of the emission being measured.
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (don't forget added the external attenuation and cable loss).

9.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

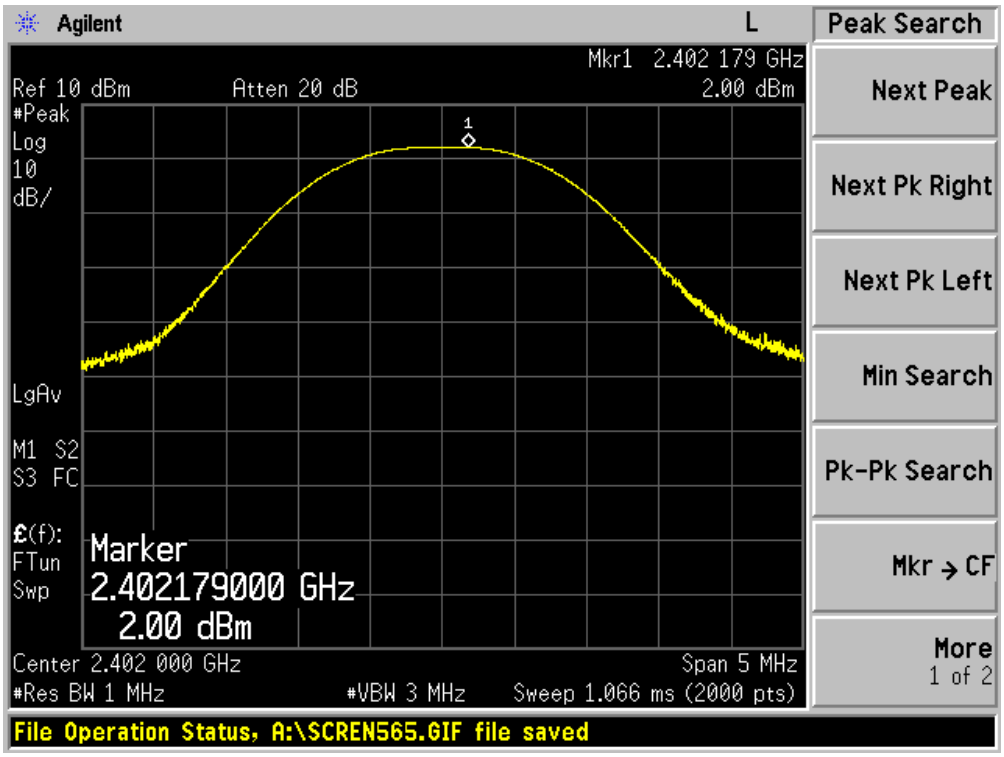
9.6. Test Result

Product	:	Seecode Vision
Test Item	:	Peak Output Power
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

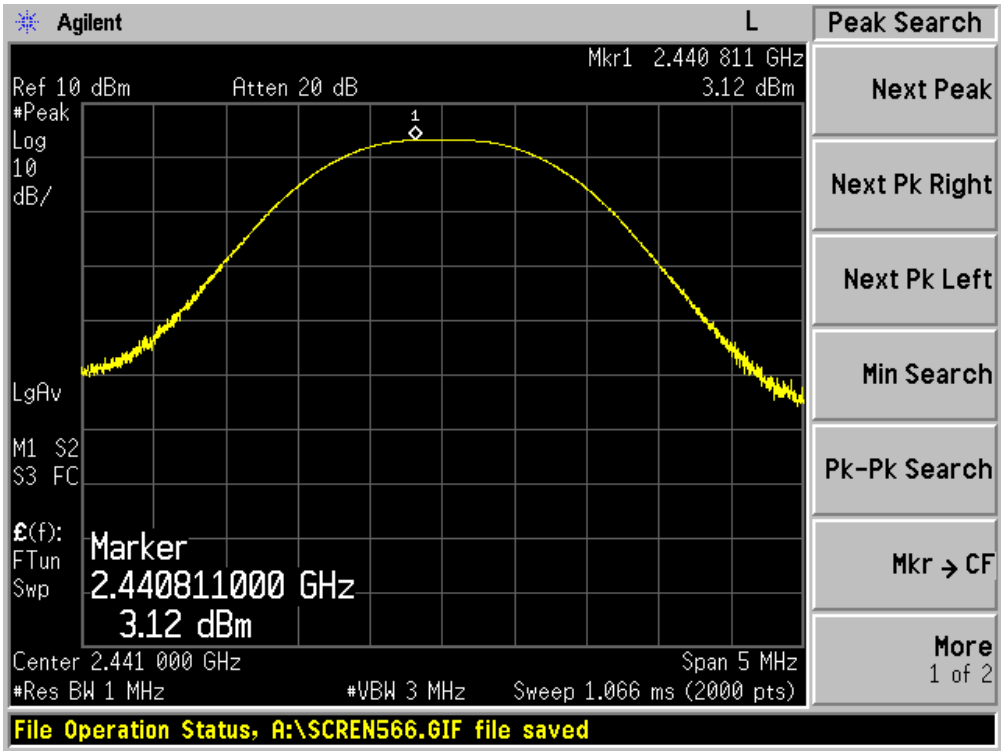
Channel No.	Frequency (MHz)	Measurement Level (dBm)	External Attenuation (dBm)	Peak Output Power (dBm)	Limit (dBm)	Result
00	2402	2.00	0.32	2.32	30	Pass
39	2441	3.12	0.35	3.47	30	Pass
78	2480	3.24	0.40	3.64	30	Pass

Note: The antenna gain of transmitter is less than 6 dBi and other than fixed, point-to-point operation, therefore the limit is 30 dBm.

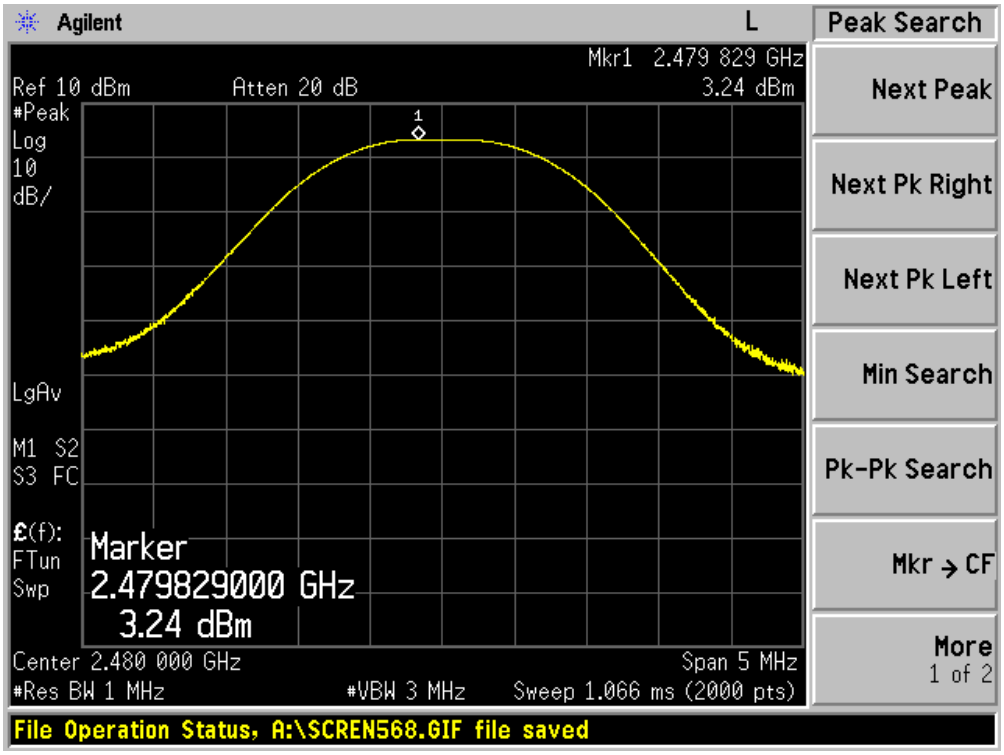
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



10. Band-edge Compliance of RF Conducted Emissions

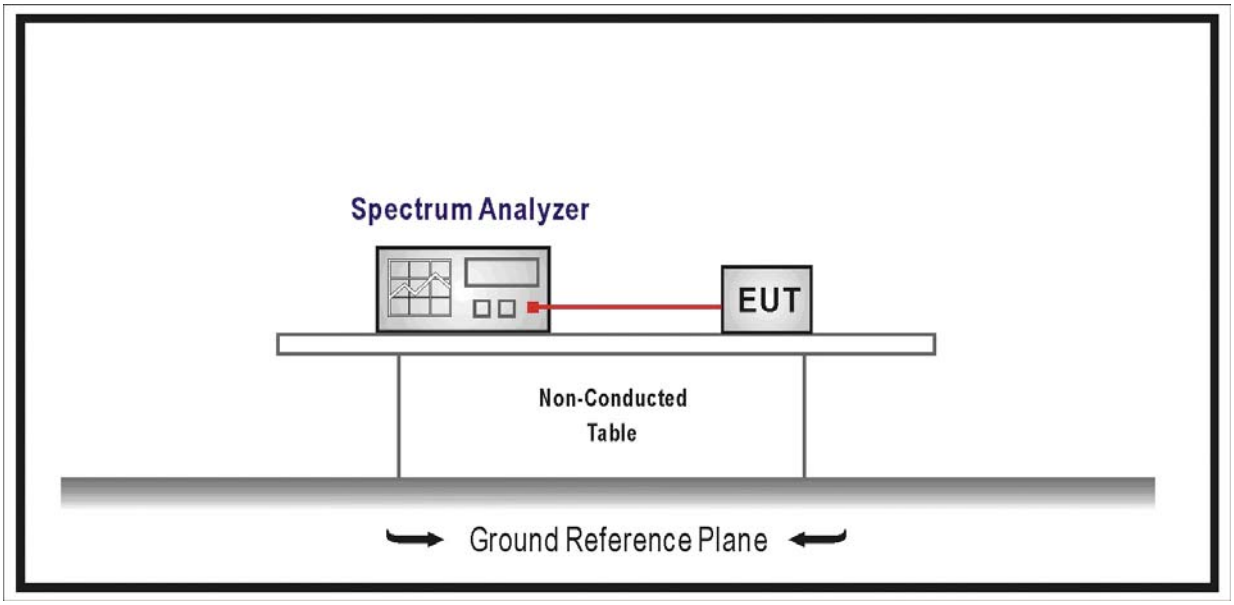
10.1. Test Equipment

Band-edge Compliance of RF Conducted Emissions / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

- Intentional radiators operating under the alternative provisions to the general emission limits as contained in 15.217 through 15.257 and in Subpart E of FCC part 15, must be designed to ensure that 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is

produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) of FCC part 15 is not required.

10.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation.
RBW ≧ 1% of the span
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation prouduct outside of the band, if this level is greater than that at the bandedge.
Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.
Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

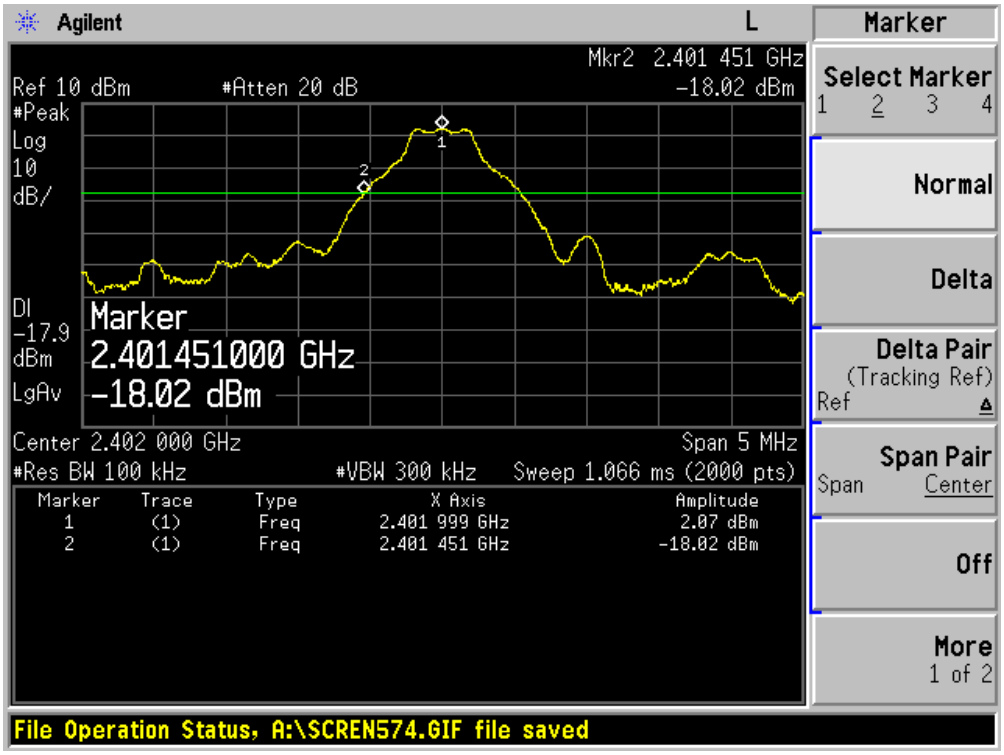
10.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

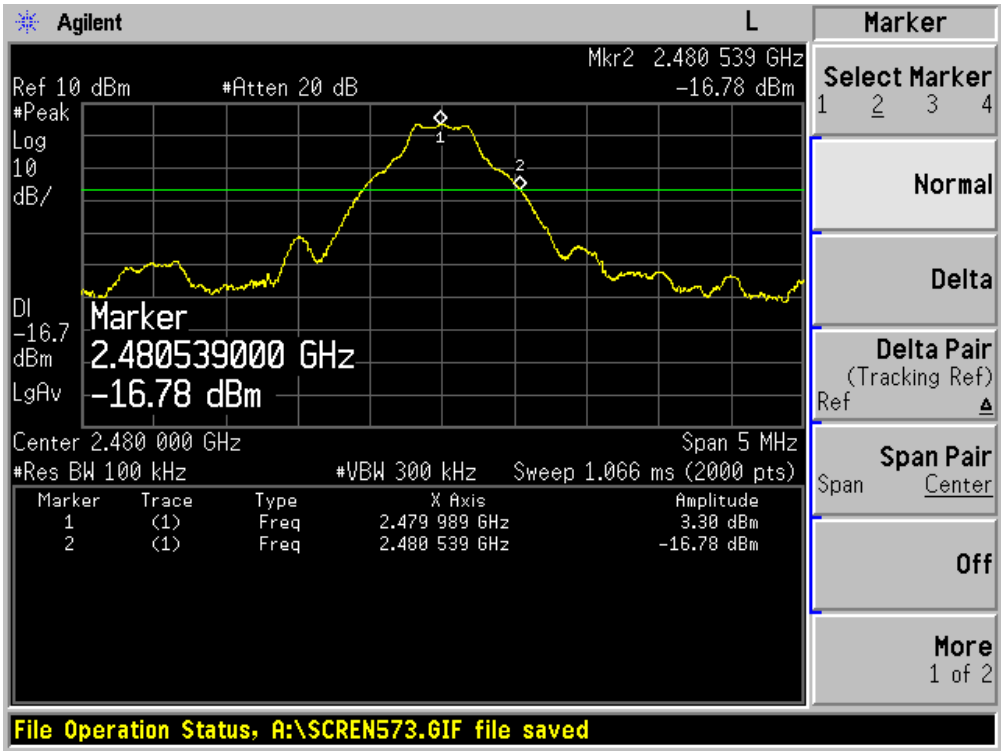
10.6. Test Result

Product	:	Seecode Vision
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

Channel 00 (2402MHz)



Channel 78 (2480MHz)



11. Spurious RF Conducted Emissions

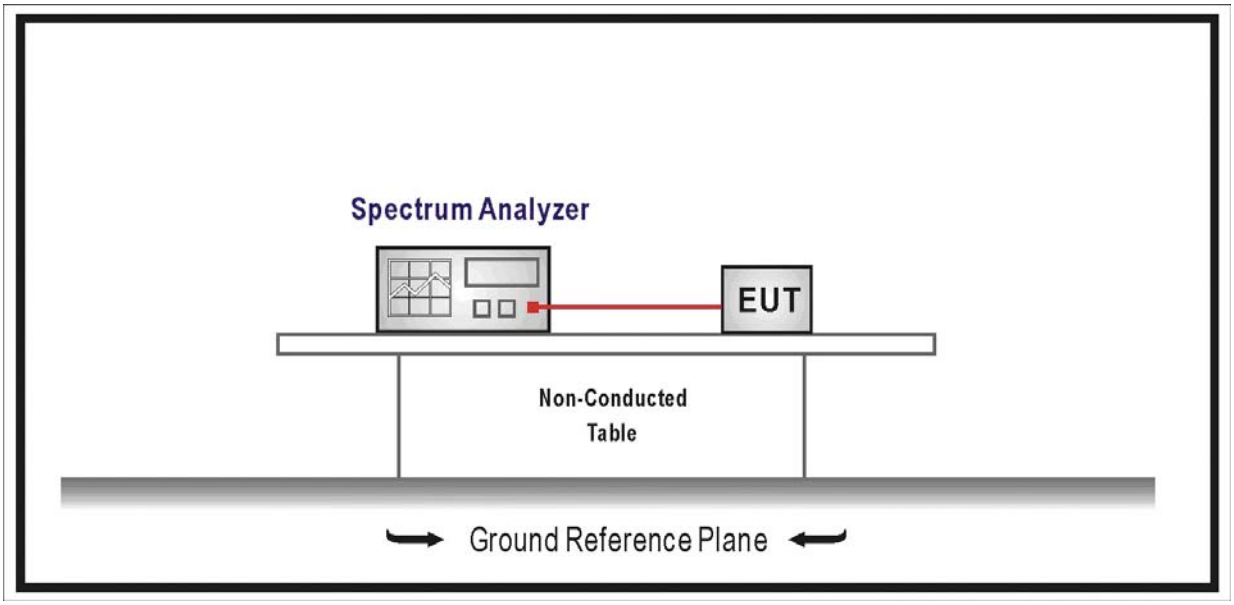
11.1. Test Equipment

Spurious RF Conducted Emissions / AC-4

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2008/06/11
Coaxial Cable	Huber+Suhner	AC4-RF	09	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2008/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

11.2. Test Setup



11.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this

paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) of FCC part 15 is not required.

11.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10^{th} harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

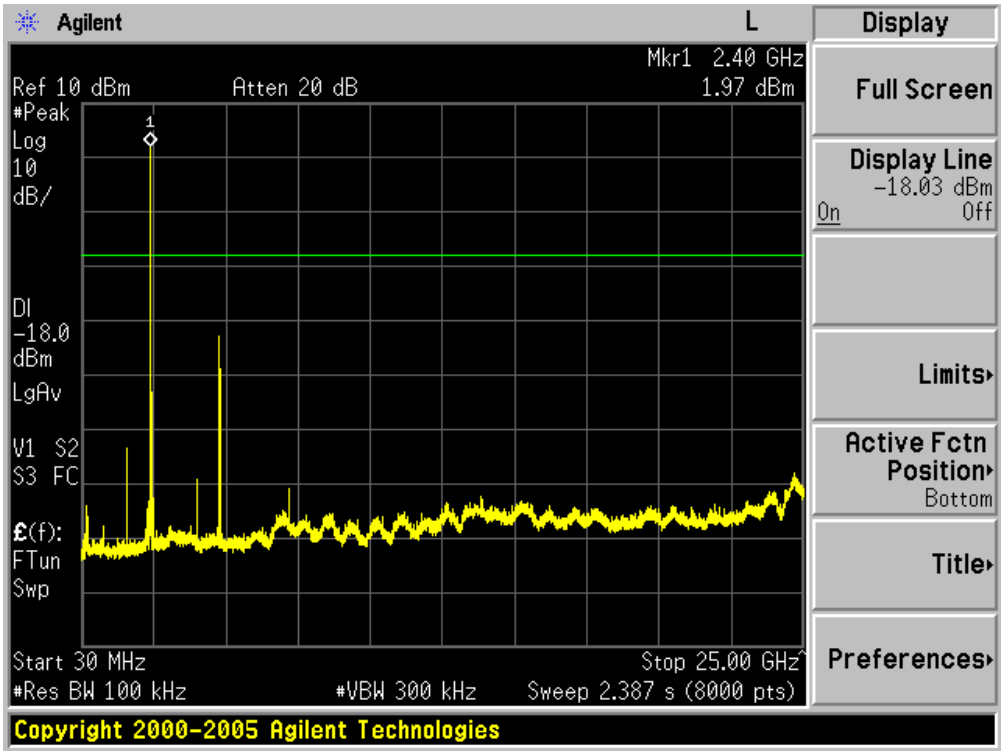
11.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

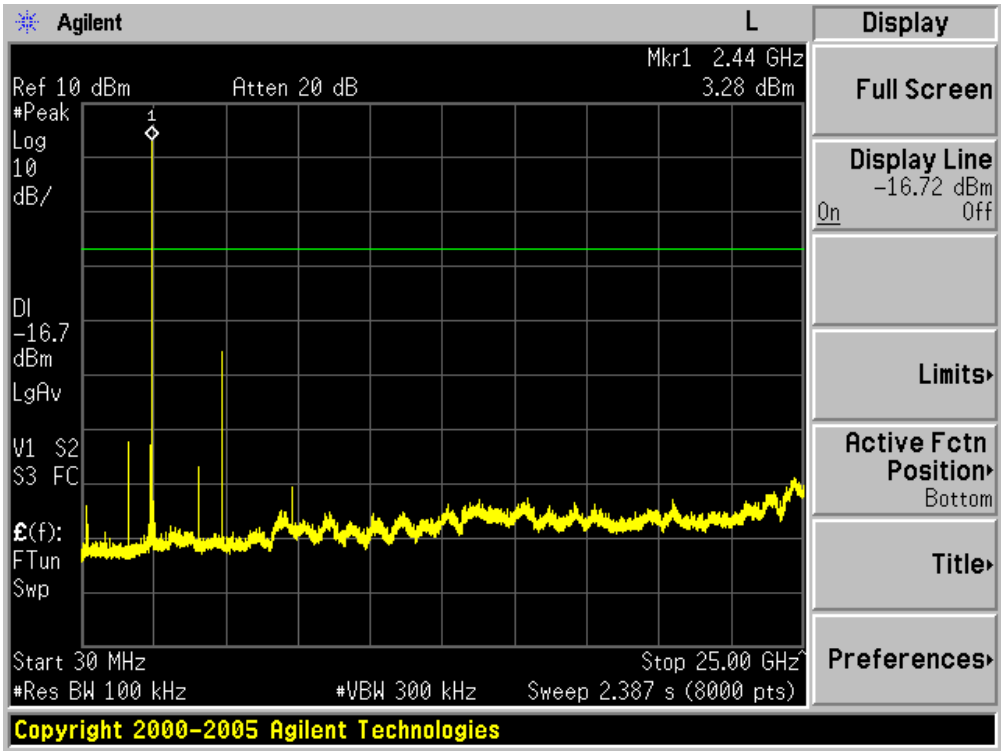
11.6. Test Result

Product	:	Seecode Vision
Test Item	:	Spurious RF Conducted Emissions
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit

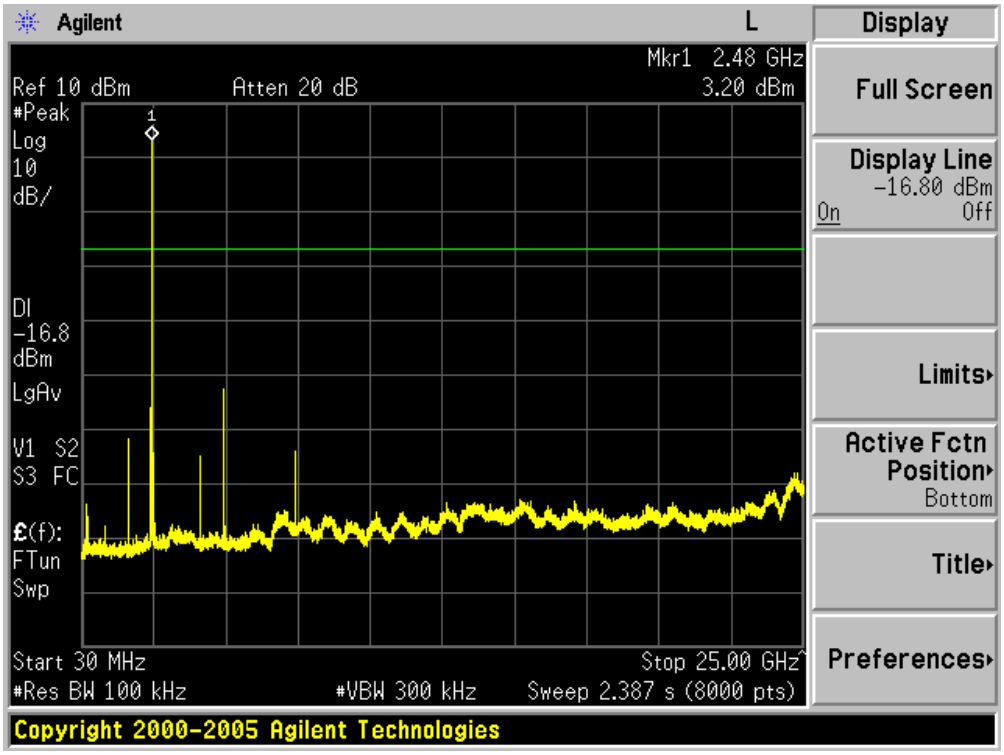
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



12. Radiated Emission Band Edge

12.1. Test Equipment

☐Radiated Emission Band Edge / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2007/11/12
EMI Test Receiver	R&S	ESCI	100573	2008/05/10
Preamplifier	Quietek	AP-025C	QT-AP003	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112B	2932	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2007/11/25
50ohm Coaxial Switch	Anritsu	MP59B	6200447304	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	04	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH002	2008/03/31

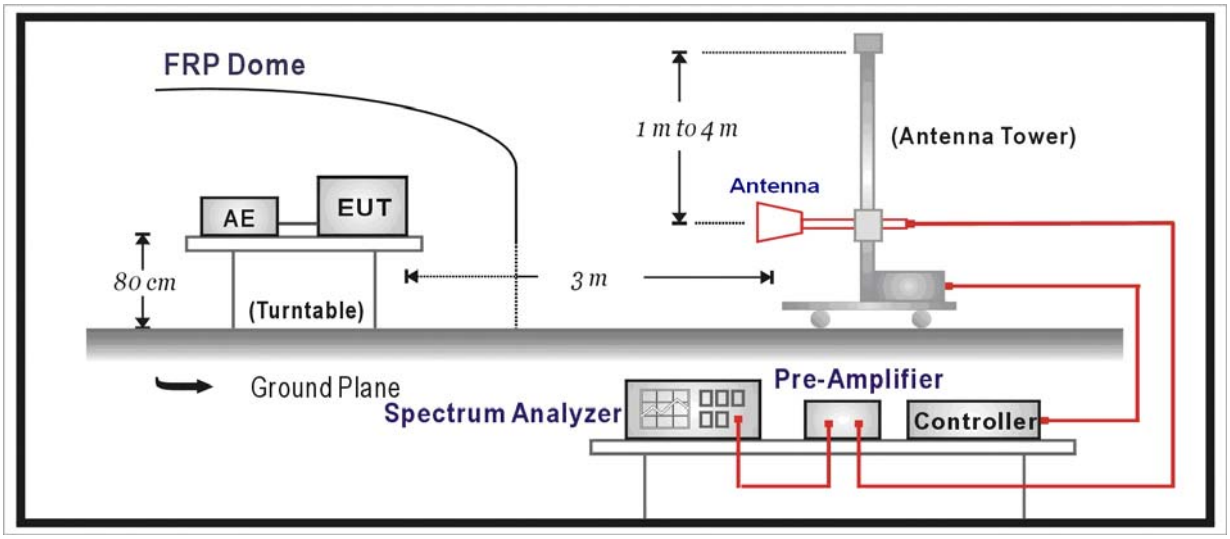
☒Radiated Emission Band Edge / AC-3

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2008/04/24
EMI Test Receiver	R&S	ESCI	100176	2007/11/15
Preamplifier	Quietek	AP-025C	QT-AP004	2007/11/25
Preamplifier	Quietek	AP-180C	CHM-0602012	2007/11/25
Bilog Type Antenna	Schaffner	CBL6112D	22254	2007/11/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2007/11/25
50ohm Coaxial Switch	Anritsu	MP59B	6200464463	2007/11/25
Coaxial Cable	Huber+Suhner	AC2-C	05	2007/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2008/03/31

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Note 2: The test instruments marked with “X” are used to measure the final test results.

12.2. Test Setup



12.3. Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) of FCC part 15.

12.4. Test Procedure

According to FCC Public Notice DA 00-705, March 30, 2000.
This test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205 of FCC part 15. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≧ 1 GHz, 100 kHz for f < 1GHz
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Follow the guidelines in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being

corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b) of FCC part 15.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209 of FCC Part 15. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit of FCC part 15.

If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method may be employed.

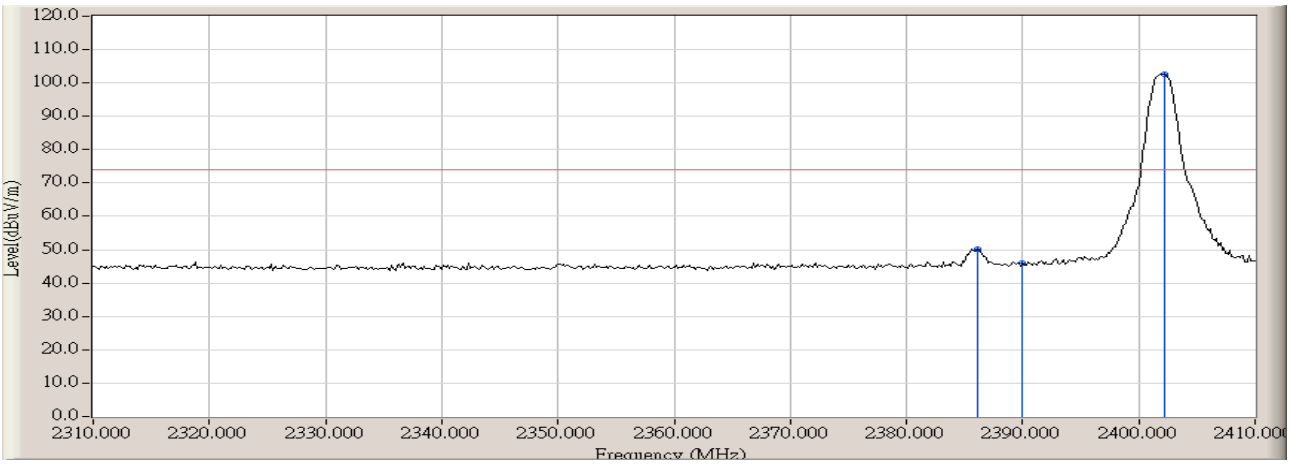
12.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

below 1G is defined as ± 3.8 dB

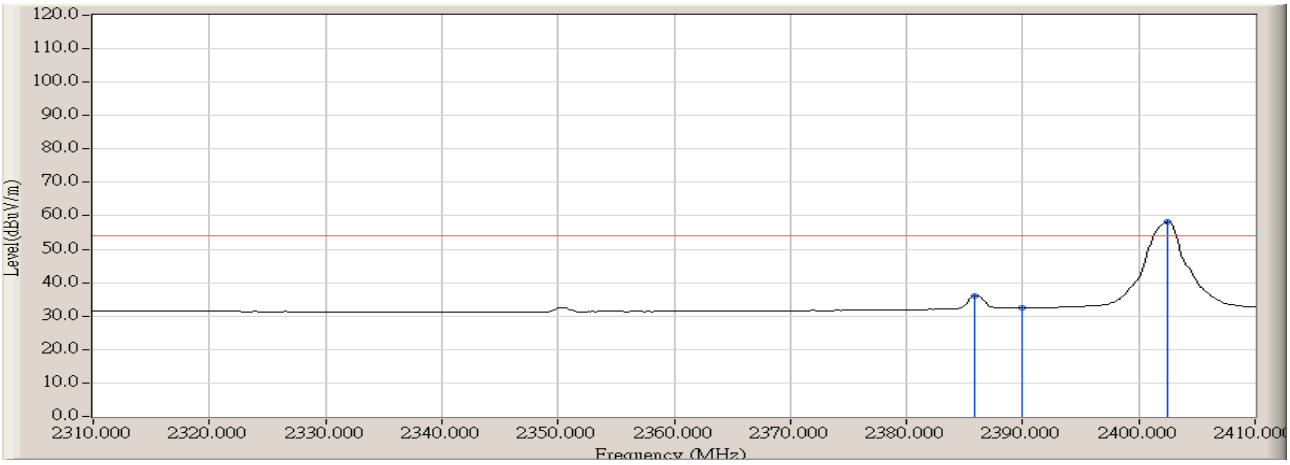
12.6. Test Result

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 19:13**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



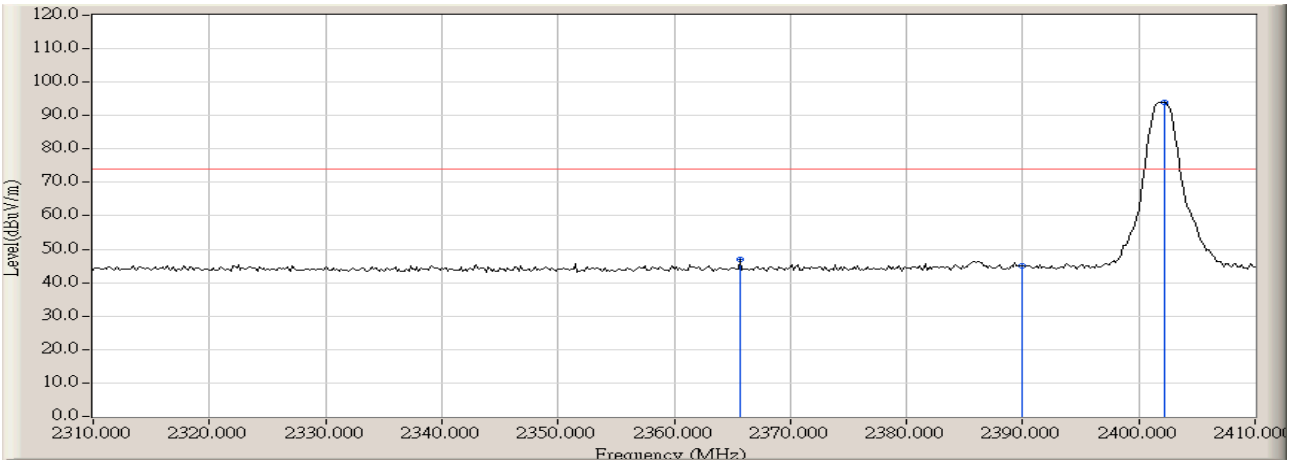
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2386.167	-3.213	53.295	50.082	-23.888	73.970	PEAK
2		2390.000	-3.202	49.113	45.911	-28.059	73.970	PEAK
3	*	2402.167	-3.199	105.847	102.647	N/A	N/A	PEAK

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 19:14**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2385.833	-3.215	39.182	35.968	-18.002	53.970	AVERAGE
2		2390.000	-3.202	35.660	32.458	-21.512	53.970	AVERAGE
3	*	2402.500	-3.200	61.294	58.094	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 19:11**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**

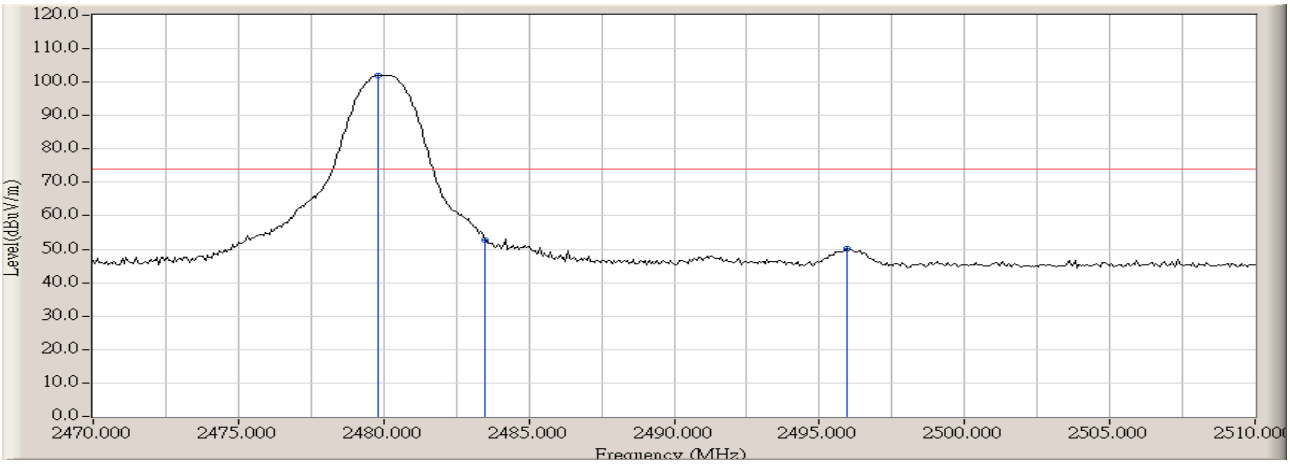


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2365.667	-3.267	50.204	46.937	-27.033	73.970	PEAK
2		2390.000	-3.202	48.368	45.166	-28.804	73.970	PEAK
3	*	2402.167	-3.199	97.128	93.928	N/A	N/A	PEAK

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 19:11**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2402MHz**

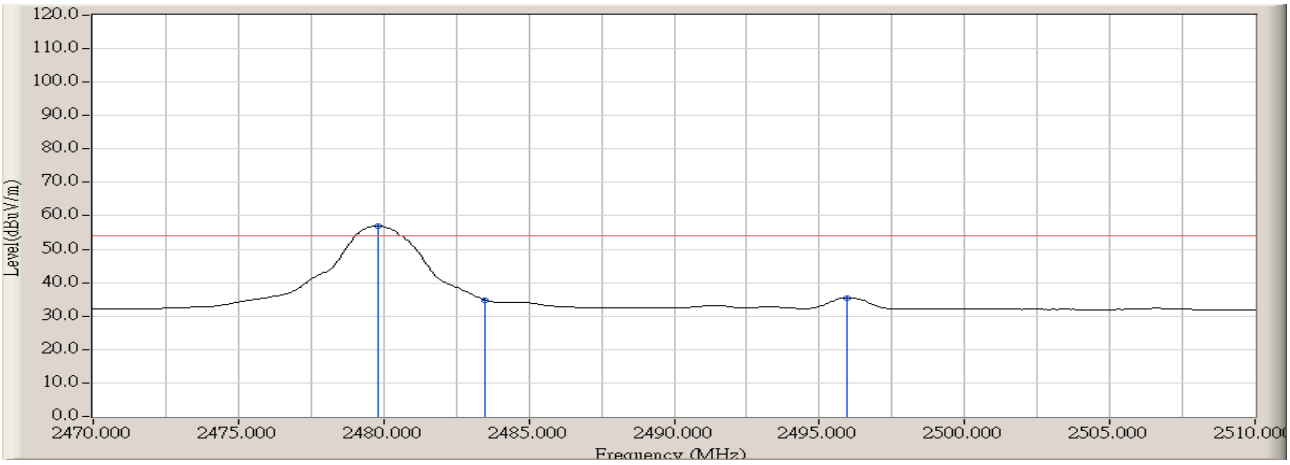
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2385.833	-3.215	36.555	33.341	-20.629	53.970	AVERAGE
2		2390.000	-3.202	35.122	31.920	-22.050	53.970	AVERAGE
3	*	2402.167	-3.199	56.909	53.709	N/A	N/A	AVERAGE

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 18:54**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



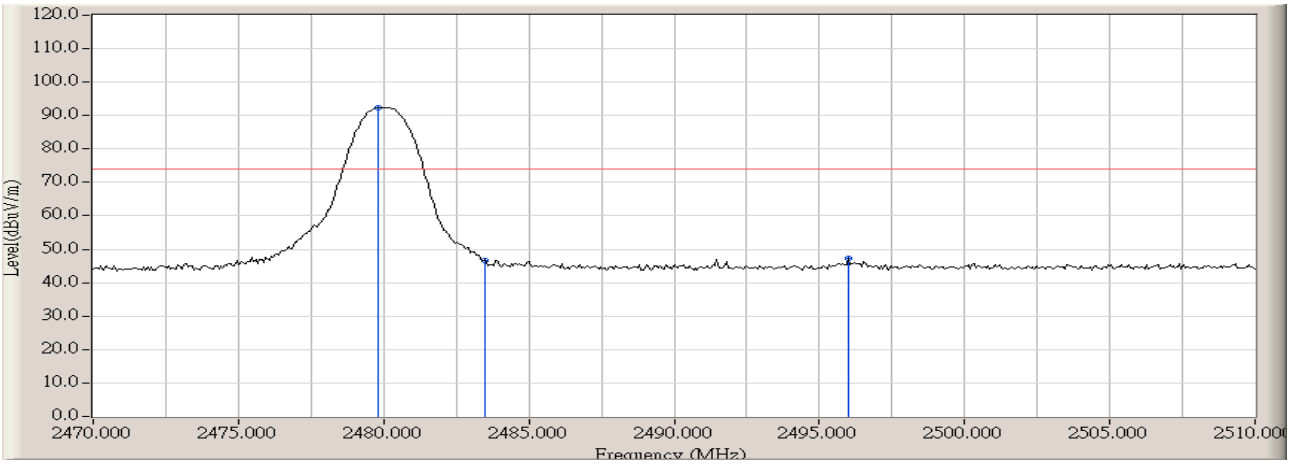
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.800	-3.187	105.178	101.990	N/A	N/A	PEAK
2		2483.500	-3.177	55.973	52.796	-21.174	73.970	PEAK
3		2495.933	-3.140	53.261	50.121	-23.849	73.970	PEAK

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 18:57**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - HORIZONTAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



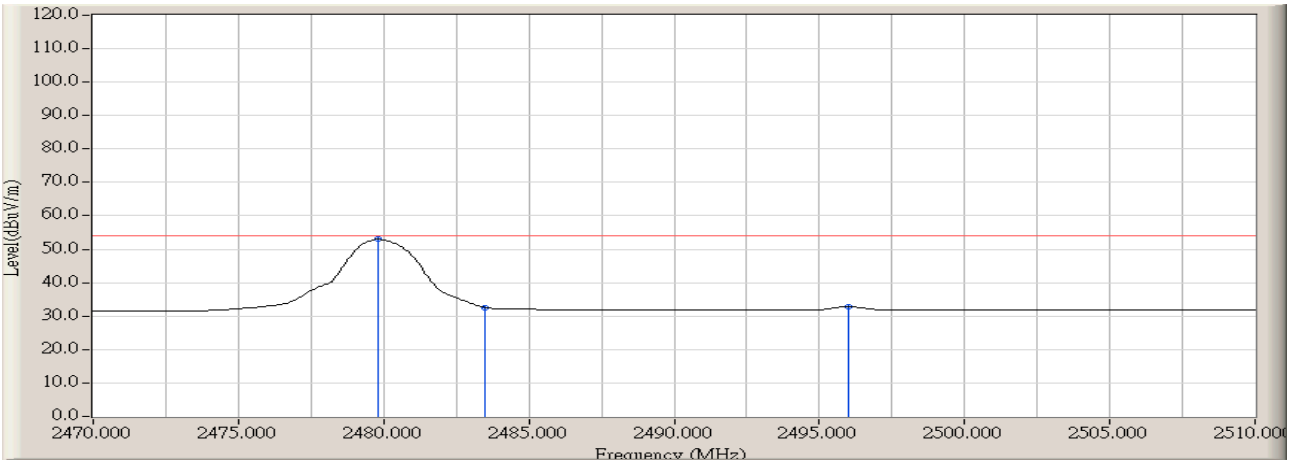
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.800	-3.187	60.131	56.943	N/A	N/A	AVERAGE
2		2483.500	-3.177	37.962	34.785	-19.185	53.970	AVERAGE
3		2495.933	-3.140	38.667	35.527	-18.443	53.970	AVERAGE

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 18:51**
Limit : FCC_SpartC_15.209_03M_PK	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.800	-3.187	95.508	92.320	N/A	N/A	PEAK
2		2483.500	-3.177	49.675	46.498	-27.472	73.970	PEAK
3		2496.000	-3.140	50.322	47.182	-26.788	73.970	PEAK

Engineer : Robin	
Site : AC3 (3m Semi-Anechoic Chamber)	**Time : 2008/06/29 - 18:52**
Limit : FCC_SpartC_15.209_03M_AV	**Margin : 0**
EUT : Seecode Vision	**Probe : BBHA9120D_496(1-18GHz) - VERTICAL**
Power : DC 12V	**Note : Mode 1: Transmit at channel 2480MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.800	-3.187	56.142	52.954	N/A	N/A	AVERAGE
2		2483.500	-3.177	35.720	32.543	-21.427	53.970	AVERAGE
3		2496.000	-3.140	35.926	32.786	-21.184	53.970	AVERAGE