FCC COMPLIANCE REPORT

for

Kadence Designs LLC

Remote

Model Number: M2.2

Prepared for : Kadence Designs LLC
Address : P.O.Box 2359,Thompson Falls,MT 59873

Prepared By : NS Technology Co., Ltd.
Address : Chenwu Industrial Zone, Houjie Town, Dongguan City, Guangdong, China

Tel: +86-769-85935656
Fax: +86-769-85991080

Report Number : NSE-F09103931
Date of Test : Sept. 8~Oct. 12, 2009
Date of Report : Oct. 16, 2009

TABLE OF CONTENTS

NS Technology Co., Ltd.

Applicant: **Address:**	Kadence Designs LLC P.O.Box 2359,Thompson Falls,MT 59873		
Manufacturer: **Address:**	Celewave Electronics(Shenzhen) Co.,Ltd No 1-2 building,No 2 Industry District, Shang Heng lang Huaxing Road, Dalang Street,Baoan District, Shenzhen City,China		
E.U.T:	Remote		
Model Number:	M2.2		
Trade Name:	LightSpeaker™	**Operating Frequency:**	908MHz
Date of Receipt:	Sept. 8, 2009	**Date of Test:**	Sept. 8~Oct. 30, 2009
Test Specification:	FCC Part 15 Subpart C: July. 10, 2008 ANSI C63.4:2003 RSS-210,Issue 7 June 2007, Annex2,9 RSS-GEN, Issue 2 June 2007		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied. **Issue Date: Oct. 16,2009**		

Tested by:	Reviewed by:	Approved by:
Jade	Iceman	Steven
Jade/ Engineer	Iceman Hu / Supervisor	Steven Lee / Manager

Other Aspects:
None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

1. GENERAL PRODUCT INFORMATION

1.1. Product Function

Details please refer to Technical Construction Form and User Manual.

1.2. Description of Device (EUT)

E.U.T.	:	Remote
Model No.	:	M2.2
Operating Frequency	:	908MHz
Number of Channels	:	1 Channels
Type of Modulation	:	FSK
Antenna Type	:	Integral
System Input Voltage	:	Nominal Voltage: DC 3V
Temperature Range(Operating)	:	0 ~+ 40℃

1.3. Difference between Model Numbers

1.4. Independent Operation Modes

The basic operation modes are:

1.4.1. TX Mode

2. TEST SITES

2.1. Test Facilities

EMC Lab : Certificated by TUV Rheinland, Germany.
Date of registration: July 28, 2003

Certificated by FCC, USA
Registration No.: 502831
Date of registration: February 09, 2009

Certificated by VCCI, Japan
Registration No.: R-2527 & C-2770
Date of registration: March 23, 2007

Certificated by CNAL, CHINA
Registration No.: L1744
Date of registration: November 25, 2004

Certificated by Intertek ETL SEMKO
Registration No.: TMP-013
Date of registration: June 11, 2005

Certificated by TUV/PS, Hong Kong
Date of registration: December 1, 2005

Certificated by Industry Canada
Registration No.: 5936A
Date of registration: March 4, 2009

Certificated by ATCB, America
Date of registration: August 03, 2006

Name of Firm : NS Technology Co., Ltd.

Site Location : Chenwu Industrial Zone, Houjie Town, Dongguan City, Guangdong, China

2.2. List of Test and Measurement Instruments

2.2.1.For radiated emission test (30MHz-1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCS30	100340	May 31,09	May 31,10
Spectrum Analyzer	HP	8593E	3448U00806	May 31,09	May 31,10
Bilog Antenna	Teseq	CBL 6111D	25758	Oct. 15,08	Oct. 15,09
Signal Amplifier	Agilent	8447D	2944A10488	May 2,09	May 2,10
50Ω Coaxial Switch	ANRITSU	MP59B	6200530577	May 2,09	May 2,10
RF Cable	IMRO	IMRO-400	966 Cable 1#	May 2,09	May 2,10
RF Cable	DRAKA	M17/84-RG 223	966 Cable 2#	May 2,09	May 2,10

2.2.2.For radiated emission test(1GHz-10GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	HP	8593E	3448U00806	May 31,09	May 31,10
Horn Antenna	EMCO	3117	00062558	Jan. 19,09	Jan. 19,11
Signal Amplifier	BURGEON	PEC-38-30M18G -12-SFF	NSEMC001	May 31,09	May 31,11
RF Cable	DRAKA	M06/25-RG102	966Cable 3#24G	May 2,09	May 2,10

2.2.3.For Band edge compliance and 20dB bandwidth test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCS30	100340	May 31,09	May 31,10
Spectrum Analyzer	HP	8593E	3448U00806	May 31,09	May 31,10
Bilog Antenna	Teseq	CBL 6111D	25758	Oct. 15,08	Oct. 15,09
Signal Amplifier	Agilent	8447D	2944A10488	May 2,09	May 2,10
50Ω Coaxial Switch	ANRITSU	MP59B	6200530577	May 2,09	May 2,10
RF Cable	IMRO	IMRO-400	966 Cable 1#	May 2,09	May 2,10
RF Cable	DRAKA	M17/84-RG 223	966 Cable 2#	May 2,09	May 2,10

3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its highest possible radiated level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections Between EUT and Simulators

3.3. Test Operation Mode and Test Software

Refer to clause 1.4

3.4. Special Accessories and Auxiliary Equipment

None.

3.5. Countermeasures to Achieve EMC Compliance

None.

4. TEST SUMMARY

Test items and result lists

No.	Item	Standard	Results
1	Conduction Emission Test	FCC Part15C: 15.209 ANSI C63.4-2003 RSS-210 RSS-GEN 7.2.2	N/A
2	Radiated Emission Test	FCC Part15C: 15.249 ANSI C63.4-2003 RSS-210 A2.9 RSS-GEN	PASS
3	Band Edge Compliance Test	FCC Part15: 15.249 RSS-210 RSS-GEN	PASS
4	20dB（99%） Bandwidth Test	FCC Part 15: 15.215 RSS-210 RSS-GEN	PASS

Note: N/A is an abbreviation for Not Applicable.

5. EMISSION TEST RESULTS

5.1. Radiated Emission

5.1.1. Test limits

1) FCC part 15C section 15.209
2) FCC part 15C section 15.249(a)
3) RSS-210 A2.9

5.1.2. Test procedure

The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency band of 30MHz to 1GHz,The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations. The broadband antenna (calibrated by dipole antenna) was used as a receiving antenna. At the frequency band of 1GHz to 10GHz,The measuring antenna moved from 1 to 4 m for horizontal and vertical polarization. The horn antenna was used as a receiving antenna.

The resolution bandwidth and video bandwidth of the test receiver was 120 kHz and 300kHz for Quasi-peak detection at frequency below 1GHz.

The resolution bandwidth and video bandwidth of the test receiver was1MHz and 1MHz for Peak detection at frequency above 1GHz.

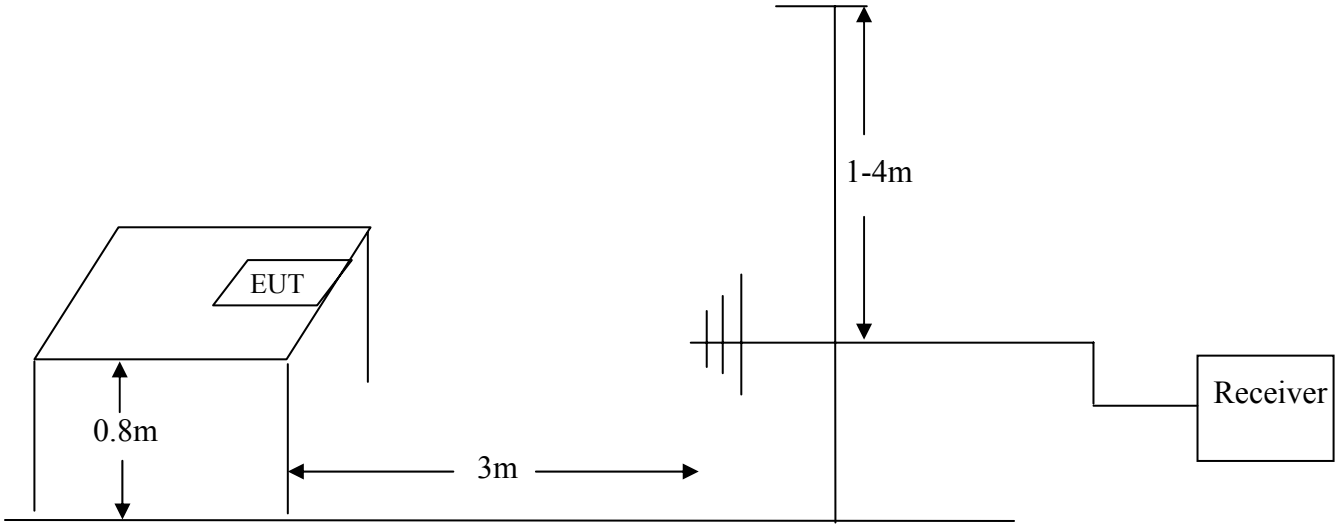
For Average measurement at frequency above 1GHz.The resolution bandwidth of the test receiver was 1MHz ; due to the shortest pulse width T is 116us, according the video bandwidth should not smaller than 1/T,so the video bandwidth is 10Hz.

In 1GHz to 10GHz, The EUT was checked by Horn ANT . But the test result is background.

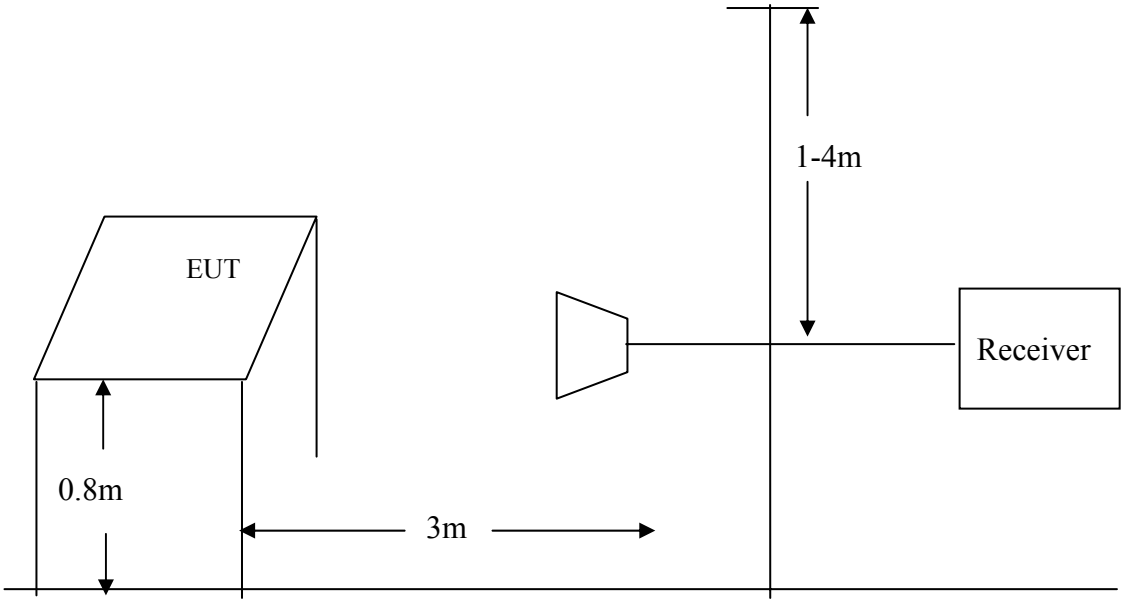
The EUT position(X. Y. Z) were checked and worse case was happened in Y position.
So Y position was chose for find measurement.
The EUT was tested in Chamber Site.
The EUT is no RX module,So it’s needn’t to test RX mode.

5.1.3.Test Setup Diagram

5.1.3.1. Frequency range: 30MHz-1000MHz



5.1.3.2. Frequency range: 1 GHz -10GHz



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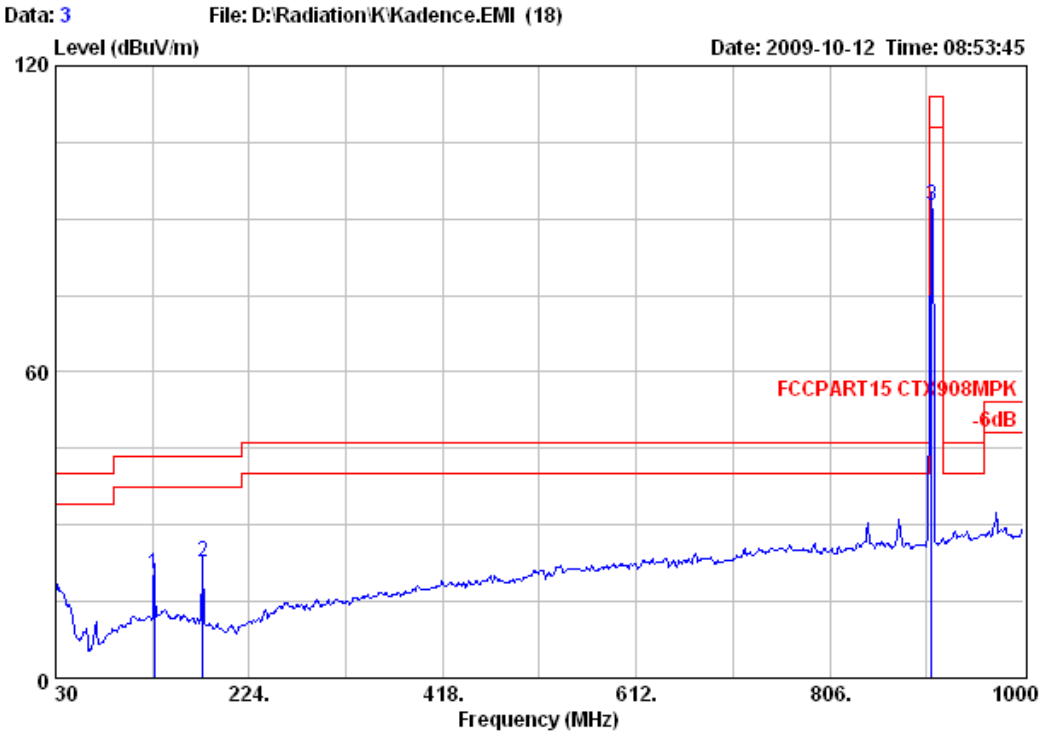
Chenwu Industrial Zone,Houjie Town,
Dongguan City,Guangdong,China
Tel:+86-769-85935656
Fax:+86-769-85991080



Test Site : 966 Chamber
Limit : FCCPART15 CTX908MPK
Dis. / Ant. : 3m 25758 Ant. Pol.: HORIZONTAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:58%
Test Mode : TX Mode
Ant high:2.8m; Table angle:168'

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Ant. Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	128.94	20.41	43.50	23.09	7.68	11.98	0.75	QP
2	177.44	22.76	43.50	20.74	12.26	9.66	0.84	QP
3	907.85	92.43	114.00	21.57	66.66	24.00	1.77	Peak

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Dongguan City,Guangdong,China
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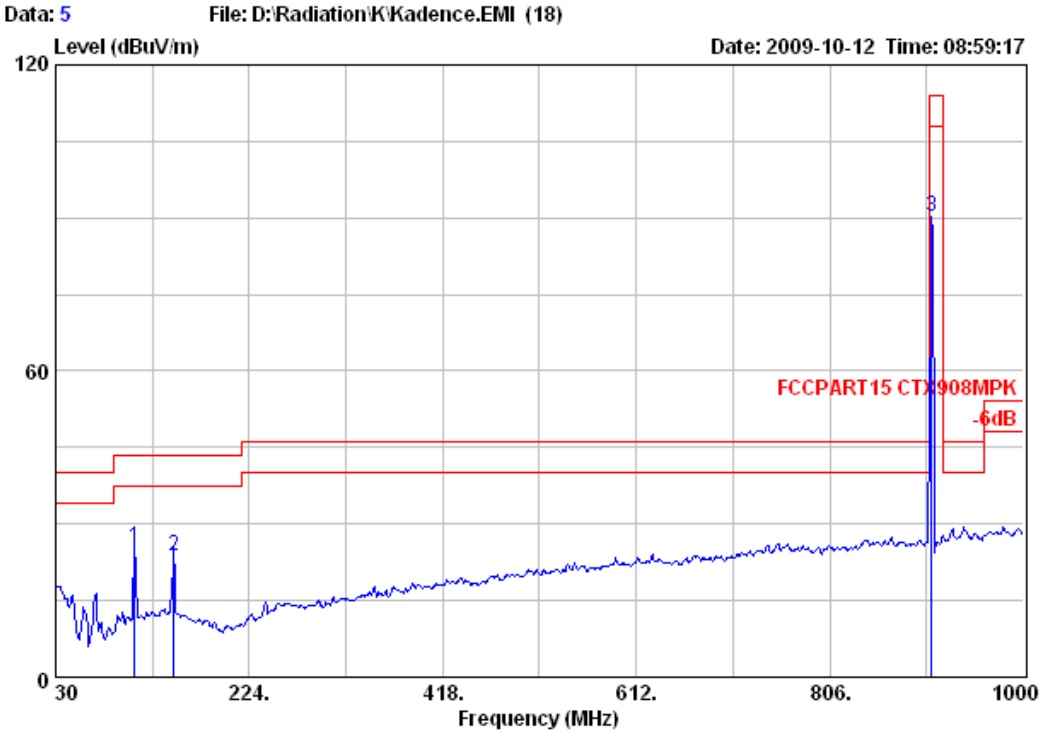
Fax:+86-769-85991080



Test Site : 966 Chamber
Limit : FCCPART15 CTX908MPK
Dis. / Ant. : 3m 25758 Ant. Pol.: VERTICAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:58%
Test Mode : TX Mode
Ant high:1.4m; Table angle:29'

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	109.54	25.47	43.50	18.03	13.56	11.21	0.70	QP
2	148.34	23.68	43.50	19.82	11.28	11.61	0.79	QP
3	907.85	90.35	114.00	23.65	64.58	24.00	1.77	Peak

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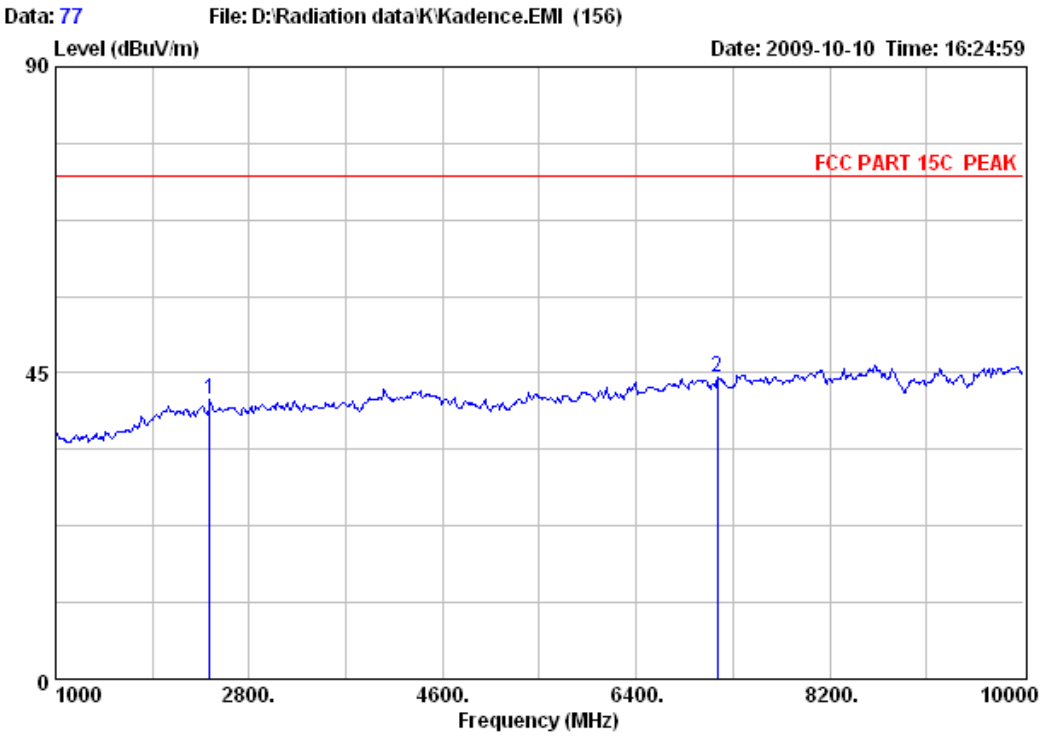

Test Site : 966 Chamber
Limit : FCC PART 15C PEAK
Dis. / Ant. : 3m 3117 Ant. Pol.: VERTICAL
EUT : Remote
M/N : M2.2
Power : DC 3V
Test Engineer : Jade
Comment : Temp.:25.2'C Humi.:56%
Test Mode : TX Mode
Ant high:1.2m; Table angle:36'

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	2431.00	41.03	74.00	32.97	7.28	31.52	2.23	Peak
2	7156.00	44.48	74.00	29.52	5.09	36.87	2.52	Peak

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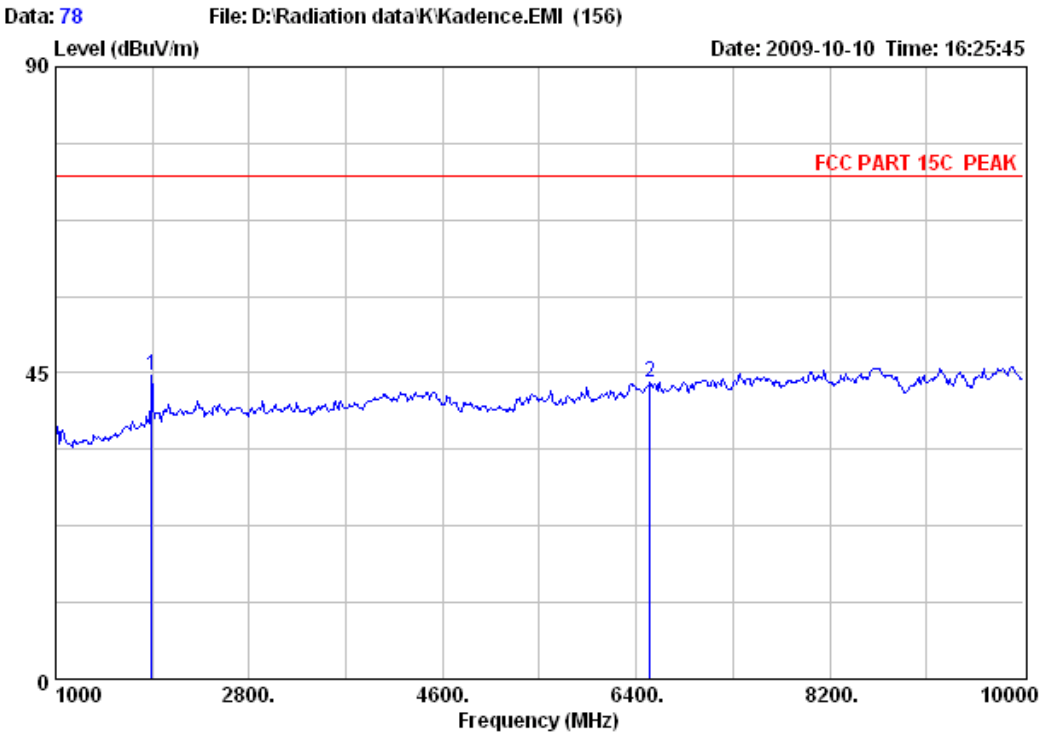

Test Site : 966 Chamber
Limit : FCC PART 15C PEAK
Dis. / Ant. : 3m 3117 Ant. Pol.: HORIZONTAL
EUT : Remote
M/N : M2.2
Power : DC 3V
Test Engineer : Jade
Comment : Temp.:25.2'C Humi.:56%
Test Mode : TX Mode
Ant high:2.7m; Table angle:116'

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	1891.00	44.51	74.00	29.49	11.98	30.34	2.19	Peak
2	6526.00	43.63	74.00	30.37	4.53	36.62	2.48	Peak

5.2. 20dB Bandwidth

5.2.1. Test limits

No requirement.

5.2.2. Test procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to the spectrum analyzer through an RF attenuator.
3. Set SA Center Frequency = Operation frequency, RBW=120kHz,VBW=300kHz.
4. Set SA trace max hold, then view.

5.2.3. Test result

Pass

Test Polarization	Frequency MHz	20dB bandwidth MHz
Horizontal	908	1.30
Vertical	908	1.35

The test plots as following:

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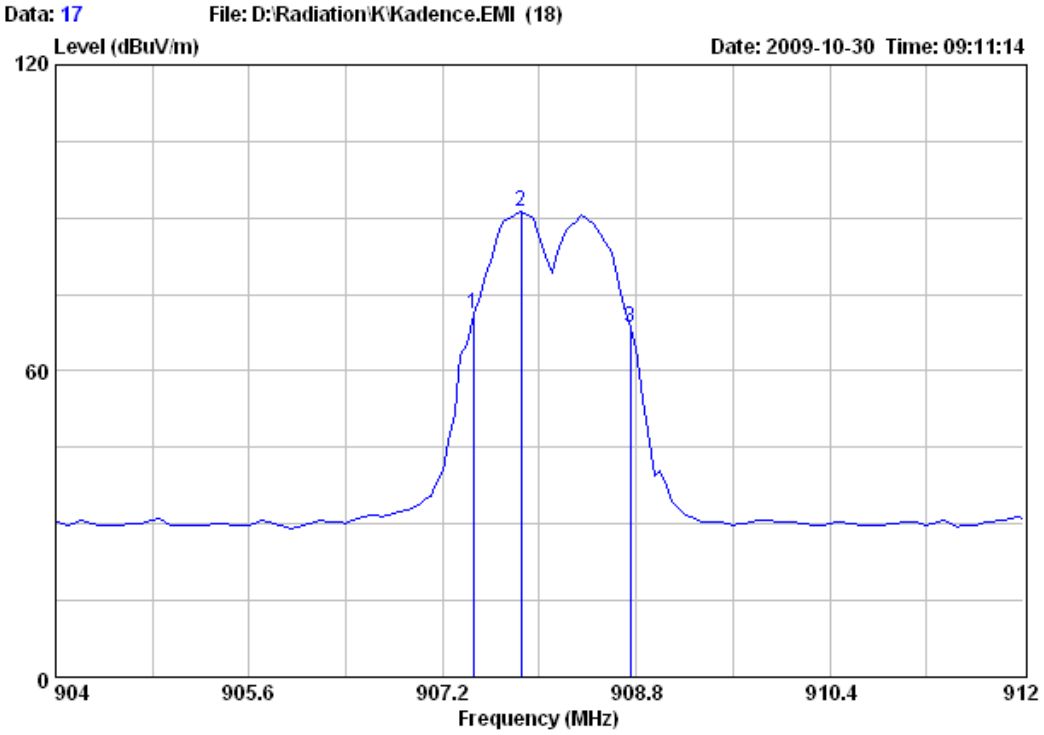

Test Site : 966 Chamber
Limit :
Dis. / Ant. : 3m 25758 Ant. Pol.: HORIZONTAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:55%
Test Mode : TX Mode

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	907.45	71.19	/	/	45.42	24.00	1.77	Peak
2	907.85	91.39	/	/	65.62	24.00	1.77	Peak
3	908.75	68.44	/	/	42.65	24.02	1.77	Peak

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Dongguan City,Guangdong,China
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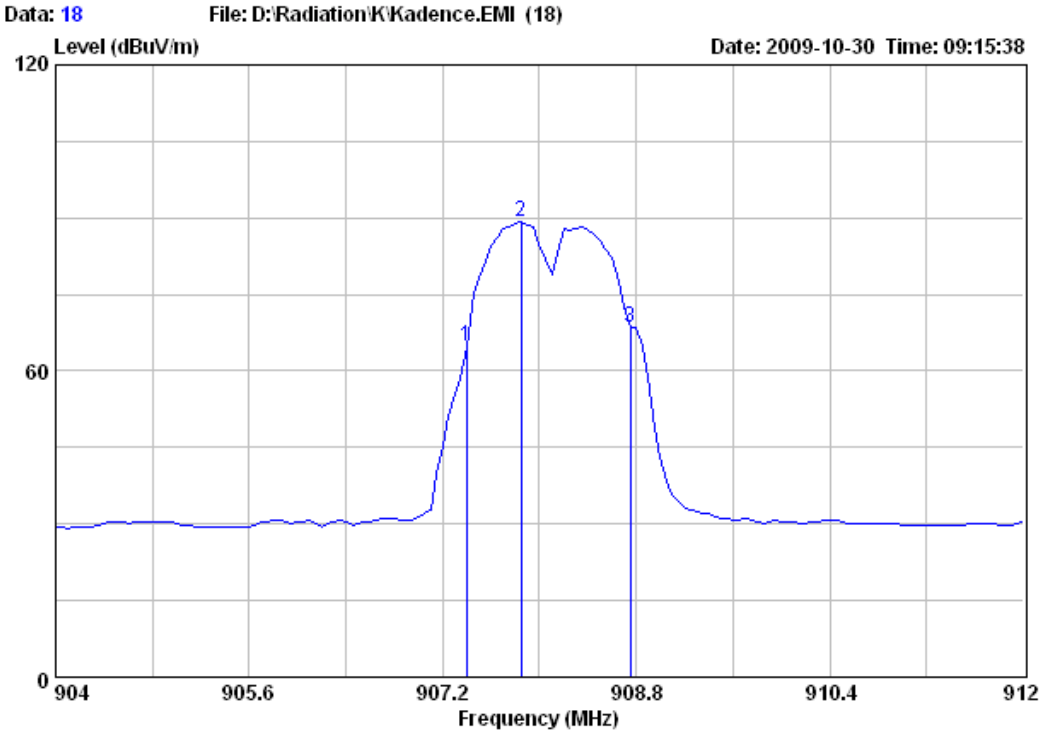
Fax:+86-769-85991080



Test Site : 966 Chamber
Limit :
Dis. / Ant. : 3m 25758 Ant. Pol.: VERTICAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:55%
Test Mode : TX Mode

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	907.40	64.81	/	/	39.04	24.00	1.77	Peak
2	907.85	89.32	/	/	63.55	24.00	1.77	Peak
3	908.75	68.65	/	/	42.86	24.02	1.77	Peak

5.3. 99% Bandwidth

5.3.1.Test procedure

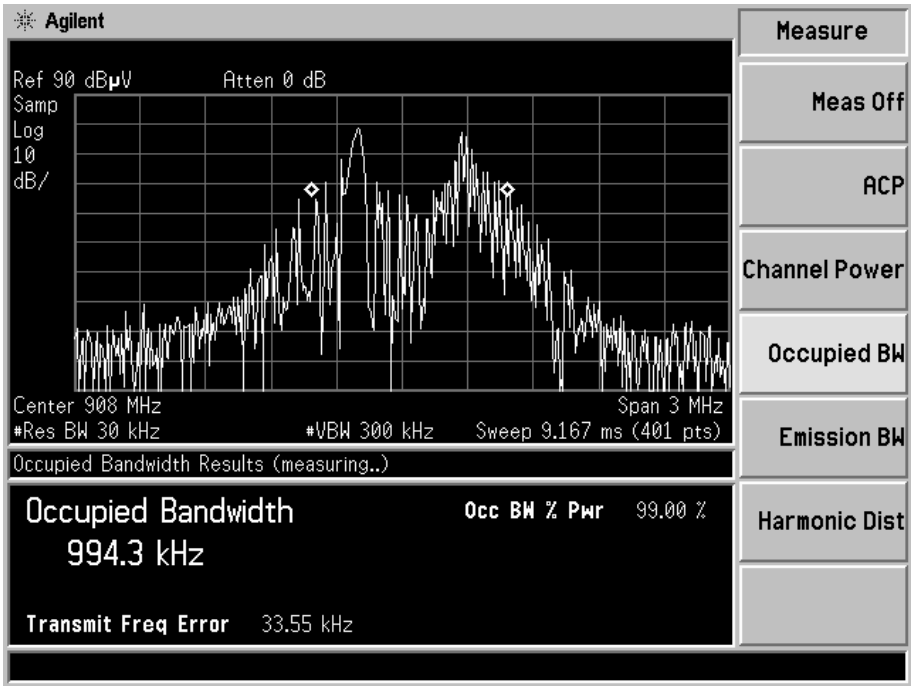
1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to the spectrum analyzer through an RF attenuator.
3. Set SA Center Frequency = Operation frequency, RBW=30kHz,VBW=300kHz.
4. Set SA trace max hold, then view.

5.3.2. Test result

Pass

Frequency MHz	20dB bandwidth kHz
908	994.3

The test plots as following:



5.4. Band Edge

5.4.1. Test limits

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 and RSS-210, whichever is the lesser attenuation.

5.4.2. Test procedure

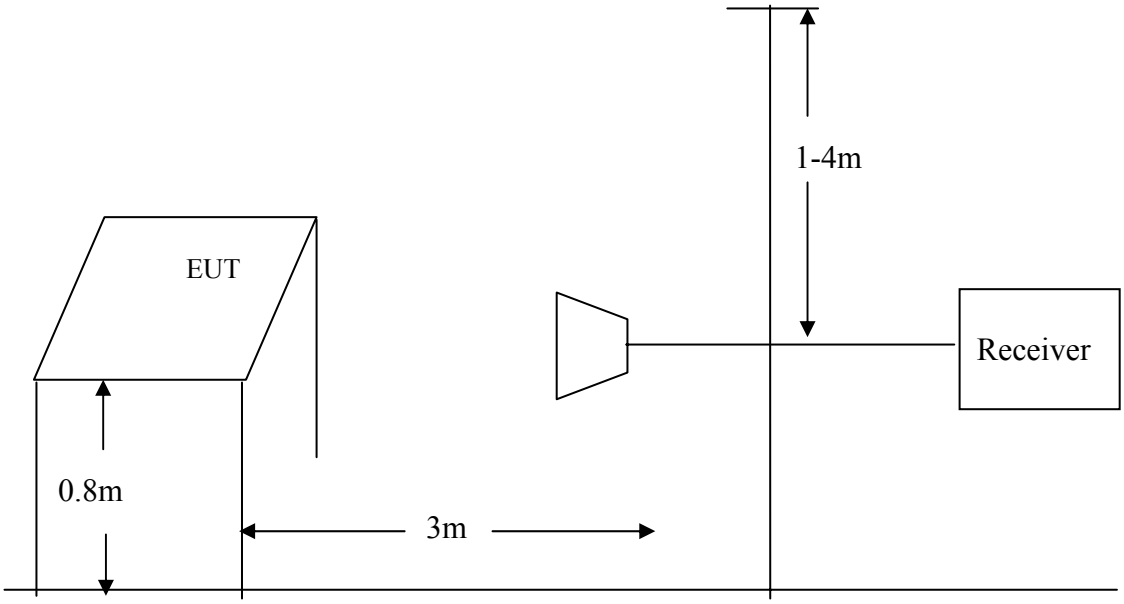
The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency band of 30MHz to 1GHz,The measuring antenna moved from 1 to 4 m for horizontal and vertical polarization. The broadband antenna was used was a receiving antenna.

The resolution bandwidth and video bandwidth of the test receiver was120kHz and 300kHz for Peak detection at frequency below 1GHz.

The EUT position(X. Y. Z) were checked and worse case was happened in Y position. So Y position was chose for find measurement.

The EUT was tested in Chamber Site.

5.4.3. Test Setup Diagram



5.4.4. Test result

PASS.

The test plots as following:

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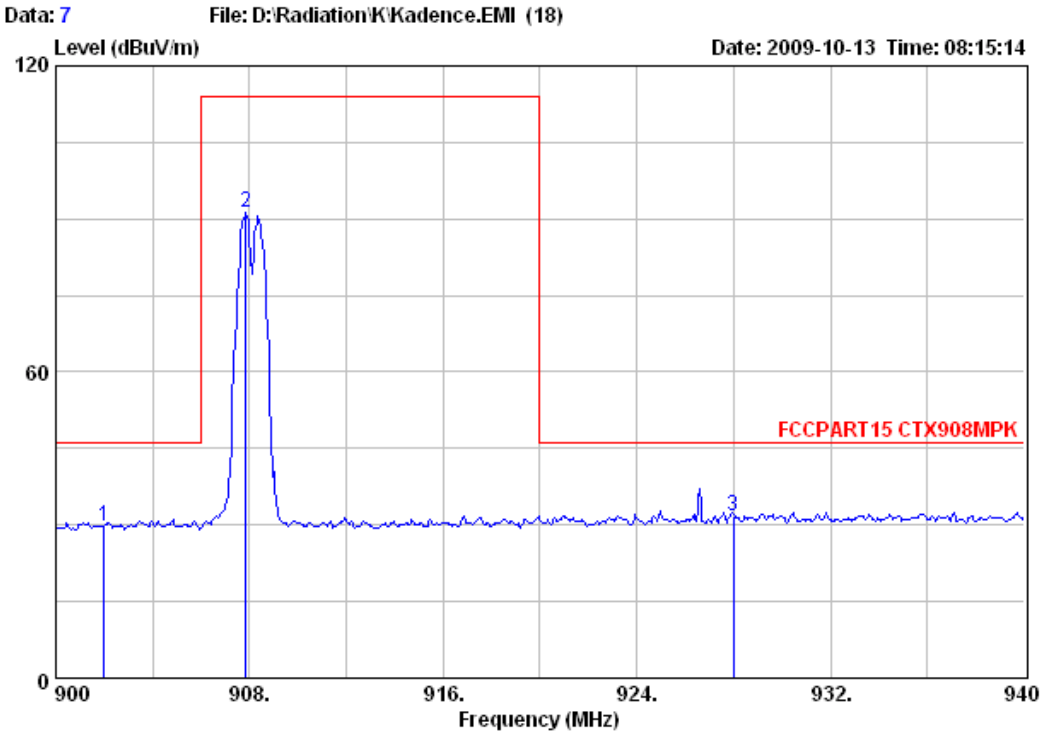
Fax:+86-769-85991080



Test Site : 966 Chamber
Limit : FCCPART15 CTX908MPK
Dis. / Ant. : 3m 25758 Ant. Pol.: HORIZONTAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:55%
Test Mode : TX Mode

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	902.00	29.79	46.00	16.21	4.18	23.85	1.76	Peak
2	907.85	91.39	114.00	22.61	65.62	24.00	1.77	Peak
3	928.00	31.61	46.00	14.39	5.21	24.60	1.80	Peak

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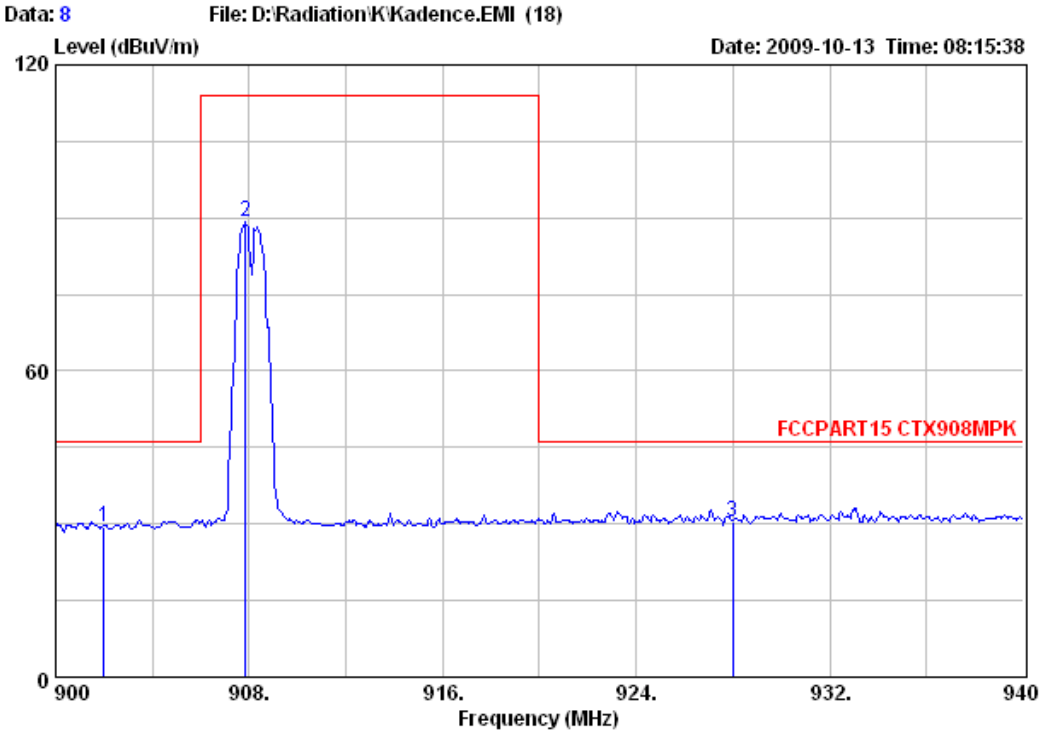

Test Site : 966 Chamber
Limit : FCCPART15 CTX908MPK
Dis. / Ant. : 3m 25758 Ant. Pol.: VERTICAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:55%
Test Mode : TX Mode

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	902.00	29.47	46.00	16.53	3.86	23.85	1.76	Peak
2	907.85	89.32	114.00	24.68	63.55	24.00	1.77	Peak
3	928.00	30.49	46.00	15.51	4.09	24.60	1.80	Peak

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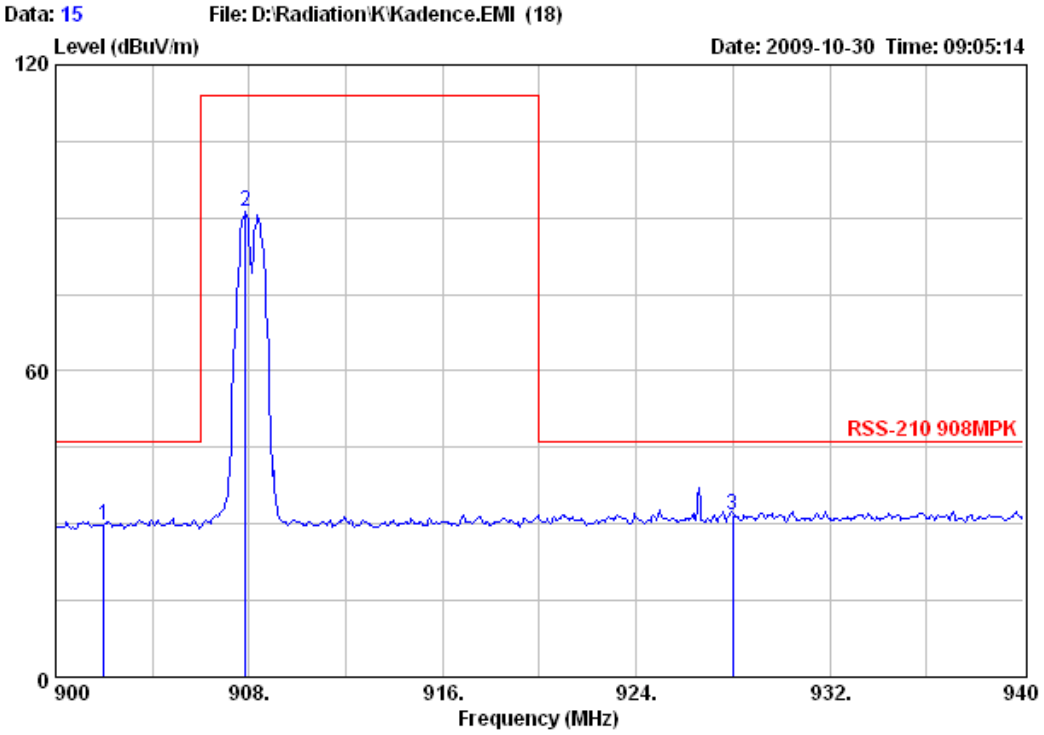

Test Site : 966 Chamber
Limit : RSS-210 908MPK
Dis. / Ant. : 3m 25758 Ant. Pol.: HORIZONTAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:55%
Test Mode : TX Mode

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	902.00	29.79	46.00	16.21	4.18	23.85	1.76	Peak
2	907.85	91.39	114.00	22.61	65.62	24.00	1.77	Peak
3	928.00	31.61	46.00	14.39	5.21	24.60	1.80	Peak

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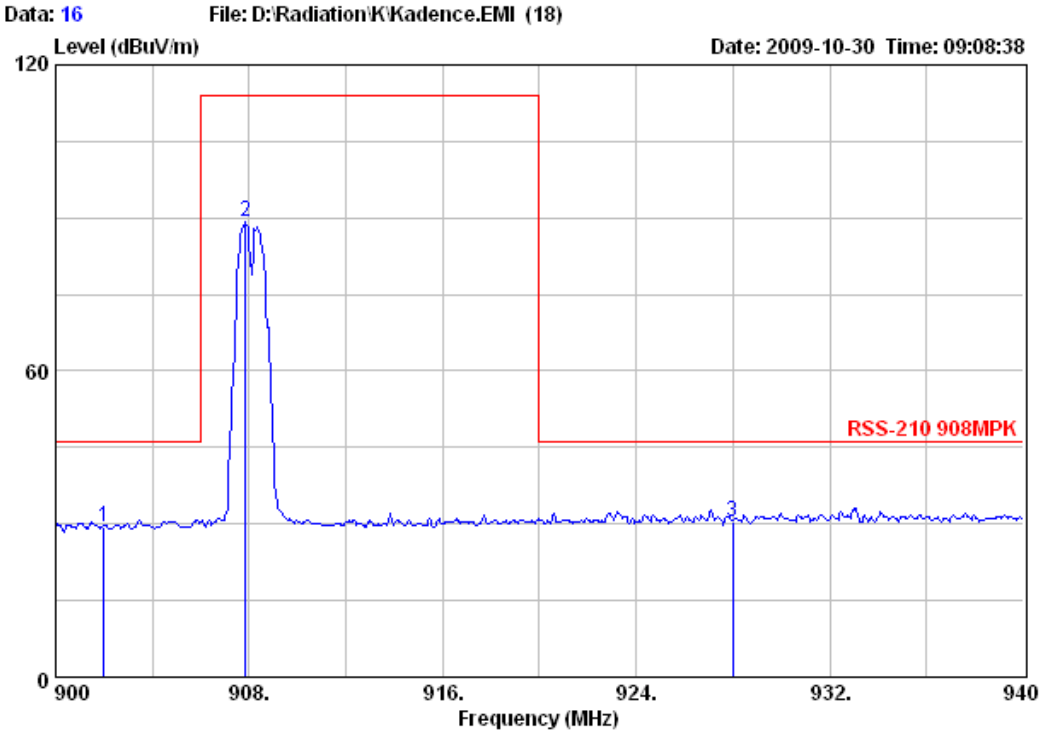

Test Site : 966 Chamber
Limit : RSS-210 908MPK
Dis. / Ant. : 3m 25758 Ant. Pol.: VERTICAL
EUT : Remote
Power : DC 3V
M/N : M2.2
Test Engineer : Jade
Comment : Temp:25.3'C Humi:55%
Test Mode : TX Mode

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	902.00	29.47	46.00	16.53	3.86	23.85	1.76	Peak
2	907.85	89.32	114.00	24.68	63.55	24.00	1.77	Peak
3	928.00	30.49	46.00	15.51	4.09	24.60	1.80	Peak