

# FCC CERTIFICATION REPORT

**Test Report No. : E1/2013/90045****Applicant : Sequans Communications****Address of Applicant : 19 LE PARVIS DE LA DEFENSE, 92073 Paris-La Défense  
Cedex France****Equipment Under Test (EUT) :****Name : VZ20M****Brand Name : EZLinkLTE VZ20M****Model No. : VZ20M****Added Model(s) : N/A****FCC ID: 2AAGMVZ20M****Standards : FCC Part 15:2013, Subpart B, Class B****Date of Receipt : Sep. 13, 2013****Date of Test : Sep. 13 ~ Oct. 01, 2013****Date of Issue : Oct. 22, 2013**

<b>Test Result :</b>	<b>PASS</b>
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In the configuration tested, the EUT complied with the standards specified above.

**Remarks :**

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report shall not be reproduced except in full, without the written approval of the laboratory. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

**Test By:****Date**

Oct. 22, 2013

**Wisely Huang(Engineer)****Approved By****Date**

Oct. 22, 2013

**Victor Wen(Assistant Manager)**

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FCC ID: 2AAGMVZ20M

Report No. : E1/2013/90045

Page : 2 of 20

## Version

Version No.	Description	Date
00	Original report	Oct. 22, 2013

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# Contents

<b>1. GENERAL INFORMATION</b> .....	<b>5</b>
1.1 APPLICANT & MANUFACTURER INFORMATION .....	5
1.2 GENERAL DESCRIPTION OF EUT .....	5
1.3 DETAILS OF EUT .....	5
1.4 OPERATION PROCEDURE .....	5
1.5 DESCRIPTION OF SUPPORT UNITS .....	6
1.6 MODIFICATION LIST .....	6
1.7 CABLE LIST .....	6
1.8 TEST SET-UP CONFIGURATION .....	6
1.9 MEASUREMENT PROCEDURE .....	7
1.10 STANDARDS APPLICABLE FOR TESTING .....	7
1.11 SUMMARY OF RESULTS .....	7
<b>2. RADIO DISTURBANCE</b> .....	<b>8</b>
2.1 TEST RESULTS .....	8
2.2 FREQUENCY RANGE .....	8
2.3 LIMITS OF CONDUCTED AND RADIATED EMISSION .....	8
2.3.1 LIMIT OF CONDUCTED EMISSION OF FCC PART 15, SUBPART B/CISPR 22 .....	8
2.3.2 LIMIT OF RADIATED EMISSIONS OF FCC PART 15, SUBPART B/CISPR 22 .....	9
2.4. TEST OF CONDUCTED EMISSION .....	10
2.4.1 TEST EQUIPMENTS .....	10
2.4.2 TEST SITE .....	10
2.4.3 OPERATING ENVIRONMENT .....	10
2.4.4 UNCERTAINTY OF CONDUCTED EMISSION .....	10
2.4.5 MEASUREMENT LEVEL AND FACTOR CALCULATE METHOD .....	10
2.4.6 MEASUREMENT DATA .....	10
2.5 TEST OF RADIATED EMISSION .....	11
2.5.1 TEST INSTRUMENTS .....	11
2.5.2 TEST SITE .....	11
2.5.3 OPERATING ENVIRONMENT .....	12
2.5.4 UNCERTAINTY OF RADIATED EMISSION .....	12
2.5.5 MEASUREMENT LEVEL AND FACTOR CALCULATE METHOD .....	12

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## Contents

2.5.6 MEASUREMENT DATA .....	13
3. PHOTOGRAPHS OF TEST .....	21
4. PHOTOGRAPHS OF PRODUCT .....	22

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## 1. General Information

### 1.1 Applicant & Manufacturer Information

Applicant : Sequans Communications

Address of Applicant : 19 LE PARVIS DE LA DEFENSE, 92073 Paris-La Défense  
Cedex France

### 1.2 General Description of EUT

Name : VZ20M

Brand Name : EZLinkLTE VZ20M

Model No. : VZ20M

Added Model(s) : N/A

FCC ID: 2AAGMVZ20M

Model Difference : N/A

### 1.3 Details of EUT

Tested Power Supply : DC 3.7V

Modes/Function : Operation mode

Worst case : Operation mode

Highest Internal Source Frequency: 1755MHz

### 1.4 Operation Procedure

1. Set up EUT with support units and turn on the power of all equipment.
2. Pre-test the EUT in all modes by each mode, then figure the worst case out.
3. Tests under the normal operation pattern.

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### 1.5 Description of Support Units

PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
LTE Base Station	R&S	WCDMA 500	N/A
Power Supply	DHA	DPS-3003	N/A

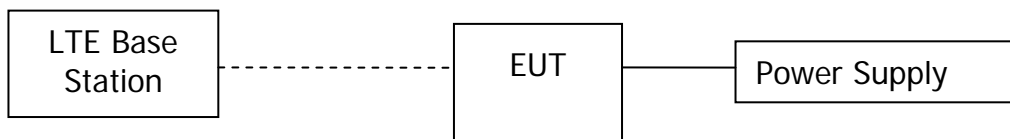
### 1.6 Modification List

No modification by SGS Taiwan Electronics & Communication Laboratory.

### 1.7 Cable List

Cable Type	Length	Shield/Non-shield
N/A	N/A	N/A

### 1.8 Test Set-Up Configuration



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### 1.9 Measurement Procedure

Conducted Emission Testing was performed according ANSI C63.4:2003 in a shielded room with peripherals placed on a table, 0.8m high over a metal floor. It was located more than required distance away from the shielded room wall.

Radiated Emission Testing was performed according to ANSI C63.4:2003 at the test site. The EUT was placed in a 0.8m high table along with the peripherals. The turn table was separated from the antenna distance 10meters. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for maximum.

The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Reported are maximized emission levels.

### 1.10 Standards Applicable for Testing

Table of tests to be carried out under FCC Part 15, Subpart B

Test Standards	Status
FCC Part 15, Subpart B	Applicable
Deviation from Standard	No Deviation

### 1.11 Summary of Results

Highest Emission					
Standard	Test Type	Result	Phase/Polar.	Frequency(MHz)	Margin(dB)
FCC Part 15 Subpart B Class B / CISPR 22 Class B	Conducted Emission	N/A	Line	N/A	N/A
			Neutral	N/A	N/A
	Radiated Emission	PASS	Hor.	30.5400	-5.47(QP)

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## 2. Radio Disturbance

### 2.1 Test Results

	Results
Conducted Emission	<b>N/A</b>
Radiated Emission	<b>Pass</b>

### 2.2 Frequency Range

Conducted Emission : 150 kHz - 30 MHz

Radiated Emission : See below table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

### 2.3 Limits Of Conducted And Radiated Emission

#### 2.3.1 Limit Of Conducted Emission Of FCC Part 15, Subpart B/CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi - peak	Average	Quasi - peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

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

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected there to, shall not exceed the level of field strengths specified above.

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**2.3.2 Limit Of Radiated Emissions Of FCC Part 15, Subpart B/CISPR 22**

**FCC Limit:**

- Detector Function : Quasi – Peak

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30~88	39	40
88~216	43.5	43.5
216~960	46.44	46
Above 960	49.54	54

- Detector Function : Peak , Average

FREQUENCY (MHz)	Class A (dBuV) (at 3m)		Class B (dBuV) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	79.3	59.3	73.9	53.9

**CISPR Limit:**

- Detector Function : Quasi – Peak

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30-230	40	30
230-1000	47	37

- Detector Function : Peak , Average – Class A

Frequency range GHz	Average Limit dB(µV/m)	Peak Limit dB(µV/m)
1 to 3	56	76
3 to 6	60	80

- Detector Function : Peak , Average – Class B

Frequency range GHz	Average Limit dB(µV/m)	Peak Limit dB(µV/m)
1 to 3	50	70
3 to 6	54	74

Note : The lower limit applies at the transition frequency.

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## 2.4. Test of Conducted Emission

### 2.4.1 Test Equipments

SGS Conducted Emission Test Site No.A					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	101311	Jun. 27, 2013	Jun. 26, 2014
Coaxial Cables	N/A	N30N30-1042-150cm	N/A	Feb. 07, 2013	Feb. 06, 2014
LISN	SCHWARZBECK	NSLK 8127	8127-648	Jun. 17, 2013	Jun. 16, 2014
Pulse Limiter	R&S	ESH3Z2	357.8810.52	Nov. 26, 2012	Nov. 25, 2014
LISN	Rolf-Heine	NNB-2/16Z	99012	Mar. 22, 2013	Mar. 21, 2014
ISN	TESEQ	ISN T800	34384	Feb. 27, 2013	Feb. 26, 2014
RF Current Probe	FCC	F-35A	139	Mar. 27, 2013	Mar. 26, 2014
Capacitive Voltage Probe	FCC	F-CVP-1	97	Mar. 27, 2013	Mar. 26, 2014
DC LISN	SCHWARZBECK	NNBM 8125	8125-1598	May 31, 2013	May 31, 2014
DC LISN	MESS TEC	LN-KFZ/200	02/10163	Sep. 21, 2013	Sep. 20, 2014
High Voltage Probe	SCHWARZBECK	TK 9420	TK 9420-5223	Mar. 04, 2013	Mar. 03, 2014
Test Software	Farad	EZ-EMC	Ver. SGS-03A1	N.C.R.	N.C.R.

### 2.4.2 Test Site

SGS Taiwan LTD. Electronics & Communication Laboratory  
No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan 333

### 2.4.3 Operating Environment

Temperature : N/A                      Humidity : N/A  
Atmospheric Pressure : N/A

### 2.4.4 Uncertainty of Conducted Emission

Expanded uncertainty (k=2) of Conducted Emission measurement is 1.06dB.

### 2.4.5 Measurement level and Factor calculate method

Factor = LISN insertion loss + Cable loss  
Measurement Level = Reading Level + Factor

### 2.4.6 Measurement Data

N/A

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## 2.5 Test of Radiated Emission

### 2.5.1 Test Instruments

Below 1G & Above 1G

SGS 966 Chamber No.A					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	R&S	FSV 40	101058	Jan. 28, 2013	Jan. 27, 2014
EMI Test Receiver	R&S	ESCI 7	100950	Jan. 28, 2013	Jan. 27, 2014
Broadband Antenna	ETC	MCTD 2786	BL13J03016	Jun. 27, 2013	Jun. 26, 2014
Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D673	Jan. 29, 2013	Jan. 28, 2014
Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170-184	Jan. 28, 2013	Jan. 27, 2014
Horn Antenna	ETS-Lindgren	3160-09	00117895	Feb. 14, 2013	Feb. 13, 2014
Horn Antenna	ETS-Lindgren	3160-10	00117781	Feb. 14, 2013	Feb. 13, 2014
Pre Amplifier	R&S	SCU-18	10203	Jan. 21, 2013	Jan. 20, 2014
Pre Amplifier	R&S	SCU-26	100780	Jul. 19, 2013	Jul. 18, 2014
Pre Amplifier	R&S	SCU-40	100356	Jul. 17, 2013	Jul. 16, 2014
Pre Amplifier	EMC Instruments	EMC184045	980135	Jan. 24, 2013	Jan. 23, 2014
Coaxial Cable	JUNFLOW	MWX221-NMSNMS	J0778929	Jan. 24, 2013	Jan. 23, 2014
Coaxial Cable	JUNFLOW	MWX221-NMSNMS	J0776783	Jan. 24, 2013	Jan. 23, 2014
Coaxial Cable	Huber+Suhner	SUCCOFLEX 102	23051/2	Feb. 08, 2013	Feb. 07, 2014
Coaxial Cable	Huber+Suhner	SUCCOFLEX 102	22962/2	Feb. 08, 2013	Feb. 07, 2014
Controller	Chance Most	886	N/A	N.C.R.	N.C.R.
Antenna Master	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Turn Table	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Site NSA	SGS	966 Chamber A	SAC-A	Mar. 05, 2013	Mar. 04, 2014
Site VSWR	SGS	966 Chamber A	SAC-A	Dec. 29, 2012	Dec. 28, 2013
Test Software	Farad	EZ-EMC	Ver. SGS-03A1	N.C.R.	N.C.R.

### 2.5.2 Test Site

SGS Taiwan LTD. Electronics & Communication Laboratory  
 No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan 333

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### 2.5.3 Operating Environment

Temperature : 25 degree C                      Humidity : 60 %RH  
Atmospheric Pressure : 996 mBar

### 2.5.4 Uncertainty of Radiated Emission

Expanded uncertainty (k=2) of radiated emission measurement is 3.68dB.(30-1000MHz)  
Expanded uncertainty (k=2) of radiated emission measurement is 6.30dB.(1-18GHz)

### 2.5.5 Measurement level and Factor calculate method

Correct Factor = Antenna Factor + Cable loss- Amplifier Gain  
Measurement Level = Reading Level + Correct Factor

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**2.5.6 Measurement Data**  
**Below 1G**  
**Spanion**  
**Horizontal polarization**

Site: SGS 966 Chamber A	Polarization: <b>Horizontal</b>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation	Power: DC 3.7V	Humidity: 60 %
Mode: Opeartion	Distance:	
Note: Spanion		

**Radiated Emission**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	30.5400	50.15	-15.62	34.53	40.00	-5.47	QP	
2		135.7000	37.93	-22.36	15.57	43.50	-27.93	QP	
3		346.0000	43.95	-17.97	25.98	46.00	-20.02	QP	
4		368.7000	53.80	-17.49	36.31	46.00	-9.69	QP	
5		400.6000	44.56	-16.83	27.73	46.00	-18.27	QP	
6		871.2000	31.75	-9.56	22.19	46.00	-23.81	QP	

\*:Maximum data    x:Over limit    !:over margin

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Vertical polarization

Site: SGS 966 Chamber A	Polarization: <b>Vertical</b>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation	Power: DC 3.7V	Humidity: 60 %
Mode: Operation	Distance:	
Note: Spansion		

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	35.0300	51.76	-18.12	33.64	40.00	-6.36	QP	
2		61.3000	55.20	-29.12	26.08	40.00	-13.92	QP	
3		138.0000	47.48	-22.29	25.19	43.50	-18.31	QP	
4		343.8000	42.29	-18.02	24.27	46.00	-21.73	QP	
5		368.7000	51.27	-17.49	33.78	46.00	-12.22	QP	
6		873.6000	30.72	-9.56	21.16	46.00	-24.84	QP	

\*:Maximum data    x:Over limit    !:over margin

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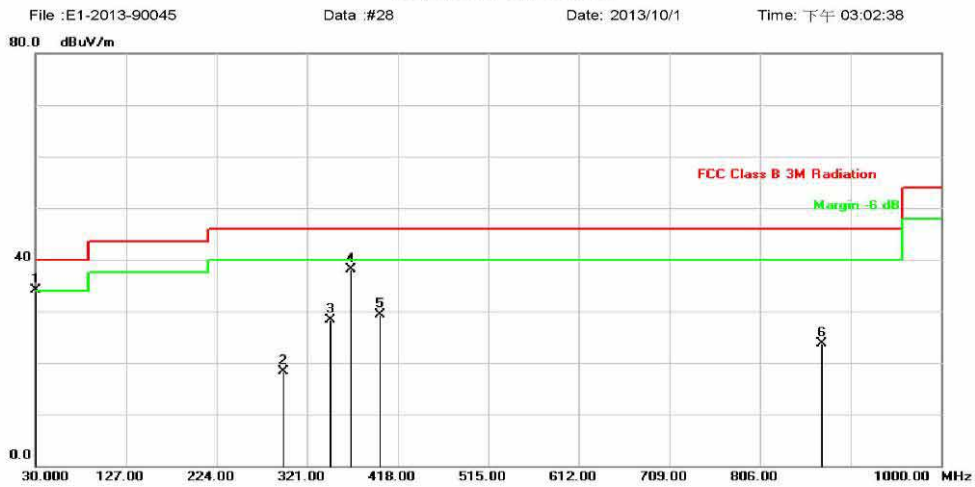
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**Winbond  
Horizontal polarization**

Site: SGS 966 Chamber A	Polarization: <b>Horizontal</b>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation	Power: DC 3.7V	Humidity: 60 %
Mode: Operation	Distance:	
Note: Winbond		

**Radiated Emission**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	30.7900	49.81	-15.76	34.05	40.00	-5.95	QP	
2		295.7000	37.43	-19.14	18.29	46.00	-27.71	QP	
3		346.1000	46.20	-17.97	28.23	46.00	-17.77	QP	
4		368.7000	55.68	-17.49	38.19	46.00	-7.81	QP	
5		399.8000	46.24	-16.84	29.40	46.00	-16.60	QP	
6		872.4000	33.35	-9.56	23.79	46.00	-22.21	QP	

\*:Maximum data    x:Over limit    !:over margin

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Vertical polarization

Site: SGS 966 Chamber A	Polarization: <b>Vertical</b>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation	Power: DC 3.7V	Humidity: 60 %
Mode: Operation	Distance:	
Note: Winbond		

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	35.0300	51.03	-18.12	32.91	40.00	-7.09	QP	
2		135.8000	48.54	-22.36	26.18	43.50	-17.32	QP	
3		346.1000	43.01	-17.97	25.04	46.00	-20.96	QP	
4		368.7000	52.90	-17.49	35.41	46.00	-10.59	QP	
5		412.8000	42.09	-16.62	25.47	46.00	-20.53	QP	
6		871.2000	48.25	-9.56	38.69	46.00	-7.31	QP	

\*:Maximum data    x:Over limit    !:over margin

File :E1-2013-90045\Data :#27

Page: 1

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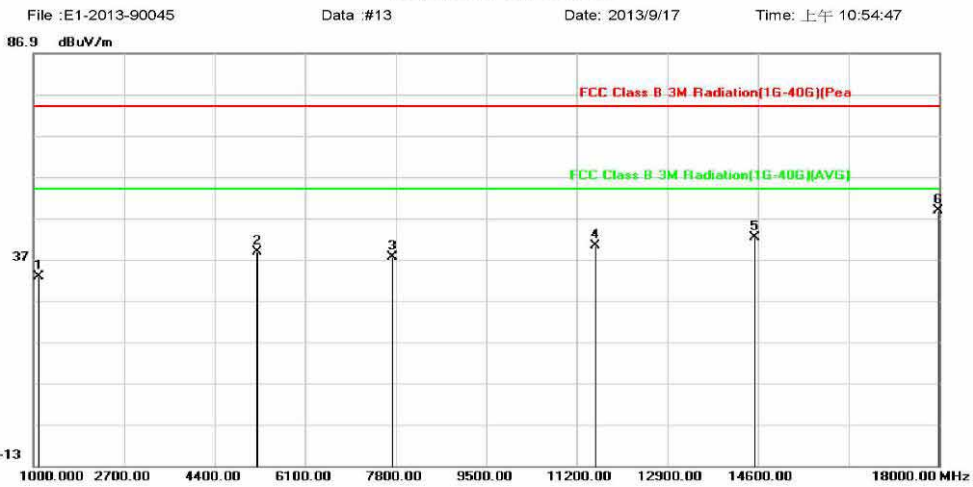
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**Above 1G  
Spansion  
Horizontal polarization**

Site: SGS 966 Chamber A	Polarization: <b>Horizontal</b>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation(1G-40G)(Pea	Power: DC 3.7V	Humidity: 60 %
Mode: Opeartion	Distance:	
Note: Spansion		

**Radiated Emission**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1102.000	47.46	-14.65	32.81	74.00	-41.19	peak	
2		5199.000	41.67	-2.89	38.78	74.00	-35.22	peak	
3		7749.000	33.36	4.11	37.47	74.00	-36.53	peak	
4		11557.000	29.94	10.36	40.30	74.00	-33.70	peak	
5		14549.000	29.08	13.09	42.17	74.00	-31.83	peak	
6 *		17983.000	26.33	22.36	48.69	74.00	-25.31	peak	

\*:Maximum data    x:Over limit    !:over margin

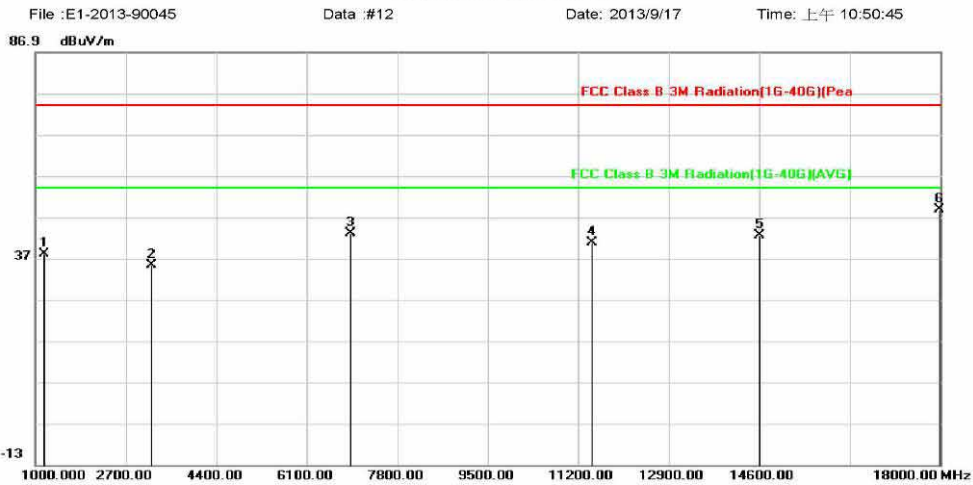
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Vertical polarization

Site: SGS 966 Chamber A	Polarization: <b>Vertical</b>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation(1G-40G)(Pea)	Power: DC 3.7V	Humidity: 60 %
Mode: Opeartion	Distance:	
Note: Spansion		

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1170.000	52.44	-14.41	38.03	74.00	-35.97	peak	
2		3193.000	42.94	-7.56	35.38	74.00	-38.62	peak	
3		6933.000	40.67	2.44	43.11	74.00	-30.89	peak	
4		11455.000	30.37	10.35	40.72	74.00	-33.28	peak	
5		14600.000	29.45	13.00	42.45	74.00	-31.55	peak	
6	*	17983.000	26.52	22.36	48.88	74.00	-25.12	peak	

\*:Maximum data    x:Over limit    !:over margin

File :E1-2013-90045\Data :#12

Page: 1

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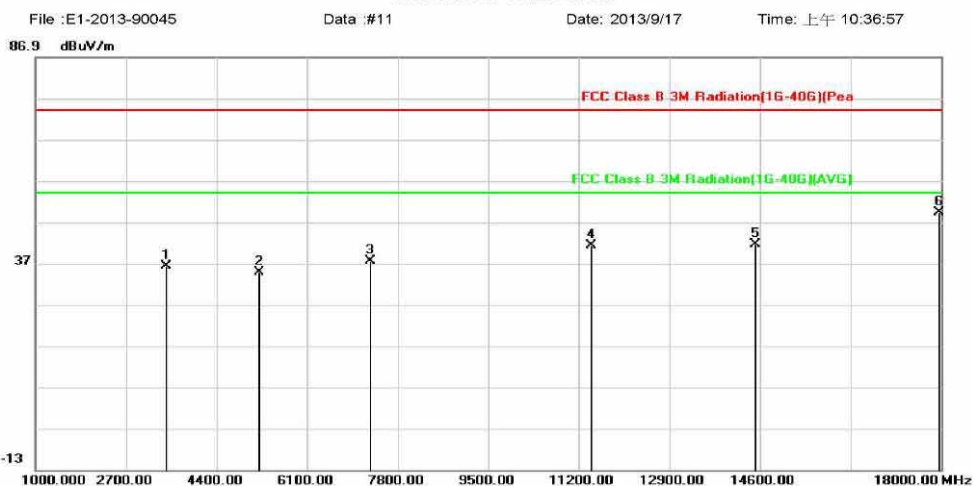
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**Winbond  
Horizontal polarization**

Site: SGS 966 Chamber A	Polarization: <i>Horizontal</i>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation(1G-40G)(Pea	Power: DC 3.7V	Humidity: 60 %
Mode: Operation	Distance:	
Note: Winbond		

**Radiated Emission**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		3465.000	43.46	-7.08	36.38	74.00	-37.62	peak	
2		5199.000	37.64	-2.89	34.75	74.00	-39.25	peak	
3		7290.000	34.24	3.36	37.60	74.00	-36.40	peak	
4		11438.000	30.98	10.27	41.25	74.00	-32.75	peak	
5		14515.000	28.43	13.14	41.57	74.00	-32.43	peak	
6 *		17966.000	27.30	22.08	49.38	74.00	-24.62	peak	

\*:Maximum data    x:Over limit    !:over margin

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Page: 1

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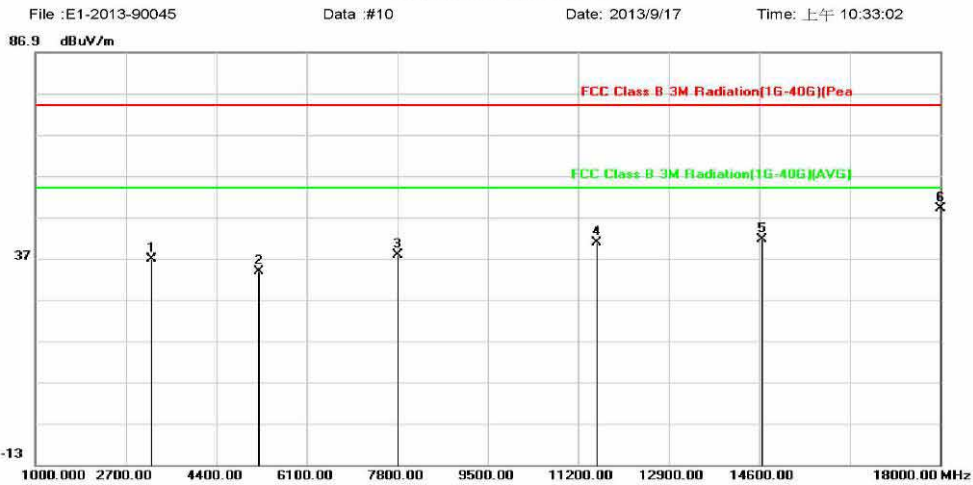
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Vertical polarization

Site: SGS 966 Chamber A	Polarization: <b>Vertical</b>	Temperature: 26 °C
Limit: FCC Class B 3M Radiation(1G-40G)(Pea)	Power: DC 3.7V	Humidity: 60 %
Mode: Opeartion	Distance:	
Note: Winbond		

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		3193.000	44.33	-7.56	36.77	74.00	-37.23	peak	
2		5199.000	36.67	-2.89	33.78	74.00	-40.22	peak	
3		7800.000	33.55	4.16	37.71	74.00	-36.29	peak	
4		11557.000	30.36	10.36	40.72	74.00	-33.28	peak	
5		14651.000	28.65	12.92	41.57	74.00	-32.43	peak	
6	*	18000.000	26.43	22.63	49.06	74.00	-24.94	peak	

\*:Maximum data    x:Over limit    !:over margin

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