

No.	E0806WT8888-1573-1
Total page	22

TEST REPORT

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Product Name : GSM 18000 Indoor BTS

Type and Specification : RM2 1900MHz

Test Category : Entrusted Test

Manufacturer : Guangdong Nortel Telecommunications Equipment Co.,Ltd

Applicant: Guangdong Nortel Telecommunications Equipment Co.,Ltd



**China Electronic Product Reliability And
Environmental Testing Research Institute**

CEPREI (Headquarters) Laboratory

Items For Attention

1. It would be invalid test report without specific stamp for test institute or the authority.
2. It would be invalid duplicated report without specific stamp for test institute or the authority.
3. It would be invalid test report without all the signatures of compilation, reviewer and approver.
4. It would be invalid test report, if there is any scrawl in the test report without official authorization.
5. Any disputes about the report must be submitted for test institute within 15 days from the day when the report is received, otherwise that would be invalid out of expiry.
6. Generally, the responsible is only for the samples in entrusted test.

Remark: Possible test case verdicts:

Test item does meet the requirement.....P (Pass)

Test item does not meet the requirement.....F (Fail)

Test case does not apply to the test object.....N (N/A)

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TEST REPORT

Product	GSM 18000 Indoor BTS			Model / Type	RM2 1900MHz
Factory	Guangdong Nortel Telecommunications Equipment Co.,Ltd			Trade/Mark	Nortel
Address of Factory	Rongli Industrial Park ,Liheng Road ,Ronggui Shunde Foshan Guangdong 528306 P.R.China.				
Manufacturer	Guangdong Nortel Telecommunications Equipment Co.,Ltd				
Address of manufacturer	Rongli Industrial Park ,Liheng Road ,Ronggui Shunde Foshan Guangdong 528306 P.R.China.				
Applicant	Guangdong Nortel Telecommunications Equipment Co.,Ltd				
Address of Applicant	Rongli Industrial Park ,Liheng Road ,Ronggui Shunde Foshan Guangdong 528306 P.R.China.				
Sampling Method	Sampling by the factory			Production Date	/
Number of Specimen	1	Testing Duration	2008.06.23- 2008.06.27	Ambient Condition	15~35℃ , 45~75%RH, 86~106kPa
Test Standards: FCC Part 15-2006 《RADIO FREQUENCY DEVICES》 ICES003 FCC PART 24 § 24.238					
Test Instruments and Equipments: See Equipments List of This Report.					
Conclusion: EUT complied with the requirements of the test standards.					
Testing Technician: <u>刘鑫</u> (Liu xin)					
Responsible Engineer: <u>陈辉</u> (Chen Hui)					
Approver: <u>陈辉</u>				Date: <u>2008-07-08</u>	
Remark: /					

EMC Standards Compliance List / Test Summary:

The following standards have been applied to ensure the product conforms to Emission requirements of the Reference: EMC_Test_Plan_81818-571635-TP-18-FCC.

EMC Test plan for GSM 18000 Indoor BTS Introduction:

Electromagnetic Emissions		
Test Item	Clause Standard	Result
Conducted Emission at DC port	ICES003(EN55022)	PASS
Radiated Emissions	Class B of FCC PART15	PASS
Radiated emissions spurious	FCC PART 24 § 24.238 & RS.133	PASS

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Section 1 General Information

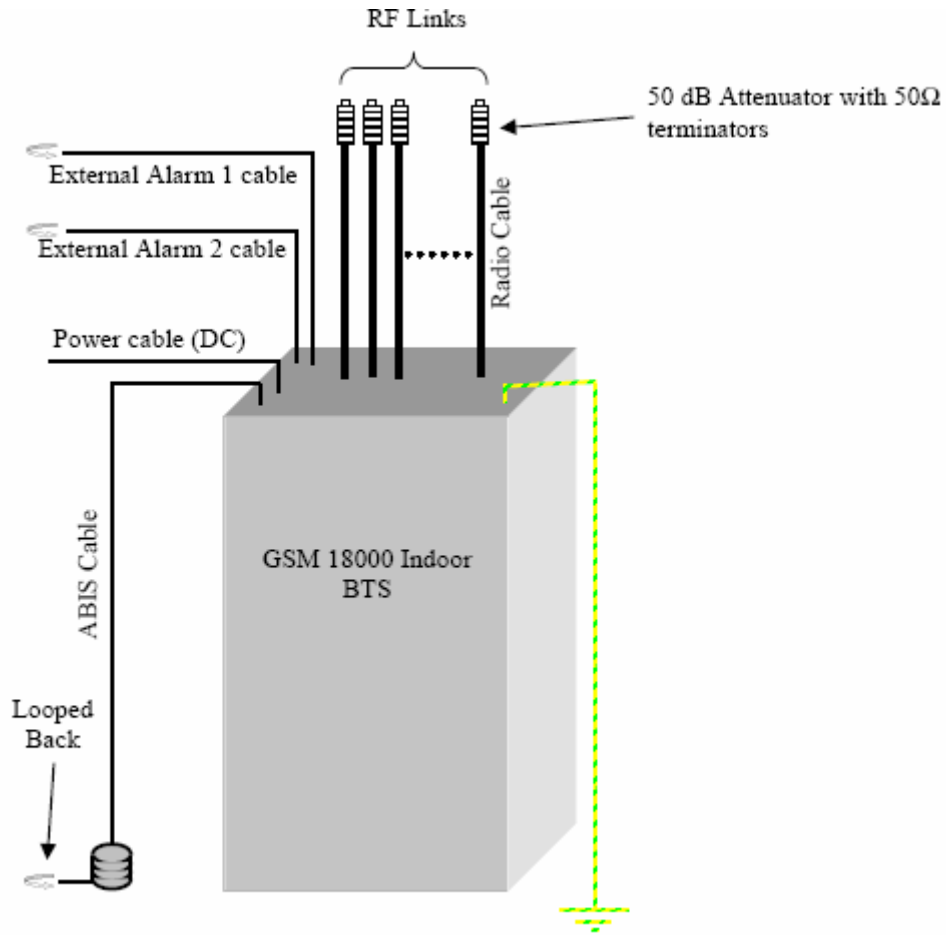
1.1 Introduction

This report documents the emission test results for the GSM 18000 Indoor BTS.

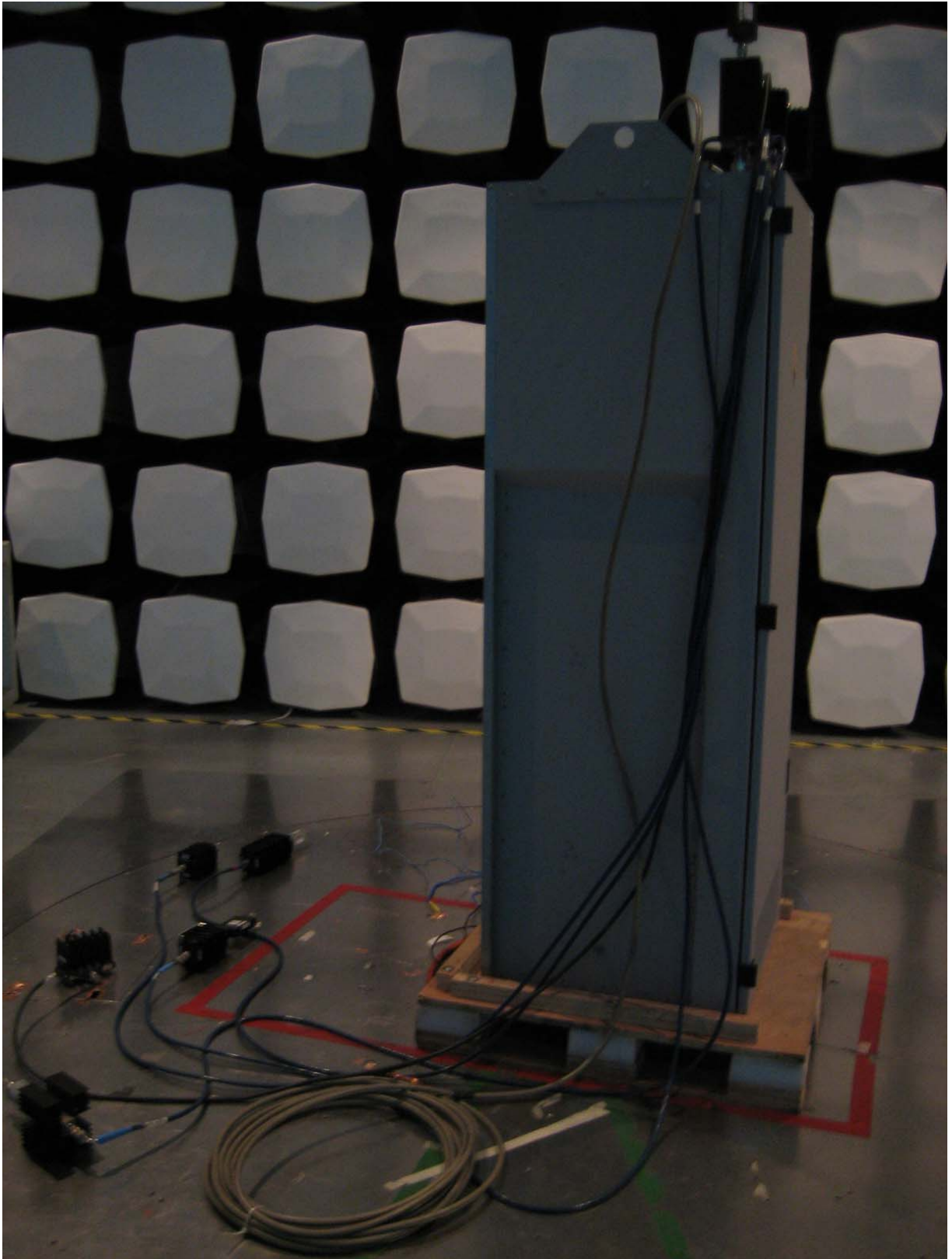
1.2 EUT General and Technical Descriptions

EUT Name:	GSM 18000 Indoor BTS
EUT Model:	RM2 1900MHz
EUT Trademark:	Nortel
Input Voltage:	DC-48V
Power Cable Description:	DC cable: un-shielded.
Other Cables Description:	ABIS cable: shielded.
Function(s) Description:	GSM base station.

1.3 Emissions testing configuration



1.4 EUT Photographs



Section 2 Electromagnetic Emissions

2.1 Conducted Emission at DC Terminals

2.1.1 Conducted Emission Test Information

Temperature:	25°C	Humidity:	65% RH
ATM Pressure:	103 k Pa	Grounding:	Grounding
Test Voltage:	-48VDC	Tested Range:	150kHz to 30MHz
Tested by:	Liu Xin	Date of test:	2008-06-26
Test Reference:	ICES003		
Results:	PASS		

2.1.2 Measurement Equipments Used for Conducted Emission

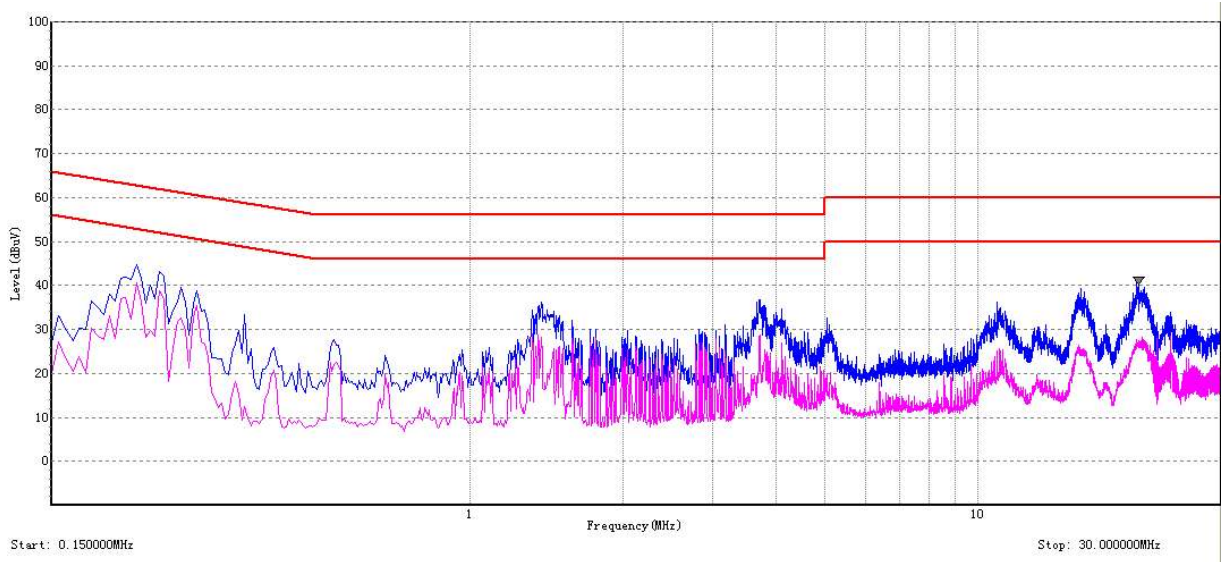
Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Test Receiver	R&S	ESCS 30	640101042	2008-06-08	2009-06-08
LISN	R&S	ESH3-Z5	640101042-02	2008-06-08	2009-06-08
Anechoic Chamber	Lindgren	FACT-4	640101037	2008-06-08	2009-06-08

2.1.3 Test Data

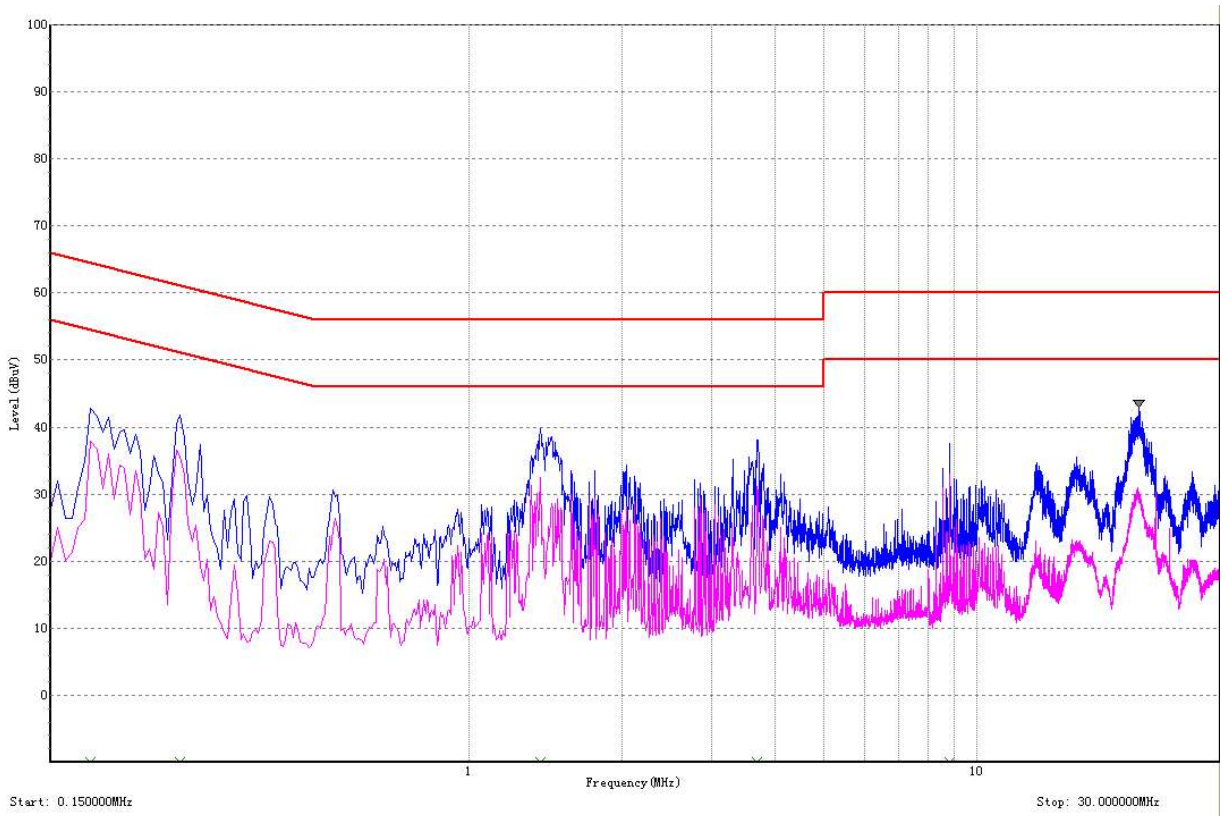
0V terminal							
No.	Frequency (MHz)	Corrected QP Level (dBμV)	Limits QP (dBμV)	Margin QP (dB)	Corrected AVE Level (dBμV)	Limits AVE (dBμV)	Margin AVE (dB)
1	0.220	44.7	62.9	-18.2	40.7	52.9	-12.2
2	1.380	36.1	56.0	-19.9	28.2	46.0	-17.8
3	3.710	36.7	56.0	-19.3	28.1	46.0	-17.9
4.	10.93	36.3	60.0	-23.7	21.5	50.0	-28.5
5	15.92	39.2	60.0	-20.8	24.6	50.0	-25.4
6	20.67	41.0	60.0	-19.0	25.8	50.0	-24.2
-48V terminal							
No.	Frequency (MHz)	Corrected QP Level (dBμV)	Limits QP (dBμV)	Margin QP (dB)	Corrected AVE Level (dBμV)	Limits AVE (dBμV)	Margin AVE (dB)
1	0.180	42.8	64.6	-21.8	37.9	54.6	-16.6
2	0.270	41.9	61.2	-19.3	35.7	51.2	-15.5
3	1.380	39.7	56.0	-16.3	32.4	46.0	-13.6
4.	3.695	38.1	56.0	-17.9	31.1	46.0	-14.9
5	8.840	37.6	60.0	-22.5	32.0	50.0	-18.0
6	20.88	43.4	60.0	-16.6	30.1	50.0	-19.9

Note: The Corrected QP Level and Corrected AVE Level included The Cable attenuation.

2.1.4 Test curves



DC port conducted Emission Graph (0V terminal)



DC port conducted Emission Graph (-48V terminal)

Note: The curves included The Cable attenuation.

2.1.5 Test Setup



DC port Conducted Emission Test Set-up

/

2.2 Radiated Emission (30-1000MHz)

2.2.1 Radiated Emission Test Information

Temperature:	25°C	Humidity:	65% RH
ATM Pressure:	103 k Pa	Grounding:	Grounding
Test Voltage:	-48VDC	Tested Range:	30MHz to 1000MHz
Tested by:	Liu Xin	Date of test:	2008-06-26
Test Reference:	FCC PART 15		
Results:	PASS		

2.2.2 Measurement Equipments Used for Radiated emission

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	2008-06-08	2009-06-08
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2008-06-08	2009-06-08
0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	2008-06-08	2009-06-08
10m Semi- Anechoic Chamber	ETS	N/A	N/A	2008-06-08	2009-06-08

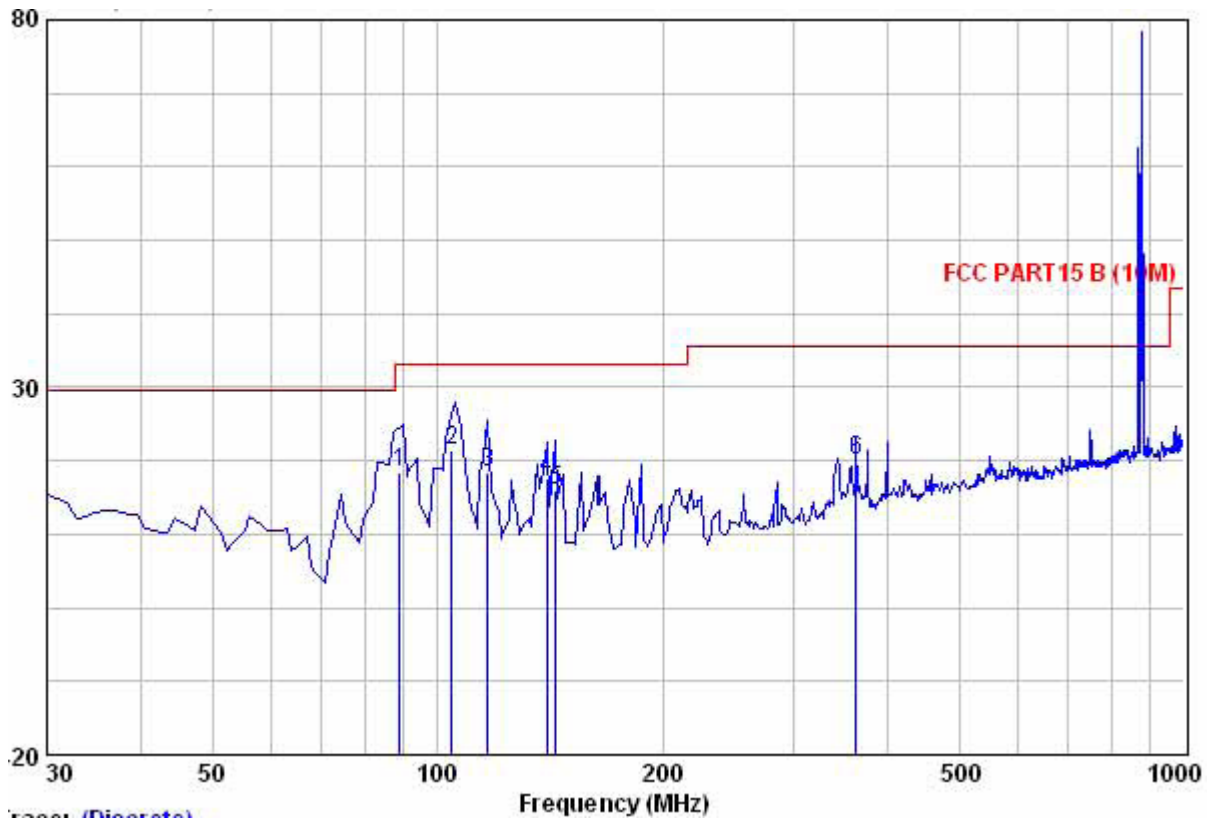
2.2.3 Test Data

Horizontal (30-1000MHz)				
No.	Frequency (MHz)	Corrected QP Level dB (µV/m)	10 Meter Limits dB (µV/m)	Margin (dB)
1	89.2	18.5	33.1	-14.6
2	104.7	21.4	33.1	-11.7
3	117.3	18.4	33.1	-14.7
4	140.6	17.6	33.1	-15.5
5	144.5	15.9	33.1	-17.2
6	362.7	20.1	35.6	-15.5
Vertical (30-1000MHz)				
No.	Frequency (MHz)	Corrected QP Level dB (µV/m)	10 Meter Limits dB (µV/m)	Margin (dB)
1	41.6	14.2	29.5	-15.3
2	67.8	19.1	29.5	-10.4
3	104.7	14.6	33.1	-18.5
4	141.6	17.1	33.1	-16.0
5	207.5	13.8	33.1	-19.3
6	216.2	13.7	35.6	-21.9

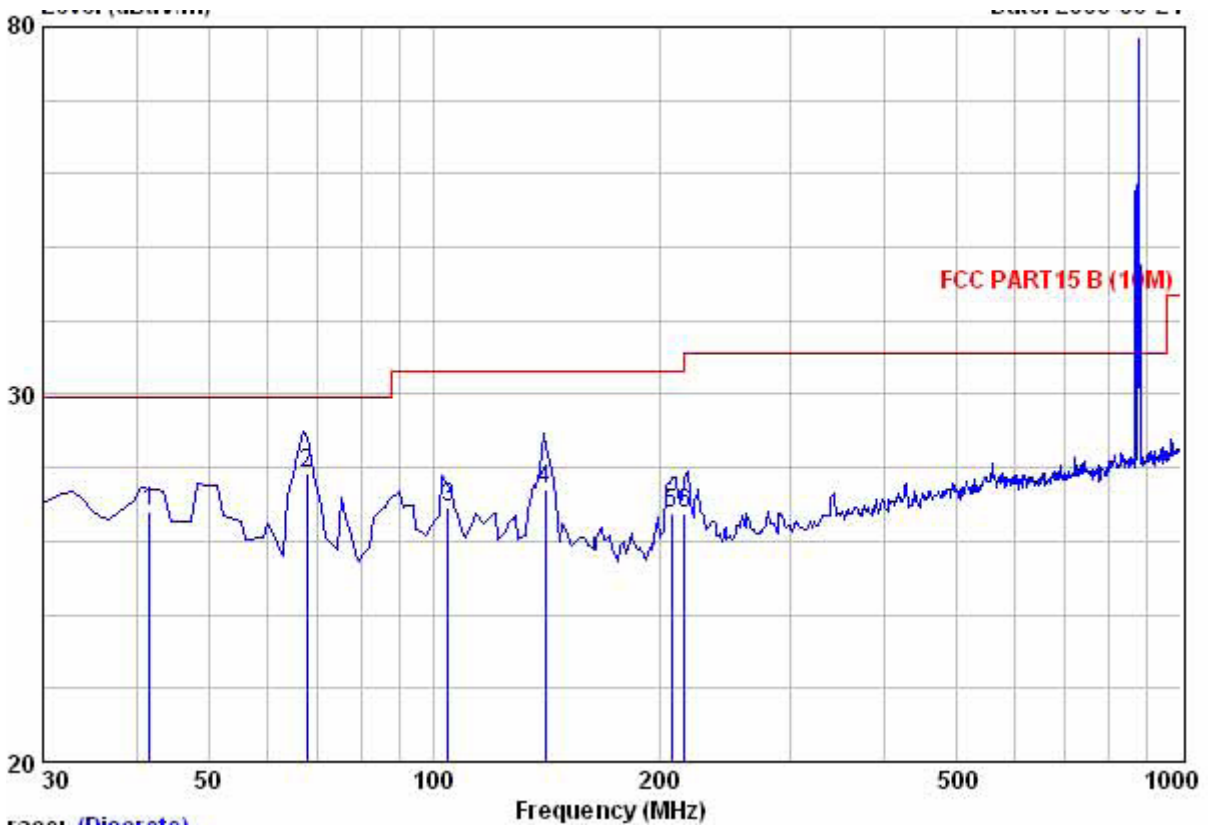
Note: The Corrected QP Level included The Cable attenuation and The Antenna Factor.

Test was performed at 10m semi-anechoic chamber.

2.2.4 Test Curves



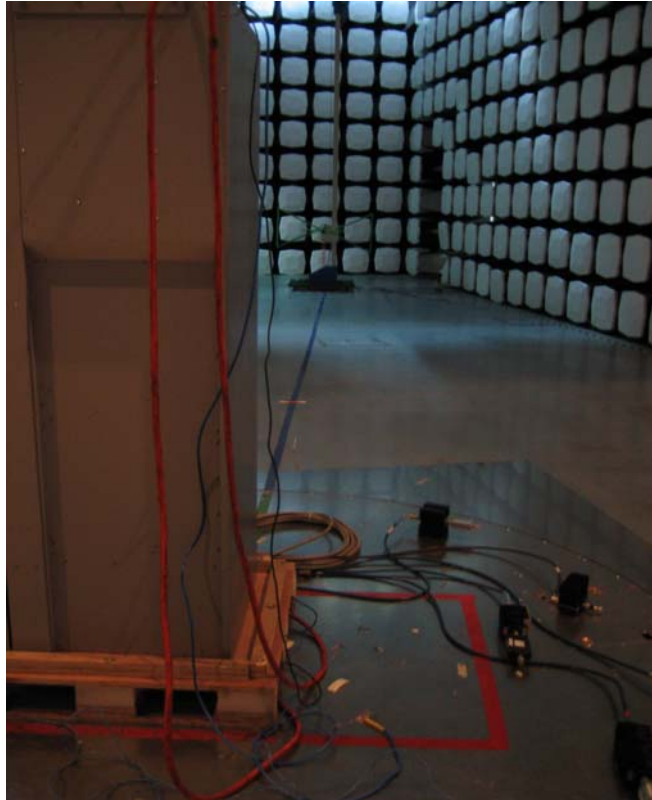
Horizontal Radiated Emission Plot (Peak, Max Hold Mode)



Vertical Radiated Emission Plot (Peak, Max Hold Mode)

Note: The Curves included The Cable attenuation and The Antenna Factor.
GSM frequencies were excluded.

2.2.5 Test Setup



Radiated Emission Test Set-Up 30-1000MHz

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2.3 Radiated Emission (1GHz-18GHz)

2.3.1 Radiated Emission Test Information

Temperature:	25°C	Humidity:	65% RH
ATM Pressure:	103 k Pa	Grounding:	Grounding
Test Voltage:	-48VDC	Tested Range:	1GHz to 18GHz
Tested by:	Liu Xin	Date of test:	2008-06-26
Test Reference:	FCC PART 15		
Results:	PASS		

2.3.2 Measurement Equipments Used for Radiated emission

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	2008-06-08	2009-06-08
Horn Antenna	R & S	HF906	100095	2008-06-08	2009-06-08
1-26.5GHz Pre-Amplifier	Agilent	8449B	3008A01649	2008-06-08	2009-06-08
10m Semi- Anechoic Chamber	ETS	N/A	N/A	2008-06-08	2009-06-08

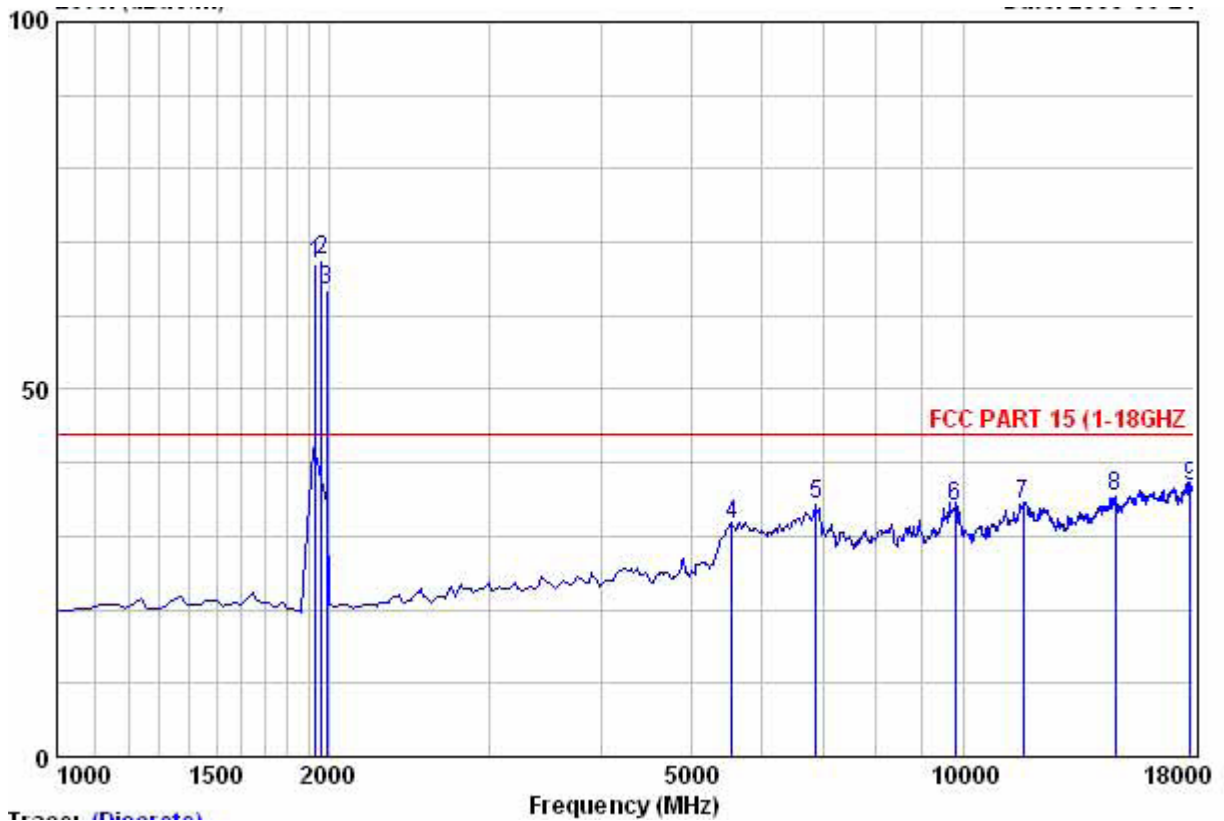
2.3.3 Test Data

Horizontal (1-18GHz)				
No.	Frequency (MHz)	Corrected Peak Level dB (μ V/m)	10 Meter Limits dB (μ V/m)	Margin (dB)
1	5556.0	31.5	44.0	-12.5
2	6882.0	34.3	44.0	-9.7
3	9789.0	34.1	44.0	-9.9
4	11659.0	34.2	44.0	-9.8
5	14736.0	35.3	44.0	-8.7
6	17830.0	36.9	44.0	-7.1
Vertical (1-18GHz)				
No.	Frequency (MHz)	Corrected Peak Level dB (μ V/m)	10 Meter Limits dB (μ V/m)	Margin (dB)
1	5556.0	31.2	44.0	-12.8
2	6712.0	32.4	44.0	-11.6
3	9738.0	33.4	44.0	-10.6
4	11659.0	34.1	44.0	-9.9
5	12271.0	33.7	44.0	-10.3
6	16997.0	35.2	44.0	-8.8

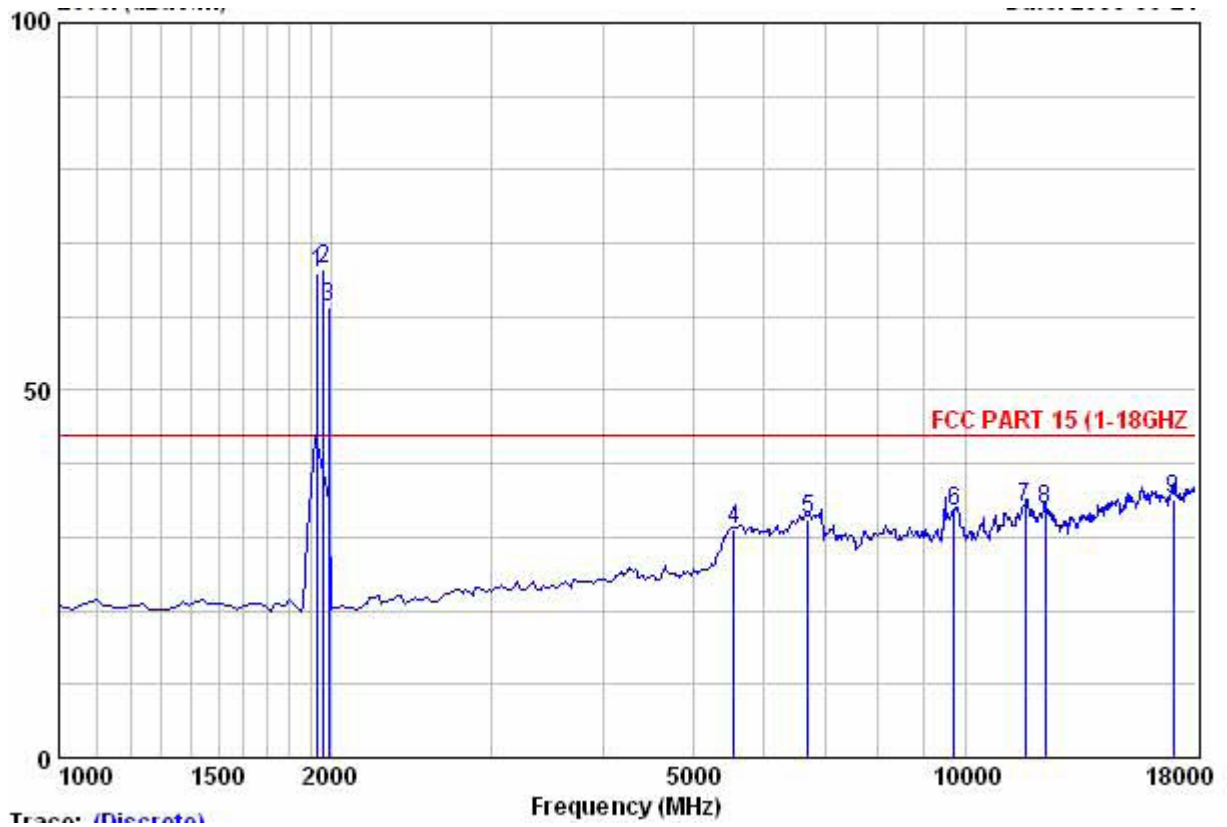
Note: The Corrected Peak Level included The Cable attenuation and The Antenna Factor.

Test was performed at 10m semi-anechoic chamber.

2.3.4 Test Curves



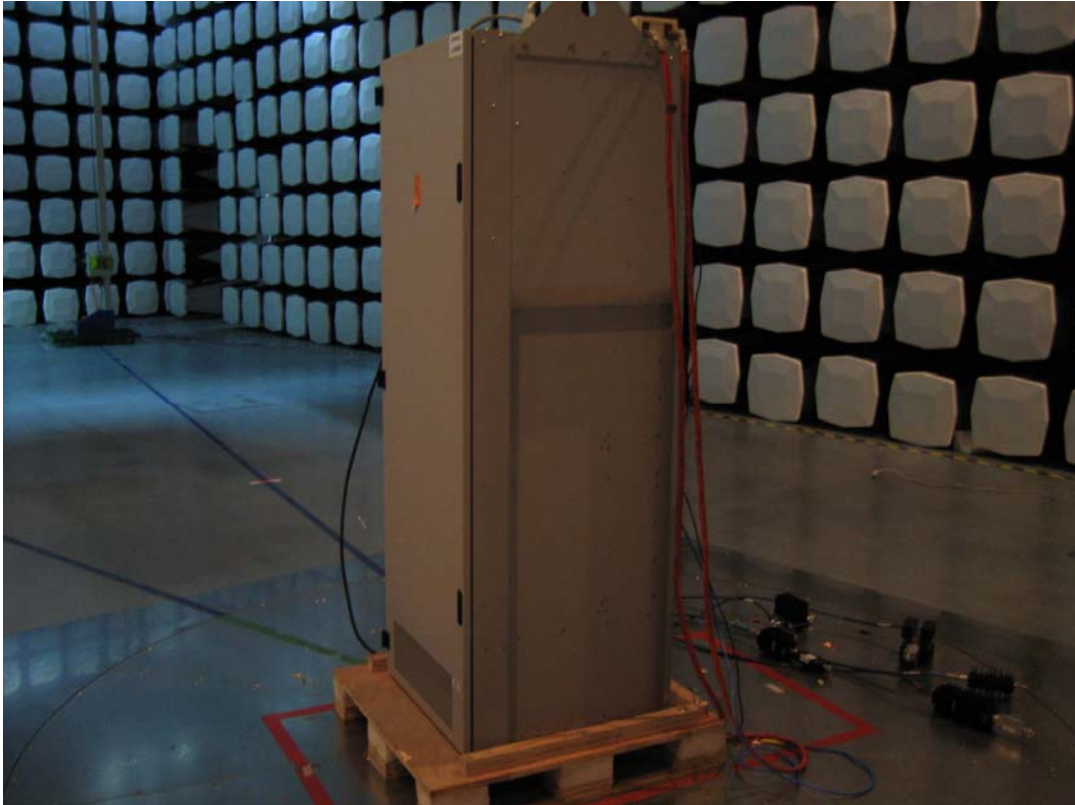
Horizontal Radiated Emission Plot (Peak, Max Hold Mode)



Vertical Radiated Emission Plot (Peak, Max Hold Mode)

Note: The Curves included The Cable attenuation and The Antenna Factor.
GSM frequencies were excluded.

2.3.5 Test Setup



Radiated spurious Emission Test Set-Up 1G-18GHz

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2.4 Radiated Emission spurious (30MHz-20GHz)

2.4.1 Radiated Emission Test Information

Temperature:	25°C	Humidity:	65% RH
ATM Pressure:	103 k Pa	Grounding:	Grounding
Test Voltage:	-48VDC	Tested Range:	30MHz to 20GHz
Tested by:	Liu Xin	Date of test:	2008-06-26
Test Reference:	FCC PART 24 § 24.238	Test method:	/
Results:	PASS		

2.4.2 Measurement Equipments Used for Radiated emission

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	2008-06-08	2009-06-08
Horn Antenna	R & S	HF906	100095	2008-06-08	2009-06-08
0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	2008-06-08	2009-06-08
1-26.5GHz Pre-Amplifier	Agilent	8449B	3008A01649	2008-06-08	2009-06-08
10m Semi- Anechoic Chamber	ETS	N/A	N/A	2008-06-08	2009-06-08

2.4.3 Limits for radiated emissions from FCC Part 24 § 24.238, and RSS133

Frequency range	Minimum requirement(e.r.p.)/ Reference Bandwidth
30MHz≤f≤20GHz	The spurious emission must be attenuated by at least 43+10log(P) P=Transmitter rated Power in watts

Measurements were made according to the procedures outline in ANSI/TIA-603-C-2004

The emissions were investigated up to the tenth harmonic of the fundamental emission(20GHz).

The measured level of the emissions was recorded and compared to the limit.

The reference level for spurious radiation was taken with reference to an ideal dipole antenna excited by the rated output power according to the following relationship:

$$E(V / m) = \frac{1}{R(m)} * \sqrt{50 * P_t * G}$$

Where,

- E=field strength in Volts/meter
- R=Measurement distance in meters
- P_t= Transmitter rated Power in watts
- G=Gain of ideal Dipole(linear)
- Limit level =71.77dBμV/m

2.4.4 Test Data

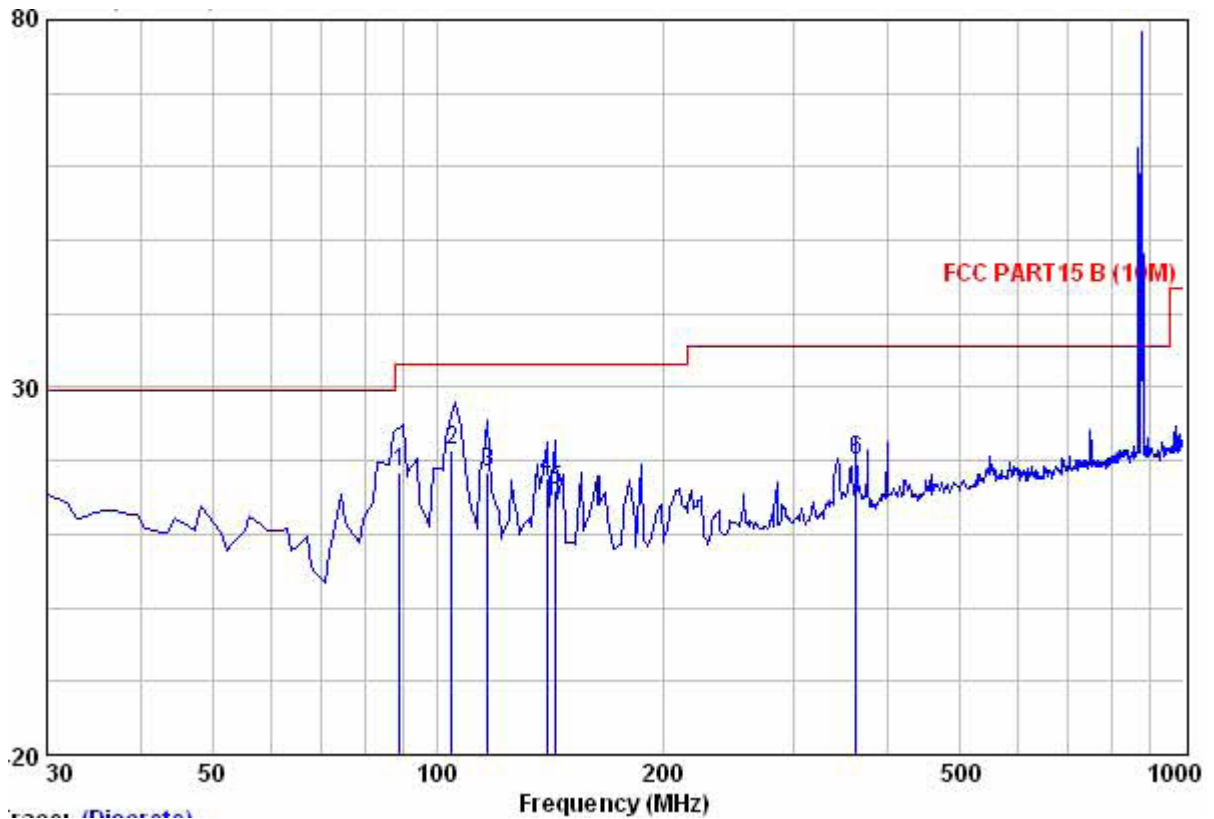
Horizontal				
Channels Investigated	Frequency (MHz)	Corrected Peak Level dB ($\mu\text{V}/\text{m}$)	10 Meter Limits dB ($\mu\text{V}/\text{m}$)	Margin (dB)
Low channel	1930.2	66.9	74.0	-7.1
Mid channel	1960.0	67.6	74.0	-6.4
High channel	1989.8	63.5	74.0	-10.5
Vertical				
No.	Frequency (MHz)	Corrected Peak Level dB ($\mu\text{V}/\text{m}$)	10 Meter Limits dB ($\mu\text{V}/\text{m}$)	Margin (dB)
Low channel	1930.2	66.0	74.0	-8.0
Mid channel	1960.0	66.5	74.0	-7.5
High channel	1989.8	61.3	74.0	-12.7

Note: The Corrected Peak Level included The Cable attenuation and The Antenna Factor.

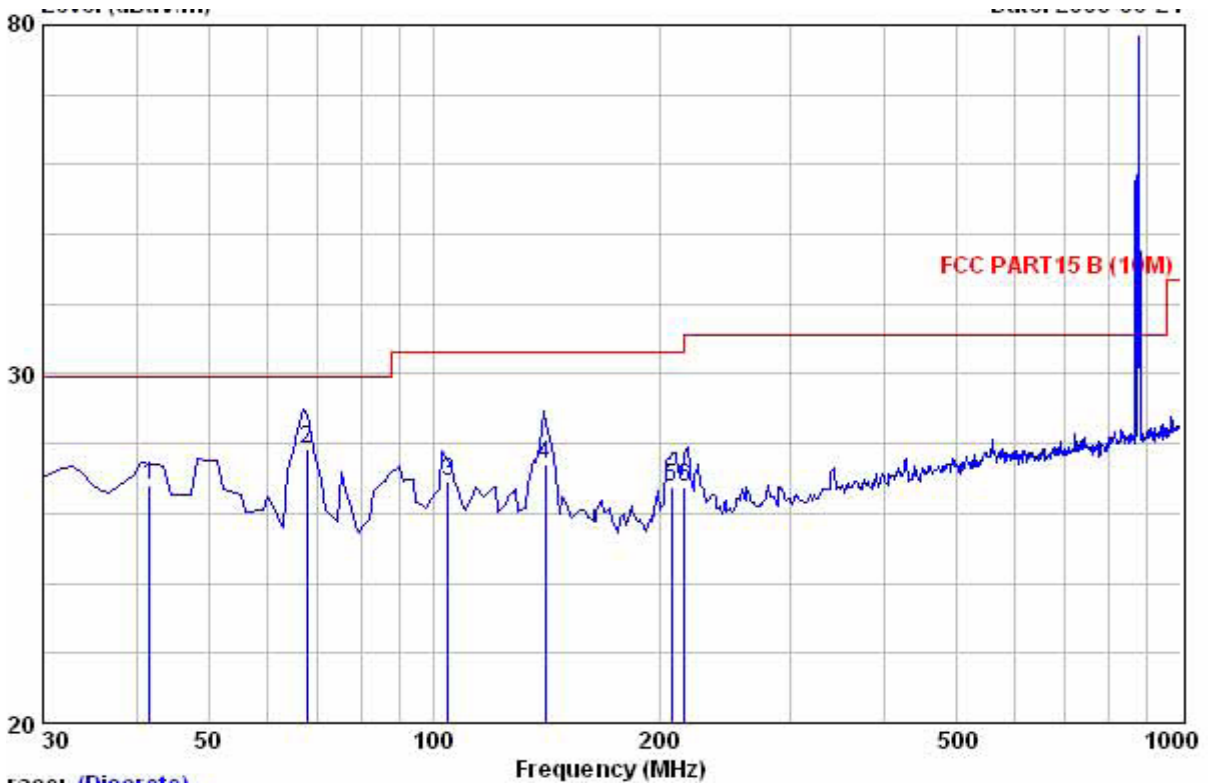
Test was performed at 10m semi-anechoic chamber.

Highest spurious emission recorded was below the 71.77dBuV/m equivalent field strength limit at 10m by more than 20dB

2.4.5 Test Curves



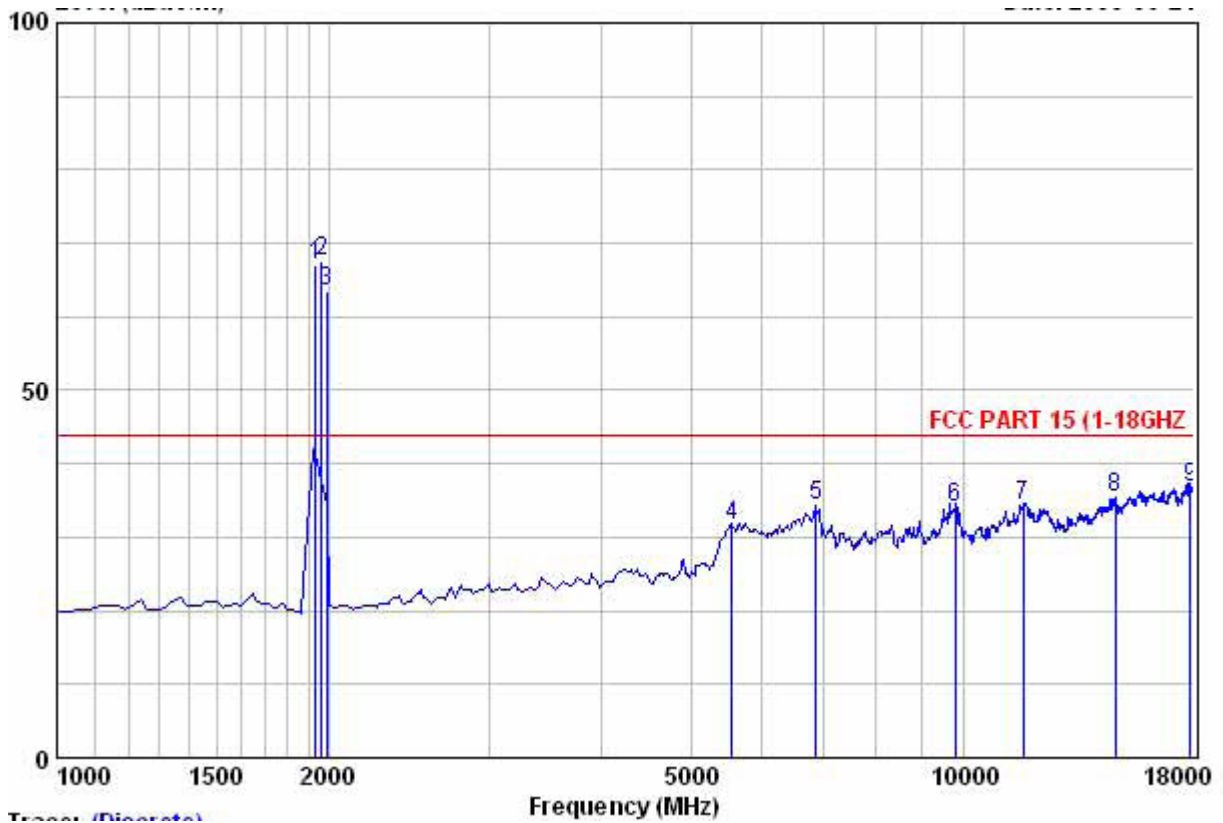
Horizontal Radiated Emission Plot (Peak, Max Hold Mode)30M-1GHz



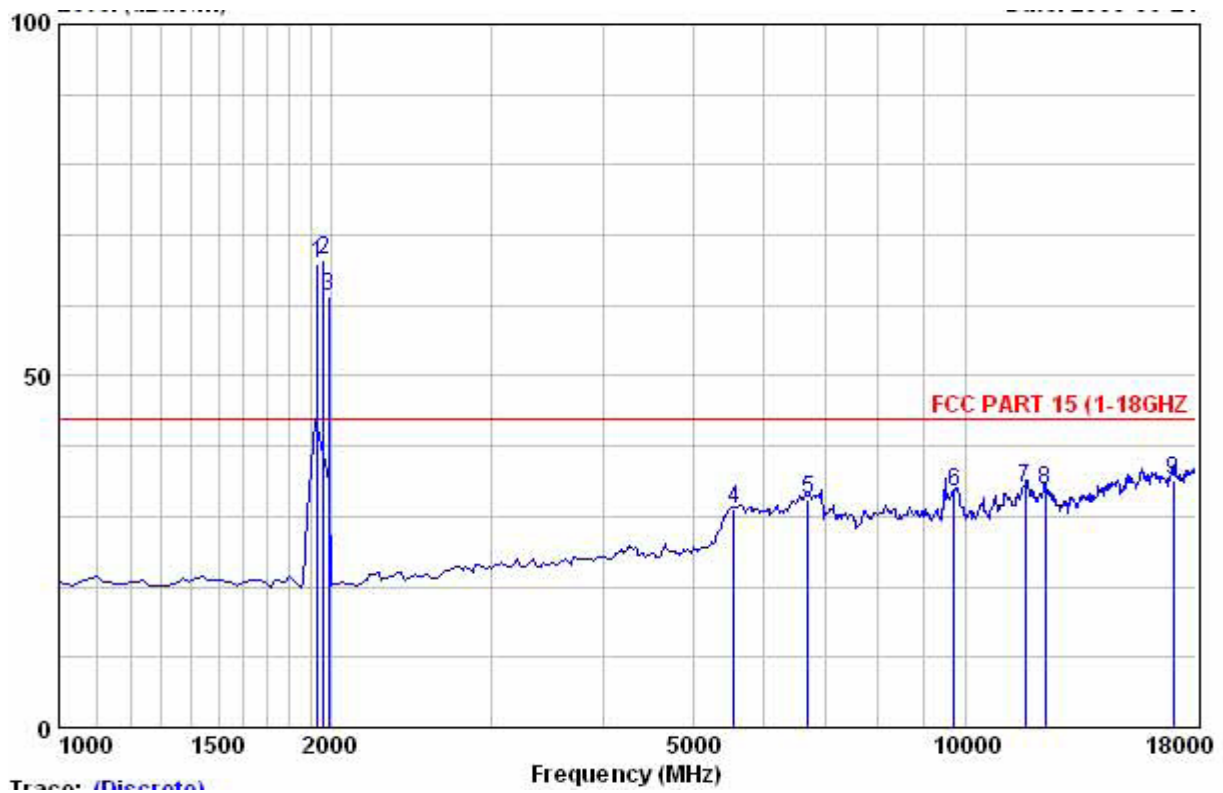
Vertical Radiated Emission Plot (Peak, Max Hold Mode) 30M-1GHz

Note: The Curves included The Cable attenuation and The Antenna Factor.

GSM frequencies were excluded. Highest spurious emission recorded was below the 71.77dBuV/m equivalent field strength limit at 10m by more than 20dB



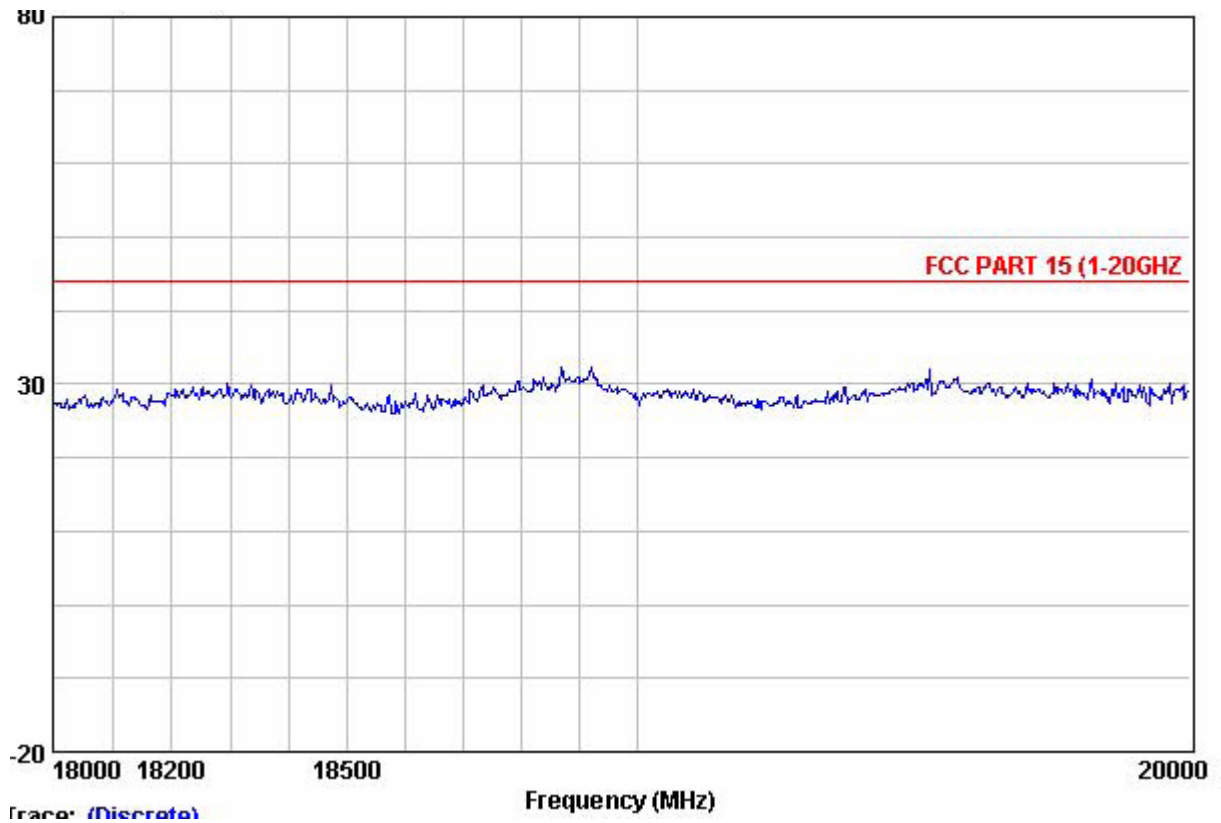
Horizontal Radiated Emission Plot (Peak, Max Hold Mode)1-18GHz



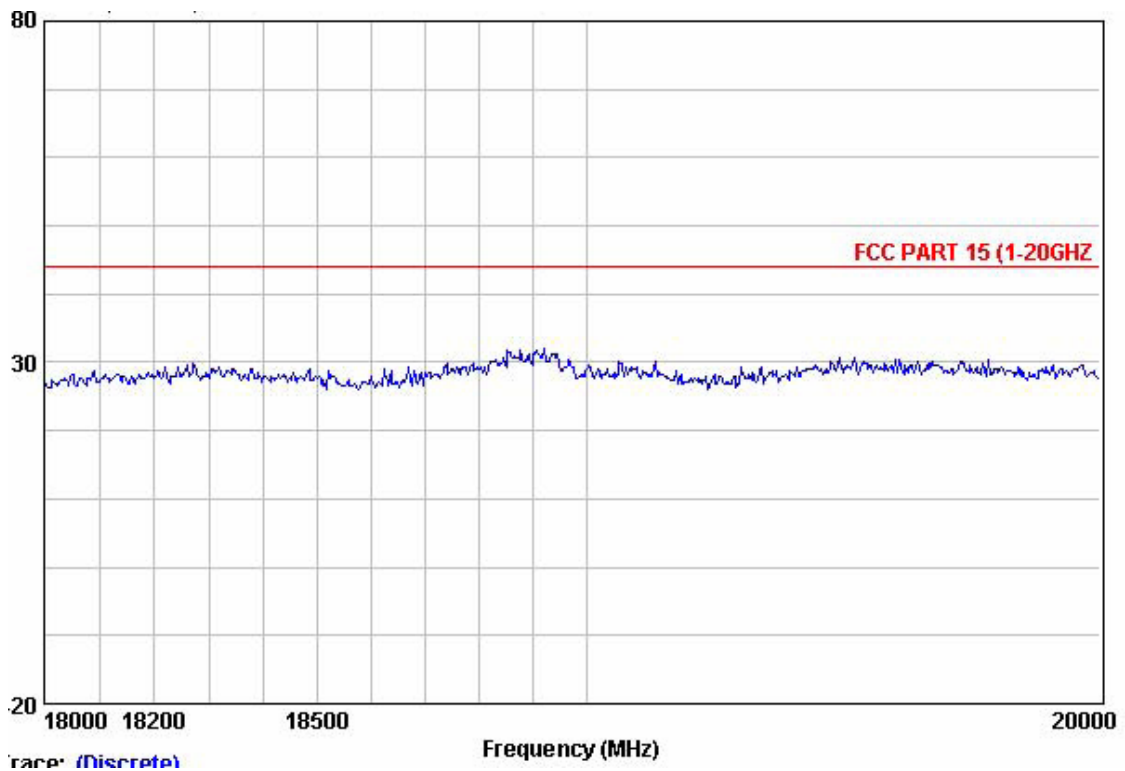
Vertical Radiated Emission Plot (Peak, Max Hold Mode) 1-18GHz

Note: The Curves included The Cable attenuation and The Antenna Factor.

GSM frequencies were excluded. Highest spurious emission recorded was below the 71.77dBuV/m equivalent field strength limit at 10m by more than 20dB



Horizontal Radiated Emission Plot (Peak, Max Hold Mode)18-20GHz



Vertical Radiated Emission Plot (Peak, Max Hold Mode) 18-20GHz

Note: The Curves included The Cable attenuation and The Antenna Factor.

GSM frequencies were excluded. Highest spurious emission recorded was below the 71.77dBuV/m equivalent field strength limit at 10m by more than 20dB

END OF THE TEST REPORT