ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

UN-INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART B REQUIREMENT

OF

Product Name:	**RM-687**
Brand Name:	**Nokia**
Model Name:	**RM-687**
FCC ID:	**QMNRM-687**
Report No.:	**EI/2010/30016**
Issue Date:	**Mar. 25, 2010**
FCC Rule Part:	**Part 15 B, Class B**
Filing Type:	**Certification**
Prepared for:	**Nokia Inc. 12278 Scripps Summit Dr.San Diego CA92131 USA**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan**

Testing Laboratory
0513

VERIFICATION OF COMPLIANCE

Applicant:	Nokia Inc. 12278 Scripps Summit Dr.San Diego CA92131 USA
Manufacturer:	Compal Communications (Nanjing) Co. Ltd Nanjing Jiangning Export Processing Zone (South Area) No.68-2 Suyuan Street
Product Name:	RM-687
Brand Name:	Nokia
Model Name:	RM-687
Model Difference:	N/A
File Number:	EI/2010/30016
Date of test:	Mar. 17, 2010 ~ Mar. 19, 2010
Date of EUT Receive:	Mar. 17, 2010

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15B, Class B. The test results of this report relate only to the tested sample identified in this report.

Test By:	Nick Lin	***Date:***	Mar. 25, 2010
	Nick Lin/Engineer		
Prepared By:	Eva Kao	***Date:***	Mar. 25, 2010
	Eva Kao / Asst. Supervisor		
Approved By:	Vincent Su	***Date:***	Mar. 25, 2010
	Vincent Su/Manager		

Version

Version No.	Date	Description
00	Mar. 25, 2010	Initial creation of document

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1. GENERAL INFORMATION

1.1 Product Description

General:

Type Name:	RM-687	
Brand Name:	Nokia	
Model Name:	RM-687	
Model Difference:	N/A	
Data Cable:	Model: CA-101, Supplier: HON HAI Precision Ind. Co	
Power Supply:	3.7 Vdc re-chargeable battery	
	Battery:	Model: BL-4C, Supplier: Samsung SDI Co., Ltd

CDMA:

Cellular Phone Standards Frequency Range and Power:	CDMA2000 Cellular	824.70 ~ 848.31MHz	24.36 dBm
	EVDO Cellular	824.70 ~ 848.31MHz	24.08 dBm
Type of Emission:	1M25F9W		
MEID:	A0000001B35EA7		
Software Version:	SK_2250B_TLC		
Hardware Version:	2000		

Bluetooth:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V2.1 + EDR (GFSK + π/4DQPSK + 8DPSK)
Channel number:	79 channels
Transmit Power:	3.84 dBm (Peak)
Modulation type:	Frequency Hopping Spread Spectrum
Antenna Designation:	PIFA Antenna, -2.5dBi.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: QMNRM-687** filing to comply with Part15 Subpart B, class B of the FCC CFR 47 Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county,which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Nokia Celluar CDMA Phone FCC ID: QMNRM-687 Was Tested With a notebook computer connected via USB interface port. The Phone drivers were installed on the computer to be able to communicate with the phone by continuously sending a querying text fele (AT commands) to the phone using HyperTermnial . For more information please see section 5.4 and section 6.5 for test data and APPENDIX 1 for set-up photographs.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4:2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4:2003.

2.4 Limitation

(1) Conducted Emission

According to section 15.107(a) Conducted Emission Class B Limits is as following.

Frequency range MHz	Class B Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	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 MHz to 0.50 MHz.

3.The measurement uncertainty is ± 2.586 dB.

(2) Radiated Emission

According to section 15.109(a) Radiated Emission Class B Limits is as following:

Frequency (MHz)	Field strength μV/m	Distance (m)	Field strength at 3m dBμV/m
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of 3 meters.
3. The measurement uncertainty is ± 4.22 dB

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

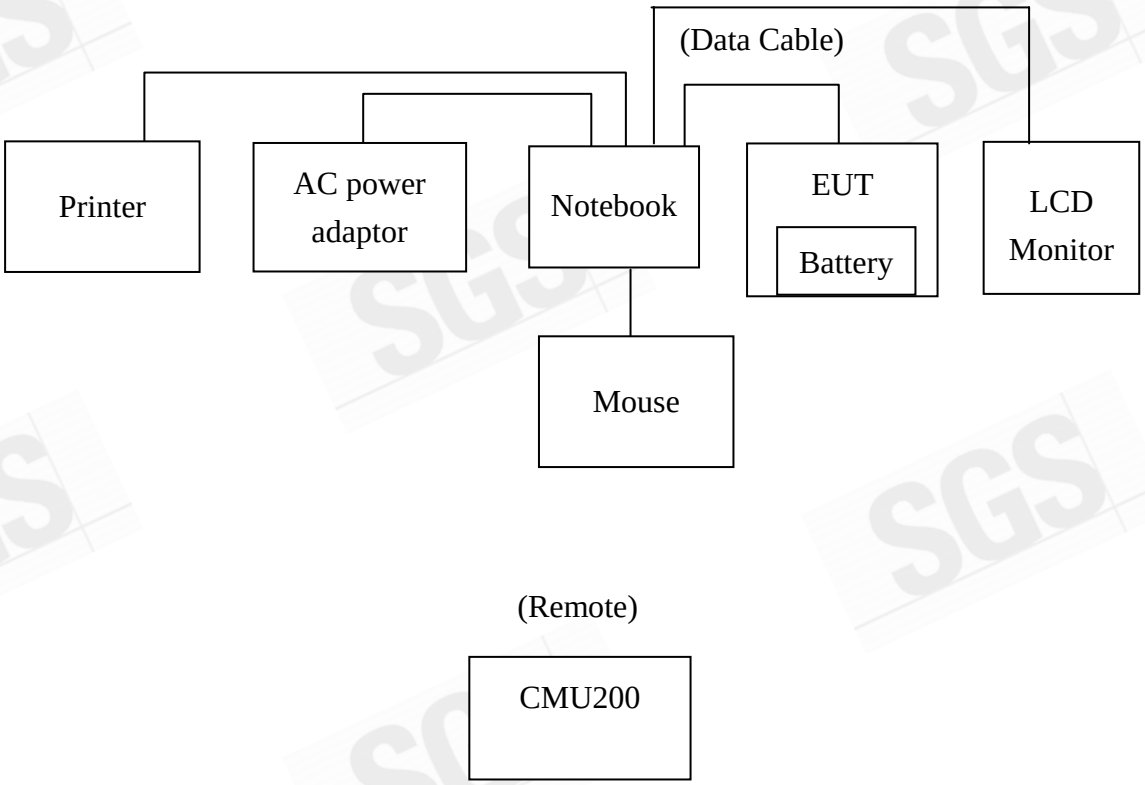


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	EUT	RM-687	RM-687	N/A	N/A	N/A
2.	Battery	Nokia	BL-4C	N/A	N/A	N/A
3.	USB Cable	Nokia	CA-101	N/A	120cm Un-shielded	N/A

Table 2-2 Support Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	Notebook	IBM	T60	L3A9050	Un-shielded	Un-shielded
2.	USB Mouse	HP	MO19UCA	N/A	Un-shielded	N/A
3.	Radio Communication Analyzer	R&S	CMU200	102189	Un-shielded	Un-shielded
4.	LCD Monitor	HP	HSTND-2F02	N/A	Un-shielded	Un-shielded
5.	Printer	HP	DJ640C	TH12QE110Y	Un-shielded	Un-shielded

3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.107	Conducted Emission Class B	Compliant
§15.109	Radiated Emission Class B	Compliant

4. Description of test modes

The EUT was stayed in normal operation mode with CMU200.

The data cable was connected to PC and data transferred by program.

Test Plan
Conducted Emission
1. Data link with PC

Radiated Emission
1. Data link with PC

5. Conducted Emissions Test

5.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

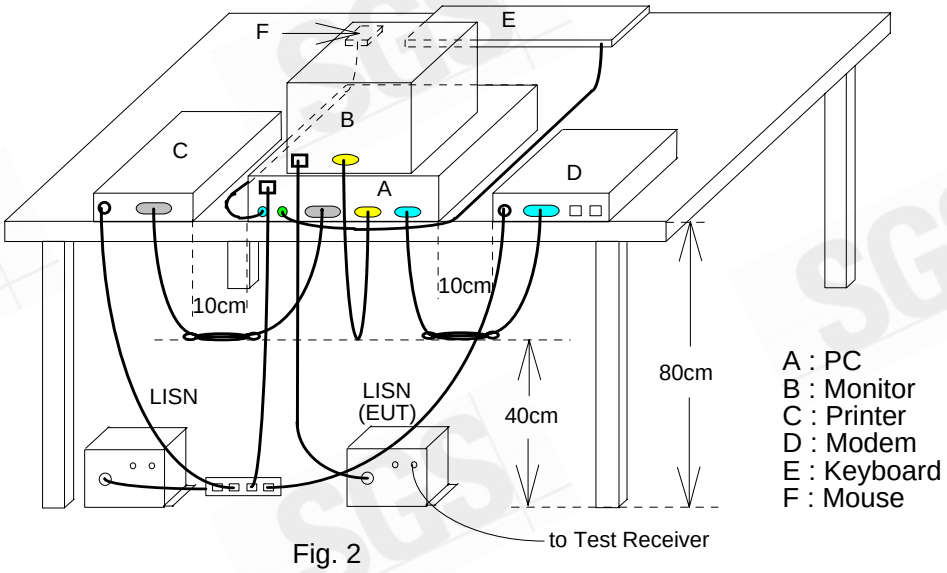


Fig. 2

5.3 Measurement Equipment Used:

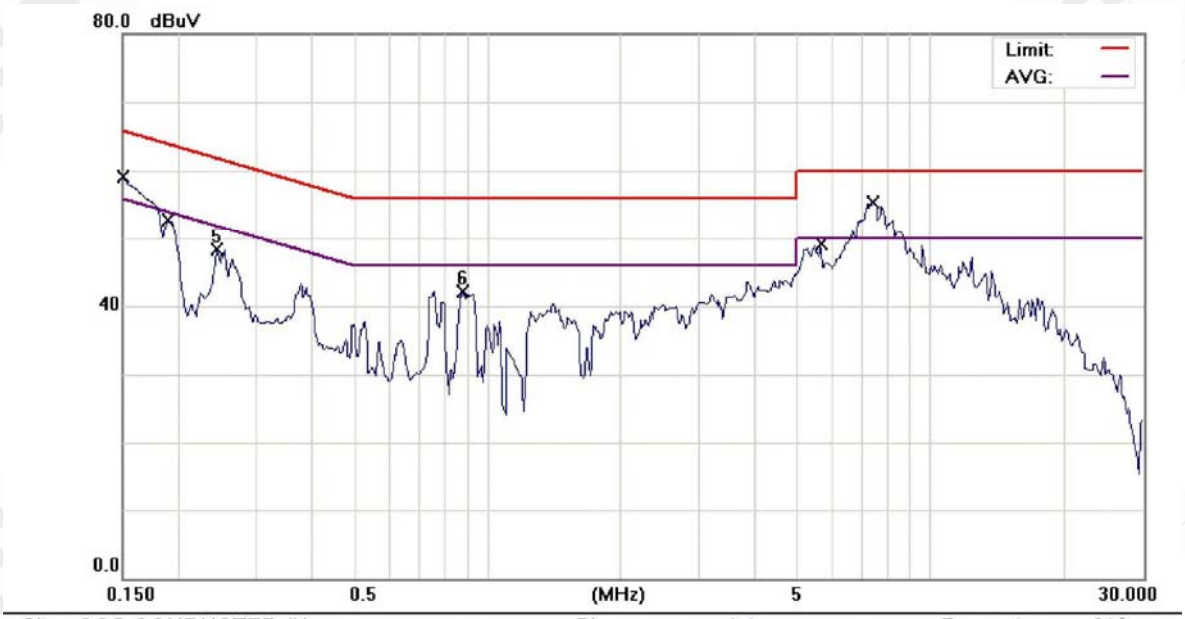
Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCS30	828985/004	09/15/2009	09/14/2010
LISN	Rolf-Heine	NNB-2/16Z	99012	02/02/2010	02/01/2011
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	02/02/2010	02/01/2011
Coaxial Cables	N/A	WK CE Cable	N/A	11/28/2009	11/27/2010

5.4 Measurement Result

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Data Link with PC	Test Date:	Mar. 19, 2010
		Test By:	Nick

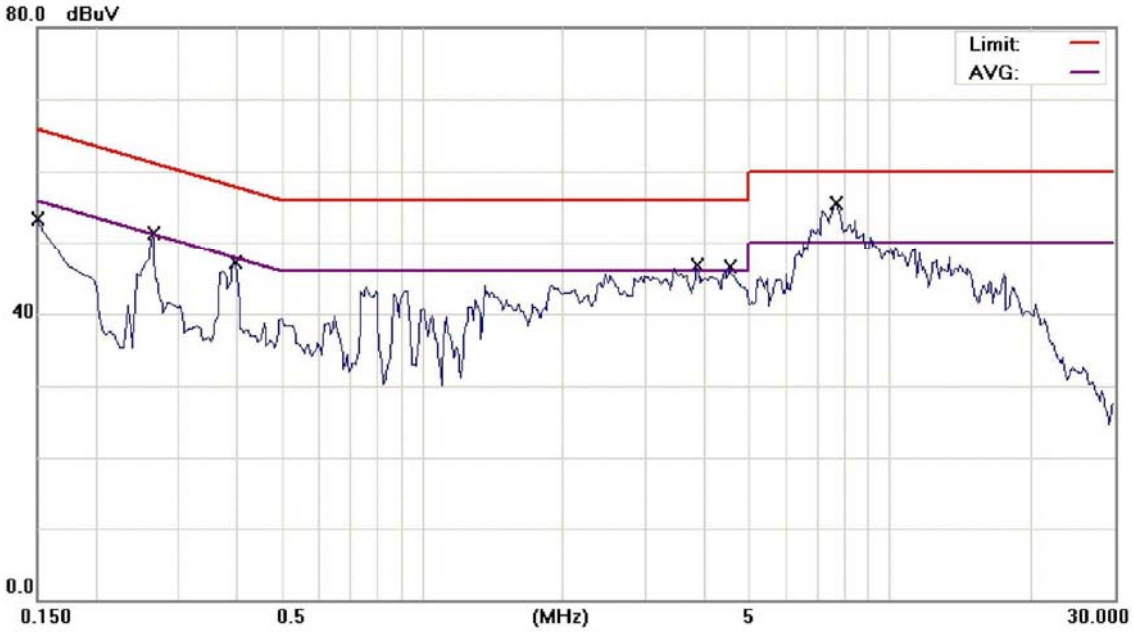


Site SGS CONDUCTED #1
Limit: FCC Class B Conduction(QP)
EUT: RM-687
M/N: RM-687
Note: Data link (Cable : CA-101)

Phase: L1
Power: AC 120V/60Hz
Distance:

Temperature: 24 ℃
Humidity: 61 %
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1506	56.02	0.17	56.19	65.97	-9.78	QP	
2		0.1506	32.34	0.17	32.51	55.97	-23.46	AVG	
3		0.1893	49.85	0.13	49.98	64.07	-14.09	QP	
4		0.1893	31.88	0.13	32.01	54.07	-22.06	AVG	
5		0.2450	48.20	0.11	48.31	61.92	-13.61	peak	
6		0.8800	42.09	0.09	42.18	56.00	-13.82	peak	
7		5.6666	47.85	0.19	48.04	60.00	-11.96	QP	
8		5.6666	30.45	0.19	30.64	50.00	-19.36	AVG	
9	*	7.4017	55.48	0.27	55.75	60.00	-4.25	QP	
10		7.4017	42.39	0.27	42.66	50.00	-7.34	AVG	



Site SGS CONDUCTED #1
Limit: FCC Class B Conduction(QP)
EUT: RM-687
M/N: RM-687
Note: Data link (Cable : CA-101)

Phase: N
Power: AC 120V/60Hz
Distance:

Temperature: 24 ℃
Humidity: 61 %
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1505	49.97	0.19	50.16	65.97	-15.81	QP	
2		0.1505	32.91	0.19	33.10	55.97	-22.87	AVG	
3		0.2641	44.37	0.13	44.50	61.30	-16.80	QP	
4		0.2641	33.91	0.13	34.04	51.30	-17.26	AVG	
5		0.3998	42.86	0.11	42.97	57.86	-14.89	QP	
6		0.3998	29.82	0.11	29.93	47.86	-17.93	AVG	
7		3.8595	40.98	0.17	41.15	56.00	-14.85	QP	
8		3.8595	24.63	0.17	24.80	46.00	-21.20	AVG	
9		4.5592	42.60	0.18	42.78	56.00	-13.22	QP	
10		4.5592	25.41	0.18	25.59	46.00	-20.41	AVG	
11	*	7.6685	51.18	0.30	51.48	60.00	-8.52	QP	
12		7.6685	37.60	0.30	37.90	50.00	-12.10	AVG	

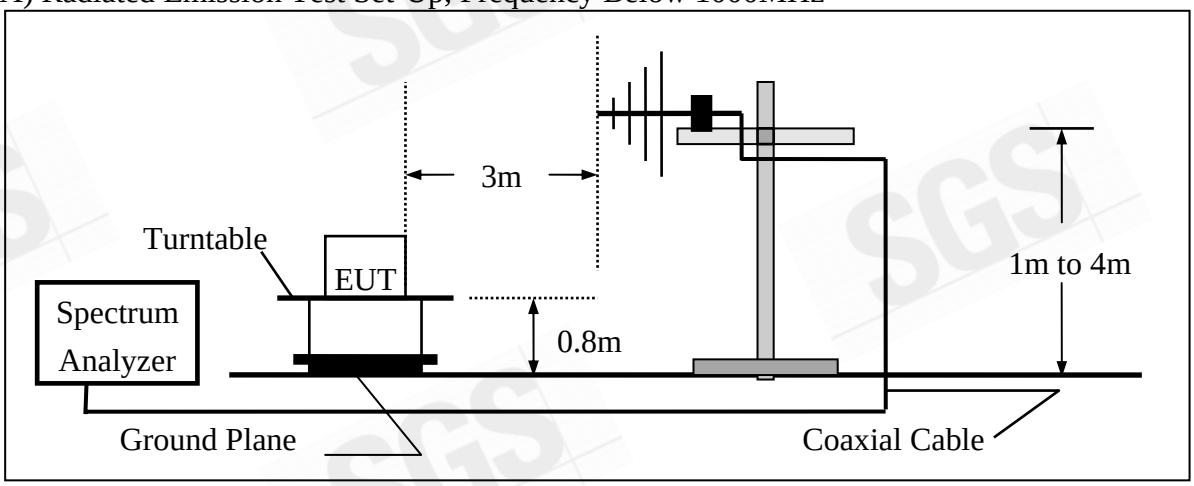
6. Radiated Emission Test

6.1 Measurement Procedure

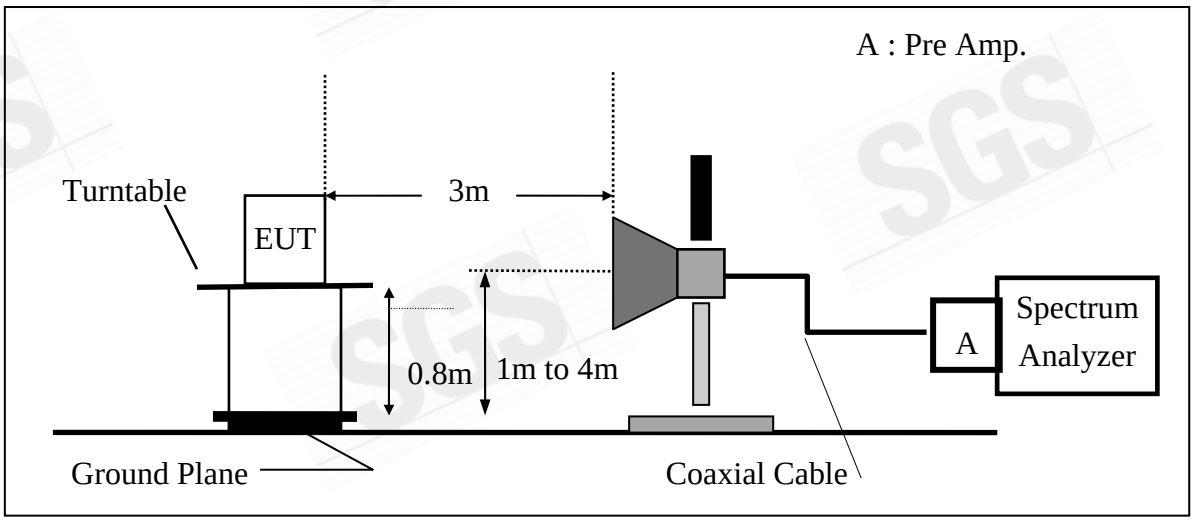
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



6.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2011
Loop antenna	MESSTEC	FLA30	03/10086	07/08/2009	07/07/2011
Bilog Antenna	SCHWAZBECK	VULB9160	3136	09/15/2009	09/14/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/27/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2010	01/04/2011
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010

6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

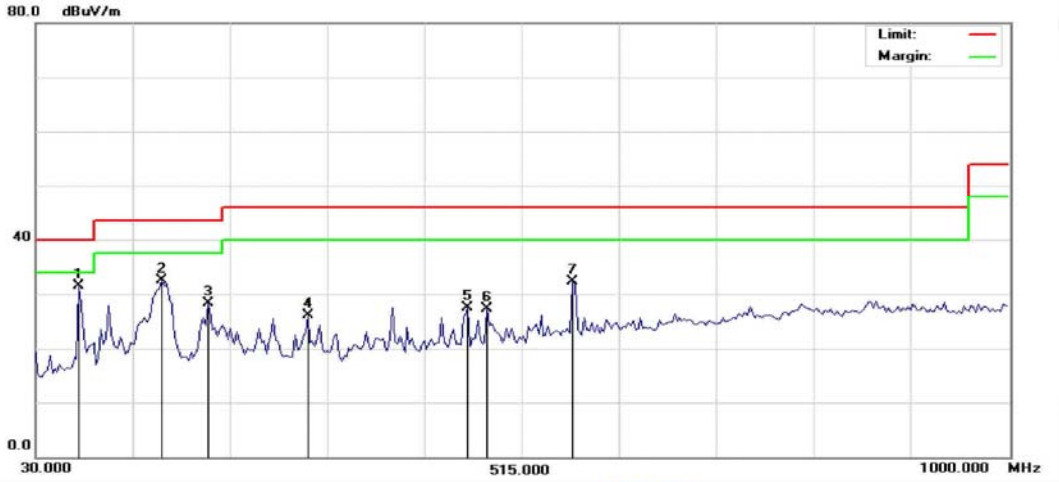
FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

6.5 Measurement Result

Test Mode: Data Link with PC
Frequency Range: 30MHz-1GHz

Test Date : Mar. 18, 2010
Test By: Nick



Site : 9*6*6 Chamber
Limit: FCC Class B 3M Radiation
EUT: RM-687
M/N: RM-687
Note: Data link (Cable : CA-101)

Polarization: *Vertical*
Power: AC 120V/60Hz
Distance: 3m

Temperature: 24 ℃
Humidity: 59%
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	73.6500	47.64	-16.22	31.42	40.00	-8.58	QP	
2		156.1000	45.26	-12.83	32.43	43.50	-11.07	QP	
3		202.1750	43.02	-14.66	28.36	43.50	-15.14	QP	
4		301.6000	37.17	-11.16	26.01	46.00	-19.99	QP	
5		461.6500	34.46	-7.03	27.43	46.00	-18.57	QP	
6		481.0500	34.28	-6.98	27.30	46.00	-18.70	QP	
7		565.9250	37.84	-5.45	32.39	46.00	-13.61	QP	

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

(2) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurement as necessary.

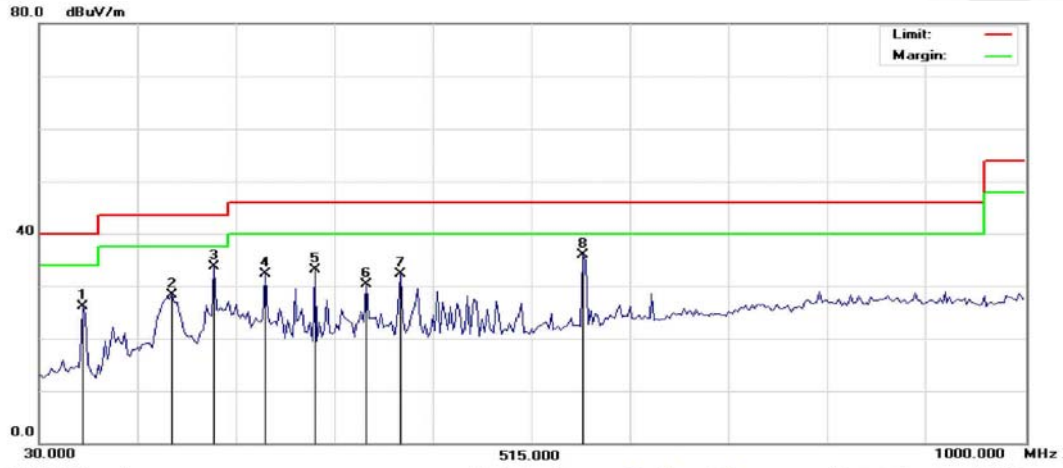
(3) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz and 1GHz to 10GHz was 1MHz

Test Mode: Data Link with PC

Test Date : Mar. 18, 2010

Frequency Range: 30MHz-1GHz

Test By: Nick



Site : 9*6*6 Chamber
Limit: FCC Class B 3M Radiation
EUT: RM-687
M/N: RM-687
Note: Data link (Cable : CA-101)

Polarization: *Horizontal*
Power: AC 120V/60Hz
Distance: 3m

Temperature: 24 ℃
Humidity: 59%
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		73.6500	42.28	-16.22	26.06	40.00	-13.94	QP	
2		160.9500	40.92	-12.68	28.24	43.50	-15.26	QP	
3	*	202.1750	48.39	-14.66	33.73	43.50	-9.77	QP	
4		253.1000	45.10	-12.83	32.27	46.00	-13.73	QP	
5		301.6000	44.33	-11.16	33.17	46.00	-12.83	QP	
6		352.5250	40.28	-10.06	30.22	46.00	-15.78	QP	
7		386.4750	41.28	-8.96	32.32	46.00	-13.68	QP	
8		565.9250	41.36	-5.45	35.91	46.00	-10.09	QP	

Remark：

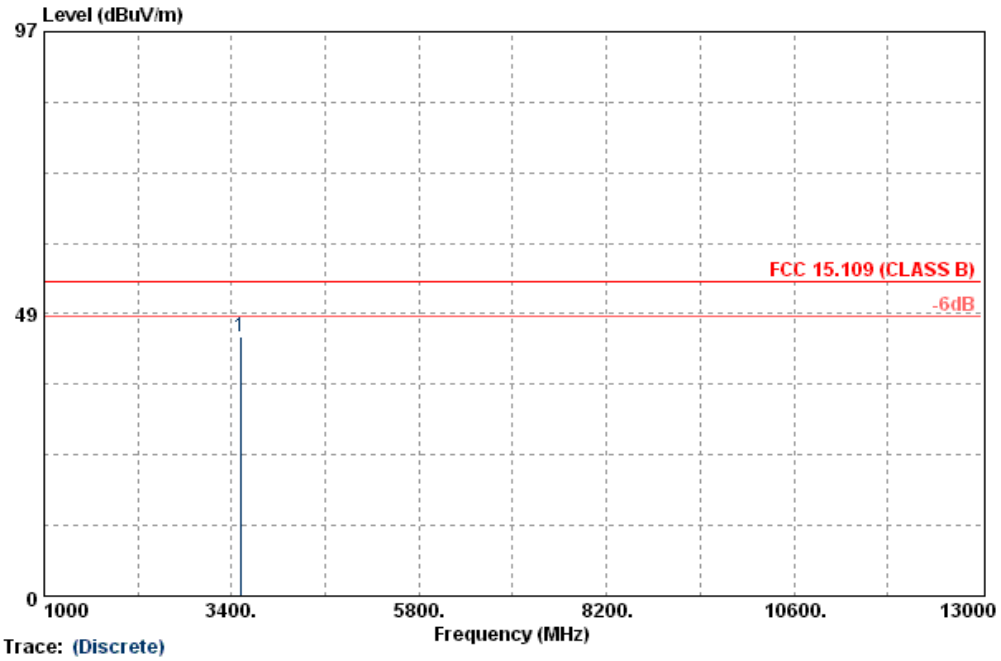
(1) Measuring frequencies from 30 MHz to the 1GHz。

(2) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurement as necessary.

(3) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz and 1GHz to 10GHz was 1MHz

Test Mode: Data Link Mode
Frequency Range: 1GHz-13GHz

Test Date : Mar. 18, 2010
Test By: Nick



Trace: (Discrete)

Condition	: BBHA9120D VERTICAL
Project No.	: EI-2010-30016
Applicant	: Compal
EUT Description	: RM-687
EUT Model	: RM-687
Test Mode	: Data link (Cable:CA-101)
Temp./Humid.	: 24/58
Operator	: Nick

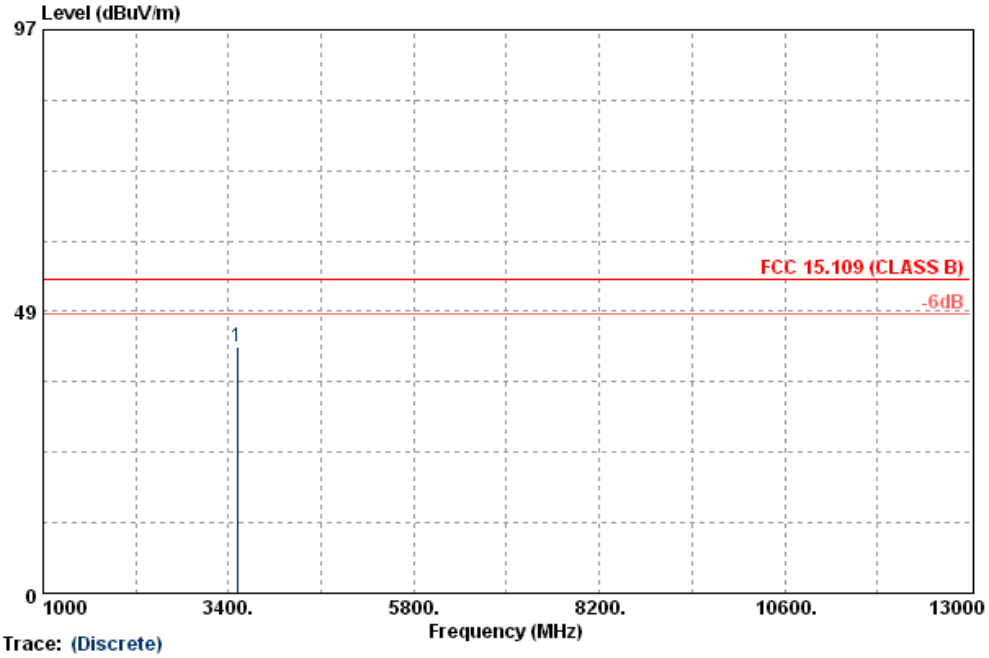
	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Factor	Level	Limit Line	Over Limit	Remar
	MHz	dBuV	dB/m	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1 @	3515.50	42.57	28.54	33.03	6.61	2.12	44.69	53.98	-9.29	Peak

Remark：

(1) Measuring frequencies from 1GHz to the 13GHz.
(2) All Readings above 1GHz are Peak and Average measurement as necessary.
(3) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz and 1GHz to 10GHz was 1MHz

Test Mode: Data Link Mode
Frequency Range: 1GHz-13GHz

Test Date : Mar. 18, 2010
Test By: Nick



Trace: (Discrete)

Condition	: BBHA9120D HORIZONTAL
Project No.	: EI-2010-30016
Applicant	: Compal
EUT Description	: RM-687
EUT Model	: RM-687
Test Mode	: Data link (Cable:CA-101)
Temp./Humid.	: 24/58
Operator	: Nick

	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Factor	Level	Limit Line	Over Limit	Remar
	MHz	dBuV	dB/m	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1 @	3515.50	40.41	28.54	33.03	6.61	2.12	42.53	53.98	-11.45	Peak

Remark：

(1) Measuring frequencies from 1GHz to the 13GHz.
(2) All Readings above 1GHz are Peak and Average measurement as necessary.
(3) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz and 1GHz to 10GHz was 1MHz