



243 Jubug-Ri, Yangji-Myeon, Yongin-Si, Gyeonggi-Do, Korea 449-822
 Tel: +82-31-323-6008 Fax: +82-31-323-6010
<http://www.ltalab.com>



Dates of Tests: Mar 19 ~ 22, 2007
 Test Report S/N: LR500190703E
 Test Site : LTA CO., LTD.

CERTIFICATIO OF COMPLIANCE

FCC ID.

SXV-COWON-CR1

APPLICANT

COWON SYSTEMS, Inc.

FCC Classification	:	Low Power Communication Device Transmitter
Manufacturing Description	:	Cradle for PMP
Manufacturer	:	COWON SYSTEMS, Inc.
Model name	:	COWON CR1
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.239 Subpart C; ANSI C-63.4-2003
Frequency Range	:	88.1 MHz, 88.5MHz, 88.9MHz
Data of issue	:	March 23, 2007

This test report is issued under the authority of:

The test was supervised by:

 Dong -Min JUNG, Technical Manager

 Kyung-Taek LEE, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.



NVLAP LAB Code.: 200723-0

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1. General information's

1-1 Test Performed

Company name : LTA Co., Ltd.
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822
 Web site : <http://www.ltalab.com>
 E-mail : chahn@ltalab.com
 Telephone : +82-31-323-6008
 Facsimile : +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competent of calibration and testing laboratory”.

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2007-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2007-07-13	EMC accredited Lab.
FCC	U.S.A	610755	2008-03-28	FCC filing
VCCI	JAPAN	R2133, C2307	2008-06-22	VCCI registration
IC	CANADA	IC5799	2008-04-23	IC filing

2. Information's about test item

2-1 Client

Company name : COWON SYSTEMS, Inc.
 Address : COWON Tower, 689-3, Yeoksam-dong, Gangnam-gu, Seoul 135-080, Korea
 Telephone / Facsimile : +82-2-6900-0000 / +82-2-6900-0011

2-2 Manufacturer

Company name : Enersen Co., Ltd.
 Address : #508 Daeryung Techno Town 6th, 493-6, gasan-dong, Keumcheun-gu, Seoul, Korea
 TEL / FAX : +82-2-866-6823 / +82-2-866-6831

2-3 Equipment Under Test (EUT)

Trade name : Cradle for PMP
 FCC ID : SXV-COWON-CR1
 Model name : COWON CR1
 Serial number : Identical prototype
 Date of receipt : March 05, 2007
 EUT condition : Pre-production, not damaged
 Antenna type : Pattern Antenna,
 Frequency Range : 88.1MHz, 88.5MHz, 88.9MHz
 Operator Selection of Operating Frequency: Manual Switch
 Power Source : 12VDC

2-4 Tested frequency & signal

	LOW	MID	HIGH
<u>1</u> Frequency (MHz)	88.1	88.5	88.9
<u>2</u> Audio signal:	We tested only under the module of audio input. The device audio input source from maximum audio input for the tested. Test report is recorded the worst mode data.		

2-5 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
PMP	COWON Q5	N/A	COWON
-	-	-	-

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Status (note 1)
15.239	Field Strength of Fundamental and Emissions within permitted band.	< 250 uV @ 3m	C
15.239	Occupied channel bandwidth	< 200kHz	C
15.209	Radiated Emission	< FCC 15.209 limits	C
15.207	AC Conducted Emissions	< FCC 15.207 limits	NA / Note2
15.203	Antenna Requirement	-	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: It is not need to test this requirement, because the EUT shall be operated by car battery

Note 3: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

FCC Parts 15.239; ANSI C-63.4-2003

3.2 Transmitter requirements

3.2.1 Field Strength of Fundamental and Emissions within permitted band.

Procedure:

The field strength of emissions from intentional radiators operated within the bands 88 ~108MHz was measured in accordance with FCC Part §15.239. The test set-up was made according to ANSI C 63.4:2003.

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in an OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Span = 1 MHz

RBW = 120 kHz

VBW = 300 kHz

Trace = max hold

Sweep = auto

Detector function = Peak & Average

Measurement Data: **Complies**

Operating Condition: Transmit the audio signal (modulated signal)

Frequency (MHz)	Pol. (H/V)	Read Level (dBuV/m)		C.F (dB)	Result Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
88.1	H	53.3	51.5	-16.25	37.05	35.25	68	48	30.95	12.75
88.1	V	58.4	57.6	-16.25	42.15	41.35	68	48	25.85	6.65
88.5	H	50.5	48.8	-15.07	35.43	33.73	68	48	32.57	14.27
88.5	V	56.4	54.2	-15.07	41.33	39.13	68	48	26.67	8.87
89.1	H	48	46.8	-14.14	33.86	32.66	68	48	34.14	15.34
89.1	V	55.7	54	-14.14	41.56	39.86	68	48	26.44	8.14

Note 1: Field Strength Calculation

C.F = Antenna Factor + Cable Loss - Preamp Factor

Margin = Limit - Level

Minimum Standard: FCC Part 15.239

The maximum Field Strength authorized within 200kHz is 250 uV/m@3m

3.2.2 Radiated Emissions

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 100 kHz (30MHz ~ 1 GHz)

VBW ≥ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

Detector function = peak

Trace = max hold

Sweep = auto

Measurement Data: Complies

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

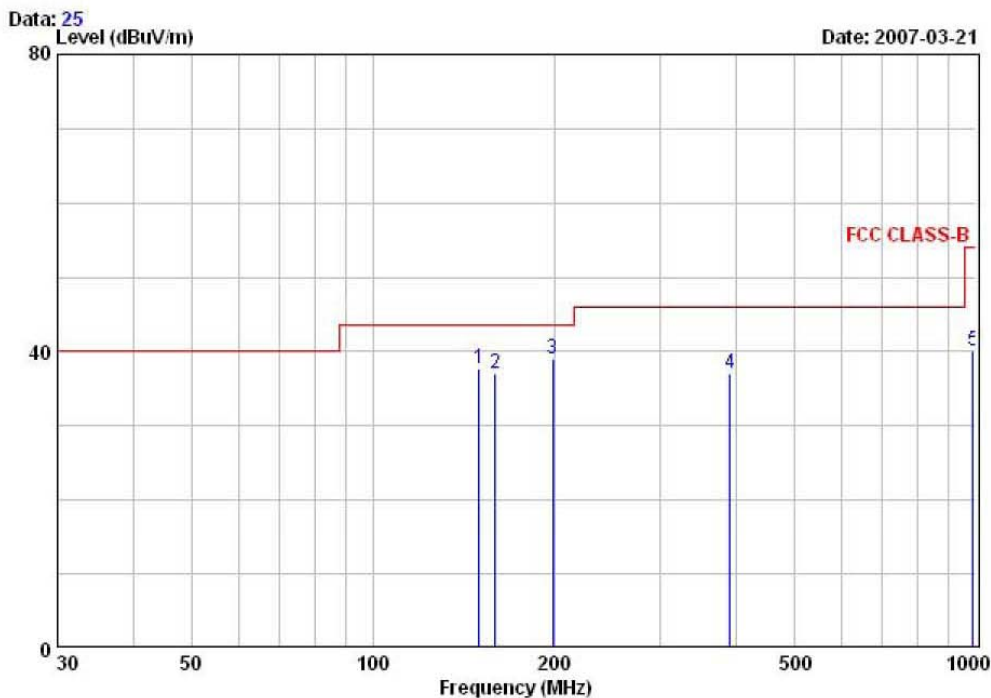
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Frequency: 88.1MHz



243 Jubug-ri, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
Tel :+82-31-3236008,9
Fax:+82-31-3236010

EUT/Model No.: COWON CRL Test Mode: TX:88.1 mode
Temp Humi : 9 / 53 Tested by: B. S. KIM



Peak	Freq MHz	Reading dBuV	C.F dB	Result QK dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Polarity
1	150.01	47.90	-10.17	37.73	43.50	5.77	287	157	HORIZONTAL
2	159.80	47.20	-10.14	37.06	43.50	6.44	318	257	HORIZONTAL
3	198.59	52.20	-13.28	38.92	43.50	4.58	315	24	HORIZONTAL
4	390.72	44.80	-7.72	37.08	46.00	8.92	100	85	VERTICAL
5	989.54	36.77	3.43	40.20	54.00	13.80	347	99	HORIZONTAL

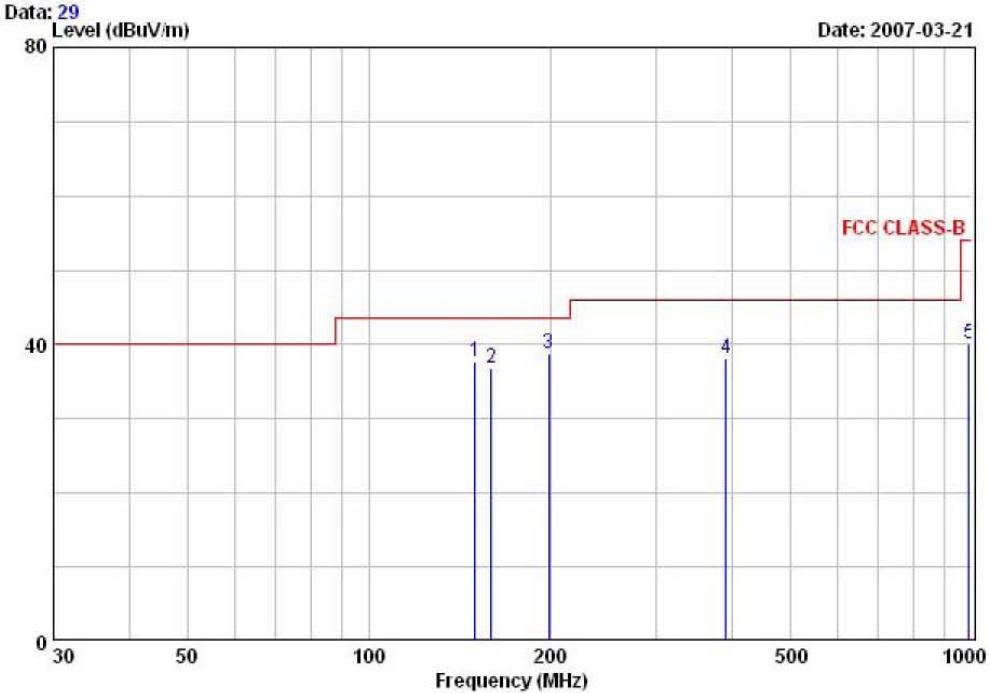
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Frequency: 88.5MHz



243 Jubug-ri, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
Tel.+82-31-3236008,9
Fax:+82-31-3236010

EUT/Model No.: COWON CRL Test Mode: TX: 88.5 mode
Temp Humi : 9 /53 Tested by: B. S. KIM



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
1	150.01	47.80	-10.17	37.63	43.50	5.87	287	157 HORIZONTAL
2	159.80	47.00	-10.14	36.86	43.50	6.64	318	257 HORIZONTAL
3	198.59	52.10	-13.28	38.82	43.50	4.68	315	24 HORIZONTAL
4	390.72	45.80	-7.72	38.08	46.00	7.92	100	85 VERTICAL
5	989.54	36.67	3.43	40.10	54.00	13.90	347	99 HORIZONTAL

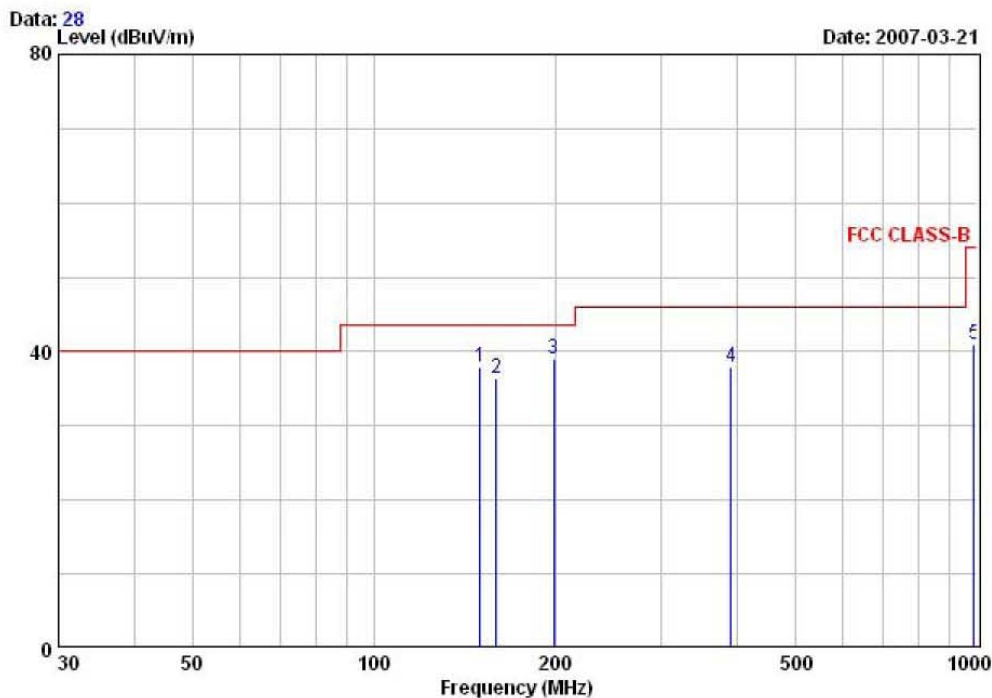
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Frequency: 88.9MHz



243 Jubug-ri, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
Tel. +82-31-3236008,9
Fax: +82-31-3236010

EUT/Model No.: COWON CRL Test Mode: TX:88.9 mode
Temp Humi : 9 / 53 Tested by: B. S. KIM



	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
1	150.01	48.00	-10.17	37.83	43.50	5.67	287	157	HORIZONTAL
2	159.80	46.50	-10.14	36.36	43.50	7.14	318	257	HORIZONTAL
3	198.59	52.40	-13.28	39.12	43.50	4.38	315	24	HORIZONTAL
4	390.72	45.70	-7.72	37.98	46.00	8.02	100	85	VERTICAL
5	989.54	37.47	3.43	40.90	54.00	13.10	347	99	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

3.2.3 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: **Not Applicable**

- It is not need to test this requirement, because the EUT shall be operated by car battery

Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

3.2.4 20dB Bandwidth

Procedure:

The channel Bandwidth is defined as the minimum declared bandwidth within which the transmitter's necessary bandwidth can be contained. The transmitter was adjusted to work at the selected channels. The Channel BW was measured at an amplitude level reduced from the reference level by the 20dB.

Occupied Bandwidth was measured as shown in the below.

The EUT was placed on a 0.8m high wooden table. An antenna was placed near the EUT and measurements of frequencies were recorded for reference during final measurements. Measurements were performed with the EUT rotated 360 degrees to determine worst-case orientation for maximum emissions.

→

The spectrum analyzer is set to:

Frequency Range = 88 ~ 108MHz

RBW = 10 kHz

VBW = 30 kHz

Trace = max hold

Detector function = Peak

Sweep = auto

Span = 300 kHz

Operating Condition: Transmit the maximum audio signal (modulation)

we played a song from the COWON Q5 with the maximum audio input.

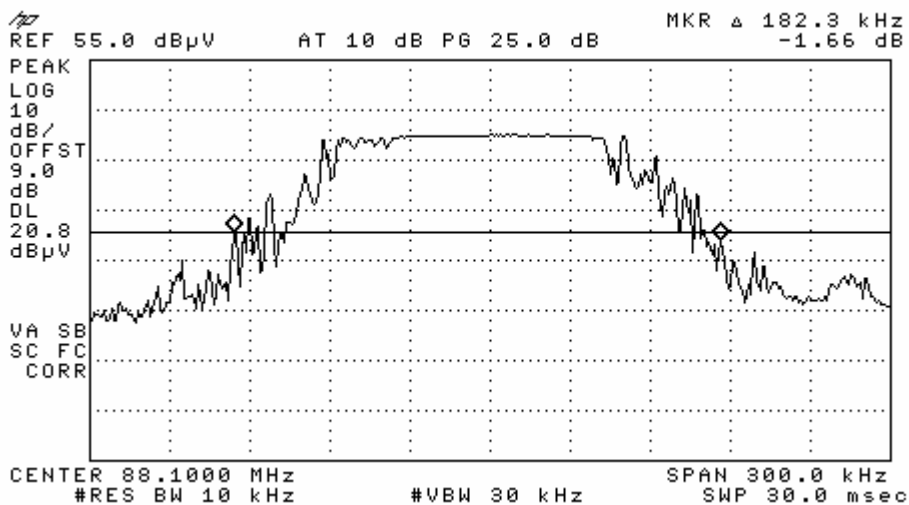
Measurement Data: **Complies**

Refer to the next page.

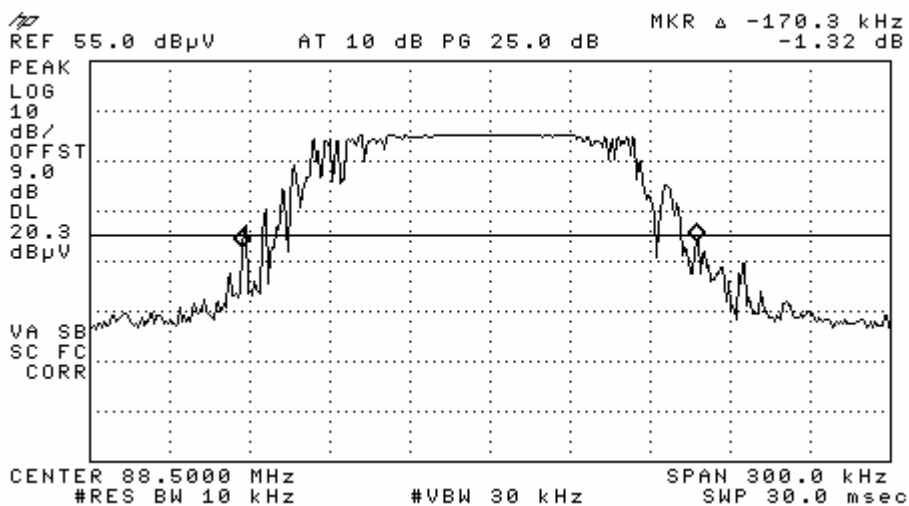
Minimum Standard:

Occupied Bandwidth < 200kHz.

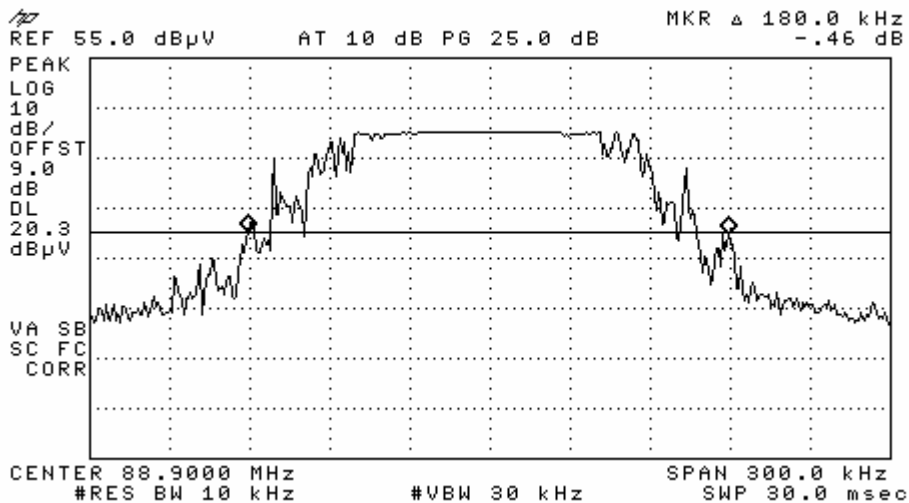
20 dB Occupied Bandwidth



L



L



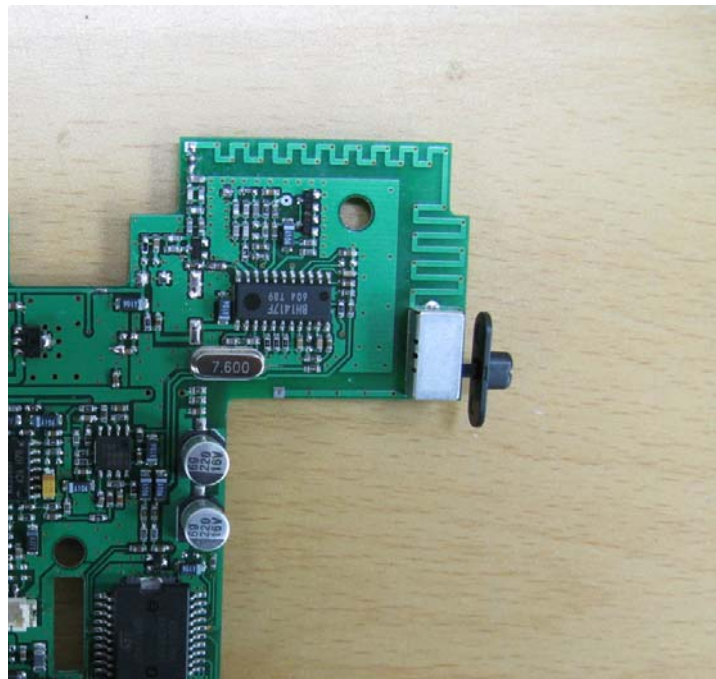
3.2.5 Antenna Requirement

Define:

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the applicant can be used with the device. The use of permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with this requirement.

--- The antenna Type: PCB Pattern antenna

--- Refer to below Photograph



APPENDIX

TEST EQUIPMENT USED FOR TESTS

No.	Description	Model No.	Serial No.	Manufacturer	Cal. Due
1	Spectrum Analyzer	8594E	3624A03247	HP	Jan-08
2	Spectrum Analyzer	8594E	3649A03649	HP	Mar-08
3	Spectrum Analyzer	8594E	3624A03313	HP	Mar-08
4	Spectrum Analyzer	8563E	3425A02505	HP	Mar-08
5	EMI Test Receiver	ESVD	843748/001	R&S	Jan-08
6	EMI Test Receiver	ESHS10	828404/009	R&S	Jan-08
7	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Feb-08
8	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Feb-08
9	TRILOG Antenna	VULB 9160	9160-3172	SCHWARZBECK	Feb-08
10	Horn Antenna	3115	00055005	ETS	Jun-07
11	Dipole Antenna	VHA9103	2116	SCHWARZBECK	Nov-07
12	Dipole Antenna	VHA9103	2117	SCHWARZBECK	Nov-07
13	Dipole Antenna	UHA9105	2261	SCHWARZBECK	Nov-07
14	Dipole Antenna	UHA9105	2262	SCHWARZBECK	Nov-07
15	RF Amplifier	8447D	2439A09058	HP	Jan-08
16	RF Amplifier	8447D	2944A07882	HP	May-07
17	RF Amplifier	8449B	3008A02126	Agilent	Jun-07
18	LISN	KNW-407	8-1430-1	Kyoritsu	Jan-08
19	Two-Line V-Network	ESH3-Z5	893045/017	R&S	Jan-08
20	V-NETWORK	ESH3-Z6	100378	R&S	Feb-08
21	Attenuator	8491A	37822	HP	Nov-07
22	Attenuator	8491A	63196	HP	Nov-07
23	Attenuator	8498A	1801A06689	HP	Nov-07
24	Power Divider	11636A	6243	HP	Nov-07
25	Digital Multi Meter	34401A	US36062141	HP	Apr-07
26	DC Power Supply	6622A	3448A03079	HP	Oct-07
27	Power Meter	EPM-441A	GB32481702	HP	Apr-07
28	Power Sensor	8481A	2702A64048	HP	Apr-07
29	Audio Analyzer	8903B	3729A18901	HP	Nov-07
30	Modulation Analyzer	8901B	3749A05878	HP	Nov-07
31	Temp/Humi Chamber	YJ-500	LTAS06041	진영테크	Oct-07
32	Signal Generator	8371B	US34490456	HP	Mar-08
33	Signal Generator	8648C	3623A02597	HP	Mar-08
34	Frequency Counter	5342A	2826A12411	HP	Mar-08
-	-	-	-	-	-