683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080
Tel: +82-31-321-2664 Fax: +82-31-321-1664
http://www.digitalemc.com

CERTIFICATE OF COMPLIANCE
FCC Part 15C Certification

Dates of Tests: February 11 ~ 12, 2005
Test Report S/N:DR50110502D
Test Site : DIGITAL EMC CO., LTD.

FCC ID. **SYTORCFMTRH10**

APPLICANT **Reigncom Tech. Ltd.**

FCC Classification	:	**Low Power Communication Device Transmitter**
Device name	:	**FM Transmitter**
Manufacturer	:	**kwang sung electronics. H.K. Co., ltd**
Model name	:	**FM Transmitter for H10**
Test Device Serial number	:	**Identical prototype**
FCC Rule Part(s)	:	**FCC Part 15 Subpart C**
		ANSI C-63.4-2001
Frequency Range	:	**88.1 ~ 107.9 MHz**
Data of issue	:	**February 14, 2005**

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

NVLAP LAB CODE 200559-0

TABLE OF CONTENTS

1. General information's

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.
Address : 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080
http://www.digitalemc.com E-mail : demc@unitel.co.kr
Tel: +82-31-321-2664 Fax: +82-31-321-1664

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".
This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200559-0.

Test operator: engineer

Data	Name	Signature
February 14, 2005	Won -Jong LEE	

Report Reviewed By: Technical Director

Data	Name	Signature
February 14, 2005	Harvey Sung	

Ordering party:

Company name	:	**Reigncom Tech. Ltd.**
Address	:	**5F Sungwoo Bd. 291-5, Yatap-Dong, Bundang-Gu,**
Zip code	:	**463-835**
City/town	:	**Sungnam-Si, Kyunggi-Do**
Country	:	**Korea**
Date of order	:	**February 04, 2005**
Attention	:	**Mr. Woo-Jin Jung**

2. Information's about test item

SYTORCFMTRH10

2.1 Equipment information

Equipment model name	FM Transmitter for H10
Type of equipment	wireless equipment which is used a feeble radio wave
Frequency band	88.1 ~ 107.9 MHz
Power	DC 3.3V by main system

2.2 Tested environment

Temperature	:	15 ~ 35 (°C)
Relative humidity content	:	20 ~ 75 %
Air pressure	:	86 ~ 103 kPa
Tested Voltage	:	DC 3.3V by main system

2.3 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
HDD Audio	H10	N/A	Iriver.
-	-	-	-

2.4 Tested frequency

Frequency	TX	RX
Low frequency	88.1 MHz	-
Mid frequency	98.0 MHz	-
High frequency	107.9MHz	-

Note: Measurements were performed top and bottom location in the frequency range of operation according to the section 15.31(m)

2.5 EMI Suppression Device(s)/Modifications

-> none

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
15.203	Antenna Requirement	-	C

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

Note 2: The sample was tested according to the following specification:

FCC Parts 15.239; ANSI C-63.4-2001

3.2 TEST 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 63.4:2001.

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.

Measurement Data: Complies

Operating Condition: Transmit the audio signal

Frequency (MHz)	Pol. (H/V)	Read Level (dBuV)		Factor (dB)	Result Level (dBuV)		Limit (dBuV)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
88.1	**H**	**67.0**	**65.5**	**-18.7**	**48.3**	**46.8**	**68**	**48**	**19.7**	**1.2**
88.1	**V**	**64.6**	**62.9**	**-18.7**	**45.9**	**44.2**	**68**	**48**	**22.1**	**3.8**
98	**H**	**66.5**	**64.2**	**-17.1**	**49.4**	**47.1**	**68**	**48**	**18.6**	**0.9**
98	**V**	**64.4**	**63.0**	**-17.1**	**47.3**	**45.9**	**68**	**48**	**20.7**	**2.1**
107.9	**H**	**62.5**	**61.0**	**-15.7**	**46.8**	**45.3**	**68**	**48**	**21.2**	**2.7**
107.9	**V**	**59.8**	**58.4**	**-15.7**	**44.1**	**42.7**	**68**	**48**	**23.9**	**5.3**

Note 1: Field Strength Calculation

Factor = 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

TEST EQUIPMENT USED: 02, 22, 30, 31, 33, 34, 39, 40, 41, 47, 49

3.2.2 Radiated Emission

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 63.4:2001.

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:

Frequency Range = 30 MHz ~ 10^{th} harmonic.

RBW = 120 kHz (30MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10^{th} harmonic)

Trace = max hold Detector function = Peak

Sweep = auto Receiver Detector = Quasi-Peak

Operating Condition: 1. Transmit the audio signal

2. Data read / write mode

Measurement Data: **Complies**

- Refer to the next page.

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.

TEST EQUIPMENT USED: 02, 30, 31, 33, 34, 39, 40, 41, 47, 49

Measurement Data:

1 : Harmonics of the 88.1 MHz (Transmit the audio signal)

Frequency (MHz)	Pol	Read Level (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
176.2	H	45.4	-10.1	35.3	43.5	8.2
264.3	H	50.0	-7.0	43.0	46	3.0
352.4	H	48.5	-10.4	38.1	46	7.9
440.5	H	40.4	-8.9	31.5	46	14.5
528.6	H	43.2	-7.3	35.9	46	10.1
616.7	H	46.1	-7.4	38.7	46	7.3
704.8	H	43.9	-5.0	38.9	46	7.1
792.9	H	39.3	-4.5	34.8	46	11.2

2: Harmonics of the 98.0 MHz (Transmit the audio signal)

Frequency (MHz)	Pol	Read Level (dBuV/m)	Probe Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
196	H	41.1	-9.6	31.5	43.5	12.0
294	H	45.9	-6.1	39.8	46	6.2
490	H	42.2	-7.5	34.7	46	11.3
588	H	40.1	-6.7	33.4	46	12.6
686	H	43.5	-6.6	36.9	46	9.1

Note 1: Field Strength Calculation

Factor = Antenna Factor + Cable Loss - Preamp Factor

Margin = Limit - Level

Note 2.: Up to the 10th harmonics were investigated according to 15.239 and the worst-case emissions are reported.

Note 3: No other emission were detected at a level greater than 20 dB below limit.

3: Harmonics of the 107.9 MHz (Transmit the audio signal)

Frequency (MHz)	Pol	Read Level (dBuV/m)	Probe Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
215.8	H	36.1	-8.7	27.4	43.5	16.1
323.7	H	42.6	-10.8	31.8	46	14.2
431.6	H	36.2	-8.0	28.2	46	17.8
539.5	H	37.3	-7.3	30	46	16.0
647.4	H	37.5	-6.0	31.5	46	14.5

Note 1: Field Strength Calculation

Factor = Antenna Factor + Cable Loss - Preamp Factor

Margin = Limit - Level

Note 2.: Up to the 10^{th} harmonics were investigated according to 15.239 and the worst-case emissions are reported.

Note 3: No other emission were detected at a level greater than 20 dB below limit.

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 receiving function. 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.

The spectrum analyzer is set to:

Frequency Range = 0.15 MHz ~ 30MHz.

RBW = 9 kHz (0.15 MHz ~ 30MHz.) VBW ≥ RBW

Trace = max hold Detector function = peak / Quasi-peak / average

Operating Condition: 1. Charging mode by PC Sweep = auto

Measurement Data: Not Applicable

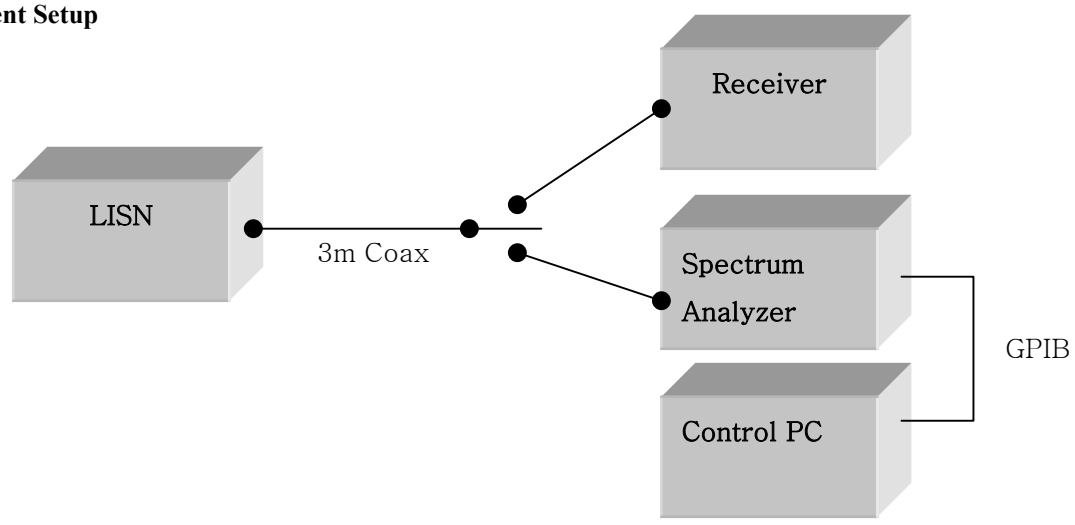
Because This product is only operated by dc source of the main system.

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

Measurement Setup



TEST EQUIPMENT USED: 42, 43, 44, 45, 46, 48

3.2.4 Occupied Channel 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 26dB.

The plot is taken at 50kHz/division frequency span, 30kHz resolution bandwidth and 5dB/division logarithmic display from a spectrum analyzer.

The spectrum analyzer is set to:

Frequency Range =

RBW = 30 kHz

VBW ≥ RBW

Trace = max hold

Detector function = Peak

Sweep = auto

Span = 500 kHz

Operating Condition: Transmit the audio signal

Measurement Data: **Complies**

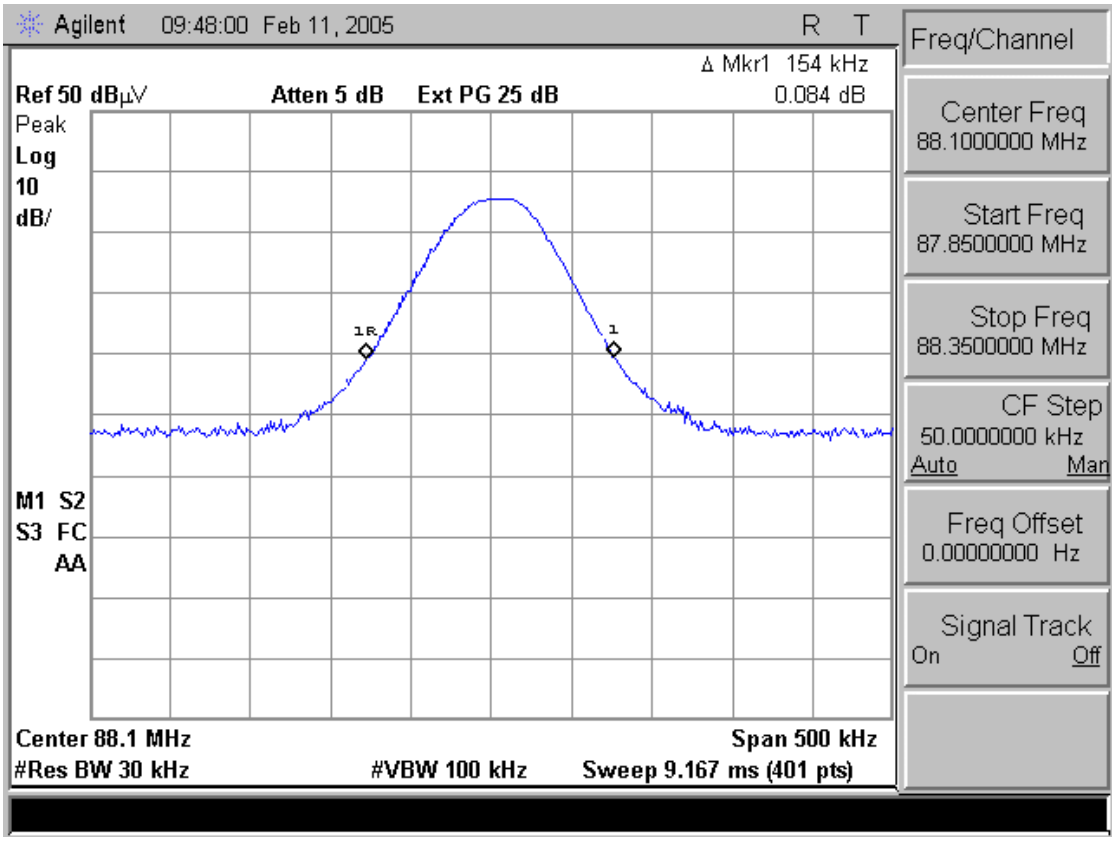
Refer to the next page.

Minimum Standard:

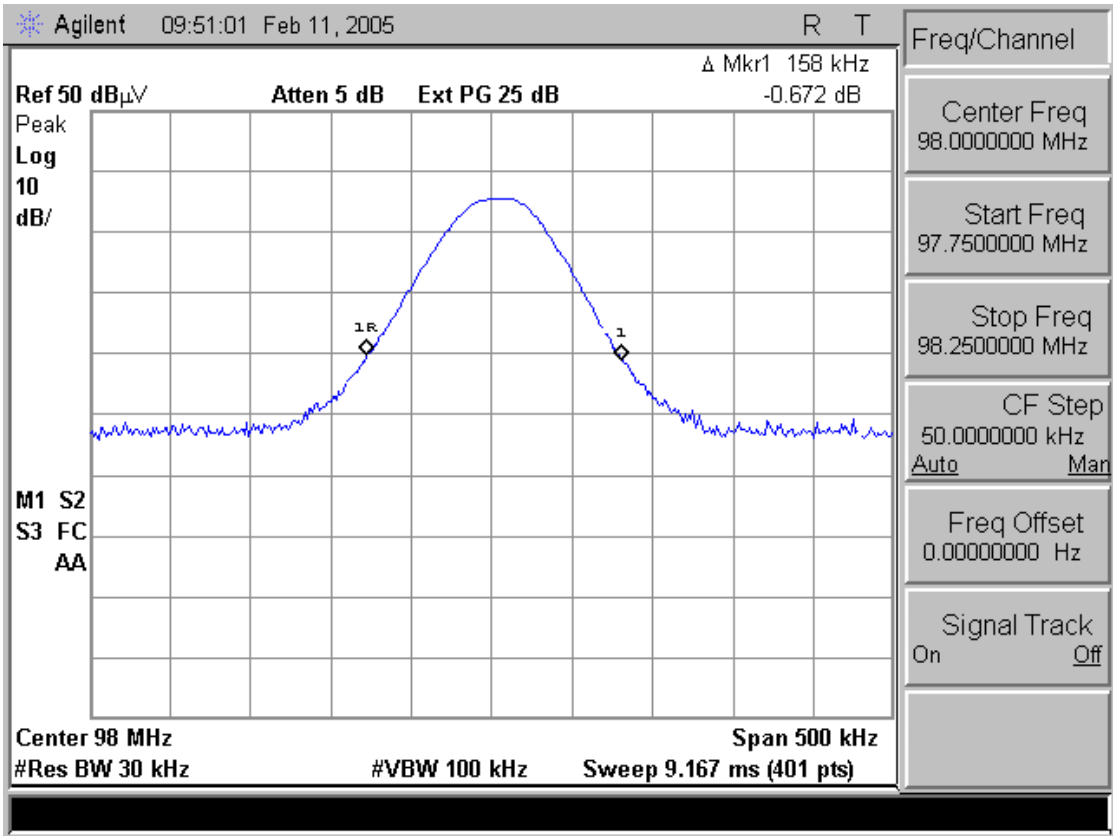
Occupied Channel Bandwidth < 200kHz.

TEST EQUIPMENT USED: 01, 34, 39, 40, 41,

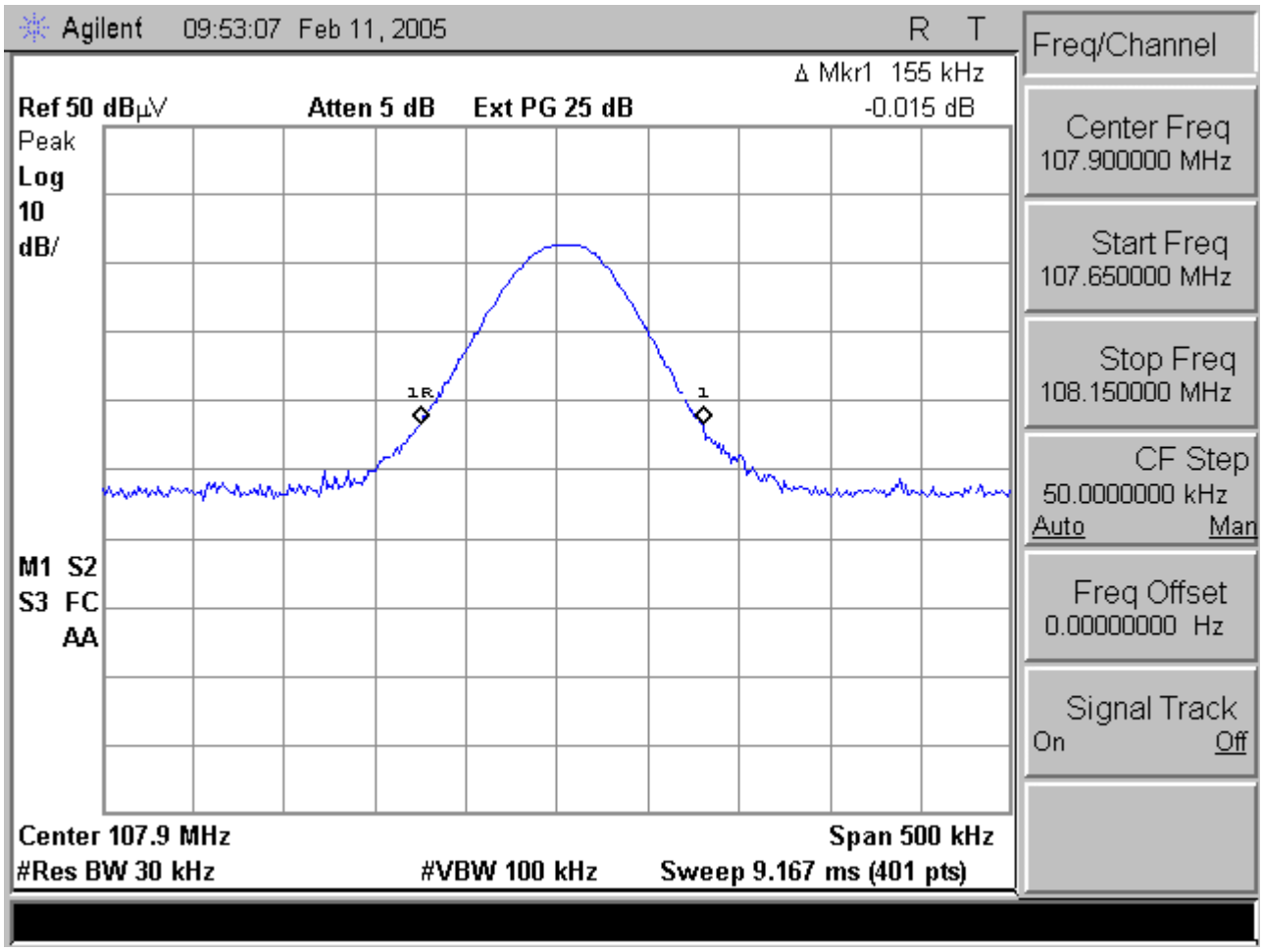
Occupied Channel Bandwidth plot (88.1 MHz)



Occupied Channel Bandwidth plot (98.0 MHz)



Occupied Channel Bandwidth plot (107.9 MHz)

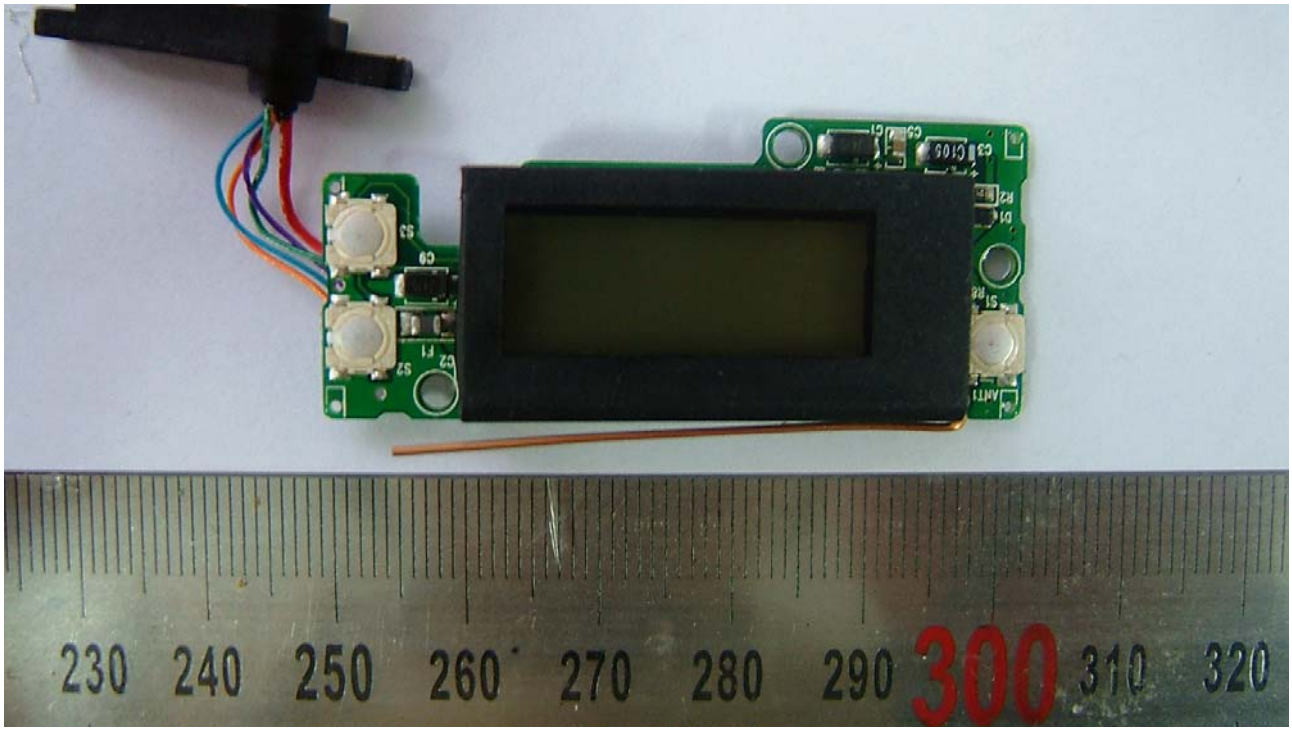


3.2.5 Antenna Requirement

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: Wire antenna / length: 40mm



APPENDIX I

TEST EQUIPMENT USED FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
01	Spectrum Analyzer	Agilent	E4404B	19/11/05	US41061134
02	Spectrum Analyzer	H.P	8563E	25/09/05	3551A04634
03	Power Meter	H.P	EPM-442A	15/07/05	GB37170413
04	Power Sensor	H.P	8481A	15/07/05	3318A96332
05	Frequency Counter	H.P	5342A	07/10/05	2119A04450
06	Multfunction Synthesizer	H.P	8904A	07/10/05	3633A08404
07	Signal Generator	H.P	8673D	26/09/05	2844A00753
08	Signal Generator	H.P	E4421A	15/07/05	US37230529
09	Signal Generator	H.P	8657A	26/05/05	3430U02049
10	Audio Analyzer	H.P	8903B	21/07/05	3011A0944B
11	Modulation Analyzer	H.P	8901B	15/07/05	3028A03029
12	Sensor Module	H.P	11722A	15/07/05	3111A04665
13	Oscilloscope	LeCroy	9314A	10/10/05	93144390
14	CDMA Mobile Station Test Set	H.P	8924C	07/10/05	US35360688
15	Power Splitter	WEINSCHEL	1593	07/10/05	332
16	BAND Reject Filter	Microwave circuits INC.	NO308372	07/10/05	3125-01DC0312
17	BAND Reject Filter	Wainwright	WRCG1750	07/10/05	SN2
18	AC Power supply	DAEKWANG	5KVA	03/04/05	N/A
19	DC Power Supply	H.P	6622A	24/03/05	465487
20	Attenuator (30dB)	H.P	8498A	07/10/05	50101
21	Attenuator (10dB)	WEINSCHEL	23-10-34	07/10/05	BP4387
22	HORN ANT	EMCO	3115	04/04/05	6419
23	HORN ANT	EMCO	3115	01/10/05	21097
24	HORN ANT	A.H.Systems	SAS-574	09/11/06	154
25	HORN ANT	A.H.Systems	SAS-574	09/11/06	155
26	Dipole Antenna	Schwarzbeck	VHA9103	29/10/05	2116

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
27	Dipole Antenna	Schwarzbeck	VHA9103	29/10/05	2117
28	Dipole Antenna	Schwarzbeck	UHA9105	29/10/05	2261
29	Dipole Antenna	Schwarzbeck	UHA9105	29/10/05	2262
30	RFI/FIELD Iintensity Meter	Kyorits	KNM-504D	25/07/05	SN-161-4
31	Frequency Converter	Kyorits	KCV-604C	25/07/05	4-230-3
32	TEMP & HUMIDITY Chamber	JISCO	J-RHC2	14/09/05	021031
33	Log Periodic Antenna	Schwarzbeck	UHALP9108A1	29/10/05	1098
34	Biconical Antenna	Schwarzbeck	VHA9103	29/10/05	VHA91031946
35	Digital Multimeter	H.P	34401A	07/04/05	3146A13475
36	Attenuator (10dB)	WEINSCHEL	23-10-34	07/10/05	BP4386
37	High-Pass Filter	ANRITSU	MP526	12/05/05	M27756
38	Attenuator (3dB)	Agilent	8491B	15/09/05	58177
39	Amplifier (25dB)	Agilent	8447D	08/10/05	2944A10144
40	Position Controller	TOKIN	5901T	N/A	14173
41	Driver	TOKIN	5902T2	N/A	14174
42	Spectrum Analyzer	H.P	8591E	23/05/05	3649A05889
43	RFI/FIELD Intensity Meter	Kyorits	KNW-2402	07/07/05	4N-170-3
44	LISN	Kyorits	KNW-407	16/08/05	8-317-8
45	LISN	Kyorits	KNW-242	16/08/05	8-654-15
46	CVCF	NF Electronic	4400	N/A	344536 4420064
47	Software	ToYo EMI	EP5/RE	N/A	Ver 2.0.800
48	Software	ToYo EMI	EP5/CE	N/A	Ver 2.0.801
49	Software	AUDIX	e3	N/A	Ver 3.0
50	Software	Agilent	Benchlink	N/A	A.01.09 021211

APPENDIX II

Label and User's Manual Information

Certification Labeling Requirements

§15.19 Labeling requirements.

(a) In addition to the requirements in part 2 of this chapter, a device subject to **certification, or verification** shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under part 73 of this chapter, land mobile operation under part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

User's Manual Information

§15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B - Unintentional Radiators:
§15.105 Information to the user.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

***Note**: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

--Reorient or relocate the receiving antenna.
--Increase the separation between the equipment and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.