EMC TEST REPORT

FCC EVALUATION REPORT FOR CERTIFICATION

Korea Standard Technology

Test report No.: KST-FCC0401

Manufacturer's Name : INNOVIEW CO.,LTD.

Manufacturer's Address : 3F DONGNAM B/D, GAYANG-DONG, KANGSEO-GU, SEOUL, KOREA

EUT's:

FCC ID	**:**	**RP5INV-30W**
Product Name	**:**	**LCD TV & Monitor**
Model Number(s)	**:**	**INV-30W**
Product Options	**:**	**With Analog RGB (D-sub)**
Category	**:**	**FCC Part 15 sub. part B Class B Digital Device & TV interface devices**

Supplementary Information

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI C63.4-1992.

I attest to the accuracy of data and all measurements reported herein were performed by 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.

Date: January 8, 2004

Tested by: Kim, Ha-Hyoung

Approved by: Lee, Woen-Woo

Contents

1. Description of Device

1) Kind of equipment:	LCD TV & Monitor
2) FCC ID:	RP5INV-30W
3) Model Name:	INV-30W
4) Serial No.:	None
5) Type of Sample Tested:	Pre-production
6) High Frequency Used:	27.000 MHz / 24.576 MHz 18.432 MHz / 14.318 MHz / 12.000MHz
7) Adapter	Model name : 02261324160 Manufacturer : LI SHIN INTERNATIONAL ENTERPRISE CORP. Serial no : A20329017203
8) Power Rating:	1phase AC100-240V, 1.5A, 50/60Hz Output: DC 12V, 6A
9) Tested Power supply:	1phase AC120V, 60Hz
10) Date of Manufacture:	November 10, 2003
11) Manufacture:	INNOVIEW CO., LTD.
12) Description of Operating:	Scroll All “H” Character Resolution 1024*768 , Vertical Frequency: 75Hz & TV tuner mode
13) Dates of Test:	December 3 ~ 5, 2003
14) Place of Tests:	Korea Standard Technology EMC site
15) Test Report No:	KST-FCC0401

2. Test Facility

The open field test site and conducted measurement facility are used for these testing, where are located following address and drawing. This site was fully described in a report dated November 14, 2002, that was submitted to the FCC.

Korea Standard Technology (KOSTEC Co., Ltd)

Head office:
302 City Bild, 1600-3 Kwanyang-dong, Dongan-gu, Anyang-shi, Kyunggi-do, Korea
Telephone No : 82-31-388-2051
Facsimile No: 82-31-388-2052

Test Lab
:180-254, Annyung-Ri, Taean-Yup, Hwasung-shi, Kyunggi-do, Korea
Telephone No : 82-31-222-4251
Facsimile No: 82-31-222-4252

MIC(Ministry of Information and Communication) No: **KR0042**

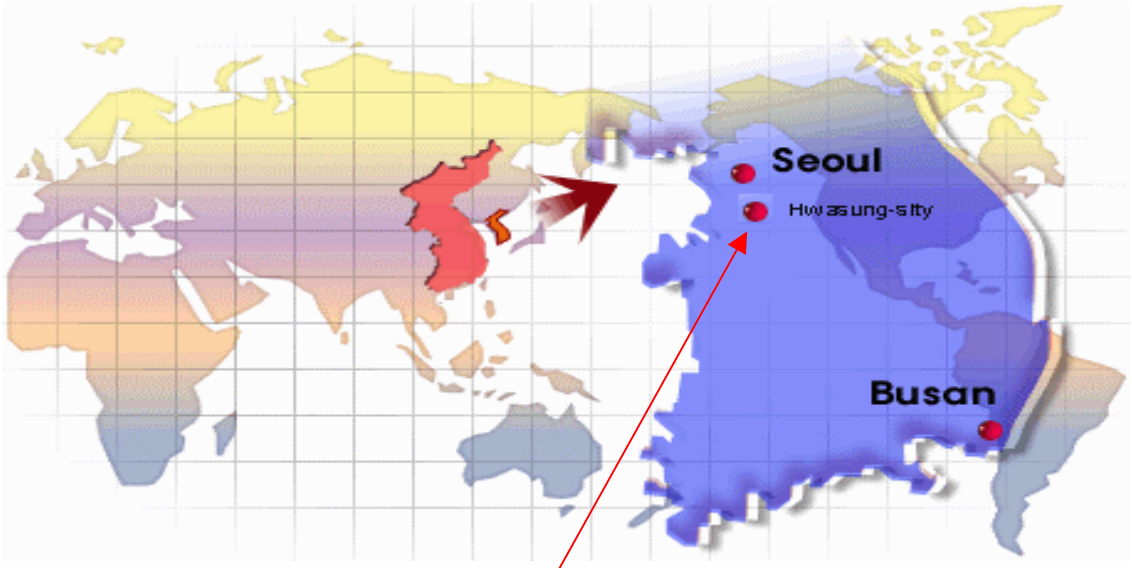
FCC Filing No. : **525762**

VCCI Membership Number : **2005**

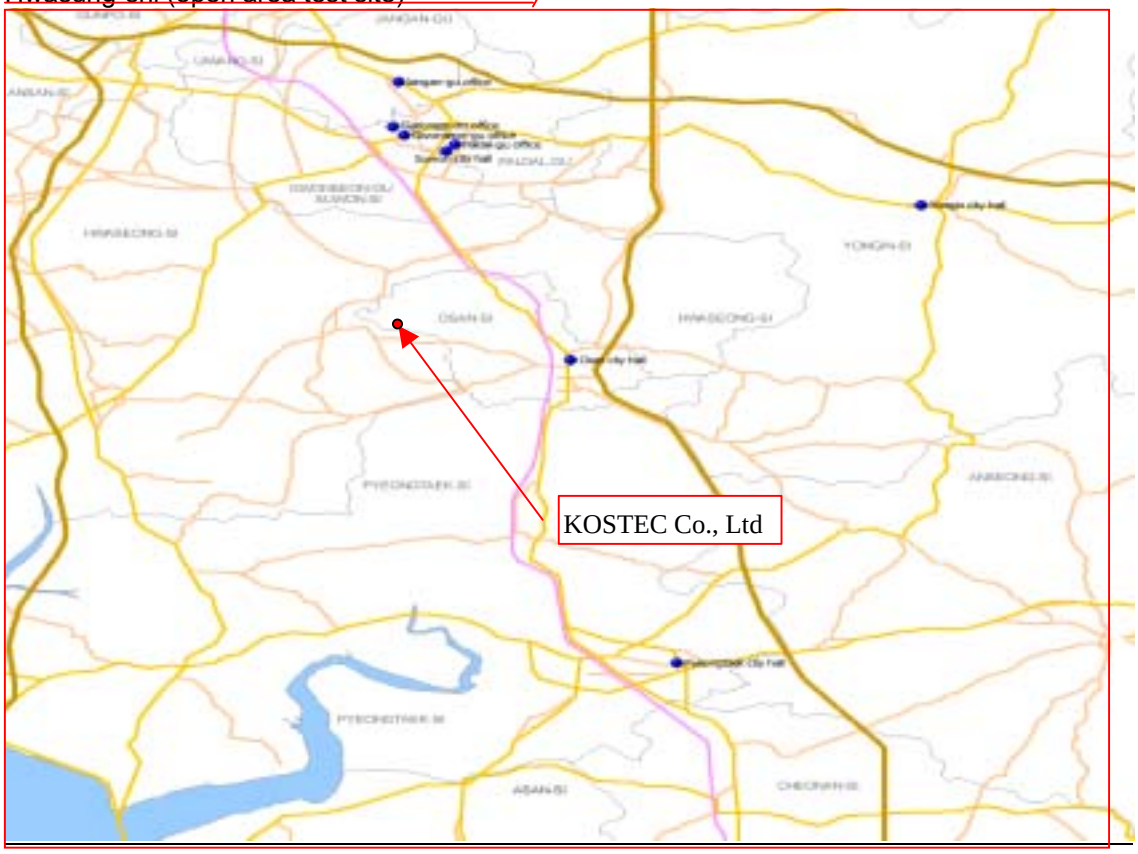
VCCI Registration Number : **R-1657 / C-1763**

3. MAP

Korea



Hwasung-shi (open area test site)



4. TEST SYSTEM CONFIGURATION

Operation Environment

Ambient	Temperature (° C)	Humidity (%)	Pressure (hPa)
10m Open Area site	8.2	51	1022
Shielded room:	15.3	48	1021

Test site
These testing were performed following locations ;

Shielded room : Conducted Emission,

10m Open Area Site: Radiated Emission

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.
The factors contributing to uncertainties are test receiver, Cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, ite imperfection, mismatch, and system repeatability.
Based on NIS 80,81, The measurement uncertainty level with a 95% confidence level were applied.

sample calculation

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss from the measured reading.
The sample calculation is as follows:

FS = MR + LF + CL
MR = Meter Reading
LF = LISN Factor
CL = Cable Loss

If MR is 30dB, LISN Factor 1dB, CL 1dB
The result (MR) is
30 + 1 + 1 = 32dBuV

5. Description of E.U.T.

Product Description

Manufactured By:	INNOVIEW CO.,LTD.
Address:	3F DONGNAM B/D, GAYANG-DONG, KANGSEO-GU, SEOUL, KOREA
Model:	INV-30W
Serial Number:	None

Configuration of EUT

Description	Manufacturer	Model/Part #	Serial Number
LCD Panel	LG.PHILIPS LCD Co.,Lcd.	LC300W01	30033P3A00046
AD Board	INNOVIEW CO.,LTD.	None	None
Controller	LG.PHILIPS LCD Co.,Lcd.	LC300W01-A3 Con	1B019
Inverter Board	KOREA TAIYO YUDEN CO.,LTD.	KLS-300	2921
OSD Board	INNOVIEW CO.,LTD.	None	None
Interface Board	LGIT CO.,LTD.	LC300W01-A3	LG0238
Tuner Board	INNOVIEW CO.,LTD.	None	None
Speaker	None	None	None
Remote Control	INNOVIEW CO.,LTD	None	None
Ac/dc adapter	LI SHIN INTERNATIONAL ENTERPRISE CORP.	02261324160	A20329017203

EUT Used cables

Cable Type	Shield	Length (m)	Ferrite	Connector	Connection Point 1	Connection Point 2
POWER	Y	1.5	-	DC INLET	Adapter	EUT
VGA In	Y	1.5	Y	D-sub	EUT	PC
DVI	Y	1.5	Y	D-sub	EUT	-
Audio In	Y	1.2	-	Jack	EUT	PC
Antenna	-	-	-	PAL	75Ω	-
H.P Out	-	2.0	-	Jack	EUT	Headset
SCART	Y	2.0	-	D-sub	EUT	-

Operating conditions

The operating mode/system were as follows in details:

Operating : After Connected from personal comput to E.U.T by RGB cable(D-sub 15 pin). And then use to “H” pattern program for data transmission and continuously ‘H’ pattern displayed on the LCD Monitor. And 75Ω terminated in end point of TV tuner antenna terminal. And TV tuner mode.

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7. TEST RESULTS

7.1 Conducted emission

Measurement procedure

Mains
The measurements were performed in a shielded room. EUT was placed on a non-metallic table height of 0.4m above the reference ground plane. They were folded back and forth forming a bundle 30cm to 40Cm long and were hanged at a 40cm height to the ground plane.
Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source.
Both lines of power cord, hot and neutral, were measured.

Used equipment

Equipment	Model no.	Serial no.	Makers	Next cal date	Used
Test receiver	ESPI3	100109	R&S	2004.03.11	●
L.I.S.N.	ESH2-Z5	100044	R&S	2004.04.25	●
	ESH2-Z5	100147	R&S	2004.04.25	●

Measurement uncertainty
Conducted Emission measurement : ± 2.4dB (K=2)

Test Data

< Without Ground >

FREQ.	LEVEL(dBμV)		LINE	Loss	LIMIT(dBμV)		MARGIN(dBμV)	
(MHz)	QP	AV	Pol	(dB)	QP	AV	QP	AV
0.162	61.34	36.90	L	0.29	65.57	55.57	4.52	18.96
0.190	59.66	49.85	L	0.08	61.89	51.89	2.31	2.12
0.238	47.75	41.36	L	0.29	59.66	49.66	12.20	8.59
0.566	41.16	40.77	N	0.90	56.00	46.00	15.74	6.13
1.954	41.25	40.92	N	0.44	56.00	46.00	15.19	5.52
2.582	40.32	39.43	N	0.57	56.00	46.00	16.25	7.14
18.830	26.77	18.68	L	1.77	60.00	60.00	35.00	43.09

* Level = test receiver reading value
* Loss = LISN insertion Loss + Cable Loss

< With Ground >

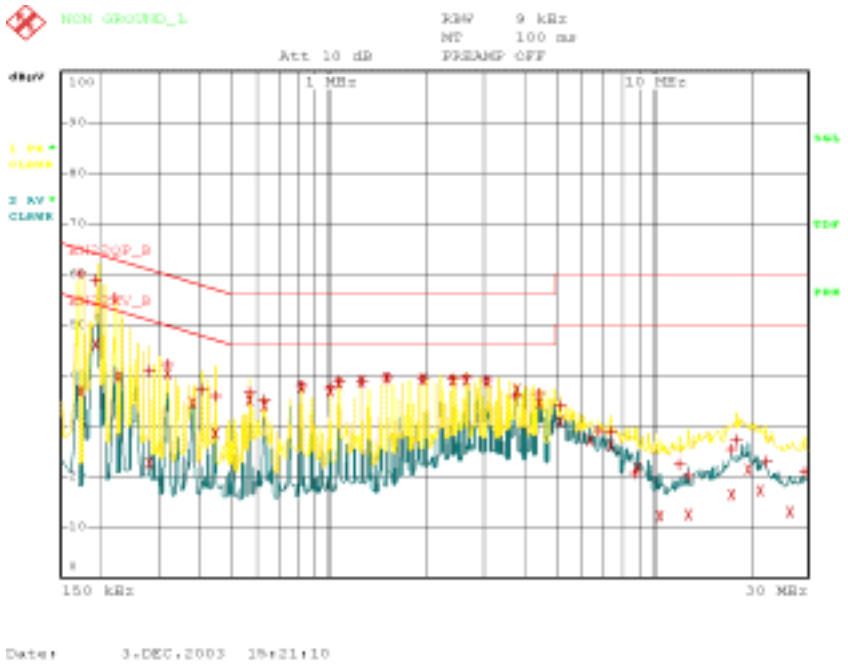
FREQ.	LEVEL(dBμV)		LINE	Loss	LIMIT(dBμV)		MARGIN(dBμV)	
(MHz)	QP	AV	Pol	(dB)	QP	AV	QP	AV
0.166	60.15	35.83	N	0.29	65.57	55.57	5.71	20.03
0.226	54.77	39.51	N	0.29	61.89	51.89	7.41	12.67
1.258	42.19	42.14	N	0.44	56.00	46.00	14.25	4.30
2.394	41.36	41.19	L	0.57	56.00	46.00	15.21	5.38
5.162	35.76	34.14	N	0.75	60.00	50.00	24.99	16.61
14.038	26.57	16.52	N	1.69	60.00	50.00	35.12	35.17
18.130	29.23	22.93	N	1.77	60.00	50.00	32.54	28.84

* Level = test receiver reading value
* Loss = LISN insertion Loss + Cable Loss

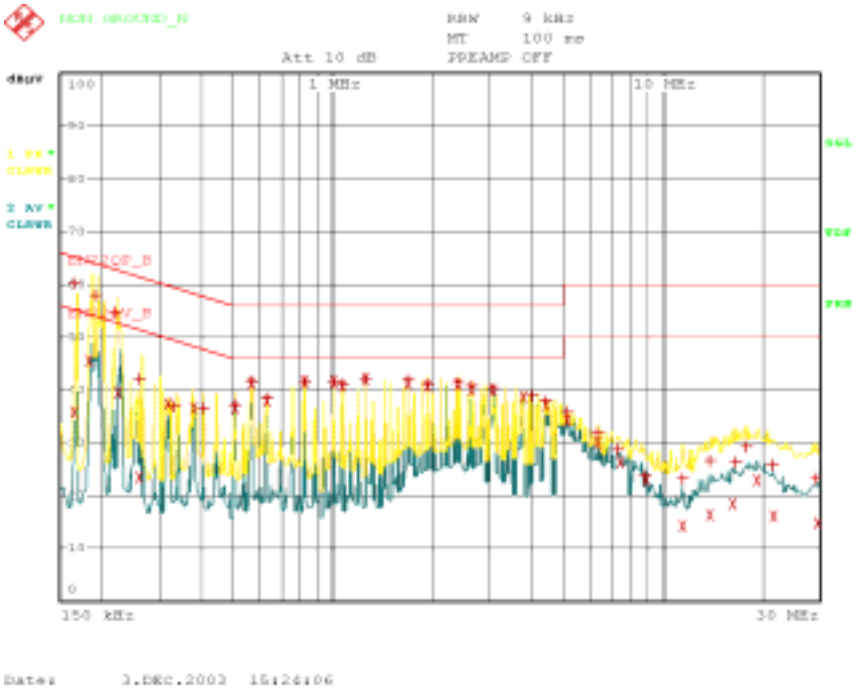
Conducted emission test graph

< Without Ground >

Line. Live

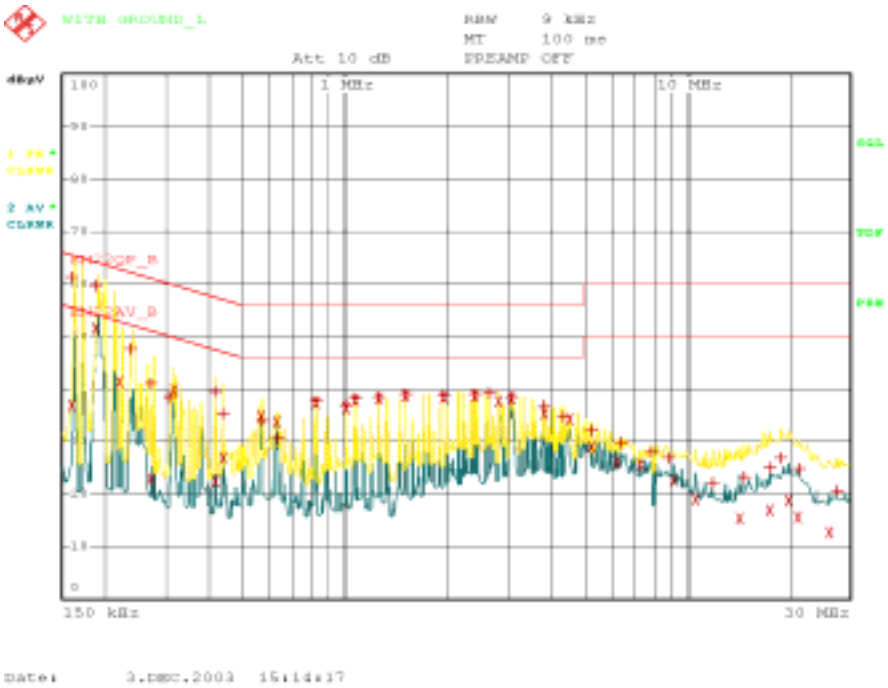


Line. Neutral

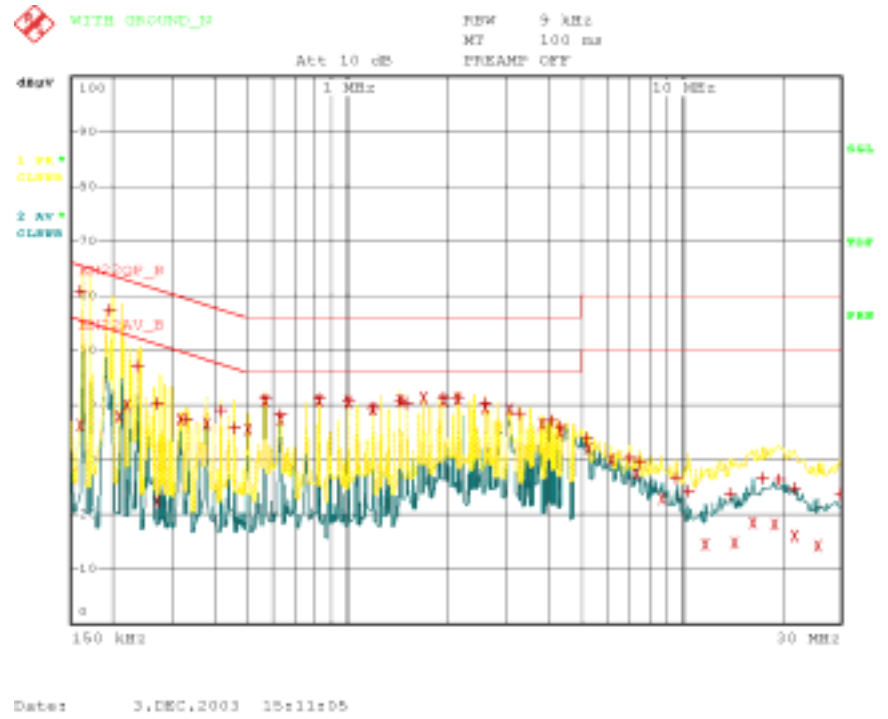


< With Ground >

Line. Live



Line. Neutral



7.2 Radiated Emission

Measurement procedure

A pretest was performed at 3m distances in a semi-anechoic chamber for searching correct frequency.
The final test was done at a 10m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.
Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Used equipment

Equipment	Model no.	Serial no.	Makers	Next cal	USED
Test receiver	ESCS30	100111	R&S	2004.3.17	●
Ultra broadband antenna	HL562	100075	R&S	2004.3.18	●
Antenna Mast	AT14	none	Daeil EMC	-	●
Turn Table	TT15	none	Daeil EMC	-	●
10m Open area site	None	none	KOSTEC Lab	-	●
chamber(3m)	none	none	FRANCONIA	-	

Measurement uncertainty

Radiated Emission measurement :

30-300MHz +3.96dB / -4.04dB
300-1000MHz +3.04dB / -3.00dB

Test Data

Freq (MHz)	Reading (dBuV/m)	P (H/V)	H (m)	A (.)	Antenna (dB)	Cable Loss (dB)	Result (dBuV/m)	Limit (dB)	Margin (dB)
54.00	19.41	V	1.50	180	5.07	3.02	27.50	40.0	12.50
135.00	18.40	V	1.80	160	8.30	4.10	30.80	43.5	12.70
162.00	19.48	H	3.50	180	7.46	4.46	31.40	43.5	12.10
297.00	18.47	V	2.30	150	10.86	6.47	35.80	46.0	10.20
351.00	15.47	H	3.30	200	12.33	7.10	34.90	46.0	11.10
405.00	15.85	V	2.10	110	13.60	7.45	36.90	46.0	9.10
459.00	14.56	H	3.20	150	14.78	7.86	37.20	46.0	8.80
616.98	13.03	V	2.00	50	17.22	9.35	39.60	46.0	6.40

Reading = Test receiver reading / P= antenna Polarization / H=antenna Hight
A=turn table Angle / Antenna = antenna factor / Cable loss = used cable loss
Result = reading + antenna + loss / Margin = Limit - result
* Receiving Antenna Mode: Horizontal, Vertical / * Test site: 3m Open area site

Disturbance radiation due to local oscillator

Channel	Frequency (MHz)	Reading (dBuV)	Pol (H/V)	Total Loss (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
2 (55.25MHz)	101.0			12.8		43.5	
	202.0			12.5		43.5	
	303.0			17.6		46.0	
	404.0			21.0		46.0	
	505.0			23.4		46.0	
	606.0			26.4		46.0	
	707.0			28.5		46.0	
	808.0			30.5		46.0	
	909.0			32.7		46.0	
4 (67.25MHz)	108.5	12	H	12.9	24.9	43.5	18.6
	217.0	2.3	H	13.0	15.3	46.0	30.7
	325.5	13.7	H	18.5	32.2	46.0	13.8
	434.0			22.0		46.0	
	542.5			25.0		46.0	
	651.0			27.5		46.0	
	759.5	4.2	H	29.8	34	46.0	12
	868.0			31.5		46.0	
	976.5			33.7		54.0	
6 (83.25MHz)	129.0	29.4	H	12.9	42.3	43.5	1.2
	258.0	15.6	H	15.7	31.3	46.0	14.7
	387.0	19.8	V	20.5	40.3	46.0	5.7
	516.0	20.6	H	24.0	44.6	46.0	1.4
	645.0	17.2	H	27.2	44.4	46.0	1.6
	774.0	13.7	H	30.0	43.7	46.0	2.3
	903.0	11.9	H	32.6	44.5	46.0	1.5
7 (175.25MHz)	221.0	5.7	H	13.2	18.9	46.0	27.1
	442.0					46.0	
	663.0					46.0	
	884.0					46.0	
10 (193.25MHz)	239.0	6.3	H	14.3	20.6	46.0	25.4
	478.0					46.0	
	717.0					46.0	
	956.0	2.4	H	33.4	35.8	46.0	10.2
13 (211.25MHz)	257.0	17.2	H	15.7	32.9	46.0	13.1
	514.0	18.9	H	23.9	42.8	46.0	3.2
	771.0	9.7	V	29.9	39.6	46.0	6.4
14	517.0	6.3	H	24.1	30.4	46.0	15.6
19	547.0	9.1	H	25.2	34.3	46.0	11.7
28	601.0	14.2	H	26.3	40.5	46.0	5.5
36	649.0	15.1	H	27.4	42.5	46.0	3.5
44	697.0	11.5	H	28.3	39.8	46.0	6.2
53	751.0	7.4	H	29.8	37.2	46.0	8.8
61	799.0	11.7	V	30.4	42.1	46.0	3.9
69	847.0	14.1	V	31.1	45.2	46.0	0.8

Reading = Test receiver reading / P= antenna Polarization /
Total loss = used cable loss + antenna factor / Result = reading + antenna + loss /
Margin = Limit – result / * Receiving Antenna Mode: Horizontal, Vertical