



DIGITAL EMC CO., LTD.

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CERTIFICATION OF COMPLIANCE

Telian Corporation

5th FL. Namjeun bldg, 53-3 Haan-Dong, Kwangmyung-Si,
Kyunggi-Do, Korea, 423-060

Dates of Tests: December 12 ~ 15, 2005

Test Report S/N: DR50110601A

Test Site : DIGITAL EMC CO., LTD.

FCC ID

TL7SPP2000T

APPLICANT

GREAT PLEASURE ELECTRONICS CO., LTD

FCC Classification	:	Part 15 Low Power Communication Device Transmitter
Device name	:	POWERSETER
Manufacturer	:	GREAT PLEASURE ELECTRONICS CO., LTD
FCC ID	:	TL7SPP2000T
Model name	:	Transmitter: SPP2000T
		Receiver: SPP2000R
Add Model name	:	Transmitter : SPP1500T
		Transmitter + Receiver : SPP2000, SPP1500
Test Device Serial number	:	Identical prototype
FCC Rule Part(s)	:	FCC Part 2 and Part 15 Subpart C(15.249)
Frequency Range	:	Transmitter : 2404.5 ~ 2480.5 MHz
		Receiver : 2404.5 ~ 2480.5 MHz
Data of issue	:	January 2, 2006

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

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1. General information

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

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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

January 2, 2006

Won-Jung LEE



Data

Name

Signature

Report Reviewed By: manager

January 2, 2006

Harvey Sung



Data

Name

Signature

Ordering party:

Company name : GREAT PLEASURE ELECTRONICS CO., LTD

Address : 604, Taean Top Plaza, B2-11BL, Jinan-Li, Taean-Eup, Huasung-Si

Zip code : 445-972

City/town : Kyunggi-Do

Country : Korea

Date of order : November 16, 2005

2. Information about test item

TL7SPP2000T

2.1 Equipment information

Equipment model name	Transmitter: SPP2000T Receiver: SPP2000R
Add Equipment model name	Transmitter: SPP1500T Transmitter + Receiver: SPP2000, SPP1500
Type of equipment	Wireless Presenter
Frequency band	Transmitter : 2404.5 ~ 2480.5MHz Receiver : 2404.5 ~ 2480.5MHz
Type of Modulation	FSK
Channel Spacing	1MHz
Physical channel	77 CH
Type of antenna	Printed Antenna
Power Requirement	Transmitter: DC 3.0V(Alkaline Battery AAA × 2EA) Receiver: DC 5.0V(From USB port of PC)

2.2 Tested frequency

Frequency	TX
Low frequency	2404.5 MHz
Middle frequency	2440.5 MHz
High frequency	2480.5 MHz

2.3 Tested environment

Temperature	: 15 ~ 35 (°C)
Relative humidity content	: 20 ~ 75 %
Air pressure	: 86 ~ 103 kPa
Details of power supply	: Transmitter: DC3.0V(AAA size Battery 2pcs) Receiver: DC 5V from USB Port

2. Information about test item

TL7SPP2000T

2.4 Ancillary Equipment

- Transmitter

Equipment	Model No.	Serial No.	Manufacturer
-	-	-	-
-	-	-	-

- Receiver

Equipment	Model No.	Serial No.	Manufacturer
PC	Y8Y	408KIEV102124	LG
LCD Monitor	M17D-AN	N106H4JT100842	SAMSUNG
Printer	SRP-770	SRP77008060035	SAMSUNG
Keyboard	3701N	303707100662	BTC
Mouse	SMOP5000WX	04010159128	CHIC TECHNOLOGY
-	-	-	-

2.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing -> none

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
I. Transmitter				
15.249	Field Strength Limits(Fundamental)	Refer to the FCC 15.249(a)	Radiated	C
15.209	Radiated emission limits (Spurious and harmonics)	< FCC 15.209 limits	Radiated	C
15.207	AC Conducted Emissions	< FCC 15.207 limits	Line Conducted	NT
15.215	Occupied Bandwidth	Refer to the FCC 15.215(C)	Conducted	C
II. Receiver				
15.209	Radiated emission limits	< FCC 15.209 limits	Radiated	C
15.207	AC Conducted Emissions	< FCC 15.207 limits	Line Conducted	C
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable				

The sample was tested according to the following specification:

FCC Parts 15.249; ANSI C-63.4-2003

3.2 Transmitter requirements

3.2.1 AC Conducted Emissions for receivers

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: **Complies**

- No other emissions were detected at a level greater than 10dB below limit.
- Refer to the next page.

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

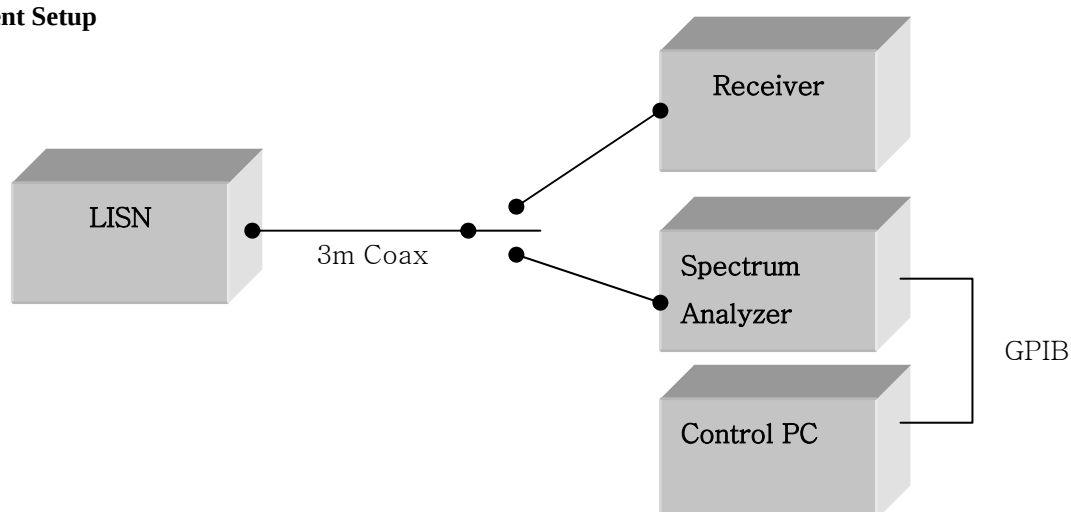
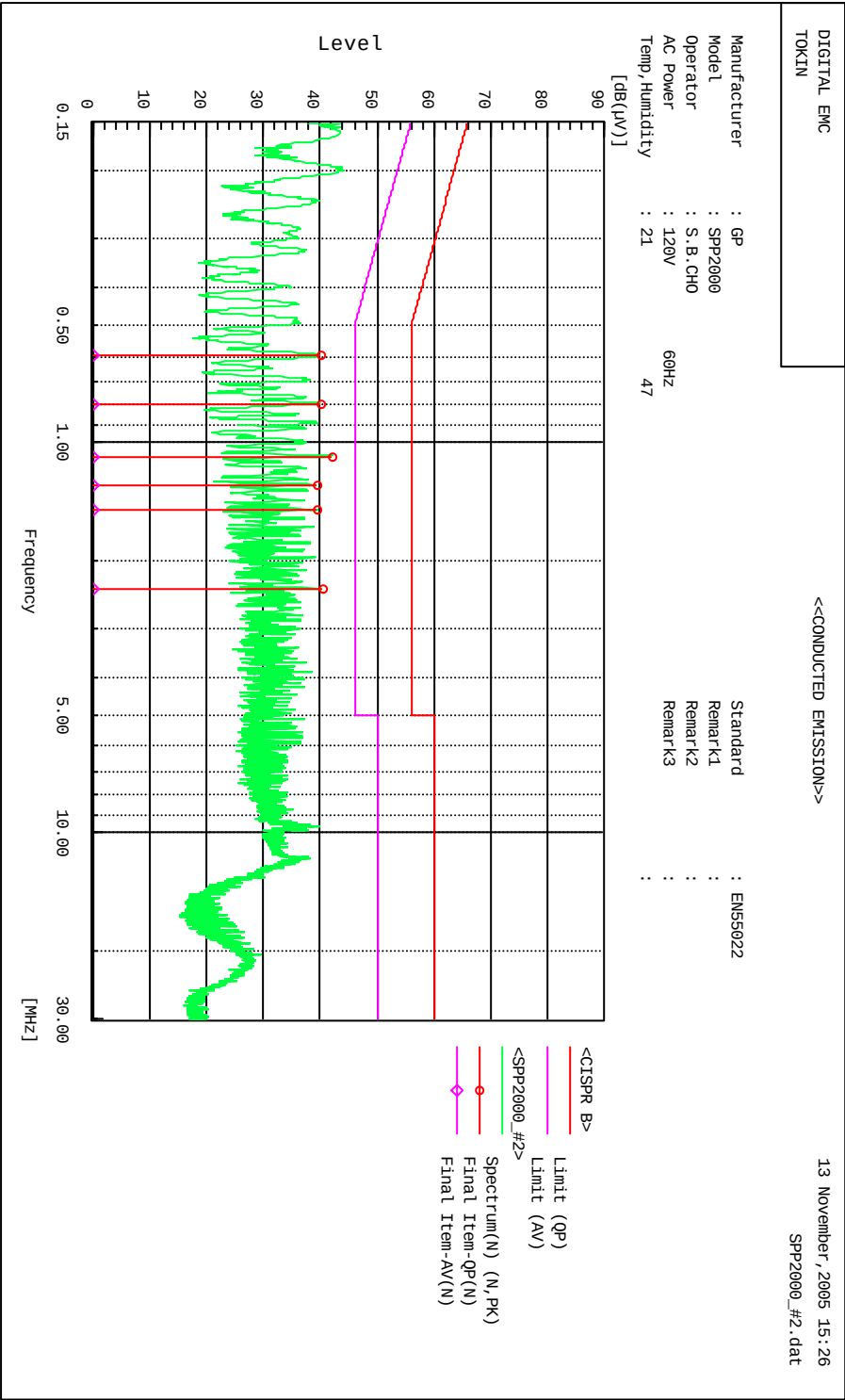
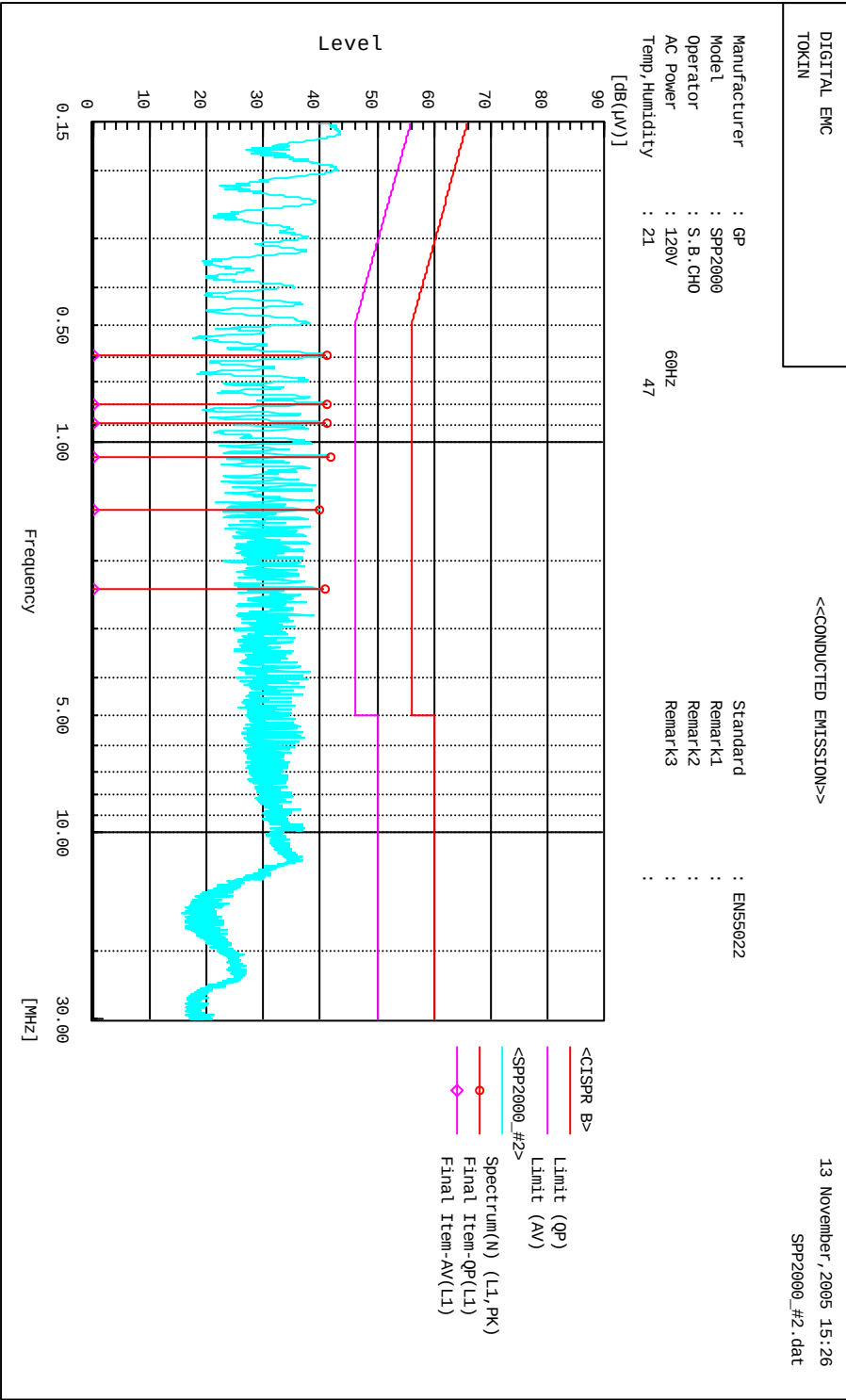


Figure 2: Measurement setup for AC Conducted Emission

Receiver : SPP2000R / Line



Receiver : SPP2000R / Neutral



Receiver : SPP2000R / Data

***** DIGITAL EMC *****
 <<CONDUCTED EMISSION>>

13 November, 2005 15:46

SPP2000_#2.dat

Standard : EN55022
 Manufacturer : GP
 Model : SPP2000
 Operator : S.B.CHO
 AC Power : 120V 60Hz
 Temp, Humidity : 21 47
 Remark1 :
 Remark2 :
 Remark3 :
 :

Final Result

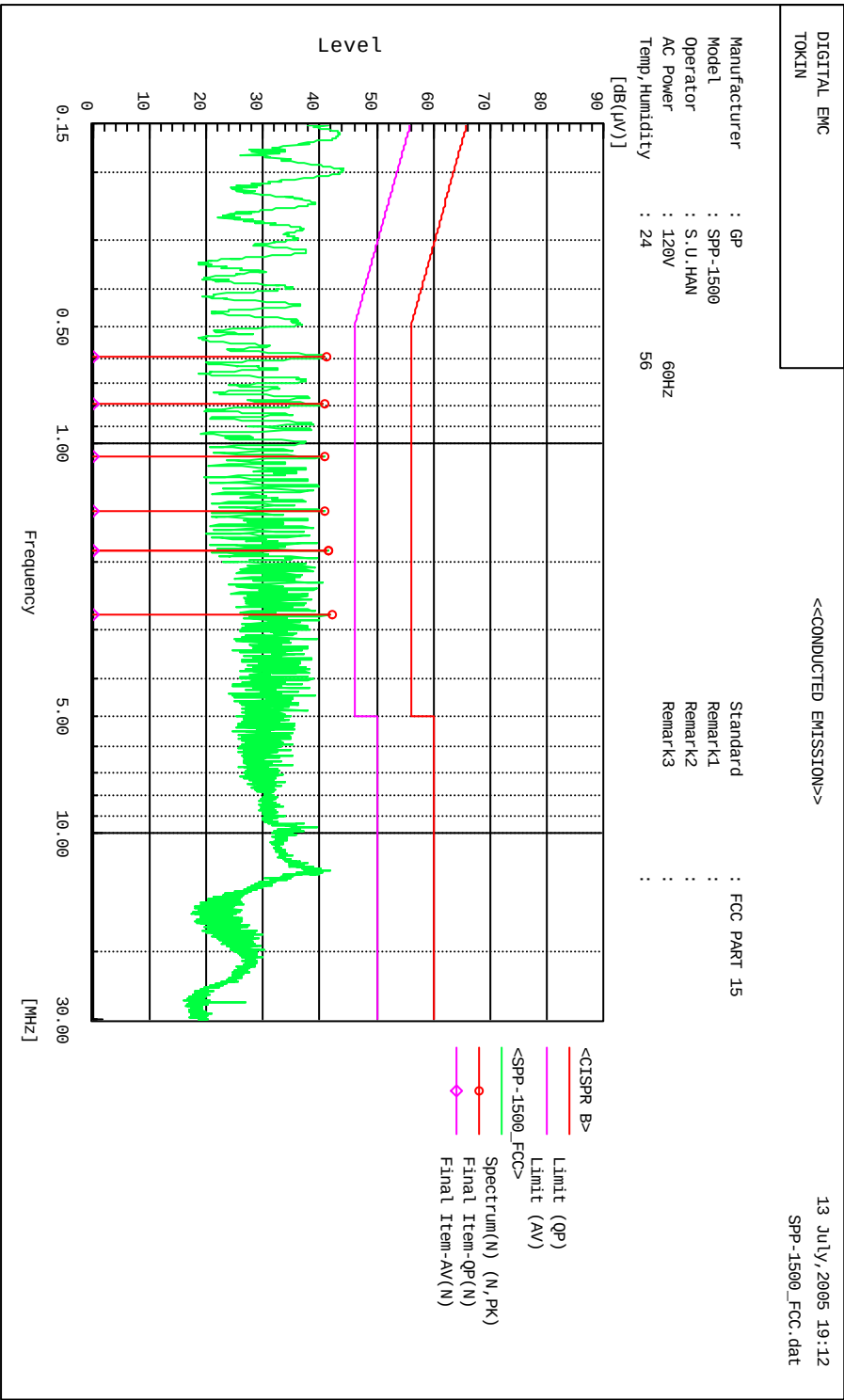
--- N Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.594	39.8	0.0	0.3	40.1	0.0	56.0	46.0	15.9	0.0
2	0.793	39.9	0.0	0.3	40.2	0.0	56.0	46.0	15.8	0.0
3	1.082	42.0	0.0	0.2	42.2	0.0	56.0	46.0	13.8	0.0
4	1.282	39.3	0.0	0.2	39.5	0.0	56.0	46.0	16.5	0.0
5	1.486	39.4	0.0	0.2	39.6	0.0	56.0	46.0	16.4	0.0
6	2.365	40.2	0.0	0.3	40.5	0.0	56.0	46.0	15.5	0.0

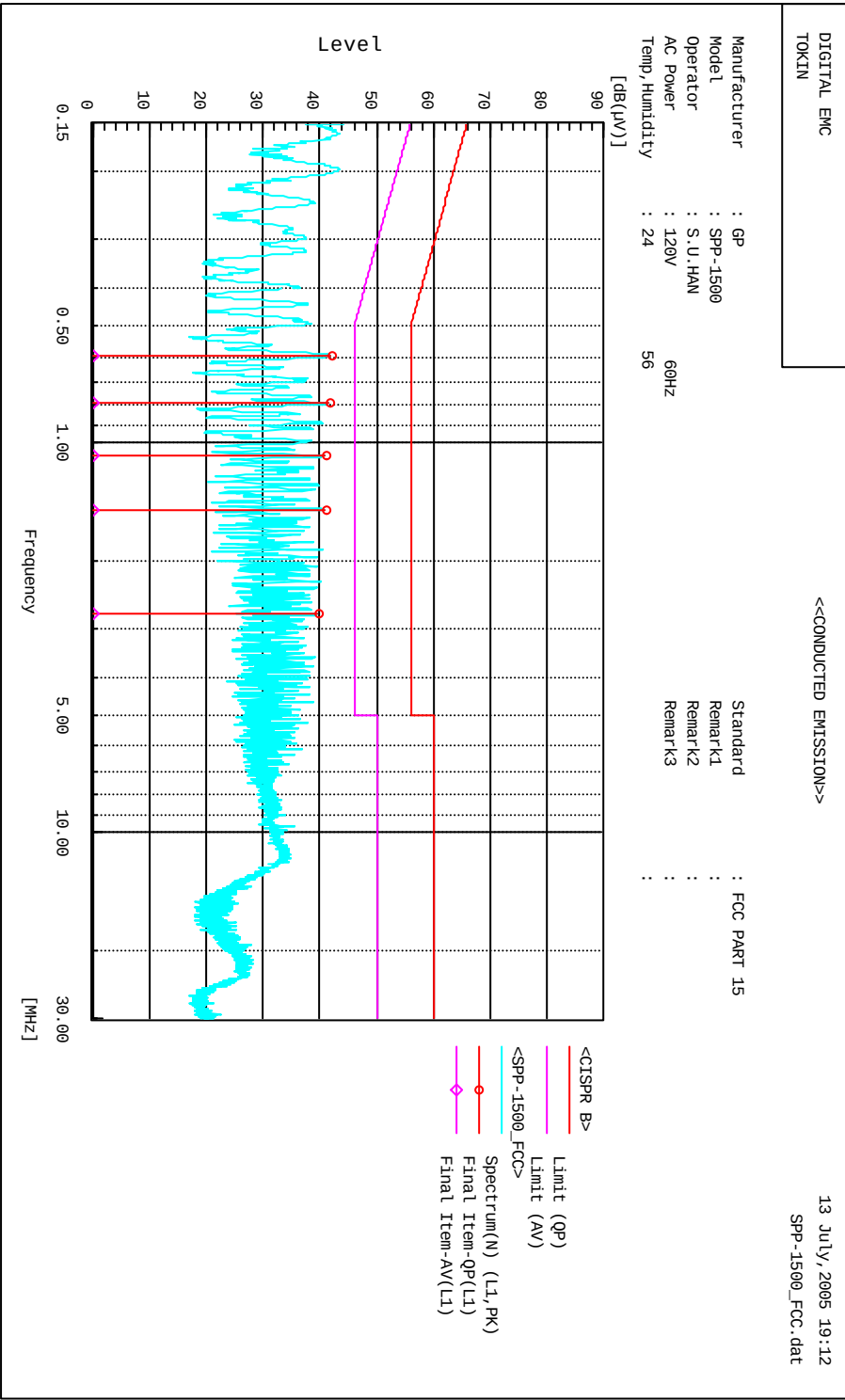
--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.596	40.8	0.0	0.3	41.1	0.0	56.0	46.0	14.9	0.0
2	0.793	41.0	0.0	0.3	41.3	0.0	56.0	46.0	14.7	0.0
3	0.887	40.8	0.0	0.3	41.1	0.0	56.0	46.0	14.9	0.0
4	1.082	41.5	0.0	0.3	41.8	0.0	56.0	46.0	14.2	0.0
5	1.483	39.7	0.0	0.3	40.0	0.0	56.0	46.0	16.0	0.0
6	2.365	40.6	0.0	0.3	40.9	0.0	56.0	46.0	15.1	0.0

Receiver : SPP1500R / Line



Receiver : SPP1500R / Neutral



Receiver : SPP1500R / Data

***** DIGITAL EMC *****
 <<CONDUCTED EMISSION>>

13 July, 2005 19:22

SPP-1500_FCC.dat

Standard : FCC PART 15
 Manufacturer : GP
 Model : SPP-1500
 Operator : S.U.HAN
 AC Power : 120V 60Hz
 Temp, Humidity : 24 56
 Remark1 :
 Remark2 :
 Remark3 :
 :

Final Result

--- N Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.595	40.9	0.0	0.3	41.2	0.0	56.0	46.0	14.8	0.0
2	0.790	40.5	0.0	0.3	40.8	0.0	56.0	46.0	15.2	0.0
3	1.079	40.8	0.0	0.2	41.0	0.0	56.0	46.0	15.0	0.0
4	1.480	40.7	0.0	0.2	40.9	0.0	56.0	46.0	15.1	0.0
5	1.876	41.4	0.0	0.2	41.6	0.0	56.0	46.0	14.4	0.0
6	1.876	41.4	0.0	0.2	41.6	0.0	56.0	46.0	14.4	0.0
7	2.755	42.0	0.0	0.3	42.3	0.0	56.0	46.0	13.7	0.0

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.595	42.0	0.0	0.3	42.3	0.0	56.0	46.0	13.7	0.0
2	0.791	41.6	0.0	0.3	41.9	0.0	56.0	46.0	14.1	0.0
3	1.076	41.0	0.0	0.3	41.3	0.0	56.0	46.0	14.7	0.0
4	1.480	40.9	0.0	0.3	41.2	0.0	56.0	46.0	14.8	0.0
5	2.755	39.5	0.0	0.5	40.0	0.0	56.0	46.0	16.0	0.0

3.2.2 Radiated Emission

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 = 120 kHz (30MHz ~ 1 GHz, Quasi-Peak)

RBW = 1 MHz (1 GHz ~ 10th harmonic, Peak)

VBW = 1MHz, Detector function = peak

RBW = 1 MHz (1 GHz ~ 10th harmonic, Average)

VBW = 10Hz, Detector function = peak

Distance = 3m

Trace = max hold

Sweep = auto

Measurement Data: **Complies**

- No other emissions were detected at a level greater than 10dB below limit.
- Refer to the next page.

Fundamental / Harmonics emission: FCC Part 15.249(a)

Frequency (MHz)	Limit @ 3m	
	Fundamental (mV/m)	Harmonics (uV/m)
2400~2483.5	50	500

General 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.

Fundamental Measurement Data(worst case):

Frequency (MHz)	Pol	PK Reading (dBuV)	T.F (dBuV/m)	PK Result (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2404.5	H	73.1	3.4	69.7	94	24.3
2440.5	H	74.8	3.5	71.3	94	22.7
2480.5	H	79.0	3.6	75.4	94	18.6

Harmonic and other emission Measurement Data(worst case): Fundamental Frequency = 2404.5MHz

Frequency (MHz)	Pol	PK Reading (dBuV)	T.F (dBuV/m)	PK Result (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4809.0	H	51.7	12.4	39.3	54	14.7
-						
-	-	-	-	-	-	-

Harmonic and other emission Measurement Data(worst case): Fundamental Frequency = 2440.5MHz

Frequency (MHz)	Pol	PK Reading (dBuV)	T.F (dBuV/m)	PK Result (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4881.0	H	54.1	12.5	41.6	54	12.4
-	-	-	-	-	-	-

Harmonic and other emission Measurement Data(worst case): Fundamental Frequency = 2480.5MHz

Frequency (MHz)	Pol	PK Reading (dBuV)	T.F (dBuV/m)	PK Result (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
4961.0	H	52.7	12.8	39.9	54	14.1
-	-	-	-	-	-	-

Note.

1. Peak results meet Average limit, so average measurement is not performed
2. No other emissions were detected at a level greater than 15dB below limit.
3. Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

Receiver Measurement data

- SPP2000R

Frequency (MHz)	Pol	QP Reading (dBuV)	T.F (dBuV/m)	QP Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
97.90	V	51.20	-16.92	34.28	43.50	9.22
604.72	H	44.50	-4.75	39.75	46.00	6.25
733.25	H	40.50	-2.48	38.02	46.00	7.98
750.22	H	39.00	-2.68	36.32	46.00	9.68
755.07	H	46.00	-2.73	43.27	46.00	2.73
755.07	V	40.50	-2.73	37.77	46.00	8.23
987.87	H	43.50	0.79	44.29	54.00	9.71
987.87	V	40.00	0.79	40.79	54.00	13.21

- SPP1500R

Frequency (MHz)	Pol	QP Reading (dBuV)	T.F (dBuV/m)	QP Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
37.27	V	45.00	-11.33	33.67	40.00	6.33
39.70	V	46.50	-12.40	34.10	40.00	5.90
306.45	V	40.50	-3.72	36.78	46.00	9.22
328.27	V	44.50	-4.81	39.69	46.00	6.31
328.27	H	43.00	-4.81	38.19	46.00	7.81
337.97	V	42.50	-5.26	37.24	46.00	8.76
725.97	H	42.00	-2.41	39.59	46.00	6.41
750.22	H	42.00	-2.68	39.32	46.00	6.68
900.57	H	41.00	-0.56	40.44	46.00	5.56
900.57	V	38.00	-0.56	37.44	46.00	8.56
-	-	-	-	-	-	-

Note.

1. No other emissions were detected at a level greater than 10dB below limit.
2. Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

3.2.3 Occupied Bandwidth

Procedure:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst-case (i.e., the widest) bandwidth. If no bandwidth requirement is specified by the procuring or regulatory agency, measure the bandwidth at -26 dB with respect to the reference level.

The spectrum analyzer is set to:

Center frequency = Low, Middle and High Channel.

SPAN = 10 MHz

RBW = VBW = 100 KHz

Trace = max hold

Measurement Data: Complies

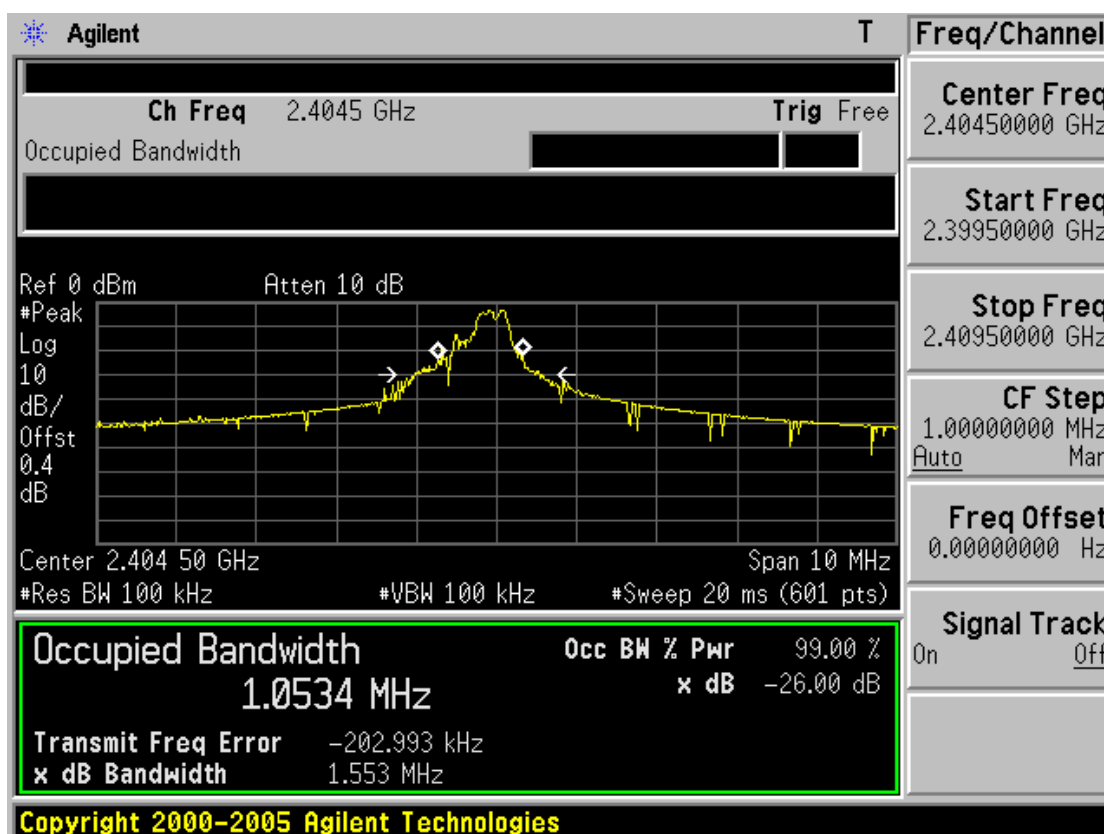
- Refer to the next page.

Limit:

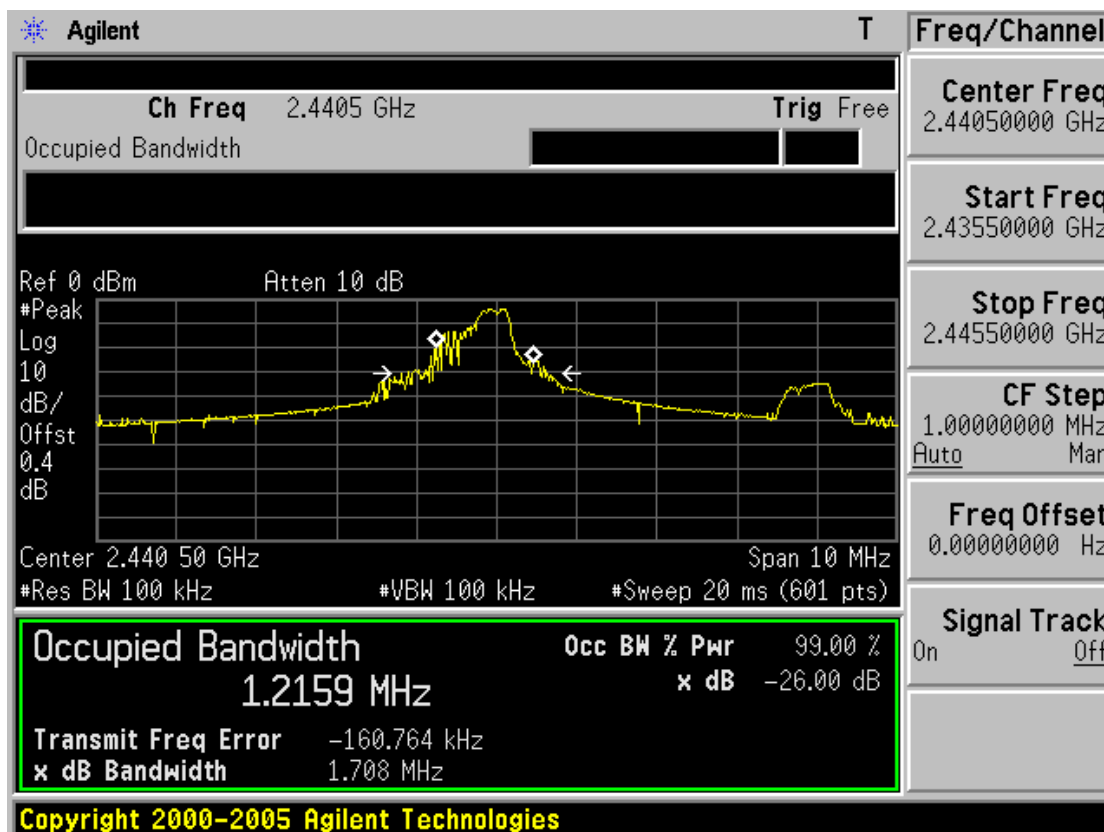
The 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated.

Measurement Data:

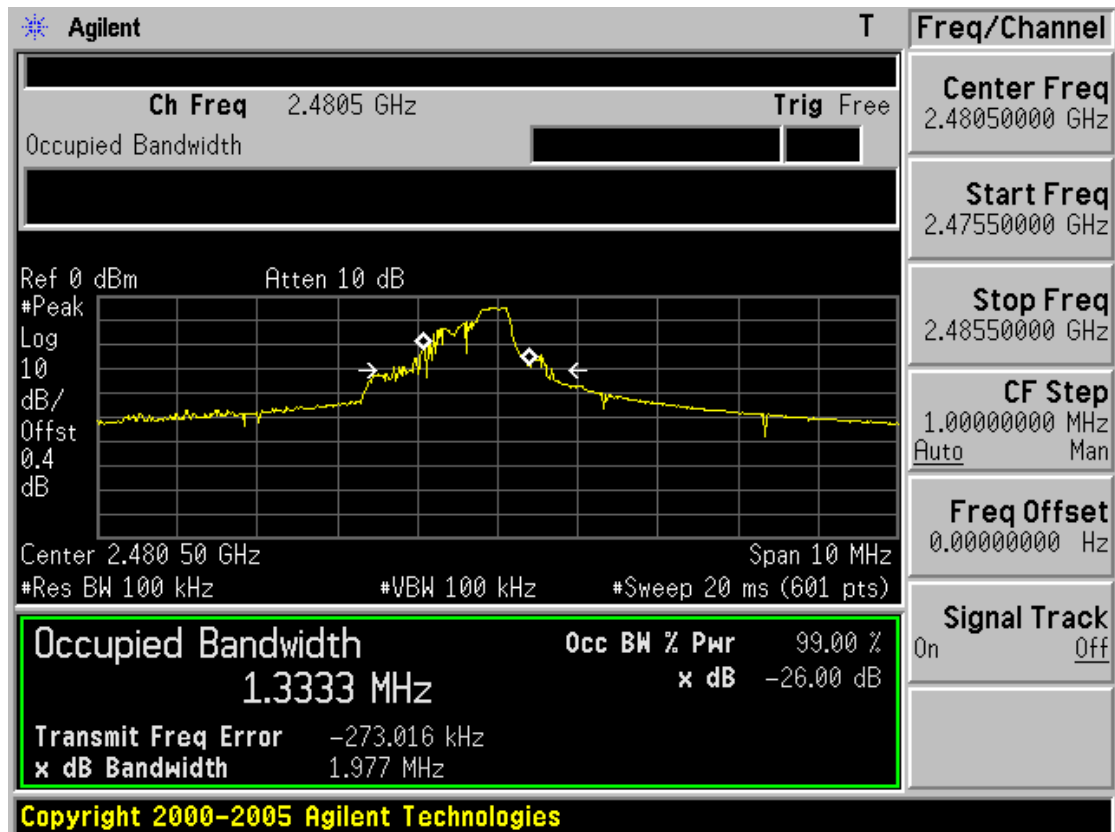
- 2404.5MHz :26dB Bandwidth = 1.553MHz



- 2440.5MHz : 26dB Bandwidth = 1.708MHz



- 2480.5MHz : 26dB Bandwidth = 1.977MHz



APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
01	Spectrum Analyzer	Agilent	E4404B	18/04/06	30601-01-6025569
02	Spectrum Analyzer	H.P	8563E	06/10/06	3551A04634
03	Spectrum Analyzer	Agilent	E4440A	06/10/06	MY45304199
04	Power Meter	H.P	EPM-442A	04/07/06	GB37170413
05	Power Sensor	H.P	8481A	05/07/06	3318A96332
06	Frequency Counter	H.P	5342A	21/10/06	2119A04450
07	Multifunction Synthesizer	H.P	8904A	21/10/06	3633A08404
08	Signal Generator	Rohde Schwarz	SMR20	17/05/06	101251
09	Signal Generator	H.P	E4421A	05/07/06	US37230529
10	Audio Analyzer	H.P	8903B	07/07/06	3011A0944B
11	Modulation Analyzer	H.P	8901B	05/07/06	3028A03029
12	CDMA Mobile Station Test Set	H.P	8924C	21/10/06	US35360688
13	Power Splitter	WEINSCHTEL	1593	25/10/06	332
14	BAND Reject Filter	Microwave Circuits	N0308372	21/10/06	3125-01DC0312
15	BAND Reject Filter	Wainwright	WRCG1750	21/10/06	SN2
16	AC Power supply	DAEKWANG	5KVA	18/04/06	N/A
17	DC Power Supply	H.P	6622A	18/04/06	465487
18	Attenuator (30dB)	H.P	8498A	21/10/06	50101
19	Attenuator (10dB)	WEINSCHTEL	23-10-34	24/10/06	BP4387
20	HORN ANT	EMCO	3115	06/03/07	6419
21	HORN ANT	EMCO	3115	04/25/07	21097
22	HORN ANT	A.H.Systems	SAS-574	09/11/06	154
23	HORN ANT	A.H.Systems	SAS-574	09/11/06	155
24	Dipole Antenna	Schwarzbeck	VHA9103	18/10/06	2116
25	Dipole Antenna	Schwarzbeck	VHA9103	18/10/06	2117
26	Dipole Antenna	Schwarzbeck	UHA9105	18/10/06	2261

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
27	Dipole Antenna	Schwarzbeck	UHA9105	18/10/06	2262
28	RFI/FIELD Intensity Meter	Kyorits	KNM-504D	07/07/06	SN-161-4
29	Frequency Converter	Kyorits	KCV-604C	07/07/06	4-230-3
30	TEMP & HUMIDITY Chamber	JISCO	J-RHC2	13/09/07	021031
31	Log Periodic Antenna	Schwarzbeck	UHALP9108A1	29/09/06	1098
32	Biconical Antenna	Schwarzbeck	VHA9103	28/11/06	VHA91031946
33	Digital Multimeter	H.P	34401A	18/04/06	3146A13475
34	Universal Radio Communication Tester	Rohde Schwarz	CMU200	28/04/06	107631
35	High-Pass Filter	ANRITSU	MP526	12/05/06	MP27756
36	Attenuator (3dB)	Agilent	8491B	11/08/06	MY39260699
37	Amplifier (25dB)	Agilent	8447D	18/04/06	2944A10144
38	Position Controller	TOKIN	5901T	N/A	14173
39	Driver	TOKIN	5902T2	N/A	14174
40	Spectrum Analyzer	H.P	8591E	18/04/06	3649A05889
41	RFI/FIELD Intensity Meter	Kyorits	KNW-2402	04/07/06	4N-170-3
42	LISN	Kyorits	KNW-407	11/08/06	8-317-8
43	LISN	Kyorits	KNW-242	11/08/06	8-654-15
44	CVCF	NF Electronic	4400	N/A	344536 4420064
45	Software	ToYo EMI	EP5/RE	N/A	Ver 2.0.800
46	Software	ToYo EMI	EP5/CE	N/A	Ver 2.0.801
47	Software	AUDIX	e3	N/A	Ver 3.0
48	Software	Agilent	Benchlink	N/A	A.01.09 021211