



Dates of Tests: March 21 ~ 30, 2012

Test Report S/N: LR500111204A

Test Site : LTA CO., LTD.

CLASS II PERMISSIVE CHANGE TEST REPORT

FCC ID

BBQ-XJH1750

IC

2388B-XJH1750

APPLICANT

CASIO COMPUTER CO.,LTD.

Equipment Class	:	Part 15 Low Power Transceiver, RX Verified(DXX)
Manufacturing Description	:	DATA PROJECTOR
Manufacturer	:	CASIO COMPUTER CO.,LTD.
Model name	:	XJ-H2650
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.249 Subpart C; ANSI C-63.4-2003 RSS-210 and ISSUE No. :8 Date :2010
Frequency Range	:	2402 ~ 2479MHz
Data of issue	:	April 02, 2012

This test report is issued under the authority of:



Kyu-Hyun Lee, Manager

The test was supervised by:



Ki-Hun Cho, 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. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



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>
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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”.

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	2012-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2013-04-24	EMC accredited Lab.
FCC	U.S.A	610755	2014-04-27	FCC filing
FCC	U.S.A	649054	2013-04-13	FCC CAB
VCCI	JAPAN	R2133(10m), C2307	2014-06-21	VCCI registration
VCCI	JAPAN	T-2009	2013-12-23	VCCI registration
IC	CANADA	IC5799	2012-05-14	IC filing

2. Information's about test item

2-1 Client & Manufacturer

Company name : CASIO COMPUTER CO.,LTD.
 Address : 2-1, Sakaecho 3-chome, Hamura-shi, Tokyo 205-8555, Japan
 Telephone / Facsimile : +81-42-579-7282/+81-42-579-7726

2-2 Equipment Under Test (EUT)

Trade name : DATA PROJECTOR
 Model name : XJ-H2650
 Serial number : Identical prototype
 Date of receipt : March 15, 2012
 EUT condition : Pre-production, not damaged
 Antenna type : Printed antenna with -1.51dBi gain
 Frequency Range : 2402 ~ 2479MHz
 Number of channels : 78
 Channel spacing : 1MHz
 Type of Modulation : MSK
 Power Source : 100~240Vac

2-4 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2402	2441	2479

2-5 Ancillary Equipment

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

2-6 Model Descripton

Differnce			
item	XJ-H1750	XJ-H2650	Notes
Optical Mainfold Digital Mirror Device	for XGA	for WXGA	Change of the Digital Mirror Device for Optical Manifold
Main PWB	number of layer 8 layer	number of layers 6 layers	Altered the printed wiring and number of layers. Supports the RGB-function of the Stand-By State. Addition of the Line-OUT port.

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(d)	Band Edge	> 20 dBc		C
15.249 / 15.209	Field Strength of Harmonics	< 54 dBuV (at 3m)	Radiated	C
15.207 /15.107	AC Conducted Emissions	EN 55022	Line Conducted	C
15.203	Antenna requirement	-	-	C

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

Note 1: Antenna Requirement

→ The CASIO COMPUTER CO.,LTD. XJ-H2650 unit complies with the requirement of §15.203.

The antenna type is the Printed antenna

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

FCC Parts 15.249; ANSI C-63.4-2003
RSS-210 and ISSUE No.: 8 Date: 2010

3.2 Transmitter requirements

3.2.1 Band Edge

Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 10~30 MHz Detector function = peak

Measurement Data: Complies

- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc
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Band-edges in the restricted band 2310-2390 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
			Antenna	Amp. Gain	Cable	AV / Peak	AV / Peak	AV / Peak	AV / Peak	AV / Peak	AV / Peak
2388.0	34.0 49.4	H	25.4	37.1	4.0	54.0 74.0	26.2 41.7	27.8 32.3			

Band-edges in the restricted band 2483.5-2500 MHz measurement

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
			Antenna	Amp. Gain	Cable	AV / Peak	AV / Peak	AV / Peak	AV / Peak	AV / Peak	AV / Peak
2483.5	34.2 59.0	V	25.4	37.1	4.0	54.0 74.0	26.5 51.3	27.6 22.7			

Note : This EUT was tested in 3 orthogonal positions and the worst-case data was presented.

3.2.2 Field Strength of Harmonics - Transmitter

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)

Peak:VBW \geq RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Average:VBW=10Hz

Span = 100 MHz

Detector function = Peak and Average

Trace = max hold

Sweep = auto

Measurement Data: Complies

- Refer to the next page.
- No other emissions were detected at a level greater than 20dB below limit include from 9KHz to 30MHz.
- The three antennas were used with this EUT during the Testing.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
0.009 ~ 0.490	2400/F(kHz) (@ 300m)
0.490 ~ 1.705	24000/F(kHz) (@ 30m)
1.705 ~ 30	30(@ 30m)
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.

Measurement Data:

Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
				Antenna	Amp.Gain	Cable	AV/Peak	AV/Peak	AV/Peak	AV/Peak		
4804.0	37.9	47.8	V	31.4	36.5	5.7	54.0	74.0	38.6	48.4	15.4	25.6
4882.0	37.7	48.6	V	31.4	36.5	5.7	54.0	74.0	38.4	49.3	15.6	24.7
4958.0	37.1	47.6	V	31.4	36.5	5.7	54.0	74.0	37.8	48.3	16.2	25.7

- No other emissions were detected at a level greater than 20dB below limit.

Radiated Emissions – Operating + Ping + Serial

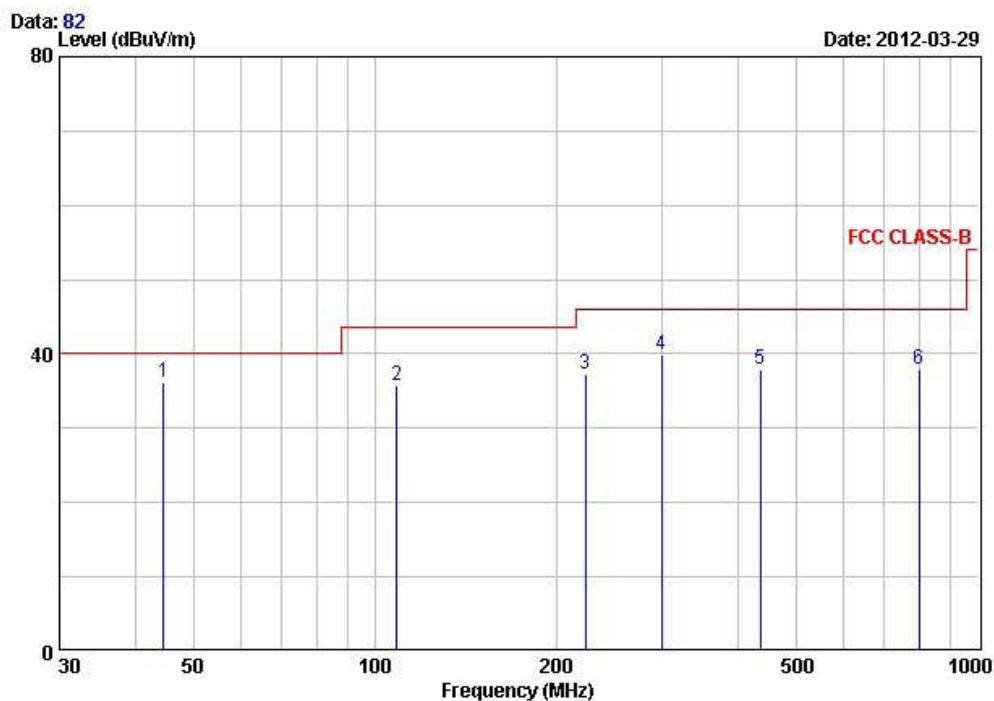
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Gyeonggi-do 449-822 Korea
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BUT/Model No.: XJ-H2650 (CASIO)

TEST MODE: Operation+ping+serial

Temp Humi : 10 / 42

Tested by: PARK.H.W



Freq MHz	Reading dBuV/m	C.F dB/m	Result dBuV/m	Limit QP		Margin dB	Height cm	Angle deg	Polarity
				dBuV/m	dB				
1 44.70	52.00	-15.85	36.15	40.00	3.85	100	189	VERTICAL	
2 108.80	52.40	-16.75	35.65	43.50	7.85	154	277	HORIZONTAL	
3 223.60	51.80	-14.47	37.33	46.00	8.67	261	234	HORIZONTAL	
4 298.60	51.20	-11.33	39.87	46.00	6.13	105	191	HORIZONTAL	
5 436.30	45.80	-7.94	37.86	46.00	8.14	106	192	VERTICAL	
6 799.30	37.20	0.70	37.90	46.00	8.10	151	263	VERTICAL	

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

3.2.3 Field Strength of Harmonics - Receivers

Definition:

The field strength of emissions from intentional radiators was measured. In case of the air temperature of the test site is out of the range is 10 to 40°C before the testing proceeds the warm-up time of EUT maintain adequately

Test method	: FCC Part 15.209
Frequency Range	: 30 MHz ~ 10 th harmonic.
Bandwidth	: 120 kHz (F < 1GHz) 1 MHz (F > 1GHz)
Distance of antenna	: 3 meters
Test mode	: Rx mode
Result	: Complies

Measurement Data:

- Refer to the next page.
- No other emissions were detected at a level greater than 20dB below limit
- It gave the worse case emissions.

Field Strength Limit

Part 15.209 LIMIT:

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.

Measurement Data:

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp.Gain	Cable						
4803.0	38.1	47.0	V	31.4	36.5	5.7	54.0	74.0	38.7	47.7	15.3	26.3
Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp.Gain	Cable						
4865.0	37.1	46.6	V	31.4	36.5	5.7	54.0	74.0	37.8	47.3	16.2	26.7
Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp.Gain	Cable						
4958.0	35.5	45.9	V	31.4	36.5	5.7	54.0	74.0	36.2	46.5	17.8	27.5

No other emissions were detected at a level greater than 20dB below limit.

3.2.4 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: Complies

- Refer to the next page.
- No other emissions were detected at a level greater than 20dB below limit
- It gave the worse case emissions

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

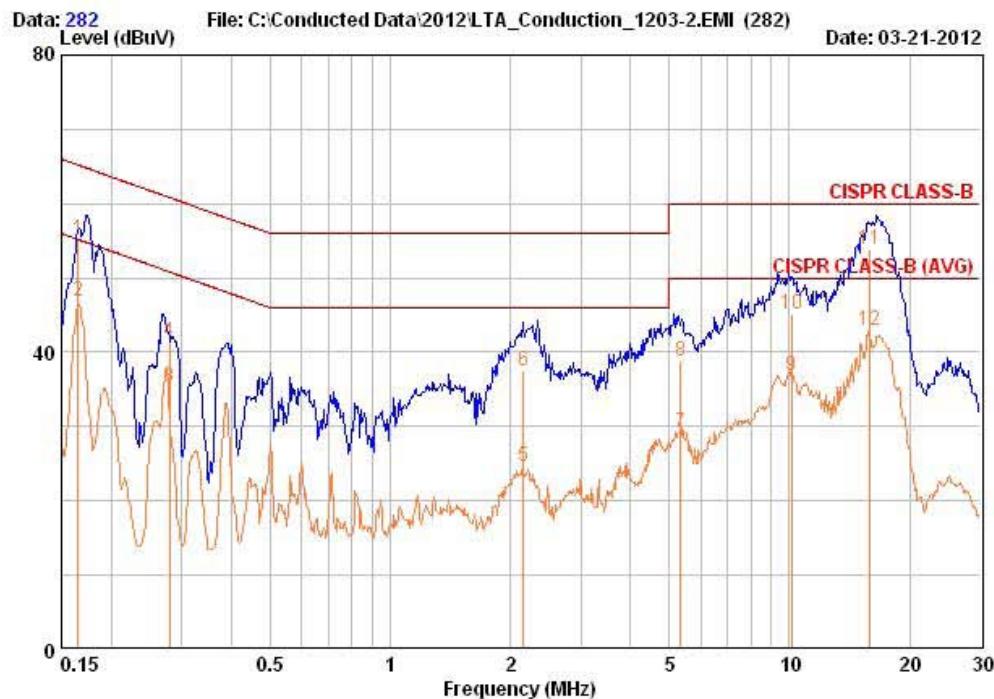
Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Note: The limits will decrease with the frequency logarithmically within 0.15MHz to 0.5MHz

Radiated Emissions – Operating + Ping + Serial LINE

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BUT / Model No. : XJ-H2650(CASIO) Phase : LINE
 Test Mode : Operating+Ping+Serial Test Power : 120 / 60
 Temp./Humi. : 22°C / 49% Test Engineer : PARK.H.W



Freq MHz	RD QP		RD AV		C.F. dB	Result QP		Result AV		Limit QP		Limit AV		Margin QP		Margin AV	
	dBuV	dBuV	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dB	dB	dB	dB
0.165	45.44	37.24	9.65	55.09	46.89	65.21	55.21	10.12	8.32								
0.280	31.93	25.63	9.58	41.51	35.21	60.82	50.82	19.31	15.61								
2.155	27.76	14.96	9.72	37.48	24.68	56.00	46.00	18.52	21.32								
5.333	29.09	19.49	9.73	38.82	29.22	60.00	50.00	21.18	20.78								
10.129	35.37	26.97	9.81	45.18	36.78	60.00	50.00	14.82	13.22								
15.870	43.80	32.90	9.99	53.79	42.89	60.00	50.00	6.21	7.11								

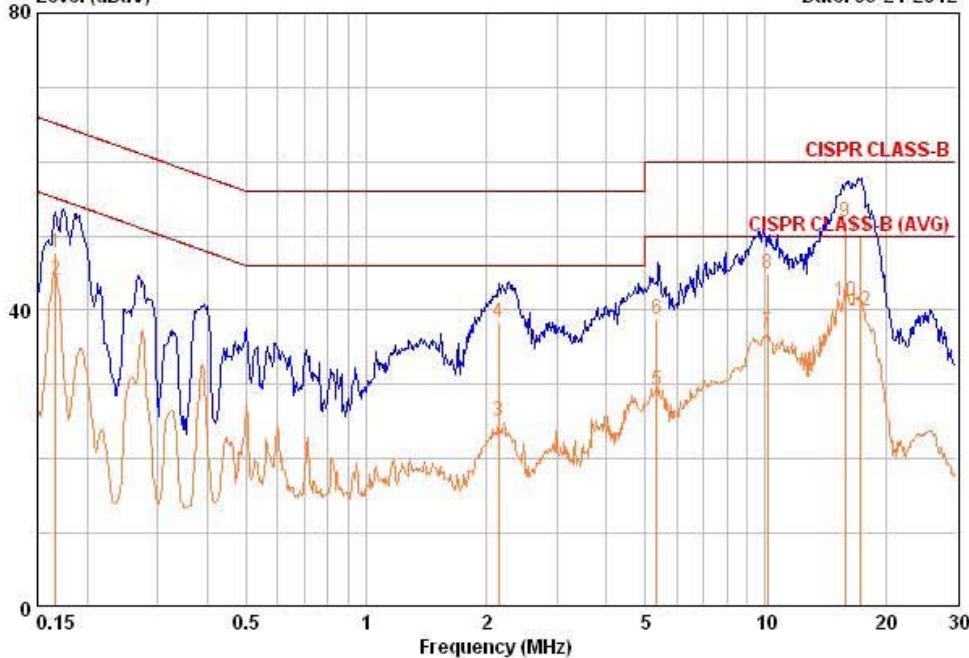
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

Radiated Emissions – Operating + Ping + Serial NEUTRAL

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

EUT / Model No. : XJ-H2650(CASIO) Phase : NEUTRAL
 Test Mode : Operating+Ping+Serial Test Power : 120 / 60
 Temp./Humi. : 22°C / 49% Test Engineer : PARK.H.W

Data: 284 File: C:\Conducted Data\2012\LTA_Conduction_1203-2.EMI (284) Date: 03-21-2012



Freq MHz	RD QP		RD AV		C. F dB	Result dBuV	Result dBuV	Limit dBuV	Limit dBuV	Margin dB	Margin dB
	QP	AV	QP	AV							
0.167	38.14	34.54	9.57	47.71	44.11	65.11	55.11	17.40	11.00		
2.143	28.66	15.36	9.69	38.35	25.05	56.00	46.00	17.65	20.95		
5.345	28.99	19.49	9.76	38.75	29.25	60.00	50.00	21.25	20.75		
10.128	35.27	27.27	9.71	44.97	36.97	60.00	50.00	15.03	13.03		
15.877	42.10	31.30	9.88	51.99	41.19	60.00	50.00	8.01	8.81		
17.210	40.19	29.99	9.91	50.10	39.90	60.00	50.00	9.90	10.10		

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Interval	Last Cal. Date
1	Spectrum Analyzer (~30GHz)	FSV-30	100757	R&S	1 year	2012-01-10
2	Signal Generator (~3.2GHz)	8648C	3623A02597	HP	1 year	2012-03-26
3	Signal Generator (1~20GHz)	83711B	US34490456	HP	1 year	2012-03-26
4	Attenuator (3dB)	8491A	37822	HP	2 year	2010-10-08
5	Attenuator (10dB)	8491A	63196	HP	2 year	2010-10-08
6	Attenuator (30dB)	8498A	3318A10929	HP	2 year	2011-01-05
7	Test Receiver (~30MHz)	ESHS10	828404/009	R&S	1 year	2012-03-26
8	EMI Test Receiver (~1GHz)	ESCI7	100722	R&S	1 year	2011-10-07
9	RF Amplifier (~1.3GHz)	8447D	2439A09058	HP	2 year	2010-10-08
10	RF Amplifier (1~18GHz)	8449B	3008A02126	HP	2 year	2012-03-26
11	Horn Antenna (1~18GHz)	BBHA 9120D	9120D122	SCHWARZBECK	2 year	2010-12-24
12	Horn Antenna (18 ~ 40GHz)	SAS-574	154	Schwarzbeck	2 year	2010-11-25
13	Horn Antenna (18 ~ 40GHz)	SAS-574	155	Schwarzbeck	2 year	2010-11-25
14	TRILOG Antenna	VULB 9160	9160-3172	SCHWARZBECK	2 year	2010-10-07
15	Dipole Antenna	VHA9103	2116	SCHWARZBECK	2 year	2010-11-25
16	Dipole Antenna	VHA9103	2117	SCHWARZBECK	2 year	2010-11-25
17	Dipole Antenna	VHA9105	2261	SCHWARZBECK	2 year	2010-11-25
18	Dipole Antenna	VHA9105	2262	SCHWARZBECK	2 year	2010-11-25
19	Hygro-Thermograph	THB-36	0041557-01	ISUZU	2 year	2010-04-12
20	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
21	Power Divider	11636A	6243	HP	2 year	2010-10-08
22	DC Power Supply	6622A	3448A03079	HP	-	-
23	Frequency Counter	5342A	2826A12411	HP	1 year	2012-03-26
24	Power Meter	EPM-441A	GB32481702	HP	1 year	2012-03-26
25	Power Sensor	8481A	US41030291	HP	1 year	2011-10-07
26	Audio Analyzer	8903B	3729A18901	HP	1 year	2011-10-07
27	Modulation Analyzer	8901B	3749A05878	HP	1 year	2011-10-07
28	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2011-10-07
29	Stop Watch	HS-3	601Q09R	CASIO	2 year	2012-03-26
30	LISN	ENV216	100408	R&S	1 year	2011-10-07
31	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	2 year	2010-05-13
32	Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	-	-
33	Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	-	-
34	Loop Antenna	FMZB 1516	151602/94	SCHWARZBECK	2 year	2011-04-05