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FCC PART 15.247 Class II Permissive Change

Applicant Name:

LG Electronics Inc.

60-39, Gasan-dong, Gumchon-gu,
Seoul 153-023, Korea

Date of Issue:
May 13, 2010
Test Site/Location:
HCT.CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si, Kyungki-do, Korea
Test Report No.: HCTR1005FR04-1
HCT FRN: 0005866421

IC Recognition No.: 5944A-1

FCC ID:	**BEJGW300**
IC:	**2703C-GW300**
APPLICANT:	**LG Electronics Inc.**

FCC Model(s):	GW300, GW300FD
IC Model(s):	GW300, GW300FD
EUT Type:	Cellular/ PCS GSM/ EDGE Phone with Bluetooth
Frequency Range:	2402 - 2480 MHz (Bluetooth)
Modulation type	GFSK, PSK
FCC Classification:	FCC Part 15 Frequency Hopping Spread Spectrum Transceiver
FCC Rule Part(s):	Part 15 subpart C 15.247
IC Rule :	RSS-210 , RSS-GEN
IC Registration No. :	5944A-1

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT.CO., LTD. Certifies that no party to this application has been denied FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.862

Jong Seok Lee

Report prepared by
: Jong Seouk Lee
Test engineer of RF Team

Approved by
: Sang Jun Lee
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1005FR04-1	May 06, 2010	First Approval Report
HCTR1005FR04-1-1	May 13, 2010	Radiated Test Report

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1. GENERAL INFORMATION

Applicant:	LG Electronics Inc.
Address:	60-39, Gasan-dong, Gumchon-gu, Seoul 153-023, Korea
FCC ID:	BEJGW300
IC:	2703C-GW300
Application Type:	FCC Class II Permissive Change
EUT:	Cellular/ PCS GSM/ EDGE Phone with Bluetooth
Model Name	FCC: GW300, GW300FD IC: GW300, GW300FD
Date of Test:	April 19, 2010 ~ April 25, 2010
Contact person:	Name: Bong Hyo, Han Phone #: +82-2-2033-1160 Fax #: +82-2-2033-1222
Place of Tests:	HCT Co., Ltd. Icheon, Kyounki-Do, Korea (IC Recognition No. : 5944A-1)

2. EUT DESCRIPTION

Product	Cellular/ PCS GSM/ EDGE Phone with Bluetooth
Model Name	FCC: GW300, GW300FD IC: GW300, GW300FD
Power Supply	DC 3.7 V
Battery type	Standard
Frequency Range	2402 ~ 2480 MHz
Modulation Type	GFSK(Normal), PSK(EDR)
Modulation Technique	FHSS
Number of Channels	79 Channels
Antenna Specification	Manufacturer: E.M.W Antenna Co., Ltd. Antenna type: Multi-Layer PCB Chip Antenna Peak Gain : -4.248 dBi

※ 15.247 Requirements for Bluetooth transmitter.

▪ This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:

1) This system is hopping pseudorandomly.

2) Each frequency is used equally on the average by each transmitter.

3) The receiver input bandwidths that match the hopping channel bandwidths of their corresponding transmitters

4) The receiver shifts frequencies in synchronization with the transmitted signals.

▪ 15.247(g): The system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this Section 15.247 should the transmitter be presented with a continuous data (or information) stream.

▪ 15.247(h): The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz(ANSI C63.4-2003) and FCC Public Notice DA 00-705 dated March 30, 2000 entitled “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems” were used in the measurement of the **LG Electronics Inc.**
Cellular/ PCS GSM/ EDGE Phone with Bluetooth FCC ID: BEJGW300

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 10, 2009 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

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

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

7. FCC PART 15.247 REQUIREMENTS

7.1 SPURIOUS EMISSIONS

7.1.1 Radiated Spurious Emissions

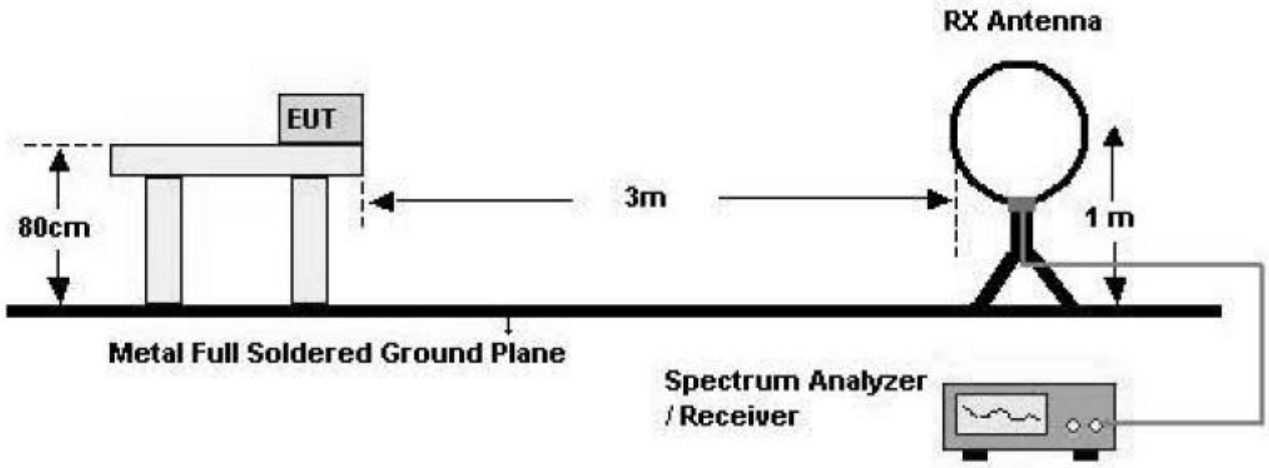
LIMIT : §15.247(d), §15.205, §15.209

1. 20dBc in any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed

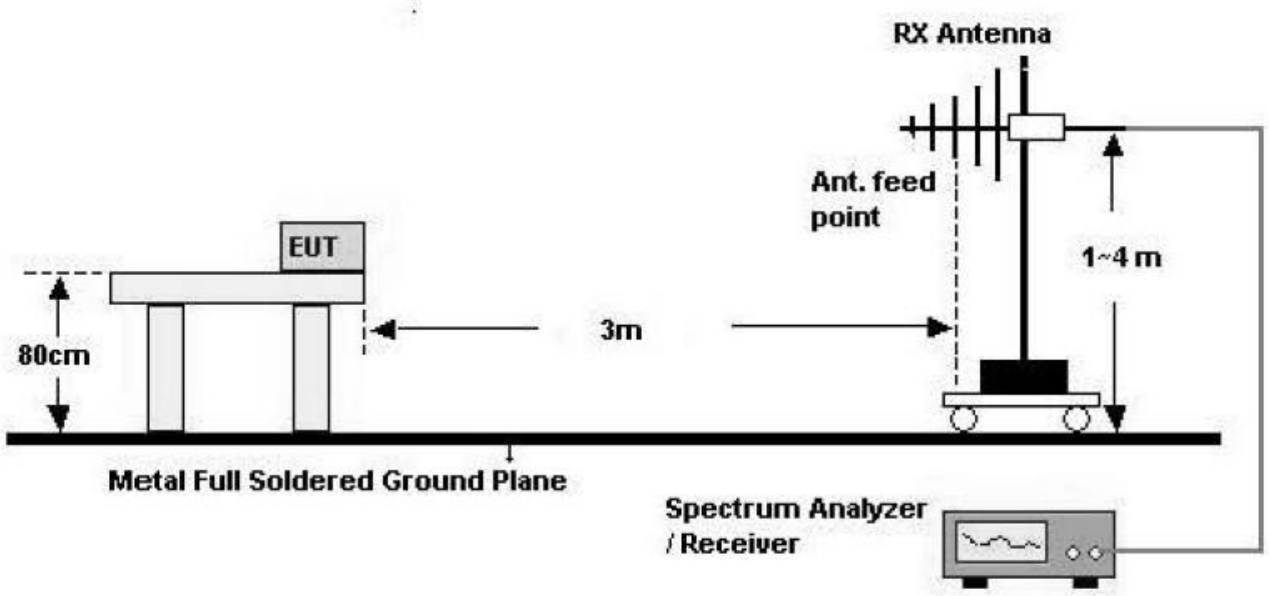
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

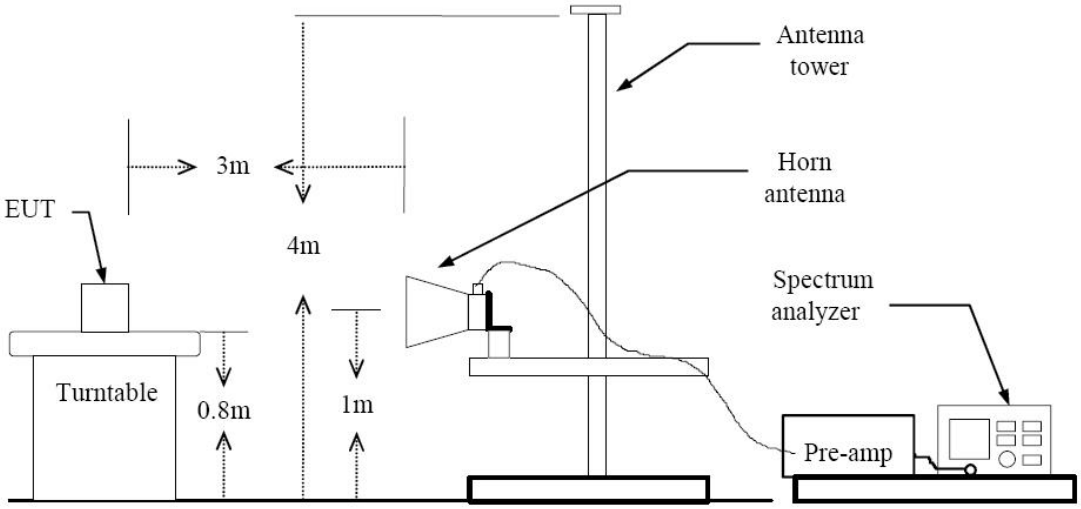
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Link

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dB㎶	dB /m	dB	(H/V)	dB㎶/m	dB㎶/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor

TEST RESULTS

Below 1 GHz

Operation Mode: EDR Mode (Channel : 2402)

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
762.35	11.5	22.1	3.0	H	36.60	46.0	9.4
970.90	10.1	24.0	3.8	H	37.91	54.0	16.1
467.47	11.9	16.8	2.3	V	30.96	46.0	15.0
536.34	12.2	18.0	2.5	V	32.66	46.0	13.3
750.71	12.4	22.0	3.0	V	37.36	46.0	8.6
800.18	12.2	22.2	3.1	V	37.50	46.0	8.5

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done Normal Mode and EDR Mode test. Worst case of EUT is EDR Mode.

Above 1 GHz

Operation Mode: CH Low (Normal)

Frequency [MHz]	Reading dBuV	AN.+CL-AMP GAIN. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4804	50.82	-6.08	V	44.74	74	29.26	PK
4804	41.48	-6.08	V	35.40	54	18.60	AV
7206	50.16	1.28	V	51.44	74	22.56	PK
7206	39.98	1.28	V	41.26	54	12.74	AV
4804	53.69	-6.08	H	47.61	74	26.39	PK
4804	41.50	-6.08	H	35.42	54	18.58	AV
7206	50.51	1.28	H	51.79	74	22.21	PK
7206	36.99	1.28	H	38.27	54	15.73	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
5. We have done Normal Mode and EDR Mode test. Worst case of EUT is Normal Mode.

Operation Mode: CH Mid (Normal)

Frequency [MHz]	Reading dBuV	AN.+CL-AMP GAIN. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4882	49.48	-5.81	V	43.67	74	30.33	PK
4882	38.22	-5.81	V	32.41	54	21.59	AV
7323	50.68	1.65	V	52.33	74	21.67	PK
7323	37.06	1.65	V	38.71	54	15.29	AV
4882	49.17	-5.81	H	43.36	74	30.64	PK
4882	37.34	-5.81	H	31.53	54	22.47	AV
7323	50.05	1.65	H	51.70	74	22.30	PK
7323	37.06	1.65	H	38.71	54	15.29	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
5. We have done Normal Mode and EDR Mode test. Worst case of EUT is Normal Mode.

Operation Mode: CH High (Normal)

Frequency [MHz]	Reading dBuV	AN.+CL-AMP GAIN. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4960	50.18	-5.53	V	44.65	74	29.35	PK
4960	38.67	-5.53	V	33.14	54	20.86	AV
7440	50.54	2.03	V	52.57	74	21.43	PK
7440	37.71	2.03	V	39.74	54	14.26	AV
4960	49.53	-5.53	H	44.00	74	30.00	PK
4960	37.16	-5.53	H	31.63	54	22.37	AV
7440	50.72	2.03	H	52.75	74	21.25	PK
7440	37.70	2.03	H	39.73	54	14.27	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MH.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
5. We have done Normal Mode and EDR Mode test. Worst case of EUT is Normal Mode.

7.1.2 Radiated Restricted Band Edge Measurements

Test Requirements and limit, §15.247(d), §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c).

Operation Mode:	8DPSK(EDR)
Operating Frequency	2402, 2480 MHz
Channel No.	0, 78 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2340.88	51.17	-12.54	H	38.63	74	35.37	PK
2340.88	37.58	-12.54	H	25.04	54	28.96	AV
2350.48	50.40	-12.50	V	37.90	74	36.10	PK
2320.08	37.79	-12.63	V	25.16	54	28.84	AV
2499.77	50.31	-11.85	H	38.46	74	35.54	PK
2499.77	37.62	-11.85	H	25.77	54	28.23	AV
2499.31	49.56	-11.85	V	37.71	74	36.29	PK
2499.31	37.51	-11.85	V	25.66	54	28.34	AV

Notes:

1. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.
   Note: We have done Normal Mode and EDR Mode test. Worst case of EUT is EDR Mode.

8. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ESH2-Z5/ LISN	Annual	04/05/2011	861741/013
Rohde & Schwarz	ESH3-Z6/ LISN	Annual	06/13/2010	100329
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	12/18/2010	9160-3150
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	ESH3-Z2/ PULSE LIMITER	Annual	10/30/2010	375.8810.352
MITEQ	AMF-6D-001180-35-20P/AMP	Annual	05/20/2010	990893
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	09/23/2011	296
Rohde & Schwarz	FSP30 / Spectrum Analyzer	Annual	07/31/2010	839117/011
Agilent	E4440A / Spectrum Analyzer	Annual	12/23/2010	US45303008
Agilent	E4416A /Power Meter	Annual	01/14/2011	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	07/28/2010	MY4442009
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	06/29/2010	1
Hewlett Packard	11636B/Power Divider	Annual	12/24/2010	11377
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	01/08/2011	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	12/01/2010	010002156287001199
TESCOM	TC-3000A / BLUETOOTH TESTER	Annual	01/11/2011	3000A490112
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	06/22/2010	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/13/2012	9009-2536