

10 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b-CH1)



Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1306FR12	Date of Issue: June 07, 2013	EUT Type: GSM Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE440	

Conducted Spurious Emission (802.11b-CH11)



Conducted Spurious Emission (802.11g-CH1)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1306FR12	Date of Issue: June 07, 2013	EUT Type: GSM Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE440	

Conducted Spurious Emission (802.11g-CH6)

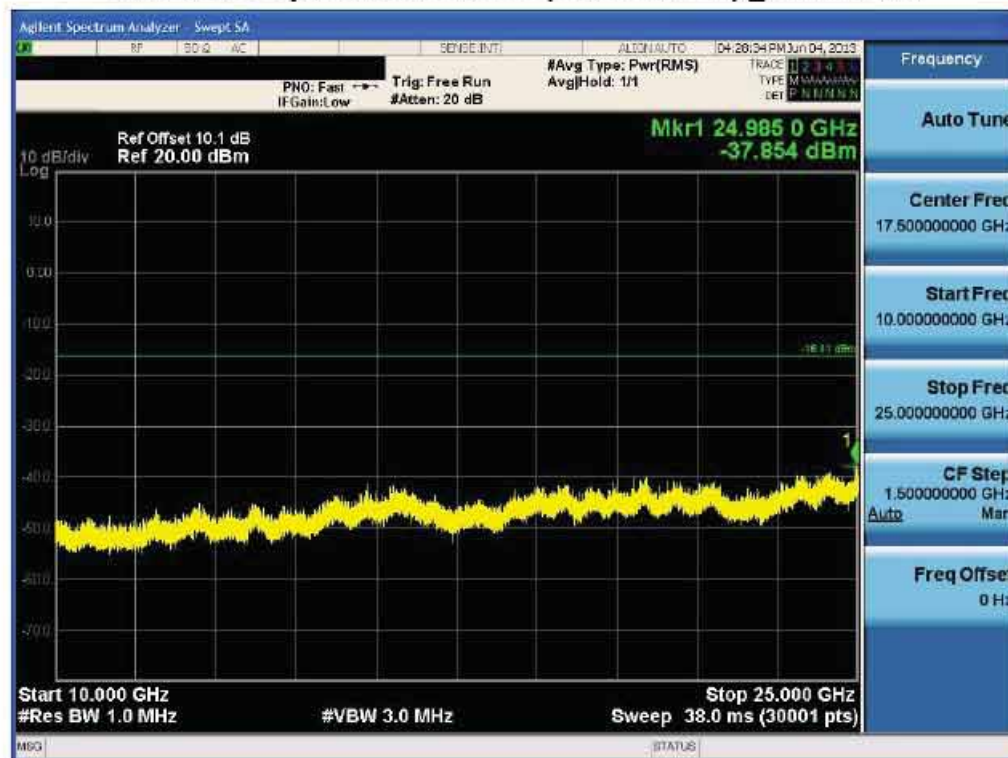


Conducted Spurious Emission (802.11g-CH11)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1306FR12	Date of Issue: June 07, 2013	EUT Type: GSM Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE440	

Conducted Spurious Emission (802.11n-CH1) _20 MHz BW



Conducted Spurious Emission (802.11n-CH6) _20 MHz BW

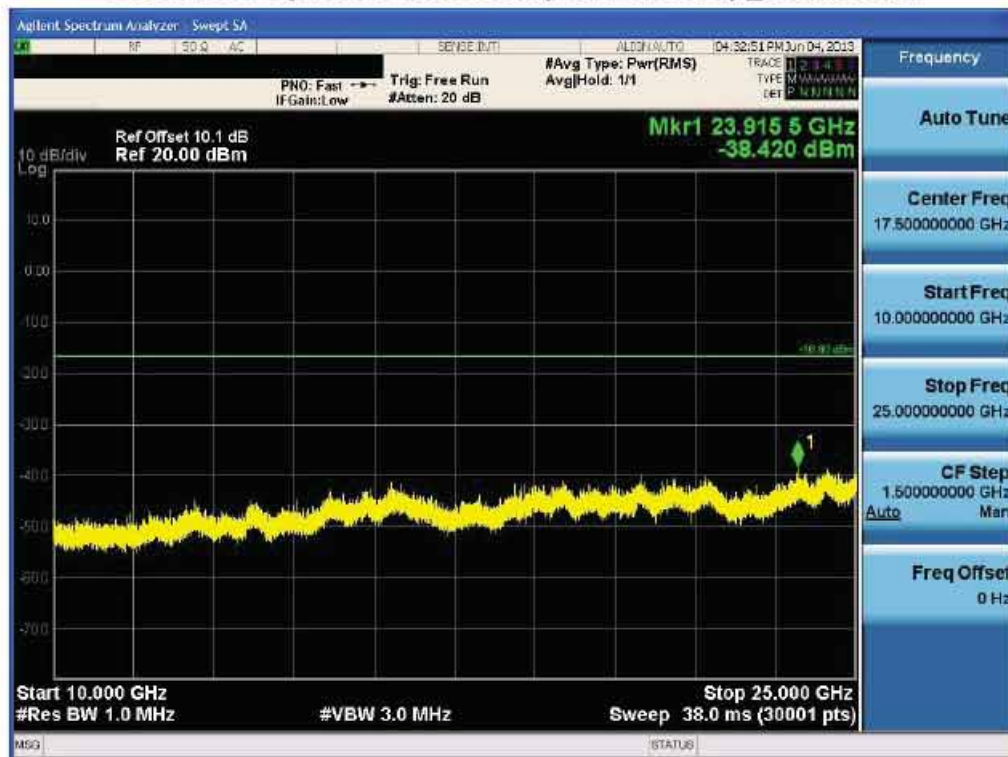


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1306FR12	Date of Issue: June 07, 2013	EUT Type: GSM Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE440	

Conducted Spurious Emission (802.11n-CH11) _20 MHz BW



Conducted Spurious Emission (802.11n-CH3) _40 MHz BW

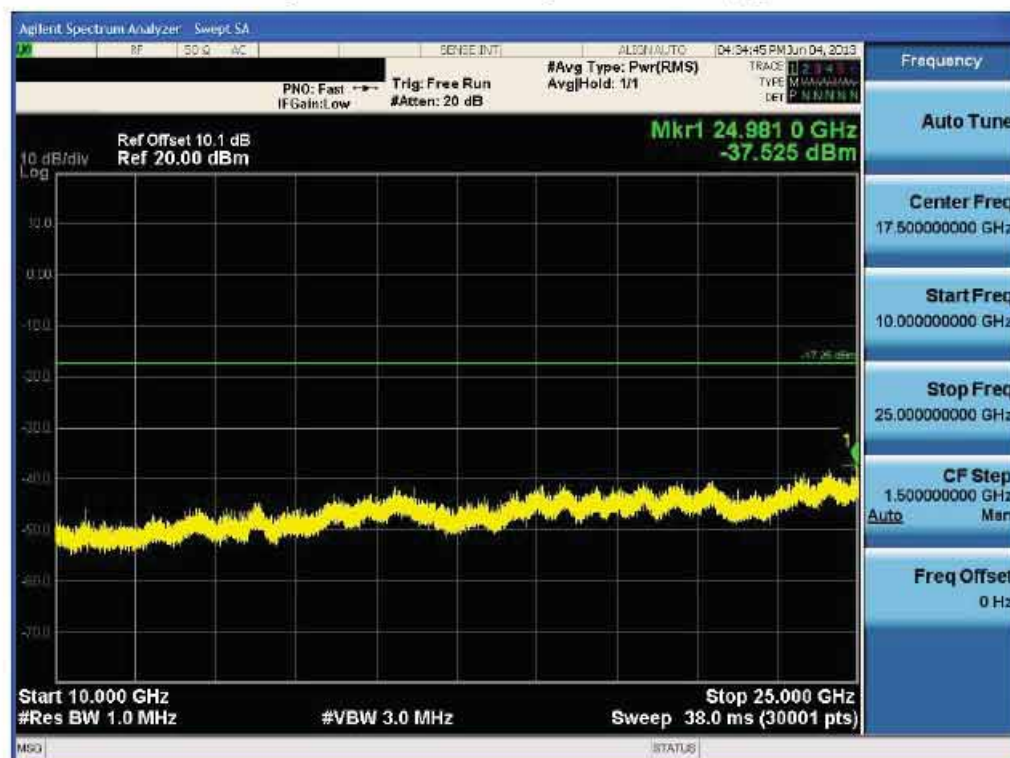


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1306FR12	Date of Issue: June 07, 2013	EUT Type: GSM Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE440	

Conducted Spurious Emission (802.11n-CH6) _40 MHz BW



Conducted Spurious Emission (802.11n-CH9) _40 MHz BW



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCTR1306FR12	Date of Issue: June 07, 2013	EUT Type: GSM Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE440	

8.5 RADIATED MEASUREMENT.

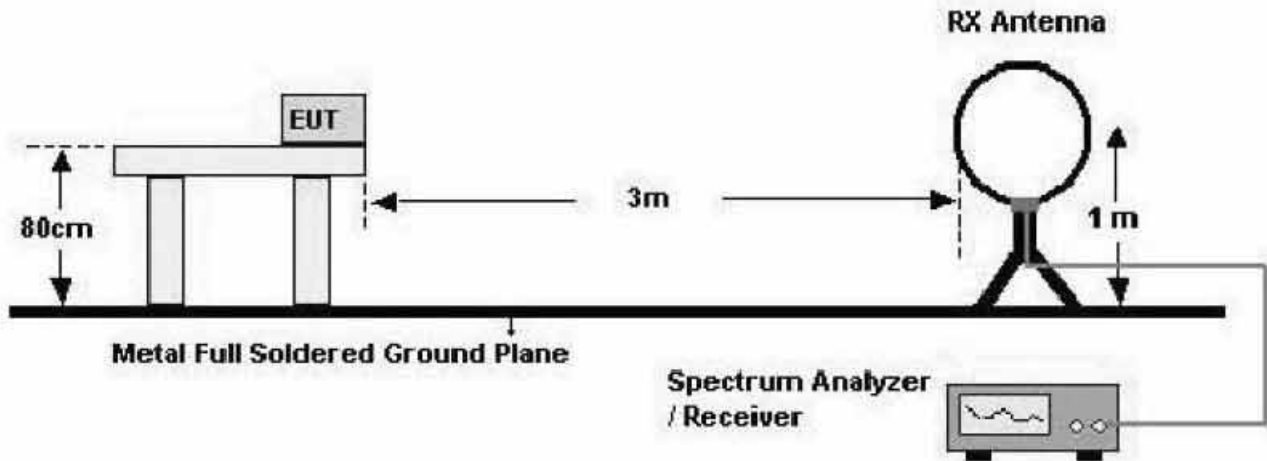
8.5.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

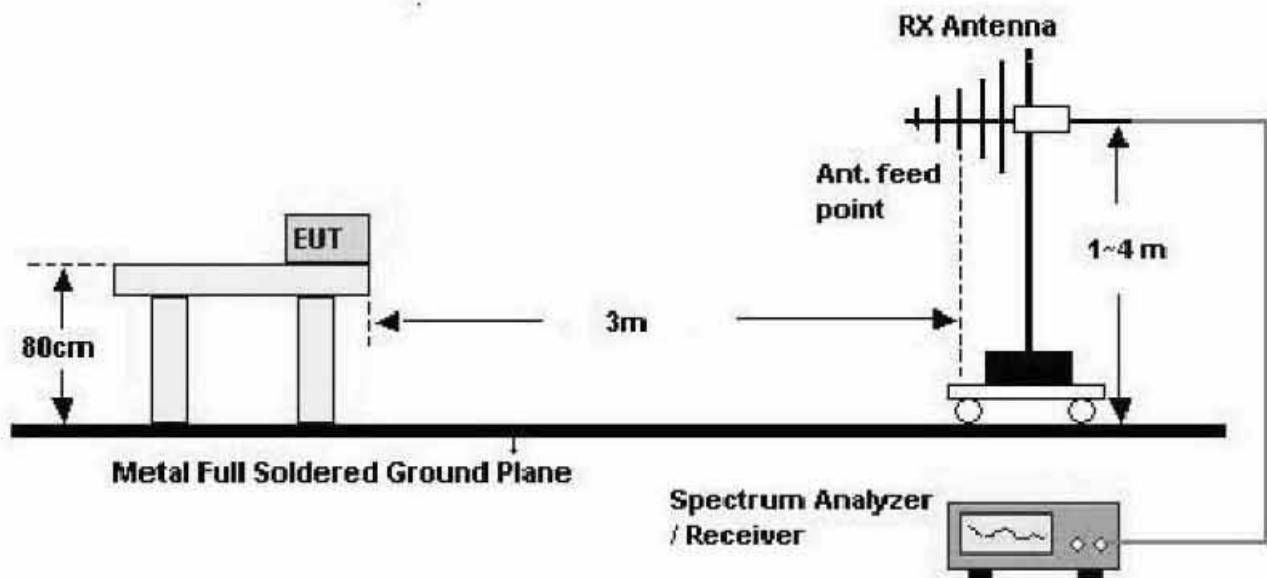
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

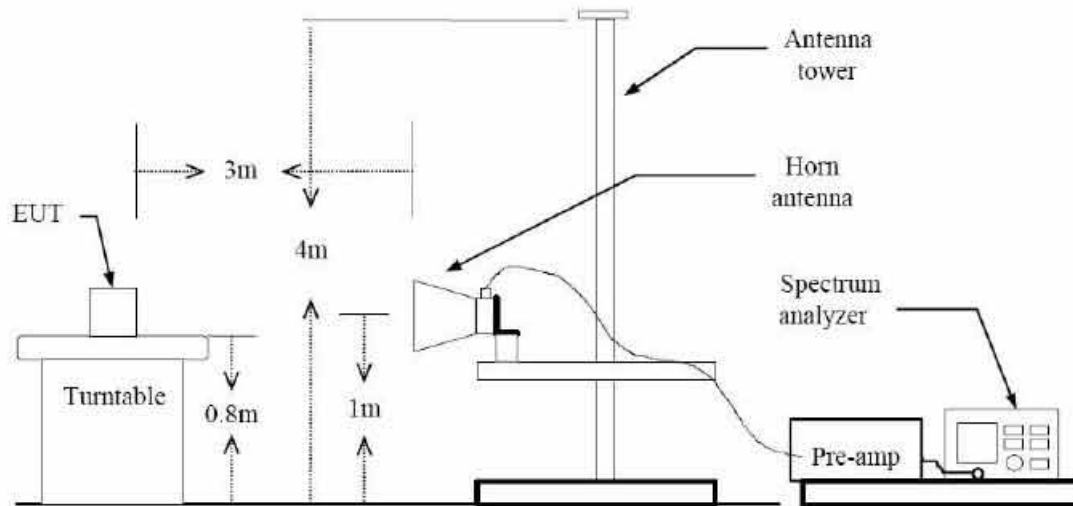
Test Configuration

Below 30 MHz



30 MHz - 1 GHz





TEST PROCEDURE USED

ANSI C63.4(2003)

Method 12.2.4 in KDB 558074, issued 04/09/2013 (Peak)

Method 12.2.5.1 in KDB 558074, issued 04/09/2013(Average Case 1)

Method 12.2.5.3 in KDB 558074, issued 04/09/2013(Average Case 2)

Spectrum Setting

- Peak

Peak emission levels are measured by setting the instrument as follows:

RBW = cf. Table 1.

VBW $\geq$ 3 x RBW.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes.

(Note that the required measurement time may be longer for low duty cycle applications).

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

- Average

Case 1

If the EUT can be configured or modified to transmit continuously (duty cycle $\geq$ 98 percent) then the average emission levels shall be measured using the following method (with EUT transmitting continuously).

RBW = 1 MHz (unless otherwise specified).

VBW $\geq 3 \times$ RBW.

Detector = RMS, if span/(# of points in sweep) $\leq$ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

Averaging type = power (i.e., RMS).

- 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
- 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

Sweep time = auto.

Perform a trace average of at least 100 traces.

Case 2

If continuous transmission of the EUT (i.e., duty cycle $\geq$ 98 percent) cannot be achieved and the duty cycle is not constant (i.e., duty cycle variations exceed $\pm$ 2 percent), then the following procedure shall be used:

Set RBW = 1 MHz.

Set VBW $\geq 1/T$.

Video bandwidth mode or display mode

- 1) The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).
- 2) As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 times (1/duty cycle) traces.

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TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB /m	dB	(H/V)	dB μ V/m	dB μ V/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
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

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

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 x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Above 1 GHz

Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	53.66	-0.79	V	52.87	74	21.13	PK
4824	46.60	-0.79	V	45.81	54	8.19	AV
7236	49.47	9.08	V	58.55	74	15.45	PK
7236	37.65	9.08	V	46.73	54	7.27	AV
4824	52.95	-0.79	H	52.16	74	21.84	PK
4824	43.97	-0.79	H	43.18	54	10.82	AV
7236	49.92	9.08	H	59	74	15.00	PK
7236	37.67	9.08	H	46.75	54	7.25	AV

Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	50.61	-0.79	V	49.82	74	24.18	PK
4824	37.82	-0.79	V	37.03	54	16.97	AV
7236	49.19	9.08	V	58.27	74	15.73	PK
7236	37.43	9.08	V	46.51	54	7.49	AV
4824	50.33	-0.79	H	49.54	74	24.46	PK
4824	37.69	-0.79	H	36.9	54	17.10	AV
7236	49.32	9.08	H	58.4	74	15.60	PK
7236	37.37	9.08	H	46.45	54	7.55	AV

Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	50.00	-0.79	V	49.21	74	24.79	PK
4824	37.45	-0.79	V	36.66	54	17.34	AV
7236	49.55	9.08	V	58.63	74	15.37	PK
7236	37.42	9.08	V	46.5	54	7.50	AV
4824	50.24	-0.79	H	49.45	74	24.55	PK
4824	37.55	-0.79	H	36.76	54	17.24	AV
7236	49.21	9.08	H	58.29	74	15.71	PK
7236	37.40	9.08	H	46.48	54	7.52	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. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: 802.11 b
Transfer Rate: 1 Mbps
Operating Frequency 2437
Channel No. 06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	55.57	-0.37	V	55.20	74	18.80	PK
4874	50.29	-0.37	V	49.92	54	4.08	AV
7311	48.44	8.64	V	57.08	74	16.92	PK
7311	36.98	8.64	V	45.62	54	8.38	AV
4874	54.36	-0.37	H	53.99	74	20.01	PK
4874	47.23	-0.37	H	46.86	54	7.14	AV
7311	48.85	8.64	H	57.49	74	16.51	PK
7311	37.02	8.64	H	45.66	54	8.34	AV

Operation Mode: 802.11 g
Transfer Rate: 6 Mbps
Operating Frequency 2437
Channel No. 06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	51.15	-0.37	V	50.78	74	23.22	PK
4874	37.93	-0.37	V	37.56	54	16.44	AV
7311	49.11	8.64	V	57.75	74	16.25	PK
7311	35.22	8.64	V	43.86	54	10.14	AV
4874	50.08	-0.37	H	49.71	74	24.29	PK
4874	37.79	-0.37	H	37.42	54	16.58	AV
7311	48.87	8.64	H	57.51	74	16.49	PK
7311	35.21	8.64	H	43.85	54	10.15	AV

Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.94	-0.37	V	50.57	74	23.43	PK
4874	37.88	-0.37	V	37.51	54	16.49	AV
7311	49.22	8.64	V	57.86	74	16.14	PK
7311	35.27	8.64	V	43.91	54	10.09	AV
4874	50.72	-0.37	H	50.35	74	23.65	PK
4874	37.77	-0.37	H	37.40	54	16.60	AV
7311	48.93	8.64	H	57.57	74	16.43	PK
7311	35.25	8.64	H	43.89	54	10.11	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. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: 802.11 b
Transfer Rate: 1 Mbps
Operating Frequency 2462
Channel No. 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	55.05	-0.15	V	54.90	74	19.10	PK
4924	49.16	-0.15	V	49.01	54	4.99	AV
7386	49.16	9.06	V	58.22	74	15.78	PK
7386	37.27	9.06	V	46.33	54	7.67	AV
4924	53.46	-0.15	H	53.31	74	20.69	PK
4924	45.50	-0.15	H	45.35	54	8.65	AV
7386	48.92	9.06	H	57.98	74	16.02	PK
7386	37.16	9.06	H	46.22	54	7.78	AV

Operation Mode: 802.11 g
Transfer Rate: 6 Mbps
Operating Frequency 2462
Channel No. 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	50.29	-0.15	V	50.14	74	23.86	PK
4924	37.09	-0.15	V	36.94	54	17.06	AV
7386	48.53	9.06	V	57.59	74	16.41	PK
7386	35.53	9.06	V	44.59	54	9.41	AV
4924	50.14	-0.15	H	49.99	74	24.01	PK
4924	37.18	-0.15	H	37.03	54	16.97	AV
7386	48.98	9.06	H	58.04	74	15.96	PK
7386	35.42	9.06	H	44.48	54	9.52	AV

Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	50.12	-0.15	V	49.97	74	24.03	PK
4924	37.12	-0.15	V	36.97	54	17.03	AV
7386	48.67	9.06	V	57.73	74	16.27	PK
7386	35.50	9.06	V	44.56	54	9.44	AV
4924	50.18	-0.15	H	50.03	74	23.97	PK
4924	37.20	-0.15	H	37.05	54	16.95	AV
7386	48.77	9.06	H	57.83	74	16.17	PK
7386	35.45	9.06	H	44.51	54	9.49	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. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	2422
Channel No.	03 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4844	50.29	-0.72	V	49.57	74	24.43	PK
4844	37.17	-0.72	V	36.45	54	17.55	AV
7266	49.27	9.95	V	59.22	74	14.78	PK
7266	37.43	9.95	V	47.38	54	6.62	AV
4844	50.31	-0.72	H	49.59	74	24.41	PK
4844	37.43	-0.72	H	36.71	54	17.29	AV
7266	49.33	9.95	H	59.28	74	14.72	PK
7266	37.38	9.95	H	47.33	54	6.67	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. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case of EUT is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.93	-0.37	V	50.56	74	23.44	PK
4874	37.84	-0.37	V	37.47	54	16.53	AV
7311	49.45	8.64	V	58.09	74	15.91	PK
7311	35.21	8.64	V	43.85	54	10.15	AV
4874	51.02	-0.37	H	50.65	74	23.35	PK
4874	37.81	-0.37	H	37.44	54	16.56	AV
7311	49.33	8.64	H	57.97	74	16.03	PK
7311	35.24	8.64	H	43.88	54	10.12	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. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case of EUT is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	2452
Channel No.	09 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4904	50.21	-0.10	V	50.11	74	23.89	PK
4904	37.14	-0.10	V	37.04	54	16.96	AV
7356	48.68	9.00	V	57.68	74	16.32	PK
7356	35.52	9.00	V	44.52	54	9.48	AV
4904	50.27	-0.10	H	50.17	74	23.83	PK
4904	37.19	-0.10	H	37.09	54	16.91	AV
7356	48.71	9.00	H	57.71	74	16.29	PK
7356	35.51	9.00	H	44.51	54	9.49	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. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case of EUT is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.5.2 RADIATED RESTRICTED BAND EDGES

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:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	30.98	33.90	H	64.88	74	9.12	PK
2390.0	15.26	33.90	H	49.16	54	4.84	AV
2390.0	32.10	33.90	V	66.00	74	8.00	PK
2390.0	15.30	33.90	V	49.20	54	4.80	AV
2483.5	28.10	33.99	H	62.09	74	11.91	PK
2483.5	13.27	33.99	H	47.26	54	6.74	AV
2483.5	26.48	33.99	V	60.47	74	13.53	PK
2483.5	12.53	33.99	V	46.52	54	7.48	AV

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	25.68	33.90	H	59.58	74	14.42	PK
2390.0	14.93	33.90	H	48.83	54	5.17	AV
2390.0	26.66	33.90	V	60.56	74	13.44	PK
2390.0	14.98	33.90	V	48.88	54	5.12	AV
2483.5	24.68	33.99	H	58.67	74	15.33	PK
2483.5	12.98	33.99	H	46.97	54	7.03	AV
2483.5	25.28	33.99	V	59.27	74	14.73	PK
2483.5	12.71	33.99	V	46.70	54	7.30	AV

Operation Mode:	802.11n_20 MHz
Transfer Rate:	6.5 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	29.70	33.90	H	63.60	74	10.40	PK
2390.0	15.05	33.90	H	48.95	54	5.05	AV
2390.0	31.98	33.90	V	65.88	74	8.12	PK
2390.0	15.17	33.90	V	49.07	54	4.93	AV
2483.5	26.08	33.99	H	60.07	74	13.93	PK
2483.5	13.11	33.99	H	47.10	54	6.90	AV
2483.5	26.06	33.99	V	60.05	74	13.95	PK
2483.5	12.29	33.99	V	46.28	54	7.72	AV

Operation Mode:	802.11n_40 MHz
Transfer Rate:	13.5 Mbps
Operating Frequency	2422 MHz, 2452 MHz
Channel No.	03 Ch, 09 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	29.82	33.90	H	63.72	74	10.28	PK
2390.0	16.21	33.90	H	50.11	54	3.89	AV
2390.0	30.05	33.90	V	63.95	74	10.05	PK
2390.0	16.38	33.90	V	50.28	54	3.72	AV
2483.5	26.75	33.99	H	60.74	74	13.26	PK
2483.5	14.18	33.99	H	48.17	54	5.83	AV
2483.5	25.68	33.99	V	59.67	74	14.33	PK
2483.5	13.37	33.99	V	47.36	54	6.64	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss
2. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.6 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test for 11 Mbps, Ch.6 and 802.11b. Because 802.11b mode is worst case.

■ **RESULT PLOTS**

Conducted Emissions (Line 1)

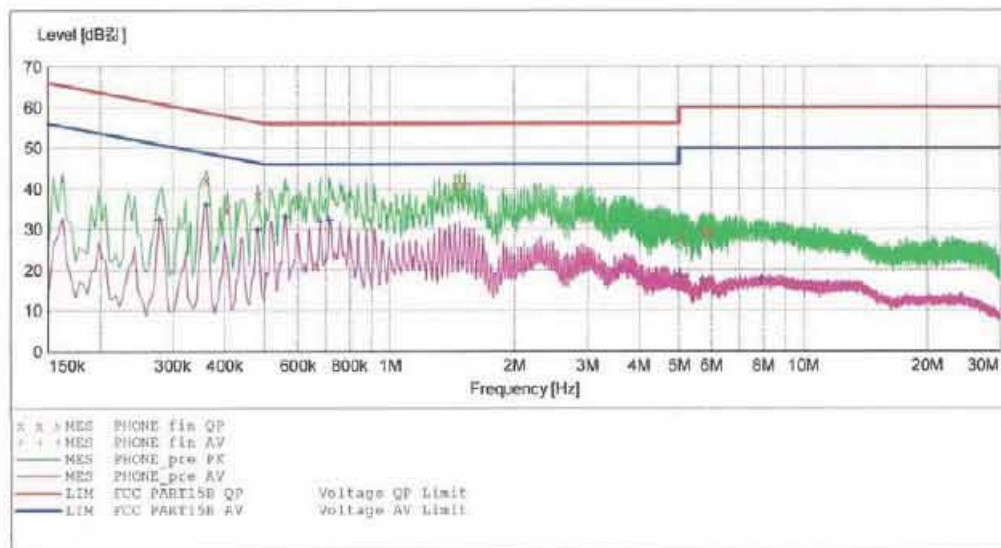
HCT

EMC

EUT: LG-E440
Manufacturer: LG
Operating Condition: WLAN MODE
Test Site: SHIELD ROOM
Operator: JC SHIN
Test Specification: FCC PART15 B
Comment: H

SCAN TABLE: "FCC CLASS B(H)"

Short Description:			KN22 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin QP"

2013-06-05 11:21오전

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.362001	42.10	9.8	59	16.5	---	---
0.406001	34.90	9.8	58	22.9	---	---
0.482001	38.30	9.8	56	18.0	---	---
1.440000	40.60	9.9	56	15.4	---	---
1.476000	42.40	9.9	56	13.6	---	---
1.520000	40.30	9.9	56	15.7	---	---
5.076000	28.60	10.2	60	31.4	---	---
5.748000	29.50	10.2	60	30.5	---	---
5.948000	29.20	10.2	60	30.8	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

2013-06-05 11:21오전

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.278001	32.40	9.8	51	18.5	---	---
0.362001	35.90	9.8	49	12.8	---	---
0.482001	29.80	9.8	46	16.5	---	---
0.560000	33.00	9.8	46	13.0	---	---
0.680000	31.90	9.8	46	14.1	---	---
0.716000	32.30	9.8	46	13.7	---	---
5.032000	18.70	10.2	50	31.3	---	---
5.712000	17.70	10.2	50	32.3	---	---
7.912000	17.80	10.3	50	32.2	---	---

Conducted Emissions (Line 2)

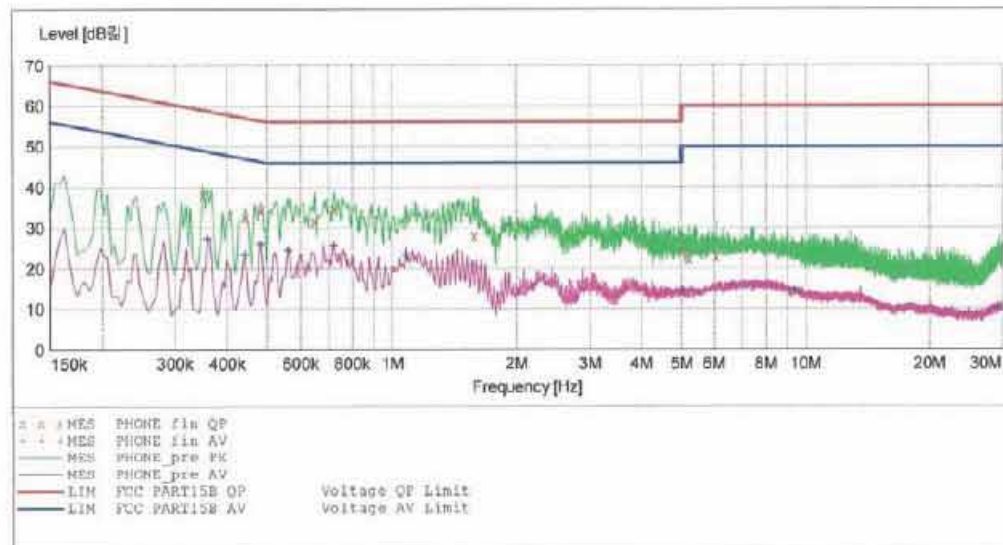
HCT

EMC

EUT: LG-E440
Manufacturer: LG
Operating Condition: WLAN MODE
Test Site: SHIELD ROOM
Operator: JC SHIN
Test Specification: FCC PART15 B
Comment: N

SCAN TABLE: "FCC CLASS B(N)"

Short Description:			KN22 CLASS B			
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin QP"

2013-06-05 11:17오전

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.350001	38.20	10.0	59	20.8	---	---
0.442001	32.80	10.0	57	24.2	---	---
0.482001	34.40	10.0	56	21.9	---	---
0.648000	31.60	10.0	56	24.4	---	---
0.724000	34.80	10.0	56	21.2	---	---
1.580000	28.00	10.1	56	28.0	---	---
5.000000	24.40	10.4	56	31.6	---	---
5.220000	22.30	10.4	60	37.7	---	---
6.076000	23.00	10.4	60	37.0	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

2013-06-05 11:17오전

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.358001	27.40	10.0	49	21.4	---	---
0.442001	23.50	10.0	47	23.6	---	---
0.482001	25.90	10.0	46	20.4	---	---
0.560000	24.50	10.0	46	21.5	---	---
0.724000	25.70	10.0	46	20.3	---	---
1.080000	23.50	10.1	46	22.5	---	---
5.000000	14.50	10.4	46	31.5	---	---
9.436000	14.50	10.7	50	35.5	---	---
29.088000	10.10	11.8	50	39.9	---	---

9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	02/06/2014	100073
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	12/17/2014	3150
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	04/16/2014	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	04/25/2014	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	05/14/2014	MY51110063
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	SCU-18/ Signal Conditioning Unit	Annual	09/11/2013	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2014	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2014	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/08/2014	839117/011
Agilent	E4416A/Power Meter	Annual	11/07/2013	GB41291412
Agilent	E9327A/POWER SENSOR	Annual	04/16/2014	MY4442009
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	Annual	02/08/2014	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	04/16/2014	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	04/16/2014	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	03/19/2014	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2013	11377
Agilent	87300B/Directional Coupler	Annual	12/24/2013	3116A03621
Hewlett Packard	11667B / Power Splitter	Annual	05/29/2014	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2013	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2013	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	04/24/2014	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	04/25/2014	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
CERNEX	CBLU1183540 / POWER AMP	Annual	07/27/2013	21691
Agilent	8493C / Attenuator(10 dB)	Annual	07/30/2013	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617