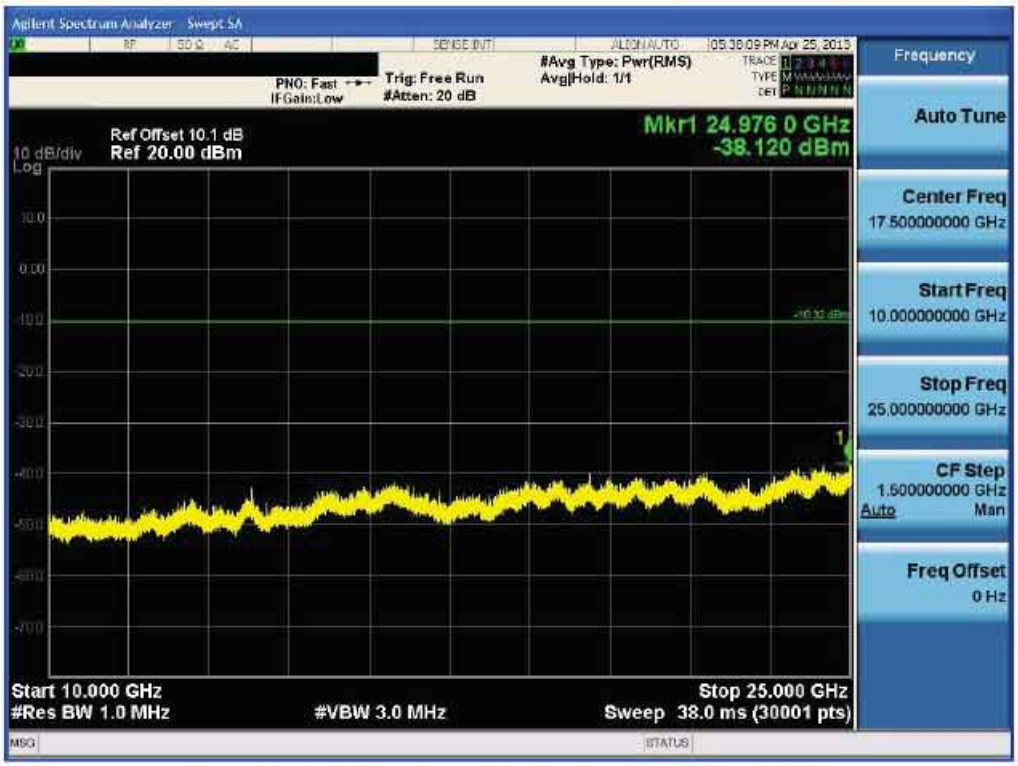
10 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b-CH1)

Conducted Spurious Emission (802.11b-CH6)

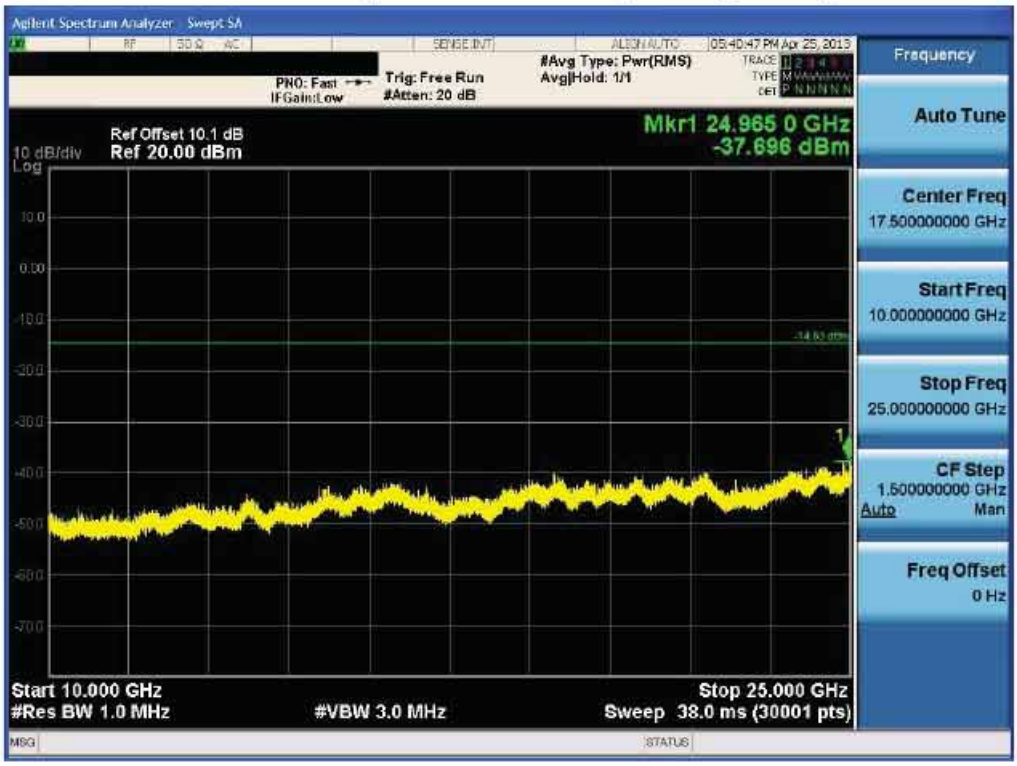
Conducted Spurious Emission (802.11b-CH11)



Conducted Spurious Emission (802.11g-CH1)

Conducted Spurious Emission (802.11g-CH6)

Conducted Spurious Emission (802.11g-CH11)



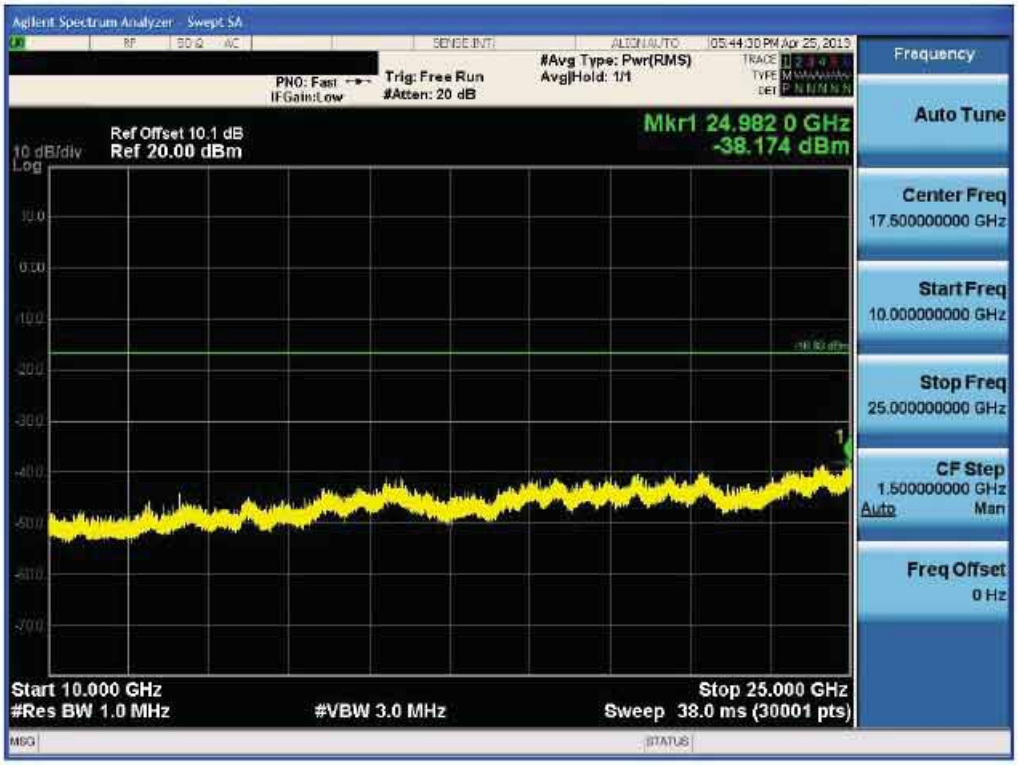
Conducted Spurious Emission (802.11n-CH1) _20 MHz BW

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

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

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

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



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

8.5 RADIATED MEASUREMENT.

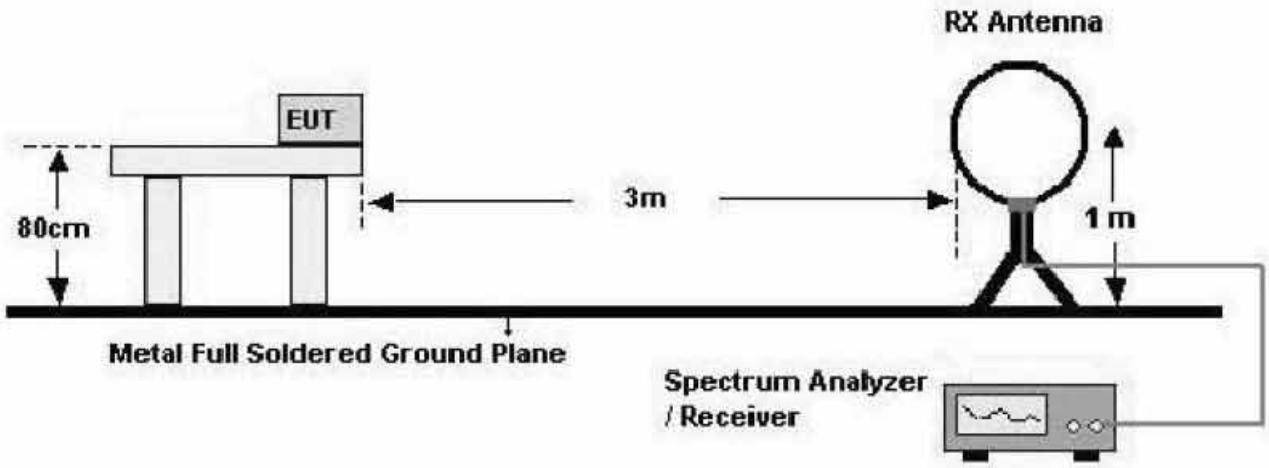
8.5.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

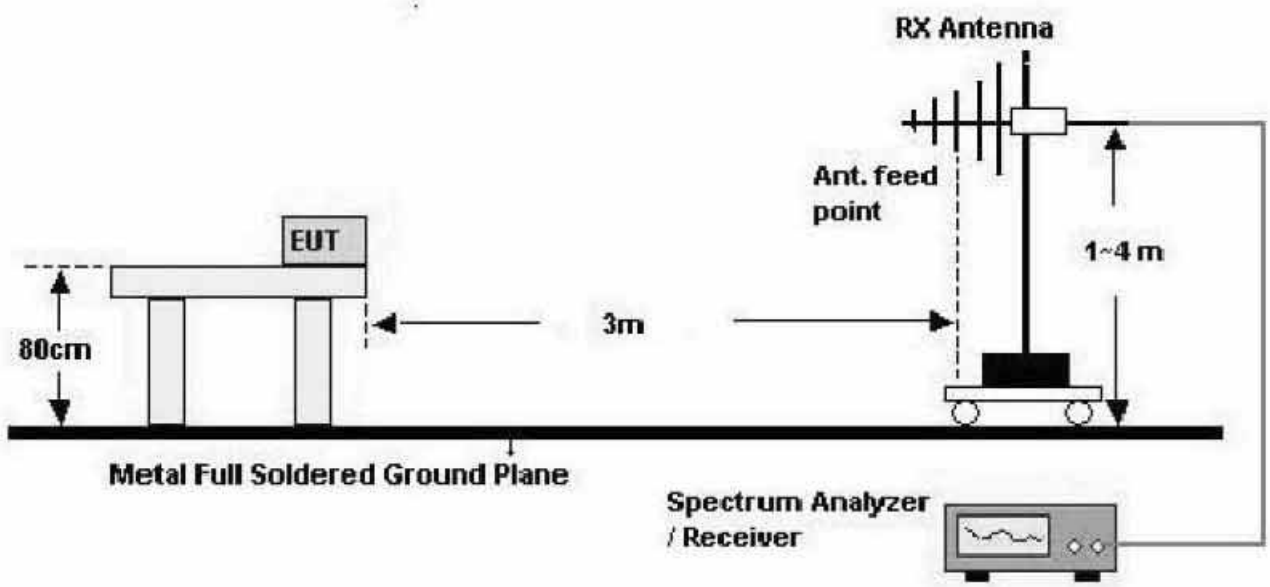
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

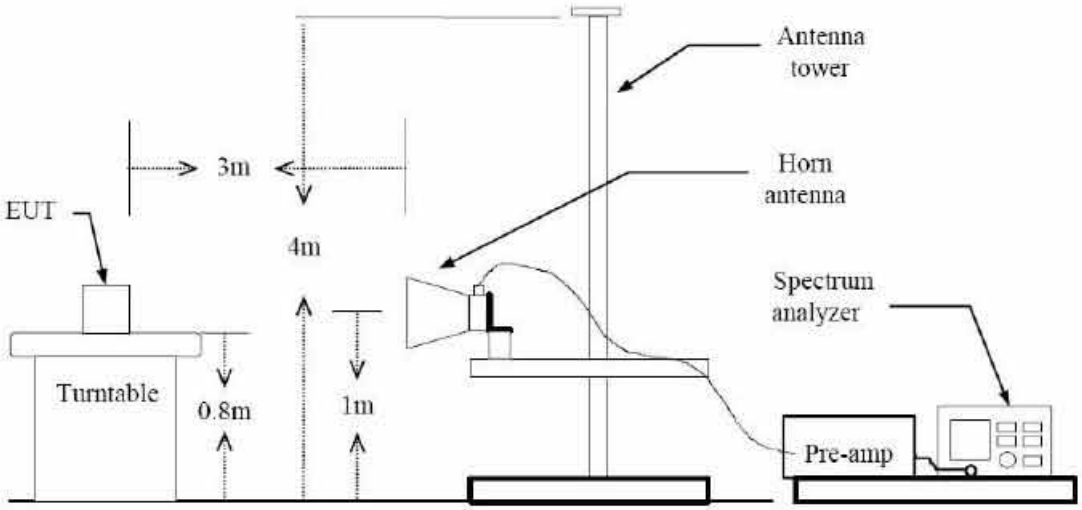
Below 30 MHz



30 MHz - 1 GHz



Above 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 ≥ 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 ≥ 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 ≥3 x RBW.

Detector = RMS, if span/(# of points in sweep) ≤ (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 ≥ 98 percent) cannot be achieved and the duty cycle is not constant (i.e., duty cycle variations exceed ± 2 percent), then the following procedure shall be used:

Set RBW = 1 MHz.

Set VBW ≥ 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.

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBμV	dB /m	dB	(H/V)	dBμV/m	dBμV/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	dBμV	dB /m	dB	(H/V)	dBμV/m	dBμV/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	53.81	-0.79	V	53.02	74	20.98	PK
4824	45.32	-0.79	V	44.53	54	9.47	AV
7236	50.15	9.08	V	59.23	74	14.77	PK
7236	38.07	9.08	V	47.15	54	6.85	AV
4824	54.29	-0.79	H	53.5	74	20.50	PK
4824	45.34	-0.79	H	44.55	54	9.45	AV
7236	50.12	9.08	H	59.2	74	14.80	PK
7236	38.05	9.08	H	47.13	54	6.87	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	50.82	-0.79	V	50.03	74	23.97	PK
4824	37.53	-0.79	V	36.74	54	17.26	AV
7236	49.68	9.08	V	58.76	74	15.24	PK
7236	36.40	9.08	V	45.48	54	8.52	AV
4824	50.34	-0.79	H	49.55	74	24.45	PK
4824	37.22	-0.79	H	36.43	54	17.57	AV
7236	49.69	9.08	H	58.77	74	15.23	PK
7236	36.38	9.08	H	45.46	54	8.54	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	50.82	-0.79	V	50.03	74	23.97	PK
4824	37.52	-0.79	V	36.73	54	17.27	AV
7236	49.58	9.08	V	58.66	74	15.34	PK
7236	36.41	9.08	V	45.49	54	8.51	AV
4824	50.80	-0.79	H	50.01	74	23.99	PK
4824	37.48	-0.79	H	36.69	54	17.31	AV
7236	49.67	9.08	H	58.75	74	15.25	PK
7236	36.52	9.08	H	45.6	54	8.40	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	54.80	-0.37	V	54.43	74	19.57	PK
4874	47.75	-0.37	V	47.38	54	6.62	AV
7311	49.61	8.64	V	58.25	74	15.75	PK
7311	37.63	8.64	V	46.27	54	7.73	AV
4874	54.79	-0.37	H	54.42	74	19.58	PK
4874	47.03	-0.37	H	46.66	54	7.34	AV
7311	49.88	8.64	H	58.52	74	15.48	PK
7311	37.58	8.64	H	46.22	54	7.78	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	50.60	-0.37	V	50.23	74	23.77	PK
4874	37.63	-0.37	V	37.26	54	16.74	AV
7311	49.55	8.64	V	58.19	74	15.81	PK
7311	36.37	8.64	V	45.01	54	8.99	AV
4874	50.55	-0.37	H	50.18	74	23.82	PK
4874	37.27	-0.37	H	36.90	54	17.10	AV
7311	49.60	8.64	H	58.24	74	15.76	PK
7311	36.34	8.64	H	44.98	54	9.02	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	50.62	-0.37	V	50.25	74	23.75	PK
4874	37.59	-0.37	V	37.22	54	16.78	AV
7311	49.67	8.64	V	58.31	74	15.69	PK
7311	36.35	8.64	V	44.99	54	9.01	AV
4874	50.79	-0.37	H	50.42	74	23.58	PK
4874	37.62	-0.37	H	37.25	54	16.75	AV
7311	49.55	8.64	H	58.19	74	15.81	PK
7311	36.39	8.64	H	45.03	54	8.97	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	53.60	-0.15	V	53.45	74	20.55	PK
4924	44.85	-0.15	V	44.70	54	9.30	AV
7386	50.19	9.06	V	59.25	74	14.75	PK
7386	37.86	9.06	V	46.92	54	7.08	AV
4924	53.51	-0.15	H	53.36	74	20.64	PK
4924	44.46	-0.15	H	44.31	54	9.69	AV
7386	49.97	9.06	H	59.03	74	14.97	PK
7386	37.86	9.06	H	46.92	54	7.08	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	50.52	-0.15	V	50.37	74	23.63	PK
4924	37.61	-0.15	V	37.46	54	16.54	AV
7386	49.63	9.06	V	58.69	74	15.31	PK
7386	36.35	9.06	V	45.41	54	8.59	AV
4924	50.62	-0.15	H	50.47	74	23.53	PK
4924	37.21	-0.15	H	37.06	54	16.94	AV
7386	49.73	9.06	H	58.79	74	15.21	PK
7386	36.55	9.06	H	45.61	54	8.39	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	50.33	-0.15	V	50.18	74	23.82	PK
4924	37.64	-0.15	V	37.49	54	16.51	AV
7386	49.61	9.06	V	58.67	74	15.33	PK
7386	36.39	9.06	V	45.45	54	8.55	AV
4924	50.46	-0.15	H	50.31	74	23.69	PK
4924	37.59	-0.15	H	37.44	54	16.56	AV
7386	49.62	9.06	H	58.68	74	15.32	PK
7386	36.41	9.06	H	45.47	54	8.53	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	50.61	-0.72	V	49.89	74	24.11	PK
4844	38.02	-0.72	V	37.3	54	16.70	AV
7266	49.35	9.95	V	59.3	74	14.70	PK
7266	36.72	9.95	V	46.67	54	7.33	AV
4824	50.10	-0.72	H	49.38	74	24.62	PK
4824	37.66	-0.72	H	36.94	54	17.06	AV
7236	48.84	9.95	H	58.79	74	15.21	PK
7236	36.68	9.95	H	46.63	54	7.37	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	50.46	-0.37	V	50.09	74	23.91	PK
4874	37.82	-0.37	V	37.45	54	16.55	AV
7311	48.68	8.64	V	57.32	74	16.68	PK
7311	36.74	8.64	V	45.38	54	8.62	AV
4874	50.28	-0.37	H	49.91	74	24.09	PK
4874	37.68	-0.37	H	37.31	54	16.69	AV
7311	49.45	8.64	H	58.09	74	15.91	PK
7311	36.65	8.64	H	45.29	54	8.71	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	50.38	-0.10	V	50.28	74	23.72	PK
4904	37.91	-0.10	V	37.81	54	16.19	AV
7356	48.75	9.00	V	57.75	74	16.25	PK
7356	36.35	9.00	V	45.35	54	8.65	AV
4924	50.45	-0.10	H	50.35	74	23.65	PK
4924	37.72	-0.10	H	37.62	54	16.38	AV
7386	48.83	9.00	H	57.83	74	16.17	PK
7386	36.58	9.00	H	45.58	54	8.42	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	32.27	33.90	H	66.17	74	7.83	PK
2390.0	15.70	33.90	H	49.60	54	4.40	AV
2390.0	30.04	33.90	V	63.94	74	10.06	PK
2390.0	15.25	33.90	V	49.15	54	4.85	AV
2483.5	30.51	33.99	H	64.50	74	9.50	PK
2483.5	15.45	33.99	H	49.44	54	4.56	AV
2483.5	29.58	33.99	V	63.57	74	10.43	PK
2483.5	14.58	33.99	V	48.57	54	5.43	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	25.53	33.90	H	59.43	74	14.57	PK
2390.0	15.45	33.90	H	49.35	54	4.65	AV
2390.0	25.76	33.90	V	59.66	74	14.34	PK
2390.0	14.52	33.90	V	48.42	54	5.58	AV
2483.5	26.58	33.99	H	60.57	74	13.43	PK
2483.5	15.55	33.99	H	49.54	54	4.46	AV
2483.5	26.05	33.99	V	60.04	74	13.96	PK
2483.5	15.53	33.99	V	49.52	54	4.48	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	29.44	33.90	H	63.34	74	10.66	PK
2390.0	16.23	33.90	H	50.13	54	3.87	AV
2390.0	29.96	33.90	V	63.86	74	10.14	PK
2390.0	15.62	33.90	V	49.52	54	4.48	AV
2483.5	30.31	33.99	H	64.30	74	9.70	PK
2483.5	16.32	33.99	H	50.31	54	3.69	AV
2483.5	30.04	33.99	V	64.03	74	9.97	PK
2483.5	15.81	33.99	V	49.80	54	4.20	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	30.34	33.90	H	64.24	74	9.76	PK
2390.0	17.09	33.90	H	50.99	54	3.01	AV
2390.0	29.87	33.90	V	63.77	74	10.23	PK
2390.0	16.86	33.90	V	50.76	54	3.24	AV
2483.5	30.46	33.99	H	64.45	74	9.55	PK
2483.5	17.00	33.99	H	50.99	54	3.01	AV
2483.5	28.41	33.99	V	62.40	74	11.60	PK
2483.5	16.86	33.99	V	50.85	54	3.15	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.**
4. **Spectrum Setting**

- Peak

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

RBW = cf. Table 1.

VBW ≥ 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 ≥ 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 ≥3 x RBW.

Detector = RMS, if span/(# of points in sweep) ≤ (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).

3) As an alternative, the detector and averaging type may be set for linear voltage averaging.
4) 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 ≥ 98 percent) cannot be achieved and the duty cycle is not constant (i.e., duty cycle variations exceed ± 2 percent), then the following procedure shall be used:

Set RBW = 1 MHz.

Set VBW ≥ 1/T.

Video bandwidth mode or display mode

3) 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).
4) 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.

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

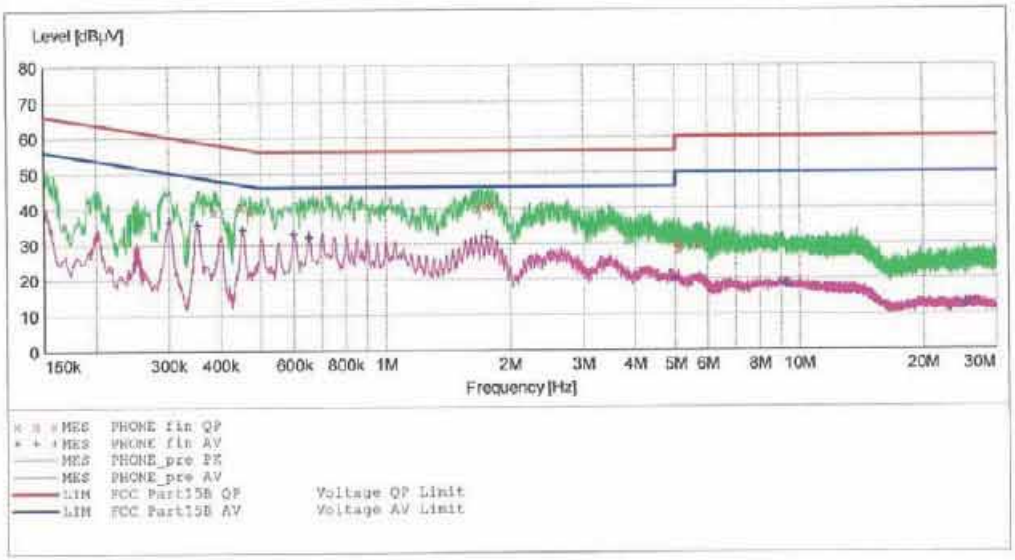
EMC

```
EUT:                    LG-E467f
Manufacturer:           LG
Operating Condition:    WLAN MODE
Test Site:              SHIELD ROOM
Operator:               JS LEE
Test Specification:     FCC PART 15 B
Comment:                H
```

SCAN TABLE: "FCC PART 15 B(H)"

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

4/30/2013 3:07PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.387010	39.30	9.8	58	18.9	---	---
0.450010	40.80	9.8	57	16.1	---	---
0.471010	39.20	9.8	57	17.3	---	---
1.676000	40.10	9.9	56	15.9	---	---
1.764000	40.90	9.9	56	15.1	---	---
1.808000	41.00	9.9	56	15.0	---	---
5.072000	29.70	10.2	60	30.3	---	---
5.120000	28.40	10.2	60	31.6	---	---
5.660000	29.30	10.2	60	30.7	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

4/30/2013 3:07PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.301010	36.70	9.7	50	13.5	---	---
0.352010	35.60	9.7	49	13.4	---	---
0.453010	34.00	9.8	47	12.9	---	---
0.600000	32.90	9.8	46	13.1	---	---
0.652000	31.90	9.8	46	14.1	---	---
1.756000	31.70	9.9	46	14.3	---	---
5.000000	20.10	10.2	46	25.9	---	---
9.292000	18.30	10.4	50	31.7	---	---
25.280000	12.70	12.0	50	37.3	---	---

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Conducted Emissions (Line 2)

HCT

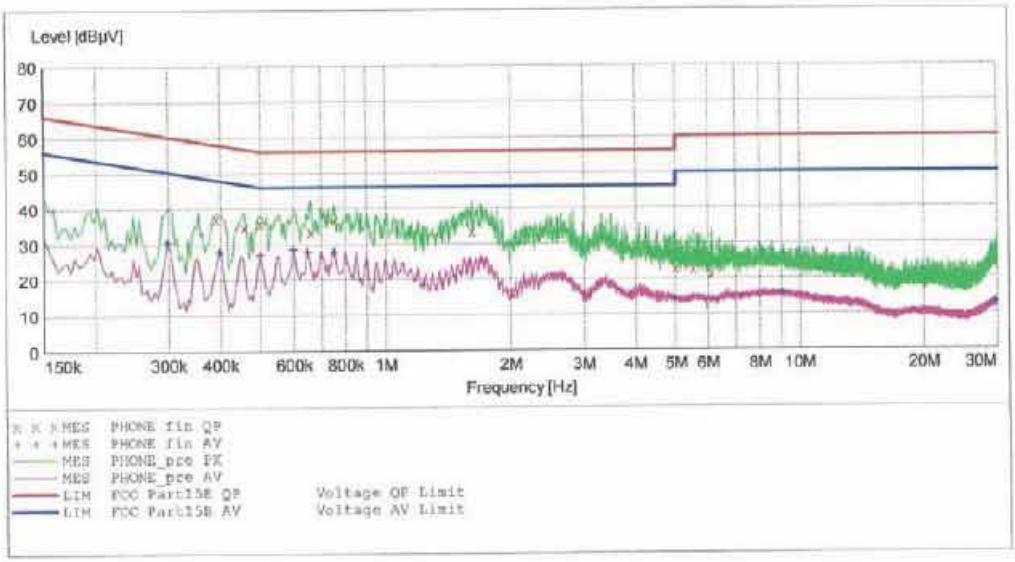
EMC

EUT: LG-E467f
Manufacturer: LG
Operating Condition: WLAN MODE
Test Site: SHIELD ROOM
Operator: JS LEE
Test Specification: FCC PART 15 CLASS B
Comment: N

SCAN TABLE: "FCC PART 15 B(N)"

Short Description: FCC PART 15 CLASS B

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



MEASUREMENT RESULT: "PHONE_fin QP"

4/30/2013 3:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.390010	37.20	10.0	58	20.9	---	---
0.458010	34.70	10.0	57	22.0	---	---
0.498010	35.80	10.0	56	20.2	---	---
0.660000	33.50	10.0	56	22.5	---	---
0.752000	36.70	10.0	56	19.3	---	---
1.620000	33.30	10.1	56	22.7	---	---
5.000000	22.60	10.4	56	33.4	---	---
5.524000	22.60	10.4	60	37.4	---	---
6.120000	21.30	10.4	60	38.7	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

4/30/2013 3:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.298010	30.40	9.9	50	19.9	---	---
0.398010	27.90	10.0	48	20.0	---	---
0.498010	26.90	10.0	46	19.1	---	---
0.600000	28.50	10.0	46	17.5	---	---
0.648000	27.70	10.0	46	18.3	---	---
0.752000	27.90	10.0	46	18.1	---	---
5.000000	14.10	10.4	46	31.9	---	---
9.116000	15.60	10.6	50	34.4	---	---
29.532000	12.60	12.7	50	37.4	---	---

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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	05/21/2013	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
Hewlett Packard	11667B / Power Splitter	Annual	06/05/2013	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
MITEQ	AMF-6D-001180-35-20P/ POWER AMP	Annual	07/30/2013	990893
Agilent	8493C / Attenuator(10 dB)	Annual	07/30/2013	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617
CERNEX	CBLU1183540 / POWER AMP	Annual	07/27/2013	21691