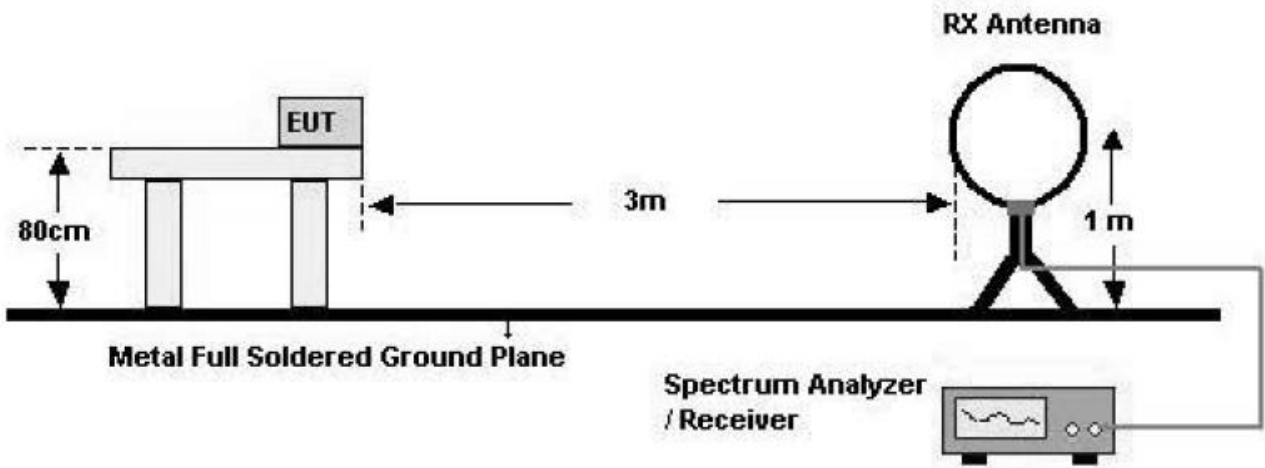
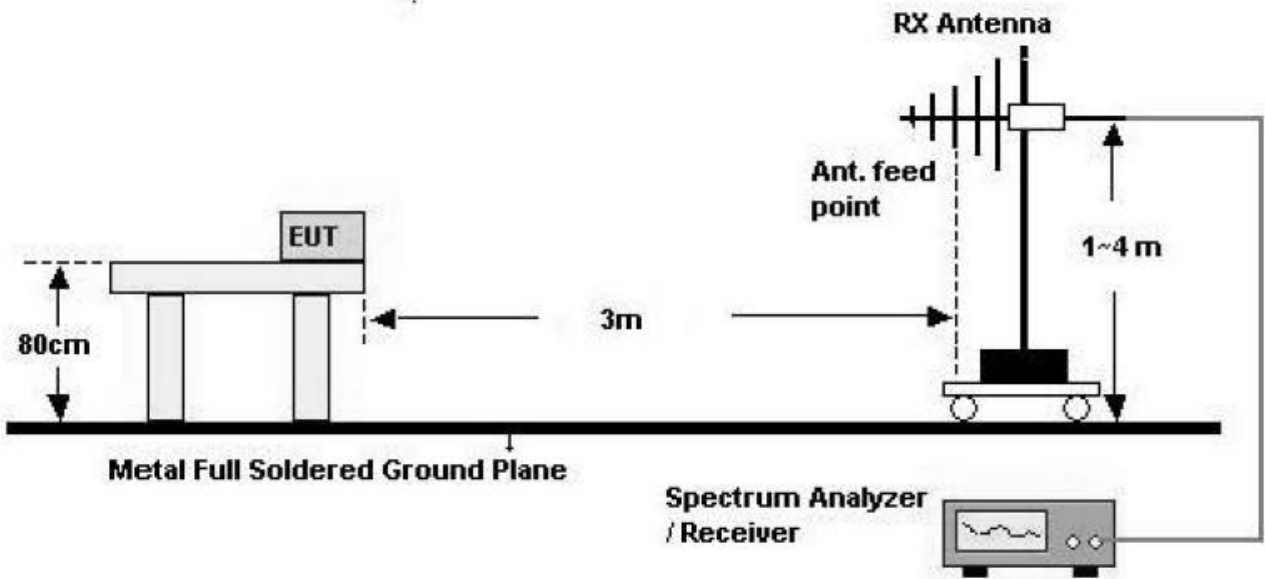


Test Configuration

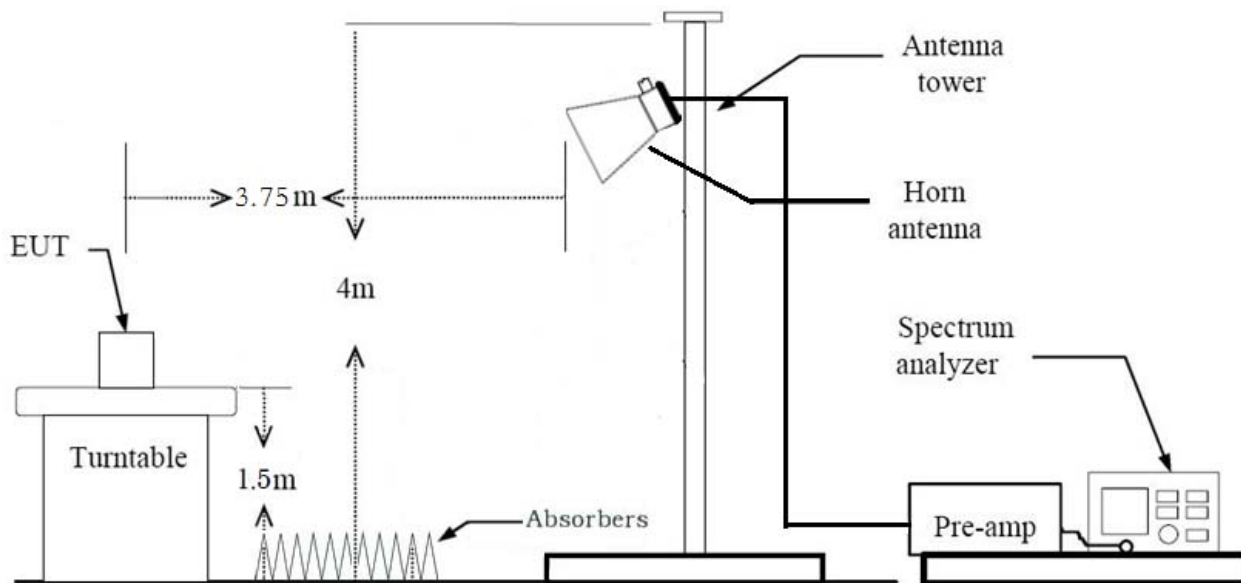
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

Method 12.2.4 in KDB 558074 v04

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 (duty cycle \geq 98%)

Set RBW = 1 MHz

Set VBW \geq 3 x RBW

Detector = RMS

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

Sweep time = auto.

Trace mode = average (at least 100 traces).

- Average (duty cycle < 98%, duty cycle variations are less than $\pm 2\%$)

Set RBW = 1 MHz

Set VBW \geq 3 x RBW

Detector = RMS.

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

Sweep time = auto.

Trace mode = average (at least 100 traces).

A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.

Note :

1. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).

2. The duty cycle factor for 802.11 b/g/n_HT20, 40

Mode	Worst Data rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
b	1	12.418	13.079	94.94	0.225
g	6	2.063	2.171	95.01	0.222
n_HT20	MCS 0	1.924	2.021	95.17	0.215
n_HT40	MCS 0	0.944	1.043	90.51	0.433

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.
6. The test results for below 30 MHz is correlated to an open site.
The result on OATS is about 2 dB higher than semi-anechoic chamber (10 m chamber)

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]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	56.62	0.12	V	56.74	73.98	17.24	PK
4824	50.11	0.12	V	50.23	53.98	3.75	AV
7236	50.64	6.42	V	57.06	73.98	16.92	PK
7236	39.00	6.42	V	45.42	53.98	8.56	AV
4824	55.76	0.12	H	55.88	73.98	18.10	PK
4824	49.84	0.12	H	49.96	53.98	4.02	AV
7236	49.69	6.42	H	56.11	73.98	17.87	PK
7236	38.27	6.42	H	44.69	53.98	9.29	AV

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

Frequency [MHz]	Reading [dBuV]	Ducy Cycle Factor [dB]	A.F.+C.L.-A.G.+D,F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	64.87	0.00	0.12	V	64.99	73.98	8.99	PK
4824	50.47	0.23	0.12	V	50.82	53.98	3.17	AV
7236	51.91	0.00	6.42	V	58.33	73.98	15.65	PK
7236	39.61	0.23	6.42	V	46.26	53.98	7.72	AV
4824	63.99	0.00	0.12	H	64.11	73.98	9.87	PK
4824	49.84	0.23	0.12	H	50.19	53.98	3.79	AV
7236	50.88	0.00	6.42	H	57.30	73.98	16.68	PK
7236	38.12	0.23	6.42	H	44.77	53.98	9.22	AV

Operation Mode: 802.11 n_HT20

Transfer MCS Index: 0

Operating Frequency: 2412

Channel No.: 01 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D,F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	63.58	0.00	0.12	V	63.70	73.98	10.28	PK
4824	48.55	0.22	0.12	V	48.89	53.98	5.09	AV
7236	51.31	0.00	6.42	V	57.73	73.98	16.25	PK
7236	39.54	0.22	6.42	V	46.18	53.98	7.80	AV
4824	62.54	0.00	0.12	H	62.66	73.98	11.32	PK
4824	47.27	0.22	0.12	H	47.61	53.98	6.37	AV
7236	50.84	0.00	6.42	H	57.26	73.98	16.72	PK
7236	38.94	0.22	6.42	H	45.58	53.98	8.40	AV

Operation Mode: 802.11 n_HT40

Transfer MCS Index: 0

Operating Frequency: 2422

Channel No.: 03 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D,F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4844	57.56	0.00	0.16	V	57.72	73.98	16.26	PK
4844	43.97	0.41	0.16	V	44.54	53.98	9.44	AV
7266	51.99	0.00	6.47	V	58.46	73.98	15.53	PK
7266	39.18	0.41	6.47	V	46.06	53.98	7.92	AV
4844	56.76	0.00	0.16	H	56.92	73.98	17.06	PK
4844	42.88	0.41	0.16	H	43.45	53.98	10.53	AV
7266	51.08	0.00	6.47	H	57.55	73.98	16.44	PK
7266	38.55	0.41	6.47	H	45.43	53.98	8.55	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

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. Duty cycle factor applies only below 98%.
5. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor(802.11b)
6. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
+ Duty Cycle Factor(802.11g/n_HT20, 40)
7. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
8. 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]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	56.31	0.62	V	56.93	73.98	17.05	PK
4874	50.33	0.62	V	50.95	53.98	3.03	AV
7311	50.26	5.56	V	55.82	73.98	18.17	PK
7311	38.53	5.56	V	44.09	53.98	9.90	AV
4874	55.44	0.62	H	56.06	73.98	17.92	PK
4874	49.96	0.62	H	50.58	53.98	3.40	AV
7311	49.87	5.56	H	55.43	73.98	18.56	PK
7311	37.59	5.56	H	43.15	53.98	10.84	AV

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

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	63.57	0.00	0.62	V	64.19	73.98	9.79	PK
4874	49.64	0.23	0.62	V	50.49	53.98	3.50	AV
7311	52.09	0.00	5.56	V	57.65	73.98	16.34	PK
7311	39.47	0.23	5.56	V	45.25	53.98	8.73	AV
4874	62.51	0.00	0.62	H	63.13	73.98	10.85	PK
4874	48.87	0.23	0.62	H	49.72	53.98	4.27	AV
7311	51.49	0.00	5.56	H	57.05	73.98	16.94	PK
7311	38.12	0.23	5.56	H	43.90	53.98	10.08	AV

Operation Mode: 802.11 n_HT20
 Transfer MCS Index: 0
 Operating Frequency 2437
 Channel No. 06 Ch

Frequency [MHz]	Reading [dBuV]	Ducy Cycle Factor [dB]	A.F.+C.L.-A.G.+D,F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	63.57	0.00	0.62	V	64.19	73.98	9.79	PK
4874	48.56	0.22	0.62	V	49.40	53.98	4.58	AV
7311	50.37	0.00	5.56	V	55.93	73.98	18.06	PK
7311	39.49	0.22	5.56	V	45.26	53.98	8.72	AV
4874	62.51	0.00	0.62	H	63.13	73.98	10.85	PK
4874	47.55	0.22	0.62	H	48.39	53.98	5.59	AV
7311	49.86	0.00	5.56	H	55.42	73.98	18.57	PK
7311	38.47	0.22	5.56	H	44.24	53.98	9.74	AV

Operation Mode: 802.11 n_HT40
 Transfer MCS Index: 0
 Operating Frequency 2437
 Channel No. 06 Ch

Frequency [MHz]	Reading [dBuV]	Ducy Cycle Factor [dB]	A.F.+C.L.-A.G.+D,F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	56.68	0.00	0.62	V	57.30	73.98	16.68	PK
4874	42.65	0.41	0.62	V	43.68	53.98	10.30	AV
7311	51.56	0.00	5.56	V	57.12	73.98	16.87	PK
7311	38.81	0.41	5.56	V	44.78	53.98	9.20	AV
4874	55.49	0.00	0.62	H	56.11	73.98	17.87	PK
4874	41.50	0.41	0.62	H	42.53	53.98	11.45	AV
7311	50.67	0.00	5.56	H	56.23	73.98	17.76	PK
7311	37.84	0.41	5.56	H	43.81	53.98	10.17	AV

* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

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. Duty cycle factor applies only below 98%.
5. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor(802.11b)
6. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
+ Duty Cycle Factor(802.11g/n_HT20, 40)
7. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
8. 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]	A.F.+C.L.-A.G.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	56.02	0.53	V	56.55	73.98	17.43	PK
4924	50.19	0.53	V	50.72	53.98	3.26	AV
7386	50.74	7.03	V	57.77	73.98	16.21	PK
7386	39.43	7.03	V	46.46	53.98	7.52	AV
4924	55.88	0.53	H	56.41	73.98	17.57	PK
4924	49.45	0.53	H	49.98	53.98	4.00	AV
7386	50.07	7.03	H	57.10	73.98	16.88	PK
7386	38.49	7.03	H	45.52	53.98	8.46	AV

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

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G.+D.F., [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	64.05	0.00	0.53	V	64.58	73.98	9.40	PK
4924	50.00	0.23	0.53	V	50.76	53.98	3.22	AV
7386	51.75	0.00	7.03	V	58.78	73.98	15.20	PK
7386	39.50	0.23	7.03	V	46.76	53.98	7.22	AV
4924	63.51	0.00	0.53	H	64.04	73.98	9.94	PK
4924	49.70	0.23	0.53	H	50.46	53.98	3.52	AV
7386	50.82	0.00	7.03	H	57.85	73.98	16.13	PK
7386	38.91	0.23	7.03	H	46.17	53.98	7.82	AV

Operation Mode: 802.11 n_HT20
 Transfer MCS Index: 0
 Operating Frequency 2462
 Channel No. 11 Ch

Frequency [MHz]	Reading [dBuV]	Ducy Cycle Factor [dB]	A.F.+C.L.-A.G.+D,F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	63.24	0.00	0.53	V	63.77	73.98	10.21	PK
4924	46.19	0.22	0.53	V	46.94	53.98	7.04	AV
7386	50.77	0.00	7.03	V	57.80	73.98	16.18	PK
7386	39.59	0.22	7.03	V	46.84	53.98	7.14	AV
4924	62.70	0.00	0.53	H	63.23	73.98	10.75	PK
4924	45.16	0.22	0.53	H	45.91	53.98	8.07	AV
7386	49.85	0.00	7.03	H	56.88	73.98	17.10	PK
7386	38.64	0.22	7.03	H	45.89	53.98	8.09	AV

Operation Mode: 802.11 n_HT40
 Transfer MCS Index: 0
 Operating Frequency 2452
 Channel No. 9 Ch

Frequency [MHz]	Reading [dBuV]	Ducy Cycle Factor [dB]	A.F.+C.L.-A.G.+D,F, [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4904	55.92	0.00	0.41	V	56.33	73.98	17.65	PK
4904	43.87	0.41	0.41	V	44.69	53.98	9.29	AV
7356	50.18	0.00	6.96	V	57.14	73.98	16.84	PK
7356	38.23	0.41	6.96	V	45.60	53.98	8.38	AV
4904	54.78	0.00	0.41	H	55.19	73.98	18.79	PK
4904	42.59	0.41	0.41	H	43.41	53.98	10.57	AV
7356	49.71	0.00	6.96	H	56.67	73.98	17.31	PK
7356	37.22	0.41	6.96	H	44.59	53.98	9.39	AV

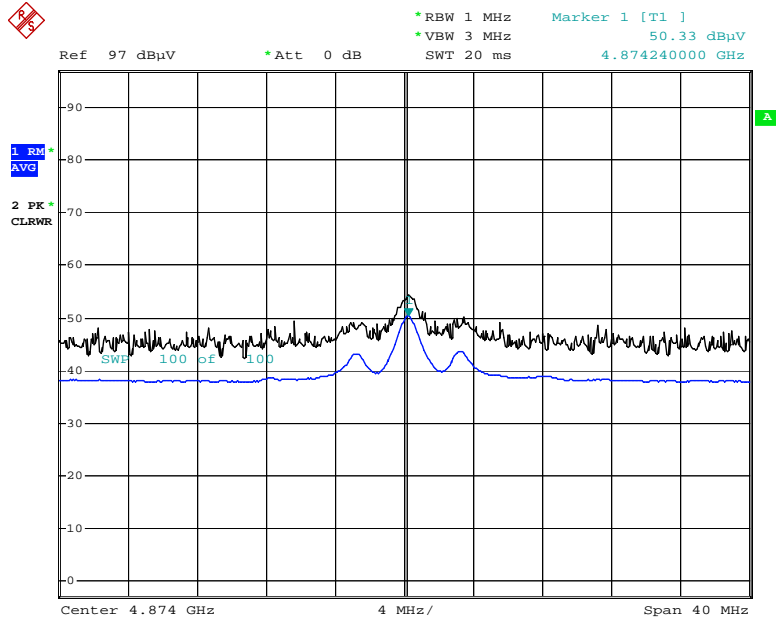
* A.F.: Ant. Factor / C.L.: Cable Loss / A.G.: Amp. Gain / D.F: Distance Factor

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. Duty cycle factor applies only below 98%.
5. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor(802.11b)
6. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor
+ Duty Cycle Factor(802.11g/n_HT20, 40)
7. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
8. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

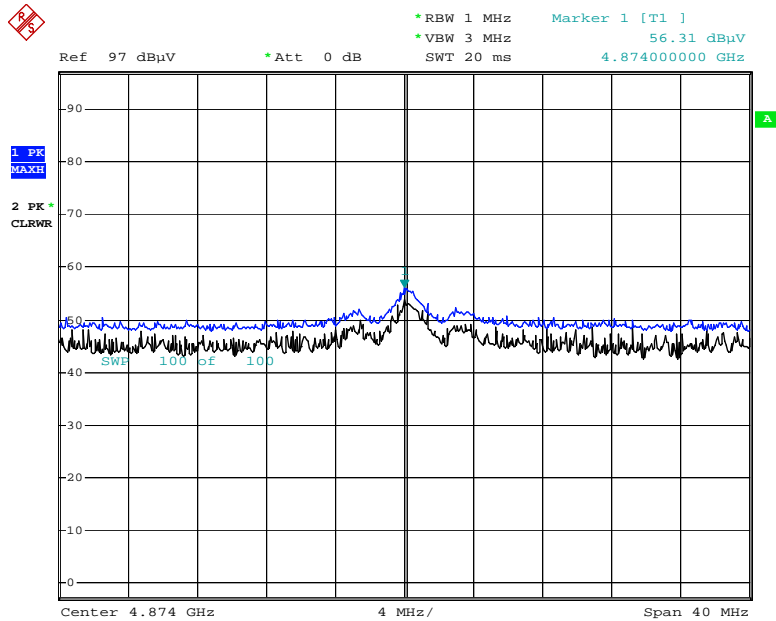
■ **RESULT PLOTS (Worst Case: V) _MIMO**

Radiated Spurious Emissions plot – Average Reading (802.11b, Ch.6 2nd Harmonic)



Date: 4.APR.2018 09:44:50

Radiated Spurious Emissions plot – Peak Reading (802.11b, Ch.6 2nd Harmonic)



Date: 4.APR.2018 09:39:36

Note : Only the worst case plots for Radiated Spurious Emissions.

9.6.2 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]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	30.29	0.00	34.42	H	64.71	73.98	9.27	PK
2390.0	17.00	0.23	34.42	H	51.65	53.98	2.33	AV
2390.0	31.39	0.00	34.42	V	65.81	73.98	8.17	PK
2390.0	17.31	0.23	34.42	V	51.96	53.98	2.03	AV
2483.5	31.50	0.00	33.59	H	65.09	73.98	8.89	PK
2483.5	17.09	0.23	33.59	H	50.91	53.98	3.08	AV
2483.5	32.58	0.00	33.59	V	66.17	73.98	7.81	PK
2483.5	17.67	0.23	33.59	V	51.49	53.98	2.49	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]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	26.99	34.42	H	61.41	73.98	12.57	PK
2390.0	16.88	34.42	H	51.30	53.98	2.68	AV
2390.0	27.68	34.42	V	62.10	73.98	11.88	PK
2390.0	17.45	34.42	V	51.87	53.98	2.11	AV
2483.5	26.57	33.59	H	60.16	73.98	13.82	PK
2483.5	17.21	33.59	H	50.80	53.98	3.18	AV
2483.5	27.07	33.59	V	60.66	73.98	13.32	PK
2483.5	17.31	33.59	V	50.90	53.98	3.08	AV

Operation Mode: 802.11n_HT20
 Transfer MCS Index: 0
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No.: 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	28.69	0.00	34.42	H	63.11	73.98	10.87	PK
2390.0	16.87	0.22	34.42	H	51.51	53.98	2.47	AV
2390.0	29.30	0.00	34.42	V	63.72	73.98	10.26	PK
2390.0	17.20	0.22	34.42	V	51.84	53.98	2.14	AV
2483.5	35.44	0.00	33.59	H	69.03	73.98	4.95	PK
2483.5	16.57	0.22	33.59	H	50.38	53.98	3.60	AV
2483.5	36.37	0.00	33.59	V	69.96	73.98	4.02	PK
2483.5	16.94	0.22	33.59	V	50.75	53.98	3.23	AV

Operation Mode: 802.11n_HT40
 Transfer MCS Index: 0
 Operating Frequency 2422 MHz, 2452 MHz
 Channel No. 03 Ch, 9 Ch

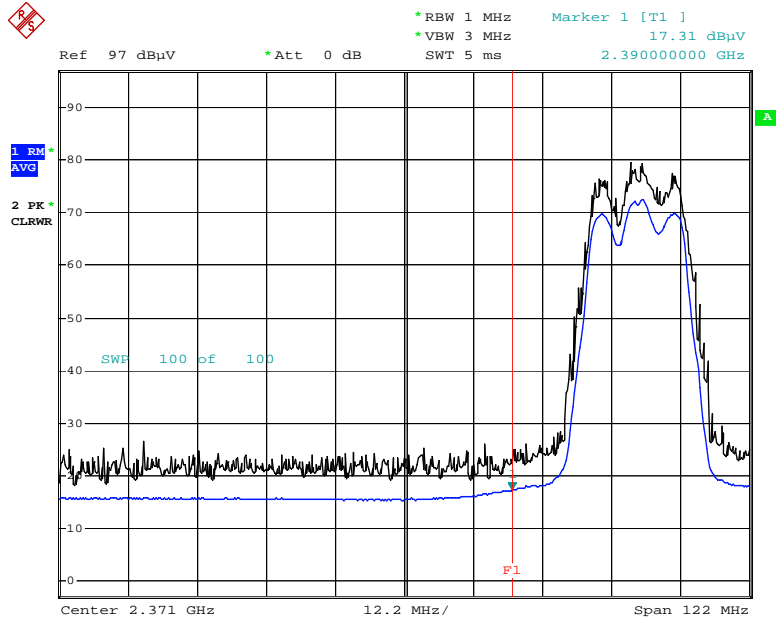
Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	26.97	0.00	34.42	H	61.39	73.98	12.59	PK
2390.0	16.86	0.41	34.42	H	51.69	53.98	2.29	AV
2390.0	27.95	0.00	34.42	V	62.37	73.98	11.61	PK
2390.0	17.09	0.41	34.42	V	51.92	53.98	2.06	AV
2483.5	30.81	0.00	33.59	H	64.40	73.98	9.58	PK
2483.5	17.29	0.41	33.59	H	51.29	53.98	2.69	AV
2483.5	31.45	0.00	33.59	V	65.04	73.98	8.94	PK
2483.5	17.84	0.41	33.59	V	51.84	53.98	2.14	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss +Distance Factor +
Duty Cycle Factor(802.11g, n_HT20, 40)
2. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Distance Factor(802.11b)
3. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

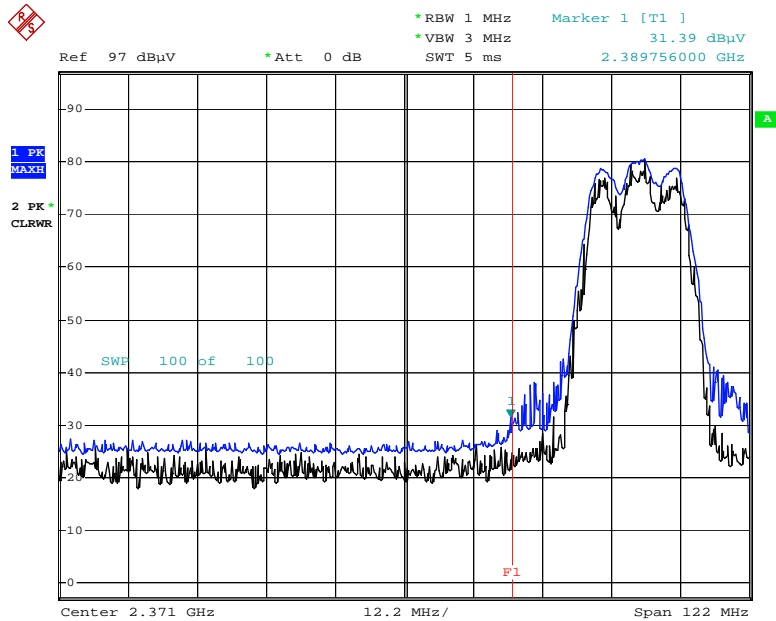
■ **RESULT PLOTS(Worst Case: V)_MIMO**

Radiated Restricted Band Edges plot – Average Reading (802.11g, Ch.1)



Date: 4.APR.2018 08:27:39

Radiated Restricted Band Edges plot – Peak Reading (802.11g, Ch.1)



Date: 4.APR.2018 09:51:56

Note : Only the worst case plots for Radiated Restricted Band Edges.

9.7 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 (dB μ V)	
	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 worst data rate, channel, operation mode.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

■ **RESULT PLOTS**

Conducted Emissions (Line 1)

EMI Auto Test(21)

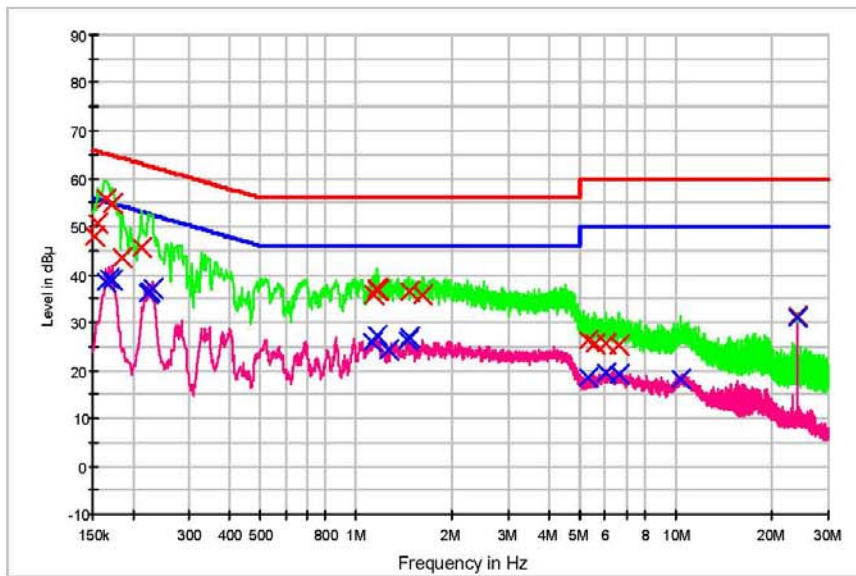
1 / 2

HCT TEST Report

Common Information

EUT: AR4520
 Manufacturer: 가온미디어
 Test Site: SHIELD ROOM
 Operating Conditions: WLAN 2.4G MODE

FCC CLASS B



— FCC CLASS B_OP — FCC CLASS B_AV — Preview Result 1-PK+
— Preview Result 2-AVG X Final Result 1-QPK X Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	48.0	9.000	Off	N	9.6	17.9	65.9
0.156000	50.5	9.000	Off	N	9.6	15.1	65.7
0.164000	55.7	9.000	Off	N	9.6	9.6	65.3
0.172000	54.8	9.000	Off	N	9.6	10.1	64.9
0.186000	43.5	9.000	Off	N	9.6	20.7	64.2
0.212000	45.5	9.000	Off	N	9.6	17.6	63.1
1.136000	35.9	9.000	Off	N	9.7	20.1	56.0
1.156000	36.7	9.000	Off	N	9.7	19.3	56.0
1.160000	37.2	9.000	Off	N	9.7	18.8	56.0
1.174000	36.7	9.000	Off	N	9.7	19.3	56.0
1.464000	36.4	9.000	Off	N	9.7	19.6	56.0
1.618000	35.8	9.000	Off	N	9.7	20.2	56.0
5.300000	26.1	9.000	Off	N	9.9	33.9	60.0
5.590000	25.6	9.000	Off	N	9.9	34.4	60.0
6.036000	25.7	9.000	Off	N	9.9	34.3	60.0
6.060000	25.7	9.000	Off	N	9.9	34.3	60.0
6.650000	25.1	9.000	Off	N	9.9	34.9	60.0
24.000000	31.3	9.000	Off	N	10.2	28.7	60.0

2018-04-14

오전 10:59:07

EMI Auto Test(21)

2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.164000	38.4	9.000	Off	N	9.6	16.9	55.3
0.168000	39.2	9.000	Off	N	9.6	15.9	55.1
0.172000	38.9	9.000	Off	N	9.6	15.9	54.9
0.222000	36.0	9.000	Off	N	9.6	16.8	52.7
0.226000	36.5	9.000	Off	N	9.6	16.1	52.6
0.230000	37.0	9.000	Off	N	9.6	15.5	52.4
1.116000	26.0	9.000	Off	N	9.7	20.0	46.0
1.160000	27.2	9.000	Off	N	9.7	18.8	46.0
1.164000	27.1	9.000	Off	N	9.7	18.9	46.0
1.258000	24.1	9.000	Off	N	9.7	21.9	46.0
1.450000	26.3	9.000	Off	N	9.7	19.7	46.0
1.464000	26.9	9.000	Off	N	9.7	19.1	46.0
5.296000	18.6	9.000	Off	N	9.9	31.4	50.0
6.060000	19.5	9.000	Off	N	9.9	30.5	50.0
6.074000	19.5	9.000	Off	N	9.9	30.5	50.0
6.650000	19.2	9.000	Off	N	9.9	30.8	50.0
10.296000	18.3	9.000	Off	N	10.0	31.7	50.0
24.000000	31.0	9.000	Off	N	10.2	19.0	50.0

2018-04-14

오전 10:59:07

Conducted Emissions (Line 2)

EMI Auto Test(21)

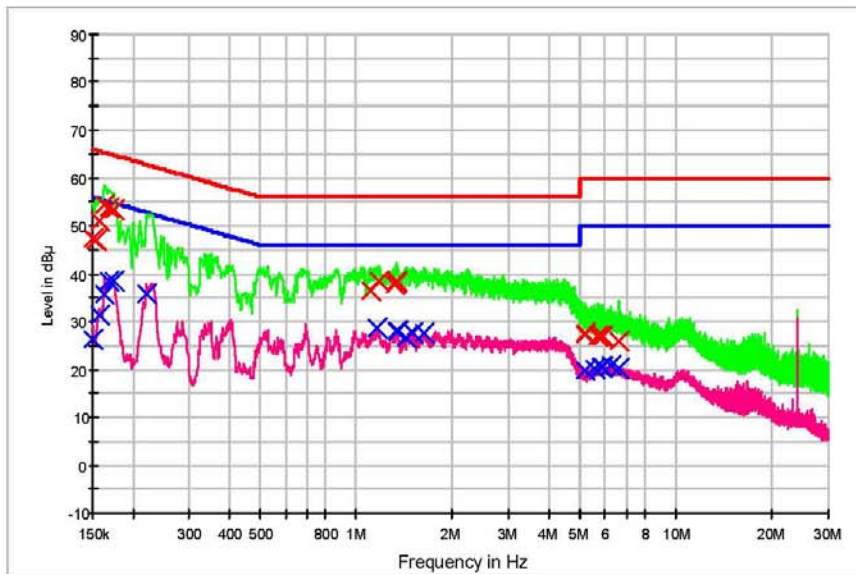
1 / 2

HCT TEST Report

Common Information

EUT: AR4520
 Manufacturer: 가우미디어
 Test Site: SHIELD ROOM
 Operating Conditions: WLAN 2.4G MODE

FCC CLASS B



— FCC CLASS B_OP — FCC CLASS B_AV
— Preview Result 2-AVG X Final Result 1-QPK
— Preview Result 1-PK+ X Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	47.2	9.000	Off	L1	9.6	18.8	66.0
0.154000	47.0	9.000	Off	L1	9.6	18.8	65.8
0.158000	51.2	9.000	Off	L1	9.6	14.4	65.6
0.162000	54.3	9.000	Off	L1	9.6	11.1	65.4
0.168000	53.8	9.000	Off	L1	9.6	11.2	65.1
0.174000	53.5	9.000	Off	L1	9.6	11.2	64.8
1.102000	36.6	9.000	Off	L1	9.7	19.4	56.0
1.172000	38.5	9.000	Off	L1	9.7	17.5	56.0
1.176000	38.3	9.000	Off	L1	9.7	17.7	56.0
1.324000	37.9	9.000	Off	L1	9.7	18.1	56.0
1.338000	38.4	9.000	Off	L1	9.7	17.6	56.0
1.342000	38.2	9.000	Off	L1	9.7	17.8	56.0
5.186000	27.5	9.000	Off	L1	9.8	32.5	60.0
5.220000	27.3	9.000	Off	L1	9.8	32.7	60.0
5.730000	26.9	9.000	Off	L1	9.9	33.1	60.0
5.854000	26.9	9.000	Off	L1	9.9	33.1	60.0
5.932000	27.0	9.000	Off	L1	9.9	33.0	60.0
6.636000	26.0	9.000	Off	L1	9.9	34.0	60.0

2018-04-14

오전 11:11:25

EMI Auto Test(21)

2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	26.2	9.000	Off	L1	9.6	29.8	56.0
0.158000	31.3	9.000	Off	L1	9.6	24.2	55.6
0.162000	35.6	9.000	Off	L1	9.6	19.7	55.4
0.168000	38.5	9.000	Off	L1	9.6	16.6	55.1
0.174000	38.4	9.000	Off	L1	9.6	16.3	54.8
0.220000	35.9	9.000	Off	L1	9.6	16.9	52.8
1.168000	28.5	9.000	Off	L1	9.7	17.5	46.0
1.336000	27.8	9.000	Off	L1	9.7	18.2	46.0
1.346000	27.9	9.000	Off	L1	9.7	18.1	46.0
1.436000	26.7	9.000	Off	L1	9.7	19.3	46.0
1.502000	27.6	9.000	Off	L1	9.7	18.4	46.0
1.628000	27.8	9.000	Off	L1	9.7	18.2	46.0
5.188000	19.8	9.000	Off	L1	9.8	30.2	50.0
5.564000	20.2	9.000	Off	L1	9.8	29.8	50.0
5.854000	20.5	9.000	Off	L1	9.9	29.5	50.0
5.932000	20.6	9.000	Off	L1	9.9	29.4	50.0
6.258000	20.8	9.000	Off	L1	9.9	29.2	50.0
6.636000	20.3	9.000	Off	L1	9.9	29.7	50.0

2018-04-14

오전 11:11:25

10. LIST OF TEST EQUIPMENT

10.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/20/2017	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/27/2017	Annual	100033
ESPAC	SU-642 / Temperature Chamber	03/30/2018	Annual	0093008124
Agilent	N9020A / Signal Analyzer	06/13/2017	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/22/2017	Annual	MY49431210
Agilent	N1911A / Power Meter	04/16/2018	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/16/2018	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/20/2017	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/12/2017	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/30/2017	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	07/10/2017	Annual	07560
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A
Rohde & Schwarz	CBT / Bluetooth Tester	05/16/2017	Annual	100422

10.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	11/21/2017	Biennial	9120D-1191
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/21/2017	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/27/2017	Annual	101068-SZ
Wainwright Instruments	WHKX10-2700-3000-18000-40SS / High Pass Filter	08/01/2017	Annual	4
Wainwright Instruments	WHKX8-6090-7000-18000-40SS / High Pass Filter	07/11/2017	Annual	5
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/30/2017	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2018	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/12/2017	Annual	2
WEINSCHTEL	56-10 / Attenuator(10 dB)	10/13/2017	Annual	72316
CERNEX	CBLU1183540 / Broadband Low Noise Amplifier	01/03/2018	Annual	24613
CERNEX	CBL06185030 / Broadband Low Noise Amplifier	01/03/2018	Annual	24615
CERNEX	CBL18265035 / Power Amplifier	01/10/2018	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/30/2017	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	03/27/2018	Annual	3000C000276