

Ch6

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2379.570	46.34	2.9	32.0	11.53	54.0	7.7	H	155	28
2485.020	46.54	2.9	32.0	11.61	54.0	7.5	H	155	74
4873.500	33.28	-35.5	34.1	34.70	54.0	20.7	H	155	140
7311.000	38.48	-31.6	35.8	34.28	54.0	15.5	H	155	8
9748.500	40.33	-31.3	36.9	34.71	54.0	13.7	H	155	80
12340.500	41.80	-31.6	39.0	34.32	54.0	12.2	H	155	243

Ch11

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2483.600	46.42	2.9	32.0	11.49	54.0	7.6	H	155	24
2483.800	46.42	2.9	32.0	11.49	54.0	7.6	H	155	336
4924.500	33.76	-35.2	34.1	34.83	54.0	20.2	H	155	248
7386.000	38.96	-31.2	35.8	34.39	54.0	15.0	H	155	268
9847.500	41.09	-30.6	37.0	34.64	54.0	12.9	H	155	290
12310.500	41.80	-31.6	39.0	34.39	54.0	12.2	H	155	300

802.11g - Peak

Ch1

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2384.340	62.32	2.9	32.0	27.50	74.0	11.7	H	155	176
2389.156	62.85	2.9	32.0	28.02	74.0	11.2	H	155	198
4824.000	40.10	-35.2	34.1	41.25	74.0	33.9	H	155	220
7236.000	42.97	-32.4	35.8	39.62	74.0	31.0	V	155	242
9648.000	47.00	-30.1	36.8	40.36	74.0	27.0	H	155	66
12060.000	45.23	-31.0	38.9	37.35	74.0	28.8	H	155	88

Ch6

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2348.600	46.94	-27.7	31.9	42.70	74.0	27.1	H	155	22
2523.200	48.03	-26.8	32.0	42.79	74.0	26.0	H	155	66
4874.000	42.58	-35.5	34.1	44.00	74.0	31.4	V	155	132
7311.000	43.24	-31.6	35.8	39.04	74.0	30.8	H	155	0
9748.000	45.78	-31.3	36.9	40.16	74.0	28.2	V	155	88
12185.000	47.49	-29.1	39.0	37.63	74.0	26.5	V	155	242

Ch11

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2484.055	61.22	2.9	32.0	26.29	74.0	12.8	H	155	22
2489.965	60.89	2.9	32.0	25.96	74.0	13.1	H	155	330
4924.000	40.52	-35.2	34.1	41.60	74.0	33.5	H	155	242
7386.000	43.11	-31.2	35.8	38.53	74.0	30.9	V	155	264
9848.000	47.04	-30.5	37.0	40.56	74.0	27.0	V	155	286
12310.000	46.68	-31.6	39.0	39.25	74.0	27.3	V	155	308

802.11n-HT20-Average

Ch1

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2387.400	46.18	2.9	32.0	11.36	54.0	7.8	H	155	268
2389.900	46.26	2.9	32.0	11.43	54.0	7.7	H	155	290
4824.000	33.51	-35.2	34.1	34.66	54.0	20.5	H	155	312
7236.000	37.80	-32.4	35.8	34.45	54.0	16.2	H	155	46
9648.000	41.54	-30.1	36.8	34.90	54.0	12.5	H	155	70
12060.000	41.95	-31.0	38.9	34.07	54.0	12.0	H	155	92

Ch6

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2390.960	46.17	2.9	32.0	11.34	54.0	7.8	H	155	92
2482.510	46.54	2.9	32.0	11.62	54.0	7.5	H	155	115
4873.500	33.26	-35.5	34.1	34.68	54.0	20.7	H	155	135
7311.000	38.53	-31.6	35.8	34.33	54.0	15.5	H	155	156
9748.500	40.38	-31.3	36.9	34.76	54.0	13.6	H	155	180
12184.500	43.96	-29.1	39.0	34.12	54.0	10.0	H	155	204

Ch11

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2486.300	46.37	2.9	32.0	11.44	54.0	7.6	H	155	8
2495.600	46.38	2.9	32.0	11.44	54.0	7.6	H	155	26
4924.500	33.84	-35.2	34.1	34.92	54.0	20.2	H	155	72
7386.000	39.05	-31.2	35.8	34.48	54.0	15.0	H	155	136
9847.500	41.27	-30.6	37.0	34.81	54.0	12.7	H	155	94
12310.500	41.86	-31.6	39.0	34.45	54.0	12.1	H	155	48

802.11n-HT20-Peak

Ch1

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2388.386	61.49	2.9	32.0	26.67	74.0	12.5	H	155	264
2389.086	63.15	2.9	32.0	28.32	74.0	10.9	H	155	286
4824.000	40.88	-35.2	34.1	42.03	74.0	33.1	V	155	308
7236.000	42.91	-32.4	35.8	39.55	74.0	31.1	H	155	44
9648.000	46.59	-30.1	36.8	39.95	74.0	27.4	H	155	66
12060.000	45.91	-31.0	38.9	38.02	74.0	28.1	V	155	88

Ch6

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2344.800	47.41	-27.7	31.9	43.12	74.0	26.6	H	155	88
2534.400	47.74	-26.8	32.0	42.51	74.0	26.3	H	155	110
4874.000	42.18	-35.5	34.1	43.60	74.0	31.8	H	155	132
7311.000	43.05	-31.6	35.8	38.85	74.0	31.0	V	155	154
9748.000	45.88	-31.3	36.9	40.26	74.0	28.1	V	155	176
12185.000	46.88	-29.1	39.0	37.03	74.0	27.1	H	155	198

Ch11

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)	Antenna Height (cm)	Turntable angle (deg)
2483.580	61.04	2.9	32.0	26.12	74.0	13.0	H	155	0
2484.520	61.03	2.9	32.0	26.10	74.0	13.0	H	155	22
4924.000	41.08	-35.2	34.1	42.15	74.0	32.9	H	155	66
7386.000	43.41	-31.2	35.8	38.84	74.0	30.6	V	155	132
9848.000	47.48	-30.5	37.0	41.00	74.0	26.5	H	155	88
12310.000	43.58	-31.6	39.0	36.15	74.0	30.4	V	155	44

Test graphs as below:

Full Spectrum

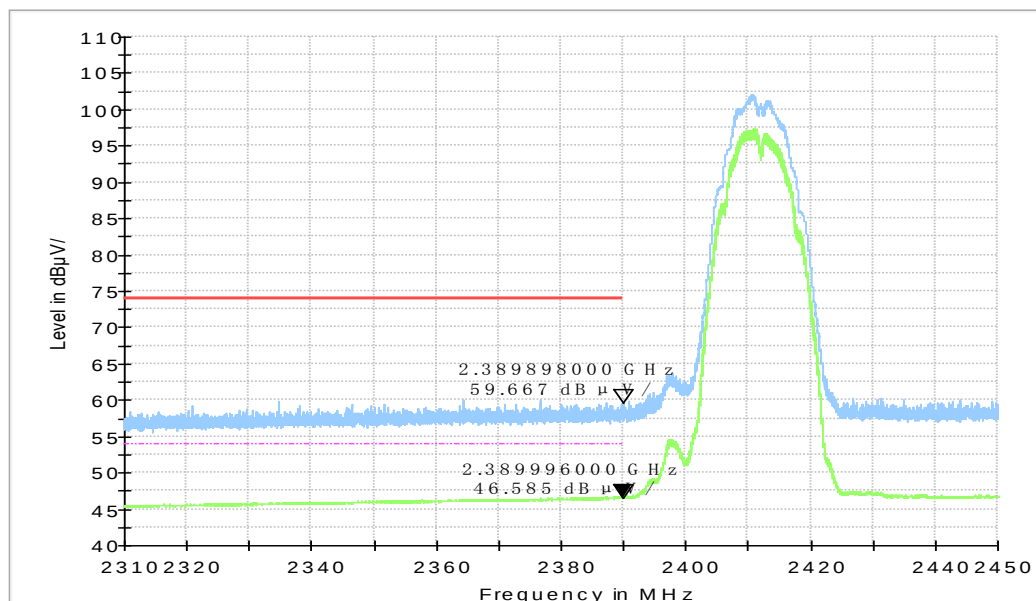


Fig.A.6.2.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.43GHz

Full Spectrum

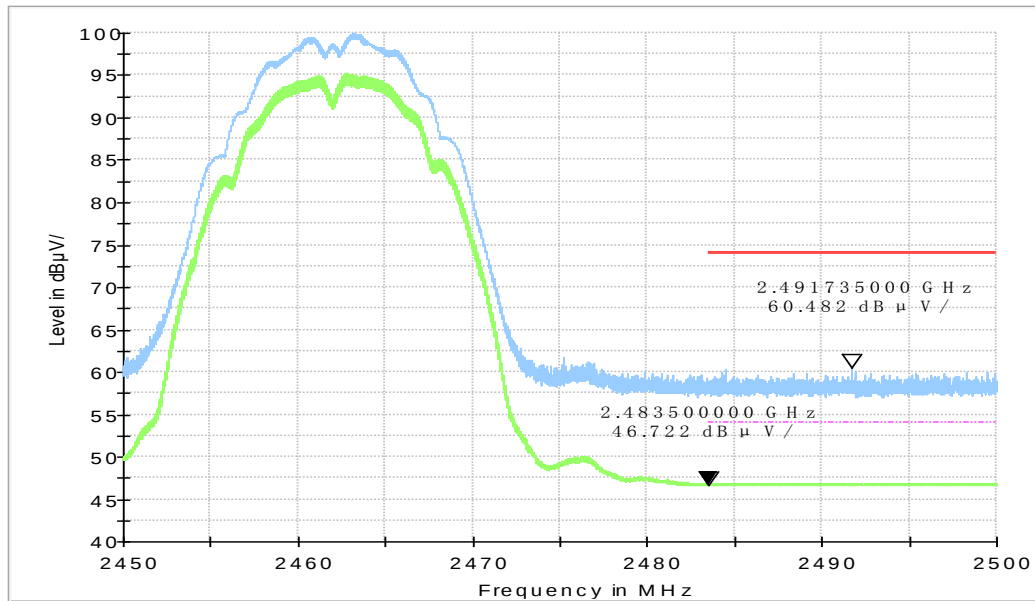


Fig.A.6.2.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

RE - Power-2.31GHz-2.45GHz

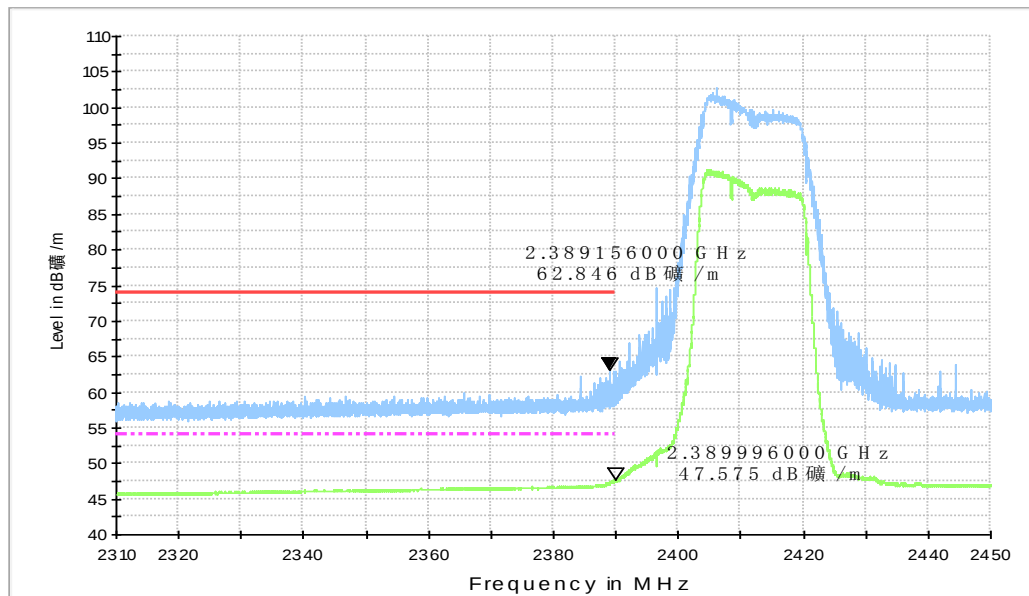


Fig.A.6.2.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.43GHz

RE - Power-2.45GHz-2.5GHz

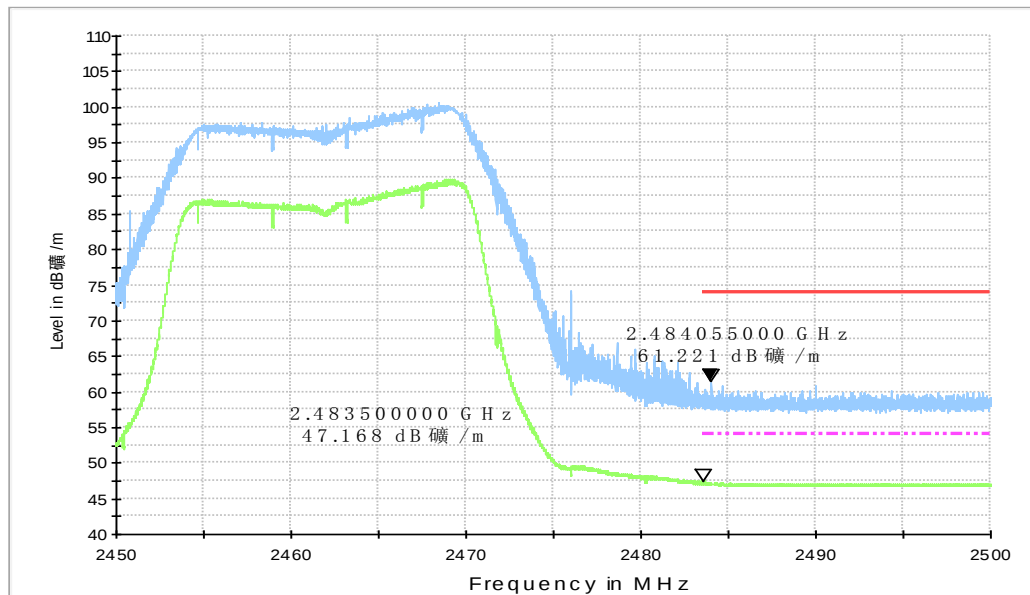


Fig.A.6.2.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

RE - Power-2.31GHz-2.45GHz

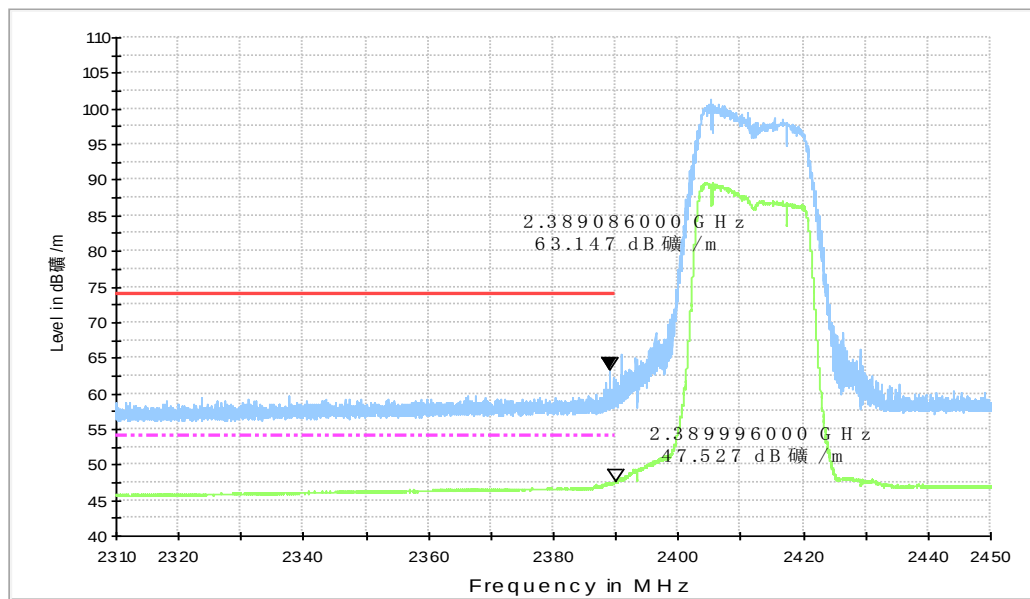


Fig.A.6.2.5 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31GHz - 2.45GHz

RE - Power-2.45GHz-2.5GHz

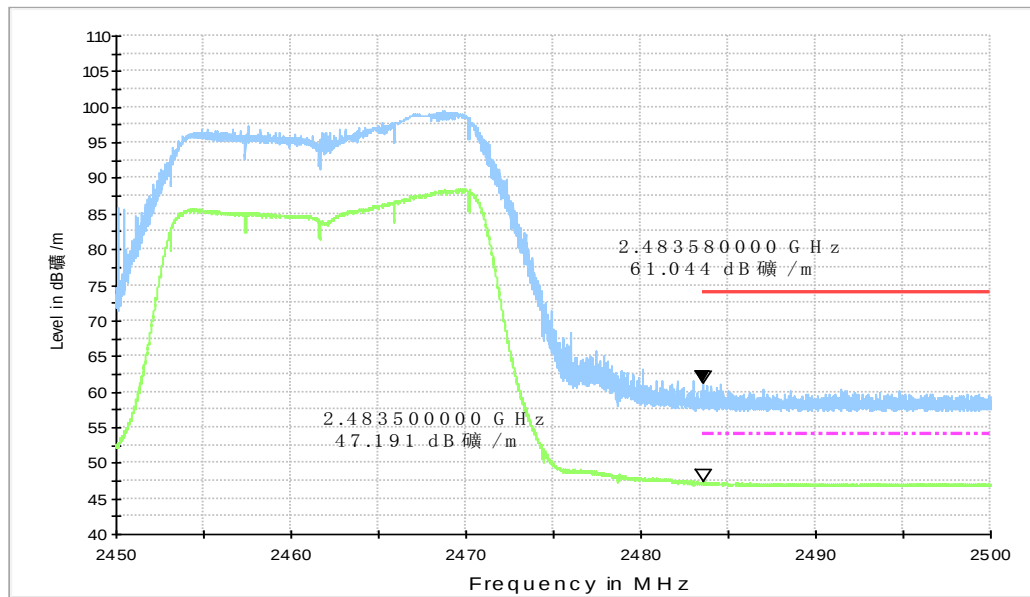


Fig.A.6.2.6 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

A.7. AC Power-line Conducted Emission

Method of Measurement: See ANSI C63.10-2013-clause 6.2

- 1 The one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.
- 2 If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.
- 3 The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.
- 4 If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.
- 5 If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.³⁶ Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:
WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	66 to 56	Fig.A.7.1 Fig.A.7.3 Fig.A.7.4	Fig.A.7.2	P
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	56 to 46	Fig.A.7.1 Fig.A.7.3 Fig.A.7.4	Fig.A.7.2	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: Pass
Test graphs as below:

Traffic with AE2:

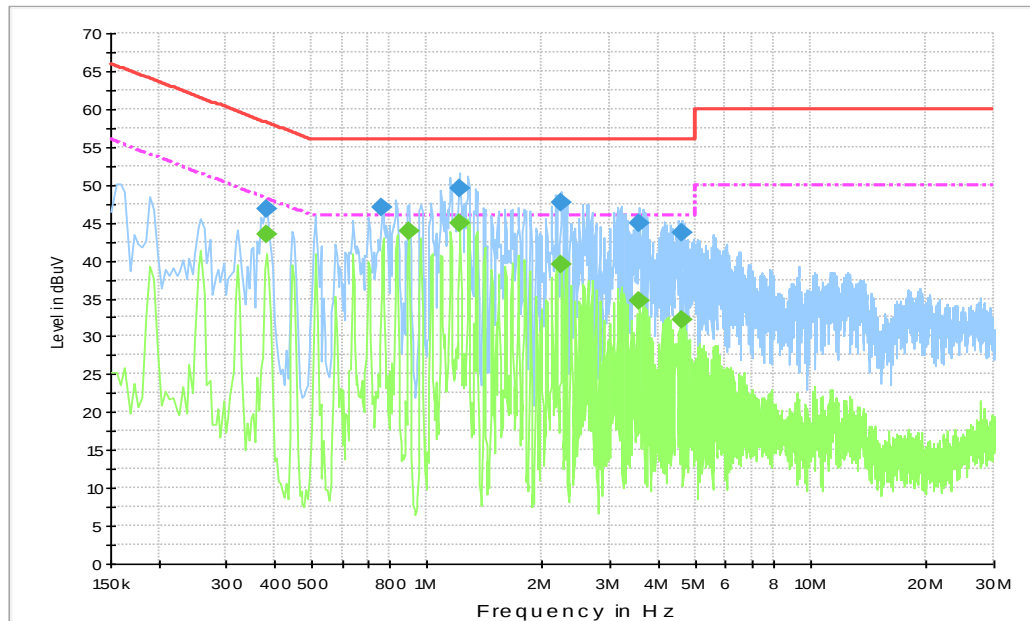


Fig.A.7.1 AC Powerline Conducted Emission-802.11b

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.384000	46.9	10000	9.000	On	N	20.0	11.3	58.2
0.766500	46.9	10000	9.000	On	N	19.9	9.1	56.0
1.212000	49.4	10000	9.000	On	N	19.8	6.6	56.0
2.238000	47.5	10000	9.000	On	N	19.8	8.5	56.0
3.574500	44.9	10000	9.000	On	N	19.8	11.1	56.0
4.600500	43.7	10000	9.000	On	N	19.8	12.3	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.384000	43.5	10000.	9.000	On	N	20.0	4.7	48.2
0.897000	43.8	10000.	9.000	On	N	19.9	2.2	46.0
1.216500	44.9	10000.	9.000	On	N	19.8	1.1	46.0
2.238000	39.5	10000.	9.000	On	N	19.8	6.5	46.0
3.583500	34.6	10000.	9.000	On	N	19.8	11.4	46.0
4.605000	32.1	10000.	9.000	On	N	19.8	13.9	46.0

Note: The measurement results showed here are worst cases of the combinations of different USB cables.

Idle with AE2:

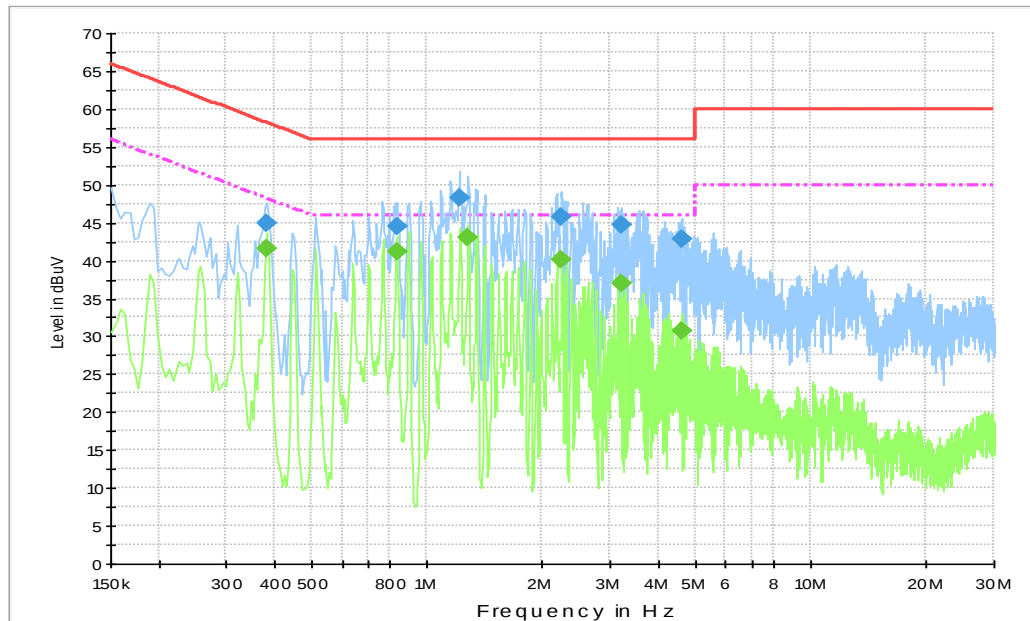


Fig.A.7.2 AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.384000	44.9	10000	9.000	On	N	20.0	13.3	58.2
0.834000	44.5	10000	9.000	On	N	19.9	11.5	56.0
1.216500	48.2	10000	9.000	On	N	19.8	7.8	56.0
2.238000	45.7	10000	9.000	On	N	19.8	10.3	56.0
3.196500	44.7	10000	9.000	On	N	19.8	11.3	56.0
4.600500	42.8	10000	9.000	On	N	19.8	13.2	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.384000	41.5	10000.	9.000	On	N	20.0	6.7	48.2
0.834000	41.1	10000.	9.000	On	N	19.9	4.9	46.0
1.279500	43.1	10000.	9.000	On	N	19.8	2.9	46.0
2.242500	40.0	10000.	9.000	On	N	19.8	6.0	46.0
3.201000	36.9	10000.	9.000	On	N	19.8	9.1	46.0
4.600500	30.8	10000.	9.000	On	N	19.8	15.2	46.0

Note: The measurement results showed here are worst cases of the combinations of different USB cables.

Traffic with AE3:

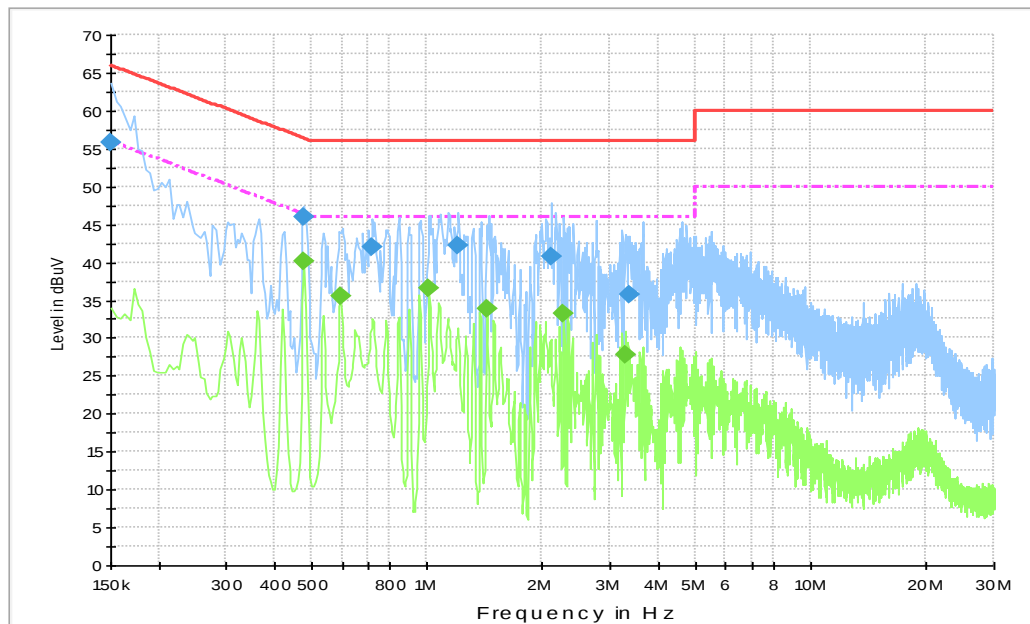


Fig.A.7.3 AC Powerline Conducted Emission-802.11b

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	55.8	10000	9.000	On	L1	28.9	10.2	66.0
0.478500	46.1	10000	9.000	On	L1	20.0	10.3	56.4
0.721500	42.1	10000	9.000	On	N	20.0	13.9	56.0
1.207500	42.2	10000	9.000	On	N	19.8	13.8	56.0
2.107500	40.8	10000	9.000	On	N	19.8	15.2	56.0
3.381000	35.8	10000	9.000	On	N	19.8	20.2	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.478500	40.2	10000.	9.000	On	L1	20.0	6.2	46.4
0.595500	35.4	10000.	9.000	On	L1	20.0	10.6	46.0
1.014000	36.5	10000.	9.000	On	L1	19.8	9.5	46.0
1.432500	33.8	10000.	9.000	On	L1	19.8	12.2	46.0
2.274000	33.1	10000.	9.000	On	L1	19.8	12.9	46.0
3.282000	27.7	10000.	9.000	On	L1	19.8	18.3	46.0

Note: The measurement results showed here are worst cases of the combinations of different USB cables.

Traffic with AE4:

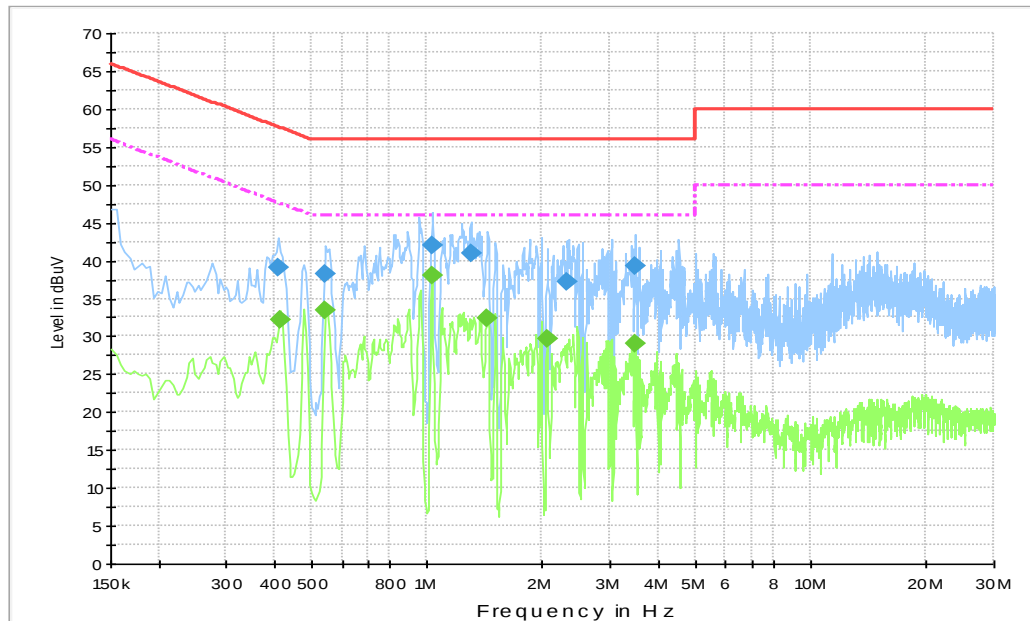


Fig.A.7.4 AC Powerline Conducted Emission-802.11b

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

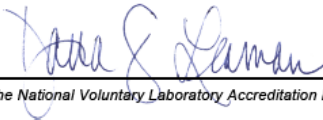
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.411000	39.1	10000	9.000	On	L1	20.0	18.5	57.6
0.546000	38.2	10000	9.000	On	L1	20.0	17.8	56.0
1.032000	42.1	10000	9.000	On	N	19.9	13.9	56.0
1.302000	40.9	10000	9.000	On	L1	19.8	15.1	56.0
2.323500	37.1	10000	9.000	On	L1	19.8	18.9	56.0
3.502500	39.2	10000	9.000	On	L1	19.8	16.8	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.415500	32.1	10000.	9.000	On	L1	20.0	15.4	47.5
0.546000	33.4	10000.	9.000	On	L1	20.0	12.6	46.0
1.027500	37.9	10000.	9.000	On	L1	19.9	8.1	46.0
1.441500	32.4	10000.	9.000	On	L1	19.8	13.6	46.0
2.053500	29.6	10000.	9.000	On	L1	19.8	16.4	46.0
3.493500	29.0	10000.	9.000	On	L1	19.8	17.0	46.0

Note: The measurement results showed here are worst cases of the combinations of different USB cables.

ANNEX B: Accreditation Certificate

United States Department of Commerce National Institute of Standards and Technology  Certificate of Accreditation to ISO/IEC 17025:2005	
NVLAP LAB CODE: 600118-0	
Telecommunication Technology Labs, CAICT Beijing China	
<i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i>	
Electromagnetic Compatibility & Telecommunications	
<i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).</i>	
2019-09-26 through 2020-09-30 <i>Effective Dates</i>	  <i>For the National Voluntary Laboratory Accreditation Program</i>

END OF REPORT