FCC ID: QVJSAP300
Access Point 300

Exhibit 2a

Engineering Report on
Power Lines Conducted Emissions (15.207)

Section A
Test*:* Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300

Client: FleetMind Solutions

Product: Access Point 300, Model: S-AP-300

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Test*:* Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Reference: FCC Part 15.207/Industry Canada RSS 210, 6.6 (a)

Criteria: 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 450 kHz to 30 MHz shall not exceed 250 micro-volts (48 dbµV). Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

Condition: Conducted Test

Set-up: Test setup from Figure a1 was used.

***Equipment*:** See Appendix A

Methodology: See page 13

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Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

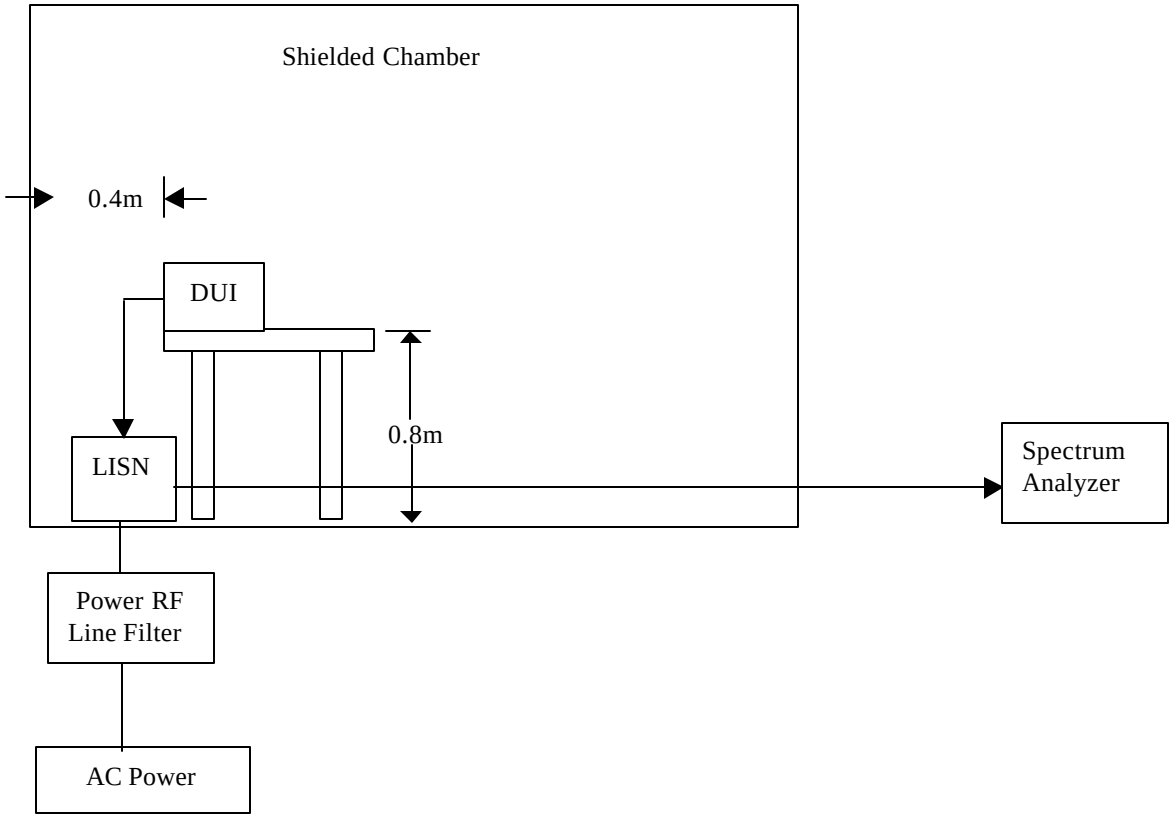

Figure a1: Conducted Emissions on Power Lines - Testing Setup

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Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Methodology:

Measurement of conducted emissions was carried out according to the description of ANSI C63.4-1992 paragraph 7.2, TableTop Equipment, Sec. 6.2.1.

Conducted power-line measurements were made over the frequency range from 450 kHz to 30 MHz, to determine the line-to-ground radio noise voltage that is conducted from the unit power line-input terminals that are directly (or indirectly via separate transformers power supplies) connected to a public power network.

The power-input leads of the wall mount power supply were connected to the Line Impedance Stabilization Network (LISN) using the 50 ohms/50 micro henry CISPR network. The LISN and the Unit were connected and positioned as shown in Figure 1.

Measurements were performed using the spectrum analyzer with quasi-peak function and 9kHz resolution bandwidth. Specific peaks were measured from the continuous plots.

The rear of the unit and peripherals were aligned and flush with the rear of the tabletop. The rear of the tabletop was 40 cm removed from the vertical conducting (shielded room) wall.

In order to find out the maximum emission, the preliminary test and a final test were performed.

The preliminary investigation was performed through the whole specified frequency range of 450kHz – 30MHz in a single scan, to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration.

The specified frequency range was then divided into several sub-divisions (450kHz – 5MHz, 5MHz – 8MHz, 8MHz - 12MHz, 12MHz-15MHz, 15MHz-20 MHz, 20MHz- 25MHz,and 25MHz – 30MHz) having narrow span in which frequencies and the levels of the interfering signals could be observed more accurately. Changing the typical cable positions or cable manipulation under the typical system configuration maximized the maximum emission in the each sub-divided frequency band. The level and the frequencies at the points, which were regarded as relatively high emission in the sub-band, was measured and recorded. This step was repeated for all sub bands.

Based on the collected results, and the operation mode produced the maximum emission was selected and recorded in the report.

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Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Test Results:

Test Data is tabulated in Tables a1 and a2. Only nine highest measured values are presented in each table. Plots are shown in Graphs a1 to a14.

TABLE a1
CONDUCTED R.F. EMISSION LEVELS
Line: LIVE, Detection: Quasi-Peak
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB)
	dBµV "C1"	µV	dBµV "C3"	µV	"C5"
0.651	36.21	64.6	48.0	250.0	11.79
1.372	35.90	62.4	48.0	250.0	12.10
13.464	34.55	53.4	48.0	250.0	13.45
13.824	38.42	83.4	48.0	250.0	9.58
13.950	36.66	68.1	48.0	250.0	11.34
14.423	35.93	62.6	48.0	250.0	12.07
14.664	33.59	47.8	48.0	250.0	14.41
20.849	34.26	51.6	48.0	250.0	13.74
21.088	33.84	49.2	48.0	250.0	14.16

Margin C5 = C3-C1 in dB
All the above measurements were performed in the shielded room.

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Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

TABLE a2
CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL, Detection: Quasi-Peak
Resolution Bandwidth: 9 kHz

Frequency (MHz)	Measured Level		Limit		Margin (dB) "C5"
	dBµV "C1"	µV	dBµV "C3"	µV	
0.480	31.76	38.7	48.0	250.0	16.24
1.271	35.69	60.9	48.0	250.0	12.31
1.440	31.24	36.5	48.0	250.0	16.76
9.819	28.06	25.3	48.0	250.0	19.94
10.060	29.72	30.6	48.0	250.0	18.28
13.576	37.84	78.0	48.0	250.0	10.16
13.818	36.22	64.7	48.0	250.0	11.78
13.942	35.66	60.7	48.0	250.0	12.34
20.874	32.14	40.5	48.0	250.0	15.86

Margin (C5) = C3-C1 in dB
All the above measurements were performed in the shielded room.

Test performed by: Yingshi Chen **Date:** April, 2003

Conclusion: The unit complies with requirements.

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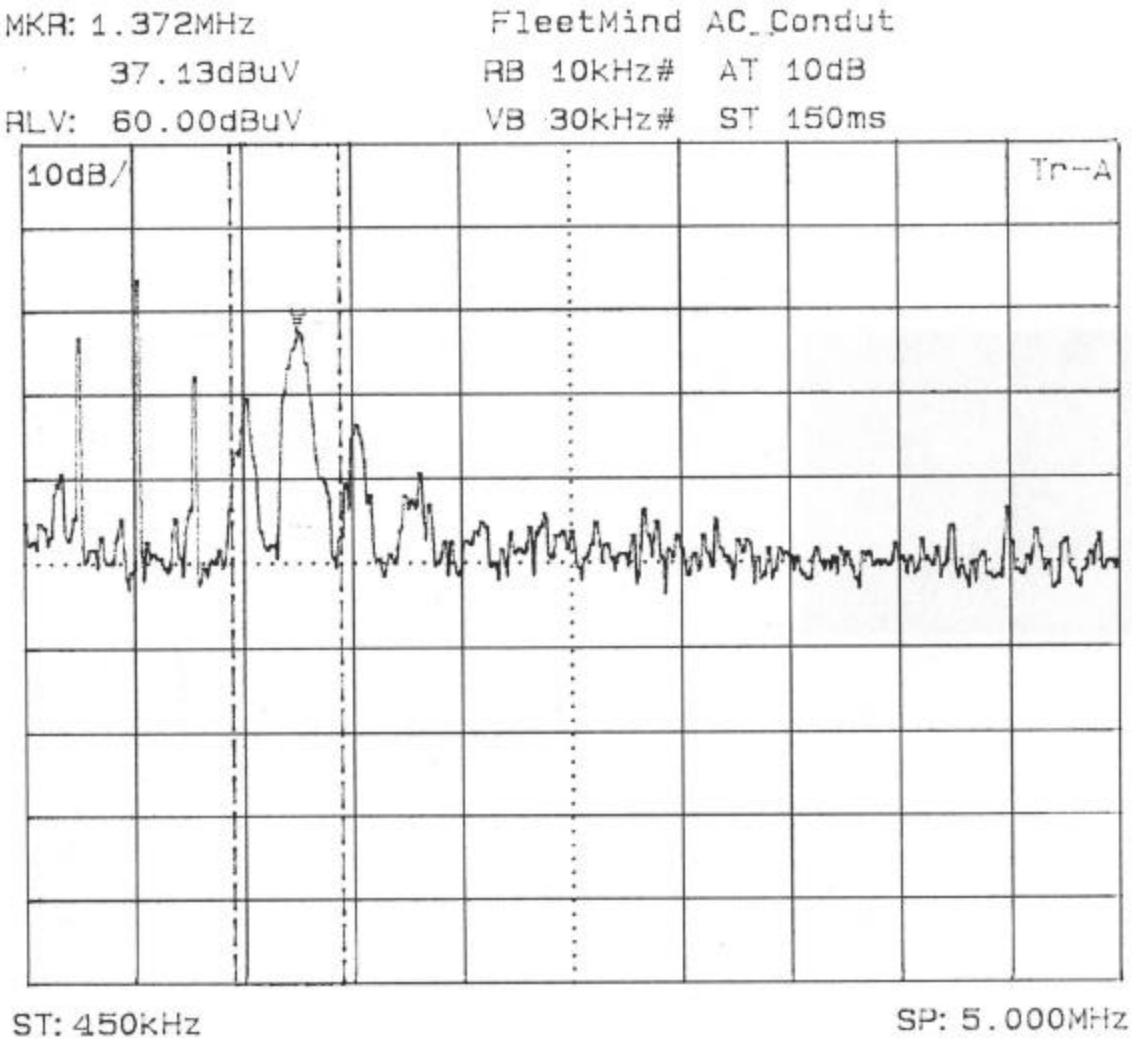
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a1



CONDUCTED R.F. EMISSION LEVELS
Line: LIVE
Frequency Range: 450 kHz –5.0 MHz

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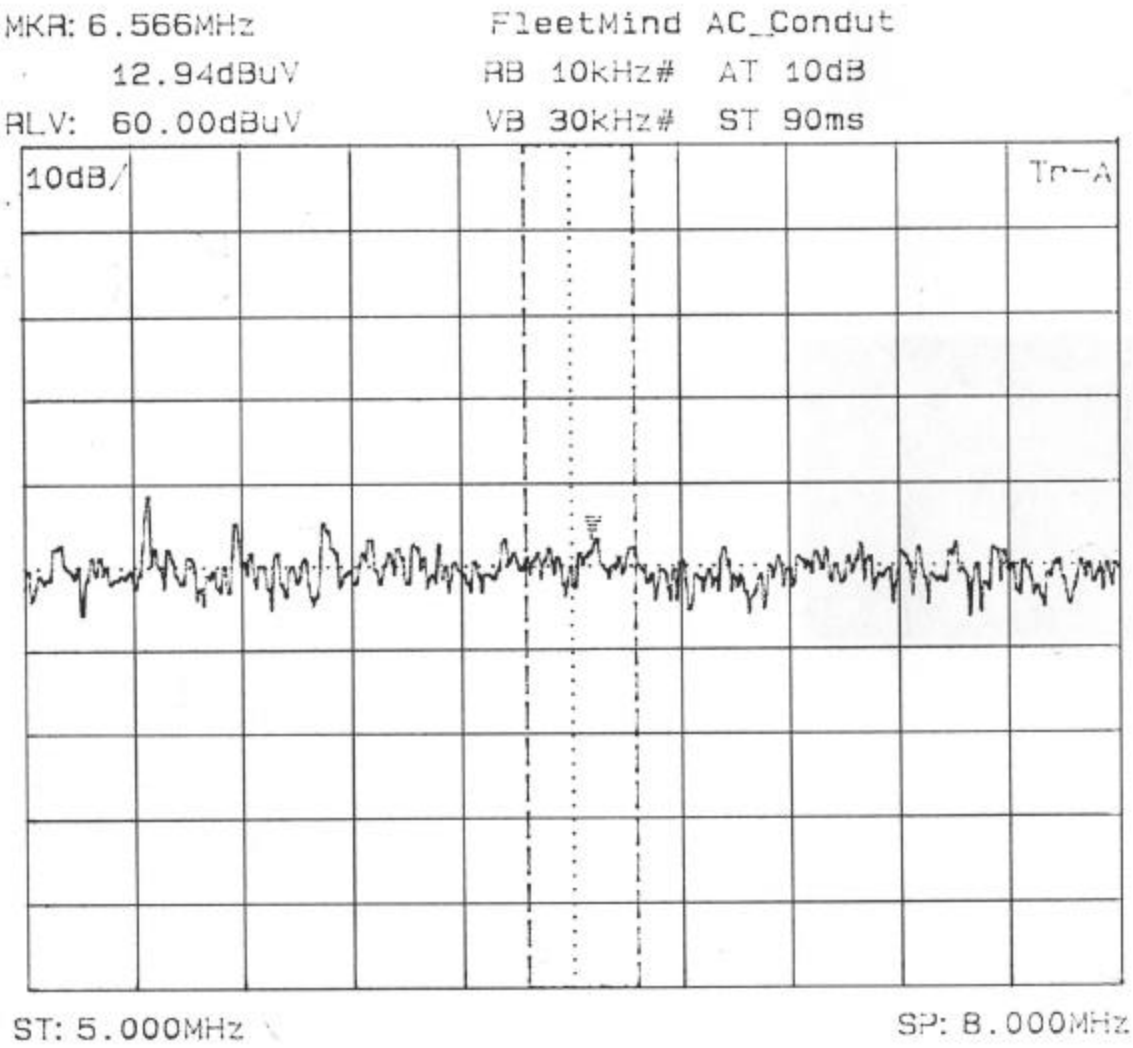
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a2



CONDUCTED R.F. EMISSION LEVELS
Line: LIVE
Frequency Range: 5.0MHz – 8.0 MHz

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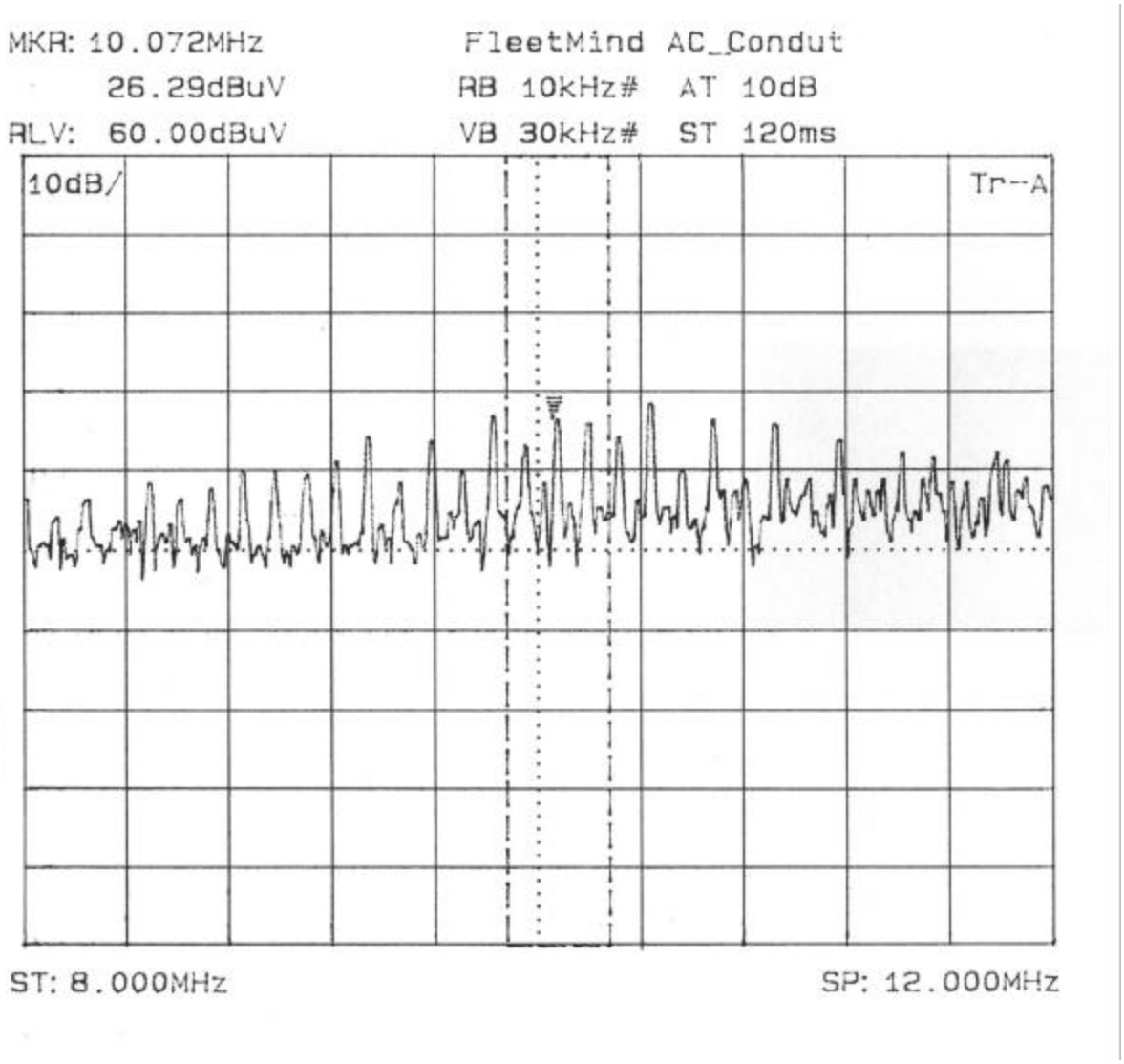
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a3



CONDUCTED R.F. EMISSION LEVELS
Line: LIVE
Frequency Range: 8.0 MHz – 12.0 MHz

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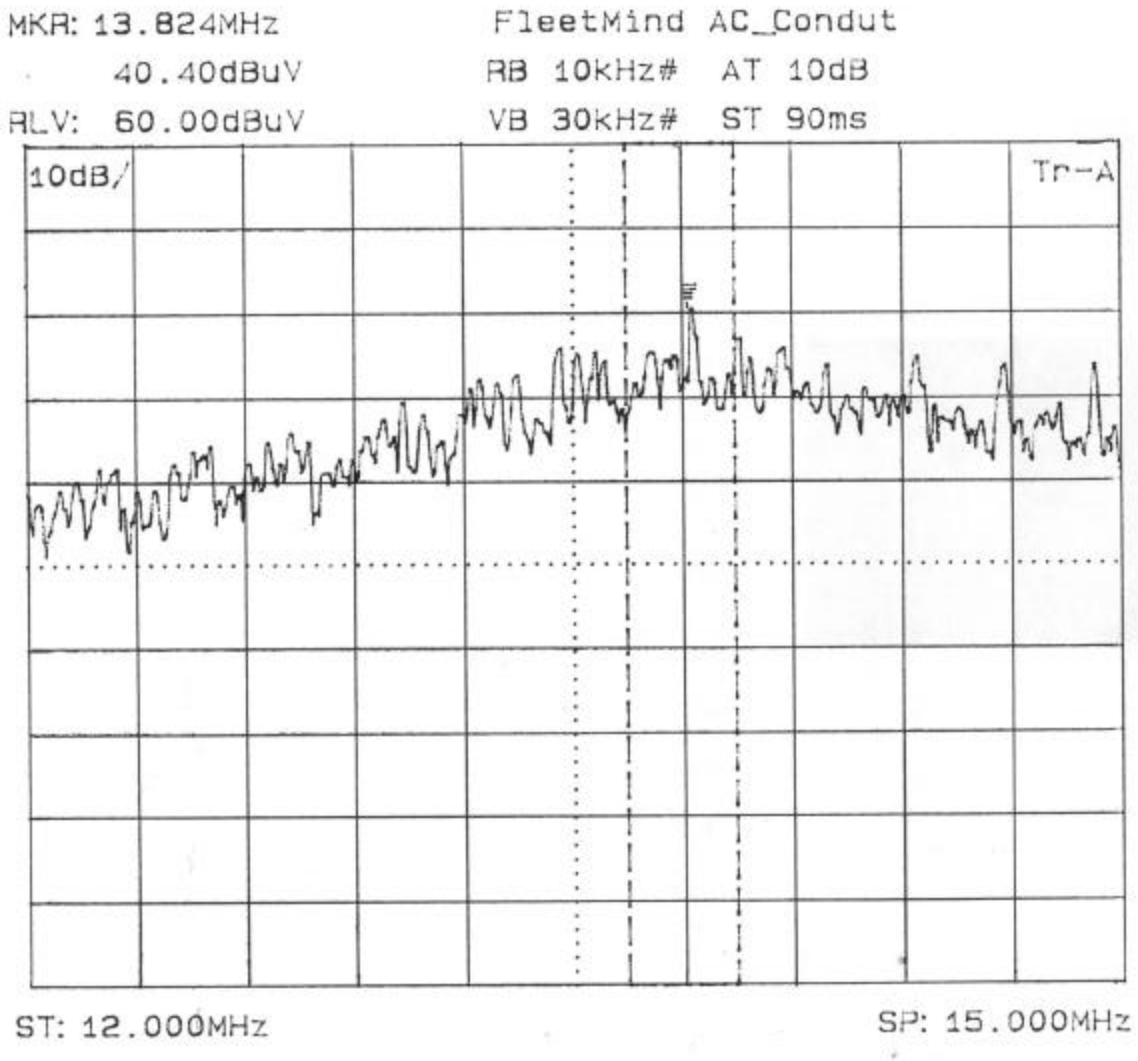
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a4



CONDUCTED R.F. EMISSION LEVELS
Line: LIVE
Frequency Range: 12.0 MHz – 15.0 MHz

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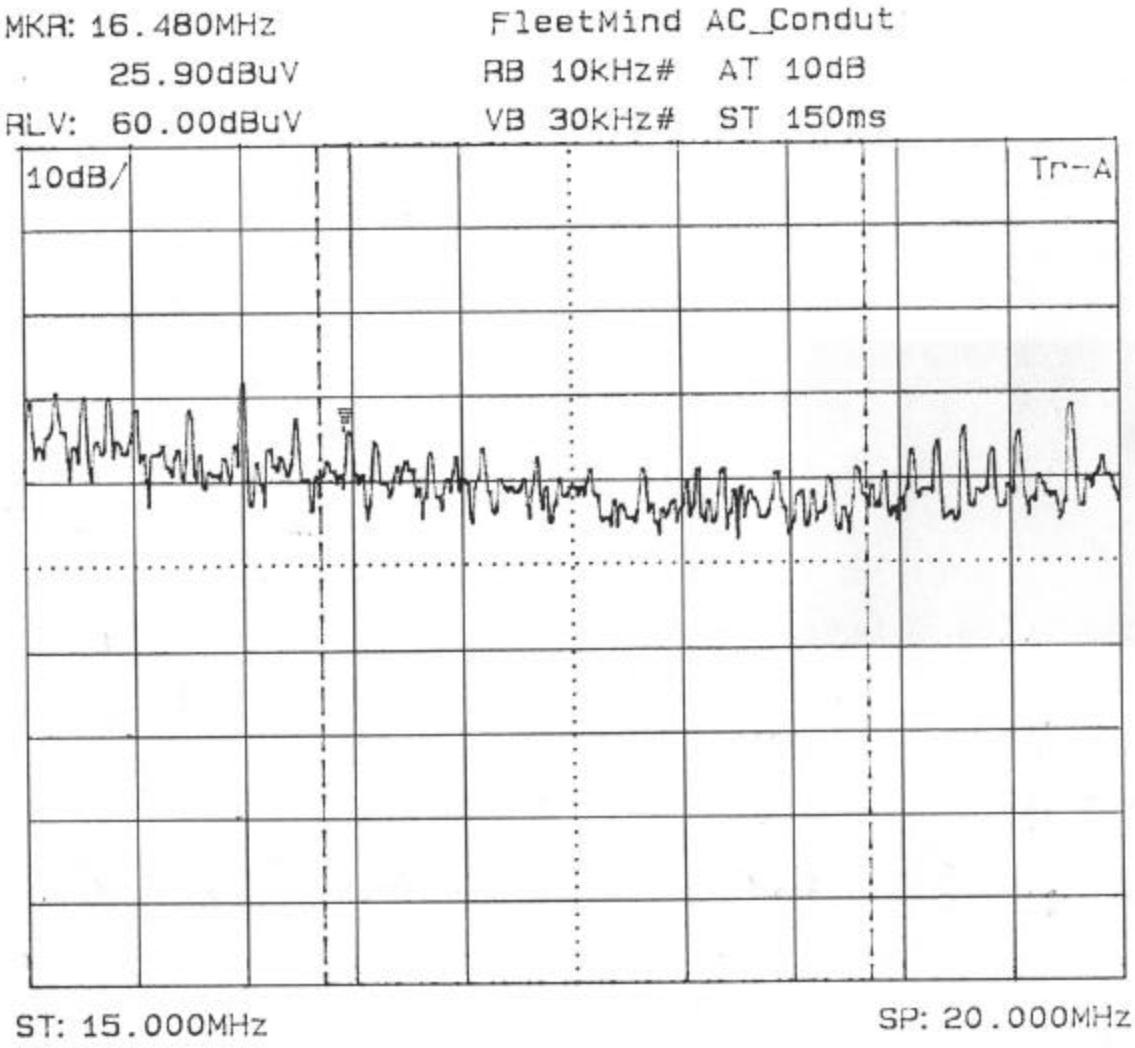
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a5



CONDUCTED R.F. EMISSION LEVELS
Line: LIVE
Frequency Range: 15.0 MHz – 20.0 MHz

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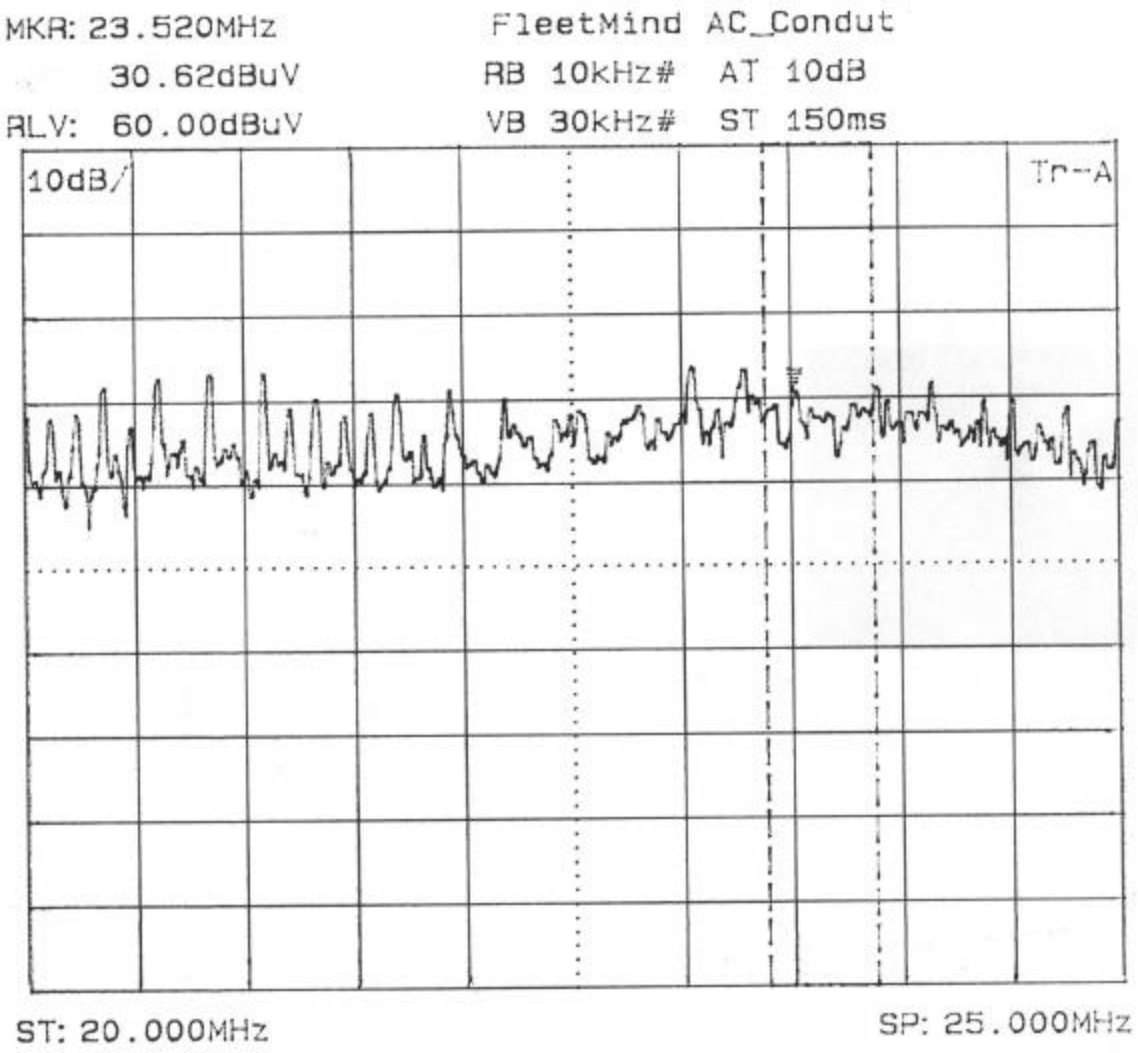
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a6



CONDUCTED R.F. EMISSION LEVELS
Line: LIVE
Frequency Range: 20.0 MHz – 25.0 MHz

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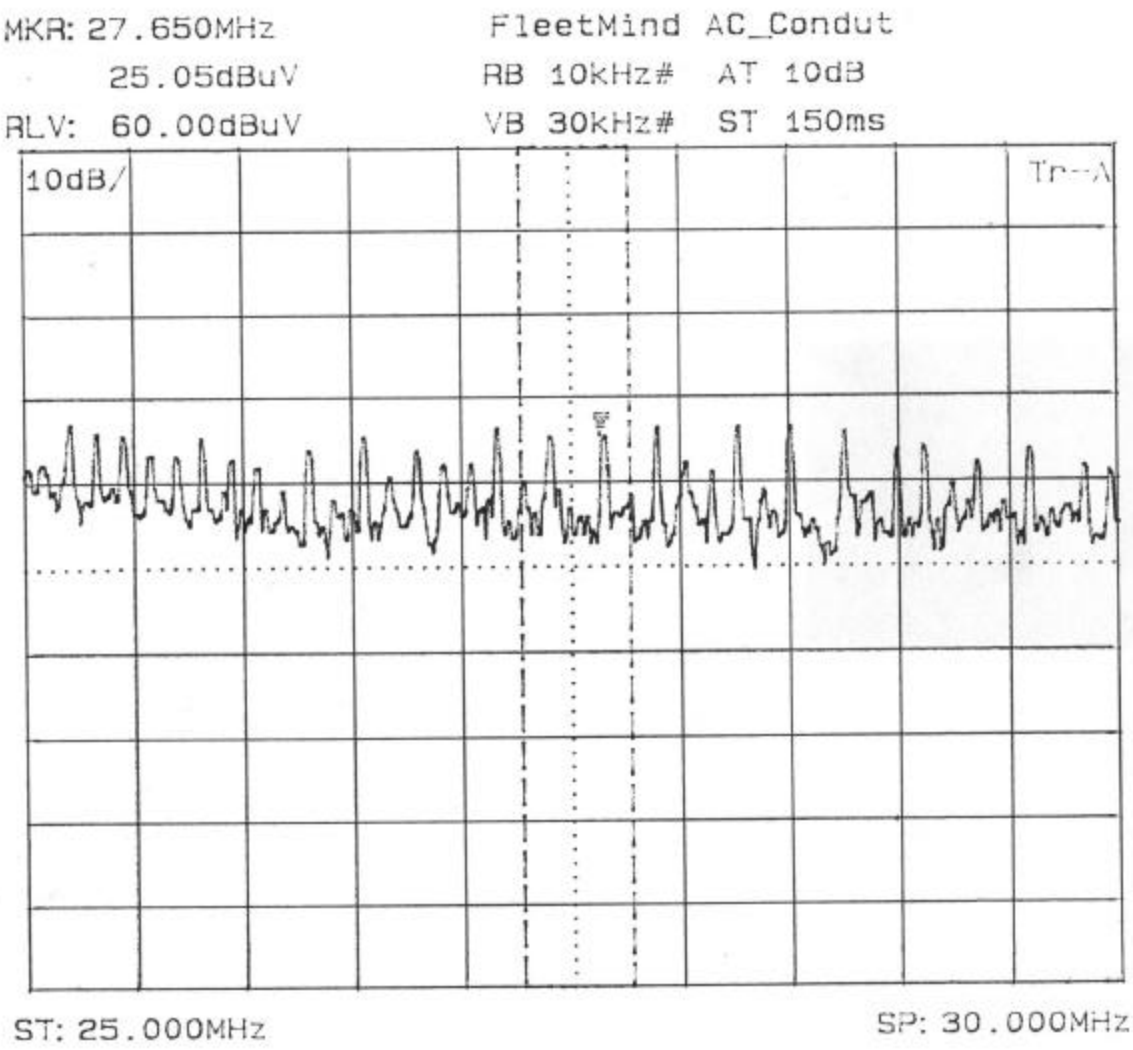
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a7



CONDUCTED R.F. EMISSION LEVELS
Line: LIVE
Frequency Range: 25.0 MHz – 30.0 MHz

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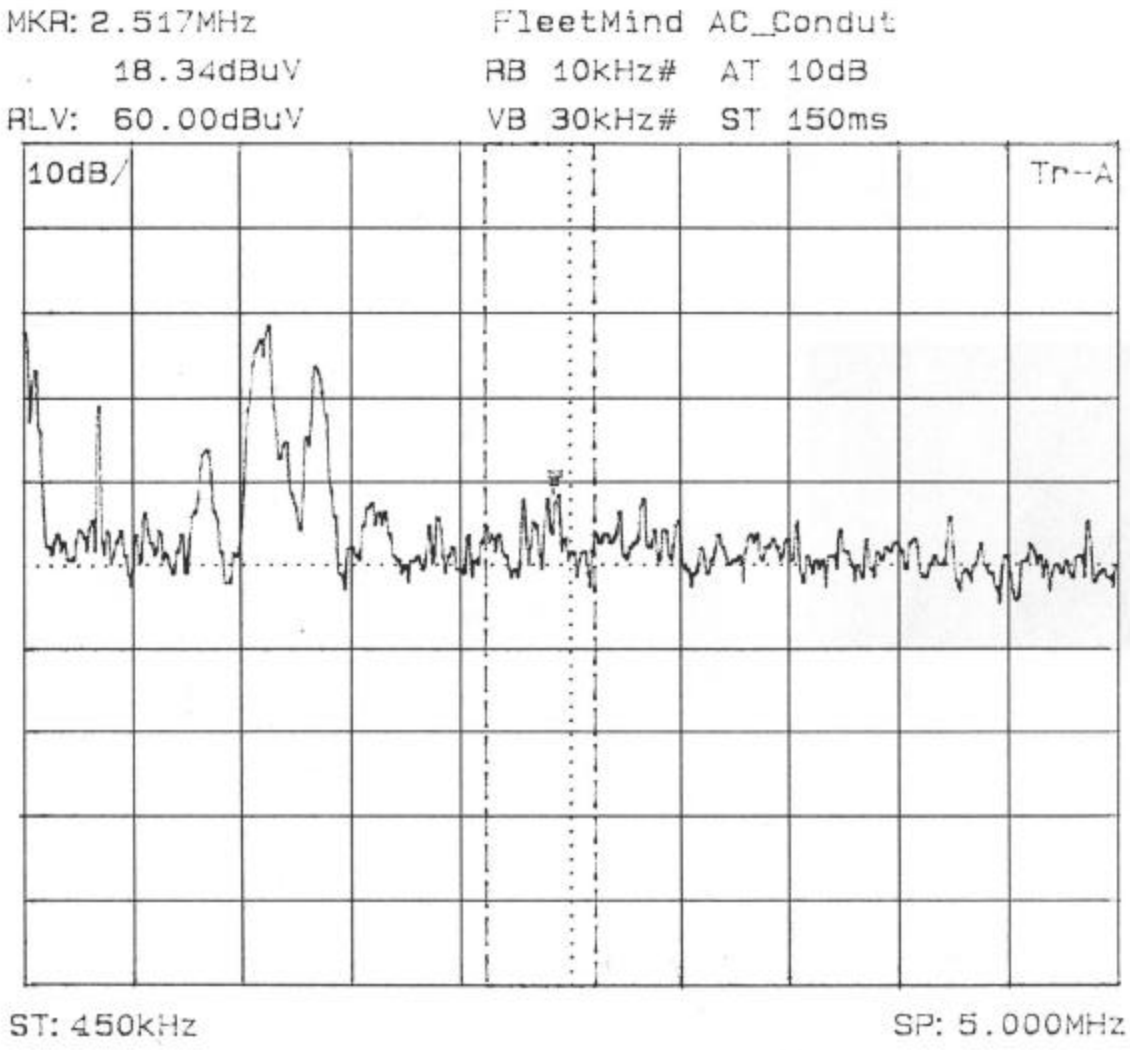
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a8



CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL
Frequency Range: 450 KHz – 5.0 MHz

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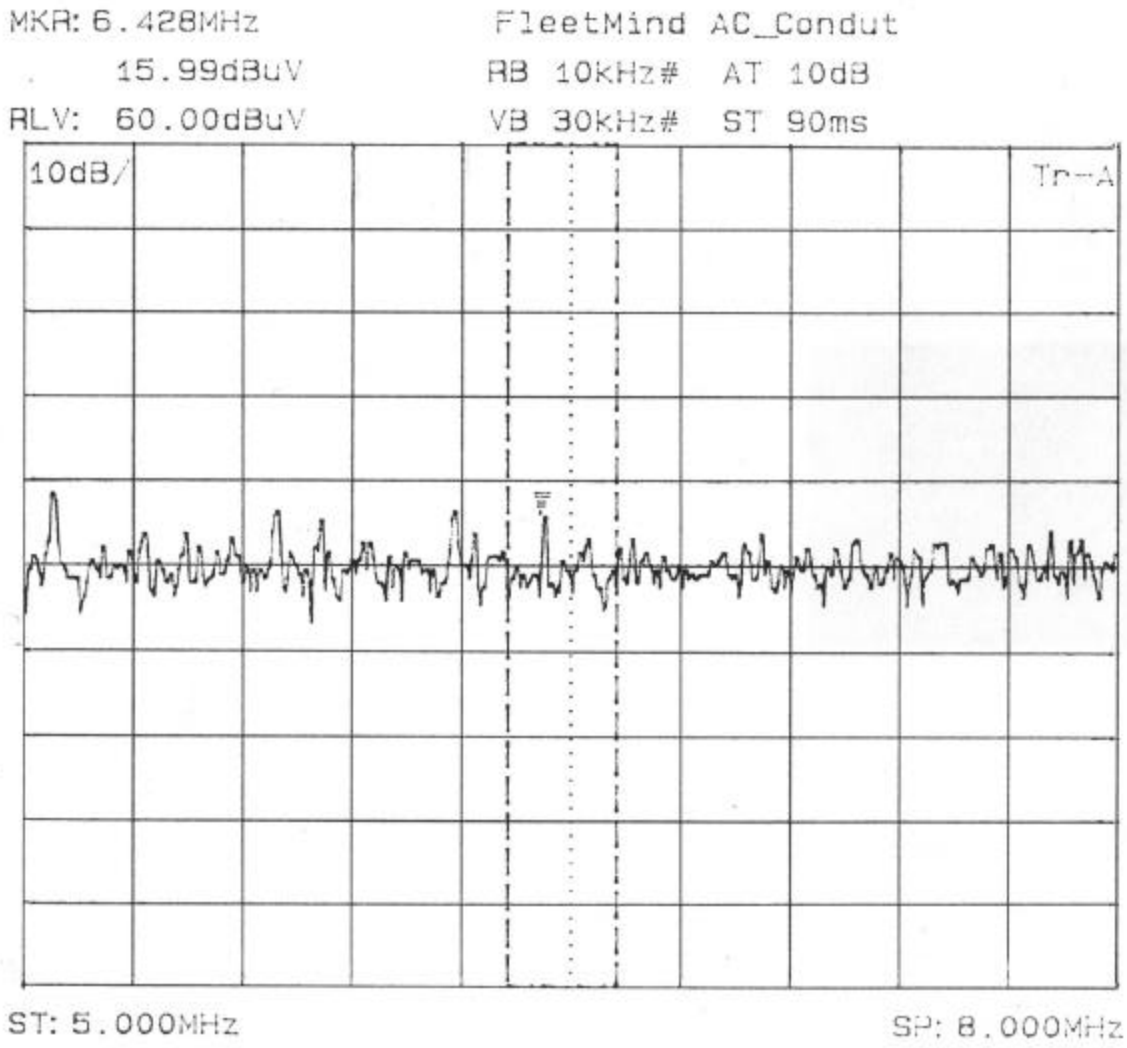
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a9



CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL
Frequency Range: 5.0 MHz – 8.0 MHz

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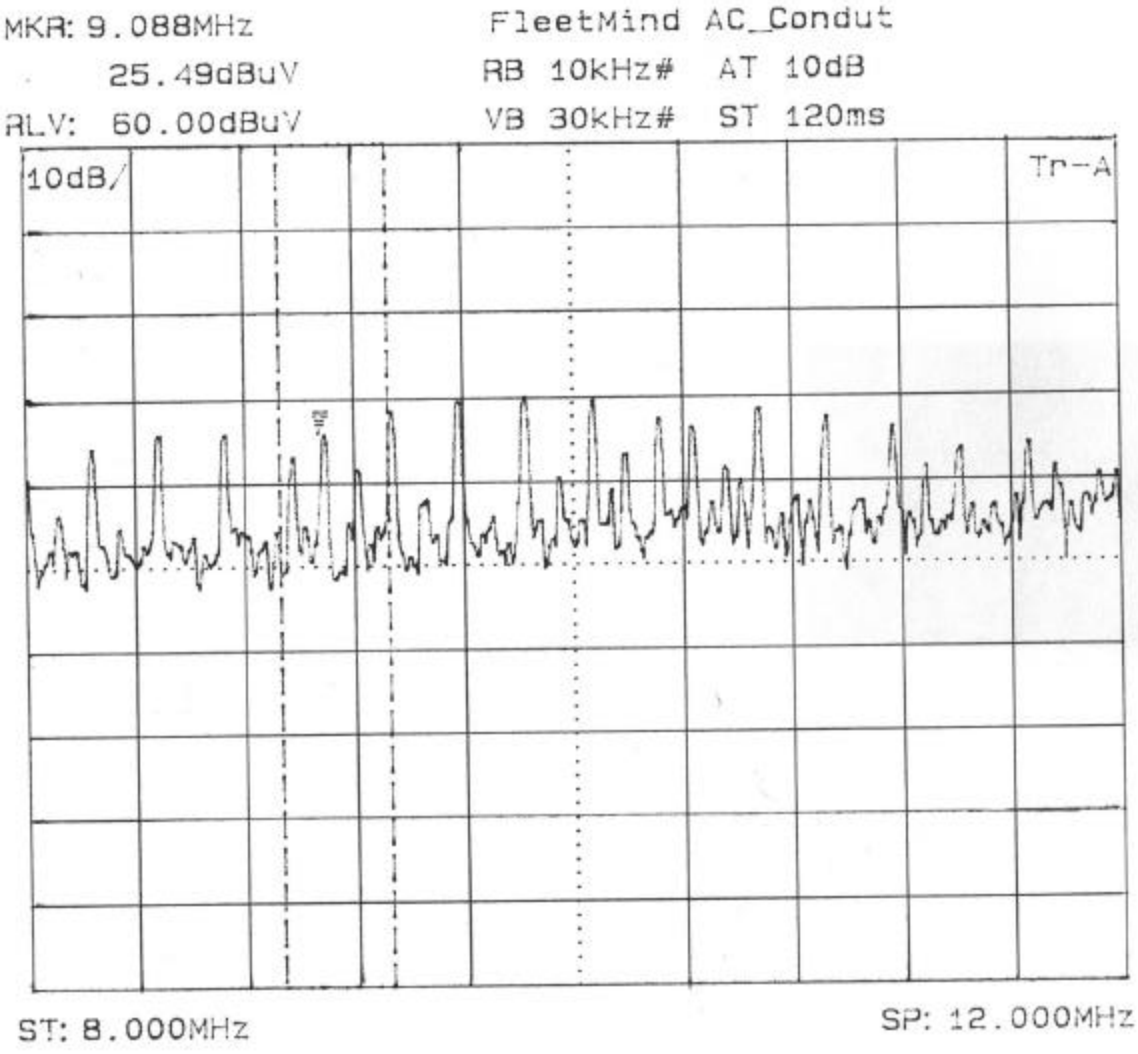
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a10



CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL
Frequency Range: 8.0 MHz – 12.0 MHz

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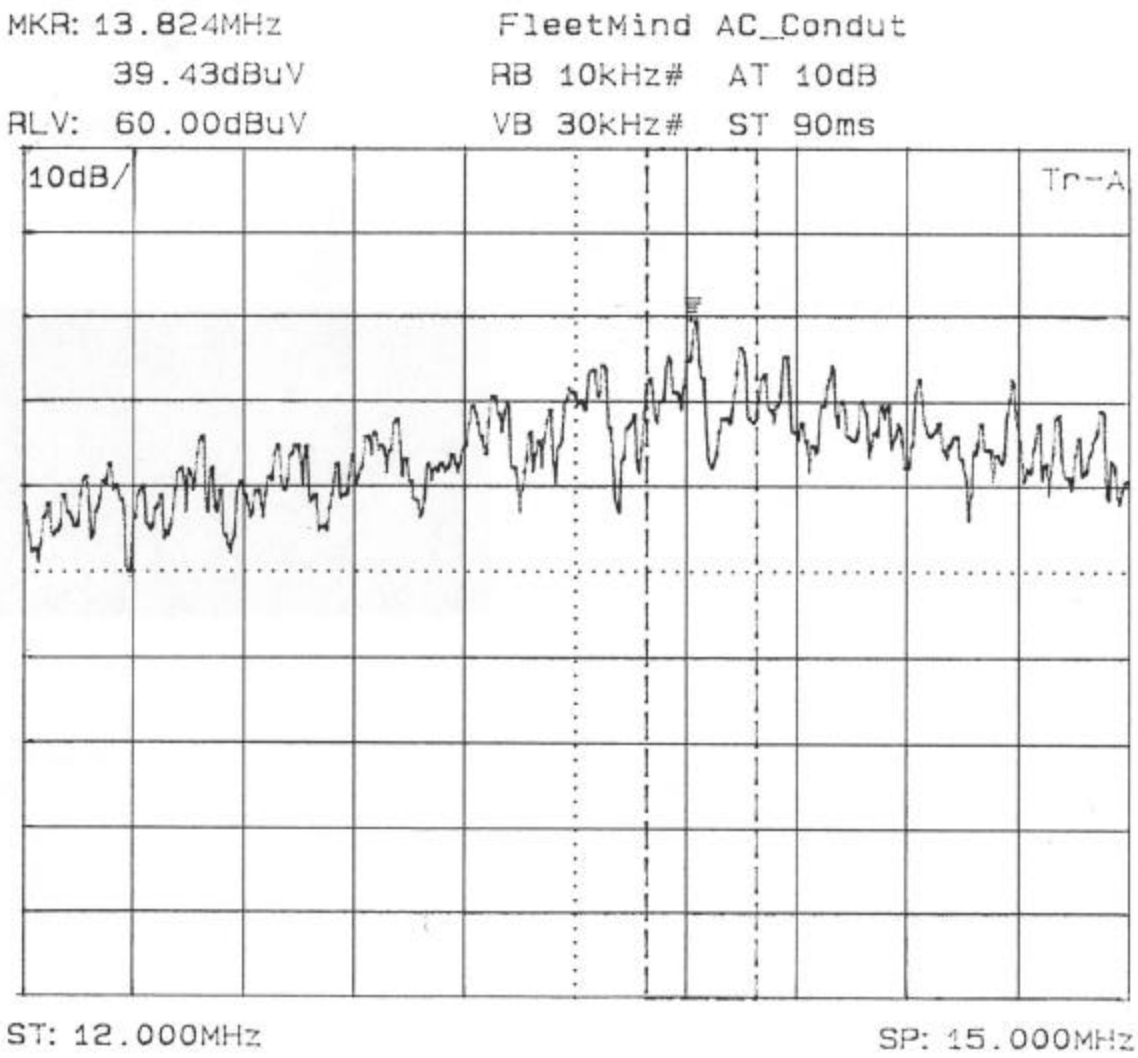
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a11



CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL
Frequency Range: 12.0 MHz – 15.0 MHz

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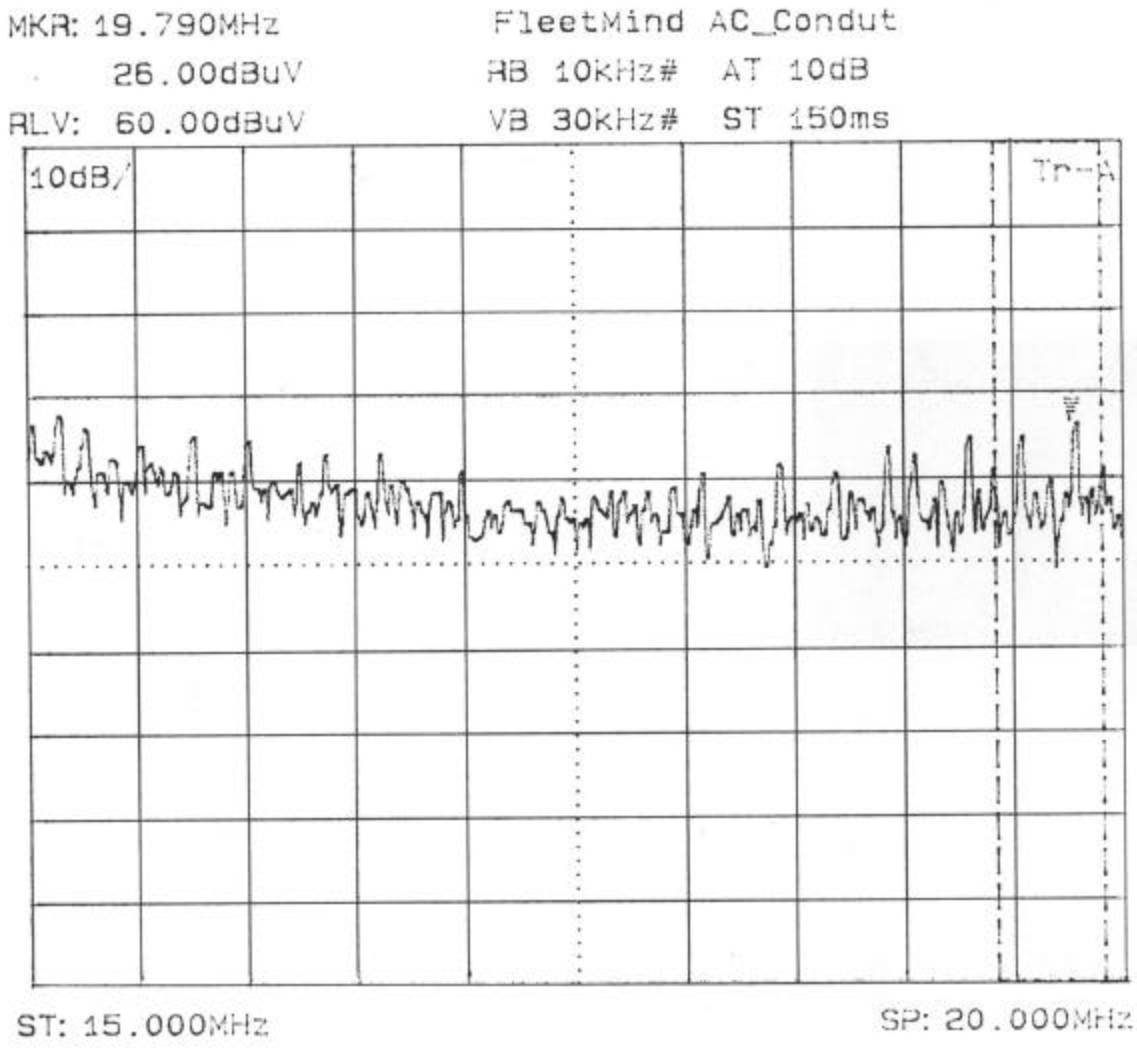
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a12



CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL
Frequency Range: 15.0 MHz – 20.0 MHz

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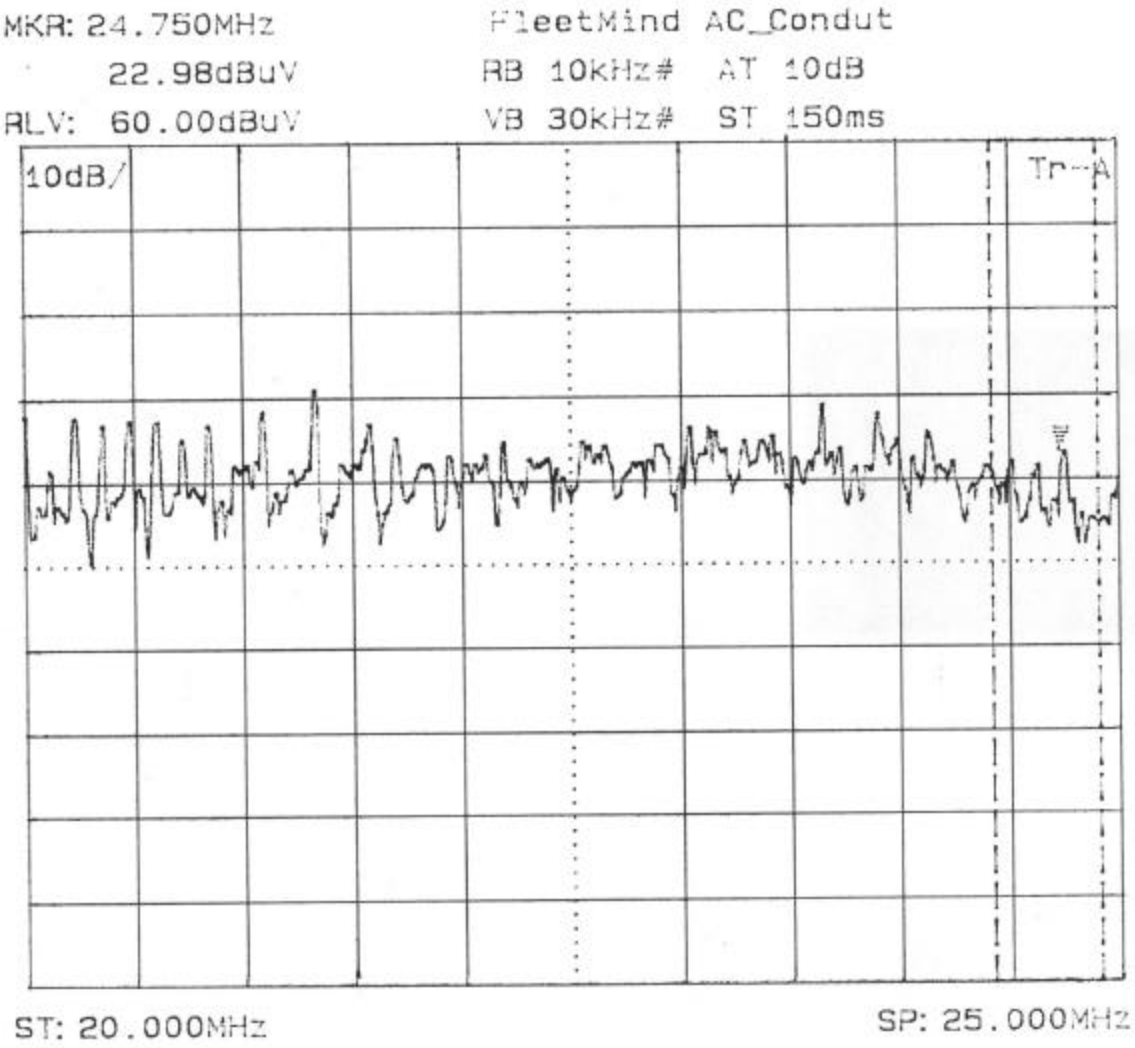
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a13



CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL
Frequency Range: 20.0 MHz – 25.0 MHz

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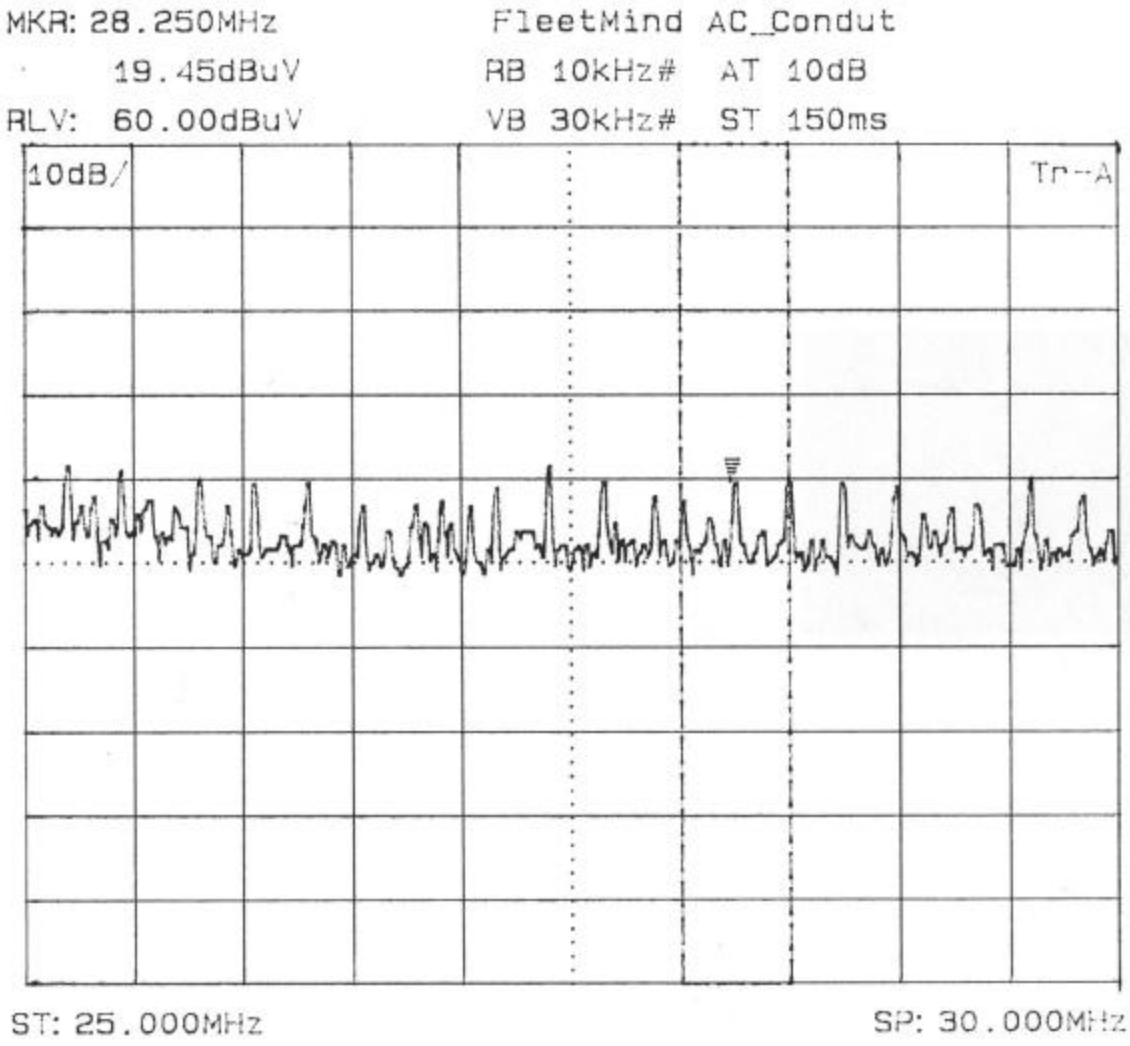
Test*:* Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Graph a14



CONDUCTED R.F. EMISSION LEVELS
Line: NEUTRAL
Frequency Range: 25.0 MHz – 30.0 MHz

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Pictures of the test set-up

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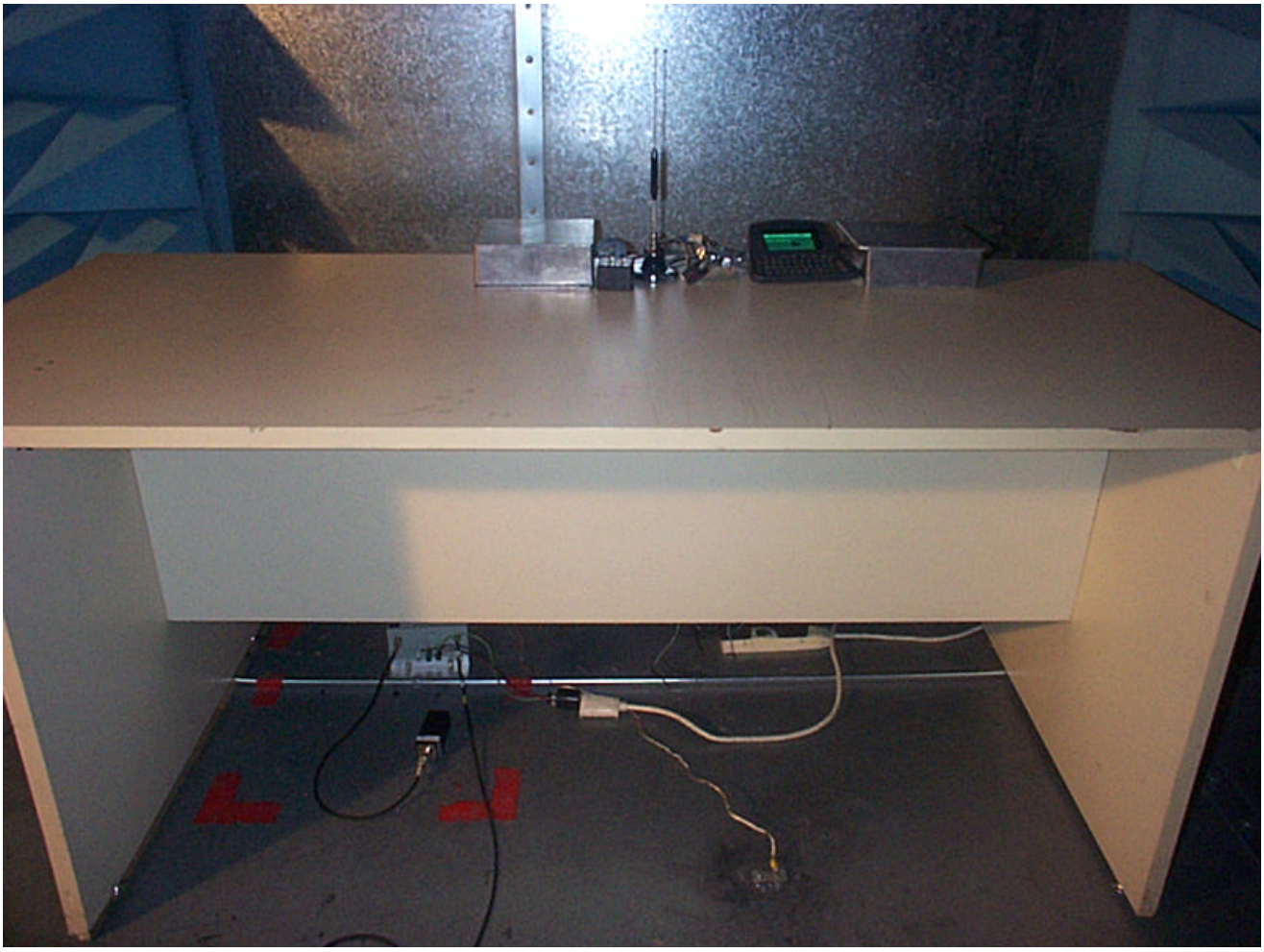
Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300



Testing Conducted Emissions on Power Lines
FleetMind Access Point connected to LISN
Frequency range: 450 kHz – 30 MHz

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Test: Power Lines (Transmitter AC Wireline) Conducted Emissions

FCC ID: QVJSAP300
Client: FleetMind Solutions
Product: Access Point 300, Model: S-AP-300

Testing Conducted Emissions on Power Lines
FleetMind Access Point connected to LISN
Frequency range: 450 kHz – 30 MHz

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