6.4. **Radiated Spurious Emissions Data** -- Pursuant 47 CFR 2.1053, 2.1057, 90.210(g) and 90.691(a).

FCC Limits

Radiated spurious emissions shall be attenuated below the maximum level of emission of the carrier frequency in accordance with the following formula:

Spurious attenuation (dB) = 43 + 10 $\log_{10}$ (P), P = maximum power output power setting in Watts.

NOTE 1: The following data reflects worst-case measurements taken on the unit.

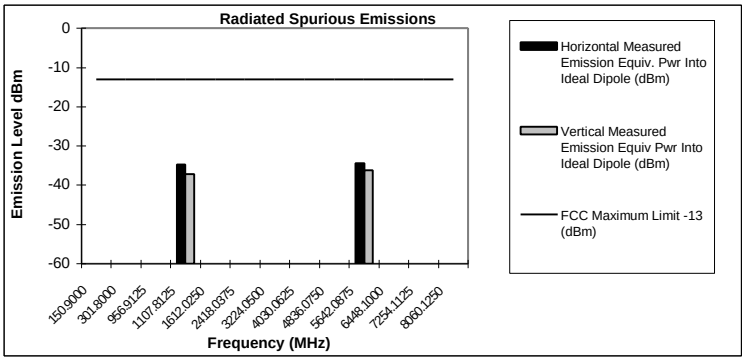
NOTE 2: Spurious emissions are independent of modulation type. M-16QAM was used to obtain the results reported.

NOTE 3: No emissions were detected in low power mode of operation, within the resolution of the setup.

Transmitter Radiated Spurious Emissions

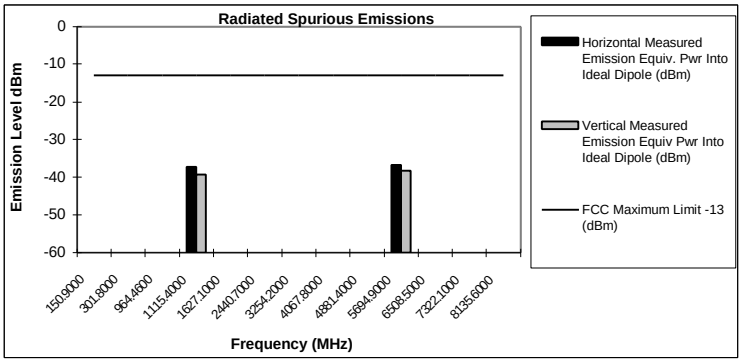
806.0125 MHz

Spur	Frequency (MHz)	FCC Maximum Limit -13 (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
IF	150.9000	-13	*	*
2XIF	301.8000	-13	*	*
LO	956.9125	-13	*	*
IF+LO	1107.8125	-13	-31.75	-34.15
2X FUND	1612.0250	-13	*	*
3X FUND	2418.0375	-13	*	*
4X FUND	3224.0500	-13	*	*
5X FUND	4030.0625	-13	*	*
6X FUND	4836.0750	-13	*	*
7X FUND	5642.0875	-13	-31.43	-33.19
8X FUND	6448.1000	-13	*	*
9X FUND	7254.1125	-13	*	*
10XFUND	8060.1250	-13	*	*



813.5625 MHz

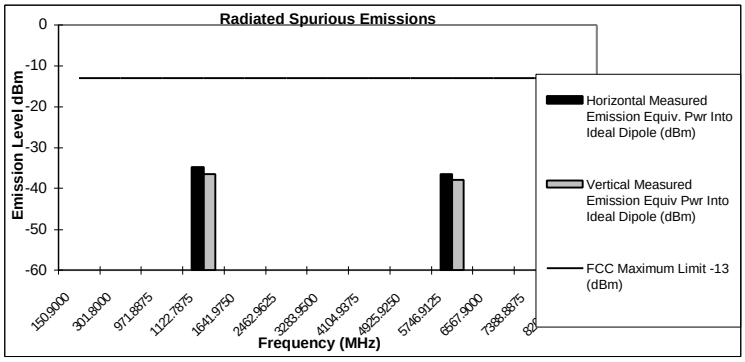
Spur	Frequency (MHz)	FCC Maximum Limit -13 (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
IF	150.9	-13	*	*
2XIF	301.8	-13	*	*
LO	964.5	-13	*	*
IF+LO	1115.4	-13	-34.17	-36.2
2X FUND	1627.1	-13	*	*
3X FUND	2440.7	-13	*	*
4X FUND	3254.2	-13	*	*
5X FUND	4067.8	-13	*	*
6X FUND	4881.4	-13	*	*
7X FUND	5694.9	-13	-33.7	-34.3
8X FUND	6508.5	-13	*	*
9X FUND	7322.1	-13	*	*
10XFUND	8135.6	-13	*	*



* Indicates the spurious emission was less than -40dBm or could not be detected due to noise limitations.

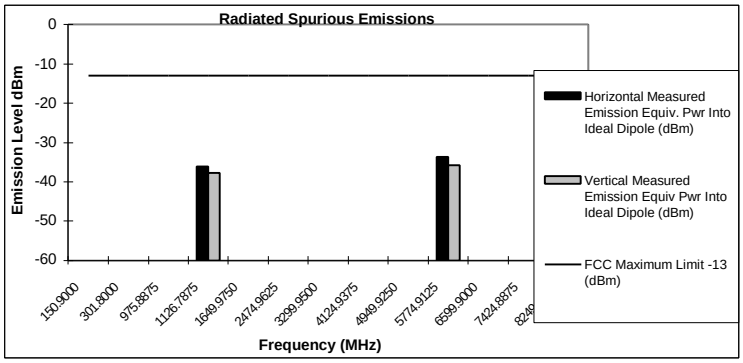
820.9875 MHz

Spur	Frequency (MHz)	FCC Maximum Limit -13 (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
IF	150.9000	-13	*	*
2XIF	301.8000	-13	*	*
LO	971.8875	-13	*	*
IF+LO	1122.7875	-13	-28.8	-29.9
2X FUND	1641.9750	-13	*	*
3X FUND	2462.9625	-13	*	*
4X FUND	3283.9500	-13	*	*
5X FUND	4104.9375	-13	*	*
6X FUND	4925.9250	-13	*	*
7X FUND	5746.9125	-13	-30.5	-31.8
8X FUND	6567.9000	-13	*	*
9X FUND	7388.8875	-13	*	*
10XFUND	8209.8750	-13	*	*



824.9875 MHz

	Frequency (MHz)	FCC Maximum Limit -13 (dBm) 25 kHz Ch. Spac.	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
IF	150.9	-13	*	*
2XIF	301.8	-13	*	*
LO	975.9	-13	*	*
IF+LO	1126.8	-13	-30.05	-31.75
2X FUND	1650.0	-13	*	*
3X FUND	2475.0	-13	*	*
4X FUND	3300.0	-13	*	*
5X FUND	4124.9	-13	*	*
6X FUND	4949.9	-13	*	*
7X FUND	5774.9	-13	-27.7	-29.82
8X FUND	6599.9	-13	*	*
9X FUND	7424.9	-13	*	*
10XFUND	8249.9	-13	*	*



* Indicates the spurious emission was less than -60dBm or could not be detected due to noise limitations.

6.5. **Frequency Stability Data** -- Pursuant 47 CFR 2.1055

Measurements were made per method described in paragraph 7.5.

Because of its dependence on the stability of the base station oscillator, it is not possible to provide stability data for this transmitter as is commonly supplied for type acceptance per 47 CFR 2.055 for a radio with a locally stabilized oscillator. The following information is provided to clarify how the transmitter attains the necessary accuracy of 1.9 PPM or better.

The transmitter's suppressed carrier emission is produced by mixing of modulated intermediate frequency with a higher, digitally synthesized injection frequency with a resolution of 12.5 kHz. Both of these frequencies are derived from a temperature compensated crystal oscillator (Y300 in figure 4.1).

Transmission frequency accuracy is enhanced by the radio receiver circuitry, which causes the radio operating frequency to become locked to within 0.4 PPM of the base station once it has acquired the primary control channel. Thus the temperature and voltage performance of the transmitter is within 0.4PPM accuracy of the higher stability base station oscillator.

The AFC routine and frequency locking mechanism are implemented using both hardware and software. The hardware and software combined provide an automatic frequency control function, which locks the receiver to within 0.4 PPM of the control channel oscillator over the entire voltage range from 3.0 V to 4.3 V (as shown in Table 6-14 and Figure 6-22) and temperature from –30 C to +60 C (as shown in Table 6-13 and Figure 6-21). This degree of AFC accuracy is determined by the bandwidth of the phase locked loop within the IC. Since the base station stability is FCC regulated to be 1.5 PPM or better, the absolute accuracy of the transmitter is □1.9 PPM. Transmitter frequency stability is guaranteed over all specified environmental operating conditions (supply voltage, temperature, humidity, etc), because of the nature of the base station frequency locking mechanism.

Frequency stability is independent of modulation scheme (QPSK, Quad-16QAM, Quad-64QAM) and the chosen scheme for the report data is: Quad-16QAM. The data shown in Tables 12-13 and 14-15 were taken with the radio set to transmit at 820.4625 MHz while locked to a R2660C service monitor.

Temperature	Freq Error	Freq Error
deg C	Hz	ppm
-30	83	0.117
-20	76	0.103
-10	69	0.095
0	39	0.049
10	45	0.055
20	43	0.054
30	47	0.06
40	38	0.048
50	50	0.063
60	49	0.061

Table 6-13: Transmitter frequency stability data - frequency vs. temperature

Supply Voltage	Freq Error	Freq Error
V	Hz	ppm
3.0	60	0.075
3.1	59	0.074
3.2	57	0.070
3.3	59	0.074
3.4	60	0.075
3.5	59	0.074
3.6	57	0.070
3.7	60	0.075
3.8	63	0.079
3.9	65	0.081
4.0	65	0.081
4.1	68	0.085
4.2	68	0.085
4.3	68	0.085

Table 6-14: Transmitter frequency stability at 30^{o} C - frequency vs. supply voltage.

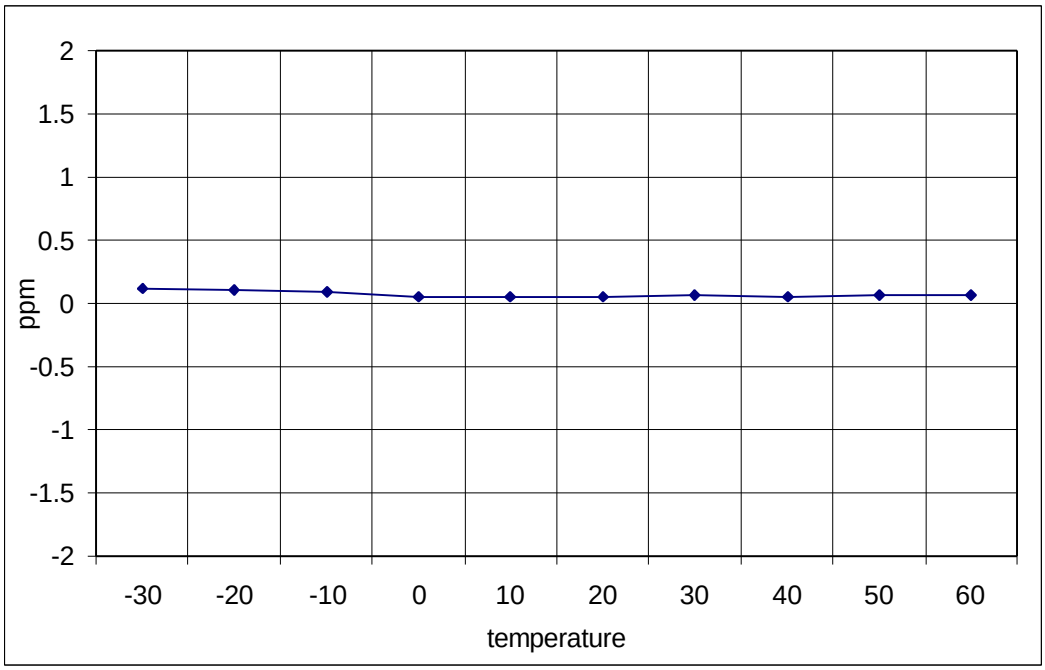


Figure 6-21: Transmitter frequency stability vs. temperature

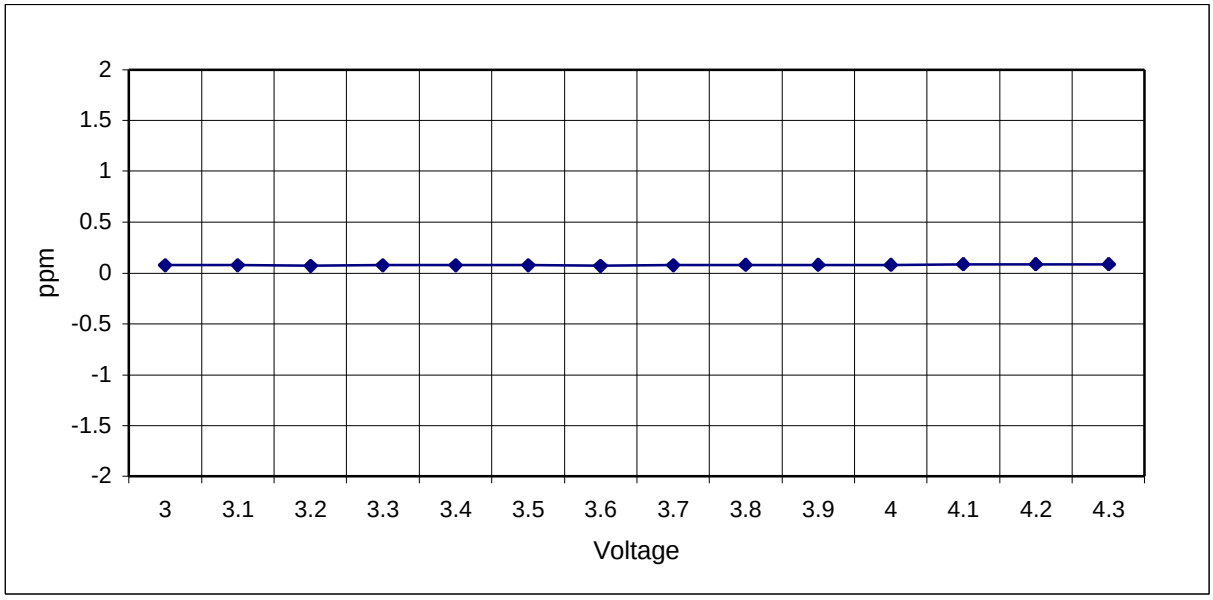


Figure 6-22: Transmitter frequency stability at 25^{o} C - frequency vs. supply voltage

6.6. **Power Line RF Voltage** -- Pursuant 47 CFR 15.107

The portable RF device can transmit while resting in a battery charger that is connected to the AC power line. Power line RF volatge measurements were made per method described in paragraph 7.6 and are shown in Figures 6-23 to 6-30.

The maximum permitted voltage, per 47 CFR 15.107, is 250 microvolts (48 dBµv) over the frequency range 450 kHz to 30 MHz. Data provided in Figures 6-23 to 6-26 demonstrate compliance with this limit.

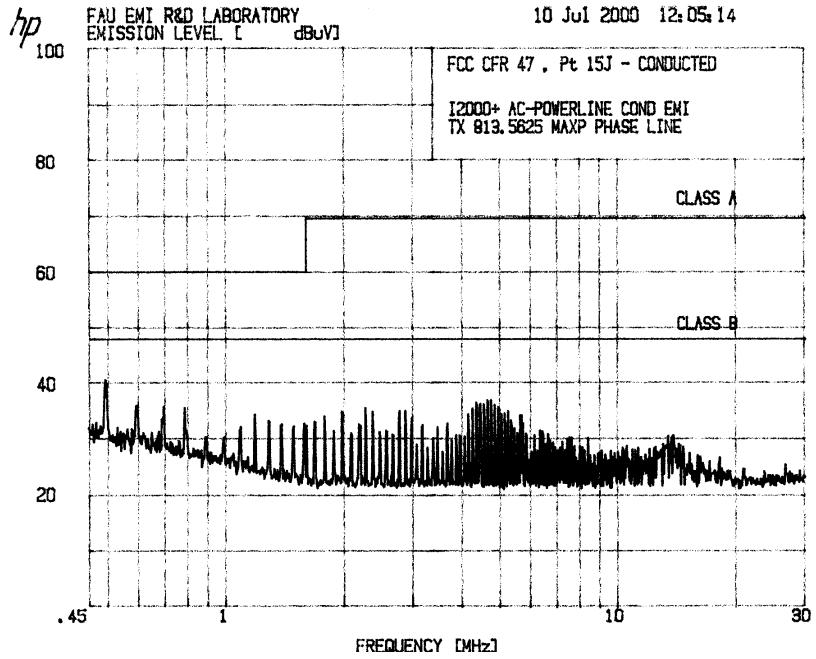


Figure 6-23: Spurious voltage at charger phase line with maximum transmitter output power setting and transmit frequency of 813.5625 MHz.

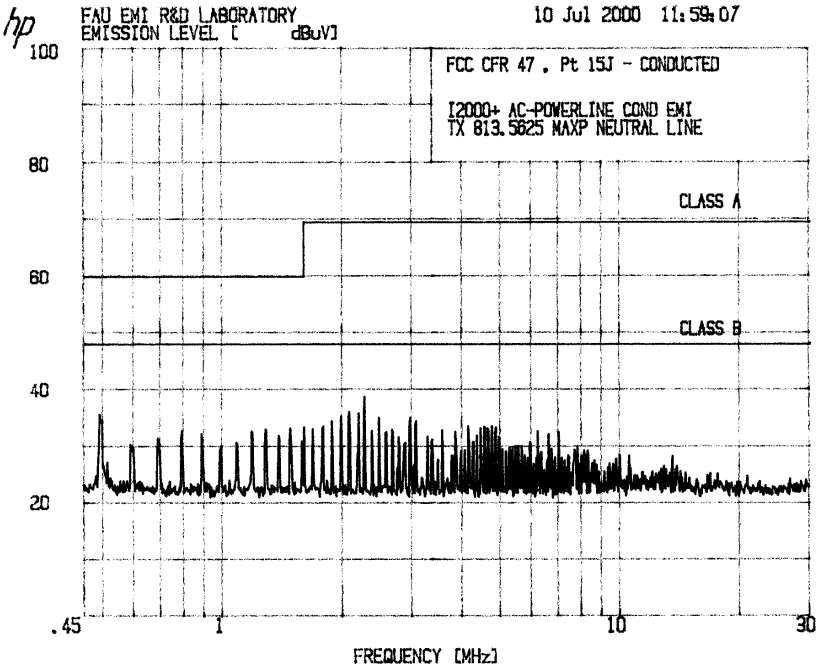


Figure 6-24: Spurious voltage at charger neutral line with maximum transmitter output power setting and transmit frequency of 813.5625 MHz.

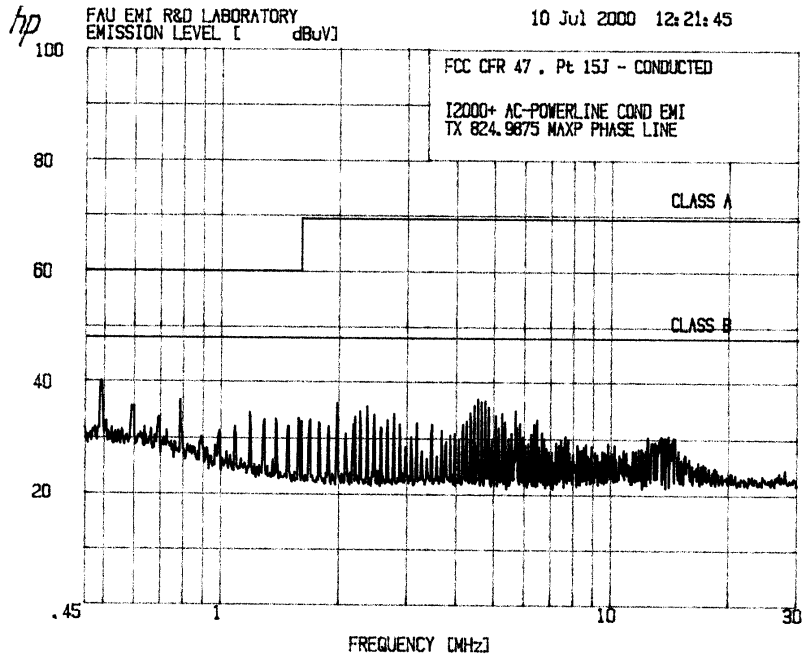


Figure 6-25: Spurious voltage at charger phase line with maximum transmitter output power setting and transmit frequency of 824.9875 MHz.

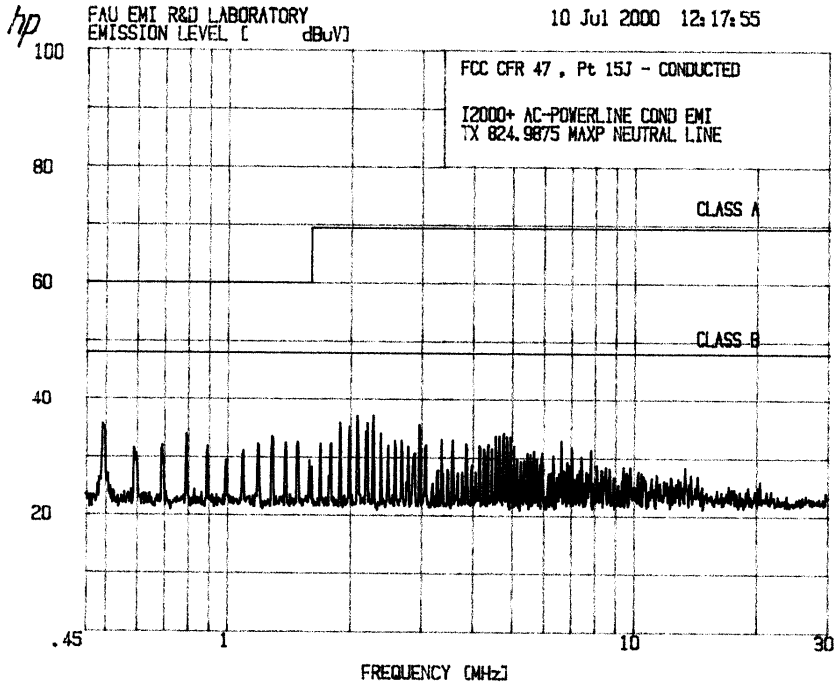


Figure 6-26: Spurious voltage at charger neutral line with maximum transmitter output power setting and transmit frequency of 824.9875 MHz.

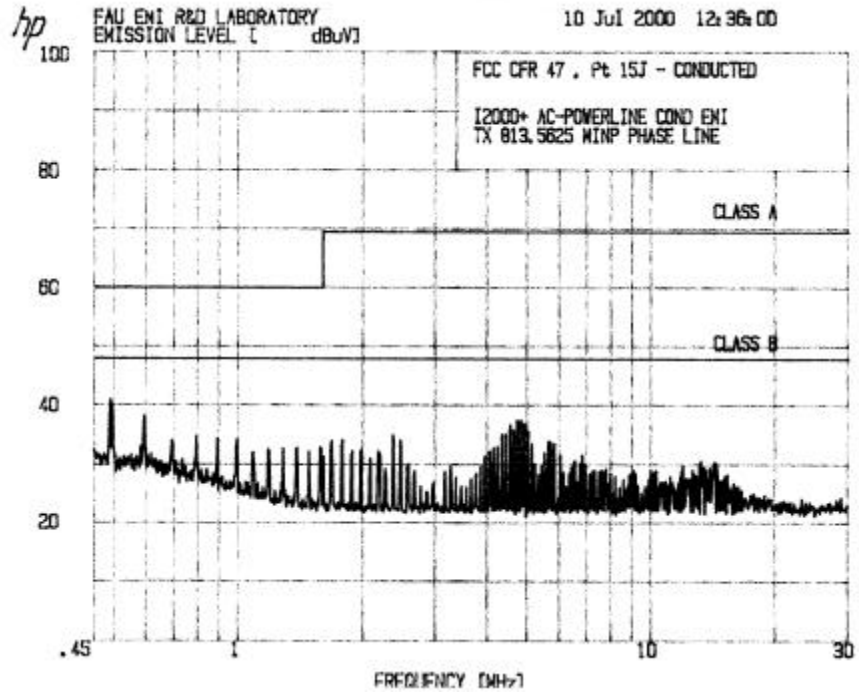


Figure 6-27: Spurious voltage at charger phase line with minimum transmitter output power setting and transmit frequency of 813.6525 MHz.

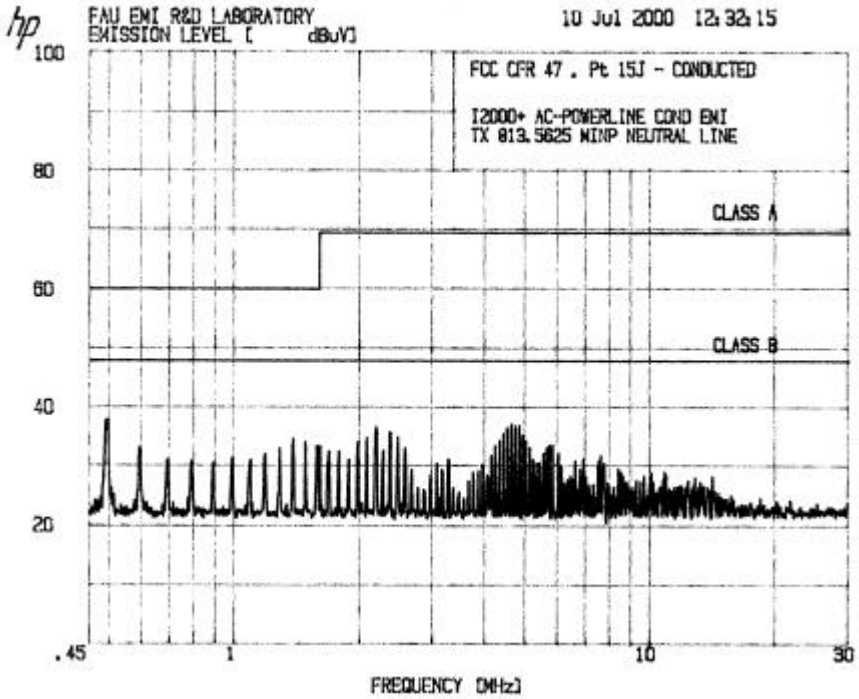


Figure 6-28: Spurious voltage at charger neutral line with minimum transmitter output power setting and transmit frequency of 813.5625 MHz.

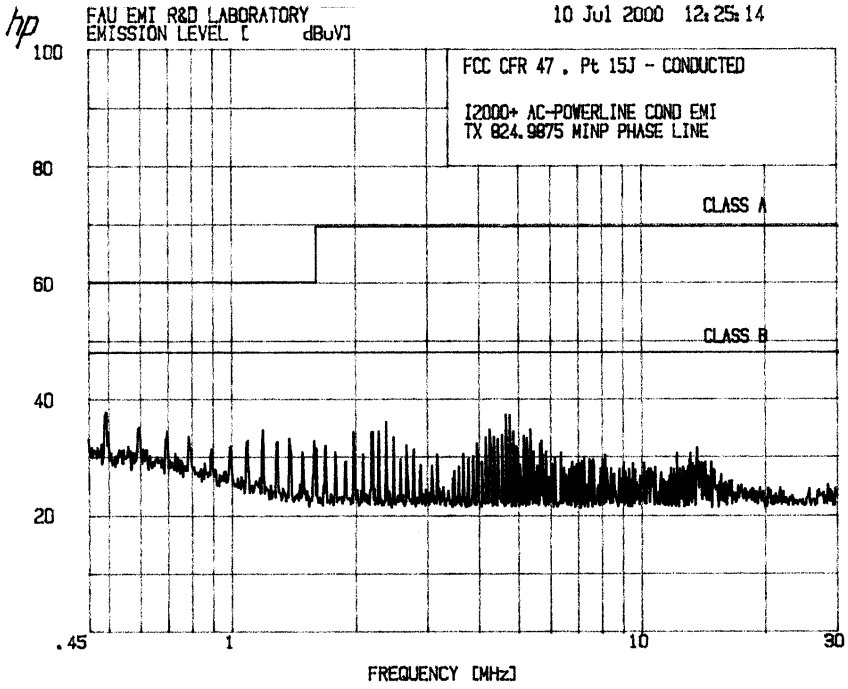


Figure 6-29: Spurious voltage at charger phase line with minimum transmitter output power setting and transmit frequency of 824.9875 MHz.

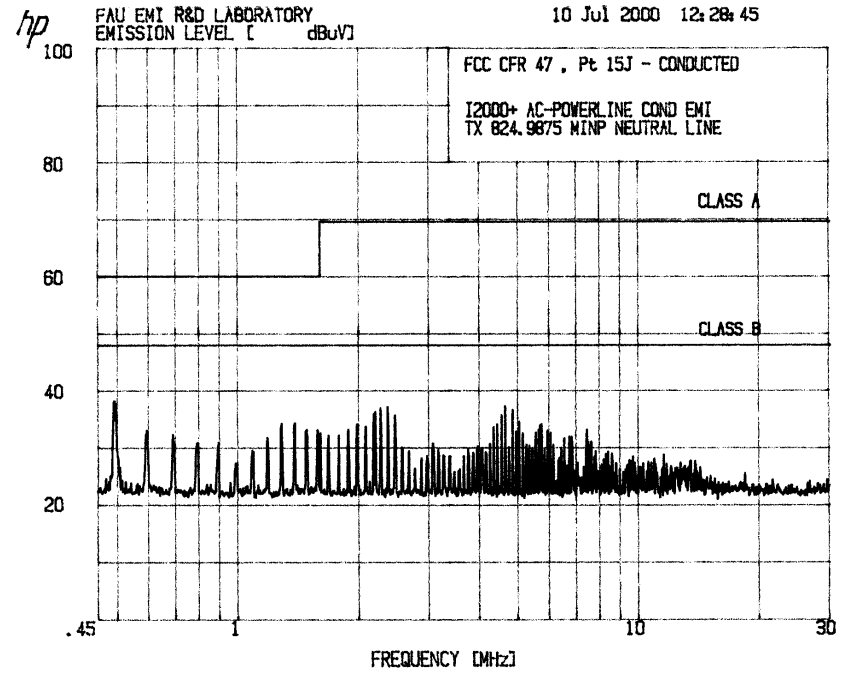


Figure 6-30: Spurious voltage at charger neutral line with minimum transmitter output power setting and transmit frequency of 824.9875 MHz.