

7.3 Radiated Emissions - FCC Section 15.209(Unintentional Radiation)

Radiated emissions tests were performed over the frequency range of 30MHz to 10GHz, 10 times the highest fundamental frequency. Measurements of the radiated field strength were made at a distance of 3m from the boundary of the equipment under test (EUT) and the receiving antenna. The antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. Radiated measurements were made with the Spectrum Analyzer’s resolution bandwidth set to 120KHz for measurements above 30MHz.

The EUT was caused to go into a “Receive Only” mode of operation for this test. Results of the test are given in Table 7.3-1 below:

Table 7.3-1: Radiated Emissions Tabulated Data

Frequency (MHz)	Uncorrected Reading (dBµV)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Position (°)	Total Correction Factor (dB)	Corrected Reading (dBµV)	Limit (dBµV)	Margin (dB)	Results
95.7	10.42	h	100	0	11.73	22.15	43.5	21.4	Pass
106.4	6.59	h	100	0	13.18	19.77	43.5	23.7	Pass
114.1	8.21	h	100	0	13.89	22.10	43.5	21.4	Pass
152.8	5.24	h	100	0	13.53	18.77	43.5	24.7	Pass
229.1	8.14	h	100	0	14.14	22.28	46	23.7	Pass

7.4 Peak Output Power Requirement - FCC Section 15.247(b)

The peak output power of the EUT was made at the antenna connector using an 8560E Spectrum Analyzer. The 20dB bandwidth of the device was measured to be 91.7kHz, therefore a spectrum analyzer with the RBW set to 1MHz was used to measure the output power of the device. For the measurement, the EUT was caused to generate a constant carrier. A 75 to 50Ohm adapter was used to compensate for the impedance mismatch of the EUT and measurement equipment. A correction factor of 6dB was added to the measured result and is reflected below. Results are shown below in Table 7.4-1 and Figure 7.4-1.

Table 7.4-1: Peak Output Power

Frequency (MHz)	Output Power (dBm)
911.09	18

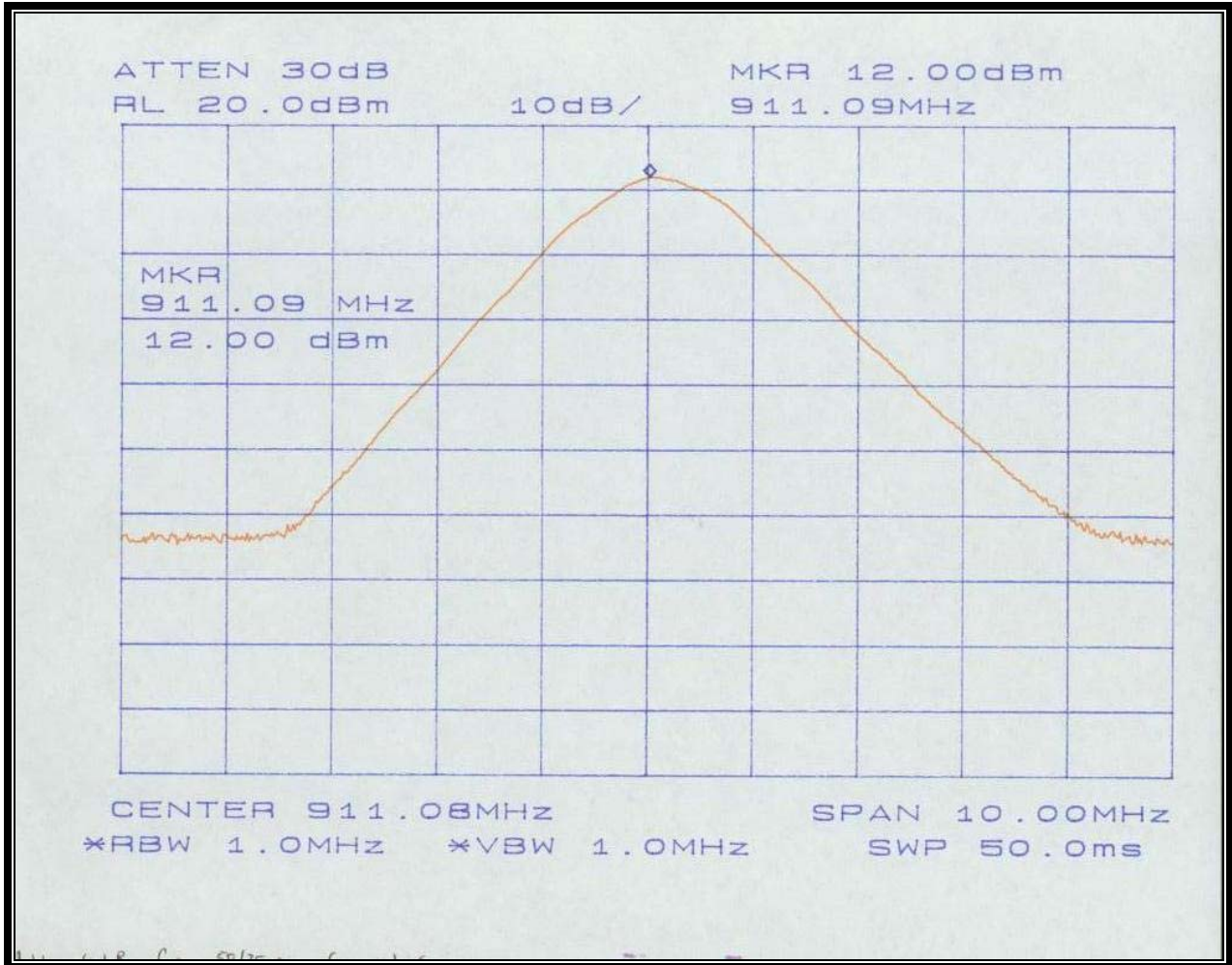


Figure 7.4-1: Output power

7.5 Channel Usage Requirements - FCC Section 15.247(a)(1)

15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the wanted signal.

15.247(a)(1)(i): For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

7.5.1 Adjacent Channel Separation

Results: The 20dB bandwidth of the hopping channel was measured to be 91.7 kHz (See figure 7.5.4-1 below). The adjacent channel separation was measured to be 135.7kHz. Results are shown in figure 7.5.1-1 below:

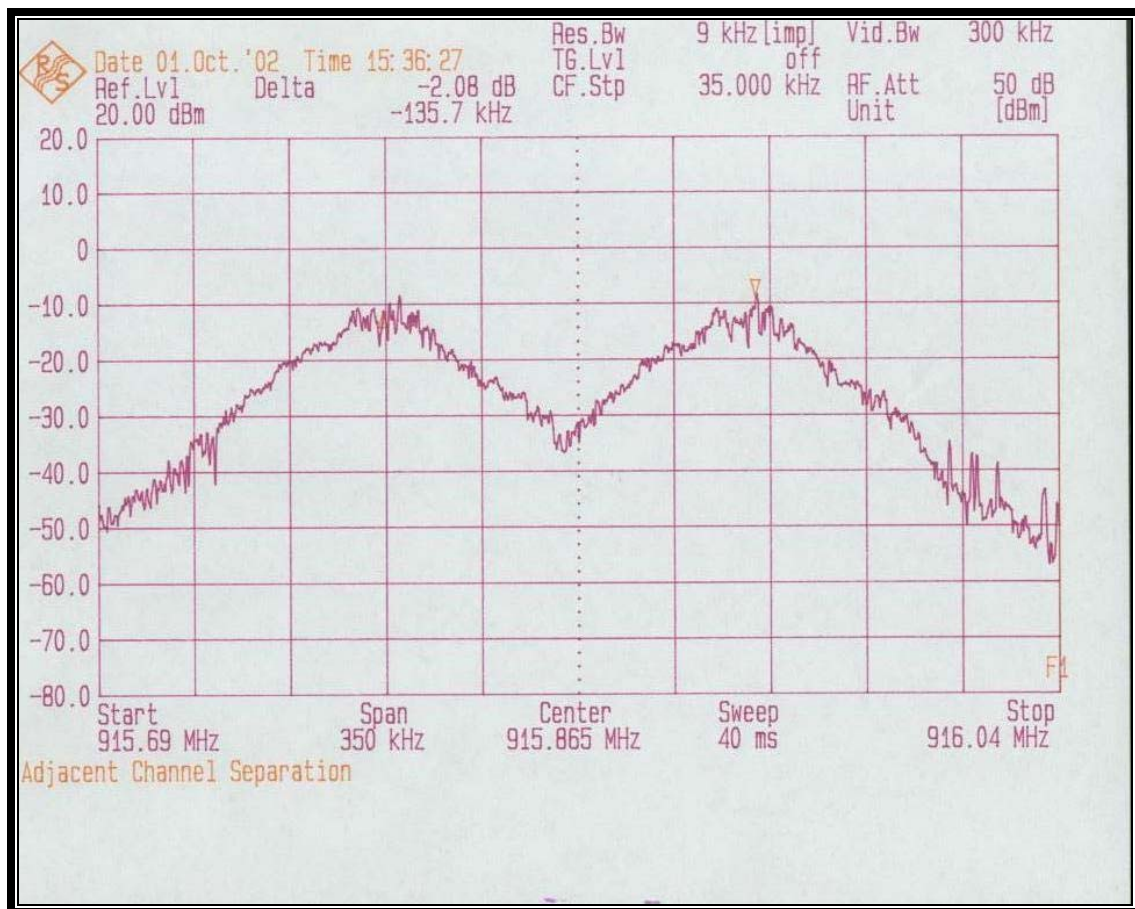


Figure 7.5.1-1: Adjacent Channel Separation

7.5.2 Number of Hopping Channels

Result: The 20dB bandwidth of the device is less than 250kHz. The device employs 50 hopping channels as required. Results are shown in figure 7.5.2-1 below

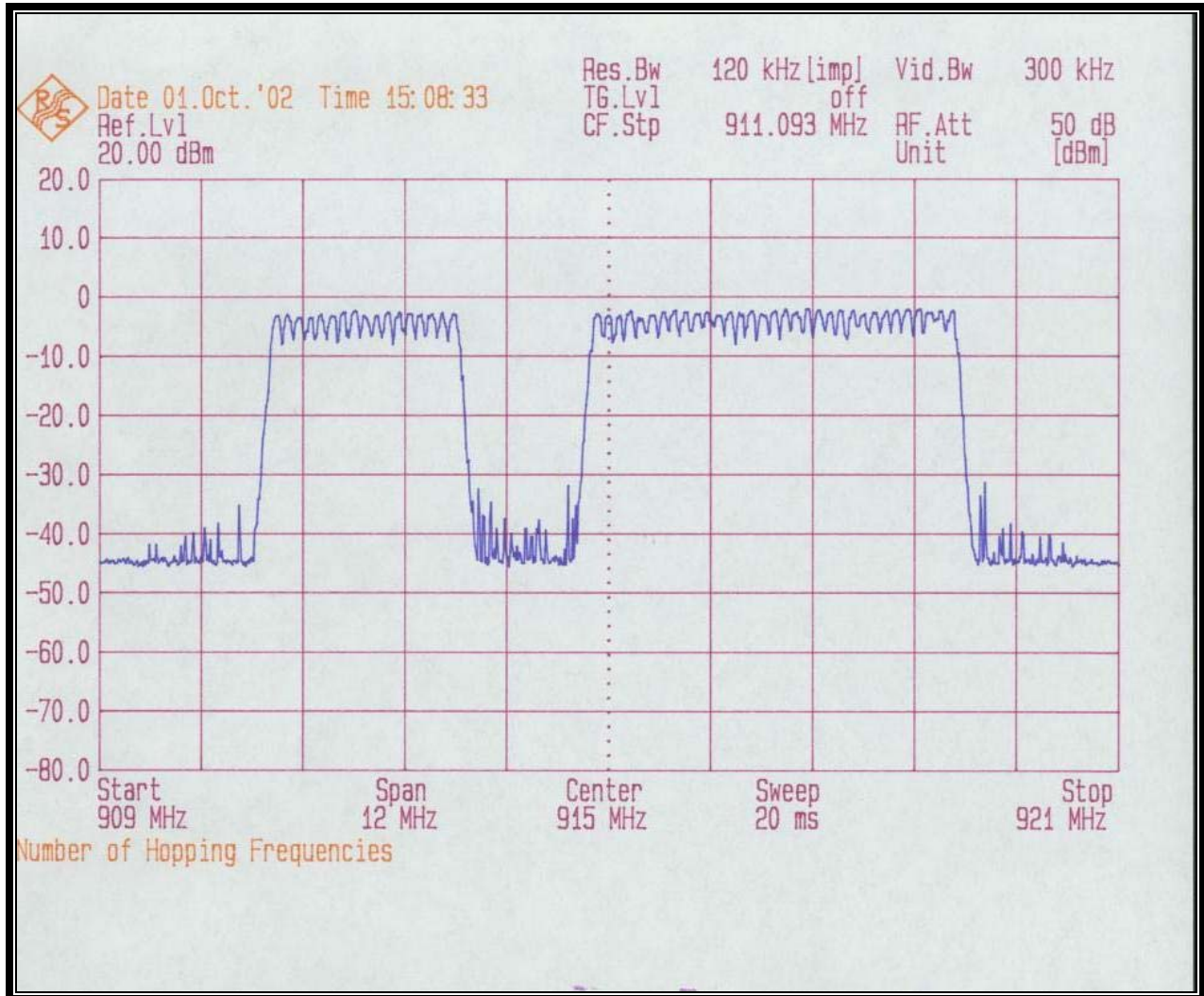


Figure 7.5.2-1: Number of Hopping Channels

7.5.3 Channel Dwell Time

Result: The duration of the RF transmission is 7.05 ms followed by a 10 second rest period in which the device hops to another channel according to the pseudorandom frequency table before transmitting another 7.05mS burst. Therefore the average time of occupancy on any channel in a 20 second period is 7.05mS. See theory of operation in appendix I of this report for further details. A single transmission is shown in figure 7.5.3-1 below:

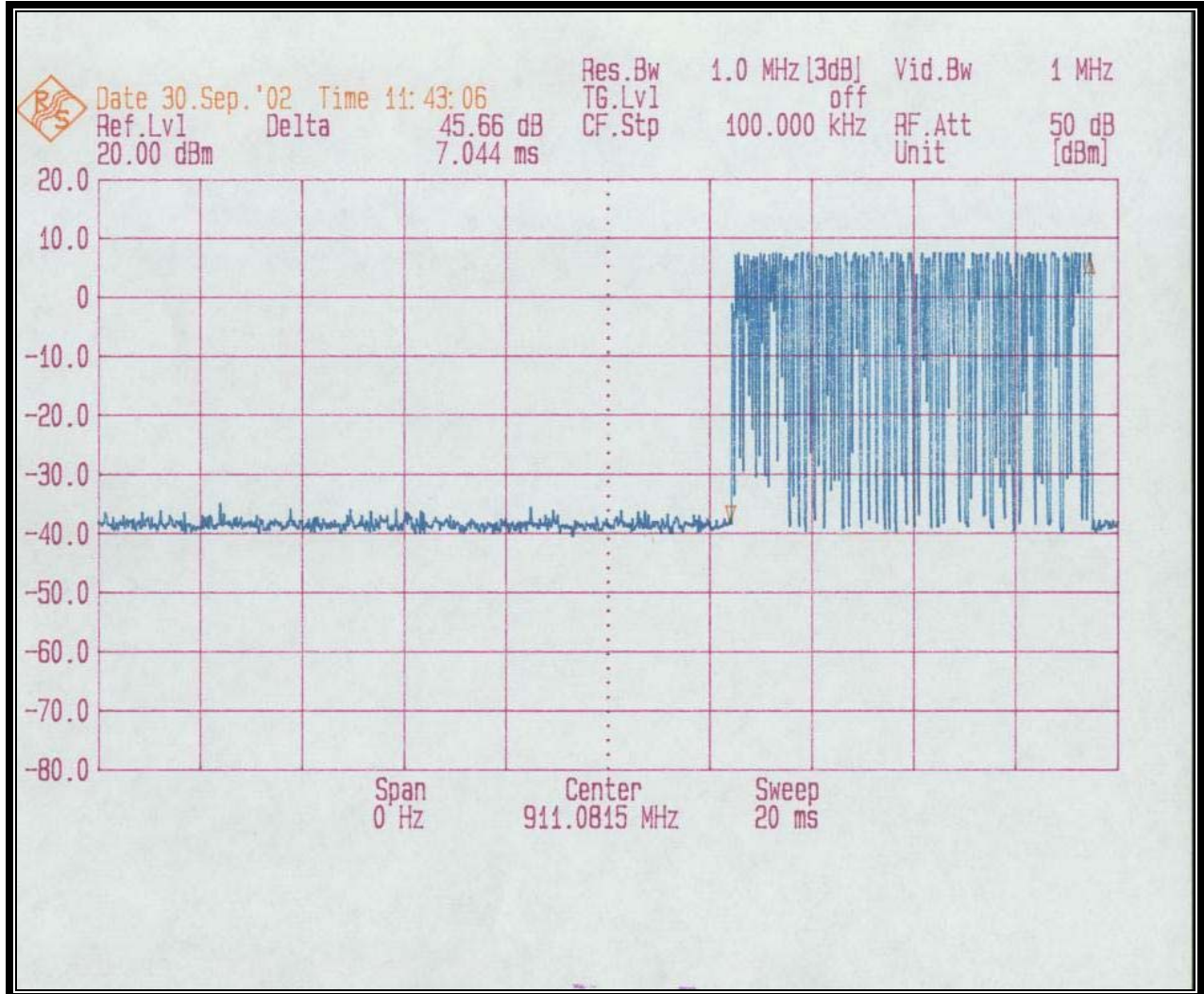


Figure 7.5.3-1: Channel Dwell Time

7.5.4 20dB Bandwidth

Result: The 20dB bandwidth was found to be less than 500kHz as required. Results are shown below in figure 7.5.4-1.

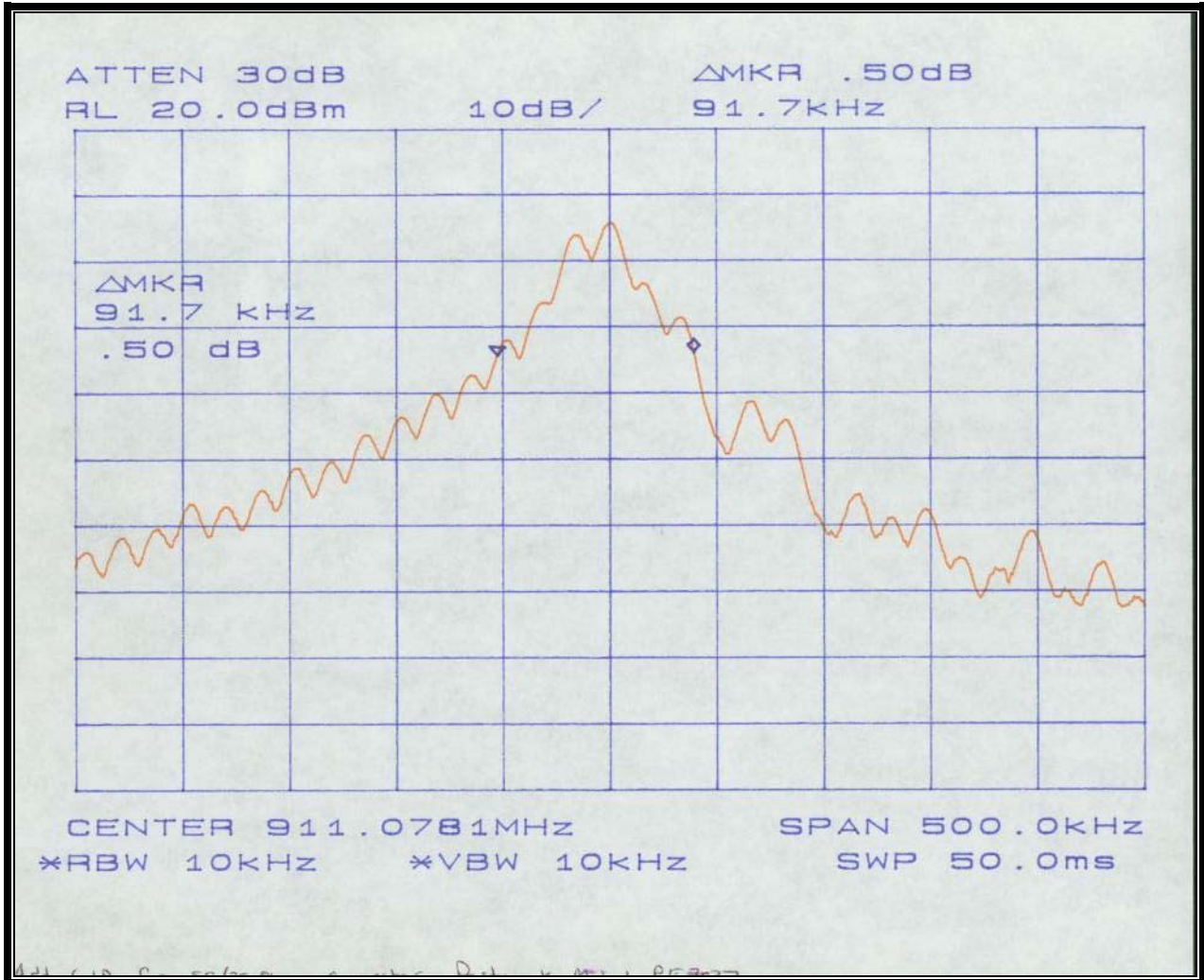


Figure 7.5-1: 20dB Bandwidth