

# Intertek Testing Services NA Inc.

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## 3.3.2 Spurious Harmonic (CDPD High)

Conducted harmonics were investigated from the fundamental frequency to 10 GHz, which is beyond the tenth harmonic. Levels reported with a "NF" are actual equipment noise floors; the signals are below the noise floor.

The limit for these emissions is in accordance with §22.907. The spurious signals must be attenuated below the level of the carrier at least 45.9 dB. For an output power of 1950 mwatts, the signals must be attenuated at least 45.9 dB below the level of the carrier. Note that the level of the carrier, in peak, was 32.9 dBm.

The emissions detected are reported below:

Frequency (MHz)	Reading (dBm)	Limit for 2 Watt System (dBm)	Margin (dB)
822	-29	-12	-17
875.95	-44	-12	-32
1697	-36	-12	-22
2546	-42	-12	-28

*Notes: Margins with negative (-) are below the limit  
Readings with NF are noise floor readings.*

Test Engineer: Kouma Sinn

Test Date: 01-04-97

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## 3.4 Spurious Radiation from Cabinet (CDPD Low)

Data was obtained from the cabinet using the procedures outlined in ANSI C63.4 (1992). For these measurements, the RF output and Port was terminated into matching impedances.

The level of the fundamental emission was 1780 mWatts (32.5 dBm) measured direct using a spectrum analyzer in peak detection mode. This power level was converted to a field strength as expected from a tuned dipole antenna at a distance of 3 meters. The following equation was used for the calculation:

$$Er = 1.64 * (5.5/r) \sqrt{Pt} \text{ where}$$

Er = Field strength in Volts per meter

r = Test distance in meters

Pt = Transmitter power in Watts

$$\begin{aligned} Er &= (1.64) (5.5/3) \sqrt{1.78} = 4.0113940 \text{ V/m} \\ &= 4011394 \mu\text{V/m} \\ &= 132 \text{ dB}\mu\text{V/m} \end{aligned}$$

Therefore:

Pt = 770 mWatts (peak)

r = 3 meters

$$Er = 1.64 * (5.5/3) \sqrt{.770}$$

$$Er = 2.64 \text{ V/m or } 128.4 \text{ dB}\mu\text{V/m}$$

The limit is 45.5 dB below 132.5 dB $\mu$ V/m or 86.5 dB $\mu$ V/m.

An emission at 1648 MHz was measured at a level of 50 dB $\mu$ V/m which is 37 dB below the limit. All other emission were at noise floor.

Radiated emission tests were performed in accordance with §15.109 for an RF Receiver. Also, antenna power conduction tests for the receiver per §15.111 were performed. Radiated emissions from the RF receiver must meet the §15.109 limits.

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## 3.4 Spurious Radiation from Cabinet (CDPD Mid)

Data was obtained from the cabinet using the procedures outlined in ANSI C63.4 (1992). For these measurements, the RF output and Port was terminated into matching impedances.

The level of the fundamental emission was 1900 mWatts (32.8 dBm) measured direct using a spectrum analyzer in peak detection mode. This power level was converted to a field strength as expected from a tuned dipole antenna at a distance of 3 meters. The following equation was used for the calculation:

$$Er = 1.64 * (5.5/r) \sqrt{Pt} \text{ where}$$

Er = Field strength in Volts per meter

r = Test distance in meters

Pt = Transmitter power in Watts

$$\begin{aligned} Er &= (1.64) (5.5/3) \sqrt{1.90} = 4.144404 \text{ V/m} \\ &= 4144404 \mu\text{V/m} \\ &= 132 \text{ dB}\mu\text{V/m} \end{aligned}$$

Therefore:

Pt = 770 mWatts (peak)

r = 3 meters

$$Er = 1.64 * (5.5/3) \sqrt{.770}$$

$$Er = 2.64 \text{ V/m or } 128.4 \text{ dB}\mu\text{V/m}$$

The limit is 45.8 dB below 132 dB $\mu$ V/m or 86 dB $\mu$ V/m.

An emission at 1674 MHz was measured at a level of 45 dB $\mu$ V/m which is 42 dB below the limit. All other emission were at noise floor.

Radiated emission tests were performed in accordance with §15.109 for an RF Receiver. Also, antenna power conduction tests for the receiver per §15.111 were performed. Radiated emissions from the RF receiver must meet the §15.109 limits.

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## 3.4 Spurious Radiation from Cabinet (CDPD High)

Data was obtained from the cabinet using the procedures outlined in ANSI C63.4 (1992). For these measurements, the RF output and Port was terminated into matching impedances.

The level of the fundamental emission was 1950 mWatts (32.9 dBm) measured direct using a spectrum analyzer in peak detection mode. This power level was converted to a field strength as expected from a tuned dipole antenna at a distance of 3 meters. The following equation was used for the calculation:

$$Er = 1.64 * (5.5/r) \sqrt{Pt} \text{ where}$$

Er = Field strength in Volts per meter

r = Test distance in meters

Pt = Transmitter power in Watts

$$\begin{aligned} Er &= (1.64) (5.5/3) \sqrt{1.95} = 4.198582 \text{ V/m} \\ &= 4198582 \mu\text{V/m} \\ &= 132 \text{ dB}\mu\text{V/m} \end{aligned}$$

Therefore:

$$Pt = 770 \text{ mWatts (peak)}$$

$$r = 3 \text{ meters}$$

$$Er = 1.64 * (5.5/3) \sqrt{770}$$

$$Er = 2.64 \text{ V/m or } 128.4 \text{ dB}\mu\text{V/m}$$

The limit is 45.9 dB below 132 dB $\mu$ V/m or 86 dB $\mu$ V/m.

An emission at 1698 MHz was measured at a level of 44 dB $\mu$ V/m which is 43 dB below the limit. All other emission were at noise floor.

Radiated emission tests were performed in accordance with §15.109 for an RF Receiver. Also, antenna power conduction tests for the receiver per §15.111 were performed. Radiated emissions from the RF receiver must meet the §15.109 limits.