CD&T FCC ID: ODYD121R3

A. DEVICE UNDER TEST

The product is transmitter used for the wireless transmission of public utility water meter data. This device works in conjunction with a receiver (ODYD237) that has been previously certified. This product is designed to operate under the provisions of Part 15.249 of the FCC rules.

The transmit frequency is 916.500 MHz. nominal. The modulation mode is on/off keying using a pulse position scheme. This device is programmed to transmit single data packets at intervals of 1 to 18 seconds. Power for the device is provided by an internal "D" size 3.6 volt lithium battery.

The rf section consists of a RF Monolithics TX6000 transmitter module, a two element antenna matching network and helical wire antenna. The antenna is custom manufactured for the applicant and is solder connected to the printed circuit board. The entire assembly is housed in a sonic welded plastic enclosure. There is no provision to connect an external antenna.

B. MEASUREMENT PROCEDURE: RADIATED EMISSIONS

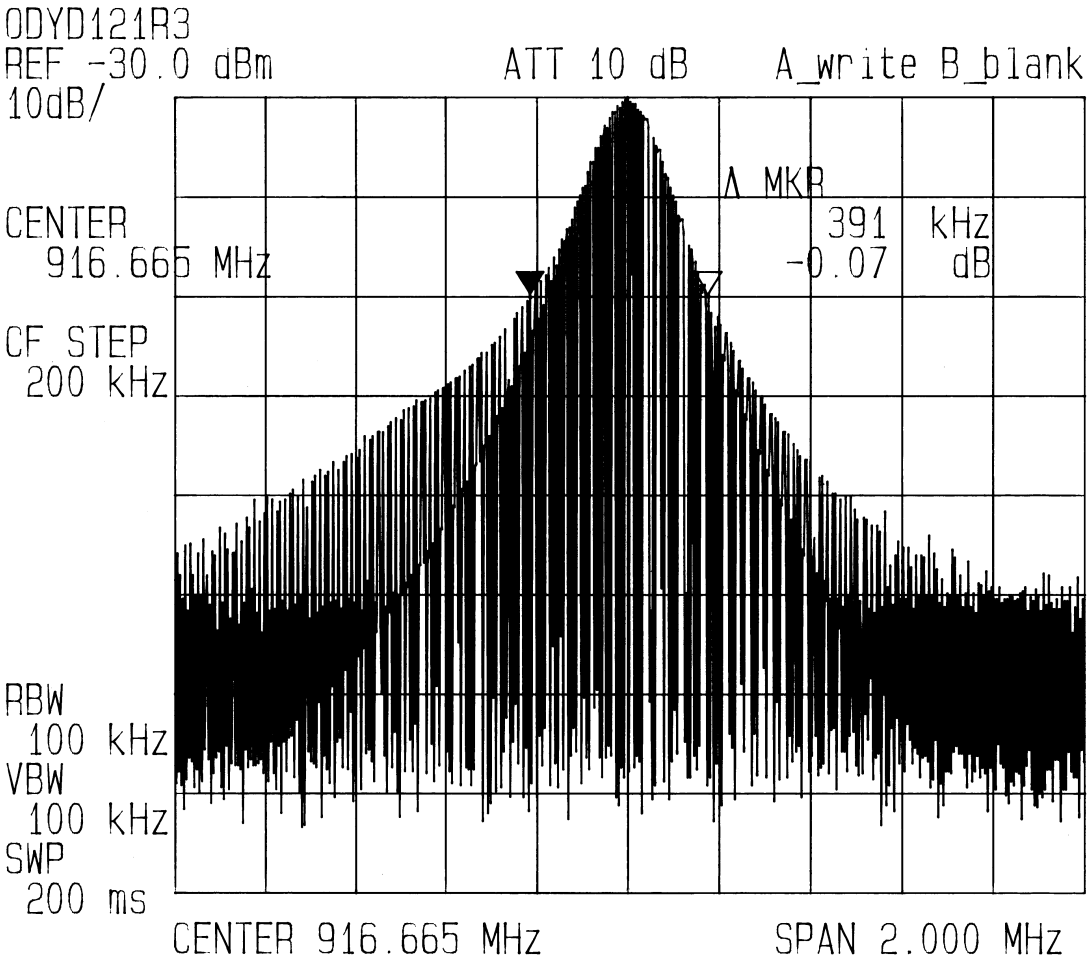
Testing of this device was conducted at the Hyak Laboratory test facility located in Spotsylvania, Virginia.

Transmitter field strength measurements were conducted according to the procedures set forth in ANSI C63.4 (1992). Testing was conducted with a fresh battery and monitored periodically to insure that the battery voltage (under load) was maintained at 95% of nominal or greater.

The device under test was placed on a rotating turntable 0.8 meters high, centered at 3 meters distant from the measurement antenna. The device was placed in the center of the turntable and tested in the two positions shown in the test setup photographs.

For the purpose of testing, the sample was set to transmit a constant 1 kHz. pulse stream. The occupied bandwith (Plot 1) was captured with the sample transmitting typical data packets.

Plot 1


ODYD121R3
REF -30.0 dBm
ATT 10 dB
A_write B_blank
10dB/
Δ MKR
391 kHz
-0.07 dB
CENTER
916.665 MHz
CF STEP
200 kHz
RBW
100 kHz
VBW
100 kHz
SWP
200 ms
CENTER 916.665 MHz
SPAN 2.000 MHz

The field strength measurements were taken using an HP8596E spectrum analyzer, an EMCO 3121C dipole set, an EMCO 3115 double ridge guide horn and an Avantek UJ210 preamp. The device was scanned from 30 MHz. to 10 GHz. and all emissions were noted. In this case, the only emissions detected were those harmonically related to the fundamental transmit frequency.

At each detected emission frequency, the device was measured by rotating the turntable and adjusting the antenna height over a range of 1 to 4 meters to obtain the maximum output level. This procedure was performed with both horizontal and vertical antenna polarizations for both of the setup positions shown in the test setup photos. The peak reading for each frequency was recorded in the fourth column in Table 1 below.

Measurements taken for weak emissions were performed by reducing the distance from the measurement antenna to 1 meter and factoring –9.54dB into the calculation. This method was used for the 7^{th} and 8^{th} harmonics.

Table 1

RADIATED EMISSIONS DATA

CLIENT: DATAMATIC LLC FCC ID: ODYD121R3

ANTENNA: DIPOLES/DRG HORN EUT: DATA TRANSMITTER

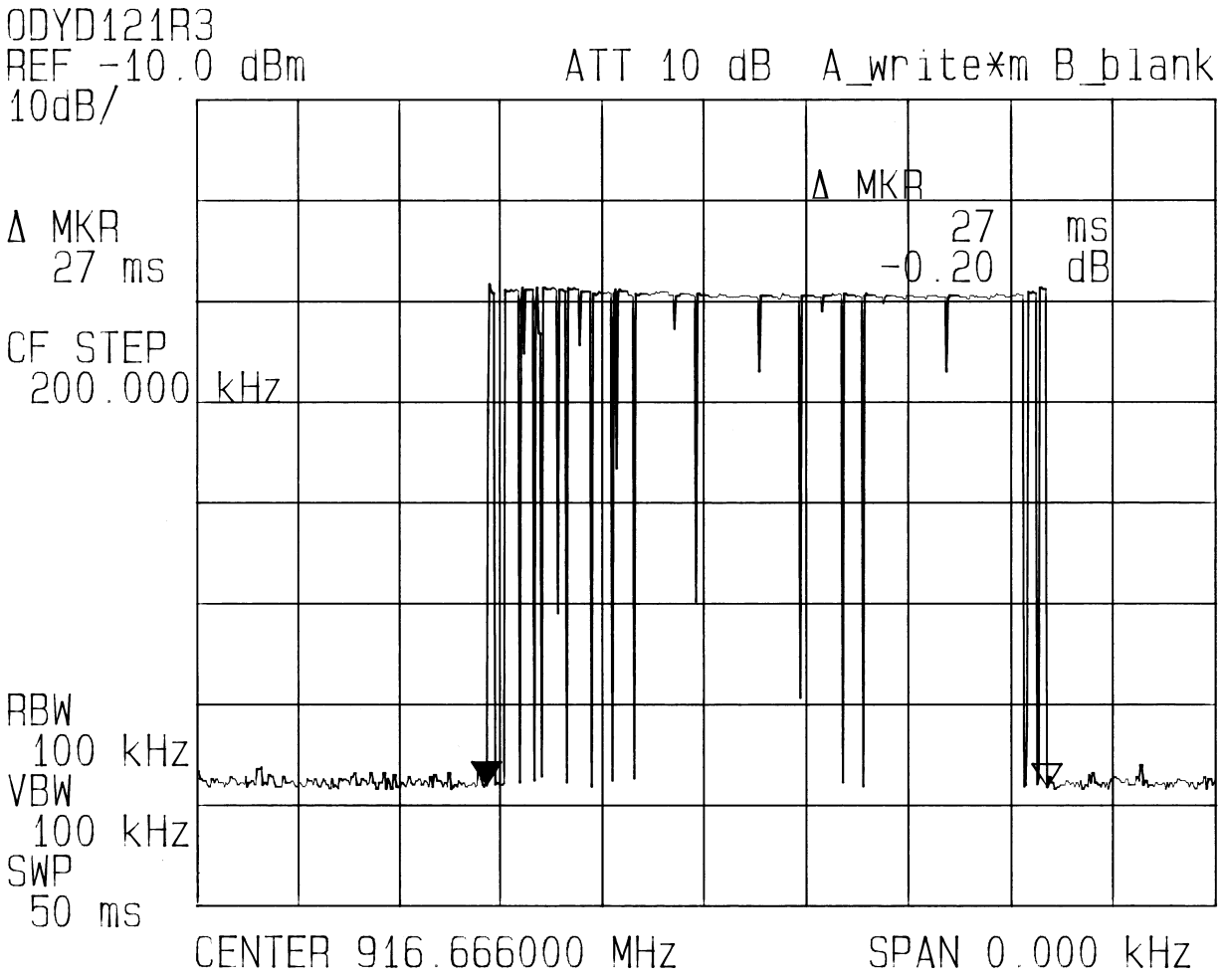
PART 15.249, 15.35 TEST DATE: 08-FEB-01

Frequency In MHz.	Ant. Polar. H/V	Ant. Factor dB	Peak reading dBm	Duty Cycle -dB	Peak Power uV/m@3m	Corrected Power uV/m@3m	FCC Limit uV/m@3m
916.597	V	30.5	-43.93	0.0	47698	47698	50000
1833.194	V	30.2	-86.41	11.4	346	93	500
2749.791	V	33.4	-93.06	11.4	233	63	500
3666.388	H	35.7	-96.17	11.4	212	57	500
4582.985	H	36.6	-101.76	11.4	124	33	500
5499.581	V	38.6	-109.03	11.4	67	18	500
6416.178	V	39.1	-112.88	11.4	46	12	500
7332.775	H	40.8	-116.35	11.4	37	10	500

C. DUTY CYCLE AND INTERVAL CALCULATIONS

The occupied bandwidth and duty cycle measurements were made using an Advantest R3361A spectrum analyzer and plotted with an HP7475A pen plotter. The computation for the duty cycle correction factor in column five in Table 1 is derived from the manufacture's description of the data scheme and is verified by Plot 2 below.

Plot 2



The code format for this device is a pulse position scheme that comprises 260 bit frames of 104 s. each. The entire packet length is 27.04ms. and is transmitted at intervals of 1 second or longer. Spaces between pulses have been ignored in the calculation but would result in a slightly higher correction factor. The correction factor is given by:

20log(27.04./100ms.) = - 11.3598 dB.

As provided in Part 15.35 of the FCC rules, a correction factor of –11.4dB is used for the calculations on the data sheets. As shown in Plot 3, the packet repeat interval from this sample was approximately 5 seconds.

PLOT 3