

Test Report
For
Datamatic Ltd.
Firefly Transceiver FCC ID: ODYD2300

DUT: Meter Transceiver Model D2300

Test Date: 20-May-2004

Manufacturer: Datamatic, Ltd.
3600 K Avenue
Plano, Texas
(972) 234-5000

Conducted by: Control Design & Testing, Inc.
6010 Red Fox Drive
Spotsylvania, VA 22553
(540) 582-2826

CD&T

FCC ID: ODYD2300

A. DEVICE UNDER TEST

The product is transceiver used for the wireless transmission of public utility electric meter data. This device works in conjunction with a handheld transceiver (ODYD740) 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 proprietary binary data, pulse position scheme. This device is programmed to transmit single data packets at intervals of 1 to 18 seconds and to communicate continuously in half duplex mode when interrogated by the D740 handheld transceiver. Power for the device is 230 VAC, nominal and is tapped from the meter busbar on the utility side. Memory retention is provided by two lithium 2032 coin cells.

The rf section consists of an RF Monolithics TR1000L transmitter hybrid IC, a two element antenna matching network and helical wire antenna. The antenna is soldered directly to the printed circuit board. There is no provision to connect an external antenna.

This device will be sold as a retrofit and will fit several of a family of existing electric meters. The meter body shown in this report is typical of the meter family. The battery, circuit, layout and board form factor will be the same in each case.

B. MEASUREMENT PROCEDURE: RADIATED EMISSIONS

Testing of this device was conducted at the Carl T. Jones test facility located in Springfield, Virginia. FCC Site #90490, IC #3101

The receiver section of this device is a sequenced TRF, clocked at approximately 745 kHz., and does not have a local oscillator. The device, as tested in the receive mode, was scanned from 30 MHz. to 1 GHz. No emissions were detected.

Transmitter field strength measurements were conducted according to the procedures set forth in ANSI C63.4 (1992). The device under test was placed on a rotating turntable 0.8 meters high, centered at three meters distant from the measurement antenna. The device was placed in the center of the turntable and tested in the position shown in the test setup photographs.

For the purpose of radiated emissions testing, the sample was programmed a constant pulse stream. For the occupied bandwidth (Plot 1) the sample was set to transmit typical data packets

Plot 1

hp

REF -17.0 dBm #AT 0 dB

PEAK

LOG

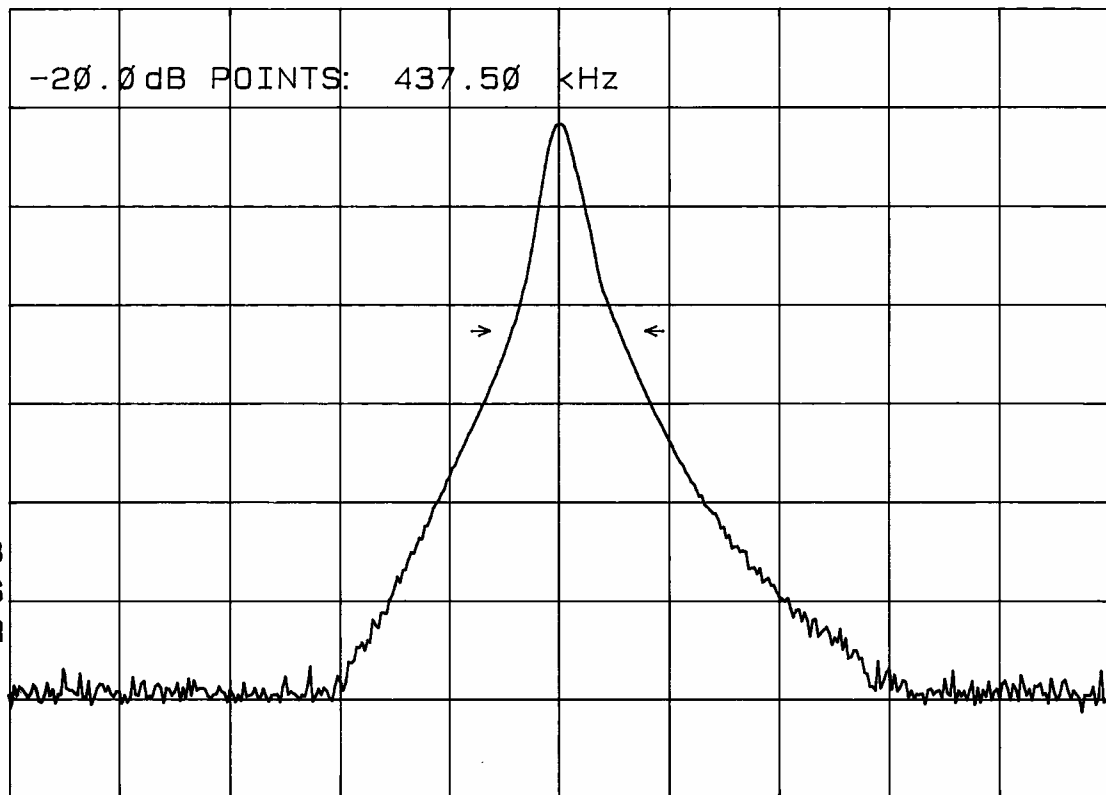
10

dB/

WA SB

SC FS

CORR



CENTER 916.425 MHz

#RES BW 100 kHz

#VBW 100 kHz

SPAN 5.000 MHz

#SWP 1.50 sec

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. 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 6th and 7th harmonics.

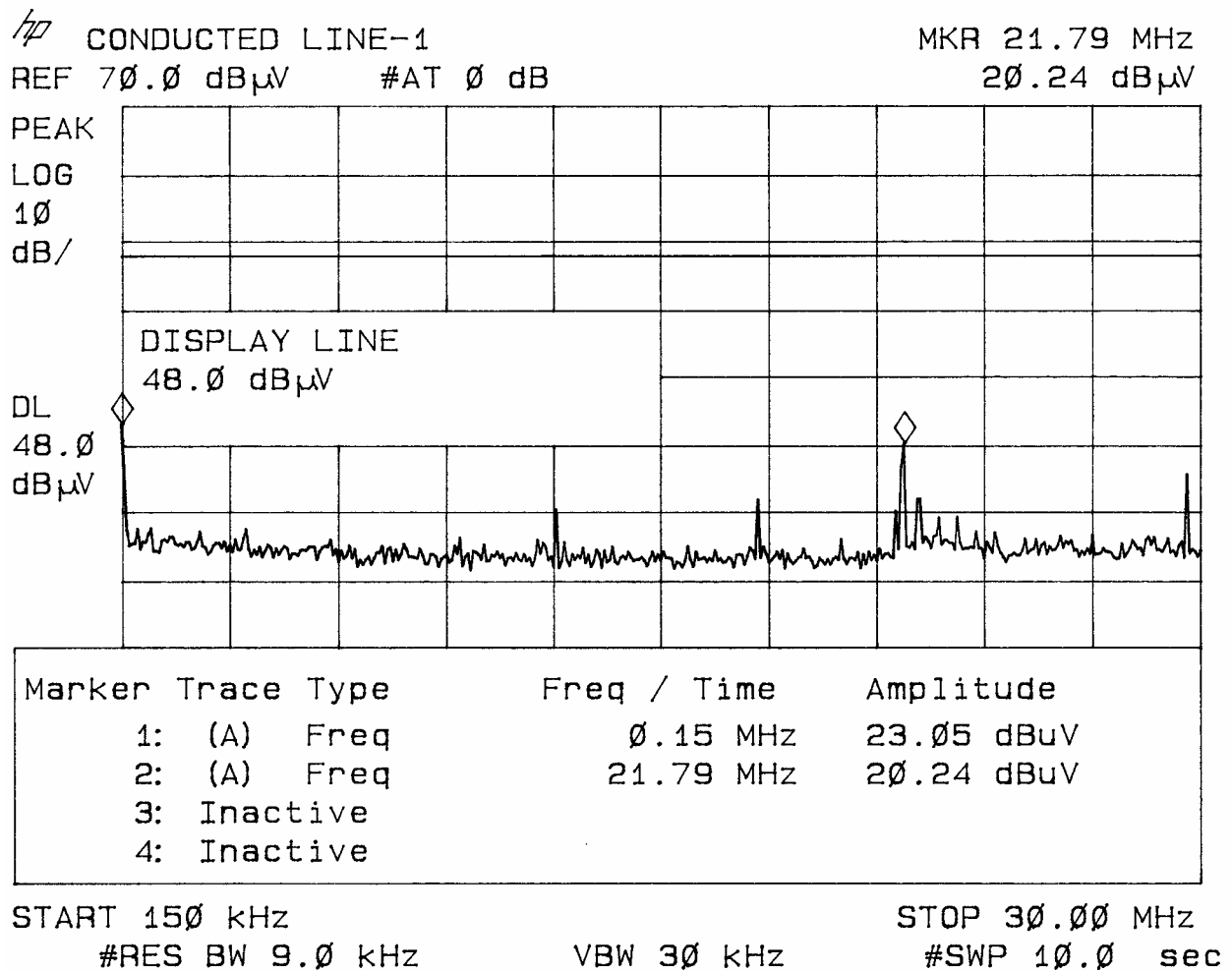
As provided in Part 15.35, the pulse format used by this device would result in a duty cycle correction of approximately -5.4 dB . However, since the peak readings for all harmonic and spurious emissions were 6dB or more under the limits, this correction was not applied to the calculations.

Table 1

RADIATED EMISSIONS DATA							
CLIENT: DATAMATIC				FCC ID: ODYD2300			
ANTENNA: DIPOLES/DRG HORN				EUT: DATA TRANSCEIVER			
PART 15.249, 15.109				TEST DATE: 20-May-04			
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
916.436	H	30.8	-44.83		44514		50000
1832.872	H	30.2	-91.32		197		500
2749.308	V	33.4	-96.09		164		500
3665.744	H	35.7	-99.10		151		500
4582.180	H	36.6	-100.56		142		500
5498.616	V	38.6	-108.08		75		500
6415.052	V	39.1	-113.29		44		500

C. MEASUREMENT PROCEDURE: LINE CONDUCTED EMISSIONS

Plots of the conducted emissions were taken using a matched pair of Solar Design model 8028-50-TS-24, 50 μ H LISN's fed from the high side of a 115/230VAC transformer. The outputs were connected to an HP8594E spectrum analyzer and plotted on an HP7475A pen plotter.

Plot 2

Plot 3

