

A. DEVICE UNDER TEST

The device is a low power data receiver used to receive and decode data transmissions from its companion transmitter (ODF-RS01) and translate the data received in temperature measurements that can then be used to control a heating/cooling system in a manner similar to a standard room thermostat. This product is designed to operate under the provisions of Part 15.109 of the FCC rules, with 15.107 also applicable. The frequency of operation is 418 MHz. nominal.

Power for the device was provided by an external NEMA Class II low voltage cable as would be typical for a standard room thermostat. The device is internally regulated at +5 volts and will accept input voltages from +9 to +12 volts DC.

This receiver of this device is a TRF circuit using SAW filters to achieve the desired receive frequency. A SAW delay line is used to provide a time lag between two rf amplifiers so that the amplifiers may be alternately turned on and off (approx. 245kHz.) and thus realize a relative high gain without the risk of instability. The entire receiver is contained in a single monolithic integrated circuit. The only external element is the antenna. There are no tunable elements in this device.

B. MEASUREMENT PROCEDURE: RADIATED EMISSIONS

Field strength measurements were conducted according to the procedures set forth in ANSI C63.4 (1992). Testing was conducted with the device powered from a HP-6216A DC power supply set to 12 volts. The power supply was connected to the mains through slip attached to the base of the turntable.

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 three logical positions shown in the test setup photographs. This housing is designed to mount on a wall like an ordinary thermostat. However since the possibility exists for mounting on a ceiling, the device was tested in a "flat" and an "upright" position also. In all positions, the primary source of emissions seemed to be in the plane parallel with the plane of the printed circuit board.

The field strength measurements were taken using an HP8596E spectrum analyzer, an EMC0 3121C dipole set and an Avantek UJ210 preamp. The device was scanned from 30MHz. to 4.2GHz. and all emissions were noted. In this case the only emissions detected were those that were harmonically related to the clock oscillator fundamental frequency.

At each detected frequency of emission, 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 with the device in the positions described above. The peak reading for each frequency was recorded in the second column on the data sheet. No emissions were detected above 80 MHz.

C. LINE CONDUCTED MEASUREMENTS

The line conducted measurements were performed using an OneAC CB-1120 power line conditioner, a Compliance Design LISN, a HP8594E spectrum analyzer and a HP7475A plotter. The resulting plots are provided.