

A. DEVICE UNDER TEST

The device is a low power receiver used to receive and decode control transmissions from its companion transmitter (HS9-RT8220). The received signals are used to control the flame level and fan speed of a gas fireplace. This product is designed to operate under the provisions of Part 15.109 of the FCC rules. The frequency of operation is 303.825 MHz. nominal.

The device is powered from a thermopile voltage generator located inside the fireplace. There is no connection the mains. Testing was conducted with a lithium battery in series with a dropping resistor to simulate the power that would normally be supplied by the thermopile.

This receiver of this device is a TRF circuit using SAW filters to achieve the desired receive frequency. A SAW delay line is employed 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 relatively high gain without instability. The entire receiver is contained in a single monolithic integrated circuit. The only external RF element is the antenna. There are no tunable elements in this device.

B. MEASUREMENT PROCEDURE: RADIATED EMISSIONS

Testing of this device and its associated transmitter (HS9-RV8220) was conducted at the Hyak Labs. Test facility in Spotsylvania, Virginia.

Field strength measurements were conducted according to the procedures set forth in ANSI C63.4 (1992). The device was set to its normal mode of operation with a steady incoming data stream applied from its companion transmitter.

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 device is designed to be hand held. 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 HP8594E spectrum analyzer, a Compliance Design B100 biconical antenna and an Avantek UJ210 preamp. The device was scanned from 30 MHz. to 2.9 GHz. and all emissions were noted. In this case the only emissions detected were those that were harmonically related to the microprocessor clock oscillator fundamental frequency.

At each detected 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 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 64 MHz.