# FCC ID: DI29800

## 1. Duty Cycle Factor of Baseband Signal for 9800 RF Remote Control

The baseband signal modulating the 430.0 MHz RF carrier is the same digital signal that drives the infrared LED in a remote control to operate audio/video systems. This signal is typically a 40 kHz, low duty-cycle square waveform, modulated by a lower frequency code sequence specific for the device to be controlled. The duty cycle of the 40 kHz waveform must be low in order to optimize the emission efficiency of the infrared LED. A snapshot of the baseband signal for a Sony TV is shown in Figs. 1,2,and3 (attached). Fig. 1 shows the timing between two code sequences, separated by a blanking interval. Fig. 2 shows the pattern of a typical code sequence, and fig. 3 shoes the 40 kHz carrier frequency of a code sequence. The duty cycle factor of the baseband signal will be calculated as the product of the duty cycles of all three waveforms.

**Waveform of Fig. 1**

Ton (max)=22.8ms

T=45.60ms

Duty Cycle (1)=[Ton(max) / T]=(22.8ms/45.6ms)=0.5

**Waveform of fig. 2**

Ton (max)=18.52ms

T=22.8ms

Duty Cycle (2)= [Ton(max) / T]=(18.52ms/22.6ms)=0.81

**Waveform of Fig. 3**

Ton (max)=7.3us

T=24.85us

Duty Cycle (3)=[Ton(max) / T]=(7.3us/24.85us)=0.29

**Duty Cycle Factor = D.C. (1) * D.C. (2) * D.C. (3) * 100=**
=0.5 * 0.81 * 0.29 * 100= **11.745%**

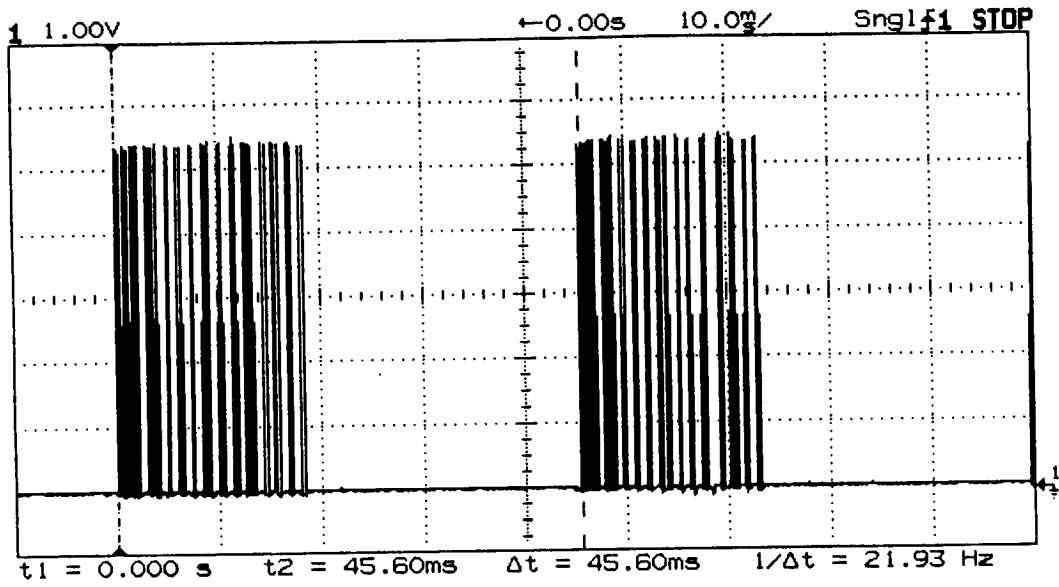**2.** The 9800 RF remote control has a built-in, internal antenna, which is not user accessible. Therefore, the device meets the requirements of 15.203.
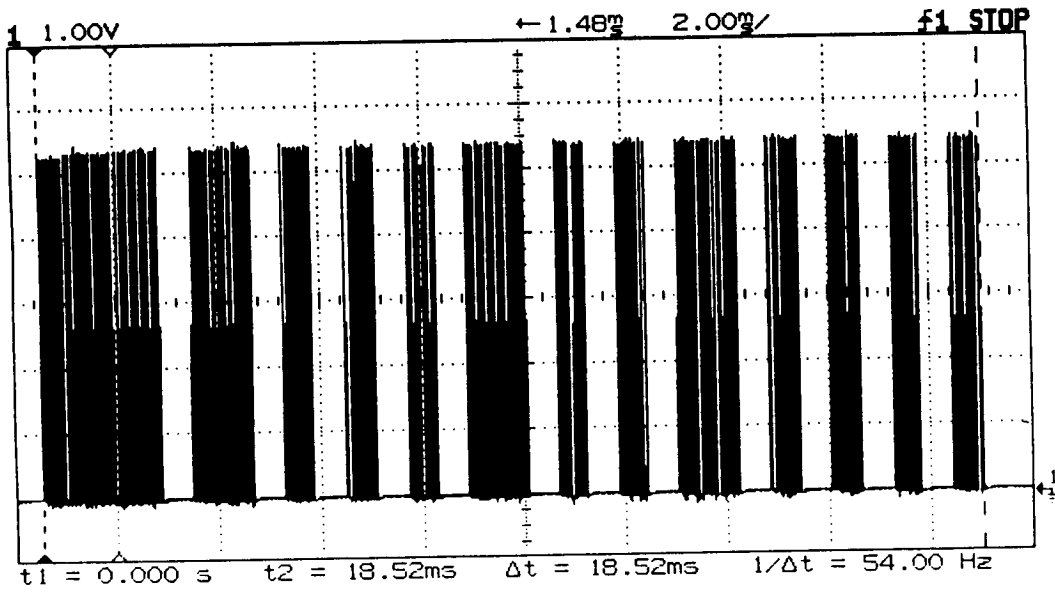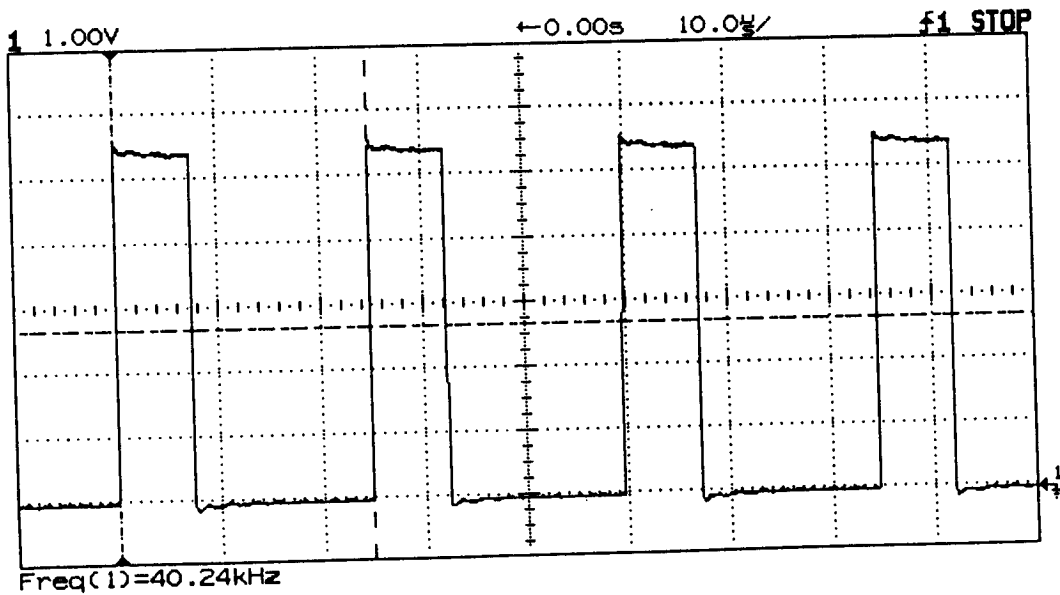
Figure 1



Figure 2



Figure 3