

# Frequency Shift Keying

CS LAB

Pratik Mahajan

194260

SecB(ECE)

Tools Used → MATLAB

Theory → Frequency shift keying is the most common form of digital modulation in the high frequency radio frequency radio spectrum, and has important applications in telephone circuits. In frequency shift keying, the instantaneous frequency of the carrier is switched between 2 or more levels according to the baseband digital data. Binary FSK is a modulation scheme typically used to send digital information between digital equipment such as teleprinter and computers. One frequency is designated as the "mark" frequency and other as the "space" frequency. The mark and space corresponding to binary 0 and 1 respectively. Minimum duration of a mark/space condition is called element length.

In the binary frequency shift keying (BFSK), only two frequencies are used.

$$S_0(t) \Rightarrow A_c \cos(2\pi f_c t + \phi_0) \text{ for } m(t) = 0$$
$$S_1(t) \Rightarrow A_c \cos(2\pi f_c t + \phi_1) \text{ for } m(t) = 1$$

```

clear;
clc;

% Take=ing input Bit Stream
b = input('Enter the Bit stream \n '); %b = [0 1 0 1 1 1 0];
n = length(b);
t = 0:.01:n;
x = 1:1:(n+1)*100;

for i = 1:n
    if (b(i) == 0)
        b_p(i) = -1;
    else
        b_p(i) = 1;
    end
    for j = i:.1:i+1
        bw(x(i*100:(i+1)*100)) = b_p(i);
    end
end

bw = bw(100:end);
wo = 2*(2*pi*t);
W = 1*(2*pi*t);

% For 1's in Input Bit Stream
sinHt = sin(wo+W);

% For 1's in Input Bit Stream
sinLt = sin(wo-W);

st = sin(wo+(bw).*W);

subplot(4,1,1)
plot(t,bw)
xlabel('Time(sec)');
ylabel('Amplitude(volt)');
title('Input Binary Data');
grid on ; axis([0 n -2 +2])

subplot(4,1,2)
plot(t,sinHt)
xlabel('Time(sec)');
ylabel('Frequency of Ones');
title('Carrier Frequency F1 for "1"');
grid on ; axis([0 n -2 +2])

subplot(4,1,3)
plot(t,sinLt)
xlabel('Time(sec)');
ylabel('Frequency of Zeros');
title('Carrier Frequency F2 for "0"');
grid on ; axis([0 n -2 +2])

subplot(4,1,4)

```

```
plot(t,st)
xlabel('Time(sec) ');
ylabel('Amplitude(volt) ');
title('FSK Modulated Signal');
grid on ; axis([0 n -2 +2])
```

```
Fs=1;
figure %pburg(st,10)
periodogram(st)
```

Figure 1

File Edit View Insert Tools Desktop Window Help

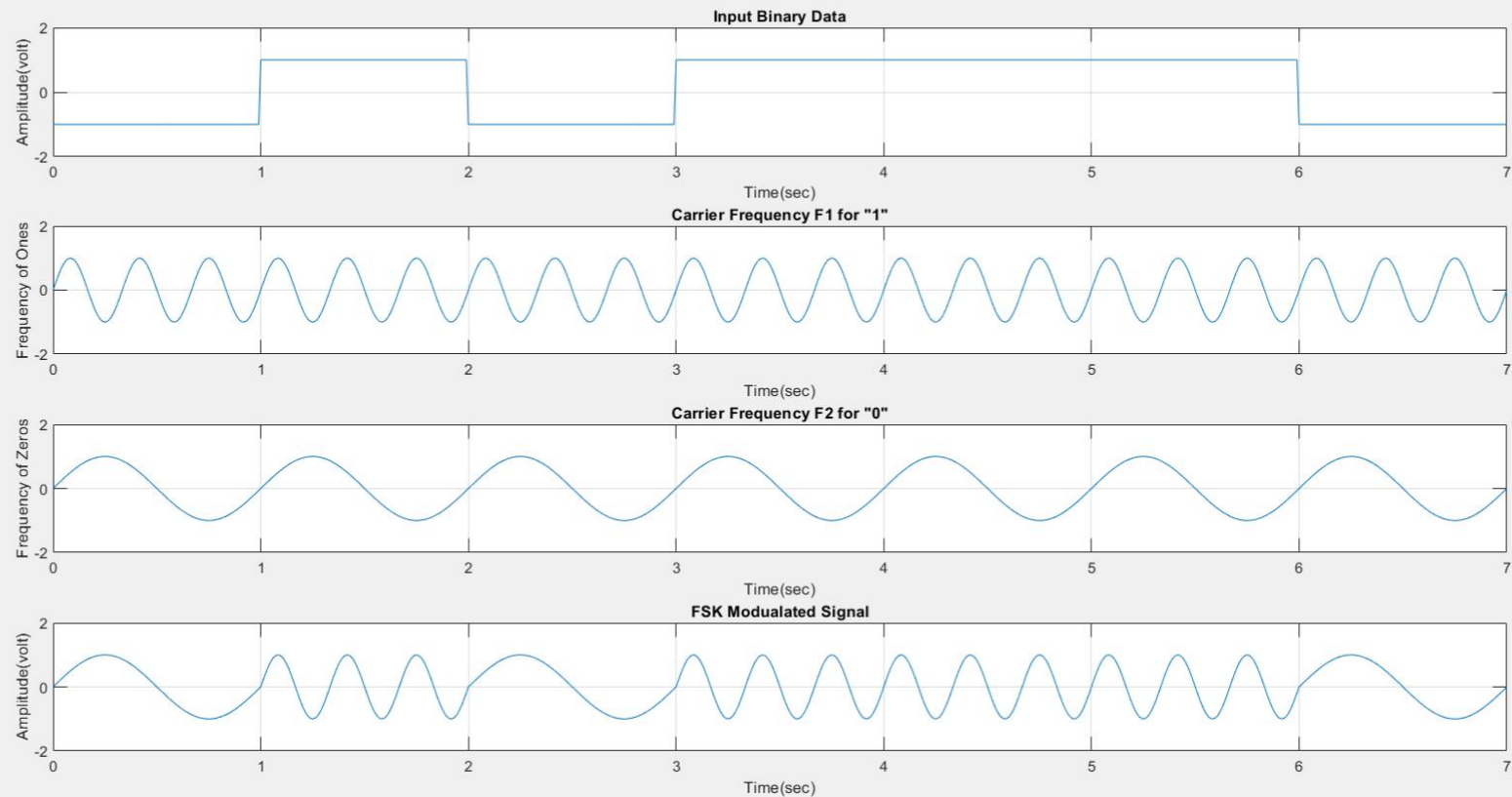
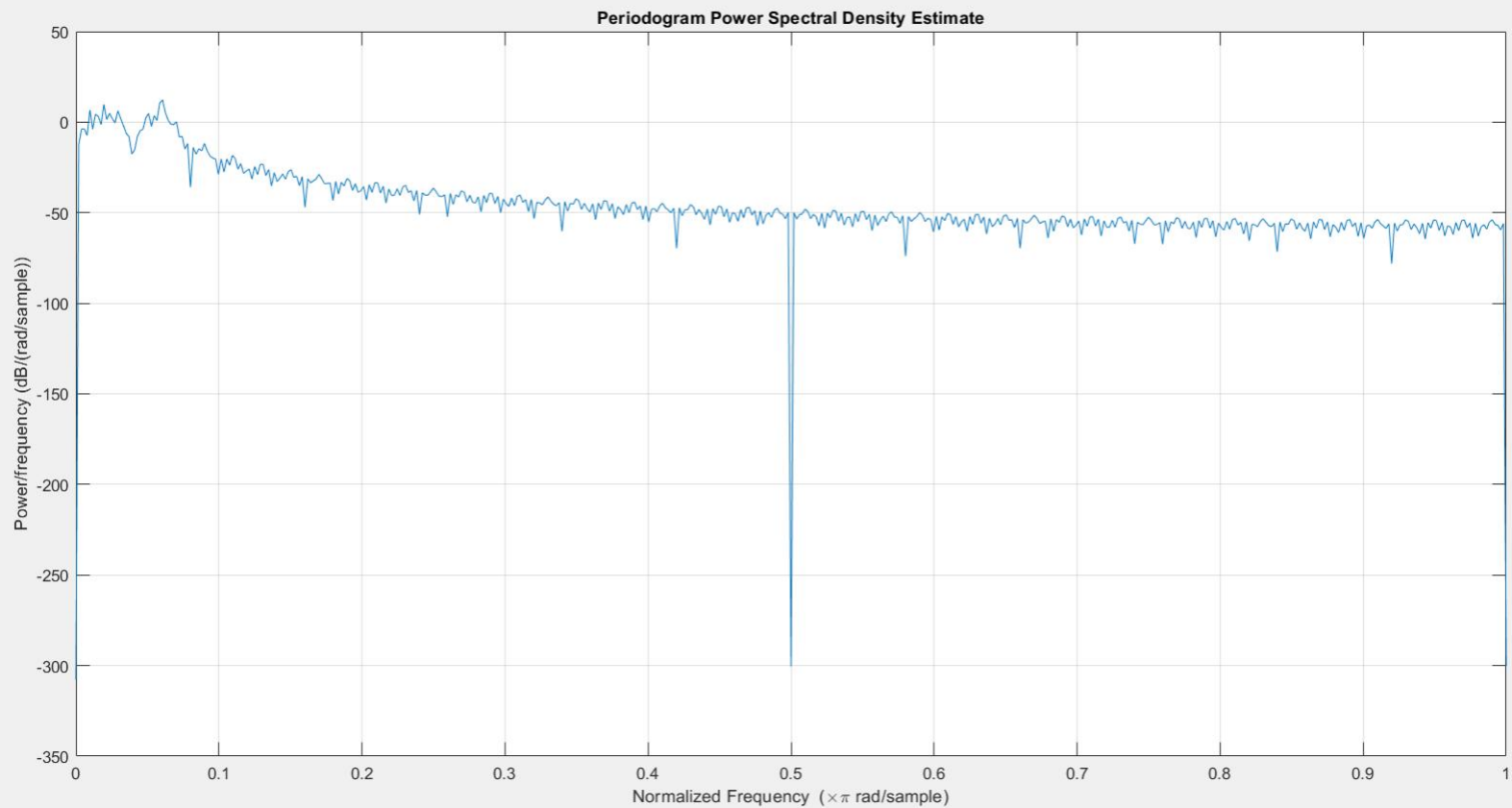


Figure 2

File Edit View Insert Tools Desktop Window Help





Results:→

The MATLAB program for frequency shift keying of a digital signal was developed.

Plots were observed for modulated signal and its power spectral density.