ANNEXURE-3

% Program 1 - Program to Retrive the already Recorded data of DUT and to plot the Power Spectral %Density as a function of frequency and to plot averaged magnitude of FFT as a function of frequency

```
clear
  ggj = 0;
  for ji = 1:1:5
     if ji<10
      jt = sprintf('k7404v0%d.wav',ji);
   else
      jt =sprintf(' k7404v%d.wav',ji);
    end
   jt
   ggj = ggj+1;
    vol = ji/10

   switch ji
   case 1 ,rtx ='m'
   case 2 ,rtx ='c'
   case 3 ,rtx ='r'
   case 4 ,rtx ='g'
   case 5 ,rtx ='b'
   case 6 ,rtx ='y'
   otherwise
      rtx ='k'
      end
      fid4 = fopen( jt,'r');
    jilz1 = fread(fid4);
   fclose(fid4);

       lenr = length(jilz1)
         wolfer = jilz1(201:5000);
        s = wolfer;
  t = 1:1:length(s);
  Fs = 22050;
  figure(1)
  plot(t,s,rtx);
  hold on
      xlabel('SAMPLES at 22050/second');
      ylabel('8 BIT PULSE CODE AMPLITUDE');
     fr = 11025;
  ll = [10 10000];
  ul = [20 9990];
rp = 2;
rs = 10;
```

```
lr = ll./fr;
ur = ul./fr;
disp('ellipord')
[n,wn] = ellipord(ur,lr,rp,rs);
[b,a ] = ellip(n,rp,rs,wn);
mmm = wn*fr;
  sf=filter(b,a,s);
   SF=fft(sf);
   amp = SF(1);
   SF(1) = [];
   SF=abs(SF).^2;
   n = length(SF);
   nyquist - 1/2;
    freq1 = (1:n/2)/(n/2)*nyquist;
    freq = freq1.*22050;
   kk = length(freq);
  figure(5)
  psf = SF(1:kk);
 gg = find(psf <1);
  psf(gg) =[];
  freq(gg) = [];
  psf = psf;
  psf1 = cumsum(psf);
  bbb = 1:1:length(psf1);
  psf1 = psf1./bbb';
    loglog(freq,psf,rtx);
    xlabel('FREQUENCY');
    YLABEL('MAGNITUDE OF FAST FOURIER TRANSFORM');
    hold on
    figure(7)

  loglog(bbb,psf1,rtx)
  xlabel('FREQUENCY');
    YLABEL('AVERAGED MAGNITUDE OF FAST FOURIER TRANSFORM');
  hold on
end
 clear
```

1/f Noise - Noise in n-channel MOSFETs.

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ABSTRACT

Commercially available MOSFET devices have been investigated for 1/f Noise under linear operating conditions. 1/f noise studies are essential to critically evaluate the electronic devices. The MOSFETs are in wide consumer use in several power applications. The percentage failure of these devices due to excess noise is unknown. In the present study, widely used MOSFETs have been systematically investigated for 1/f noise. These studies would help the user to identify his requirements for critical applications.

The main problem involved with the 1/f noise studies is that noise free power sources and noise free amplifiers are to be designed. The noise after necessary amplification is to be recorded and analyzed. Our preliminary studies indicated that usage of A/D converters introduce extra noise of the analog devices probably used in the construction of these devices. The 1/f noise resulting in MOSFETs has been directly recorded using sound recording device of the multi-media kit available in a PC.

The noise so recorded has been analyzed using MATLAB (Ver 5) and FILTER, FFT and other functions of the package. 1/f noise is predominates in a low frequency region below 2 kHz. Most of the noise generated above 2 kHz is likely to be due to other phenomena such as burst, telegraphic and other noise. Huge power spectral pulses are present in the 2-10 kHz region which are under investigation.

Studies are in progress to delineate the nature of 1/f noise and other noise present in the MOSFETs. The exact mechanisms of the noise in MOSFETs through power spectral density measurement are likely to throw light on the variations in the conduction mechanisms of the channel.

The Paper Entitled "1/f Noise - Noise in n-Channel MOSFETs" has been presented at National Symposium on Instrumentation, held at GOA UNIVERSITY, GOA on 2nd to 5th, February 2000. The Paper has been accepted for Publication in the Journal of Instrument Society of India.

(P 130)

I/f NOISE NOISE IN n-CHANNEL MOSFETS.

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Commercially available MOSFET devices have been investigated for I/f Noise under linear operating conditions. I/f noise studies are essential to critically evaluate the electronic devices. The MOSFETs are in wide consumer use in several power applications. The percentage failure of these devices due to excess noise is unknown. In the present study, widely used MOSFETs have been systematically investigated for I/f noise. These studies would help the user to identify his requirements for critical applications. The main problem involved with the I/f noise studies is that noise free power sources and noise free amplifiers are to be designed. The noise after necessary amplification is to be recorded and analyzed. Our preliminary studies indicated that usage of A/D converters introduce extra noise of the analog devices probably used in the construction of these devices. The I/f noise resulting in MOSFETs has been directly recorded using sound recording device of the multi-media kit available in a PC. The noise so recorded has been analyzed using MATLAB (Ver 5) and FILTER, FFT and other functions of the package. I/f noise is predominates in a low frequency region below 2 kHz. Most of the noise generated above 2 kHz is likely to be due to other phenomena such as burst telegraphic and other noise. Huge power spectral pulses are present in the 2-10 kHz region which are under investigation. Studies are in progress to delineate the nature of I/f noise and other noise present in the MOSFETs. The exact mechanisms of the noise in MOSFETs through power spectral density measurement are likely to throw light on the variations in the conduction mechanisms of the channel.