At +/- 1 standard deviation,   (100-31.73)= 68.27% is within that range.
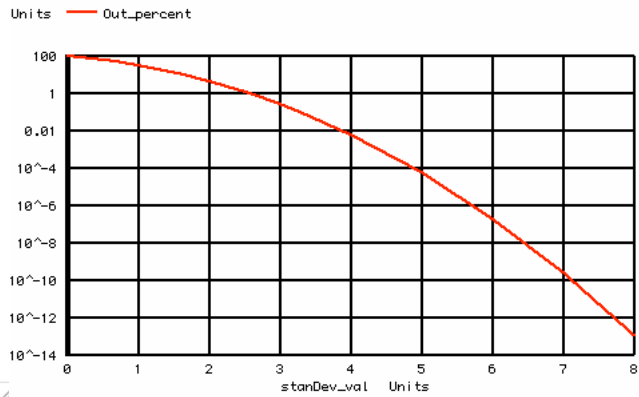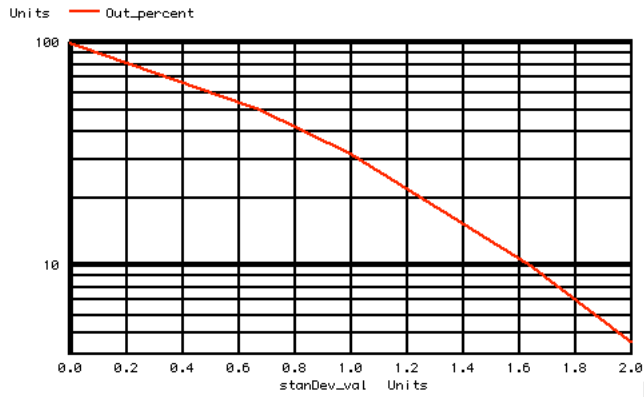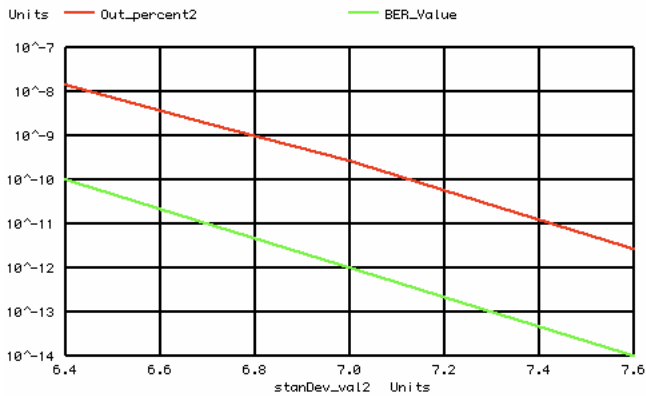**At +/- 3 standard deviations, (100-0.27) = 99.73% is within the +/- standard deviation range.**

At +/- 7 standard deviation,   2.56000000e-10% is outside that range.
The BER (Bit Error Rate) should as least be below 2.56e-12/1.414
since a square wave has 1.414 more rms energy.

The BER curve above comes from a National semiconductor article.

```
==================Add_Standard_Deviation_Data=====================
plot              OutsideData% vs standard_deviation
==================Add_BER_Data=========================
plot              OutsideData% and BER vs standard_deviation
==================done============================
```

Plot_BER_vs_SD
```
*=========Create_Signal_No_Reason===================
*V_SIN#    NODE_P NODE_N DC     VALUE  SIN(   V_DC   AC_MAG FREQ    DELAY  FDamp)
VIN        VP     0      DC     0      SIN(   0      1      1                     )

.control
set        pensize = 2
unlet      stanDev_val
unlet      Out_percent
let        stanDev_val    =    vector(14)
let        Out_percent    =    vector(14)
echo       "===================Add_Standard_Deviation_Data========================="
let        stanDev_val[0] =    0
let        Out_percent[0] =    100
let        stanDev_val[1] =    .674
let        Out_percent[1] =    50
let        stanDev_val[2] =    1
let        Out_percent[2] =    31.73
let        stanDev_val[3] =    1
let        Out_percent[3] =    31.73
let        stanDev_val[4] =    1.645
let        Out_percent[4] =    10
let        stanDev_val[5] =    2
let        Out_percent[5] =    4.5500264
let        stanDev_val[6] =    2.576
let        Out_percent[6] =    1
let        stanDev_val[7] =    3
let        Out_percent[7] =    0.2699796
let        stanDev_val[8] =    3.2906
let        Out_percent[8] =    0.1
let        stanDev_val[9] =    4
let        Out_percent[9] =    0.006334
let        stanDev_val[10] =   5
```

```
let      Out_percent[10] =    0.0000573303
let      stanDev_val[11] =    6
let      Out_percent[11] =    0.0000001973
let      stanDev_val[12] =    7
let      Out_percent[12] =    0.0000000002560
let      stanDev_val[13] =    8
let      Out_percent[13] =    1.246e-13
plot     Out_percent vs       stanDev_val ylog
echo     "plot           OutsideData% vs standard_deviation"
echo     "==================Add_BER_Data======================="
unlet    stanDev_val2
unlet    Out_percent2
unlet    BER_Value
let      stanDev_val2      =  vector(5)
let      Out_percent2      =  vector(5)
let      BER_Value         =  vector(5)
let      stanDev_val2[0]   =  6.400
let      Out_percent2[0]   =  14.3n
let      BER_Value[0]      =  100p
let      stanDev_val2[1]   =  6.700
let      Out_percent2[1]   =  1.9n
let      BER_Value[1]      =  10p
let      stanDev_val2[2]   =  7
let      Out_percent2[2]   =  257p
let      BER_Value[2]      =  1p
let      stanDev_val2[3]   =  7.300
let      Out_percent2[3]   =  27p
let      BER_Value[3]      =  .1p
let      stanDev_val2[4]   =  7.600
let      Out_percent2[4]   =  2.7p
let      BER_Value[4]      =  .01p
plot     Out_percent2         BER_Value vs stanDev_val2 ylog
echo     "plot           OutsideData% and BER vs standard_deviation"
echo     "==================done==============================="
.endc
.end
```