

TUSB501 HSPICE model

Huanzhang Huang
hzhuang@ti.com

TUSB501_HSPICE.zip

hspice model set

- **Testbench**

sim_tusb501.hsp

- **Encrypted netlist encrypted netlist**

TOP_TUSB501_PKG_HSP.hsp.en

- **Process corners models Encrypted netlist**

model_slow.encrypted

model_nominal.encrypted

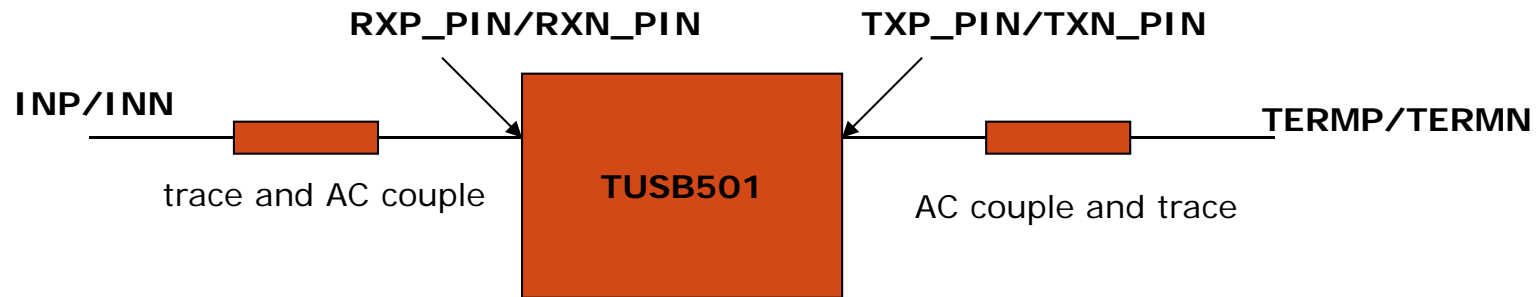
model_fast.encrypted

- **FR4 Trace model**

FR4_1c_4mil.rlgc

HSPICE TESTBENCH

Measure Vod, rise/fall time, De-Emphasis level at outn1/oup1, outn2/oup2



HSPICE testbench

HSPICE model simulation example

```
*** process
.inc ./model_nominal.encrypted
*.inc model_slow.encrypted
*.inc model_fast.encrypted
.param sh_bjt=1
```

Process set
to nominal

```
*** power supply
*** nom=3.3
.param pvcc=3.3
*.param pvcc=3.0
*.param pvcc=3.6
```

Power set
to 3.3v

```
*** temperature
.temp 25
*.temp 125
*.temp -40
```

Temp set to
25C

```
*** de-emphasis setting
*** 0.5/0/1
*** DE=0/-3.5/-6dB (OS=0.5)
.param de=0.5
*.param de=1
*.param de=0
```

DE set to -
3.5dB

```
*** equalizer setting
*** 0/0.5/1
*** EQ=3/6/9dB
.param eq=0.5
*.param eq=0
*.param eq=1
```

EQ set to
6dB

```
*** swing setting
*** 0/1
*** 930/1300mV
.param os=0
*.param os=1
```

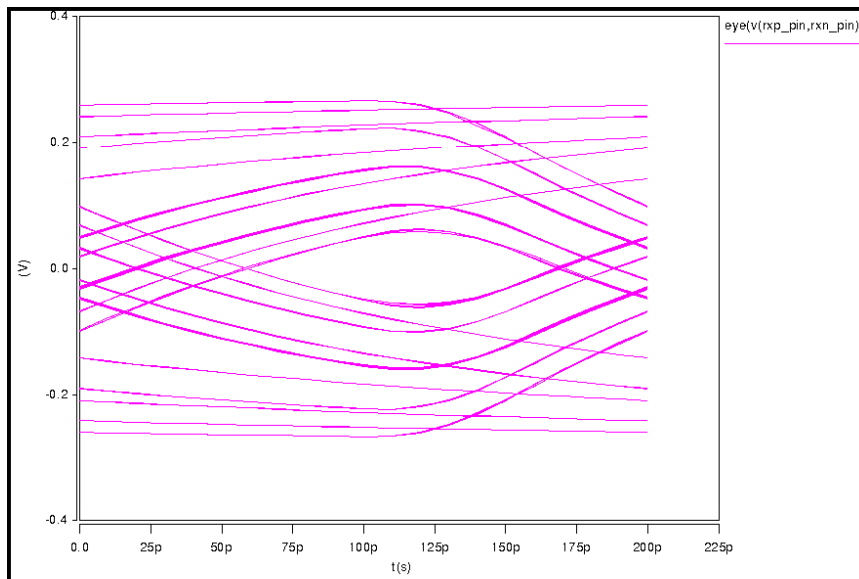
OS set to
930mV

```
*** testbench parameter
```

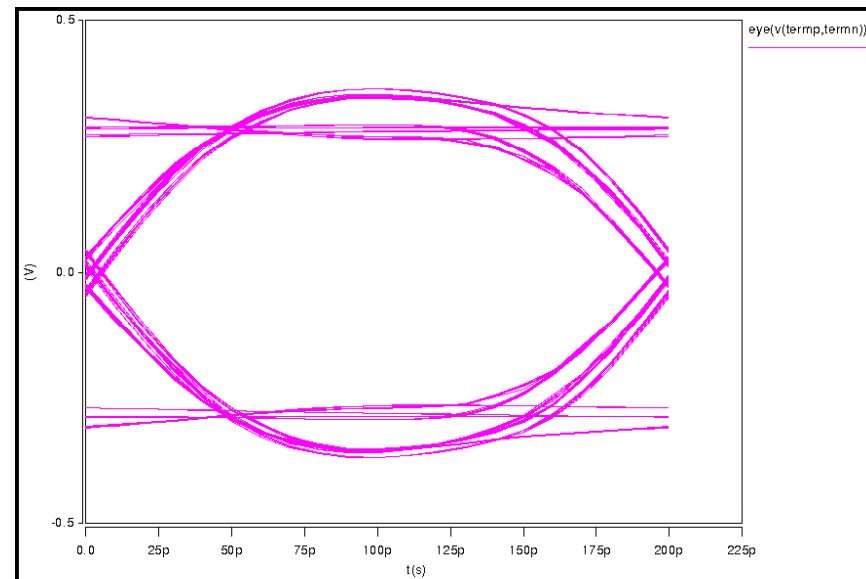
```
*** trace length in inch(input trance and output trace FR4)
.param ltrc_in=40
.param ltrc_out=10
```

Input/output trace
set to 40/10inch

Sample simulation result
vcc=3.3V, temp=25C, process=nom
with 40" input FR4 trace and 10" output trace



Input eye



Output eye