

Title: Trying in layout

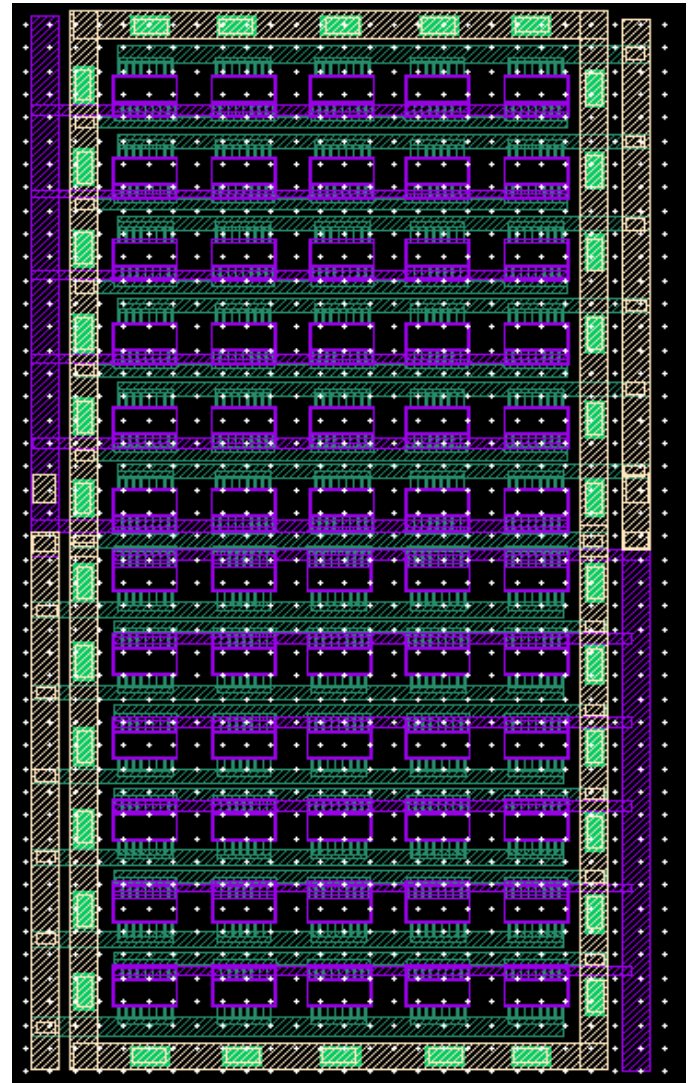
Name: Belal Ali Ramadan

Date: 2/4/2022

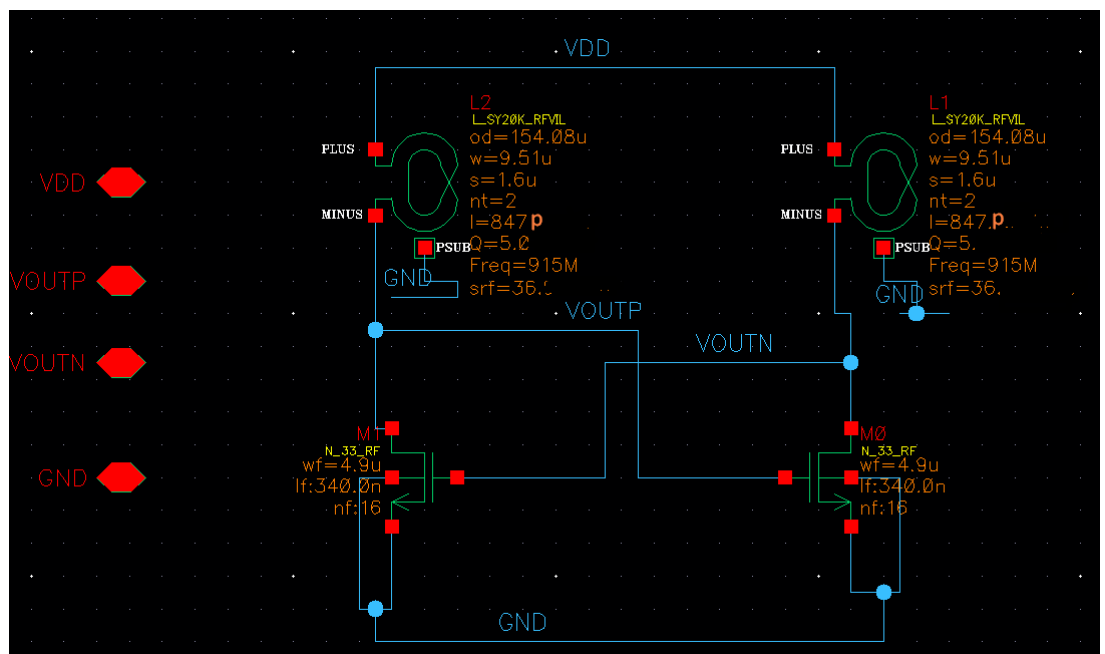
Driver:

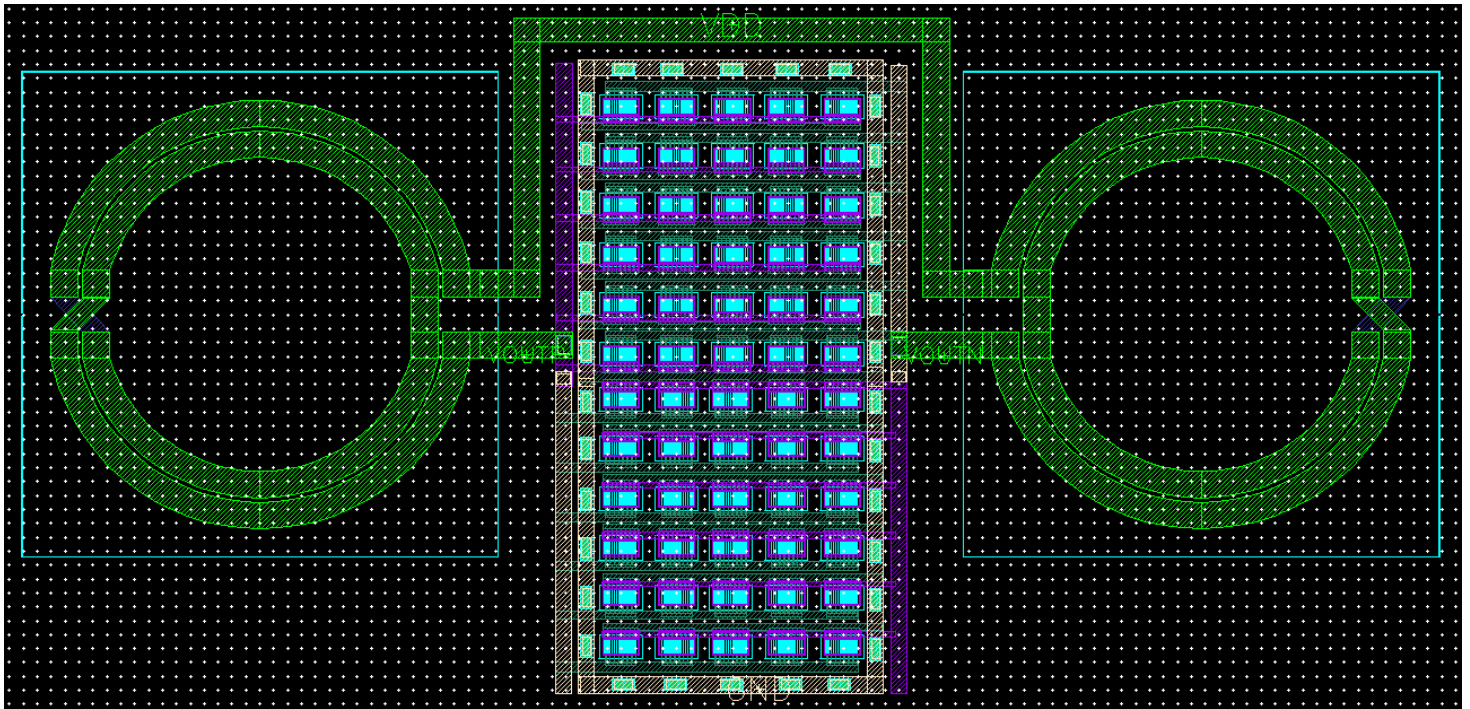
1-Cross coupled connection





Layer	Pu...	V	S
HVGATE	drw	<input type="checkbox"/>	<input type="checkbox"/>
PO0	drw	<input type="checkbox"/>	<input type="checkbox"/>
PO1	drw	<input type="checkbox"/>	<input type="checkbox"/>
VARACT	drw	<input type="checkbox"/>	<input type="checkbox"/>
CONT	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ME1	drw	<input type="checkbox"/>	<input type="checkbox"/>
VI1	drw	<input type="checkbox"/>	<input type="checkbox"/>
ME2	drw	<input type="checkbox"/>	<input type="checkbox"/>
VI2	drw	<input type="checkbox"/>	<input type="checkbox"/>
ME3	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VI3	drw	<input type="checkbox"/>	<input type="checkbox"/>
ME4	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VI4	drw	<input type="checkbox"/>	<input type="checkbox"/>
ME5	drw	<input type="checkbox"/>	<input type="checkbox"/>
VI5	drw	<input type="checkbox"/>	<input type="checkbox"/>
ME6	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VI6	drw	<input type="checkbox"/>	<input type="checkbox"/>
ME7	drw	<input type="checkbox"/>	<input type="checkbox"/>



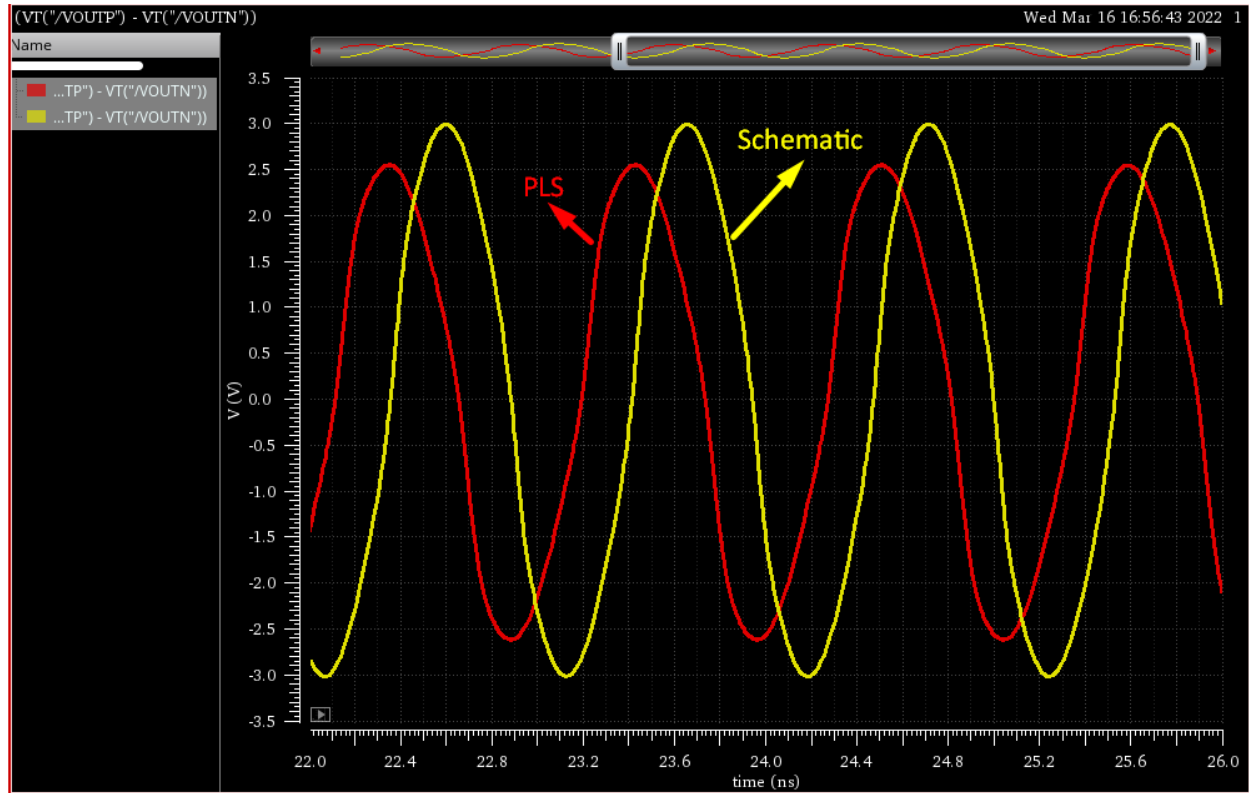
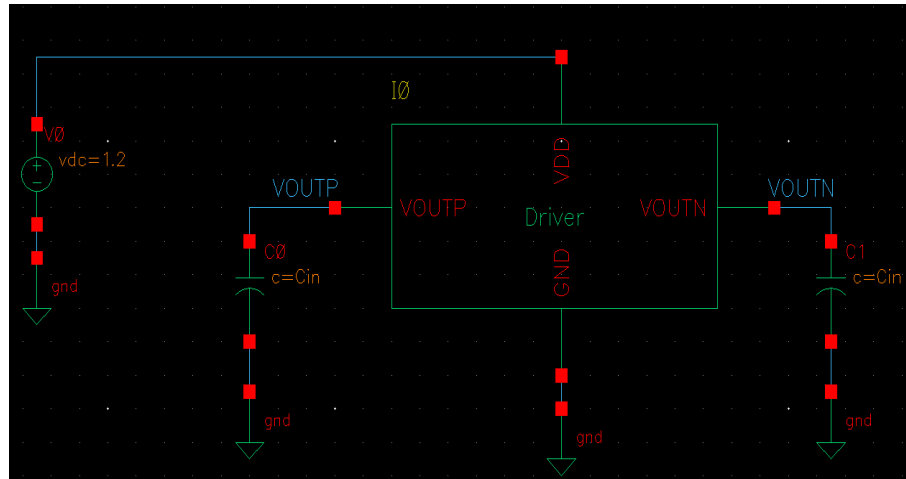
2-Schematic and layout





	Layer	Pu...	V	S
	ME3	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VI3	drw	<input type="checkbox"/>	<input type="checkbox"/>
	ME4	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VI4	drw	<input type="checkbox"/>	<input type="checkbox"/>
	ME5	drw	<input type="checkbox"/>	<input type="checkbox"/>
	VI5	drw	<input type="checkbox"/>	<input type="checkbox"/>
	ME6	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VI6	drw	<input type="checkbox"/>	<input type="checkbox"/>
	ME7	drw	<input type="checkbox"/>	<input type="checkbox"/>
	VI7	drw	<input type="checkbox"/>	<input type="checkbox"/>
	ME8	drw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

3-Post-layout simulation



4-Monte carlo Simulation

1-Variation in all parameters

```
l130e_33_rf_v102_mc_statistical.m.mdl.scs
~/my_project/Models/Spectre/Monte_Carlo

simulator lang=spectre insensitive=yes

parameters mc_n_bpw_33_rf_vth0_ma=0
parameters mc_n_bpw_33_rf_u0_ma=0
parameters mc_n_33_rf_vth0_ma=0
parameters mc_n_33_rf_u0_ma=0
parameters mc_p_33_rf_vth0_ma=0
parameters mc_p_33_rf_u0_ma=0

statistics {
mismatch {
vary mc_n_bpw_33_rf_vth0_ma dist=gauss std=1/1
vary mc_n_bpw_33_rf_u0_ma dist=gauss std=1/1
vary mc_n_33_rf_vth0_ma dist=gauss std=1/1
vary mc_n_33_rf_u0_ma dist=gauss std=1/1
vary mc_p_33_rf_vth0_ma dist=gauss std=1/1
vary mc_p_33_rf_u0_ma dist=gauss std=1/1
}
}
```

```
l130e_33_rf_v102_mc_statistical.p.mdl.scs
~/my_project/Models/Spectre/Monte_Carlo

l130e_33_rf_v102_mc...tatistical.m.mdl.scs x l130e_33_rf_v

parameters d_cjsw_nwtw_33n=(0.1 / 3 * mc_n_bpw_33_rf_cjsw_nwtw)
parameters d_cj_nw_33n=(0.1 / 3 * mc_n_bpw_33_rf_cj_nw)
parameters d_cjsw_nw_33n=(0.1 / 3 * mc_n_bpw_33_rf_cjsw_nw)

statistics {
process {
vary mc_n_33_rf_tox_np dist=gauss std=sigma/3
vary mc_n_33_rf_nch dist=gauss std=sigma/3
vary mc_n_33_rf_vth0 dist=gauss std=sigma/3
vary mc_n_33_rf_wint dist=gauss std=sigma/3
vary mc_n_33_rf_lint dist=gauss std=sigma/3
vary mc_n_33_rf_rdsd dist=gauss std=sigma/3
vary mc_n_33_rf_dlc dist=gauss std=sigma/3
vary mc_n_33_rf_dwc dist=gauss std=sigma/3
vary mc_n_33_rf_cj dist=gauss std=sigma/3
vary mc_n_33_rf_cjsw dist=gauss std=sigma/3
vary mc_n_33_rf_cjswg dist=gauss std=sigma/3
vary mc_n_33_rf_rshg dist=gauss std=sigma/3
vary mc_n_33_rf_rcnt dist=gauss std=sigma/3
vary mc_n_33_rf_rvia dist=gauss std=sigma/3
vary mc_n_33_rf_rch dist=gauss std=sigma/3
vary mc_n_33_rf_cgd_ext dist=gauss std=sigma/3
vary mc_n_33_rf_cds_ext dist=gauss std=sigma/3
vary mc_n_33_rf_cgb_ext dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cj_nwtw dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cjsw_nwtw dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cj_nw dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cjsw_nw dist=gauss std=sigma/3
}
}
```

2-Variation in vth only

```
l130e_33_rf_v102_mc_statistical.p.mdl.scs
~/my_project/Models/Spectre/Monte_Carlo

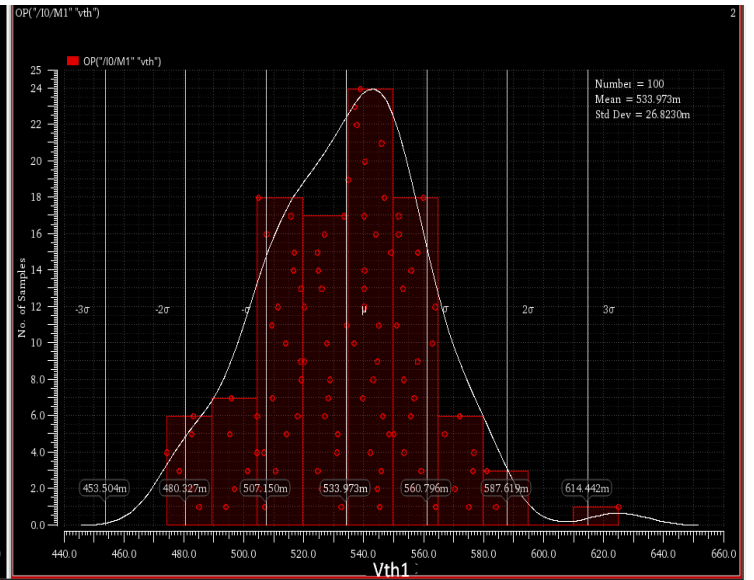
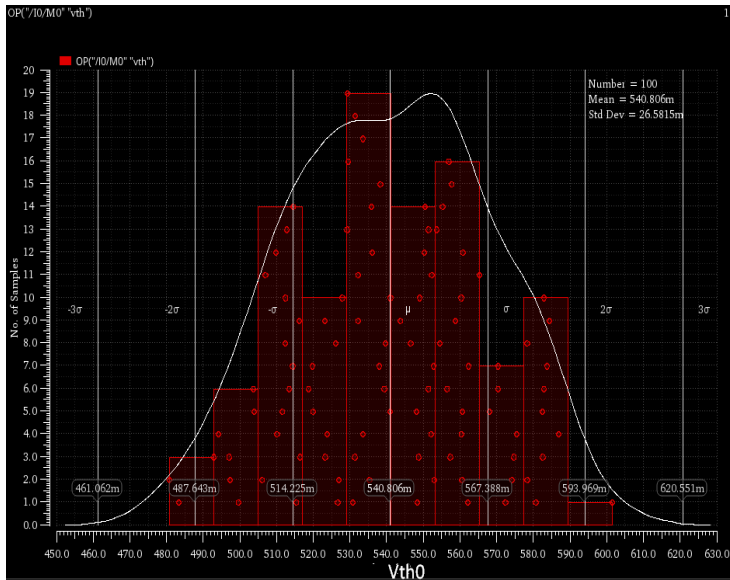
simulator lang=spectre insensitive=yes

parameters mc_n_bpw_33_rf_vth0_ma=0
parameters mc_n_bpw_33_rf_u0_ma=0
parameters mc_n_33_rf_vth0_ma=0
parameters mc_n_33_rf_u0_ma=0
parameters mc_p_33_rf_vth0_ma=0
parameters mc_p_33_rf_u0_ma=0

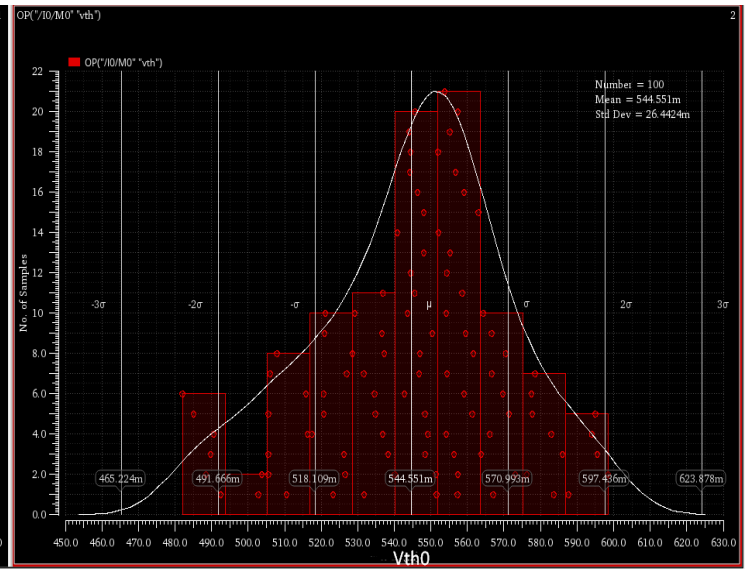
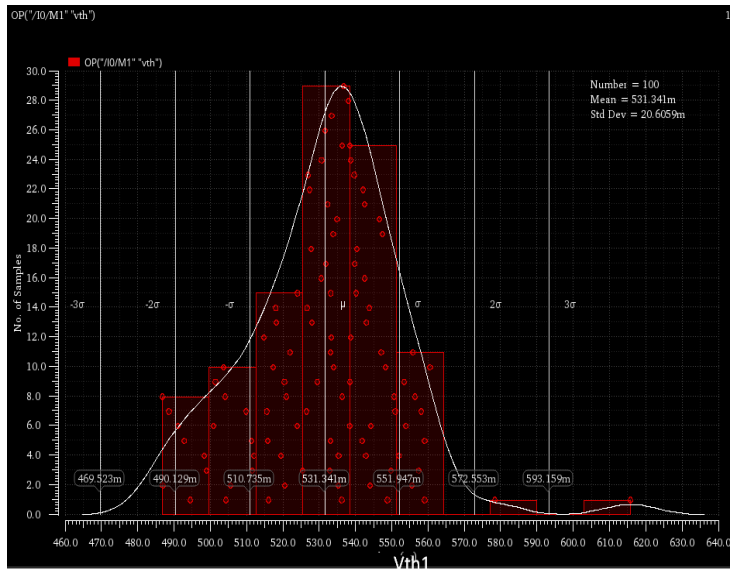
statistics {
mismatch {
//vary mc_n_bpw_33_rf_vth0_ma dist=gauss std=1/1
//vary mc_n_bpw_33_rf_u0_ma dist=gauss std=1/1
vary mc_n_33_rf_vth0_ma dist=gauss std=1/1
//vary mc_n_33_rf_u0_ma dist=gauss std=1/1
//vary mc_p_33_rf_vth0_ma dist=gauss std=1/1
//vary mc_p_33_rf_u0_ma dist=gauss std=1/1
}
}
```

```
statistics {
process {
//vary mc_n_33_rf_tox_np dist=gauss std=sigma/3
//vary mc_n_33_rf_nch dist=gauss std=sigma/3
vary mc_n_33_rf_vth0 dist=gauss std=sigma/3
//vary mc_n_33_rf_wint dist=gauss std=sigma/3
//vary mc_n_33_rf_lint dist=gauss std=sigma/3
//vary mc_n_33_rf_rdsd dist=gauss std=sigma/3
//vary mc_n_33_rf_dlc dist=gauss std=sigma/3
//vary mc_n_33_rf_dwc dist=gauss std=sigma/3
//vary mc_n_33_rf_cj dist=gauss std=sigma/3
//vary mc_n_33_rf_cjsw dist=gauss std=sigma/3
//vary mc_n_33_rf_cjswg dist=gauss std=sigma/3
//vary mc_n_33_rf_rshg dist=gauss std=sigma/3
//vary mc_n_33_rf_rcnt dist=gauss std=sigma/3
//vary mc_n_33_rf_rvia dist=gauss std=sigma/3
//vary mc_n_33_rf_rch dist=gauss std=sigma/3
//vary mc_n_33_rf_cgd_ext dist=gauss std=sigma/3
//vary mc_n_33_rf_cds_ext dist=gauss std=sigma/3
//vary mc_n_33_rf_cgb_ext dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cj_nwtw dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cjsw_nwtw dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cj_nw dist=gauss std=sigma/3
vary mc_n_bpw_33_rf_cjsw_nw dist=gauss std=sigma/3
}
}
```

1-all parameters results

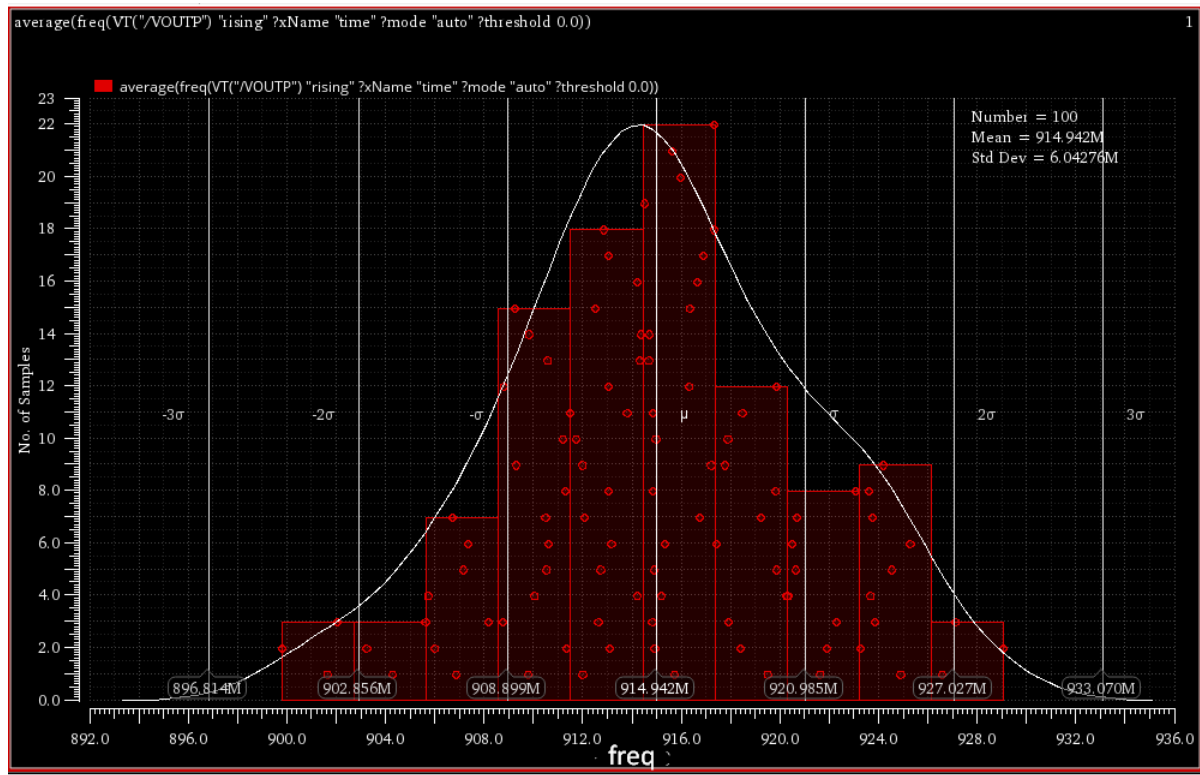


2-Vth results



2-Varaiton in frequency

- All parameters



- Vth only

