LTspice Model
RS-485/RS-422 transceiver
STMicroelectronics NV
ST485AB

Model Information

Model A macro model
Call Name MDC_ST485AB_LT
Pin Assign 1:RO 2:_RE 3:DE 4:DI 5:GND 6:A 7:B 8:Vcc
File List Model Library MDC_ST485AB_LT01.lib
Model Report MDC_ST485AB_LT.pdf(this file)

Verified Simulator Version LTspice 17.1.8

Note

References
The information which was used for modeling is as follow:

[Data Sheet]
- ●Date/Version August 2007 Rev. 3
- ●Product name ST485AB
- ●Company name STMicroelectronics NV

[Characteristics listed]
- ●Characteristics Vil, Vih, Vod1, Vod2, Voc, Iosd, Vth, dVth Voh, Vol, Iozr, Rrin, Iosr, DR, tpLH, tpHL, tSKE, tTLH, tTHL, tpZL, tpZH, tpHZ, tpLZ, tSK(EN), tSK(DS)

Simulation Condition
This table shows the range of evaluated simulation range that was not occurs any convergence problems in this area.

Item	Condition			Unit
	Min	Typ	Max	
Supply Voltage	4.5	5.0	5.5	V
Temperature		25.0		deg C

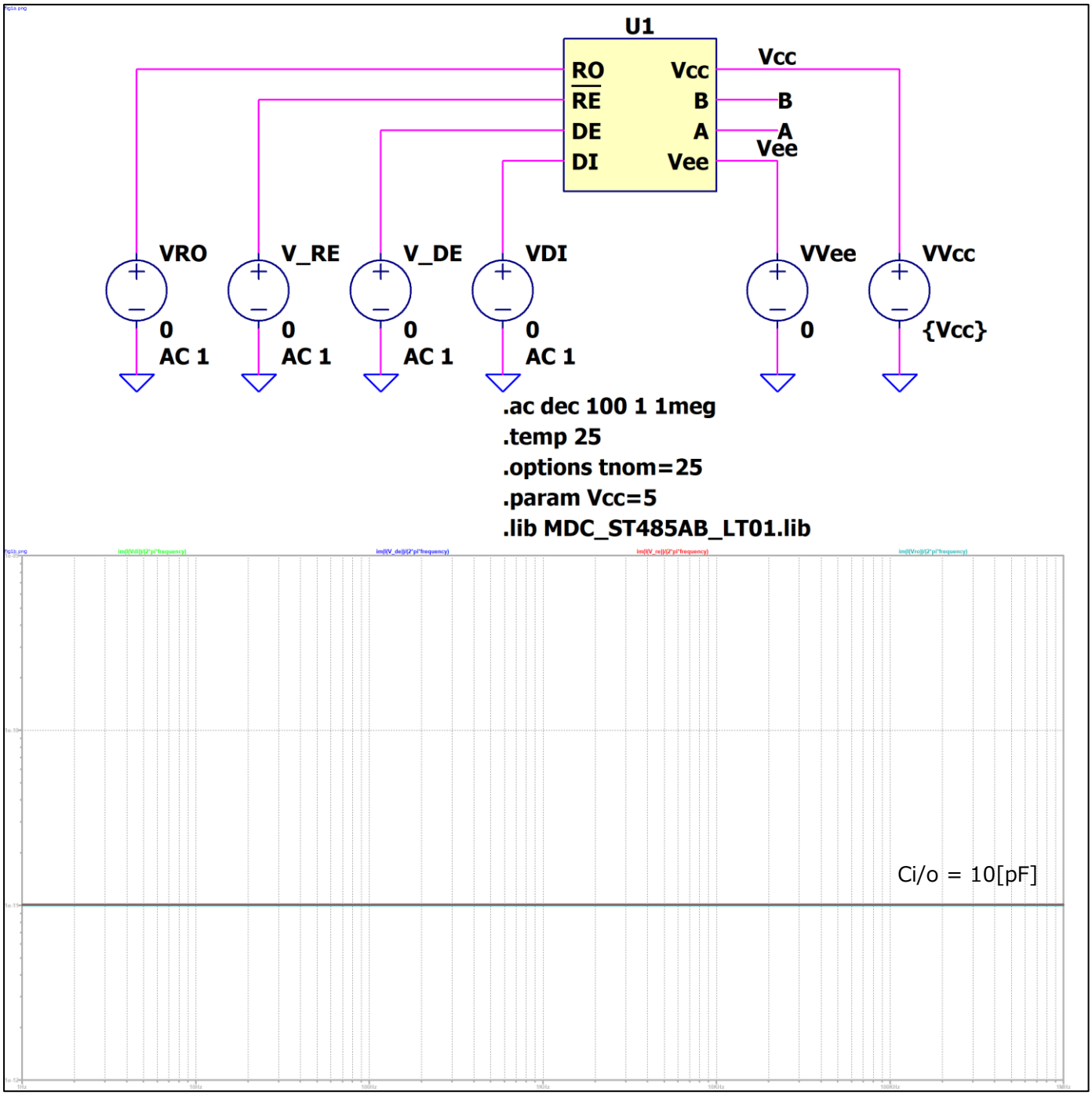
Transceiver

○ : Implemented
× : Not Implemented
— : Not applicable

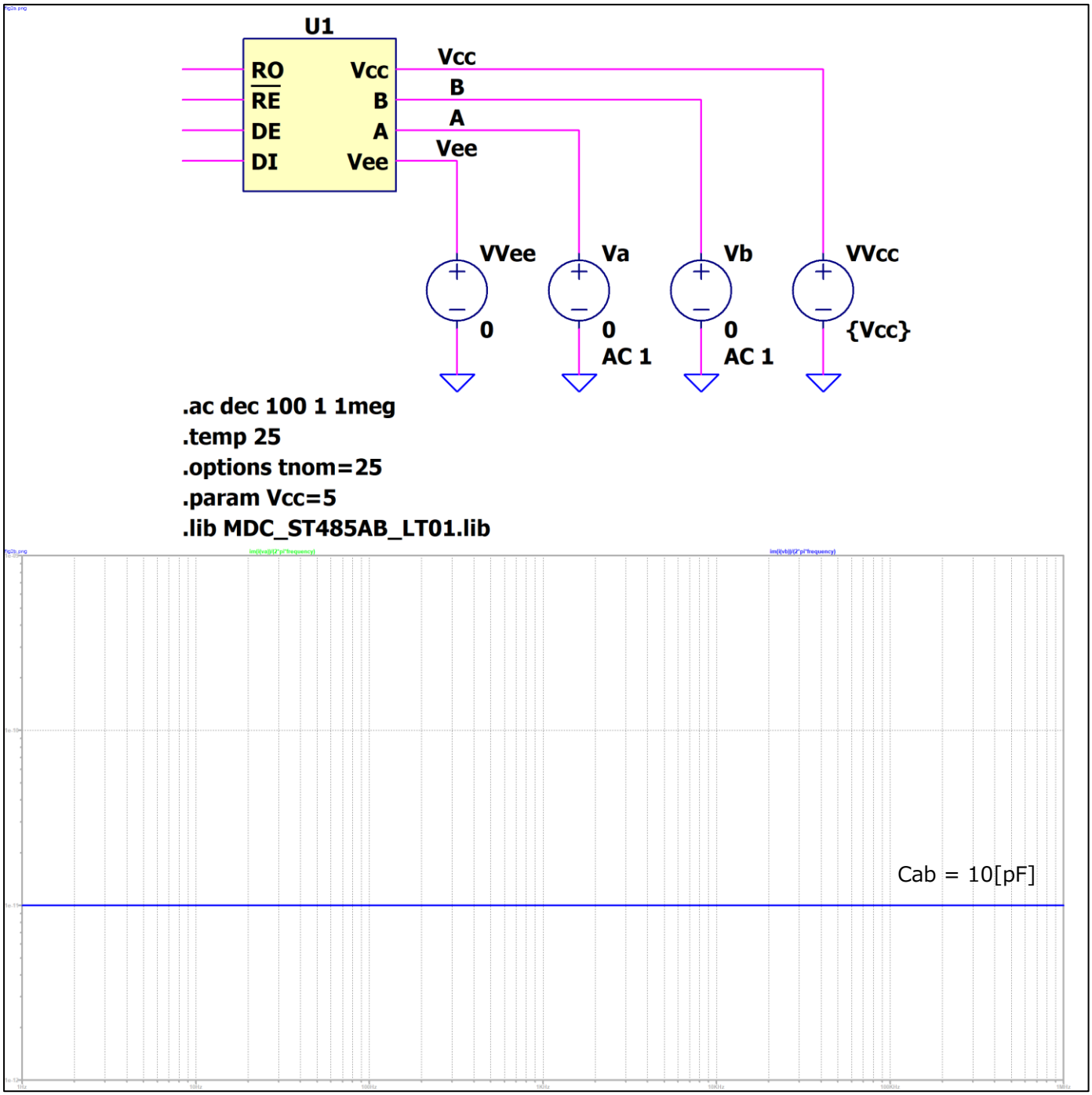
Model Functions Table

	RANK=1	
Functions	**RANK**	**Implemented**
Truth Table	1	○
Transmitter electrical characteristics	1	○
Receiver electrical characteristics	1	○
Driver switching characteristics	1	○
Receiver switching characteristics	1	○

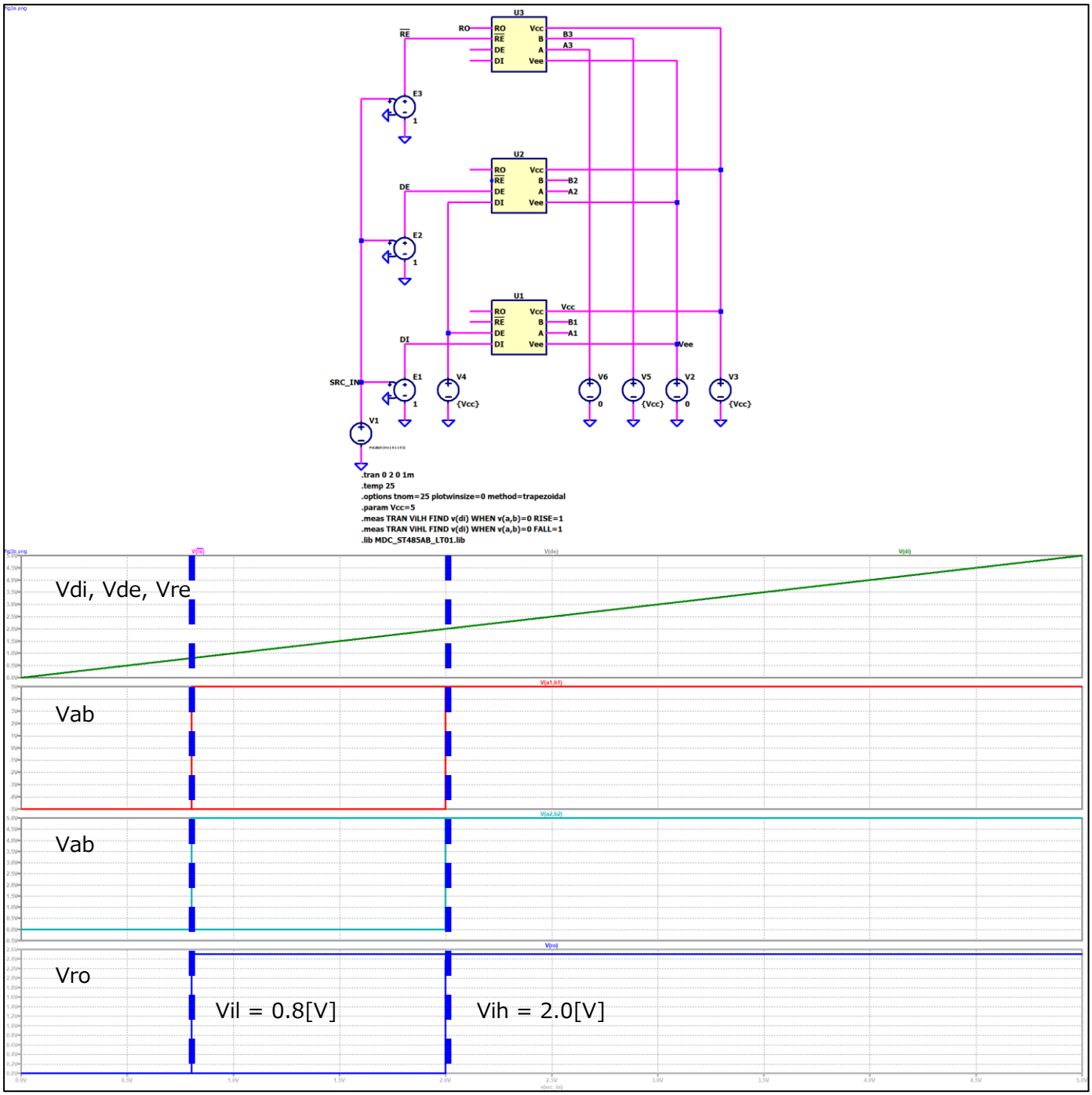
Testbench for Ci/o of DE, DE, _RE (Vcc = 5V)



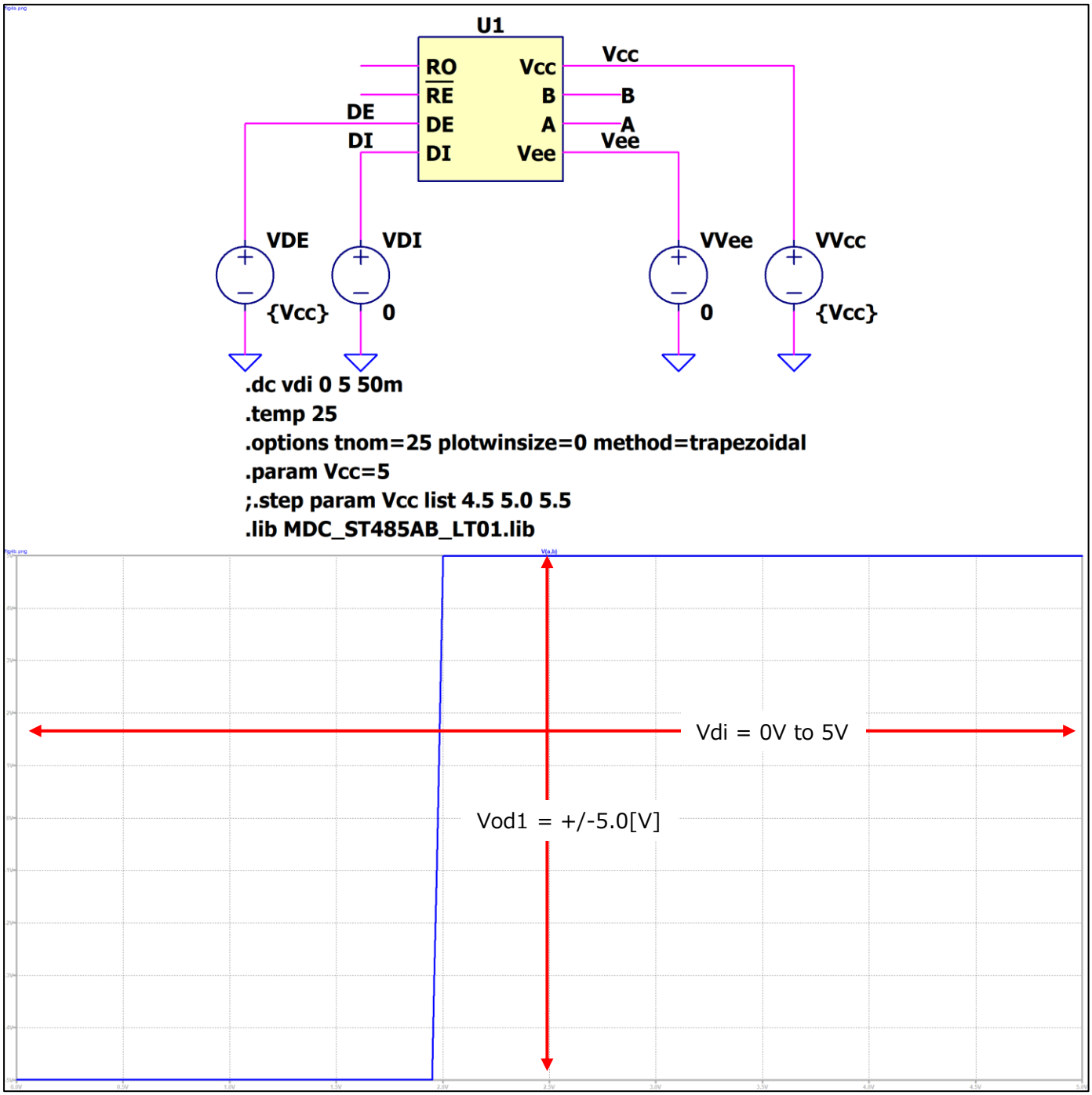
Testbench for Cab (Vcc = 5V)



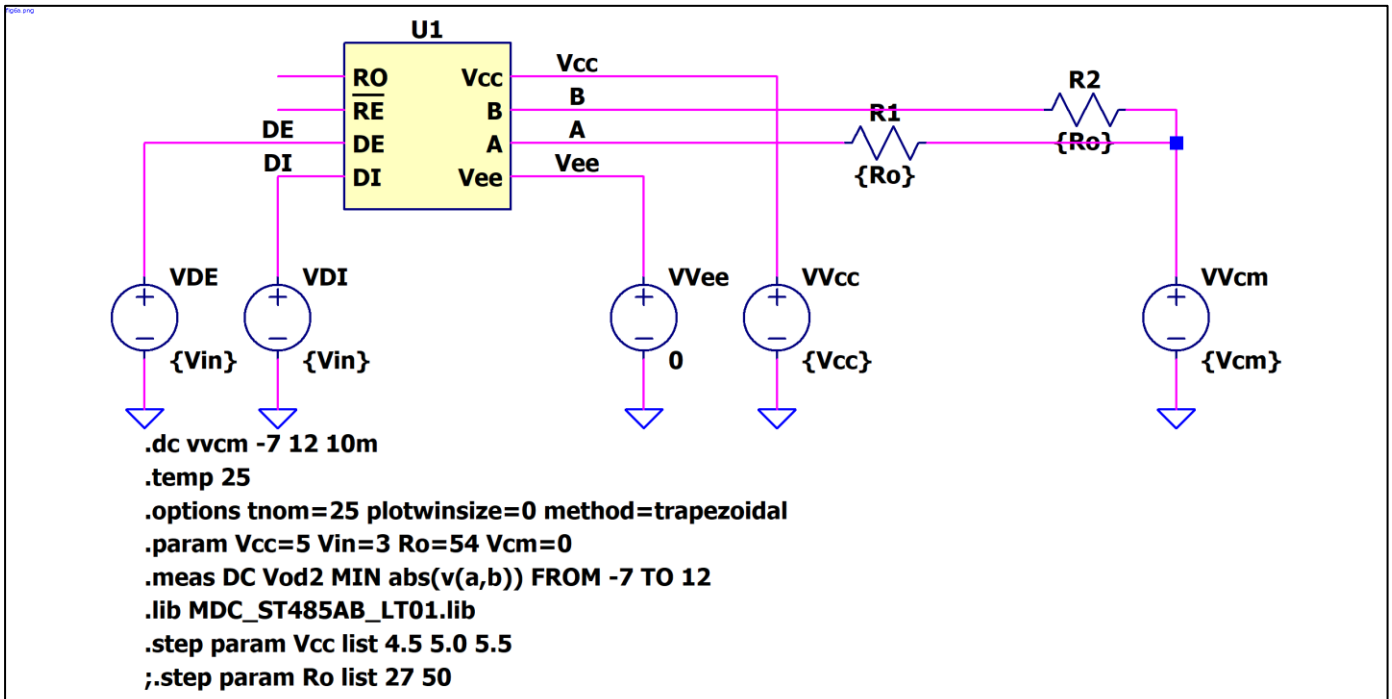
Testbench for Vil, Vih (Vcc = 5V)



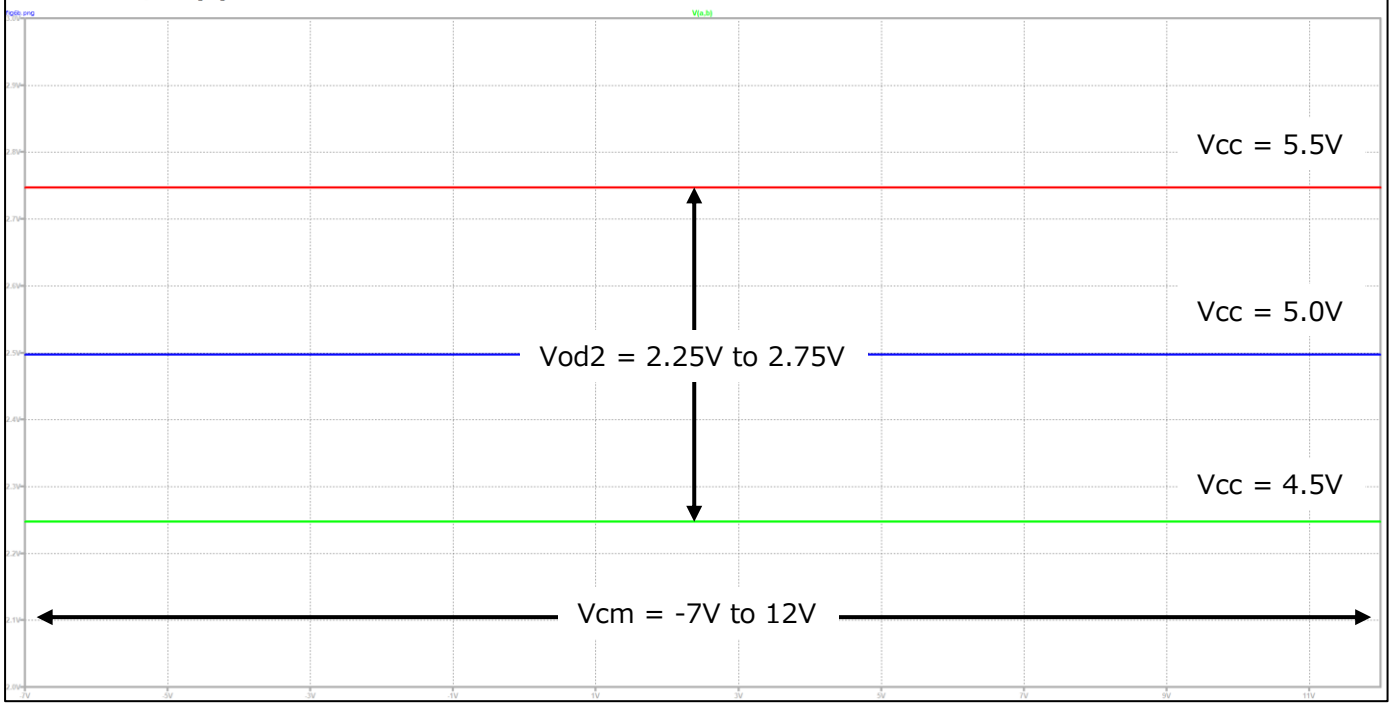
Testbench for Vod1 (Vcc = 5V, No load)



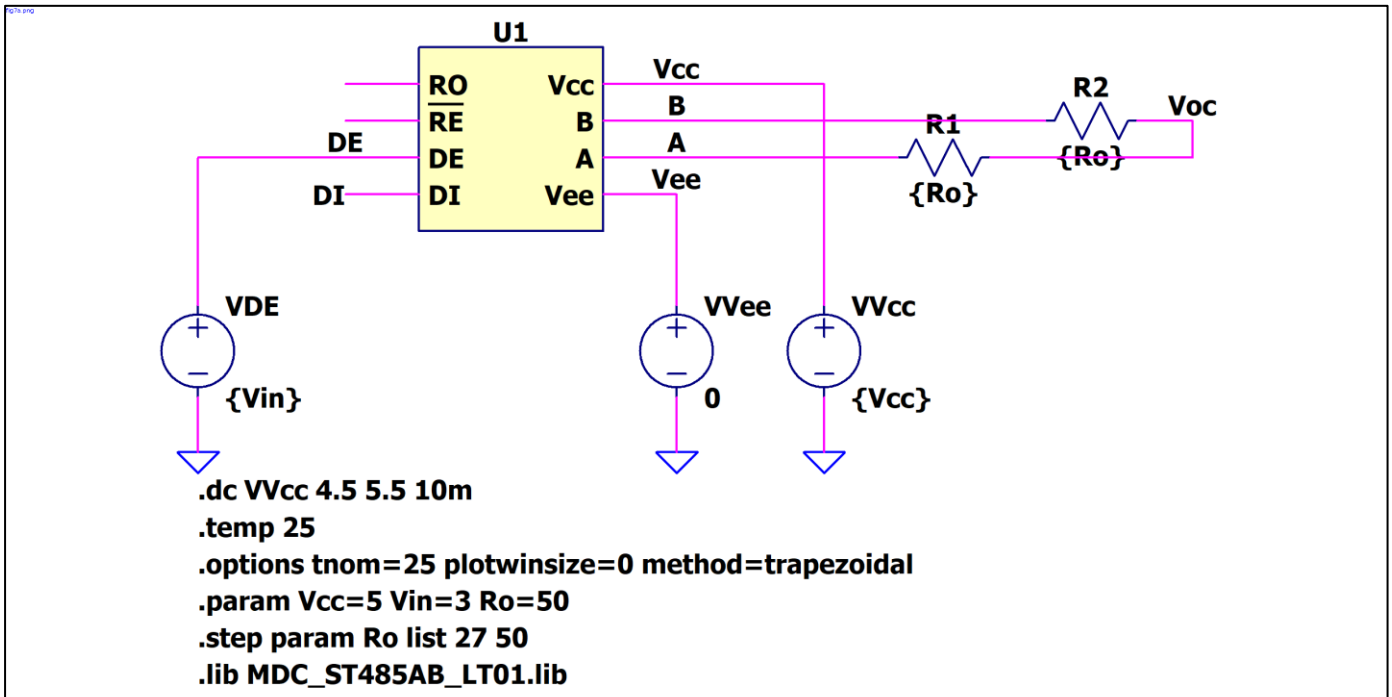
Testbench for Vod2 (Vcc = 5V, Road = 54ohm)

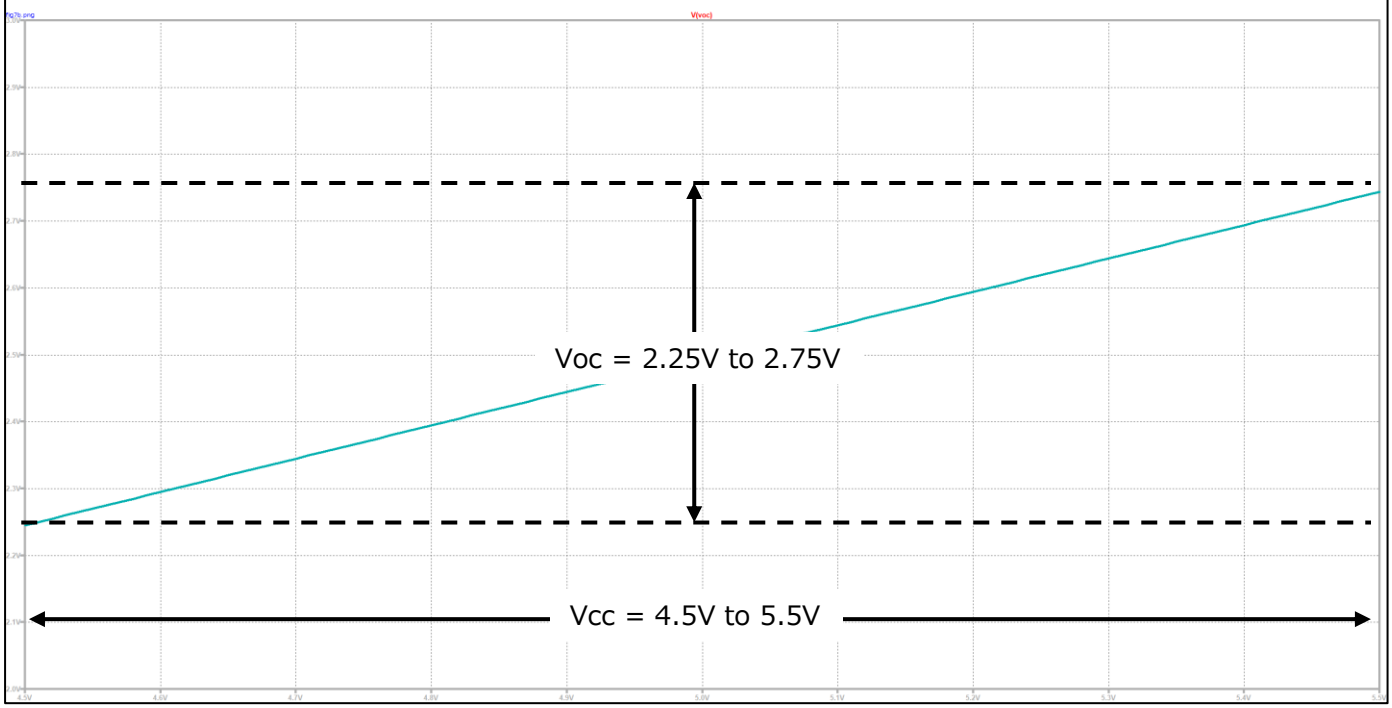



```
.dc vvcm -7 12 10m
.temp 25
.options tnom=25 plotwinsize=0 method=trapezoidal
.param Vcc=5 Vin=3 Ro=54 Vcm=0
.meas DC Vod2 MIN abs(v(a,b)) FROM -7 TO 12
.lib MDC_ST485AB_LT01.lib
.step param Vcc list 4.5 5.0 5.5
;.step param Ro list 27 50
```

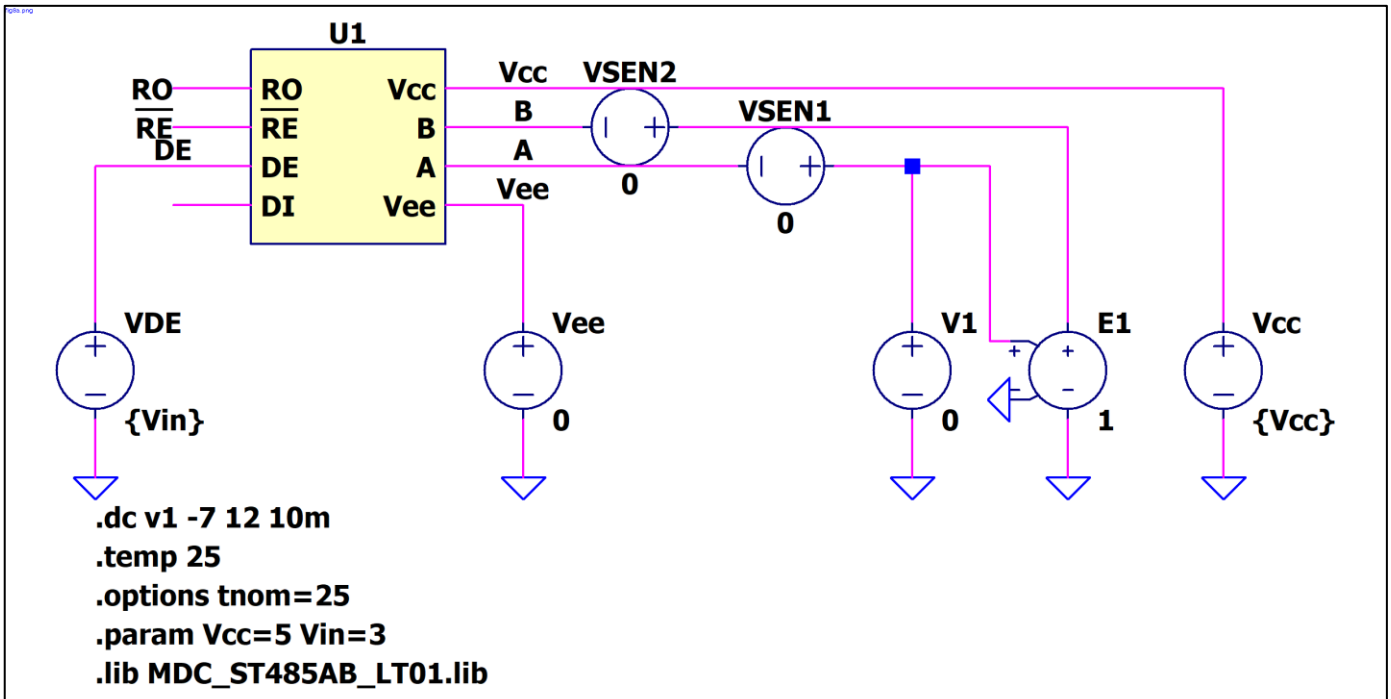


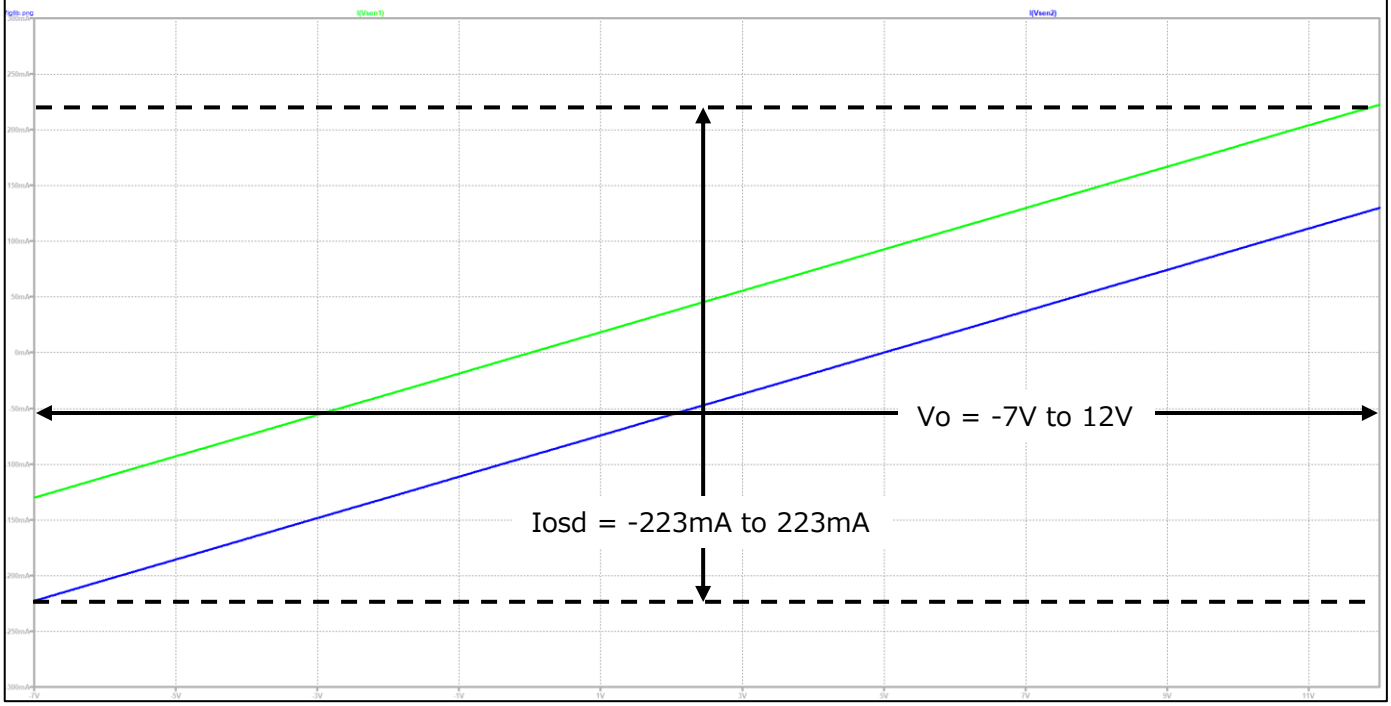
Testbench for Voc (Vcc = 5V, Rload = 27ohm /50ohm)



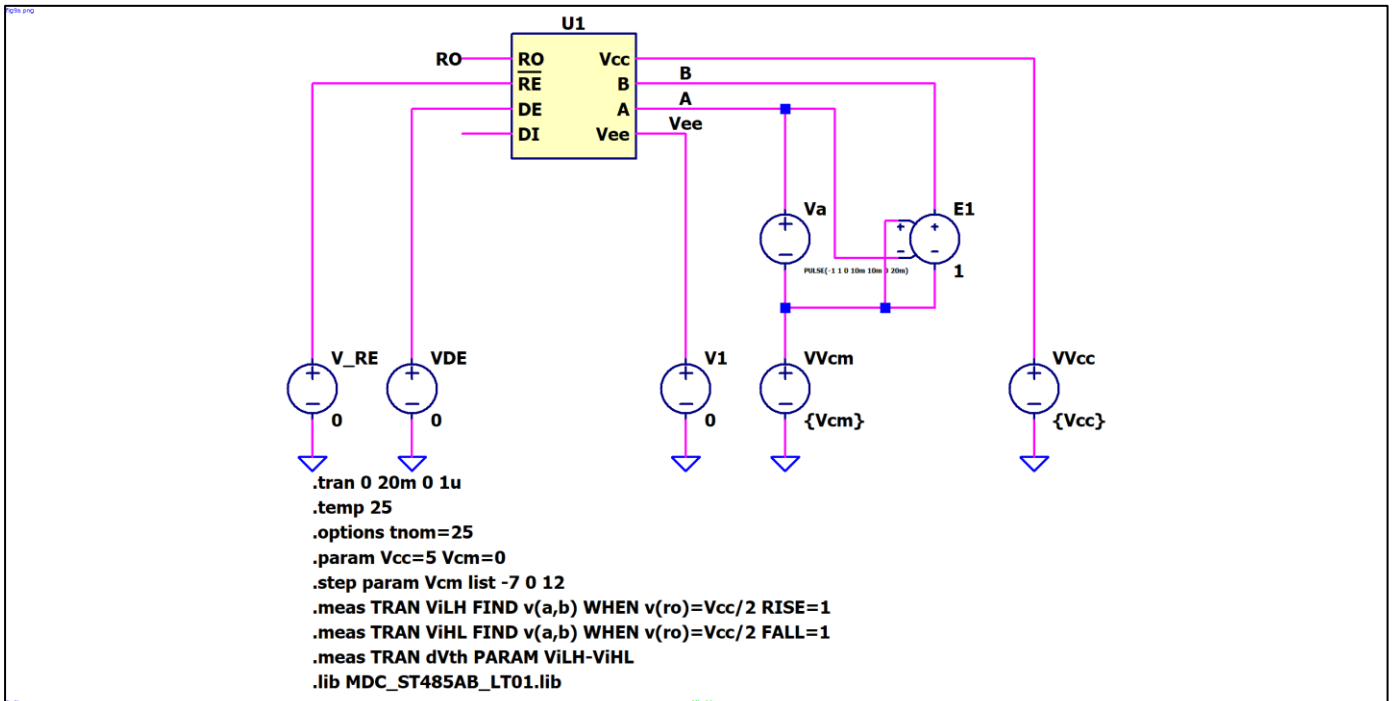


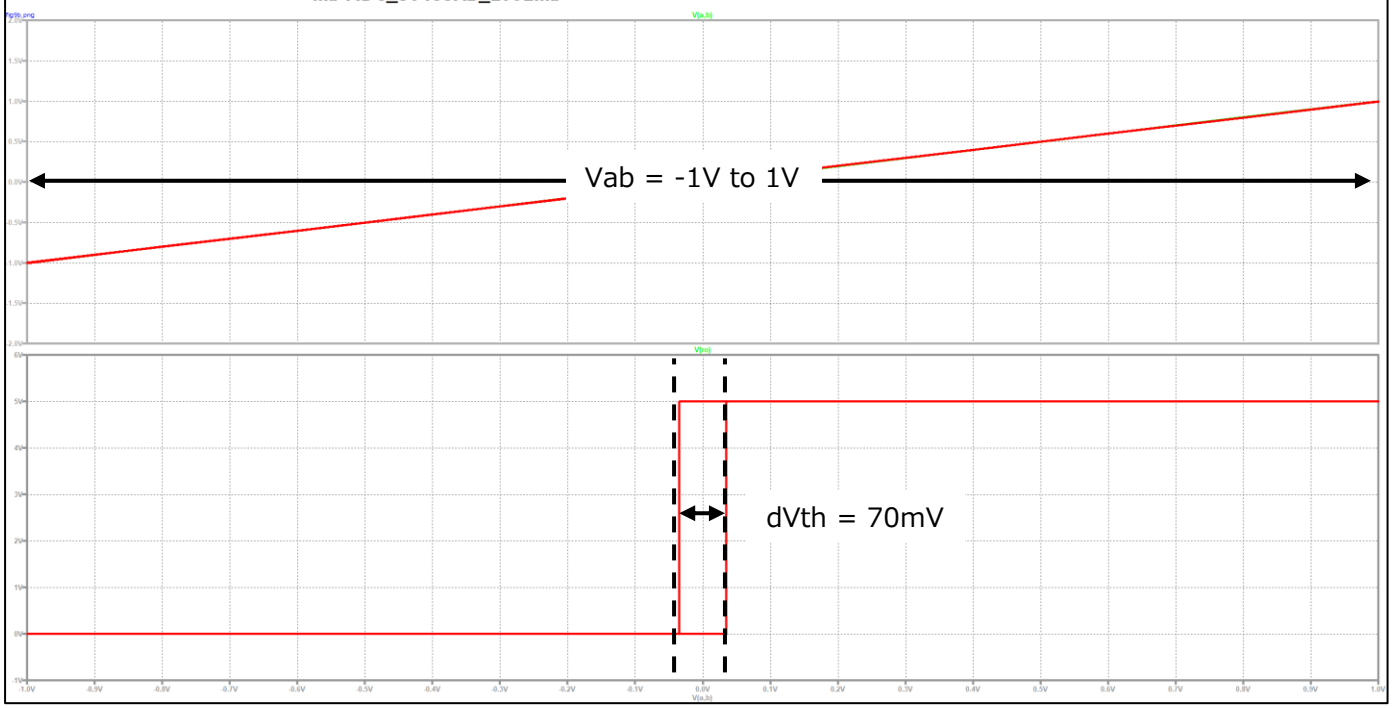
Testbench for Iosd (Vcc = 5V, Vo = -7V to 12V)



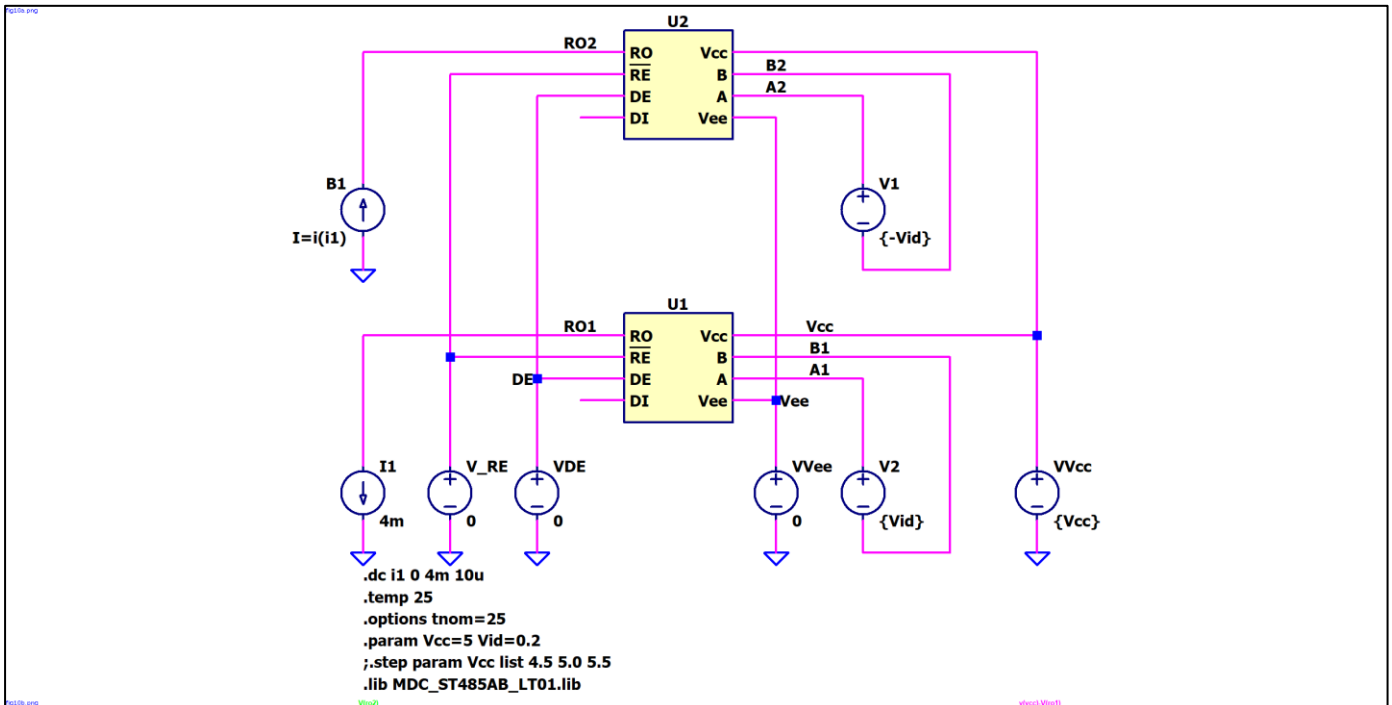


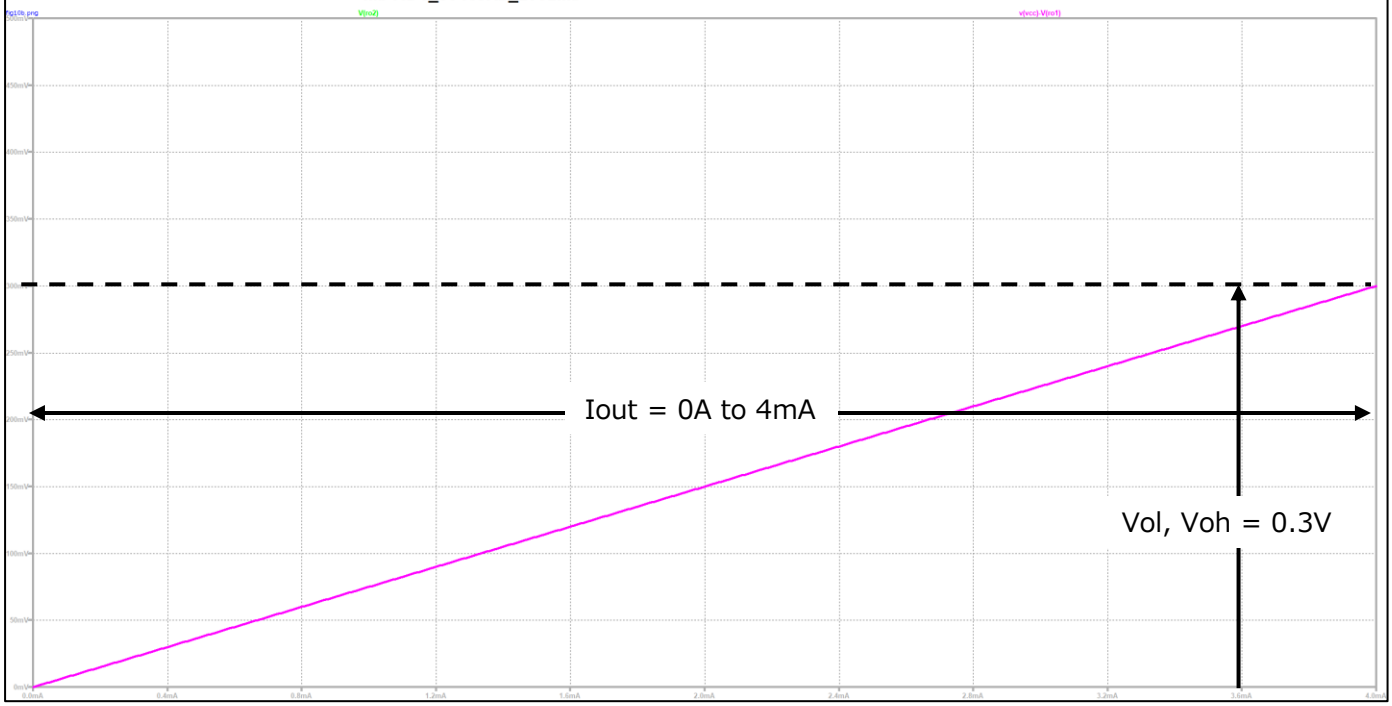
Testbench for Vth, dVth (Vcc = 5V, Vcm = -7V to 12V)



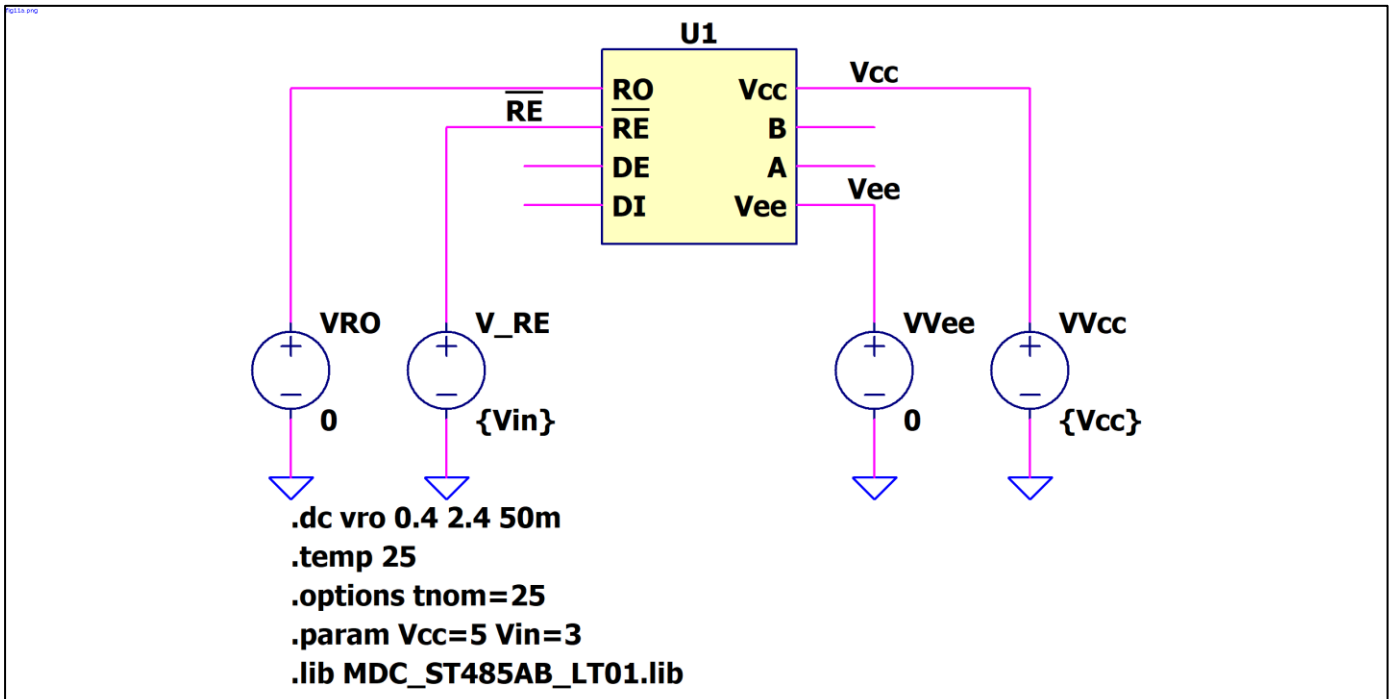


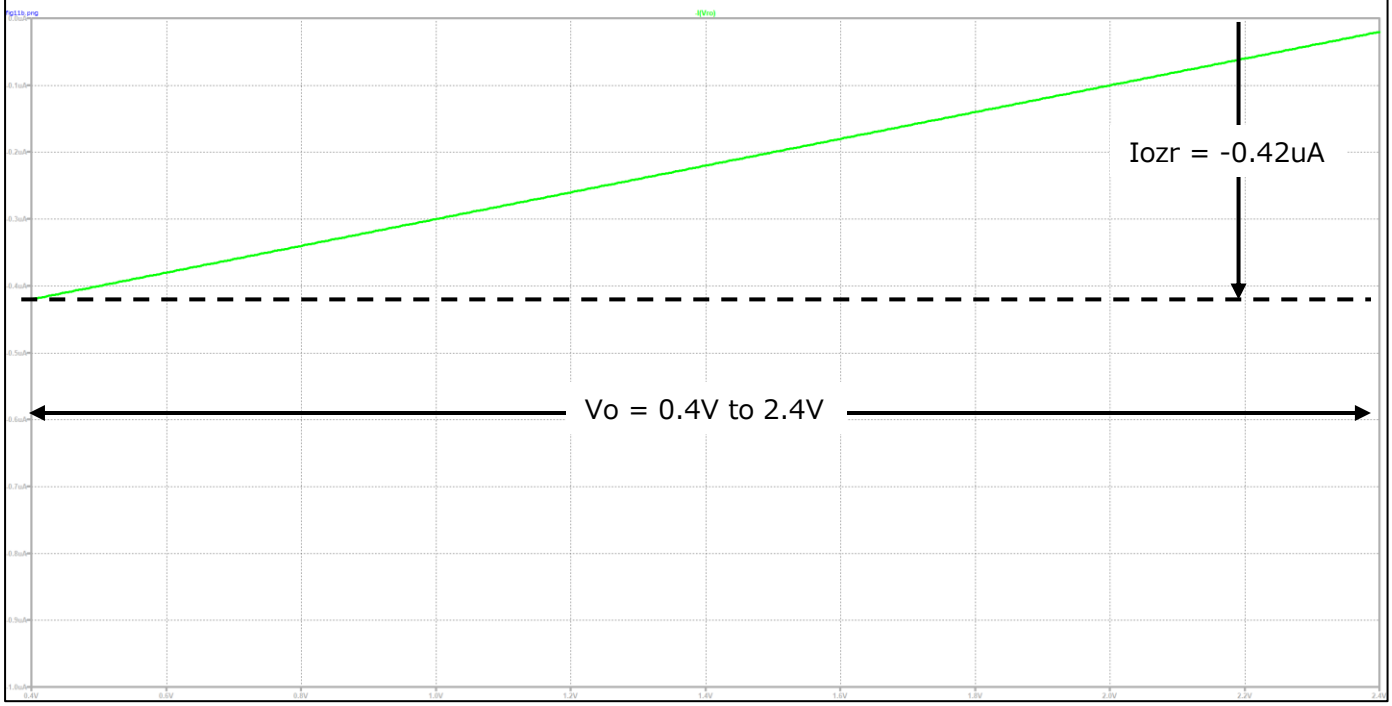
Testbench for Vol, Voh (Vcc = 5V, Iout = +/-4mA, Vid = +/-0.2V)



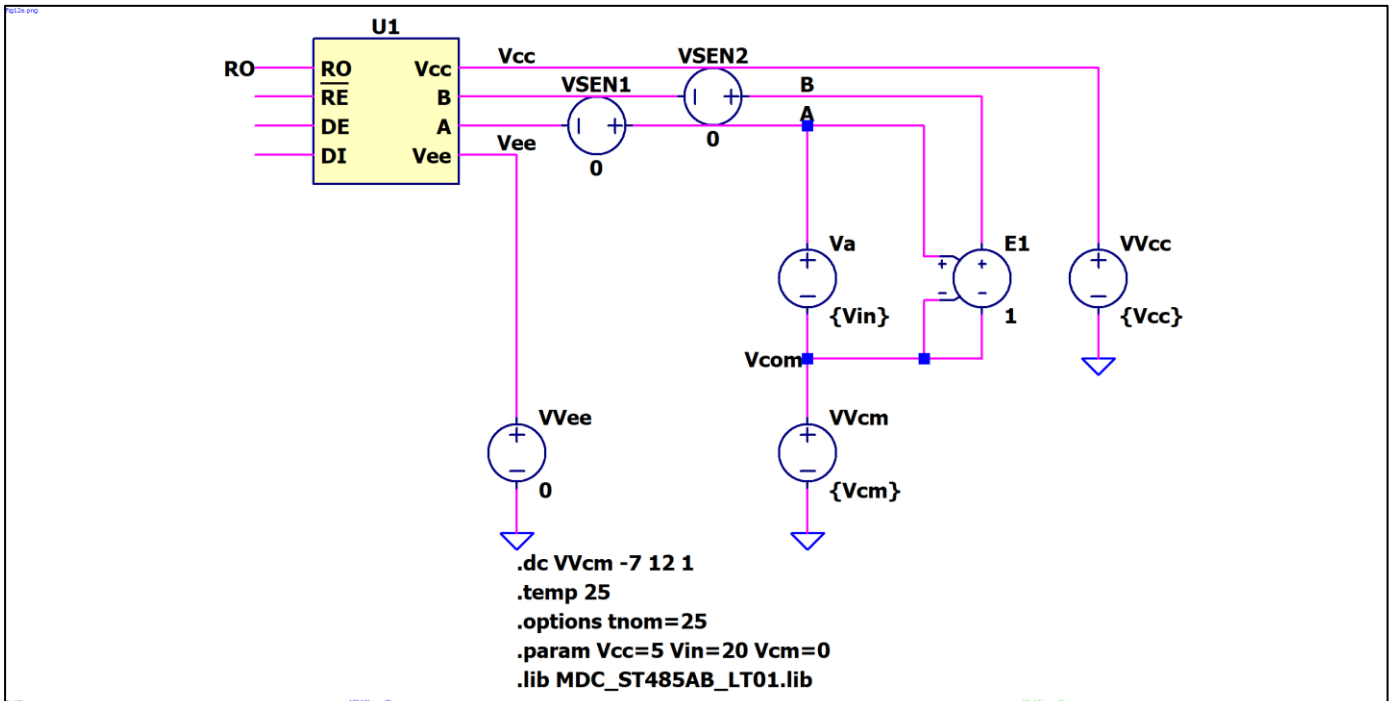


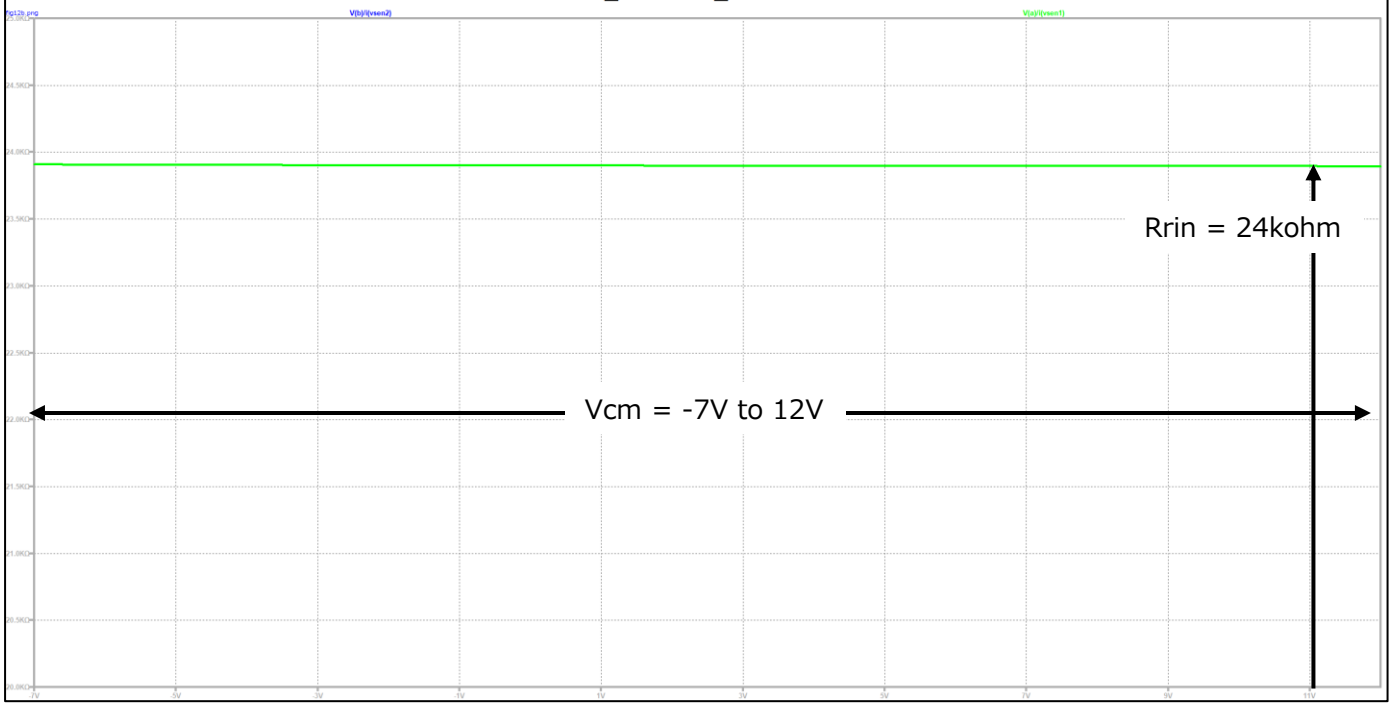
Testbench for Iozr (Vcc = 5V, Vo = 0.4V to 2.4V)



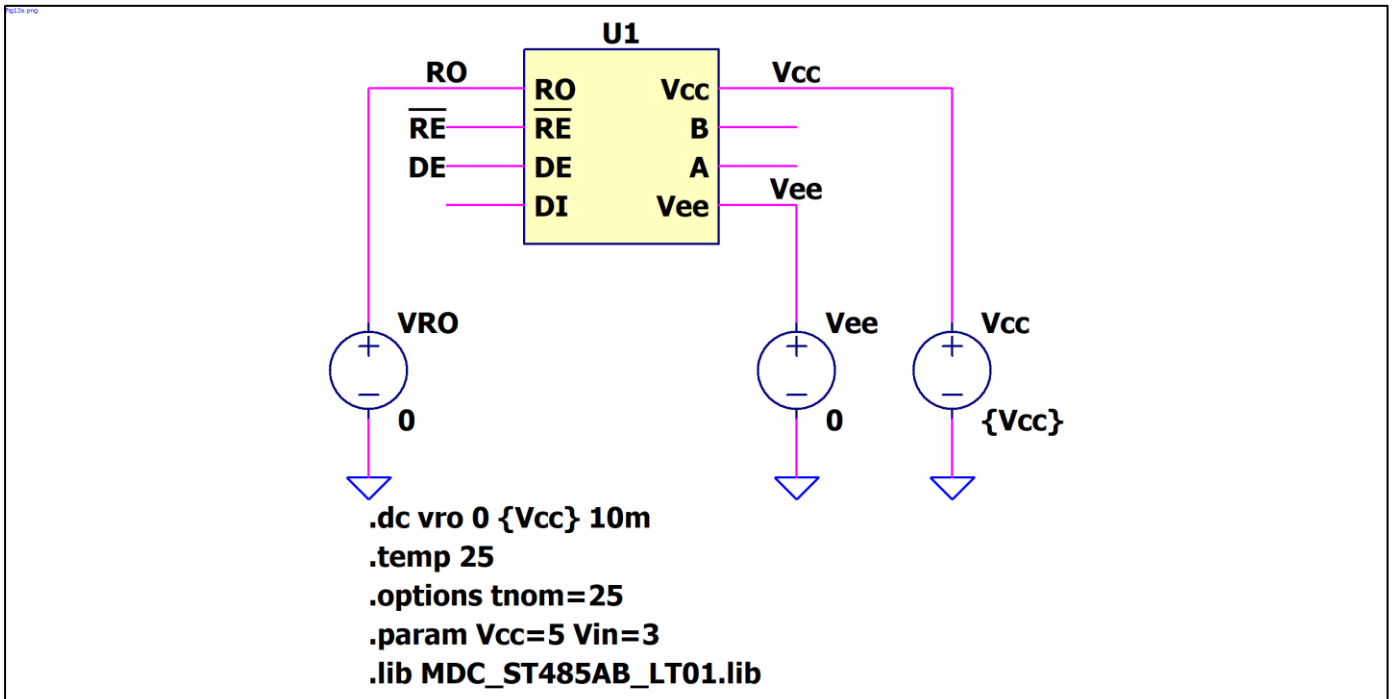


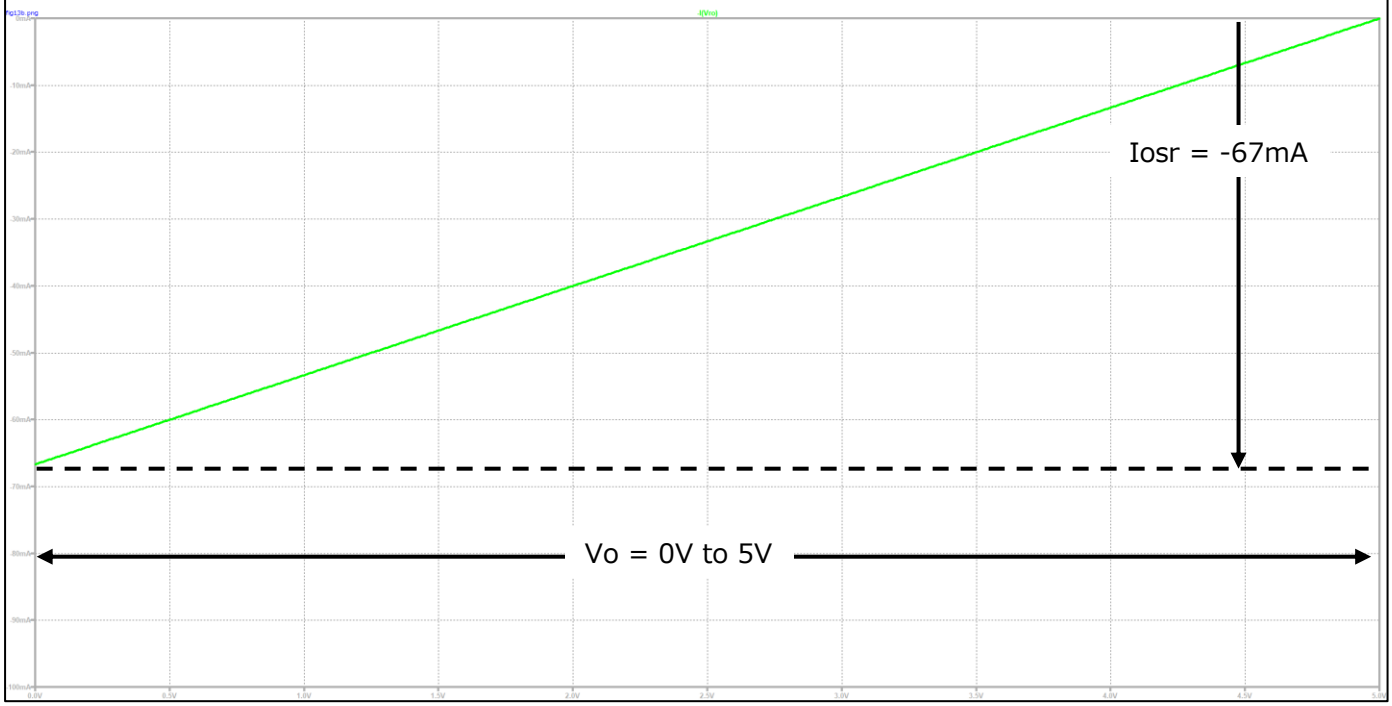
Testbench for Rrin (Vcc = 5V, Vcm = -7V to 12V)



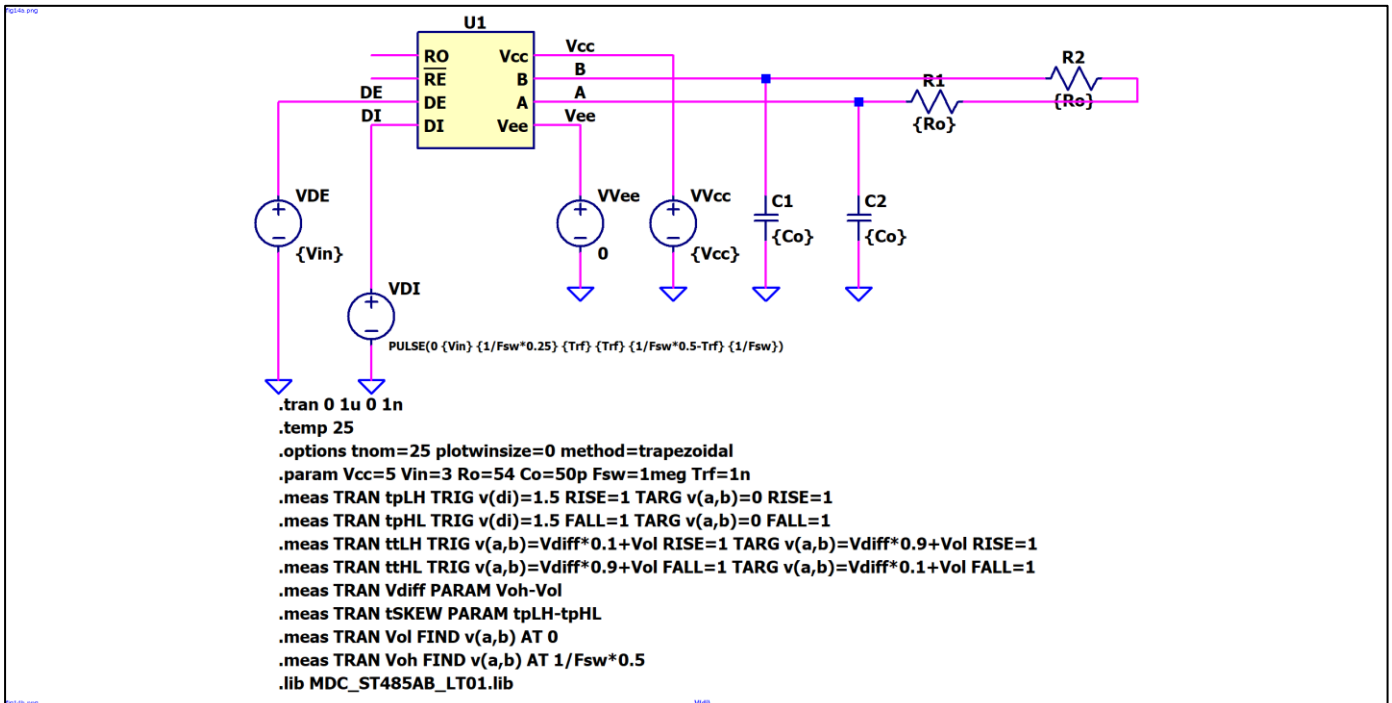


Testbench for Iosr (Vcc = 5V, Vo = 0V to 5V)

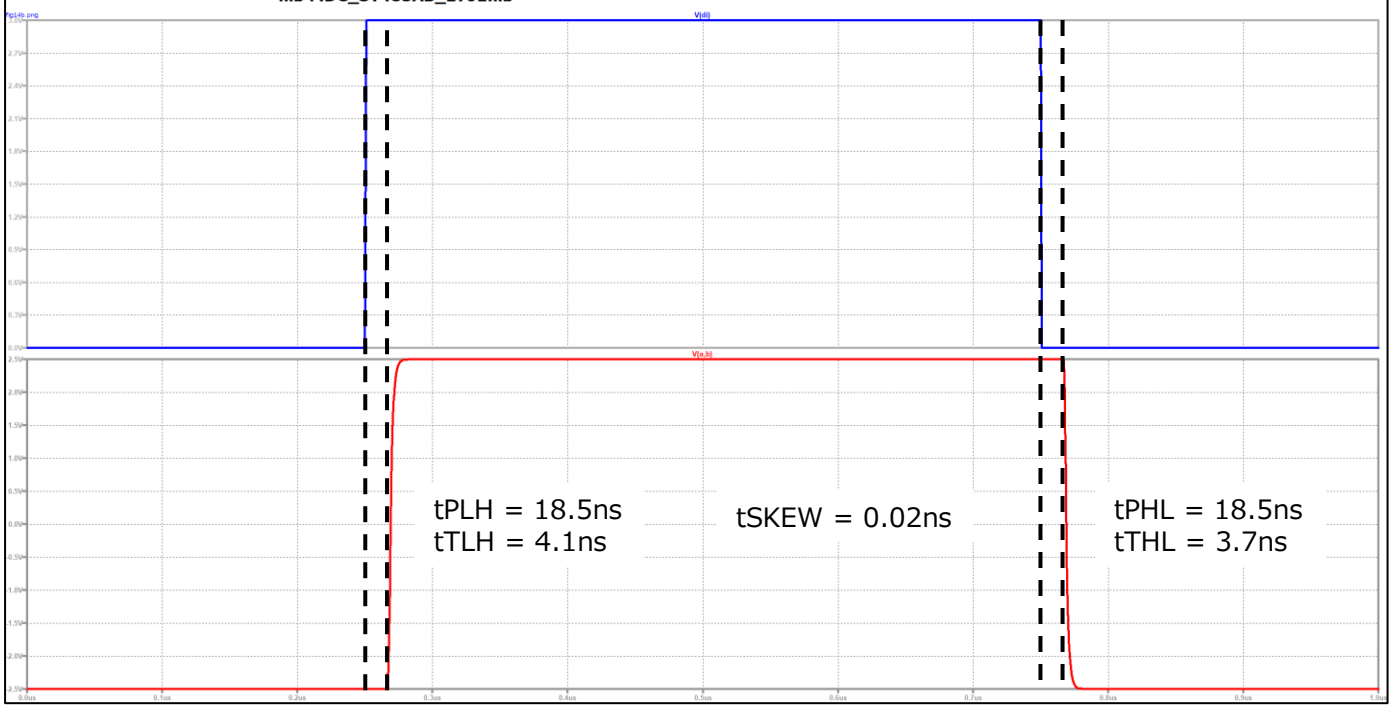




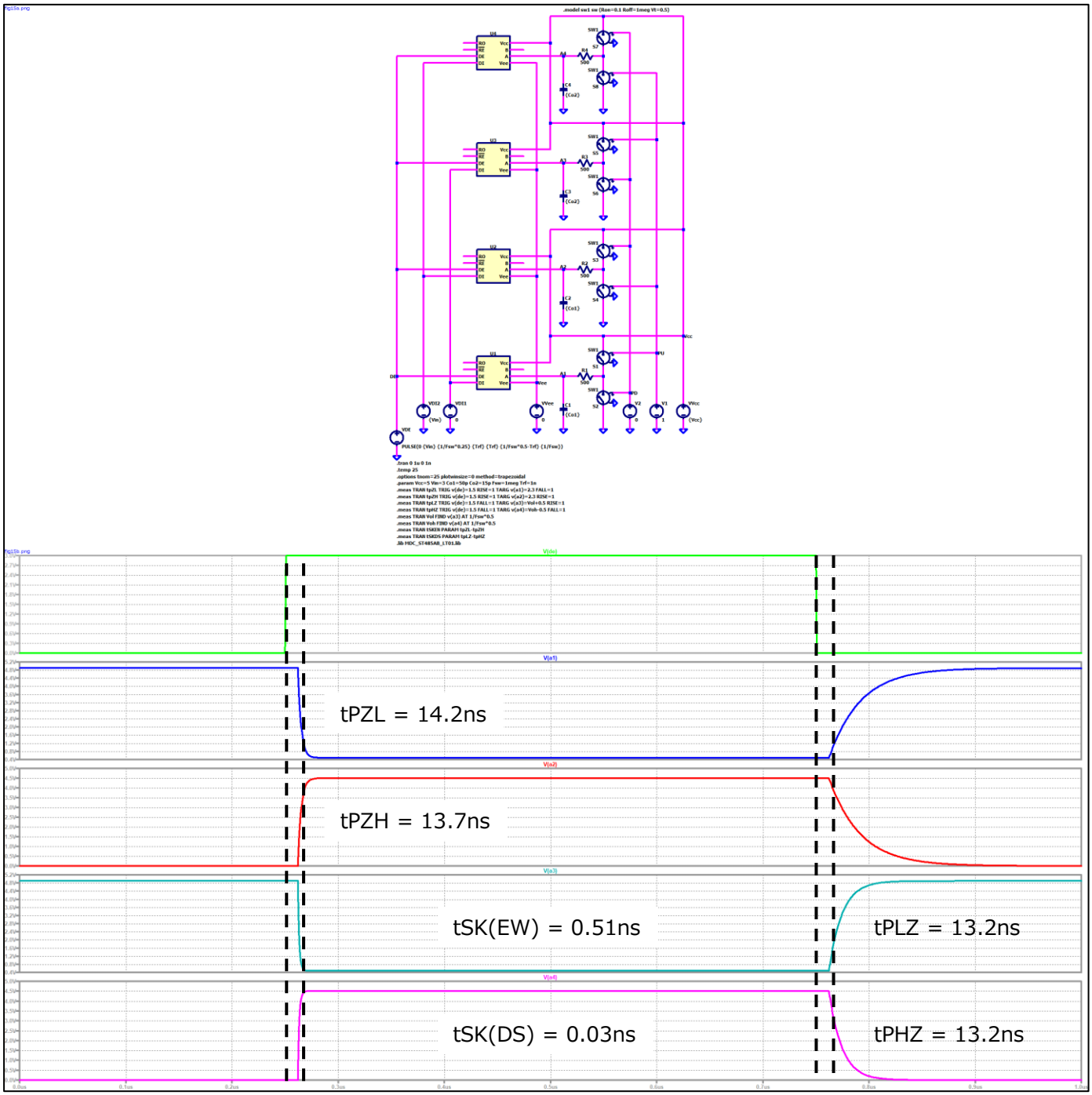
Testbench for tPLH, tPHL of driver (Vcc = 5V, Ro = 54ohm, Co = 50pF)



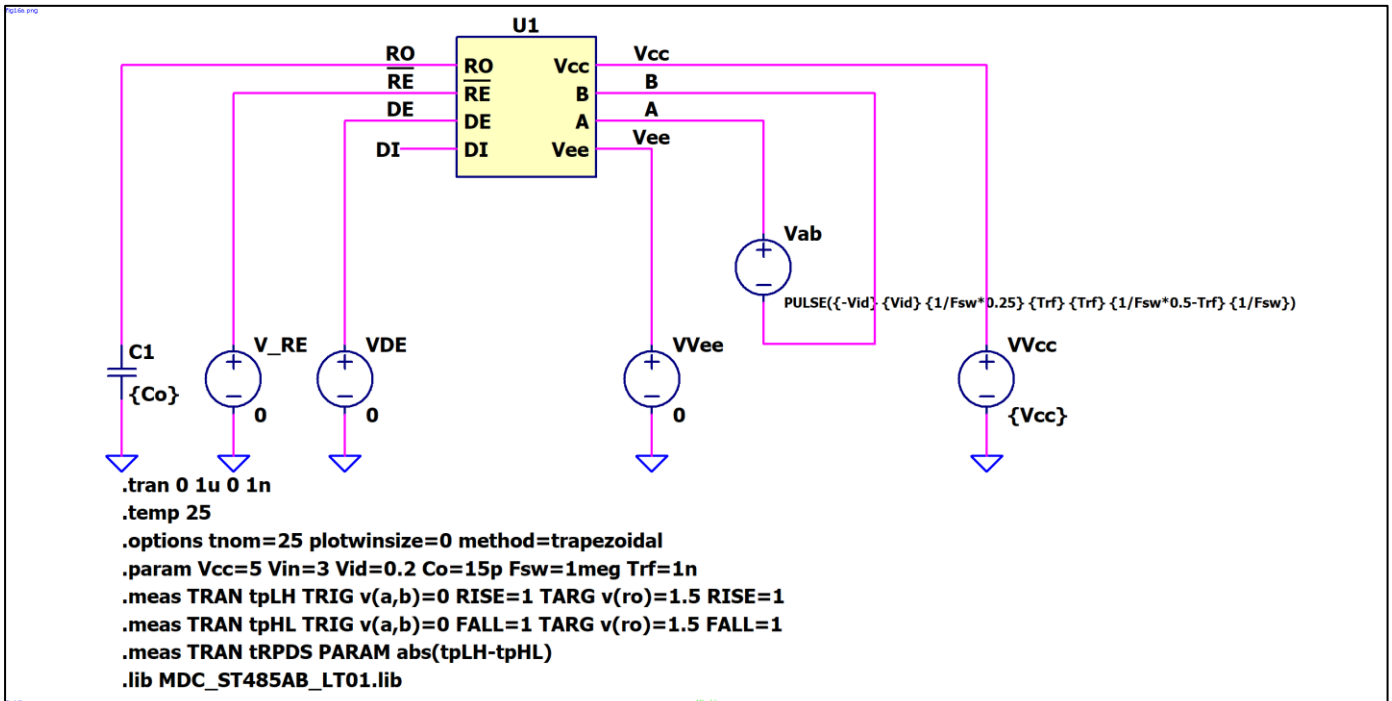

```
.tran 0 1u 0 1n
.temp 25
.options tnom=25 plotwinsize=0 method=trapezoidal
.param Vcc=5 Vin=3 Ro=54 Co=50p Fsw=1meg Trf=1n
.meas TRAN tpLH TRIG v(di)=1.5 RISE=1 TARG v(a,b)=0 RISE=1
.meas TRAN tpHL TRIG v(di)=1.5 FALL=1 TARG v(a,b)=0 FALL=1
.meas TRAN ttLH TRIG v(a,b)=Vdiff*0.1+Vol RISE=1 TARG v(a,b)=Vdiff*0.9+Vol RISE=1
.meas TRAN ttHL TRIG v(a,b)=Vdiff*0.9+Vol FALL=1 TARG v(a,b)=Vdiff*0.1+Vol FALL=1
.meas TRAN Vdiff PARAM Voh-Vol
.meas TRAN tSKEW PARAM tpLH-tpHL
.meas TRAN Vol FIND v(a,b) AT 0
.meas TRAN Voh FIND v(a,b) AT 1/Fsw*0.5
.lib MDC_ST485AB_LT01.lib
```



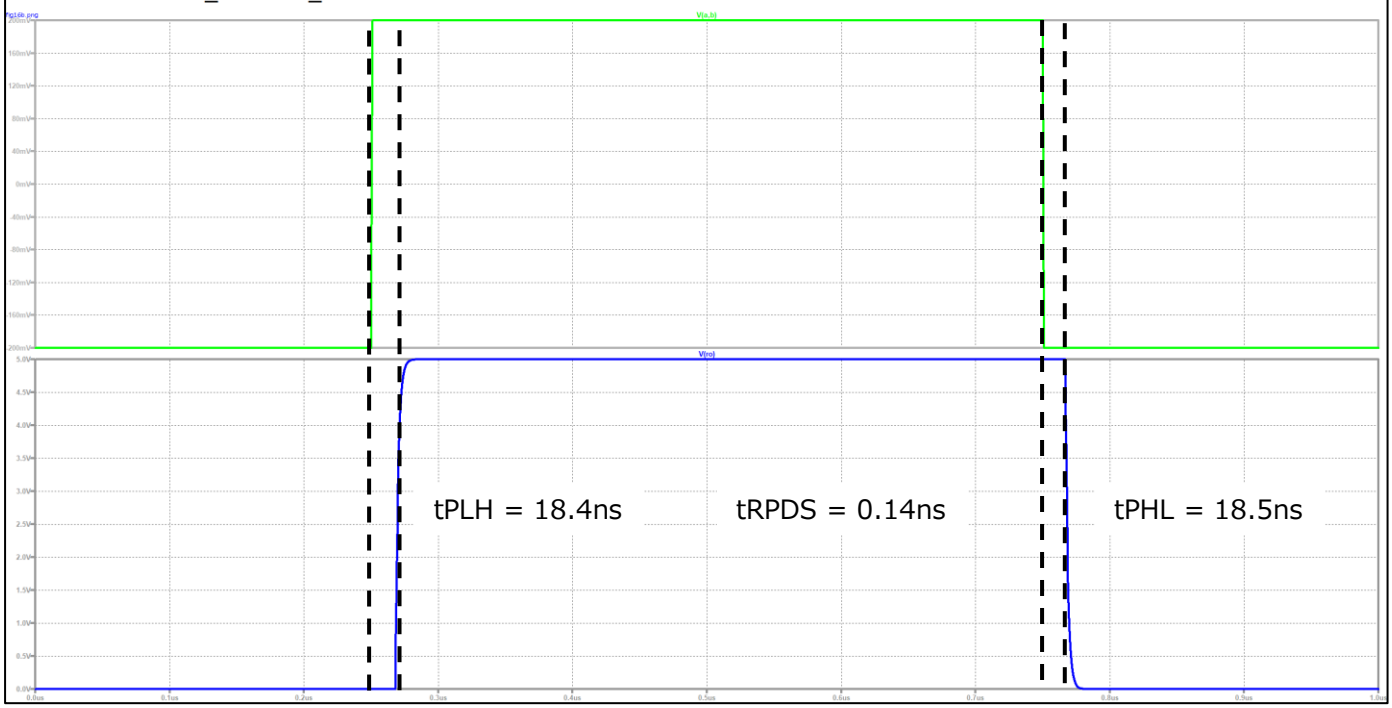
Testbench for tPZL/tPHL, tPZH/tPHZ of driver (Vcc = 5V, Ro = 54ohm, Co = 50pF/15pF)



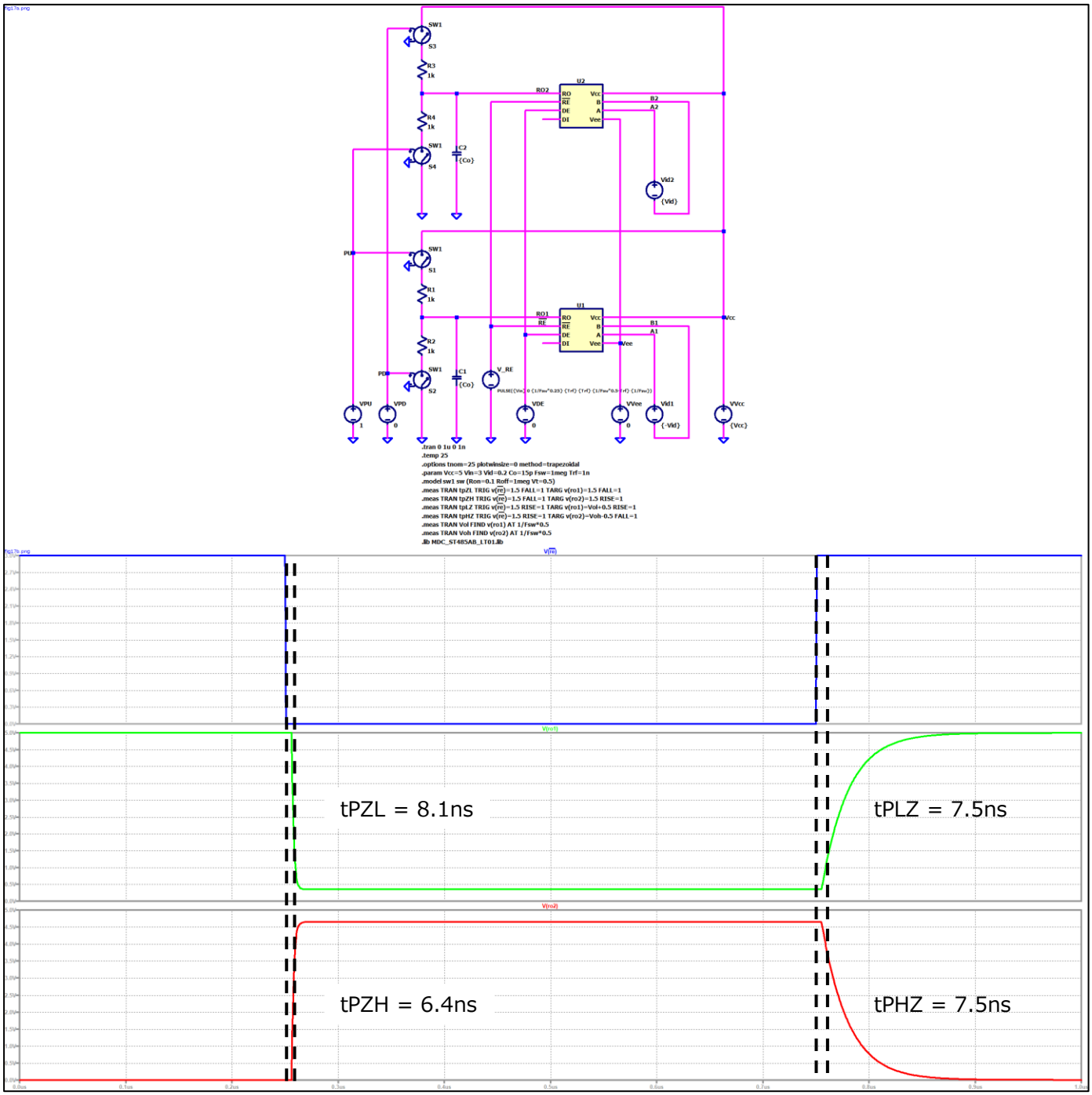
Testbench for tPLH, tPHL of receiver (Vcc = 5V, Vid = 0.2V, Co = 15pF)




```
.tran 0 1u 0 1n
.temp 25
.options tnom=25 plotwinsize=0 method=trapezoidal
.param Vcc=5 Vin=3 Vid=0.2 Co=15p Fsw=1meg Trf=1n
.meas TRAN tpLH TRIG v(a,b)=0 RISE=1 TARG v(ro)=1.5 RISE=1
.meas TRAN tpHL TRIG v(a,b)=0 FALL=1 TARG v(ro)=1.5 FALL=1
.meas TRAN tRPDS PARAM abs(tpLH-tpHL)
.lib MDC_ST485AB_LT01.lib
```



Testbench for tPZL/tPHL, tPZH/tPHZ of receiver (Vcc = 5V, Co = 15pF)



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