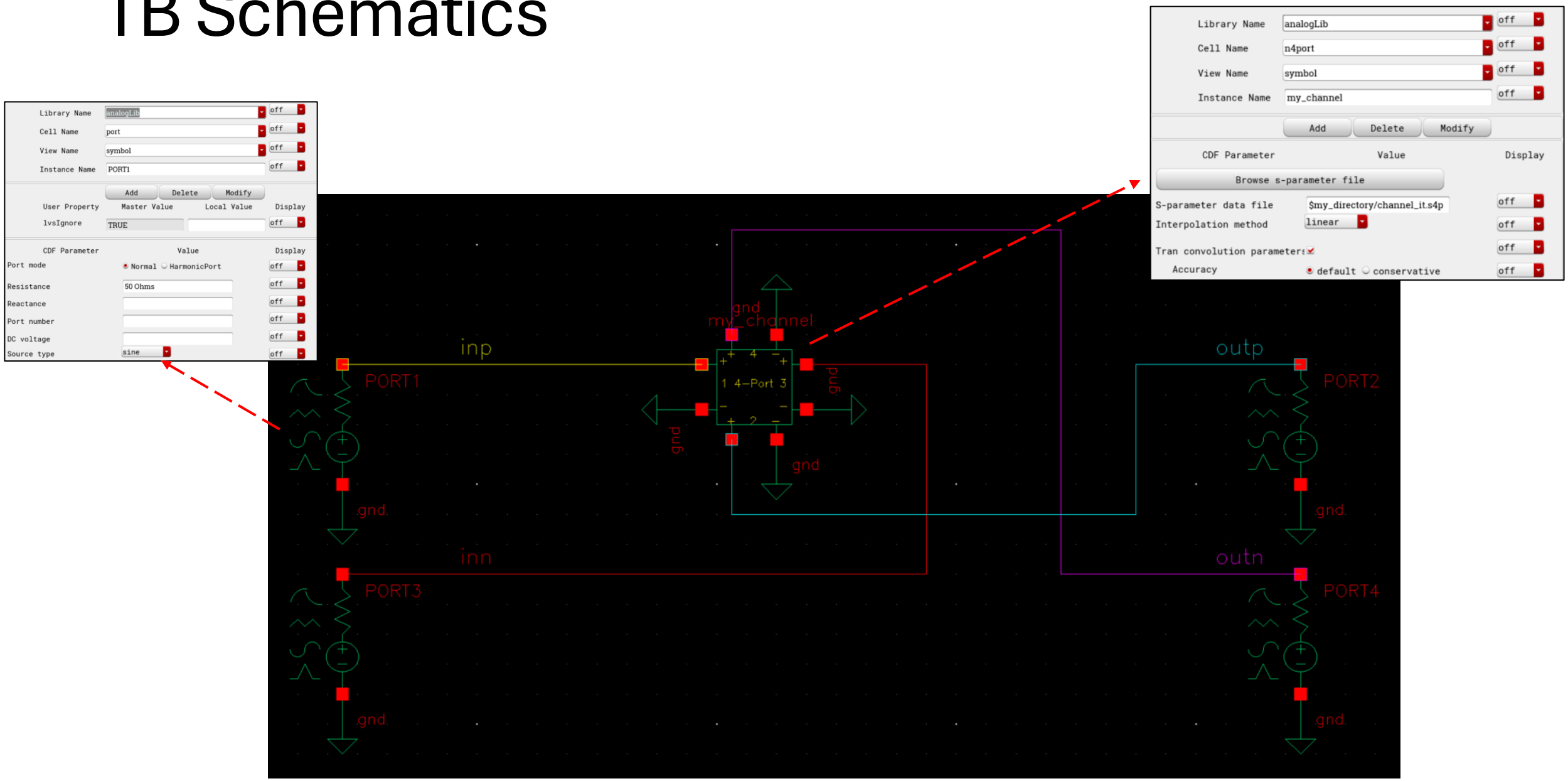
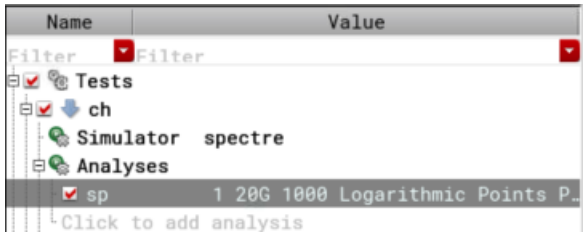
Lab (1)
Channel Characterization

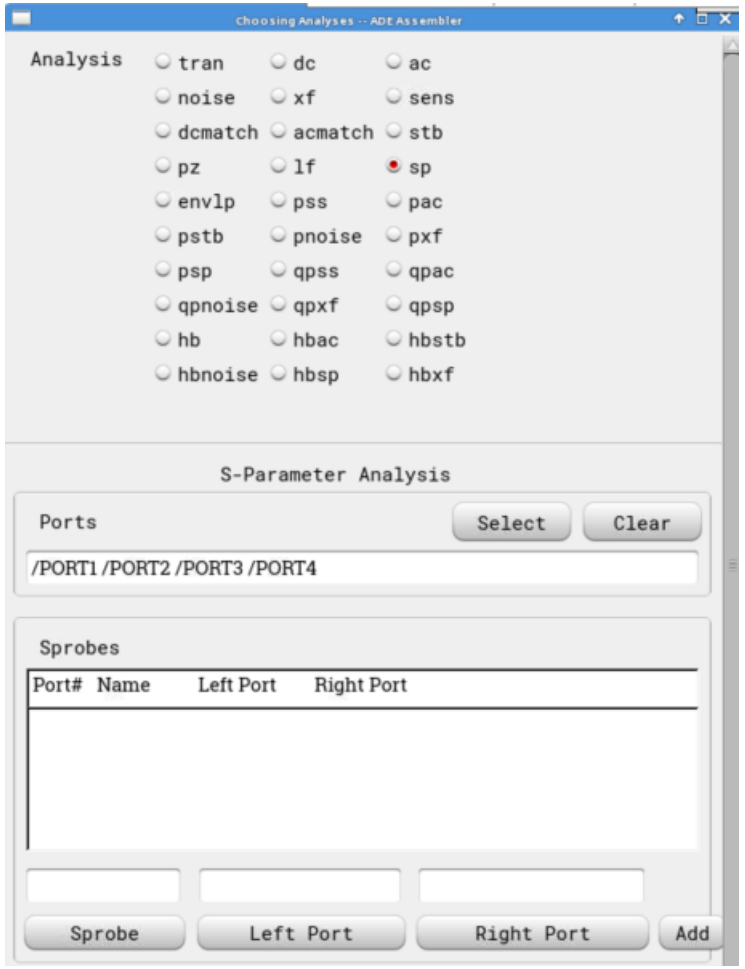
1) S-Parameters of the Channel

TB Schematics



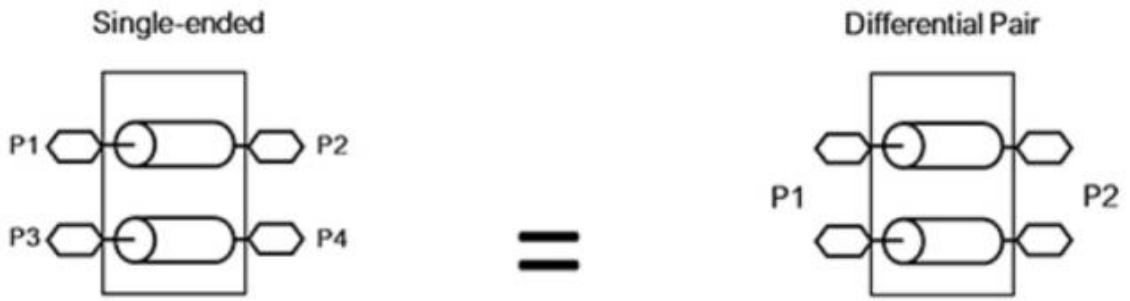
Analysis Setup





Test Expressions

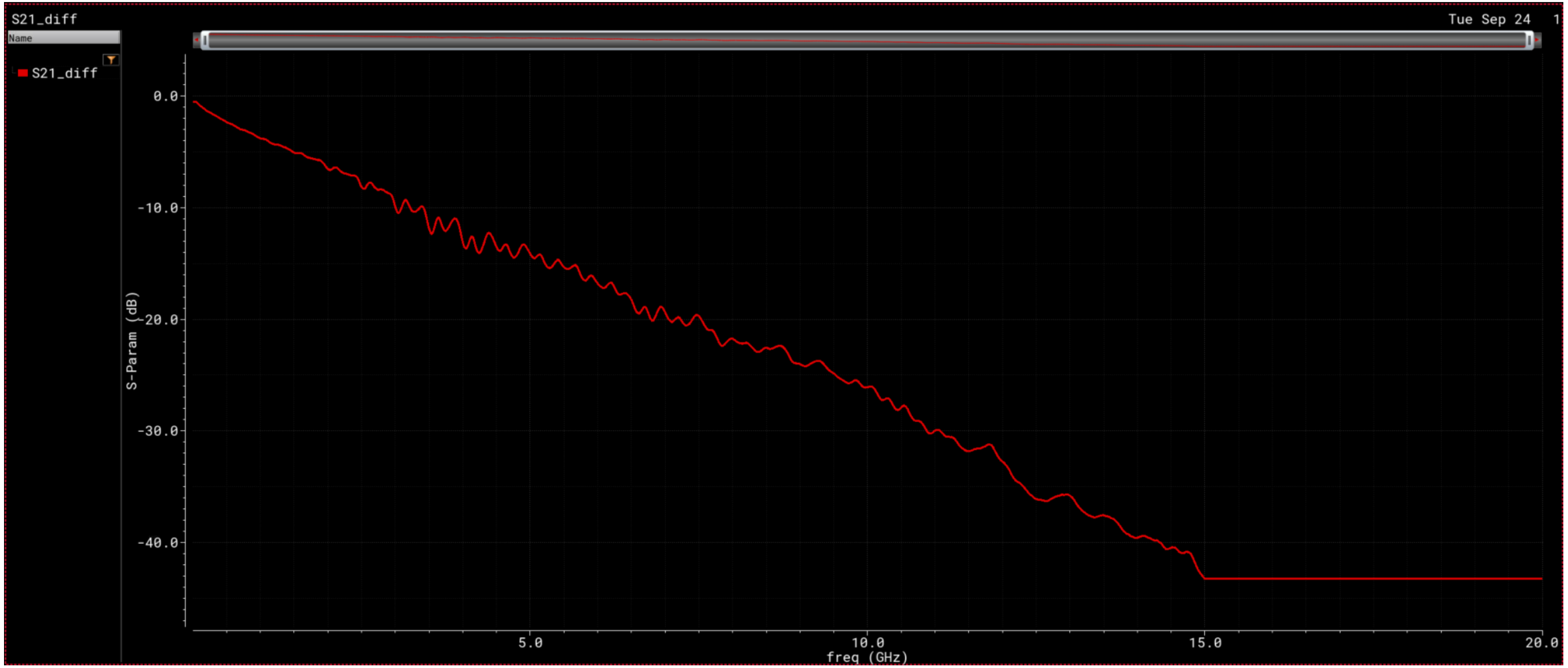
Name	Type	Details
Filter	Filter	Filter
S21	expr	aaSP("/PORT2" "/PORT1")
S43	expr	aaSP("/PORT4" "/PORT3")
S23	expr	aaSP("/PORT2" "/PORT3")
S41	expr	aaSP("/PORT4" "/PORT1")
S21_diff	expr	dB20((0.5 * ((S21 + S43) - S23 - S41)))



$$SDD21 = 0.5[S21 - S23 - S41 + S43]$$

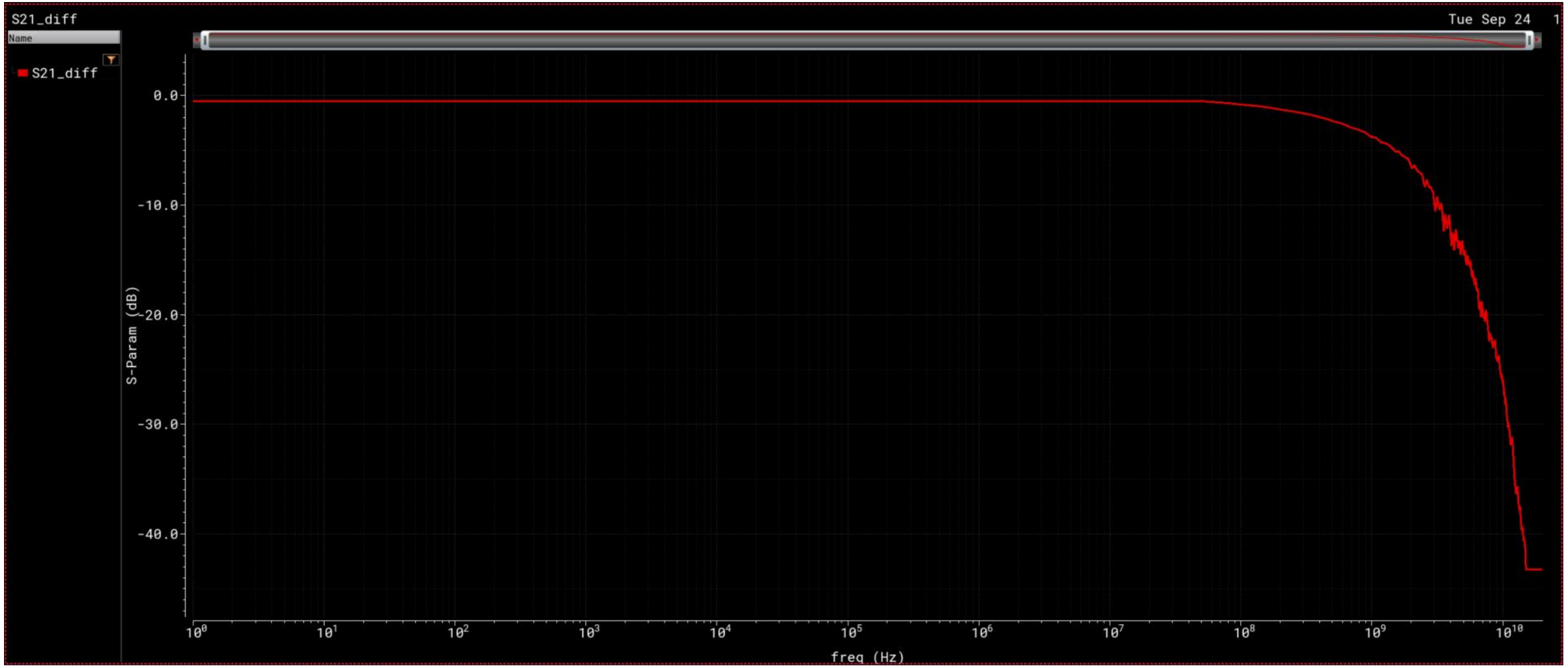
Results

- Freq – linear Scale



Results

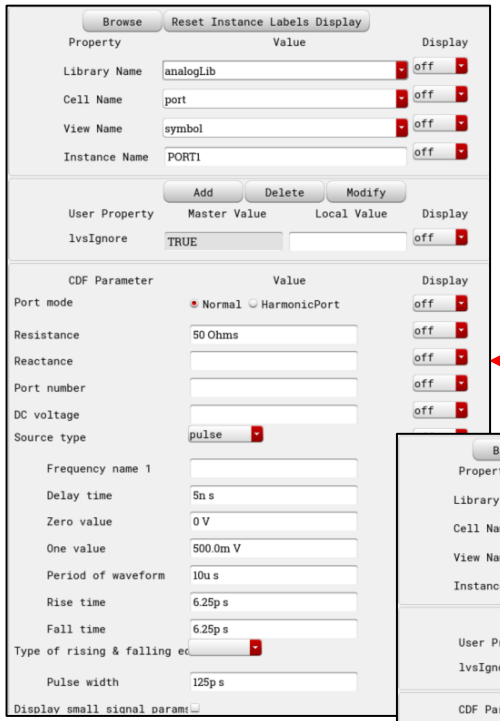
- Freq – log Scale

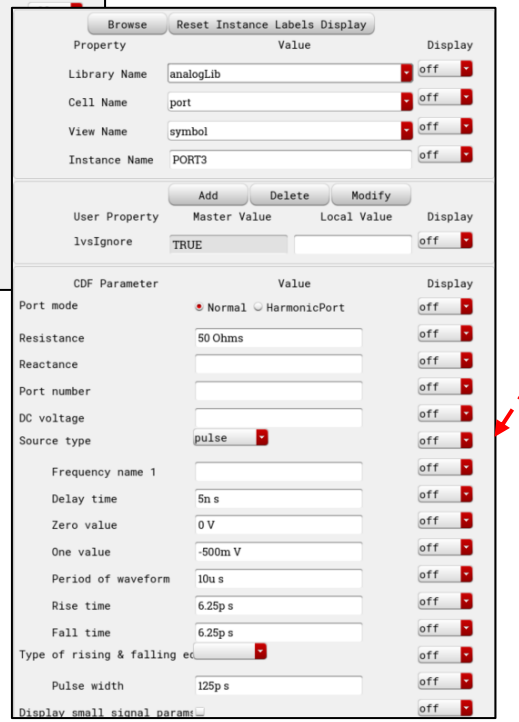


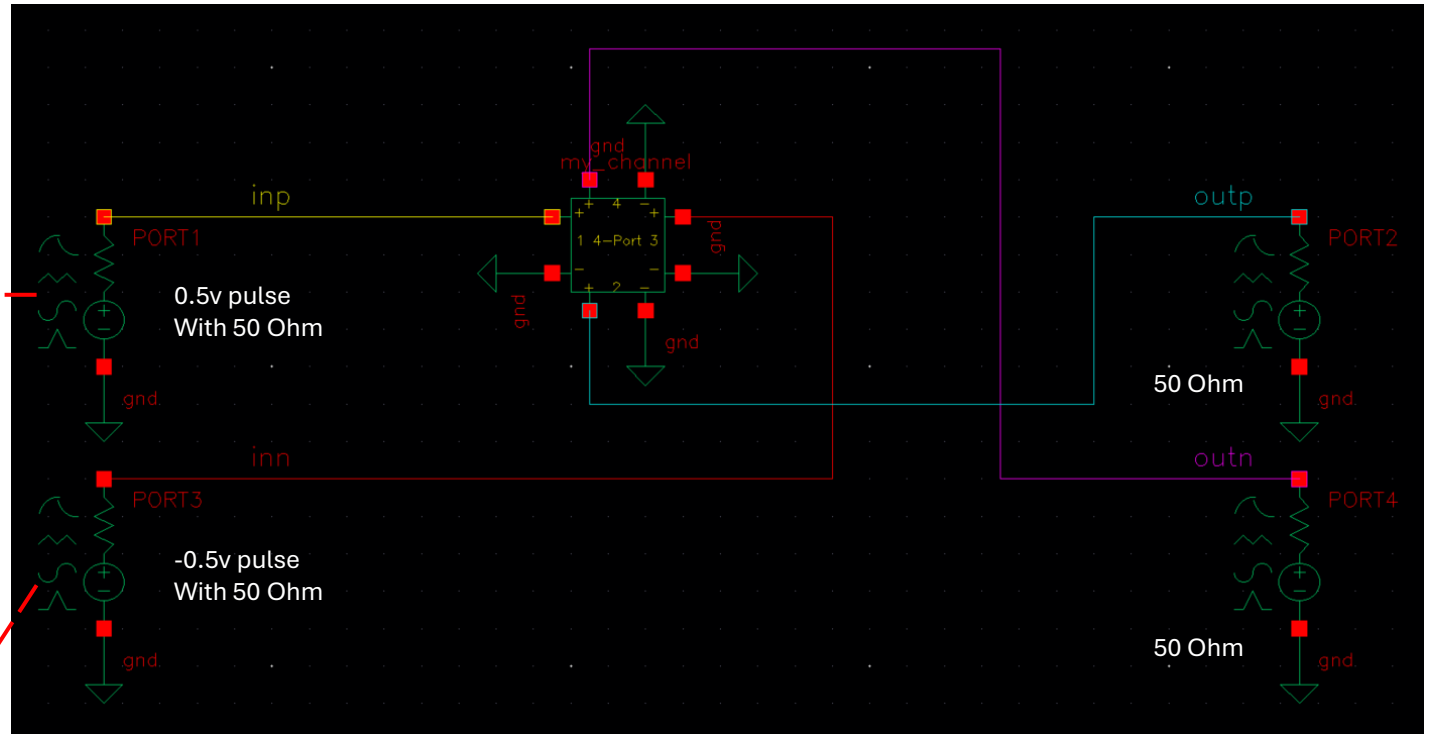
2) Pulse Response of the Channel

(8 Gbps)

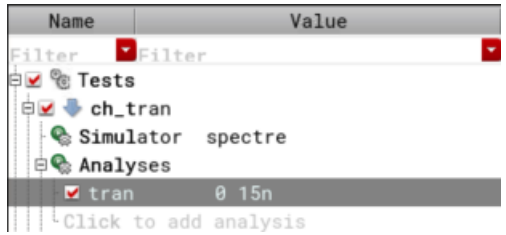
TB Schematics

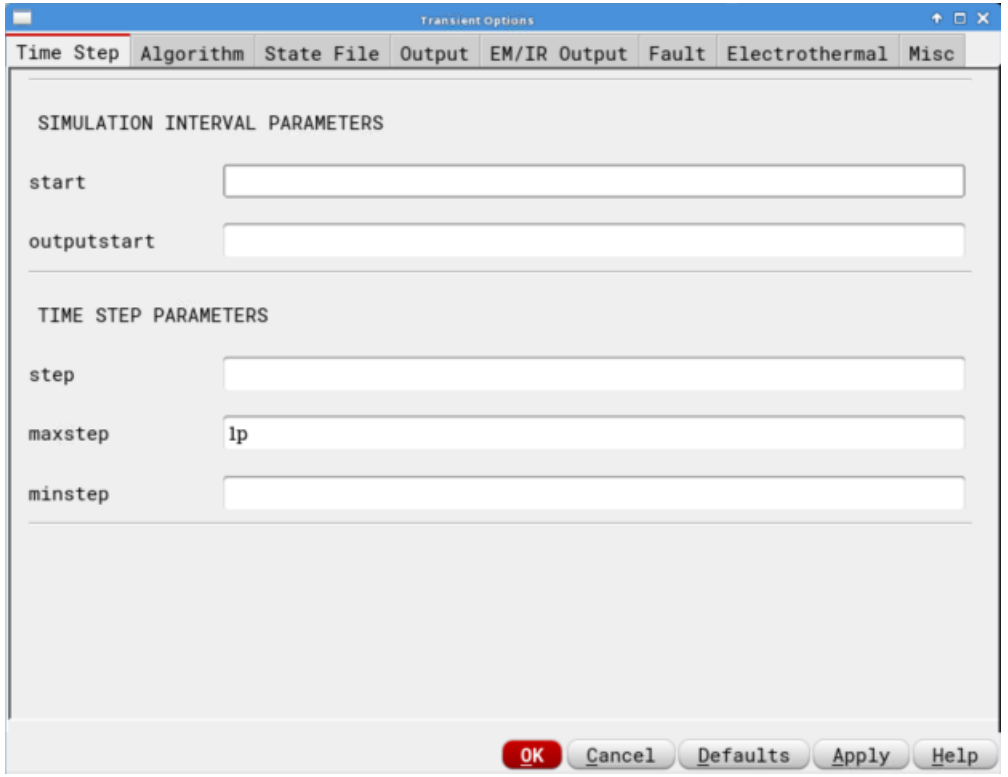






Analysis Setup





Test Expressions

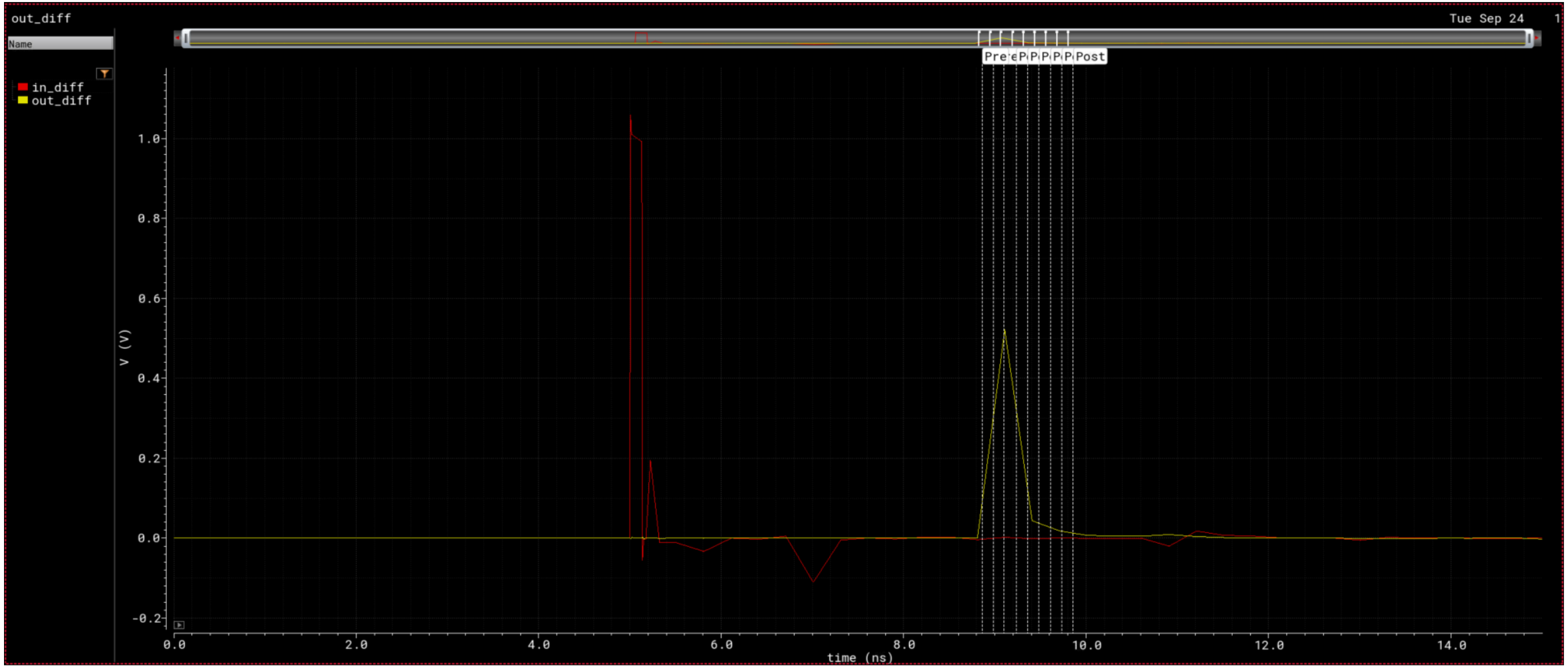
Name	Type	Details
Filter	Filter	Filter
** Waveforms **	expr	
	signal	/inp
	signal	/inn
	signal	/outp
	signal	/outn
in_diff	expr	(VT("/inp") - VT("/inn"))
out_diff	expr	(VT("/outp") - VT("/outn"))
** Expressions **	expr	
Datarate	expr	8e+09
UI	expr	(1 / Datarate)
** Main Cursor **	expr	
cursor_main	expr	ymax(out_diff)
t_cursor_main	expr	xmax(out_diff)
** Post & Pre Cursors **	expr	
t_cursor_pre_2	expr	(t_cursor_main - (2 * UI))
t_cursor_pre_1	expr	(t_cursor_main - UI)
t_cursor_post_1	expr	(t_cursor_main + UI)
t_cursor_post_2	expr	(t_cursor_main + (2 * UI))
t_cursor_post_3	expr	(t_cursor_main + (3 * UI))
t_cursor_post_4	expr	(t_cursor_main + (4 * UI))
t_cursor_post_5	expr	(t_cursor_main + (5 * UI))
t_cursor_post_6	expr	(t_cursor_main + (6 * UI))
cursor_pre_2	expr	value(out_diff t_cursor_pre_2)
cursor_pre_1	expr	value(out_diff t_cursor_pre_1)
cursor_post_1	expr	value(out_diff t_cursor_post_1)
cursor_post_2	expr	value(out_diff t_cursor_post_2)
cursor_post_3	expr	value(out_diff t_cursor_post_3)
cursor_post_4	expr	value(out_diff t_cursor_post_4)
cursor_post_5	expr	value(out_diff t_cursor_post_5)
cursor_post_6	expr	value(out_diff t_cursor_post_6)

$DataRate = 8\ Gb/s$

$UI = {}^{1}/_{8G} = 125ps$

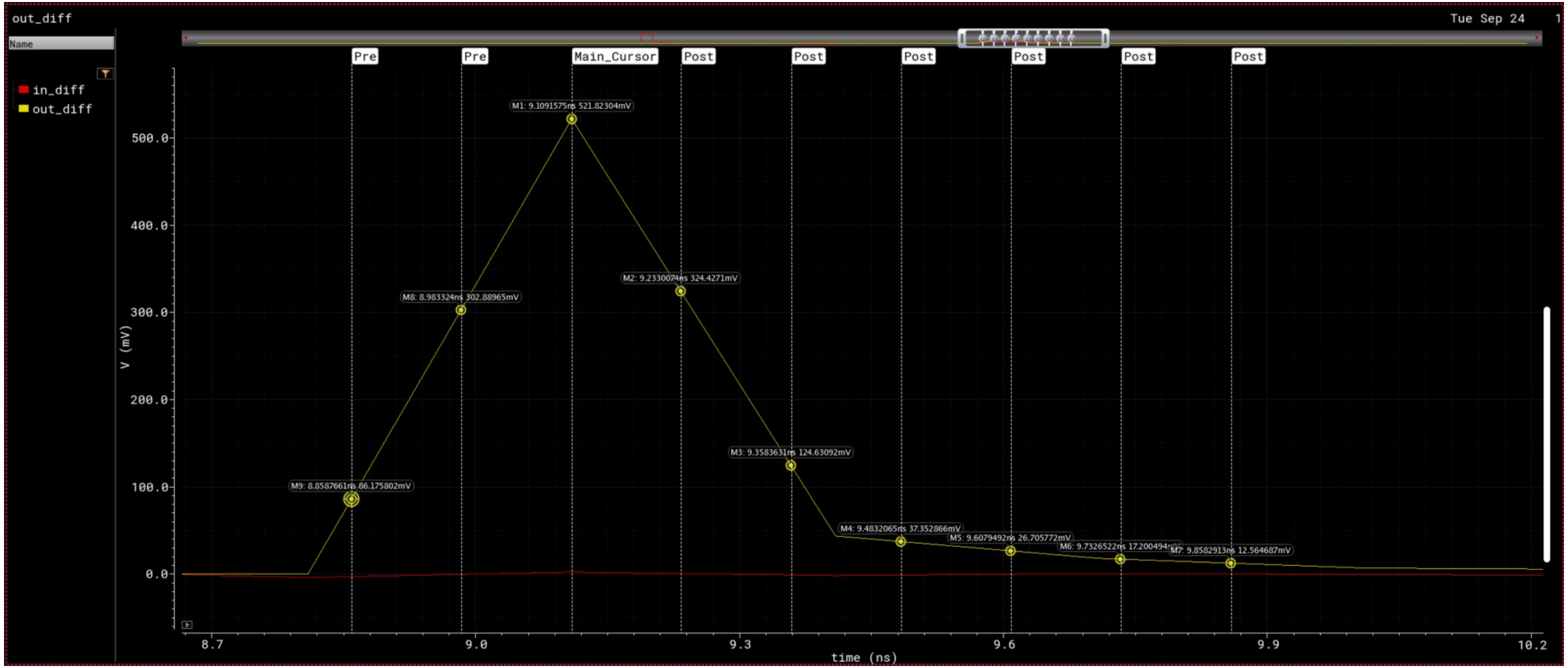
Results

- Waveforms



Results

- Waveforms



Results

- Cursor Values

Cursor Type	UI	Time (ns)	Output Value (mV)
Pre-Cursor	-2	8.859	86.86
Pre-Cursor	-1	8.984	304.3
Main-Cursor	**0**	**9.109**	**521.8**
Post-Cursor	1	9.234	322.6
Post-Cursor	2	9.359	123.4
Post-Cursor	3	9.484	37.27
Post-Cursor	4	9.609	26.6
Post-Cursor	5	9.734	17.14
Post-Cursor	6	9.859	12.53