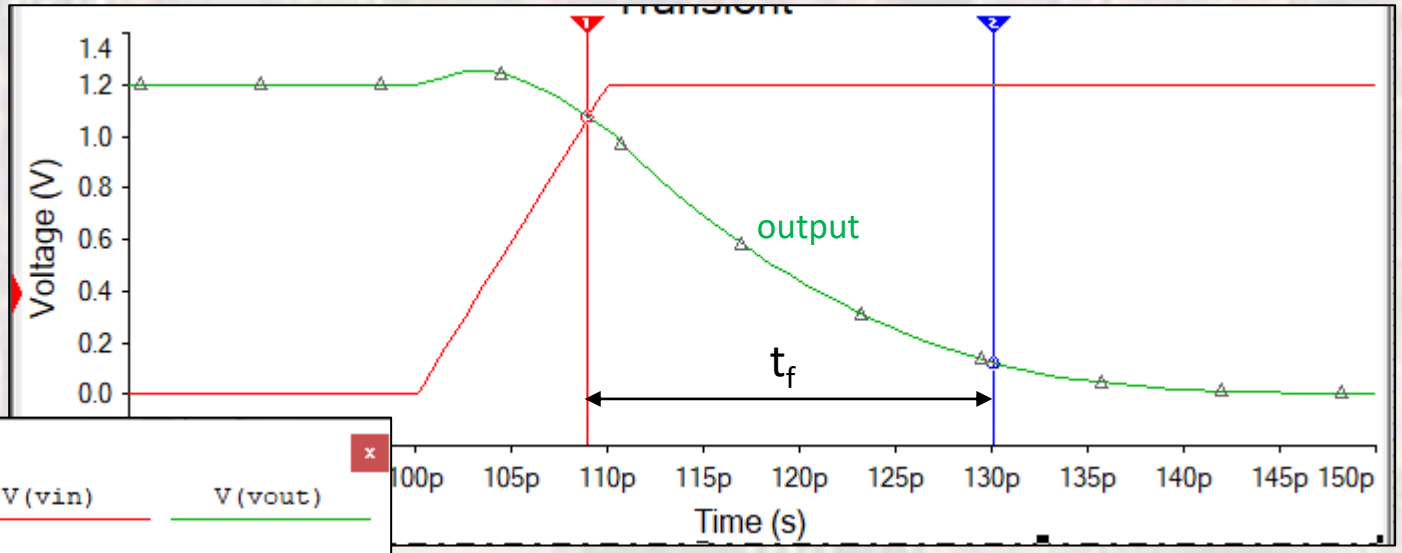
Common Waveform Measurements

Last modified 12/21/23

Fall Time

- t_f
  - t_f measure from 90% of “high” value to 10% of “high” value
  - Intended to exclude any ripple or overshoot



Cursor

	V(vin)	V(vout)	
x1	108.8671p	108.8671p	
y1	1.0641	1.0800	← 90% of 1.2
x2	130.1178p	130.1178p	
y2	1.2000	120.0000m	← 10% of 1.2
dx	21.2507p	21.2507p	← t_f
dy	135.9498m	-960.0000m	
dy/dx	6.3974G	-45.1750G	
1/dx	47.0573G	47.0573G	

Note: there is limited resolution so the value measured may be slightly different

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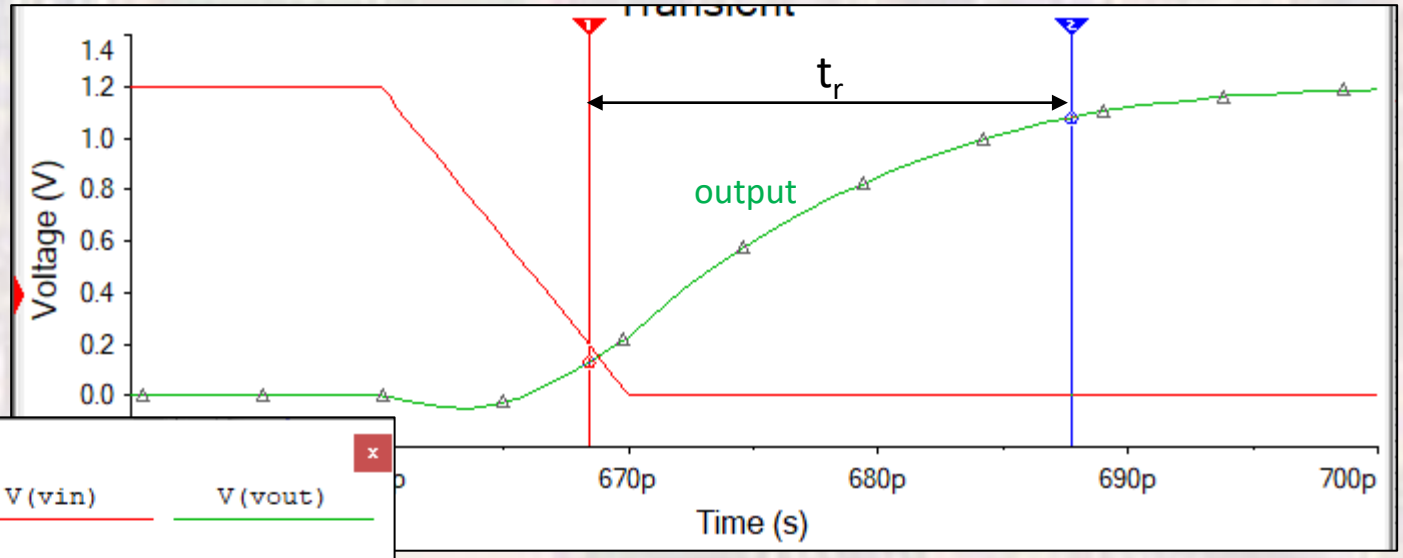
Rise Time

- t_r
  - t_r measure from 10% of “high” value to 90% of “high” value
  - Intended to exclude any ripple or overshoot



Cursor

	V(vin)	V(vout)	
x1	668.3788p	668.3788p	
y1	194.5425m	129.3741m	← 10% of 1.2
x2	687.7419p	687.7419p	
y2	0.0000	1.0800	← 90% of 1.2
dx	19.3631p	19.3631p	← t_r
dy	-194.5425m	950.6259m	
dy/dx	-10.0471G	49.0948G	
1/dx	51.6447G	51.6447G	

Note: there is limited resolution so the value measured may be slightly different

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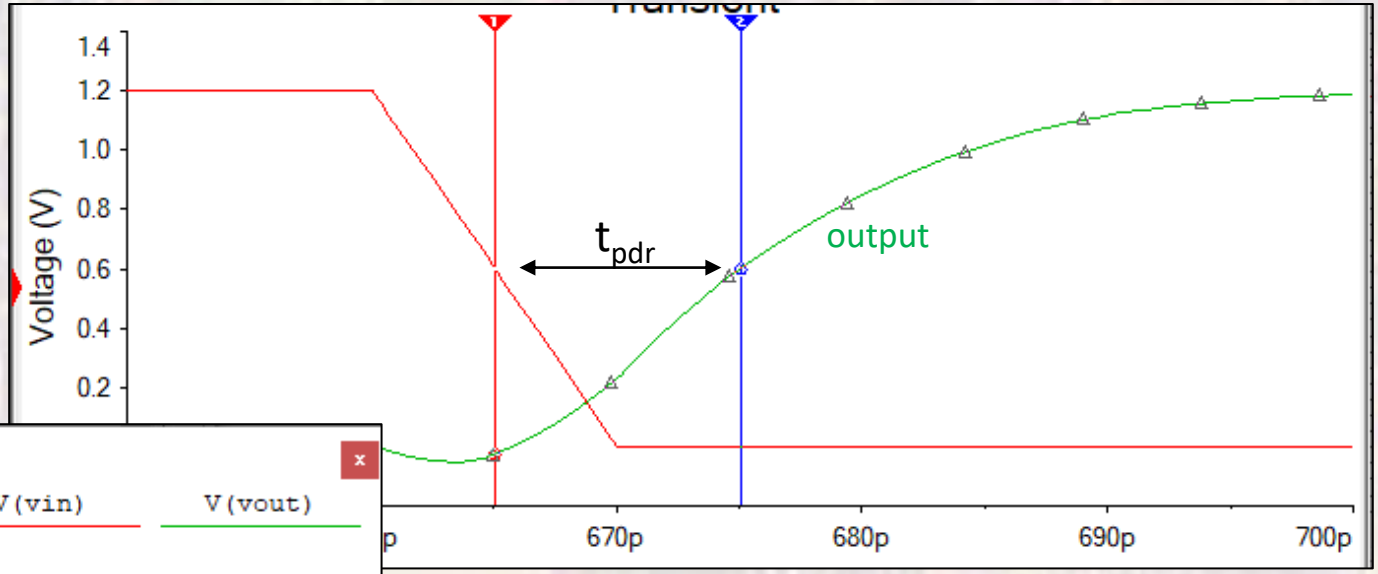
Propagation Delay - Rising

- t_{pdr}
  - t_{pdr} measure from 50% of input "high" value to 50% of output "high" value on an output rising edge



Cursor

	V(vin)	V(vout)
x1	665.0000p	665.0000p
y1	600.0000m	~~-25.3284m~~
x2	675.0160p	675.0160p
y2	0.0000	600.0000m
dx	10.0160p	10.0160p
dy	-600.0000m	625.3284m
dy/dx	-59.9044G	62.4332G
1/dx	99.8407G	99.8407G

← 50% of input

← 50% of output

← t_{pdr}

Note: there is limited resolution so the value measured may be slightly different

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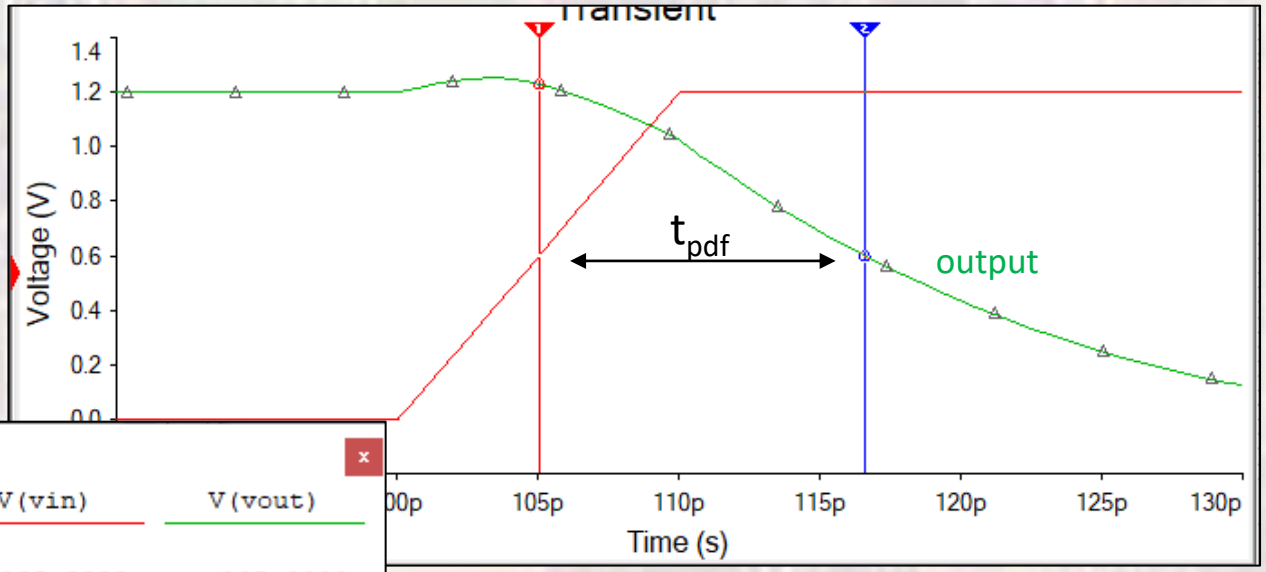
Propagation Delay - Falling

- t_{pdf}
  - t_{pdf} measure from 50% of input "high" value to 50% of output "high" value on an output falling edge



Cursor

	V(vin)	V(vout)
x1	105.0000p	105.0000p
y1	600.0000m	1.2201
x2	116.5737p	116.5737p
y2	1.2000	600.0000m
dx	11.5737p	11.5737p
dy	600.0000m	-628.0845m
dy/dx	51.8418G	-54.2683G
1/dx	86.4029G	86.4029G

← 50% of input

← 50% of output

← t_{pdf}

Note: there is limited resolution so the value measured may be slightly different

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