Independent Voltage Source V

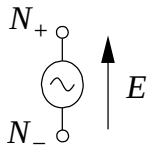

Figure 1: Independent Voltage Source Element.

Form:

`V`*name*N_+N_-[[*DC*] [*DCvalue*] [`AC`[*ACmagnitude*[*ACphase*]]] [`DISTOF1`[*F1magnitude*[*F1phase*]]] [`DISTOF2`[*F2magnitude*[*F2phase*]]]]

N_+	is the positive voltage source node.
N_-	is the negative voltage source node.
`DC`	is the optional keyword for the `dc` value of the source.
DCvalue	is the `dc` voltage value of the source.(Units: V; Optional; Default: 0; Symbol: V_{DC})
`AC`	is the keyword for the `ac` value of the source.
ACmagnitude	is the `ac` magnitude of the source used during `ac` analysis. That is, it is the peak `ac` voltage so that the `ac` signal is *ACmagnitude*$\sin(\omega t +$ ACphase$)$. *ACmagnitude* is ignored for other types of analyses. (Units: V; Optional; Default: 1; Symbol:V_{AC})
ACphase	is the ac phase of the source. It is used only in `ac` analysis. (Units: Degrees; Optional; Default: 0; Symbol:$\phi_{\rm AC}$)
`DISTOF1`	is the distortion keyword for distortion component 1 which has frequency `F1`.
F1magnitude	is the magnitude of the distortion component at `F1`. See `.DISTOF1` keyword above. (Units: V; Optional; Default: 1; Symbol: V_{F1})
F1phase	is the phase of the distortion component at `F1`. See `.DISTOF1` keyword above. (Units: Degrees; Optional; Default: 0; Symbol: ϕ_{F1})
`DISTOF2`	is the distortion keyword for distortion component 2 which has frequency `F2`.
F2magnitude	is the magnitude of the distortion component at `F2`. See `.DISTOF2` keyword above. (Units: V; Optional; Default: 1; Symbol: V_{F2})
F2phase	is the phase of the distortion component at `F2`. See `.DISTOF2` keyword above. (Units: Degrees; Optional; Default: 0; Symbol: ϕ_{F2})

Exponential:

`EXP(`V_1 V_2 [T_{D1}] [τ_1] [T_{D2}] [τ_2]`)`

Parameters:

Example:

```
VSIGNAL  2 0 EXP(0.1 0.8 1 0.35 2 1)
```

Description:

The exponential transient is a single-shot event specifying two exponentials. The voltage is

Name	Description	Units	Default
V_1	initial voltage	V	REQUIRED
V_2	pulsed voltage	V	REQUIRED
T_{D1}	rise delay time	s	0.0
τ_1	rise time constant	s	TSTEP
T_{D2}	fall delay time	s	TSTEP
τ_2	fall time constant	s	TSTEP

V_1 for the first T_{D1} seconds at which it begins increasing exponentially towards V_2 with a time constant of τ_1 seconds. At time T_{D2} the voltage exponentially decays towards V_1 with a time constant of τ_2. That is,

$$v = \begin{cases} V_1 & t \le T_{D1} \\ V_1 + (V_2 - V_1)(1 - e^{(-(t - T_{D1})/\tau_1)}) & T_{D1} < t \le T_{D2} \\ V_1 + (V_2 - V_1)(1 - e^{(-(t - T_{D1})/\tau_1)}) + (V_1 - V_2)(1 - e^{(-(t - T_{D2})/\tau_2)}) & t > T_{D2} \end{cases} \quad (1)$$

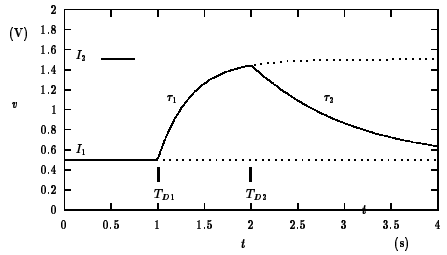

Figure 2: Voltage source exponential (EXP) waveform]Voltage source exponential (EXP) waveform for EXP(0.1 0.8 1 0.35 2 1)

Notes:
The actual element in TRANSIM is the vexp element. See TRANSIM element vexp for full documentation.

Credits:

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