Independent Voltage Source V

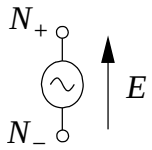

Figure 1: Independent Voltage Source Element.

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 $ACmagnitude \sin(\omega t + \text{ACphase})$. *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:ϕ_{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})

Pulse:

`PULSE(` V_1 V_2 [T_D] [T_R] [T_F] [W] [T] `)`

Parameters:

Example:

```
VCLOCK 20 5 PULSE(0 5 1N 2N 1.5N 21.9N 5N 20N)
```

Description:

Name	Description	Units	Default
V_1	initial voltage	V	REQUIRED
V_2	pulsed voltage	V	REQUIRED
T_D	delay time	s	0.0
T_R	rise time	s	`TSTEP`
T_F	fall time	s	`TSTEP`
W	pulse width	s	`TSTOP`
T	period	s	`TSTOP`

The pulse transient waveform is defined by

$$v = \begin{cases} V_1 & t \le T_D \\ V_1 + \frac{t'}{T_R}(V_2 - V_1) & 0 < t' \le T_R \\ V_2 & T_R < t' < (T_R + W) \\ V_2 - \frac{t'-W}{T_F}(V_1 - V_2) & (T_R + W) < t' < (T_R + W + T_F) \\ V_1 & (T_R + W + T_F) < t' < T \end{cases} \quad (1)$$

where

$$t' = t - T_D - (n-1)T \quad (2)$$

and t is the voltage analysis time and n is the cycle index. The effect of this is that after an initial time delay T_D the transient waveform repeats itself every cycle.

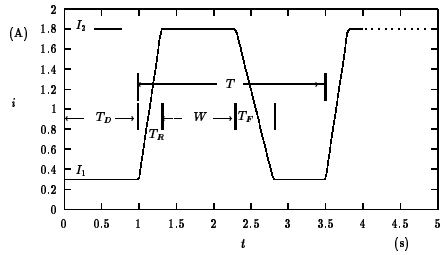

Figure 2: Voltage source transient pulse (`PULSE`) waveform for
`PULSE(0.3 1.8 1 2.5 0.3 1 0.7)`

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

Credits:

Name	Affiliation	Date	Logo
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