Independent Voltage Source V

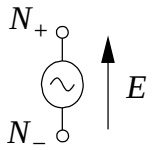

Figure 1: Independent Voltage Source Element.

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})

Piece-Wise Linear:

`PWL(`T_1 V_1 [T_2 V_2 `...` T_i V_i `...` T_N V_N] `)`

Example:

```
VSIGNAL 20 5 PWL(1 0.25 1 1 2 0.5 ... 3 0.5 4 1 ... 4.5 1.25 ...)
```

Description:

Each pair of values (T_i, V_i) specifies that the value of the source is V_i at time = T_i. At

times between T_i and T_{i+1} the values are linearly interpolated. If $T_1 > 0$ then the voltage is constant at *DCValue* (specified on the element line) until time T_1.

$$v = \begin{cases} DCvalue & t < T_1 \\ V_i & t = T_i \\ V_{i+1} & t = T_{i+1} \\ V_i + \left(\frac{t-T_i}{T_{i+1}-T_i}\right)(V_{i+1} - V_i) & T_i < t \leq T_{i+1} \\ V_N & t > T_N \end{cases} \tag{1}$$

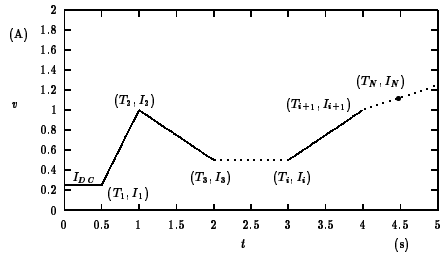

Figure 2: Voltage source transient piece-wise linear (`PWL`) waveform for `PWL(1 0.25 1 1 2 0.5 ... 3 0.5 4 1 ... 4.5 1.25 ...)` with *DCValue = 0.25*.

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

Credits:

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