Pulse voltage source vpulse

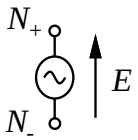

Figure 1: Independent Voltage Source Element.

Form: `vpulse:`⟨`instance name`⟩ n_1 n_2 ⟨`parameter list`⟩
n_1 is the positive element node,
n_2 is the negative element node.
Parameters:

Parameter	Type	Default value	Required?
v1: Initial value (V)	DOUBLE	0	no
v2: Pulsed value (V)	DOUBLE	0	no
td: Delay time (s)	DOUBLE	0	no
tr: Rise time (s)	DOUBLE	0	no
tf: Fall time (s)	DOUBLE	0	no
pw: Pulse width (s)	DOUBLE	0	no
per: Period (s)	DOUBLE	0	no

Example:

```
vpulse:vclock 8 0 v1=0.3 v2=1.8 td=1 tr=2.5 tf=0.3 pw=1 per=0.7
```

Description:
*f*REEDA™has a trapezoidal pulse source function, which starts with an initial delay from the beginning of the transient simulation interval to an onset ramp. During the onset ramp, the voltage or current changes linearly from its initial value to the pulse plateau value. After the pulse plateau, the voltage or current moves linearly along a recovery ramp, back to its initial value. The entire pulse repeats with a period per from onset to onset.
The pulse transient waveform is defined by

$$v = \begin{cases} v_1 & 0 < t < t_d \\ v_1 + \frac{t}{t_r}(v_2 - v_1) & t_d < t < (t_d + t_r) \\ v_2 & t_d + t_r < t < (t_d + t_r + pw) \\ v_2 - \frac{t-pw}{t_f}(v_1 - v_2) & (t_d + t_r + pw) < t < (t_d + t_r + pw + t_f) \\ v_1 & (t_d + t_r + pw + t_f) < t < per \end{cases} \quad (1)$$

Notes:
This is the `V` element in the SPICE compatible netlist.

Version:
2002.05.01

Credits:

Name	Affiliation	Date	Links
Satish Uppathil	NC State University	May 2002	NC STATE UNIVERSITY
uvs@ieee.org			www.ncsu.edu

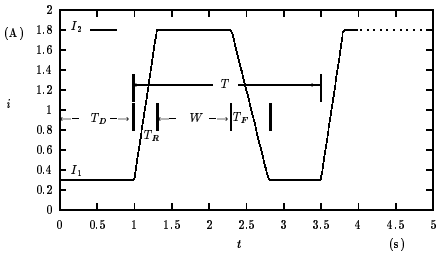

Figure 2: Voltage source transient pulse waveform for `vpulse:vclock 8 0 v1=0.3 v2=1.8 td=1 tr=2.5 tf=0.3 pw=1 per=0.7`