

triangle_2a.gce

Attributes

```
mainvars: t ref
rparms:
+ duty_cycle=0.5
+ offset=0.1
+ tperiod=0
+ g_high=1.0
+ epsl=1.0e-9
```

Description

triangle_2a.gce is a symmetric triangular wave source with the general variable **t** as its output. It also produces a reference signal **ref** which can be compared (externally) with the triangular waveform **t**, to generate gate pulses for switches. The parameters have the following meaning:

tperiod: Period of the triangular waveform. 0 to **g_high**.

epsl: Used in time step control. **epsl** can generally be set to be $0.001 \times \text{tperiod}$.

duty_cycle: Duty cycle (D) is used to compute the reference value **ref** (V_R) as

$$V_R = (1 - D) g_{\text{high}}.$$

offset: offset (assumed to be positive) is the time (with respect to $t = 0$) at which **t** and **ref** cross.

The effect of the various parameters of **triangle_2a.gce** on the waveforms is shown in Fig. 1. The corresponding circuit file is given below.

```

title: testing of triangle_2a

begin_circuit
    gelement type=triangle_2a t=t1 ref=ref1
+    tperiod=4 g_high=1 epsl=1e-3
+    duty_cycle=0.3 offset=0.0

    gelement type=triangle_2a t=t2 ref=ref2
+    tperiod=4 g_high=1 epsl=1e-3
+    duty_cycle=0.3 offset=0.2

    outvar:
+    t1=var_of_t1
+    t2=var_of_t2
+    ref1=var_of_ref1
+    ref2=var_of_ref2
end_circuit

begin_solve
    solve_type=startup
    initial_sol initialize
end_solve

begin_solve
    solve_type=trns
    initial_sol previous
    begin_output
        filename=triangle_2a_1_gce.dat
        variables: t1 ref1
    end_output
    begin_output
        filename=triangle_2a_2_gce.dat
        variables: t2 ref2
    end_output
    method:
+    back_euler=yes
+    t_start=0 t_end=8 delt_const=0.5 delt_min=0.1
end_solve

end_cf

```

AC behaviour is not implemented.

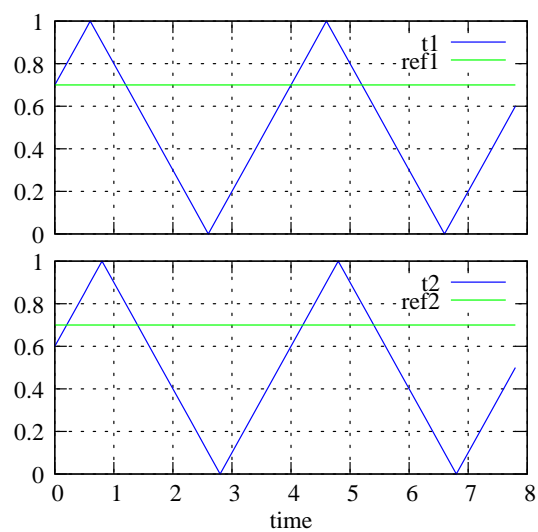


Figure 1: Results obtained with `triangle_2a.gce` (see the circuit file for details).