

Grid array substrate: 1-port thermal element with a single averaged surface heating element thermalgrid

Form:

thermalgrid:(instance name) n_1 n_2 (parameter list)

n_1 and n_2 are the element nodes.

Parameters:

Parameter	Type	Default value	Required?
ntimesteps: Number of time steps in transient simulation	INTEGER	0	no
dt: Length of timestep (s)	DOUBLE	0	no
tambient: Ambient temperature (K)	DOUBLE	300	no
time_d: Flag, if true, calculate in the time domain.	BOOLEAN	false	no
l: Substrate x-dimension in meters.	DOUBLE	0.05	no
w: Substrate y-dimension in meters	DOUBLE	0.05	no
d: Substrate z-dimension in meters.	DOUBLE	0.0016	no
xl: x-coordinate of left edge of heating element (m)	DOUBLE	0.04	no
xr: x-coordinate of right edge of heating element (m)	DOUBLE	0.01	no
yu: y-coordinate of upper edge of heating element (m)	DOUBLE	0.04	no
yd: y-coordinate of lower edge of heating element (m)	DOUBLE	0.01	no
xi: Adjustment for T^4 non linearity.	DOUBLE	1.3	no
eta: Adjustment for natural convection.	DOUBLE	3	no
epsilon: Emissivity.	DOUBLE	0.7	no
ks: Thermal conductivity $W/m.K$	DOUBLE	0.294	no
rho: Density $kg.m^{-3}$	DOUBLE	1900	no
c: Specific heat $J/kg.K$	DOUBLE	1150	no
ndevices: Number of heat dissipating devices	INTEGER	1	no
b: Exponent in power law temperature dependence of thermal conductivity	DOUBLE	0	no

Example:

```
thermalgrid: test1 1 10 Ntimesteps=nsteps dt=deltat Tambient=temp time_d=1 l = 0.05  
w = 0.05 d = 0.0016 xl = 0.04 xr = 0.01 yu = 0.04 yd = 0.01 xi = 1.3 eta = 3  
epsilon = 0.7 ks = 0.294 rho = 1900 c = 1150 ndevices = 1
```

Notes:

There is no equivalent SPICE element.

Version:

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Credits:

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