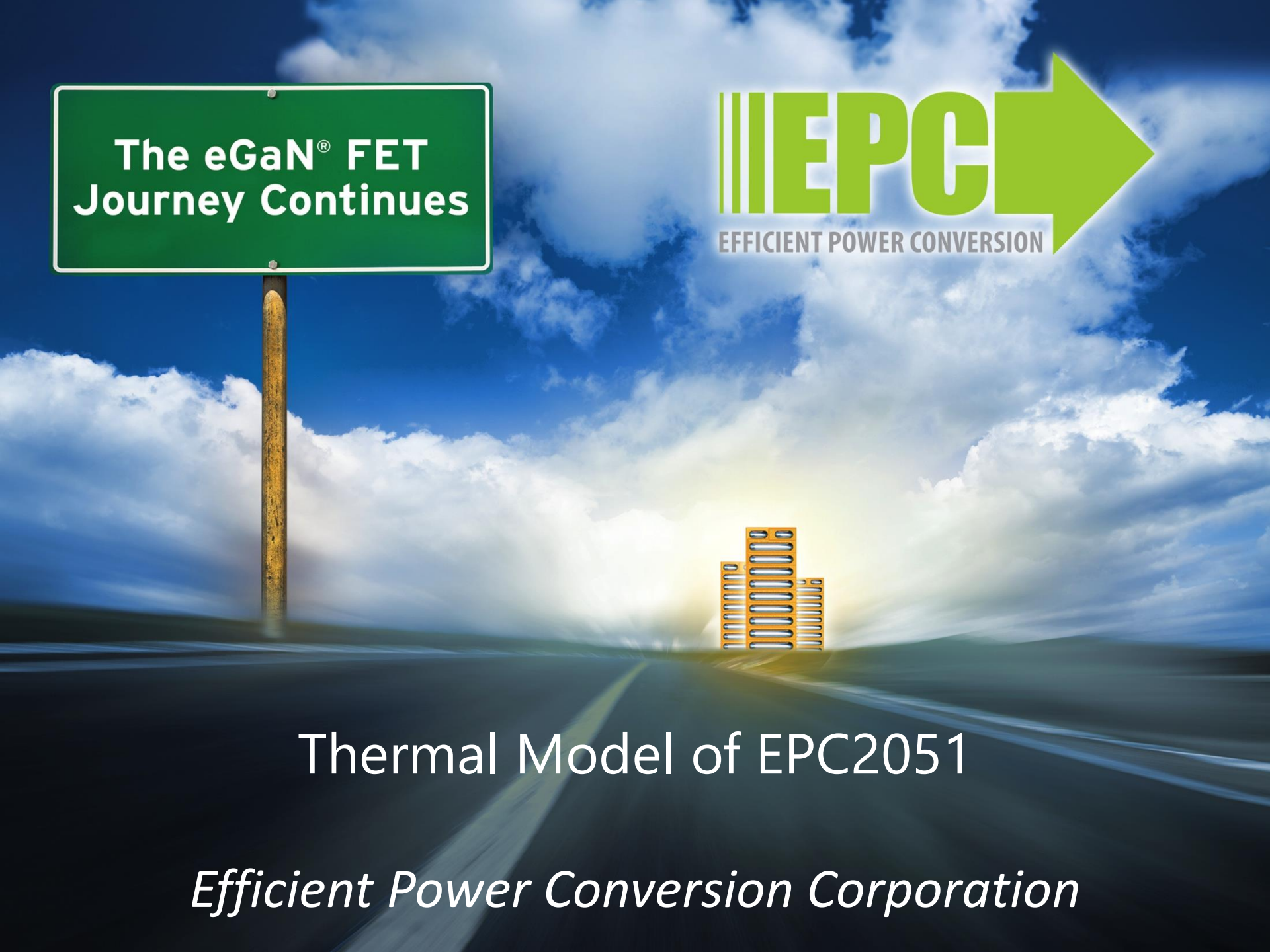


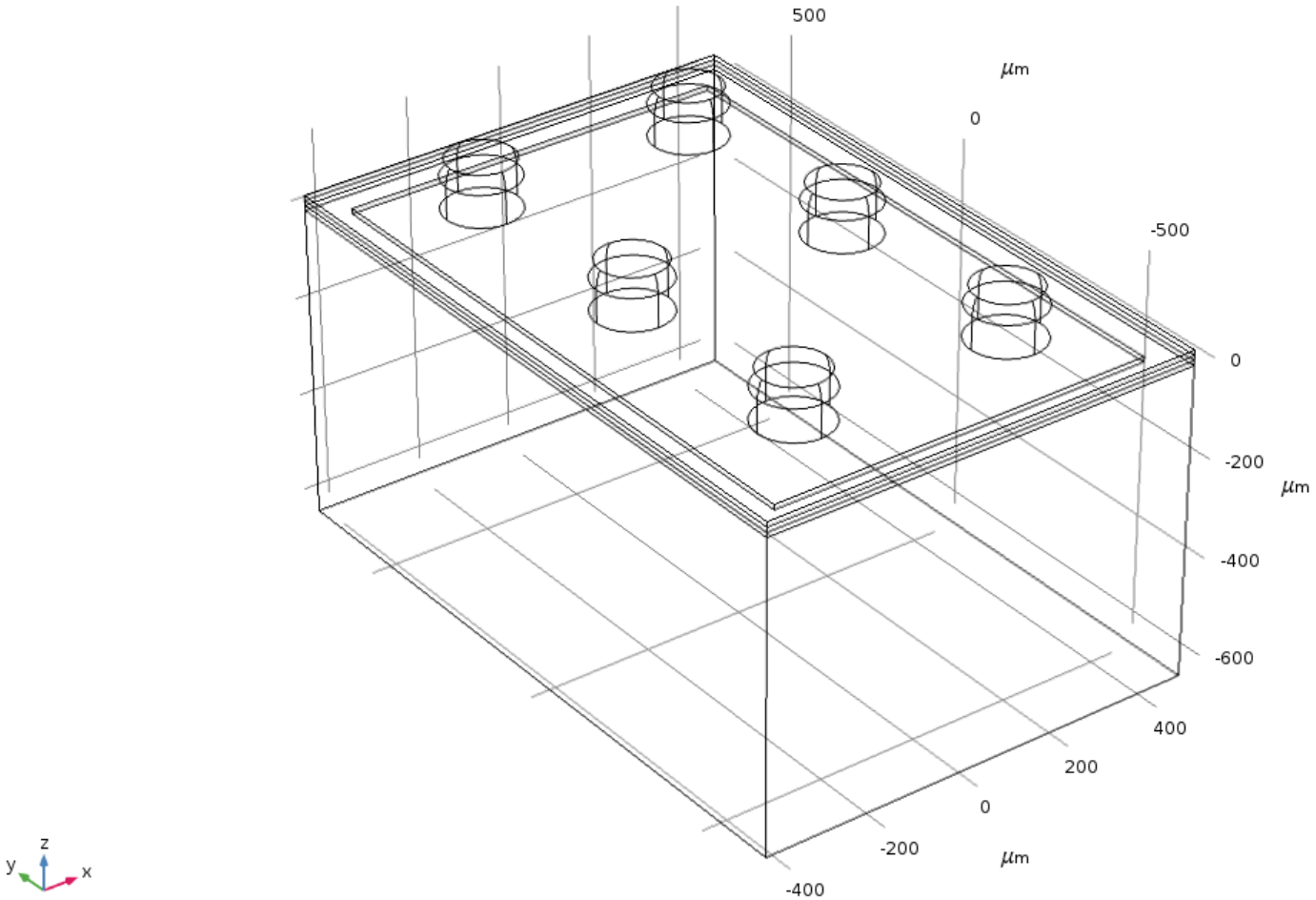
Thermal Model of EPC2051

Efficient Power Conversion Corporation

EPC2051 FEA thermal simulations

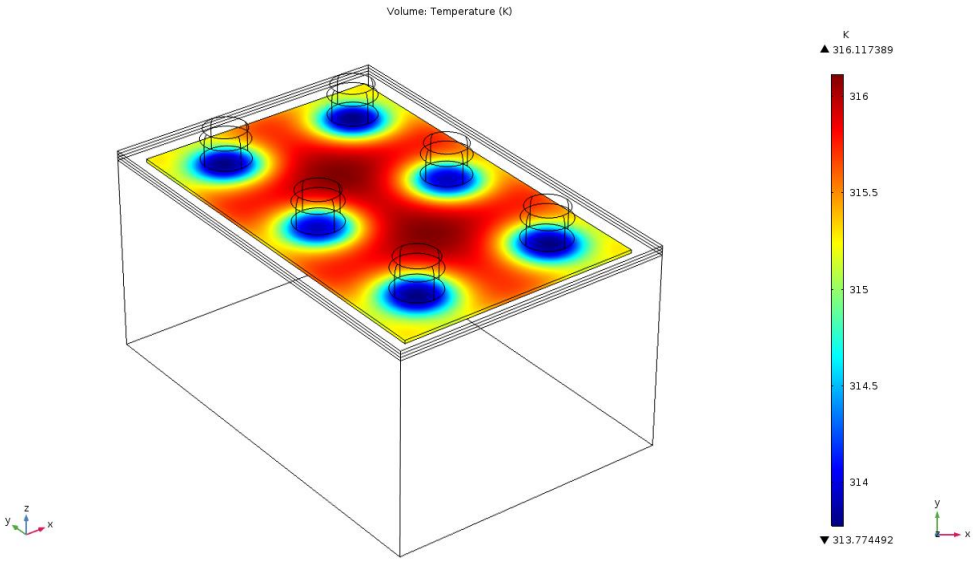
- The thermal model applies to EPC2051.
- A power dissipation of 1 W in the device active area is assumed.
- Finite element analysis (FEA) thermal simulations
  - $R_{\Theta JB}$ and $R_{\Theta JC}$ are obtained by stationary simulations.
  - $Z_{\Theta JB}$ and $Z_{\Theta JC}$ are obtained by transient simulations.
- R-C thermal model is generated.

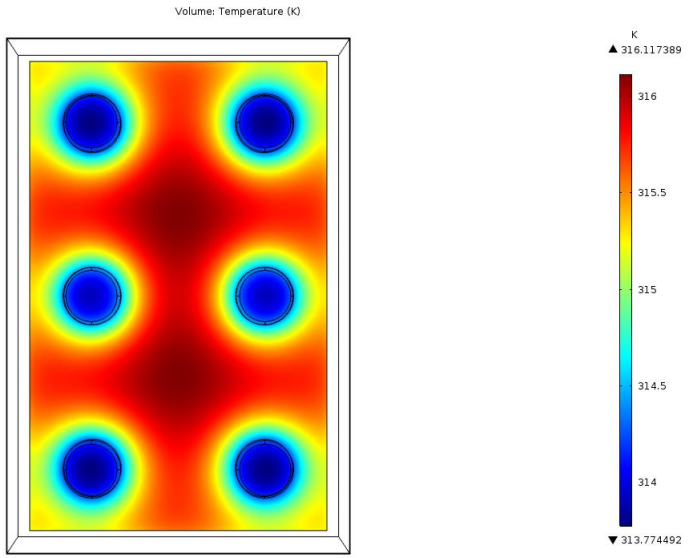
EPC2051 device structure



Steady-state $R_{\Theta JB}$

Typical $R_{\Theta JB}$ = 16 °C/W

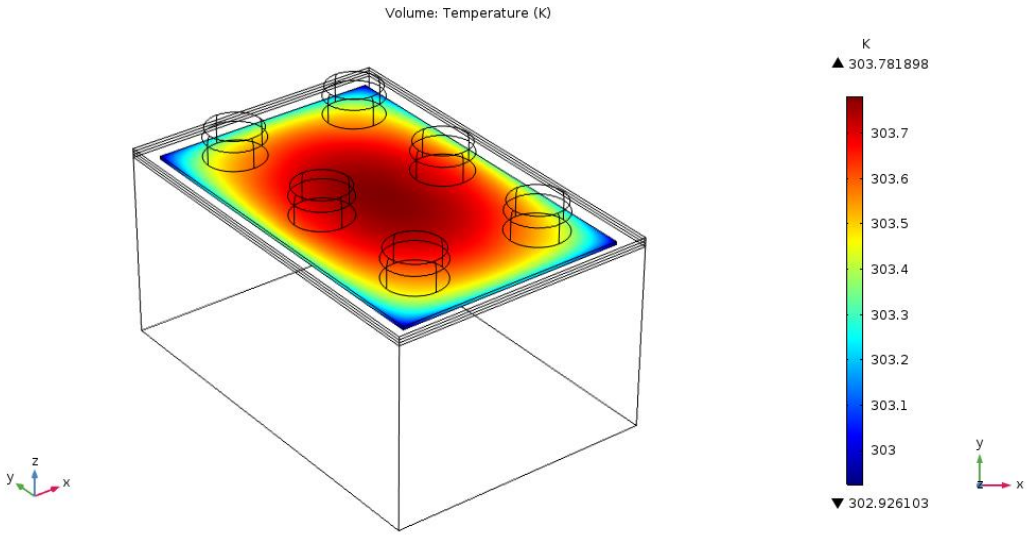


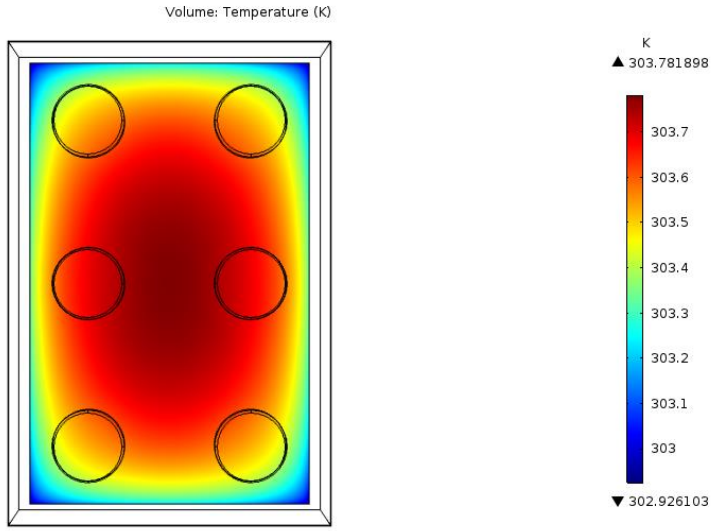


- Operating condition: Power = 1 W in the active area.
- Boundary condition: Temperature of top of solder balls set to be 300 K.

Steady-state $R_{\Theta JC}$

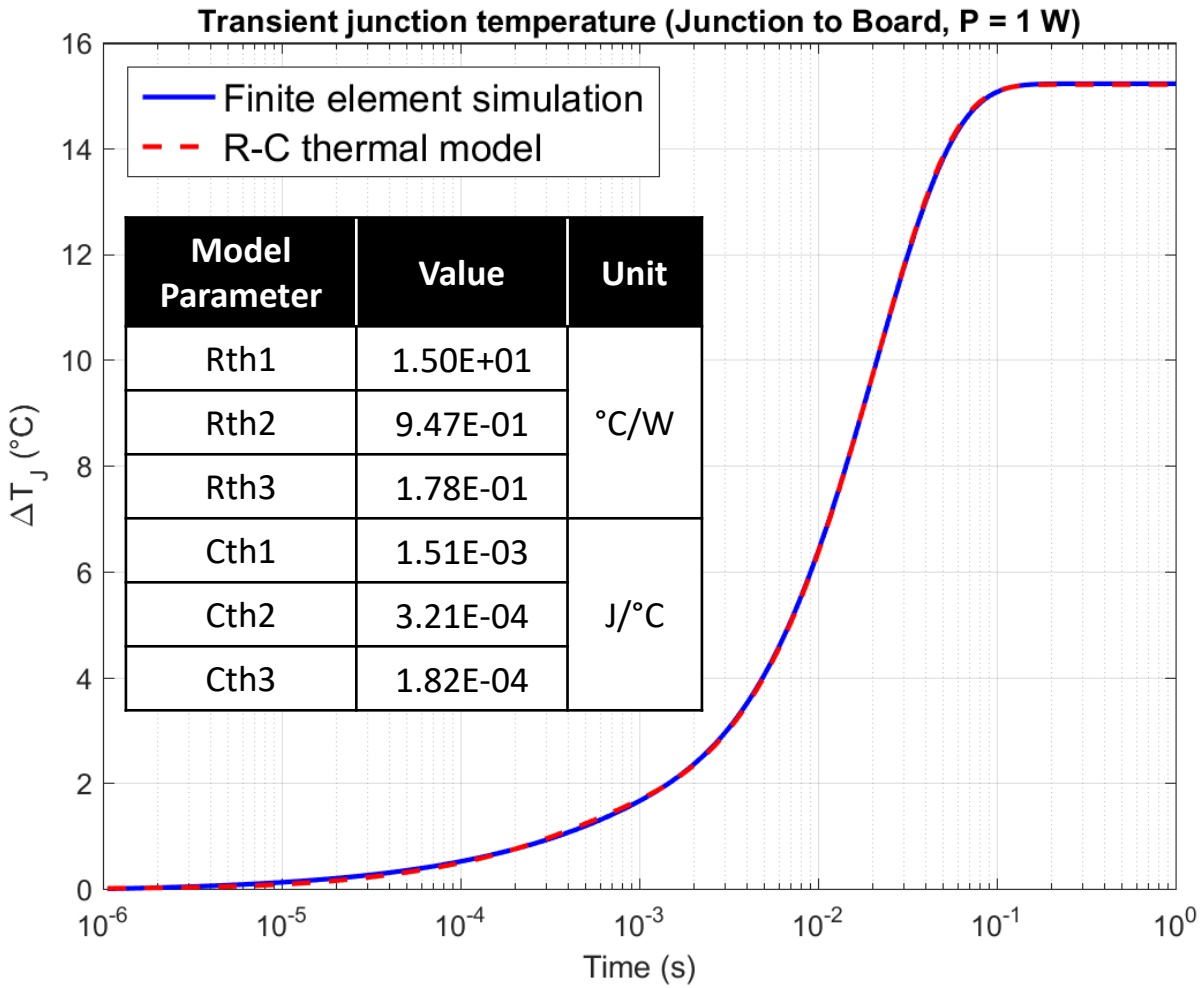
Typical $R_{\Theta JC}$ = 3.8 °C/W



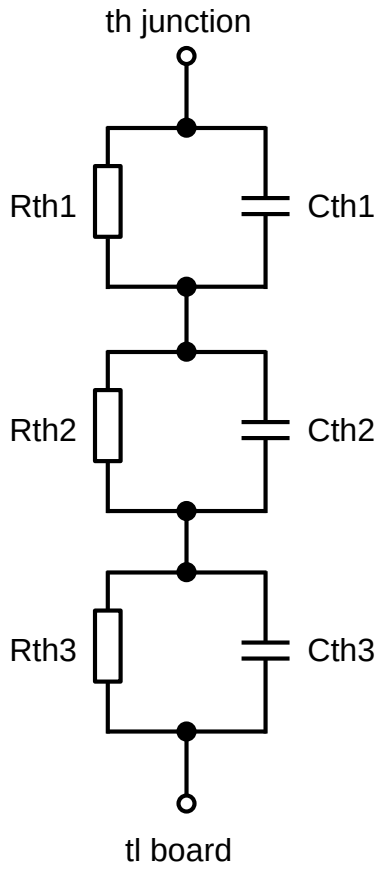


- Operating condition: Power = 1 W in the active area.
- Boundary condition: Temperature of bottom of the device backside set to be 300 K.

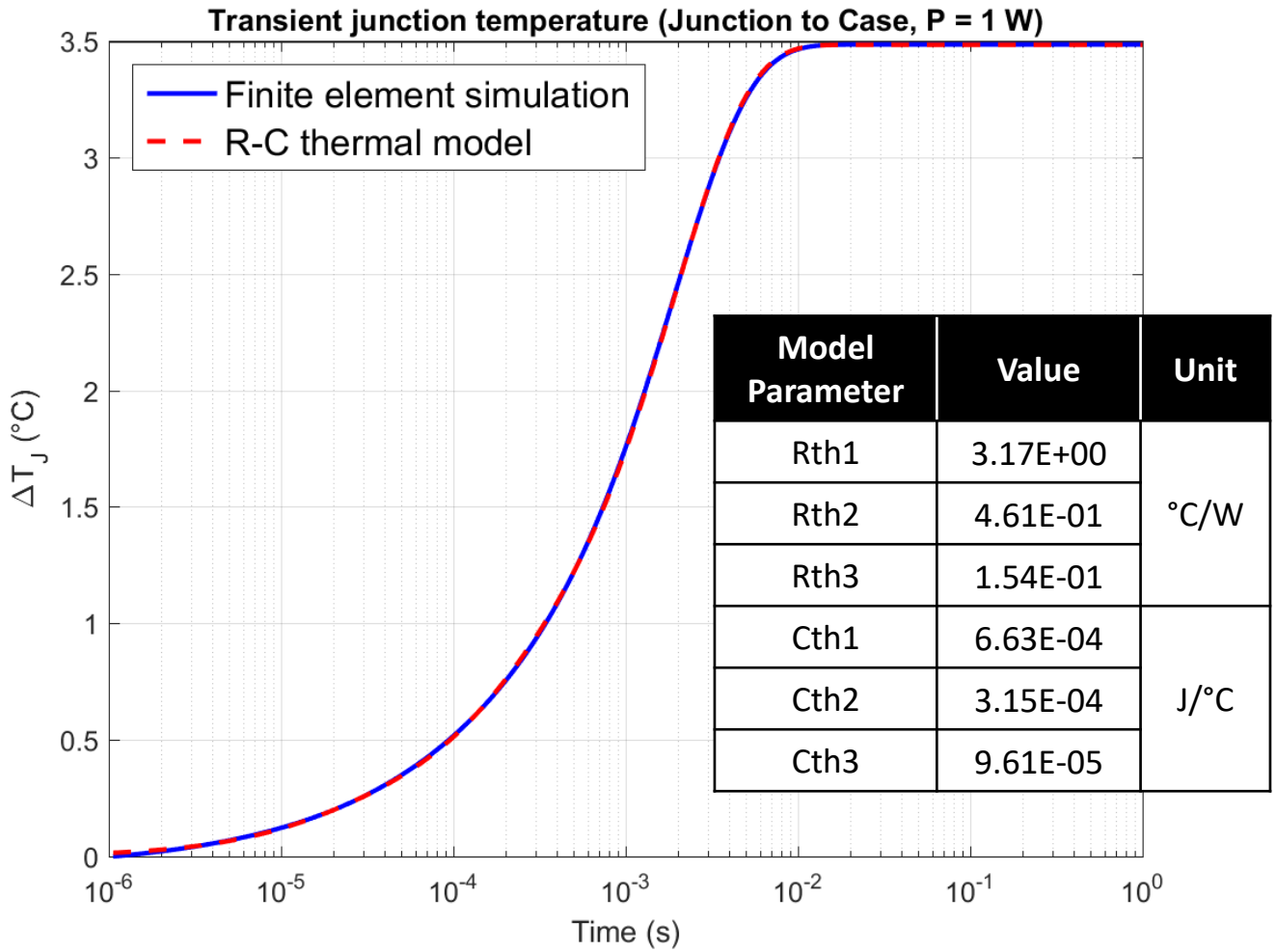
$Z_{\Theta JB}$ R-C thermal model



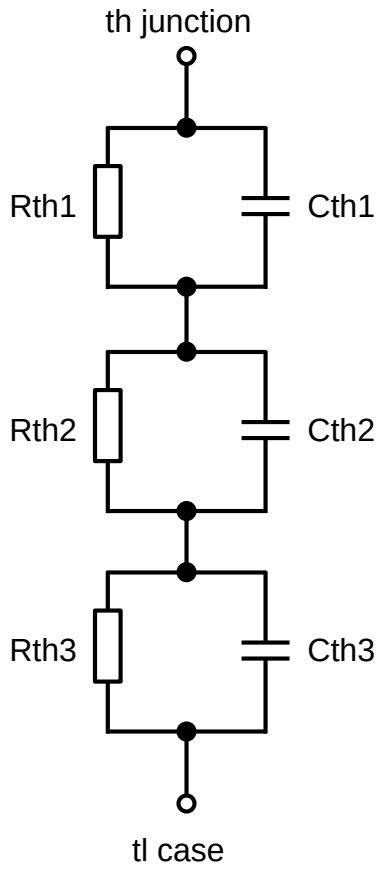
Model Parameter	Value	Unit
Rth1	1.50E+01	°C/W
Rth2	9.47E-01	
Rth3	1.78E-01	
Cth1	1.51E-03	J/°C
Cth2	3.21E-04	
Cth3	1.82E-04	



$Z_{\Theta JC}$ R-C thermal model



Model Parameter	Value	Unit
Rth1	3.17E+00	°C/W
Rth2	4.61E-01	
Rth3	1.54E-01	
Cth1	6.63E-04	J/°C
Cth2	3.15E-04	
Cth3	9.61E-05	



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