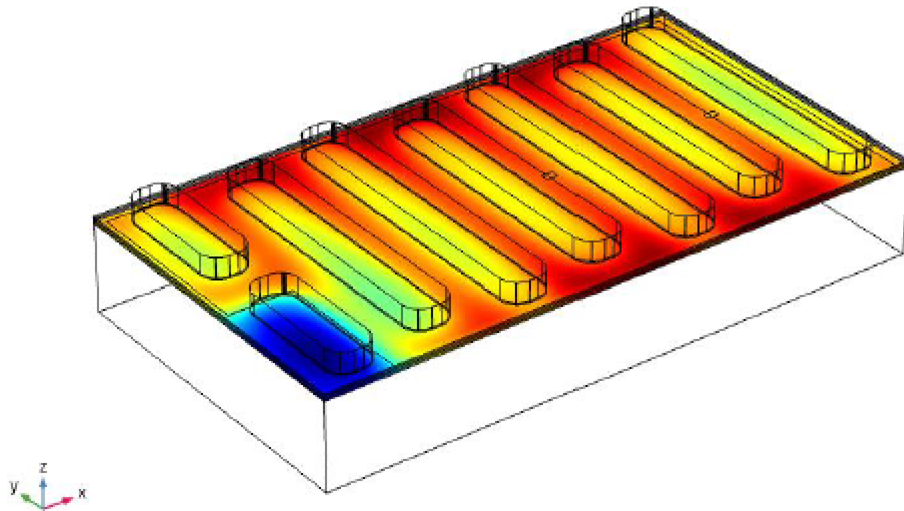
Thermal Model of EPC2088

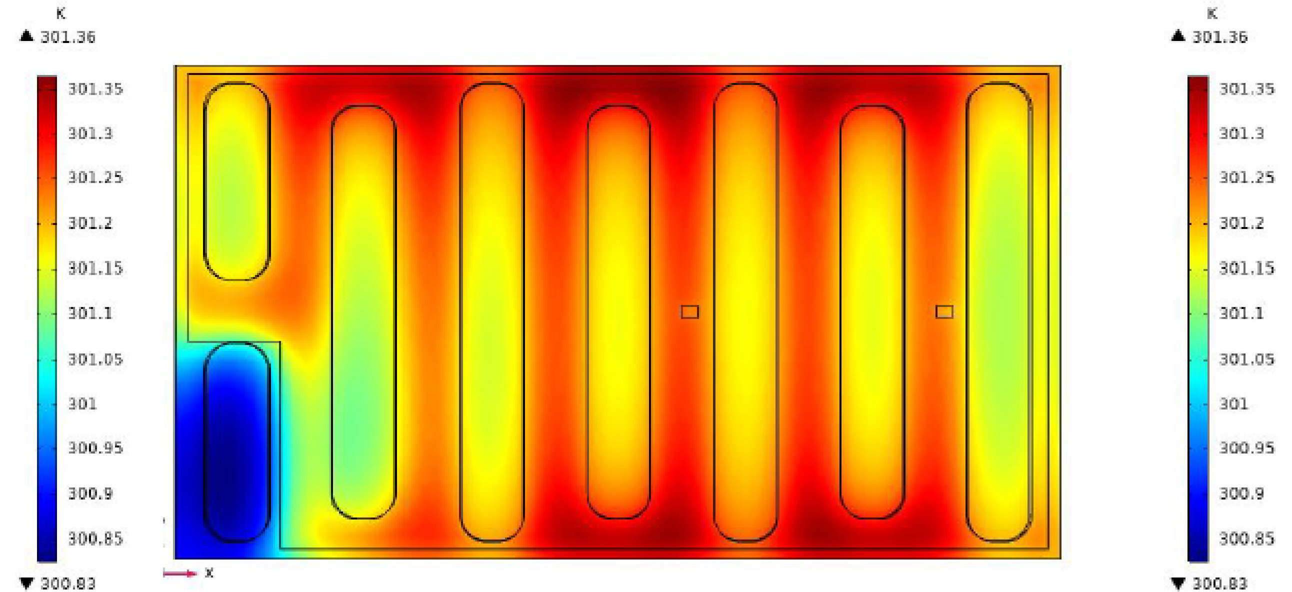
EPC2088 FEA thermal simulation

- The thermal model applies to EPC2088.
- 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.

Steady-state $R_{\Theta JB}$

Typical $R_{\Theta JB}$ = 1.4 °C/W



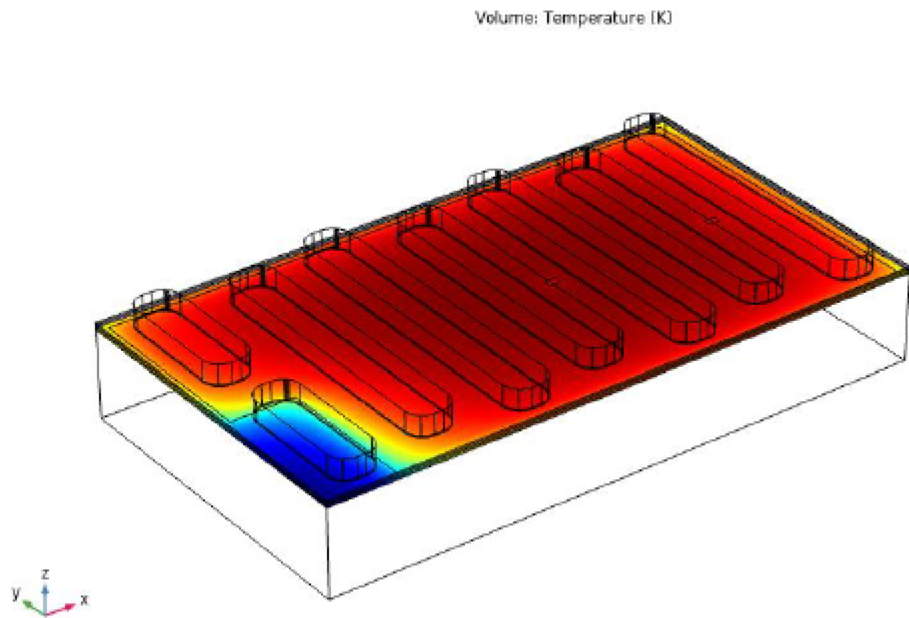


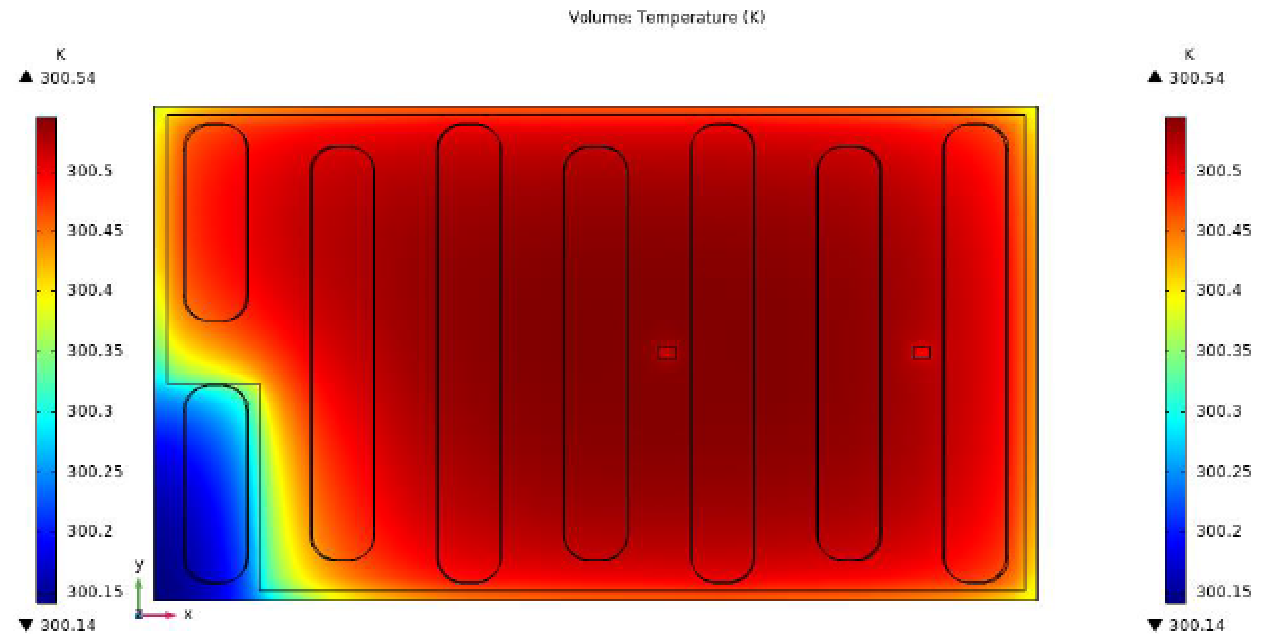
- Operating condition: Power = 1 W in the active area.
- Boundary condition: Temperature of top of solder bumps set to be 300 K.

Steady-state $R_{\Theta JC}$

EFFICIENT POWER CONVERSION

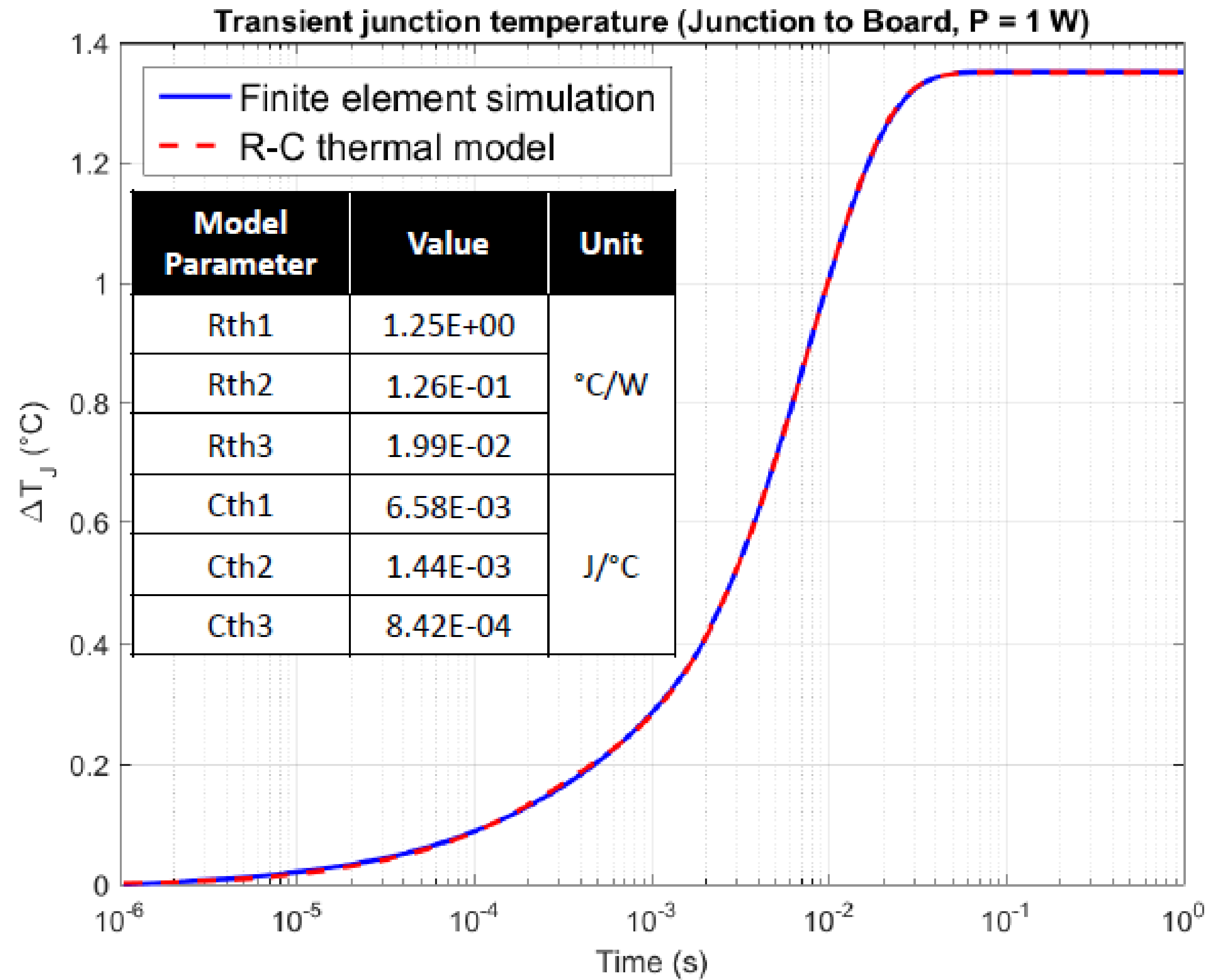
Typical $R_{\Theta JC}$ = 0.5 °C/W



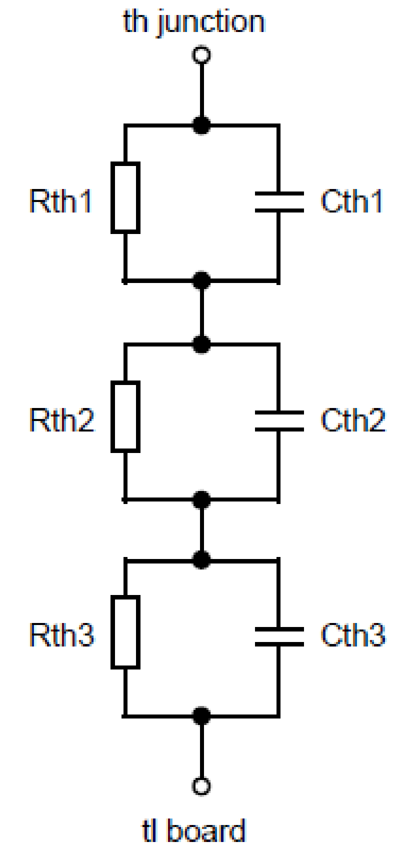


- Operating condition: Power = 1 W in the active area.
- Boundary condition: Temperature of the device backside set to be 300 K.

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



Model Parameter	Value	Unit
Rth1	1.25E+00	°C/W
Rth2	1.26E-01	
Rth3	1.99E-02	
Cth1	6.58E-03	J/°C
Cth2	1.44E-03	
Cth3	8.42E-04	



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

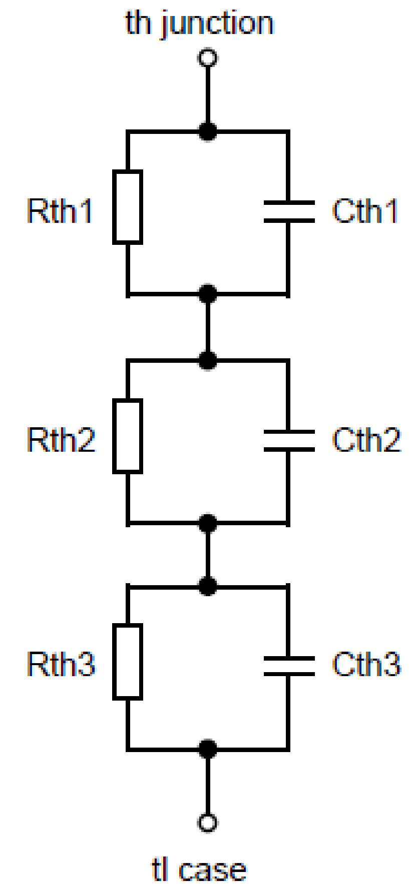
Transient junction temperature (Junction to Case, P = 1 W)

Finite element simulation
R-C thermal model

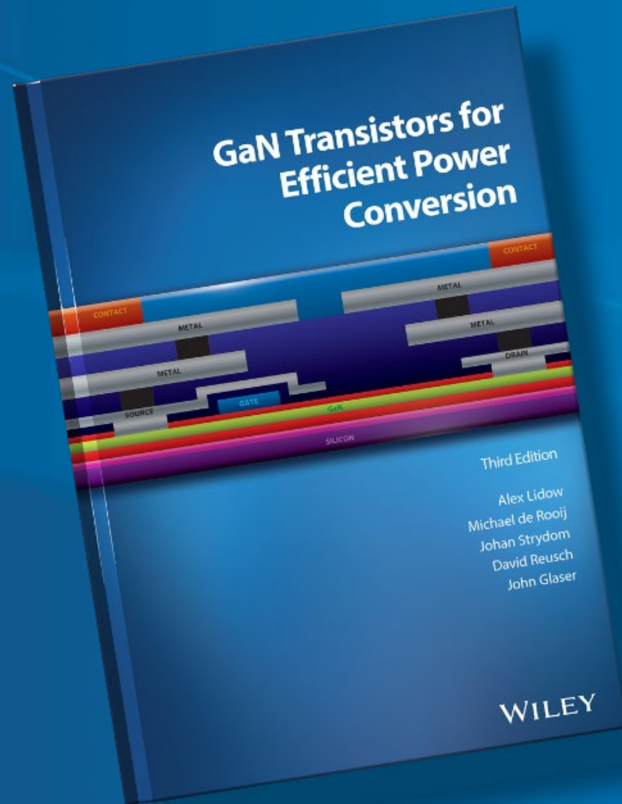
ΔT_J (°C)

Time (s)

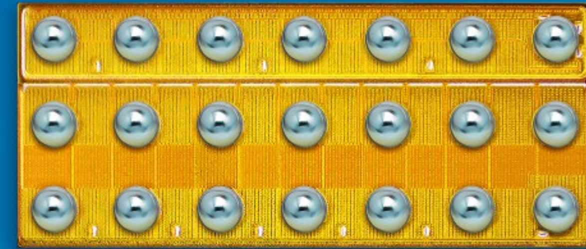
Model Parameter	Value	Unit
Rth1	4.36E-01	°C/W
Rth2	7.36E-02	
Rth3	2.05E-02	
Cth1	3.78E-03	J/°C
Cth2	1.61E-03	
Cth3	6.25E-04	



How To GaN Video Series



3rd Edition Textbook



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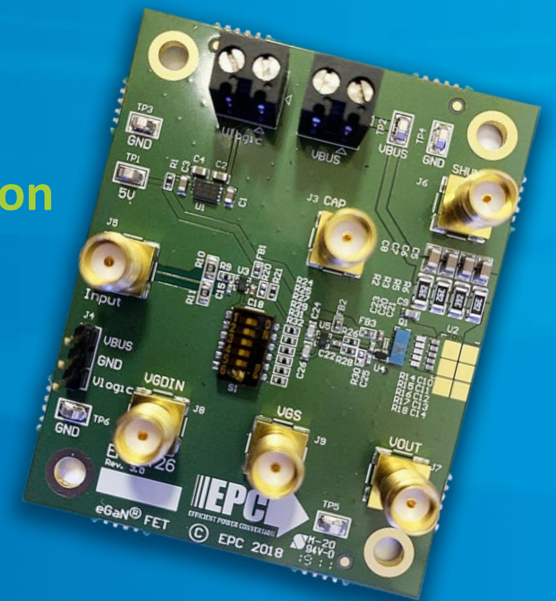
Evaluation Kits



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