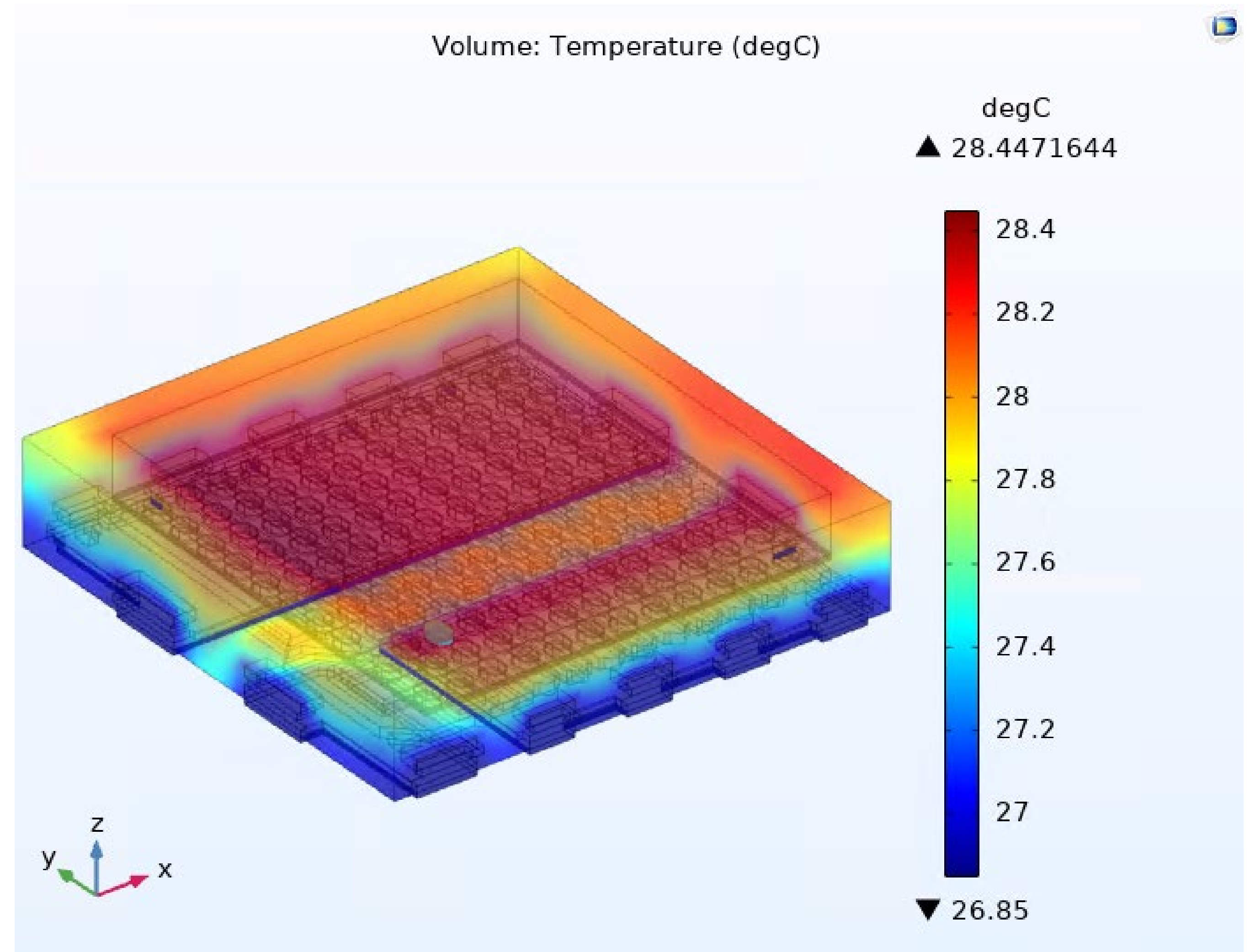
Thermal Model of EPC2378

EPC2378 FEA thermal simulation

- The thermal model applies to EPC2378.
- 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 $R_{\Theta JB}$

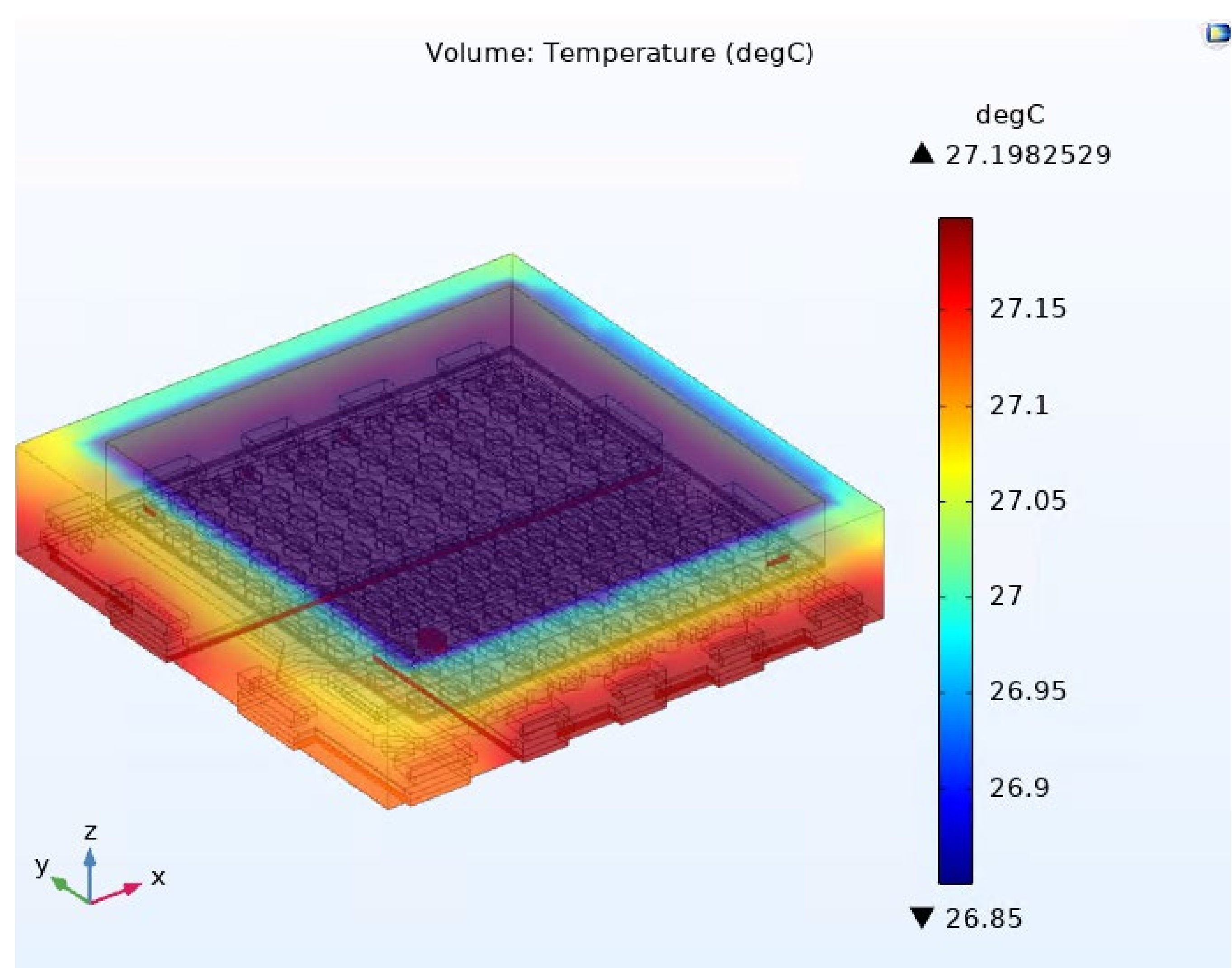
- Example: P = 1 W



Steady-state $R_{\Theta JC}$

EFFICIENT POWER CONVERSION

- Example: P = 1 W



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

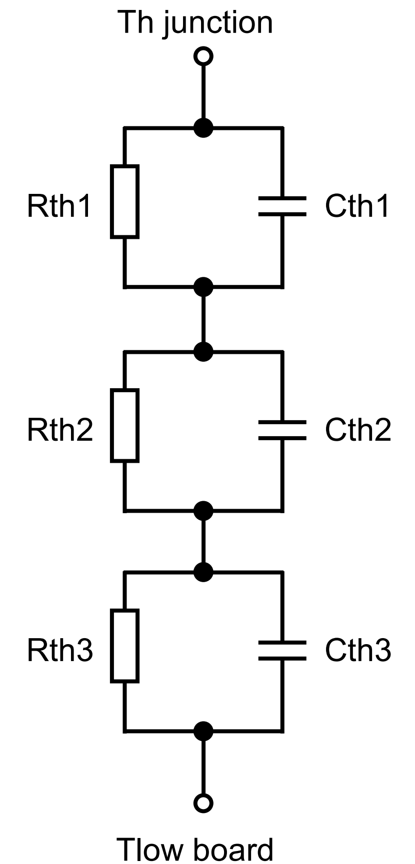
Transient junction temperature (Junction to Board, P = 1 W)

- Finite element simulation
- R-C Thermal model

ΔT_J (°C): 0.0, 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6

Time (s): 10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}, 10^{-2}, 10^{-1}, 10^{0}

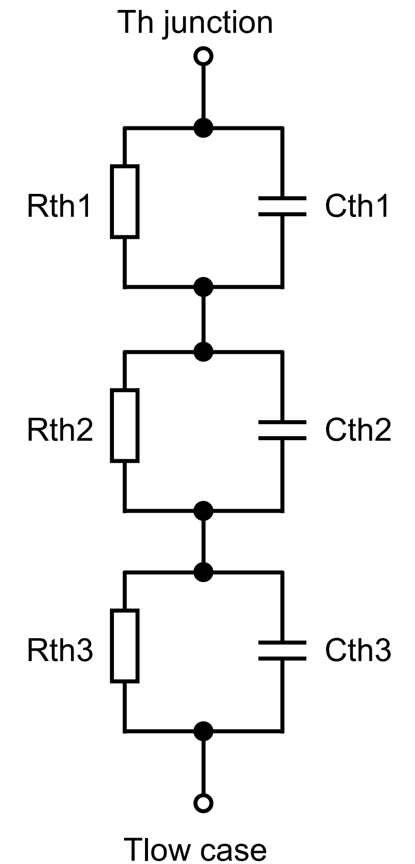
Model Parameter	Value	Unit
Rth1	1.10E-01	°C/W
Rth2	1.53E-01	
Rth3	1.33E+00	
Cth1	6.74E-04	J/°C
Cth2	2.50E-01	
Cth3	7.32E-03	



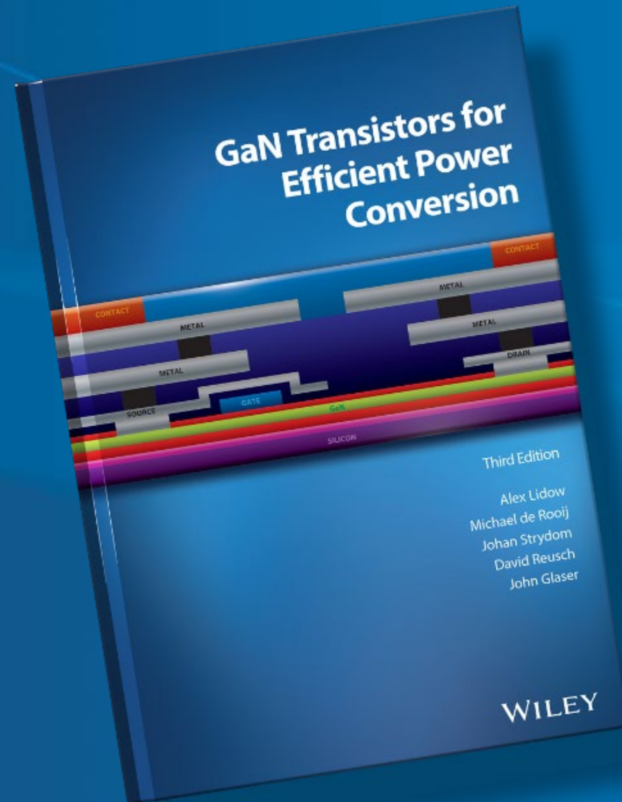
$Z_{\Theta JC}$ R-C thermal model

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

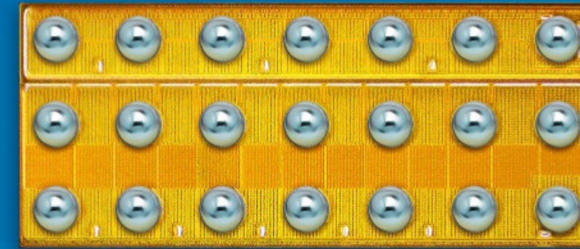
Model Parameter	Value	Unit
Rth1	6.19E-02	°C/W
Rth2	9.47E-02	
Rth3	1.94E-01	
Cth1	4.10E-04	J/°C
Cth2	1.26E-01	
Cth3	3.34E-03	



How To GaN Video Series

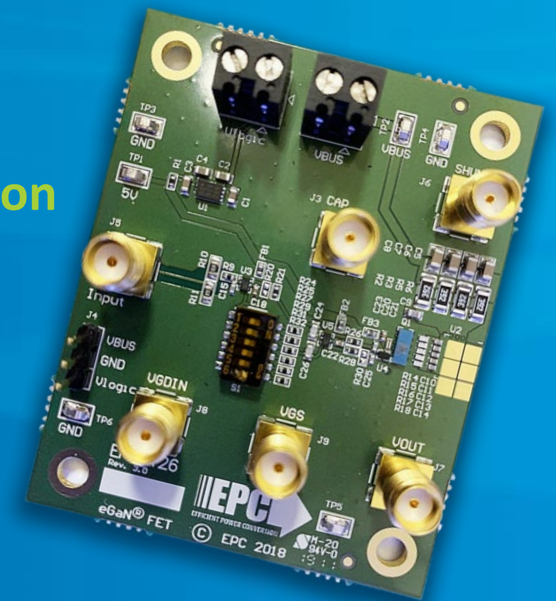


3rd Edition Textbook



eGaN® FETs and ICs

Evaluation Kits



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