The eGaN® FET
Journey Continues

IIIEPC
EFFICIENT POWER CONVERSION

Thermal Model of EPC2206

Efficient Power Conversion Corporation

EPC2206 FEA thermal simulations

- The thermal model applies to EPC2206.

- 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.

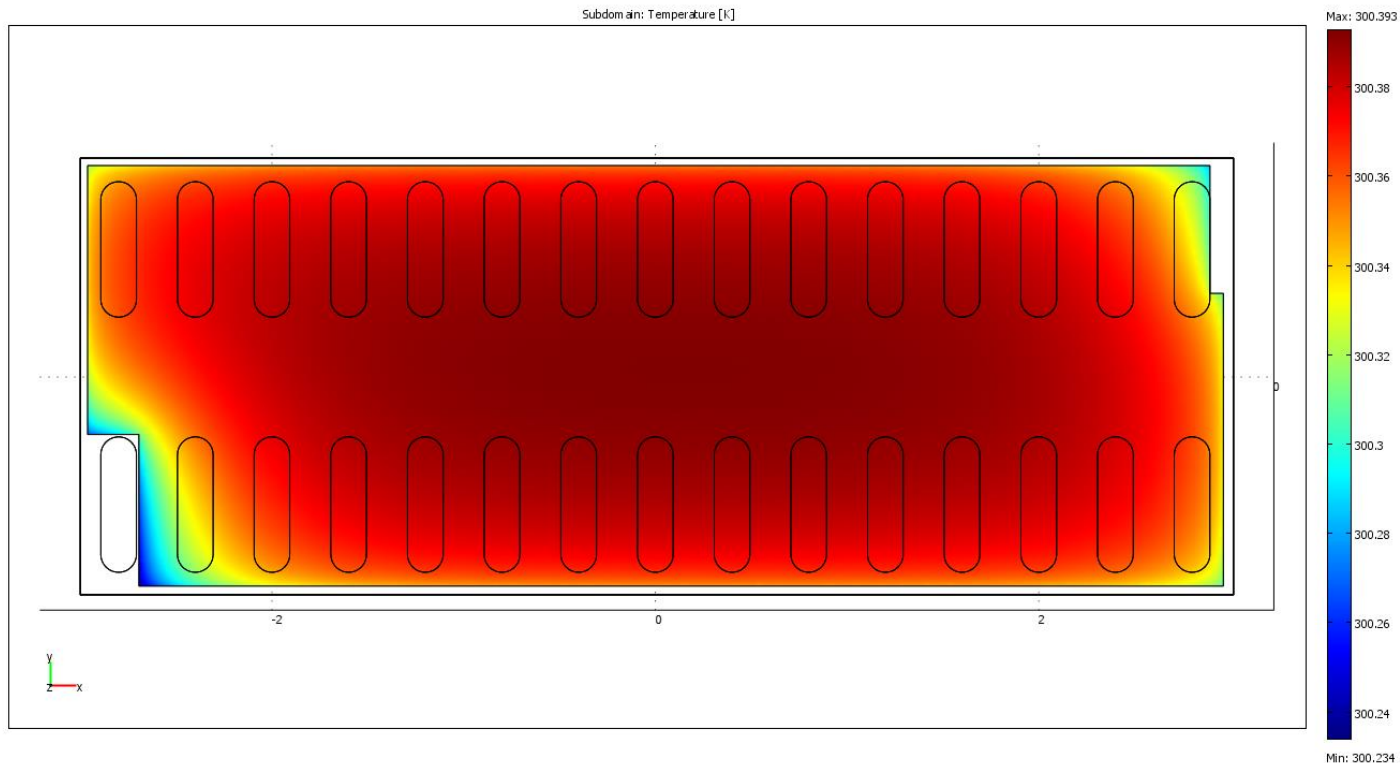- R-C thermal model is generated.

Steady-state $R_{\Theta JB}$

Typical $R_{\Theta JB}$ = 1.1 °C/W
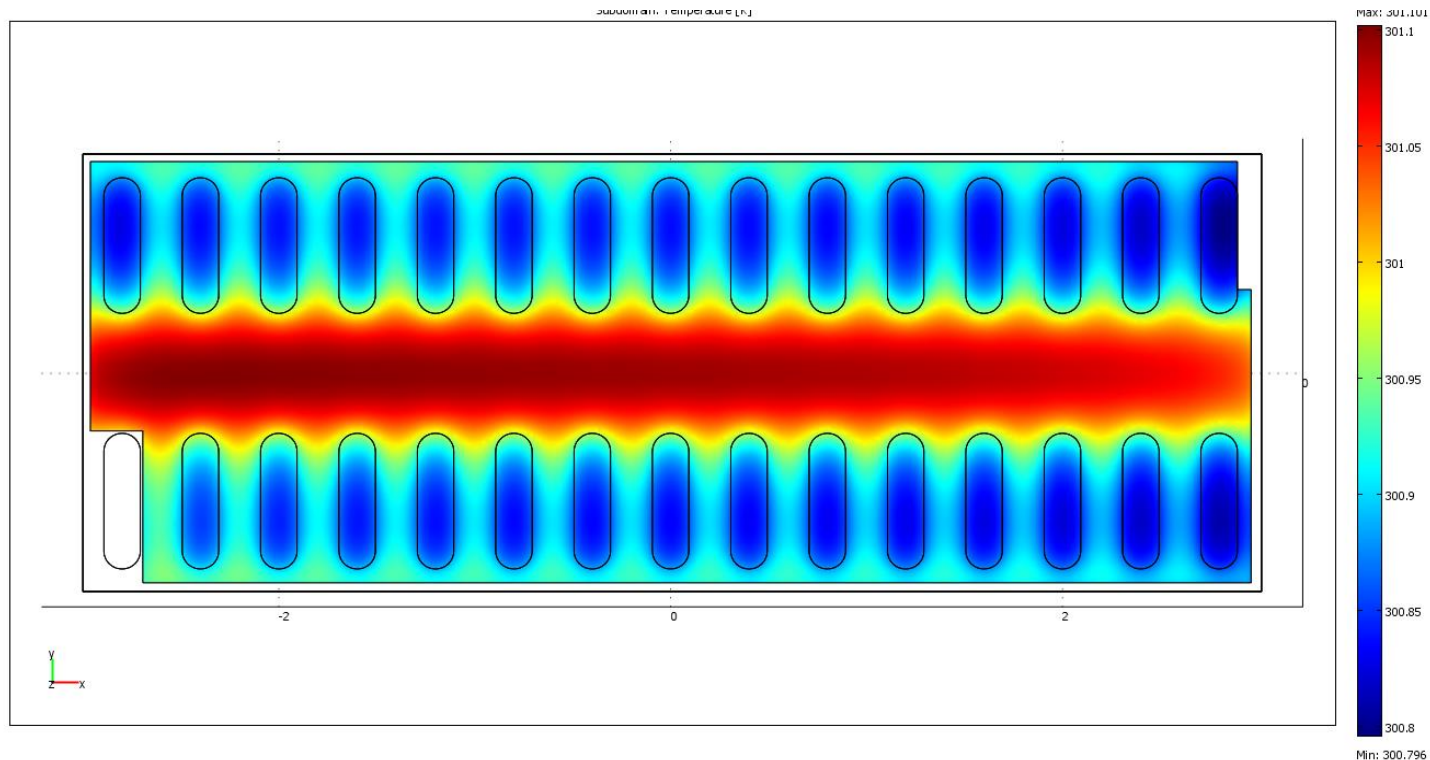
- Operating condition: Power = 1 W in the active area.
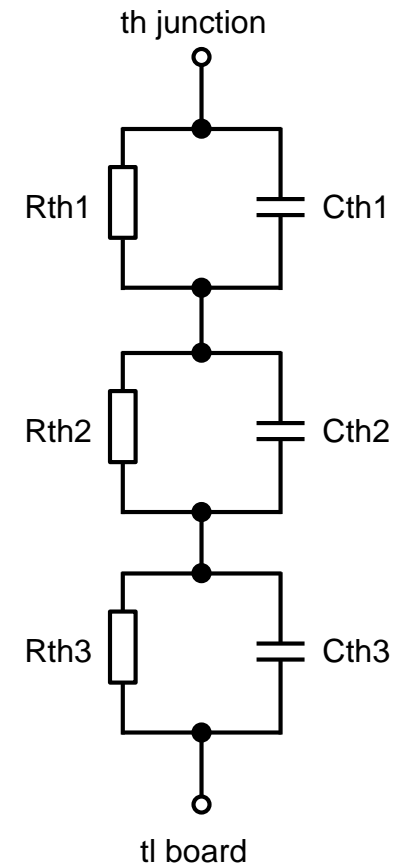- Boundary condition: Temperature of top of solder balls set to be 300 K.

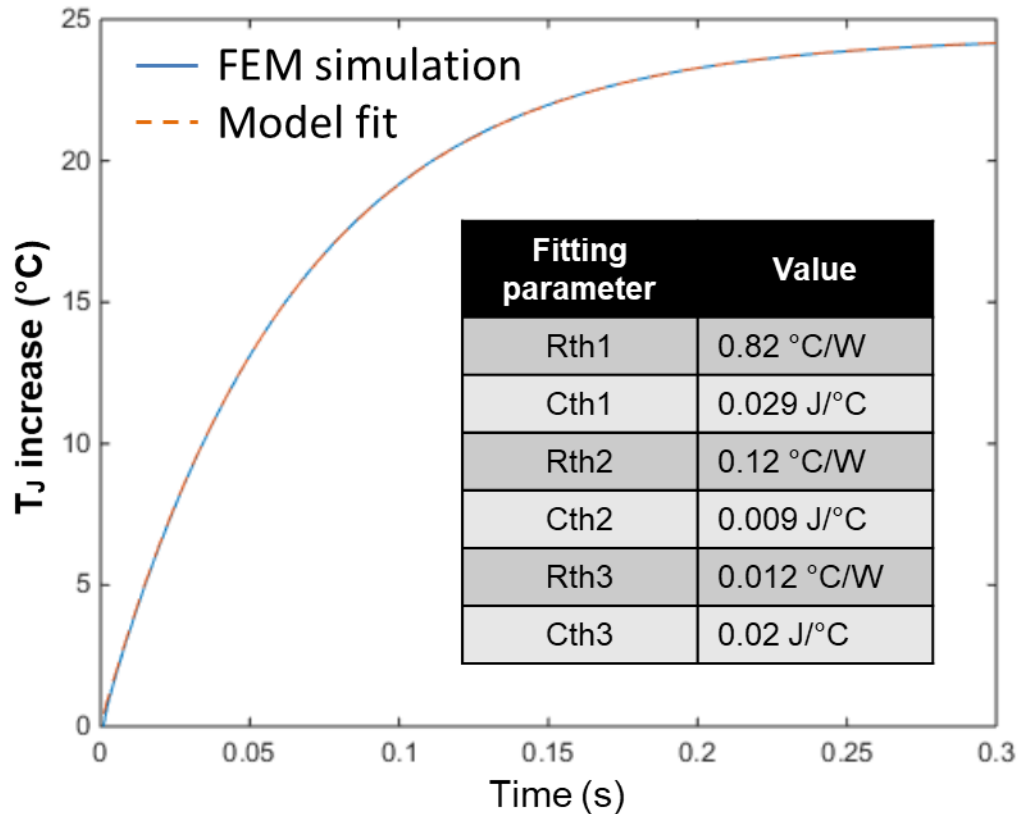# Steady-state $R_{\Theta JC}$
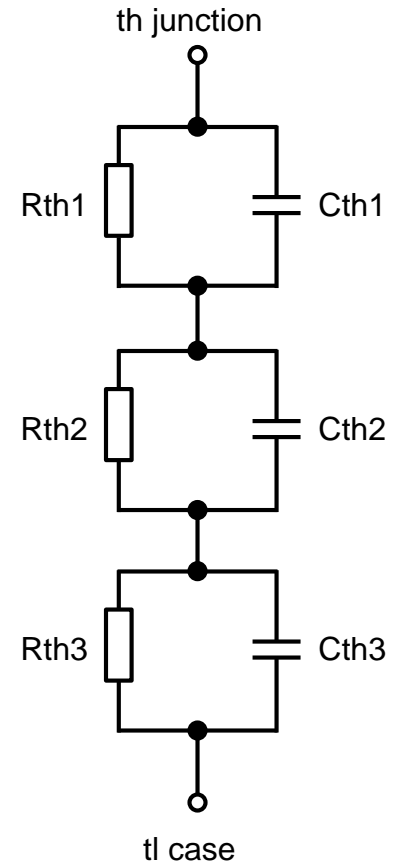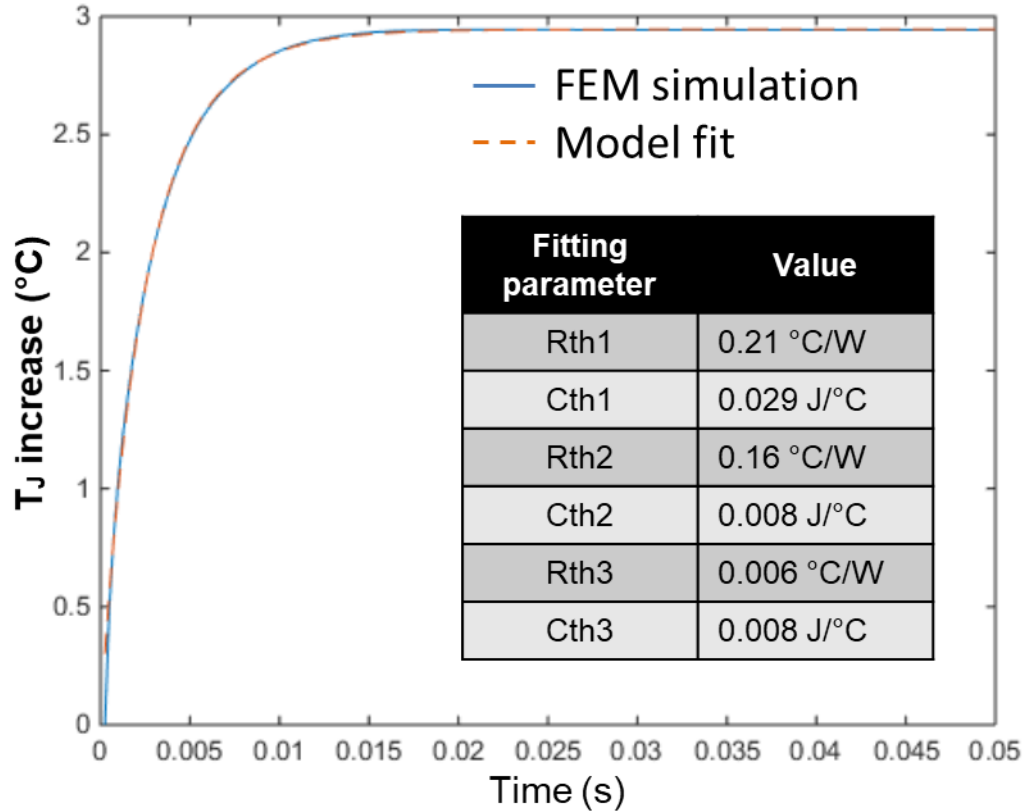
Typical $R_{\Theta JC}$ = 0.4 °C/W

- 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

Fitting parameter	Value
Rth1	0.82 °C/W
Cth1	0.029 J/°C
Rth2	0.12 °C/W
Cth2	0.009 J/°C
Rth3	0.012 °C/W
Cth3	0.02 J/°C

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

Fitting parameter	Value
Rth1	0.21 °C/W
Cth1	0.029 J/°C
Rth2	0.16 °C/W
Cth2	0.008 J/°C
Rth3	0.006 °C/W
Cth3	0.008 J/°C

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The end of the road for silicon...

but a clear road ahead for GaN FETs and ICs!