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 $R_{ΘJB}$

Typical $R_{ΘJB} = 1.1 \, °C/W$

- 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 $R_{\Theta JC} = 0.4 \ ^\circ\text{C/W}$

- 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

![Graph showing temperature increase over time with fitting parameters](image)

### 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

---

th junction

Rth1

Cth1

Rth2

Cth2

Rth3

Cth3

tl case
The end of the road for silicon…
but a clear road ahead for GaN FETs and ICs!

www.epc-co.com