Guidelines/recommendations
“Measuring the thermal conductivity and thermal resistance of prepregs und bonding sheets” (the user is responsible for implementation)

Objective:
- Measuring thermal conductivity $\lambda$ in [W/mK] and thermal resistance $R_{th}$ in [K/W]

Methods:
- Test method ASTM D5470 or ASTM D5470 equivalent (guarded hot plate method; TIM tester)

Parameter recommendations:
- Sample construction:
  - Prepregs sandwiched between 35µm Cu foil
  - Prepreg with glass fiber type 106
  - Total prepreg thickness 200 – 400µm (*), i.e. sandwich several sheets together
- Temperature difference $T > 10$ K and heat flow $Q$: 1-20 W (*)
- Measurement temperature: 50 – 60°C

(*) The sample thickness should be adjusted according to the thermal conductivity of the material to satisfy the conditions for $T$ and $Q$
Equations

Thermal resistance $R_{th}$:

$$R_{th} = \frac{\Delta T}{Q}$$

Thermal conductivity $\lambda$:

$$\lambda = \frac{d}{A \cdot R_{th}} = \frac{d}{A} \cdot \frac{Q}{\Delta T}$$

Use the following equation to calculate the thermal conductivity of prepregs/bonding sheets from the total thermal conductivity of the multi-layer composite:

$$\lambda_s = \frac{d_s}{\sum_{i=1}^{n} \frac{d_i}{\lambda_i}}$$

$\lambda$: Thermal conductivities

d: Layer thicknesses

i: Index of each layer (n layers)

$\lambda_s$: Thermal conductivity of the multi-layer composite

d$S$: Total thickness of the multi-layer composite