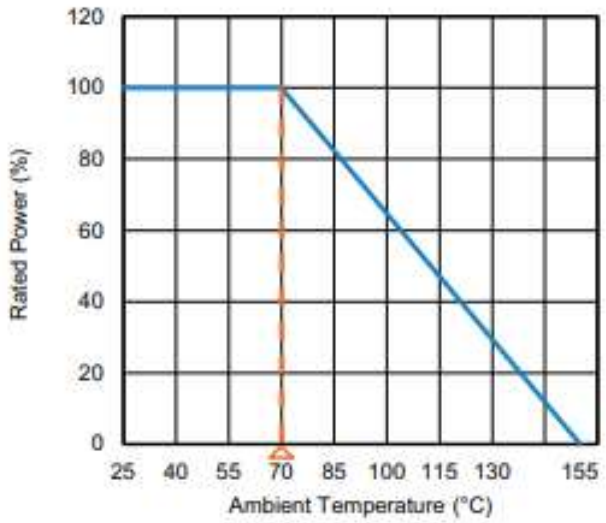
Power Dissipation Increase for CH Series Resistors

Vishay Sfernice is pleased to announce an increase in the power dissipation of its CH series microwave resistors, without product modification and without impacting high frequency performance.

The upper ambient temperature at 155 °C is based on the maximum element temperature (MET) of the resistor. The slope is equal to (-1/Rth_{ja}) and is linked to the component, the PCB, and environment conditions.

PCB material: FR4 base material, 150 mm x 100 mm x 1.5 mm, 35 µm Cu layer thickness, natural convection.



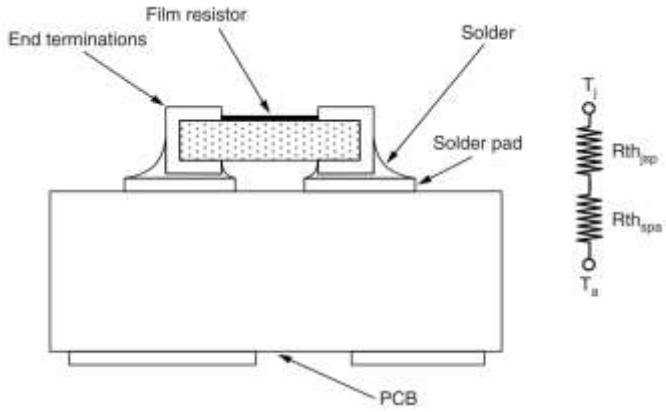
Model	Rated Power Pn (mW)	
	From	To
CH0402	50	300
CH0603	125	400

Thermal Resistances: Component and PCB

The heat generated within the resistor is dissipated to the surrounding environment in the following way:

- Conduction from the resistive layer, or junction, through the body of the chip, to the solder pads
- Spreading by conduction within the PCB
- Convection from the PCB to the ambient

The thermal model is as follows: $P = \frac{\Delta T}{(Rth_{jsp} + Rth_{spa})} = \frac{(T_j - T_a)}{(Rth_{jsp} + Rth_{spa})}$



- T_j is the temperature of the resistive layer; maximal allowed temperature is 155 °C for T_j
- T_a is the ambient temperature around the PCB
- T_{sp} is the temperature of the solder pad
- **Rth_{ja}** is the thermal resistance between the resistive layer and the ambient
- **Rth_{jsp}** is the thermal resistance between the resistive layer and the solder joint
- **Rth_{spa}** is the thermal resistance between the solder joint and the ambient. It takes into account the convection from the PCB to ambient
- **P** is the dissipated power expressed in W

Model	Rth_{ja} (°C/W)	Rth_{jsp} (°C/W)	Rth_{spa} (°C/W)
CH0402	283	90	193
CH0603	213	47	166

Useful Links

- CH Product Page https://www.vishay.com/ppg?53014
- CH Infographic https://www.vishay.com/doc?48510
- CH Did You Know https://www.vishay.com/doc?48566

Contact Information

Europe
Alexandre Moulin
alexandre.moulin@vishay.com