Koelvin Berekening:

**Berekening diodebrug**

Geg: Ud = 2,2V I = 4 A

Rthj-c = 4 °C/W Rthc-h = 0,5 °C/W

Rthh-a = 6,5 °C/W Ta = 25 °C

Gev: Tj

Opl: P = 𝑈d∗𝐼 = 2,2 ∗ 4 = 8,8𝑊

Rthj-a = Rthj−c+ Rthc−h+Rthh−a = 4 + 0,5 + 6,5 = 11°C/W

Tj = (𝑃𝐷∗ Rthj−a)+𝑇𝑎 = (8,8∗11)+25 = 121,8°C

**Berekening koelvin emittervolger (13V)**

Geg: Uin = 15,9 V Ic = 1,5 A Uz = 13V

Ube = 0,7V Rthj-c = 1,52 °C/W Rthc-h = 0,5 °C/W

Rthh-a = 6 °C/W Ta = 25 °C

Gev: Tj

Opl: Uce = 𝑈𝑖𝑛 − 𝑈𝑧 – 𝑈𝑏𝑒 = 15,9 − 13 − 0,7 = 2,2V

P = 𝑈𝑐𝑒∗𝐼𝑐 = 2,2 ∗ 1,5 = 3,3𝑊

Rthj-a = Rthj−c+ Rthc−h+Rthh−a = 1,52 + 0,5 + 6 = 8,2°C/W

Tj = (𝑃𝐷∗ Rthj−a)+𝑇𝑎 = (8,2∗3,3)+25 = 52 °C

**Berekening koelvin LM317 & LM337 (13,75V)**

Geg: Uin = 15,9 V I = 0,5 A Uout = 13,75V

Rthj-c = 5 °C/W Rthc-h = 0,5 °C/W

Rthh-a = 17°C/W Ta = 25 °C

Gev: Tj

Opl: Up = 𝑈𝑖𝑛 − 𝑈𝑜𝑢𝑡 = 15,9 – 13,75 = 2,15V

P = 𝑈𝑝∗𝐼=2,15∗0,5= 1,075𝑊

Rthj-a = Rthj−c+ Rthc−h+Rthh−a= 5 + 0,5 + 17 = 22,5°C/W

Tj = (𝑃𝐷∗ Rthj−a)+𝑇𝑎 = (1,075∗22,5)+25 = 49,19°C

**Berekening koelvin LM317 (5V)**

Geg: Uin = 15,9 V I = 1 A Uout = 5V

Rthj-c = 5 °C/W Rthc-h = 0,5 °C/W

Rthh-a = 3,6°C/W Ta = 25 °C

Gev: Tj

Opl: Up = 𝑈𝑖𝑛 − 𝑈𝑜𝑢𝑡 = 15,9 – 5 = 10,9V

P = 𝑈𝑝∗𝐼=10,9∗1= 10,9𝑊

Rthj-a = Rthj−c+ Rthc−h+Rthh−a= 5 + 0,5 + 3,6 = 9,1°C/W

Tj = (𝑃𝐷∗ Rthj−a)+𝑇𝑎 = (10,9∗9,1)+25 = 124,19°C