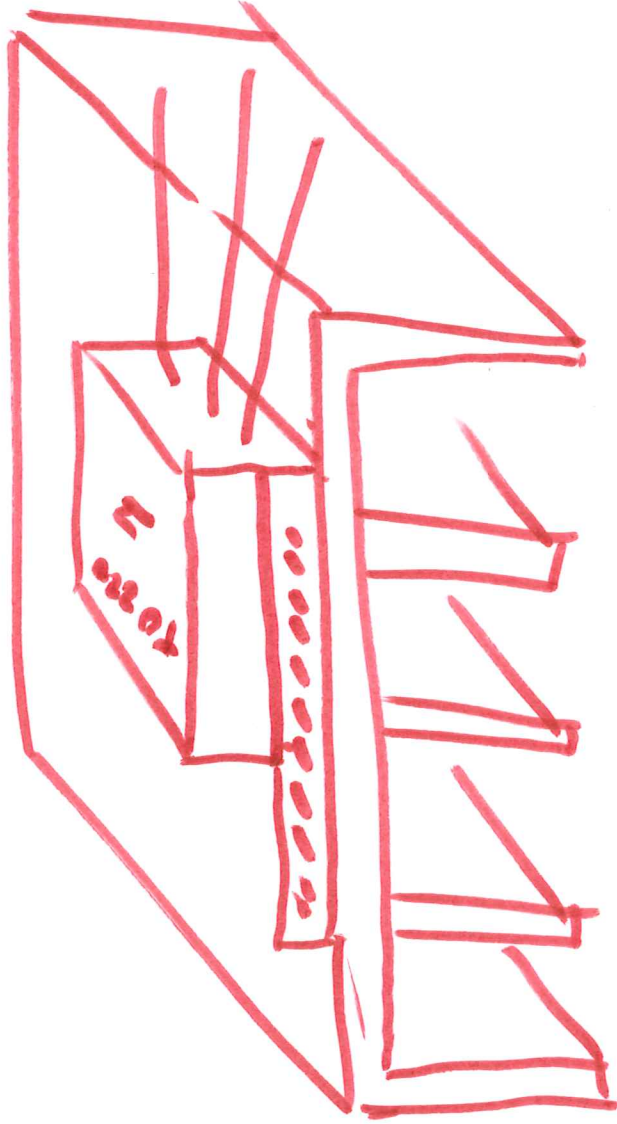


ECE 404-TD / 504-TD

ST: T&D APPLICATIONS OF
VOLTAGE SOURCE CONVERTERS

SESSION no. 9



$$T_j = 150^\circ\text{C}$$

$$T_A = 25^\circ\text{C}$$

$$R_{jc} = 1.67 \text{ }^\circ\text{C}/\text{W}$$

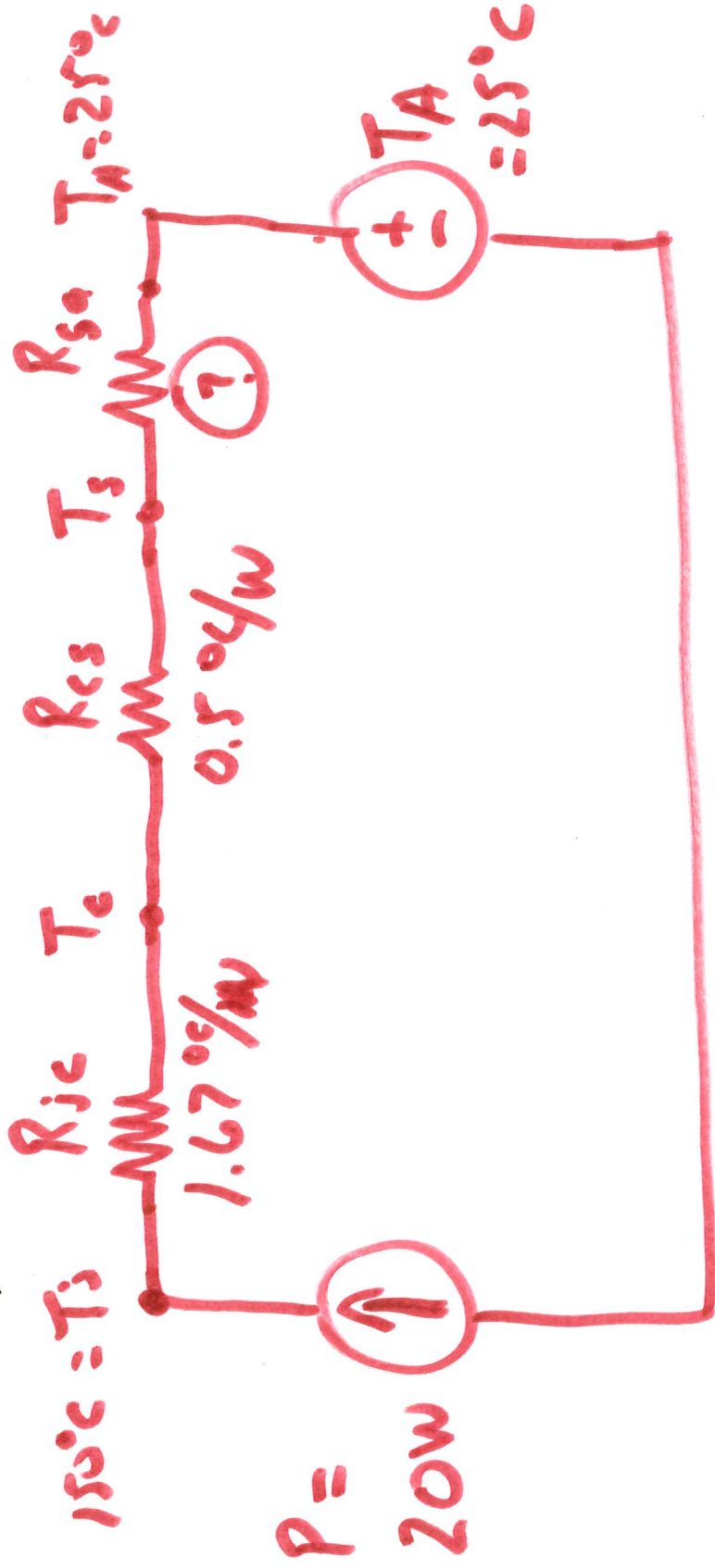
$$R_{cs} = 0.1 \text{ }^\circ\text{C}/\text{W}$$

4597

$$R_{j-a} = 6.21 \text{ }^\circ\text{C}/\text{W}$$

If $P_{loss} = 20\text{W}$, Find A

SIAR.



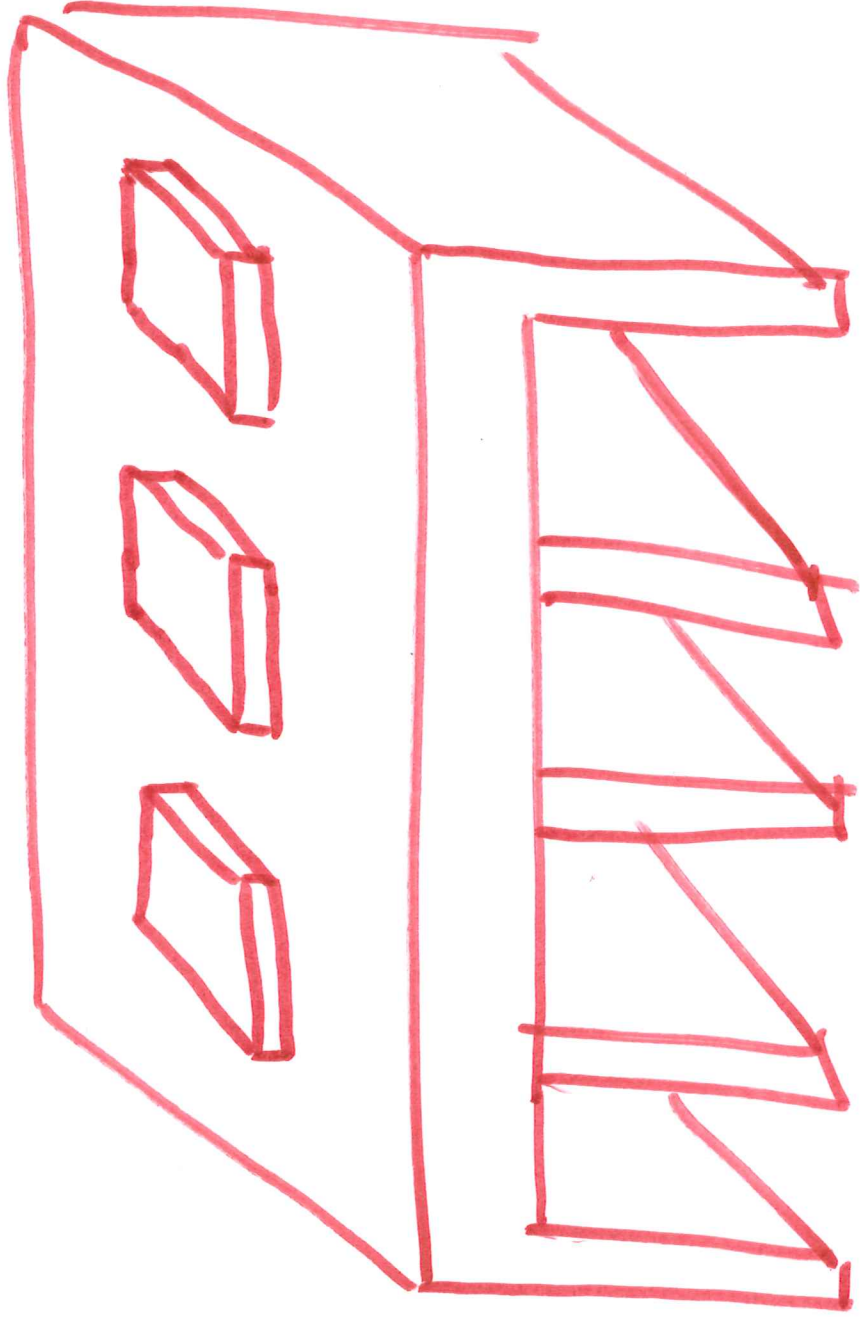
FIND ~~T_j~~ R_{sa}

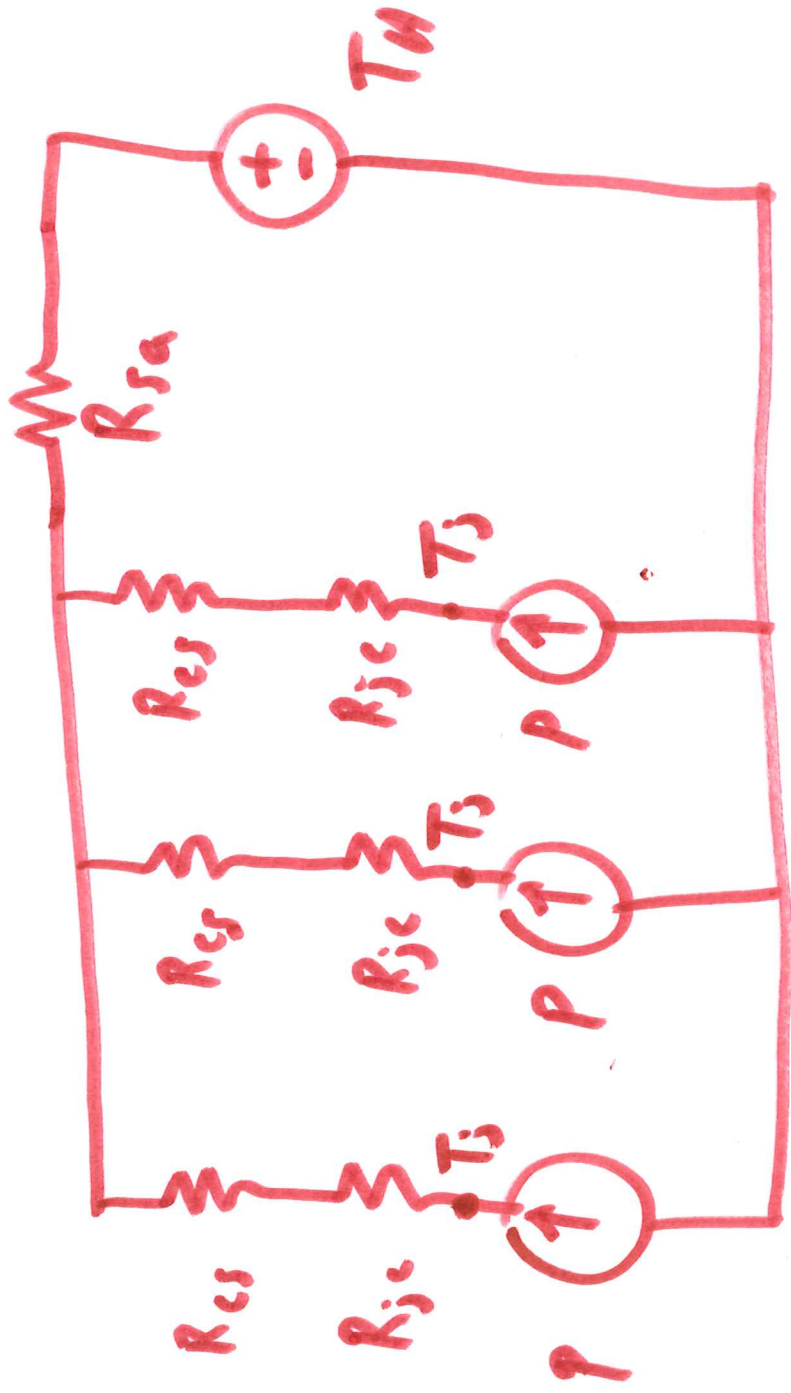
$$T_j - P (R_{jc} + R_{cs} + R_{sa}) - T_A = 0$$

$$R_{sa} = \frac{T_j - T_A}{P} - R_{jc} - R_{cs}$$

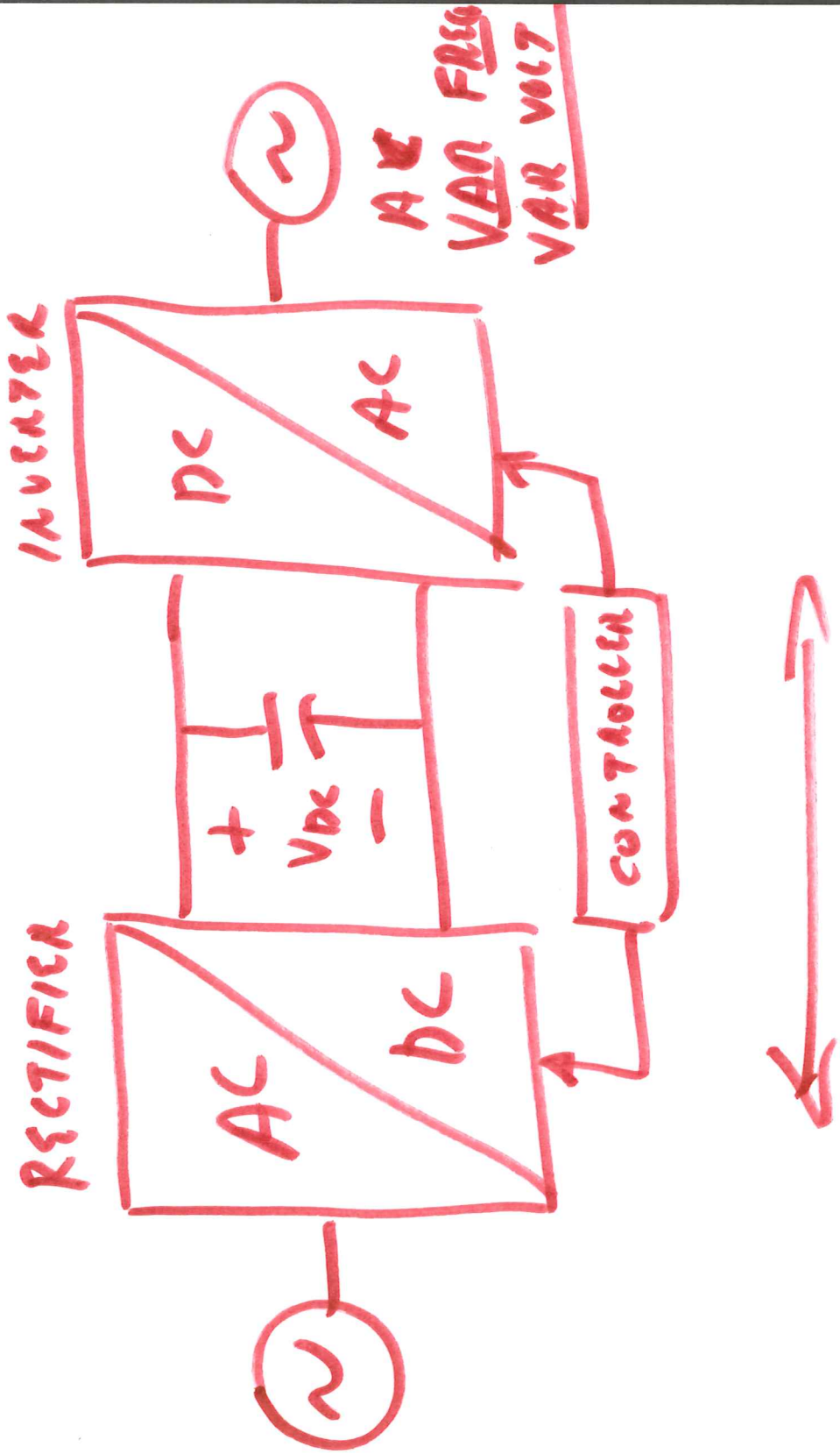
$$R_{sa} = \frac{150^{\circ}\text{C} - 25^{\circ}\text{C}}{20\text{W}} = 1.67^{\circ}\text{C}/\text{W} - 0.5^{\circ}\text{C}/\text{W}$$

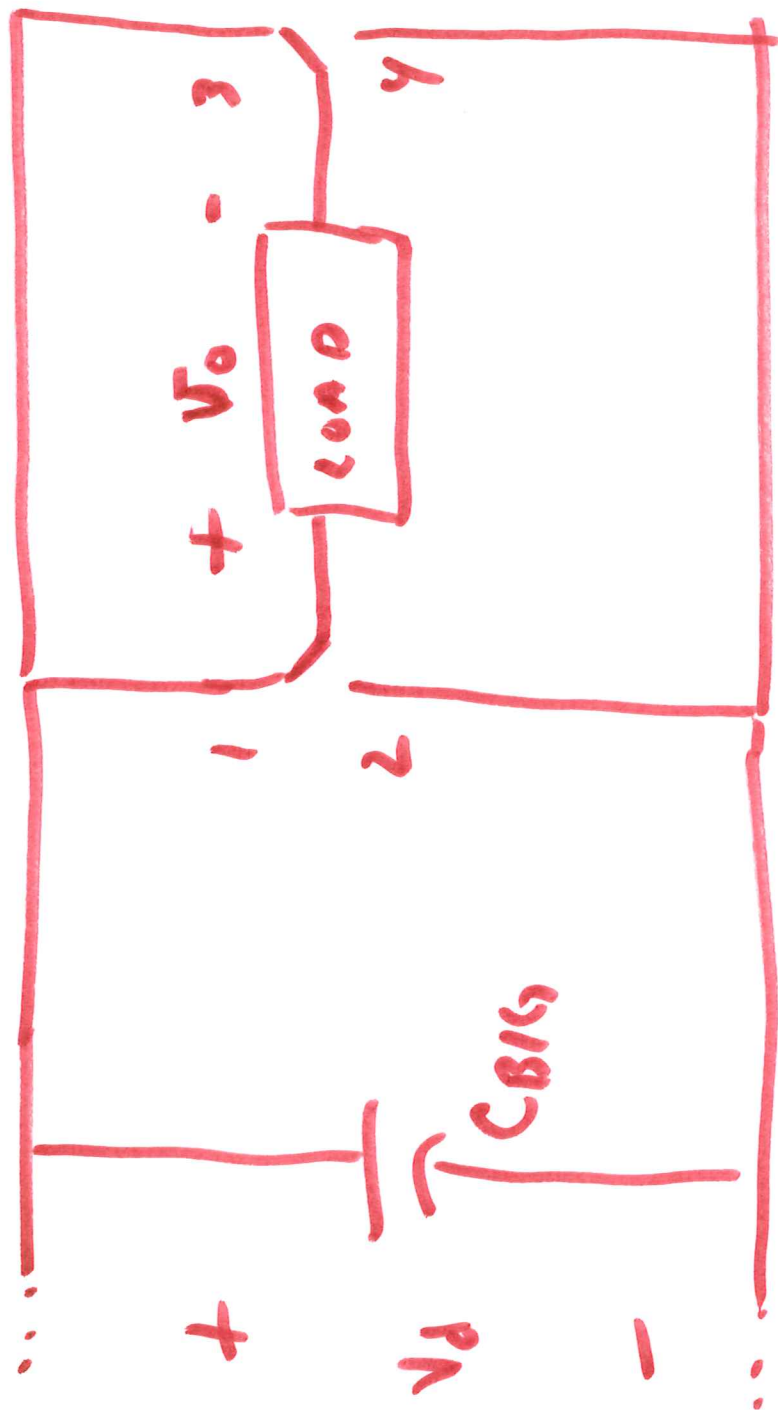
$$R_{sq} = 4.08^{\circ}\text{C}/\text{W}$$



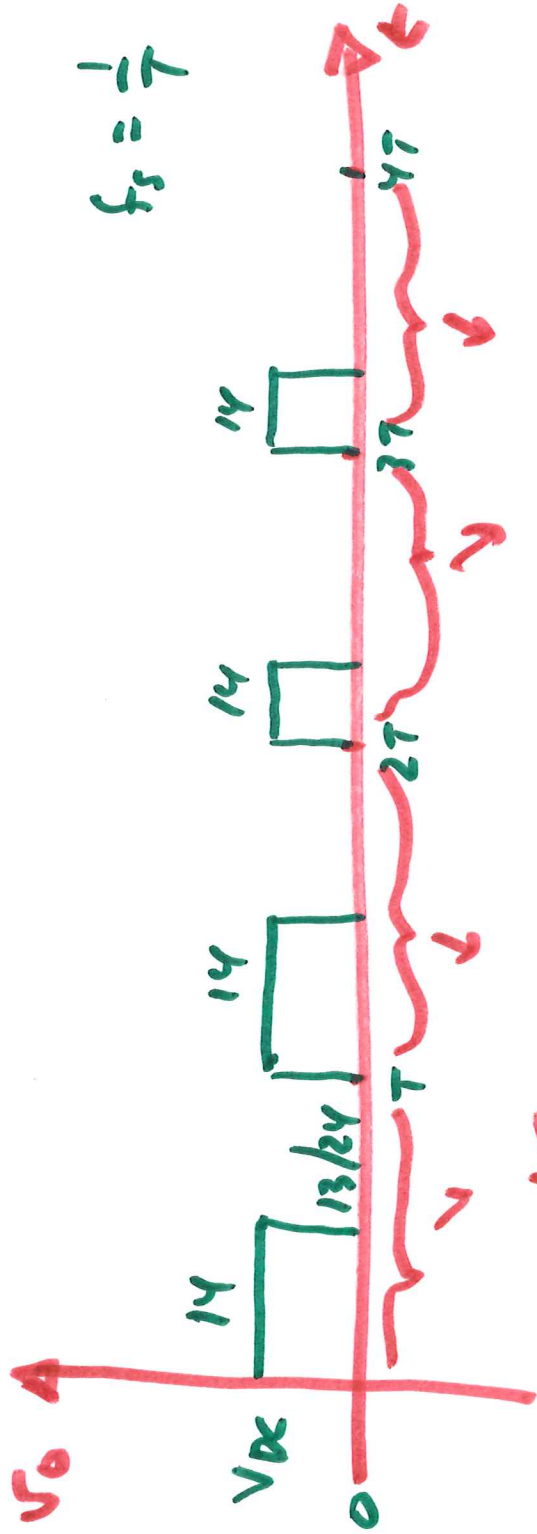


$$T_j = P(R_{jc} + R_{cs}) + 3P R_{sa} + T_A$$





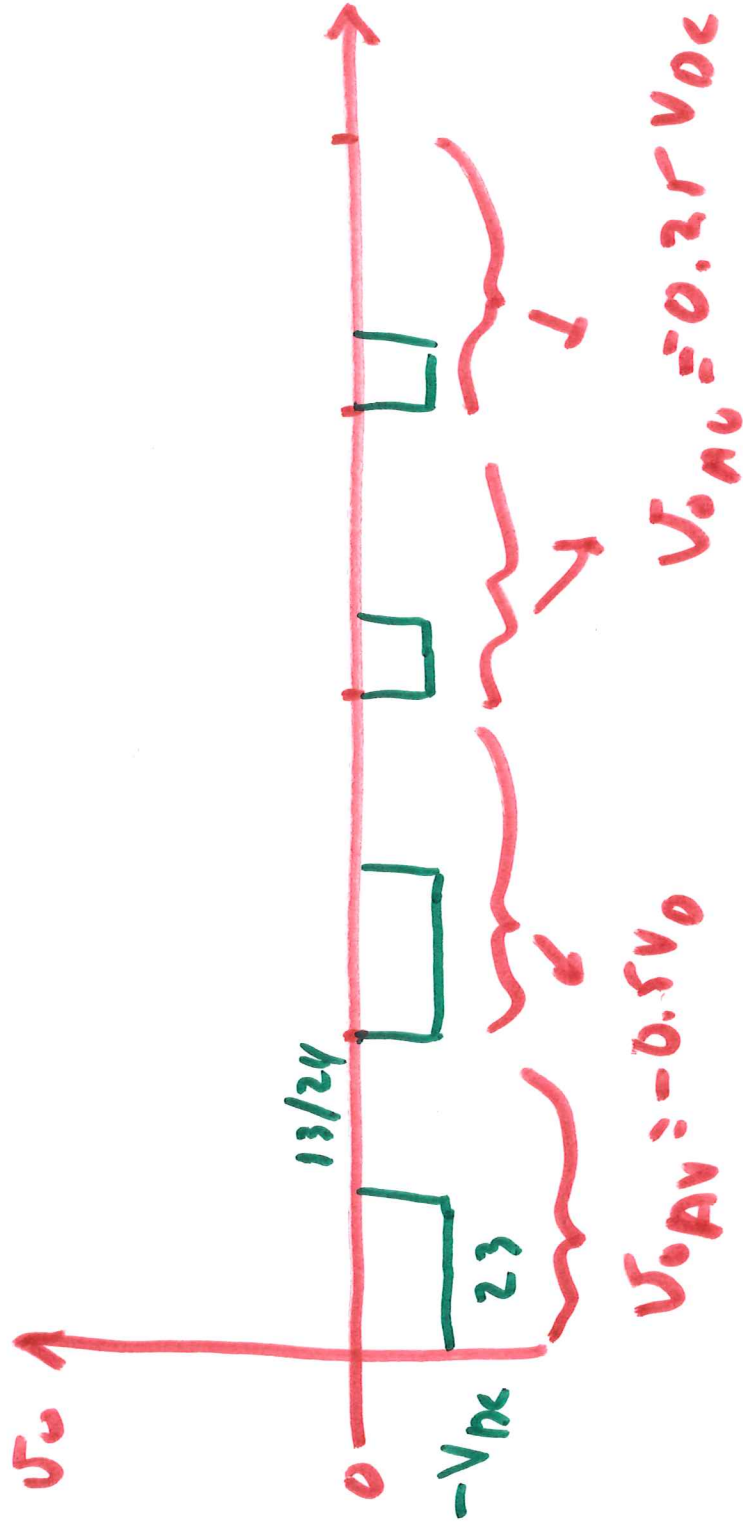
DC CONTROLLED



$$f_s = \frac{1}{T}$$

$$V_{o_{AV}} = 0.5 V_{DC}$$

$$V_{o_{AV}} = 0.25 V_{DC}$$



ECE 404 / 504

**T & D Applications of Voltage
Sourced Converters**

Lesson 9

Example on heat sinking

DC link drive systems

**Options: switches on: 14, 23,
13, 24**

14: V_o is +

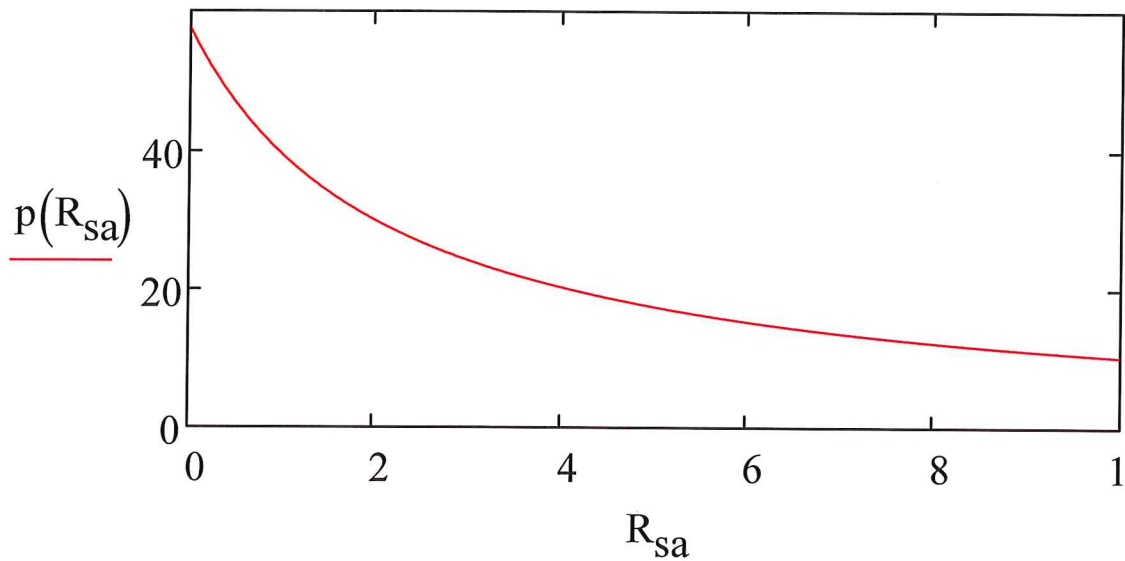
23: V_o is -

13, 24: V_o is 0

Again, we use switches strictly OFF or ON because we want power to go to the LOAD, not to the SWITCH.

Heat Sink Example

$$p(R_{sa}) := \frac{150 - 25}{1.67 + 0.5 + R_{sa}}$$



$$p_t := 20$$

$$R_{sa} := \frac{150 - 25}{p_t} - 1.67 - 0.5 = 4.08$$

0