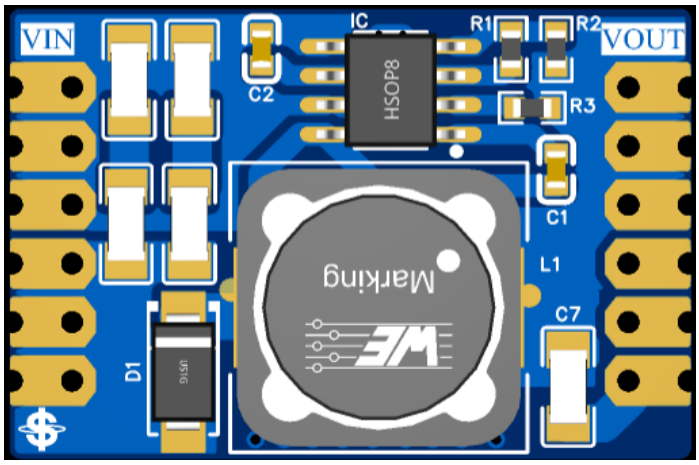
Linear Regulator Using ST1S14

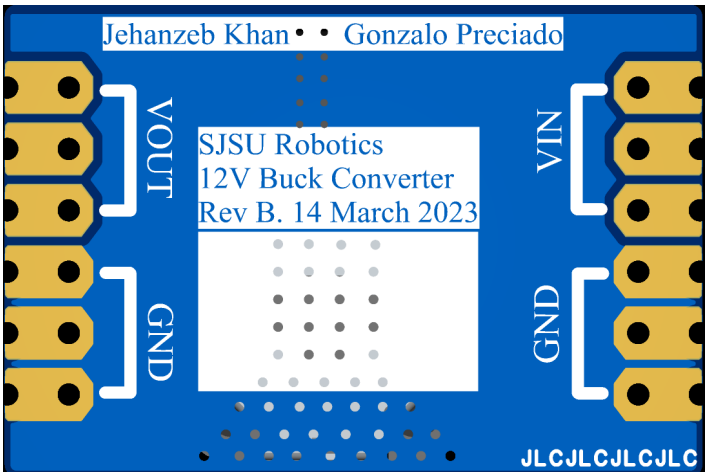


Application

Voltage Regulator Stepping down 48V to 5V depending on the voltage divider network providing up to 3A of current.
Designed with the ST1S14 chip from STMicroelectronics.

ST1S14 Features

3A DC current output
Operating Input Voltage of 5.5 to 48
850KHz internal switching frequency
Thermal Shutdown of 160 C Max



Manufacturer	Series	Inductor value (µH)	Saturation current (A)
Wurth Elektronik	WE-HCI 7040	1 to 4.7	20 to 7
	WE-HCI 7050	4.9 to 10	20 to 4.0
Coilcraft	XPL 7030	2.2 to 10	29 to 7.2

Table 1: Induction Selection

The selected inductor must have a higher saturation current than the output current.

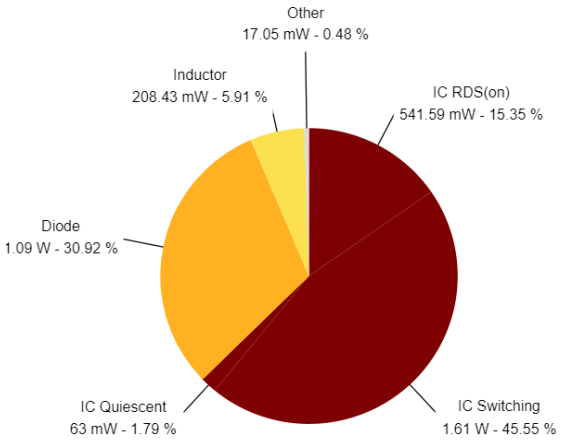


Figure 2: Power Loss Chart

Calculation for Voltage divider network

$$G_{DIV}(s) = \frac{R_2}{R_1 + R_2} \cdot \frac{(1 + s \cdot R_1 \cdot C_{R1})}{\left(1 + s \cdot \frac{R_1 \cdot R_2}{R_1 + R_2} \cdot C_{R1}\right)}$$