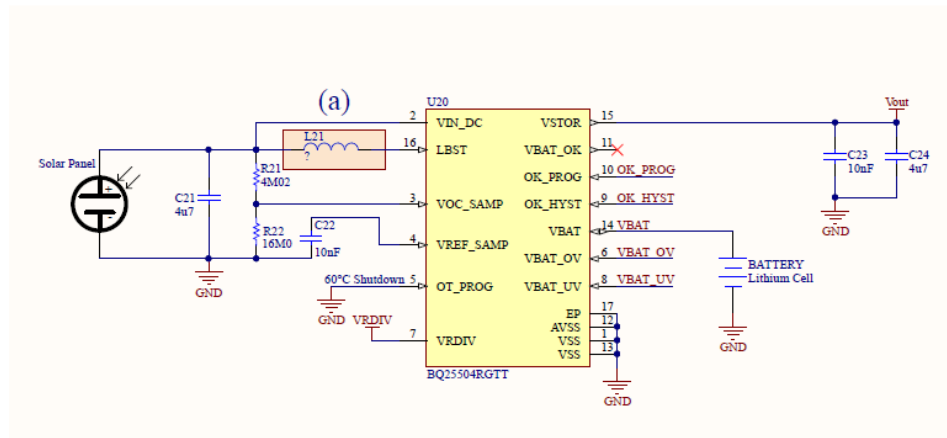


## 8 Inductor Waveforms

A Personal Solar Torch has an energy harvester circuit as shown below:



(This schematic is available as a separate PDF.)

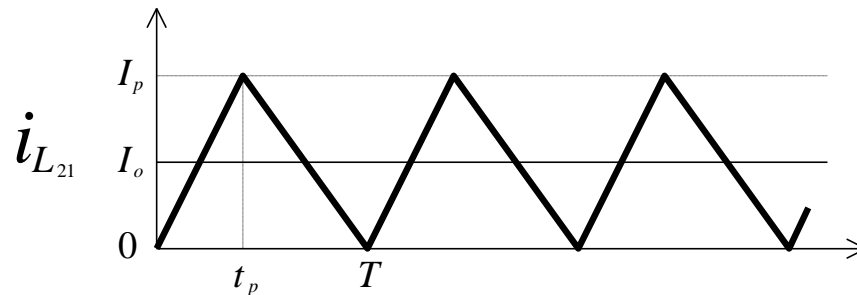


Figure 8.1 - Measured current waveform

- Using information given in the [energy harvester datasheet](#), find the recommended value of inductor L21. (datasheet section 7.5 or 9.1.2)
- During testing, the current waveform of the inductor was measured, as shown in Figure 8.1. This waveform is controlled by the BQ25504's built-in "boost converter" circuit. Find the period,  $T$  (datasheet section 7.5).
- The peak current was found to occur at  $t_p = 480$  ns .  
Between time 0 and  $t_p$ , pin 16 is connected to the 0 V common (GND) node by an internal transistor. Assuming  $V_{\text{solarpanel}} = 2.0$  V , determine the peak current,  $I_p$  .
- Determine the average inductor current,  $I_o$  .
- Between time  $t_p$  and  $T$ , pin 16 is connected to pin 15 by an internal transistor (instead of to GND). What is the average power being delivered to the capacitors C23 and C24?
- Draw a sketch of the inductor's voltage waveform.