1)

a)In order to have 12V output voltage with the input voltage of 16V in a buck boost converter

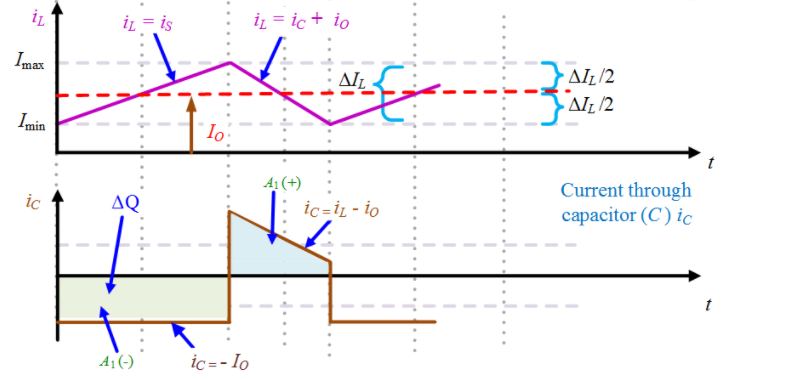


Figure x: Buck Boost Converter Waveforms

The output power is 24W and the output voltage is 12V. Therefore

b) In order to calculate voltage ripple at the output, one needs to consider charging and/or discharging operation of capacitor.

(2% output voltage ripple)

**c) Component Selection**

**Table xx: Selected Products with Ratings for Buck-Boost Converter**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Component | Product | Voltage Rating | Current Rating | Price | Amount |
| L | **744375 29203681** | **-** | **4.8A** | **$9.16000** | **1** |
| C | **C1608X5R1E225K080AB** | **25V** | **-** | **$0.19000** | **1** |
| Diode | **CDBA540-HF** | **40V** | **5A** | **$0.44000** | **1** |
| MOSFET | **2156-FDS5692Z-FSTR-ND** | **50V** | **5.8A** | **$0.99000** | **1** |
|  |  |  | Total Price | $10.78 |  |

Because components ratings are the same as the Cuk Converter, we choose the same components as the Cuk Converter. Component selection reasonings are mentioned in the Question 2.

**d)**