UJT Relaxation Oscillator

Introduction:

UJT can be used in oscillator circuit for generating saw tooth wave form at the emitter and positive going as well as negative going pulses at baseB1 and B2 respectively.

When capacitor charges to peak value V_p of UJT it turns on and capacitor discharges though low resistance path provided by R_{B1} to valley voltage V_v of UJT and this cycle continues thus saw tooth waveform is generated across capacitor.

Schematic Diagram:

The schematic diagram of UJT Relaxation Oscillator is shown below:

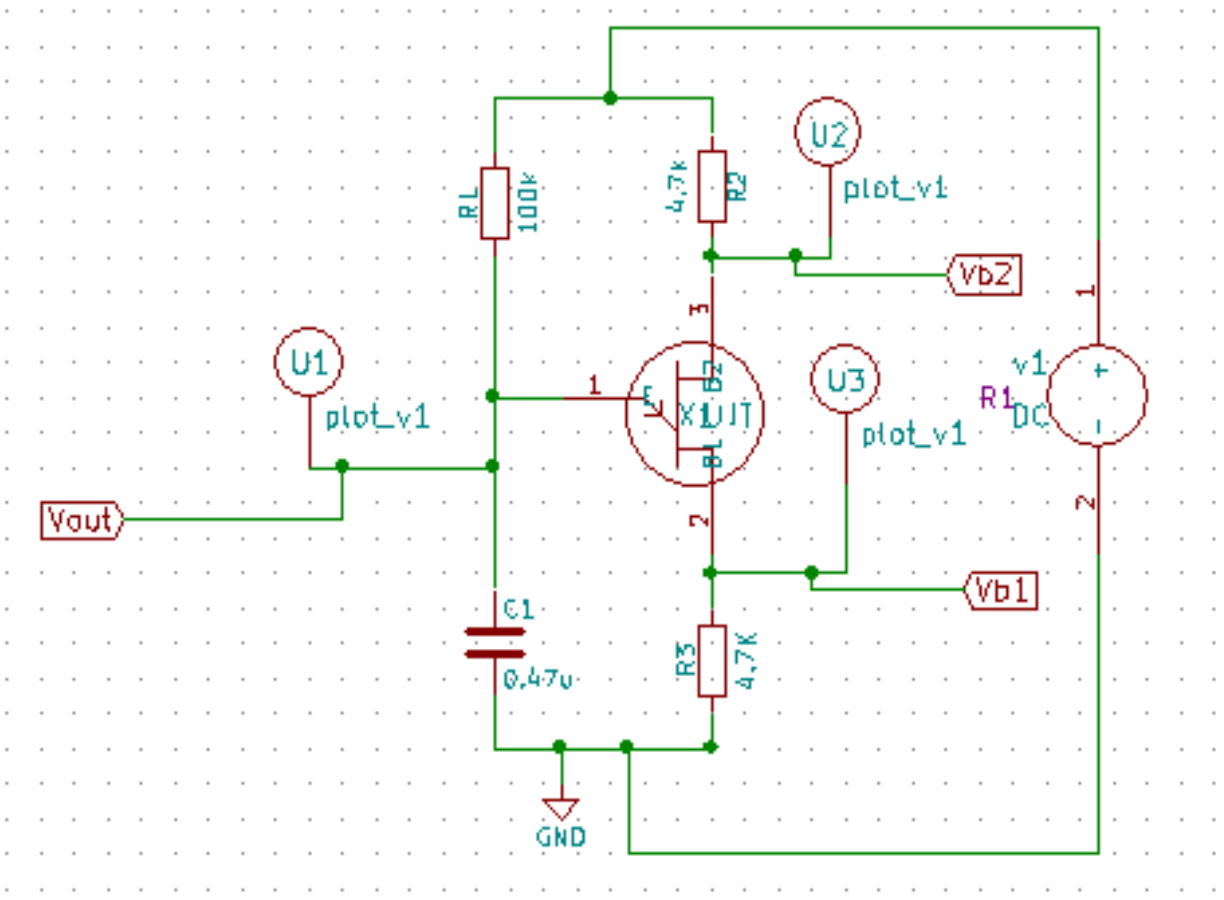

Fig.1. UJT Relaxation Oscillator schematic diagram

NGSPICE Output waveform at Base1 terminal:

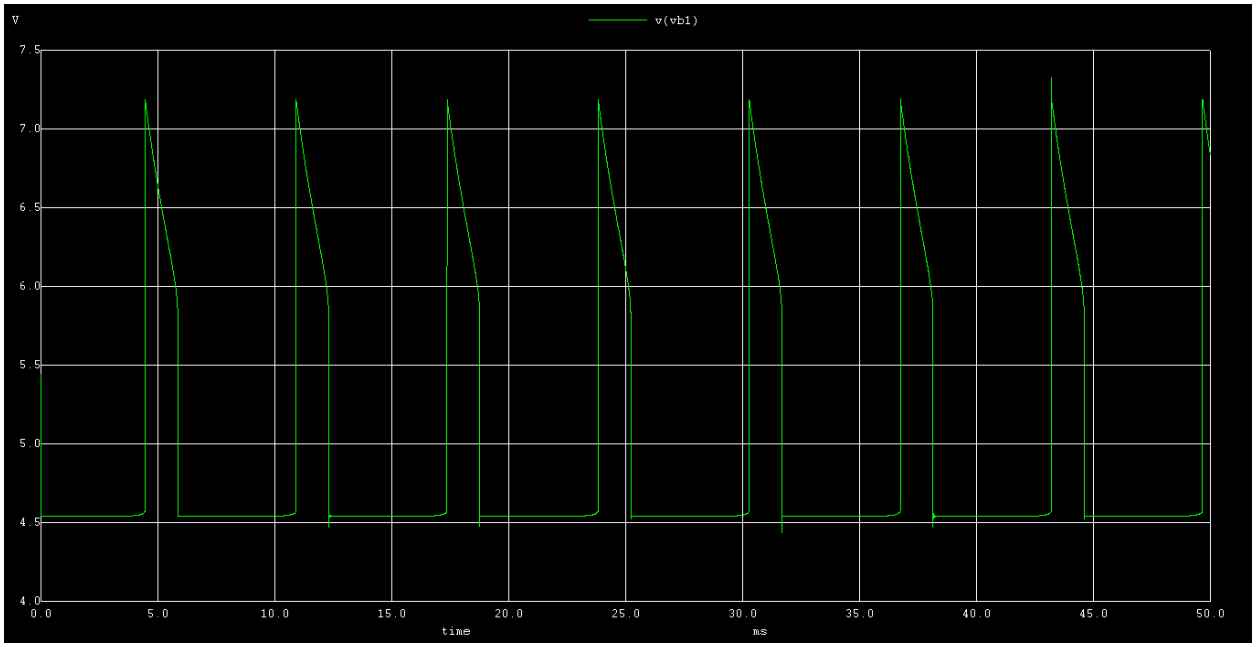

Fig.2. NGSPICE Output waveform at Base1 terminal of UJT Relaxation Oscillator

NGSPICE Output waveform at Base2 terminal:

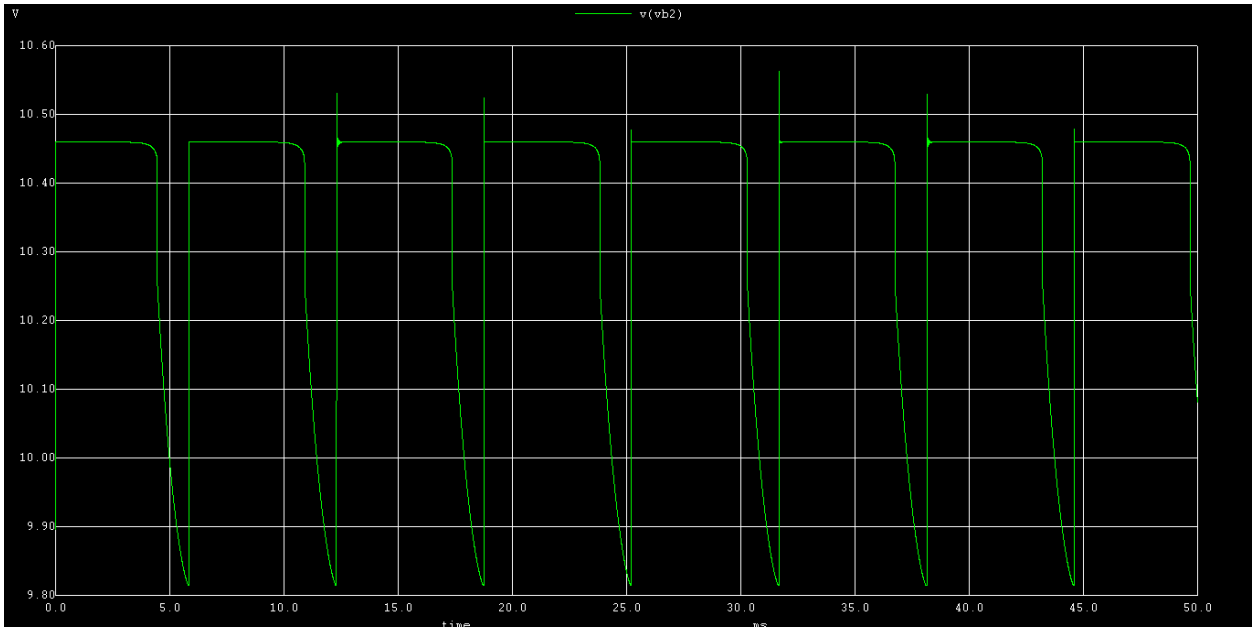

Fig.3. NGSPICE Output waveform at Base2 terminal of UJT Relaxation Oscillator

NGSPICE Output waveform across capacitor:

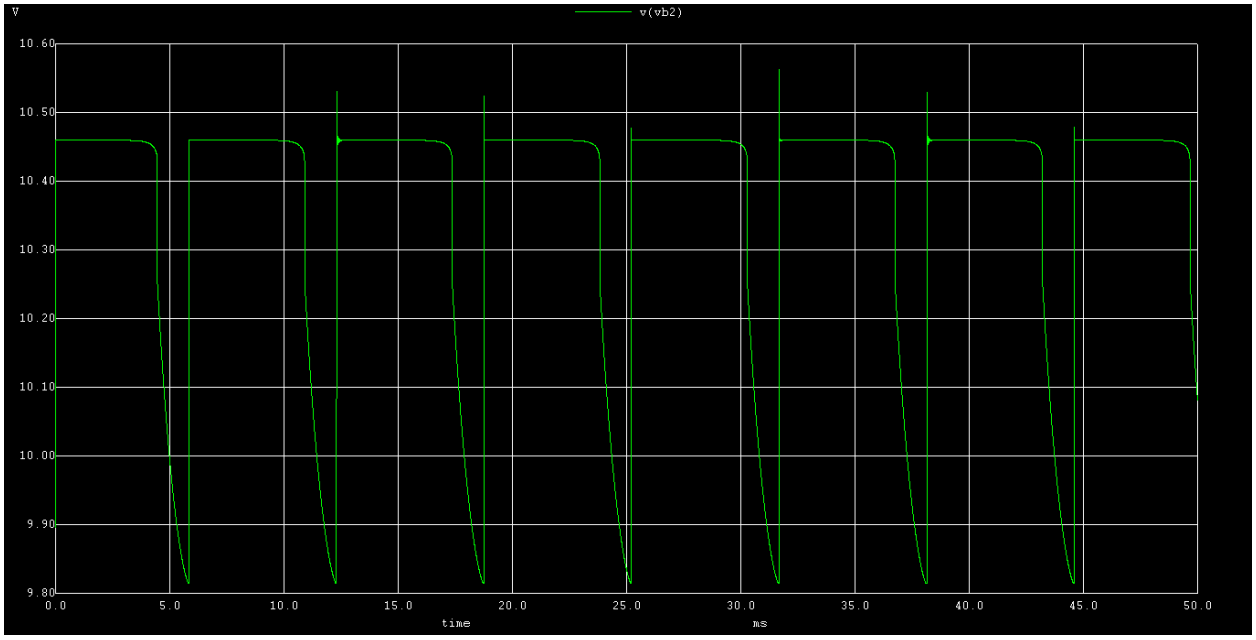

Fig.4. NGSPICE Output waveform across capacitor of UJT Relaxation Oscillator

Python Plot of output waveform at Base1 terminal:

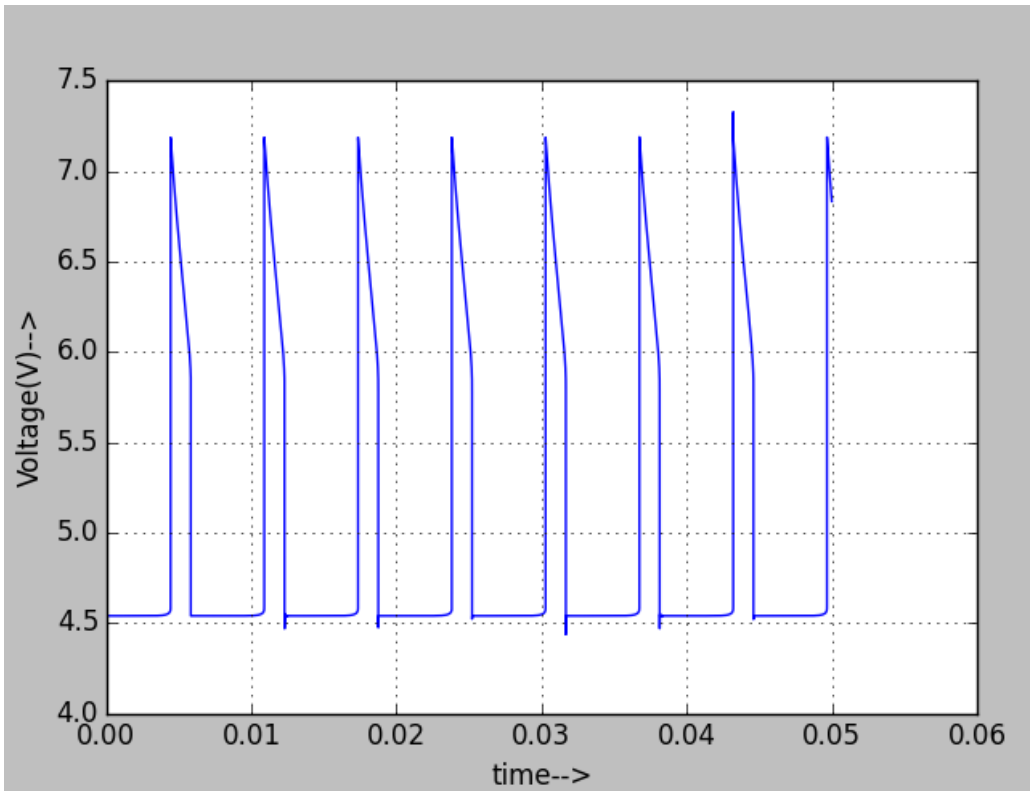

Fig.5. Python Plot of output waveform at Base1 terminal

Python Plot of output waveform at Base2 terminal:

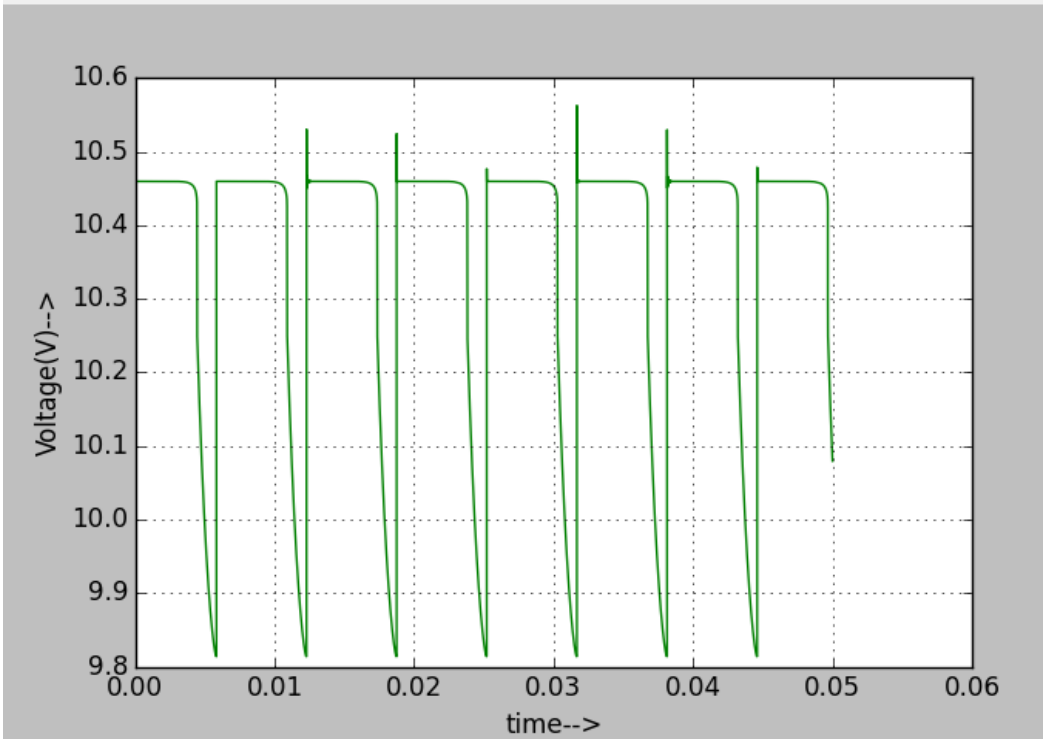

Fig.6. Python Plot of output waveform at Base2 terminal

Python Plot of output waveform across capacitor:

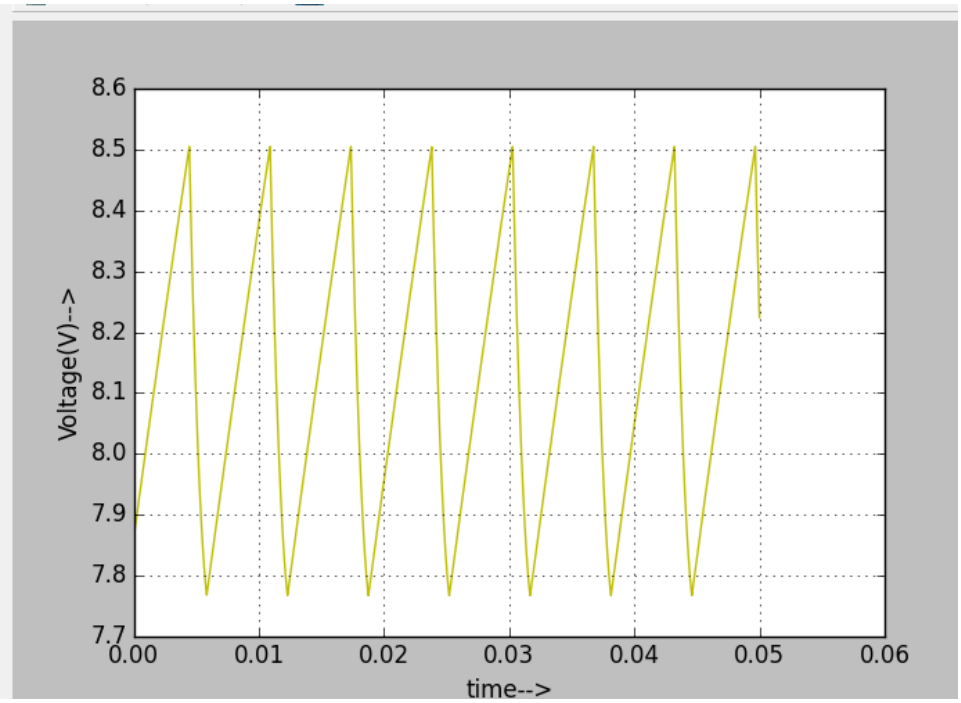

Fig.7. Python Plot of output waveform across capacitor

Reference:

https://www.electronics-tutorials.ws/power/unijunction-transistor.html

Conclusion:

Thus UJT relaxation oscillator was designed and output waveform is obtained successfully using eSim software.

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