

Contents

List of Figures	iv
List of Tables	v
1 Introduction	1
2 Circuit Design and Analysis	1
2.1 Boost Converter Circuit and Analysis	2
2.1.1 Calculation of Energy Loss in the Capacitor	3
2.1.2 Calculation of Time for Current to Flow Into the Inductor	3
2.1.3 Calculation of Time for Current to Flow Out of the Inductor	3
2.1.4 Calculation and Selection of Output Resistor	3
2.1.5 Calculation of Waveform Generator Settings	3
2.2 Astable Multivibrator Circuit and Analysis	3
2.2.1 Calculation of Frequency and Duty Cycle	3
2.2.2 Selection of Capacitors Values	3
2.3 Low Pass Filter Circuit and Analysis	3
2.4 DC–DC Power Supply Circuit and Analysis	3
2.5 Thévenin Equivalent Output Impedance of the DC–DC Power Supply	3
3 Simulated Performance	4
3.1 Boost Converter Simulation	5
3.1.1 Transient Analysis	5
3.1.2 Current Through Transistor	5
3.1.3 Temperature Analysis	5
3.2 Astable Multivibrator Simulation	5
3.3 Low Pass Filter Simulation	5
3.4 DC-DC Power Supply Simulation	5
4 Experimental Implementation	5
4.1 Boost Converter	6
4.2 Astable Multivibrator	6
4.3 Low Pass Filter	6
4.4 DC-DC Power Supply	6
5 Discussion	7
5.1 Boost Converter	8
5.2 Astable Multivibrator	8
5.3 Low Pass Filter	8
5.4 DC–DC Converter	8
6 DC–DC Power Supply Cost Estimate	8
7 Conclusions	8

Appendices	9
A This is the first appendix	9
B This is the second appendix	9
References	10