

# Project Report

Project Name: DC - DC Buck Boost Converter

Professor-in-charge: Dr. Vijay A. S.

## # Components for PWM Generator:

Qty	Value	Device	Package	Parts	Description
2	R2 10 k $\Omega$ , R3 50 k $\Omega$	3362P	3362P	R2 (D-Vary), R3 (F-Vary) R2 use P103 AND R3 solder P503	Potentiometer 3362 Series
2		MA03-1	MA03-1	EMCM, PLL	PIN HEADER
8		PINHD-1X2	1X02	C1-C2, E1-E2, GND, JP12- JP10, O/P++, O/P--, SUPPLY, VCC	BERG STRIP PINS HEADER
1	100 nF	C10/4	C10B4	C1	CAPACITOR
1	10 nF	C2.5/2	C2.5-2	C3	CAPACITOR
1	10 nF	C5/7.2	C5B7.2	C2	CAPACITOR
2	150 $\Omega$	R- EU_0617/22	0617/22	R4, R5	RESISTOR
1	4.7 k $\Omega$	R- EU_0207/10	0207/10	R1	RESISTOR
1	47 k $\Omega$	R- EU_0207/10	0207/10	R7	RESISTOR
1	TL494IN	TL494IN	DIL16	IC1	SWITCHMODE Pulse Width Modulation Control Circuit

## # Components for the converter circuit:

1mH Inductor, MOSFET driver TC4426, Power MOSFET IRFZ44NPbF, 0.01 ohm precision resistors, Heat sink, Power Diode QH08TZ600, 470  $\mu$ F capacitor, rheostat with high power rating (40W) , connecting wires.

## # TL494 PWM Generator IC:

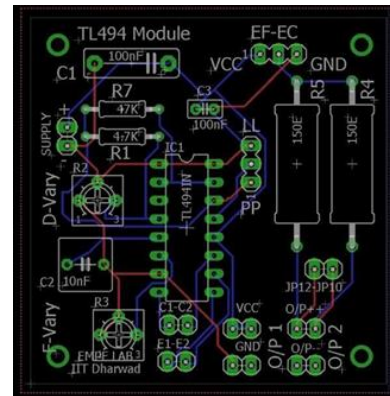


This is the PWM Generator used in the projects for generating pulsating square wave.

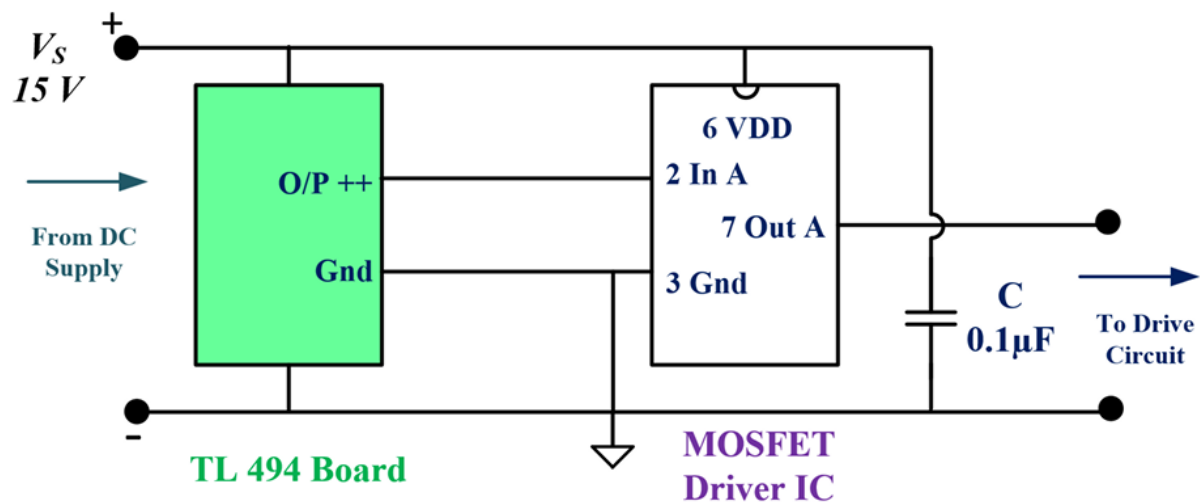
The TL494 Pulse Width Modulation (PWM) Generator is used to generate pulsating square wave for the switching of MOSFET.

The frequency of the output wave can be varied from 5KHz to 50KHz by the potentiometer R3.

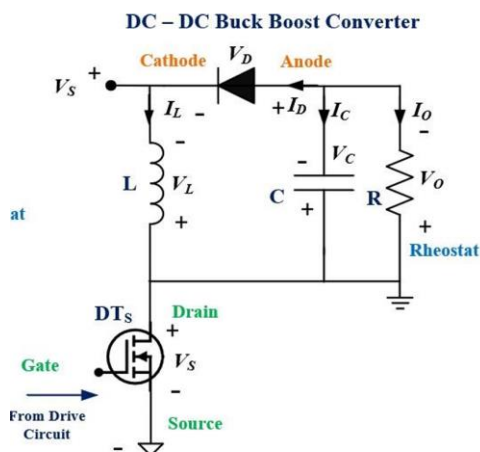
The duty of the output wave can also be varied from 35% to 65% by the potentiometer R2.



## # Interface Circuit to Driver IC:



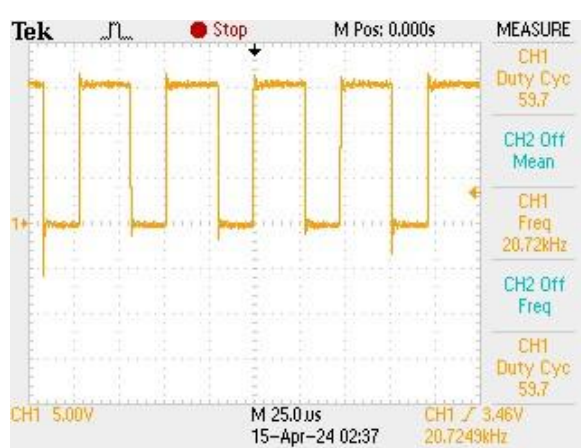
## # Buck Boost Converter circuit:



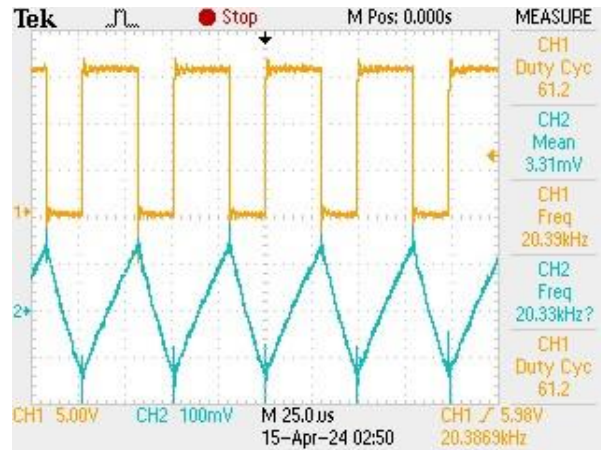
## # Specifications:

Input 12 V, Output 4-20 V, switching frequency 20 kHz, Output current 1A.

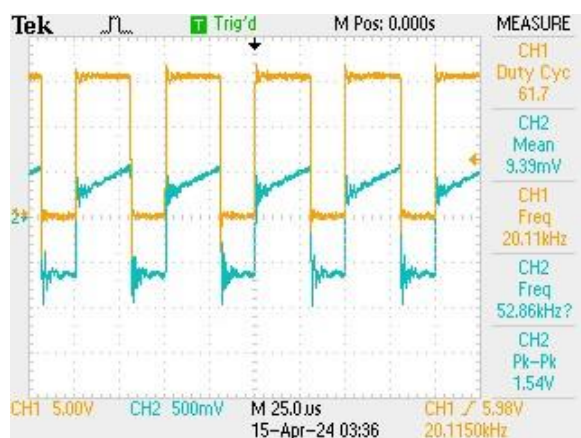
## # Results:



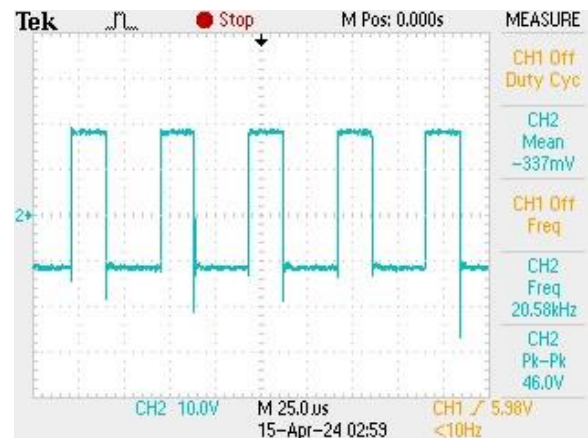
The gate pulse at 60% duty cycle.



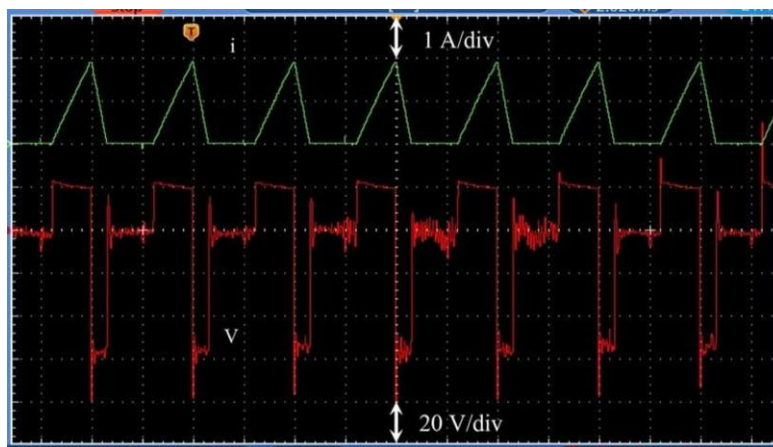
Inductor Current at 60% duty cycle.



Current through MOSFET at 60% duty cycle.



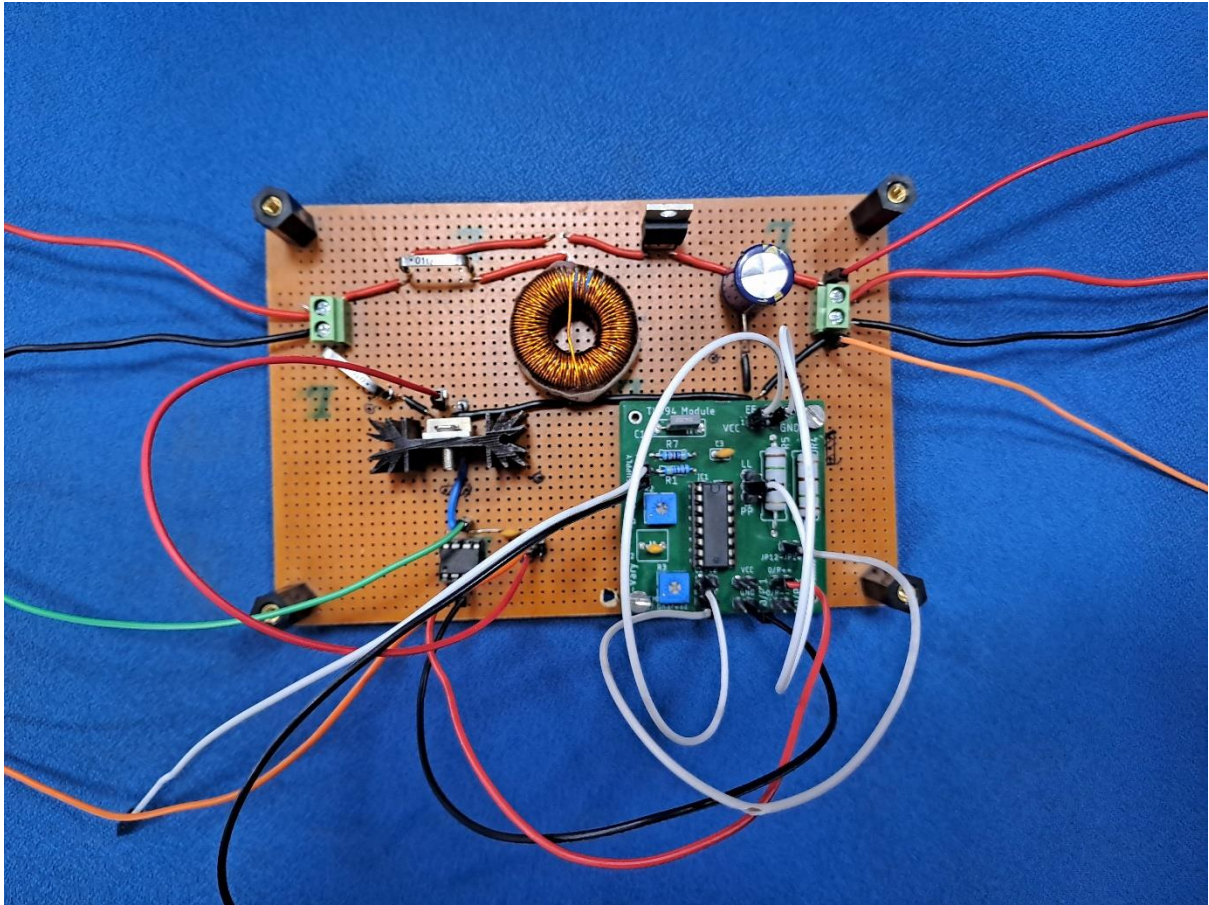
Waveform of voltage across diode.



Inductor current in DCM when load resistance is increased to 187 ohms.



## # Circuit Picture:



-----The End-----