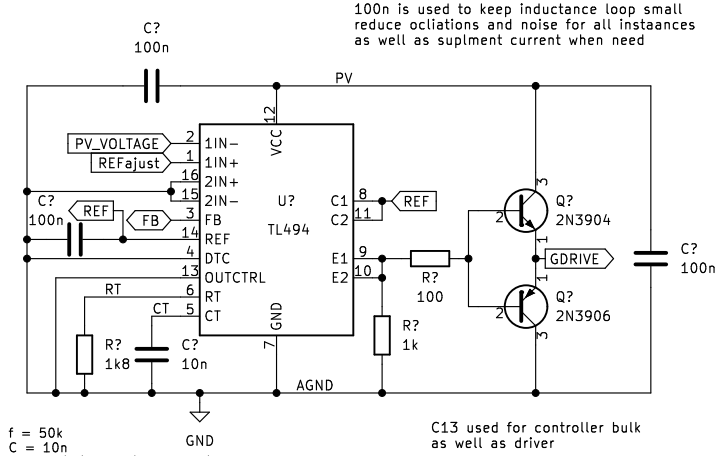
TL494 PWM @ 55kHz



f = 50k
C = 10n
R = 1/(fC) = 1/(50k * 10n) = 2k
Closest is 1k8 or 2k2
Gives f of ~55kHz with 1k8

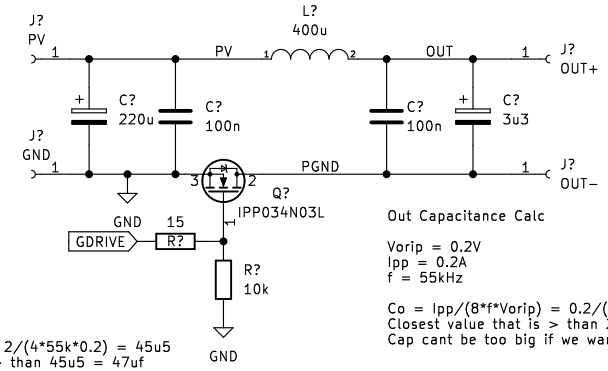
C13 used for controller bulk
as well as driver

Selection of the 1k was to help reduce tf
The selection of the 100 was to help with tr
and tf by pushing the npn in to saturation hard
and to provide mimial resitance for the pnp

POWER STAGE

Inductor Calc

Vs = 17V peak power from PV characterisation
Io = 1.5A − 2A using largest value
f = 55kHz due to slelected RT
Ipp = 0.2A
L = Vs/(4*f*Ipp) = 17/(4*55k*0.2) = 364uH



In Capacitance Calc

Io = 2A
Virip = 0.2V
f = 55kHz

Cin = Io/(4*f*Virip) = 2/(4*55k*0.2) = 45u5
Closest value that is > than 45u5 = 47uf
More Cap on input is better

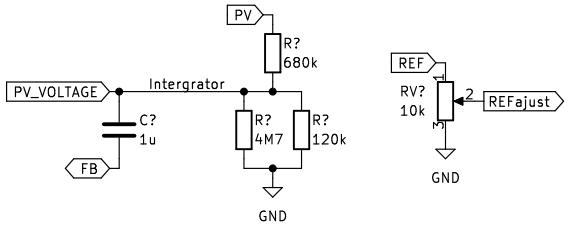
Out Capacitance Calc

Vorip = 0.2V
Ipp = 0.2A
f = 55kHz

Co = Ipp/(8*f*Vorip) = 0.2/(8*55k*0.2) = 2u3
Closest value that is > than 2u3 = 3u3
Cap cant be too big if we want fast responce

10k on gate is to help make sure the gate has no charge
left when the drive goes low

Intergrator Controller



Vdiv = 2.5V
Vmp = 17V
t = 100m
C = 1u
R = t/C = 100m/1u = 100k
Thev equivlent is Ru//Rl = 1/(1/Ru + 1/Rl)
voltage divider Rl/(Ru+Rl) * 17 = 2.5
Solving for Rl & Ru
Ru = 680k Rl = 117.241k

~117k Can be made with 120k//4M7