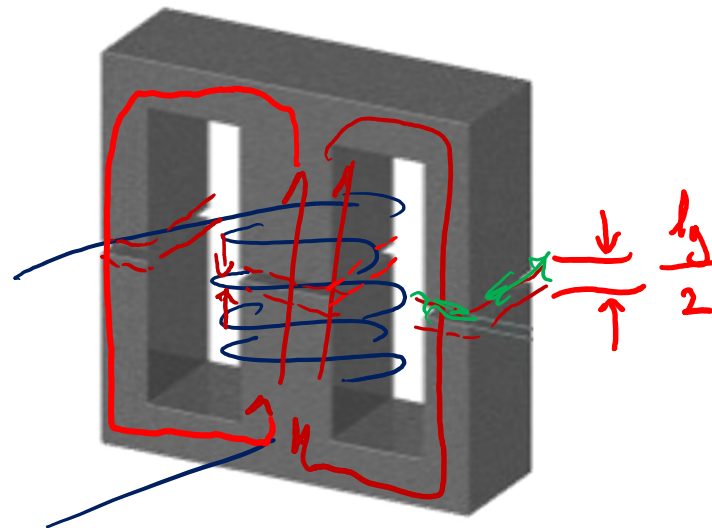
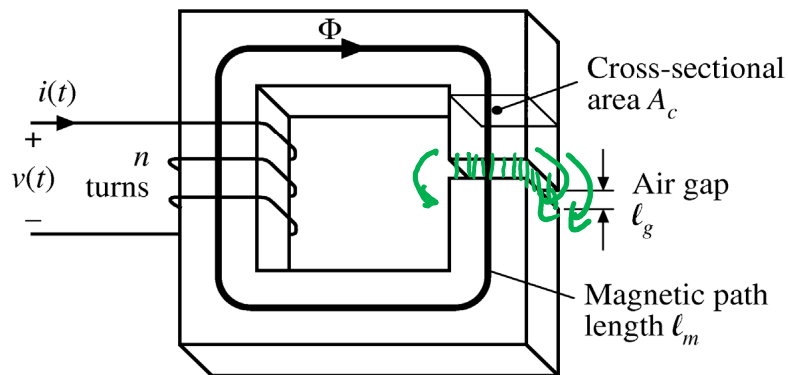


Experiment #3 Comments

- Focus on clean wiring, emphasizing good layout techniques
 - Keep pulsating current loops small
 - No wire is an ideal short
- Drill vector board holes first
- Avoid transients
 - Start switching, then slowly bring up input voltage
- Always have representative waveforms on oscilloscope
 - Switched node voltage, inductor current

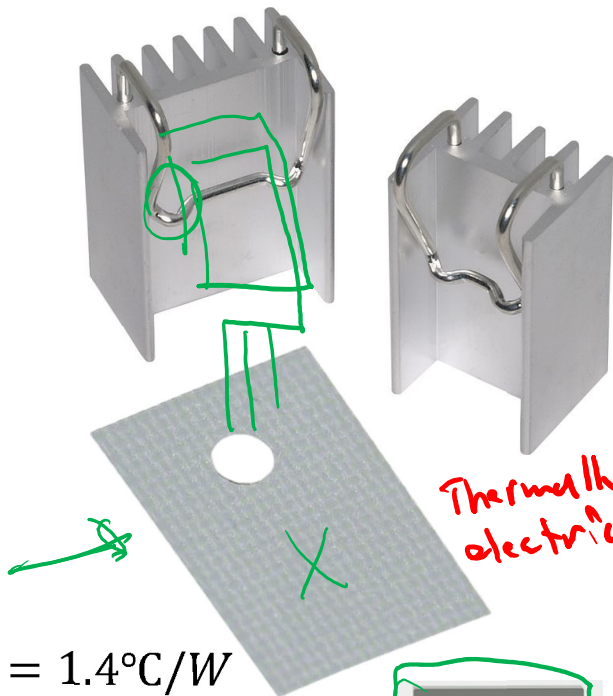
Inductor Air Gap



$$L \approx L_{ideal} \left(\underbrace{1 + \frac{l_g}{\sqrt{A_c}} \ln \left(\frac{2W}{l_g} \right)}_{\text{Fringe Factor}} \right)$$

Fringe Factor

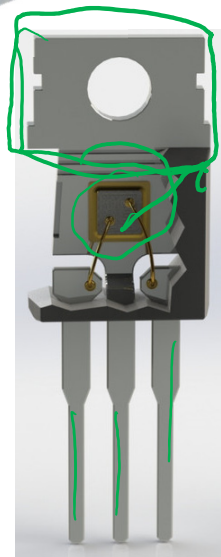
Heatsink



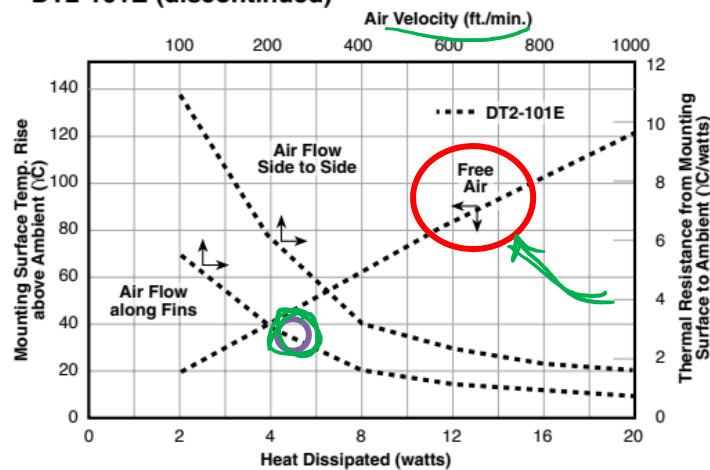
*Thermally conductive
electrically isolating*

$R_{TP} = 1.4^{\circ}\text{C/W}$

$R_{\theta_{jc}} = 0.5^{\circ}\text{C/W}$

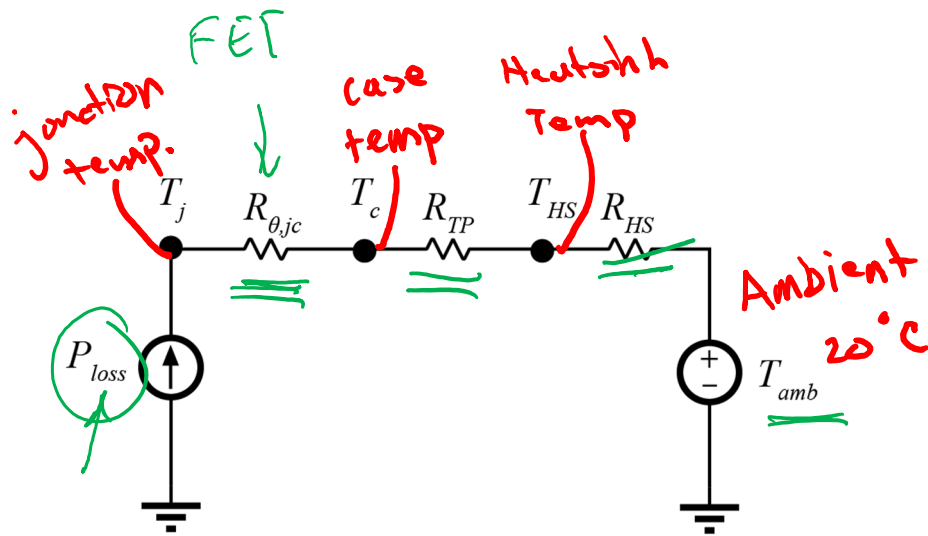


DT2-101E (discontinued)

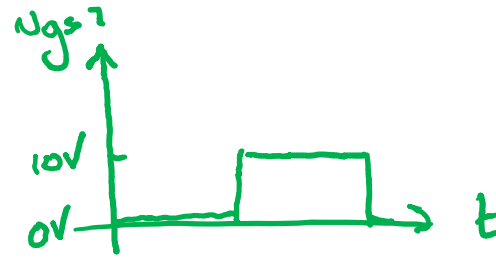
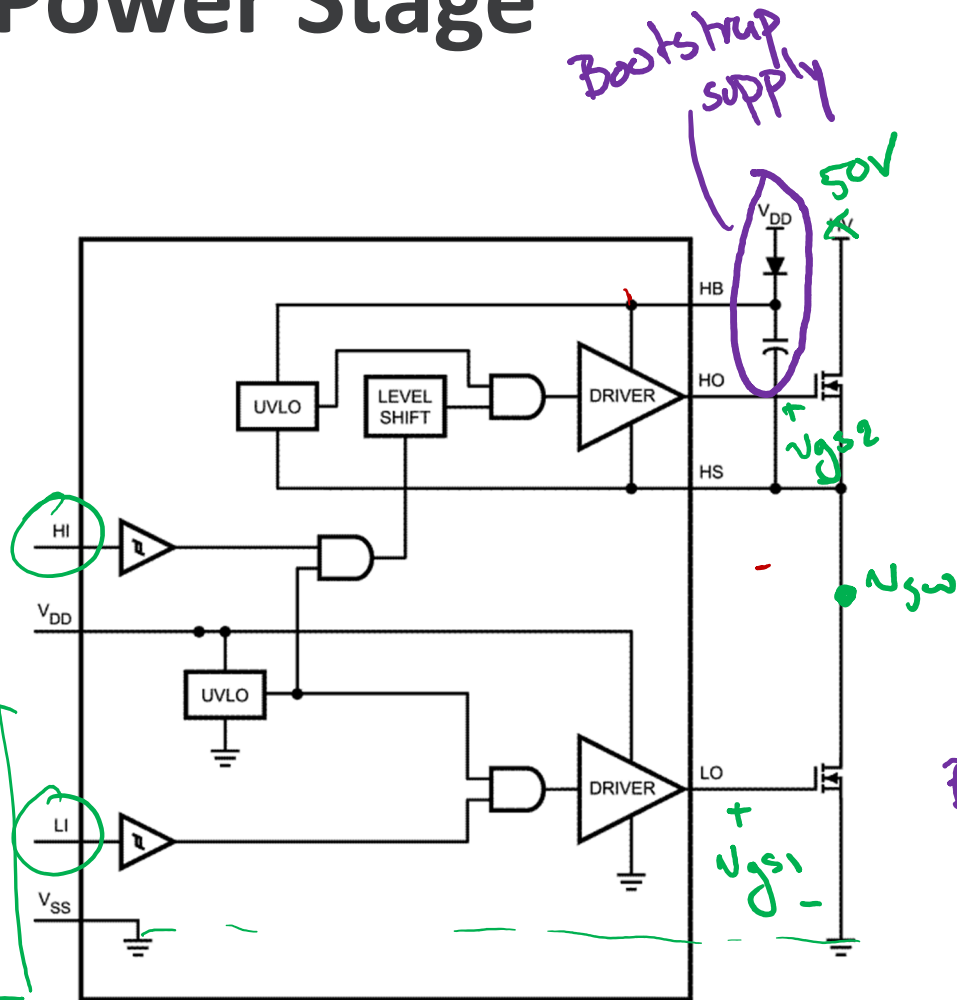


$R_{HS,nat} = 7^{\circ}\text{C/W}$

$R_{HS,250FPM} = 3^{\circ}\text{C/W}$

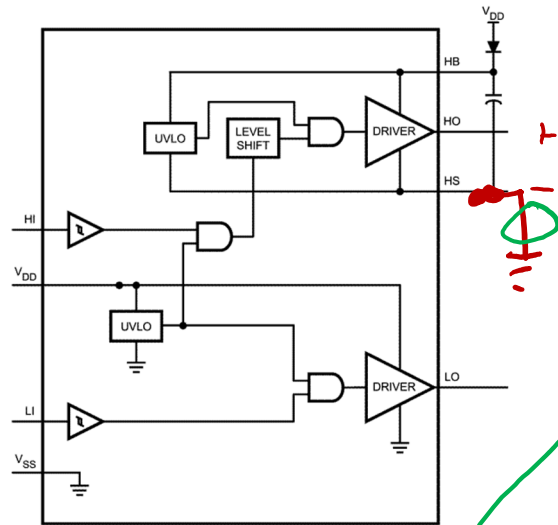


Power Stage

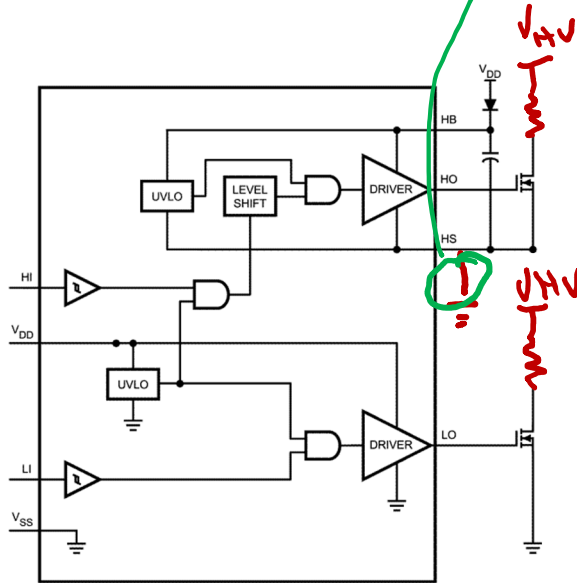
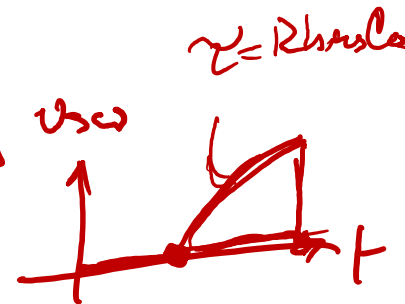
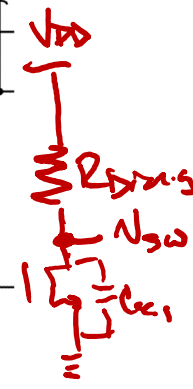
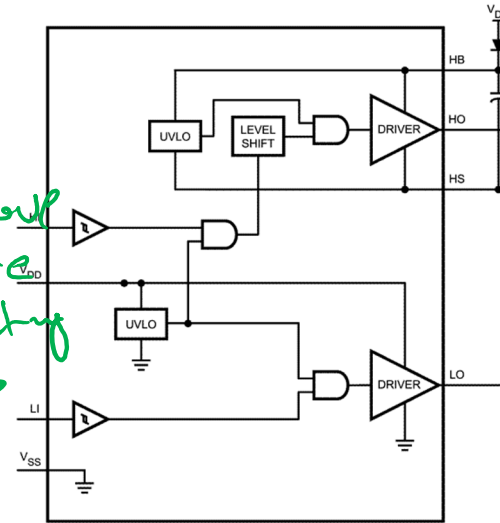


Bootstrap: diode recharges capacitor from V_{DD} every time low-side FET turns on

Some Test Circuits



Remove before connecting FETs



HS

