

# Proportional Control Efficiencies for Wavelength Electronics MPT-2500 & HTC 1500

By

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For

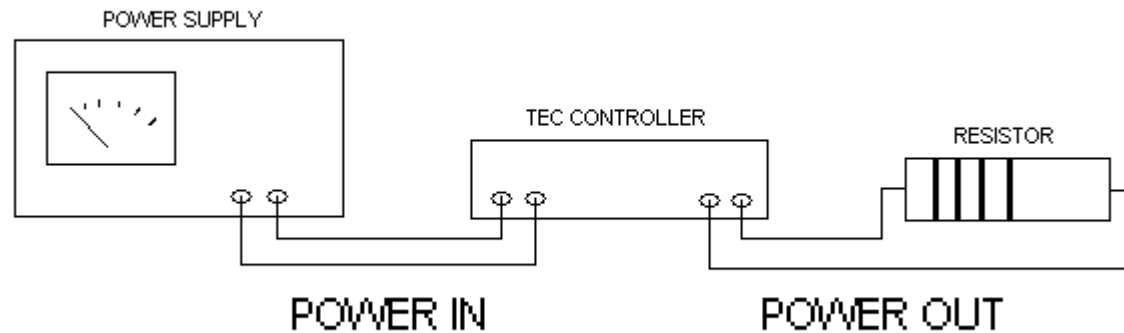
Professor Alex Hoehn

ASEN 5519

# Overview

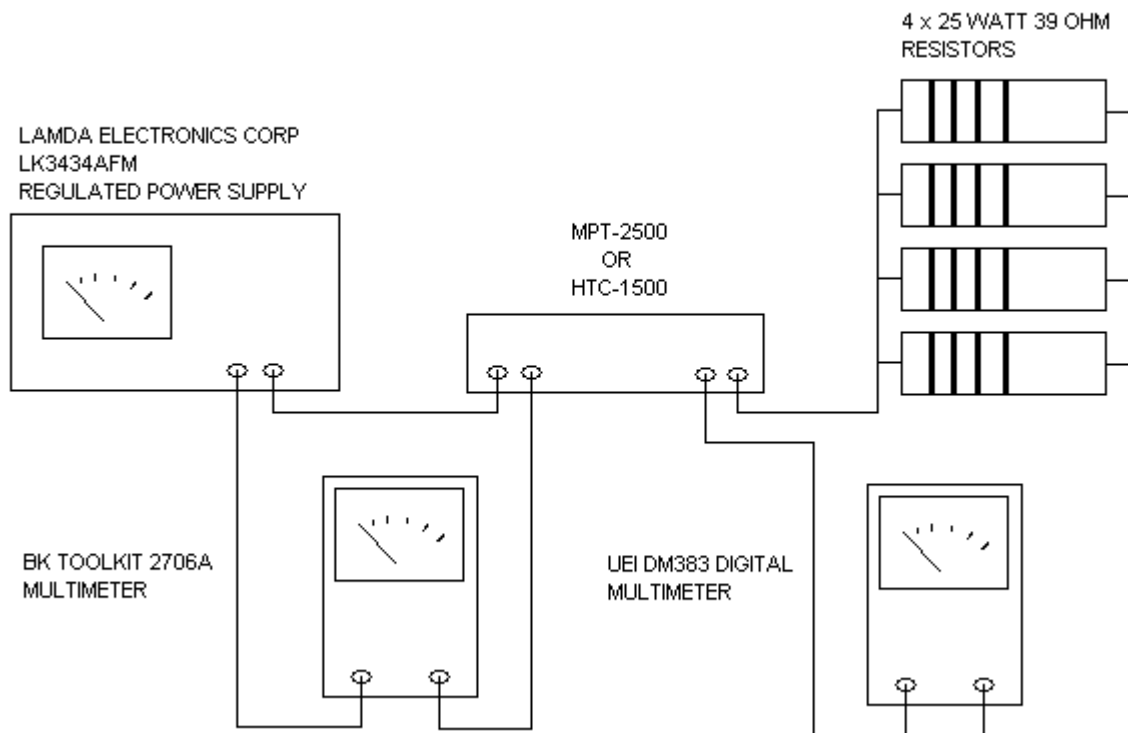
- Efficiency Definition
- Experimental Setup
- Results
  - HTC, MPT Performance and Comparison
  - MPT, PWM Comparison
- Discussion

# Efficiency Definition



$$\text{Efficiency} = \frac{\text{Power}_{In}}{\text{Power}_{Out}} = \left( \frac{V_{In} * I_{In}}{V_{Out} * I_{Out}} \right) * 100\%$$

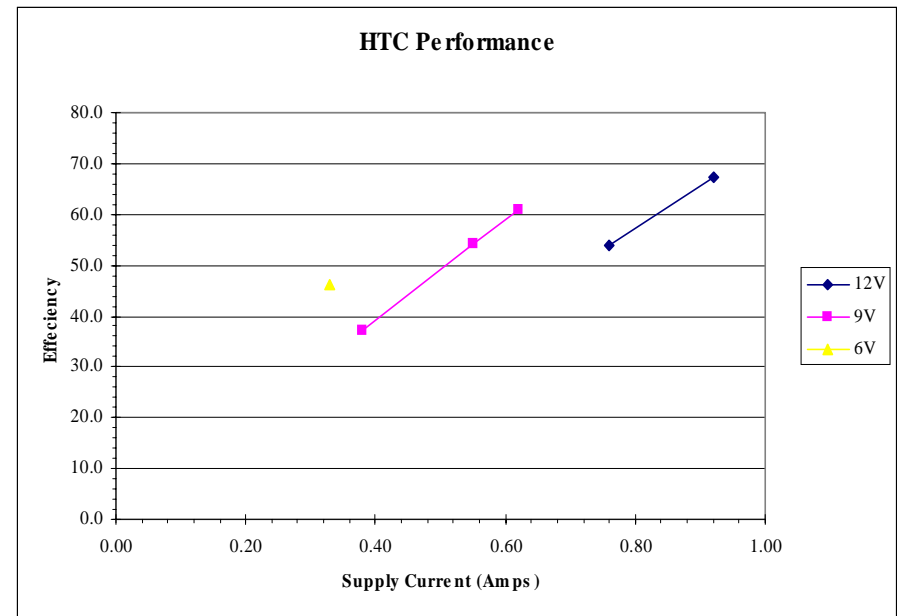
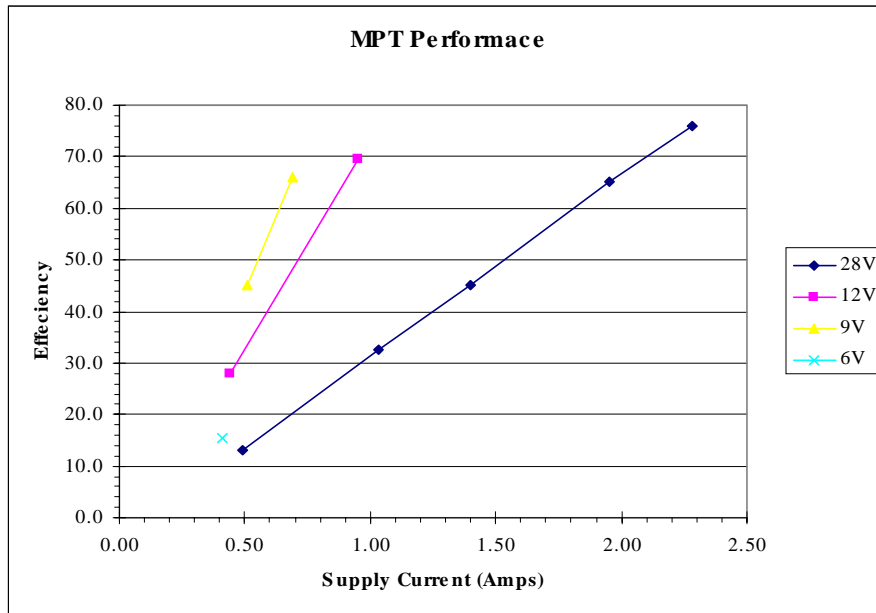
# Experimental Setup



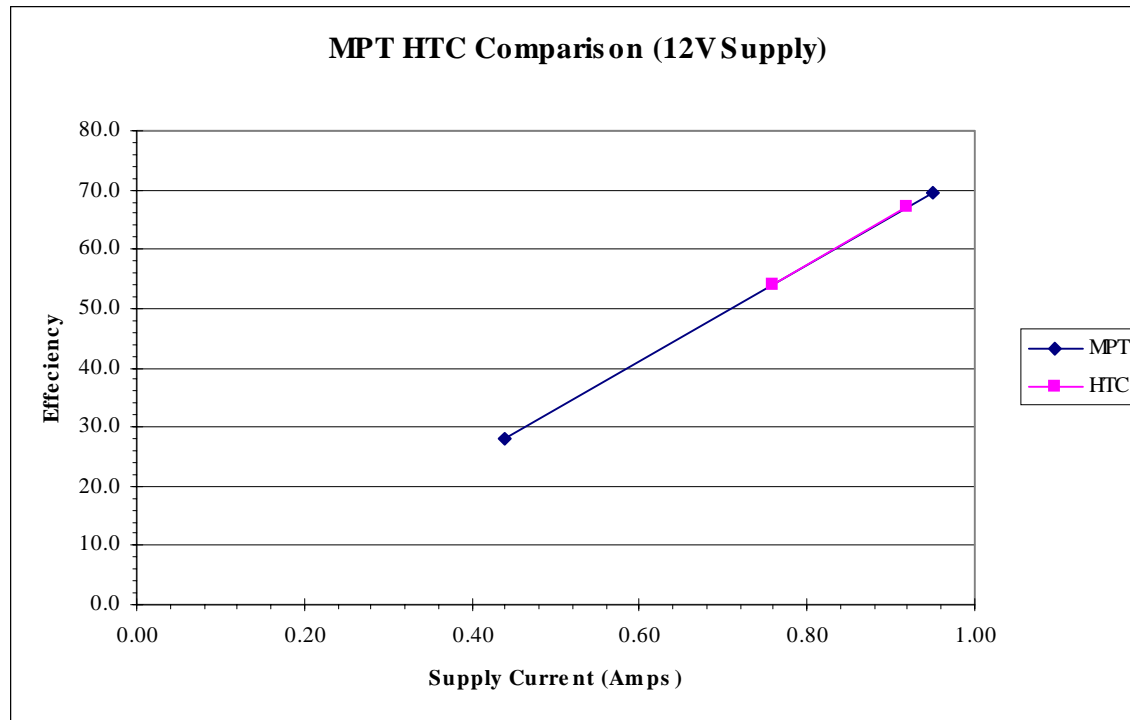
- Resistors instead of a TEC
  - $10.3 \Omega$
  - 100W
  - Hotplate
- Additional Multimeter to measure Voltages

# Results - MPT, HTC

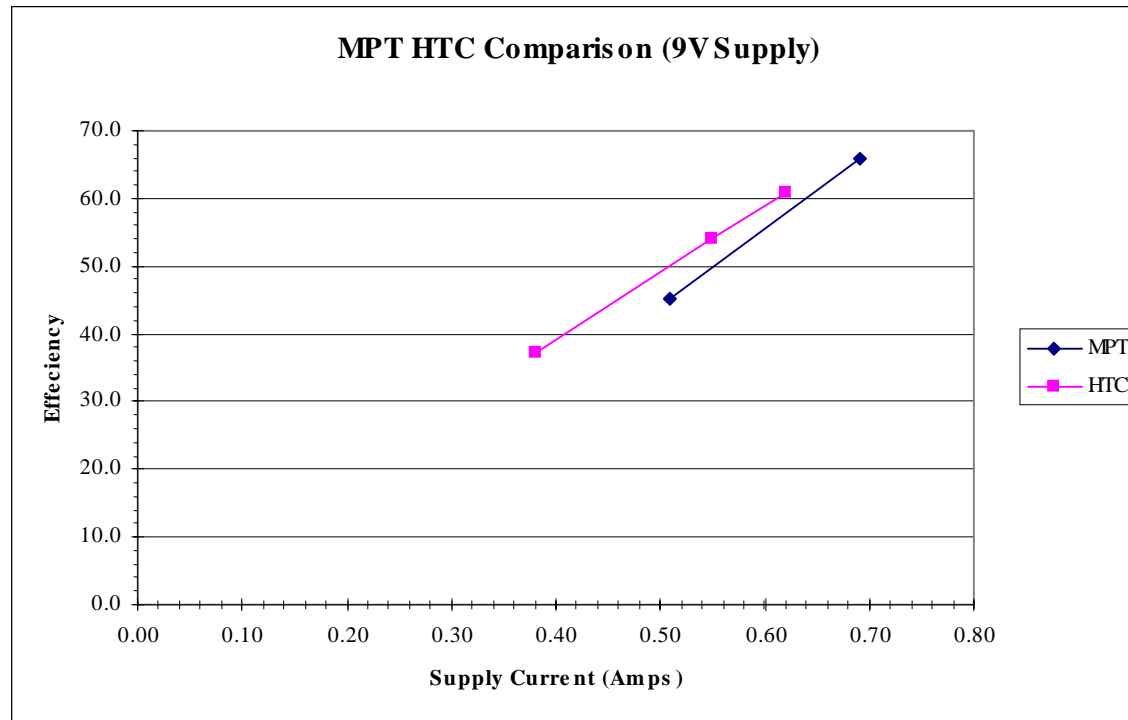
## Performance



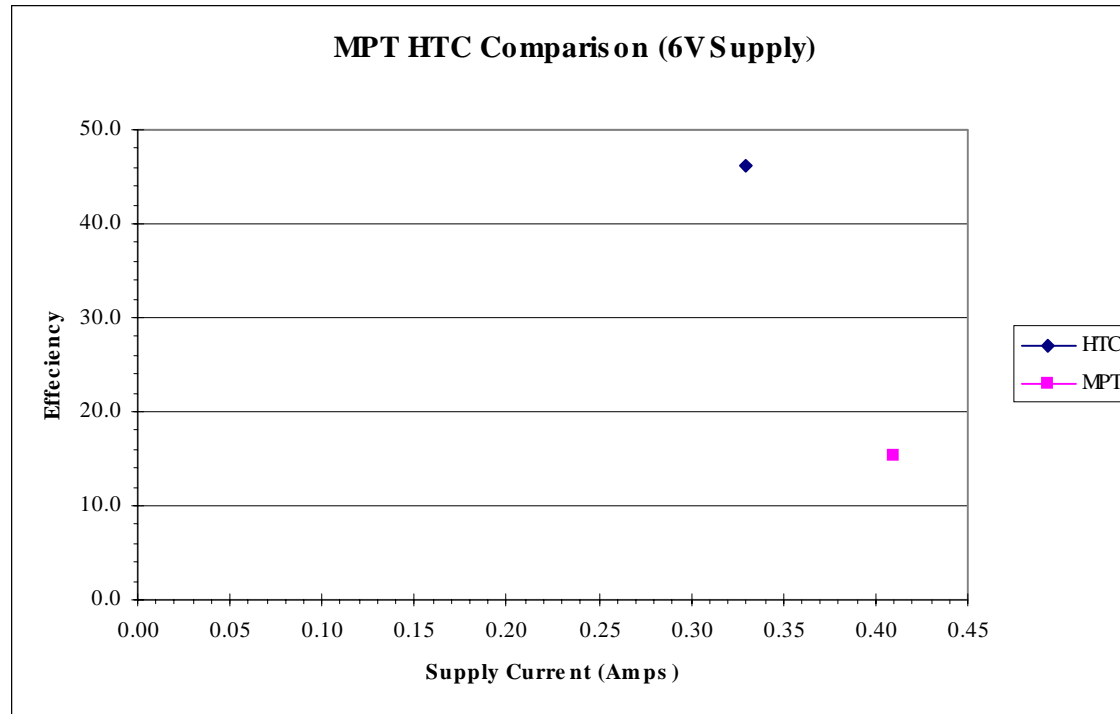
# Results-MPT, HTC Comparison



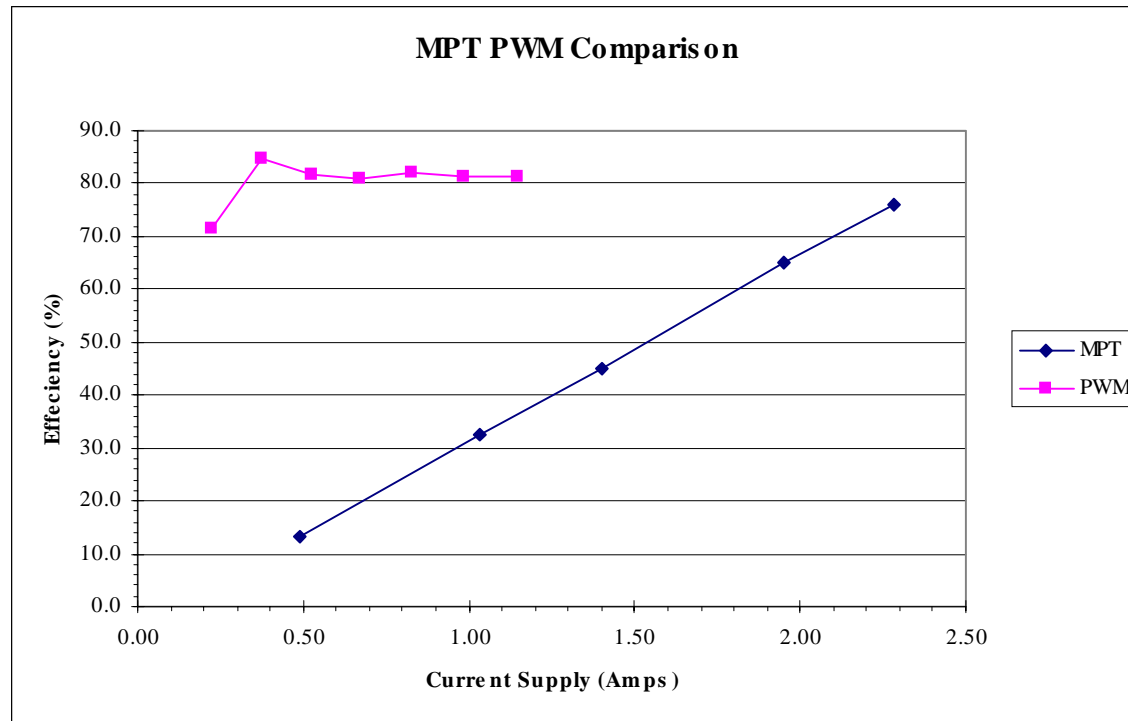
# Results-MPT, HTC Comparison



# Results-MPT, HTC Comparison



# Results-PWM, MPT Comparison



PWM data provided by Charles Dumont

# Discussion

- Linear Efficiency Response Over Measured Range for MPT and HTC
  - Better Efficiencies for Lower Supply Voltages
  - HTC Has Better Efficiencies **ONLY** for Low Supply Voltages (9V & 6V)
- PWM Rules!