

Characterization of Gallium Nitride based Visible Light Emitting Diodes

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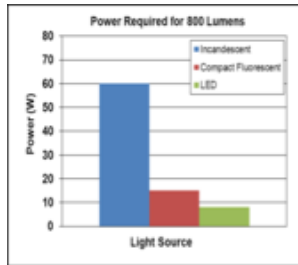
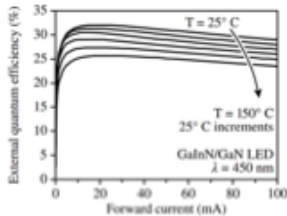
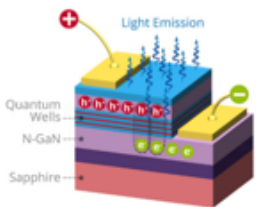
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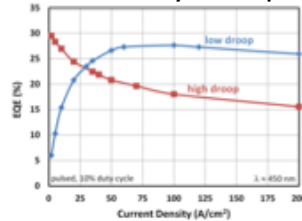
Background



LEDs main sections

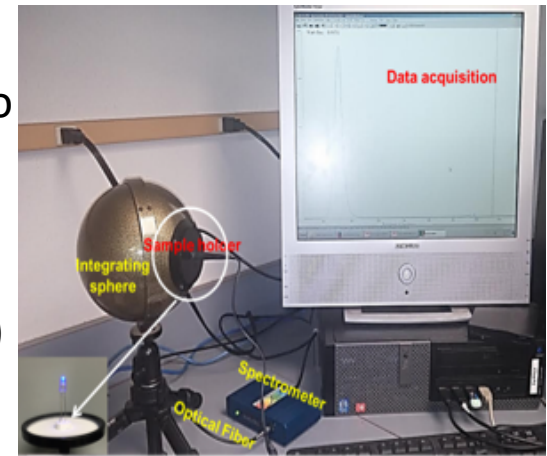


Efficiency Droop



Method

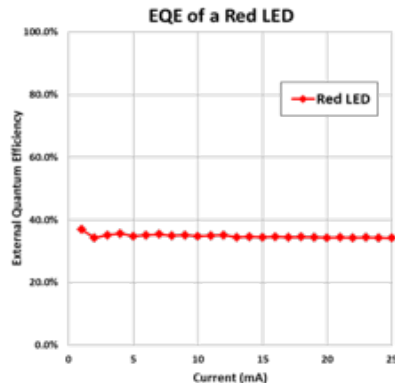
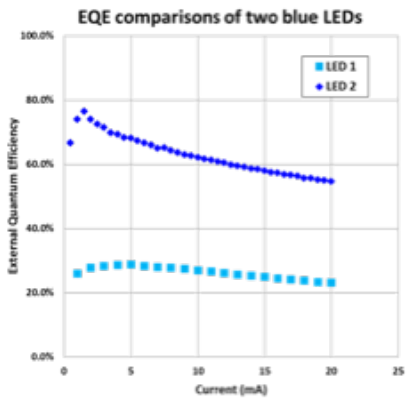
Integrating Sphere Setup to measure External Quantum Efficiency (EQE) vs Current



Results

Blue is a gallium nitride based LED

Red is a gallium arsenide based LED



This proves that Efficiency droop is more pronounced in the GaN family of devices

Conclusions and Future Work

- Successfully setup the integration sphere and the components to measure EQE of packaged LEDs.
- Measured Current vs. Voltage curves of our fabricated LEDs and store-bought LEDs
- Measured EQE for store-bought LEDs
- Efficiency droop is a characteristic of gallium nitride LEDs
- GaN based nanostructures (nanowires and nanowalls) could be potentially engineered to mitigate effects of efficiency droop
- Package nanostructured LEDs within bell shaped epoxy, similar to commercial store-bought LEDs and measure EQE