

# Limits of SSL?

Estimates and Extrapolation

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# What is next in SSL?

- Improved Performance
- Lower Cost
- Better Quality
- New Form Factors
- New Connectivity
- Even Wider Usage
- Better Education

# Amazing Progress

- Filament style
- 2700K
- 500 lumens
- 4.5W
- 111 lumens/Watt
- 15000 hours
- \$3 (\$6/k-lumen)



**Great Value**

INCANDESCENT REPLACEMENT  
DIMMABLE  
LONG LIFE 13 YEARS

Lighting Facts Per Bulb	
Brightness	500 lumens
Estimated Yearly Energy Cost	\$0.54
Based on 3 hrs/day, 11¢/kWh Cost depends on rates and use	
Life	13.7 years
Based on 3 hrs/day	
Light Appearance	Warm <span style="float: right;">Cool</span>
2700 K	
Energy Used	4.5 watts

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for replacement or money back.  
1-877-505-2267 or visit us  
online at [walmart.com](http://walmart.com)

120 volts | 4.5 watts | 2700 K

# Cost of Light

Lamp	Year	Lumens	Lifetime K-hrs	Cost (\$)	W	LPW	Cents/lumen	Cost of Light
Philips 60W	2017	800	10	\$1.99	8	100	0.25	\$3.12

What if we beneficially double or halve the specs?

Specification	Cost of Light Impact
Lumen output (800 to 1600)	\$1.56
Lifetime (10K to 20K hours)	\$2.06
Cost (\$1.99 to \$1.00)	\$3.00
Power (8W to 4W)	\$2.62



CoL – Cost of Light is in dollars per million lumen hours

# Savings thru Performance

## Age of Incandescent

- Lighting was 15% of electrical bill
- 10 lpw – high costs

## Age of LED

- Factor of 10 increase (10 to 100 lpw)
- Lighting now 2-4% of electrical bill



# Savings Again?

Is there a cost benefit to save a few percent of your electrical bill?

Unlikely. If a homeowner spends hundreds of dollars changing once, why would they spend this again?

Targeting long term replacements gives little incentive to manufacturers.

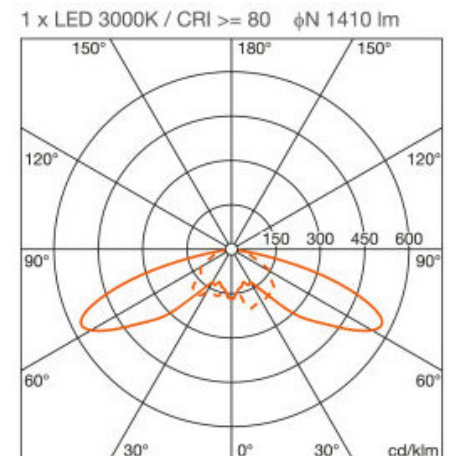
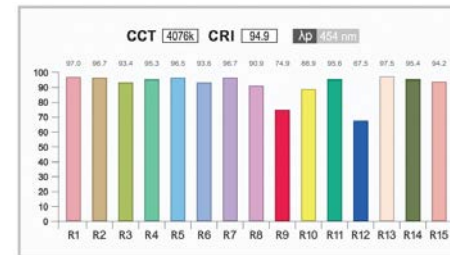
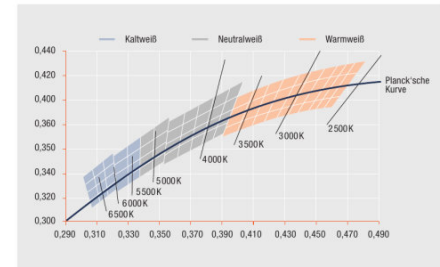
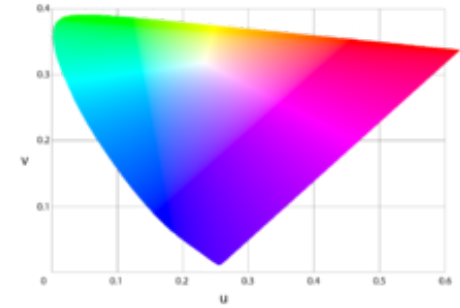


# Quality

So many ways to measure quality:

- Chromaticity (CIE  $u'v'$ )
- Color Consistency (SCDM)
- Color Rendering (CRI, R9 - GAI, CQS)
- Color Temperature (CCT)
- Lifetime (L70)

What about System Quality?



# Improved Control

Light control history:

Switches

Dimming

Scenes – Presets

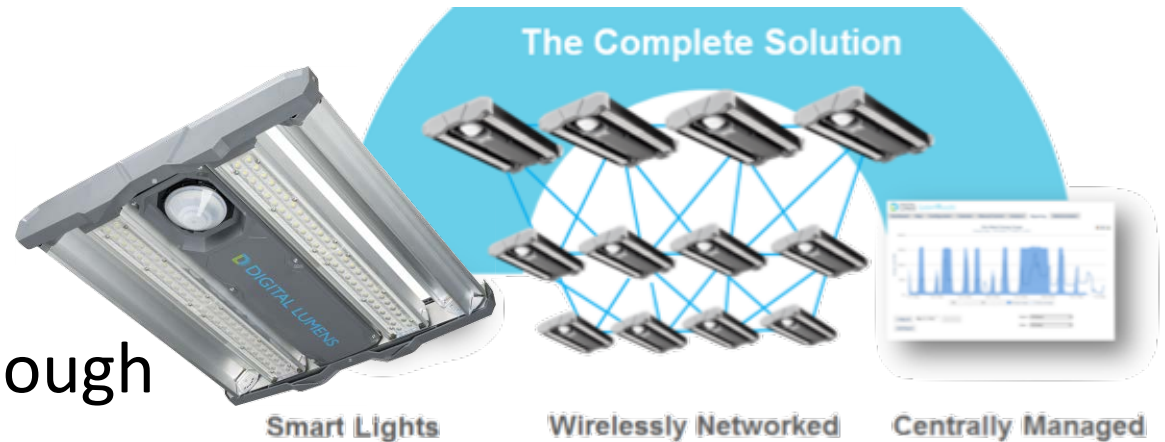
Cues

Sensing

Occupancy

Daylight

Significant savings through  
sensing and control





# Control - IoT



**SILK IS SMART**

- Automatic Color Temperature Shift
- Custom Light Scheduling
- Wi-Fi Connectivity
- Automatic Dimming
- Custom Light Switch Behaviors
- Free Silk Light App

- Internet and Bluetooth connectivity
- Smartphone driven controls & monitoring

- Energy savings
- Better environmental control
- Aesthetics & design (S/W)



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the art of not doing™

FoxDen is a suite of IoT products that are controlled by your smart device, no hub or bluetooth required.

START AT \$40

HELP US BEGIN OUR JOURNEY BY FREE ORDERING OUR LAUNCH PRODUCT. THE FOXDEN LED SMART BULB AND SWITCH BELOW FOR MORE REASONS WHY YOU NEED TO ORDER ONE TODAY! DON'T FORGET TO CHECK BACK OFTEN FOR THE MANY UPDATES THAT ARE COMING AND FOLLOW US ON SOCIAL MEDIA.



**LumiFi**

Browse Light Moods

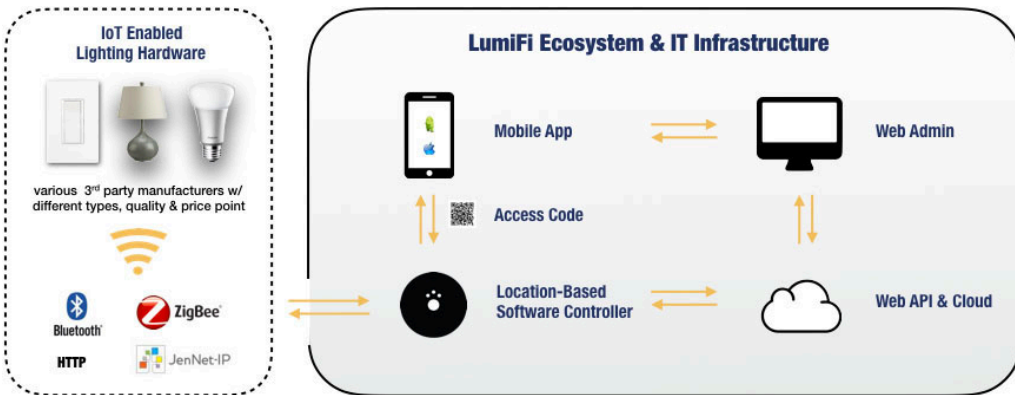
OUR STANDARD MOOD SELECTION

- Energize
- Relax
- Focus
- Rest
- Sexy
- Lounge
- Party
- TV Mode
- Romance

OUR DELUXE MOODS

- Wake-Up Sunrise
- Patriot Day
- Live Weather

WITH MANY MORE TO COME ...



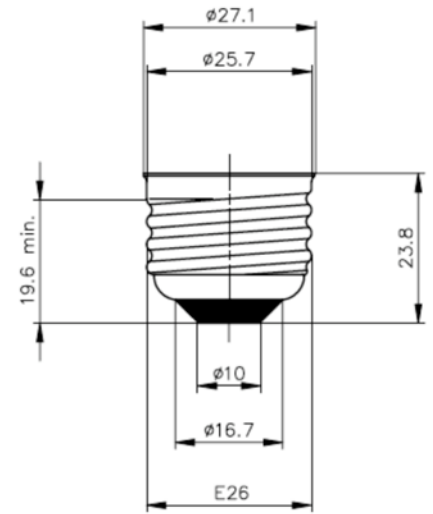
# Form Factor

Edison base, now called E26, has not changed over a century.

Provides mechanical and electrical connections but not thermal or data

Shape is iconic but pointless in a new age of light.

Very big opportunity to drive LED use.



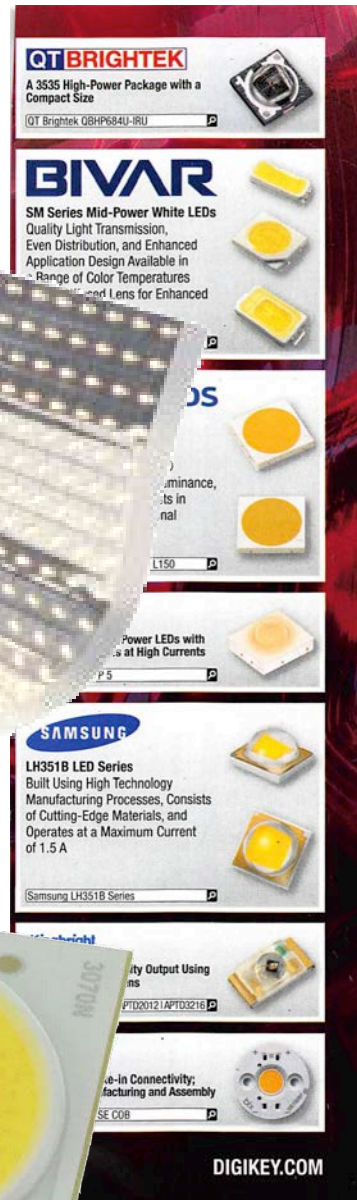
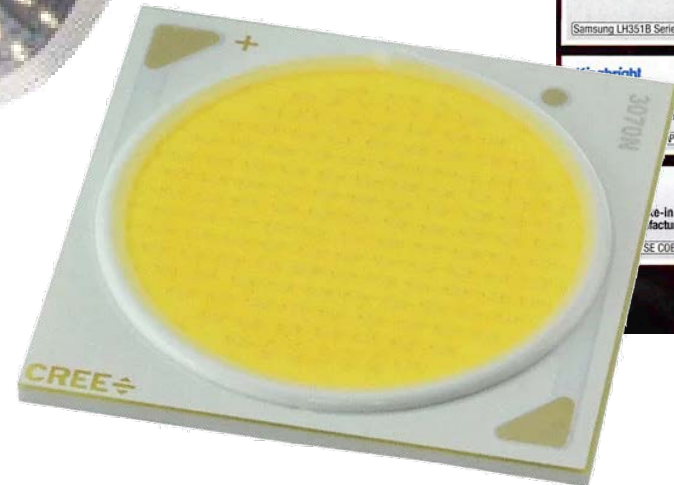
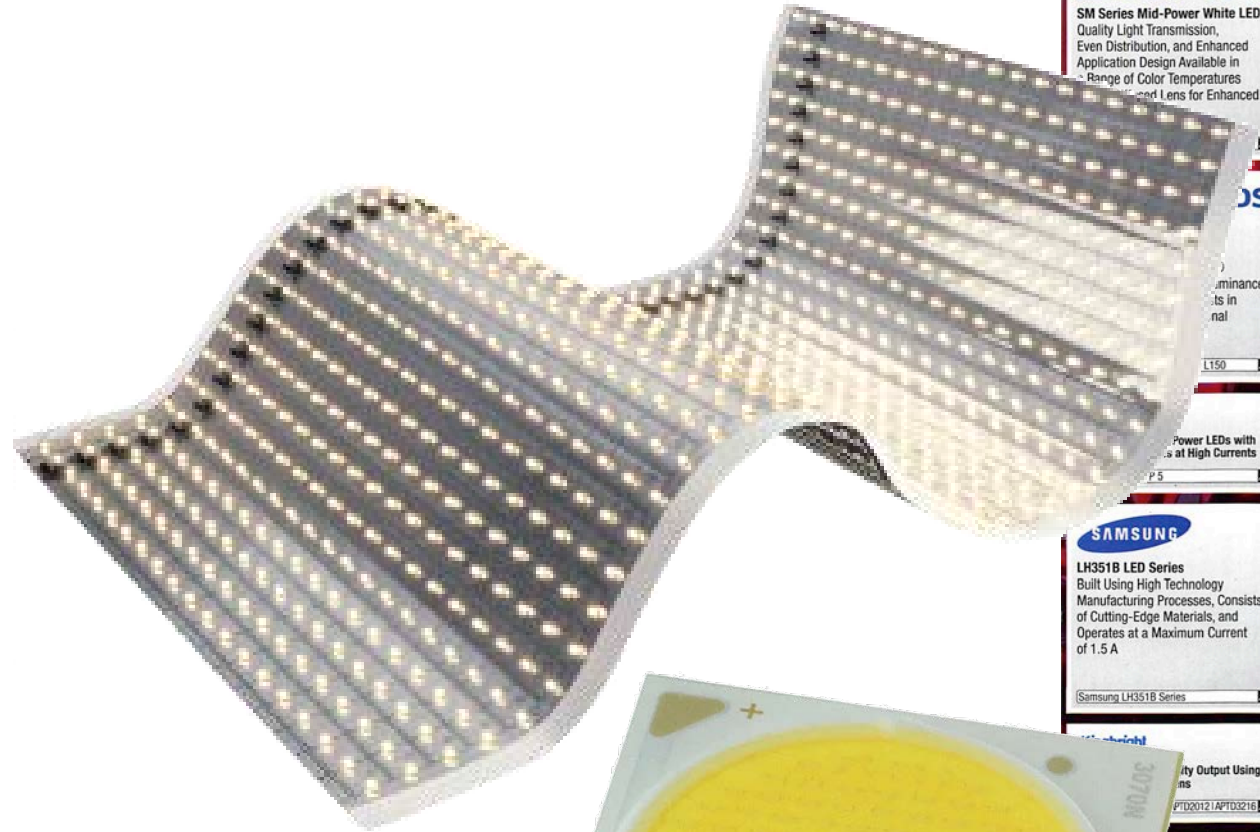


# Form Factor

Points

Lines

Planes



Whole new design horizons

Thank You