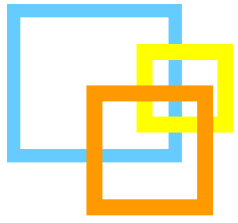


電力電子產業趨勢與照明應用

Power Electronics Industry Trends

2013/10/11

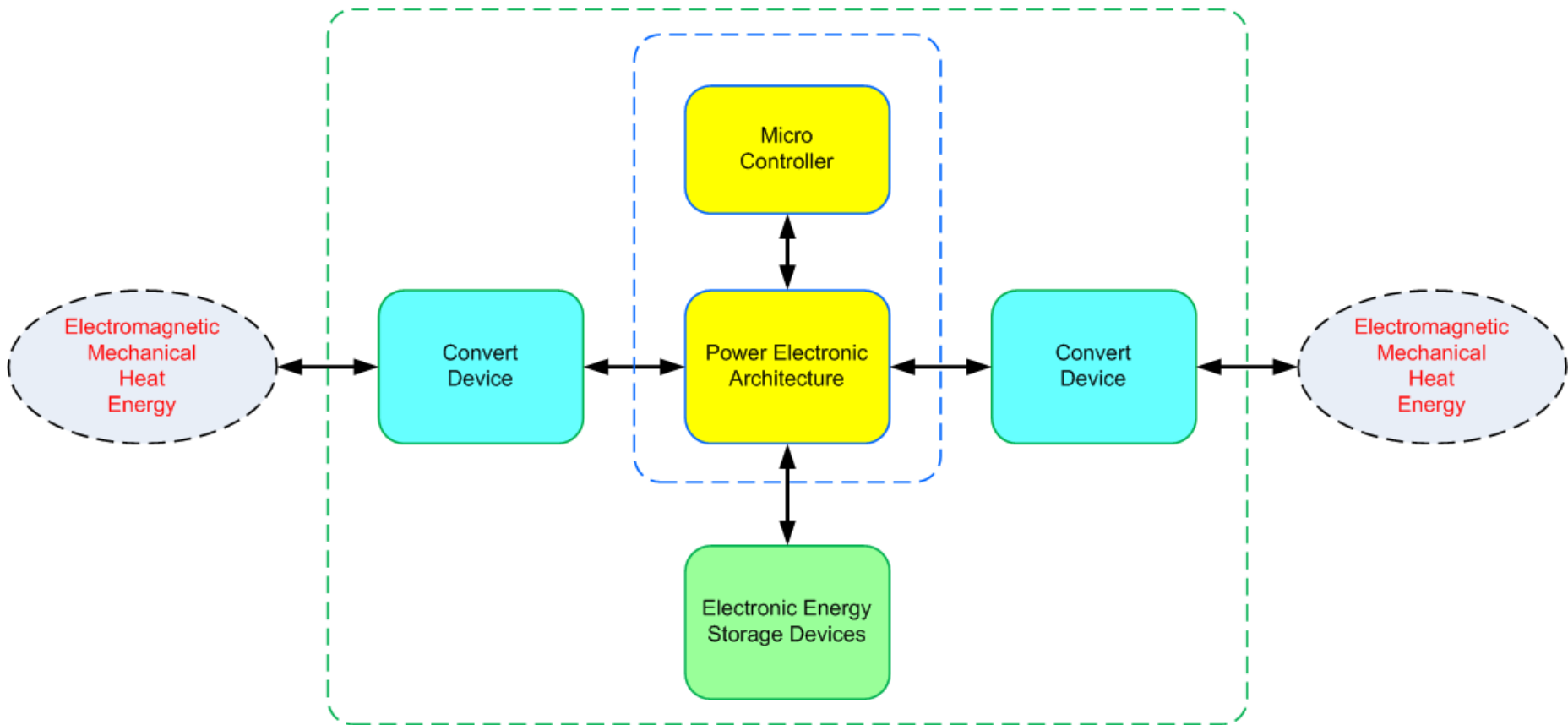
林憲男

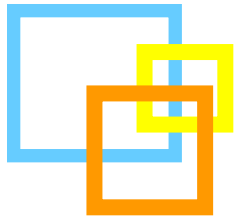


Outline

1. News
2. Introduction
3. Power Electronics Industry Trends
4. LED Lighting Application
5. Q & A

Power Electronics Field





Micro Controller Trends

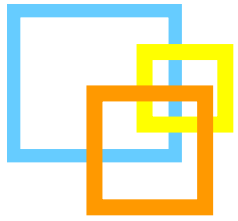
Physical

1. Operation Frequency Increase
2. Low Power Consumption
3. Multi-Function

Commercial

1. Miniaturization
2. Low Cost
3. Digitized
4. Artificial intelligence (AI)





Power Electronic Architecture Trends

Physical

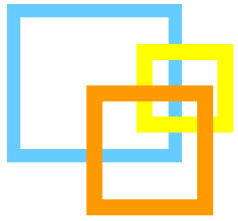
1. High Converting Efficiency
2. Low Power Consumption
3. Miniaturization
4. Long Life Time
5. High Reliability



Commercial

1. Simple Schematic Design
2. Low Cost
3. Integrate Circuit
4. Digitized

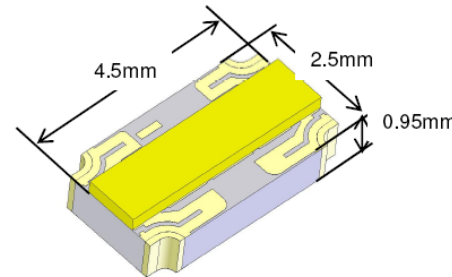




Convert Device Trends

Physical

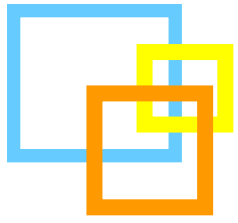
1. High Converting Efficiency
2. Low Power Consumption
3. Miniaturization
4. Low Input Voltage
5. Long Life Time
6. High Reliability



Commercial

1. Simple Production Process
2. Low Cost
3. Digitized





Electronic Energy Storage Device Trends

Physical

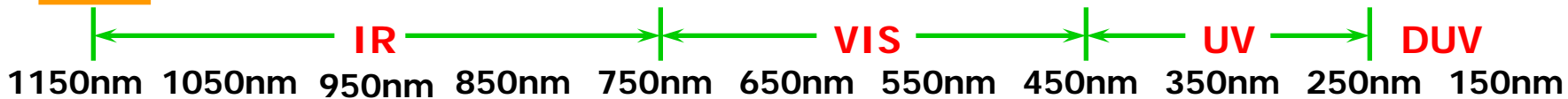
1. Operation Frequency Increase
2. Low Power Consumption
3. Multi-Function

Commercial

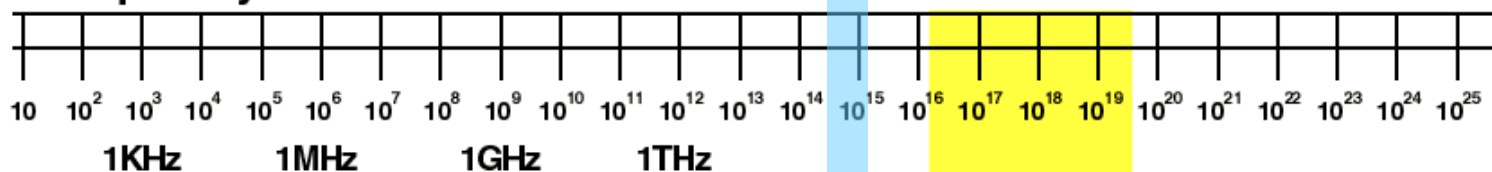
1. Miniaturization
2. Low Cost
3. Digitized
4. Artificial intelligence (AI)



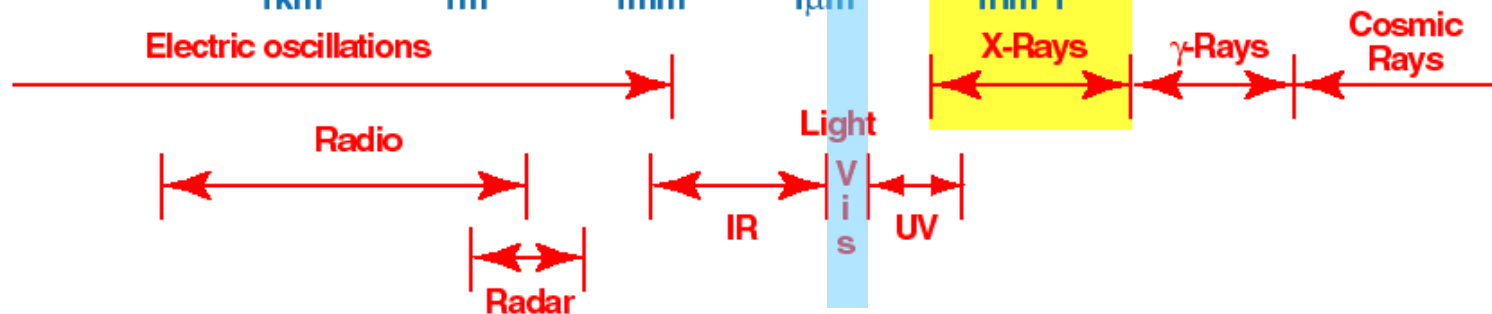
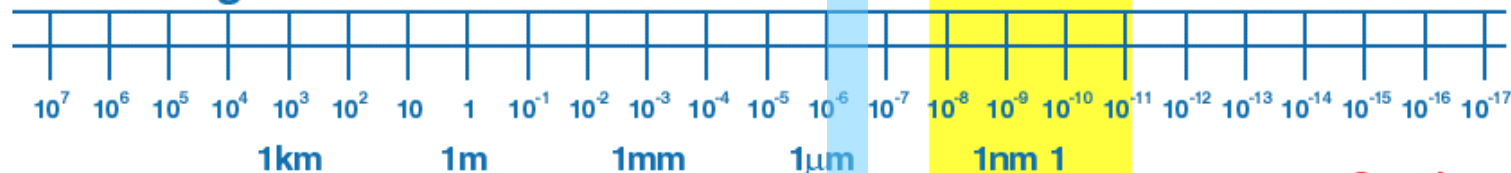
Electromagnetic Waves

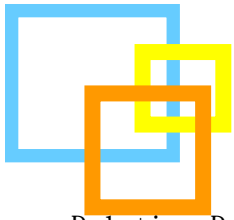


Frequency Hz



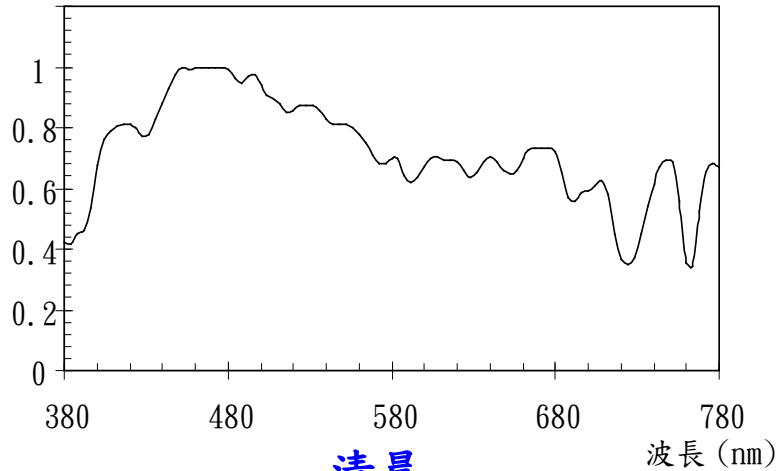
Wavelength Metres





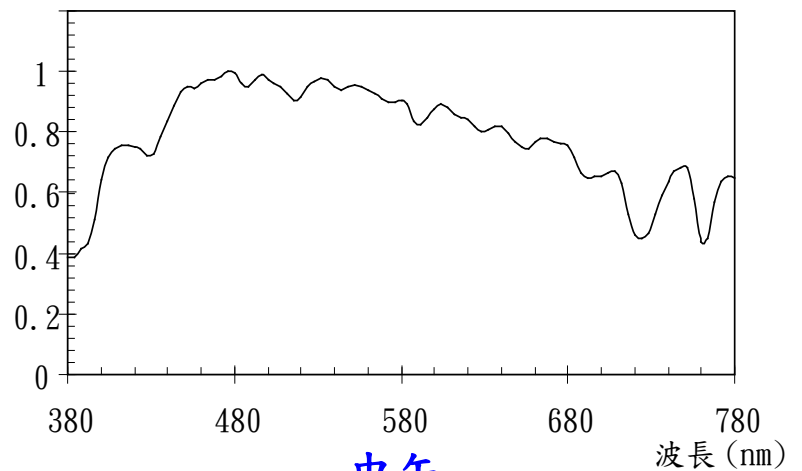
Sunlight Spectrum

Relative Response 100% = 0.006529 (W/sr/m²)



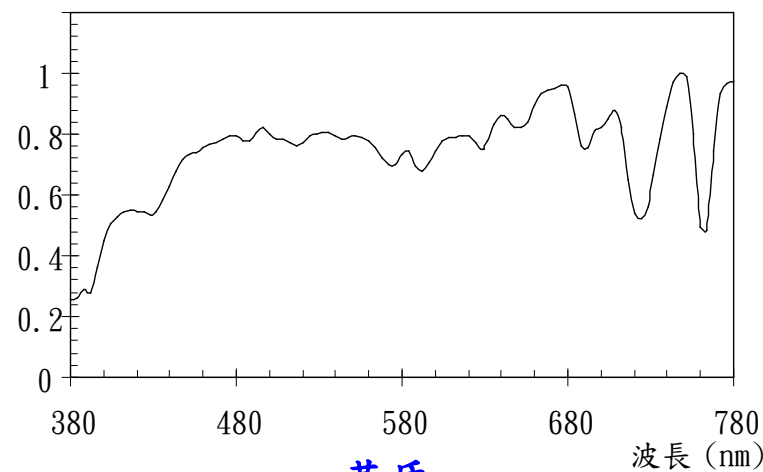
清晨

Relative Response 100% = 0.245 (W/sr/m²)

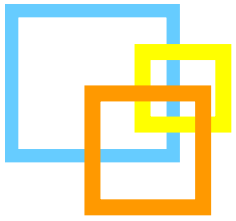


中午

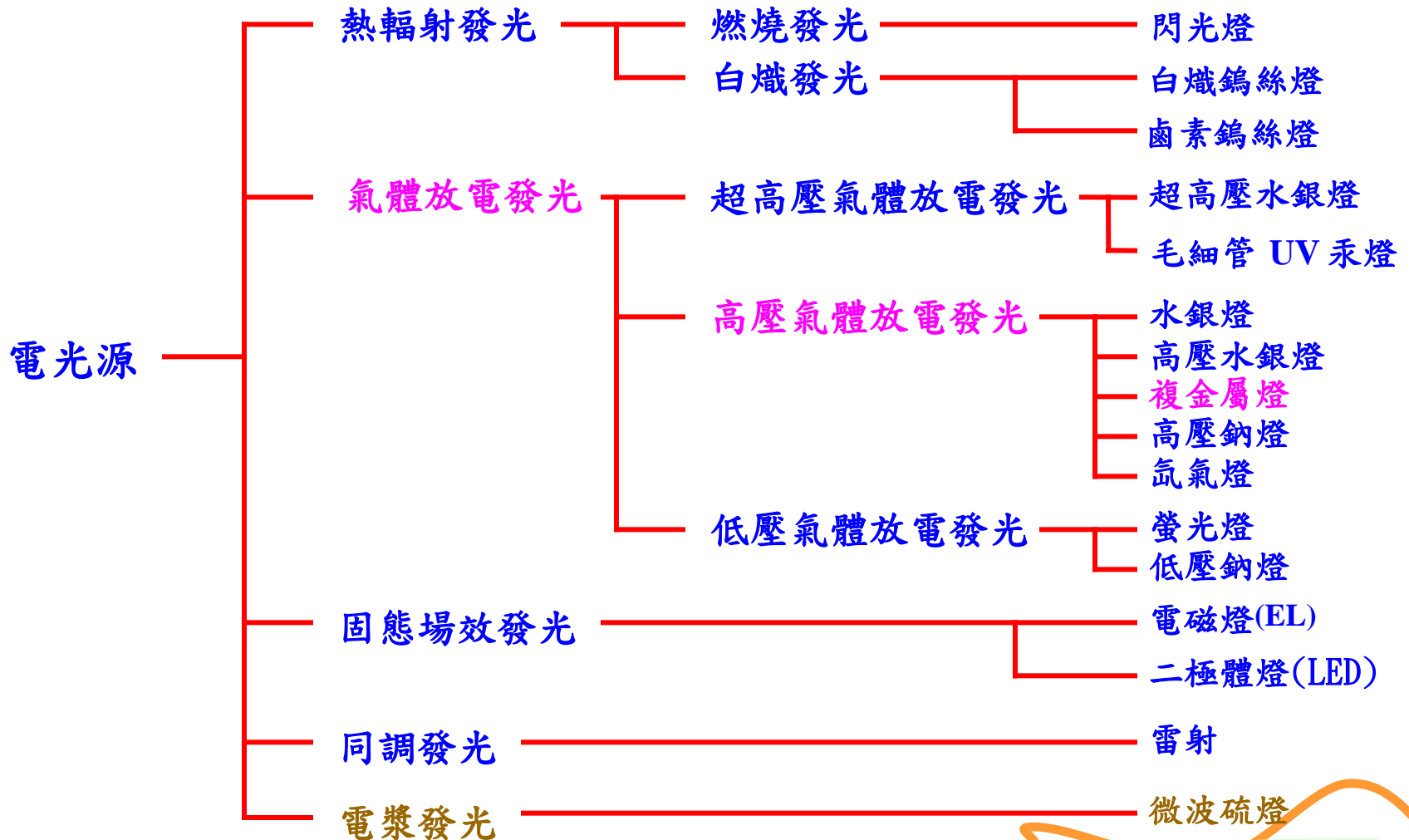
Relative Response 100% = 0.0022 (W/sr/m²)



黃昏



Light Source Classification



Light Source History

白熾光源

1880 鎢絲燈



1960 鹵素燈



放電光源

1930 日光燈



1980 省電燈



1900 水銀燈



1930 鈉燈



1960 複金屬燈



1980 CCFL



固態光源

1960 LED

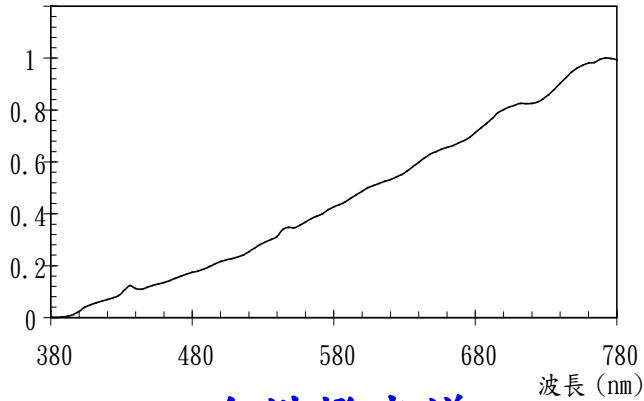


2013 LED



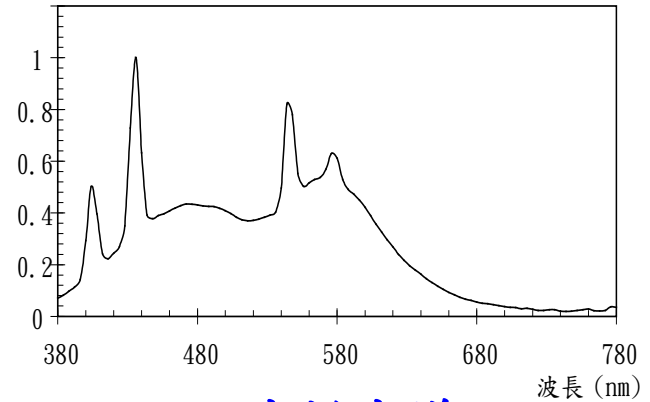
Light Source Spectrum

Relative Response 100 % = 0.03041 (W/sr/m²)



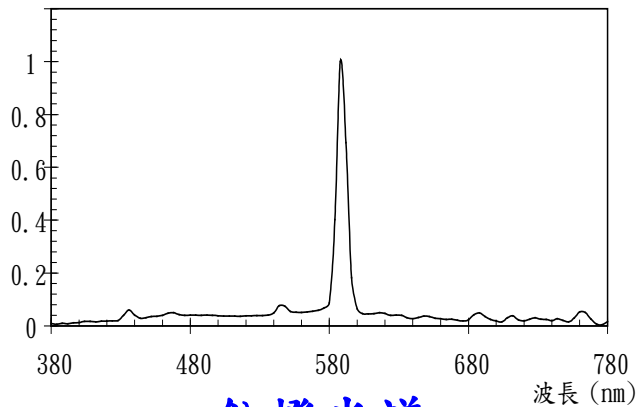
白熾燈光譜

Relative Response 100% = 0.3224 (W/sr/m²)



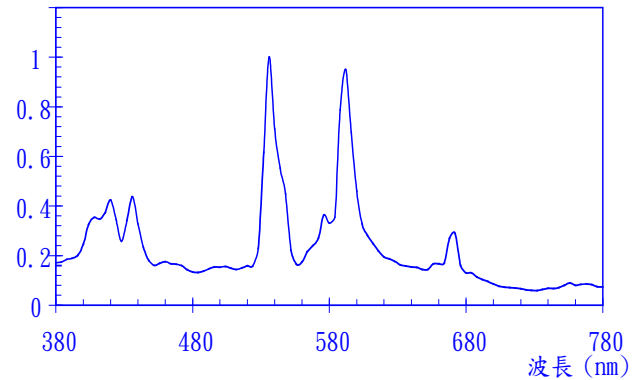
日光燈光譜

Relative Response 100% = 0.08436 (W/sr/m²)

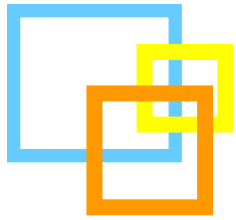


鈉燈光譜

Relative Response 100% = 3.459 (W/sr/m²)

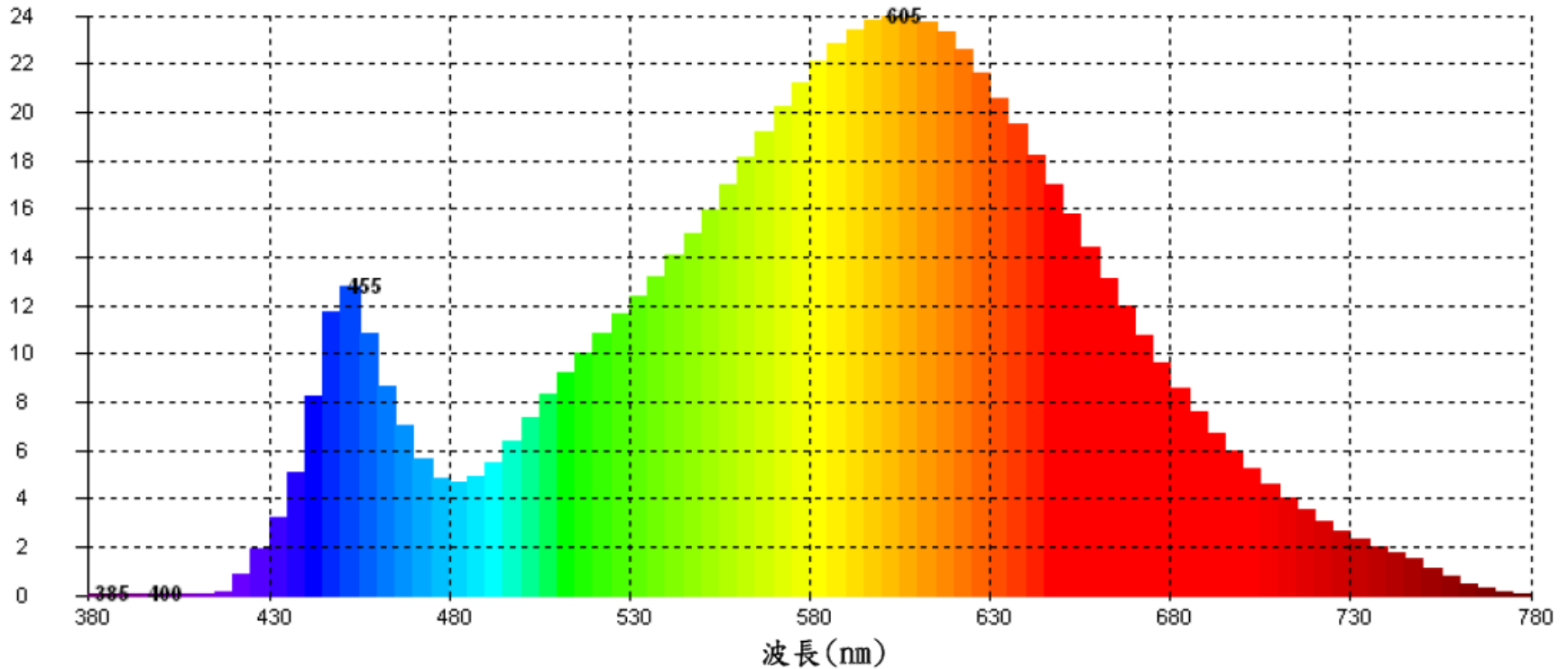


複金屬燈光譜



LED Spectrum

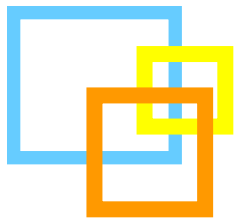
強度 (mW/nm)



色座標_x
0.4408

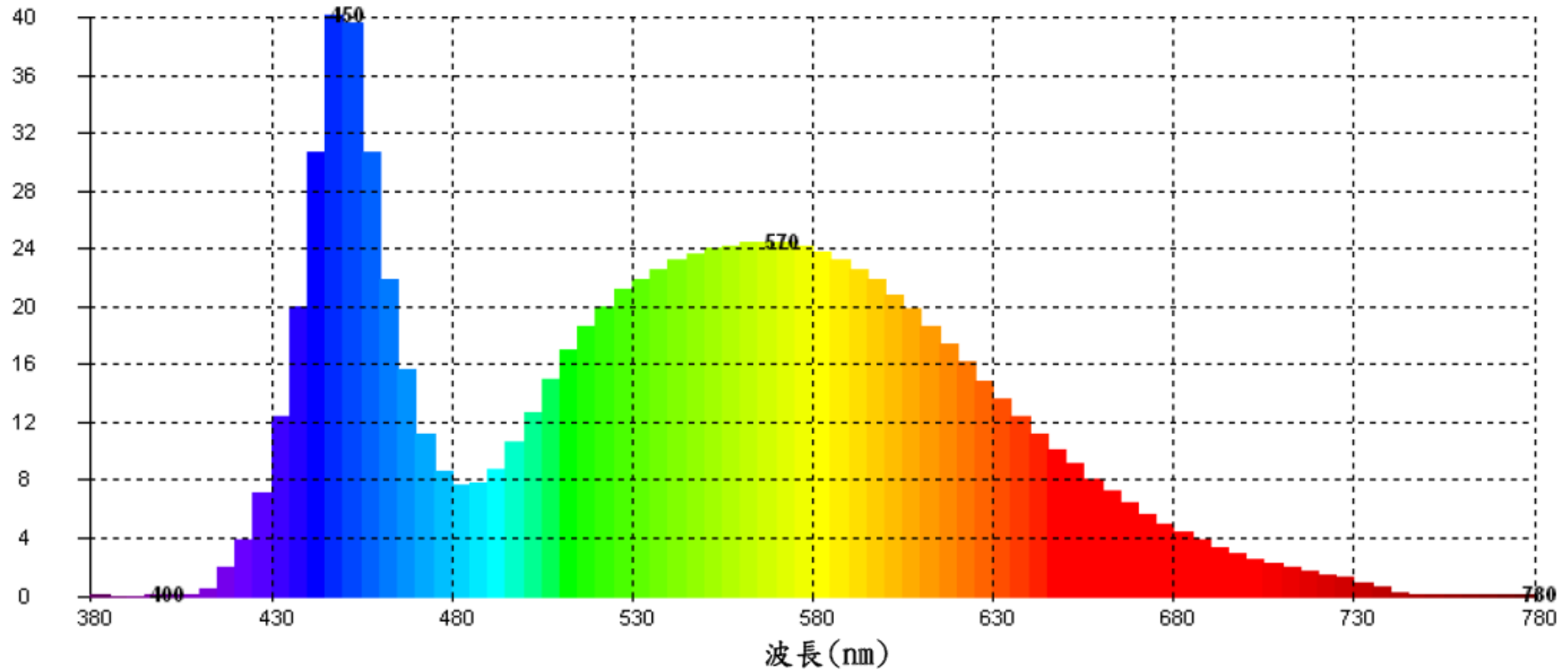
色座標_y
0.3972

色溫 (K)
2880

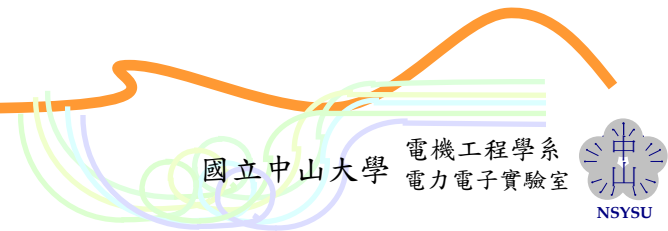


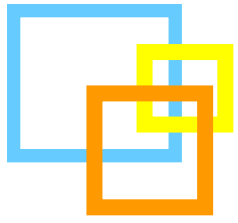
LED Spectrum

強度(mW/nm)



色座標_x 色座標_y 色溫(K)
0.3342 0.3422 5423





Why is the LED ?

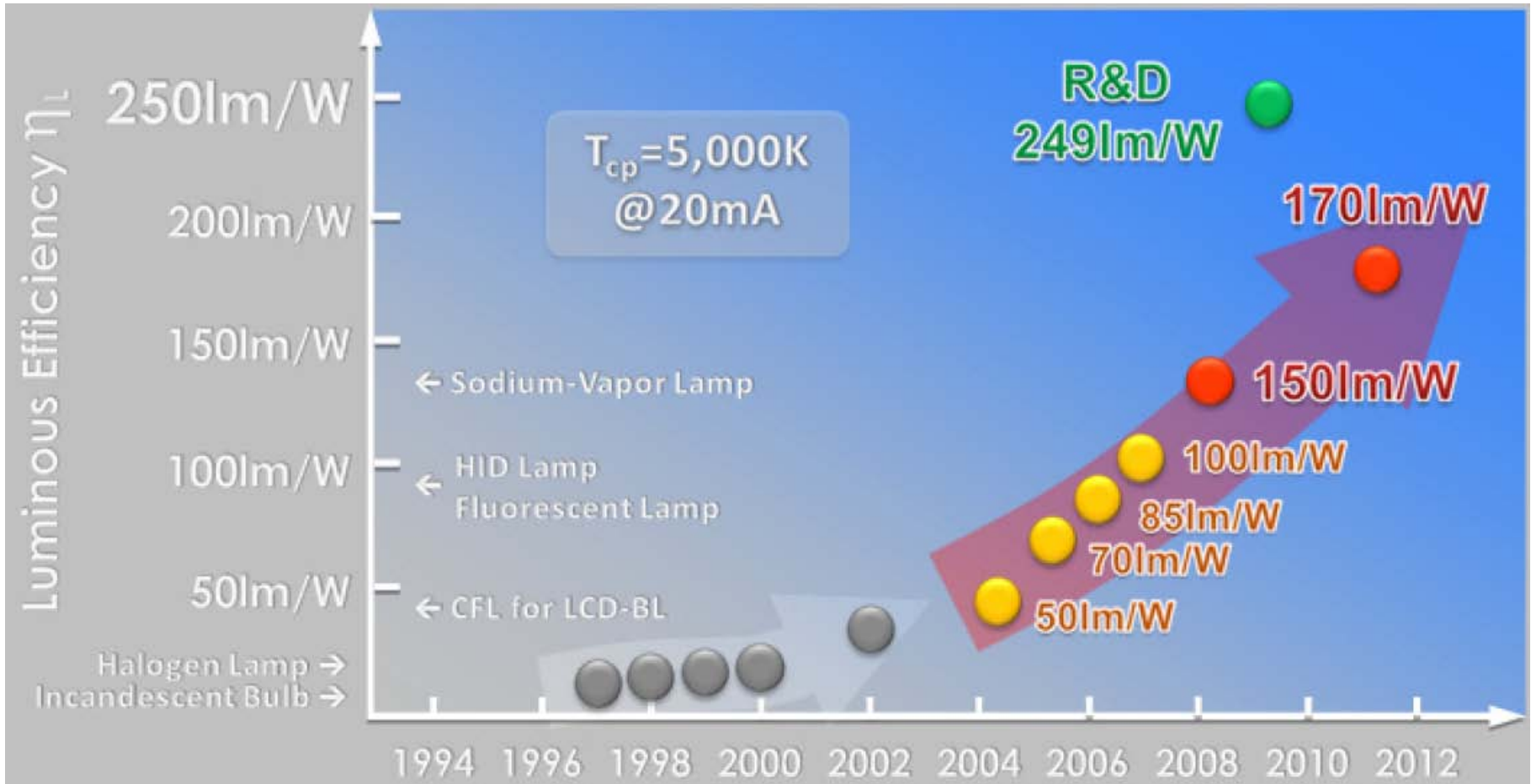
Physical

1. High Light Efficiency
2. Low Power Consumption
3. Miniaturization
4. Low Input Voltage
5. Long Life Time
6. High Reliability

Commercial

1. Low Cost
2. Easy Application

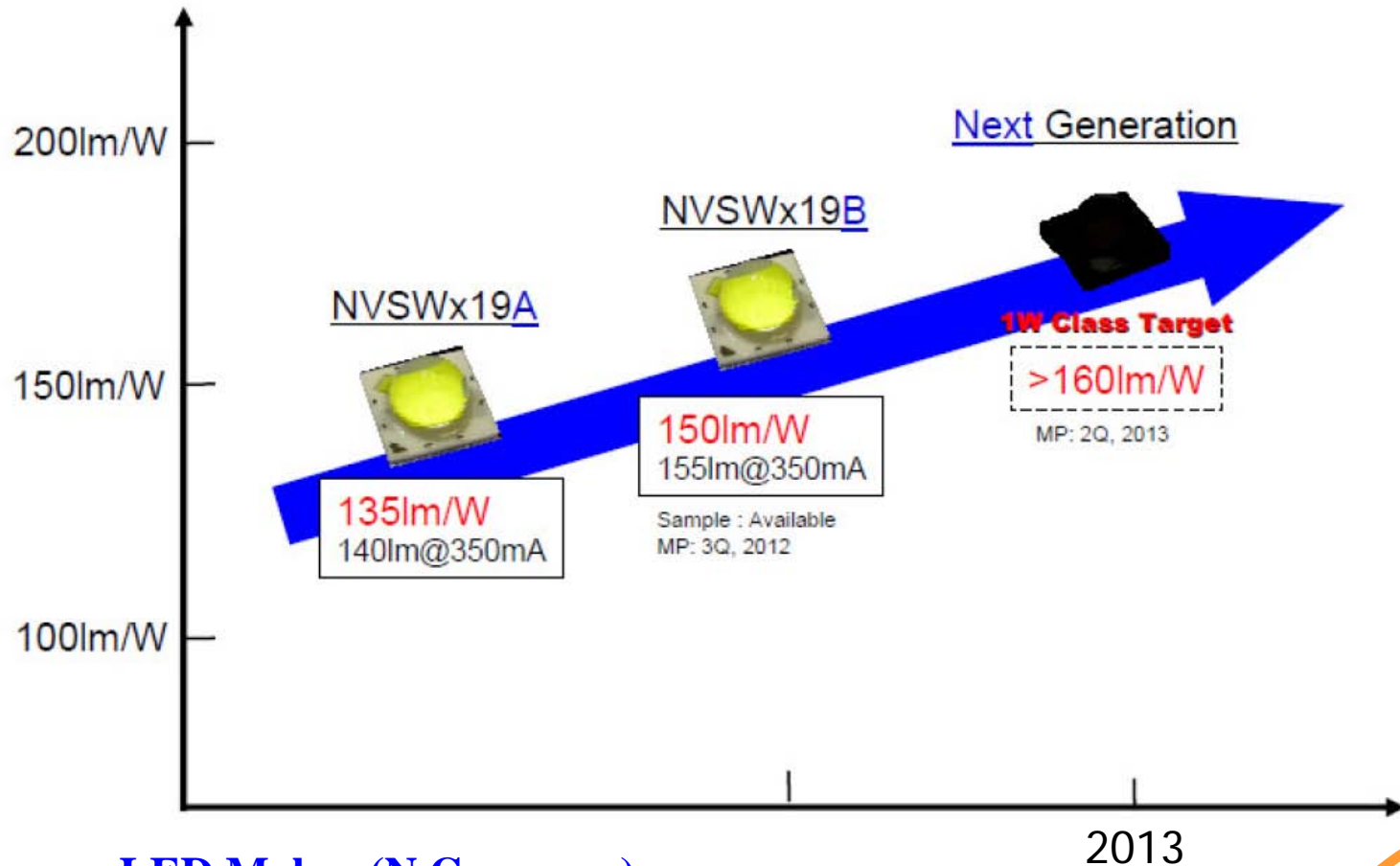
White LED lm/W Milestone



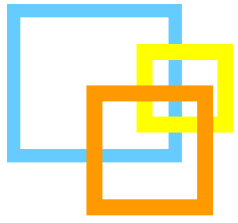
Note : Japan LED Maker (N Company)

White LED lm/W Milestone

CCT=5000K ($T_j=25^\circ\text{C}$)



Note : Japan LED Maker (N Company)



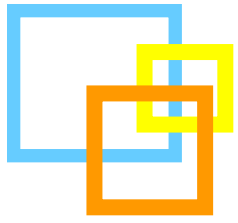
Why is the LED ?

Physical

1. High Light Efficiency
2. Low Power Consumption
3. Miniaturization
4. Low Input Voltage
5. Long Life Time
6. High Reliability

Commercial

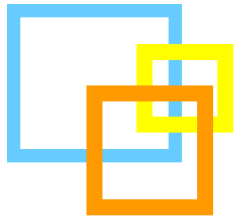
1. Low Cost
2. Easy Application



LED Lighting Age

Business ?



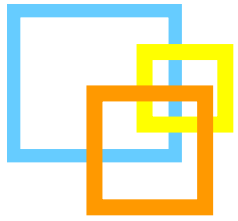


LED Lighting Products

Replacement

1. Low Cost
2. Quick Installation
3. High Light Efficiency
4. Low Power Consumption
5. High Luminance Output
6. Long Life Time
7. High Reliability
8. High Color Rendering Index (CRI)



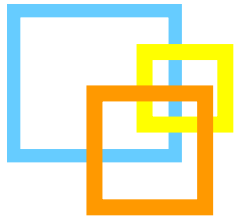


LED Lighting Products

New Lighting Fixture

1. Customization
2. Multi-Technology Application
3. Quick Installation
4. High Light Efficiency
5. Low Power Consumption
6. High Luminance Output
7. Long Life Time
8. High Reliability
9. High Color Rendering Index (CRI)
10. Other Application



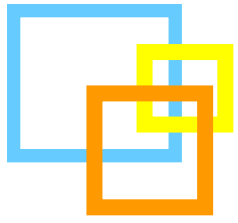


Multi-Technology Application

Power Module

1. Miniaturization
2. High Power Efficiency
3. Low Cost
4. Long Life Time
5. High Reliability

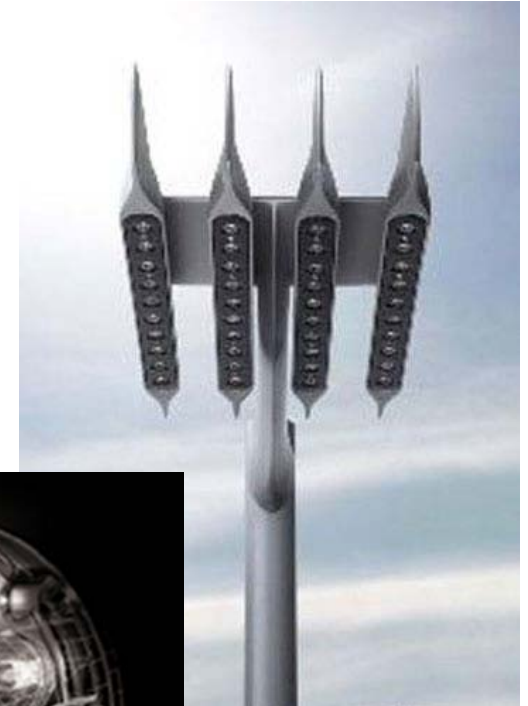
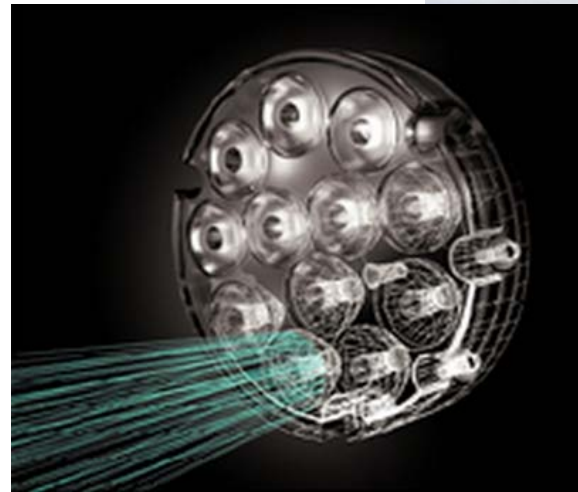


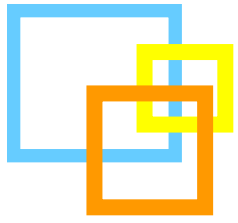


Multi-Technology Application

Light Guide

1. High Light Efficiency
2. High Power Efficiency
3. Low Cost
4. Long Life Time
5. High Reliability

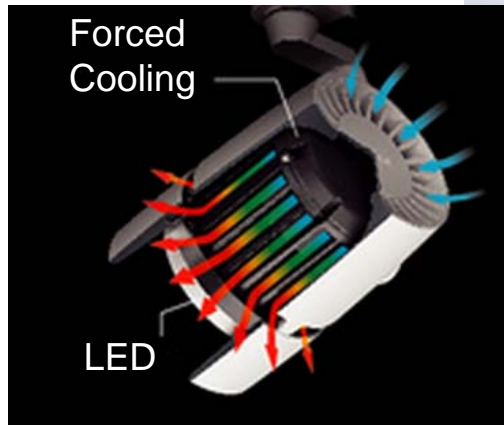
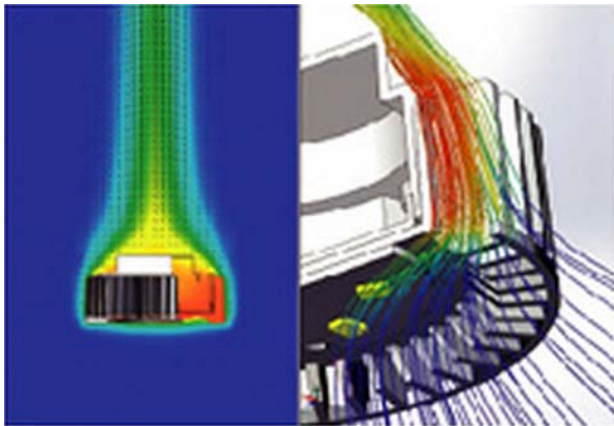


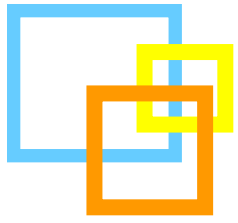


Multi-Technology Application

Thermal Management

1. High Efficiency Heat Sink
2. Low Cost
3. Long Life Time
4. High Reliability





Thank You!