

居家智能照明的应用与前景

WPI Steven Lin
20140807

Agenda

- 智能照明是什麼？(調光=智能？)
- 居家智能照明是一種需要也是一種體驗
- 室內照明的市場概況
- WPI ATU 的智能照明方案

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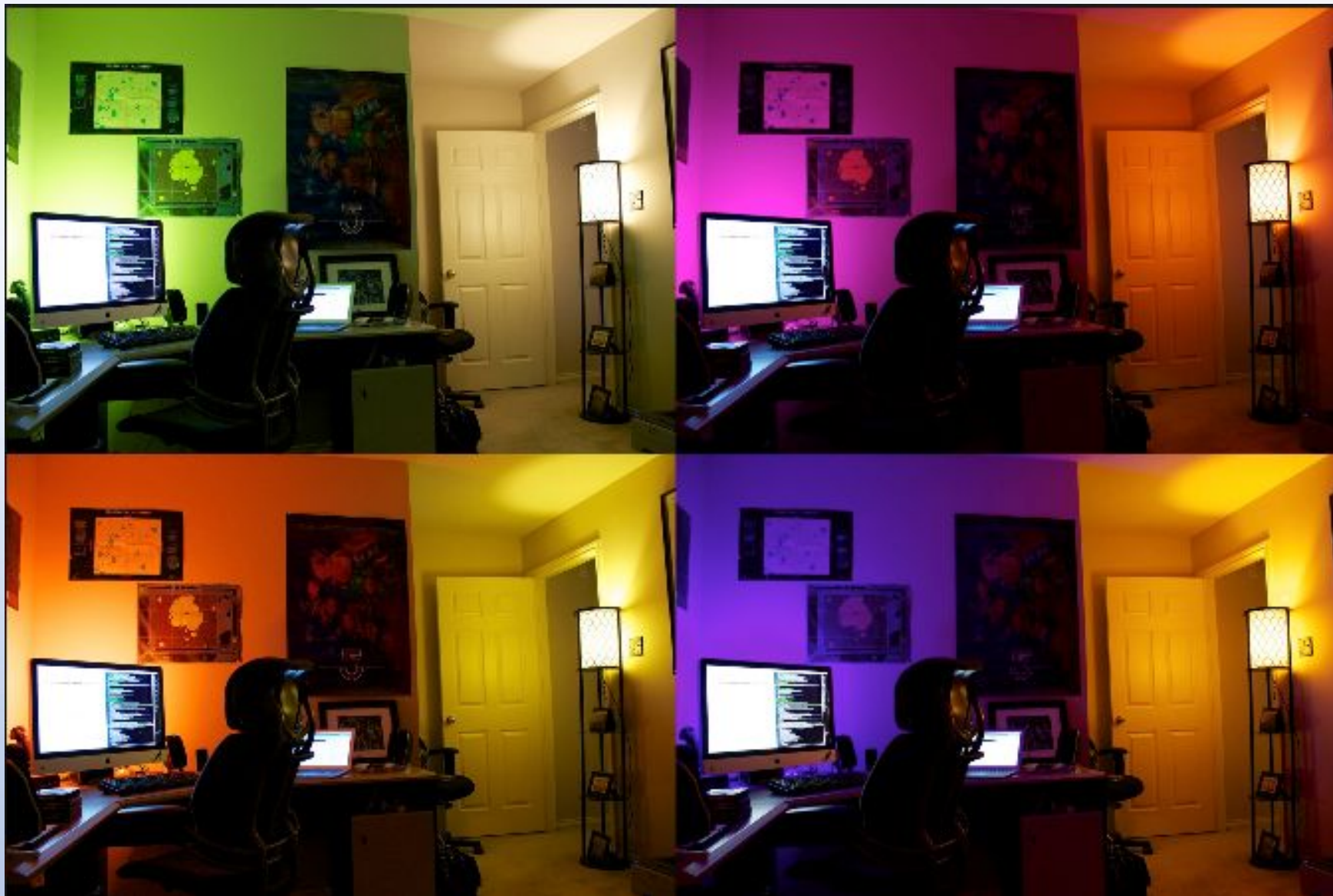
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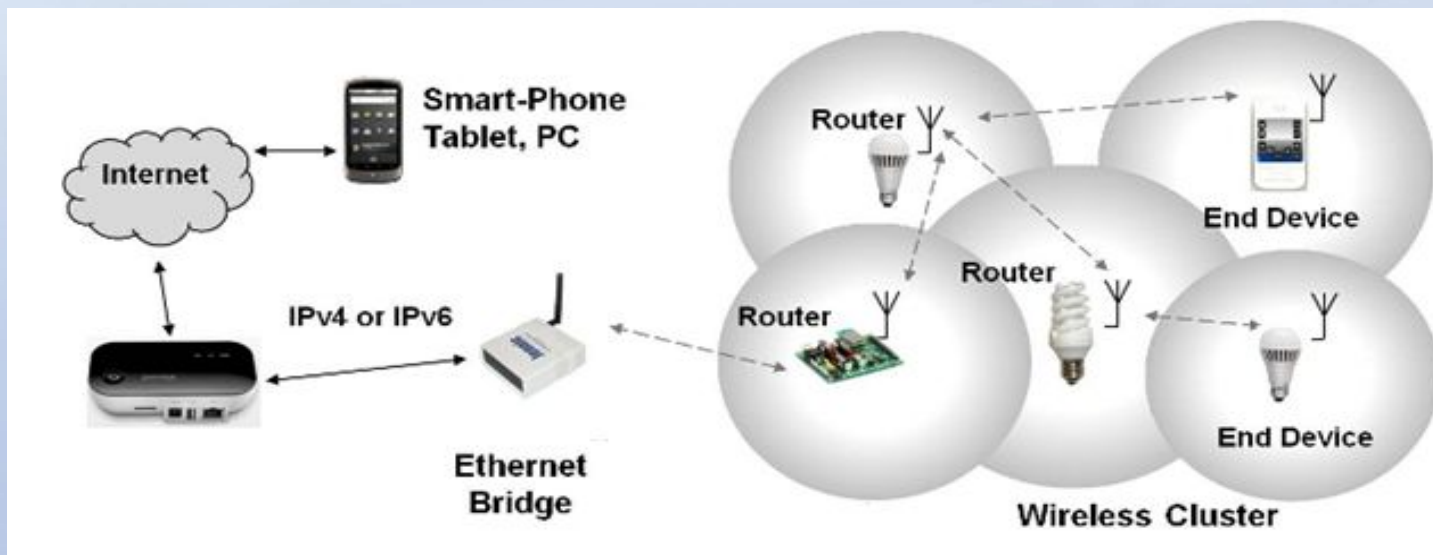


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智能照明是什麼

LED 被称为第四代照明光源或绿色光源，具有节能、环保、寿命长、体积小等特点，可以广泛应用于各种指示、显示、装饰、背光源、普通照明和城市夜景等领域。近年来，世界上一些经济发达国家围绕 LED 的研制展开了激烈的技术竞赛。城市智能照明系统作为智慧城市的核心子系统，运用无线 ZigBee、Wi-Fi、BLE 等多种物联网和 IT 技术，实现了远程单灯开关、调光、检测等管控功能。



View by Smart City

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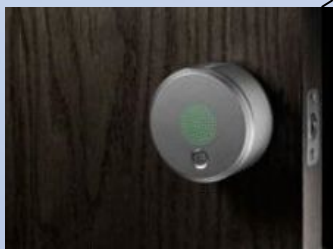


SOURCE : FROST & Sullivan

View by Smart kit


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入口




Toward Smart Light

Today



Emerging in volume – on the market today



“Bulbs get most of the attention due to the sheer size of the market, and this is an important step in adoption. However, bulbs will be a bridge solution and a Trojan Horse for a more sustainable content driven, networked, intelligent market”

SOURCE : CANACCORD , April 2013

Toward Smart Light

LED differentiation is driven by diversity of application requirements...



...and by addition of new functionality



Toward Smart Light

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User control and customization

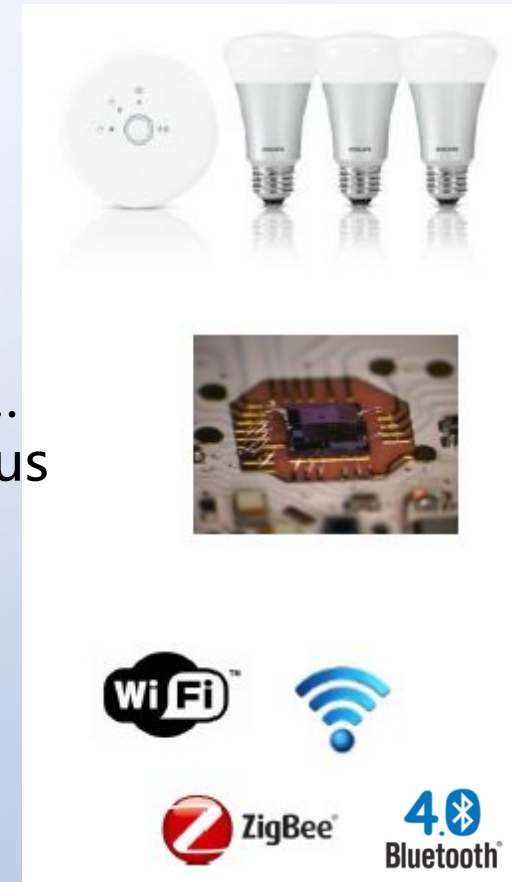
- User-controlled color tuning, dimming, etc.
- Timed / programmed features
- Utilize digital nature of LED lighting

Sensors and intelligence

- Environment: location, daylight, occupancy, ...
- Performance: optical, thermal, operating status
- Advanced: optimization for energy savings, visual acuity, health, ...

Connected lighting

- Communication and networking
- Control of light zones / sites
- Remote monitoring and control



 ZigBee	 Wi-Fi	 Bluetooth
ZLL 为标准协议 需要透过网关	现有已量产 WiFi 较耗电,成本较高	可连接 BLE 4.0 以上 智能手机, PAD

大聯大控股
Member of WPI Holdings



世平集團
World Peace Industrial Group

Smart LED Bulb (1/7)



Philips Hue

- Smart LED bulbs
- Wireless: [ZigBee](#) - Connects to Internet via ZigBee hub
- Street price of \$270 for starter kit comprising three bulbs and a hub
additional bulbs are \$60 each

Smart LED Bulb (2/7)



Spark Devices

- Smart socket
- Wireless: [WiFi](#)
- Internet of Things - connects directly to the home network, no special hub required
- RGB controls ... if you screw in an RGB LED
- Preorder for \$49

Smart LED Bulb (3/7)



GreenWave Reality Connected Lighting Solution

- Smart LED bulbs
- 6LoWPAN (IP over 802.15.4)
- Connects to Internet via hub
- White lights, not RGB
- \$200 kit includes four LED bulbs, gateway and remote control

Smart LED Bulb (4/7)



LIFX

- Smart LED bulbs
- Wireless: [WiFi](#)
- Internet of Things - connects directly to the home network, no special hub required
- Kickstarter preorder was \$69 for one bulb

Smart LED Bulb (5/7)



Environmental Lights LinkUp

- Smart LED bulbs
- Wireless: [Proprietary 2.4g RF](#)
- Connects to Internet with LinkUp WiFi router
- Several varieties of white and RGB bulbs
- Basic kit with two white lights and basic handheld RF controller: \$75.20
- Basic kit with one RGB light and RGB handheld controller: \$54
- LinkUp wireless router/hub required for WiFi control: \$56

Smart LED Bulb (6/7)



Lumen

- Smart LED bulbs
- Wireless: [Bluetooth 4.0](#)
- No remote access/control via Internet (apparently)
- RGB

Smart LED Bulb (7/7)



Smart Home Labs RoboSmart

- Smart LED Bulbs
- Wireless: [Bluetooth](#)
- No remote access/control via Internet (apparently)
- White lights, not RGB
- \$34 (wholesale)

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智能照明被需要嗎

- 根据调查显示，70%-80%设计师只对智能化照明技术有应用意识，却还没有太多的实际经验。
- 一直以来，智能照明总是被消费者贴上“价格高昂”“奢侈品”等标签，消费者也自然而然地形成一种错误的消费理念。所以，无论企业如何宣传智能照明，消费者都以冰冷的反应来回应。
- 通过灯具的合理布局和选型充分体现了节能、环保、安全、舒适等特点。
- 据初步测算，每年我国智能照明产品的需求超过1000万盏。此外，我国现在已有“智慧城市”试点193个，未来结合智慧城市的建设和智能家居概念的深入人心，智能照明前景可期
- 2014~2015年两年智能照明行业将额外提供至少600亿元人民币的市场空间。如果按照30%的年复合增长计算，保守估算到2018年此项数值将达到近800亿元，5年内累计数额超过2000亿元。
- 智能化照明将紧随智慧城市的建设而大放异彩

SmartTimes

- 随着物联网概念的热炒，智能照明的受关注程度也水涨船高。据市场研究机构Transparency Market Research (TMR) 公布的报告表示，智能照明市场预计到2020年将价值332.3亿英镑（ 3489亿人民币 ）。并预言从2013年到2029年LED照明市场增速超过30%。面对这样一个大市场，行业内的巨头都纷纷推出智能照明的相关方案，以期在接下来的智能照明蓝海里抢得先机。



飛利浦提供全台40間hue體驗區配備互動裝置，內建APP遊戲與影片，讓民眾近距離體驗智慧照明魅力。廠商提供



- **腾讯数码讯**（编译：张晓微）在众筹网站Kicistarter上最近出现了一个新项目，为那些对智能照明系统感兴趣的用户降低了使用门槛。只要25美元（约合人民币150元），我们就可以预订一个入门级的LuMini智能照明灯。尽管LuMini智能系统与Philips Hue等该领域的领导者相比还有一定的差距，但是LuMini智能系统是目前最便宜智能家居照明系统。

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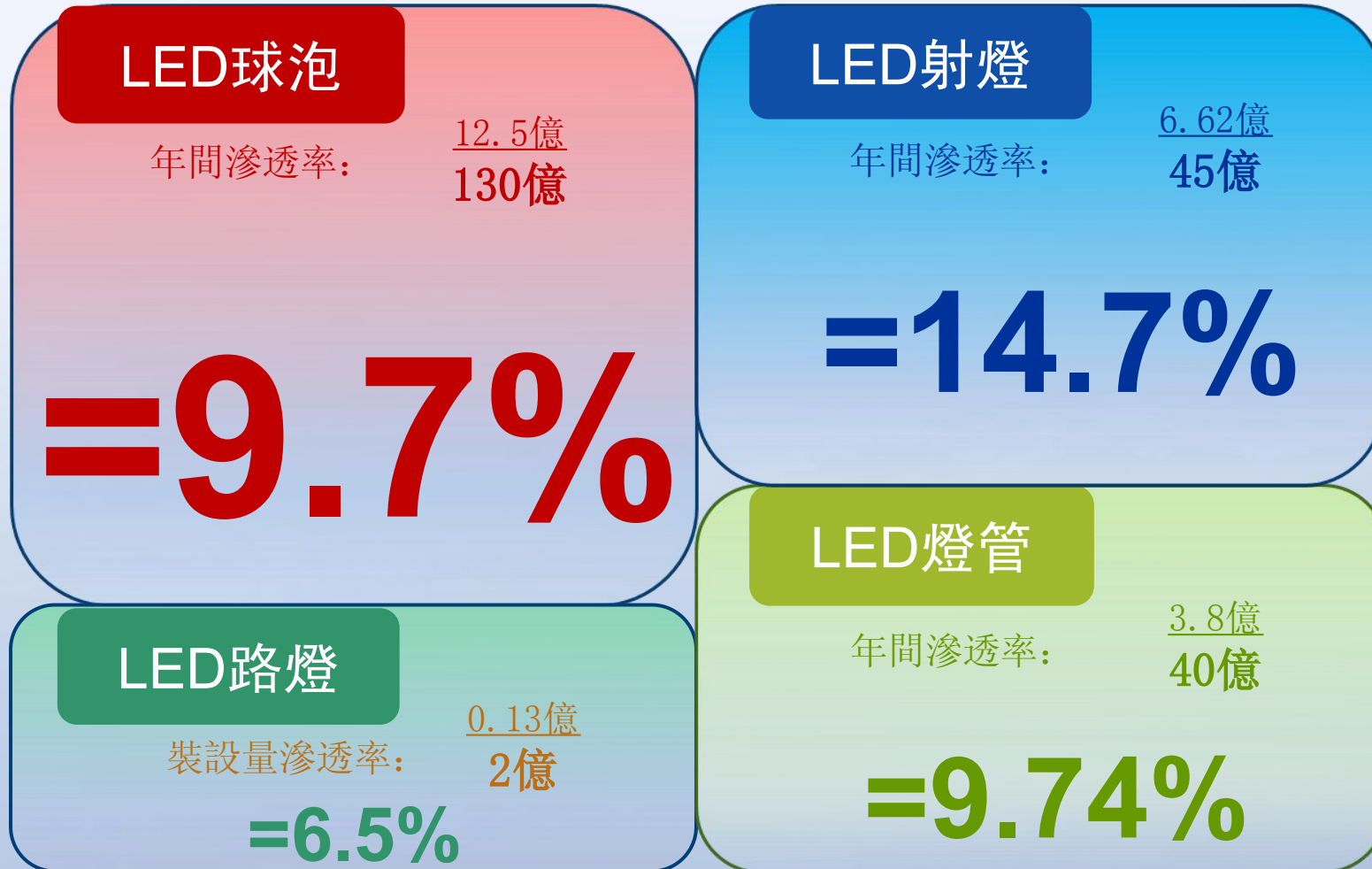
2014 照明 LED YoY 預估

單位：百萬顆

應用別	2013	2014	YoY	原因說明
Mobile device	23,949	26,146	9.2%	全球智慧型手機年增率29.8%，且雙flash使用量增。
Tablet	6,481	8,864	36.8%	終端需求年成長23.6%，且因264 ppi比重增，帶動LED使用顆數增長。
NB	7,412	6,915	-6.7%	終端需求衰退6.6%，然因高顯色性面板比重增，單台NB中LED使用量微減。
Monitor	3,542	3,185	-10.1%	終端產品需求衰退，該面板年減6.5%。
TV	12,402	11,936	-3.8%	直下式機種比重高，然使用顆數少。 4K2K尚能提升LED使用顆數，然該機種佔總LED TV比重低。
看板	10,499	10,814	3.0%	主要成長動能在小間距顯示屏
車用	8,646	9,493	9.8%	高階車款導入LED照明意願高
照明	33,709	55,350	64.2%	主要應用別如LED燈泡、燈管、射燈出貨量近倍數成長。

資料來源：DIGITIMES，2013/12

2014年LED照明各應用市場規模預估



資料來源：DIGITIMES，2013 / 12

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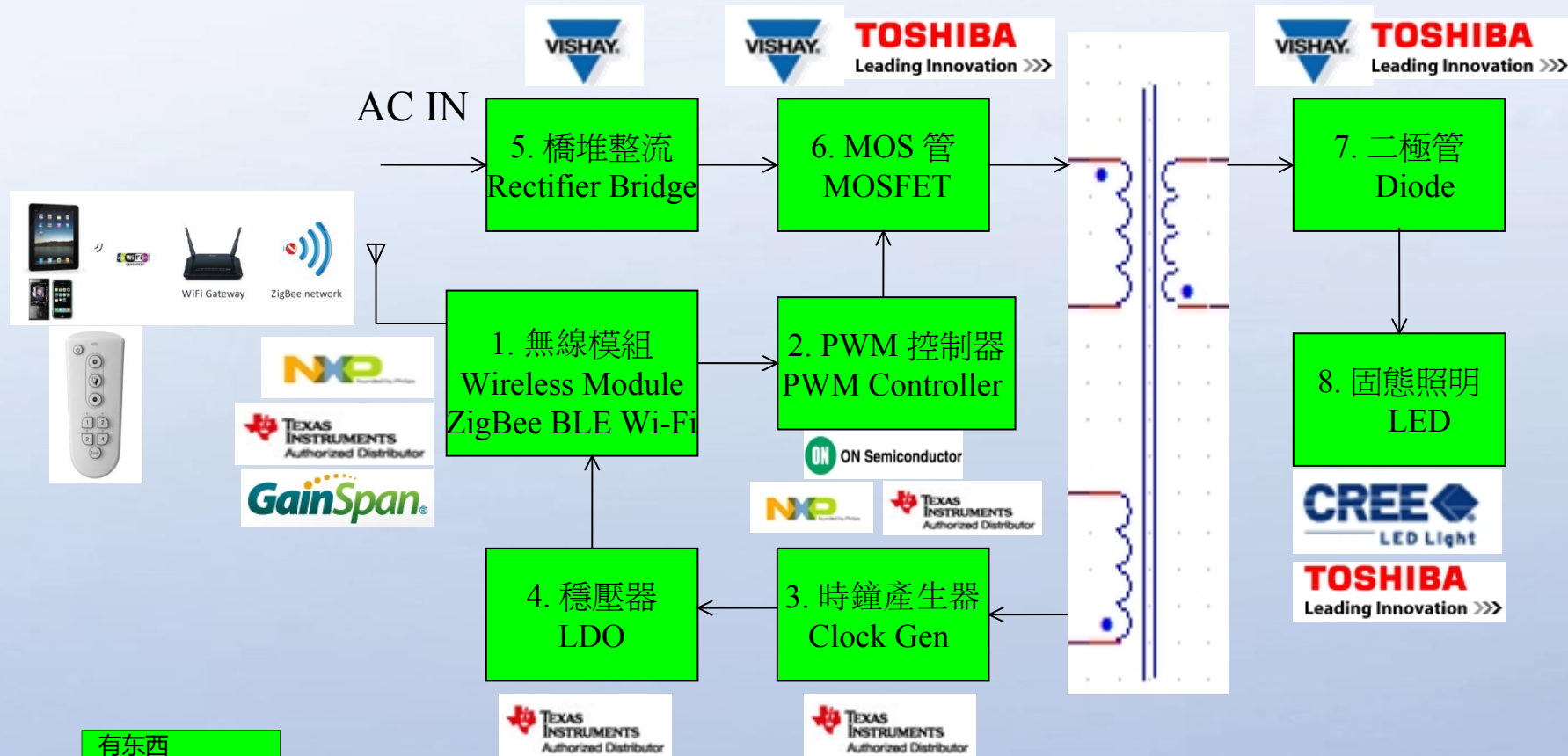
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WPI ATU
的智能照明的方案？



WPI ATU Smart Lighting Solution

- Block Diagram -



有东西
have
没有东西
Don't have

WPI ATU Smart LED Driver(1/2)

- PCBA -



RF Module

BOT View



PWM Controller

TOP View

WPI ATU Smart LED Driver(2/2)



BLE



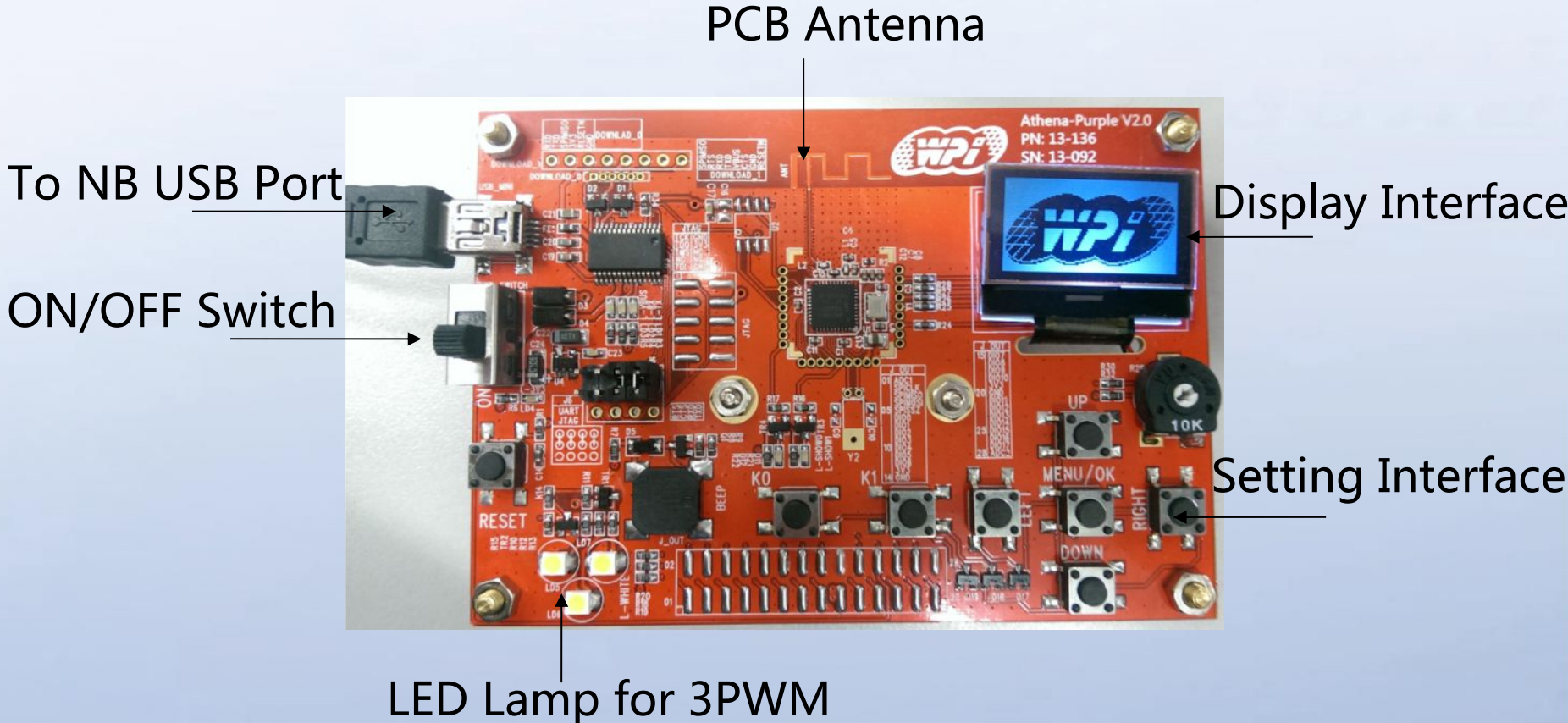
Zigbee



LPWiFi

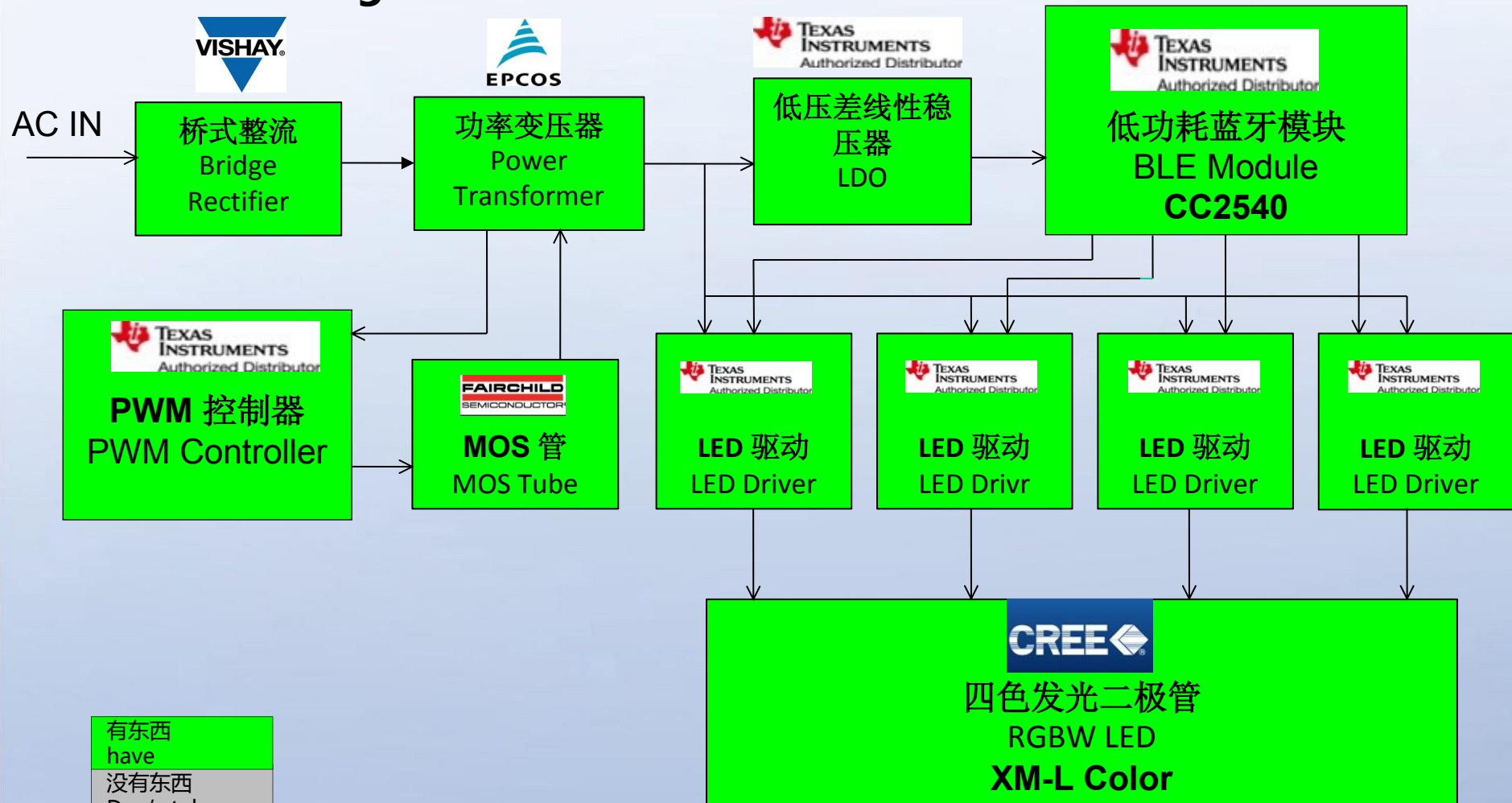


WPI ATU Zigbee (JN5168) Developing Kit



WPI ATU BLE LED Lighting (1/3)

- Block Diagram -



有东西 have
没有东西 Don't have

WPI ATU BLE LED Lighting (2/3)

- PCBA -

AC-DC Power →

CC254x Module



RGB LED

DC-DC LED Driver →

WPI ATU BLE LED Lighting (3/3)

- With BLE4.0 APP -

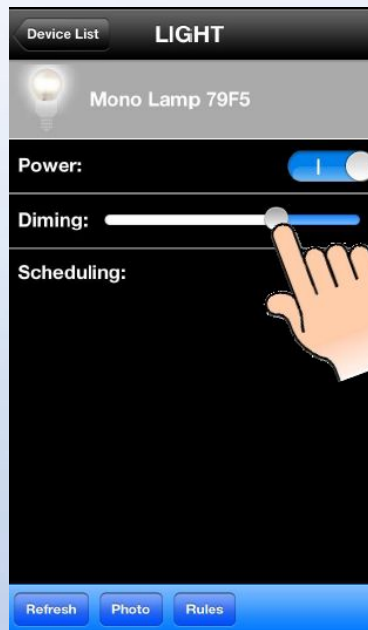


支持蓝牙 4.0、安装了蓝牙LED 调光软件的手机或平板电脑

LED 驱动 + TI CC2540 模块的调光板

WPI ATU Smart LED Bulb (1/2)

- APP Solution -



IOS APP + Router + LED Lamp (Base on ZLL)

WPI ATU Smart LED Bulb (2/2)

- RC Solution -



Remoter Controller + LED Lamp (Base on RF4CE)

总结

- ✓ 良好的使用者体验
- ✓ 符合人性化的套件
- ✓ 创造被需要的动机
- ✓ 物联网的基础布建



谢谢 !

聯繫人：林俊宏 / Steven Lin
郵箱：steven.lin@wpi-group.com
電話：185 2082 0086