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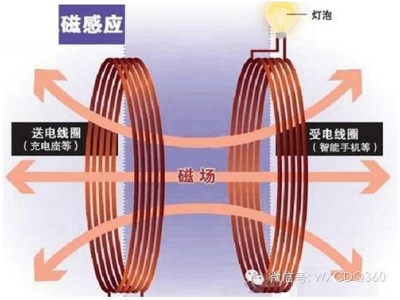
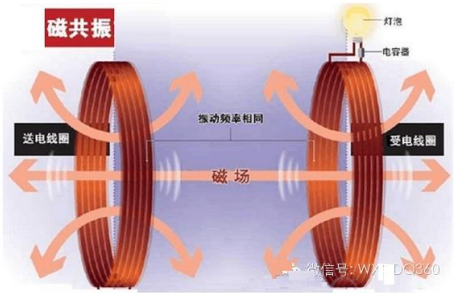
無線充電應用解決方案

» Wireless charger

無線充電技術分類

	磁感應 (MI)	磁共振 (MR)
技術原理	通過發射端與接收端兩個線圈之間的磁場偶合進行能量的傳輸。	接收端線圈電路與發射端線圈電路達到協振，從而實現能量的傳輸。
傳輸功率	數W~數百KW	數mW~數百mW
傳輸距離	小於1cm	數cm~數m
相關優點	1. 適合短距離接觸充電 2. 轉換效率高 (65%~75%) 3. 成本相對便宜	1. 適合稍遠距離充電 2. 充電位置相對自由 3. 可以一對多充電
相關挑戰	1. 充電距離較短 2. 充電位置相對受限 3. 金屬等導體會感應發熱	1. 安全與健康遭受質疑 2. 成本相對較高 3. 效率相對較低 (50%~60%)
相關標準	WPC 的 Qi，PMA 的 Power2.0	A4WP 的 Rezence
示意圖		

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無線充電聯盟組織

Table VI: Wireless Charging Technology Alliances			
	WPC	**A4WP**	**PMA**
Full Name	Wireless Power Consortium	Alliance for Wireless Power	Power Matters Alliance
Logo			
Basic Technique	magnetic induction	magnetic resonance	magnetic induction
Member Number	200+	100+	/
Certified Product	700+	0	/
Main Member	Philips, Panasonic & HTC	Qualcomm, Samsung & NXP	BlackBerry, Starbucks & NEC

About the WPC

- Founded in 2008
- **213** members in 20 countries committed to promoting and advancing the only open global wireless power standard, **Qi**
  - 28 Taiwanese companies members today
  - Members include Aircharge, Belkin, ConvenientPower, Delphi, Foxconn, Freescale, Haier, HTC, IKEA, Leggett & Platt, LG, Motorola, MediaTek, Microsoft, Panasonic,Philips, PowerbyProxy, Qualcomm, Samsung, Texas Instruments, Verizon Wireless, among others
- Addressing a range of consumer products, applications
- Network of WPC-certified labs around world

Unmatched Success

- **50M+** Qi-compatible devices in circulation
- **700+** products certified
- **3,000+** public Qi locations
- **80+** smartphones
- **15** models of cars
- Qi built into furniture

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無線充電市場2015主要事件

- **2015年4月 Samsung Galaxy S6 和 S6 Edge** 導入了革新性的充電技術，搭載於機身之中的無線充電IC晶片高度集成化，效率高能耗低，無線充電僅需要3個小時即可完全充滿，與普通線充速度平齊。
- **2015年6月宜家**推出了一系列的無線充電傢俱和元件，希望把所有咖啡店、機場、酒吧和工作單位的檯面變成充電站，讓你隨處都能輕鬆地為手機充電。宜家美國照明部的銷售主管 Holly Harraway 說，宜家想讓無線充電 “變得更方便，且更不顯眼。”

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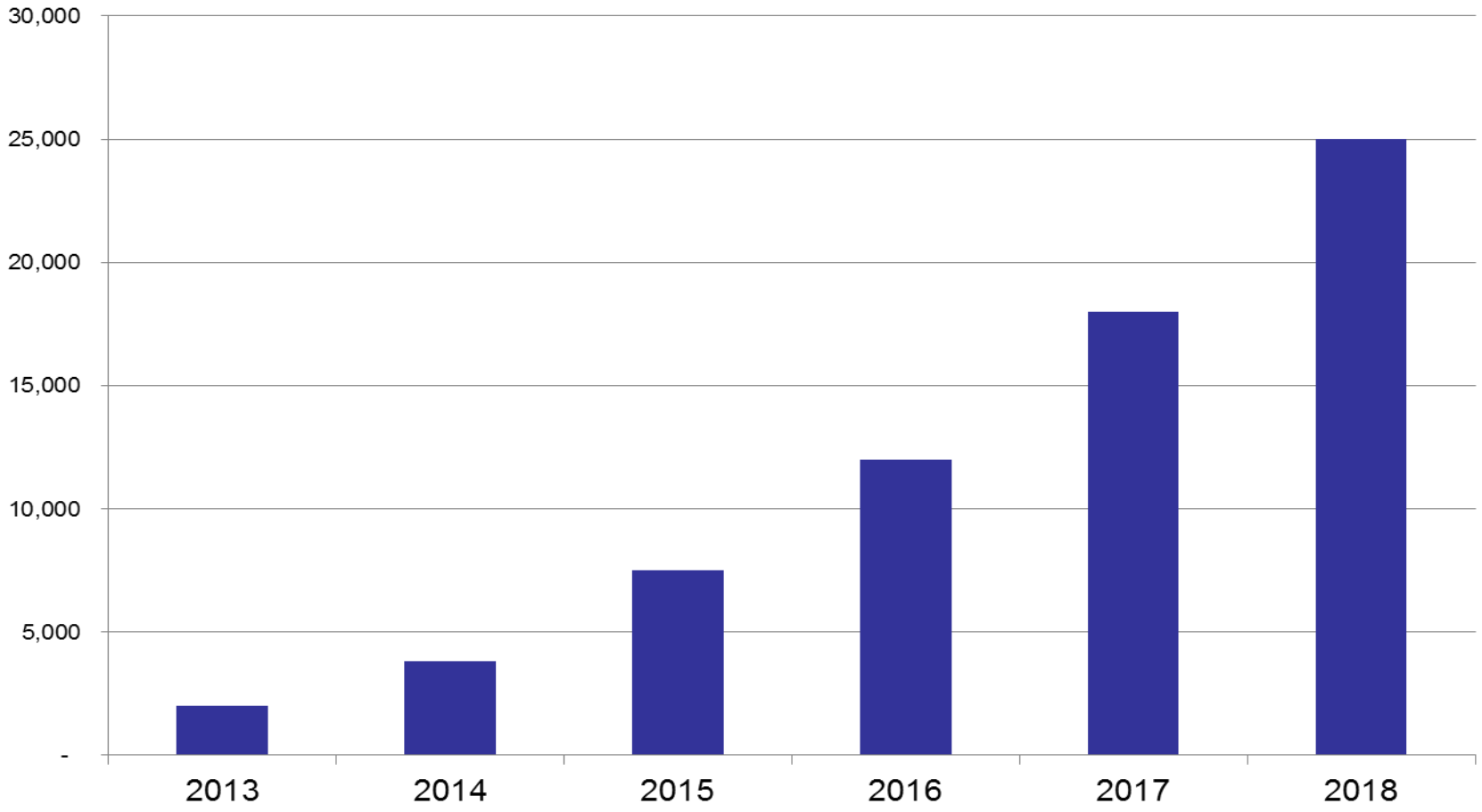
無線充電市場資料

全球WPC Qi 小功率無線充電器出貨量



Resource from IHS

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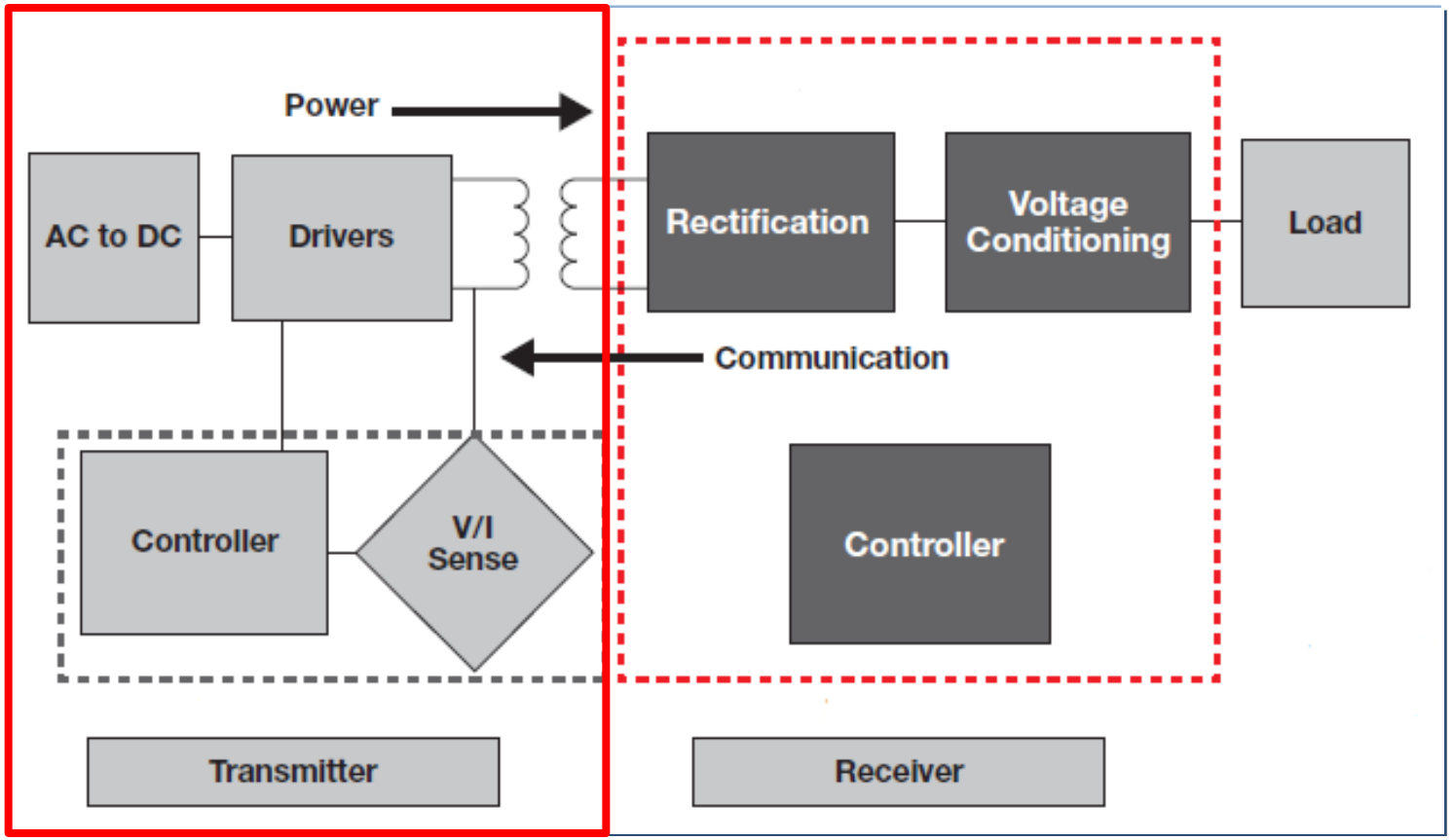
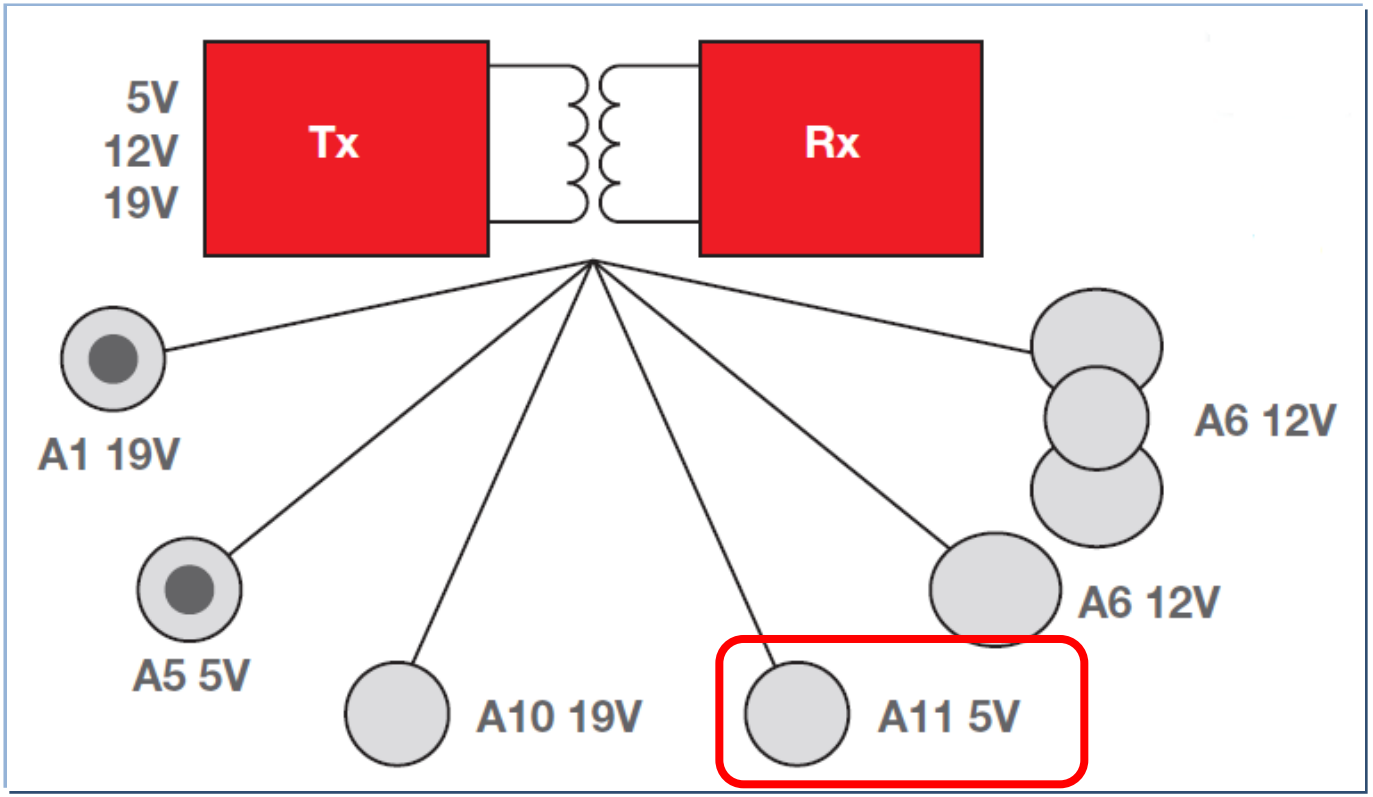
WPC Qi無線充電系統框圖



WPC Qi 無線充電子系統框圖



NuMicro Mini55 主要參數

- **ARM® Cortex ® -M0 core**
  - 最高工作頻率48MHz
  - 單週期 32-bit 硬件乘法器
  - 單週期 32-bit 硬件除法器
- **記憶體**
  - 17.5KB Flash
  - 2KB SRAM
  - 2kB Flash for ISP loader
- **模擬外設**
  - 12 通道，取樣速率 500Ksps, 10-bit ADC
  - 轉換可以通過軟體出發，PWM 觸發，外部事件觸發
  - 2個模擬比較器
- **通訊外設**
  - 2 x UART
  - 1 x SPI
  - 1 x I^2C
- **PWM**
  - 6 x 16-bit PWM
  - 時鐘最高48MHz
  - 支持中心對齊和邊沿對齊
  - 支援不對稱模式
  - 死區可程式設計
  - 支持占空比/週期觸發ADC轉換
  - 支持比較器事件觸發PWM，強制PWM輸出低做電流保護
- **其他**
  - 寬電壓工作範圍：2.1V~ 5.5 V
  - 寬溫度工作範圍：-40℃~105℃
  - 128-bit UCID

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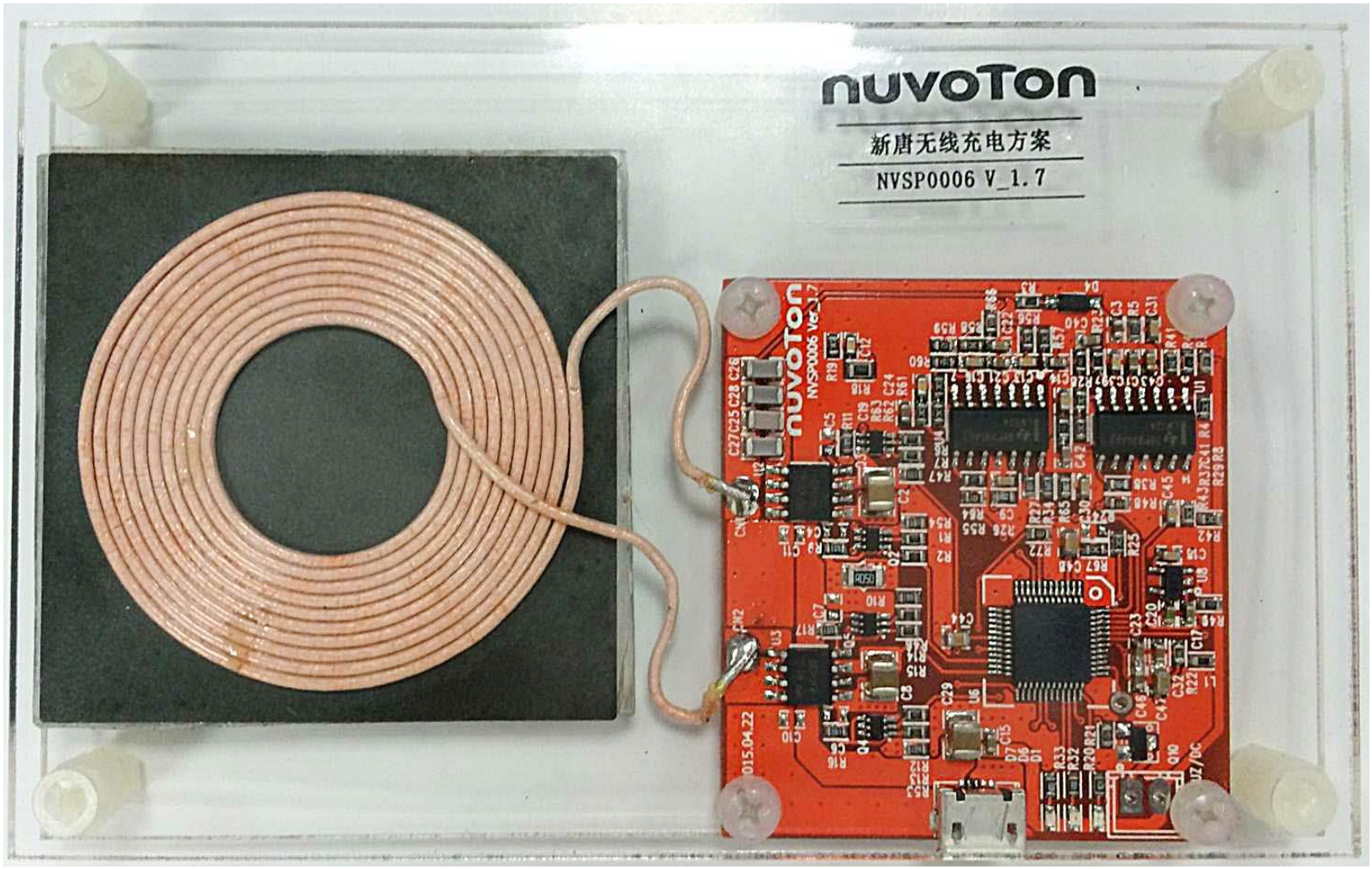
新唐無線充電方案演示板



新唐無線充電解決方案

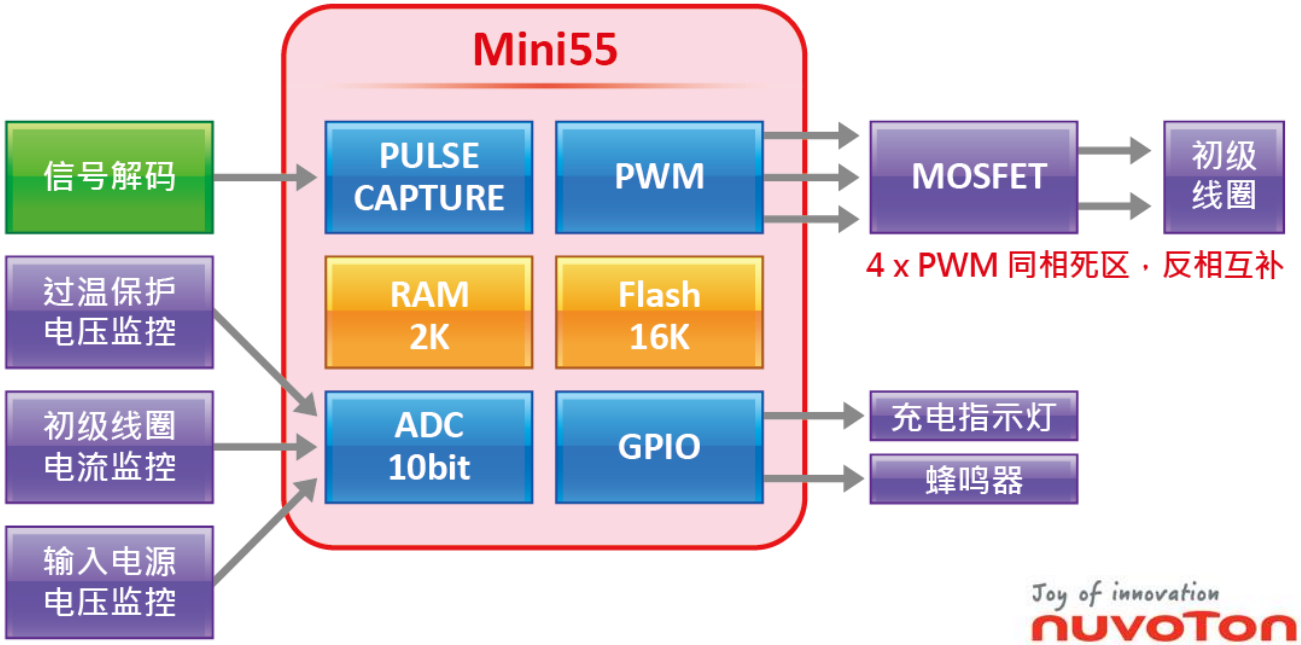
■ 應用芯片

- Mini55LDE/ZDE

■ 方案特性

- 32位CPU/48MHz/1T乘法器的強大運算能力
- 48MHz 16-bit PWM
- 轉換效率達 75%
- 相容 Qi 1.1 標準
- 動態功率調整
- 異物檢測 (FOD)

■ 系統示意圖



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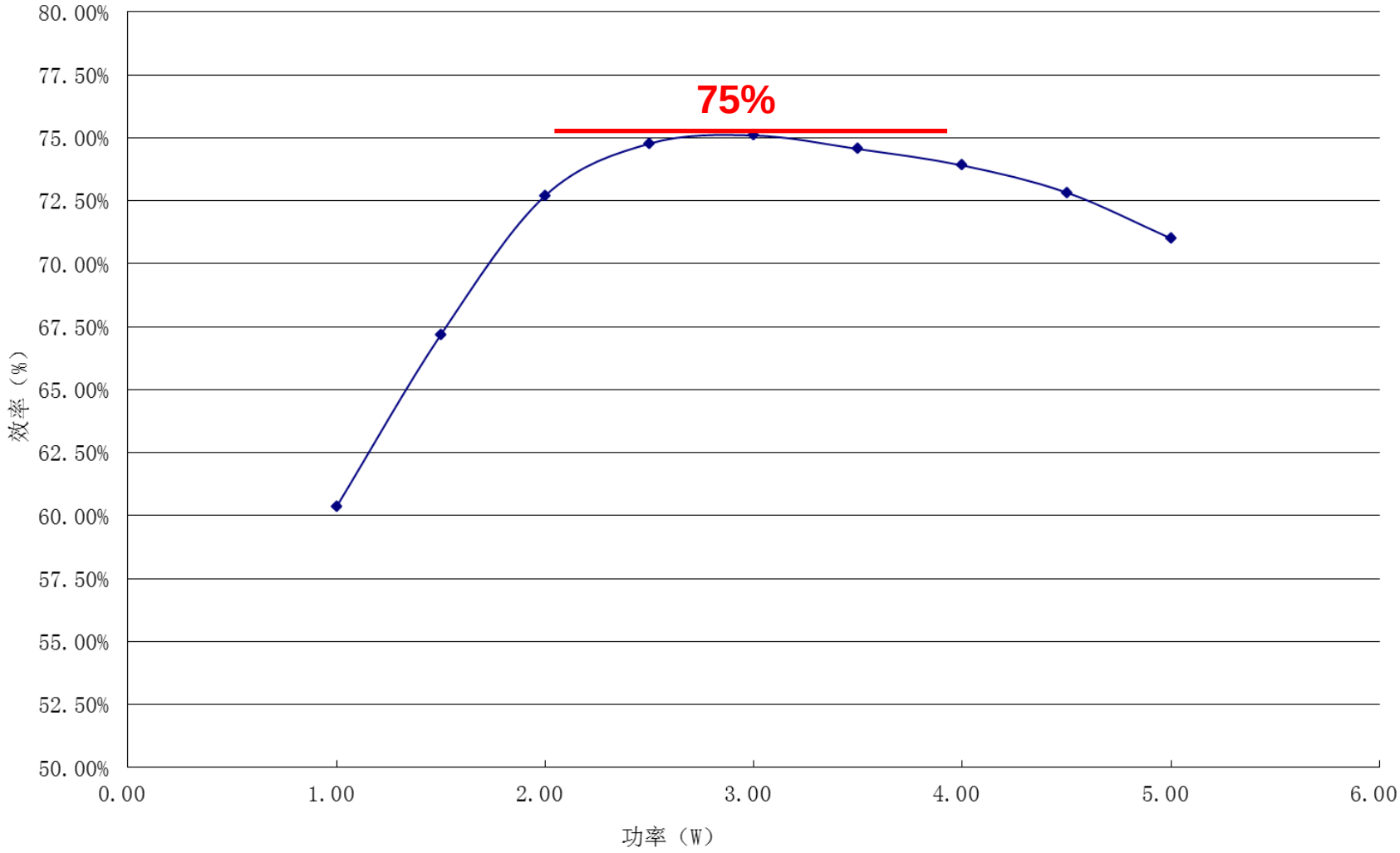
效率曲線



Why Nuvoton?

- **Nuvoton:**
  WPC 正式會員
- **Nuvoton:**
  方案通過WPC 認證
- **Certificate No.:**
  GZES1411013461IT
- **Nuvoton認證經驗可輔助客戶成功通過認證**
- **本地方案研發、本地技術支持**

SGS

Qi CERTIFICATE

Certificate No.:	GZES1411013461IT
Certificate Holder :	Nuvoton Technology Corporation No. 4 Creation Road III Hsinchu Science Park 30077 Hsinchu TW
Product Submitted :	Wireless Power Charge
Model No.:	NVSP0006
Transmitter coil type :	A11
Manufacturer :	Same as Certificate Holder
Compliance Standards	System Description Wireless Power Transfer Volume 1 : Low power Part 3 : Compliance Testing Ver1.1.2
Compliance Evidence	GZES141101346131
Interoperability Standards	Qi Interoperability Test Specification v1.2
Interoperability Evidence	IDD04150394T

This certificate is only valid for the equipment and configuration described, in conjunction with the test data detailed above.
It does not permit the use of the SGS PRODUCT CERTIFICATION MARK.

Anson Luo
Laboratory Manager
SGS-CSTC

2015-04-27

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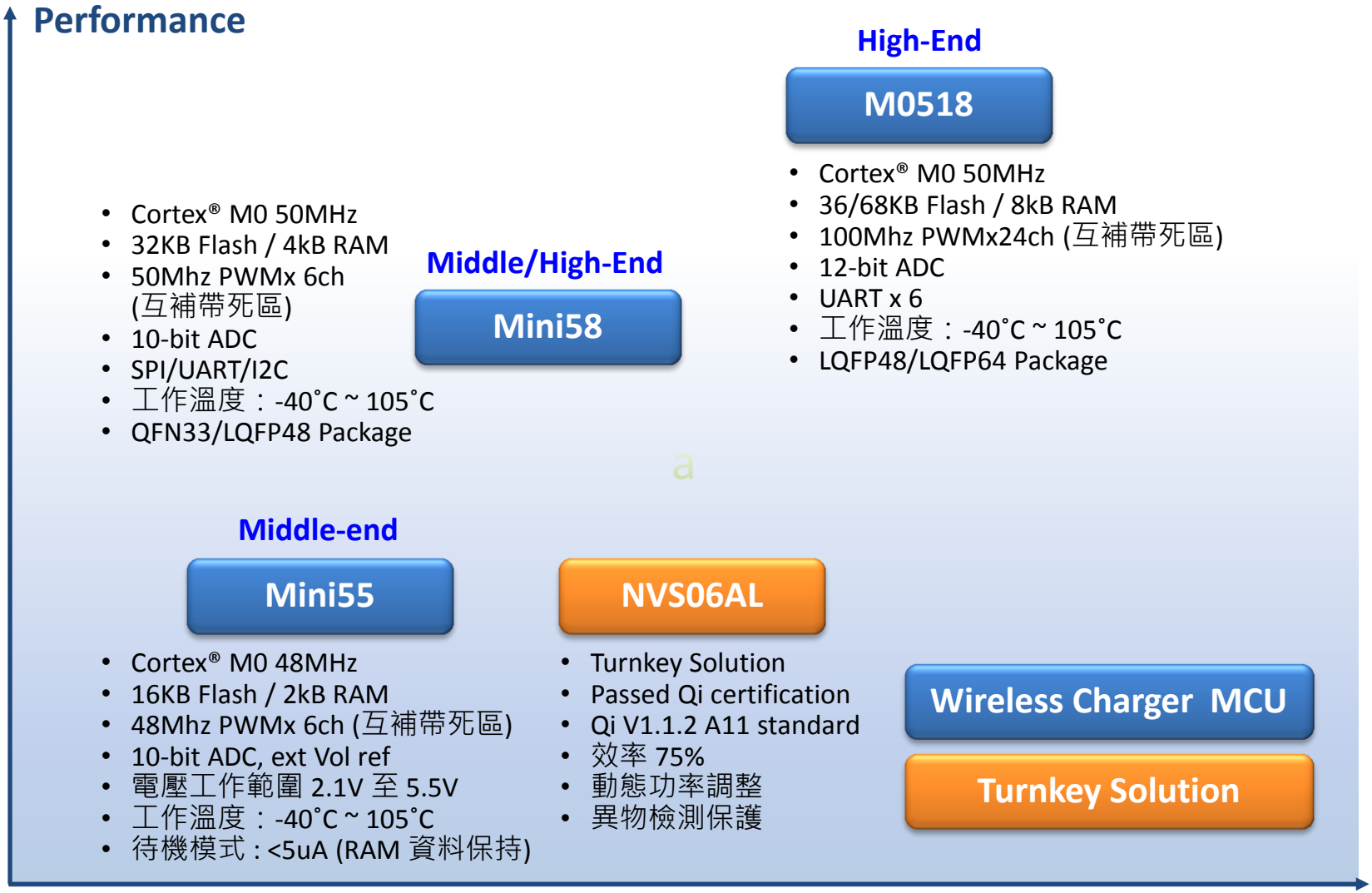
Wireless Charger Application Portfolio



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Thanks for
your listening