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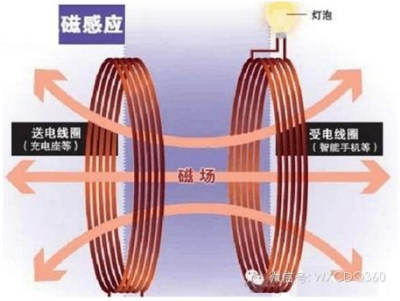
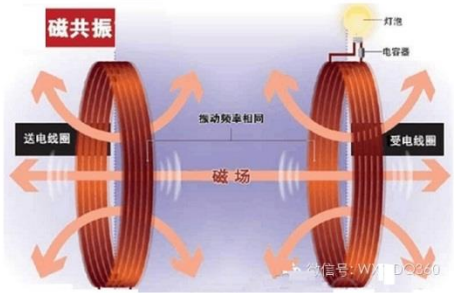
无线充电应用解决方案

» Mini55 and NVS06AL

无线充电技术分类

	磁感应 (MI)	磁共振 (MR)
技术原理	通过发射端与接收端两个线圈之间的磁场偶合进行能量的传输。	接收端线圈电路与发射端线圈电路达到协振，从而实现能量的传输。
传输功率	数W~数百KW	数mW~数百mW
传输距离	小于1cm	数cm~数m
相关优点	1. 适合短距离接触充电 2. 转换效率高 (65%~75%) 3. 成本相对便宜	1. 适合稍远距离充电 2. 充电位置相对自由 3. 可以一对多充电
相关挑战	1. 充电距离较短 2. 充电位置相对受限 3. 金属等导体会感应发热	1. 安全与健康遭受质疑 2. 成本相对较高 3. 效率相对较低 (50%~60%)
相关标准	WPC 的 Qi，PMA 的 Power2.0	A4WP 的 Rezence
示意图		

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无线充电联盟组织

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

关于 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

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成功案例

- **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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无线充电市场2015主要事件

- **2015年4月 Samsung Galaxy S6 和S6 Edge**导入了革新性的充电技术，搭载于机身之中的无线充电IC芯片高度集成化，效率高能耗低，无线充电仅需要3个小时即可完全充满，与普通线充速度平齐。
- **2015年6月宜家**推出了一系列的无线充电家具和组件，希望把所有咖啡店、机场、酒吧和工作单位的台面变成充电站，让你随处都能轻松地为手机充电。宜家美国照明部的销售主管Holly Harraway说，宜家想让无线充电 “变得更方便，且更不显眼。”

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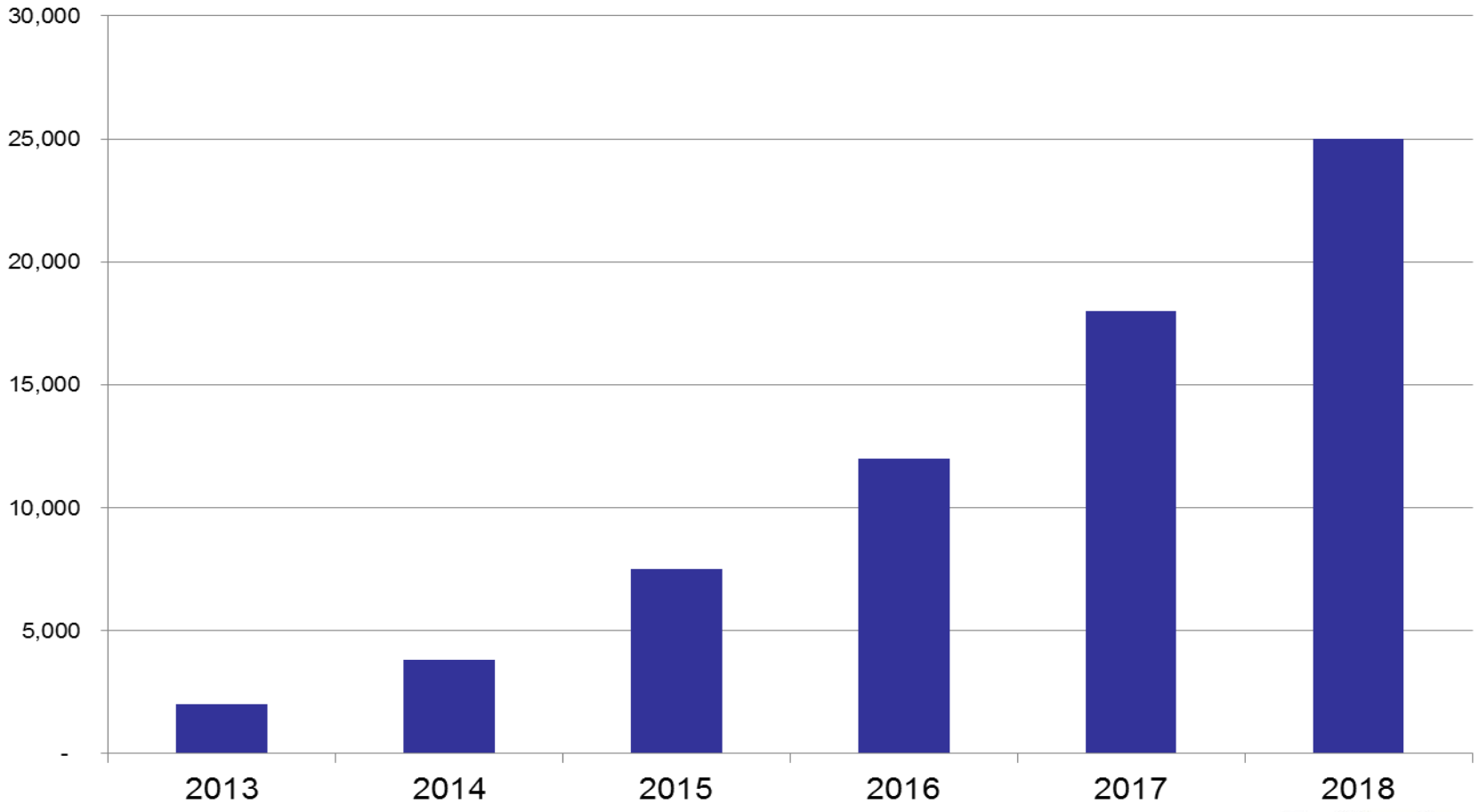
无线充电市场数据

全球WPC Qi 小功率无线充电器出货量



Resource from IHS

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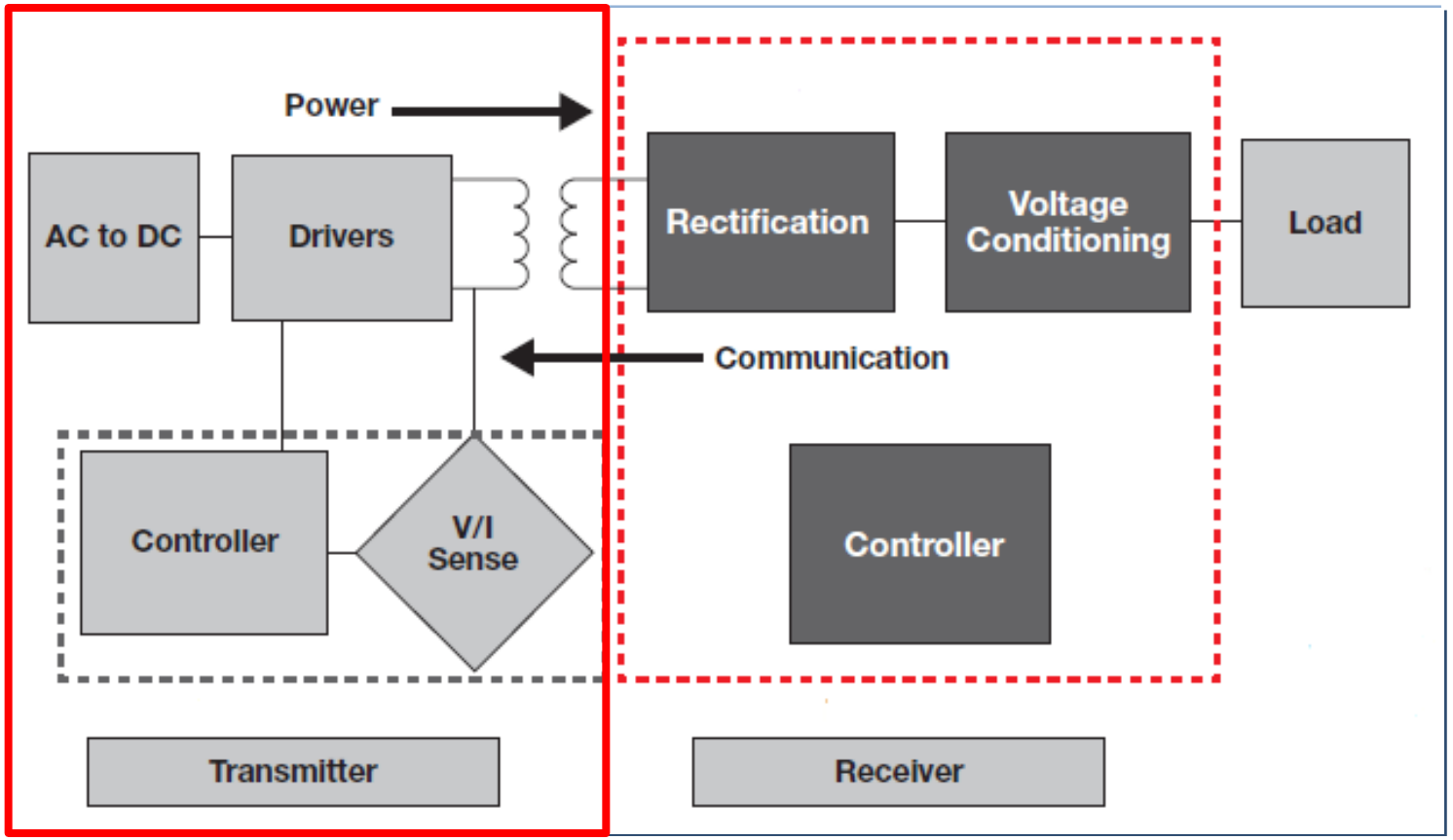
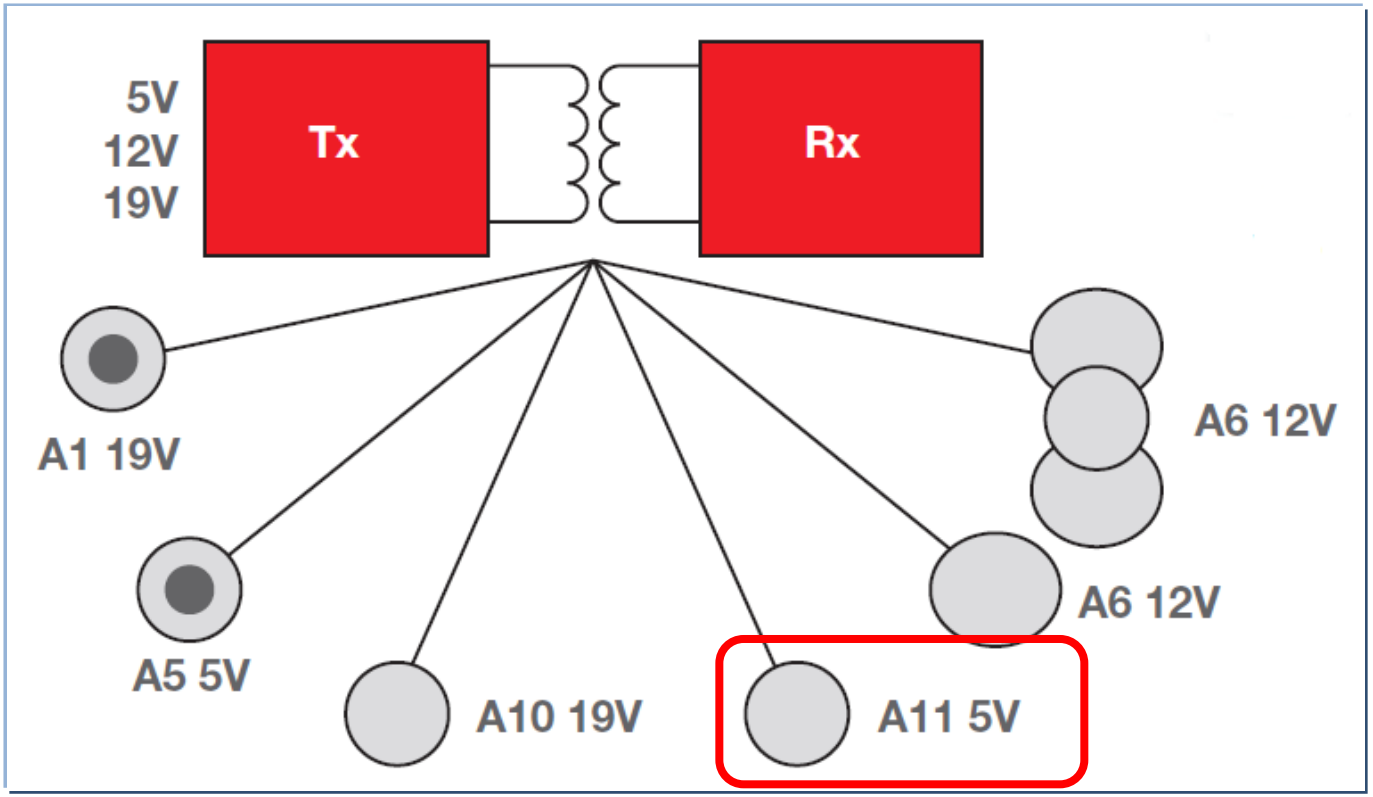
WPC Qi无线充电系统框图



WPC Qi无线充电子系统框图



新唐无线充电解决方案

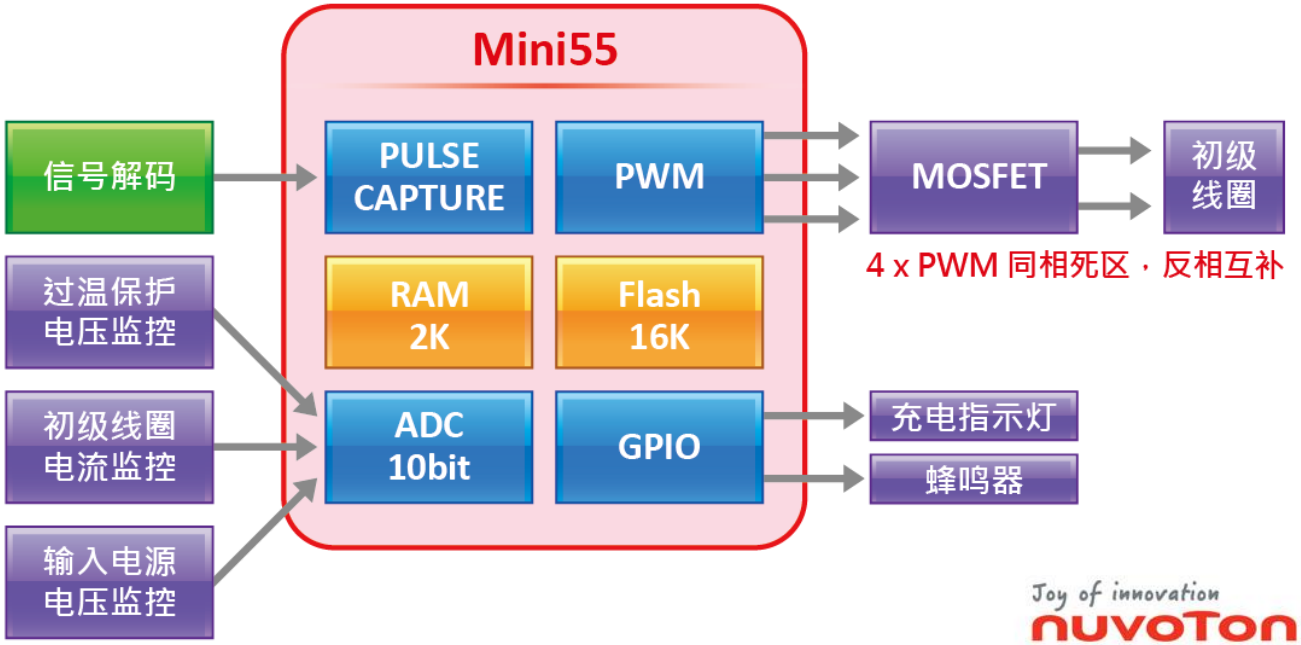
应用芯片

- Mini55LDE/ZDE

方案特性

- 32位CPU/48MHz/1T乘法器的强大运算能力
- 48Mhz 16-bit PWM
- 转换效率达75%
- 相容Qi 1.1标准
- 动态功率调整
- 异物检测（FOD)

系统示意图



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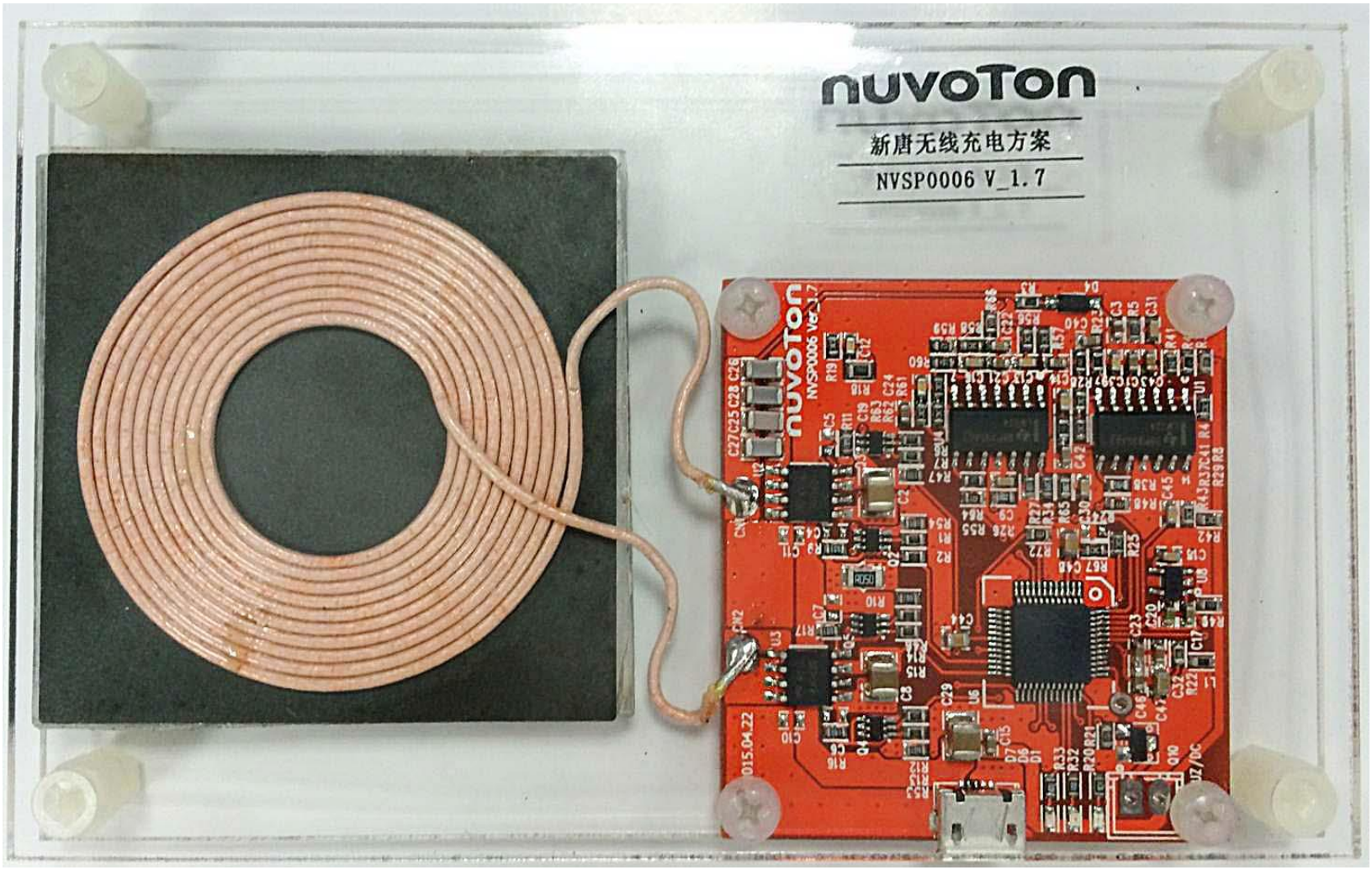
新唐无线充电方案演示板



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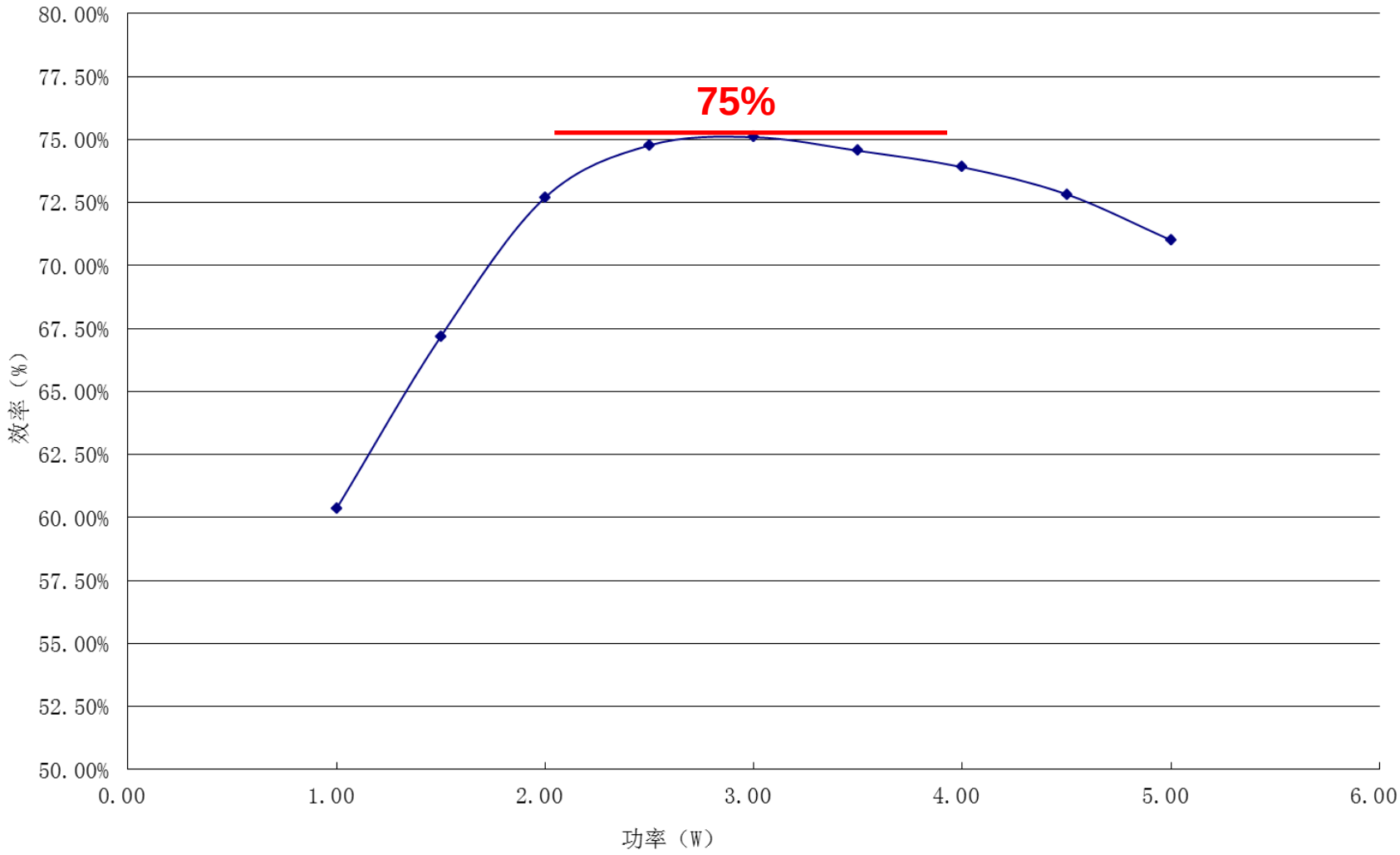
效率曲线



NuMicro Mini55 主要参数

- **ARM® Cortex ® -M0 core**
  - 最高工作频率48MHz.
  - 单周期 32-bit 硬件乘法器
  - 单周期 32-bit 硬件除法器
- **存储器**
  - 17.5KB Flash
  - 2KB SRAM
  - 2kB Flash for ISP loader
- **模拟外设**
  - 12 通道，采样率 500Ksps, 10-bit ADC
  - 转换可以通过软件出发，PWM 触发，外部事件触发
  - 2个模拟比较器
- **通讯外设**
  - 2 x UART
  - 1 x SPI
  - 1 x I^2C
- **PWM**
  - 6 x 16-bit PWM
  - 时钟最高48MHz
  - 支持中心对齐和边沿对齐
  - 支持不对称模式
  - 死区可编程
  - 支持占空比/周期触发ADC转换
  - 支持比较器事件触发PWM,强制PWM输出低做电流保护
- **其他**
  - 宽电压工作范围：2.1V~ 5.5 V
  - 宽温度工作范围：-40℃~105℃
  - 128-bit UCID

Why Nuvoton?

- WPC 正式会员
- 方案通过WPC 认证 (GZES1411013461IT)
- Nuvoton 认证经验可辅助客户成功通过认证
- 本地方案研发、本地技术支持

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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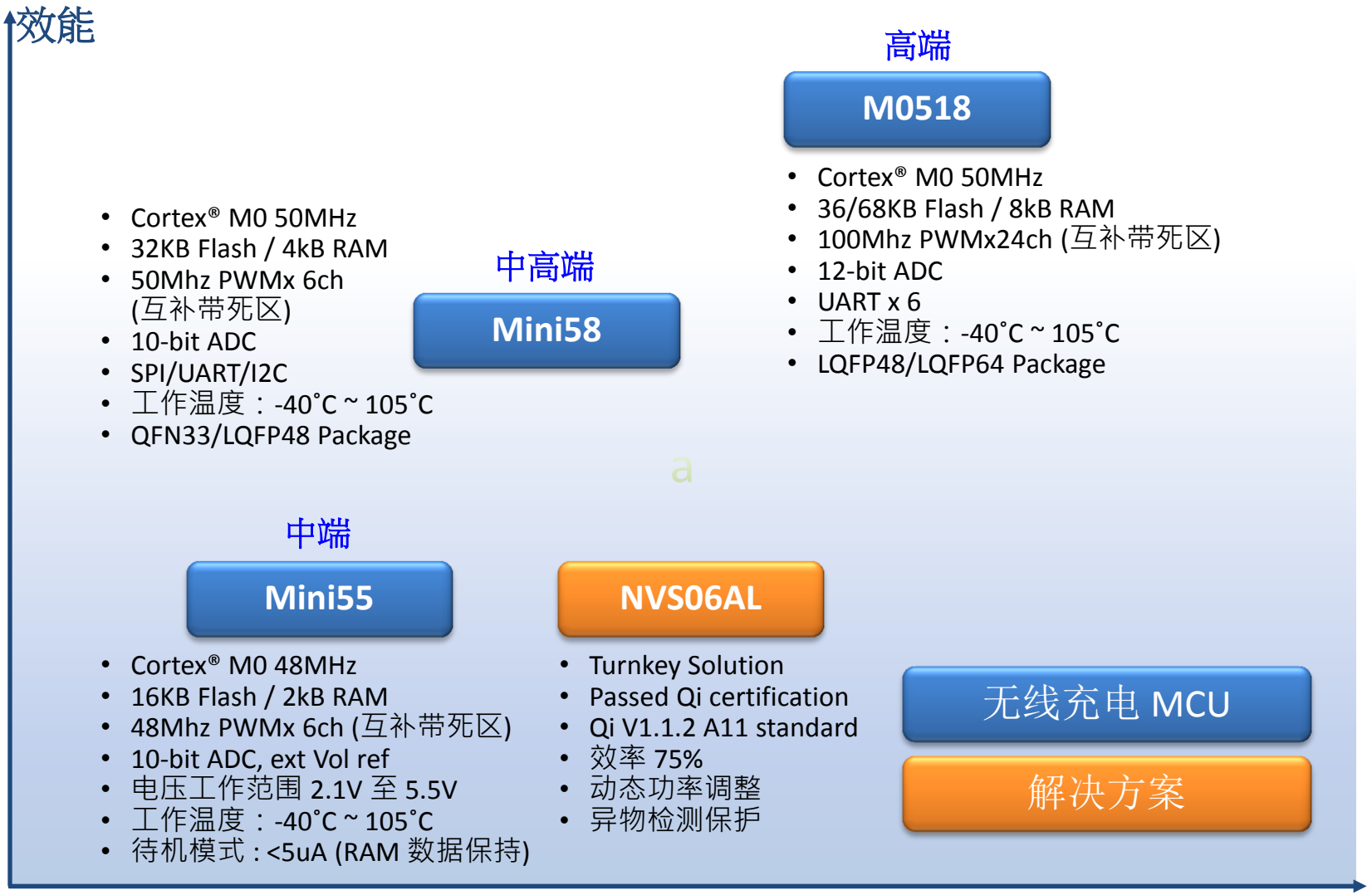
新唐无线充电 MCU 芯片解决方案



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