



Product Safety Engineering Society
Taipei Chapter

Wireless Charging/無線充電

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Date: 2011-12-14



Agenda

- 無線充電簡介
- 無線充電相關產品與發展
- 無線充電相關安全考量



無限充電技術

- Radio Frequency (射頻技術)
- Microwave Power Transmission (微波)
- Laser Powerbeaming (雷射光)

Note: FDA CDRH (North America) and IEC 60825-1 (International)



Class II



Class IIIa



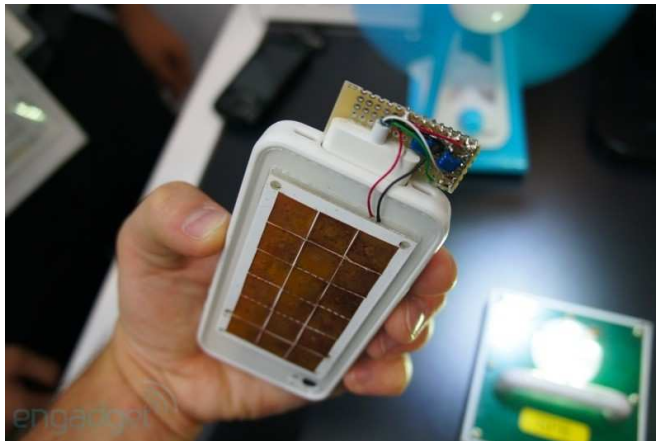
無限充電技術

- Electrical conduction (電傳導), e.g,
- Solar power, wind power, etc.
- Induction; Inductive coupling (電磁感應偶合), e.g.,
RFID, Induction heater, Toothbrush, etc.



無限充電技術

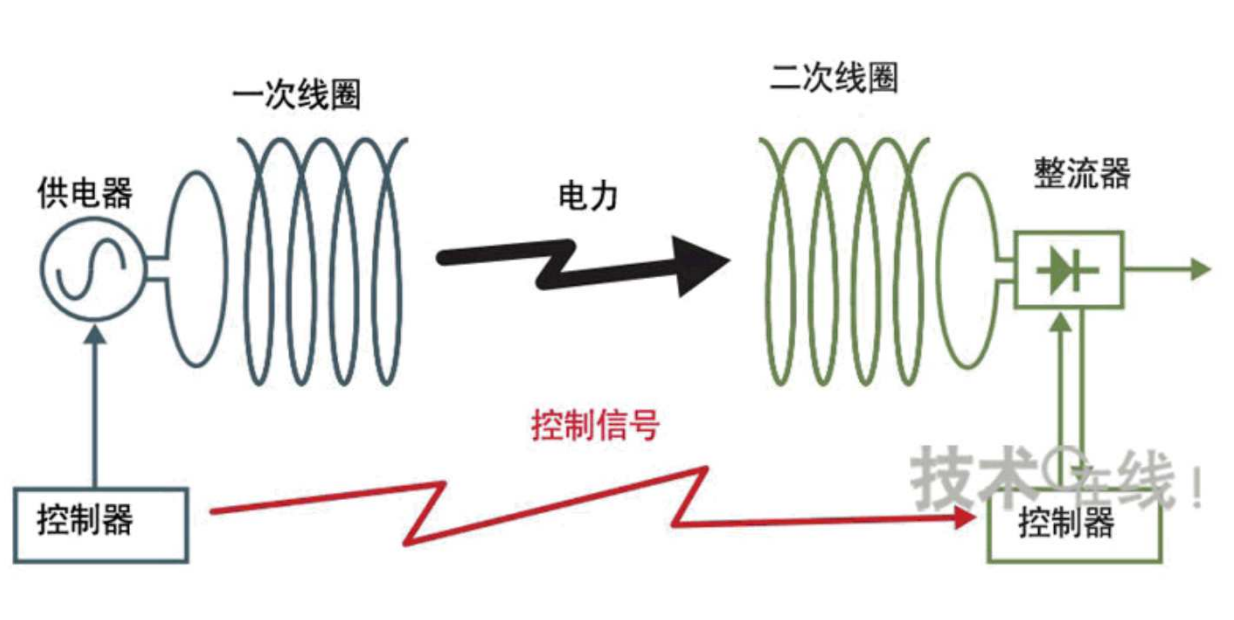
→ Capacitive coupling.



<http://www.engadget.com/>



Inductive coupling



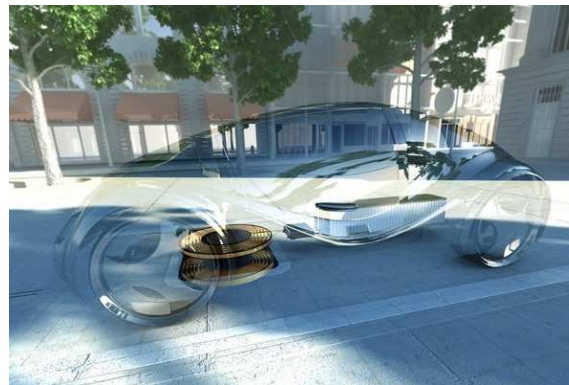
<http://big5.nikkeibp.com.cn/>



無線充電技術應用



Automotive industry:



Car Charger

Universal Charging Surface for Autos

- Single position charging surface for the car
- Adjustable to easily fit Powermat enabled devices
- Attaches to multiple locations and is powered by a standard 12V outlet (cigarette lighter)
- Includes Car Charger, 12V Power Supply



• Available Q3 2011
• \$59.99 retail

engadget
Information. Product by. Charge.

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<http://www.engadget.com/>



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無線充電技術應用 (Cont.)



SAMSUNG TOMORROW
www.samsungtomorrow.com



<http://www.engadget.com/>



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無線充電技術應用 (Cont.)

PV & Wireless Charging:



<http://www.engadget.com/>



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無線充電技術應用 (Cont.)



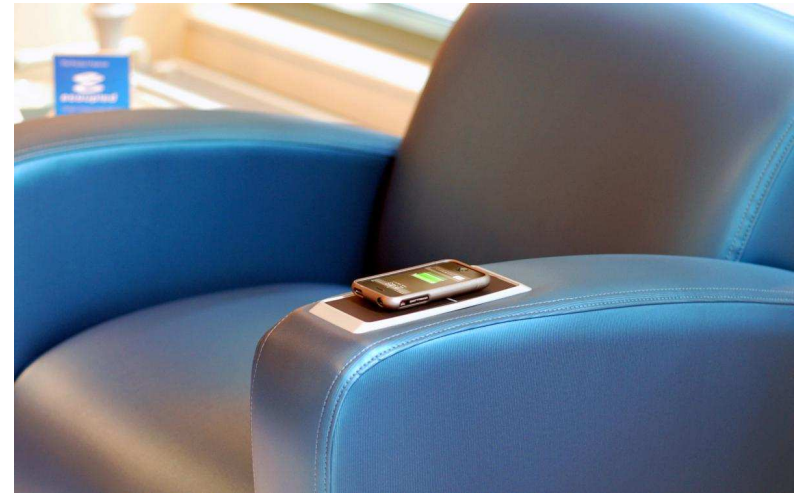
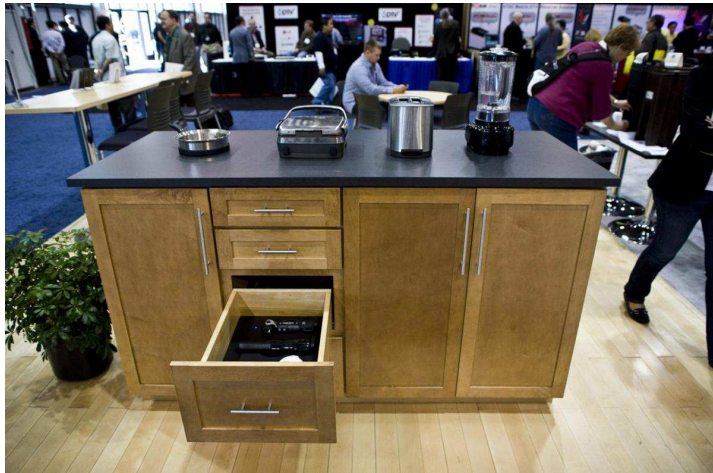
<http://www.engadget.com/>



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無線充電技術應用 (Cont.)



<http://ecoupled.com/>



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無線充電技術應用 (Cont.)



Wireless powered telemetry



<http://www.edn.com/blog/PowerSource/>



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相關機構/協會



➔ WPC: Wireless Power Consortium (5W)



➔ CEA Wireless Power Subcommittee R6sc3

- WG1 - Nomenclature
- WG2 - Safety and Emissions
- WG3 - Efficiency and Standby Power
- WG4 - Mid Range
- WG5 - Short range



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當前相關標準

- CEA: CEA-2042.1: **Wireless Power Glossary of Terms**
- ANSI/UL 2738: **Standard for Induction Power Transmitters and Receivers for use with Low Energy Products**
- WPC Qi low power specifications:
 - **Part 1, Interface Definition**
 - **Part 2, Performance Requirements**
 - **Part 3, Compliance Testing**



值得注意的潛在危險與可能因應對策

□ General safety Hazards

→ 參考適當產品標準

□ Non-approved device on platform

→ 磁力啟動機制

→ 資料碼辨識

→ 熱保護裝置

→ Heat sinks

→ 風扇

→ Heat pipe

→ PLD (Power Loss detection)



值得注意的淺在危險與可能因應對策

- Exposure/interference of large magnetic fields/
dissipated power in free space
 - 降低能量傳輸
 - 降低操作頻率
 - 降低傳輸距離





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謝謝大家的時間！

