

無線充電介紹



Reported: 台北工程部

Date: Dec 27th 2017

Update :





- 無線充電發展史
- 磁感應原理
- 磁共振原理
- RF無線充電
- 比較表
- 發展重點



無線充電發展史

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From this...



有線充電

To this today...

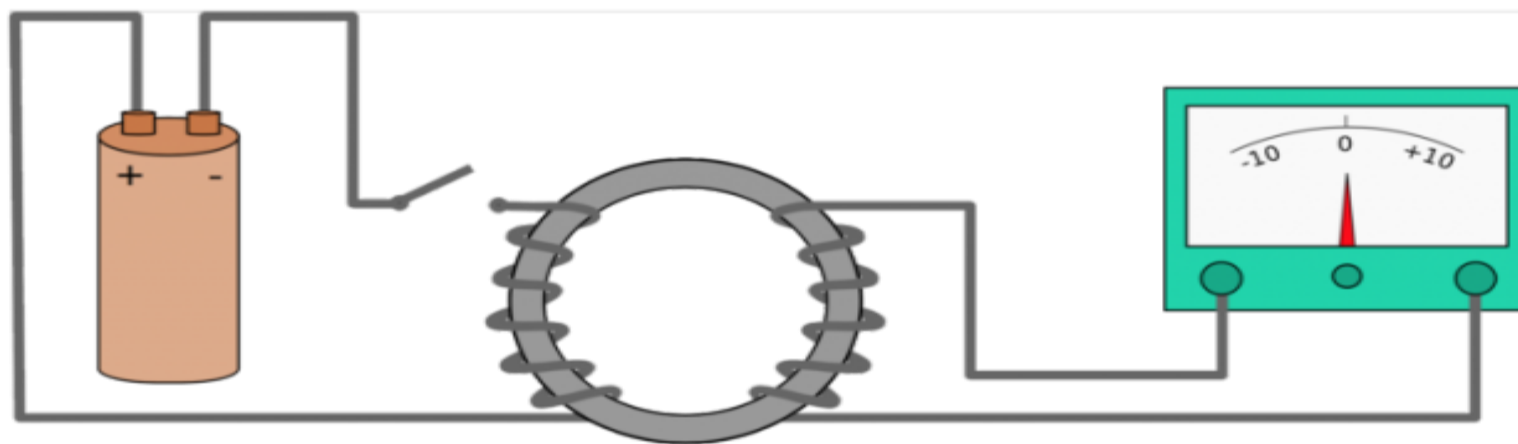


無線充電(接觸式)

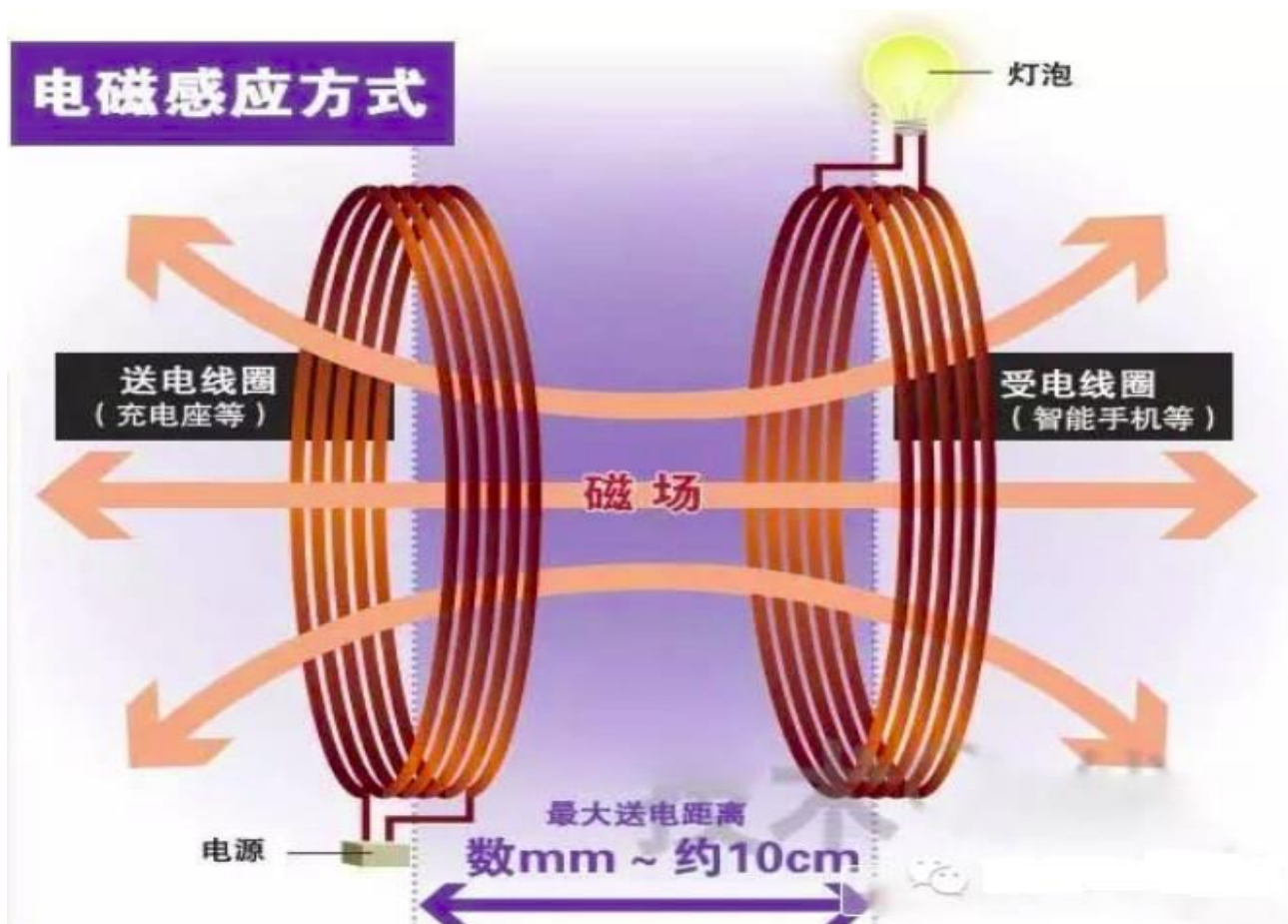
To this from 201x...



短距離無線充電



▲ 法拉第鐵圈實驗示意圖：左邊線圈磁通量的改變，會在右邊線圈感應出電流。



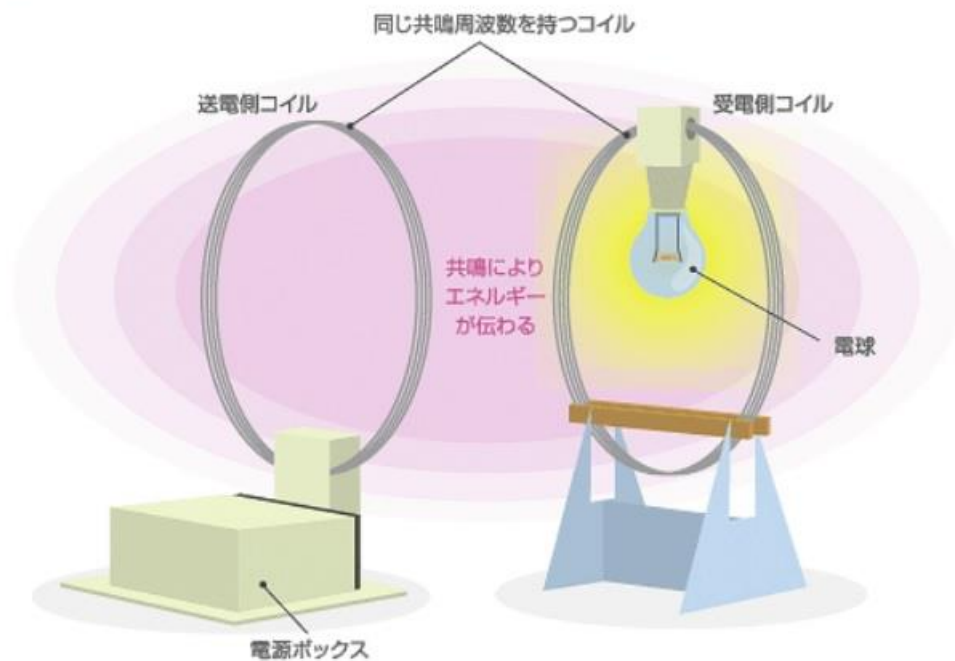
▲ 目前的主流，但TX線圈及RX線圈距離不能太遠。



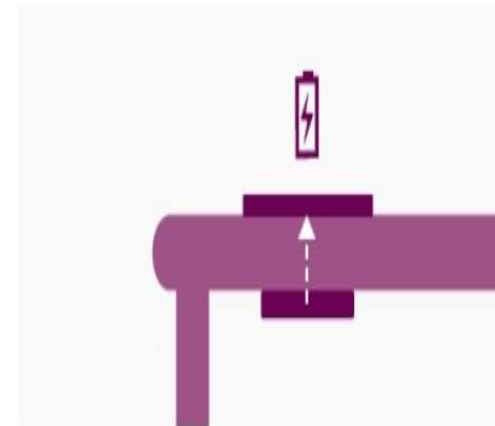
磁共振原理

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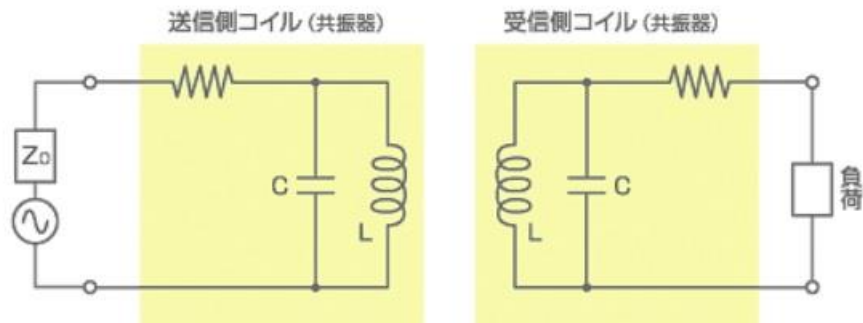
磁気共鳴方式による送電



Resonant



< 回路図 >





RF 無線充電

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Charging distance
up to 5 mm

FCC now

International from Q2'17



Charging distance
up to 3 feet

FCC Q3'17

International from Q4'17



Charging distance
up to 15 feet

2018



**Near Field
Solution
(10W)**

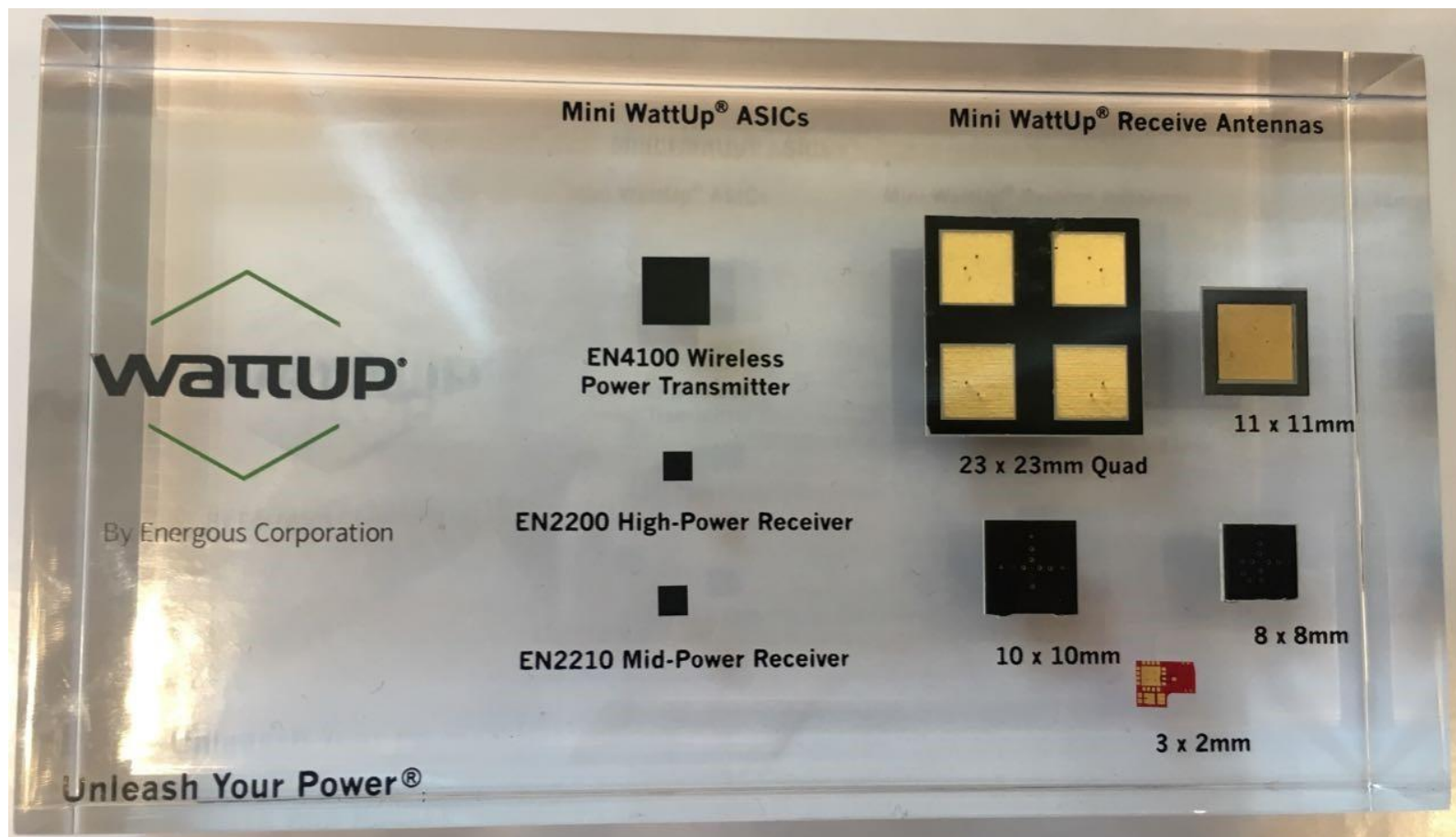


**Mid Field
Solution
(3~5W)**



**Far Field
Solution
(mW)**

▲ RF 無線充電目前以WattUp技術為主，號稱無線充電的終極手段



▲ WattUp採用的小型天線使用現有元件的PCB形成，不須線圈



- Wireless Power Alliance

Alliance Name	WPC	Airfuel
Mark		
Established	Dec/2008	2015由 A4WP及PMA 合併
No. of Members	367	126
Key Members	Apple ,Samsung ,Nokia , Qualcomm	Starbucks ,Qualcomm ,Dell , Samsung
Method	Inductive Coupling	Inductive Coupling
Power Freq Band	100k-205kHz	277k-357kHz
Commercial Status	> 867 certified products	> 126 certified products



Uncoupled (Energous)

e.g. best fit for low power wearables

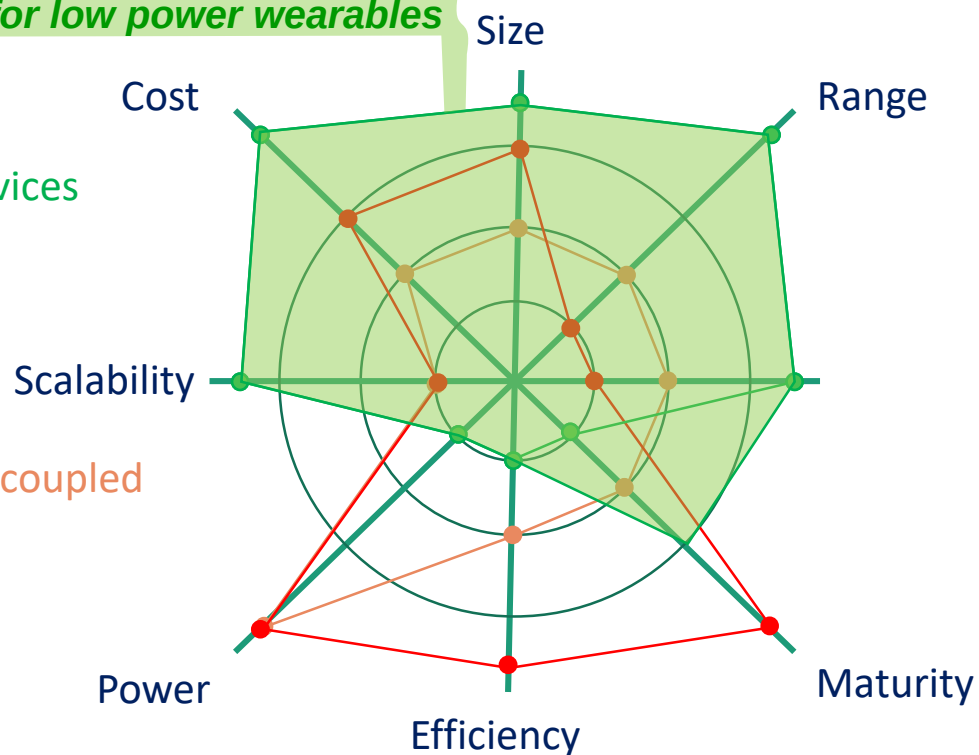
- Ideal for **consumer and IoT devices**
- Low power, smallest size, multiple devices

Loose coupled Resonant (Airfuel)

- Ideal for **automotive**
- High power, multiple devices, loosely coupled

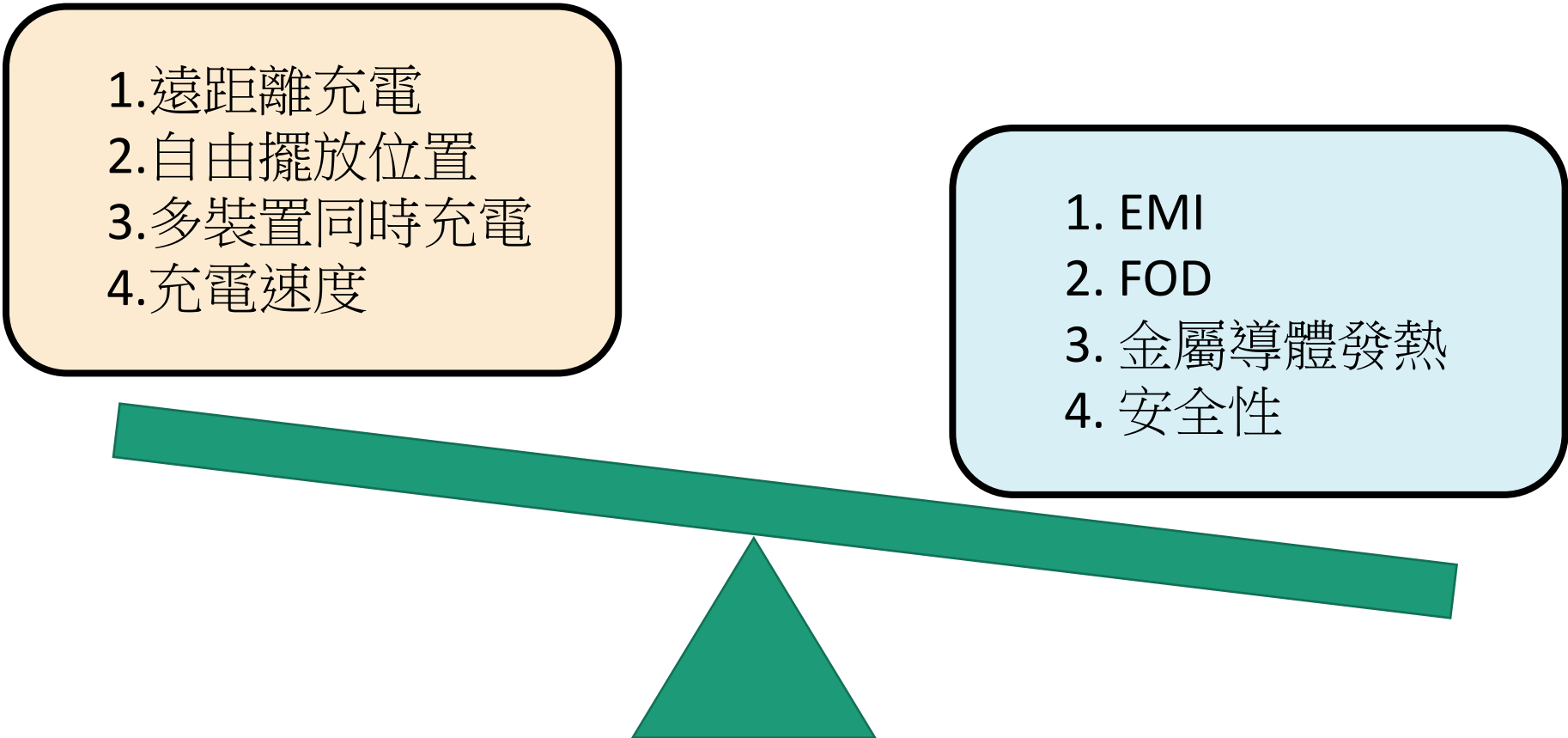
Tight coupled Inductive (WPC)

- Most mature solution today
- Low cost, single device, tightly coupled



Key: best is furthest from centre of chart



- 
- 1. 遠距離充電
 - 2. 自由擺放位置
 - 3. 多裝置同時充電
 - 4. 充電速度

- 1. EMI
- 2. FOD
- 3. 金屬導體發熱
- 4. 安全性



欲知詳情請洽...

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FAE team

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Thank You

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