



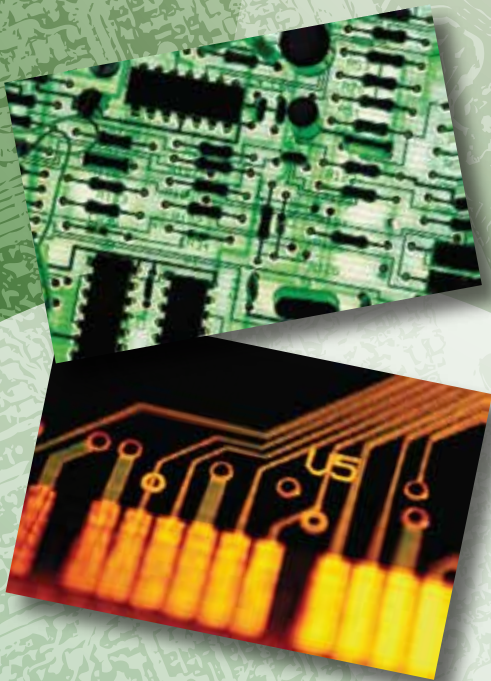
# 實用射頻電路板設計： 無線電訊產品及網絡

## Practical RF PCB Design: Wireless Telecommunication Products & Networks

新科技培訓計劃 (NTTS) 預先認可  
(50% 學費退還)

5-6 August 2011

### 課程簡介 Introduction



現今消費市場對無線通訊產品的要求相當高。設計優良的射頻電路板，是無線電訊產品的主要成功因素。因為電路板的佈局對產品的表現、穩定及可靠性影響極大。現時，無線產品市場競爭激烈，產品開發過程時間緊迫，本課程針對射頻產品電路板的專業設計技巧，與參加者分享相關知識及經驗，協助參加者以最少迭代次數設計出高性能射頻電路板。

One of the most demanding consumer products in the market is the wireless telecommunication product. A well-designed Radio Frequency Printed Circuit Board (RF PCB) contributes significantly to the success of any wireless product as the layout of the PCB greatly affects the performance, stability and reliability of the product. In view of today's highly competitive wireless products market with increasingly compressed development time-frame, this training programme aims to share professional knowledge and experience of RF PCB design techniques so as to help the participants to design to-performing RF PCBs in less number of iterations.

主辦機構 Organizer



協辦單位 Co-organizer



支持單位 Supporting Organization



Agilent Technologies

## 課程宗旨 *Course Objectives*

本課程旨在為參加者提供一個實用，並以工業角度的電路板設計培訓。課程由實戰經驗豐富的射頻專家，有系統地教授各技術及理論，並會涵蓋消費產品個案研究。課程特別適合射頻從業員報讀，以掌握最新知識及技術，保持競爭力。

This course aims to provide participants with an insightful training on RF PCB design from a practical, industrial perspective. Participants will be led through a systematic, theoretical presentation with case studies on commercial products in the training. The course will be conducted by an RF expert with rich industrial experience. It is suitable for RF professionals who want to keep up-to-date their skills and knowledge in RF PCB design and stay competitive.

## 課程對象 *Target Audience*

射頻設計師、無線產品設計師、應用工程師、設計經理及相關行業專家

RF Designers, Wireless Product Designers, Field Application Engineers, Design Managers and related professionals

## 講者簡介 *About the Speaker*

**劉善啓先生**先後於英國及美國取得電子工程學碩士及工商管理碩士學位。他在香港及美國有超過二十一年射頻系統、產品設計和RFIC的經驗。他曾在美國Motorola 和Conexant 任職主任工程師多年，主要從事手機的RFIC和矽材料調頻器開發。劉先生擁有五個射頻設計專利。現時他在香港及美國開設無晶圓半導體公司——「立聲威科技有限公司」，主要業務為RFIC、射頻模塊、射頻系統的設計及銷售。劉先生於全球各地教授多個射頻設計課程，經驗豐富。

**Mr. Henry Lau** received his M.Sc. and MBA degrees from UK and USA respectively. He has more than 21 years of experience in designing RF systems, products and RFICs in both Hong Kong and US. He worked for Motorola and Conexant in US as Principal Engineer on developing RFICs for cellular phone and silicon tuner applications. Mr Lau holds five patents, all in RF designs. He is currently running Lexiwave Technology, a fabless semiconductor company in Hong Kong and US designing and selling RFICs, RF modules and RF solutions. He has also been teaching numerous RF-related courses internationally.

## 授課語言 *Medium of Instruction*

廣東語輔以英文專業術語 (英文講義)

Cantonese with English terminology (English handout)

## 課程資料 *Course Information*

日期及時間 : 2011年8月5-6日 09:30-17:00  
地點 : 九龍達之路78號生產力大樓1樓  
課程費用\* : HK\$2,700 / HK\$2,430 (2011年7月15日或之前報名)

Date : 5-6 August 2011 09:30-17:00  
Venue : 1/F, HKPC Building, 78 Tat Chee Avenue, Kowloon  
Course fee : HK\$2,700 / HK\$2,430 (Enrol on or before 15 July 2011)

\*本課程獲新科技培訓計劃 (NTTS) 預先認可，符合資助要求的企業可獲發還50%課程費用。The training course has been successfully pre-approved under the New Technology Training Scheme (NTTS). Each eligible trainee can obtain a training grant of 50% of the actual course fee.  
有關資助計劃詳情請瀏覽 For NTTS details, please visit : <http://ntts.vtc.edu.hk>。

## 課程大綱 Course Outline

### 1. 射頻電路的設計

- 由產品設計、電路設計，到電路板設計
- 層堆疊式分配
- 接地方法及技巧
- 互連及I/O
- 旁路及解耦
- 分區方法

### 1. Printed circuit board design for RF circuits

- From product design, circuit design to PCB design
- Layer stack-up assignment
- Grounding methods and techniques
- Interconnects and I/O
- Bypassing and decoupling
- Partitioning methods

### 2. 其他電路的設計

- 時鐘電路
- 基頻電路
- 音頻電路
- 開關穩壓器電路
- 阻抗控制電路
- 子插件板及背板

### 2. Printed circuits board design for other circuits

- Clock circuits
- Base-band circuits
- Audio circuits
- Switching regulator circuits
- Impedance-controlled circuits
- Daughter cards and Backplanes

### 3. 符合電磁波兼容／電磁干擾要求的電路板設計

- 美國及歐洲電信標準協會標準
- 電磁波兼容、電磁干擾及靜電釋放的要求
- 接地方法
- 解耦法
- 屏蔽法

### 3. PCB design for EMC/EMI compliance

- Standards: US and ETSI
- EMC, EMI and ESD compliance
- Grounding methods
- Decoupling methods
- Shielding methods

### 4. 其他設計技巧

- 生產因素考慮
- 有系統的產品設計模式
- 連接器
- 鐵氧體磁珠的選擇
- 其他射頻因素考慮
- 外殼設計

### 4. Additional Design Techniques

- Production concerns
- Systematic product design approach
- Connectors
- How to select ferrite device
- Other RF concerns
- Casing design

### 5. 個案研究

- 短距離通訊裝置
- 無線射頻識別系統
- 遙遠控制
- 長距離通訊裝置

### 5. Case studies

- Short range communication device
- RFID
- Remote control
- Long range communication system

## 查詢 Enquiry

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