

系統電路電源整合與訊號整合分析

之接觸式針測與非接觸式近場測試技術

摘要：

技術成果上，主要是以 SiP 系統層級封裝及系統電路訊號整合(SI)與電源整合(PI)特性最佳化及特性量測驗證為技術發展目的，整合系統電路接觸式量測技術(如：接頭或探針進行之散射參數或時域量測)、非接觸量測技術(如：磁場或電場近場量測)，配合模擬及系統整合設計技術流程，發展電磁干擾、電源與訊號整合以及靜電散逸路徑等系統電路特性最佳化設計分析技術，提供系統電路直觀有效的高品質訊號整合(SI)與電源系統整合(PI)解決方案。

在技術上之**創新與突破**主要有：

1. 系統電路雙面直接校正量測技術 (接觸式針測技術)：

解決 SiP 系統層級封裝接觸式針測量測技術無法直接校正量測、量測頻寬與準確性不佳瓶頸，成功發展雙面直接校正量測環境、校正治具，完成量測驗證，取得多項專利並成功推廣至多家產業使用。

2. 近場量測技術應用於系統電路整合設計驗證 (非接觸式近場技術)：

解決傳統接觸式高頻量測僅能就多埠電路輸出入特性進行量測驗證，導入高精密度機器手臂環境之新式近場量測系統，以近場輻射電磁場隨頻率與時間變化，成功實際量測驗證多埠電路在操作時問題發生之原因與位置，為系統特性測試驗證建立新式量測技術。技術內容為非接觸近場技術發展之「系統電路層級之靜電消散路徑檢測」、「系統電路同步切換雜訊頻域暨時域量測與應用」

關鍵字：雙面校正、近場量測、同步切換雜訊、靜電消散、訊號整合、電源整合、
頻域量測、時域量測、解耦合電容

Novel Probing Contact and Non-Contact Near-field Testing Technologies Development for Signal Integrated and Power Integrate of System-in Package and System-Level Circuit

Abstract

The purposes of measurement technologies development are mainly based on signal integration (SI) and power integration (PI) characteristics optimization and verification on system-in-package and system-level circuit. Development novel measurement technologies of electromagnetic interference(EMI), power and signal integration(PI/SI) and electrostatic discharge path (ESD path) by integrated contact measurement technology (such as connector or probing for scattering parameters or time-domain measurements), non-contact measurement techniques (such as magnetic field or electric field near field measurements) and integration design flow provide intuitive and efficient system circuit signal integration (SI) and power system integration (PI) solutions.

Technology innovation and breakthroughs including:

1. Directed Double-side Calibration and Probing Measurement

Solve the bottlenecks of non-directly multi-side probing, narrow frequency bandwidth and poor accuracy to System-in-package testing. Patent protection non-layer structure double-sided calibration kits substrate and direct double-side probing probe-station are developed and promotion to the industry successfully.

2. Near-field measurement technology apply to integration circuit design

Introduce the new near-field measurement system of high-precision robot arm near-field environment to solve the problem that traditional contact high frequency measurement can only verify circuit characteristics during output/input ports. Define the problem causes and locations during circuit operation by novel measurement technologies of the near-field radiation electromagnetic field varies with frequency and time, establish a novel and new non-contact measurement techniques for system testing. Novel technical content included “System-level Static-charge Dissipation Path Detection” and “Time-domain and Frequency-domain Simultaneous Switching Noise Detecting and Application” .

Keywords: Double-side Calibration, Near-field, Simultaneous Switching Noise, Static-charge Dissipation, Signal Integrated, Power Integrated, Decoupling Capacitor