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IC PACKAGE PITCH, LEADFRAME PLATING, AND SUBSTRATE MARKETS

2013 EDITION

An Extension of the Most Comprehensive Report Available On The Global IC Packaging Industry

Report Highlights

- **Industry Overview**
- **The Economic State of the Industry**
- **Summary of Market Forecasts, 2012–2017**
  - **IC Package Pitch by Package Family and I/O Count**
  - **Leadframe Plating and Lead-free Issues**
  - **IC Packaging Substrates**

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Synopsis

Integrated circuits (ICs) are placed in a package, which gives the semiconductor die the mechanical and electrical interface to the printed circuit board (PCB). Once packaged, the IC transforms from a “die” into a “chip”.

This report, the **IC Package Pitch, Leadframe Plating, And Substrate Markets**, provides information which will help determine the size of a package, the test socket size, and the footprint of the device on a PCB, as well as provide information on material choices for leadframes, which affects the test companies, printed circuit board manufacturers, and others who delve into the interfaces with the package leadframe. The following paragraphs describe the topics of discussion within the report.

Package Pitch

One of the functions of an IC package is to provide the mechanical connection to the printed circuit board (PCB). Whether the connection is a lead, ball, land pad, or pin, each of these elements will be spaced at a certain distance to the next interconnection to the board. The distance between the center of one lead or ball to the next is referred to as the pitch.

Chapter 4 of this report covers the package pitch of all the IC package families available, including DIP, SOT, SO, TSOP, DFN, CC, QFP, QFN, PGA, BGA, FBGA, and WLP, by I/O count ranges of 3-18, 20-32, 34-100, 102-304, 308-999, and 1,000 and up.

Leadframe Plating Options

The leadframe is the skeleton of the IC package, providing the electrical and mechanical connection from the die to the PCB. Most leadframes are made out of copper, and it, and all materials used to create leadframes, do not solder to a PCB, so the leadframes must be plated with some type of solderable material to make the leadframe adhere to the PCB in a reflow oven. This material also protects the leadframe from oxidation, corrosion, and abrasion. Leadframes fall into either preplate or postplate options.

Preplate leadframes are plated well before die attach and assembly, by the leadframe manufacturer. Postplate leadframes are plated after die attach, interconnection, and overmolding, as part of the package assembly operations.

Chapter 5 covers the leadframe plating options, and issues associated with these choices.

IC Package Substrates

Packages such as PGAs, BGAs, LGAs, and FBGAs all attach to a substrate, also known as an interposer. The substrate replaces the leadframe as the interposer between the die and the PCB. The substrate can be made from a variety of materials, including BT (bismaleimide triazine) resin, FR-4, FR-5, ceramic, and polyimide flex tape. The substrate generally has balls or pins on the underside that attach it to the PCB. The package is considered an LGA, or land grid array, if the substrate is placed on the PCB directly, without balls or pins.

Chapter 6 contains forecasts of the various substrate options by Package Family, Substrate Units, Substrate Area, and Substrate Revenue, from 2012-2017.

IC Package Pitch, Leadframe Plating, and Substrate Markets - 2013 Edition continues **NVR's** leadership position in assessing the status and future of IC packaging. This analysis is an effective and economical tool for any company associated in the semiconductor industry to aid in assessing their own markets and potential areas of growth. The report sells for $995 and is delivered by email as a single-user PDF file. Extra single-user licenses sell for $250 each and a corporate license is $1000. With the purchase of the report, an Excel spreadsheet of all tables may be obtained for an additional $750 and a printed copy for $250.

About the Author

Sandra L Winkler has been an industry analyst starting in 1988, and from 1995 has been a staff member of Electronic Trend Publications, now New Venture Research Corporation. She has produced numerous off-the-shelf and custom reports throughout her career. She began her analyst career in the telecommunications industry, with Frost and Sullivan and since 1995 has focused on the semiconductor packaging industry, authoring more than 30 widely cited reports on the topic, most notably, The Worldwide IC Packaging Market, Advanced IC Packaging Markets and Trends, and IC Packaging Materials. She is a contributing editor and writer for Chip Scale Review magazine, Global SMT & Packaging News, and contributes to the IEEE/CPMT newsletter and other media. Ms. Winkler has earned an MBA from Santa Clara University and is on the executive planning committee of the IEEE/CPMT Santa Clara Valley chapter, serving as Luncheon Program Chair.

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