TSMC Integrated Fan-Out (inFO) Package in Apple’s A10 Application Processor

Reverse engineering and costing of the new inFO packaging technology from TSMC used for Apple’s latest A10 application processor, found in the iPhone 7 and 7 Plus

Each year, Apple integrates new technology and innovations into the iPhone. This year, with the iPhone 7, Apple is the first to bring out Package on Package (PoP) Wafer-Level Packaging (WLP) at the consumer scale. For its new application processor (AP), the A10, Apple has decided to use TSMC’s new integrated Fan-Out PoP (inFO-PoP) packaging technology.

Located on the main board, the application processor (bottom package) and the DRAM Chip (top package) are in PoP configuration. Depending on the version (iPhone 7 or iPhone 7 Plus), the DRAM memory has different space management.

The Apple A10 is a wafer-level package using TSMC’s packaging technology with copper pillar Through inFO Vias (TIVs) to replace the well-known Through Molded Via (TMV) technology. With this new technology, Apple has made a huge break from traditional PoP packaging found in previous AP generations. In this report, we show the differences and the innovations of this package, including copper pillars, the redistribution layer, and silicon high density capacitor integration. A detailed comparison will give the pros and cons of inFO technology compared to PoP packaging used in the Exynos 8 and the Snapdragon 820.

Thanks to the inFO process, Apple is able to offer a very thin package on package, with a high number of I/O pads and better thermal management. The result is a very cost-effective component that can compete with any well-known PoP. This report also compares costs with other chips and includes a technical comparison with the previous Apple AP, the A9.

Title: Apple A10 inFO-PoP
Pages: 100
Date: October 2016
Format: PDF & Excel file
Price: Full report: EUR 3,490

COMPLETE TEARDOWN
WITH:
- Detailed photos
- Precise measurements
- Material analysis
- Manufacturing process flow
- Supply-chain evaluation
- Manufacturing cost analysis
- Estimated sales price
- Comparison with Samsung Exynos 8 and Qualcomm Snapdragon 820
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