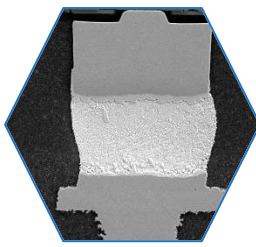
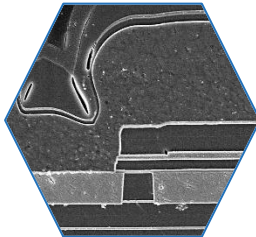


## AMD Ryzen 5 Pro SoC Central Processing Unit

*System-on-chip mobile processor using TSMC’s 7nm process technology with multiple layers of MIM capacitor material embedded between the die metal layers.*



**Title:** AMD Ryzen 5 Pro SoC Central Processing Unit

**Pages:** 110

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**Price:** EUR 6,490

**Reference:** SPR21637

The recent transition to working and learning from home has driven resurgent growth in the laptop CPU market, with 1H21 generating 62% more revenue for CPU designers than 1H19. With solutions like the Ryzen 5, AMD has increased their laptop CPU revenue by almost 2.5x over the same period, raising their revenue share to 12% in Q2-2021. Advanced Micro Devices (AMD) has introduced several system-on-chip circuits using 7nm to target business and commercial products. AMD’s Ryzen PRO processors are multi-core processors with high performance, enhanced battery life, and several security features.

AMD’s Ryzen 5 Pro 5650U processor uses a 6-core processor, where multiple cores maximize performance for professional and business applications. It is designed with layered security features to protect its users from any data breach. Laptops powered by the Ryzen 5 Pro processor benefit from an enhanced, uncompromised battery life that allows users to operate longer hours without being on the power source.

AMD’s processor is built on a 7nm FinFET process designed to boost power efficiency in laptops and provide ultimate processing speeds. The 7nm technology and optimized architecture design enable consumers to reap the benefit of high computing performance in a light design.

This report constitutes an exhaustive analysis of the AMD Ryzen 5PRO 5650U system-on-chip processor, including a full analysis of the package and SoC die. Also provided are a complete teardown and

physical analysis including 3D x-ray images as well as optical and SEM pictures of the package cross-section and the die cross-section. The die cross-section reveals several layers of MIM capacitors embedded between the die metal layers. EDX analysis allowing for material identification was undertaken to reveal the materials used in the manufacturing process. This report also includes a floorplan analysis that discloses the high-level chip architecture and an estimation of IP block area. High-resolution SEM images expose the 7nm process technology.

Additionally, a section is included which details the manufacturing process of the processor. Lastly, the cost analysis includes an estimation of the wafer cost, die cost, packaging, and component cost of the Ryzen R5 PRO 5650U processor.

### COMPLETE TEARDOWN WITH:

- Detailed photos
- Precise measurements
- Materials analysis
- Floorplan
- 3D X-ray images
- Manufacturing process flow
- Supply chain evaluation
- Manufacturing cost analysis

## TABLE OF CONTENTS

### Overview/Introduction

- Executive Summary
- Reverse Costing Methodology

### Company Profile & Market Analysis

- AMD Financials
- AMD Location
- AMD Main Products
- AMD Pro Mobile Processors
- Market Analysis

### Physical Analysis

- Summary of the Physical Analysis
- Package Analysis
  - ✓ Package views
  - ✓ Package cross-section
  - ✓ Processor cross-section
- Processor Die
  - ✓ Processor die view & dimensions
  - ✓ Processor delayering
  - ✓ Processor die process

- ✓ Processor die cross-section
- ✓ Processor die process characteristics
- Floorplan
- 3D X-Ray

### Manufacturing Process

- Processor Die Front-End Process
- Processor Fabrication Unit
- Final Test & Packaging Fabrication Unit
- Summary of the Main Parts

### Cost Analysis

- Summary of the Cost Analysis
- Yields Explanation & Hypotheses
- Processor Die
  - ✓ Die front-end cost
  - ✓ Die probe test, thinning & dicing
  - ✓ Die wafer cost
  - ✓ Die cost
  - ✓ Packaging cost
  - ✓ Component cost

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### Estimated Selling Price



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**Don Scansen** has partnered with System Plus Consulting to launch the new die architecture and front-end process analysis of advanced SoC devices including APU, CPU, GPU, and FPGA. Don previously supported clients ranging from individual patent owners to Fortune 500 companies providing competitive analysis and intellectual property support. He holds a PhD in electrical engineering.



**Véronique Le Troadec** has joined System Plus Consulting as a laboratory engineer. Coming from Atmel Nantes, she has extensive knowledge in failure analysis of components and in deprocessing of integrated circuits.

## RELATED ANALYSES



### Intel Tiger Lake i7 CPU

Intel's 11th-generation core processor using its latest 10nm SuperFin process.

August 2021 - EUR 6,490\*



### Samsung Exynos 2100 System-on-Chip

5G mobile processor using Samsung's 5nm FinFET process with embedded packaging.

September 2021 - EUR 6,490\*

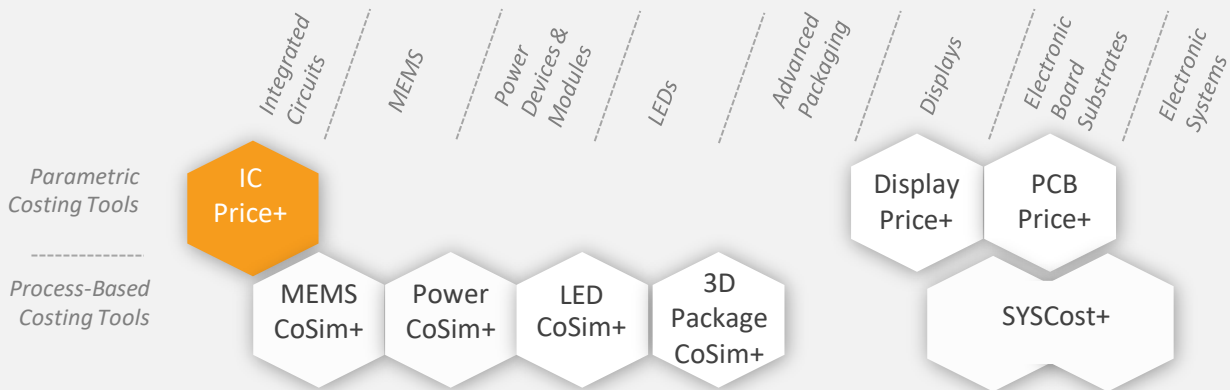


### Computing and AI Technologies for Mobile and Consumer Applications 2021

Penetrating everyday products will see the market for AI technologies for the consumer market reach \$5.6B in 2026.

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## COSTING TOOLS



Our analysis is performed with our costing tool IC Price+.

System Plus Consulting offers powerful costing tools to evaluate the production cost and selling price from single chip to complex structures.

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## ABOUT SYSTEM PLUS CONSULTING

### WHAT IS A REVERSE COSTING®?

Reverse Costing® is the process of disassembling a device (or a system) in order to identify its technology and calculate its manufacturing cost, using in-house models and tools.



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# TERMS AND CONDITIONS OF SALES

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## 1. INTRODUCTION

The present terms and conditions apply to the offers, sales and deliveries of services managed by System Plus Consulting except in the case of a particular written agreement.

Buyer must note that placing an order means an agreement without any restriction with these terms and conditions.

## 2. PRICES

Prices of the purchased services are those which are in force on the date the order is placed. Prices are in Euros and worked out without taxes. Consequently, the taxes and possible added costs agreed when the order is placed will be charged on these initial prices.

System Plus Consulting may change its prices whenever the company thinks it necessary. However, the company commits itself in invoicing at the prices in force on the date the order is placed.

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