

BCD Technology and Cost Comparison 2021

In-depth comparative study of 40 BCD technologies from the major 17 manufacturers (Infineon, STMicroelectronics, NXP, Renesas, etc.)

This report presents an in-depth analysis of the latest innovations in Bipolar-CMOS-DMOS devices. It shows the differences between 40 selected devices from Infineon, STMicroelectronics, Elmos, Bosch, NXP, Littlefuse, Texas Instruments, Analog Devices, Tower Semiconductor, Denso, Renesas, Toyota, Toshiba, Mitsubishi, Rohm, and TSMC. The report covers all the major players in the market and their new technologies.

In this 2021 version, you will find:

- More details on galvanic isolation.
- Four new manufacturers: Xfab, Mitsubishi, Rohm, TSMC.
- Nine new technologies, 90nm, high voltage.
- An update of the wafer cost calculation for the 31 technologies linked to the effects of COVID-19 and the worldwide material shortage.

BCD (Bipolar-CMOS-DMOS) has been developed to simplify the control of power devices by proposing a monolithic IC solution to integrate different functions such as the gate driving circuit and current/temperature measurements to protect the power component in the same silicon IC.

The 2021 version adds nine new technologies from seven manufacturers and four new manufacturers (X-Fab, Mitsubishi, Rohm, and TSMC), who have adopted very different solutions analyzed in this report. Additionally, 13 SOI technologies are studied in this report, with technology nodes ranging from 3 μ m - 90nm. The components range from monolithic piloted power transistors to microcontrollers with high-voltage analog inputs and outputs.

For each analyzed device, this report

details the manufacturing process and materials used, the component design, and the technical choices. The cost report provides an estimation of the cost structure of the wafers using the various technologies, highlighting the influence of the technological innovations.

This report also offers a unique opportunity to understand the technology evolutions and the manufacturing cost of the major BCD manufacturers and furnishes the basics for an optimal choice of components during design and integration.

In this report, System Plus Consulting analyzes and compares products from the 17 main manufacturers, with a focus on technology evolution and a description of the cost impact of these innovations. Technical and cost comparisons of the main parameters, transistors, metal layers, isolation, and passives are all performed.

COMPLETE TEARDOWN WITH

- Synthesis of the technology evolution (substrate, transistor, metallisation, and passives)
- Detailed photos
- SEM analysis of transistor structure, metal layer
- Exhaustive technology comparison
- In-depth economic analysis
- Manufacturing cost breakdown

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- Passives: Summary, Capacitor in Polysilicon, Resistor in Polysilicon, Metal Insulator Metal Capacitor, Thin Film Resistors, Inductors, Shrink, High Voltage

Foundry Technologies

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- Analog Devices: BCD 0.5 μ m, BCD 0.18 μ m, BCD 0.7 μ m
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- Synthesis Comparison
- Synthesis Comparison

Company Services

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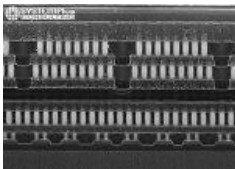


Sylvain Hallereau has been Project Manager at System Plus Consulting since 2000. He is in charge of costing analyses for Integrated Circuits, Power semiconductors and LEDs. He has significant experience in the modeling of manufacturing costs for electronics components, Sylvain holds a Master degree in Microelectronics from the University of Nantes, France.



Tom Herve has joined System Plus Consulting as a Microelectronic Laboratory Technician in order to strengthen the laboratory team. In 2020, Tom was graduated from the University of Blois where he obtained a Technical degree (DUT) in Physical Measurements. He previously worked on different subject among which precipitation of zinc oxide.

RELATED ANALYSES



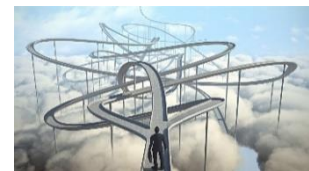
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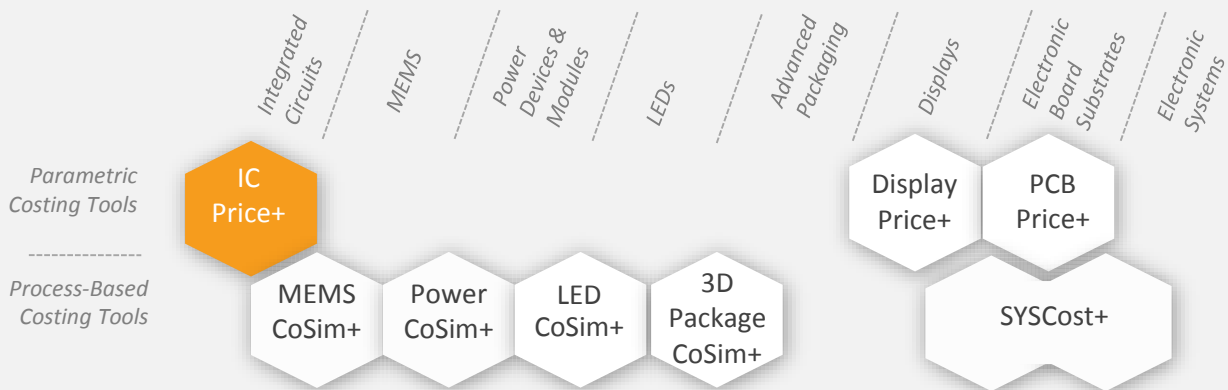
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COSTING TOOLS



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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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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