

## Whitepaper

# Reducing Design Iterations in Custom IC Developments

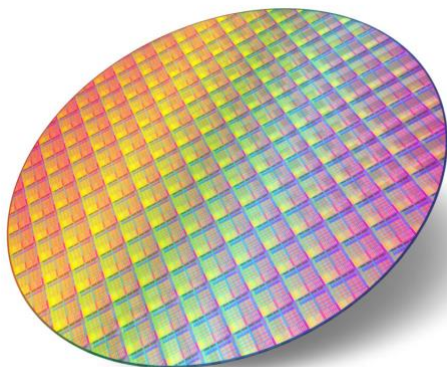
ICsense®  
**ISO 9001:2008 and ISO13485:2012 certified**  
Gaston Geenslaan 14  
3001 Leuven, Belgium  
Tel: +32(0)16 589 700  
Fax: +32(0)16 589 720  
<http://www.icsense.com>



View a 2-min video of this [approach](#) here.

Silicon wafers are produced as part of the development process of your custom ASIC. This takes up to 3 months. Each additional design iteration requires this time-consuming step. Therefore, the number of design iterations, or so called “respins,” needs to be minimised to reduce costs and meet project timing.

## FUNCTIONAL SILICON FROM THE INITIAL PROTOTYPE RUN



*Typical wafer fabrication takes around 3 months. Less iterations means reduced time-to-market and lower investment.*

From the first ASIC prototypes, ICsense guarantees **100% functional silicon**, ready for your demo purposes. We have developed a unique design environment to drastically reduce the number of respins.

Since its start, ICsense has reached mass production in all its designs with just 1 iteration, providing our customers with **fast time-to-market** and **projects within budget**.

At the core of our comprehensive and unique design environment are known industry tools from **Cadence and Synopsys**. To increase design efficiency, we built an abstraction layer around these tools along with a requirements management system to further de-risk the development process.

## TRADITIONAL IC DESIGN IS LARGELY MANUAL

To understand the power of the ICsense design environment, let's first have a look at a **traditional flow for IC design** (Figure 1). This includes:

1. **Manual sizing** of transistors and building blocks.
2. **Manual control of simulation** test benches.
3. **Manual checking of compliance** with the target specification.
4. **Manual input** in a requirements database.

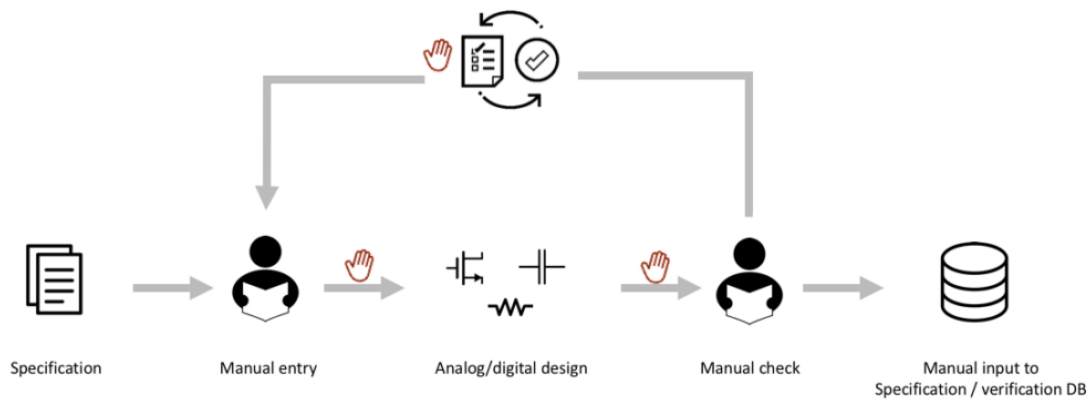


Figure 1: A traditional IC design flow is mostly manual, introducing errors, outdated parameters and additional design iterations

This time-consuming process is **prone to human error**, **outdated parameters**, and **increases the amount of design iterations**. To overcome these risks, ICsense created a unique design flow that meets the toughest project requirements in safety critical automotive and medical design.

## ICSENSE'S UNIQUE DESIGN APPROACH

In traditional IC design, the designer uses a graphical GUI (Graphical User Interface) inside the design software. Transistor sizing, control of parameters and corner settings are all manually set and updated as the design progresses, which is inefficient.

Therefore, first of all, we **parametrize** every circuit and test bench. With **embedded design plans** we can **automate transistor sizing**, to make more time for performance improvements. Our design plans enforce:

- a systematic design approach,
- traceability of design choices, and
- efficient porting to future technology nodes.

## EMBEDDED REQUIREMENTS MANAGEMENT

Secondly, our unique RMS, **Requirement Management System**, is embedded in this design environment to **enable real-time consistency with the latest spec version** (Figure 2). This system ensures full compliance and test coverage. It enables forward and backward traceability of the specifications as **required by ISO26262 automotive functional safety** and ISO 13485 medical standards.

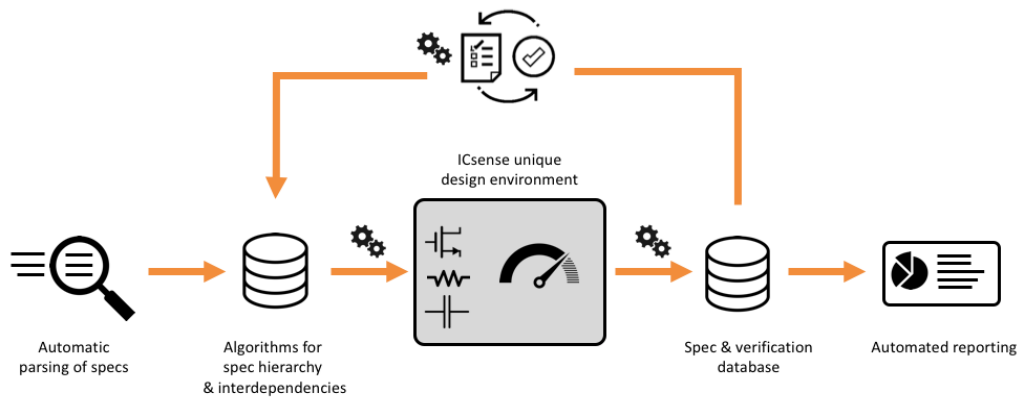


Figure 2: ICsense design flow with integrated requirements management

Thirdly, after manufacturing the **test and characterisation results are automatically verified against the requirements**. The platform traces customer requirements and its verification from concept to production, through the whole ASIC life cycle in a systematic and efficient way. It automatically links specifications to their corresponding verification plan, simulation, and bench tests results (Figure 3).

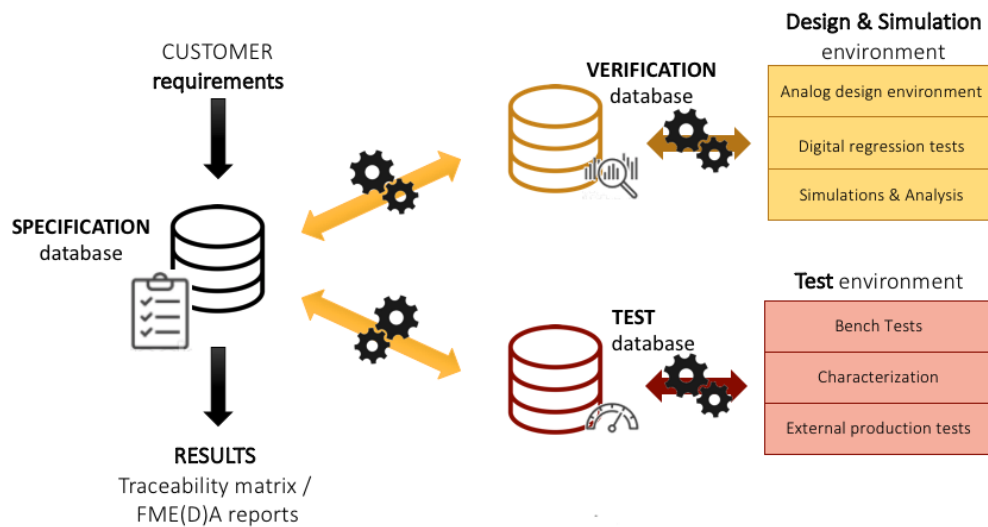


Figure 3: Embedded Requirements Management enables real-time Specification consistency and ensures full compliance and test coverage, mandatory for ISO26262 safety critical IC design.

## ABOUT ICSENSE

ICsense -an independent subsidiary of the TDK group- is Europe's premier IC design company. ICsense's core business is ASIC development and supply and custom IC design services.

ICsense has the largest fab-independent European design group with world-class expertise in analog, digital, mixed-signal and high-voltage IC design. The company develops and supplies customer exclusive ASIC solutions for the automotive, medical, industrial and consumer market compliant with ISO9001, ISO13485, IEC61508-ISO26262.

Contact us today for your next ASIC design and supply project.

ASIC supply [supply@icsense.com](mailto:supply@icsense.com)

Design service [designservice@icsense.com](mailto:designservice@icsense.com)