

# Unprecedented Technical Capabilities

Where patent intelligence and reverse engineering converge.

Chipworks has been reverse-engineering products, devices, systems and components for over a decade and as a result has the most extensive Integrated Circuit resource information centre and parts inventory in the world. Since its inception in 1992, Chipworks has supported the world's largest semiconductor and electronics companies with reverse engineering capabilities – in support of patent licensing initiatives or for competitive technical intelligence. Chipworks has state-of-the-art facilities in North America, Europe and Asia, and an engineering team that is fully-trained in patent interpretation.

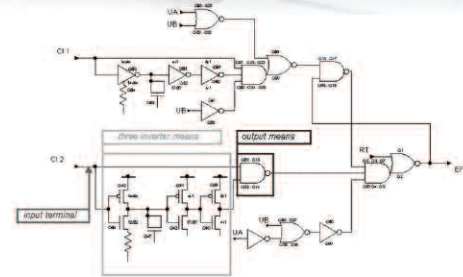
## Our Clients

Chipworks partners with the world's greatest electronics and semiconductor manufacturers, and their patent, licensing and legal representation, to provide empirical technical evidence for use in two key areas: for IP groups and patent litigators who need to assert their patent rights or defend against questionable infringement claims; and for engineering or product management teams who need to know what's inside their competitors' products. The goal is to minimize or eliminate licensing payouts, discover new royalty opportunities and to protect vital markets.

## Our Areas of Expertise

Chipworks has intimate knowledge of almost every type of system and process – from legacy technology through to leading edge innovations. It is this combination of experience, equipment, proprietary methodologies and engineering imagination that, when combined with patent knowledge, makes Chipworks an indispensable ally. Though not an exhaustive list, the following shows the breadth of Chipwork's reverse engineering capabilities in terms of *circuit*, *process* and *systems* analysis:

- Code extraction and analysis
- PC board extraction
- System level analysis: operations, signal paths and interconnections
- Semiconductor circuit extraction
- Schematic recreation
- Process and package analysis
- Microprobing



**CHIPWORKS**  
has  
**state-of-the-art  
research facilities to  
ensure sophisticated,  
thorough and  
accurate analyses**



## Circuit Analysis

Chipworks analyzes memories, analog/digital converters, wireless devices, smartcard chips and a host of other circuits for evidence of infringement. With sophisticated tools and expert know-how, engineers can remove a microchip and perform a microscopic analysis of specific areas of interest in terms of function, method of connection and operation. As a result, clients gain valuable technical insight into their own or their competitors' technology.

## Process Analysis

As experts in the semiconductor field and a long history of scrutinizing MOS, CMOS, BiCMOS and Bipolar devices, Chipworks' engineers have an edge because they often already know what to look for before the analysis even begins. The team uses advanced analytical instruments, various types of microscopy, x-ray, profiling and sample preparation techniques to examine feature sizes, material composition, fabrication techniques and doping levels in silicon substrates. Clients can expect fast and accurate results to enhance their competitive intelligence and strengthen their patent licensing initiatives.

## Systems Analysis

The Chipworks' engineering team can identify and analyze any hardware or software component, and their interactions, and provide tangible intelligence about specific functions. Systems analysis is a natural extension to Chipworks' expertise in circuit and process analysis. Specific areas of analysis expertise include digital cameras, MP3 and DVD players/recorders, televisions and virtually any consumer electronics product, satellite and GPS receivers, blood pressure monitors and the whole gamut of computer systems, parts and peripherals. Chipworks' clients receive accurate and reliable evaluations of systems, be they their own or those of their competitors.

## Microprobing

Chipworks also performs a type of systems reverse engineering called microprobing, an analytical technique used to achieve electrical contact with, or access to, a point in the active circuitry of a die using a "microprobing station". Microprobing measures real time waveforms, currents and voltages which are critical for identifying specific functions that occur under specific conditions.

### Our Clients

- The world's leading semiconductor and electronics companies
- Corporate Intellectual Property and Licensing groups
- Top Intellectual Property law firms around the globe
- Engineering and product development teams

### Why Choose Chipworks?

- Intimate knowledge of the global semiconductor/electronics industry
- Combined in-house technical, market intelligence and patent interpretation expertise makes Chipworks a one-stop partner
- State-of-the-art research facilities ensures sophisticated, thorough and accurate analyses
- World's largest inventory of IC parts and devices dating back to the 1960's and an extensive prior art resource library

### Represented Industry Sectors

- Consumer electronics
- Computer hardware, software and peripherals
- Automotive electronics
- Communications
- Displays
- Medical and industrial equipment
- Video, gaming and graphics systems

### Types of Devices and Products

- Operating systems
- Microprocessors
- Embedded systems
- Memory controllers
- Flash/optical drives
- DSPs
- PCs and printers
- Video displays

### About Chipworks:

Chipworks reverse engineers and analyzes semiconductor and microelectronic systems for two distinct and complementary groups. Patent Intelligence customers are law firms and Intellectual Property groups who need Chipworks' support to defend or enhance their licensing positions. Technical Intelligence customers are engineering and product development groups who use Chipworks experience and expertise to help them understand competitive technology, benchmark their innovations and speed their time-to-market.

