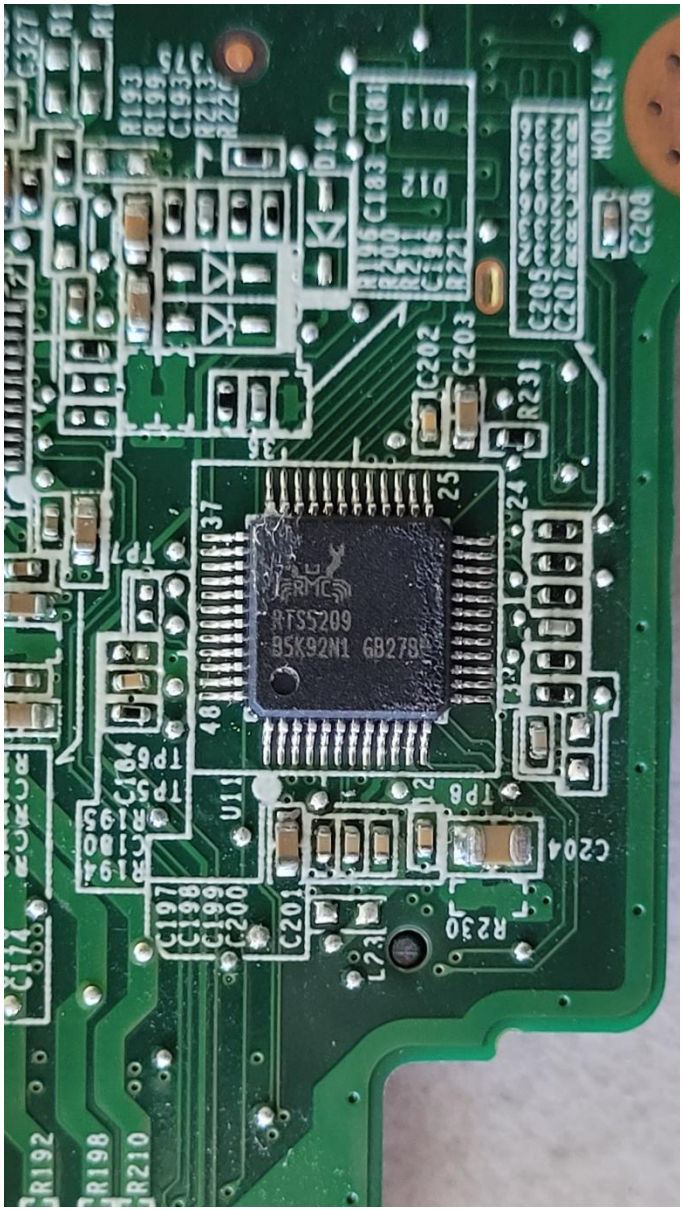
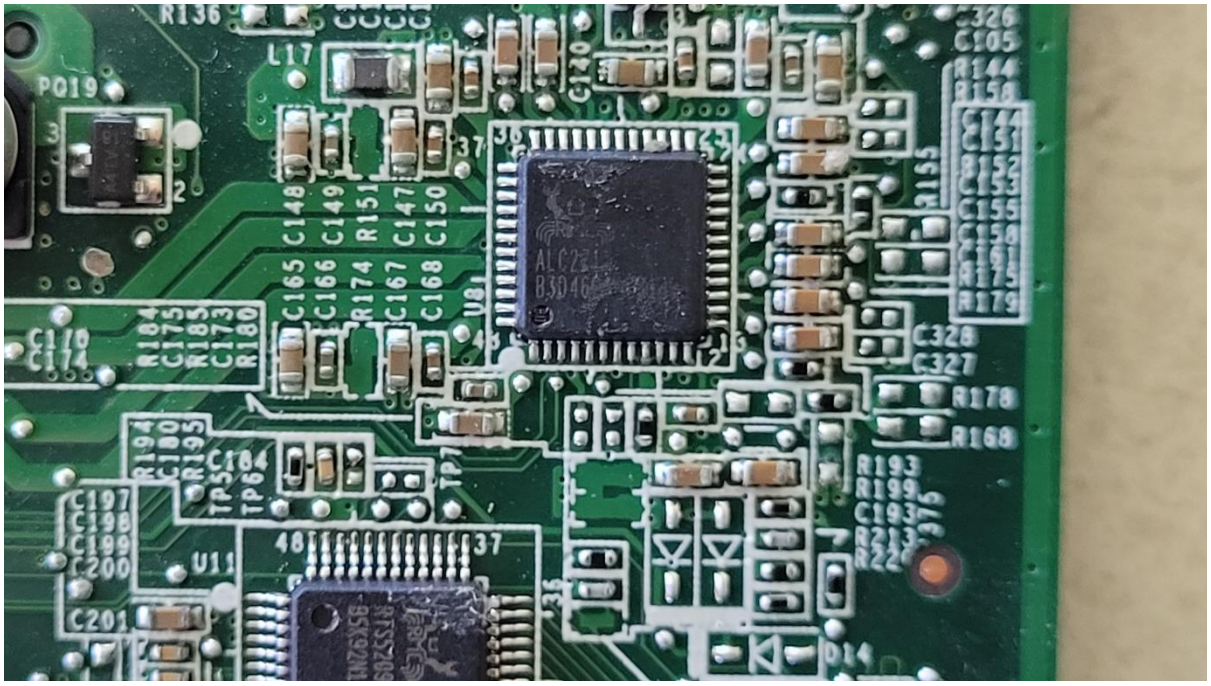
For this challenge, we decided to reverse engineer the Acer Aspire One d257 as we had an old one laying around with a broken screen. Compared to other potential devices it was much more complicated, which allowed us more opportunities to explain our thought process and how we slowly built up a picture of how the laptop worked.

We are team 3204C from St Peter's College, Palmerston North. Our team consists, of Jacob, Vasek, Deiz, and Max.



The RT5209 is a step-down DC-DC converter IC (Integrated Circuit) made by Richtek. It is a high efficiency, high switching frequency converter that can convert a high input voltage to a lower output voltage. The IC can is often used in a variety of applications including portable devices, battery-powered equipment, and power supplies.



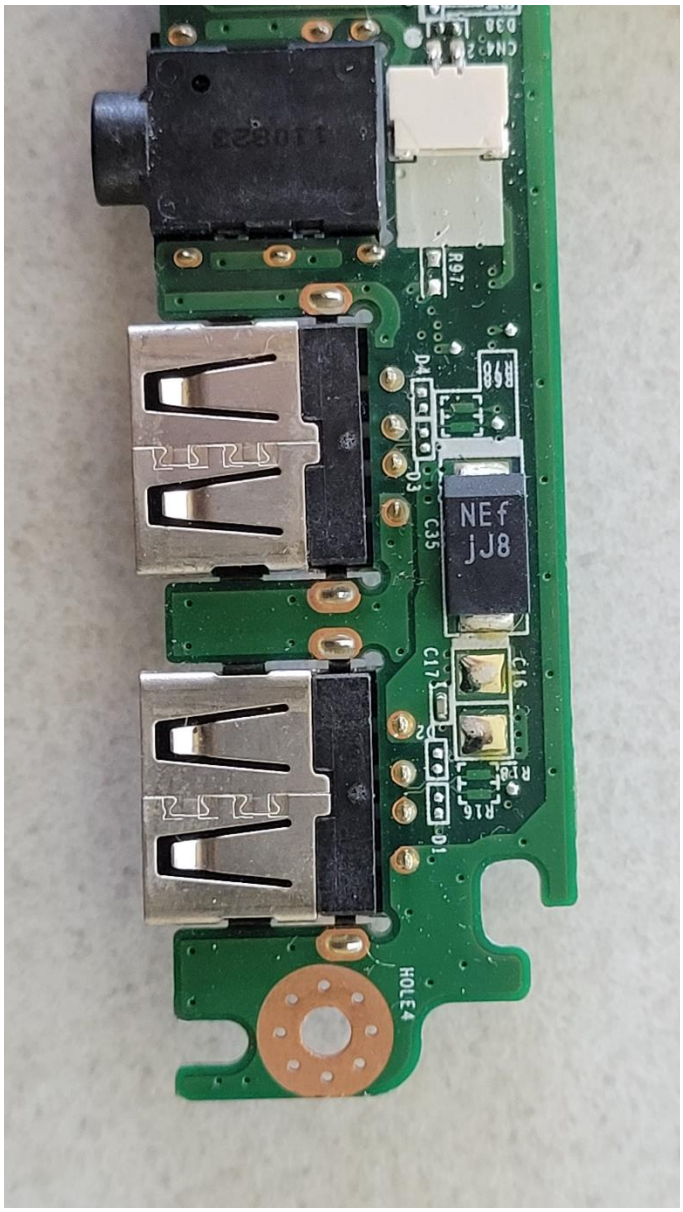
Unfortunately, we were unable to find specific information on this chip due to it being scratched.

However, in a laptop, a power management IC (PMIC) is responsible for controlling and regulating the power flow to various components. It manages the charging and discharging of the battery, and also controls the voltage and current supplied to the CPU, GPU, and other system components.

Richtek is a supplier of PMICs for laptops, their PMIC typically include a variety of functions such as battery charging, power path management, power sequencing, and voltage regulation.

For example, they might integrate DC-DC converter, LDO, and power path management functions into a single IC, which can help to improve the overall efficiency and reduce the number of components required in the design.

The PMIC can monitor the battery's state of charge, current, voltage, temperature, and other parameters, and can adjust the charging algorithm accordingly. It may also include protection features such as over-voltage protection, over-current protection, and thermal protection to ensure the safety of the battery and other components.



The "J8" marking on a resistor typically indicates that it is a military-specification resistor. J8 refers to the military specification number MIL-PRF-39017. These resistors are manufactured to meet the stringent requirements of the military, aerospace, and defense industries. They are subject to a more rigorous testing regimen than commercial-grade resistors and are designed to operate in extreme environments.

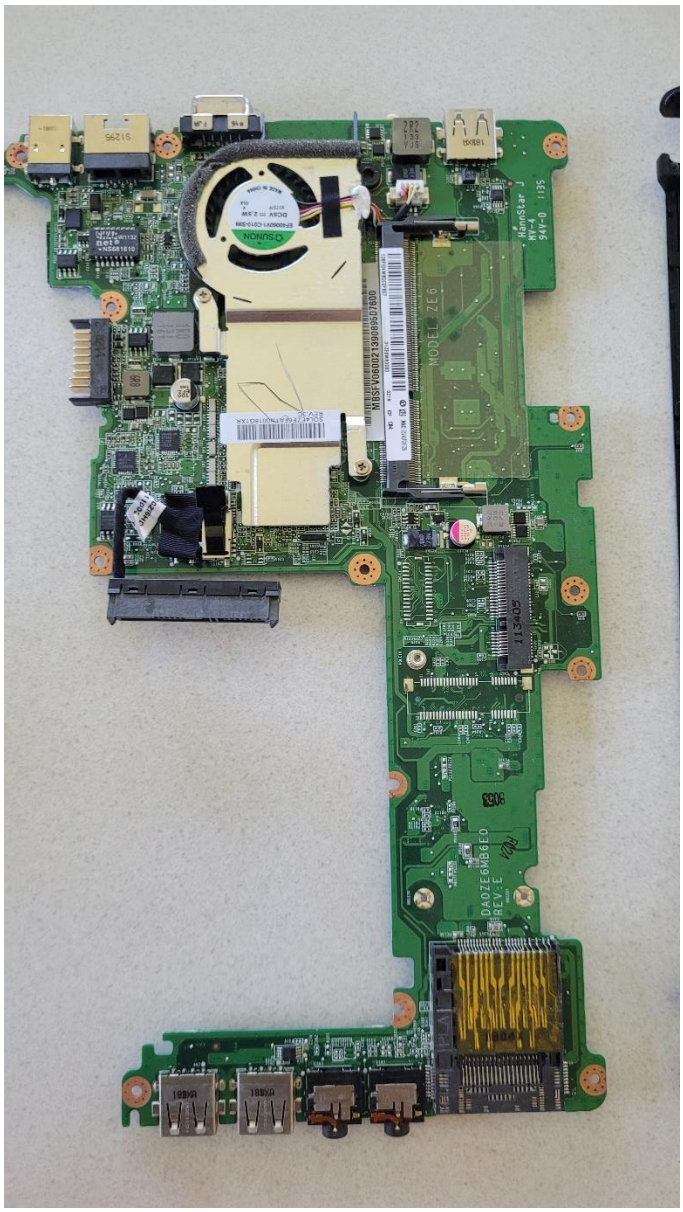
The "NE" marking on a resistor typically indicates that it is a metal film resistor. Metal film resistors are precision resistors made of a thin film of metal (such as nickel, nickel-chromium, or aluminum) that has been deposited onto a ceramic or glass substrate. They have a very low temperature coefficient of resistance (TCR), which means that their resistance does not change much with temperature changes.

The "F" marking on a resistor is used to indicate the tolerance of a resistor. In general, a resistor tolerance of ±5% is commonly denoted by an "F" marking.

USB 2.0 is a widely used standard for connecting peripheral devices, such as computers, to peripherals such as keyboards, mice, and external hard drives. It is the

second version of the USB (Universal Serial Bus) standard and was released in April 2000.


DA0ZE6MB6E0
REV:E
nuvoton



A laptop motherboard is the main circuit board inside a laptop computer. It is also known as the mainboard or system board. The motherboard connects all of the other hardware components in the laptop, including the CPU, memory, storage, and other peripherals.

The laptop motherboard typically includes a variety of components and interfaces, including:

- The CPU socket: This is where the central processing unit (CPU) is installed.
- Memory slots: These are where the laptop's RAM (random access memory) is installed.

- The chipset: This is a group of integrated circuits that control communication between the processor and other components.

- The BIOS chip: This chip stores the firmware that controls the basic input/output functions of the laptop.

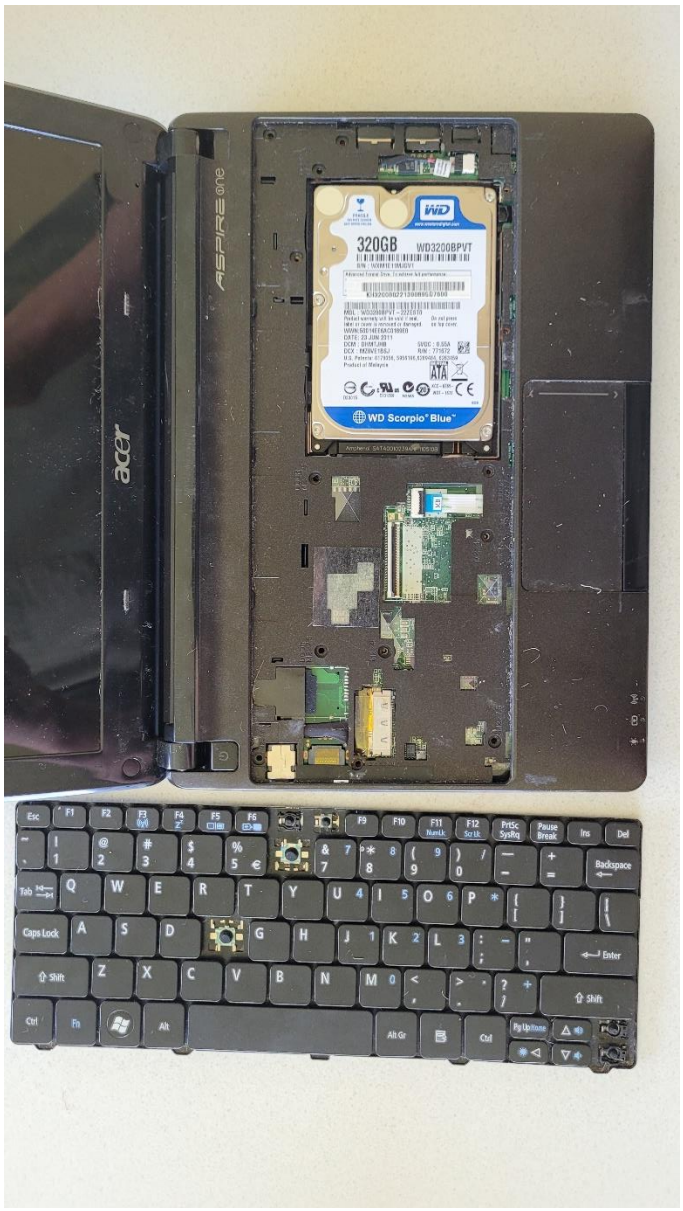
- Power connectors: These connect the motherboard to the laptop's battery and the power adapter.

- Expansion slots: These allow for additional components to be added to the laptop, such as a graphics card or network card.

- Peripheral interfaces: These include USB ports, audio jacks, and video outputs.
- The cooling system: Laptop motherboards usually include heatsinks and fans to cool the CPU and other components

This is the laptop fully dissasembled, and the following images are the process of deconstruction.


320GB
acer


ASPIRE one
acer
320GB
WD3200BPVT
WD Scorpio Blue


acer
ASPIRE one


acer
ASPIRE one

A DDR3 SODIMM (Small Outline Dual Inline Memory Module) is a type of memory module that is commonly used in laptops and other small form factor computers. It is similar to the DDR3 DIMM (Dual Inline Memory Module) that is used in desktop computers, but it is smaller and has a different pin configuration.

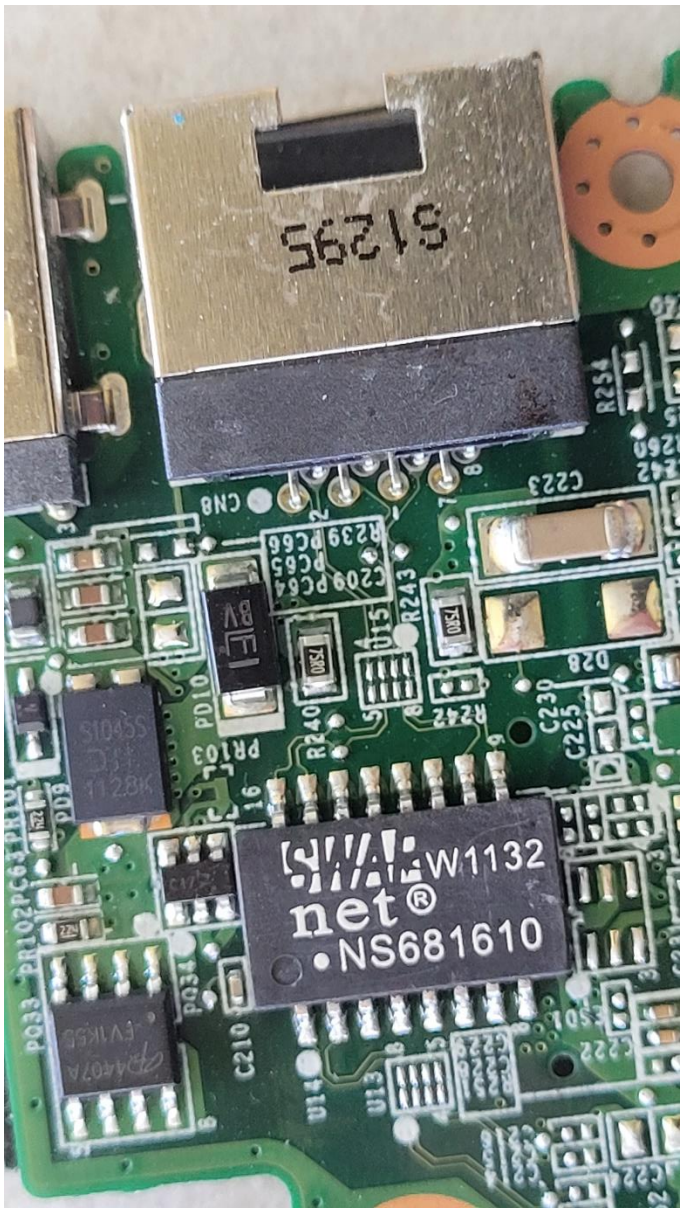
A DDR3 SODIMM module is typically composed of a printed circuit board (PCB) that holds one or more memory chips. The memory chips are usually made of dynamic random-access memory (DRAM) and are organized into an array of memory cells. The module also includes a number of connectors or pins that allow it to connect to the memory controller on the motherboard.

The Elpida J1108BFBG is a specific model of DDR3 SODIMM (Small Outline Dual Inline Memory Module) memory module made by Elpida Memory, Inc. (which is now part of Micron).

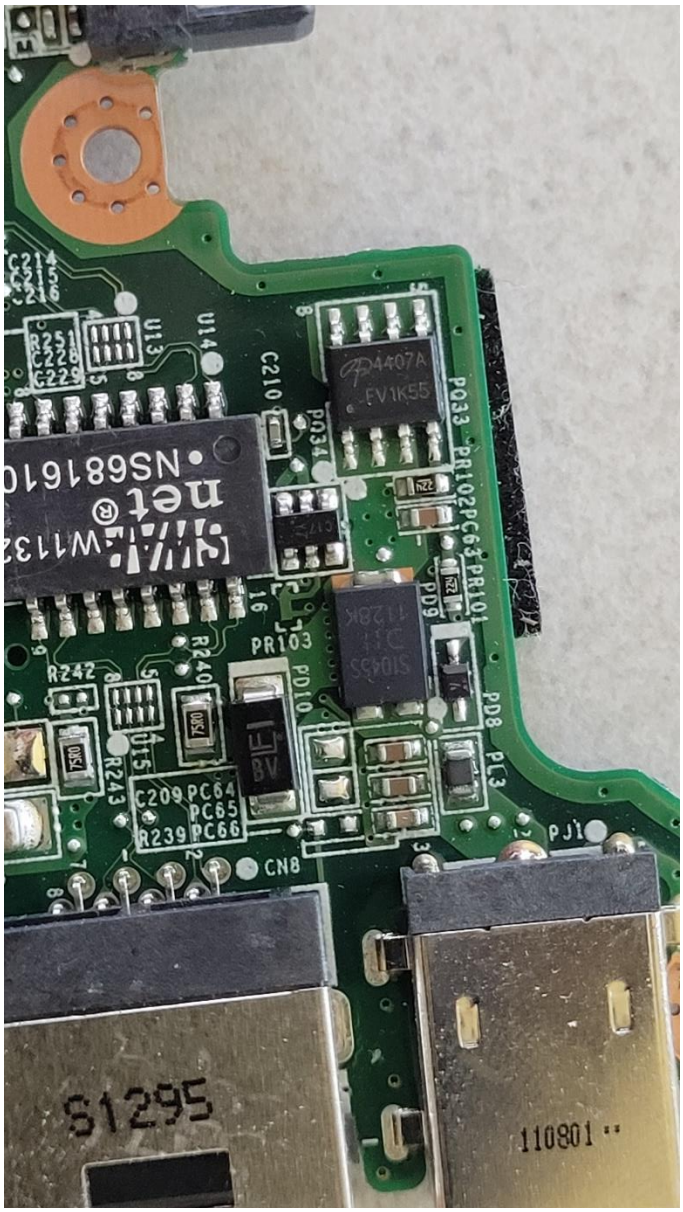
This module is a 2GB DDR3 SODIMM memory module that operates at a clock frequency of 1333 MHz (PC3-10600), it also has a CAS latency of 9 cycles and a voltage of 1.5V.

This particular module, like most DDR3 SODIMM, it is organized into a 64M x 8 configuration, which means that it has 64 million memory cells organized in 8 banks. The J1108BFBG SODIMM also includes 204-pin connectors that allow it to connect to the memory controller on the motherboard.

It is important to note that this specific module is EOL (End of life) product and not available for purchase anymore.



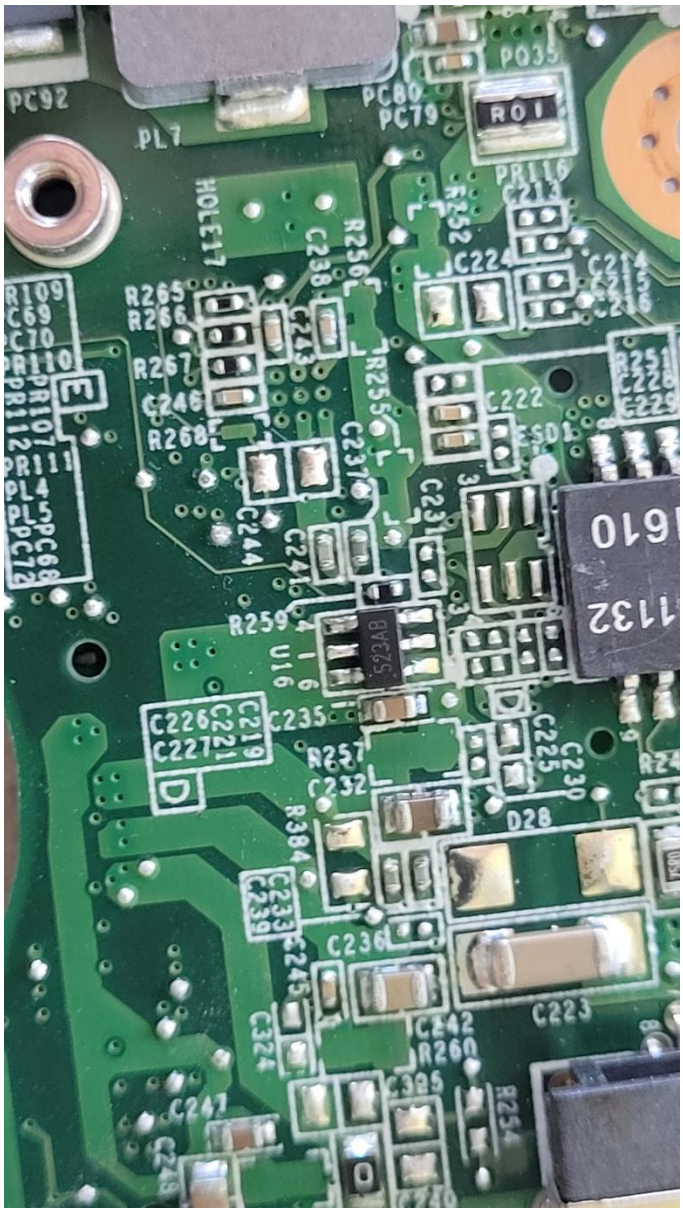
We couldn't find any specific information about the IC "NS681610" by Swapnet because it is either an non-existing product or an internal reference number that isn't available to the public. The name NS681610 isn't a standard identifier or code that could specify a device in the market and it is not common among the standard naming conventions for ICs. It could be that the IC is not commercially available, or it might be a custom IC that was developed for a specific application or customer and is not offered for general sale. Additionally, the company might not have published any documentation or data sheets about the product, or the information may not have been indexed by the sources we have access to.



The 4407A is a N-channel MOSFET (metal–oxide–semiconductor field-effect transistor) made by Fairchild Semiconductor. MOSFETs are electronic devices that are commonly used as electronic switches, amplifiers, and voltage regulators in a wide variety of electronic circuits.

The 4407A is a surface-mount device (SMD) which is designed to minimize the on-resistance (RDS(on)) and has a very low threshold voltage. The 4407A is rated for a drain current of 9 A, and a drain-source voltage (VDS) of 60V. The MOSFET also has a low RDS(on) making it useful for high-current and high-voltage power switching applications.

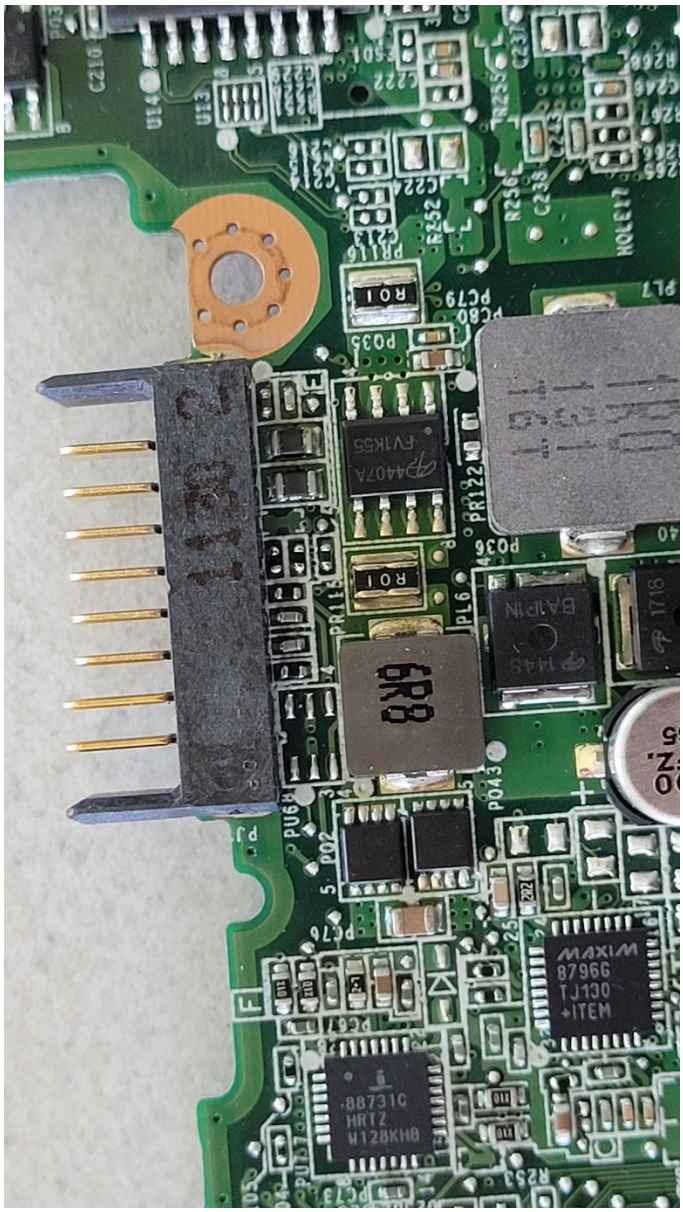
It is worth noting that the device is now discontinued and might not be available for purchase anymore.



We couldn't find much information about the device 1910-523AB by Texas Instruments because it is likely an internal reference number or an identifier used by the company to identify a specific product or version of a product that may not have been released to the market yet, or it may have been discontinued and not available anymore.

It's possible that the device is a custom or proprietary product that is not offered for general sale, and therefore, Texas Instruments may not have published any documentation or data sheets about it, or it may not have been indexed by the sources that I have access to. Additionally, it could be that the device is no longer in production, or the production is in a very limited quantity.

Without more information about the specific device and its intended purpose, it is difficult to provide a detailed description or its specifications.

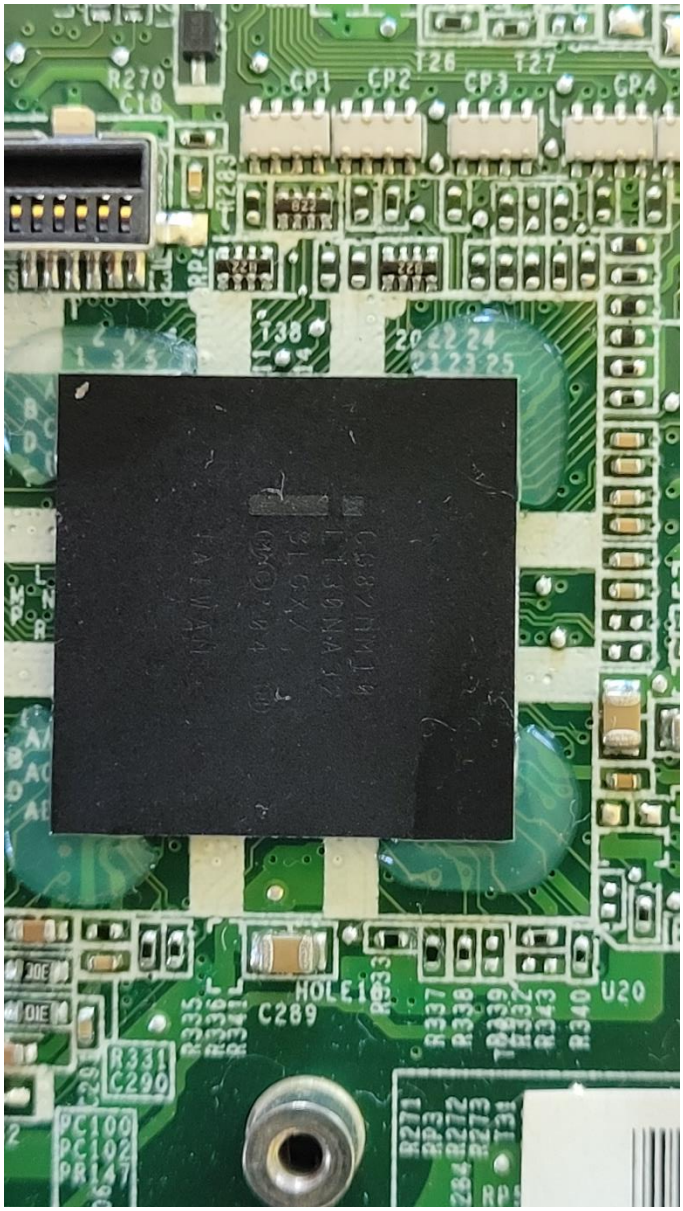


The TJ130 is a N-channel enhancement-mode power MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor) made by Toshiba. This is a discrete component device used as a switch in different types of circuits and electronics systems.

This device is specially designed to handle high current loads, it can handle up to 130A of Drain Current (ID) and a Drain-Source Voltage (VDS) of 100V. The device has low On-Resistance (RDS(on)) and a high switching speed making it useful for high-current and high-voltage power switching applications.

It is worth noting that the device is not longer in production, as it is a discontinued product and might not be available for purchase anymore.

The reference "W128KH8" is not a standard identifier for an integrated circuit (IC) or electronic device. It is not a code that can be easily recognized as a specific product made by a particular manufacturer. Without more information on the context or intended application of the device, it is hard to determine what the "W128KH8" reference could be referring to. It could be an internal part number, a production batch code, or a reference used by a specific company. It's important to note that many manufacturers use their own internal naming conventions and product codes, so it may not be widely known to the public. In order to determine more information about the specific device, it is recommended to check any documentation or specifications from the manufacturer or supplier, or contact the manufacturer or supplier directly for more information.



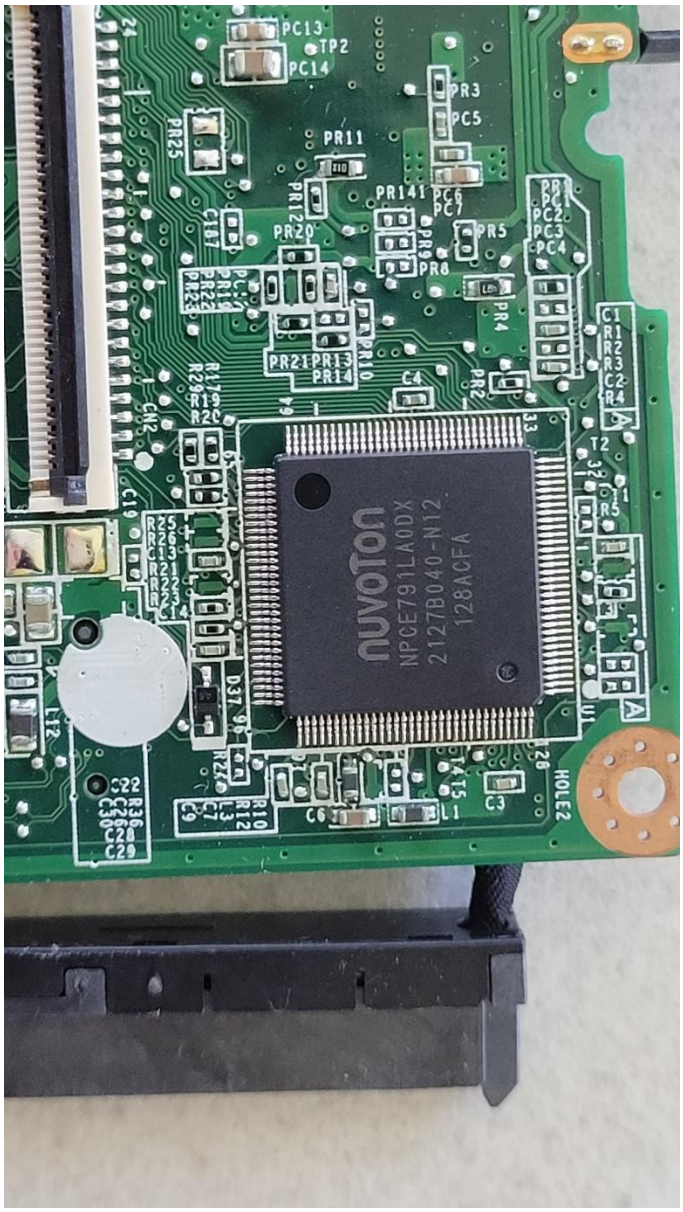
The Intel Atom N550 is a dual-core processor that was released in 2011. It is part of the Intel Atom processor family and is based on the Cedarview architecture. The processor is commonly used in netbooks, nettops, and other small form factor devices such as embedded systems.

The Intel Atom N550 is paired with the Intel NM10 Express chipset. The NM10 is a low-power, highly integrated chipset that is designed to work with the Intel Atom processor. It provides a number of features that are optimized for small form factor and low power devices.

The chipset provides a number of key features and interfaces that are important for a computer or device to function properly. It includes the following interfaces:

- Memory controller: The chipset includes a memory controller that supports DDR3 memory.
- PCI Express: The chipset provides a PCI Express interface that allows the processor to connect to other components such as graphics cards, networking cards, and other peripherals.
- USB: The chipset provides USB 2.0 ports, allowing for the connection of peripherals such as mice, keyboards, and other devices.
- SATA: The chipset provides a SATA interface for connecting storage devices such as hard drives and solid-state drives.
- HD Audio: The chipset includes an HD audio controller for high-definition audio.
- Low-power consumption: The chipset is designed for low-power consumption, making it ideal for use in small form factor devices and portable devices.

It is important to note that as this is a older device, that is no longer in production, newer alternatives with better performance and energy efficiency might be available in the market.

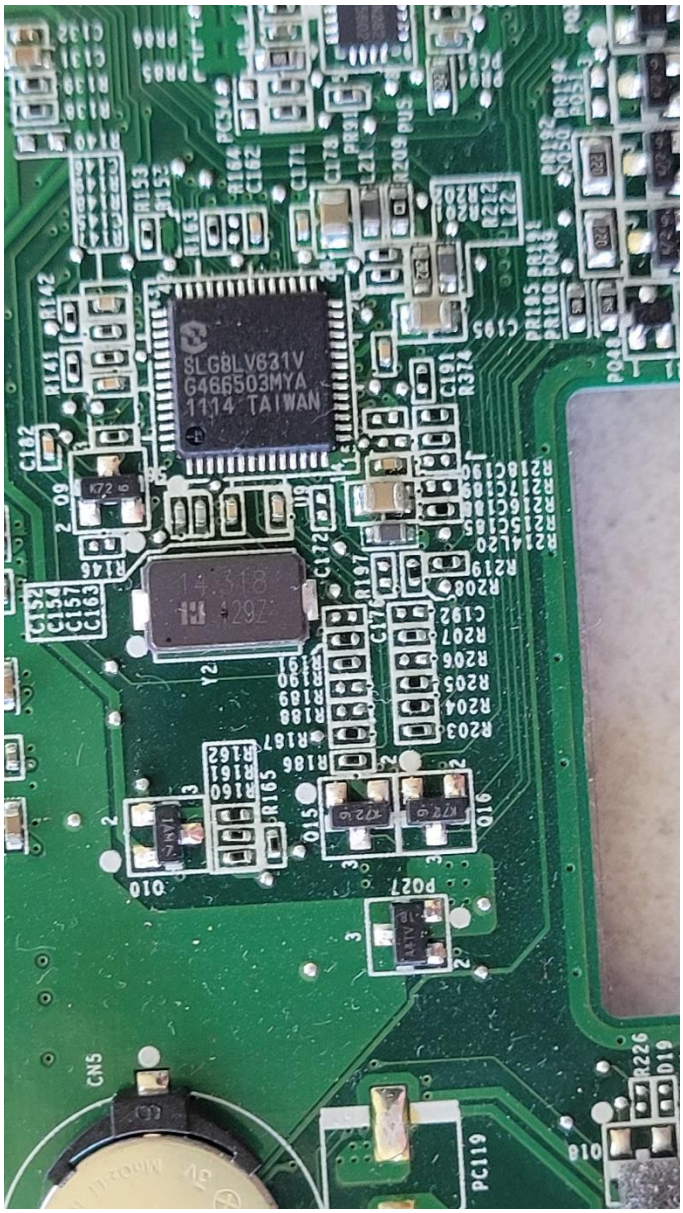


The Nuvoton 128ACFA is a microcontroller unit (MCU) developed by Nuvoton Technology Corporation. It is a small, low-power, high-performance 8-bit microcontroller based on the Nuvoton's M05x series Cortex-M0+ core. This device is designed to cater a variety of embedded applications including industrial control, consumer electronics, automotive, and communication.

The device is equipped with 128 Kbytes of flash memory and 8 Kbytes of SRAM, and it is capable of running at a frequency of up to 48 MHz. Additionally, it comes with a variety of on-chip peripherals such as Timers, PWM, UART, I2C, SPI and ADC, which provides a lot of flexibility to the developers.

The device also has a wide operating voltage range of 2.2 V to 3.6 V which makes it suitable for battery-powered applications, and also features low power modes, which allows it to conserve power in standby and sleep mode.

It is worth noting that the Nuvoton technology is being acquired by Microchip, so the support for this device might be impacted in the future. It is important to check the availability of the device and the manufacturer's product roadmaps before starting any new design based on this device.



The SLG8LV631V is a GreenPAK programmable mixed-signal IC (integrated circuit) made by Silego Technology.

GreenPAKs are programmable mixed-signal ICs that can be configured using a graphical programming interface. They offer a range of digital and analog functions such as digital logic, timing, counters, pulse generators, and voltage references in a small form factor.

The SLG8LV631V is a low voltage version which could operate in voltage range of 2.5v - 3.6V. It also have 4K of look up table (LUT) in-system programmable configuration memory, 20 programmable I/O, mixed signal blocks that can be used as I2C, SPI, UART, timers, PWM, and counters, and voltage references.

It's important to note that, Silego Technology has been acquired by Dialog Semiconductor and support for this specific device might be impacted in the future.

There were several lessons that we learnt by disassembling the Acer Aspire One D257, here are a few examples:

1. Hardware components and their function: By disassembling a laptop, we were able to identify and learn about the different hardware components that make up the device such as the processor, memory, storage, and other subsystems.

2. Design and architecture: By studying the internal layout and connections between the different components, we were able to learn about the design and architecture of the device, and how the different components interact with each other to perform their functions.

3. Manufacturing and assembly: Disassembling a laptop provided an understanding of the manufacturing and assembly processes used to build the device, and the quality control measures used to ensure that the device is functional and reliable.

4. Troubleshooting and repair: Understanding the internal components and architecture of a device will aid in troubleshooting and repairing issues that may arise with the device, rather than relying on the manufacturer for repair.

5. Finally, this project taught us the skills required to identify the underlying technology and features of a device and by that might inspire new projects, feature improvements or a better understanding of the device.