A Walk Down Memory Lane:

Disassembling the Nintendo DS Lite

Team 1965S

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My old Nintendo DS Lite with Mario Kart: every middle school geek's most prized possession.

Introduction

Released in 2006 as a successor to the first-generation Nintendo DS, the Nintendo DS Lite is

responsible for some of my favorite childhood memories. Over a decade later, I decided to take

this device apart in order to gain a deeper understanding of the electronic components that truly
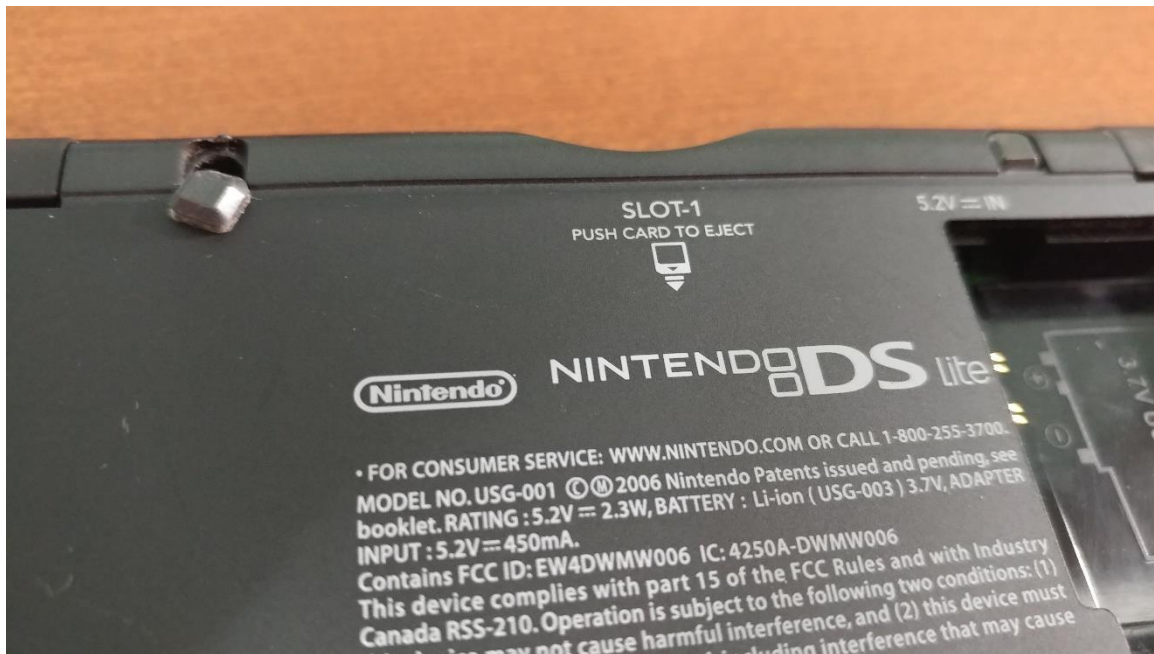
made 5th grade recess a magical time of day.

Don't let its plastic construction fool you: I once (out of curiosity) spent two hours smashing a broken DS into two pieces. I didn't succeed.

Disassembly

I always yearned to get "just a few more minutes!" out of this battery before it inevitably died in the middle of a battle.

*Nintendo hid two screws behind these rubber covers. Tricky.*

Most of the internals are underneath the bottom screen, except the Wi-Fi antenna and microphone (bottom right) which lay behind the top screen.

In order to get to the CPU and RAM, I had to desolder the game cartridge reader (silver) from the board.

Basic Electrical Components

Like most electronic devices, the DS Lite is mostly comprised of "basic" components such as resistors and capacitors.
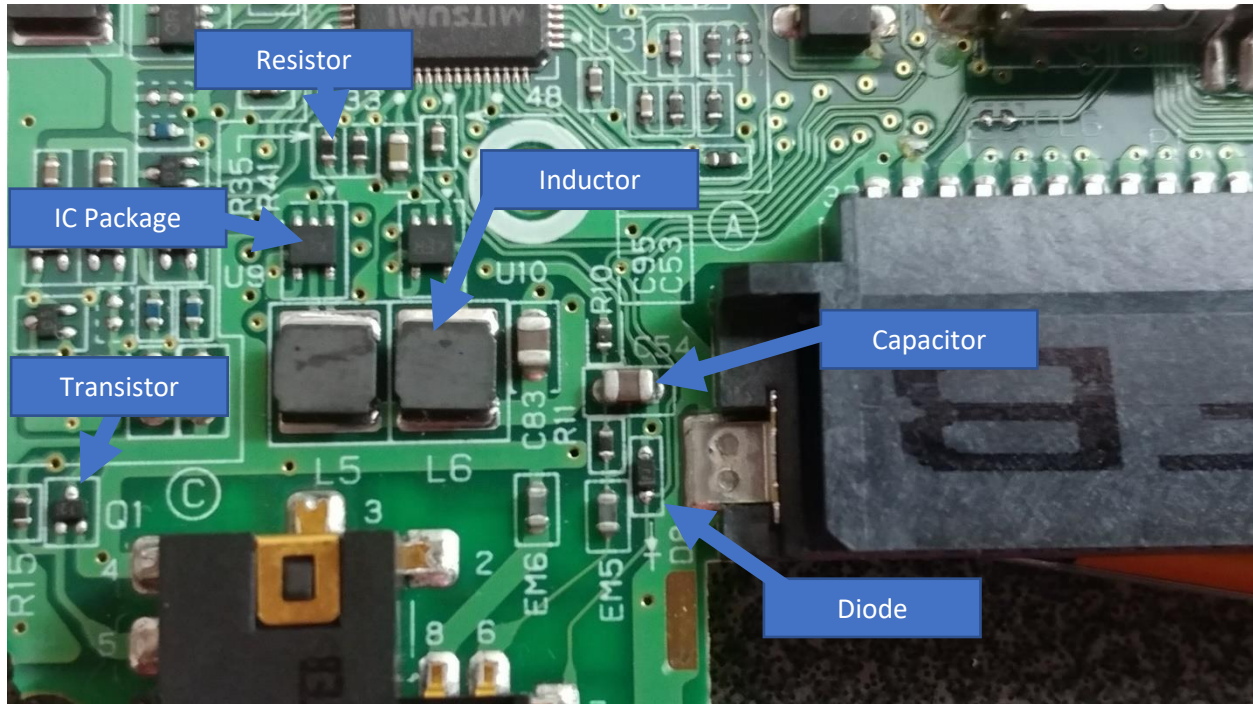
The following were found on the motherboard of the device:

- 78 Resistors (R), which impede current flow
- 6 Inductors (L), which store electrical energy as magnetic energy
- 105 Capacitors (C), which store electrical energy as electric fields
- 11 Integrated Circuit Packages (U), which are "subcircuits".
- 8 Diodes (D), which ensure current only flows in one direction
- 5 Transistors (Q), which can act as amplifiers or a binary switch

Outside of these primitive components, I also found:

- 18 Switches (SW), which mapped to the user input buttons.
- 2 COM Ports (COM), which allow communication between the motherboard and peripherals.
- 3 Variable Resistors (VR), used to alter the volume of the speaker.

Complex Components

The DS Lite's motherboard also had some more complex components connected to it.

Mitsumi Wi-Fi Module

One of the Nintendo DS Lite's most exciting features, the option to connect and play with other Nintendo devices is provided by the Mitsumi #MM3218 Wi-Fi interface.

ARM CPU and Graphics Processor

Nintendo's custom-built ARM chip actually contains two distinct processors. A 32-bit ARM946E-S CPU is responsible for rendering gameplay/video content, while a 32-bit ARM7TDMI coprocessor handles sound and Wi-Fi.

NEC RAM

Though almost miniscule by today's standards, the Nintendo DS was equipped with a 4 MB NEC uPD4632512F1 RAM chip. When playing a game, the portion of the game files currently being used/processed are moved from the game card to the RAM, giving the CPU quick access to important data.

Power & Audio Management

The Mitsumi MM3205B is chip is responsible for both providing power to the device and its peripherials, along with routing audio to the two speakers.

Conclusion

One of the most popular video game handhelds ever, exposed in all its glory. Unfortunately, I could not locate any TI components.

Five years ago, I didn't care what lay inside my Nintendo DS - I was perfectly content to head over to a friend's house and spend hours having Pokémon battles and Mario Kart races. Disassembling the Nintendo DS Lite gave me the opportunity to peer down memory lane and examine the modest collection of electronic components that, together, contributed so much to my childhood. Certainly, technology has touched our society to an extent never thought possible: and it's always exciting to grab a screw driver and understand exactly what makes it tick. And perhaps more importantly, that understanding ultimately proves to be very useful when building Vex robots - whether it be diagnosing a broken motor controller or avoiding current over-draws, having a core knowledge of electronics often comes in handy.

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