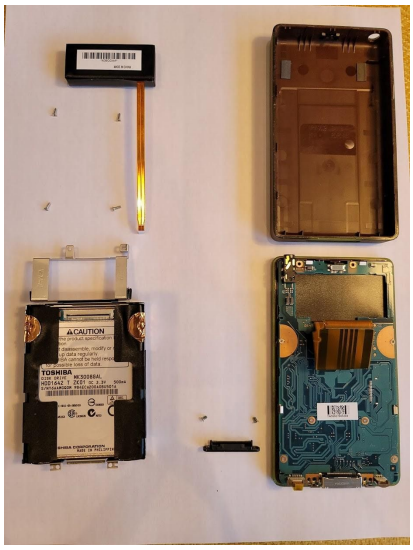
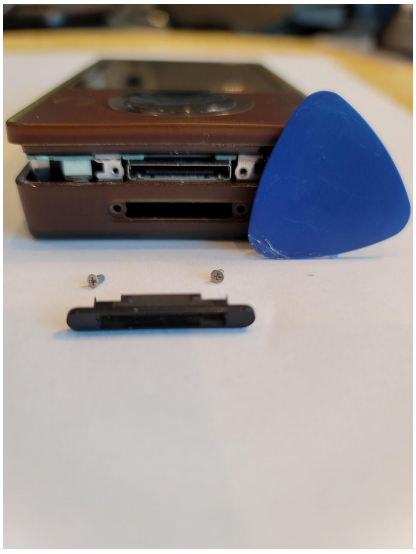
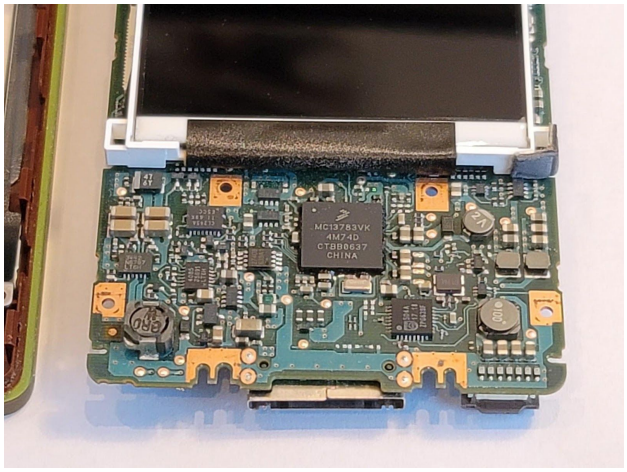
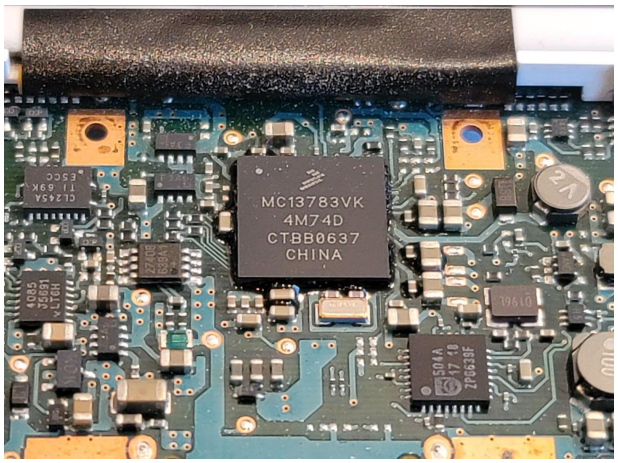

CAUTION
TOSHIBA




MC13783VK
4M74D
CTBB0637
CHINA


MC13783VK
4M74D
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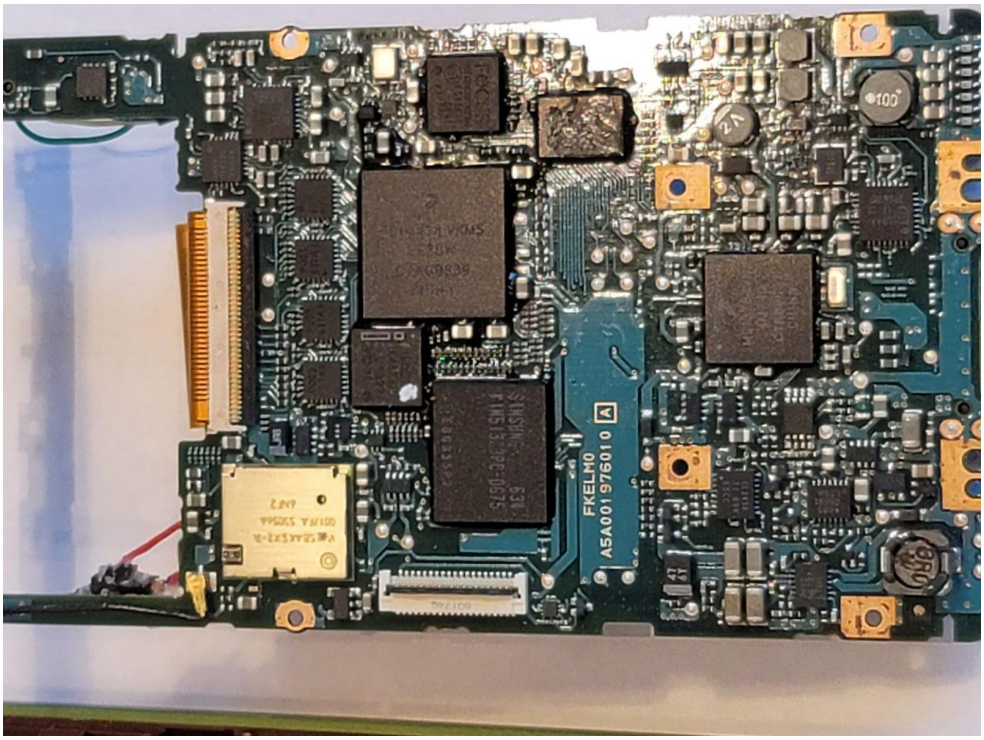
CHINA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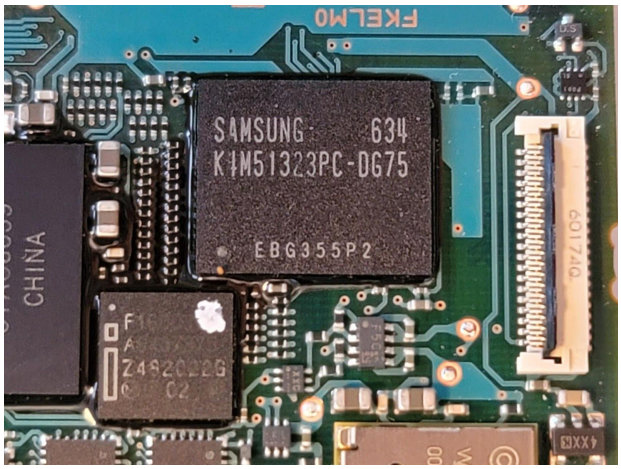
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K1M51323PC-DG75
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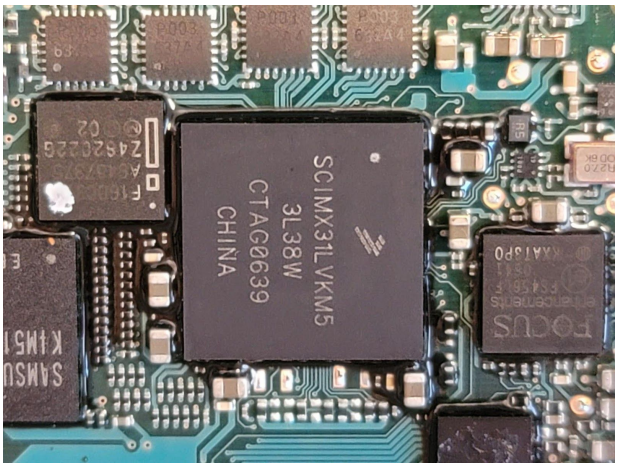
CHINA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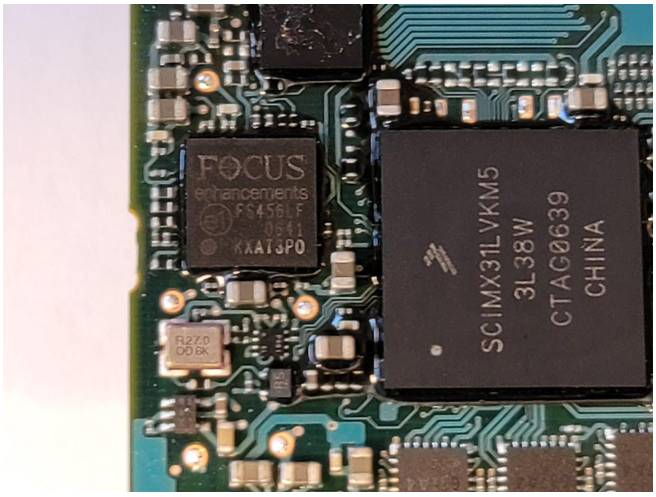
3L38W
CTAG0639
CHINA



A run-down of the four components indicated in the images:

Chip #1 - MC13783VK

- Manufactured by NXP Semiconductors
- Power Management Chip
    - PMIC ATLAS 3G PWRMNGMNT
    - (Power Management Integrated Circuit)

Chip #2 - SAMSUNG KIM51323PC-DG75

- Manufactured by Samsung Semiconductors
- SDRAM Chip (64MB 133MHz SDRAM)

Chip #3 - SCIMX31LVKM5

- Manufactured by NXP Freescale Semiconductors
- Freescale i.MX31L Processor
- ARM Core

- 128KB L2 unified cache
- Java acceleration
- Features:
    - VGA MPEG-4 HW encoding
    - Graphics acceleration
    - Image Processing Unit (IPU)
    - Display/TV Controller
- External Memory Interface
    - SDRAM 16/32-bit, 133MHz
- Advanced Power Management
    - Automatic Dynamic Voltage and Frequency Scaling (DVFS)
    - Dynamic Process and Temperature Compensation (DPTC)
    - Active well-bias
    - Power gating

Chip #4 - FOCUS enhancements FS456LF0641KXAT3P0

- Manufactured by FOCUS enhancements
- Integrated Circuit
- Video output controller for TV-Out video functionality

- Final Summary Report (up to 500 words) in PDF format only:

    - Introduction identifying the electronic device you selected and why.
    - Summary of the chips and components you found inside. Were any TI components?
    - Research findings of what these components do and the role they play in the system.
    - Conclusion. What were the lessons you learned from this experiment?
- In addition to the final report, you may add short captions to your photos (not more than 25 words each) and parts lists of components that you have discovered. These do NOT count against the 500 word limit for the summary report.
- Include at least four (4) photographs of you and/or your project (does not count towards length).
- Upload the Final Summary Report document and all supporting photos (maximum file size: 20MB per photo) directly to this online challenge site during the submission process. It is highly recommended that you include photos in the PDF report, rather than uploading them separately.

Introduction identifying the electronic device you selected and why.

The Zune is a multimedia device that can play movies, songs, etc. We chose this device because it contains complex functions both in terms of the way it operates and the capabilities it offers. It was one of the first devices on the market to offer wireless capabilities and has a wireless chip in addition to a DAC (digital to analog converter,

which is an audio output device), complex charging circuits, and many semiconductor components and integrated circuits that can be researched online. The device is modular in one's ability to disassemble and investigate the internal components, which made it a good candidate for us to disassemble because there was a great opportunity to learn about the internal components.

Summary of the chips and components you found inside. Were there any TI components?

We found four main chips when the Zune was disassembled.

Research findings of what these components do and the role they play in the system.

<u>Chip #1 - MC13783VK</u>

- Manufactured by NXP Semiconductors
- Power Management Chip
    - PMIC ATLAS 3G PWRMNGMNT
    - (Power Management Integrated Circuit)

The first chip we found was the MC13783VK. This chip is manufactured by NXP Semiconductors and is used as a power management chip and can also be used as an audio chip. A power management chip delegates the voltage sent to each of the

components on the circuit board. This device specifically takes an input voltage of 5V and steps it down to 3.3V.

Chip #2 - SAMSUNG KIM51323PC-DG75

Manufactured by Samsung Semiconductors

- SDRAM Chip (64MB 133MHz SDRAM)

The second chip we found was the SAMSUNG KIM51323PC-DG75. This chip was manufactured by Samsung Semiconductors and functions as the SDRAM chip for the Zune. The chip has 64MB of storage capacity and runs at a speed of 133MHz.
Do we explain what SDRAM is? Would it go over the word limit?

Chip #3 - SCIMX31LVKM5

The third chip we found was the SCIMX31LVKM5, manufactured by the NXP Freescale Semiconductor. This chip is used as a processor in the device. It is manufactured by NXP Freescale Semiconductors. It contains a Freescale i.MX31L processor based on an ARM core. It is very efficient and performs well in the device in terms of power consumption and has advanced power management capabilities. Some of the features

include graphics acceleration, image processing unit, and VGA MPEG-4 HW encoding. It can also be used as a display or a TV controller.

- Manufactured by NXP Freescale Semiconductors
- Freescale i.MX31L Processor
- ARM Core
- 128KB L2 unified cache
- Java acceleration
- Features:
    - VGA MPEG-4 HW encoding
    - Graphics acceleration
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    - Display/TV Controller
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- Advanced Power Management
    - Automatic Dynamic Voltage and Frequency Scaling (DVFS)
    - Dynamic Process and Temperature Compensation (DPTC)
    - Active well-bias
    - Power gating

Chip #4 - FOCUS enhancements FS456LF0641KXAT3P0

The last chip we found was the FOCUS enhancements FS456LF0641KXAT3PO, manufactured by FOCUS enhancements. The chip is an integrated circuit which held the graphics processor, memory, a video encoder, and video output. This part of the circuit served as the video output controller for the TV-out video functionality.

- Manufactured by FOCUS enhancements
- Integrated Circuit
    - Graphics processor
    - Memory
    - Video output interface
    - Video encoder
- Video output controller for TV-Out video functionality

Photos and Captions:

Conclusion. What were the lessons you learned from this experiment? (Max)

Throughout our ventures into disassembling the Zune, we learned a lot about the basics of electronics. Through disassembly, we learned how the chips connect to each other and work as a unit to make sure our entire system works. However, we also

learned how to properly disassemble electronics. When disassembling, we had to deal with the potential of parts breaking, causing them to not fit and therefore making it impossible to reassemble. However, we treated the system with care and delicacy, making sure that no part is damaged in the process. (MAX'S)

We learned how to disassemble stuff
We learned how chips work with each other in a system

We learned the purpose and function of different everyday chips
By disassembling the Zune, we learned more about how to disassemble and understand the inner workings of electronic devices. Disassembling electronics is a very important skill because it allows us engineers to learn about and modify other circuits. By researching some of the chips, we learned how engineers can package circuits that perform complicated functions in a very small amount of space. (NOT MAX'S, DELETE)

The Zune is a multimedia device that can play movies, songs, etc. We chose this device because it contains complex functions both in terms of the way it operates and the capabilities it offers. It was one of the first devices on the market to offer wireless capabilities and has a wireless chip in addition to a DAC (digital to analog converter,

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