iWave Embedding Intelligence

Product Brief

iW-Rainbow-G3 Handheld Platform

Features:

Processor
Freescale's i.MX27 @ 400MHz

Memory
32 MB Flash, (scalable up to 256MB)
64 MB Mobile DDRAM, (scalable up to 128MB)

User Interface
3.5" QVGA LCD with 240 x 320, TFT Touch Panel and Backlight, Keypad

Wireless Connectivity
SD-WiFi (through SD slot)

Camera
2 Megapixel CMOS Camera

Communication Ports
USB 2.0 Host and OTG
Serial Port
Ethernet
GSM/GPRS/EDGE

Audio
Audio In/Out

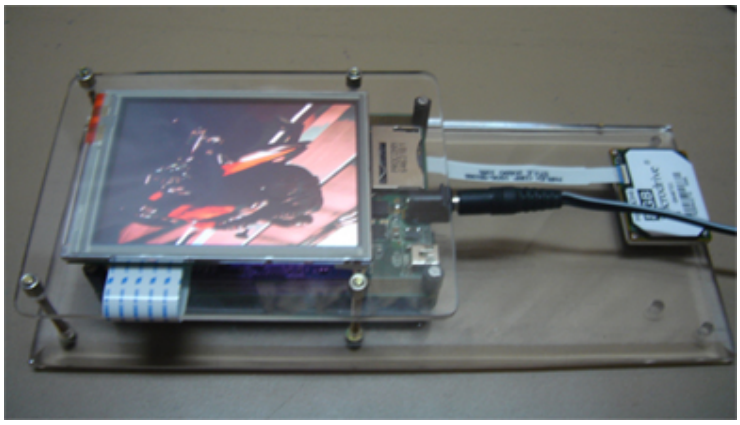
Video
Composite Video In / Video Out
RGB or YpbPr (HD TV) Out

Storage
SD/MMC
CE–ATA HDD

Battery
Lithium Ion, 3.6 V

Operating System
WinCE 6.0
Linux 2.6.19

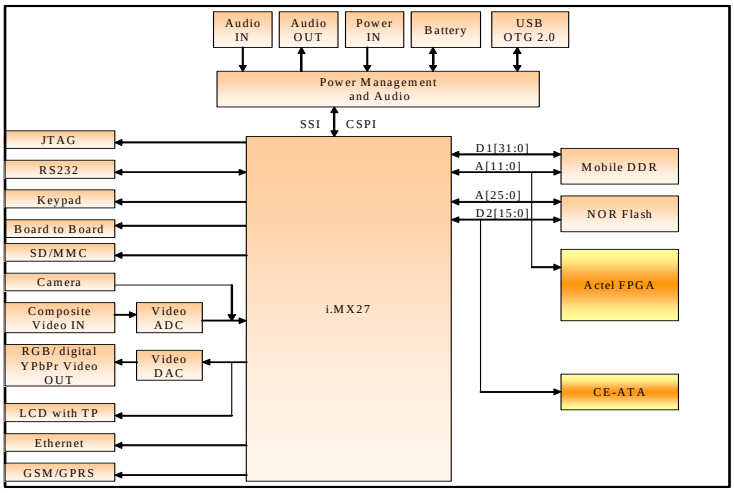
Physical Dimensions
73mm x 98mm



iW-Rainbow-G3 is based on the Freescale's i.MX27 processor with support for wireless streaming, Media codec, and security features. This flexible and cost-effective design solution is a boon for the rapidly growing consumer market. Product developers need the elemental flexibility to reach their aggressive targets, without compromising on development time, cost, power, and form factor. This generic hand-held design is targeted to OEMs, who can adopt the design and bring out innovative and cost-effective products for various applications, such as portable media players, hand-held gaming devices, smart phones, IPTV etc.

The block Diagram shows the i.MX27 based processor board with various interfaces.

- A power management IC MC13783 is interfaced with the processor, which supports USB OTG, audio in, audio out, power in and battery.
- Actel's ProASIC®3 FPGA supports the CE-ATA interface, since the processor does not directly support it.



- The composite signal output of the TV is connected to video ADC, which converts the analog composite signals into YUV format and transmits it to the CMOS sensor interface in the i.MX27 processor.
- The camera interface signals are connected directly to the i.MX27 processor through the CMOS sensor interface.
- The 18-bit digital RGB signals from the i. MX27 through the LCD interface are transmitted to the Video DAC, which converts the digital signals into the Analog RGB signal or YpbPr signals.
- MPEG 4 compression is supported.

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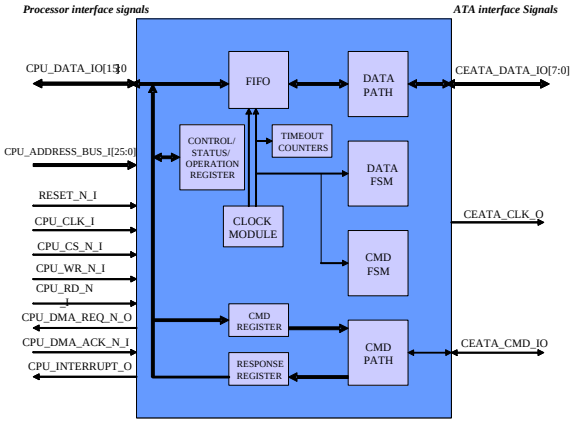
iW-Rainbow-G3 Handheld Platform



The block diagram, left, shows the modules built into the ProASIC3 chip where the CE-ATA controller logic is implemented. It also shows the interface signals between the processor and the FPGA.

The Host Controller provides an interface between the processor bus and a CE-ATA device. The core consists of the following blocks:

- **Data FSM:** This unit houses a state machine that controls the Data Path. It controls the flow of data from and to the device and takes care of the reading and writing of FIFO data.
- **CMD FSM:** This unit houses a state machine that controls the CMD Path. It controls the issue of commands to the device and monitors the response.
- **Clock Module:** This block generates a clock signal for modules working on an MMC clock and for modules working on the system clock. Based upon the inputs from the Data FSM, CMD FSM and control Register, the clock is gated to the CE-ATA device.
- **Control and Status Registers**: These registers store the configuration data and the status of the operations performed.
- **FIFO**: This unit is required to transfer data from two different clock domains.
- **Command Registers**: These registers are used to store the command index and argument which has to be issued to the device.
- **Response Registers**: These registers are used to store the response received from the device.
- **Data Path**: This module has the interface circuit to the CE-ATA bus format. It sends and receives the data between the device and the processor.
- **CMD Path**: This module takes care of storing and forwarding the command and responses between the device and the processor.
- **Timeout counters**: This module contains timers to monitor the timeout errors.

Applications:

The iW-Rainbow-G3 design can be used to enhance multimedia-rich applications such as portable media players, hand-held gaming devices, smartphones, IPTV, video telephony terminals, Telematics and Fleet

About iWave

iWave Systems Technologies is an embedded hardware and software turnkey design services focused on providing integrated solutions for developing innovative products and systems in the areas of communication, consumer electronics, and multimedia. iWave offers complete turnkey solutions for systems engineering and product development.

About Actel

Actel Corporation is the leading supplier of nonvolatile FPGA technologies, and leverages its fabless business model, flash- and antifuse-based silicon devices, software and hardware tools, IP cores, design services, and global support to offer designers single-chip, low-power, highly reliable and highly secure solutions with the lowest total system cost.

For more information regarding iW-Rainbow-G3 contact iWave Systems Technologies