Linux-ready Arm9 System on Module
M-502

Features

- ATMEL 400MHz AT91SAM9G20 CPU w/ MMU
- Linux kernel 2.6.29 with file system
- 64MB SDRAM and 256MB NAND Flash
- 1 x 10/100Mbps Ethernet
- 2 x USB 2.0 hosts supporting full speed of 12Mbps
- 1 x SD (secure digital) interface
- 4 x 921.6Kbps UARTs w/ hardware flow control
- 32 x GPIOs, CMOS / 3.3V compatible
- Compact size, 50 x 80mm only
- Ultra-low power consumption, less than 2.5 Watts
- GNU C / C++ toolchain is included

■ H/W Specifications

CPU / Memory
- CPU: ATMEL 400MHz AT91SAM9G20 w/ MMU
- Memory: 64MB SDRAM, 256MB NAND Flash
- DataFlash®: 2MB, for system backup

Network Interface
- Type: 1 x 10/100Mbps Ethernet
- PHY: DAVICOM DM9161
- Protection: 1.5KV magnetic isolation

UART
- Port 0: TXD0, RXD0, RTS0, CTS0, GND
- Port 1: TXD1, RXD1, RTS1, CTS1, DCD1, DTR1, DSR1, GND
- Port 2: TXD2, RXD2, RTS2, CTS2, GND
- Port 3: TXD3, RXD3, RTS3, CTS3, GND
- Signal Level: CMOS / 3.3V compatible

Common UART Parameters
- Baud Rate: Up to 921.6Kbps
- Parity: None, Even, Odd, Mark, Space
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Flow Control: RTS / CTS, XON / XOFF, None

UART Advanced Feature (When Used as RS-485)
- Supports 9-bit Multi-drop mode
- Supports hardware auto direction control

USB Ports
- Host Ports: 2, USB 2.0 compliant
- Host Signals: UdataA+, UdataA-, UdataB+, UdataB-
- Device (Client): 1, USB 2.0 compliant
- Device (Client) Signals: Uddata+, Uddata-, Udio

I2C(Inter-IC Bus)
- Signals: TWD, TWCK
- Supported Devices: Driver has been built-in

I2S (Inter-IC Sound)
- Transmitter Signals: TSCK, TWS, TSD
- Receiver Signals: RSCK, RWS, RSD

SPI (Serial Peripheral Interface)
- Signals: MISO, MOSI, SPCK, CS1, CS2

SD (Secure Digital Card Interface)
- Signals: MCCDA, MCCK, MCDA0~MCDA3
- Compatible with SD memory card specification 1.0

Watchdog Timer
- CPU built-in internal watchdog timer, used by Linux kernel
- Additional watchdog timer is available for users' applications

GPIO (General-purpose I/Os)
- 32 x GPIOs can be programmed as digital input or output
- Signal Level: CMOS / 3.3V compatible

Pre-defined Pins
- Reset Button (CN2, pin#35), input
- Buzzer (CN2, pin#37), output
- 2-pin DIP SW (CN2, pin#12, #13), input
- System ready LED (CN2, pin#38), output
- LAN activity LED (CN3, pin#11), output

Real Time Clock
- Chip: ST M41T81
- Backup Battery: Lithium, 48mAh

Debug Ports
- JTAG Port: for low level debug
- Console Port: RS-232 (Tx / Rx) serial console

Local Bus
- Data Bus: 8-bit (D0~D7)
- Address Bus: 8-bit (A0~A7)
- Chip Select: x 3 (CS0, CS5, CS6)
- Control Bus: RD, WR
- Signal Level: CMOS / 3.3V compatible

Power Requirement
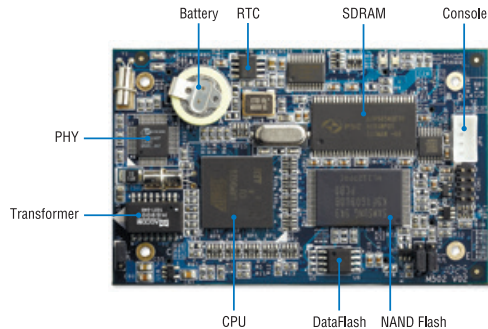- Power Input: +3.3VDC (Typical)
- Power Consumption: 2W

General
- Board Dimensions (W x L): 80 x 50mm
- 2.0mm Pitch Connectors
- CN1: 28 pins; CN2: 50 pins; CN3: 50 pins
- Mounting Holes: x 4, 2.0mm (M2) in diameter
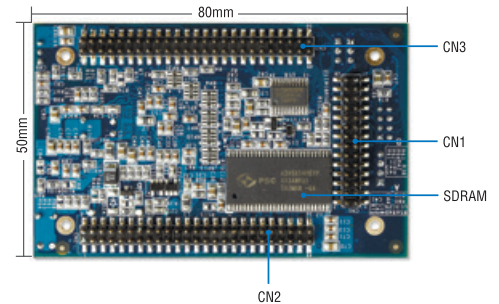- Operating Temperature: 0~70°C (32~158°F)

Linux-ready Arm9 System on Module
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Front View

Battery RTC SDRAM Console

PHY

Transformer

CPU DataFlash NAND Flash

Rear View

80mm

50mm

CN3

CN1

SDRAM

CN2

■ S/W Specifications

General
· OS: Linux, kernel 2.6.29
· Boot Loader: U-Boot
· File Systems: UBI, JFFS2, ETX2 / ETX3, VFAT / FAT, NFS

Pre-installed Utilities
· bash, busybox, sysvinit, wget, ipkg, procps (for webmin), psmics, lighttpd, vsftpd, iptables, ppp, ssh, wireless_tools, util-linux-mount / umount, usbutils, Artila utility

Daemons Started by Default
· ssh (secured shell) with sftp
· syslog / klogd (system and kernel log)
· telnet server (disable root permission in /etc/securetty)
· ftp server (vsftp)
· web server (lighttpd)
· amgrd (Artila broadcast search daemon)

Package Management & System Administration
· Supports ipkg to manage the package installation, upgrade and removal
· Supports webmin (use 'ipkg install webmin' to install) for web-based system administration

Toolchain for Linux
· GCC: C / C++ PC cross compiler
· GLIBC: POSIX Library

Standard Device Drivers
· Real Time Clock, SD / MMC, UART, Ethernet, GPIO, Buzzer
· EEPROM: Supports ATMEL AT24C16 and its compatibles

Pre-load USB Host Drivers (Could Be Customized)
· Generic Flash drive
· IEEE-802.11 WiFi adapter
· 10/100Mbps Fast Ethernet adapter
· RS-232 adapter
· ADSL modem
· ISDN modem (CDC / ACM compatible)

■ Ordering Information

M-502
· ATMEL9G20 + Linux 2.6.29 System on Module with 256MB NAND Flash, 64MB SDRAM

M-502 Starter Kit
· Includes one M-502 SoM and one carrier board with power circuitry, 3 x RS-232 ports, 1 x RS-232 / 422 / 485 port, 1 x Ethernet port, 2 x USB hosts, 1 x SD socket (at rear side), 2 x GPIO connectors, Real Time Clock, EEPROM, and local bus connector