Technical DataSheet

SBC104

Overview

SBC104 is a PC-compatible 386SX/486SXLC2 processor board supporting a 16-bit PC/104 expansion interface - which with a PC/104 VGA CRT/flat panel display module - can form a complete DOS-compatible PC for embedded applications. The board is fitted with 2Mbytes of DRAM (4Mbyte option), 1 Mbyte of FlashFile™ EPROM (2Mbyte option), and (optionally) 128Kbytes of battery-backed SRAM or a 2 – 72MByte M-Systems DiskOnChip device. System BIOS and extensions are contained in a 128Kbyte EPROM. On-board peripheral ports include COM1 and COM2, a floppy disk controller, a hard disk (IDE) controller, a parallel port (LPT1) and a keyboard interface.

SBC104 offers the following main features:

- 25MHz AMD 80386SX or 50MHz TI 486SXLC2 processor
- TI 486SXLC2 contains 8Kbytes of internal cache
- PC-AT architecture
- 2 Mbytes of DRAM (4Mbyte option)
- 1 Mbyte of FlashFile™ memory (2Mbyte option)
- Includes Arcom Flash Filing System (AFFS), pre-installed
- Includes ROM-DOS 6.22, pre-installed
- Optional 128Kbytes of battery-backed SRAM
- Optionally 2 – 72MBytes M-Systems DiskOnChip
- Real-Time Clock (RTC), battery-backed
- FDD interface, via 34-way header; HDD IDE interface via vertical 40-way header
- LPT1 parallel port, via a vertical 26-way header
- COM1/2 RS232 serial ports, via individual 9-way ‘D’-type plugs
- Link-selectable half-duplex RS485 available on COM2
- AT-type keyboard interface, via 6-way mini-DIN socket
- Mini-buzzer for audible alarm
- Watchdog timer generating an NMI or optional Reset (3 second time-out)
- PC/104 interface, 16-bit, single Master only
- Socket support for Dallas SmartWatch real-time clock
- 11mAHr Ni-MH battery: Full charge time = 70 hours
Hold-up time = 550 hours
Battery Life = 6 years @ 25°C
- Operating temperature range: **386SX**
+5°C to +65°C (with battery fitted)
-20°C to +70°C (without battery)
486SXLC
+5°C to +45°C (with battery fitted)
-20°C to +45°C (without battery)
- Storage temperature range: -40°C to +125°C
- External Battery Connection for extended CMOS battery backup
- Power consumption: @ +5V 700mA
- MTBF (using generic figures from MIL-HDBK-217F at ground benign) : 152,240 hours. *(Note figures do not include battery)*
- Single Eurocard form factor: 100x160mm or 3.9 x 6.3-in
- EMC chassis connection point in line with the Arcom PC/104 range of modules
- User LEDs for Flash drive access and processor running
- User link, fitted as standard

Arcom also manufacture a range of PC/104 expansion modules for use with the SBC104. These include opto-isolated digital and analogue I/O, VGA controller, relay output, CAN interface, multi-port serial communications, and Ethernet

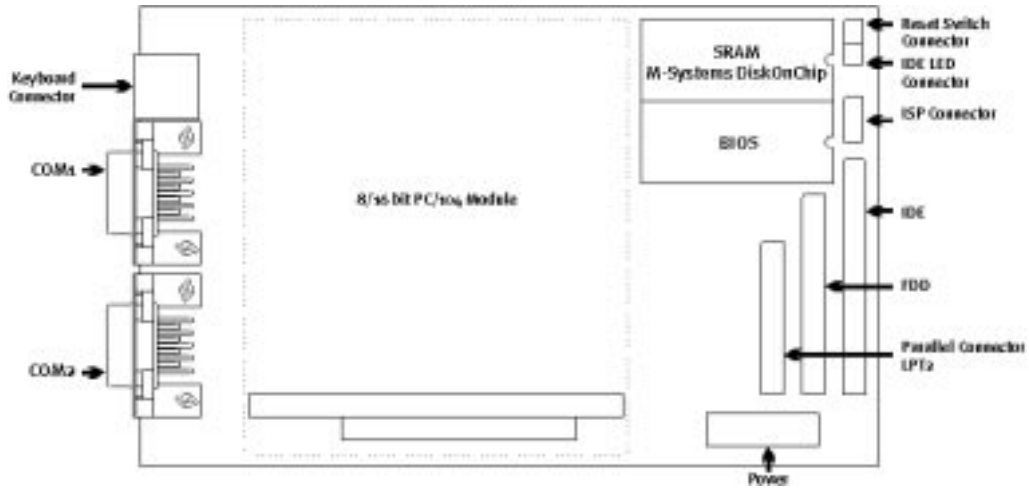
Variants

SBC104 is available in the following variants:

SBC104-386-252-F1	386SX processor, 2Mb DRAM, 1Mb Flash
SBC104-386-254-F2	386SX processor, 4Mb DRAM, 2Mb Flash
SBC104-486-504-F2	486SXLC2 processor, 4Mb DRAM, 2Mb Flash

Each board option can also be supplied with 128Kb of battery-backed SRAM

The board layout is shown below:



Software

SBC104 is supplied, as standard, with Arcom Flash Filing System (AFFS) and ROM-DOS 6.22, both pre-loaded. The AFFS is a BIOS extension which allows the on-board Flash memory to be used as a bootable read/write drive, exactly as if it were a standard hard drive. ROM-DOS 6.22 is a low-cost 'work-alike' of MS-DOS 6.22, with additional embedded features.

The board requires a +5V power supply, a PC/104 VGA board and a keyboard to start, and will boot-up to the DOS 'C' prompt.

The board is supplied with a bootable utility disk containing the following files:

- All ROM-DOS 6.22 files and utilities
- All Arcom Flash Filing System files
- SRAMDISK.SYS - Device driver to use SRAM as high speed read/write drive
- MS-Word 6.0 file (ROM-DOS.DOC) - Comparative reviews of ROM-DOS 6.22 and MS-DOS 6.22 and a list of additional commands
- All the pre-installed files are supplied on the embedded Flash
- Remote Disk for Quick downloading of application software

Note: Arcom Flash Filing System (AFFS), is the generic name given to the ported Flash Filing System called CardTrick™.

Both CardTrick and ROM-DOS 6.22 are trademarks of Datalight Inc.

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Board Features

• **AMD386SX or TI486SXLC Microprocessor:** The SBC104-386 variants use the AMD386SX 25MHz microprocessor, and the SBC104-486 uses the TI486SXLC2 50MHZ microprocessor. All board variants are driven by a clock synthesiser IC which also generates all the other clocks required on-board, apart from the RTC clock which is provided separately by a battery-backed IC. The TI 486SXLC2 part is run at 3.3V for a lower power consumption.

• **PC/104 16-bit Expansion Interface:** The I/O capabilities of the SBC104 processor board can be expanded via the 16-bit PC/104 interface fitted on the board. Additional PC/104 boards can be stacked and secured onto the board using pillars. Both 8-bit and 16-bit modules can be fitted to the SBC104. The board complies with the PC/104 specification, with the exception that the MASTER* signal is not implemented. The SBC104 is therefore the only master allowed on the bus.

• **System BIOS:** SBC104 is fitted with the Chips and Technologies' SCATsx BIOS. The BIOS includes special extensions to support the Flash Filing System. This feature allows the board to boot directly from the Flash drive. An extension is also included to ensure that the DOS clock correctly interprets the date information in the next millennium.

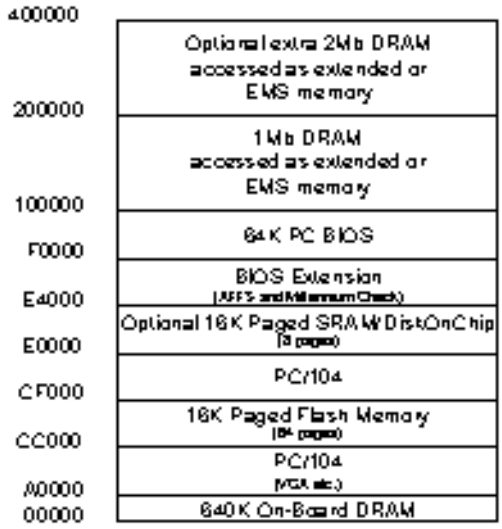
• **128Kbytes of Battery-Backed SRAM:** A 32-pin DIL socket is fitted to the board to allow the installation of an 8-bit wide 128Kbyte SRAM. The SRAM may be initialised as a battery-backed DOS drive by adding SRAMDISK.SYS to the CONFIG.SYS file.

• **Two RS232 Serial Communications Ports:** The SBC104 uses a 82C721 universal peripherals chip to implement two serial channels. These are buffered to RS232 levels on board, before being brought out to two 9-way D-type connectors. The following signals are implemented: Rx, Tx, CTS, RTS, DSR, DTR, DCD and RI. A link-selectable half-duplex RS485 option is available on COM2.

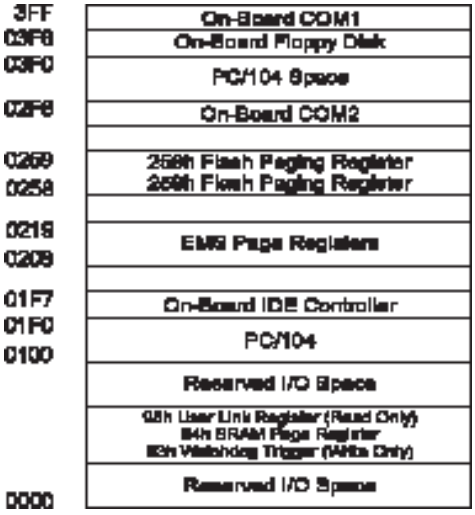
• **Additional On-Board Features:** SBC104 has a clearly labelled EMC chassis connection point which acts as a mounting hole for the PC/104 stack-through modules; the board has two user LEDs for Flash drive access and processor running; a user link (LK15) is fitted as standard; SBC104 also has socket support for the Dallas SmartWatch real-time clock.

• **M-System DiskOnChip:** The SRAM socket can be link configured to accept a DiskOnChip device. This allows 2 – 72MB of additional Flash memory to be accessed as drive d: (AFFS Flash memory is drive c:)

Memory Map



I/O Map



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