WinSystems®
DATA STORAGE

FEATURES

- PC/104-compatible Flash Disk Module
- 8 to 288 Megabyte capacity
- Supports M-Systems' DiskOnChip®series DIP or Millennium®TSOP-II Flash devices
- Embedded True Flash File System®provides full hard disk Read/Write compatibility
- MS-DOS, QNX, Windows CE/95/98/NT and Linux compatible
- Maintenance Free
- Resistant to dirt, vibration, and temperature variations
- Uses only an 8KByte memory window
- Low power consumption
- Single +5V operation
- Standard temperature range: 0°C to +70°C
- Optional -40°C to +85°C operational temperature
- Replaces M-Systems' PC104-FD module

The PCM-DOC is a PC/104-compatible, solid state disk storage module that allows a designer to substitute flash memory in applications where the environment is too harsh for mechanical hard disk or floppy disk drives. It is designed to store programs or files with data retention valid for at least 10 years.

FUNCTIONAL CAPABILITY

Overview - WinSystems' PCM-DOC is a flash disk storage module that will store up to 288 MBytes on a single board. Two versions are available to support different packaging styles of flash memory: DIP or TSOP-II.

The first version has a 32-pin DIP socket that is populated with the DiskOnChip2000®series of flash memory. It offers a wide selection of storage from 8 to 288 MBytes. The PCM-DOC-DXX is also offered with either no DiskOnChip® devices installed or with a DOC preinstalled and tested at the factory. The "D" suffix in the product order code indicates the DIP version.

The second version is populated with up to four TSOP-II parts. The benefit of TSOP-II parts are that they are soldered directly to the board making the mounting more rugged. Therefore, they can withstand more shock and vibration than a part in a socket.

The maximum amount of TSOP-II memory currently supported on the PCM-DOC-TXX is 32 MBytes. The "T" suffix indicates TSOP-II parts are installed.
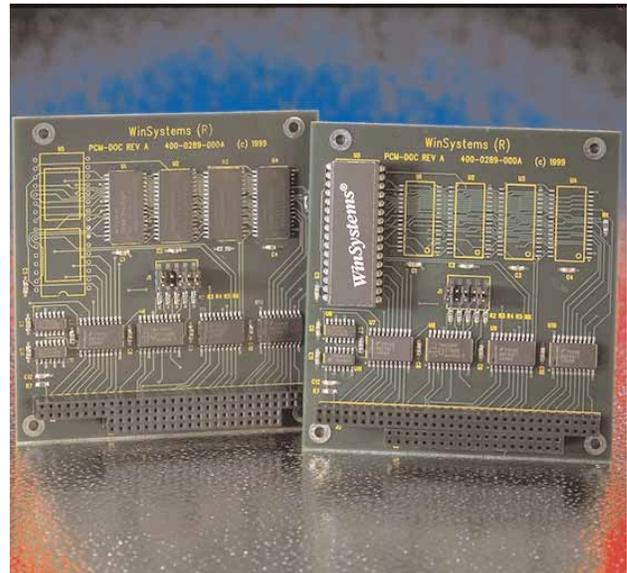
DiskOnChip2000® - The PCM-DOC module is based upon the M-Systems (Newark, CA) DiskOnChip®(DOC) flash disks. The DOC is offered in standard 32-pin DIP or TSOP-II packages to allow simple and robust mounting options for embedded systems. DOC has built-in TrueFFS (True Flash File System) technology, which provides full read/write disk emulation and hard disk compatibility at both the sector and file level.

True FFS® Technology - M-Systems' patented flash file software management technology allows the DOC to emulate a hard disk interface. Plus, it simplifies and enhances flash memories by using 3rd generation wear leveling. The benefit is that it ensures that all blocks are erased an equal number of times, which increases the life of the flash device by orders of magnitude. TrueFFS tests automatically for bad blocks during write and erase cycles and automatically swaps out a bad block without losing data. It also uses virtual blocking of the flash device to make the large erase blocks transparent to the operator.

TrueFFS provides built-in, enhanced 48-bit Reed-Solomon ECC/EDC logic for detection and correction capability for each 512-byte block of data. This ensures maximum data reliability even under stressful conditions, such as power failure.
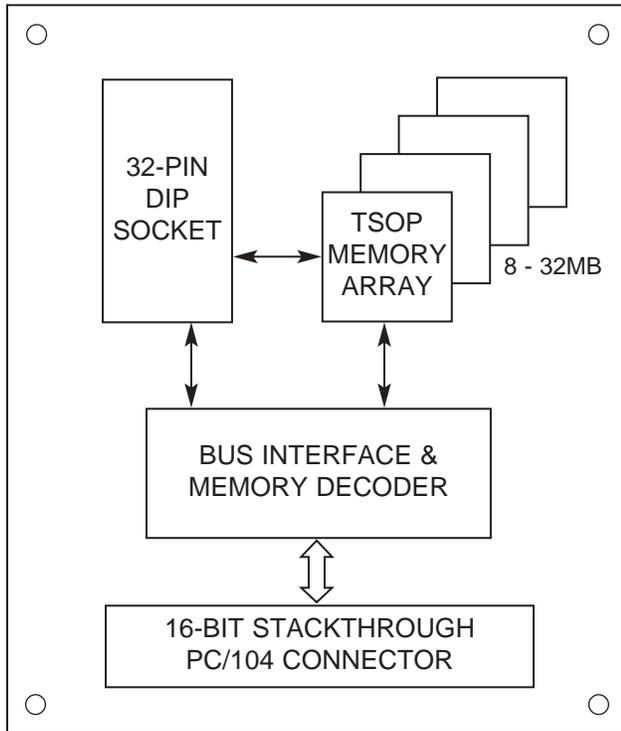
PCM-DOC BLOCK DIAGRAM

PC/104 Interface - The PCM-DOC is memory mapped on 16Kbyte boundaries from D000 to E800. The jumper selectable decoder offers 23 unique locations in the PC extended memory address space between 640K and 1M.

Software Support - TrueFFS allows broad operating systems support including Linux, MS-DOS, Windows CE/95/98/NT, QNX, VxWorks, and others. Contact WinSystems Applications Engineering for the latest list.

M-Systems Replacement Board - The PCM-DOC replaces M-Systems' PC104-FD boards that are no longer available from them. Contact WinSystems for the latest configuration and ordering information.

PCM-DOC Profile - The module measures 3.6" x 3.8" (90mm x 96mm). If a DIP DiskOnChip2000® of 48MB or larger is ordered, its socketed height exceeds the 0.435" primary side dimension. This requires that the device be soldered directly into the board or that the PCM-DOC be mounted on the top of the PC/104 stack.

Temperature Range Options - The PCM-DOC board is offered with a standard temperature range from 0° to +70° Centigrade. Its part number has a "-C" suffix. As an option, the board can be populated with parts that

operate over an extended industrial temperature range of -40° to +85° Centigrade. Contact WinSystems' Applications Engineering Department for pricing, availability, and ordering information.

SPECIFICATIONS

Electrical
PC/104 Bus: 16-bit stackthrough

Memory Capacity

DIP package: 0, 8, 16, 32, 48, 72, 144, or 288
                   MBytes in a 32-pin socket
TSOP-II package: 8, 16, 24, or 32 MBytes

Data Transfer Rates

Read: 1.2 MBytes per second
Write: Sustained: 500KBytes/sec

Power Requirements

Vcc =   +5V ±5% at 100mA (typical)

Mechanical
Dimensions: 3.6" x 3.8" (90mm x 96mm)

Environmental
Operating Temperature: 0° to +70°C standard
                        -40° to +85°C optional
Non-condensing relative humidity: 5% to 95%

ORDERING INFORMATION

DiskOnChip2000 mounted on the PCM-DOC

PCM-DOC-D0-C	PC/104 Flash module with no DiskOnChip installed (0MB)
PCM-DOC-D8-C	8MB PC/104 Flash module
PCM-DOC-D16-C	16MB PC/104 Flash module
PCM-DOC-D32-C	32MB PC/104 Flash module
PCM-DOC-D48-C	48MB PC/104 Flash module
PCM-DOC-D72-C	72MB PC/104 Flash module
PCM-DOC-D144-C	144MB PC/104 Flash module
PCM-DOC-D288-C	288MB PC/104 Flash module

DiskOnChip® TSOP-II mounted on PCM-DOC

PCM-DOC-T8-C	8MB PC/104 Flash module
PCM-DOC-T16-C	16MB PC/104 Flash module
PCM-DOC-T24-C	24MB PC/104 Flash module
PCM-DOC-T32-C	32MB PC/104 Flash module

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