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230MB 3.5-inch SCSI Hard Disk Drive: Specifications (2/95)

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TOPIC -----

This article gives the technical specifications for the Apple 230MB 3.5-inch SCSI hard disk drive.

DISCUSSION -----

Interface

-
- 50-Pin SCSI

Power

-
- 6 watts idle, 10 watts spin-up (RMS over 1st 8 seconds)
 - 8 watts during combination duty cycle of 40% W/R, 40% seek, 20% standby
 - Delayed start up of 650 ± 50ms minimum after power on
 - Voltage
 - 12VDC with +10%/-8% tolerance, voltage ripple tolerance to be at least 200 mV peak-to-peak from DC to 10 MHz; and 5VDC with ± 5% tolerance, voltage ripple tolerance to be at least 100 mV peak-to-peak from DC to 10 MHz.
 - Power Sequencing
 - Power (5 volts and 12 volts) can be supplied and removed independently to the drive with no permanent damage or loss of data. 12 volts current must be less than 2 milli-amperes when there is no 5 volts supplied to the drive.
 - Power Interruption
 - During a READ operation, 5 volts and 12 volts power can be intermittently interrupted without permanent damage or loss of data. During the WRITE operation, 5 volts and 12 volts power can be interrupted without causing permanent damage or loss of data of more than one sector.

Physical Features

-
- 150 x 102 x 25.4 mm (maximum envelope allows additional 1.5 mm clearance all around)

- Weight 1.5 lb. maximum

Performance and Functional Specifications

- Capacity 230MB: 409,700 blocks minimum
- Formatted sector size 512 bytes
- Average Access Time 16 ms
- Rotational Latency 7 ms
- Head switch time 3 ms
- The drive should read consecutive blocks with a head switch within the head switch time specified.
- Drive Response Times Under Normal Operating Conditions
 - Power On to Interface Ready 2 secs
 - Power On to Drive Ready * 18 secs
 - Spindown Time < 15 secs
- * Drive ready is defined as ready to perform read or write operations.
- Throughput
 - Minimum sequential throughput 1.2MB/sec
 - Minimum random throughput .024MB/sec
- Nonrecoverable errors aren't allowed.
- 20,000+ start/stop cycles
- 33 dbA mean at 1 meter, 39 dbA max (3 sigma)

Environmental Limits

- 5 to 55 degree C operating temperature, -40 to 65 degree C non-operating
- 10 to 90% RH operating, non-condensing, 5 to 95% RH non-operating, non-condensing
- Altitude 10,000 feet (3,000 m) operational/non-operational
- Vibration peak levels
 - 1.0g operating, 5-300 Hz
 - 2.0g non-operating, 5-500 Hz
- Shock levels
 - 10g operating
 - 60g and 60 ips non-operating,
- Must operate equally well in any orientation.

Connectors

- Power Connector
 - The power for the drive is provided through the male connector. This must come completely within the connector envelope (including mating connector) and be located on the same end of the drive as the SCSI connector. Pin 1 must be the rightmost pin when viewing the connector with drive top cover up. Pin diameter is 0.084 ± .002 inches.
- SCSI Connector
 - 50 pin, shrouded (4-sided), male, keyed, right-angle SCSI connector. The connector must be located within the envelope (including the mating connector). Pin 1 must be the rightmost pin of the upper row when viewing the connector with drive top cover up (key slot up). The pin dimension is .025 inches square and the pin material will have a minimum yield strength of 60 kpsi.
- Device Select Connector

6-pin male right angle connector located on the face opposite the SCSI connector (preferred) or a straight or right angle connector near the SCSI/power connector end of the drive and within connector envelope. Drive select connector pin spacing will be either .100 inches (preferred) or 2mm centers.

- LED Connector

2 pin, right-angle, un-shrouded, polarized male header to connect with the LED cable assembly. Must be located on the face opposite the SCSI connector. The LED connector pin spacing must be on either .100 inches or 2mm centers. If a polarized male connector can't be provided, the mating LED cable must be supplied with a polarizing feature.

Interface

ANSI X3T9.2 Small Computer Systems Interface (SCSI) with additional requirements as specified below:

- Must meet Apple SCSI HD Common Command Protocol #062-0310 with standard 50-pin SCSI interface.
- Must meet Apple SCSI Electrical Specification #062-2074.
- The buffer size must support 1:1 interleave.
- The embedded controller must provide error recovery algorithms which include ECC, seek, retry, and defect management.
- The drive should be able to respond to selection within 500 ms of a SCSI hard RESET.
- SCSI Data Burst Rate 3.0MB/sec asynchronous; 5.0MB/sec synchronous
- SCSI command overhead, defined as the time from the start of selection to the first disconnection of a READ command, which includes any Message In/Out phases, should be no more than 1.0 ms.

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