

H2172-S2, H2258-S3 & H2344-S4

IBM OEM STORAGE PRODUCTS

The latest 2.5" disk drives from IBM provide up to 344 MB in a slim 17 mm high package. Using the latest MR head technology IBM provides high performance drives particularly suited to the mobile computing market.

APPLICATIONS

- High performance portable computers
- Non-IT--process control/fax
- Removable/secure storage units

FEATURES

- 172/258/344 MB at (512 bytes/ drives sector)
- SCSI 2 interface
- Media data rate 20.0/32.0 Mbits/ Mbits/s (8 zones)
- Rotational speed 3800 rpm
- Magnet resistive heads
- 64 K Look Ahead Buffer
- ECC on the fly- 1.25 watt idle
- Shock 250 G (2 ms) non op. All 6 axis mounting
- Spin up 3 sec (typical)

BENEFITS

- High capacity 2.5"
- Popular interface with excellent performance
- Excellent data rate across disk surface
- High areal density, low component count
- Fast access to data and improved throughput
- Low power for battery powered applications
- Robust design for portable computing applications
- Fast recovery from standby
- Assured reliability

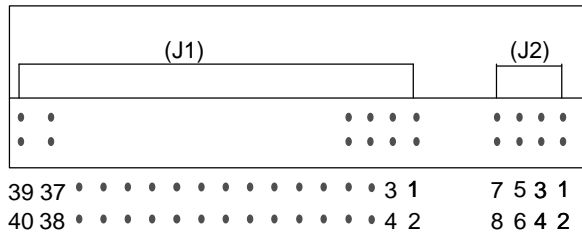
ELECTRICAL CONNECTOR LOCATIONS

DRIVER/RECEIVER

The drives support single ended drivers and receivers

CONNECTOR

The SCSI signal connectors is designed to mate with AMP PN 176135 or equivalent.



40 pin SCSI Connector

J2 Pin No	-ID1	-ID2	-ID4	Device Address
	open	open	open	0
	GND	open	open	1
	open	GND	open	2
	GND	open	open	3
	open	open	GND	4
	GND	open	GND	5
	open	GND	GND	6
	GND	GND	GND	7

CABLING

The maximum cable length from the host system to the drive is limited to 6 inches with external 1K-ohm pull up resistors.

In case that appropriate termination resistors are externally equipped to the interface lines, the cable length can be extended. The maximum cable length depends on the condition of various electrical parameters of the interface. IBM will offer technical guidance on request basis.

DEVICE ADDRESS

The drive recognizes its device address, namely SCSI ID, with the condition of -ID1, -ID2 and -ID4. The signal condition and the device address are shown above.

SIGNAL TERMINATION

The drive does not have termination nor pull up resistors for SCSI interface.

DATA ORGANIZATION

Physical Layout

	H2172-S2	H2258-S3	H2344-S4
Bytes per Block	512	512	512
Total Customer	172	258	344
Usable Data			
Bytes (MH)			
Number of Blocks	336260	504396	672525

DC POWER REQUIREMENTS

Supply Voltage	+5 Volts
Power Supply Ripple	100 mv p-p max
(0-20 MHz) (1)	
Tolerance (2)	+/- 5%
Supply Current	Mean Value
Idle average (3)	0.27 A RMS
Read/Write (3)	0.56 A RMS
Seek average (3)	0.40 A RMS
Start up	0.94 A RMS
(maximum peak) (3)	
Supply Rise Time	7-100 ms

Notes:

1. The maximum supply ripple is measured at 5 volt input of the HDD.
2. The disk drive shall not incur damage for an over voltage condition of +25% (maximum duration of 20 ms) on the 5 volt nominal supply.
3. Idle average current includes communication currents.

SIGNAL DEFINITION

The pin assignments of interface signals are listed as follows:

PIN	Signal Name	PIN	Signal Name
01	+5 V	02	+5 V
03	RET	04	RET
05	GND	06	DB0
07	GND	08	DB1
09	GND	10	DB2
11	GND	12	DB3
13	GND	14	DB4
15	GND	16	DB5
17	KEY	18	DB6
19	GND	20	DB7
21	GND	22	PARITY
23	GND	24	TERMPWR
25	-ATTN	26	-BSY

27 GND	28 -ACK
29 -RST	30 -MSG
31 GND	32 -SEL
33 -I/O	34 -C/D
35 GND	36 -REQ
37 RET	38 RET
39 +5 V	40 +5 V

J1 Signal Assignment

PIN	Signal Name	PIN	Signal Name
1	(Unused)	2	(Unused)
3	-INDEX	4	(Unused)
5	-ID1	6	-ID2
7	-ID4	8	-LED

J2 Signal Assignment

SIGNAL LINE DESCRIPTION

<i>Name</i>	<i>Description</i>
BSY	BUSY indicates that the bus is in use
SEL	SELECT is used by an Initiator to select a Target or by a Target to re-select an Initiator
C/D	CONTROL DATA indicates whether control (1) or data (0) information is on the bus
I/O	INPUT/OUTPUT indicates whether the data on the bus is an input (1) to the Initiator or an output (0) to the Target. This line is also used to differentiate between SELECTION phase (0) or RE-SELECTION phase (1)
MSG	MESSAGE is driven by Target and indicates a message phase
REQ	REQUEST is driven by Target and indicates a request for REQ/ACK data transfer handshake
ACK	ACKNOWLEDGE is driven by the Initiator and indicates an acknowledgement of a REQ/ACK data transfer handshake
ATN	ATTENTION is driven by an Initiator to inform a Target that the Initiator has a message ready
RST	RSET clears all SCSI devices from the bus and resets them <i>Note:</i> The target will not drive this line
DB(n)	8 data bits are used to transfer data over the bus. DB(7) is the most significant
DB(P)	PARITY bit associated with BD(7-0). Data parity is odd
ID(n)	These signal pins are used in set the drive address
INDEX	The signal is just for reference and the function is not specified
LED	The signal is just for reference and the function is not specified

ELECTROMAGNETIC COMPATIBILITY

The Drive meets the following EMC requirements when installed in the user system and exercised with a random accessing routine at maximum data rate:

United States Federal communication Commission (FCC) Rules and Regulations Part 15, Subject J- Computer Devices "Class B Limits."

European Economic Community (EEC) directive #76/889 related to the control of radio frequency interference and the Verband Deutscher Elektrotechniker (VDE) requirements of Germany (GOP).

OPERATING MODES

DESCRIPTION

Spin-Up

This power on mode is defined as the period of time from receipt of power at the drive assembly or receipt of Start SCSI command, to Idle mode (or "Ready" state).

Idle

In this mode the disks are spinning at rated speed, the drive is able to accept and immediately execute commands requiring disk access. Actuator assembly is located on track in the "Ready" state.

Seek/Read/Write

This is a command execution mode where the driver actuator is moving or data is being written to or read from the media.

Note 1: After power down on spindle stopped, a head locking mechanism secures the heads in the ID parking position.

MODE SELECT OPTIONS

Certain parameters are alterable using the SCSI "Mode Select" command. This allows certain drive characteristics to be modified to optimize performance on a particular system. Refer to the H2XXX-SX Functional Specification for a detailed definition of Mode Select parameters: The changeable parameters are:

Page 1

Read-Write Error Recovery Parameters

TR - Transfer Block (0)

PER - Post Error (0)

DTE - Disable Transfer on Error (0)

DCR - Disable Correction (0)

Read Retry Count (01)

Write Retry Count (01)

Page 2

Disconnect/Reconnect Control Parameters

Read Buffer Full Ratio (30H)

Write Buffer Empty Ratio (30H)

Page 8

Caching Parameters

RCD - Read Cache Disable (0)

Note: Default parameters are shown in closed brackets (X)

OPERATING ENVIRONMENT

Humidity:

Operating Relative	8% to 90% non-condensing
Non-Operating Relative	5% to 95% non-condensing

Wet Bulb Temperature:

Maximum Wet Bulb:

Operating	29.4 degrees C non-condensing
Non-Operating	40 degrees C non-condensing

Elevation:

Operating Altitude	-50 to 3000m
Ship/Storage Altitude	-150 to 4572m

Temperature:

Operating	5 to 55 degrees C
Storage	0 to 65 degrees C
Shipping	-40 to 65 degrees C
Temperature Gradient 20 degrees C per hour (maximum) (Operating, Storage & Shipping)	

Note: The system is responsible for providing sufficient air movement to maintain surface temperature below 60 degrees C at the center of top cover of the drive.

AIR COOLING REQUIREMENTS

The host system must provide sufficient air flow across the drive to maintain the temperature at less than 60 degrees C (measured at the center of the drives' top cover).

OPERATING SHOCK

The Drive will withstand (with no hard error) a 10 G half-sine wave shock pulse of 11 ms duration.

NON-OPERATING SHOCK

The Drive will withstand (with no permanent damage or degradation in performance) a 120 G half-sine wave shock pulse of 11 ms duration or 250 G for 2 ms.

OPERATING AND NON-OPERATING VIBRATION

Due to the complexity of this subject we recommend that users contact the Distributor to discuss how to perform the necessary measurements if they believe this to be an area which requires evaluation.

MECHANICAL DATA

Dimensions	H2172-S2	H2258-S3	H2344-S4
Height (min)	17.0 + 0.35	17.0 + 0.35	17.0 + 0.35
	- 0.30	- 0.30	- 0.30
Width (mm)	70.0 +/- 0.25	70.0 +/- 0.25	70.0 +/- 0.25
Length (mm)	100.0 +/- 0.25	100.0 +/- 0.25	100.0 +/- 0.25
Weight (gram)		180 Max	180 Max

MOUNTING ORIENTATION

The drive will operate in all axes (6 directions). The drive will operate within the specified error rates when tilted +/- 5 degrees from these position.

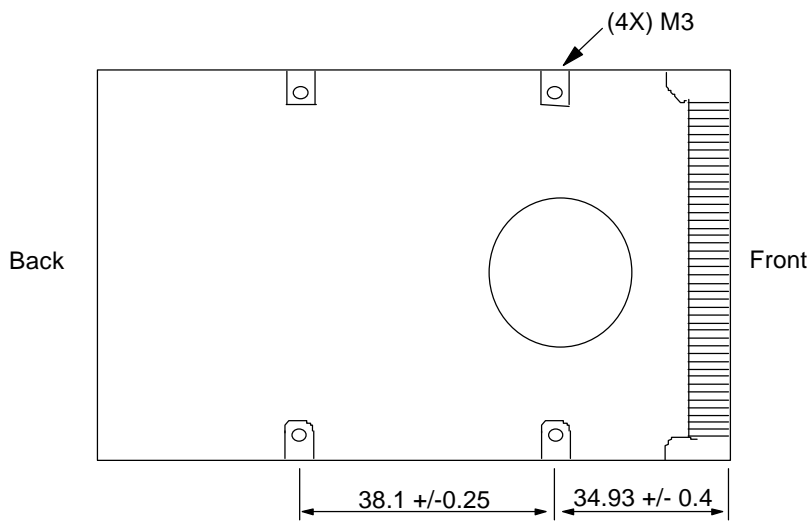
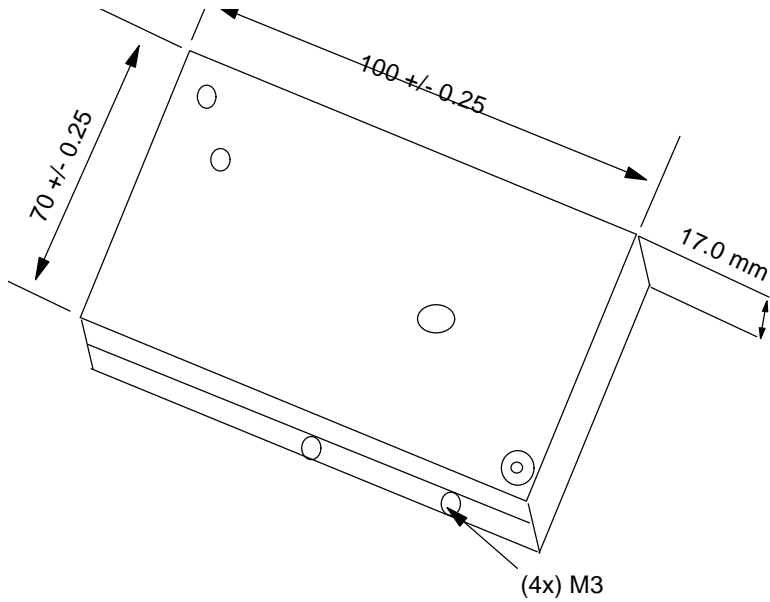
Performance and error rate will stay within specification limits if the drive is operated in the other permissible orientations from which it was formatted. Thus a drive formatted in a horizontal orientation will be able to run vertically and vice versa.

The recommended mounting screw torque is 3 +/- 0.5 kgf. cm.

The recommended mounting screw depth is 3.5 +/- 0.5 mm for bottom and 5.0 +/- mm for horizontal mounting.

The system is responsible for mounting the drive securely enough to prevent excessive motion or vibration of the drive at seek operation or spindle rotation, using appropriate screws or equivalent mounting hardware. Consult the issuer of this specification for actual application.

Vibration test and shock test are to be conducted with mounting the drive to the table using bottom four screws.



The maximum allowable penetration of the mounting screw is 3.5 mm.

PACKAGING: The drive must be protected against Electro-Static Discharge especially when being handled. The safest way to avoid damage is to put the drive in an anti static bag before ESD wrist straps, etc are removed.

Drives should only be shipped in approved containers, severe damage can be caused to the drive if the packaging does not adequately protect against the shock levels induced when a box is dropped. Consult your IBM marketing representative if you do not have an approved shipping container.

AMP is a trademark of AMP Incorporated.

This data sheet is not a substitute for the full product specification, which should be used when detailed information is required.

Product Description data represents IBM's design objectives and is provided for comparative purposes; actual results may vary based on a variety of factors. This product data does not constitute a warranty. Questions regarding IBM's warranty terms or methodology used to derive this data should be referred to your IBM OEM representative. Data subject to change without notice.