IBM OEM Storage Products

This 2.5" SCSI hard disk drive provides 810 MB in a slim 17 mm high package. Performance is enhanced by ECC on the fly and by a 64 K segmented buffer with write-cache and read look ahead. Using MR head technology IBM provides a high performance and high capacity drive fo the mobile computing market.

Applications

- High performance portable computers
- Removable/secure storage units

Features

- Closed-loop actuator servo (Embedded sector servo)
- Integrated controller
- Multi-zone recording
- 1:1 interleave
- Enhanced ECC on the fly
  - 128 bit Reed Solomon code operation 10 bit symbol
  - Multi burst on the fly correction
- Automatic retry on errors
- Self-diagnostics in power up
- Rotary voice coil motor actuator
- 1,7 run-length limited (RLL) code
- Automatic actuator lock
- Dedicated head landing zone

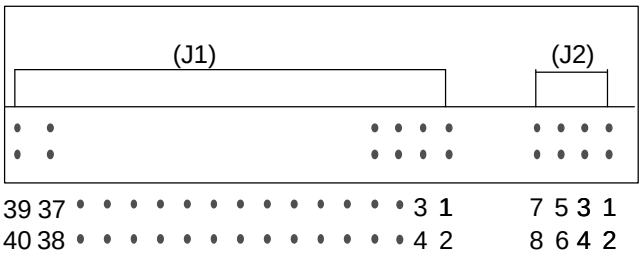
Benefits

- High capacity in 2.5" form factor
- Popular interface with excellent performance
- Excellent data rate across disk surface
- High areal density, low component count
- Fast access to data and improved throughput
- Embedded sector servo
- Improved data reliability

Electrical Connector Locations

Drive 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 below.



40 pin SCSI Connector

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

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

Data Organization

Physical Layout *DVAS-2810*

Bytes per Block 512

Formatted Capacity	810MB
Number of Blocks	1,583,568

DC Power Requirements

Supply Voltage	+5 VDC +/-5% *2
Power Supply Ripple (0-20 Mhz max)	100 mV p-p
Supply Current	
Idle	0.24 A RMS
Read/Write	0.56 A RMS
Seek	0.56 A RMS
Standby	0.08 A RMS
Start up (average to ready)	0.70 A RMS
Start up (maximum peak)	0.94 A RMS
Supply rise time	7 - 100 msec

Notes:
1. The maximum supply ripple is measured at 5V 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.

Signal Definition

The pin assignments of interface signals are listed as follows:

Pin	**Signal Name**	**Pin**	**Signal Name**
01	+5V	02	+5V
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	TERM PWR
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	+5V	40	+5V	

J1 Signal Assignment

Pin	Signal Name	Pin	Signal Name
1	(Unused)	2	-No spin up
3	-INDEX	4	(Unused)
5	-ID1	6	-ID2
7	-ID4	8	-LED

J2 Signal Assignment

Note:
No Spin up, if this pin is grounded (Pin 2) the drive will not spin up at power up - drive must be started with a start stop unit command.

Signal Line Descriptions

Name	Description
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) andRE-SELECTION phrase (1)
MSG	MESSAGE is driven by target and indicates a message phrase
REQ	REQUEST is driven by target and indicates a request for a REQ/ACK data transfer handshake
ACK	ACKNOWLEDGE is driven by the initiator and indicates an acknowledgment 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	RESET clears all SCSI devices from the bus and resets them *Note:* 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 DB(7-0). Data parity is odd
ID (n)	These signal pins are used to 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 exercise with a random accessing routine at maximum data rate:

United States Federal Communication Commission (FCC) Rules and Regulations Part 15, Subje
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.

Standby
Spindle motor is stopped. All modules except the host interface are sleeping. Commands can
be received immediately. Drive is in an interrupt waiting mode with the lowest power
dissipation.

Seek/Read/Write
This is a command execution mode where the driver actuator is moving or data is being written t
or read from the media.

Note:
After power down or spindle stopped, a head locking mechanism secures the heads in the landin
zone.

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
DVAS-2XXX Functional Specification for a detailed definition of the Mode Select parameters.

The changeable parameters are:
Page 0 - Vendor Unique Parameters
UA1 - Unit Attention Inhibit (0)
DSN - Disable Target Initiated (0)
DPC - Disable Parity Checking (0)

Page 1 - Read-Write Error Recovery Parameters

TB - 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)

Page OD - Power Condition
Standby (1)
Standby Timer (1A5E0h 3hrs)

Page 38 - Standby Timer Parameters
Auto Standby Time (B4h 3hrs)

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

Operating Environment

Humidity

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

Wet Bulb Temperature

Maximum Wet Bulb	
Operating	29.4 C non-condensing
Non-Operating	40 C non-condensing

Elevation

Operating Altitude	-300 to 3000m
Ship/Storage	-300 to 12000m
Altitude	

Temperature

Operating	5 to 55 C
Storage	0 to 65 C
Shipping	-40 to 65 C

Temperature Gradient 20 C per hour (maximum)
(Operating, Storage & Shipping)

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

Operating Shock
The drive will withstand (with no hard error) a 20G half-sine wave shock pulse of 12ms duration and no data loss or permanent damage at idle, seek and read modes within shock pulses of 60G 3.5ms half-sine wave.

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

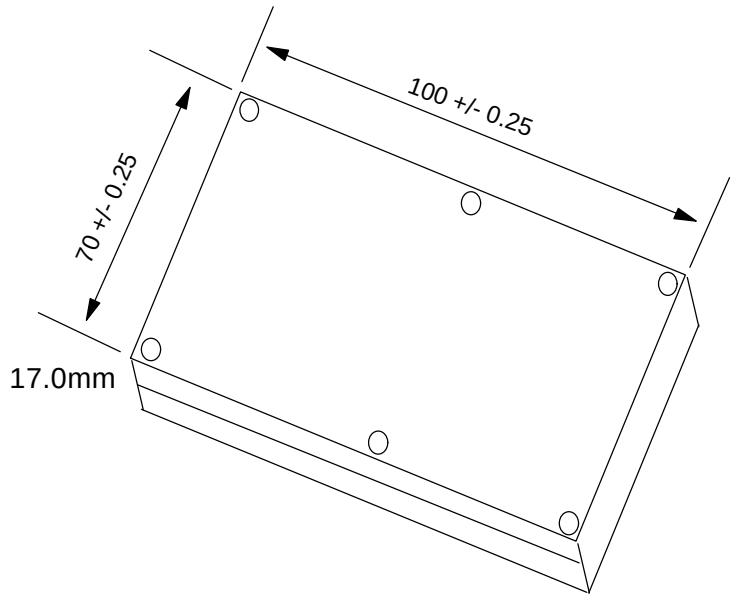
Operating and Non-Operating Vibration
Due to the complexity of this subject we recommend that users contact the Distributor to discuss how to perform the necessary measurements if they believe this to be an area which requires evaluation.

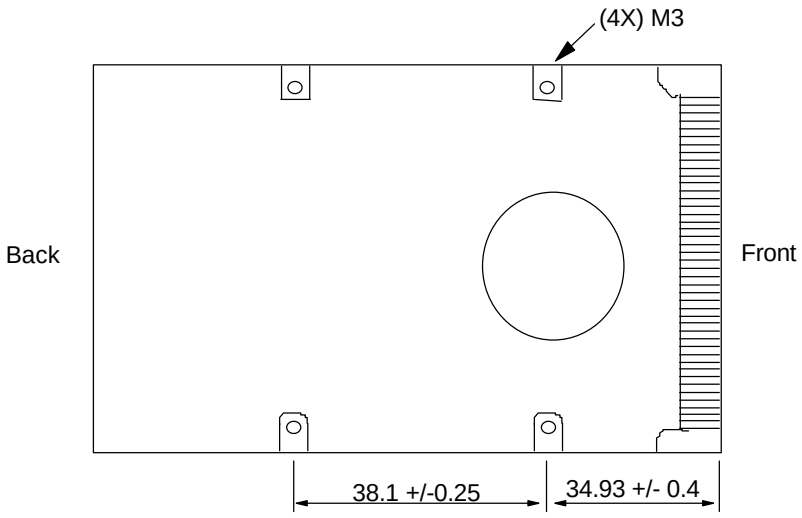
Mechanical Data

Dimensions

Height (mm)	17.0+0.35/ - 0.3
Width (mm)	70.0 +/- 0.25
Length (mm)	100.0 +/- 0.25
Weight (gram)	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 positions.
Performance and error rate will stay within specification limits if the drive is operated in the othe 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 +/- 0.5mm for bottom and 5.0 +/- mm for horizontal mounting.
The system is responsible for mounting the drive securely enough to prevent excessive motion o vibration of the drive at seek operation or spindle rotation, using appropriate screws or equivaler 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 3.5mm.

WARNING

This disk drive can be damaged by Electro-Static Discharge, please follow recommended ESD procedures before unpacking or handling the drive. Ask your Dealer for details if you need assistance.

PACKAGING

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

Drives should only be shipped in approved containers, severe damage can be caused to the drive 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.

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

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