

IBM OEM STORAGE PRODUCTS

DSAS-3270, DSAS-3360, DSAS-3540 & DSAS-3720

IBM OEM has introduced a new range of disk drives for the desktop personal computer marketplace. Available in four popular capacity points with SCSI-2 FAST interface, the drives provide excellent performance and improved reliability.

APPLICATIONS

- Desktop personal computers
- Low-end file servers
- Low-end workstations

FEATURES

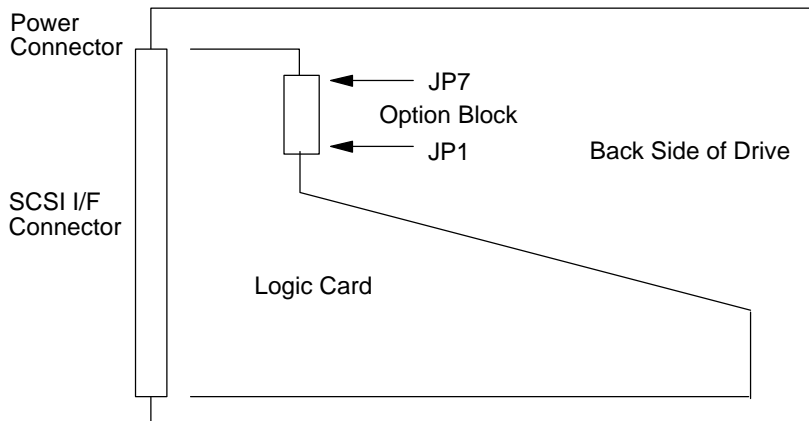
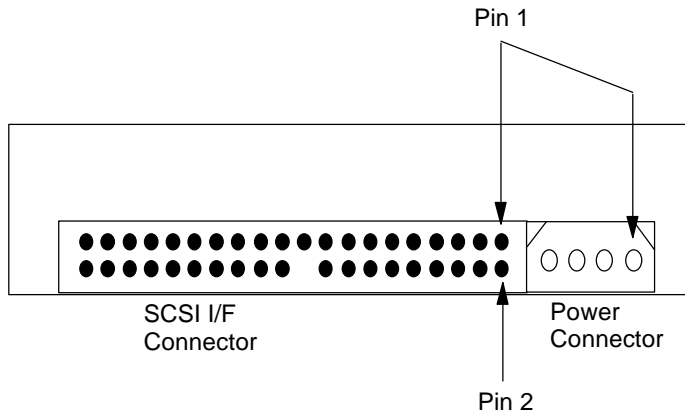
- 281, 365, 548, and 730 MB formatted capacity (512 byte/sector)
- 10 MB/s data transfer speed
- 44.5 Mb/s (OD) media data rate
32.5 Mb/s (ID) media data rate
- Average seek time 12ms (Read)
- 4500 RPM
- 192 KB segmented buffer
- Read ahead caching with LFU (Least Frequently Used) segment update
- Industry standard mounting
- The drive can be mounted with any of its six surfaces facing down
- Enhanced ECC implementation
- Power saving modes
- Robust design for EMC/RFI
- MR (Magneto Resistive) head technology

BENEFITS

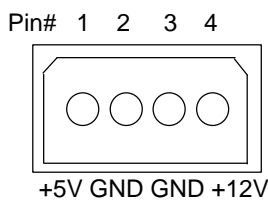
- Generic range of popular storage capacities
- Fast interface data rate
- Excellent performance on long records
- Fast access to data
- Fast data retrieval in (option 96 KB) multi-tasking applications
- Ease of installation
- Improved data throughput

- Reduced power consumption
- Easy integration across multiple platforms
- High area density, low component count
- Assured reliability

CONNECTORS

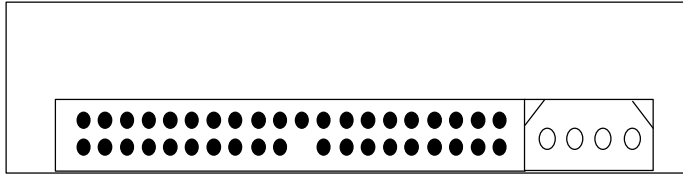


The DC power connector is designed to mate with AMP part 1-480424 (using AMP pins PN 350078-4). Equivalent connectors may be used. Pin assignments are shown below, as viewed from the end of the drive.



SCSI SIGNAL CONNECTOR

The SCSI Signal Connector is a 50-pin connector meeting the ANSI SCSI specification.



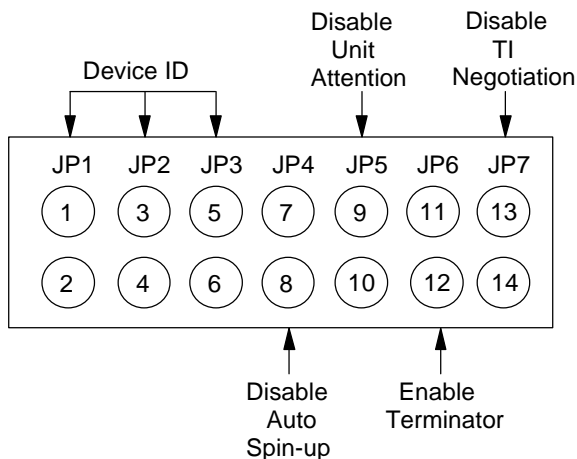
Note: It is intended that the hard disk drive should only be in electrical contact with the chassis of the PC at a designated set of mounting holes. Other electrical contact may degrade error rate performance. As a result of this it is recommended that there should be no metal contact to the hard disk drive except at the mounting holes or the side rails into which the mounting holes are tapped.

OPTION BLOCK

Jumper Setting

Jumper position and function are as shown below. Pin pitch is 2mm.

The jumpers control SCSI Device ID, Auto Spin Up, Unit Attention, SCSI Terminator Connection, and Target Initiated Synchronous Negotiation.



Notes:

1. The jumper position of JP1, 2, and 3 define SCSI ID of the drive.

If JP1,JP2,JP3,are Off, Off, Off, the SCSI ID is 0. (Shipping Default).

If JP1, JP2, JP3, are On, Off, Off, the SCSI ID is 1.

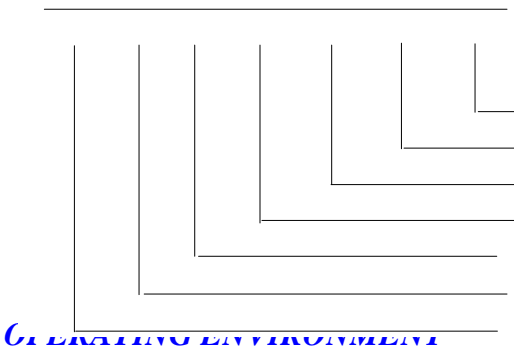
If JP1, JP2, JP3, are Off, On, Off, the SCSI ID is 2.

If JP1, JP2, JP3, are On, On, Off, the SCSI ID is 3.
If JP1, JP2, JP3, are Off, Off, On the SCSI ID is 4.
If JP1, JP2, JP3, are On, Off, On, the SCSI ID is 5.
If JP1, JP2, JP3, are Off, On, On the SCSI ID is 6.
If JP1, JP2, JP3, are On, On, On, the SCSI ID is 7.

2. If JP4 is Off, the drive will spin up automatically after power on reset. If JP4 is On, the drive will not spin up unless the host system issues a start command to the drive.
3. If JP5 is On, Unit Attention after power on reset or SCSI bus reset is disabled.
4. If JP6 is On, the internal SCSI terminator works.
5. If JP7 is On, Target Initiated Synchronous Negotiation is disabled, and then the Initiator is required to start a negotiation handshake if Synchronous SCSI transfers are desired.

DEFAULT SETTING

The default jumper setting at shipment is as follows.



Operating Conditions

Temperature	5 to 55 degrees C
Relative Humidity	8 to 90% noncondensing
Maximum Wet Bulb	
Temperature	29.4 degrees C noncondensing
Maximum Temperature	
Gradient	20 degrees C/hour
Altitude	-300 to 3048m

Nonoperating Conditions

Temperature	-40 to 65 degrees C
Relative Humidity	5 to 95% noncondensing
Maximum Wet Bulb	
Temperature	40 degrees C noncondensing
Maximum Temperature	
Gradient	20 degrees C/hour
Altitude	-300 to 12,000m

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

Operating Shock

The hard disk drive meets the following criteria while operating in respective conditions described below. The shock test consists of five shocks inputs in each axis and direction for total of 30. There must be a delay between shock pulses, long enough to allow the drive to complete all necessary error recovery procedure.

No Data Loss, Seek Errors or Permanent Damage

10G, 11ms half-sine shock pulse

No Data Loss or Permanent Damage

15G, 5ms half-sine shock pulse 30G, 4ms half-sine shock pulse

Operating Vibration

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

DATA ORGANIZATION

Logical Layout	DSAS-3270	DSAS-3360	DSAS-3540	DSAS-3720
Number of Heads	2	2	3	4
Number of LBAs	549504	713472	1070496	1427328
Sector Size	512	512	512	512
Total Customer	281 MB	365 MB	548 MB	730 MB
Usable Data Bytes				

DC POWER REQUIREMENTS

The following voltage specifications apply at the file power connector. Damage to the file electronics may result if the power supply cable is connected or disconnected while power is being applied to the file (no hot plug/unplug is allowed). There are inductive loads in the file

which could cause destructive high voltage spikes on the file if the power connection is opened. There is no special power on/off sequencing required.

Nominal Supply Voltages	+5 Volts	+12 Volts
Maximum Ripple (0-20MHz)	100 mV p-p	100 mV p-p
Voltage Supply Tolerance (incl ripple)	+/- 5%	+10%/-8%
Power Supply Current (Amps)	+5 Volts	+12 Volts
Start Peak	0.55	1.10
Idle Average	0.21	0.14
R/W Average	0.44	0.20
Seek Average	0.38	0.29

During the file start up and seeking, 12-volt ripple is generated by the file (referred to as dynamic loading). If several files have their power daisy chained together then the power supply ripple plus other file's dynamic loading must remain within the regulation tolerance of +10/-8%. A common supply with separate power leads to each file is a more desirable method of power distribution.

To prevent external electrical noise from interfering with the file's performance, the file must be held by four screws in a user system frame which has no electrical level deference at the four screws position, and has less than +/-300 millivolts peak to peak level deference to the file power connector ground.

SIGNAL DEFINITION

The pin assignments of interface signals are listed as follows:

<i>PIN</i>	<i>Signal Name</i>	<i>PIN</i>	<i>Signal Name</i>
01	Ground	02	-DB(0)
03	Ground	04	-DB(1)
05	Ground	06	-DB(2)
07	Ground	08	-DB(3)
09	Ground	10	-DB(4)
11	Ground	12	-DB(5)
13	Ground	14	-DB(6)
15	Ground	16	-DB(7)
17	Ground	18	-DB(P)
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Open	26	TRM Power

29	Ground	30	Ground
31	Ground	32	-ATN
33	Ground	34	Ground
35	Ground	36	-BSY
37	Ground	38	-ACK
39	Ground	40	-RST
41	Ground	42	-MSG
43	Ground	44	-SEL
45	Ground	46	-C/D
47	Ground	48	-REQ
49	Ground	50	-I/O

SCSI CABLE

The disk drive uses single-ended drivers and receivers which will permit cable lengths of up to 6 meters (19.68 feet). For a single ended cable a 50 conductor flat cable or a 25 signal twisted cable can be used with a maximum length of 6.0 meters, and a stub length not exceeding 0.1 meters.

SCSI BUS TERMINATOR

The file has an internal Active SCSI bus terminator, and can be controlled on/off with one jumper block provided at the card edge. The user is responsible for properly terminating and empowering the SCSI bus in the using system.

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 DSAS-3XXX Interface Specification for a detailed definition of Mode Select parameters. The changeable parameters are:

Page 0

Vendor Unique Parameters

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 (01h)

Write Retry Count (01h)

Page 2

Disconnect/Reconnect Parameters

Read Buffer Full Ratio (0C0h)

Write Buffer Empty Ratio (0C0h)

Page 7

Verify Error Recovery Parameters

PER (0)

DCR (0)

Verify Retry Count (01h)

Page 8

Caching Parameters

WCE - Write Cache Enable (1)

RCD - Read Cache Disable (0)

Number of Cache Segments

Page A

Control Mode Page Parameters

Queue Algorithm Modifier (0)

QErr - Queue Error (01h)

DQue - Disable Queuing (0)

Page OD

Power Condition

Standby (1)

Standby Timer (1A5E0h [3 hrs])

MECHANICAL DATA

Dimensions

Height 25.4 +/-0.4mm

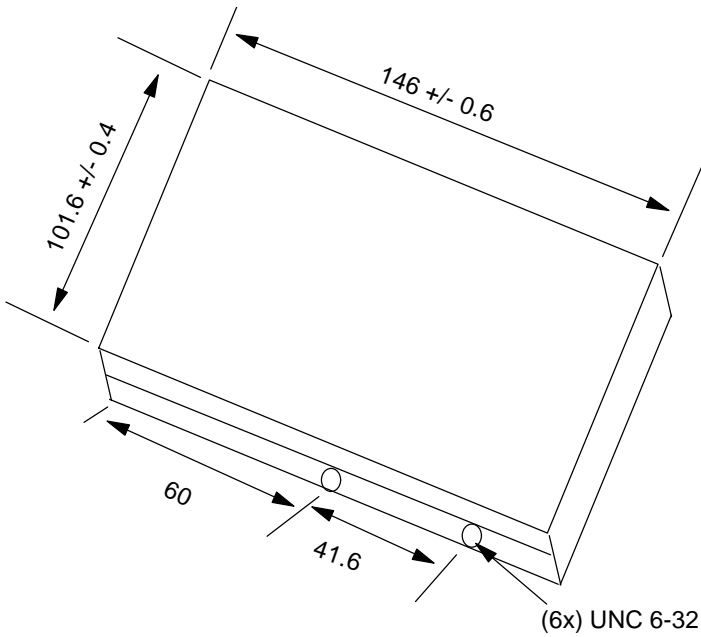
Width 101.6 +/-0.4mm

Depth 146.0 +/-0.6mm

Weight 530 g maximum

Mounting Orientation

The Drive can be mounted in any axis (6 directions).

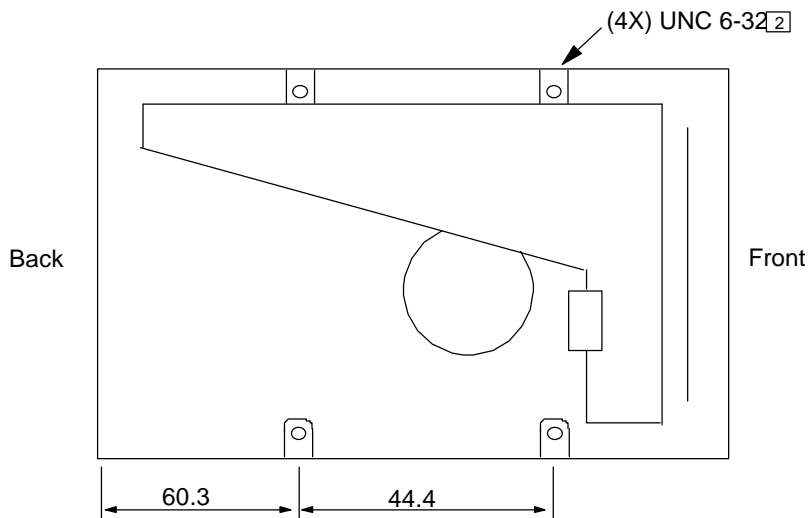


The maximum allowable penetration of the mounting screws is 1.35 mm to 2.6 mm.

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).

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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.

