

Quantum®

DLT VS80

# Tape Drive Product Specification



**DLT**  
TAPE

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It is the responsibility of the user to carefully read and understand the User Manual statements for Class A Equipment and Class B Equipment that appear on [“User Manual Statements for Class A Equipment \(Internal Tape System\)”](#) on page iii and [“User Manual Notices for Class B Equipment”](#) on page iv, respectively.

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## Revision History

All revisions made to this document are listed below in chronological order.

Document Release	Date	Summary of Changes
001597-01 Rev. 01	Nov. 10, 2000	Preliminary Release
001597-01 Rev. 02	Jan. 11, 2001	Add mounting orientation, airflow requirements, and load/unload specification.
001597-01 Rev. 03	Jan. 16, 2001	Added Non-Op Shock Bench Handling and Operating Half Sine Wave Pulse Shock testing specification
001597-01 Rev. 04	Feb. 2, 2001	Updated LED Sequence
001597-01 Rev. 05	Feb. 12, 2001	Added DC Magnetic Field, External Dimension and Power, and Regulatory Notices
001597-01 Rev. 06	Feb 15, 2001	Updated DOC Label
001597-01 Rev. 07	April 5, 2001	Updated Logo and product name. Updated Section 9.0 per DVT.
001597-01 Rev. 08	May 4, 2001	Updated power per DVT. Misc. edits.
001597-01 Rev. A09	May 17, 2004	Converted to FrameMaker, using Quantum template and Style Guide.

## User Manual Statements for Class A Equipment (Internal Tape System)

### CE Notice (European Union)

Marking by the symbol **CE** indicates compliance of this tape drive to the EMC Directive (89/336/EEC), and Low Voltage Directive (73/23/EEC) of the European Union. Compliance with these directives implies conformity to the following European Norms (the equivalent international standards and regulations are in parentheses):

- EN 60950/A11: 1997/(IEC 60950/A4: 1996), Safety of Information Technology Equipment including Electrical Business Equipment
- EN 55024: 1998 (IEC 1000-4-2, 1000-4-3, 1000-4-4, 1000-4-5, 1000-4-6, 1000-4-8, 1000-4-11), Information technology equipment – Immunity characteristics – Limits and methods of measurement

- 
- Part 2 - Electrostatic Discharge (ESD) Requirements
  - Part 3 - Radiated Electromagnetic Field Requirements
  - Part 4 - Electrical Fast Transient/Burst (EFT) Requirements
  - Part 5 - Surge Requirements
  - Part 6 - Conducted disturbances, induced by radio-frequency fields Requirements
  - Part 8 - Power frequency magnetic field Requirements
  - Part 11 – Voltage dips, short interruptions and voltage variations Requirements
  - EN 55022:1998/(CISPR 22:1997), Class B, Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment.

**The following standards apply only to the Desktop drive:**

- EN 61000-3-2: 1995, Limits for harmonic current emissions (equipment input) current up to and including 16 A per phase
- EN 61000-3-3: 1995, Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to and including 16A.

### **FCC Notices (U.S. Only)**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## **User Manual Notices for Class B Equipment**

### **FCC Notices (U.S. Only)**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more, of the following measures:

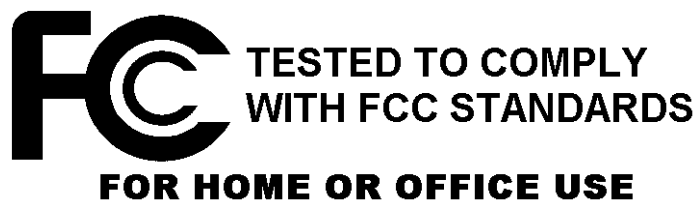
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio /TV technician for help.

---

The user may find the following booklet prepared by the Federal Communications Commission helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington D.C., 20402. Stock No. 004-00398-5

All external I/O cables connecting to this unit need to be shielded. See the User Manual or installation instructions for more options.

**CAUTION** Any changes or modifications made to this equipment may void the user's authority to operate this equipment.



FCC DOC Label

#### IC Notice (Canada)

This Class [B] digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [B] est conforme à la norme NMB-003 du Canada.

#### VCCI Notice (Japan)

Class B ITE

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをして下さい。

Translation:

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

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**VCCI Class B ITE Regulatory Mark**





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# CHAPTER 1

## Introduction

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This chapter describes the purpose, scope, and audience of this manual. It also lists related documentation.

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## 1.1 Purpose and Scope

This document describes the DLT VS80 tape drive, listing its physical and functional characteristics and presenting the standards the tape drive meets. The book consists of the following chapters:

**Table 1-1.** Chapters in this Document

Chapter	Description
Chapter 1, "Introduction"	Describes the document's purpose, scope, and audience. This chapter also lists related documents.
Chapter 2, "Physical Specification"	Describes the physical characteristics of the tape drive, including size, electrical requirements, interface, mean time before failure (MTBF), and mounting hole locations.
Chapter 3, "Functional Specifications"	Describes the functional specifications for this tape drive. Also describes front bezel light emitting diodes (LEDs) and their functions.
Chapter 4, "Performance Specifications"	Describes performance specifications, including tape speed and time to perform rewind, access, load, and unload operations.
Chapter 5, "Environmental Specifications"	Describes environmental specifications: Temperature and humidity, and altitude.
Chapter 6, "Shock and Vibration Specifications"	Describes specifications for operating shock and vibration and non-operating shock and vibration.
Chapter 7, "Electromagnetic Compatibility"	Describes the electromagnetic compatibility specifications the tape drive meets.

**Table 1-1.** Chapters in this Document (*Continued*)

Chapter	Description
<a href="#">Chapter 8, "Safety Specifications"</a>	Describes the safety specifications the tape drive meets.
<a href="#">Chapter 9, "Acoustic Noise Emissions"</a>	Describes the acoustic noise emission levels and the specifications they meet.
<a href="#">Chapter 10, "Reliability Factors"</a>	Describes factors related to the reliability of the tape drive: head life, mean time between failures (MTBF), load unload cycles, and tape life.
<a href="#">Chapter 11, "DLTape IV Recording Media Specifications"</a>	Describes the characteristics of the recording media.

This document does not include installation and operation information.

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## 1.2 Audience

The primary audience for this document consists of engineers and technicians interested in integrating the DLT VS80 tape drive into computer systems and other equipment.

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## 1.3 Related Documents

*DLT VS80 Tape Drive Installation and Operations Guide* (001596-01, Rev. A07)

*DLT1/VS80 SCSI Interface Guide*, (000825-03, Rev A02)



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## 1.4 Conventions Used In This Manual

This manual uses the following conventions:

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**NOTE:** *Notes* provide supplemental information.

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**TECH TIP:** *Tech Tips* provide information that helps you complete a procedure or avoid additional steps.

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**CAUTION** *Cautions* provide information you must know to avoid damaging the tape drive or losing data.

**WARNING!** *Warnings* provide information you must know to avoid personal injury.

# Notes



# Physical Specification

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This chapter presents the physical characteristics of the DLT VS80 subsystem: internal and external size, electrical requirements, communication interface, and mean time between failures (MTBF). This chapter also shows mounting hole locations on the internal unit, giving dimensions from both a bottom and a side view

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## 2.1 Physical Specification

This section describes the tape drive size, electrical requirements, communication interface, and MTBF. [Table 2-1](#) lists the size, weight, and orientation of internal and external units.

**Table 2-1.** Physical Specifications

Unit	Parameter	Value
<b>Internal</b>		
	Height	43.82 mm (1.725 in.) with bezel 41.70 mm (1.625 in.) without bezel
	Width	146.05 mm (5.750 in.) behind bezel 148.18 mm (5.834 in.) with bezel
	Length	216.14 mm (8.509 in.) measured from back of front bezel 220.96 mm (8.699 in.) including the bezel
	Weight	1.45 kg (3.2 lbs)
	Shipping weight	2.08 kg (4.59 lbs) depending on configuration
	Orientation	Horizontal, Vertical (2-sides)
<b>External</b>		
	Height	66.24 mm (2.608 in.)
	Width	212.13 mm (8.352 in.)

**Table 2-1.** Physical Specifications (*Continued*)

Unit	Parameter	Value
	Length	272.49 mm (10.728 in.)
	Weight	3.48 kg (7.67 lbs)
	Shipping weight	5.21 kg (11.48 lbs) depending on configuration
	Orientation	Horizontal

Table 2-2 lists each tape drive unit's electrical requirements and power consumption.

**Table 2-2.** Electrical Requirements and Power Consumption

Unit	Parameter	Value
<b>Internal</b>		
	+5 ( $\pm 5\%$ ) <sup>1</sup> Volt bus	1.6 A Typical <sup>2</sup> , 1.9 A Peak
	+12 ( $\pm 5\%$ ) <sup>1</sup> Volt bus	0.65 A Typical <sup>2</sup> , 3.5 A Peak
	Power Consumption	Less than 16W
<b>External</b>		
	Power Requirements	100-240V (auto-ranging), 50/60 Hz, 0.9 A
	Power Consumption	Less than 35W

<sup>1</sup> Voltage measured at the power bus connector pins.

<sup>2</sup> Maximum current values are for approximately 300ms durations.

Table 2-3 shows the communication interface and MTBF for the DLT VS80 tape drive.

**Table 2-3.** Communication Interface and MTBF

Parameter	Value
Communication Interface	Wide Ultra SCSI-2, Low-Voltage Differential (LVD)
MTBF	200,000 hours at 100% Duty Cycle

## 2.2 Tape Drive Dimensions and Mounting Hole Locations

The internal tape drive provides standard mounting holes. The following sections present the tape drive dimensions and mounting hole locations.

### 2.2.1 Mounting Holes (Bottom View)

Figure 4-1 shows the mounting holes and dimensions as viewed from the bottom of the tape drive.

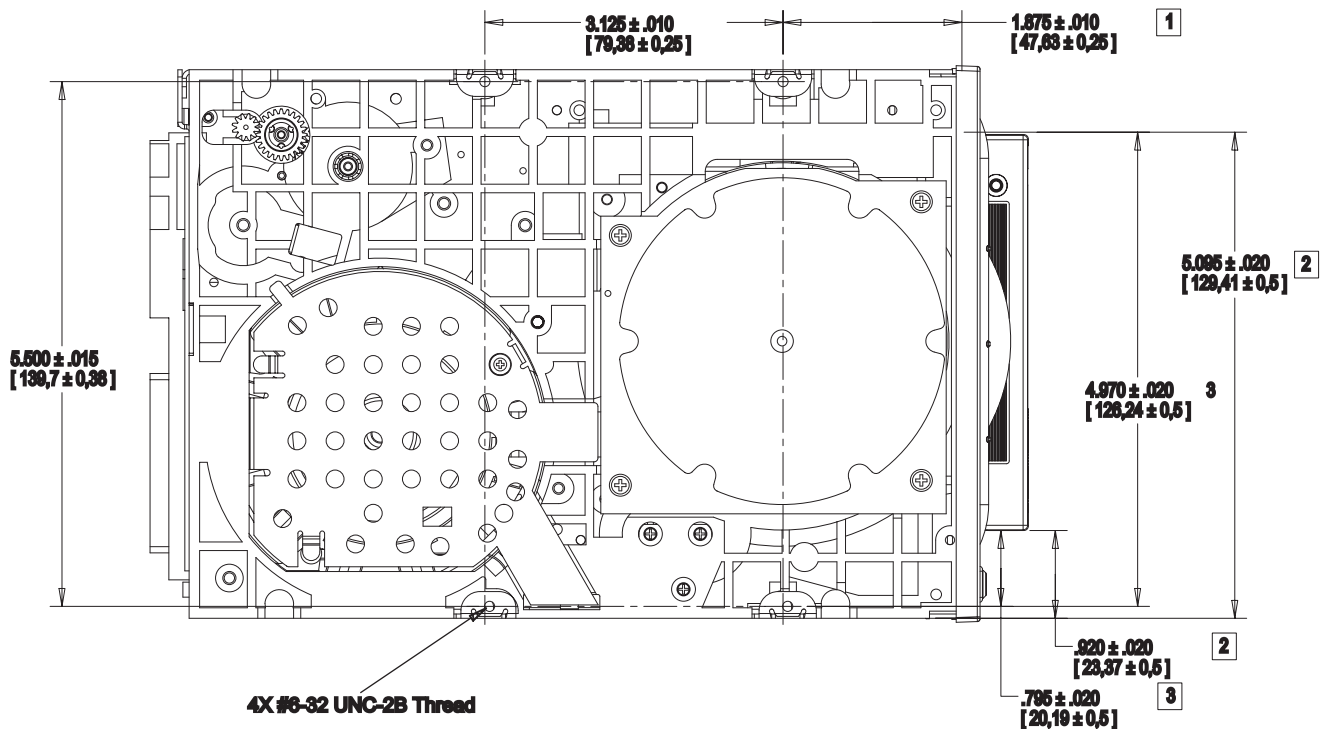
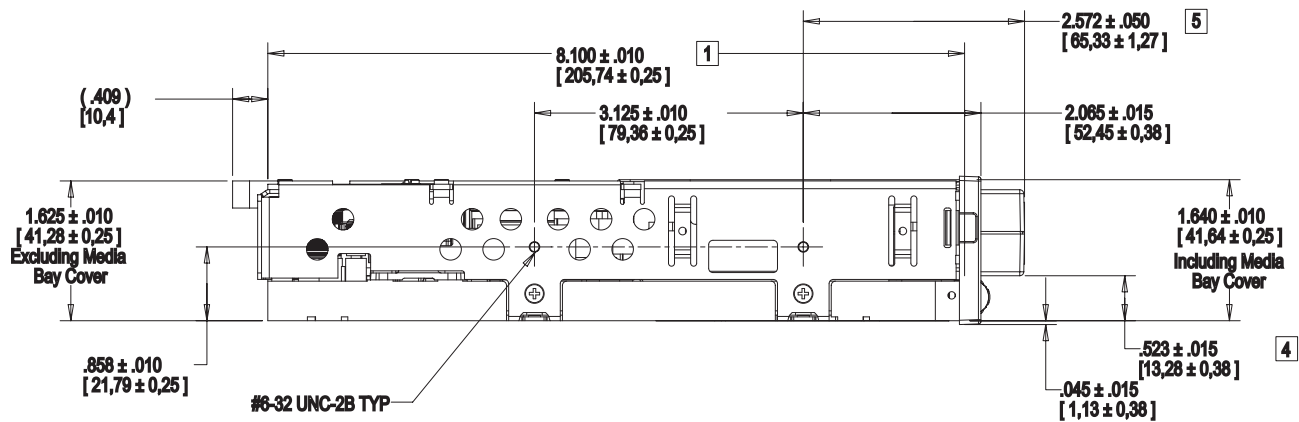


Figure 2-1. Mounting Holes and Dimensions (Bottom View)

- 
- NOTES:**
- 1 Tape drive width and length are standard 5¼-inch form factor measurements.
  - 2 Dimensions are identical on the left and right sides.
  - 3 Length dimensions are from the front of the base plate.
- 

## 2.2.2 Mounting Holes (Side View)

Figure 4-1 shows the mounting holes and dimensions as viewed from the side of the tape drive.



**Figure 2-2.** Mounting Holes and Dimensions (Side View)

- 
- NOTES:**
- 1 Tape drive width and length are standard 5¼-inch form factor measurements.
  - 2 Dimensions are identical on the left and right sides.
  - 3 Length dimensions are from the front of the base plate.
-



# Functional Specifications

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This chapter describes the functional specifications for this tape drive. It also lists the light emitting diodes (LEDs) on the tape drive front bezel, describes each LED state (on, off, blinking, and so forth), and describes what each state indicates to you.

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## 3.1 Functions

Table 3-1 lists the key functional specifications of the DLT VS80.

**Table 3-1.** Functional Specifications

Specification	Value
<b>DLTtape IV Data Cartridge Formatted Capacity</b>	
Native Mode	40 GB of user data
Compressed Mode <sup>1</sup>	80 GB of user data
<b>Interface</b>	16-bit Wide Ultra SCSI-2, Low-Voltage Differential (LVD)
<b>Drive Type</b>	DLT, streaming, 40 / 80 GB; 16-bit Low-Voltage Differential (LVD)
<b>Recording Type</b>	RLL (1,7) code
<b>Form Factor</b>	5¼-inch half-height

**Table 3-1.** Functional Specifications (*Continued*)

Specification	Value
<b>Transfer Rate</b>	
Native	3.0 MB/s
Compressed <sup>1</sup>	Up to 6.0 MB/s
Burst	16 MB/s
<b>Error Rate (Unrecoverable)</b>	1 in 10 <sup>17</sup> bits (non-media error, clean drive)

<sup>1</sup> Compressed values use a nominal 2:1 compression ratio. Actual compression is data-dependent.

## 3.2 LEDs

The DLT VS80 has 3 LEDs with the following functions:

**Table 3-2.** LED States and Functions

LED	State	Description
<b>Drive Error LED (amber)</b>		
	Blinking	An unrecoverable hard drive error or a POST error occurred - call Technical Support
	Off	No drive errors
<b>Ready LED (green)</b>		
	On	Power to the drive
	Off	No power to the drive
	Blinking (constant period & duty cycle)	Tape is in motion
	Blinking (dual period & duty cycle)	Reserved



**Table 3-2.** LED States and Functions (*Continued*)

LED	State	Description
<b>Clean/Media LED (amber)</b>		
	Blinking	A hard read/write error has occurred that is probably recoverable. Clean the drive. LED is off after completing a cleaning cycle with a DTL1 cleaning cartridge or after loading a properly formatted data cartridge. Cycling power to the drive also turns off the LED.
	Off	Cleaning is not required
<b>All three LEDs</b>		
	On	POST is starting
	Blinking	Firmware upgrade is in progress (Note that the LED sequence during an upgrade must be the same whether the upgrade is done via SCSI or via tape.)
<b>Power LED (green – External Drive Only)</b>		
	On	The drive is on
	Off	The drive is off

# Notes



# Performance Specifications

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This chapter describes performance specifications, including tape speed and time to perform rewind, access, load, and unload operations.

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## 4.1 Timing Characteristics

[Table 4-1](#) lists speed and timing characteristics of the DLT VS80.

**Table 4-1.** Tape Speed and Timing Characteristics

Specification	Value
Read/Write Tape Speed	130 in./s
Rewind Tape Speed	160 in./s
Linear Search Tape Speed	160 in./s
Average Rewind Time	68 s
Maximum Rewind Time	135 s
Average Access Time (from BOT)	68 s
Maximum Access Time (from BOT)	135 s
Load to BOT (Previously Recorded Tape)	66 s
Unload from BOT	22 s

# Notes



# Environmental Specifications

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This section describes environmental specifications:

- Temperature and Humidity
- Altitude.

The DLT VS80 tape drive conforms to an environment that includes general offices and workspaces with the following conditions:

- Conditioned and marginally-conditioned areas with central or remote air-conditioning
- Complete temperature and humidity controls
- Moderate control tolerances
- Systems capable of maintaining comfort levels (for example, typical offices and general work areas).

The tape drive does not conform to environments that consist of these conditions:

- Marginal heating or cooling apparatus
- No humidity conditioning
- Uncontrolled tolerances
- Systems inadequate to maintain constant comfort levels (for example, marginal offices and work spaces).

## 5.1 Temperature and Humidity

Table 5-1 lists the operating temperature and humidity ranges.

**Table 5-1.** Operating Temperature and Humidity Ranges

Specification	Value
Temperature Range	10 to 40 °C (50 to 104 °F)
Airflow	> 2.0 CFM
Wet Bulb Temperature	25 °C (77 °F)
Temperature Gradient	11 °C/h (51.8 °F) across range
Temperature Shock	10 °C (50 °F) over 2 minutes
Relative Humidity	20% to 80% non-condensing
Humidity Gradient	10% /h

Table 5-2 lists the temperature and humidity ranges for storing and shipping the tape drive.

**Table 5-2.** Storage/Shipment Ranges (Unpacked or Packed)

Specification	Value
Dry Bulb Temperature	-40 to 66 °C
Wet Bulb Temperature	46 °C
Temperature Gradient	20 °C/h with 5 degree margin (across the range)
Temperature Shock	15 °C with 5 degree margin (over 2 minutes)
Relative Humidity	10% to 95% Non-condensing
Humidity Gradient	10% /h

If you have stored or shipped the tape drive at a temperature, humidity, or both outside normal operating range, allow it to acclimate to operating temperature and humidity ranges before using it.

## 5.2 Altitude

The DLT VS80 drive operates in normal pressures from -500 to 30,000 feet.



# Shock and Vibration Specifications

This chapter describes operating and non-operating shock and vibration specifications.

## 6.1 Operating Shock and Vibration

Table 6-1 lists operating vibration specifications, and Table 6-2 on page 6-2 lists operating shock specifications for the DLT VS80 tape drive.

**Table 6-1.** Operating Vibration Specifications

Vibration Type	Sine	Sweep
<b>Operating</b>		
Frequency Range	5 to 500 to 5 Hz	Upward and downward sweep
Acceleration Level	0.25 G <sup>1</sup>	22 to 500 Hz
	0.01 in. DA <sup>2</sup>	5 to 22 Hz (crossover at 22 Hz)
Application	X, Y, and Z axis	Rate: 1 octave/min
<b>Overstress</b>		
Frequency Range	10 to 500 to 10 Hz	Upward and downward sweep
Acceleration Level	0.50 G	26.1 to 500 Hz
	0.010 DA	10 to 26.1 Hz (crossover)
Application	Vertical axis (top/bottom)	Rate: 1 octave/min

<sup>1</sup> G = Gravitational Constant

<sup>2</sup> DA = Double Amplitude

**Table 6-2.** Operating Shock Specifications

Parameter	Value
Pulse Shape	½ Sine Pulse
Peak Acceleration	10 G
Duration	10 ms
Application	X, Y, and Z axis, 1 in each axis/direction, 6 total
Pulse Shape	½ Sine Pulse
Peak Acceleration	5 G
Duration	11 ms
Application	X, Y, and Z axes, 10 each axis, 10 each polarity, 35 seconds between each shock, 60 shocks total

## 6.2 Non-Operating Shock and Vibration

Table 6-3, Table 6-4, and Table 6-5 list non-operating vibration and non-operating shock specifications for the DLT VS80 tape drive *inside* its shipping package.

**Table 6-3.** Non-Operating Vibration Specifications (Packaged Tape Drive)

Parameter	Value
Vibration Type	Random vibration
Frequency Range	5 to 300 Hz, vertical (z) 5 to 200 Hz horizontal (X and Y)
Vibration Levels	1.0 G <sub>RMS</sub> in X, Y, and Z axes



**Table 6-4.** Non-Operating Repetitive Shock Specification (Packaged Tape Drive)

Parameter	Value
Excitation Type	Synchronous vertical motion; 1-inch excursion
Shock (Bounce) Cycles	14,200 Total
Application	Half cycles each in X and Y orientations; 7,100 cycles in the Y orientation, 7,100 cycles in the Y orientation

**Table 6-5.** Non-Operating Shock (Drop) Specifications (Packaged Tape Drive)

Parameter	Value
Test Type	Drop Shock
Drop Height	30 in. – items < 20.9 lbs 24 in. – 21 < items < 40.9 lbs 18 in. – 41 items < 60.9 lbs 12 in. – 61 < items < 100 lbs
Application	10 drops total; 1 each side, 3 edges, 1 corner

[Table 6-6](#), [Table 6-7](#) on page 6-4, and [Table 6-8](#) on page 6-4 list non-operating vibration and non-operating shock specifications for the DLT VS80 tape drive outside its shipping package.

**Table 6-6.** Non-Operating Shock “Overstress” (Bench Handling) Specifications (Unpackaged Tape Drive)

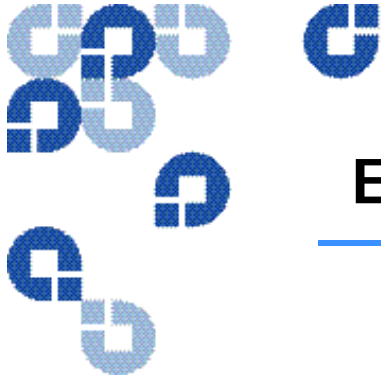
Parameter	Value
Test Type	Bench handling; pivot drop
Description	Pivot edge to a height of 4” above table and release
Application	Four shocks total; once each edge

**Table 6-7.** Non-Operating Vibration Specifications (Unpackaged Tape Drive)

Parameter	Sine Value	Sweep Value
Vibration Type	Sine	Sweep
Frequency Range	10 to 500 to 10 Hz	Upward and downward sweep
Acceleration Level	1 G	10 to 500 to 10 Hz
Application	X, Y, and Z axes	Rate: ½ octave per axes minute
Vibration Type	Random	Sweep
Frequency Range	5 to 500 Hz	Upward and downward sweep
Acceleration Level	2 G	
PSD Envelope		0.008 G <sup>2</sup> /Hz
Application	X, Y, and Z axes	X, Y, and Z axes, twice in each axis (once in each direction)

**Table 6-8.** Non-Operating Shock Specifications (Unpackaged Tape Drive)

Parameter	Value
Pulse Shape	½ sine wave
Peak Acceleration	40 G (180 in./s velocity change)
Duration	10 ms
Application	X, Y, and Z axes, twice in each axis (once in each direction)
Pulse Shape	½ sine pulse
Peak Acceleration	140 G
Duration	2 ms
Application	X, Y, and Z axes, twice in each axis (once in each direction)



# Electromagnetic Compatibility

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This chapter describes electromagnetic compatibility (EMC) specifications, including the following topics:

- Emissions
  - ▶ Radiated Emissions
  - ▶ Conducted Emissions
  - ▶ Harmonic Current Emissions < 16 A
- Immunities
  - ▶ Electrostatic Discharge Immunity
  - ▶ Radiated, Radio – Frequency, Electromagnetic Field Immunity
  - ▶ Electrical Fast Transient/Burst Immunity
  - ▶ Surge Immunity
  - ▶ Immunity to Conducted Disturbances, Induced by RF Fields
  - ▶ Power Frequency Magnetic Field immunity
  - ▶ Voltage Dips, Short Interruptions and Variations Immunity
- Voltage Fluctuations and Flicker < 16 A
- DC Magnetic Field Interference.

---

## 7.1 Emissions

The DLT VS80 tape drive meets or exceeds the electromagnetic emissions requirements in the following specifications:

- FCC Part 15 Class B (ANSI C63.4: 1992, CISPR22: 1997)
- EMC Directive (89/336/EEC)
- EN55022: 1998, Class B
- CISPR 22: 1997, Class B
- VCCI Class B
- CNS 13438
- AS/NZS 3548
- ICES - 0003.

## 7.1.1 Radiated Emissions

Class B equipment must meet limits of radiated interference field strength, in the frequency range from 30 MHz to 1000 MHz at a test distance of 10 meters. [Table 7-1](#) lists the CISPR 22: 1997 radiated emission limits.

**Table 7-1.** Radiated Emissions, 30 MHz to 1,000 MHz

Frequency Range (MHz)	Quasi-Peak limit dB ( $\mu\text{V/m}$ ) @ 10 m
30 to 230	30
230 to 1,000	37

**NOTE:** The product meets the Class B limit and has at least a 6 dB margin.

## 7.1.2 Conducted Emissions

Class B equipment must meet conducted emission limits in the frequency range of 0.15 to 30 MHz. The limit decreases in a linear manner with the logarithm of the frequency in the range of 0.15 to 0.50 MHz. [Table 7-2](#) lists the CISPR 22: 1997 conducted emission limits.

**Table 7-2.** Conducted Emissions

Frequency Range	Limits dB	
	Quasi-Peak	Average
0.15 to 0.050	66 to 56 <sup>1</sup>	56 to 46 <sup>1</sup>
0.50 to 5	56	46
5 to 30	60	50

<sup>1</sup> The limit decreases with the logarithm of the frequency.

**NOTE:** The product meets the Class B limit and has at least a 6 dB margin.

## 7.2 Harmonic Current Emissions < 16A

The DLT VS80 tape drive meets or exceeds the harmonic current emissions requirements in EN 61000-3-2: 1995. [Table 7-3](#) lists the EN 61000-3-2:1995 fluctuating harmonics limits for harmonic current emissions (equipment input) current up to and including 16A per phase.

**Table 7-3.** Fluctuating Harmonics

Harmonic Order (n)	Harmonic Ratio
3	0.9%
5	0.4%
7	0.3%
9	0.2%
2 to 10	0.2%
11 to 40	0.1%

[Table 7-4](#) lists the EN 61000-3-2:1995 low frequency harmonic emissions limits for Class D equipment.

**Table 7-4.** Harmonic Emissions Class D Equipment

Harmonic Order (n)	Maximum Permissible Harmonic Current per Watt (mA/W)	Maximum Permissible Harmonic Current (A)
2	3.4	2.3
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
13	0.35	0.33
$11 \leq n \leq 39$ (odd harmonics only)	$3.85/n$	$0.15 \times 15/n$

## 7.3 Immunities

The DLT VS80 tape drive meets or exceeds the electromagnetic immunity limits required in the following specifications:

- EMC Directive (89/336/EEC)
- EN55024: 1998 Information Technology Equipment - Immunity
- CISPR 24: 1997 Information Technology Equipment - Immunity.

### 7.3.1 ESD Immunity

Table 7-5 lists the EN 61000-4-2:1995 ESD immunity limits for operator access areas.

**Table 7-5.** ESD Immunity Limits

Parameter	Performance Criteria
Contact discharge + 4 kV	No operator intervention
Air discharge + 8 kV	(soft recoverable errors allowed)

**NOTE:** The product meets Quantum reliability levels (air discharge to 10 kV, with 15 kV desired).

### 7.3.2 Radiated Immunity

Table 7-6 lists the EN 61000-4-3:1995 radiated immunity limits.

**Table 7-6.** Radiated Immunity 80 to 1000 MHz

Parameter	Performance Criteria
80 – 1000 MHz, 1 kHz (80% AM)	No errors allowed
900 MHz, 200 Hz, 3 V/m	

### 7.3.3 Fast Transient Immunity

Table 7-7 lists the EN 61000-4-4:1995 fast transient immunity limits.

**Table 7-7.** Fast Transient Immunity

Parameter	Performance Criteria
AC Mains $\pm 1$ kV Signal Port ( $L \geq 3$ m) $\pm 500$ V	No operator intervention (soft recoverable errors allowed)

### 7.3.4 Surge Immunity

Table 7-8 lists the EN 61000-4-5:1995 surge immunity limits.

**Table 7-8.** Surge Immunity

Parameter	Performance Criteria
Common/Differential Mode AC Mains + 2 kV/+ 1 kV	No operator intervention (soft recoverable errors allowed)

### 7.3.5 Conducted Immunity

Table 7-9 lists the EN 61000-4-6:1996 conducted immunity limits.

**Table 7-9.** Conducted Immunity 0.150 to 80 MHz

Parameter	Performance Criteria
0.150 – 80 MHz, 1 kHz (80% AM), 3V	No errors allowed

### 7.3.6 Power Frequency Magnetic Field Immunity

Table 7-10 lists the EN 61000-4-8:1993 magnetic field immunity limits.

**Table 7-10.** Magnetic Field Immunity

Parameter	Performance Criteria
50 Hz, 1 A/m	No errors allowed

### 7.3.7 Voltage Dips, Short Interruptions and Variations Immunity

Table 7-11 lists the EN 61000-4-11:1994 AC dips, interruptions, and variations immunity limits.

**Table 7-11.** Voltage Dips, Short Interruptions, and Variations Immunity

Parameter	Performance Criteria
95% Vreduction 10 ms/0.5 Periods (Dips)	Soft recoverable errors allowed
30% Vreduction 500 ms/25 Periods (Dips)	Operator intervention allowed
95% Vreduction 5 s/250 Periods (Interr.)	Operator intervention allowed

## 7.4 Voltage Fluctuations and Flicker < 16A

The DLT VS80 tape drive meets or exceed the requirement of EN 61000-3-3: 1995, which describes the limits for voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to and including 16A. Table 7-12 lists the EN 61000-3-3:1995 fluctuations and flickers limits.

**Table 7-12.** Voltage Fluctuations and Flicker

$P_{st}$	$d_c$ (%)	$d_{max}$ (%)	$d(t)$ ms
1.00	3.00	4.00	200

## 7.5 DC Magnetic Field Interference

The DLT VS80 tape drive meets or exceeds the DC magnetic field interference limits required in the following specifications:

- IATA Dangerous Goods Regulations, 30<sup>th</sup> Edition, 1989-01-01
- U.S. CFR 49, paragraph 173.1020, rev. date: 1983-11-01.





# Safety Specifications

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This section describes safety specifications including:

- Safety standards
- CB Scheme.

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## 8.1 Safety

The DLT VS80 tape drive meets or exceeds the safety requirements in the following specifications:

- Low Voltage Directive (73/23/EEC)
- UL1950: 1995 – US Standard: Safety of Information Technology Equipment including Electrical Business Equipment
- CSA C22.2 #950 – Canadian Standard: Safety of Information Technology Equipment including Electrical Business Equipment
- EN 60950/A11: 1997 – European Standard: Safety of Information Technology Equipment including Electrical Business Equipment
- IEC 60950/A4: 1996 – International Standard: Safety of Information Technology Equipment including Electrical Business Equipment.

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## 8.2 CB Scheme

The DLT VS80 tape drive meets or exceeds the safety requirements in the CB Scheme – The Scheme of the IECEE for Mutual Recognition of Test Certificates for Electrical Equipment.

# Notes



# Acoustic Noise Emissions

This chapter presents the acoustic noise emission levels and the specifications they meet.

## 9.1 Declared Levels

The DLT VS80 tape drive meets or exceeds the acoustic noise emission level requirements in the following specifications:

- DEC STD 102.4
- ISO 9296
- ISO 7779
- EN27779
- ECMA 74 (Clauses 6 and 7).

Table 9-1 lists the acoustic noise emission levels.

**Table 9-1.** Acoustic Noise Emissions, Nominal

Acoustics – Declared values per DEC STD 102.4/ISO 9296/ISO 7779/EN27779/ECMA 74 (CLAUSES 6 & 7)				
Product	Sound Power Level		Sound Pressure Level	
	LwA, B		LpAm, dBA (bystander positions)	
	Idle	Operate	Idle	Operate
DLT VS80	N/A	5.5	N/A	43

**Table 9-1.** Acoustic Noise Emissions, Nominal (*Continued*)

Acoustics – Declared values per DEC STD 102.4/ISO 9296/ISO 7779/EN27779/ECMA 74 (CLAUSES 6 & 7)				
Acoustics – Declared values per ISO 9296 and ISO 7779/EN27779				
Product	Sound Power Level		Sound Pressure Level	
	LwA, B		LpAm, dBA (bystander positions)	
	Idle	Operate	Idle	Operate
DLT VS80	N/A	5.3	N/A	46

**NOTE:** Current values for specific configurations are available from Quantum representatives.



# Reliability Factors

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This chapter presents factors related to the reliability of the tape drive: head life, mean time between failures (MTBF), load/unload cycles, and tape life.

Table 10-1 lists the DLT VS80 reliability parameters and values.

**Table 10-1.** Reliability Factors

Parameter	Value	Comments
Head Life	30,000 tape motion hours	Continuous operation
MTBF	200,000 hours	Quantum does not warrant that predicted MTBF is representative of any particular unit installed for customer use. Actual figures vary from unit to unit. (MTBF is measured at 100% duty cycle, excluding head life.)
Load/Unload	50,000 cycles	Excludes media errors.
Tape Life	1,000,000 passes	

# Notes



# DLTtape IV Recording Media Specifications

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This chapter lists the media characteristics in [Table 11-1](#):

**Table 11-1.** Recording Media Specifications

DLTtape™IV Media Description	Value
Width	0.498 inch metal particle
Length	1828 ft
Data cartridge dimensions	4.16 inch x 4.15 inch x 1.0 inch
Tape Life: Archival Storage	30 years minimum @ 20 °C & 40% RH (non-condensing)
Durability	1,000,000 passes

# Notes





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