



## LTO Technology

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## Datasheet

### Optimized for High Capacity

The Ultrium tape format is the implementation of the LTO (Linear Tape-Open) Ultrium Technology that is optimized for high capacity and performance with exceptional reliability in either a stand-alone or an automated environment. It uses a single reel cartridge to maximize capacity. Ideally suited for backup, restore, and archive applications, the Ultrium tape format establishes a new benchmark for large volume backup and archive. Ultrium technology products will meet the needs of the enterprise through single-server user on a roadmap, or migration path, that extends well into the next decade.



### Benefits:

#### High Capacity

Ultrium technology allows for 800GB capacity native, 1.6TB compressed (2:1) in a single cartridge. The cartridge is smaller than existing single-reel tape cartridges.

#### High Data Rate

Ultrium technology provides for data transfer rates of up to 240 MB/second (2:1 compressed) for Generation 4 products.

#### LTO-CM (Cartridge Memory)

Enhances functionality by providing a redundant file log as well as user-defined information. An external reader allows immediate access to that information without having to insert the cartridge into a drive.

#### LTO Technology

Ultrium format products take advantage of LTO Technology's proven error correction and data compression techniques.

#### Flexibility

By specifying only those features needed for interchange of tape cartridges, the Ultrium format retains flexibility. This flexibility allows for a substantial amount of implementation freedom with respect to performance characteristics, form factor, reliability, controllers, and interfaces - Ultrium tape cartridges remain interchangeable among Ultrium format tape drives.

#### Consistent Servo

The servo format is expected to remain consistent throughout the life of the product line. A major benefit enables manufacturers to leverage investments.

#### Multi-Sourcing

Multiple sources for media and drives reduce production bottlenecks and also ensure investment protection for OEMs and end users alike.

#### Compliance Testing

By an independent organization promotes compliance to the specification. This shortens qualification cycles and simplifies future product planning for OEMs.

### Technical Notes:

Approximate cartridge dimensions: 4.1 x 4.0 x 0.8 in. (105 x 102 x 21 mm) (smaller than most existing single-reel tape cartridges).

The single-hub design allows for the cartridge to be optimally packed with media. High capacity is further enhanced by the use of an LTO Technology data compression algorithm with two controls to maximize compression efficiency.

LTO-CM is a noncontacting passive RF interface embedded in the cartridge which allows remote access of the contents of the built-in 4KB (32 Kbits) of non-volatile memory. Calibration information, manufacturer's data, and information about initialization may be retrieved without having to insert the tape cartridge into a drive.

Dedicated dual servo: The servo bands are pre-written on the tape during the tape cartridge manufacture process. If one servo element becomes defective, or if a portion of the servo code on the tape becomes corrupt, the head will continue to track as a result of the second "redundant" servo system.

Longitudinal position words encoded within the servo frames allow efficient access to absolute position down the length of the tape.

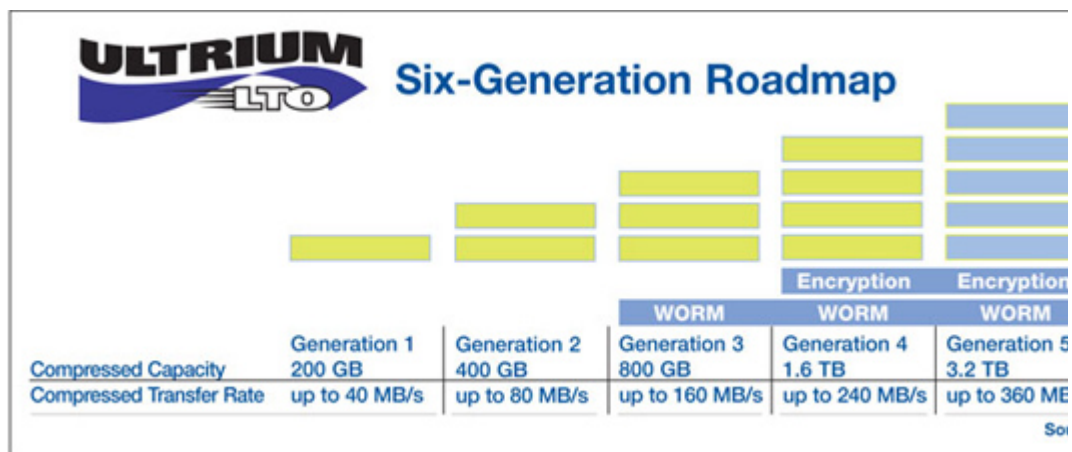
Data integrity features include two levels of error correction that can provide recovery from longitudinal media scratches. Read-While-Write (RWW) capability allows real-time verification of written data.

### Flagship Product Migration Path:

The expandability in the design of the Ultrium product line results from combining and leveraging enabling technologies to produce a technologically solid migration path. This Flagship (8-channel version) Migration Path describes improvements of the premium products in the line from generation to generation.

Hewlett-Packard, IBM and Quantum reserve the right to change the information in this migration path without notice.

For more information on licenses, please contact the LTO Program [via the Licensing Administrator](#).



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