



DEVELOPMENT STANDARD

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MAGNETIC HEAD FOR USE WITH
QIC-3210-MC RECORDING FORMAT

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Introduction

This document defines those parameters standardized on the magnetic tape head utilized in the QIC-3210-MC mini-cartridge tape drive.

This head is a read-while-write elements in serpentine mode.

It is designed for use with a 1850 Oe MC-3210 QW or equivalent cartridges at packing densities up to 75,000 F.T.P.I., with 72 tracks on the tape through physical displacement of the head.

1.0 MECHANICAL REQUIREMENTS

- 1.1. The magnetic head is of read-while-write bi-directional configuration and is to be used on a QW mini-cartridge (8mm wide tape) with 1850 OE magnetic media. No erase gap is used, so the write gap must overwrite previously recorded data.
- 1.2 Physical dimensions and track layout are detailed in Figure 1.
- 1.3 Read effective track width is 0.0020" +0.000 -0.0003"
- 1.4 Write effective track width is 0.0055" \pm 0.00015"
- 1.5 Write gap length (mechanical) is 40 μ " \pm 5 μ "
Metal in Gap write head.
Read gap length is 6 μ " nominal.
- 1.6 Number of tracks is 72
- 1.7 Track pitch of recorded tracks on tape is 0.0042" nominal (reference only).
- 1.8 Centerline to centerline spacing of the channels in the magnetic heads is 0.1207" \pm 0.0006".
- 1.9 Gap centerline offset tolerance is \pm 500 μ " (see Figure 1).
- 1.10 Read gap to write gap spacing is 0.200" \pm 0.002".
- 1.11 Tape speed is 47 inches per second for read and write.
- 1.12 Tape: QWC3210XL

2.0 ELECTRICAL AND MAGNETIC REQUIREMENTS

- 2.1 Maximum recording flux density is 75,000 F.T.P.I.
- 2.2 Recording code is 0, 2, 4, 5 GCR.
- 2.3 Read head output at 47 IPS, QWX3210XL tape, and 75,000 F.T.P.I. is 7.5 μ V P-P per turn minimum.

- 2.4 Write saturation current (I_{sat}) at 75,000 F.T.P.I. is defined as the write current value required to produce the first 95% of the maximum read output. Total I_{sat} variation shall be $\pm 30\%$ of nominal.
- 2.5 Write current (I_W) is set at the value of $1.3 I_{sat} \pm 3\%$ (No equalization used in head testing). Write current rise time shall be 25 nsec. maximum measured from -90% to + 90% point. Overshoot shall be 10% maximum of 0-pk value.
- 2.6 Resolution is determined as:

$$\frac{E_o \text{ at } 75,000 \text{ F.T.P.I.}}{E_o \text{ at } 25,000 \text{ F.T.P.I.}}$$

The minimum resolution shall be 45% without write equalization.

- 2.7 The head shall have a built in preamp. Capacitive load on winding is typical 3pF. Inductance typical 75 μ H.
- 2.8 Magnetic crossfeed is determined by the ration of the read head output without tape movement and the write head energized at 75,000 F.T.P.I. at I_W to the "read-while write" output signal at 75,000. This ratio to be a maximum of 4%.
- 2.9 Magnetic crosstalk is determined by the ration of the read head output while writing with the write head in the same gap line, to the "read-while-write: output signal at 75,000. This ratio to be a maximum of 500%.
- 2.10 Overwrite - When a recorded signal of 25,000 F.T.P.I. written at I_W s overwritten with a signal at 75,000 F.T.P.I. using I_W the remaining 25,000 F.T.P.I. signal shall be 24 dB below the "read-while-write" output level at 25,000 F.T.P.I.
- 2.11 Read gap and write gap azimuth error - Reference datum line in Figure 1 should be less than $6'$ of arc.
- 2.12 Read filter bandpass shall be -0.5dB at 2.0 MHz, Bessel, order 5

3.0 RECORDING

Method of recording

The recording method shall be the Non-Return to Zero Mark (NRZI) method where a one is represented by a change in direction of the longitudinal magnetization.

The recording shall be: $1.3 \times I_{sat} \pm 3\%$

where I_{sat} is the current providing 95% of the maximum output at 75,000 F.T.P.I. when using a Signal Amplitude Reference Tape Cartridge at nominal temperature. The I_{sat} is measured on the non saturated side of the saturation current curve.

Figure 1

