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 ad 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" ± 0.00015"

1.5 Write gap length (mechanical) is 40 μ" +/- 5 μ" Metal in Gap write head.
Read gap length is 6 μ" nominal.

1.6 Number of tracks if 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" ± 0.0006".

1.9 Gap centerline offset tolerance is ± 500 μ" (see Figure 1).

1.10 Read gap to write gap spacing is 0.200" +/- .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 μV P-P per turn minimum.
2.4 Write saturation current (Isat) 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 Isat variation shall be ± 30% of nominal.

2.5 Write current (IW) is set at the value of 1.3 Isat +/- 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:

\[ \text{Eo at 75,000 F.T.P.I.} \]
\[ \text{Eo at 25,000 F.T.P.I.} \]

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 µH.

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 IW 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 IW s overwritten with a signal at 75,000 F.T.P.I. using IW 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: \[ 1.3 \times \text{Isat} \pm 3\% \]

where Isat 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 Isat is measured on the non saturated side of the saturation current curve.
Figure 1

FORWARD TAPE MOTION

0.200 ± 0.0002"

0 ± 500μ"

0.1207 ± 0.0006 μ"

DATUM

0.45"