



DEVELOPMENT STANDARD

QIC-181
Revision A
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MAGNETIC HEAD FOR USE WITH
QIC-5210-DC RECORDING FORMAT

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(See important notices on the following page)

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1.0 GENERAL SPECIFICATIONS

1.1 Type of Head

This specification defines a multi-bump, multi-channel read while-writing with optional erase, thin film/magneto-resistive head for _” data cartridge. Heads according to this specification also fulfill the requirements of QIC-5010-DC format.

It features one configuration:

- RWR (read write read) which has 3 bumps and 2 outriggers or 3 bumps, 1 outrigger and 1 erase.

Each bump has 4 channels. Three of the 4 channels are for data and servo tracks per the 16GB and 25 GB drive formats (144 data tracks and 24 servo tracks). The fourth channel is for backward write and read compatibility per the following QIC drive formats:

	16GB
Write & Read	QIC-5020 QIC 2GB QIC 4GB QIC-1000 QIC-525
Read Only	QIC-150 QIC-120

1.2 Write Head Structure – Thin-film inductive elements.

1.3 Read Head Structure – Thin-film shielded magneto-resistive elements.

2.0 ELECTRICAL SPECIFICATIONS

2.1 Tape I/D and Speed Tension Matrix

- **16 GB Data Cartridge Drive**

Tape I/D = DC 16 GBC (1500' length)

Speed (IPS)	Tension (oz)
60	0.5 – 3.5
120	0.5 – 3.5

- **25 GB Data Cartridge Drive**

Tape I/D = DC 25GB

Speed (IPS)	Tension (oz)
52.5	0.5 – 3.5
80	0.5 – 3.5
105	0.5 – 3.5

2.2. Dynamic Performance, Unequalized – Write Head (reference square wave recording)

		5 Bump RWR
2.2.1.	Saturation current, I_{sat} (0 to peak 95% point) (ma)	45
2.2.2.	Maximum current, I_{max} $I_{max} = 1.15 \times I_{sat}$ (ma)	51.75
2.2.3.	Overwrite of 19.05 kfc _i (750 fc _{mm}) by a 76.2 kfc _i (3,000 fc _{mm}) signal (residual 19.05 kfc _i /19.05 output at I_w . I_w defined as $1.15 \times 95\% I_{sat}$. (dB)	-24 max.
2.2.4.	Channel-to-channel spread of I_{sat} (per gap line) (%)	± 5

2.3. Dynamic Performance, Unequalized – Read Head (reference square wave recording)

		5 Bump RWR
2.3.1.	Output at 76,200 FCI @ I_w (μV)	700
2.3.2.	Sense Current (ma)	10
2.3.3.	Channel-to channel spread per gap line (%)	± 5

2.3.4. Resolution for 76,200/19,050 @lw	(%)	40 ± 10
2.3.5. 2 nd Harmonic distortion @ _ f	(dB)	-15 max.
2.3.6 Crossfeed @ 4.0 Mhz for any combination of 2 channels writing and one channel reading.	(dB)	-28 max.
2.3.7. Self erasure (demagnetization at 5 th forward pass)	(%)	10 max.
2.3.8. Stray field susceptibility. This defines the maximum allowable applied magnetic field while the head is in operation.	(Oe)	5

3.0 MECHANICAL SPECIFICATIONS

3.1 Dimensions

3.1.1 Gaps (Mechanical) Reference		5 Bump RWR
3.1.1.1 Read shield spacing	(μm) (μ'')	0.4 ± 0.04 (16 ref.)
3.1.1.2 Write	(μm) (μ'')	1.6 ± 0.1 (63 ref.)
3.1.2 Physical Element Width, Reference		
3.1.2.1 QIC-16GB/25GB Read (6 places)	(μm) (mils)	19 ± 1 (0.75 ref.)
3.1.2.2 Downward Compatible Read (2 places)	(μm) (mils)	76.2 ± 3.8 (3.0 ref.)
3.1.2.3 QIC-16GB/25GB Write (3 places)	(μm) (mils)	30.5 ± 2 (1.2 ref.)
3.1.2.4 Downward Compatible Write (1 place)	(μm) (mils)	177.8 ± 3.8 (7.0 ref.)
3.1.3 Gap-to-Gap (2 places)	(mm) (mils)	1.524 ± 0.075 (60 ref.)
3.1.4. Read Channel to Write Channel – Centerline Mismatch	(μm) (mils)	2.54 (0.1 ref.)

3.1.5. QIC – 16GB/25GB Pitch Ch. 1 to Ch. 2	(μm) (mils)	408 \pm 1 (16.00 ref.)
3.1.6. QIC-16GB/25GB Pitch Ch. 2 to Ch. 3	(μm) (mils)	816 \pm 1 (32.0 ref.)
3.1.7. QIC-16GB/25GB Pitch Ch. 1 to Ch. 3	(μm) (mils)	1224 \pm 1 (48.1 ref.)
3.1.8. Downward Compatible (Ch. 4) Position, Ref. Ch. 2	(μm) (mils)	408 \pm 1 (16 ref.)

3.2 Track and Head Reference Outlines – See figures 1 and 2

4.0 STATIC SPECIFICATIONS

		5 Bump RWR
4.1	Write D.C. resistance (16/25GB) (ohms)	12 ± 5
4.2	Read D.C. resistance (16/25GB) (ohms)	65 ± 15
4.3	Write resistance (downward) (ohms)	14 ± 5
4.4	Read D.C. resistance (downward) (ohms)	120 ± 30
4.5	Insulation resistance (read & write, tested at 1.0 V.D.C) (Mohms)	3 Mohm min.
4.6	Write Impedence (reference dimensions only)	
	16/25GB coils @ 3 MHz (ohms) (nHys)	9.2 290
	16/25GB coils @ 18 MHz (ohms) (nHys)	9.1 275
	Downward coil @ 3 MHz (ohms) (nHys)	10.1 450
	Downward coil @ 18 MHz (ohms) (nHys)	10.5 435
4.7	Write resonant frequency 13/25GB (MHz)	80 min.
4.8	Write resonant frequency (downward) (MHz)	55 min.

5.0 A.C. ERASE HEAD SPECIFICATION

5.1 Mechanical Requirements

- 5.1.1. Erase track width (mm)
(inches)
- 5.1.2. Erase gap length (μm)
($\mu\text{''}$)
- 5.1.3. Erase core material

5 Bump RWR
7.6 min. (0.300)
8.64 (340)
Manganese zinc ferrite

5.2 Electrical Performance

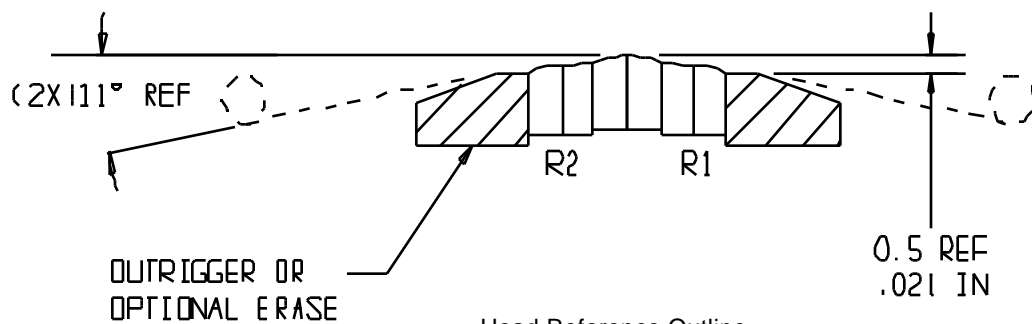
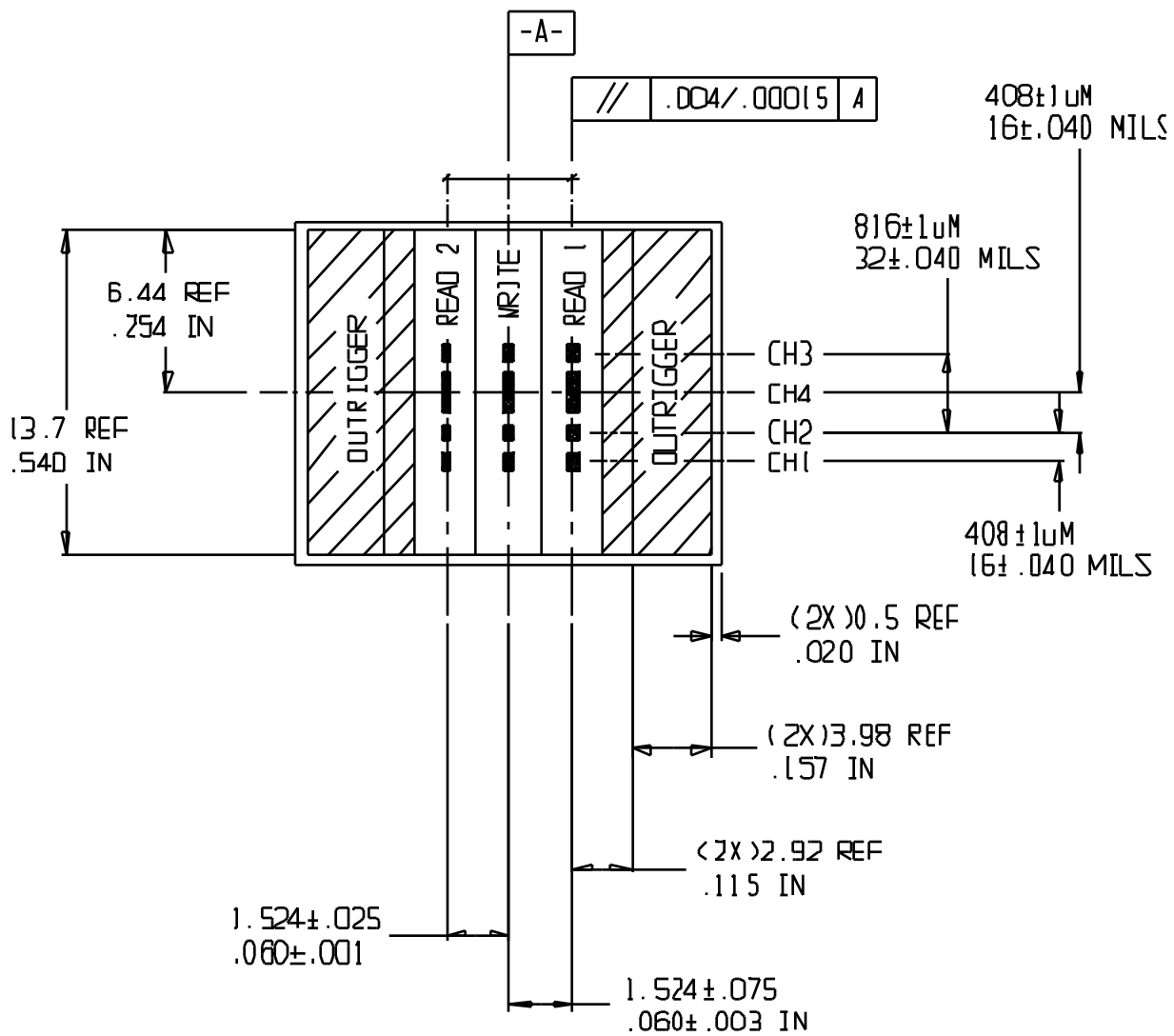
- 5.2.1. Erase mode
- 5.2.2. AC Impedance (ohms)
(1/2 coil @ 9 MHz)
- 5.2.3. Coil Configuration
- 5.2.4. Inductance (μHys)
- 5.2.5. Current (both legs) (mA)
- 5.2.6. Operation frequency (MHz)
- 5.2.7. Erasure (dB)
Residual 12.7 KFCI signal
written at 1w and 120 ips

AC
350
Center tapped
8
150
6.096
-30

6.0 HEAD CLEANING

CAUTION: The use of any head cleaning system, whether employing wet, dry, or scrubbing actions, must be extremely carefully tested and evaluated for efficacy and validated not to cause damage to the tape head structure in ways outlined below, but not limited to those areas described in the following section.

- 6.1** The following solvent(s) may be used to clean the head without:
- (a) causing damage to its structure
 - (b) permitting head fabrication glues and epoxy products to wick to the head to tape interface;
 - (c) causing damage to the media in the event that small amounts do not evaporate immediately;
 - 1. Reagent grade anhydrous isopropyl alcohol
- 6.2** Head cleaning cartridge methods must:
- (a) limit the solvent applied to a quantity sufficient to clean the head without leaving or redepositing debris;
 - (b) not permit solvent to seep into the head surface bond lines and contour airbleed slots; and
 - (c) not contribute to electrostatic discharge problems which damage the head.



Head Reference Outline
 Read Write Read
 Figure 1

ETW Table

Read Write Read
Figure 2

		5 Bump RWR
QIC – 16/25 Read	(μm) (mils)	19.0 ± 1 0.748 ± 0.040
QIC – 16/25 Write	(μm) (mils)	30.5 ± 2 1.20 ± 0.080
QIC-Downward Compatible Read	(μm) (mils)	76.2 ± 3.8 3.00 ± 0.150
QIC-Downward Compatible Write	(μm) (mils)	177.7 ± 3.8 7.00 ± 0.150