Ferroelectric Molecular Optical Storage Nanotechnology

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Abstract
Colossal Storage has invented new ways of non - contact reading and writing with non destructive reading of information to a ferroelectric molecule.

1. Introduction

The Colossal FE Optical Drive density of 40 gigabits/sq.in. up to 500 gigabits/sq.in.[1] A comparison with harddrives of today is around 4 gigabits/sq.in. maxing at ~40 gigabits.[5] With optically assisted drives maxing at ~45 gigabits/sq.in. and contact recording AFM, STM, SPM or SFM, i.e. atomic force microscope and their derivatives, maxing practically out at about ~300 gigabits/sq.in..

2. Mywork

Colossal Storage uses the Einstein/Planck Theory of Energy Quantum Electrons to control molecular properties by an atoms electron movement/displacement. [6]
The Colossal Storage FeDrive - FeHead Semiconductor Integrated Optical Read / Write Head will use Ultraviolet/Blue laser diodes with Voltage transducer to write, and UV/Blue laser diode and Nanooptical transistor or Nanofloating gate Mos Fet to read.

2.1 Ferroelectric Molecular Optical Bits

The peripheral drive uses an ultra-violet or deep blue light source with an applied Electric field orientation transducer for writing. Reading is done by a second deep blue Or ultra-violet light source that is reflected off of the ferroelectric perovskovite molecule Surface to a nanoopto photo diode that is able to detect small changes in the diffraction of the Ultra-violet or deep blue light from the ferroelectric perovskovite molecule.[4]
Writing is done when the output of the ultra-violet or deep blue light source emits photons and ferroelectric molecules absorb the photons energy creating electron movement from the valence orbit to the conduction orbits of the ferroelectric molecule. When the applied field has a positive voltage potential the electrons move towards the transducer and vice versa for a negative potential. When the ultra-violet light source and applied fields are both turned off the ferroelectric molecule stays in the orientated direction and stores the random electric field positive/negative potential, i.e. a molecular or atomic switch, which also causes the ferroelectric molecule to physically elongation or shrink up to 1.5%. The stored electric field difference (voltage) of the ferroelectric molecule is permanently changed until ultra-violet or deep blue laser light and the applied field are turned on again to reorientate the direction of the potential difference. The dipoles electrical polarity of the ferroelectric molecule physically changes the transmiscivity, diffraction, surface morphology/topography, opacity, and reflection characteristics of ultra-violet or deep blue light on the ferroelectric molecule.[2][3]

Extremely small laser spots of 300 angstroms and less can be written and read using integrated optical head structure with densities of 40 gigabits sq.in. to 500 gigabits sq.in. being realized.[8] One method of reading is done with a second much lower Quantum energy ultra-violet or deep blue light source and a photo transistor or diode are used to detect differences in the diffracted photons of the ultra-violet or deep blue laser light being reflected back from the surface of the ferroelectric perovskovite molecule into the photo diode or transistor. Second method of reading is done by a floating gate mosfet transistor that is able to detect small changes in electric lines of force of the ferroelectric molecule. The electrostatic field (electric lines of force) from the ferroelectric molecule is sensed by the read mosfet transistor. The read voltage output is the recorded data in the ferroelectric molecule and is equal to the VCC of the floating mosfet transistor plus or minus the detected electrostatic field strength (electric lines of force) of the ferroelectric molecule. The read mosfet transistor is a source follower that does not destroy the stored electric field/voltage potential difference of the ferroelectric molecule. Third method of reading is done by yet another interesting variable by a second deep blue or ultra-violet light source which cause electrons of the ferroelectric perovskovite molecule dipoles to jump from one orbit to another. Niels Bohr Atom Postulates states, light excited electrons will stay in their higher energy orbits, UV or deep blue light with specific frequency and quantum energy excite the electrons of ferroelectric molecules into higher valence orbits and fall back to the normal lower energy orbits when the UV or deep blue light source is removed.[9] The stored internal dipole position (remnant displacement of central atoms - remnant polarization) further amplifies any higher orbit electron electrical field potential either positive or negative depending on the dipole position in the ferroelectric molecule and the distance from the UV or deep blue integrated read/write head. A mosfet nanotransistor that is able to detect small changes in the electrical field potential of the ferroelectric molecule when ultra-violet or deep blue light source is focused on the ferroelectric perovskovite molecule. Removal of the second UV light source (Quantum energy is characterized lower - not to induce electron movement into the conduction band) leaves the ferroelectric molecule in its initial electrical field stored state. The stored electrical field potential of a ferroelectric molecule can be made to represent at least four electrostatic field states equal to binary information.[10]

2.2 Ferroelectric Molecular Optical Read / Write Head

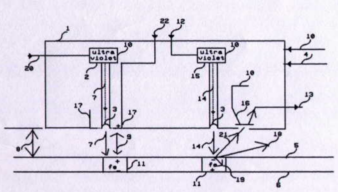

FIGURE 1

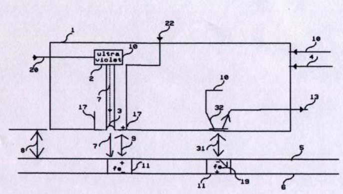

FIGURE 1

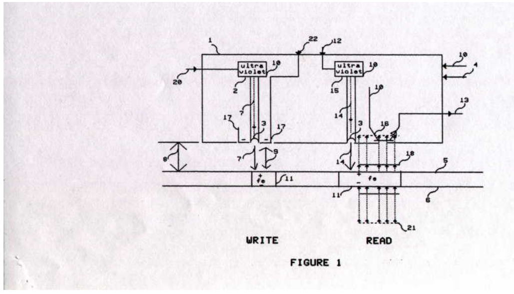

FIGURE 1

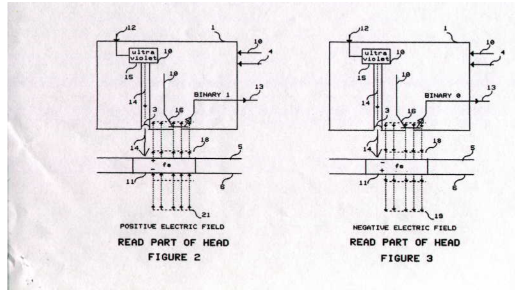

FIGURE 2

FIGURE 3

3. Related Work

Optical disk drives of today use laser light and a wide array of objective, Polarizing, and newly invented solid immersion lens (SIL). Laser light and Photon characteristics have allowed data storage peripherals to store enormous amounts of data. Sometimes the data written could only be written once, on magno-optical drive that data could be rewritten a limited amount of times by raising the temperature of the entire track and thereby causing an erasure of data. The latest means for increasing areal densities is done by a multitude of lens arrays finally feeding into a solid immersion lens (SIL). A focused infrared spot is obtained at the base of the SIL head (Terastor(Quantum)(Imation/3M). (Quinta) (Seagate) (Read-Rite) very small aperture lens (VSAL) method of technology for ferroelectric photon optical storage uses the BRAGG effect and a contact electrode. Quinta, Siros Technology, IBM, and Ioptics place single or multiple layers of recording magnetic media within a fraction of a wavelength distance from the SIL or VSAL head base, and by using a inductive transducer cause the electrons of the ferromagnetic material to take on a (clock wise rotation)-north magnetic polarity or (counter clock wise rotation)-south magnetic polarity. When a infrared photon of the right energy level hits the ferromagnetic electrons it is reflected, whereby the infrared photon takes on a light polarization property, which can be measured, the KERR effect. In contrast, the Thomas Colossal semiconductor integrated optical head is able to produce much smaller spots than infrared-based storage devices. The ferroelectric molecules not only have small size, fast switching speeds, but can store voltage much like a variable voltage battery allowing for bit voltage data compression schemes, increasing densities even further, allowing further advances into holographic storage research. Ferroelectric molecular write activity is influenced by the introduction Of ultra-violet or deep blue laser light, Einstein/Planck Theorem of Energy Quantum. An induced electrical field further alters the ferroelectric molecular Materials properties such as conductivity and electrical properties. Removal of the light source and induced electric field leave the ferroelectric molecule in an altered electrical state potential which is non-volatile. A second much lower Quantum energy ultra-violet or deep blue light source and a photo transistor or diode are used to detect differences in the diffracted photons of the ultra-violet or deep blue laser light being reflected back from the surface of the ferroelectric perovskovite molecule into the photo diode or transistor.

4. Future Work

The applications for the Colossal Read/Write head are still evolving and encompass much more than just data storage and fast random image xerographic replication. Colossal Storage is also working on holographic concepts for future storage peripheral products.[7] The Colossal Storage FE Semiconductor Read/Write head for Ferroelectric Molecular Electrostatic Field Random Reorientation can be used for many more applications than data storage, examples might be, high speed imaging and offset printing, lithography, copiers, and printers. Future integrated circuits could be made and verified that have ferroelectric wiring 1 molecule wide with the ability to polarize the wire for new switching, molecular optical wire, logic state definitions, and I/O Data Transfers states. Ferroelectric interconnects can do it cheaper, with less power, and in much higher densities.

5. Conclusions

The Colossal Storage FE Optical Drive will offer symmetrical infinite double sided disk or tape non-destructive read and writes for the retention of data storage for ten-years or more. The Colossal FE Optical Drive density of 40 gigabits/sq.in. up to 500 gigabits/sq.in. The Colossal Ferroelectric Molecular Optical NanoTechnology Drive will be able to hold more data than any other type of drive and will deliver data much faster.

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