

# Gibraltar™ 4K Formatter

## Hardware Reference Design

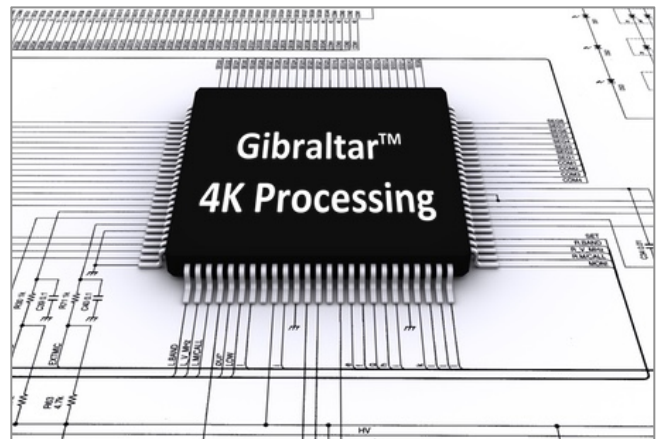
### Description:

The Gibraltar™ 4K Formatter Hardware Reference Design created by Brass Roots Technologies enables high-performance display and imaging with the native 4K DMDs (1.38") from Texas Instruments Incorporated.

Designed for 3-chip DLP® projection systems, the Gibraltar™ 4K Formatter design integrates a high-performance Xilinx FPGA and DDR3 memories to fully leverage Brass Roots Technologies' advanced firmware-based Gibraltar™ Processing architecture, which converts video and graphics input data into high fidelity, floating-point multi-toned PWM bit-planes for the native 4K DMD.

Incredibly high-bandwidth bottleneck-free processing supports sustained throughput at full DMD data rate (57+ Gbps) and enables ultra-HFR display performance up to 360 frames per second at native 4K resolution.

A distinguishing feature of the Gibraltar™ 4K Formatter design is a high-bandwidth, multi-channel SerDes Input Data interface. A wide range of input data formats are flexibly supported with minor firmware reconfiguration of the SerDes receivers.



### Top Features:

- Unlocks full bandwidth potential (57+ Gbps) of the native 4K DMD (1.38")
- Designed for 3-chip 4K DLP® projection systems
- Ultra-HFR: 360 fps at native 4K resolution
- Advanced Gibraltar™ 4K Processing
- Modern Xilinx® FPGA and DDR memories
- High-speed multi-channel SerDes interface



# Gibraltar™ 4K Formatter Hardware Reference Design

## General Specifications

- **High-Bandwidth Input Interface**
  - 12x SerDes Input Data channels (60+ Gbps)
  - 1x SerDes Control channel
  - QSPI Flash Memory Interface
  - I2C Peripheral Interface
- **Xilinx™ Kintex®-7 FPGA (XC7K410T)**
  - Integrated 4K Gibraltar™ Processing supports Pixel Processing Clock rate up to 300 MHz
  - Firmware SerDes receivers reconfigurable to support a wide range of Input Data formats
  - 50% of FPGA resources remain available for User Firmware after Gibraltar™ 4K Processing firmware integration
- **DDR3 SDRAM Memory**
  - 4x 16-bits @ 933 MHz DDR (119.4 Gbps)
- **4K Fusion DMD Interface**
  - 128-bits @ 225 MHz DDR (57.6 Gbps)
- **Flash Memory (FPGA configuration)**
  - 128 Mbit accessed via QSPI
- **Programmable Clock Generator (I2C)**
  - 4x Low-Jitter Output Clocks
- **12V DC Power Input**
  - Integrated voltage regulation for all design components

## Applications

The Gibraltar™ 4K Formatter Hardware Reference Design is the ideal platform for high-performance and specialized 3-chip DLP® projection systems:

- 4K High Frame Rate (Ultra-HFR)
- Ultra-High Definition Resolution (4K+)
- Multi-stage High Dynamic Range (HDR)
- High Brightness direct-view Laser Illumination
- Enhanced Motion Rendition
- Auto-Stereo 3D
- Interactive Environments
- Augmented Reality
- Structured Lighting
- UV Lithography and 3D Printing

## Availability

The Gibraltar™ 4K Formatter Hardware Reference Design is available to OEMs and Product Developers under license that also includes a commercial license to Brass Roots Technologies' advanced Gibraltar™ Processing technology.

Please **Contact Us** for more information.

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