

# High Definition Low Latency Stereo Camera Design Note #103

## Robotic-Assist Surgical Video Electronics



Reliable high definition stereo video imaging electronics makes critical surgical procedures possible.

**ALTERA**

*"For years, We've relied on Orchid Technologies to get the job done."*

*- Engineering Manager*

### High Definition Low Latency Stereo Imaging

High definition low latency stereo imaging requires data rates in excess of 2 gigabits per second. The management of image synchronization, stability, and diagnostics is a daunting task. Altera GX and GT class transceivers provide a unique means by which high speed data may be communicated while maintaining highly stable image synchronization. Image latency: The delay between the moment at which light strikes the CMOS imager and its subsequent processing and display must be as fast as possible. Delicate surgical procedures depend upon precise, rapid image display without needless time delay. Flexible imager substrate together with sophisticated Altera FPGA fabric makes this camera unique in its class. Operating at 1080P per channel data rates, stereo image quality approaches that of full visual acuity. FPGA-based video processing reduces image latency to line-count delays. Novel application of signal processing renders a stable image in the demanding environment created by electro-surgery.

### Demanding 60601 Patient Contact Standards

IEC 60601 demands extremely low current leakage as referenced to ground. When sophisticated electronics must come into contact with sensitive patient tissues, consistently achieving low current leakage numbers is a critically important design consideration. Orchid has many years of experience designing equipment for use in low leakage 60601 environments.

### Altera FPGA Image Processing

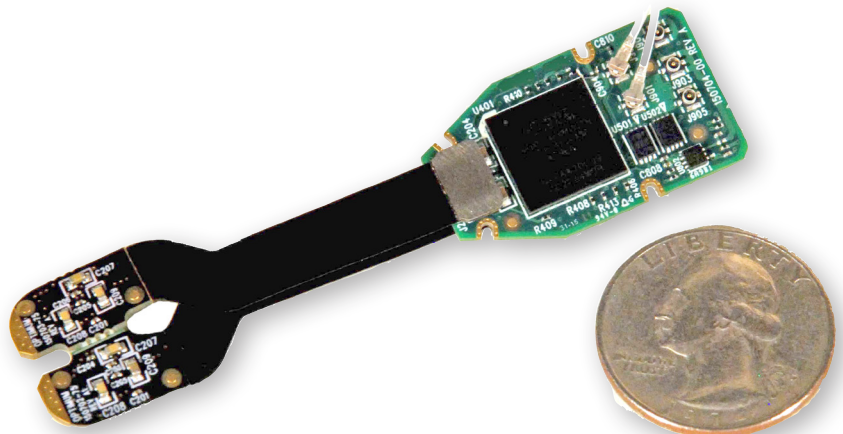
Altera FPGA devices are well suited to high speed image processing applications. High color depth Bayer to RGB data conversion, low latency image translation and zoom functions, as well as statistical functions such as exposure control, color balance and LUT functions can be implemented within the FPGA fabric. Convolution filters, and broadcast video standards such as SDI may be processed using Altera FPGAs.

### CMOS Imagers on Flexible Printed Circuits

Flexible printed circuits (flex-print) allow the creation of miniature electronic systems. Flex-print imagers enable surprisingly compact camera system design.

### Orchid Technologies: HD Video FPGA Design

The development of custom electronic products for our OEM clients is Orchid's entire business. The design of high speed, low latency FPGA-based video systems with rapid design cycles, demanding technical requirements, and unforgiving schedules sets us apart. Call Orchid Technologies today!



**ORCHID TECHNOLOGIES**  
**ENGINEERING & CONSULTING, INC.**

**Custom Engineering From Concept to Production**

147 Main Street, Maynard, MA 01754 [www.orchid-tech.com](http://www.orchid-tech.com) 978-461-2000 fax: 978-461-2003

Copyright © 2015 Orchid Technologies Engineering & Consulting Inc., all rights reserved. OTEC and the Orchid Technologies logo are trade marks of Orchid Technologies Engineering & Consulting, Inc. All other marks are the property of their respective owners.