



Self-correcting & Highly Reliable

- **RH eFPGA technology**
- **Scalable LUT array**
- **Protected array and RAM**
- **Multi-configuration methods**

FPGAs and embedded FPGAs (eFPGA) are expected to be omnipresent in electronic designs – even more pervasive than it is today in both Earth and space applications. Its programmability, built-in processor, peripheral functions and more advanced tools make it easier to use and design. With the availability of eFPGA, a variety of custom programmable solutions can be offered. This is ideal for systems requiring application-specific hardware acceleration or AI algorithms. In applications, where radiation hardened (RH) is required, customized rad-hard capabilities can be developed to support high radiation requirements where commercial FPGA devices may not be available.

At LeWiz, we specialize in Rad-Hard chip development, even for sub-22nm silicon where Rad-Hard by manufacturing is not an option. We've developed RH IP cores and circuit design techniques beyond the well-known tri-modular redundancy (TMR) method to provide RH protections for memories, combinational/sequential logic, and mixed signal or high-speed analog circuits. These are offered with our RH eFPGA technologies to meet or exceed requirements for RH sensors, data acquisition, avionics, and networking systems. Our solutions detect and correct errors making them fault tolerant and operating even if they encounter errors. We prevent radiation damage to devices, enable them to withstand >300Krads TID, mitigate single event effect, and quickly recover from erroneous conditions at multiple orders of magnitude better than other solutions available in the market.

LeWiz RH eFPGA core offers high I/O counts, scalable number of LUTs (configurable based on eFPGA tile(s)), protected on-chip RAM, DSP acceleration, DFT scan, global clock distribution, high speed I/Os, and others. The radiation-hardened capabilities include configuration memory and configuration controllers. These programmable products use well-known tools such as industry standard Synplify™ and eFPGA fast compilers. This combination offers efficient synthesis and are scalable for large designs. For FPGA programming, multiple options are offered including non-volatile memory, SD card, and high-speed standard busses.

RH eFPGA

FEATURES:

- Complete RH protection including configuration memory and controller
- Single Bit Error Detection and Correction
- Double Bit Error Detection
- Fast error recovery
- Multiple user SRAM banks
- Multiple high-speed transceiver banks
- 12.5 Gbps per lane – supports 10 Gbps Ethernet communication
- ECC on-chip memory
- High number of Input/Output per block (in the hundreds range)
- Scalable number of Look-Up Tables (LUTs)
- Scalable number of DSP acceleration
- Option for logic only or logic/memory + DSP – compatible footprint
- Efficient mapping + routing
- Built-in clock drivers for low-latency clock distribution
- DFT scan
- RH flip-flops + logic cell arrays
- ASIC ready process
- CRC protected for configuration bitstream

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