



# Sharpness Enhancer v1.0

Product Brief

## Introduction

Sharpness Enhancer IP Core is an easy-to-use video processing core for enhancing the sharpness of input video. Since the ideal amount of edge enhancement varies with several factors like viewing distance, display size, display medium and viewer's eye sight, it is necessary to provide a user control to modify sharpness.

This ready-to-use IP core helps system designers to build sharpness enhancement feature in their FPGA based systems with minimum effort and risk. The algorithm implemented in IP core makes use of a 3x3 Laplacian second order filter for edge enhancement. It provides user the facility to configure sharpness ranges and levels by setting generic parameters.

The architecture takes the advantages of high-performance XtremeDSP slices in Xilinx Virtex 5 FPGA.

## Features

- Real time video processing
- Programmable sharpness levels of 16, 32 and 64
- Programmable sharpness ranges of 1,2 and 4
- Supports RGB 8:8:8 colour format
- Supports input resolution from QVGA (320 x 240) to SXGA (1280 x 1024)
- Supports direct video streaming input
- Delay match support for input sync signals
- Optimized for Xilinx Virtex-5 FPGA

## Applications

- Post processing of video signals from digital camera
- Medical Imaging
- Home media solutions
- Consumer Displays
- Video surveillance
- Video conferencing
- Video capture devices

## Core Resource Utilization and Performance

Resource utilization after Place and Route in Virtex5 FPGA (XC5VSX50T-1FFG1136) is given in the table below.

Resource Type	Quantity Used
Slice Register	759
Slice LUT	673
Block RAM	7
DSP48E	27
Maximum Clock Frequency	250MHz

## Verification

The core has been verified through extensive simulation and rigorous code coverage measurements using ModelSim and validated in Xilinx ML506 XtremeDSP development kit equipped with Virtex5 FPGA (XC5VSX50T-1FFG1136).

## Standard Deliverables

- RTL source code in VHDL or post-synthesis EDIF/NGC netlist
- Sophisticated VHDL Testbench
- Simulation script, vectors, expected results, and comparison utility
- Product Datasheet
- Comprehensive User Guide with detailed application notes

## Documentation

- Sharpness Enhancer v1.0 Datasheet
- Sharpness Enhancer v1.0 User Guide

## Purchase and Technical Support

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