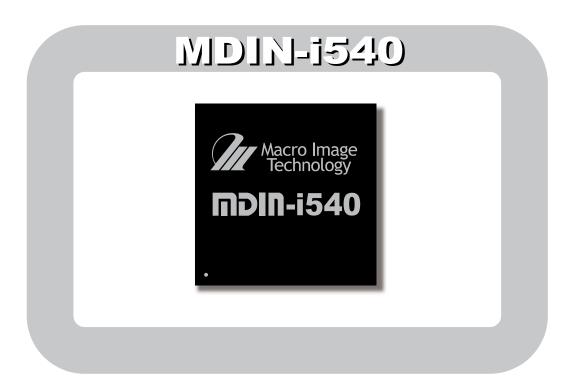
Image Signal Processor for 5M/6M/8M Pixel Image Sensor



- MDIN-i540 is a high performance Image Signal Processor for up to 8M pixel(4K30P) image sensor. It receives RGB bayer signal from image sensor in sub-LVDS or CMOS interface format and provides digital YCbCr/RGB in CMOS or LVDS interface format and composite video.
- MDIN-i540 supports excellent camera functions. For image sensor and optical lens control, programmable 3A (AE/AWB/AF), LSC, HLC/BLC, DPC functions are provided.
- For the high performance camera applications, MDIN-i540 provides various picture enhancement functions such as NR, WDR, Tone Mapping, D-WDR, Defog, DIS, Color Correction and so on.
- MDIN-i540 also provides various features such as Digital Zoom, PIP, Rotation / Mirror, Gamma Correction, Motion Detection, Privacy Masking and OSD.
- Embedded 32-bit MCU in the MDIN-i540 provides IRIS and D/N control functions. Various communication ports (SPI, I²C and UART) and user programmable GPIOs are also supported.
- MDIN-i540 is suitable for high quality video processing application for surveillance camera such as IP camera, SDI camera and analog camera (AHD, TVI and CVI). Also, MDIN-i540 is very valuable for industrial camera and medical camera.



MDIN-i540

Main Features

- ♦ Image Signal Processor for 5M / 6M / 8M Pixel Image Sensor
- Programmable AE/AWB/AF
- Motion Adaptive 2D/3D Noise Reduction
- WDR with Multiple Exposure Frames
- Tone Mapping
- DIS (Digital Image Stabilization)
- Digital Zoom, Electronic PTZ, PIP
- Rotation for Corridor Format
- Defoa

Specifications

Video Input

Image Sensor Input

10/12-bit Bayer Input

4/6/8-ch Sub-LVDS Serial and 12-bit CMOS Parallel Interface up to 4096x2160@30fps (8M Pixels)

Video Output

Digital CMOS Parallel Output

Programmable standard or non-standard video format Sub-sampling type: RGB/YCbCr 4:4:4 or YCbCr 4:2:2

Resolution: Progressive scan up to 4096x2160@30fps (4K30P) Interlaced scan up to 1920x1080i (1920x1152i)

Format: YC 4:2:2 8/10/16/20-bit(Multiplexed or separated),

YC/RGB 4:4:4 24/30-bit, BT.1120, BT.601 and BT.656 standard

Single / Dual-Wide / Dual-Edge Mode

Dual digital video output

Serialized LVDS Output

Max 2-port single lvds mode output or dual lvds mode output

Sub-sampling type: RGB/YCbCr 4:4:4 24/30-bit or YCbCr 4:2:2 16/20-bit

Resolution: up to 1920x1080@30fps in singe mode and 1920x1080@60fps in dual mode

PLL requires no external components

Composite Video Output: NTSC / PAL: 720H or 960H

Image Sensor and Lens Control

3A with Programmable AE / AWB / AF Parameters

Back Light Compensation (BLC) & High Light Compensation (HLC)

Defect Pixel Correction (DPC) with Dynamic and Static Detection

Lens Shading Correction (LSC)

Noise Reduction

Noise Adaptive 2D Edge Preserving Filter

Motion Adaptive 3D Filter

Dynamic Impulse Noise Removal

Wide Dynamic Range

Multi-Frame WDR : Line Mode or Frame Mode (Supports Up to 3Mega)

Tone Mapping for Built-in WDR Sensor

Single-frame WDR (D-WDR) for Full Frame Rate

Defog

Visibility Enhancement on the Low Contrast Scene

Removes Bad Weather Factors such as Fog, Mist, Dust and Smoke

DIS (Digital Image Stabilization)

Removes Image Jitter due to Shaking of Camera

Excellent Stabilization Performance with Wide Motion Estimation

- ♦ BLC/HLC (Back Light / High Light Compensation)
- Digital Slow Shutter
- Flicker Detection
- Black Level Compensation
- Defect Pixel Correction
- Lens Shading Correction
- Frame Rate Conversion
- Motion Detection & Privacy Masking
- OSD with 2D Graphic Engine

Format Conversion: D-Zoom & PIP

Independent Horizontal and Vertical Scaling with Anti-aliasing Filter

Zoom Ratio : x1 ~ Unlimited

PIP by Two Independent Scalers (Programmable Size & Position)

Frame Rate Conversion

Frame Rate Conversion from 3~250Hz to 3~250Hz

Conversion Ratio: x1/31 ~ x31

Motion Detection

Detection Resolution: 16x16, 32x32 or 64x64 Pixel

Four Motion Detection Windows

Programmable Motion Detection Threshold

Privacy Masking

Rectangle and Polygon Type

Programmable Color Mask Display

Video Enhancement

Edge Enhancement

Color Component Enhancement

Zone Depending Saturation & Hue Control

OSD

Four OSD Layers : Two OSD, One Cursor, One Background Layer

Up to 256-color Palette Mode Bitmap

16, 24 or 32-bit Full Color Mode Bitmap

Up to 32x63 Font Size and 1-bpp, 2-bpp or 4-bpp Font Color

MCU and SDRAM

Embedded 32-bit MCU with External Serial Flash Memory

2 x SPI Ports (Master & Slave) and 2 x I²C Ports (Master & Slave)

Embedded LPDDR2 SDRAM

Miscellaneous

Brightness, Contrast, Hue and Saturation Control

Freeze, Mirror, Flip, Rotation (Corridor Format)

Frame Lock with Sensor Slave Mode

Built-in Test Pattern Generation Logic

Electrical and Mechanical Characteristics

1.2, 1.8, 2.5 & 3.3V Supply Voltage

Low Power Consumption

196-ball FBGA (12mm x 12mm / 0.8mm pitch)