DNP

DT-018054

IMAGE ENHANCEMENT INTEGRATED CIRCUIT

The product is an Image Enhancement IC which implements Apical Limited's digital image processing technology which dynamically corrects the contrast of digital video images in real time. The product is designed to be embedded in video creation or display equipment and automatically corrects portions of the images which are either too dark or too bright, such that the video stream is recorded or displayed in an optimal way.

apical

Why an Image Enhancement IC is needed

As imaging devices such as CCD and CMOS sensors continue to develop toward high performance and high pixel densities, the amount of information which can be recorded by such sensors increases. When such information is compressed and viewed, the information in bright portions and dark potions of the screen is lost: saturation of bright areas and clipping of dark areas occurs, thus making it hard to record the images with optimal contrast. Information loss is readily noticeable in 8-bit motion video compression system as MPEG4, especially when high compression is used. For these reasons, today there is an increasing requirement to reduce the loss of picture information at the time of recording as far as possible.

Correspondingly, where pre-recorded still images and motion video are displayed, if the dynamic range of the source exceeds that of the display, regions which are too bright or too dark are not displayed with optimal contrast.

This IC product addresses these issues and limitations.

Without image processing

With image processing

Application of the Image Enhancement IC

Image capture/recording equipment

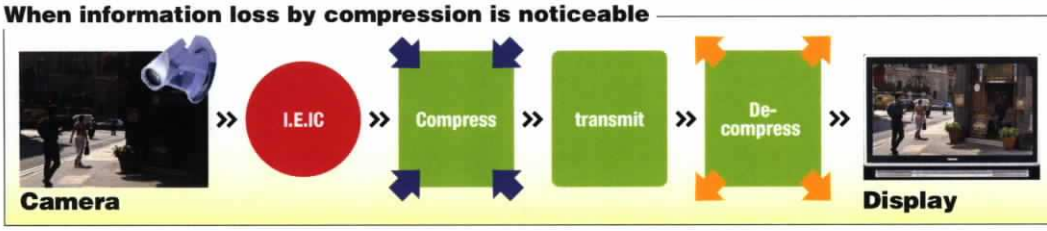
- security cameras
- digital still cameras
- digital video cameras
- industrial cameras

Display unit

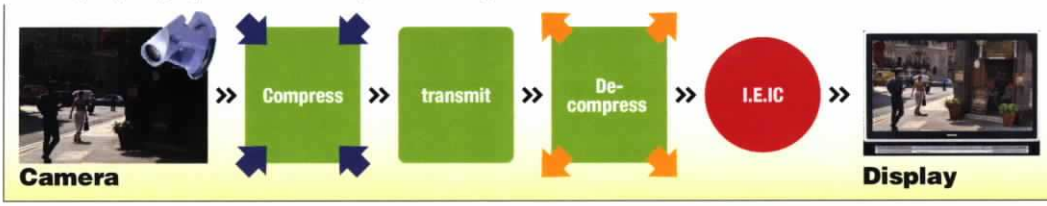
- liquid crystal displays
- printers
- projectors
- imaging devices

Recommended allocation of the Image Enhancement IC

When information loss by compression is noticeable



When image information needs to be displayed on display equipment in an optimal ways

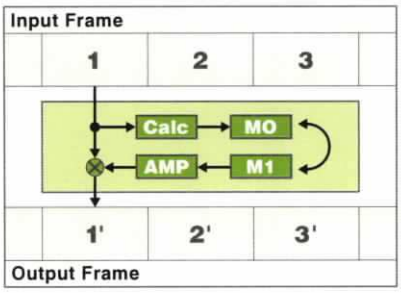


P&I Solutions DNP TECHNOLOGY

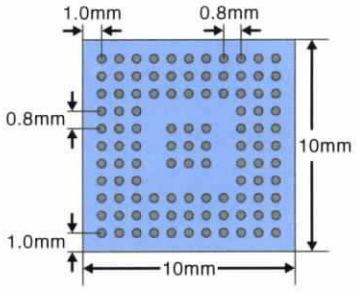
Specifications

Scanning method	Interlace/non-interlace
Input/output interface (digital)	ITU-R BT 656 (8,10bit) YUV 4:2:2 (8,10bit) YUV 4:4:4 (8,10bit) RGB 4:4:4 (8,10bit) ※Input and output have the same data format
Sampling frequency	Max. 54MHz
Frame size	Min. 240 × 240 pixels, Max.4096 × 4096 pixels
Frame/Aspect ratio	no restriction
Algorithm control	I2C compatible serial bus (*1)
Package	BGA (105 balls) : 10mm × 10mm (*2)
Power source/ Voltage	1.8V (core), 3.3V (IO)
Electricity consumption	T.B.D
Allowed temperature range	0℃~70℃ (*2)

(*1) I2C is a registered trademark of Royal Phillips Electronics.
(*2) When temperature beyond this range is required, please let us know.



Block diagram



Ball schematic

Notice from the manufacturer

1. The package or Instruction manual of the product embedding this IC is required to bear logo or equivalent mark of Apical Limited.

2. Despite our constant efforts for improving quality and reliability it is generally understood that with semiconductor products unexpected malfunctions or other problems may occur. When our semiconductor products are embedded in a device, it is the user's responsibility to design the equipment with utmost safety measures so that any malfunction or other problems with the semiconductor product will not cause injuries to human life, body or property. Users of the product are requested to design their equipment only after confirming the latest specification of the product and use it within the scope of the guarantee. For safety precautions and other important conditions of which users should be aware, please refer to the technical data or other information to be supplied separately.

3. This product is designed for use for general electronics equipment including computers, personal devices, office equipment, measuring equipment, industrial robots, home electrical appliances, etc. It is neither intended nor guaranteed that the product is used for equipment or devices such as nuclear control equipment, space and aeronautical equipment, transportation equipment, traffic signal equipment, combustion controllers, medical equipment, or other types of safety device, etc. which demand especially high quality levels and reliability and whose errors or malfunction could directly cause a threat to human life or bodily injury. Users are solely responsible for use of this product for such particular purposes.

4. The technical information contained in this brochure is given merely for the purpose of showing typical examples of function and application of the product. Therefore,such information should not be taken to give any guarantee as to the use of our (or a third party's) intellectual property rights or any other rights or to grant any license to exercise such rights.

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6. The content of this brochure is subject to change without notice due to improvement of technology or for any other reason.

Dai Nippon Printing Co., Ltd.
Electronic Device Operations Module Products sales & Development Dept.
TEL: 03-3903-8354 FAX: 03-3903-8537 E-mail: ed-info@mail.micro.dnp.co.jp
URL: http://www.dnp.co.jp/semi

