



# 12-Bit, 170 MHz, Video and Graphics Digitizer with Quad HDMI Receiver

## ADV7604

### FEATURES

#### Three 12-bit ADCs

- ADC sampling rates up to 170 MHz
- 12-channel analog input mux
- 525i/625i component analog input
- 525p/625p component progressive scan support
- 720p/1080i/1080p/1250i component HDTV support
- Digitizes RGB graphics up to 1600 × 1200 at 60 Hz (UXGA)

#### VBI data slicer (including teletext)

#### Simultaneous HDMI and analog video sync processing

#### Ultralow jitter digital PLL

#### 4:1 multiplexed HDMI receiver

- HDMI 1.3a support
  - 36-/30-/24-bit deep color support
  - Flexible audio interface (DSD, DST, Dolby® TrueHD, DTS®-HD master audio, and DTS-HD high resolution audio)
- 225 MHz HDMI receiver
- Repeater support
- High-bandwidth digital content protection (HDCP 1.3)
- Programmable/adaptive equalizer for cable lengths up to 30 meters
- Internal EDID RAM
- EDID with HDMI cable power support
- CEC support

#### General

- S/PDIF (IEC90658-compatible) digital audio output
- Highly flexible output interface
- 12-bit 4:4:4/8-bit 4:2:2 DDR pixel output interface
- Dual STDI function support standard identification
- 2 any-to-any 3 × 3 color space conversion matrixes
- 2 programmable interrupt request output pins
- Advanced sync processing for robust sync extraction of poor video sources
- AV.Link support

### APPLICATIONS

#### Advanced TV

- PDP HDTVs
- LCD TVs (HDTV ready)
- LCD/DLP® rear projection HDTVs
- CRT HDTVs
- LCoS™ HDTVs

#### AVR video receivers

#### LCD/DLP front projectors

#### HDTV STBs with PVR

#### CRT HDTVs

#### DVD recorders with progressive scan input support

### GENERAL DESCRIPTION

The ADV7604 is a high quality, single chip, multiformat video decoder, graphics digitizer with an integrated 4:1 multiplexed High-Definition Multimedia Interface (HDMI®) receiver.

The ADV7604 contains one main component processor (CP) that processes YPrPb and RGB component formats, including RGB graphics. The CP also processes the video signals from the HDMI receiver. The ADV7604 can operate in quad HDMI and analog input mode, thus providing simultaneous HDMI and analog video sync processing. This allows for fast switching between HDMI and the ADCs.

The ADV7604 supports the decoding of a component RGB/YPrPb video signal into a digital YCrCb or RGB pixel output stream. The support for component video includes 525i, 625i, 525p, 625p, 720p, 1080i, 1080p, and 1250i standards as well as many other HD and SMPTE standards.

Graphics digitization is also supported by the ADV7604. The ADV7604 is capable of digitizing RGB graphics signals from VGA to UXGA rates and converting them into a digital RGB or YCrCb pixel output stream.

The ADV7604 incorporates a quad input HDMI-compatible receiver that supports all HDTV formats up to 1080p and display resolutions up to UXGA (1600 × 1200 at 60 Hz). The reception of encrypted video is possible with the inclusion of HDCP. The HDMI receiver also includes programmable/adaptive equalization that ensures robust operation of the interface with cable lengths up to 30 meters. The HDMI receiver has advanced audio functionality, such as a mute controller that prevents audible extraneous noise in the audio output.

Fabricated in an advanced CMOS process, the ADV7604 is provided in a space-saving, 260-ball 15 mm × 15 mm BGA surface-mount, RoHS-compliant package and is specified over the -40°C to +70°C temperature range.

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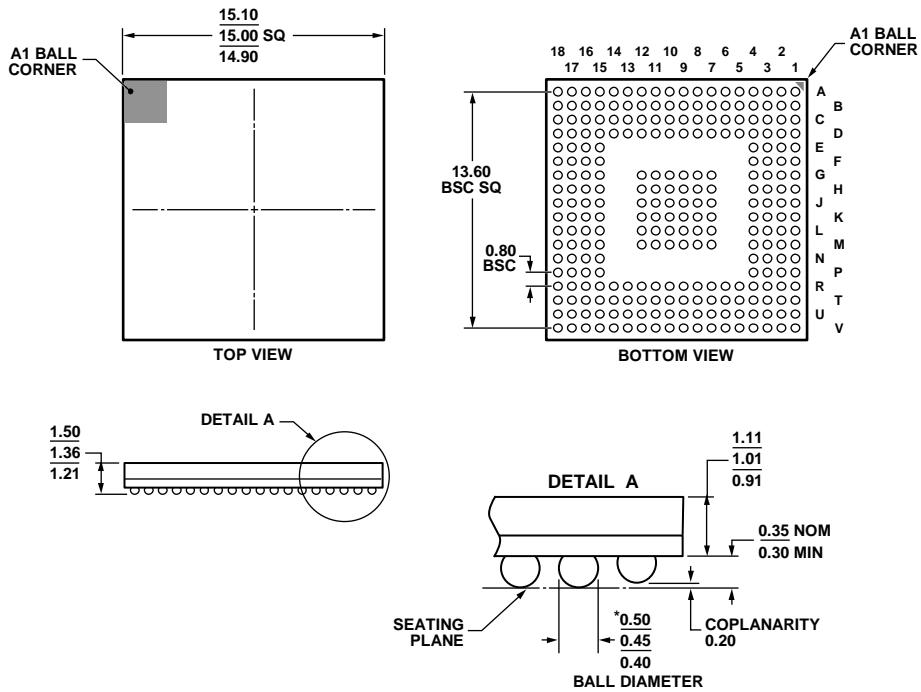
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## OUTLINE DIMENSIONS



\*COMPLIANT TO JEDEC STANDARDS MO-205-AG WITH THE EXCEPTION TO BALL DIAMETER.

Figure 1. 260-Ball Chip Scale Package Ball Grid Array [CSP\_BGA] (BC-260-1)

Dimensions shown in millimeters

011509-A

## ORDERING GUIDE

| Model <sup>1, 2, 3</sup> | Temperature Range | Package Description                              | Package Option |
|--------------------------|-------------------|--|----------------|
| ADV7604BBCZ-5            | -40°C to +70°C    | 260-Ball Chip Scale Package Grid Array [CSP-BGA] | BC-260-1       |
| ADV7604BBCZ-5P           | -40°C to +70°C    | 260-Ball Chip Scale Package Grid Array [CSP-BGA] | BC-260-1       |
| EVAL-ADV7604EB1Z         |                   | ADV7604BBCZ-5 Front End Evaluation Board         |                |
| EVAL-ADV7604EB2Z         |                   | ADV7604BBCZ-5P Front End Evaluation Board        |                |

<sup>1</sup> Z = RoHS Compliant Part.

<sup>2</sup> The ADV7604BBCZ-5 is programmed with internal HDCP keys. Customers must have HDCP adopter status (consult Digital Content Protection LLC for licensing requirements) to purchase any components with internal HDCP keys.

<sup>3</sup> The ADV7604BBCZ-5P is not programmed with internal HDCP keys for professional applications. Customers are not required to have HDCP adopter status.

I<sup>2</sup>C refers to a communications protocol originally developed by Phillips Semiconductors (now NXP Semiconductors).

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