



# Media Expansion Card

**White Paper**

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*For the Intel® 945G Express Chipset*

*May 2005*



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# Contents

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1	Introduction .....	5
	1.1 Media Expansion Card Architecture.....	6
	1.2 Media Expansion Card Features.....	6
	1.3 Media Expansion Card Software Considerations .....	8
2	Summary .....	9

## Figures

Figure 1. Media Expansion Card Overview .....	5
Figure 2. Media Expansion Card Architecture.....	6
Figure 3. Sample Media Expansion Card Back panel .....	7

## Revision History

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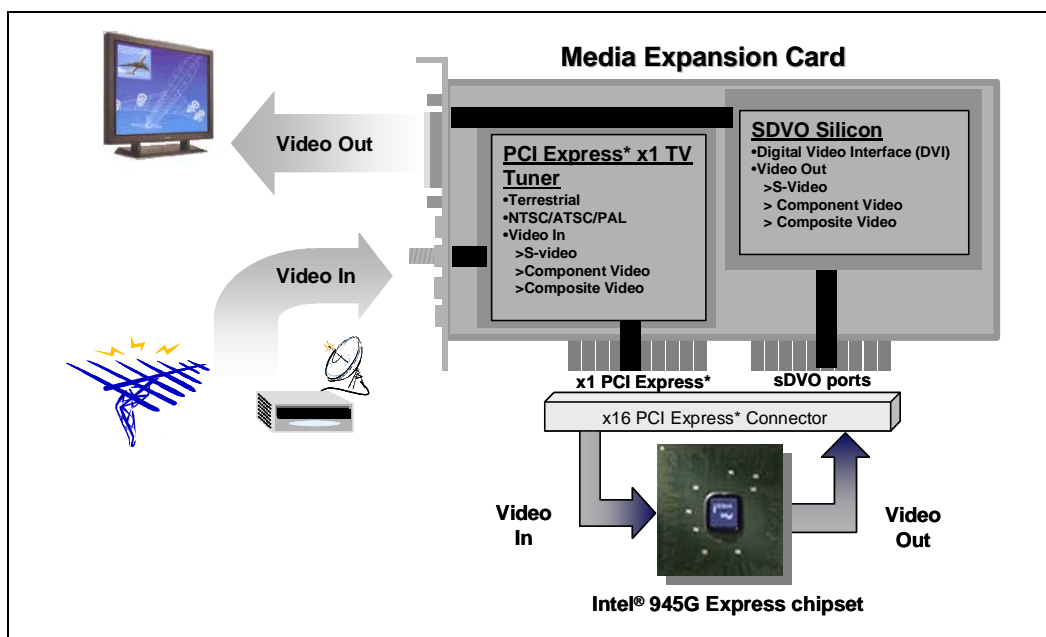
Revision	Description	Date
-001	• Initial Release.	May 2005

# 1 Introduction

This document details the Media Expansion card key benefits and operation. It is intended for a technical audience interested in learning about Media Expansion card architecture.

Media Expansion cards, formerly known as ADD2+ cards, provide flexible digital display and video-in capabilities on a single add-in card. The Intel® 945G Express Chipset will be the first Intel chipset to support Media Expansion cards. The Intel® 82945G GMCH has an integrated graphics device (IGD) with dedicated multimedia engines delivering high-performance 3D, 2D, video, and display capabilities. The GMCH also has the flexibility to use an external graphics accelerator through its x16 PCI Express\* interface. When an external graphics accelerator is not used via the x16 PCI Express connector, the Media Expansion card may be used to provide digital display and video-in options.

**Figure 1. Media Expansion Card Overview**



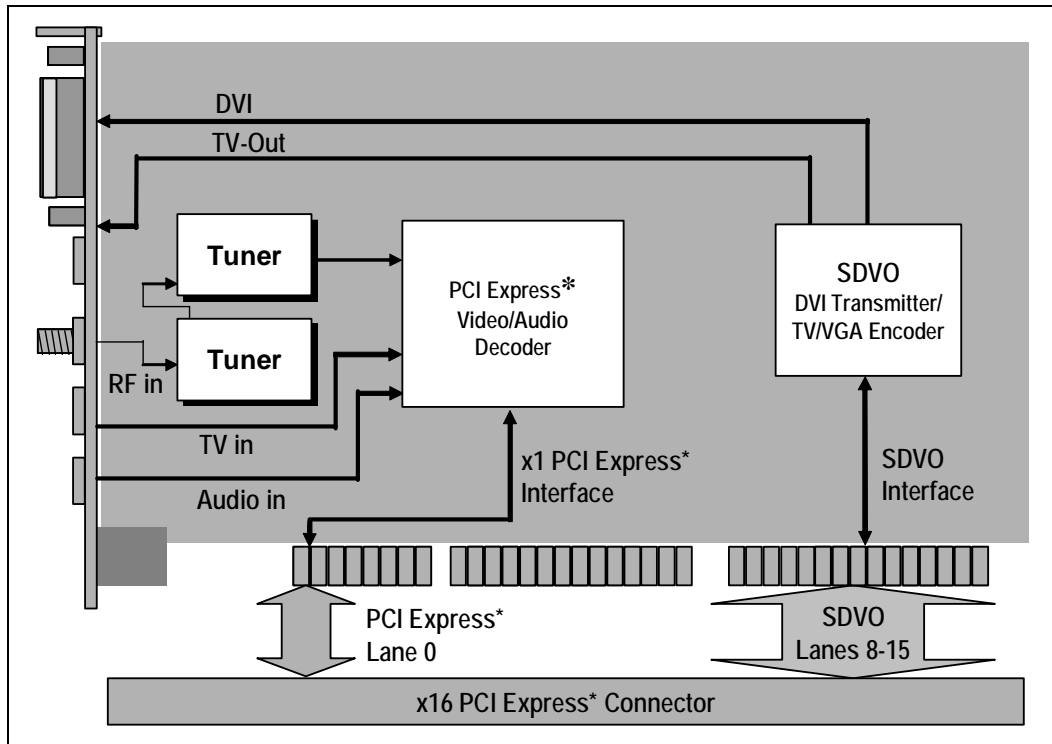
Media Expansion cards are available from many third party add-in card vendors. Media Expansion cards allow the functionality of two or more discrete PCI Express cards to be combined into one single card. For example, if an OEM wants to use a PCI Express based TV tuner add-in card and another PCI Express based video card with TV-Out capability, then the functionality of these two discrete add-in cards could be provided by a single Media Expansion card with the 945G Express chipset. This flexibility allows OEMs to lower overall system costs.

Media Expansion cards are also ideal for small form factor designs where there is only one x1 PCI Express slot in the system. Since Media Expansion cards allow for the functionality of two or more discrete PCI Express cards to be combined onto one card and use the x16 PCI Express connector, this provides more solutions for system integrators of small form factor systems with an available x1 PCI Express slot.

## 1.1 Media Expansion Card Architecture

The Media Expansion card uses the Intel Serial Digital Video Output (SDVO) interface that is multiplexed on the x16 PCI Express port for video out capabilities and one x1 PCI Express lane for video in capabilities. The SDVO port on the GMCH only uses 8 of the 16 PCI Express lanes available on the x16 PCI Express connector. The Media Expansion Card uses one of the remaining 8 PCI Express lanes to provide video-in capabilities along with the video-out capabilities via a single add-in card (see Figure 2).

Figure 2. Media Expansion Card Architecture



## 1.2 Media Expansion Card Features

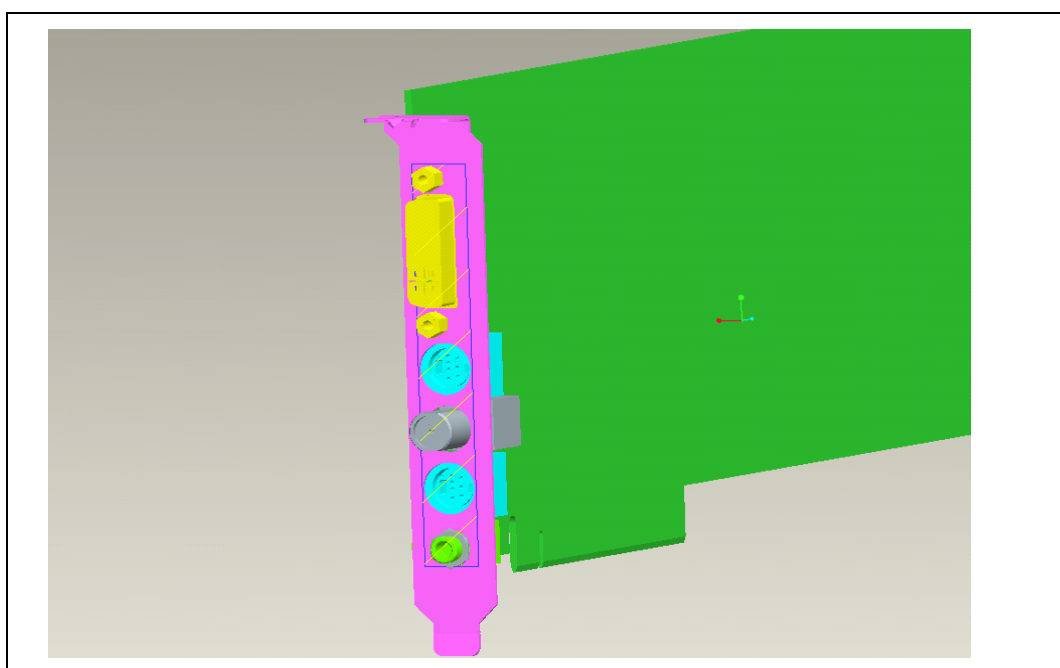
The Media Expansion card provides flexibility to OEMs when choosing a platform's digital display and video-in capabilities. With the Media Expansion cards, an OEM can use a single motherboard design for a wide variety of platforms. An OEM can ship systems with numerous TV-in and TV-Out configurations based on a few different Media Expansion cards.

The feature set of a particular Media Expansion card depends on the features of the SDVO and PCI Express video decoder devices used on the card. SDVO devices are capable of supporting a variety of display types such as Low Voltage Differential Signaling (LVDS), DVI, VGA, and TV-Out. The Media Expansion card is capable of supporting DVI, SCART, D connector, Component video, S-Video, Composite, and VGA outputs. Some SDVO silicon vendors offer support for multiple outputs. Refer to SDVO silicon vendor datasheet to see which outputs are offered in a particular SDVO device.

The PCI Express video decoder silicon can also support multiple inputs. PCI Express video encoders can support RF, FM, Component video, S-Video, Composite and Audio inputs. Refer to PCI Express video encoder silicon vendor datasheet to see which inputs are offered in a particular PCI Express video decoder device.

Figure 3 shows an example of a Media Expansion card backplane. This particular Media Expansion card has a DVI connector for digital display output and a 7-pin Mini-DIN connector that is S-Video compatible for S-Video output. The card also accepts a breakout dongle for Component video output, a RF connector for NTSC/PAL video input, and a 7-pin mini-DIN connector that is S-Video compatible for S-Video input. In addition, the card accepts a breakout dongle for Component video input and an audio connector for stereo audio input.

**Figure 3. Sample Media Expansion Card Back panel**



Using Media Expansion cards with the 945G Express chipset offers system integrators the following flexibility:

- No burden to the motherboard with additional circuitry or costs to support a variety of output display and video-in options.
- Does not require feature set tradeoffs on the motherboard or back panel to support a variety of output display and video in options.
- Frees up an x1 PCI Express slot for small form factor systems that have limited x1 PCI Express slots.
- Can use a single motherboard design to support a variety of output display and video-in options. For example, by using Media Expansion card, a single motherboard can support CRT only, DVI flat panel, CRT and Flat panel simultaneous, S-Video TV-Out, etc.

For a list of Media Expansion card vendors, contact your Intel representative.



## 1.3 Media Expansion Card Software Considerations

Software drivers that enable video-in functionality on the Media Expansion card will be provided by the Media Expansion card vendors. Software drivers that enable display output functionality via the SDVO device on the Media Expansion card will be enabled by the Intel graphics driver that is available at [www.intel.com](http://www.intel.com) for the Intel 945G Express chipset.



## 2 *Summary*

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The Media Expansion card, together with the Intel 945G Express chipset, enables single-card solutions with increased flexibility for video in/out options for system integrators. Media Expansion cards allow the functionality of two or more discrete PCI Express cards to be combined into one single card that allows OEMs to lower overall system costs. Media Expansion cards also free up an x1 PCI Express slot for small form factor systems that have limited x1 PCI Express slots.

Media Expansion cards are available from a variety of third party add-in card vendors. For a list of Media Expansion card vendors, contact your Intel representative.