Application Report
SPRAA44 − July 2004

TMS320DM642 Video Port Mini-Driver for TVP5146 and TVP5150 Decoder

Eldon Ding, Yin Ling — *DSP Catalog and Emerging End Equipment*

ABSTRACT

This application report describes the usage and design of the video capture mini−drivers that work on the TMS320DM642 Evaluation Module (EVM) with TVP5146 and TVP5150A decoders. Use this application report as well as *The TMS320DM642 Video Port Mini−Driver* (spra918a) to understand the usage of the video decoder driver. These device drivers are compliant with the DSP/BIOS IOM device driver model and follow the architecture described in spra918a.

Contents

1 Overview

TVP5150A is a low power, smallest package video decoder from Texas Instruments. It can support two composite or one s-video input and 8-bit 4:2:2 YCbCr or BT656 output.

TVP5146 is a multi-format and high quality video decoder. It is a complete solution for SDTV/HDTV and PC graphics component video applications.

It supports up to:

- 10 selectable individual composite video inputs
- Four selectable s-video inputs
- Three selectable analog YPbPr/RGB video inputs and one CVBS input
- Two selectable analog YPbPr/RGB video inputs, two s-video inputs, and two CVBS inputs
- 20-bit 4:2:2 YCbCr or 10-bit 4:2:2 YCbCr output.

The TMS320DM642 Evaluation Module (EVM) with TVP5146 and TVP5150A decoders is a reference design and evaluation platform for the DM642 DSP and TVP5146 and TVP5150A video decoder devices. With the onboard TVP5150A device, the EVM can support two composite video inputs. With the onboard TVP5146 device, the EVM can support one composite video input and one s-video input. By repopulating several resistors on the board, the EVM can support RGB/YPbPr input as well. (Please refer to the Technical Reference manual for instructions.)

This application report describes the video capture drivers for this EVM and their usage.

The capture driver described here is actually part of an IOM mini-driver and follows the driver architecture showed in Figure 1. The benefit of this architecture is to isolate the generic part and the board related (or specific) part. Then when you change an external device, you just (or only) need to change the board related part.

This application report focuses on the capture related device driver which was revised to support TVP51XX devices. The revised driver will be achived into vport.lib, the application can access the video port by the method and usage stated in the following chapters.

Meanwhile the application needs to call EVM642_init() function from the DM642 EVM Board Support Library (BSL) to initialize the board as well.

2 Usage

2.1 Configuration

To use the capture or display device driver, a device entry must be added and configured in the DSP/BIOS configuration tool. For the EVM with TVP51XX, the driver's configurarions are the same as the old version EVM, please refer to *The TMS320DM642 Video Port Mini-Driver* (SPRA918) for more information.

The other care-about is before you use it, the program must call the new init function EVMDM642_init() from the EVMDM642 BSL. In this function, the 5146 device was accessed to enable the data clock out to make the proper vport initialization.

2.2 Device Parameters for Generic Part of the Driver

The main body of generic part of the driver is inherited from the older version driver. This chapter will only list those that are not inherited (i.e., capture driver). For more information about the other drivers, refer to the *TMS320DM642 Video Port Mini-Driver* (SPRA918). For a better understanding of the parameters described below, refer to *TMS320C64x DSP Video Port/ VCXO Interpolated Control (VIC) Port Reference Guide* (SPRU629).

2.3 Device Parameters for Board Specific Part of the Drivers

This section describes the parameters of those specific video decoders TVP51XX on this EVM board. Those parameters are used in TCP51XX.c file,

2.3.1 TVP51XX Parameters

```
typedef struct {
        TVP51XX_Mode videoMode;
        TVP51XX_AnalogFormat aFmt;
        Bool enableBT656Sync;
        int inputPort;
        I2C_Handle hI2C;
} TVP51XX_ConfParams;
```

videoMode: Specifies the input video format. Possible values are defined in tvp51xx.h:

```
typedef enum TVP51XX_Mode {
        TVP51XX_MODE_NTSCSqp,
        TVP51XX_MODE_NTSC601,
        TVP51XX_MODE_PAL601,
        TVP51XX_MODE_PALSqp,
        TVP51XX_MODE_USER
}TVP51XX_Mode;
```

aFmt: Specified the analog output format of the video encoder device. Possible values are defined in tvp51xx.h:

```
typedef enum TVP51XX_AnalogFormat {
        TVP51XX_AFMT_COMPOSITE,
        TVP51XX_AFMT_SVIDEO,
        TVP51XX_AFMT_RGB,
        TVP51XX_AFMT_YPBPR
} TVP51XX_AnalogFormat;
```

enableBT656Sync: Enable insertion of SAV/EAV code defined in ITU-R BT.656 into the output video data stream.

inputPort:. Specified which port is use in TVP5150. Possible value is 0 or 1;

hI2C: Handle to the DM642 I2C controller.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		**Applications**	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
		Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments
Post Office Box 655303 Dallas, Texas 75265