TMS320DM642 Video Port Mini-Driver for TVP5146 and TVP5150 Decoder

Eldon Ding, Yin Ling

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.

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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.)

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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 achieved 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 configurations 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

```c
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:

```c
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:

```c
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.
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