PDK/PDK TDA Application notes

Return to PDK Software Developer Guide

Contents

Introduction

This page provides link to various application notes and guides for the user using TDA family of devices.

Video

Video Driver Porting

Main article: Video Driver Porting

This application note describes the detailed steps in configuring VIP, DSS and ISS CAL video drivers to custom board. This includes board level pinmux changes, VIP/CAL data capture from sensors with different parameters and configuring DSS timing to support custom LCD.

DSS Bit Exact Output

Main article: SPRAC16 (http://www.ti.com/lit/an/sprac16a/sprac16a.pdf)

The display subsystem (DSS) in TDA2xx, TDA2Ex and TDA3xx platform is used for displaying video data to external devices. But DSS can also be used as a high-speed data transfer port for any non video data. One of the basic requirements of the data transfer port is that the data that is present in the memory should not be modified before the data is sent out, which means the data sent should be bit exact with the data in memory. This application report explains how to use the DSS as a data transfer port.

DSS BT656 Workaround for TDA2x

Main article: SPRAC23 (http://www.ti.com/lit/an/sprac23/sprac23.pdf)

The display subsystem (DSS) in TDA2x has a silicon limitation (Errata) to support the standard BT656 output. This application report explains the limitation and how the DSS can be configured to interface with video encoders such as ADV7393, which supports discrete sync digital video input and convert to NTSC/PAL analog SD video output.

TDA3xx ISS Tuning and Debug Infrastructure

Main article: SPRAC16 (http://www.ti.com/lit/an/sprac43/sprac43.pdf)

TDA3xx ISS offers a powerful and feature rich Image Pipe for processing RAW sensor data and generating a high quality output stream. Image pipe is configurable allowing the users to adjust image quality based on sensor properties and individual preferences. To enable this, TI delivers example processing pipelines in Vision Software Development Kit (SDK) and PC-based graphical tool for image quality tuning. This application report explains the tuning infrastructure present in the Vision SDK for TDA3xx ISS imaging pipeline and other debug infrastructure.

Safety

ECC/EDC on TDAxx

Main article: SPRAC42A (http://www.ti.com/lit/an/sprac42a/sprac42a.pdf)

To enable safety, TDAxx processors come with error detection and correction (EDC) support for various memories. This application report provides an overview and usage description of EDC.

ADC as Voltage Monitoring

Main article: SPRAC24 (http://www.ti.com/lit/an/sprac24/sprac24.pdf)

The analog-to-digital conversion (ADC) module in TDA3x can be used as voltage monitoring. This application note describes how the ADC module can be used for monitoring the input core voltages coming from the PMIC on the board/EVM.

Error Signaling module

Main article: SPRAC27 (http://www.ti.com/lit/an/sprac27/sprac27.pdf)

The Error Signaling Module (ESM) in TDA3x is used to report certain activity on the monitored signals at an external error pin or to the device CPUs through interrupt. The external error pin is normally used as a second indication path to switch off (or reset) the device by an external device. Therefore, the external controller is able to reset the device or keep the system in a fail-safe state by disabling the peripherals outside of the ECU. This application report looks at different signals that can cause system failure and can be monitored using ESM. This document also aims at efficient use of ESM using the Starterware device driver APIs.

TESOC

Main article: SPRAC26 (http://www.ti.com/lit/an/sprac26/sprac26.pdf)

his application report explains how to use the Tester On Chip (hereafter mentioned as TESOC) module of TDA3xx SoC. It also provides detailed design information for using TESOC to run field tests on targeted modules in the TDA3xx System-on-Chip (SoC). Flow charts and other programming details are presented for writing code for TESOC. This document is intended for designers and programmers who wish to program the TESOC in TDA3xx SOC using the Starterware™ device driver APIs.

Power Management

ADAS Power Management

Main article: SPRAC22 (http://www.ti.com/lit/an/sprac22/sprac22.pdf)

Power Management (PM) in Advanced Driver Assist Systems (ADAS) requires setting the right power and clock configurations that allow any IP to consume optimal power. This helps not only reduce the total power consumed by the device, but also manage thermal dissipation of the silicon. This application report looks at different ways in which power in the TDA2xx, TDA2ex and TDA3xx family of devices can be managed, and the software APIs to achieve the same.

Miscellaneous

TDA3xx SBL

Main article: TDA3xx SBL (http://processors.wiki.ti.com/images/3/38/TDA3xx_SBL_Application_Note.pdf)

This application note explains the software architecture of TDA3xx Secondary Bootloader and how to use the different SBL software components in order to customize bootloader for a specific use case and software APIs to achieve the same. This is intended for designers and programmers who wish to use the SBL in their production systems.
Note: This document refers to Starterware package but is application and can be used for PDK also.

mFlash

Main article: SPRACC3 (http://www.ti.com/lit/an/spracc3/spracc3.pdf)

This application report focuses mainly on the procedure to flash the Secondary BootLoader and AppImage into TDA3xx Systems. sbl_mflash algorithms are not in the scope of this document. But the procedure to configure and build the executable is defined here.

DRA7x Performance

Main article: SPRAC46 (http://www.ti.com/general/docs/litabsmultiplefilelist.tsp?literatureNumber=sprac46)

This application report provides information on the DRA74x_75x and DRA72x device throughput performances and describes the DRA74x_75x and DRA72x System-on-Chip (SoC) architecture, data path infrastructure, and constraints that affect the throughput and different optimization techniques for optimum system performance. This document also provides information on the maximum possible throughput performance of different peripherals on the SoC.

TDA2XX/TDA2EX Performance

Main article: SPRAC21 (https://www.ti.com/general/docs/litabsmultiplefilelist.tsp?literatureNumber=sprac21)

This application report provides information on the TDA2xx and TDA2ex device throughput performances and describes the TDA2xx and TDA2ex System-on-Chip (SoC) architecture, data path infrastructure, and constraints that affect the throughput and different optimization techniques for optimum system performance. This document also provides information on the maximum possible throughput performance of different peripherals on the SoC.

TDA2Px Performance

Main article: SPRACE3 (http://www.ti.com/general/docs/litabsmultiplefilelist.tsp?literatureNumber=sprace3)

This application report looks into the System-on-Chip (SoC) level performance characteristics of key usecases targeted for TDA2Px. This document discusses the data path infrastructure and parameters that manage the system level throughput. Different optimization techniques for optimum system performance are also described.

Debugging With CCS on the TDA Family of Devices

Main article: SPRAC17 (http://www.ti.com/lit/an/sprac17b/sprac17b.pdf)

This application note walks through the different steps required to setup the TI Code Composer Studio™ (CCS), as well as how to debug applications on the DRA7x, TDA2x and TDA3x family of devices. The document starts with describing basic CCS debugging techniques and goes on to highlight advanced non-intrusive ways to debug software.

Performance failure analysis

Main article: SPRABX0 (http://www.ti.com/lit/an/sprabx0/sprabx0.pdf)

This application note provides a methodology through which performance issues can be identified and fixed in systems using DRA74x, DRA75x, TDA2x and TDA3x family of devices.

Quality of Service

Main article: SPRABX1 (http://www.ti.com/lit/an/sprabx1a/sprabx1a.pdf)

This application note lists various quality-of-service (QoS) knobs that are implemented in DRA74x, DRA75x and TDA2x system-on-chip (SoC) family of devices. These QoS knobs aid to optimize overall system performance while running several concurrent application scenarios.

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