TCC805x Automotive Common Hardware

Application Note for DisplayPort Interface

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Preliminary version

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TABLE OF CONTENTS

Contents

Figures

Tables

1 INTRODUCTION

This document describes the DisplayPort interface of TCC805x.

2 DISPLAYPORT INTERFACE

This chapter explains DisplayPort interface of TCC805x.

2.1 DisplayPort Ball Number

The TCC805x has one DisplayPort interface, and the ball number for each package is shown in the Table 2.1.

Table 2.1 DisplayPort Pad Name and Ball Number of Each Package

Ball Name	TCC8059 Ball Number	TCC8050/TCC8053 Ball Number
DP_PHY_TX0_P	A10	C23
DP_PHY_TX0_M	B10	A23
DP_PHY_TXRX1_P	A11	D24
DP_PHY_TXRX1_M	B11	B24
DP_PHY_TXRX2_P	A12	D26
DP_PHY_TXRX2_M	B12	B26
DP_PHY_TX3_P	A13	C27
DP_PHY_TX3_M	B13	A27

2.2 Data Transmission through DisplayPort Lane

This chapter explains the output status of data for each DisplayPort Lane.

Table 2.2 Data transmitted through DisplayPort Interface from TCC805x ES

Ball Name	Data Transmitted from TCC8059 ES	Data Transmitted from TCC8050/TCC8053 ES
DP_PHY_TX0_P	Lane 2_P	Lane 2_P
DP_PHY_TX0_M	Lane 2_M	Lane 2_M
DP_PHY_TXRX1_P	Lane 3_P	Lane 3_P
DP_PHY_TXRX1_M	Lane 3_M	Lane 3_M
DP_PHY_TXRX2_P	Lane 0_P	Lane 0_P
DP_PHY_TXRX2_M	Lane 0_M	Lane 0_M
DP_PHY_TX3_P	Lane 1_P	Lane 1_P
DP_PHY_TX3_M	Lane 1_M	Lane 1_M

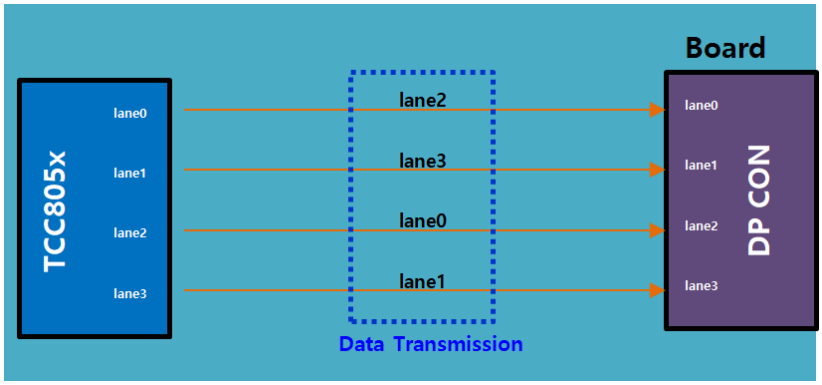

Figure 2.1 Data Transmission of TCC805x ES

In TCC805x ES, data can be output only in the form of lane swap.

In TCC805x CS, the data can be output in one of the following data form:

- Data which is the same as the ball name
- Data which is in the form of the same lane swap as ES

Table 2.3 Data Transmission Settings of TCC805x CS

Ball Name	Data Transmission Setting 1	Data Transmission Setting 2
DP_PHY_TX0_P	Lane 2_P	Lane 0_P
DP_PHY_TX0_M	Lane 2_M	Lane 0_M
DP_PHY_TXRX1_P	Lane 3_P	Lane 1_P
DP_PHY_TXRX1_M	Lane 3_M	Lane 1_M
DP_PHY_TXRX2_P	Lane 0_P	Lane 2_P
DP_PHY_TXRX2_M	Lane 0_M	Lane 2_M
DP_PHY_TX3_P	Lane 1_P	Lane 3_P
DP_PHY_TX3_M	Lane 1_M	Lane 3_M

3 WHEN USING DISPLAYPORT STANDARD CONNECTOR

This chapter explains how to use the DisplayPort in TCC805x.

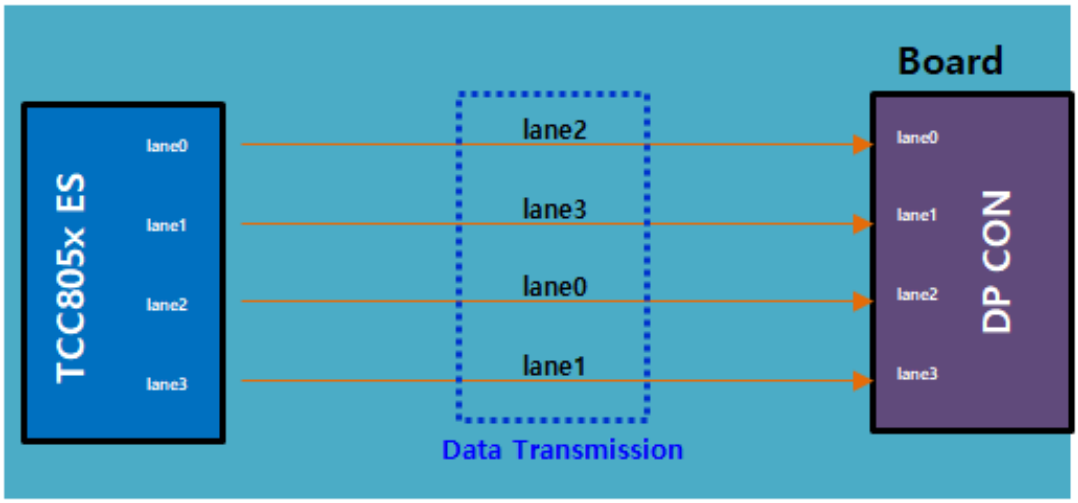

Figure 3.1 DisplayPort Design of TCC805x - Case 1

In TCC805x ES, the data is transmitted in the status that the lane is swapped. Therefore, if you connect the TCC805x ES directly to DisplayPort standard connector, the screen is not displayed.
To display the screen by using DP standard connector in TCC805x ES, the gender board should be used as shown in the Figure 3.2.

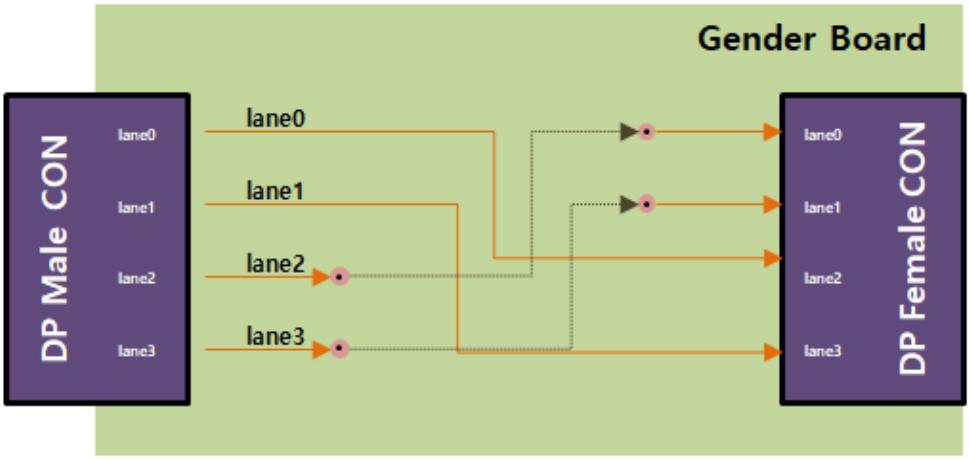

Figure 3.2 Design of Gender Board

When the DisplayPort is designed as shown in the Figure 3.1 above, the quality of signal may deteriorate due to Vias on the gender board used for TCC805x ES.
However, in case of TCC805x CS, the quality of signal does not deteriorate because gender board is not used.

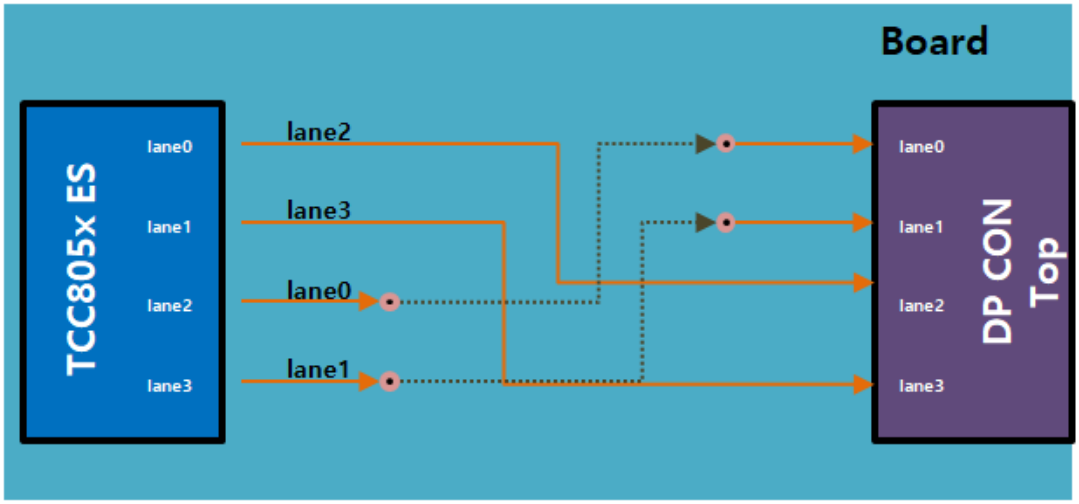

Figure 3.3 DisplayPort Design of TCC805x - Case 2

When the DisplayPort is designed as shown in the Figure 3.3 above, gender board is not required. In this case, even if the gender board is not used, the quality of signal may deteriorate because the DisplayPort lane must be designed by using Vias.

4 WHEN USING DISPLAYPORT SERIALIZER

This chapter explains how to use the DisplayPort serializer.

Some part of DisplayPort serializer supports lane swap function. Therefore, if you use the DisplayPort serializer, you can use the TCC805x CS without board revision.

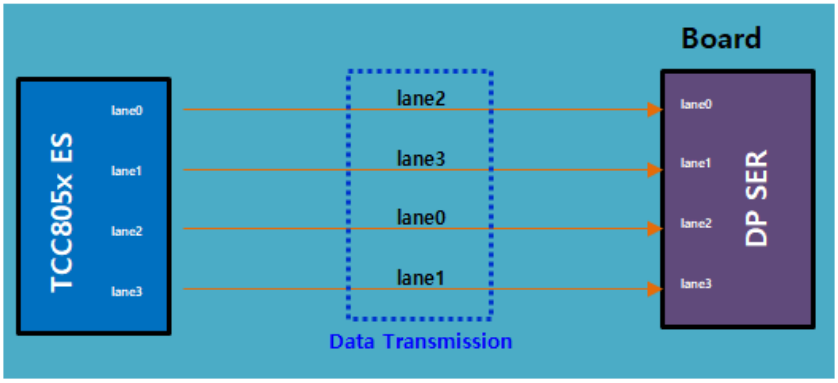

Figure 4.1 DisplayPort Design with DisplayPort Serializer

When you use the DisplayPort serializer, refer to the following usage:

- When using TCC805x ES,
  - The ball map and DisplayPort serializer should be connected one-to-one.
  - The lane swap function of DisplayPort serializer is used.

- When using TCC805x CS,
  - TCC805x is configured to output the same data as ball map, and the lane swap function is not necessary for DisplayPort serializer.
  - TCC805x is configured to output the same data as ES, and the lane swap function is continuously used in DisplayPort serializer.

5 REFERENCES

[1] Contact Telechips for more details: sales@telechips.com
[2] TCC805x Chip Specification

6 REVISION HISTORY

Rev. 0.01: 2020-06-24

- Preliminary version release

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