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ABSTRACT

This schematic checklist provides a brief explanation of the TUSB1004 and TUSB1142 device pin and the recommended configuration of the device pins for default operation. The TUSB1004 is a 10 Gbps USB 3.2 quad channel linear redriver for USB Type-A application. The TUSB1142 is a 10 Gbps USB 3.2 linear redriver with 1:2 DeMUX or 2:1 Mux function for USB-C™ application. This document is intended to aid design at the system level for general applications but should not be the only resource used. In addition to this list, customers are advised to use the information in the TUSB1004 data sheet [1], TUSB1142 data sheet [3], the EVM User's Guides [2] [4] and associated documents to gain a full understanding of device functionality

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Trademarks

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1 Schematic Checklist for TUSB1004 and TUSB1142

Table 1-1. Schematic Checklist ⁽¹⁾

| Pin Name | TUSB1004 Pin Number | TUSB1142 Pin Number | Pin Description | Recommendation |
|----------|------------------------|------------------------|---|--|
| CTX1P | 34 | 33 | Differential positive output for USB port 1 | Should be connected to SSTXn pin of USB connector through an external 220 nF AC-coupling capacitor. |
| CTX1N | 33 | 34 | Differential negative output for USB port 1 | Should be connected to SSTXn pin of USB connector through an external 220 nF AC-coupling capacitor. |
| CRX1P | 31 | 30 | Differential positive input for USB port 1 | Should be connected to RX1p pin of USB connector. Connection can be DC-coupled to USB connector, Or with external 330 nF capacitor |
| CRX1N | 30 | 31 | Differential negative input for USB port 1 | Should be connected to RX1n pin of USB connector. Connection can be DC-coupled to USB connector, Or with external 330 nF capacitor |
| CTX2P | 40 | 40 | Differential positive output for USB port 2 | Should be connected to SSTXn pin of USB connector through an external 220 nF AC-coupling capacitor. |
| CTX2N | 39 | 39 | Differential negative output for USB port 2 | Should be connected to SSTXn pin of USB connector through an external 220 nF AC-coupling capacitor. |
| CRX2P | 37 | 37 | Differential positive input for USB port 2 | Should be connected to RX2p pin of USB connector. Connection can be DC-coupled to USB connector, Or with external 330 nF capacitor |
| CRX2N | 36 | 36 | Differential negative input for USB port 2 | Should be connected to RX2n pin of USB connector. Connection can be DC-coupled to USB connector, Or with external 330 nF capacitor |
| SSTX1P | 15 | | Differential positive input for USB port 1 | Should be connected to USB 3.2 Host transmit port through an external 220 nF AC-coupling capacitor |
| SSTX1N | 16 | | Differential negative input for USB port 1 | Should be connected to USB 3.2 Host transmit port through an external 220 nF AC-coupling capacitor |
| SSRX1P | 18 | | Differential positive output for USB port 1 | Should be connected to USB 3.2 Host receiver port through an external 220 nF AC-coupling capacitor |
| SSRX1N | 19 | | Differential negative output for USB port 1 | Should be connected to USB 3.2 Host receiver port through an external 220 nF AC-coupling capacitor |
| SSTX2P | 9 | | Differential positive input for USB port 2 | Should be connected to USB 3.2 Host transmit port through an external 220 nF AC-coupling capacitor |
| SSTX2N | 10 | | Differential negative input for USB port 2 | Should be connected to USB 3.2 Host transmit port through an external 220 nF AC-coupling capacitor |
| SSRX2P | 12 | | Differential positive output for USB port 2 | Should be connected to USB 3.2 Host receiver port through an external 220 nF AC-coupling capacitor |
| SSRX2N | 13 | | Differential negative output for USB port 2 | Should be connected to USB 3.2 Host receiver port through an external 220 nF AC-coupling capacitor |

Table 1-1. Schematic Checklist ⁽¹⁾ (continued)

| Pin Name | TUSB1004 Pin Number | TUSB1142 Pin Number | Pin Description | Recommendation |
|------------|------------------------|------------------------|---|---|
| SSTXP | | 16 | Differential positive input for USB port | Should be connected to USB 3.2 Host transmit port through an external 220 nF AC-coupling capacitor |
| SSTXN | | 15 | Differential negative input for USB port | Should be connected to USB 3.2 Host transmit port through an external 220 nF AC-coupling capacitor |
| SSRXP | | 19 | Differential positive output for USB port | Should be connected to USB 3.2 Host receiver port through an external 220 nF AC-coupling capacitor |
| SSRXN | | 18 | Differential negative output for USB port | Should be connected to USB 3.2 Host receiver port through an external 220 nF AC-coupling capacitor |
| SSEQ1/A1 | 2 | 2 | In I2C mode, this pin along with A0 pin selects the 7-bit I2C target address . In pin-strap mode, this pin along with SSEQ0 selects the receiver EQ for SSTX1 and /or SSTX2 | |
| SSEQ0/A0 | 35 | 35 | In I2C mode, this pin along with A1 pin selects the 7-bit I2C target address . In pin-strap mode, this pin along with SSEQ1 selects the receiver EQ for SSTX1and/or SSTX2 | |
| EQCFG | 3 | 3 | In pin-strap mode, this controls how CEQ[1:0] pins and SSEQ[1:0] are used. In I2C mode, this pin is for T1 internal test and must be left floating for normal operation | |
| SLP_S0# | 4 | 4 | Rx.Detect function | 1: Rx.Detect Enabled. 0: Rx.Detect Disabled |
| TESTOUT1 | 7 | 7 | T1 internal use | Floating |
| TESTOUT2 | 8 | 8 | T1 Internal use | Floating |
| VIO_SEL | 14 | 14 | Selects the input thresholds for I2C | "0": I2C 3.3 V "R": I2C 1.8 V "F": I2C 3.3 V. "1": I2C 1.8 V. |
| MODE | 17 | 17 | Mode select | "0": pin strap "R":Reserved "F": I2C "1": reserved. |
| SCL/TEST2 | 21 | | I2C Clock in I2C | In pin strap: Pulldown For normal operation |
| SCL/FLIP | | 21 | I2C Clock in I2C | In pin-strap mode, this pin controls the orientation of the MUX |
| SDA/AEQENZ | 22 | 22 | I2C Data in I2C | In pin strap: 0: AEQ enabled. 1: AEQ disabled |
| AEQCFG | 23 | 23 | FULLAEQ_UPPER_EQ limit | In I2C: "0": FULLAEQ_UPPER_EQ = Ah "R": FULLAEQ_UPPER_EQ = Fh "F": FULLAEQ_UPPER_EQ = 8h "1": FULLAEQ_UPPER_EQ = Ch |
| EN | 26 | 26 | Device enable | "0": device disable "1":device enable |
| TEST1 | 27 | | T1 internal use | Connect to VCC |
| TEST1 | | 27 | T1 internal use | Connect to Gnd |
| CEQ0 | 38 | 38 | In pin-strap mode, this pin along with CEQ1 selects the receiver EQ for CRX1 and/or CRX2 | |
| CEQ1 | 29 | 29 | In pin-strap mode, this pin along with CEQ0 selects the receiver EQ for CRX1 and/or CRX2 | |
| VCC | 1,6,20,28 | 1,6,20,28 | 3.3V supply | Connect to 3.3v supply |

Table 1-1. Schematic Checklist ⁽¹⁾ (continued)

| Pin Name | TUSB1004 Pin Number | TUSB1142 Pin Number | Pin Description | Recommendation |
|-------------|------------------------|------------------------|------------------------|----------------------------------|
| Thermal Pad | | | Ground | Connect to a solid ground plane. |
| NC | 5,11,24,25,32 | 5,11,24,25,32 | No internal connection | Floating |
| RSVD1 | | 9 | Reserved | Leave pin unconnected |
| RSVD2 | | 10 | Reserved | Leave pin unconnected |
| RSVD3 | | 12 | Reserved | Leave pin unconnected |
| RSVD4 | | 13 | Reserved | Leave pin unconnected |

(1) All 4-level inputs are latched after the rising edge of EN pin. After these pins are sampled, the internal pull-up and pull-down resistors will be isolated in order to save power.

2 References

1. Texas Instruments: [TUSB1004 USB 3.2 10 Gbps Quad-Channel Adaptive Linear Redriver Data Sheet](#)
2. Texas Instruments: [TUSB1004 EVM User's Guide](#)
3. Texas Instruments: [TUSB1142 USB Type-C™ 10 Gbps USB 3.2 2:1/1:2 Mux/DeMux Adaptive Linear Redriver Data Sheet](#)
4. Texas Instruments: [TUSB1142 EVM User's Guide](#)

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