Application Note
TUSB1004/1142 Schematic Checklist

TEXAS INSTRUMENTS

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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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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 TI 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	TI internal use	Floating
TESTOUT2	8	8	TI 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		TI internal use	Connect to VCC
TEST1		27	TI 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 internalpull-up and pull-down resistors will be isolated in order to save pow.

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: *TUSB1142USB 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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