Application Report
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TUSB2046B Schematic Checklist

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ABSTRACT

TUSB2046B is a USB hub device that provides one upstream port and four downstream ports in compliance with the Universal Serial Bus (USB) specification as a full-speed hub. This schematic checklist provides a brief explanation of each device pin and the recommended configuration of the device pin for default operation. Use this information to check the connectivity for each TUSB2046B on a system schematic.

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 TUSB2046B datasheet, TUSB2046B EVM User's Guide and associated documents to gain a full understanding of device functionality.

NOTE: TUSB2046B has many configurations, this schematic checklist will cover a USB Hub that is configured over I2C with external EEPROM with downstream power switching and overcurrent reporting.

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1 TUSB2046B Schematic Checklist

Table 1. Schematic Checklist

Pin Name	Pin Number(s)	Pin Description	Recommendation
Power Pins			
VCC33	3, 25	3.3 V Positive Power Supply	0.1 uF and 10 uF decoupling capacitors on each VCC pin to GND.
GND	7, 28	Ground	Connected to Ground.
Configuration Pins			
BUSPWR	8	Controls Downstream Facing Ports power source and indicator to USB Host.	Connect 2KΩ pull down to GND for Self-powered mode. This indicates to host downstream ports are powered by external source.
EXTMEMz	26	External EEPROM Indicator.	EXTMEMz = 0, Connect to 3.3V if no external EEPROM is used. EXTMEMz != 0, Connect to GND to use external EEPROM.
EECLK	5	EEPROM Serial Clock	EXTMEMz = 0, Leave pin floating (unconnected). EXTMEMz != 0, Connect to 3-state serial clock output from external EEPROM.
EEDATA/GANGED	6	EEPROM Serial Data/ Power-management indicator.	EXTMEMz = 0, Connect to data line of external EEPROM. EXTMEMz !=0, Connect to GND for per-port power overcurrent detection on downstream ports.
SUSPND	32	Indicates suspend mode on downstream facing ports	Leave unconnected or connect to external power down logic. For normal operation, SUSPND is low. For suspend mode, SUSPND is high.

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Table 1. Schematic Checklist (continued)

Pin Name	Pin Number(s)	Pin Description	Recommendation
TSTMODE	31	Determines 6-MHz or 48-MHz clock mode of TUSB2046B	Connect pin to GND for 6-MHz operation.
TSTPLL/48MCLK	27	Test pin for 6 MHz internal clock or Input pin for 48 MHz external clock.	Connect pin to GND for 6-MHz operation.
XTAL1	30	Crystal clock input.	Using a 6-MHz crystal with 50% duty cycle, Connect the Crystal output to XTAL1. See section 8.3.2 of datasheet for more information.
XTAL2	29	Crystal clock output	Using a 6-MHz crystal with 50% duty cycle,Connect the Crystal input to XTAL2. See section 8.3.2 of datasheet for more information. Leave pin floating when using an oscillator.
RESETz	4	Device active low reset.	Connect to Power-On Reset Circuitry. Must be asserted at power up. When RESET is asserted, all logic is initialized. Generally, a reset with a pulse width between 100 μs and 1 ms is recommended after 3.3-V VCC reaches its 90%. Clock signal has to be active during the last 60 μs of the reset window.
Upstream Facing Port			
DM0	2	Upstream or Root Differential Pair for USB Full Speed Communication.	Connect DM0 and DP0 to D- and D+, respectively, to USB connector on upstream facing hub to USB host.
DP0	1		
Downstream Facing Port [4:1]			
DM[4:1]	11	Downstream Differential Pair for USB Full Speed Port [4:1].	Connect DM1 and DP1 to D- and D+, respectively, to USB connector on downstream facing hub to USB device.
DP[4:1]	12		
OVRCUR[4:1]	10	Input for overcurrent event status on downstream port [4:1].	Connect to overcurrent indicator (FTL pin) on power switch for downstream port [4:1] to allow host control of downstream port power.
PWRON[4:1]	9	Port [4:1] power control signals. Push-Pull output.	Connect to power switch EN pin to allow host control of downstream port power and protection in overcurrent event.
Notes: Routing through ESD or common mode choke before receptacle is allowed and recommened. Common mode chokes placed as close as possible to the USB connectors. Verify the pinout of the USB connectors. Verify pin-out of TUSB2046B matches datasheet. Always refer to the datasheet of this device for complete descriptions of each pin. For USB complant applications overcurrent events on downstream ports must be reported to the USB host.			

2 References

- 4-Port Hub for the Universal Serial Bus With Optional Serial EEPROM Interface, Datasheet

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