Application Report
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SN65LVPE502A to TUSB522P Change Document

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ABSTRACT

This document defines pinout differences between the SN65LVPE502A and the TUSB522P and highlights possible changes needed to convert existing system designs from using the SN65LVPE502A to the TUSB522P.

NOTE: This document also applies to the following devices: SN65LVPE502, SN65LVPE512, and SN65LVPE502B.

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1 Pinout Comparison

Table 1 documents the changes in the pin definitions of the SN65LVPE502A and TUSB522P devices and highlights pin configurations that may need to change when using the TUSB522P to replace the SN65LVPE502A in an existing system.

Table 1. SN65LVPE502A to TUSB522P Pinout Change

Pin	SN65LVPE502A	TUSB522P	SN65LVPE502A to TUSB522P Change Notes
1	VCC	VCC	No change required
2	EQ1	EQ1	Low = 3 dB, Floating = 6 dB, High = 9 dB
3	DE1	DE2	{OS = Low} Low = 0 dB, Floating = –3.5 dB, High = –6.2 dB {OS = High} Low = –2.6 dB, Floating = –5.9 dB, High = –8.3 dB
4	OS1	OS2	Low(Floating) = 900 mV, High = 1200 mV
5	EN_RXD	EN_RXD	Requires Pull-up to VCC
6	GND	NC	Can be tied to GND or left as NC
7	NC	NC	No change required
8	Host_RX1–	RX1N	Can be connected to either Host or Device
9	Host_RX1+	RX1P	Can be connected to either Host or Device
10	GND	GND	No change required
11	Host_TX2–	TX2N	Can be connected to either Host or Device
12	Host_TX2+	TX2P	Can be connected to either Host or Device
13	VCC	VCC	No change required
14	RSVD	RSV	No change required
15	OS2	OS1	Low(Floating) = 900 mV, High = 1200 mV
16	DE2	DE1	{OS = Low} Low = 0 dB, Floating = –3.5 dB, High = –6.2 dB {OS = High} Low = –2.6 dB, Floating = –5.9 dB, High = –8.3 dB
17	EQ2	EQ2	Low = 3 dB, Floating = 6 dB, High = 9 dB
18	GND	NC	Can be tied to GND or left as NC
19	Device_RX2+	RX2P	Can be connected to either Host or Device
20	Device_RX2–	RX2N	Can be connected to either Host or Device
21	GND	GND	No change required
22	Device_TX1+	TX1P	Can be connected to either Host or Device
23	Device_TX1+	TX1N	Can be connected to either Host or Device
24	NC	NC	No change required

No Changes Required

Possible Changes Required

Required for Normal Operation

2 VCC/GND

No changes are required for the VCC/GND pins. The TUSB522P has NC pins which are GND pins on the SN65LVPE502A (Pins 6 and 18), these pins can also be tied to GND.

3 No Connect

No changes are required for NC pins.

4 High-Speed Differential Signals

The TUSB522P high-speed differential signals require no changes. The TUSB522P design no longer requires dedicated pin connections for host and device as was needed for the SN65LVPE502A.

5 Equalization (EQ)

The equalization settings have changed from the SN65LVPE502A to the TUSB522P which may require changes in the configuration of the EQ1/2 pins. For example, an EQ setting of “Low” configures the SN65LVPE502A to use 7 dB of equalization, this same EQ setting should change to “Floating” to provide 6 dB equalization when configuring the TUSB522P. Table 2 and Table 3 show the EQ pin definitions for the TUSB522P and SN65LVPE502A.

Table 2. TUSB522P Equalization Control Pin Settings

Pin	Description	Logic State	Gain (dB)
EQ1/EQ2	Equalization Amount	Low	3
		Floating	6
		High	9

Table 3. SN65LVPE502A Equalization Control Pin Settings

Pin	Description	Logic State	Gain (dB)
EQ1/EQ2	Equalization Amount	Low	7
		Floating	0
		High	15

6 Output Swing (OS)

The output swing settings have changed from the SN65LVPE502A to the TUSB522P which also may require changes in the configuration of the OS1/2 pins. OS control for channels 1 and 2 are also swapped in the TUSB522P. Table 4 and Table 5 show the OS1/2 pin definitions for the TUSB522P and the SN65LVPE502A.

Table 4. TUSB522P OS Control Pin Settings

Pin	Description	Logic State	Transition Bit Output Differential Voltage (mV)
OS1/2	Output Swing	Low (Floating)	900
		High	1200

Table 5. SN65LVPE502A OS Control Pin Settings

Pin	Description	Logic State	Transition Bit Output Differential Voltage (mV)
OS1/2	Output Swing	Low	908
		Floating	1042
		High	1127

7 De-Emphasis (DE)

De-emphasis configuration settings have changed between the TUSB522P and the SN65LVPE502A. DE control for channels 1 and 2 are also swapped in the TUSB522P. These changes may require configuration changes when moving from the SN65LVPE502A to the TUSB522P. Table 6 and Table 7 show the DE pin definitions for the TUSB522P and the SN65LVPE502A.

Table 6. TUSB522P De-Emphasis Control Pin Settings

Pin	Description	Logic State	De-Emphasis Ratio (dB)	
			OS = Low(Floating)	OS = High
DE1/2	De-Emphasis Amount	Low	0	–2.6
		Floating	–3.5	–5.9
		High	–6.2	–8.3

Table 7. SN65LVPE502A De-Emphasis Control Pin Settings

Pin	Description	Logic State	De-Emphasis Ratio (dB)		
			OS = Floating	OS = Low	OS = High
DE1/2	De-Emphasis Amount	Low	–3.5	–2.2	–4.4
		Floating	0	0	0
		High	–6.0	–5.2	–6.0

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