853S01

Input Interface Termination with AC Coupling Examples

Abstract

This document provides examples of input interface termination with AC coupling. The 853S01 clock input is used for demonstration purposes in this document. These examples can also be used in the receiver with input specification. The driver can be LVPECL, CML, LVDS, HCSL, or other driver that provides a different switching clock signal.

Contents

Figures

1. Driver Examples

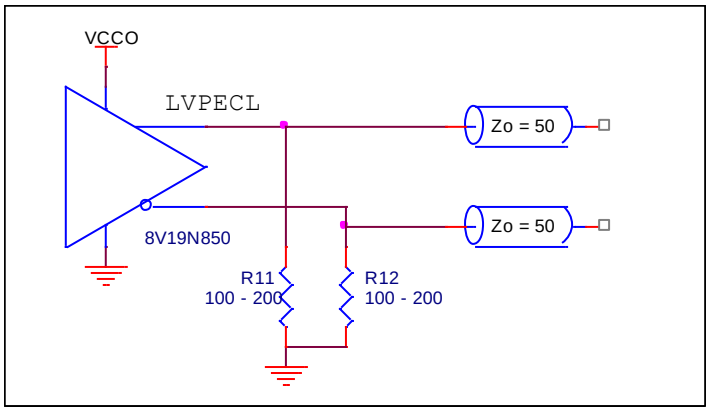

Figure 1. LVPECL Driver Example

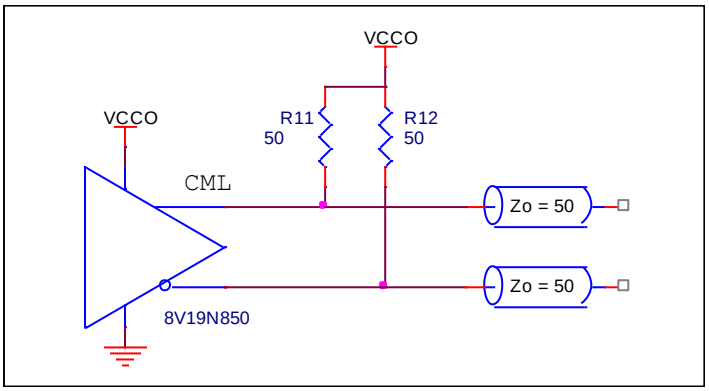

Figure 2. CML Driver Example

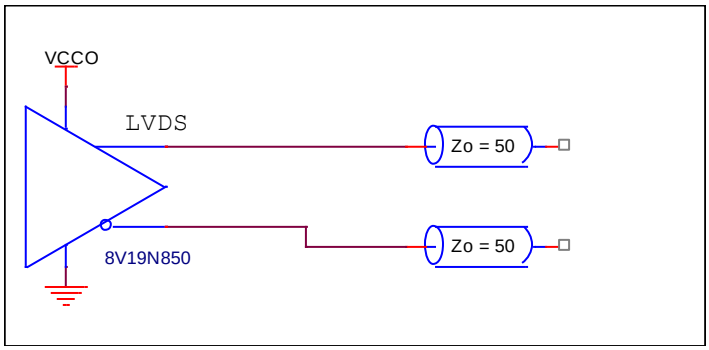

Figure 3. LVDS Driver Example

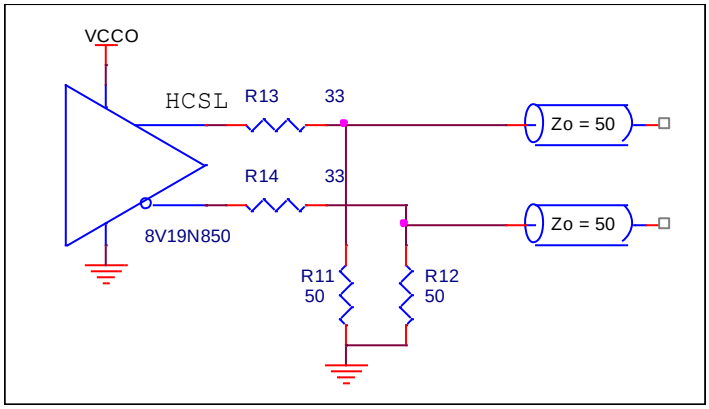

Figure 4. HCSL Driver Example

2. 853S01 Input Requirement

Table 4D. LVPECL DC Characteristics, V_{CC} = 3.3V±5%; V_{EE} = 0V, T_A = -40°C to 85°C

Symbol	Parameter		Test Conditions	Minimum	Typical	Maximum	Units
I_{IH}	Input High Current	PCLK0, PCLK1, nPCLK0, nPCLK1	V_{CC} = V_{IN} = 3.465V			150	µA
I_{IL}	Input Low Current	PCLK0, PCLK1	V_{CC} = 3.465V, V_{IN} = 0V	-10			µA
		nPCLK0, nPCLK1	V_{CC} = 3.465V, V_{IN} = 0V	-150			µA
V_{PP}	Peak-to-Peak Voltage; NOTE 1			150		1200	mV
V_{CMR}	Common Mode Input Voltage; NOTE 1, 2			1.2		V_{CC}	V
V_{OH}	Output High Voltage; NOTE 3			V_{CC} – 1.125		V_{CC} – 0.875	V
V_{OL}	Output Low Voltage; NOTE 3			V_{CC} – 1.895		V_{CC} – 1.62	V
V_{SWING}	Peak-to-Peak Output Voltage Swing			0.495		0.975	V
V_{BB}	Bias Voltage			1.695		2.145	V

NOTE 1: V_{IL} should not be less than V_{EE} – 0.3V.
NOTE 2: Common mode input voltage is defined as V_{IH}.
NOTE 3: Outputs terminated with 50Ω to V_{CC} – 2V.

Table 4E. LVPECL DC Characteristics, V_{CC} = 2.5V±5%; V_{EE} = 0V, T_A = -40°C to 85°C

Symbol	Parameter		Test Conditions	Minimum	Typical	Maximum	Units
I_{IH}	Input High Current	PCLK0, PCLK1, nPCLK0, nPCLK1	V_{CC} = V_{IN} = 2.625V			150	µA
I_{IL}	Input Low Current	PCLK0, PCLK1	V_{CC} = 2.625V, V_{IN} = 0V	-10			µA
		nPCLK0, nPCLK1	V_{CC} = 2.625V, V_{IN} = 0V	-150			µA
V_{PP}	Peak-to-Peak Voltage; NOTE 1			150		1200	mV
V_{CMR}	Common Mode Input Voltage; NOTE 1, 2			1.2		V_{CC}	V
V_{OH}	Output High Voltage; NOTE 3			V_{CC} – 1.125		V_{CC} – 0.875	V
V_{OL}	Output Low Voltage; NOTE 3			V_{CC} – 1.895		V_{CC} – 1.62	V
V_{SWING}	Peak-to-Peak Output Voltage Swing			0.495		0.975	V
V_{BB}	Bias Voltage			0.935		1.305	V

NOTE 1: V_{IL} should not be less than V_{EE} – 0.3V.
NOTE 2: Common mode input voltage is defined as V_{IH}.
NOTE 3: Outputs terminated with 50Ω to V_{CC} – 2V.

3. Input Interface with AC Coupling

3.1 Example 1

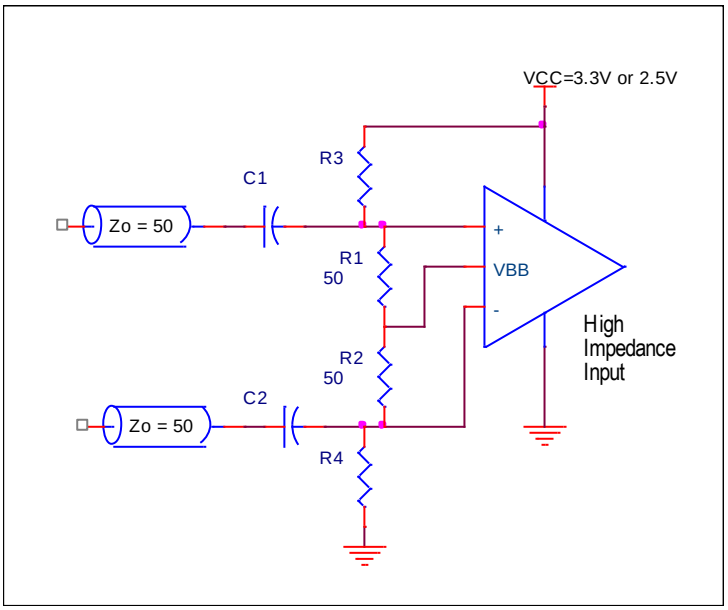

Figure 5. Example 1 – 853S01 Input Interface

R3 and R4 is optional. Suggest spare footprint for Self-oscillation Prevention.

	VCC = 2.5V	VCC = 3.3V
R3 (Ohm)	2.2k	2.2k
R4 (Ohm)	2.2k	3.6k

3.2 Example 2

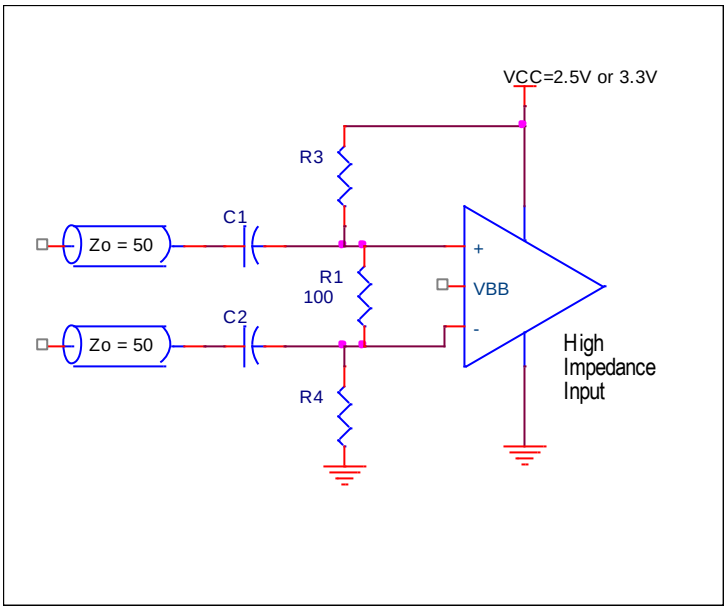

Figure 6. Example 2 – 853S01 Input Interface

R3 and R4 is optional. Suggest spare footprint for Self-oscillation Prevention.

	VCC = 2.5V	VCC = 3.3V
R3 (Ohm)	2.2k	2.2k
R4 (Ohm)	2.2k	3.6k

3.3 Example 3

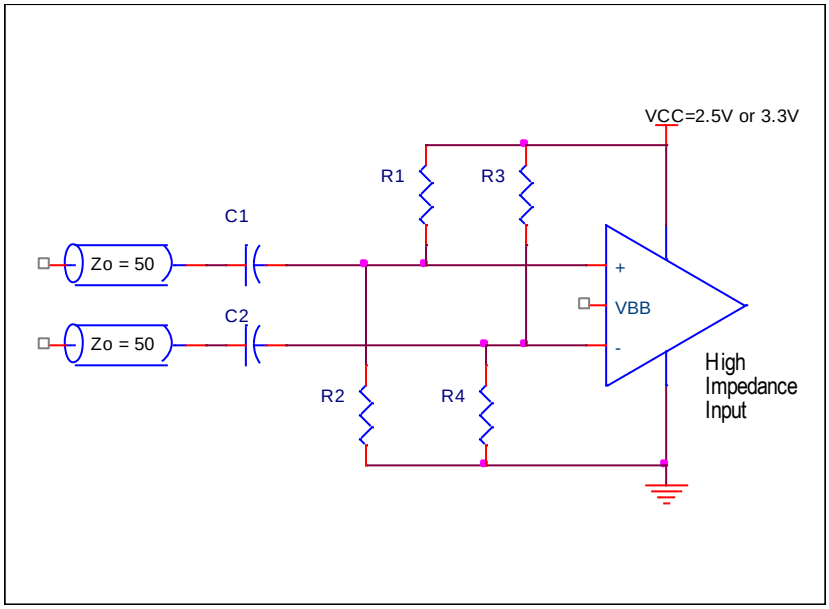

Figure 7. Example 3 – 853S01 Input Interface

	VCC = 2.5V	VCC = 3.3V
R1 (Ohm)	100	133
R3 (Ohm)	100	133
R2 (Ohm)	100	82.5
R4 (Ohm)	100	82.5

4. Revision History

Revision	Date	Description
1.0	Oct.28.20	Initial release.

IMPORTANT NOTICE AND DISCLAIMER

RENESAS ELECTRONICS CORPORATION AND ITS SUBSIDIARIES (“RENESAS”) PROVIDES TECHNICAL SPECIFICATIONS AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for developers who are designing with Renesas products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. Renesas grants you permission to use these resources only to develop an application that uses Renesas products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Renesas intellectual property or to any third-party intellectual property. Renesas disclaims responsibility for, and you will fully indemnify Renesas and its representatives against, any claims, damages, costs, losses, or liabilities arising from your use of these resources. Renesas' products are provided only subject to Renesas' Terms and Conditions of Sale or other applicable terms agreed to in writing. No use of any Renesas resources expands or otherwise alters any applicable warranties or warranty disclaimers for these products.

(Disclaimer Rev.1.01 Jan 2024)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit www.renesas.com/contact-us/.

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.