

# TR1329

## TJA1100 Customer Evaluation Board - User Guide

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User Manual

### Document information

Info	Content
<b>Title</b>	TJA1100 Customer Evaluation Board - User Guide
<b>Author(s)</b>	Steffen Lorenz; Simon Zhu
<b>Department</b>	Systems & Applications
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**Revision history**

Rev	Date	Description
1.0	20160112	Initial version
1.1	20160816	Updated for board revision V6, with latest EMC filter and ESD protection <ul style="list-style-type: none"><li>- Fig. 1, 2, 4, 5, 6, 7, 8 updated</li><li>- Section 4.1: schematics updated</li></ul>
1.2	20180131	Updated for board revision V7, with latest MDI circuitry and new connector <ul style="list-style-type: none"><li>- CE compliancy statement added</li><li>- Fig. 1, 2, 3, 4, 5, 6, 7 updated</li><li>- Section 2.2.1 description of bit strapping added</li><li>- Section 4.1 schematics updated</li></ul>

**Contact information**

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For sales office addresses, please send an email to: [salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)

## 1. Introduction

This document describes the usage of the TJA1100 Customer Evaluation Board. The Board supports the evaluation of the TJA1100 with providing (MII) a 40-pins standard header (including MII/SMI/control signals/power supplies. Details can be found in section 2.3.1) with 2,54mm pinning distance to a host controller board, the bus interface (MDI) including a screw terminal (SMKDS) connector as well as needed components for the power supply and operation. Further information is given in the following sections.

**Please note:** the evaluation board has been designed for functional evaluation of the PHY in your environment. The evaluation board is not intended for EMC or compliance qualification measurements.

This product has not undergone formal EU EMC assessment. As a component used in a research environment, it will be the responsibility of the user to ensure the finished assembly does not cause undue interference when used and cannot be CE marked unless assessed.

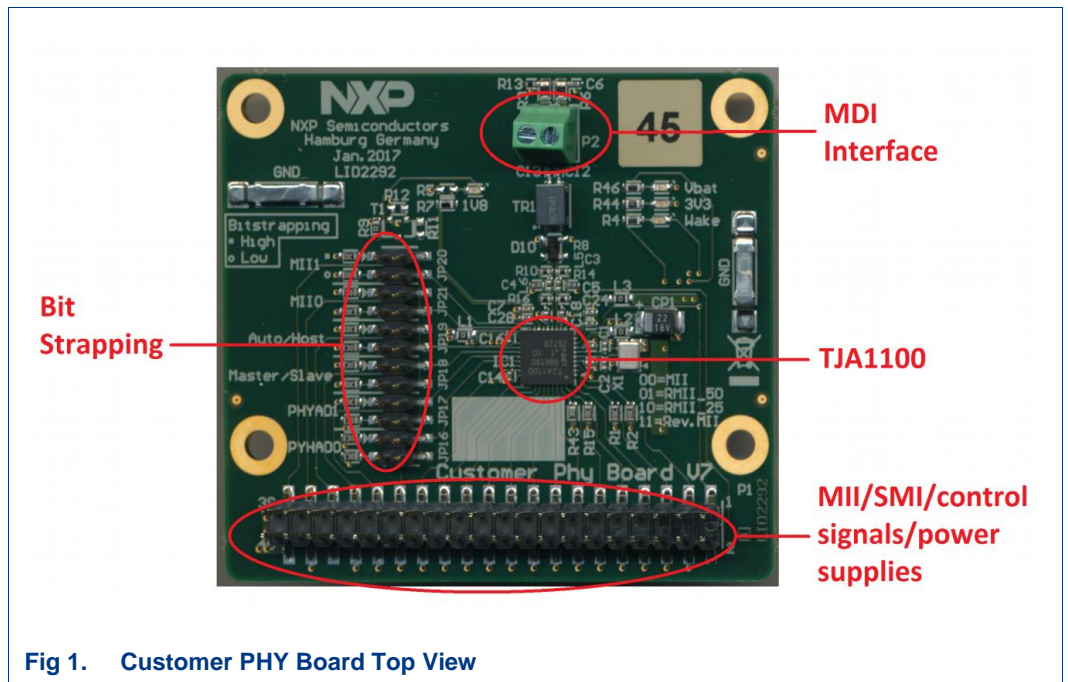


Fig 1. Customer PHY Board Top View

## 1.1 Acronyms

Table 1. Acronyms used in the document

Acronym	Description
BAT	Battery
DC	Direct Current
GND	Ground
MAC	Medium Access Controller
MDI	Medium Dependent Interface
MII	Medium Independent Interface
PHY	Physical
uC	Microcontroller

## 2. Board Setup

### 2.1 PHY Assembly

The TJA1100 is provided in a HVQFN-36 package (8x8sqmm). In case the TJA1100 on the customer evaluation board must be changed, please ensure the correct placement. The Pin 1 is located at the bottom right and is marked with a small white arrow (see Fig 2).

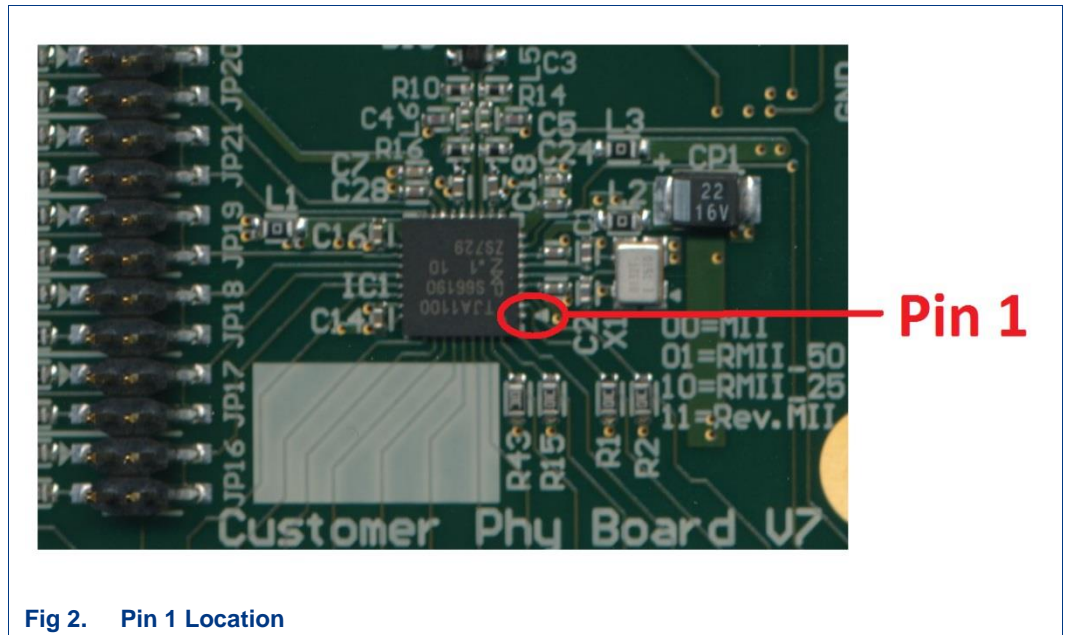


Fig 2. Pin 1 Location

### 2.2 Jumper Settings

#### 2.2.1 Bit Strapping

The TJA1100 has several configuration pins for a pre-configuration during startup. The following tables give an overview of the related jumpers and possible configurations, as shown also in Fig 3. At the PCB (Fig 4) the orientation for High (H) and Low (L) is marked.

**Please note:** all pre-configuration (except for the PHY addresses) can be overwritten via SMI command.

PHY address is used for the SMI address and for initialization of the Cipher scrambler key. The PHY address is five bits (PHYAD4...PHYAD0), and PHYAD4 is the MSB of the address.

PHYAD[4:2] are set to "001" in the TJA1100. PHYAD[1:0] are pre-determined by bit strapping.

**Table 2. Bit Strapping PHY-address**

Jumper	Function	Address 4	Address 5	Address 6	Address 7
JP16	Configuration of PHYAD0	L	H	L	H
JP17	Configuration of PHYAD1	L	L	H	H

The TJA1100 can be configured as Master or Slave, as well as Managed or Autonomous operation. When the TJA1100 is configured for Autonomous operation, the PHY will automatically enter Normal mode and activate the link on power-on without further interaction with a host controller.

**Table 3. Bit Strapping Master/Slave Configuration**

Jumper	Function	Master	Slave
JP18	Configuration of CONFIG0	H	L

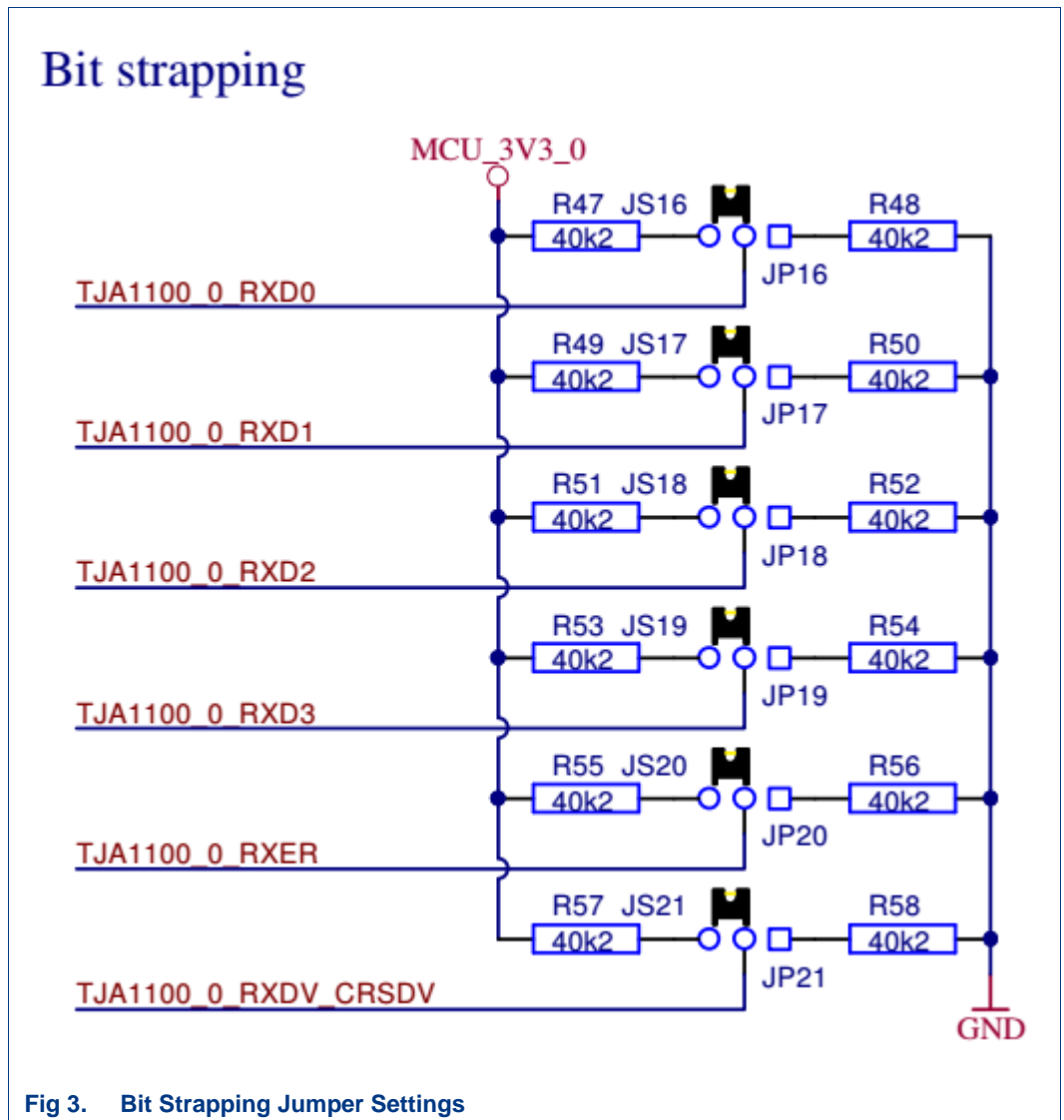
**Table 4. Bit Strapping Managed/autonomous Operation**

Jumper	Function	Managed	Autonomous
JP19	Configuration of CONFIG1	L	H

The TJA1100 provides below MII modes, which can be configured via bit strapping.

**Table 5. Jumper Settings for Bit Strapping**

Jumper	Function	MII	RMII 50MHz	RMII 25MHz	Reverse MII
JP21	Configuration of CONFIG2	L	H	L	H
JP20	Configuration of CONFIG3	L	L	H	H



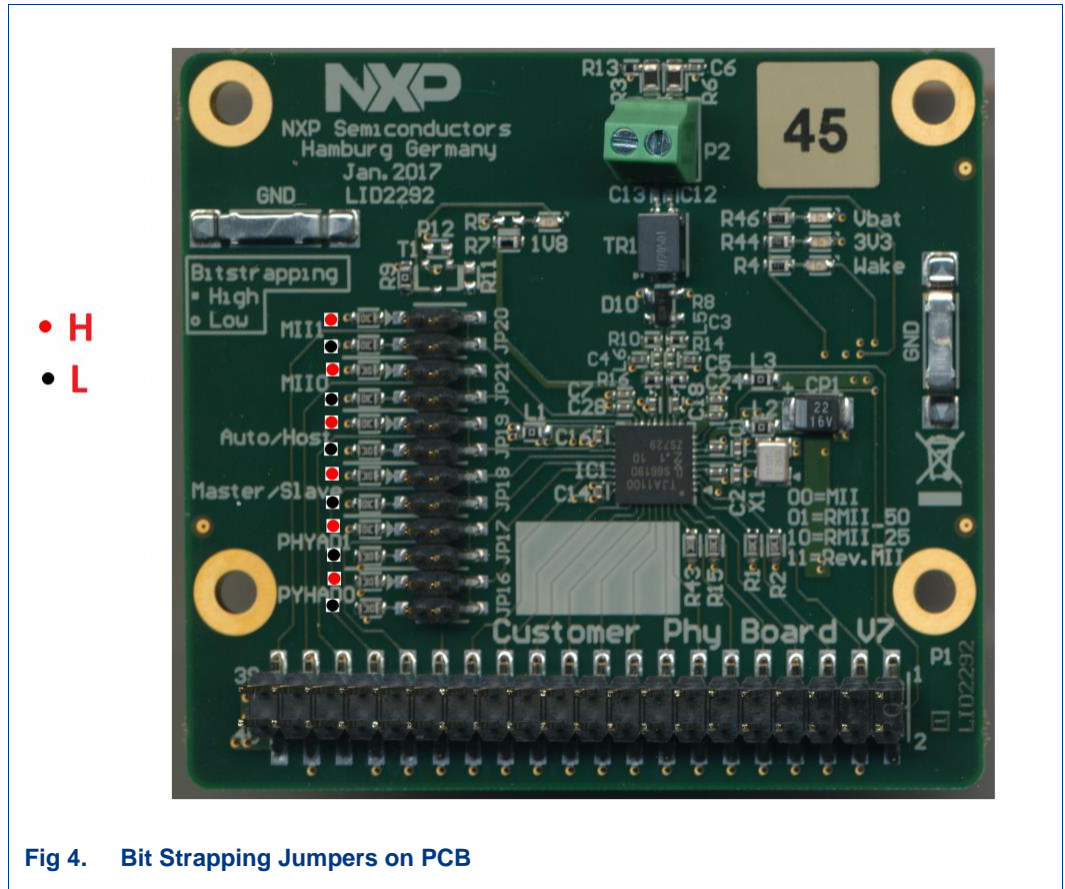


Fig 4. Bit Strapping Jumpers on PCB



## 2.3 Connectors & LEDs

### 2.3.1 MII Connector

For the MII a double row, 40 pin 2.54x2.54mm male header P1 (Fig 5) is used. At the PCB (Fig 5Error! Reference source not found.) the pinning order is marked.

The pinning order of the MII connector is given in 0.

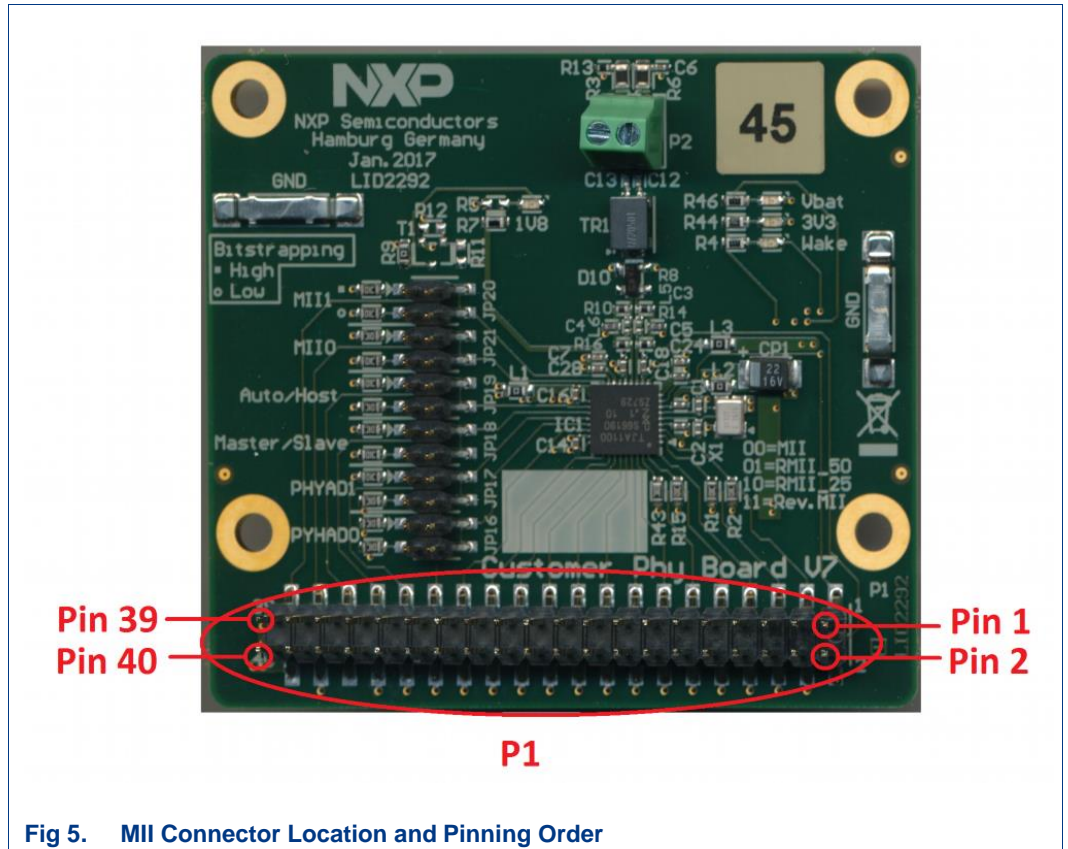


Fig 5. MII Connector Location and Pinning Order

**Table 6. MII Connector Pinning**

Pin	Signal	Signal	Pin
1	TJA1100_WAKE	TJA1100_INH	2
3	TJA1100_RSTN	GND	4
5	TJA1100_INT	GND	6
7	TJA1100_MDC	GND	8
9	TJA1100_MDIO	GND	10
11	TJA1100_EN	GND	12
13	TJA1100_TXER	GND	14
15	TJA1100_TXD0	GND	16
17	TJA1100_TXD1	GND	18
19	TJA1100_TXD2	GND	20
21	TJA1100_TXD3	GND	22
23	TJA1100_TXEN	GND	24
25	TJA1100_TXCLK	GND	26
27	TJA1100_RXCLK	GND	28
29	TJA1100_RXD0	GND	30
31	TJA1100_RXD1	GND	32
33	TJA1100_RXD2	GND	34
35	TJA1100_RXD3	3V3	36
37	TJA1100_RXDV	GND	38
39	TJA1100_RXER	BAT	40

2.3.2 MDI Connector

For the MDI interface, a two position PCB terminal connector (SMKDS, 5/2-2.54) from Phoenix Contact is used, and the details are given in Fig 6.

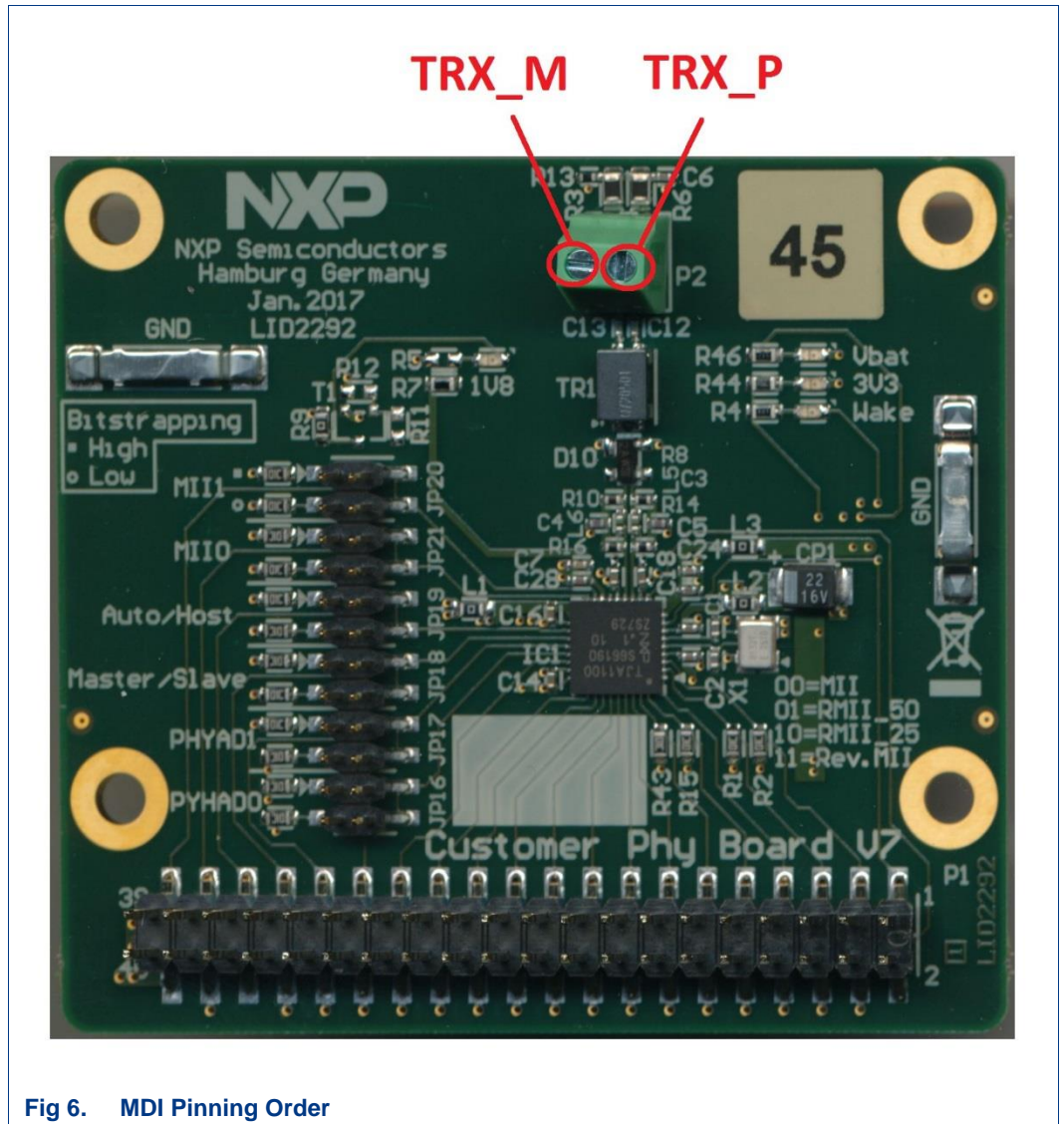


Fig 6. MDI Pinning Order

2.3.3 LEDs

The LEDs on the Board can be used to evaluate the status of the Board. Fig 7 shows all the LEDs on the Board, and Table 7 sums up the meaning of each LED.

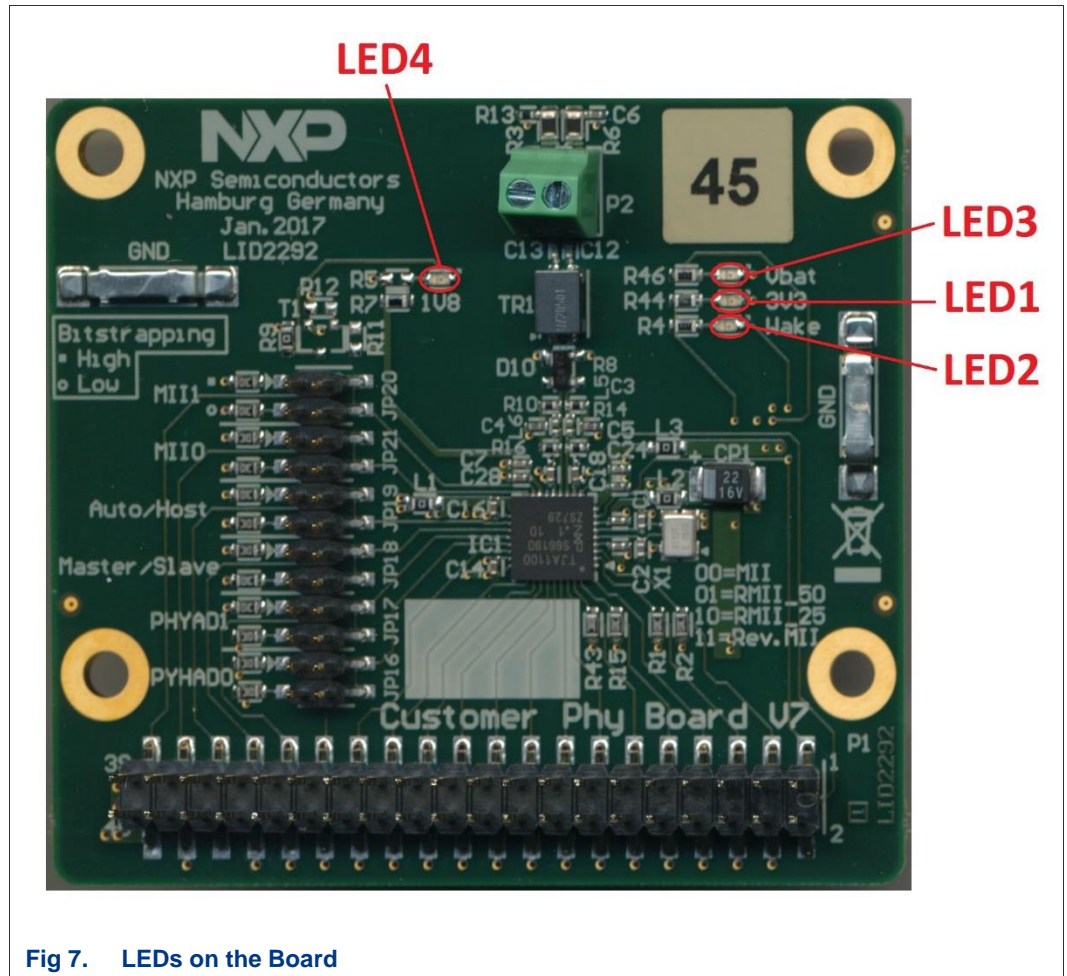


Fig 7. LEDs on the Board

Table 7. Descriptions of LEDs

LED	Description
LED1	TJA1100 3V3 Power Supply Status (ON: 3V3 is present)
LED2	TJA1100 Local Wake-up Status (Flashing: a Local Wake-up is detected)
LED3	TJA1100 Battery Power Supply Status (ON: Battery is present)
LED4	TJA1100 1V8 Digital Power Supply Status (ON: 1V8 is present)

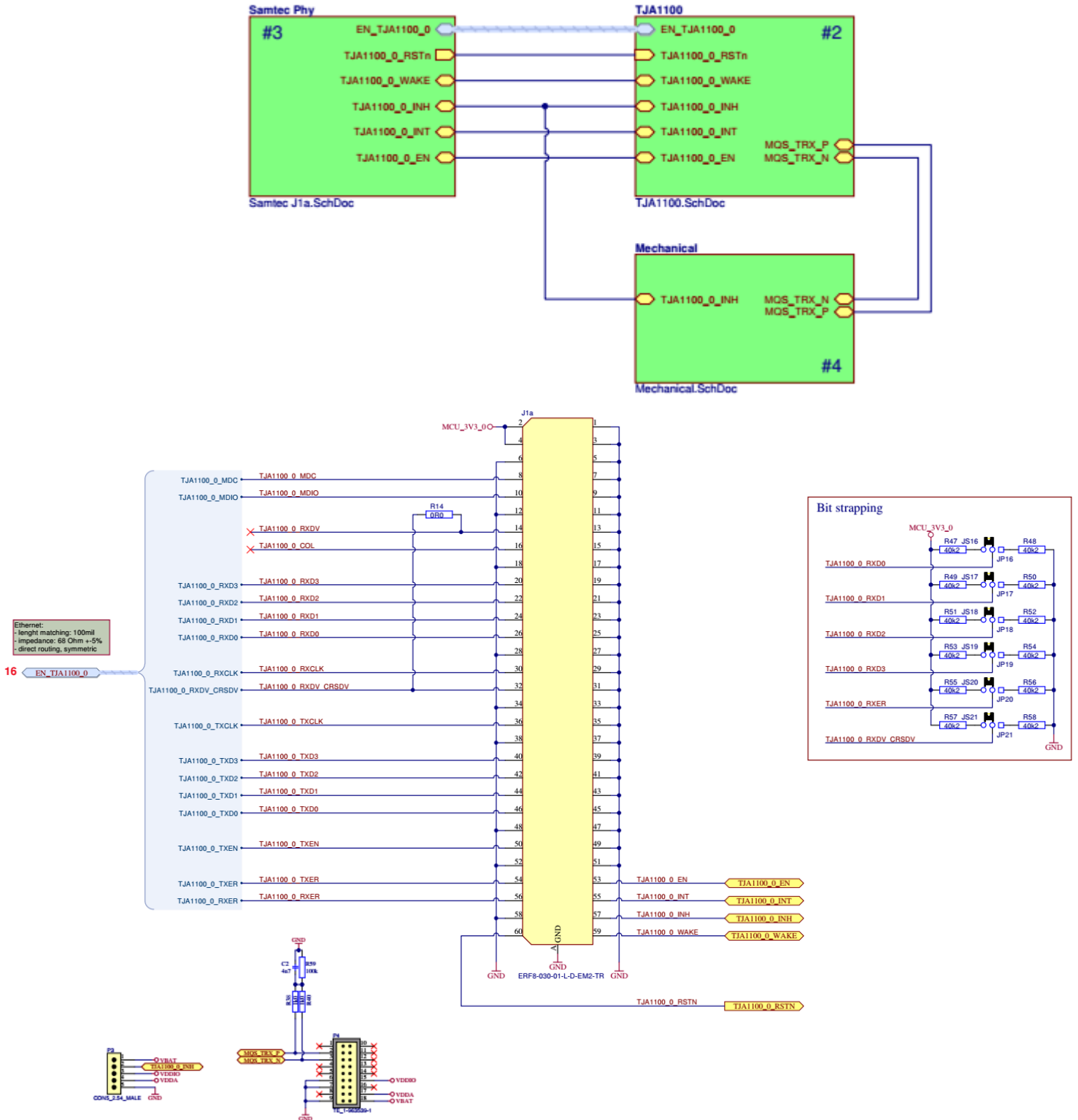
### 3. Reference

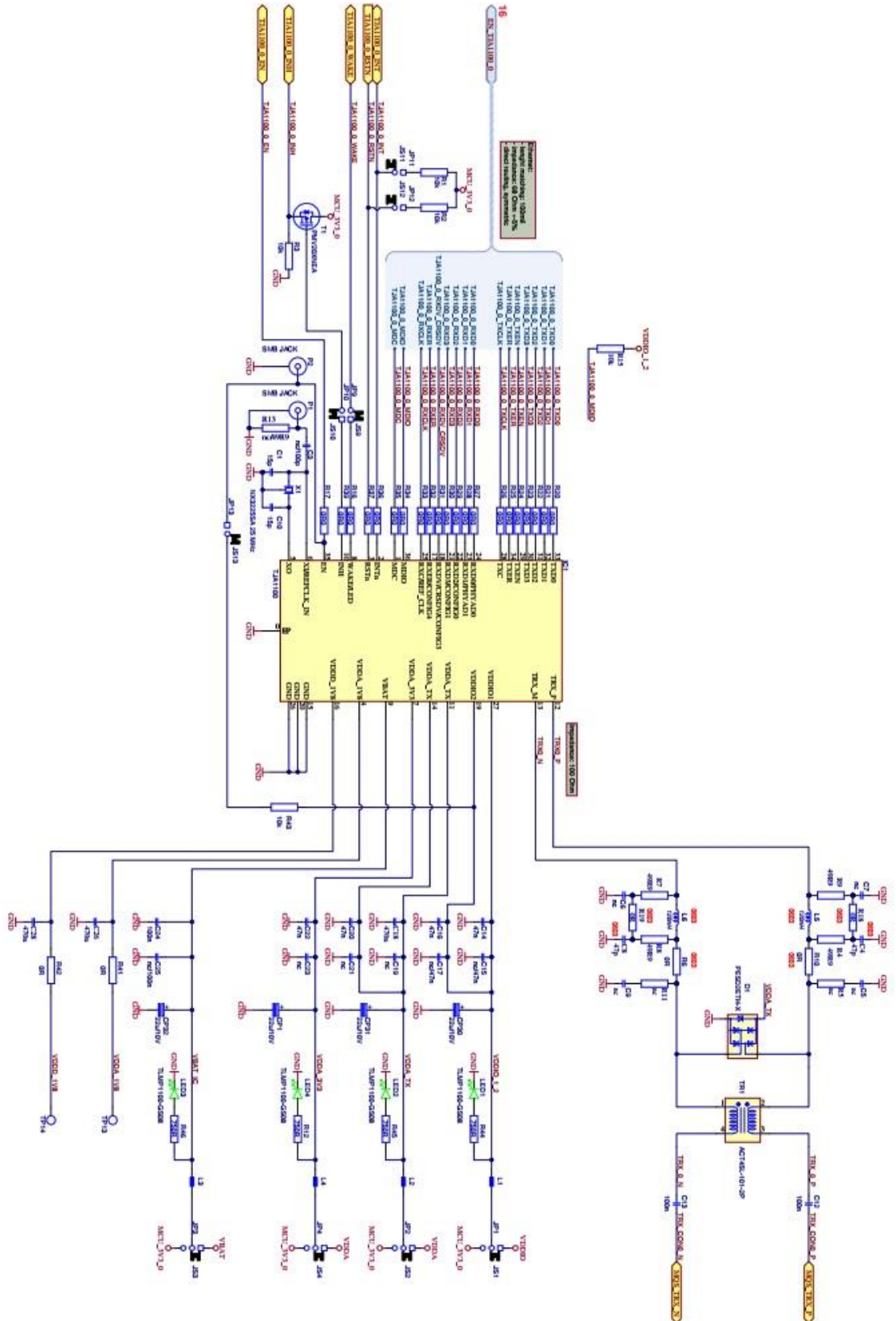
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[1] TJA1100 Datasheet, Version 3, 23 May, 2017

## 4. Appendix

### 4.1 The TJA1100 Customer Evaluation Board Schematics





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### 5.1 Definitions

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