CA-IS305x Isolated CAN Transceiver Test Board Description

General Description

This document outlines the procedure for utilizing the CA-IS305x isolated CAN transceiver evaluation board. The evaluation board allows users to assess the performance of the chip and conduct a comprehensive analysis of isolated systems, thereby accelerating the development process.

CA-IS305x Introduction

The CA-IS305x is an isolated Controller Area Network (CAN) transceiver that complies with the ISO11898-2 physical layer specification. The internal logic inputs and output buffers are isolated by a silicon dioxide (SiO2) insulating gate, capable of withstanding isolation voltages up to 5000VRMS (60s) in a wide-body SOIC package, and a typical CMTI of ±150kV/μs. The CA-IS305x is designed to be powered by a single supply from 2.5V to +5.5V on the logic side, allowing for seamless integration with CAN controllers of varying voltages. The CA-IS305x is powered by a single 2.5V to +5.5V supply on the logic side, allowing for straightforward connection of different voltage CAN controllers. The transceivers support transmission rates up to 1 Mbps and provide current limiting, thermal, and ±58 V overvoltage protection at the transmitter outputs. Additionally, dominant state timeout detection prevents bus blocking due to controller errors or TXD input failures, ensuring reliable operation. Furthermore, the CAN receiver inputs of this product family have a common-mode input range (CMR) of ±30V, which exceeds the ±2V to ±7V range specified in the ISO 11898 standard.

This article uses the CA-IS3050U as a case study to demonstrate the use of the CA-IS305x beta version. The corresponding PCB can be applied to both the CA-IS3050U and the CA-IS3050CU, which are of the same package DUB8. For other package forms with the material number, please refer to this article.

The CA-IS305x product line includes the following models:

Part #	V_{CC1}(V)	V_{CC2}(V)	transmission speed (Mbps)	Galvanic Isolation (V_{RMS})	Package
CA-IS3050G	2.5~5.5	4.5~5.5	1	5000	SOIC8-WB
CA-IS3052G	2.5~5.5	4.5~5.5	1	5000	SOIC8-WB
CA-IS3050W	2.5~5.5	4.5~5.5	1	5000	SOIC16-WB
CA-IS3052W	2.5~5.5	4.5~5.5	1	5000	SOIC16-WB
CA-IS3050U	2.5~5.5	4.5~5.5	1	3750	DUB8
CA-IS3050WG	2.5~5.5	4.5~5.5	1	7500	SOIC8-WWB

The CA-IS305Cx product line includes the following models:

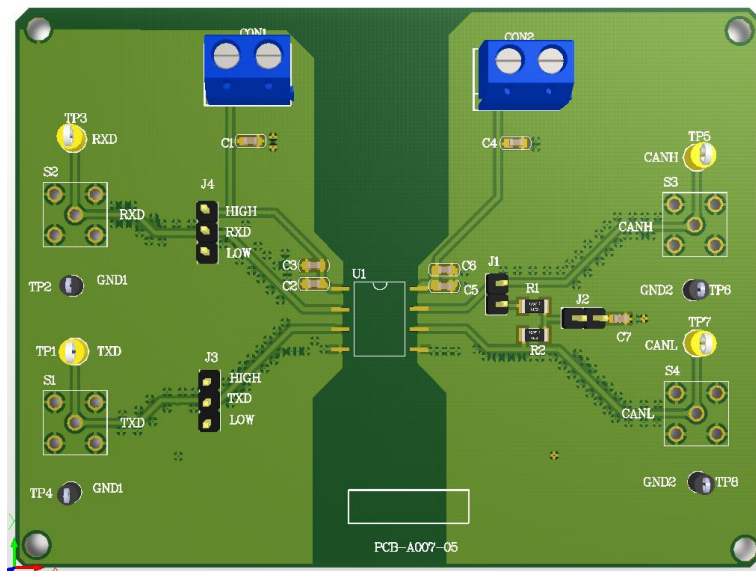| Part #	$V_{CC1}(V)$	$V_{CC2}(V)$	transmission speed (Mbps)	Galvanic Isolation (V_{RMS})	Package
CA-IS3050CG	3.0~5.5	4.5~5.5	5	5000	SOIC8-WB
CA-IS3052CG	3.0~5.5	4.5~5.5	5	5000	SOIC8-WB
CA-IS3050CW	3.0~5.5	4.5~5.5	5	5000	SOIC16-WB
CA-IS3052CW	3.0~5.5	4.5~5.5	5	5000	SOIC16-WB
CA-IS3050CU	3.0~5.5	4.5~5.5	5	3750	DUB8

CA-IS3050U DUB8 EVM Board

Figure 1. The CA-IS3050U DUB8 PCB

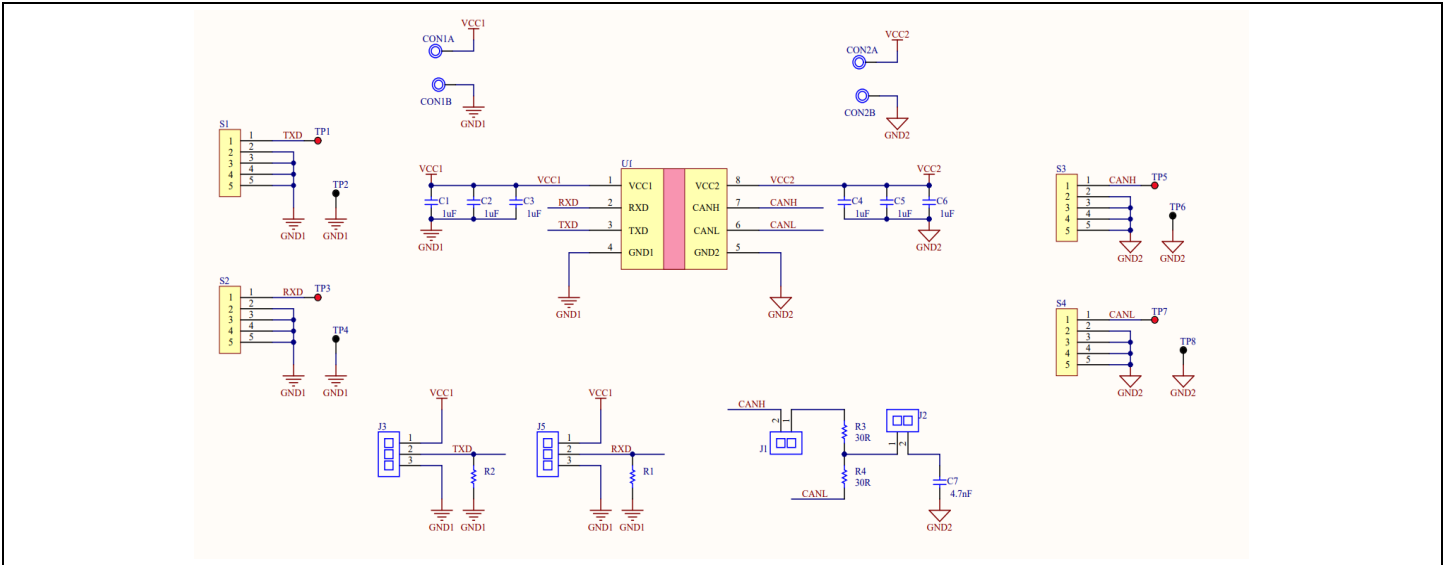## CA-IS3050U DUB8 EVM Schematic

Figure 2. CA-IS3050U DUB8 EVM Schematic
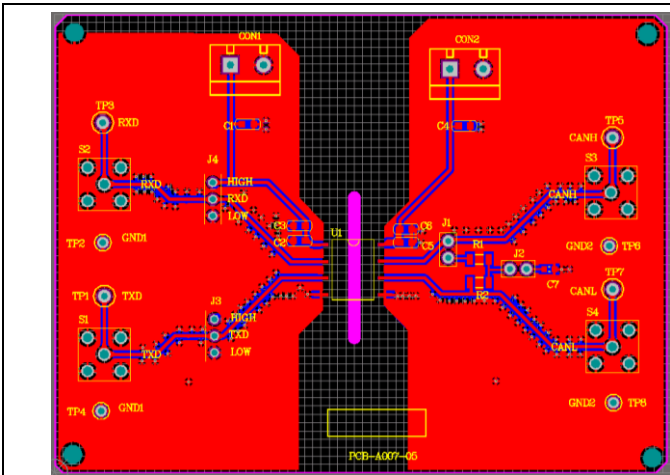
CA-IS3050U DUB8 EVM PCB Layouts
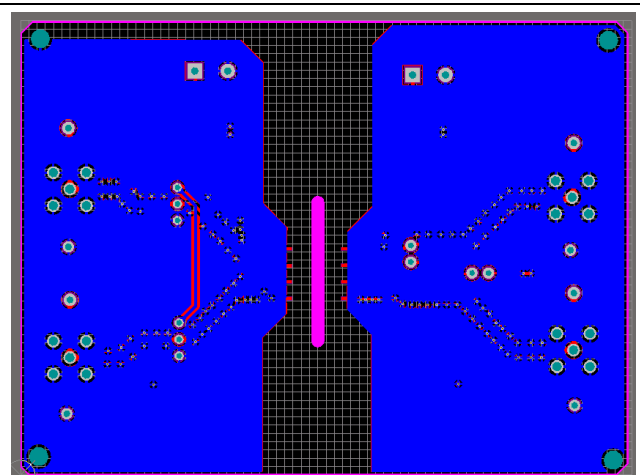

Figure 3. The CA-IS3050U DUB8 EVM PCB Layout_ Top

Figure 4. The CA-IS3050U DUB8 EVM PCB Layout_ Bottom

EVM Bill of Materials

Item	Ref Des	Qty	Description	Package	MFR	PN.
1	CON1, CON2	2	CONN, 5.08mm, Rising Cage Clamp	KF301-5.0-2P	-	-
2	C1, C2, C3, C4, C5, C6	6	Ceramic cap,1uF/10V, X7R,0603	0603	-	-
3	C7	1	Ceramic cap,4.7nF/50V, X7R,0603	0603	-	-
4	S1, S2, S3, S4	4	SMA Connect, 2.54mm	SMA	-	-
5	J1, J2	2	Header, Unshrouded, 2.54mm, Male, 2P	-	-	-
6	J3, J4	2	Header, Unshrouded, 2.54mm, Male, 3P	-	-	-
7	R1, R2	2	NA	-	-	-
8	R3, R4	2	SMD Res,30R,1%	R1206	-	-
9	TP1, TP3, TP5, TP7	4	Test Point, Yellow, Through Hole, 1mm	-	Keystone	5000
10	TP2, TP4, TP6, TP8	4	Test Point, Black, Through Hole, 1mm	-	Keystone	5001
11	U1	1	CA-IS3050U	DUB8	Chipanalog	-

Test Equipment

● Power Supplies
● 500MHz Wideband Oscilloscope (Agilent DSOX3054T)
● High-frequency Signal Generator
● 6.5-bit Digital Multi-Meter (Agilent 34465A)

Hardware Setup

1. Connect the DC voltage source to B1/B2 and B3/B4;
2. The signal generator outputs a signal of a certain frequency and amplitude, and connects the input S1 (TXD of the chip);
3. The TXD signal input can also be pulled up to VCC1 or down to GND1 via J3;
4. The input to the chip can be measured by an oscilloscope;
5. To measure the signal transmission from the input chip TXD to the bus CANH/CANL, and vice versa, an oscilloscope is used.
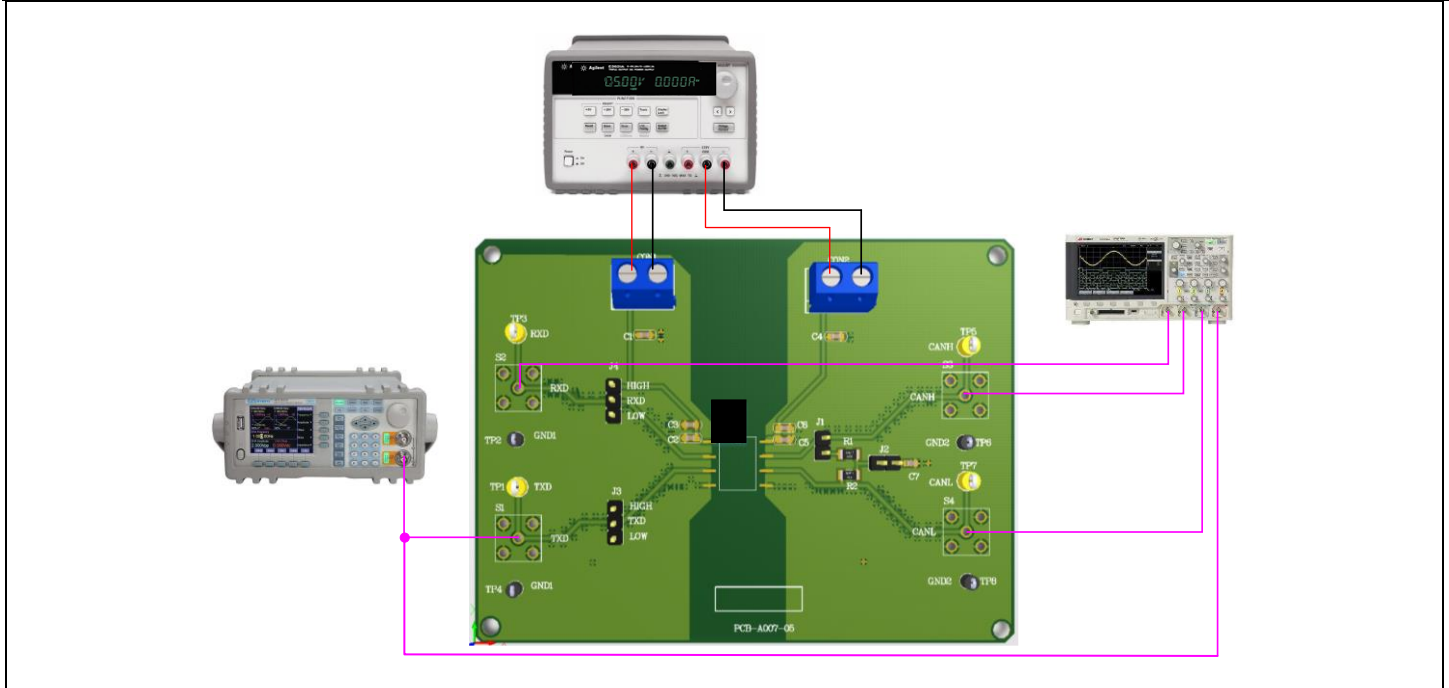
Figure 5. Hardware Setup Diagram

Typical Characteristics

Figure 6 shows the typical input and output waveforms of the CA-IS3050U measured on the evaluation board. The supply voltage VCC1=VCC2=5.0 V. The input signal TXD has a frequency of 1 MHz, an amplitude of 2.5 V, and a 50% duty cycle square wave. The TXD, CANH, CANL, RXD signals are shown below.
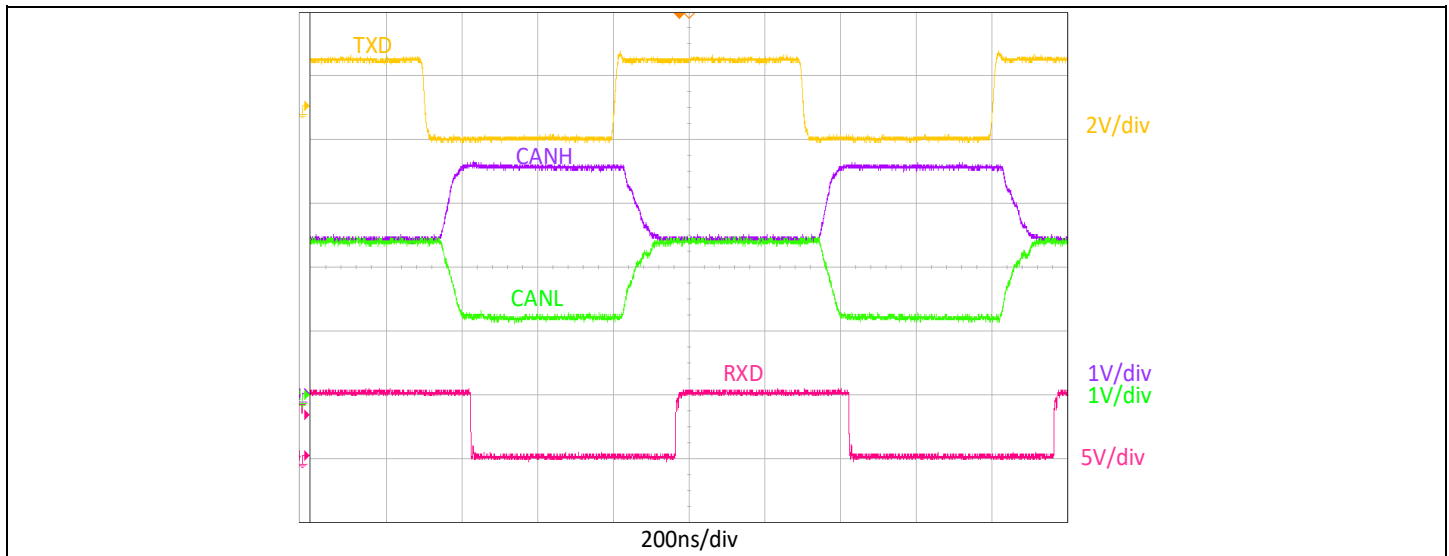

Figure 6. CA-IS3050U Input and Output Waveforms

Revision History

Revision Number	Revision Date	Description
Rev1.0	Jan. 2021	Preliminary-Datasheet
Rev1.1	Sep. 2024	Updated PCB and schematic; Add CA-IS305xC Series Products.

Important statement

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