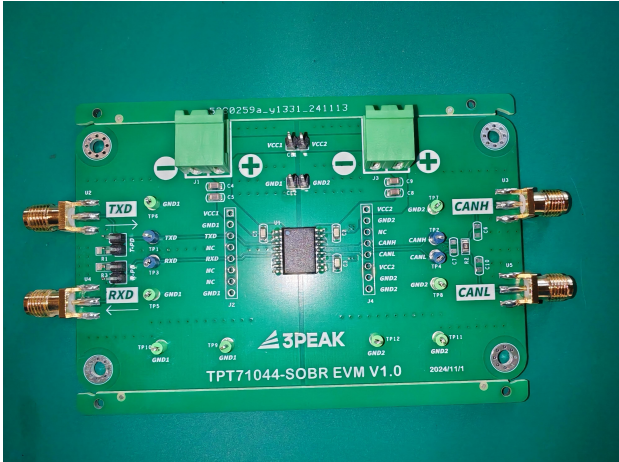


# TPT71044 EVM User's Guide

## EVM Picture



## DESCRIPTIONS

The TPT71044 device is an isolated CAN transceiver that meets the ISO11898 High-speed CAN (Controller Area Network) physical layer standard. The device is designed to be applied in CAN FD networks up to 5 Mbps and to enhance timing margin and higher data rates in long and high-loading networks. As the design, the device features cross-wire, overvoltage, and loss of ground protection from  $-42\text{ V}$  to  $+42\text{ V}$ , overtemperature shutdown, and a  $-30\text{ V}$  to  $+30\text{ V}$  common-mode range. The VCCA is the power supply input for RXD and TXD I/O pins which support a wide range from 2.25 V to 5.5 V. The 2nd power supply VCCB of CAN BUS side which supports the range from 4.5 V to 5.5 V.

The devices integrate high-performance digital isolators with 5000 VRMS (WSOP8, WSOP16 packages), 3750 VRMS (SMP8 package), and isolation ratings per UL 1577. These devices are also to be certified by VDE, UL, CSA, and CQC.

TPT710xx family is available in WSOP8, WSOP16, and SMP8 packages, and is characterized from  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .

## Key Features

- Meet ISO11898 Standard
- Support CAN FD and Data Rates up to 5 Mbps

- Typical Loop Delay: 110 ns
- 5-V Power Supply, 2.25-V to 5.5-V IO Interface
- Receiver Common-Mode Input Voltage:  $\pm 30\text{ V}$
- Bus Fault Protection:  $\pm 42\text{ V}$
- Up to 5-kV RMS Isolation Rating (WSOP)
- $\pm 200\text{-kV}/\mu\text{s}$  typ Static CMTI,  $\pm 150\text{-kV}/\mu\text{s}$  typ Dynamic CMTI
- Junction Temperatures from  $-40^{\circ}\text{C}$  to  $150^{\circ}\text{C}$
- SMP8 and Wide-SOP (WSOP8, WSOP16)
- BUS pin ESD Protection (between Bus pins and GNDB)
  - $\pm 15\text{-kV}$  IEC 61000-4-2 Contact Discharge
- Safety-Related Certifications:
  - VDE Certification according to DIN VDE V 0884-17 (IEC60747-17)
  - 5000-VRMS (WSOP16, WSOP8), 3750-VRMS (SMP8) Isolation Rating per UL 1577
  - CQC Certification per GB 4943.1
  - CSA, TUV, and CB Certifications

## APPLICATIONS

- Industrial Automation
- Motor Control
- Solar Inverters
- Battery Charging and Management

## Revision History

Revise Date	Version	Reason/Issue
2025-01-08	A0	First Issue

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# 1. Performance Specification

A summary of the TPT71044 EVM performance specifications is provided in Table.1.

Table. 1 TPT71044 EVM Performance Specification

PARAMETER		TEST condition	Min	Type	Max	UNITS
<b>INPUT CHARACTERISTICS</b>						
VCCB	Supply Voltage, VCCB		4.5		5.5	V
VCCA	Supply Voltage, VCCA		2.25		5.5	V
VIH	High-level Input Voltage (data input)		2		VCC	V
VIL	Low-level Input Voltage (data input)		0		0.8	V
<b>OUTPUT CHARACTERISTICS</b>						
VO(DOM)	Bus Output Voltage (Dominant), CANH	TXD = 0 V, $50 \Omega \leq R_L \leq 65 \Omega$ , CL = open	2.75		4.5	V
	Bus Output Voltage (Dominant), CANL	TXD = 0 V, $50 \Omega \leq R_L \leq 65 \Omega$ , CL = open	0.5		2.25	V
VO(REC)	Bus Output Voltage (recessive), CANH and CANL	TXD = VCCA, $R_L = \text{open}$	2.0	0.5 x VCCB	3.0	V
<b>SYSTEMS CHARACTERISTICS</b>						
fdata	Data Rate		0		5	Mbps
TA	Operating Ambient Temperature		-40	25	125	°C

## 2. EVM Documentation

### 2.1 Schematic

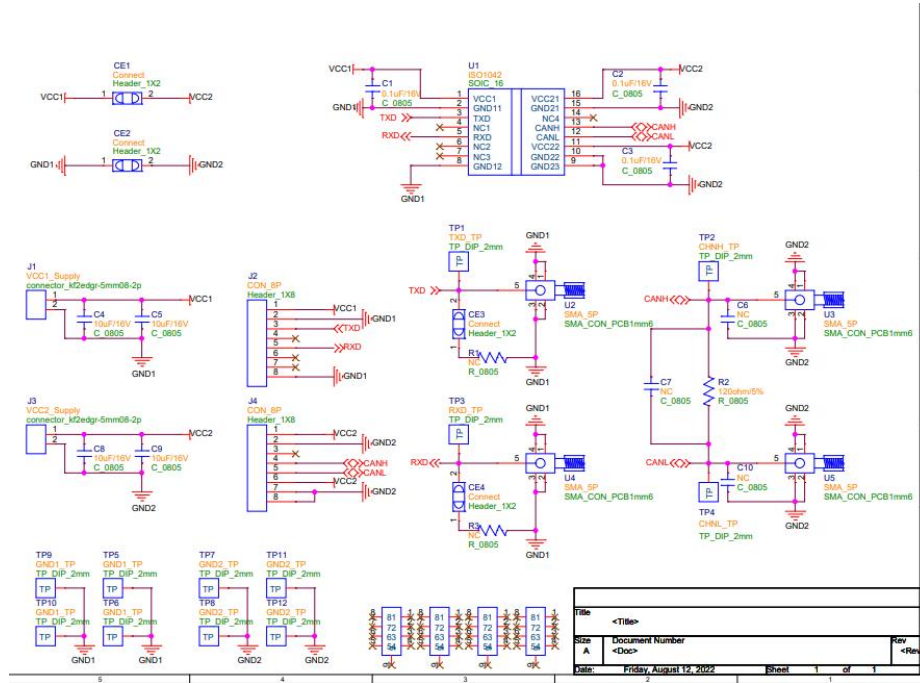


Figure. 1 TPT71044 EVM Schematic

### 2.2 PCB Layout

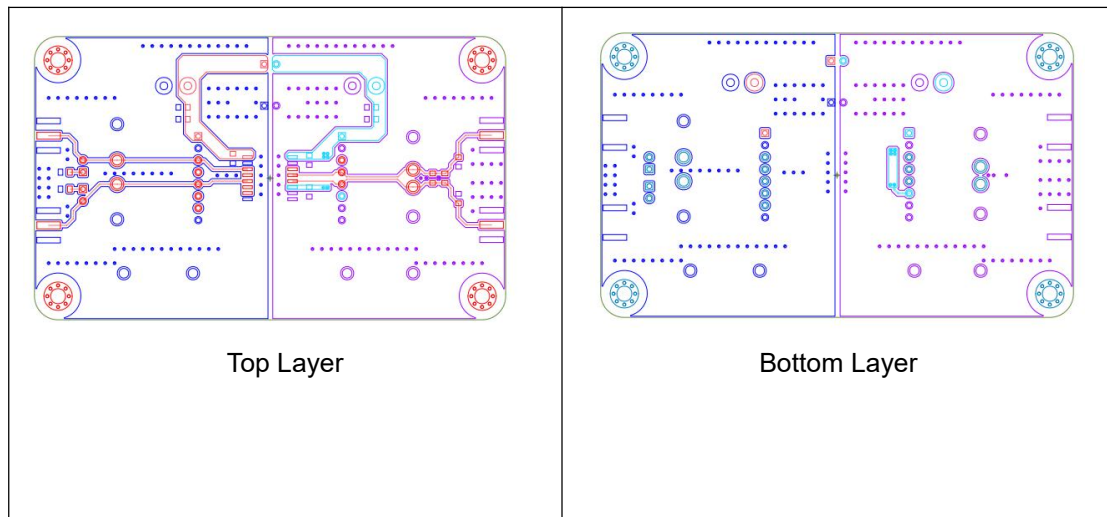


Figure. 2 TPT71044 EVM PCB Layout

## 2.3 Bill of Materials

Table. 2 TPT71044 EVM Bill of Materials

Item	Quantity	Reference	Part	PCB Footprint
1	4	CE1,CE2,CE3,CE4	Connect	Header_1X2
2	3	C1,C2,C3	0.1uF/16V	C_0805
3	4	C4,C5,C8,C9	10uF/16V	C_0805
4	3	C6,C7,C10	NC	C_0805
5	1	J1	VCC1_Supply	connector_kf2edgr-5mm08-2p
6	2	J2,J4	CON_8P	Header_1X8
7	1	J3	VCC2_Supply	connector_kf2edgr-5mm08-2p
8	2	R1,R3	NC	R_0805
9	1	R2	120ohm/5%	R_0805
10	1	TP1	TXD_TP	TP_DIP_2mm
11	1	TP2	CHNH_TP	TP_DIP_2mm
12	1	TP3	RXD_TP	TP_DIP_2mm
13	1	TP4	CHNL_TP	TP_DIP_2mm
14	4	TP5,TP6,TP9,TP10	GND1_TP	TP_DIP_2mm
15	4	TP7,TP8,TP11,TP12	GND2_TP	TP_DIP_2mm
16	1	U1	TPT71044	SOIC_16
17	4	U2,U3,U4,U5	SMA_5P	SMA_CON_PCB1mm6

## 3. Test Setup and Procedure

### 3.1 Test Setup

The TPT71044 -EVM is provided with input/output connectors and test points as shown in Table.2.

Table. 3 TPT71044 EVM Connections

Designator	Name	Description
J1	VCCA-GNDA	Power supply for VCCA
J3	VCCB-GNDB	Power supply for VCCB
U2	TXD	Signal input port of TXD
U4	RXD	Signal output port of RXD
U3	CANH	Signal output port of CANH
U5	CANL	Signal output port of CANL
TP1	TXD test port	Test point for TXD pin
TP2	CANH test port	Test point for CANH pin
TP3	RXD test port	Test point for RXD pin
TP4	CANL test port	Test point for CANL pin
TP5/TP6/TP9/TP10	GND1 test port	Test point for GND1 pin
TP7/TP8/TP11/TP12	GND2 test port	Test point for GND2 pin

Referring to Table.3, the recommended connections to evaluate TPT71044-EVM is shown in Fig.3.

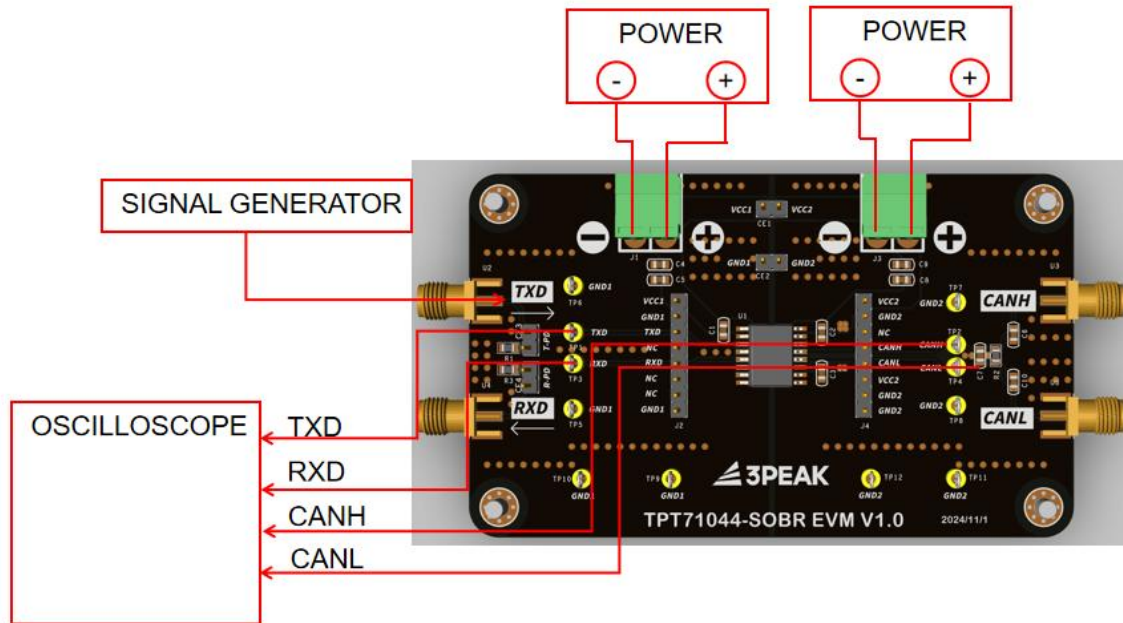


Figure. 3 EVM Test Setup

### 3.2 Test Equipment

Table.4 is the equipment used by 3PEAK, can also use other model of instruments which can support the voltage, current and power level of this EVM test.

Table. 4 Test Equipment Used by 3PEAK

Instruments	Model	Vender
DC Source and Multimeter	B2962B	Keysight
Signal Generator	33600A	Keysight
Oscilloscope	MSO58	Tektronix

### 3.3 Test Procedure

- Set up the EVM as described in Fig.3.
- Power up the EVM.
- Use the signal generator to input the square waveform.
- Oscilloscope is used to capture waveforms like bus signal and others.

## 4. Test Results and Performance Evaluation

### 4.1 Application Curves



Figure. 4 Waveforms at datarate= 500Kbps, bus load=120Ω, VCCA=3.3V, VCCB=5V

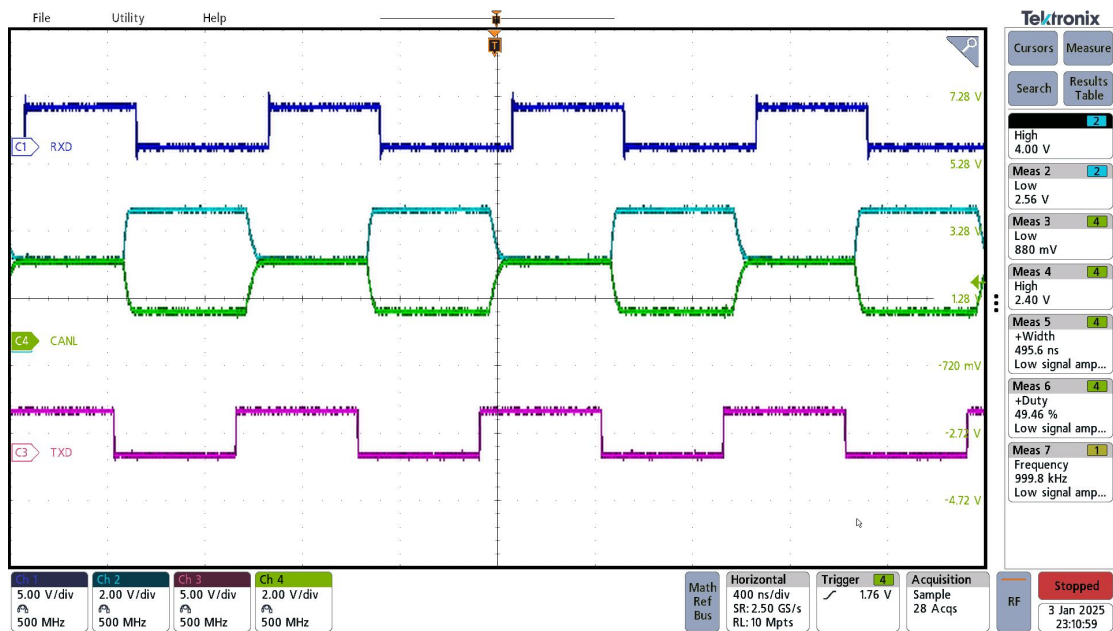


Figure. 5 Waveforms at datarate=2Mbps, bus load=120Ω, VCCA=3.3V, VCCB=5V

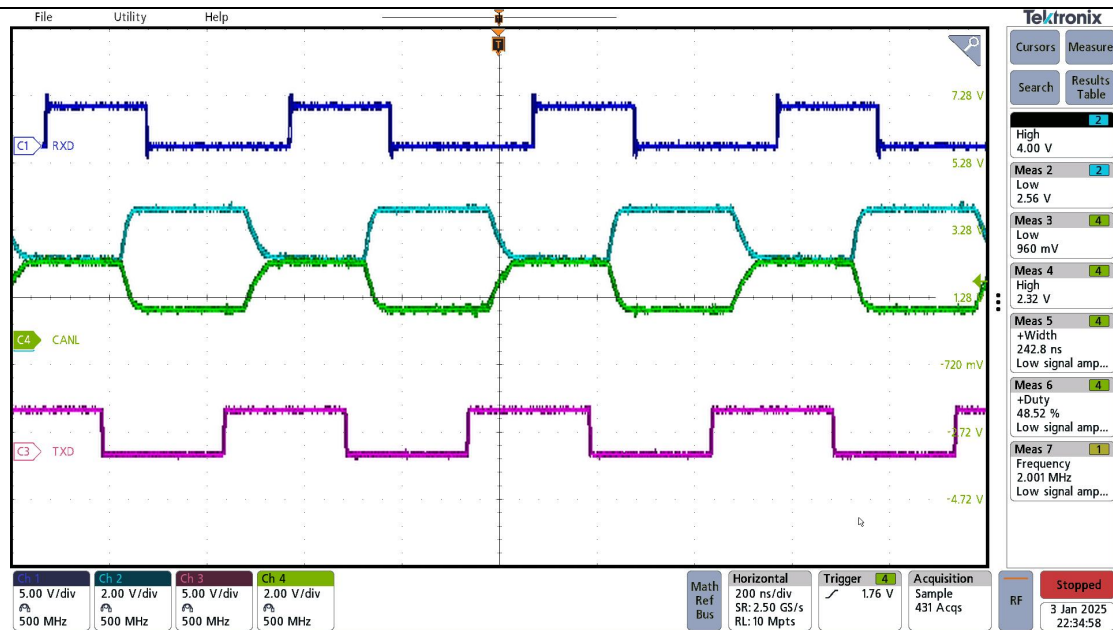


Figure. 6 Waveforms at datarate=4Mbps, bus load=120Ω, VCCA=3.3V, VCCB=5V

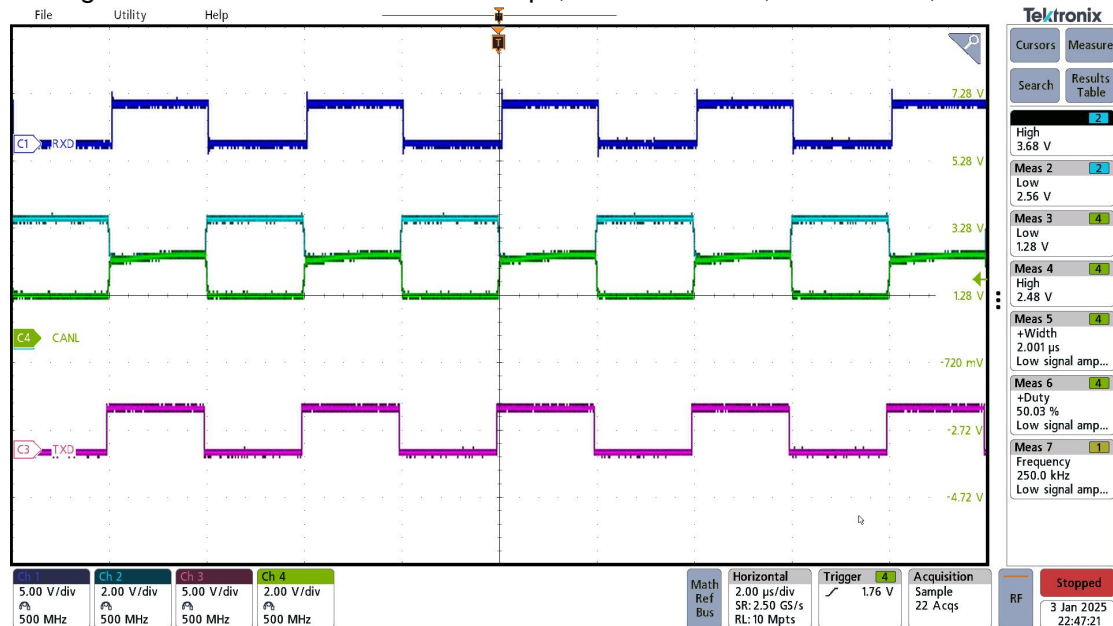


Figure. 7 Waveforms at datarate= 500Kbps, bus load=60Ω, VCCA=3.3V, VCCB=5V



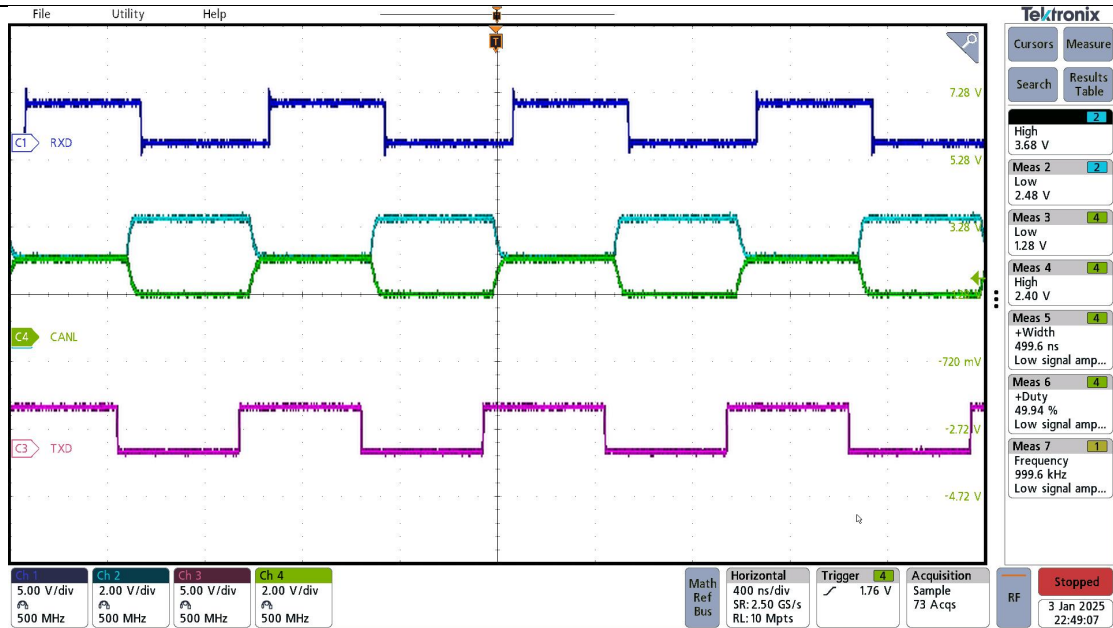


Figure. 8 Waveforms at datarate= 2Mbps, bus load=60Ω, VCCA=3.3V, VCCB=5V

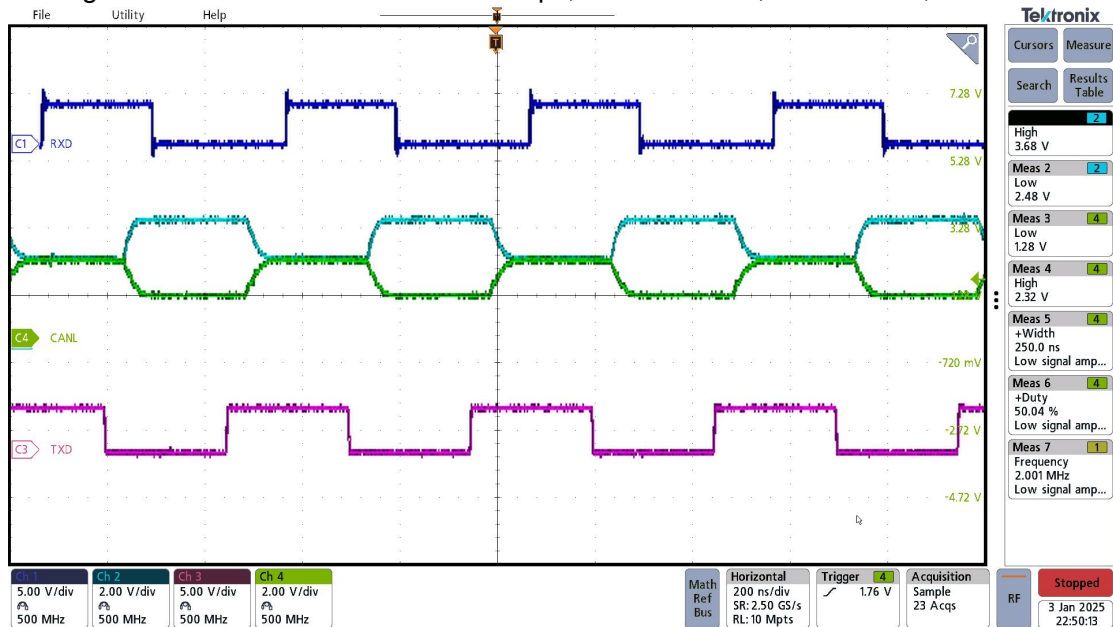


Figure. 9 Waveforms at datarate= 4Mbps, bus load=60Ω, VCCA=3.3V, VCCB=5V