

SN65HVD230 vs. TJA1050

Comparison of Responses to CAN Faults

Industrial Interface

May 31st, 2013

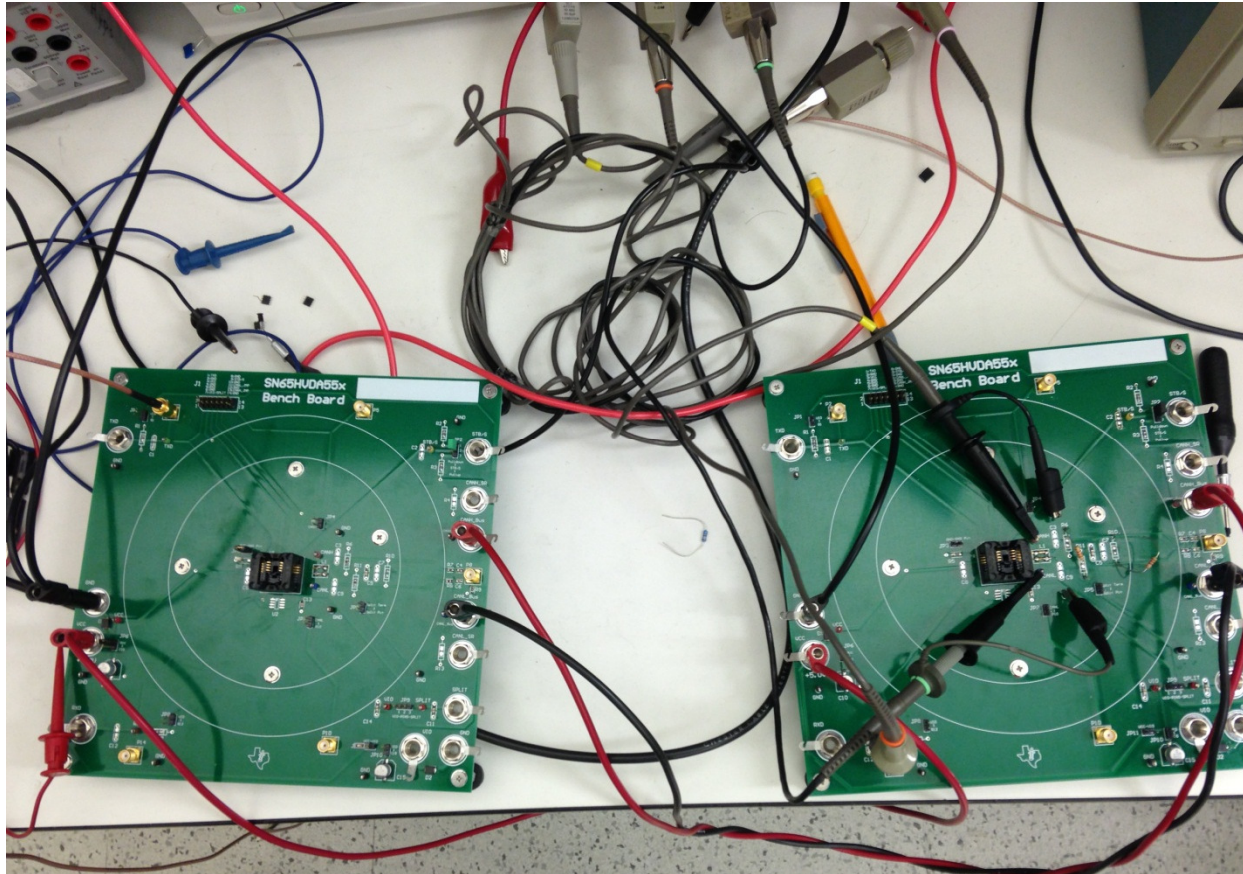
Faults Tested

- The following faults will be tested on a network of two SN65HVD230 devices and on a network of two TJA1050 devices. The results will be compared.
 - Interruption of CAN_H (wire cut)
 - Interruption of CAN_L (wire cut)
 - Short circuit of CAN_H with Vcc
 - Short circuit of CAN_L with GND
 - Short circuit of CAN_H with GND
 - Short circuit of CAN_L with Vcc
- The screen shots were all taken with TXD from the transmitting board and CANH, CANL and RXD on the receiving board.

Note: The TJA1050 is a 5V CAN XCVR and the SN65HVD230 is a 3.3 V XCVR

Test Set-Up

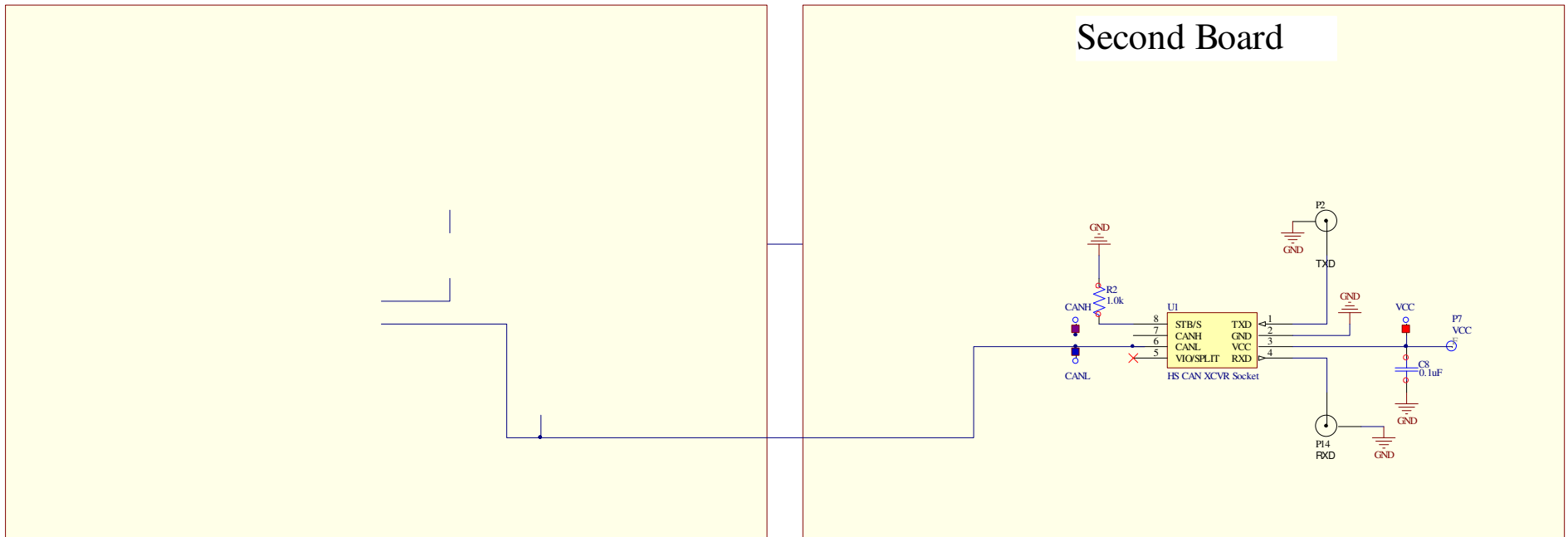
The test set-up include two CAN test boards with 2' of twisted banana plug cabling connecting the CAN bus.



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Schematic

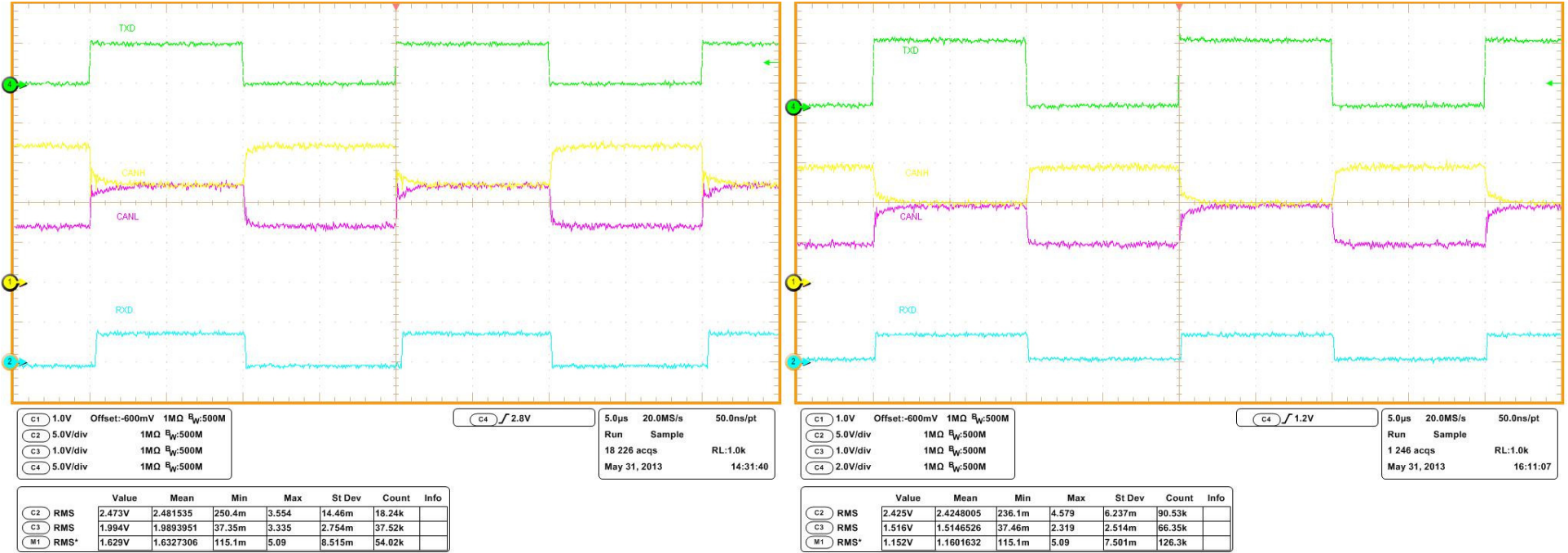
Below is a schematic of the components that were populated on the two test boards.



Normal Operation without faults

TJA1050 – Normal

SN65HVD230 – Normal

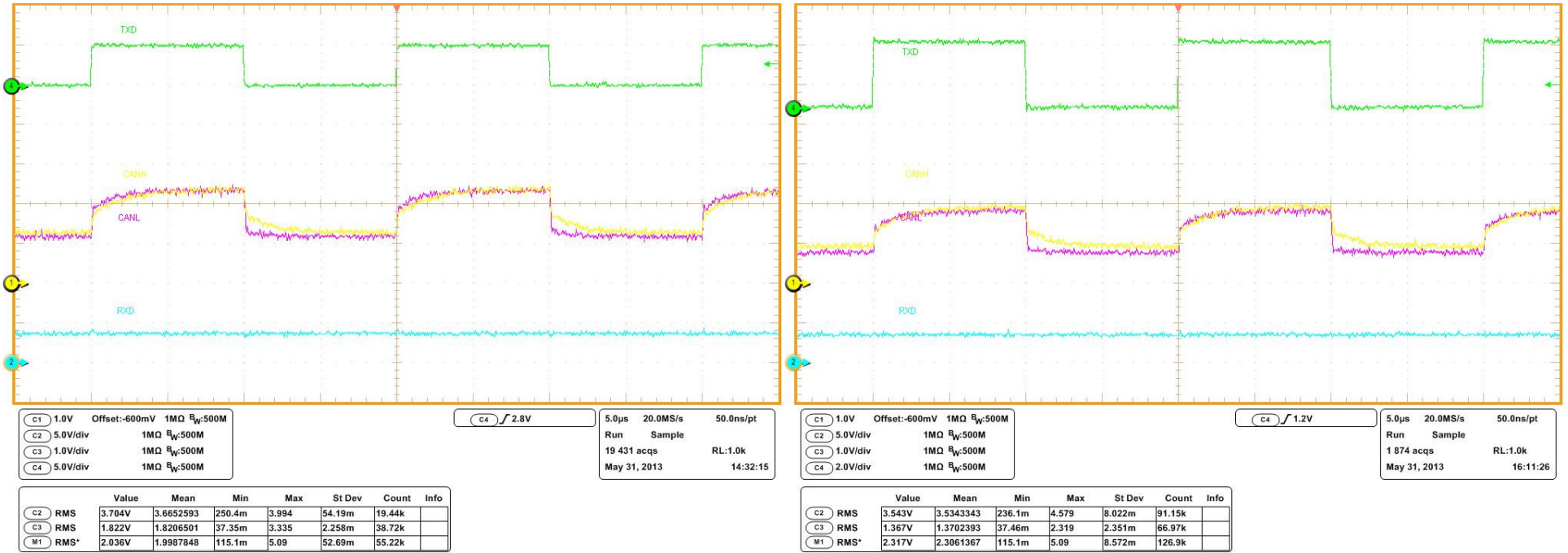


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CANH Open on Transmit Board

TJA1050 – Fault

SN65HVD230 – Fault

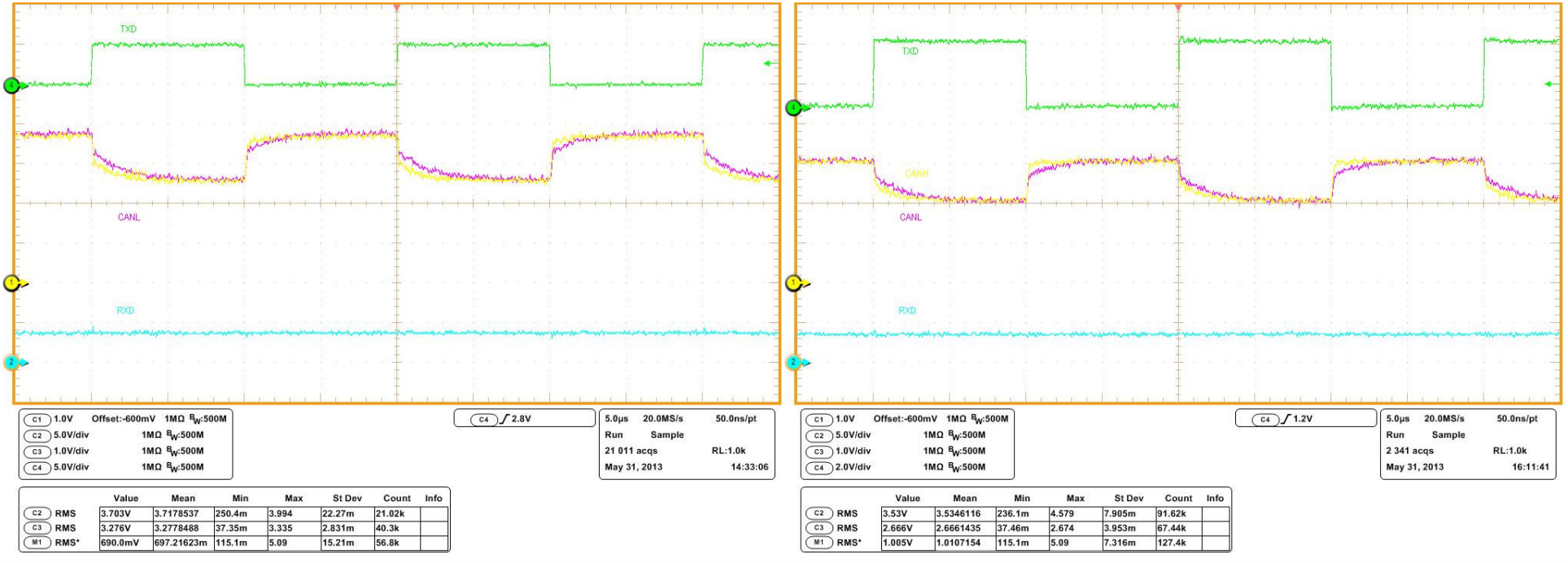


Conclusion: Neither XCVR is able to communicate with the CANH Bus line open

CANL Open on Transmit Board

TJA1050 – Fault

SN65HVD230 – Fault

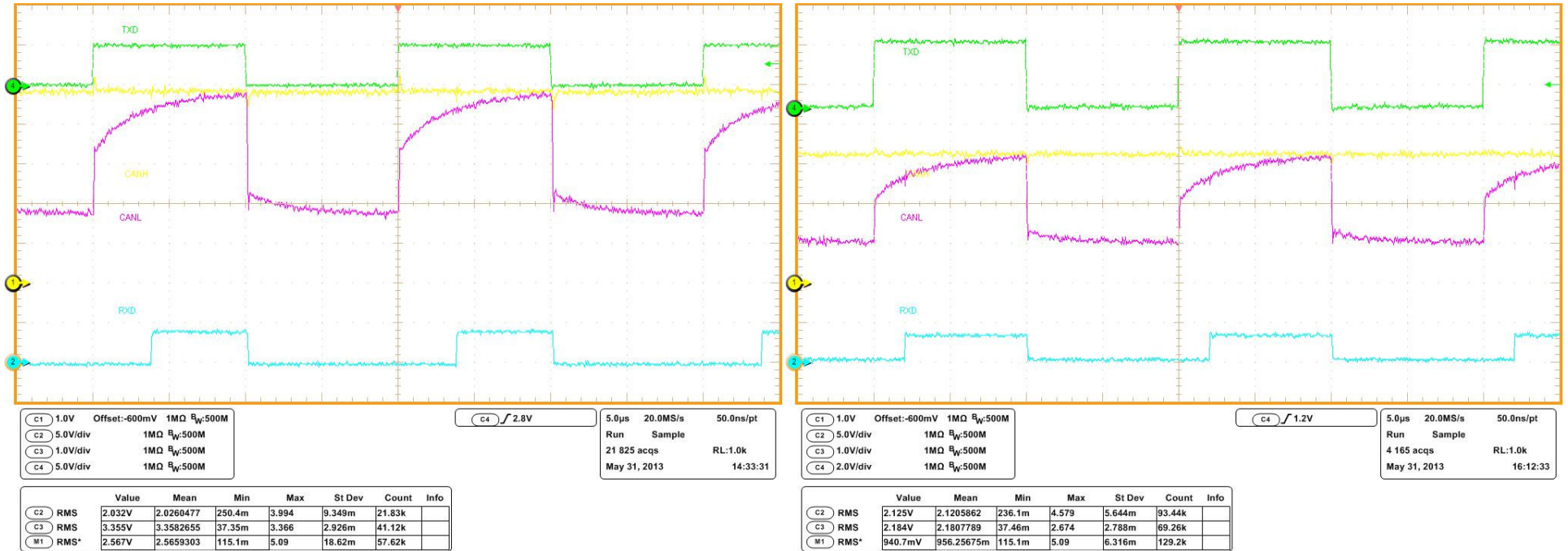


Conclusion: Neither XCVR is able to communicate with the CANL Bus line open

CANH Short to Vcc on Transmit Board

TJA1050 – Fault

SN65HVD230 – Fault

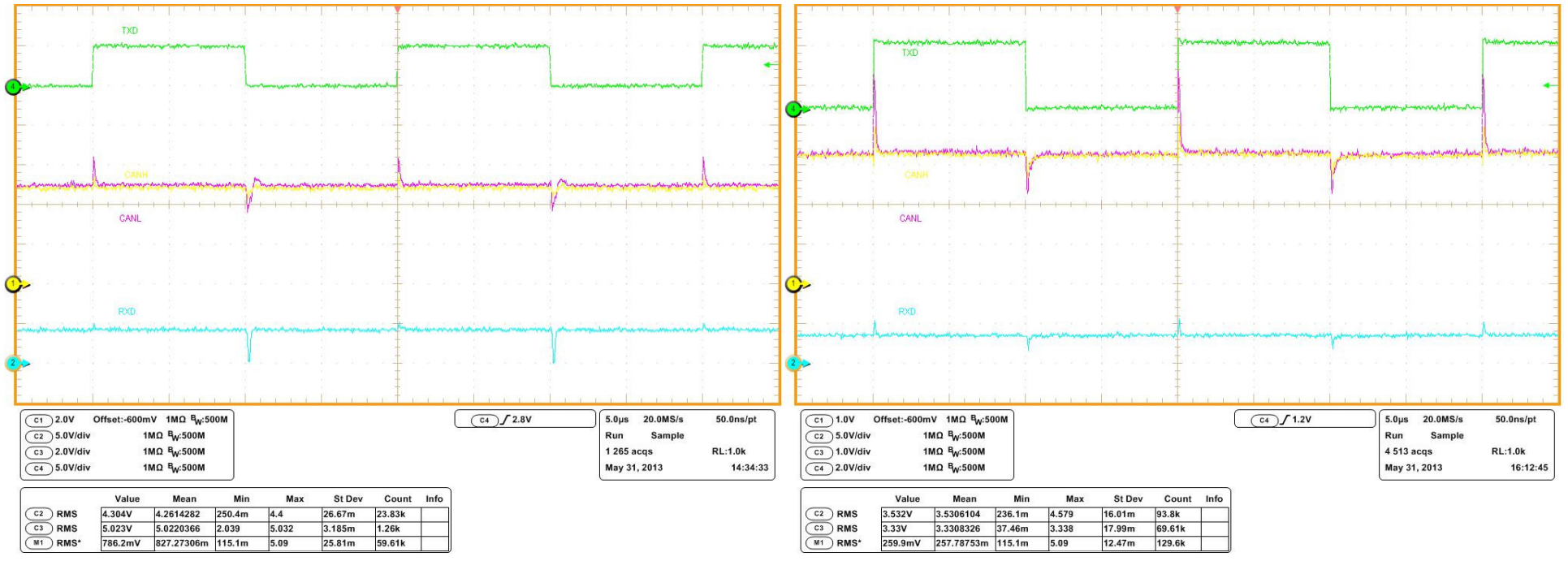


Conclusion: Both transceivers are marginally able to receive bits with skewed bit timing during a CANH short to Vcc fault.

CANL Short to Vcc on Transmit Board

TJA1050 – Fault

SN65HVD230 – Fault

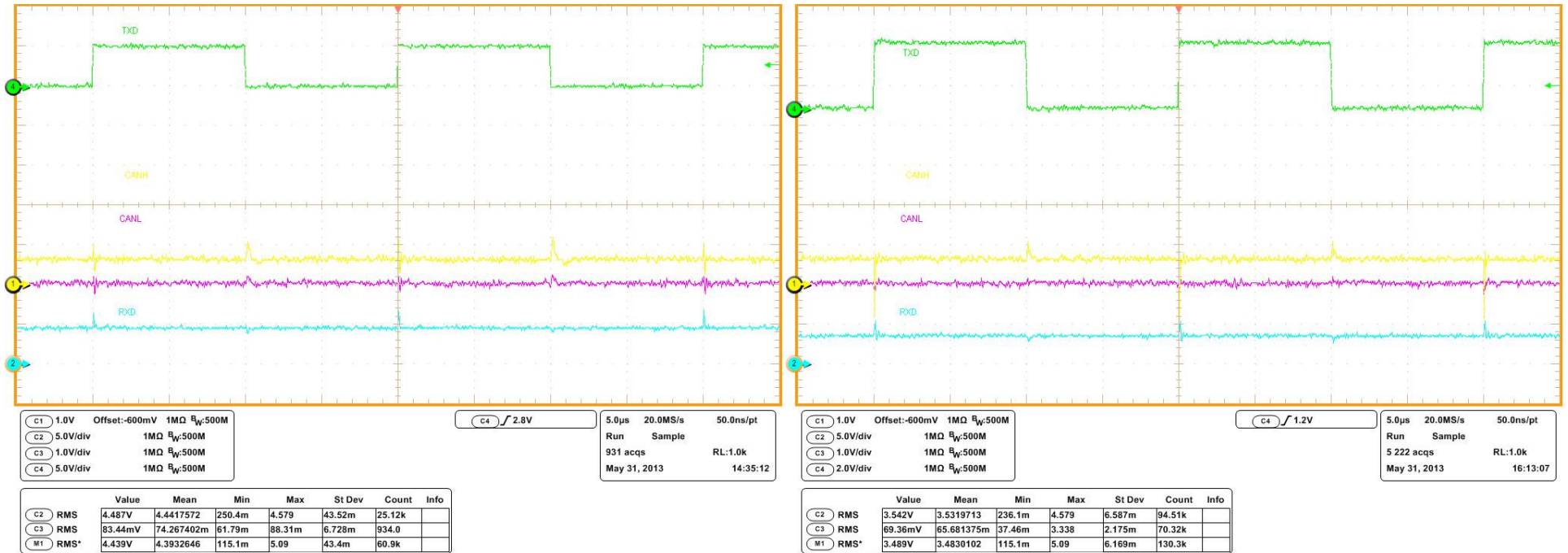


Conclusion: Neither XCVR is able to communicate with the CANL Short to Vcc

CANH Short to GND on Transmit Board

TJA1050 – Fault

SN65HVD230 – Fault

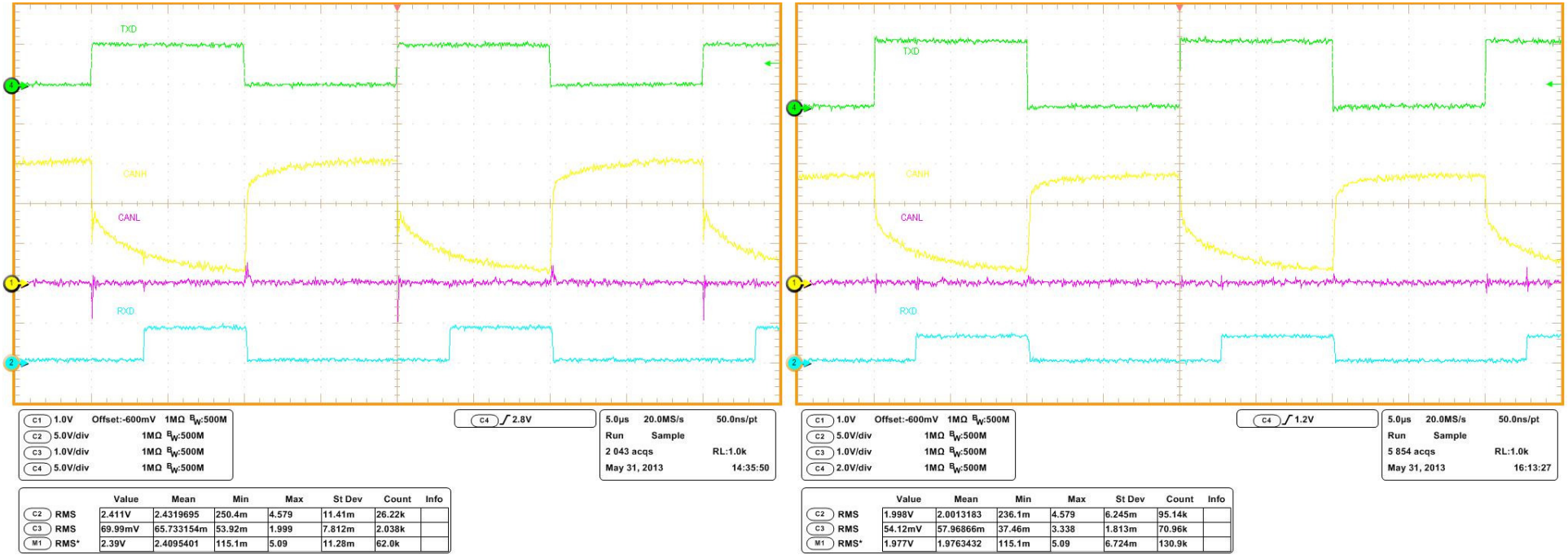


Conclusion: Neither XCVR is able to communicate with the CANH short to GND

CANL Short to GND on Transmit Board

TJA1050 – Fault

SN65HVD230 – Fault



Conclusion: Both transceivers are marginally able to receive bits with skewed bit timing during a CANL short to GND fault.

Conclusion

- In 4 fault cases neither transceiver pair is able to communicate
- In 2 fault cases both pairs of transceivers are able to marginally communicate
 - Both transceiver receive bits that are skewed

Thank You!