

RS-485 Port Protection Evaluation Board 3

Introduction

This evaluation board serves as an aid in evaluating circuit protection on RS-485 serial device port solutions using Bourns® TBU® High-Speed Protectors (HSPs), FLAT® Gas Discharge Tube (GDT) Surge Arrestors and Transient Voltage Suppressor (TVS) products designed to meet the required industry standards on RS-485 port interfaces. The recommended Bourns® TBU® HSP solution offers enhanced performance features over competing technologies, which can help the design engineer to increase the surge and transient protection level on RS-485 ports, placing the entire circuit protection solution into a smaller PCB area. Bourns has developed an RS-485 evaluation board (measuring 53.5 mm x 25.3 mm x 0.85 mm) manufactured using an FR4 PCB with nickel gold plating on the top and bottom sides.

How to Connect the Evaluation Board for Test Set-up

- Connect J1A and J1B to the exposed lines.
- Connect J2A and J2B to the RS-485 IC device.

*The default configuration of this board uses two GDTs w/ FLAT® technology (GDT3 and GDT4) and one TVS diode (TVS3). The board allows different configurations:

- Two Model 2017 GDTs w/ FLAT® technology (GDT3 and GDT4) may be replaced by a) two MOVs (MOV1 and MOV2) or b) two Model 2031 GDTs (GDT1 and GDT2) or c) two SMD package TISP® devices (TISP1 and TISP2) or d) a dual line Model 2030 GDT (GDT5).
- One SOT23 TVS diode (TVS3) may be replaced with two SMB TVS diodes (TVS1, TVS2).

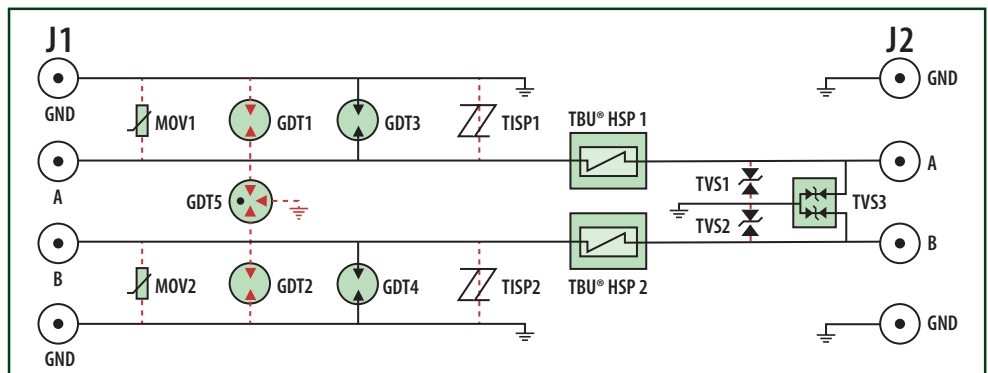


Figure 1 | RS-485 Evaluation Board 3 Schematic

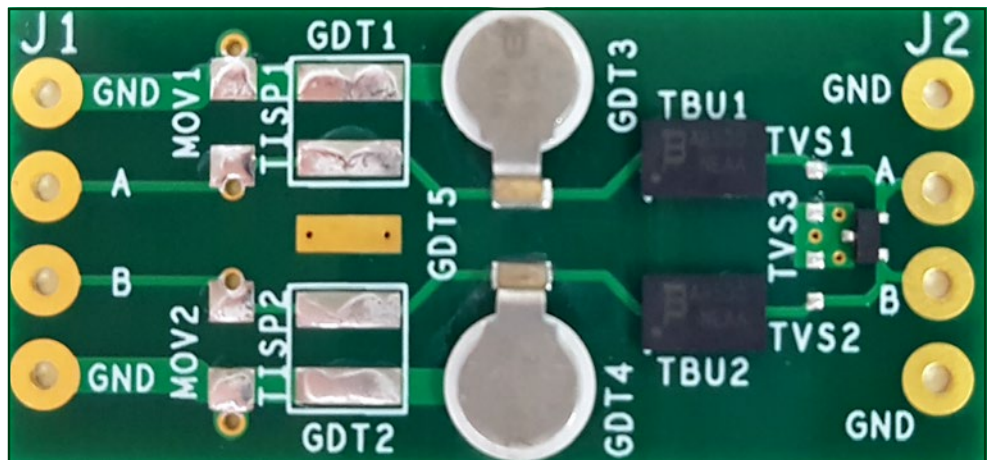


Figure 2 | RS-485 Evaluation Board 3 Top Side Layout*

Table 1 | RS-485 Evaluation Board 3 Bill of Materials

No.	Part Number	Qty.	Description	Reference
1	TBU-CA085-300-WH	2	TBU® Single Bidirectional Line 850 V 300 mA	TBU® HSP 1, TBU® HSP 2
2	2017-09-SMH-RPLF	2	GDT w/ FLAT® Technology 90 V	GDT3, GDT4
3	CDSOT23-SM712	1	Dual Bidirectional Line TVS 12 V SOT23	TVS1, TVS2

RS-485 Port Protection Evaluation Board 3

Performance Graphs

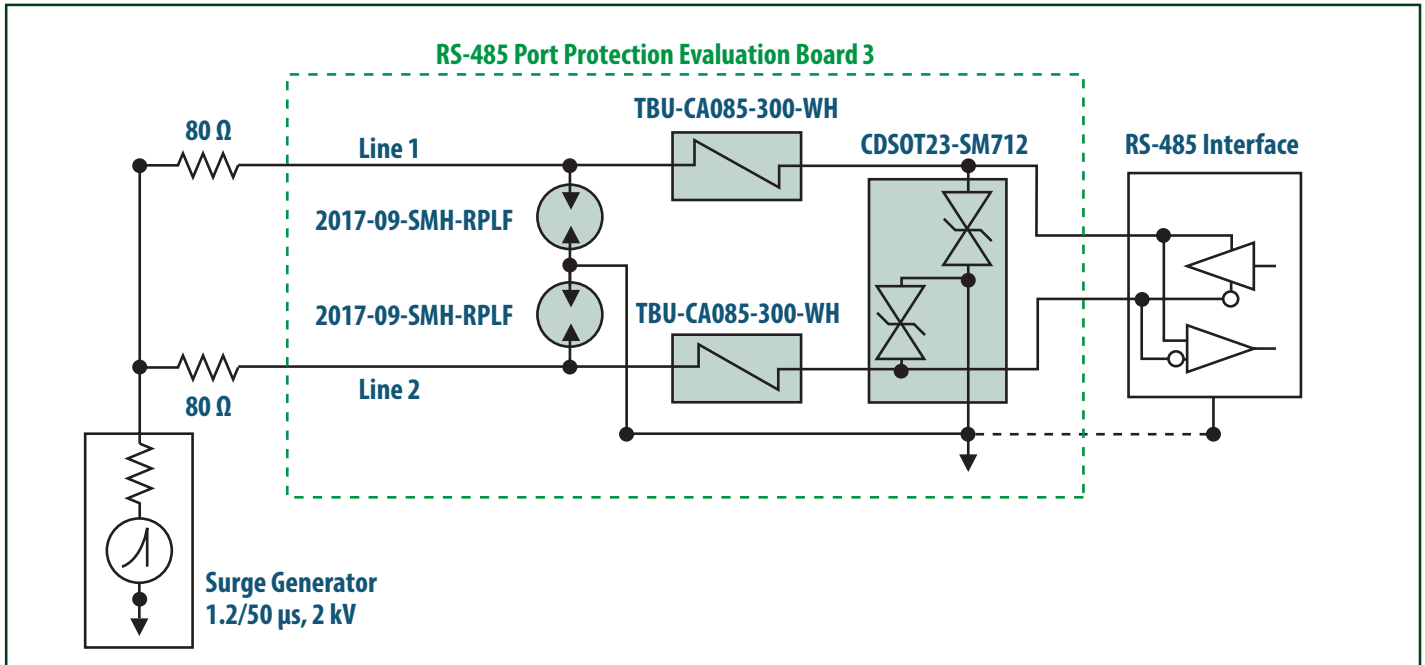


Figure 3 | RS-485 Port Protection

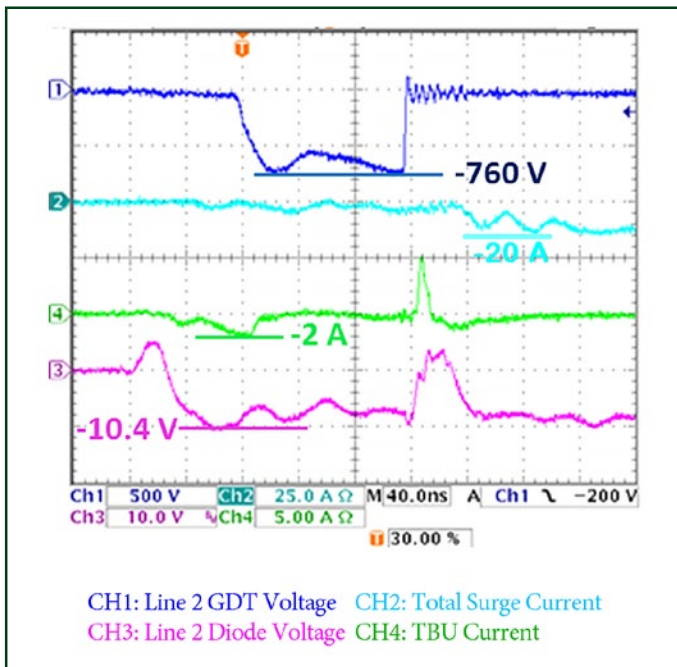


Figure 4 | Surge Test 2 kV (1.2/50 μs, R_{EXT} = 80 Ohms)

Reference

For more information on implementing advanced circuit protection technologies for RS-485 ports, please review Bourns' RS-485 Protection Solution: <http://www.bourns.com/rs485>

For further technical support and for complete circuit protection solutions, please visit www.bourns.com

COPYRIGHT © 2017 • BOURNS, INC. • 9/17 • e/K1701

"TBU" is a registered trademark of Bourns, Inc. in the U.S. and other countries, except Japan. All references to TBU in this document for use in Japan shall be deemed to be replaced with Bourns® TBU™. "Bourns" and "FLAT" are registered trademarks of Bourns, Inc. in the U.S. and other countries.