

RS-422 SLSC Module



Product Data Sheet
B&A Document 110020-C

Part No.200078-B
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INTRODUCTION

This document contains technical specifications for the RS-422 Module (B&A Part No.200078-B). Specifications are shown at 25 °C temperature, unless otherwise noted. The main features of the module are listed below:

- Separate 32 Transmit and 32 Receive RS-422 full duplex channels
- Configurable grounding
- On-board Isolated voltage regulation
- Internal House Keeping / Health Monitoring
- User controlled Flight interface power on/off
- Built-in LabVIEW FPGA Debugging Port
- Safe to connect to Flight hardware, FMEA approved
- LabVIEW drivers



DIGITAL I/O

Front panel Connectors	2 x VHDCI (Tables 1 & 2)
Channels Per Connector ¹	32
Maximum Nominal Data Rate of TX and RX Channels	32 Mbit/s
Number Of RS-422 TX Channels	32
Number Of RS-422 RX Channels	32
Backplane Connectors	3 x SLSC (Tables 3-5)
TX LH Propagation Delay (ns) ² Min, Avg, Max	26, 28, 30
TX HL Propagation Delay (ns) ² Min, Avg, Max	26, 28, 30
RX LH Propagation Delay (ns) ² Min, Avg, Max	22, 24, 26
RX HL Propagation Delay (ns) ² Min, Avg, Max	22, 24, 26

Note:

- (1) All 32 channels (TX and RX) are trace matched and have same delay on the board.
- (2) See Page 4 for propagation delay definitions.



SAFETY

The following items must be considered for safety:

- Using the RS-422 Card in a manner not described within this document may impair the protection the RS-422 Card provides.
- The SLSC-12001 chassis and the SLSC cards **do not support** hot plug-in. The entire chassis must be powered down when a module is installed.
- Always follow ESD procedures for handling.
- If cleaning is required, wipe with dry and clean towel.
- Installation of the RS-422 SLSC card must be performed in accordance with B&A “SLSC RS-422 Module User Manual” (Document No. 140021).



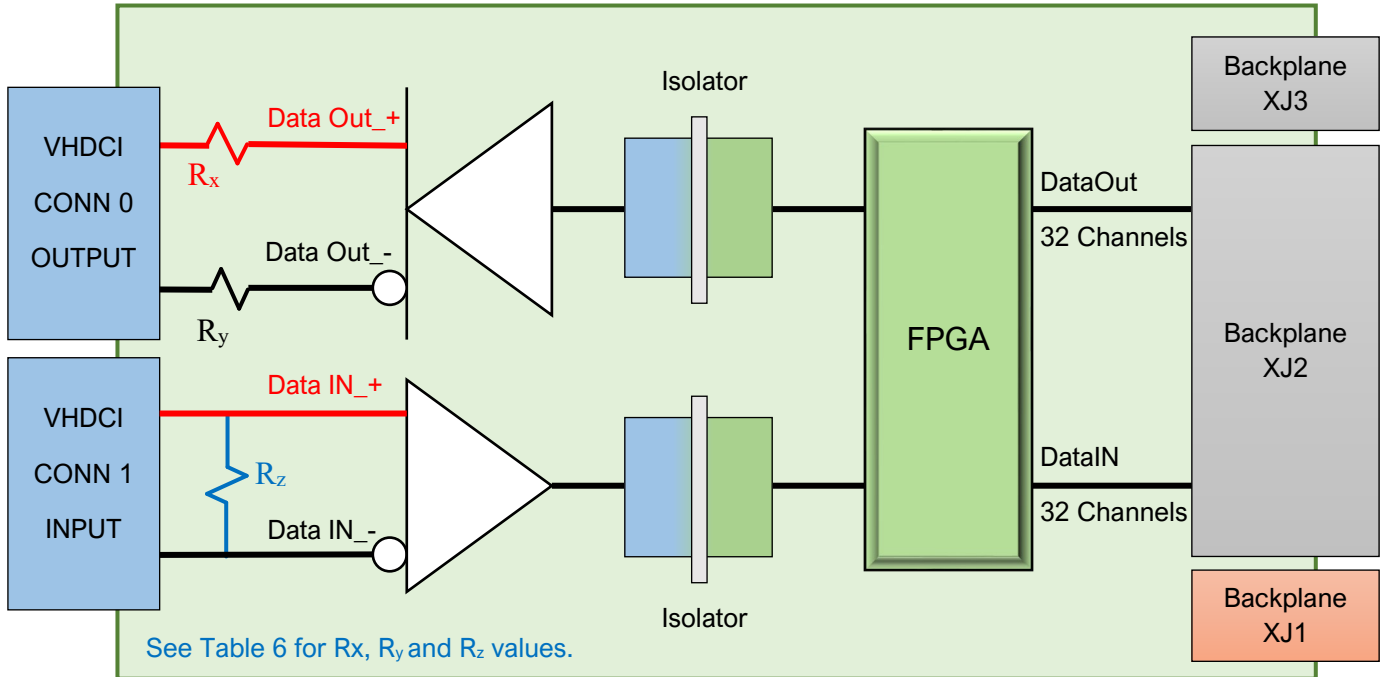
SPECIFICATIONS

Direction Control of Data Channels	Full Duplex
Power Up State	Drivers and receivers disabled
I/O Compatibility	RS-422 (differential)
Characteristic Impedance	100 Ω differential nominal
Termination Impedance	100 Ω differential nominal
Maximum Input Differential Voltage	5V
Voltage Level Compatibility	5V input tolerant 3.3V output
Number of on card Temperature Sensors	4
LabVIEW FPGA Debug Interface	Micro-USB
Grounding Configuration	See Page 3



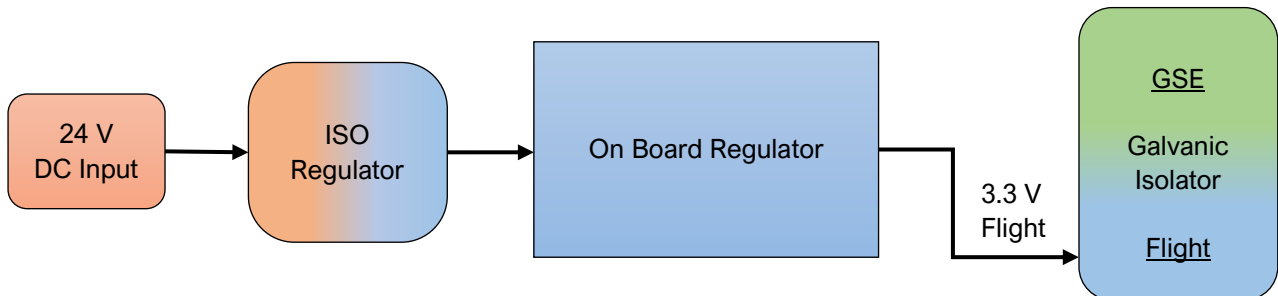
FUNCTIONAL BLOCK DIAGRAM

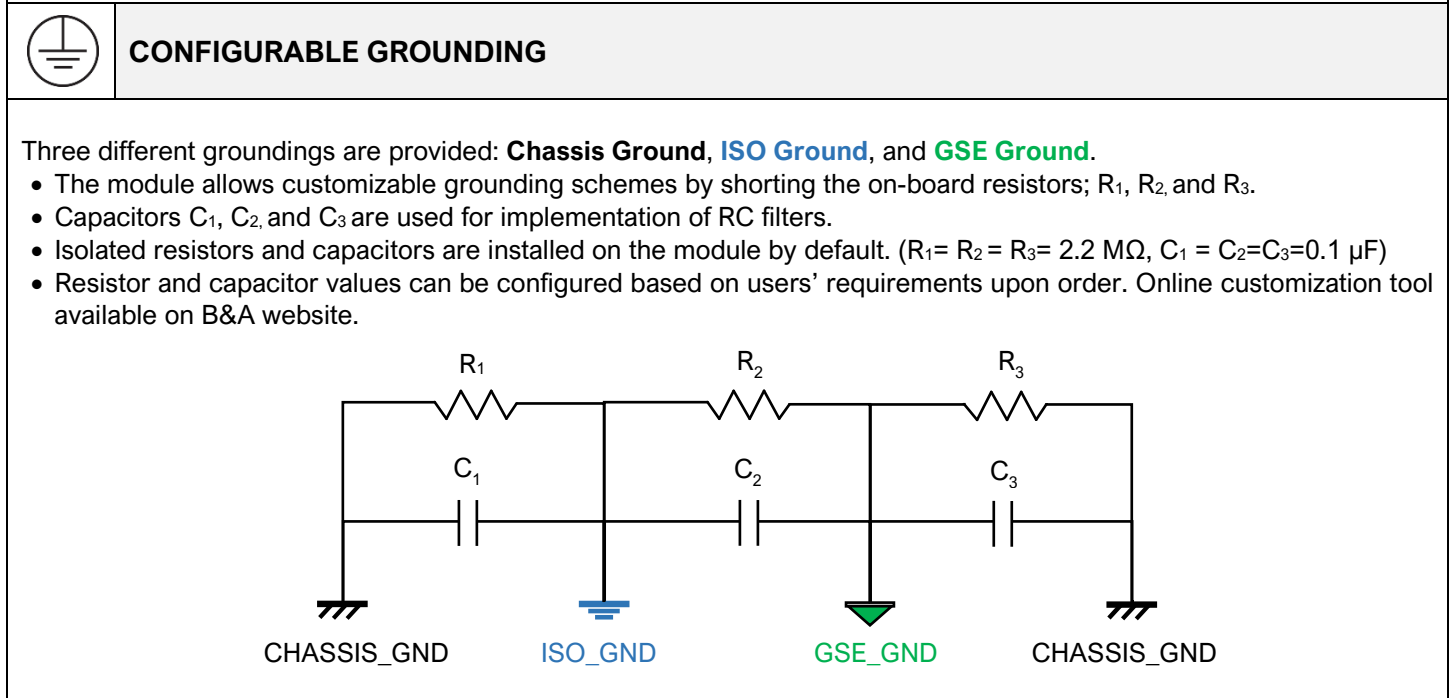
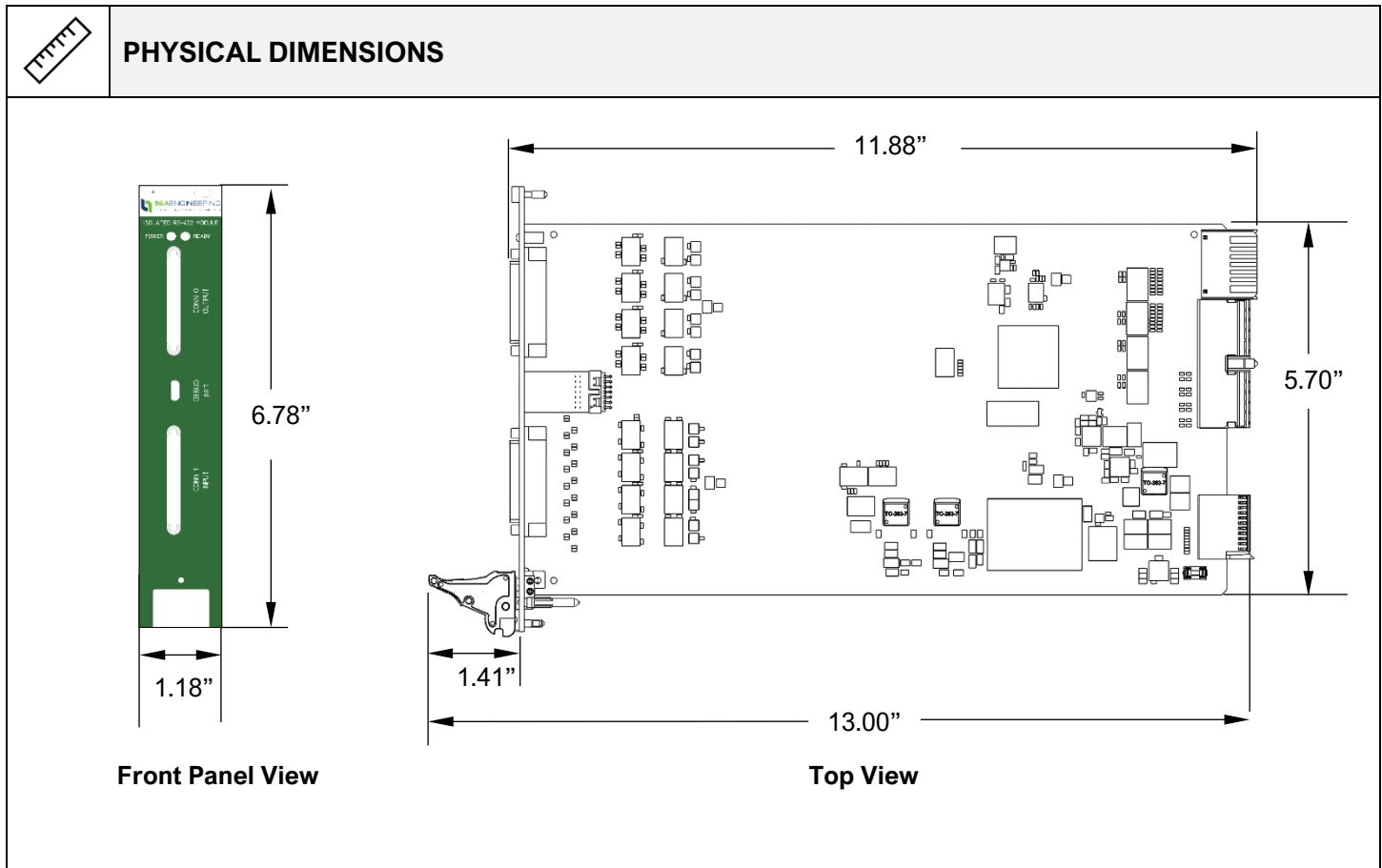
The functional block diagram is shown below. R1 and R2 vaieres for different configurations. (See Table 6)



ISOLATED VOLTAGE REGULATION

The Isolated Voltage Regulation block diagram is shown below:







PROPAGATION DELAY

The propagation delay is defined as the delay between the 50% trigger point and the 50% response point. The figure below defines two different propagation delays: The LOW to HIGH signal rise phase (LH) and HIGH to LOW signal Drop phase (HL). The signal rise and drop measurement is performed bi-directional for the TX and RX propagation direction. An Oscilloscope and Differential Probe (DP) are required to perform testing. The signal data is measured with the oscilloscope at the board INPUT, TX output, RX input, and board OUTPUT.

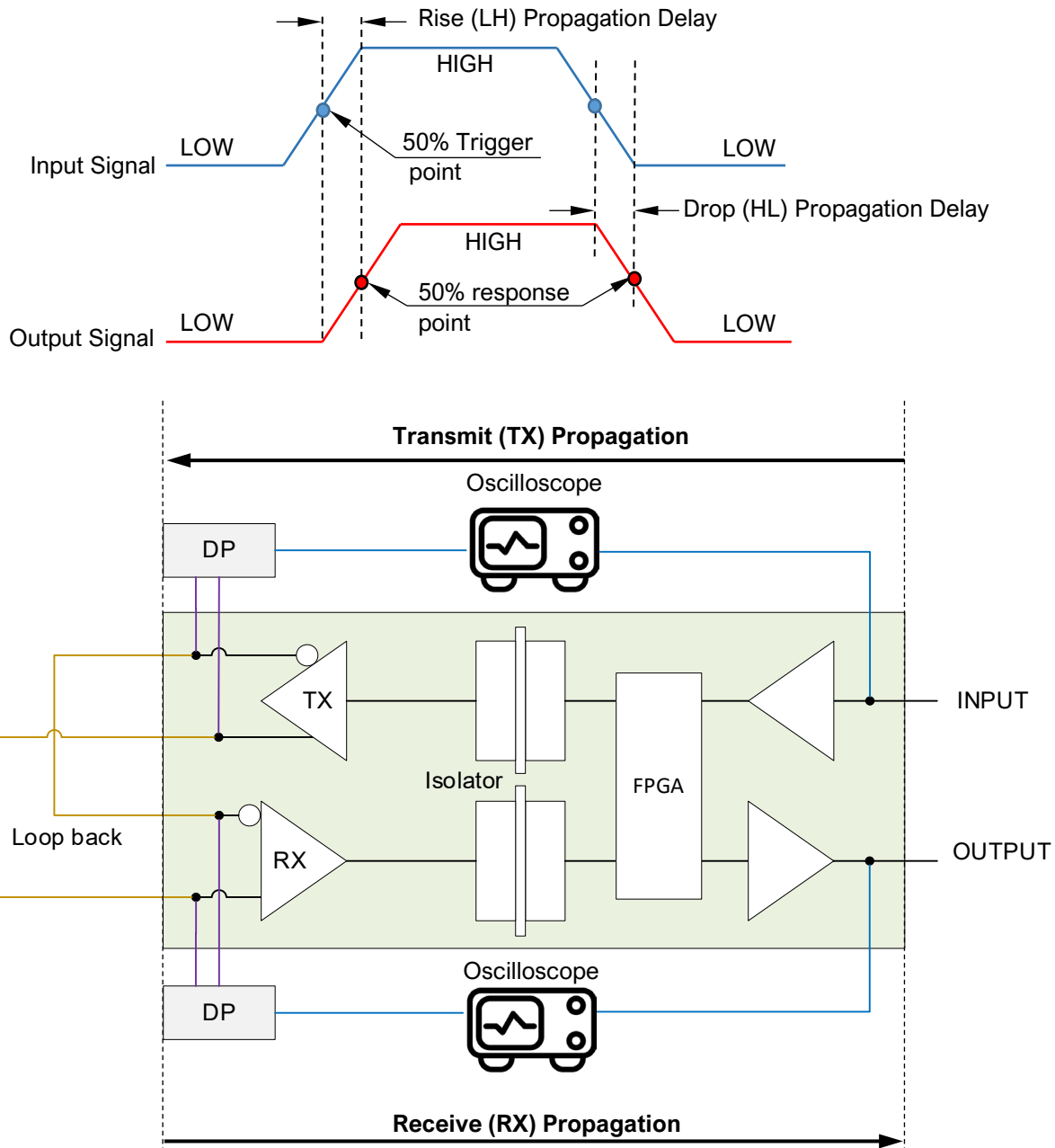
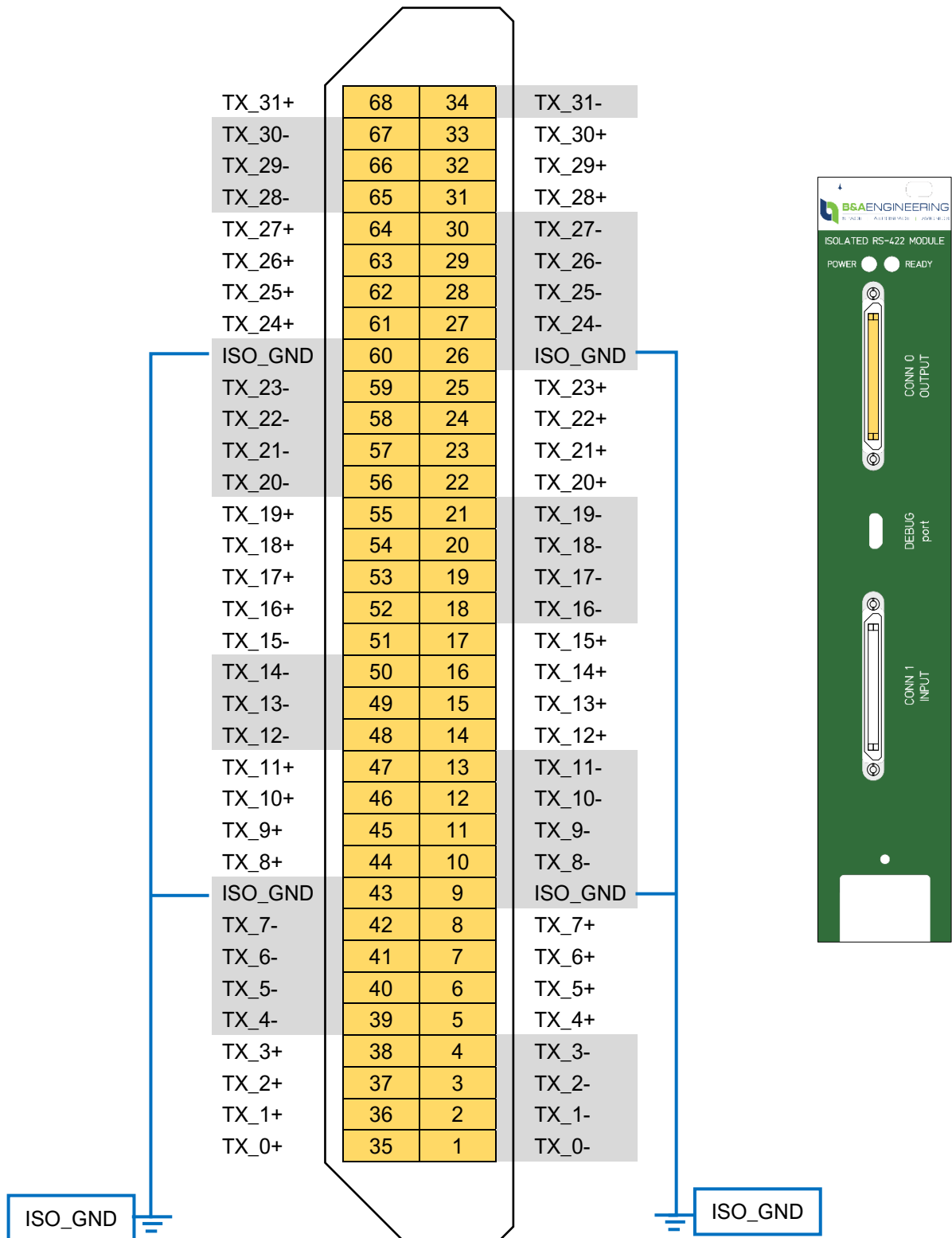
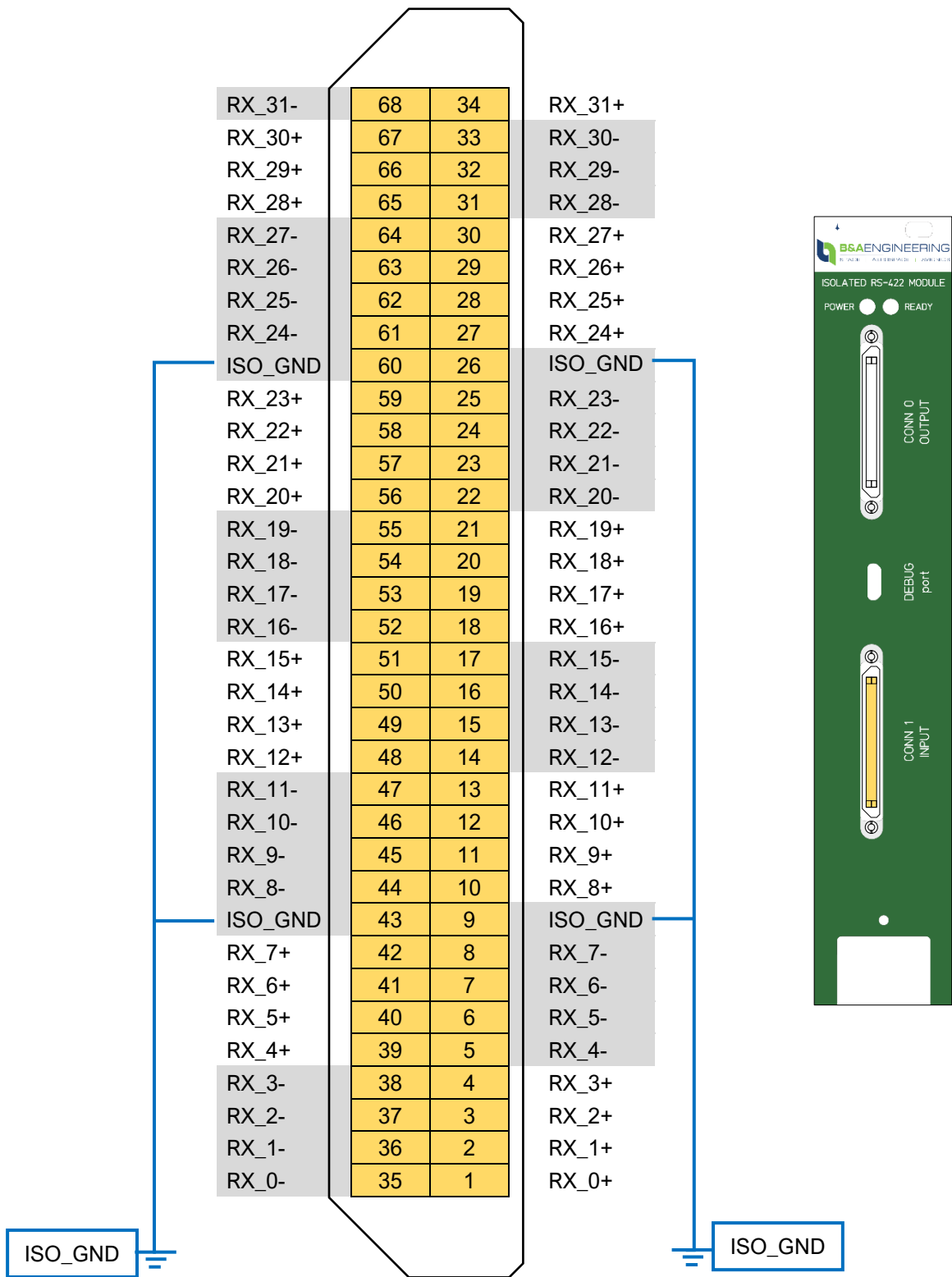


Table 1. Isolated RS-422 Module CONN 0 Pinout



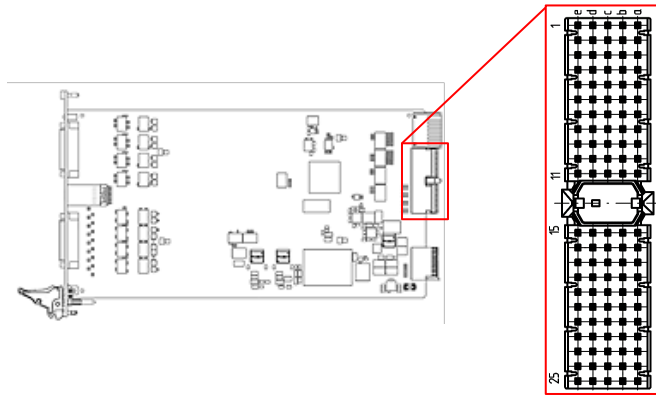
DATA SHEET

Table 2. Isolated RS-422 Module CONN 1 Pinout



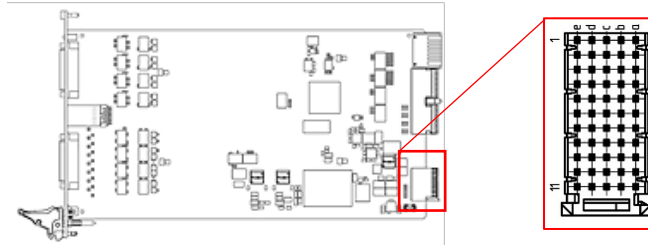
DATA SHEET

Table 3. Backplane 110P XJ2 Connector Pinout



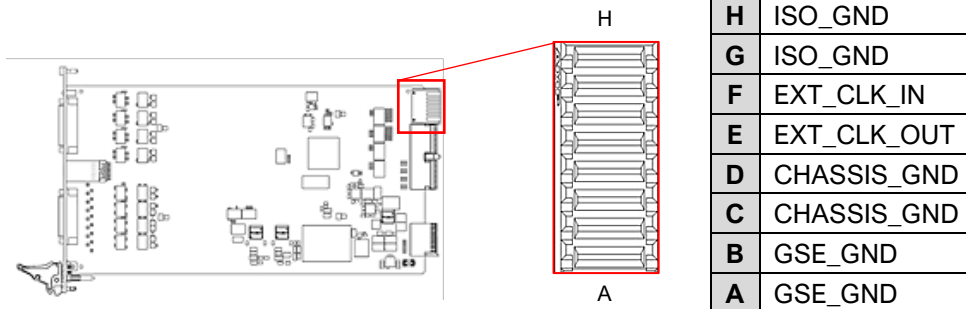
	e	d	c	b	a
1	OUT_3	OUT_2	CLK_OUT_0_IN	OUT_1	OUT_0
2	OUT_7	OUT_6	N/C	OUT_5	OUT_4
3	GND	GND	GND	GND	GND
4	OUT_11	OUT_10	N/C	OUT_9	OUT_8
5	OUT_15	OUT_14	N/C	OUT_13	OUT_12
6	GND	GND	GND	GND	GND
7	OUT_19	OUT_18	N/C	OUT_17	OUT_16
8	OUT_23	OUT_22	N/C	OUT_21	OUT_20
9	GND	GND	GND	GND	GND
10	OUT_27	OUT_26	N/C	OUT_25	OUT_24
11	OUT_31	OUT_30	N/C	OUT_29	OUT_28
12	GND	GND	GND	GND	GND
13	N/C	N/C	N/C	N/C	N/C
14	N/C	N/C	N/C	N/C	N/C
15	IN_3	IN_2	CLK_IN_0_IN	IN_1	IN_0
16	IN_7	IN_6	N/C	IN_5	IN_4
17	GND	GND	GND	GND	GND
18	IN_11	IN_10	N/C	IN_9	IN_8
19	IN_15	IN_14	N/C	IN_13	IN_12
20	GND	GND	GND	GND	GND
21	IN_19	IN_18	N/C	IN_17	IN_16
22	IN_23	IN_22	N/C	IN_21	IN_20
23	GND	GND	GND	GND	GND
24	IN_27	IN_26	N/C	IN_25	IN_24
25	IN_31	IN_30	N/C	IN_29	IN_28

Table 4. Backplane 55P XJ1 Connector Pinout



	f	e	d	c	b	a
1	GSE_GND	N/C	N/C	N/C	N/C	N/C
2	GSE_GND	N/C	N/C	N/C	N/C	N/C
3	GSE_GND	N/C	N/C	N/C	N/C	N/C
4	GSE_GND	N/C	N/C	N/C	N/C	N/C
5	GSE_GND	N/C	N/C	N/C	N/C	N/C
6	GSE_GND	N/C	N/C	N/C	N/C	N/C
7	GSE_GND	GSE_GND	N/C	GSE_GND	N/C	GSE_GND
8	GSE_GND	SLSC_SpiMosi	GSE_GND	SLSC_SpiCLK	GSE_GND	SLSC_InitIn#
9	GSE_GND	GSE_GND	SLSC_Trig_To_Mod	GSE_GND	SLSC_Tri_From_Mod	GSE_GND
10	GSE_GND	N/C	GSE_GND	SLSC_SpiMiso	GSE_GND	SLSC_ED_SS#
11	GSE_GND	24 V	SLSC Rdy/Rst#	3.3V	SLSC ID SS#	24 V

Table 5. Backplane XJ3 Connector Pinout



ORDER INFORMATION

When ordering, please specify the requested part number shown in Table 6. R_x , R_y and R_z are defined in the functional block diagram shown on Page 2. For custom orders which are not described within Table 6, please contact B&A Engineering to associate a dash number for the requested configuration (200078-X).

Table 6. Dash number for available configurations

Part No.	Product Description	R_x	R_y	R_z
200078	PWA, ISOLATED RS422 MODULE (Default)	0 Ω	0 Ω	100 Ω
200078-01	PWA, ISOLATED RS422 MODULE	49.9 Ω	49.9 Ω	0 Ω
200078-02	PWA, ISOLATED RS422 MODULE	25 Ω	25 Ω	100 Ω