



VT1521-TFB

16-CH TERMINAL BLOCK WITH TRIFILER FILTER

USER'S MANUAL

**P/N: 82-0107-000
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VXI Technology, Inc.

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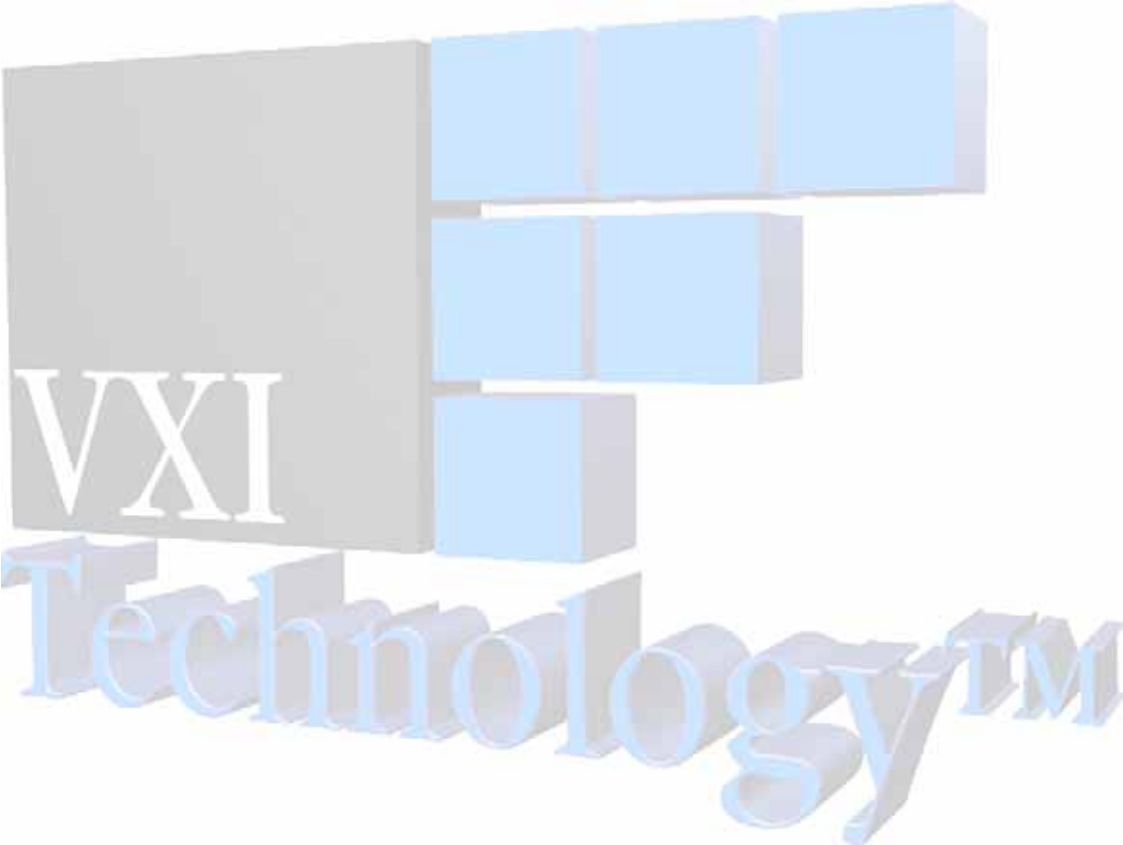


TABLE OF CONTENTS

INTRODUCTION

Certification	5
Warranty	5
Limitation of Warranty	5
Restricted Rights Legend	5
DECLARATION OF CONFORMITY	6
GENERAL SAFETY INSTRUCTIONS	7
Terms and Symbols	7
Warnings	7
SUPPORT RESOURCES	9
SECTION 1	11
INTRODUCTION	11
Introduction	11
About this Manual	11
SECTION 2	13
OPERATION	13
Operation	13
Wideband Output	13
Jumper Settings	14
Block Diagrams	16
Connector Pins / Signal Assignment	19
Mating Connectors	21
User-Defined Resistors	21
Connecting to the Terminal Module	22
Quarter-Bridge Connections	22
Half-Bridge Connections	23
Full-Bridge Connections	24

CERTIFICATION

VXI Technology, Inc. (VTI) certifies that this product met its published specifications at the time of shipment from the factory. VTI further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology (formerly National Bureau of Standards), to the extent allowed by that organization's calibration facility, and to the calibration facilities of other International Standards Organization members.

WARRANTY

The product referred to herein is warranted against defects in material and workmanship for a period of three years from the receipt date of the product at customer's facility. The sole and exclusive remedy for breach of any warranty concerning these goods shall be repair or replacement of defective parts, or a refund of the purchase price, to be determined at the option of VTI.

For warranty service or repair, this product must be returned to a VXI Technology authorized service center. The product shall be shipped prepaid to VTI and VTI shall prepay all returns of the product to the buyer. However, the buyer shall pay all shipping charges, duties, and taxes for products returned to VTI from another country.

VTI warrants that its software and firmware designated by VTI for use with a product will execute its programming when properly installed on that product. VTI does not however warrant that the operation of the product, or software, or firmware will be uninterrupted or error free.

LIMITATION OF WARRANTY

The warranty shall not apply to defects resulting from improper or inadequate maintenance by the buyer, buyer-supplied products or interfacing, unauthorized modification or misuse, operation outside the environmental specifications for the product, or improper site preparation or maintenance.

VXI Technology, Inc. shall not be liable for injury to property other than the goods themselves. Other than the limited warranty stated above, VXI Technology, Inc. makes no other warranties, express, or implied, with respect to the quality of product beyond the description of the goods on the face of the contract. VTI specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subdivision (b)(3)(ii) of the Rights in Technical Data and Computer Software clause in DFARS 252.227-7013.

VXI Technology, Inc.
2031 Main Street
Irvine, CA 92614-6509 U.S.A.

DECLARATION OF CONFORMITY
Declaration of Conformity According to ISO/IEC Guide 22 and EN 45014

MANUFACTURER'S NAME	VXI Technology, Inc.
MANUFACTURER'S ADDRESS	2031 Main Street Irvine, California 92614-6509
PRODUCT NAME	16-Ch Terminal Block with Trifilar Filter
MODEL NUMBER(S)	VT1521-TFB Option
PRODUCT OPTIONS	All
PRODUCT CONFIGURATIONS	All

VXI Technology, Inc. declares that the aforementioned product conforms to the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/366/EEC (inclusive 93/68/EEC) and carries the "CE" mark accordingly. The product has been designed and manufactured according to the following specifications:

SAFETY	EN61010 (2001)
EMC	EN61326 (1997 w/A1:98) Class A CISPR 22 (1997) Class A VCCI (April 2000) Class A ICES-003 Class A (ANSI C63.4 1992) AS/NZS 3548 (w/A1 & A2:97) Class A FCC Part 15 Subpart B Class A EN 61010-1:2001

CE Certification Pending

The product was installed into a C-size VXI mainframe chassis and tested in a typical configuration.

I hereby declare that the aforementioned product has been designed to be in compliance with the relevant sections of the specifications listed above as well as complying with all essential requirements of the Low Voltage Directive.

March 2005



Steve Mauga, QA Manager

GENERAL SAFETY INSTRUCTIONS

Review the following safety precautions to avoid bodily injury and/or damage to the product. These precautions must be observed during all phases of operation or service of this product. Failure to comply with these precautions, or with specific warnings elsewhere in this manual, violates safety standards of design, manufacture, and intended use of the product.

Service should only be performed by qualified personnel.

TERMS AND SYMBOLS

These terms may appear in this manual:

- WARNING** Indicates that a procedure or condition may cause bodily injury or death.
- CAUTION** Indicates that a procedure or condition could possibly cause damage to equipment or loss of data.

These symbols may appear on the product:



ATTENTION - Important safety instructions



Frame or chassis ground

WARNINGS

Follow these precautions to avoid injury or damage to the product:

- Use Proper Power Cord** To avoid hazard, only use the power cord specified for this product.
- Use Proper Power Source** To avoid electrical overload, electric shock, or fire hazard, do not use a power source that applies other than the specified voltage.
- Use Proper Fuse** To avoid fire hazard, only use the type and rating fuse specified for this product.

WARNINGS (CONT.)**Avoid Electric Shock**

To avoid electric shock or fire hazard, do not operate this product with the covers removed. Do not connect or disconnect any cable, probes, test leads, etc. while they are connected to a voltage source. Remove all power and unplug unit before performing any service. ***Service should only be performed by qualified personnel.***

Ground the Product

This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground.

Operating Conditions

To avoid injury, electric shock or fire hazard:

- Do not operate in wet or damp conditions.
- Do not operate in an explosive atmosphere.
- Operate or store only in specified temperature range.
- Provide proper clearance for product ventilation to prevent overheating.
- DO NOT operate if any damage to this product is suspected. ***Product should be inspected or serviced only by qualified personnel.***

Improper Use

The operator of this instrument is advised that if the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired. Conformity is checked by inspection.

SUPPORT RESOURCES

Support resources for this product are available on the Internet and at VXI Technology customer support centers.

VXI Technology World Headquarters

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Visit <http://www.vxitech.com> for worldwide support sites and service plan information.

SECTION 1

INTRODUCTION

INTRODUCTION

The VT1521-TFB terminal block option is a 16-channel terminal block with a trifilar filter per channel for high common mode signal rejection. Designed to work with the VT1521, the TFB (trifilar bridge) also contains user replaceable shunt calibration resistors. These specifications for the VT1521 reflect the combined performance of the scanning A/D and the VT1521 SCP and VT1521-TFB terminal block.

ABOUT THIS MANUAL

This manual shows how to configure the VT1521-TFB for its various modes of operation and how to connect it to the VT1521 and VT1511A.

SECTION 2

OPERATION

OPERATION

The VT1521-TFB provides the bridge completion resistor for the quarter-bridge configurations. The completion resistor can be set at one of the following values: 120 Ω , 350 Ω , or a user-defined resistor value. The completion resistor can be bypassed for half- and full-bridge configuration.

The VT1521-TFB also provides the calibration shunt resistor. The value of the on-board shunt resistor is 54.9 k Ω , but TFB option can also utilize a user-defined resistor. When shunt calibration is enabled, the shunt resistor is switched in parallel to one leg of the bridge. This causes a change in the bridge output voltage. Use it to check the bridge wiring. Please see *User-Defined Resistors* later in this section for recommended resistor types.

NOTE	The 10 V excitation level cannot be used with a 120 Ω full-bridge configuration. This low impedance bridge configuration draws too much current from the excitation supply at 10 V (>50 mA supply limit).
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This section details the appropriate jumper setting for quarter-, half-, and full-bridge configuration, the VT1511A compatible configuration, connector pin location, signal assignments, and mating connectors for use with the VT1521-TFB. It also details wideband output configuration.

WIDEBAND OUTPUT

The VT1521-TFB terminal block provides a single-pole, low-pass filter for each channel which can be enabled or bypassed on J102. Refer to Table 2-1 for jumper settings. Based on measurements taken with a 10 k Ω load, the low-pass filter has a cut-off frequency of 48 kHz.

JUMPER SETTINGS

The jumpers on the VT1521-TFB are used to manipulate bridge configuration, shield configuration, and to enable or disable wideband output. The jumper functions are detailed in Table 2-1 below. The jumper locations can be visualized in Figure 2-1 on the following page.

Jumper	Position	Description of Function	Factory Default
JPX01	OPEN	Module only operates in quarter-bridge mode.	OPEN
	1-2	Bypasses the completion resistor and enables full- or half-bridge operation as defined by the user.	
JPX02	1-2	Add shunt resistor.	1-2
	2-3	Bypasses the shunt resistor. (Used for VT1511A configuration.)	
JPX03	1-2	Enables the completion resistor.	1-2
	2-3	Bypasses the completion circuitry. (Used for VT1511A configuration.)	
JPX04	OPEN	Disables control signal to enable/disable shunt resistor.	1-2
	1-2	Enables control signal to enable/disable shunt resistor. (Must be installed for VT1521 operation.)	
JPX05	OPEN	Allows for use of user-defined completion resistor RX02.	2-3
	1-2	Sets the completion resistor value to 120 Ω	
	2-3	Sets the completion resistor value to 350 Ω	
JPX06	1-2	Allows user to select shunt resistor RX01 (54.9 k Ω)	1-2
	2-3	Allows user to select shunt resistor RX04 (user-defined)	
JPX07	OPEN	Do not capacitively couple guard to ground.	OPEN
	1-2	Capacitively couple guard to ground.	
JPX08	OPEN	Enables the shield filter.	OPEN
	1-2	Bypasses the shield filter.	
JPX09	OPEN	Enables the shield transformer.	OPEN
	1-2	Bypasses the shield transformer.	
JPX10	OPEN	Disables wideband output at J102	2-3
	1-2	Enables wideband without low-pass filter output at J102.	
	2-3	Enables wideband with low-pass filter output at J102.	
JPX11	OPEN	Disconnects completion resistor from excite. Used for half- or full-bridge in conjunction with JPX01.	1-2
	1-2	Connects completion bridge resistor to excite. Used for quarter-bridge operation while JPX01 is open.	
JPX12	OPEN	Disconnects low-pass filter from J102.	1-2
	1-2	Connects low-pass filter to J102.	
<p>NOTE: “X” represents the number of the channel on which the jumper is located. For example, JP101 represents jumper 1 on channel 1, JP201 represents jumper 1 on channel 2.</p> <p>When JPX10 is set to the 2-3 position, JPX12 must be set to the 1-2 position or no signal will be available on JP102.</p>			

TABLE 2-1: VT1521-TFB JUMPER SETTINGS

NOTE	To configure the VT1521-TFB to work with a VT1511A, set JPX02 and JPX03 to position 2-3 leave JPX12 open.
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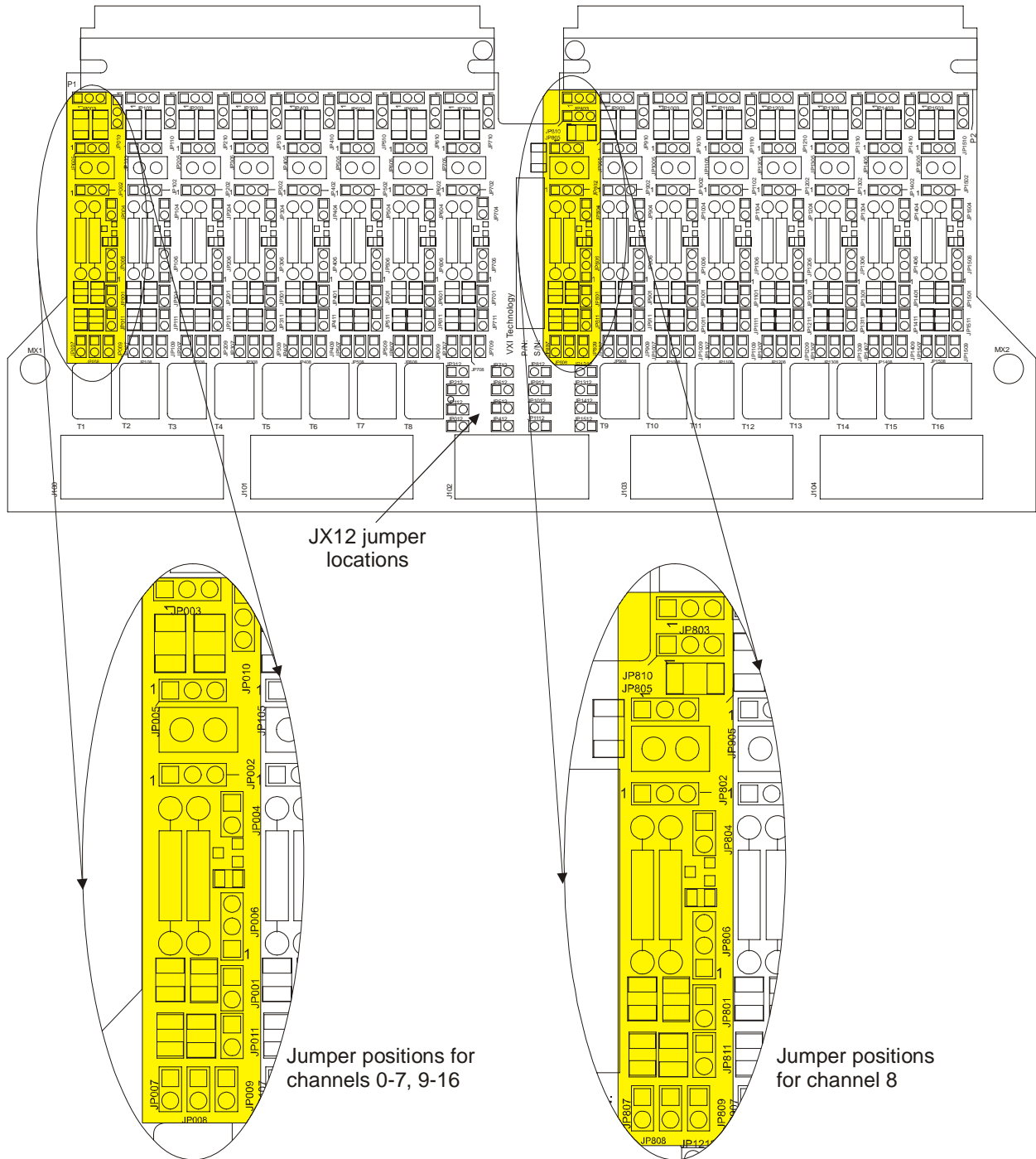


FIGURE 2-1: VT1521 JUMPER PIN LOCATIONS

BLOCK DIAGRAMS

The following pages provide block diagrams delineating the basic circuitry of the quarter-, half-, and full-bridge configurations of the VT1521-TFB. The diagrams also indicate which jumpers need to be altered from their default settings in order to attain a specific configuration.

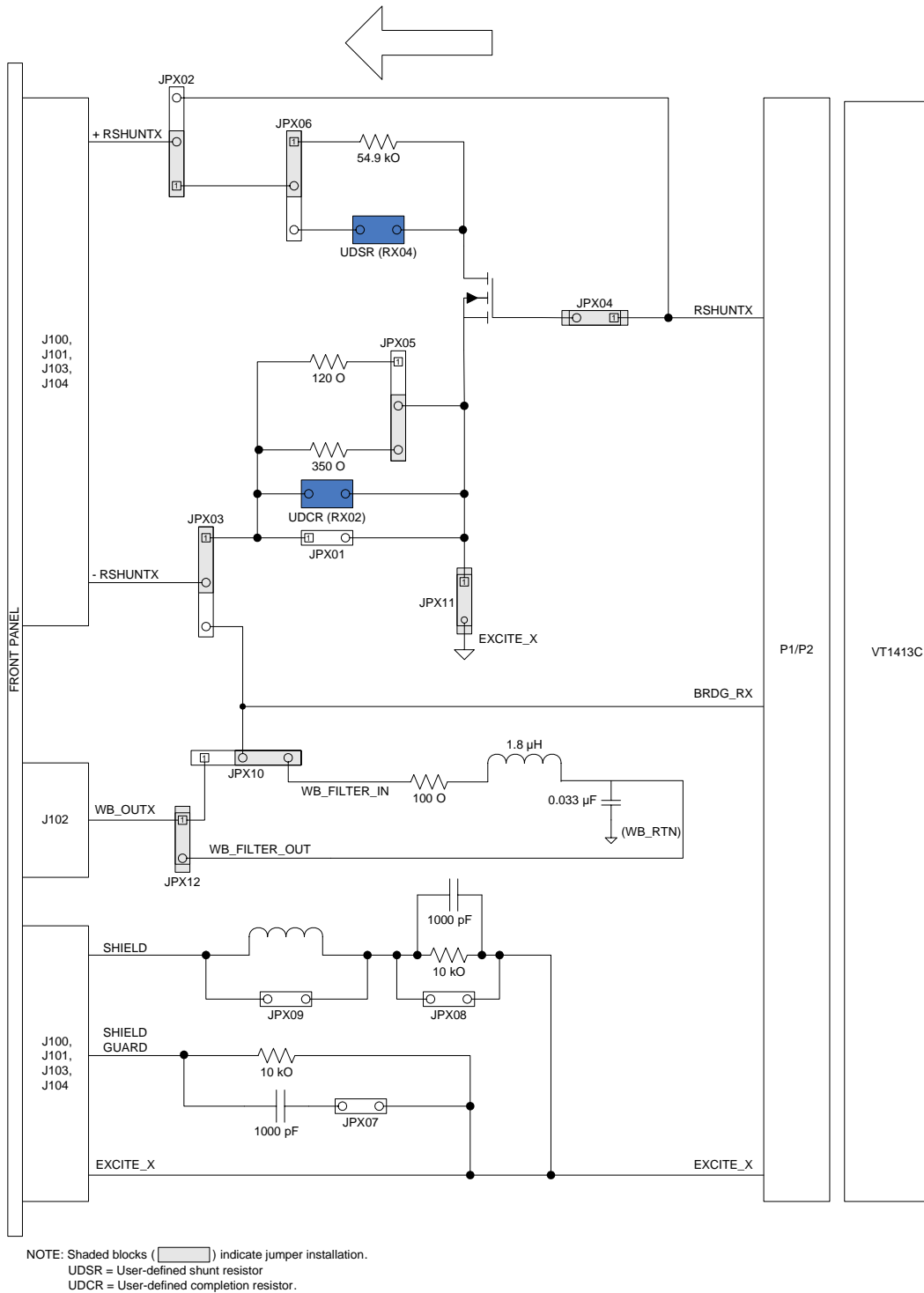
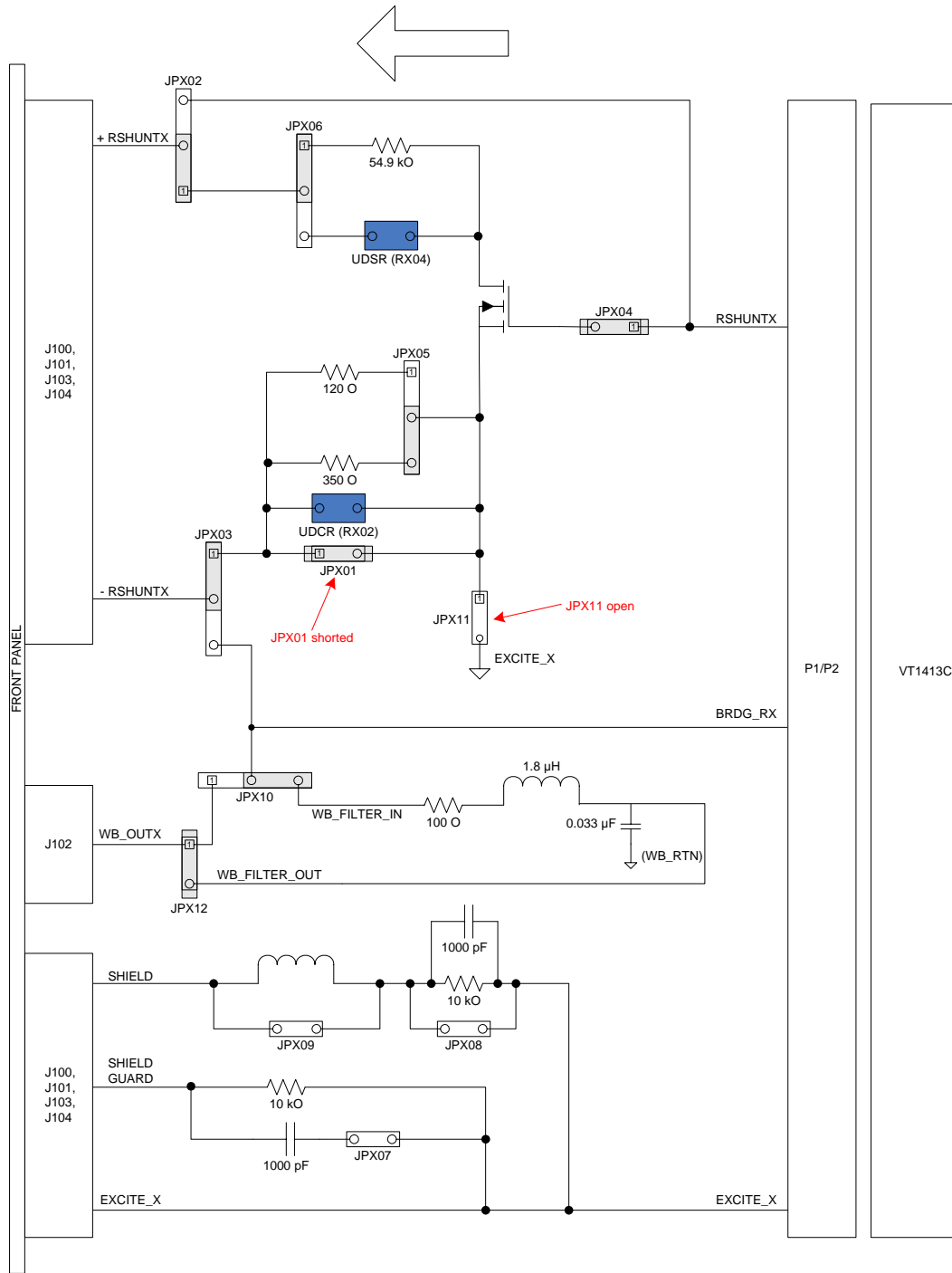


FIGURE 2-2: QUARTER-BRIDGE CONFIGURATION (DEFAULT SETTING)




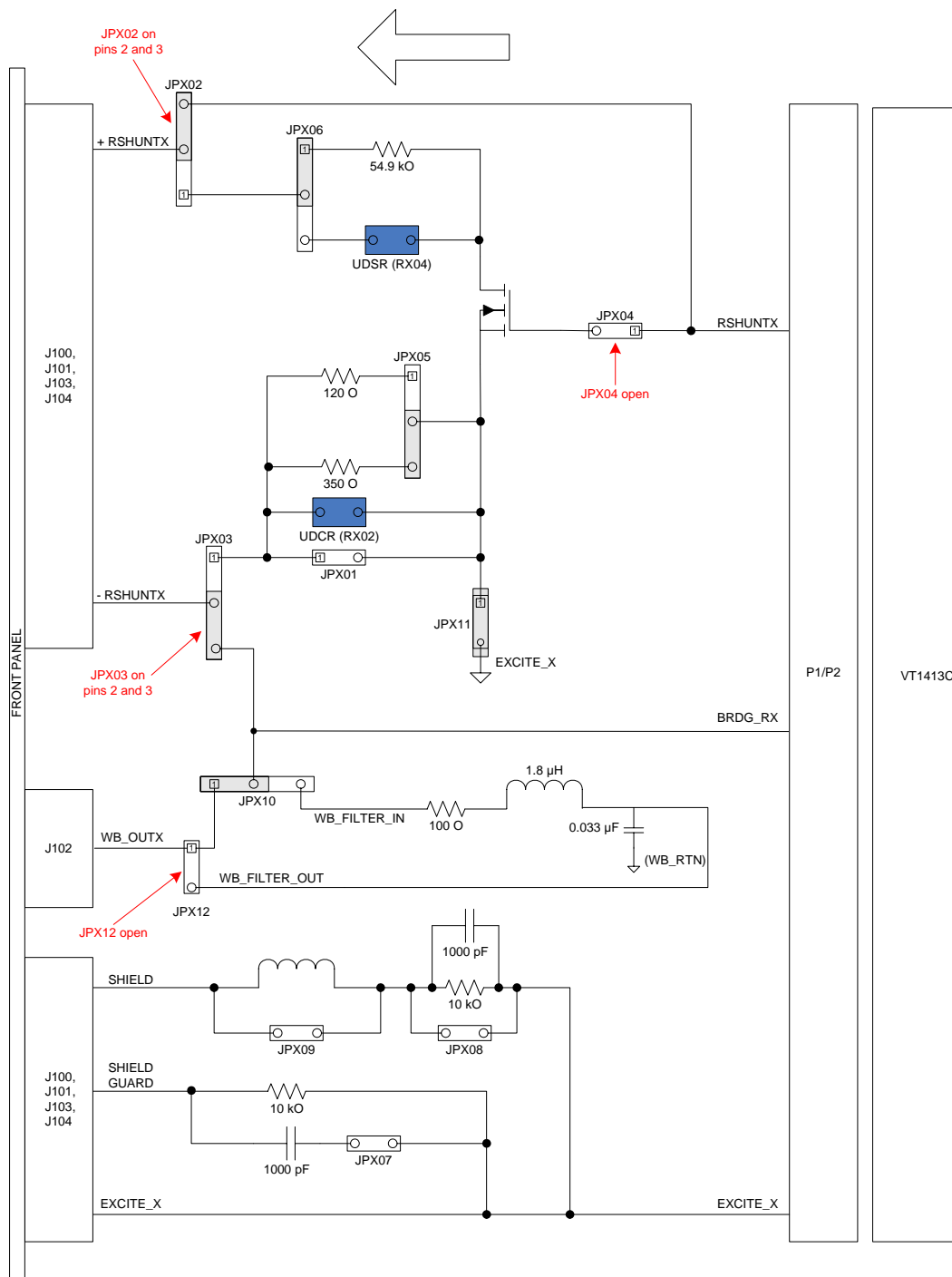
NOTE: Shaded blocks () indicate jumper installation.
 Red text denotes alterations from factory default settings.
 UDSR = User-defined shunt resistor
 UDCR = User-defined completion resistor.

FIGURE 2-3: HALF- AND FULL-BRIDGE CONFIGURATION




NOTE: Shaded blocks () indicate jumper installation.
 Red text denotes alterations from factory default settings.
 UDSR = User-defined shunt resistor
 UDCR = User-defined completion resistor.

FIGURE 2-4: VT1511A CONFIGURATION

CONNECTOR PINS / SIGNAL ASSIGNMENT

The VT1521-TFB utilized four 44-pin and one 34-pin connectors. The front panel layout is provided in Figure 2-5 and indicates orientation and connector pin references. Table 2-2, Table 2-3, and Table 2-4 provide signal assignment information.

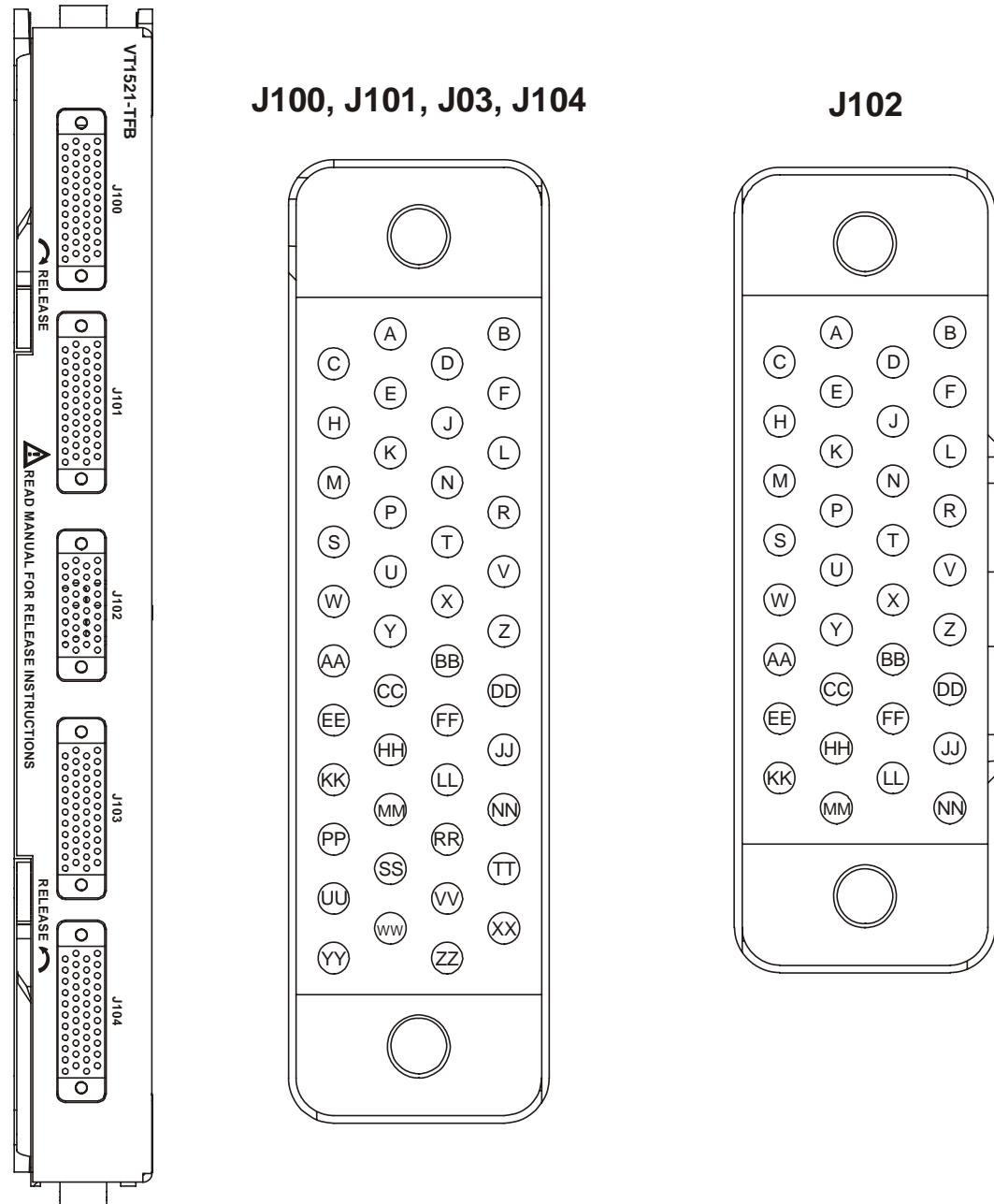


FIGURE 2-5: VT1521-TFB FRONT PANEL

TABLE 2-2: J100 / J101 CONNECTOR PINS/SIGNAL ASSIGNMENTS

J100				J101			
PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
A	EXCITE+0	AA	BRIDGE SENSE+2	A	EXCITE+4	AA	BRIDGE SENSE+6
B	ESENSE+0	BB	BRIDGE SENSE-2	B	ESENSE+4	BB	BRIDGE SENSE-6
C	BRIDGE SENSE+0	CC	ESENSE-2	C	BRIDGE SENSE+4	CC	ESENSE-6
D	BRIDGE SENSE-0	DD	EXCITE-2	D	BRIDGE SENSE-4	DD	EXCITE-6
E	ESENSE-0	EE	+RSHUNT2	E	ESENSE-4	EE	+RSHUNT6
F	EXCITE-0	FF	-RSHUNT2	F	EXCITE-4	FF	-RSHUNT6
H	+RSHUNT0	HH	SHIELD 2	H	+RSHUNT4	HH	SHIELD 6
J	-RSHUNT0	JJ	GUARD 2	J	-RSHUNT4	JJ	GUARD 6
K	SHIELD 0	KK	EXCITE+3	K	SHIELD 4	KK	EXCITE+7
L	GUARD 0	LL	ESENSE+3	L	GUARD 4	LL	ESENSE+7
M	EXCITE+1	MM	BRIDGE SENSE+3	M	EXCITE+5	MM	BRIDGE SENSE+7
N	ESENSE+1	NN	BRIDGE SENSE-3	N	ESENSE+5	NN	BRIDGE SENSE-7
P	BRIDGE SENSE+1	PP	ESENSE-3	P	BRIDGE SENSE+5	PP	ESENSE-7
R	BRIDGE SENSE-1	RR	EXCITE-3	R	BRIDGE SENSE-5	RR	EXCITE-7
S	ESENSE-1	SS	+RSHUNT3	S	ESENSE-5	SS	+RSHUNT7
T	EXCITE-1	TT	-RSHUNT3	T	EXCITE-5	TT	-RSHUNT7
U	+RSHUNT1	UU	SHIELD 3	U	+RSHUNT5	UU	SHIELD 7
V	-RSHUNT1	VV	GUARD 3	V	-RSHUNT5	VV	GUARD 7
W	SHIELD 1	WW	CHASSIS GND	W	SHIELD 5	WW	CHASSIS GND
X	GUARD 1	XX	CHASSIS GND	X	GUARD 5	XX	CHASSIS GND
Y	EXCITE+2	YY	CHASSIS GND	Y	EXCITE+6	YY	CHASSIS GND
Z	ESENSE+2	ZZ	CHASSIS GND	Z	ESENSE+6	ZZ	CHASSIS GND

TABLE 2-3: J103 / J104 CONNECTOR PINS/SIGNAL ASSIGNMENTS

J103				J104			
PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
A	EXCITE+8	AA	BRIDGE SENSE+10	A	EXCITE+12	AA	BRIDGE SENSE+14
B	ESENSE+8	BB	BRIDGE SENSE-10	B	ESENSE+12	BB	BRIDGE SENSE-14
C	BRIDGE SENSE+8	CC	ESENSE-10	C	BRIDGE SENSE+12	CC	ESENSE-14
D	BRIDGE SENSE-8	DD	EXCITE-10	D	BRIDGE SENSE-12	DD	EXCITE-14
E	ESENSE-8	EE	+RSHUNT10	E	ESENSE-12	EE	+RSHUNT14
F	EXCITE-8	FF	-RSHUNT10	F	EXCITE-12	FF	-RSHUNT14
H	+RSHUNT8	HH	SHIELD 10	H	+RSHUNT12	HH	SHIELD 14
J	-RSHUNT8	JJ	GUARD 10	J	-RSHUNT12	JJ	GUARD 14
K	SHIELD 8	KK	EXCITE+11	K	SHIELD 12	KK	EXCITE+15
L	GUARD 8	LL	ESENSE+11	L	GUARD 12	LL	ESENSE+15
M	EXCITE+9	MM	BRIDGE SENSE+11	M	EXCITE+13	MM	BRIDGE SENSE+15
N	ESENSE+9	NN	BRIDGE SENSE-11	N	ESENSE+13	NN	BRIDGE SENSE-15
P	BRIDGE SENSE+9	PP	ESENSE-11	P	BRIDGE SENSE+13	PP	ESENSE-15
R	BRIDGE SENSE-9	RR	EXCITE-11	R	BRIDGE SENSE-13	RR	EXCITE-15
S	ESENSE-9	SS	+RSHUNT11	S	ESENSE-13	SS	+RSHUNT15
T	EXCITE-9	TT	-RSHUNT11	T	EXCITE-13	TT	-RSHUNT15
U	+RSHUNT9	UU	SHIELD 11	U	+RSHUNT13	UU	SHIELD 15
V	-RSHUNT9	VV	GUARD 11	V	-RSHUNT13	VV	GUARD 15
W	SHIELD 9	WW	CHASSIS GND	W	SHIELD 13	WW	CHASSIS GND
X	GUARD 9	XX	CHASSIS GND	X	GUARD 13	XX	CHASSIS GND
Y	EXCITE+10	YY	CHASSIS GND	Y	EXCITE+14	YY	CHASSIS GND
Z	ESENSE+10	ZZ	CHASSIS GND	Z	ESENSE+14	ZZ	CHASSIS GND

TABLE 2-4: J102 CONNECTOR PINS/SIGNAL ASSIGNMENTS

J102			
PIN	SIGNAL	PIN	SIGNAL
A	WB_OUT0	V	WB_RTN_8-11
B	WB_RTN_0-3	W	WB_OUT9
C	WB_OUT1	X	WB_RTN_8-11
D	WB_RTN_0-3	Y	WB_OUT10
E	WB_OUT2	Z	WB_RTN_8-11
F	WB_RTN_0-3	AA	WB_OUT11
H	WB_OUT3	BB	WB_RTN_8-11
J	WB_RTN_0-3	CC	WB_OUT12
K	WB_OUT4	DD	WB_RTN_12-15
L	WB_RTN_4-7	EE	WB_OUT13
M	WB_OUT5	FF	WB_RTN_12-15
N	WB_RTN_4-7	HH	WB_OUT14
P	WB_OUT6	JJ	WB_RTN_12-15
R	WB_RTN_4-7	KK	WB_OUT15
S	WB_OUT7	LL	WB_RTN_12-15
T	WB_RTN_4-7	MM	CHASSIS GND
U	WB_OUT8	NN	CHASSIS GND

MATING CONNECTORS

Mating connectors for the VT1521-TFB are provided below as well as appropriate contact pins.

Description	VTI P/N	Mfr. (P/N)
34-Pin Conn. Male, Cable, Mount, SGMC Series	27-0026-034	Positronics (P/N: SGMC34MOE100J0)
44-Pin Conn. Male, Cable, Mount, SGMC Series	27-0026-044	Positronics (P/N: SGMC44MOE100J0)
Contact Pins, Male, Solder Contact for SGMC Series	27-0026-999	Positronics (P/N: MS422N)

USER-DEFINED RESISTORS

To ensure that the user-defined resistors meet tolerances and properly match the footprints on the VT1521-TFB, the following resistors are recommended.

Shunt Description and Position	Manufacturer	Type
Completion Resistor (RX02)	Vishay	VSR
Shunt Resistor (RX04)	Vishay	ERC (RNC55) or CMF (RN55E)

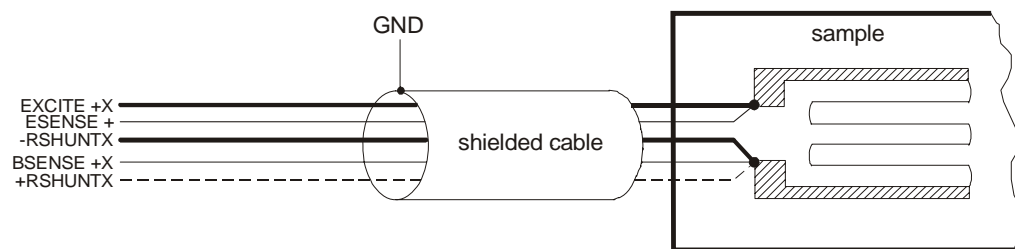
CONNECTING TO THE TERMINAL MODULE

This section shows how to make quarter-, half-, and full-bridge strain gage connections to the terminal module.

- See “Attaching and Wiring the Terminal Module” in the VT1413C User’s Manual to wire the strain gages to the Terminal Module.
- For accurate measurements, use a twisted shielded cable for the strain gage connections. Connect the shield to the specimen and to the guard (G) terminal on the Terminal Module.

Quarter-Bridge Connections

Use Figure 2-6 for quarter-bridge connections to the terminal module. Install or make sure the quarter-bridge jumper(s) is installed in the quarter-bridge configuration for all channels that are to make quarter-bridge measurements (see Table 2-1 and Figure 2-2).

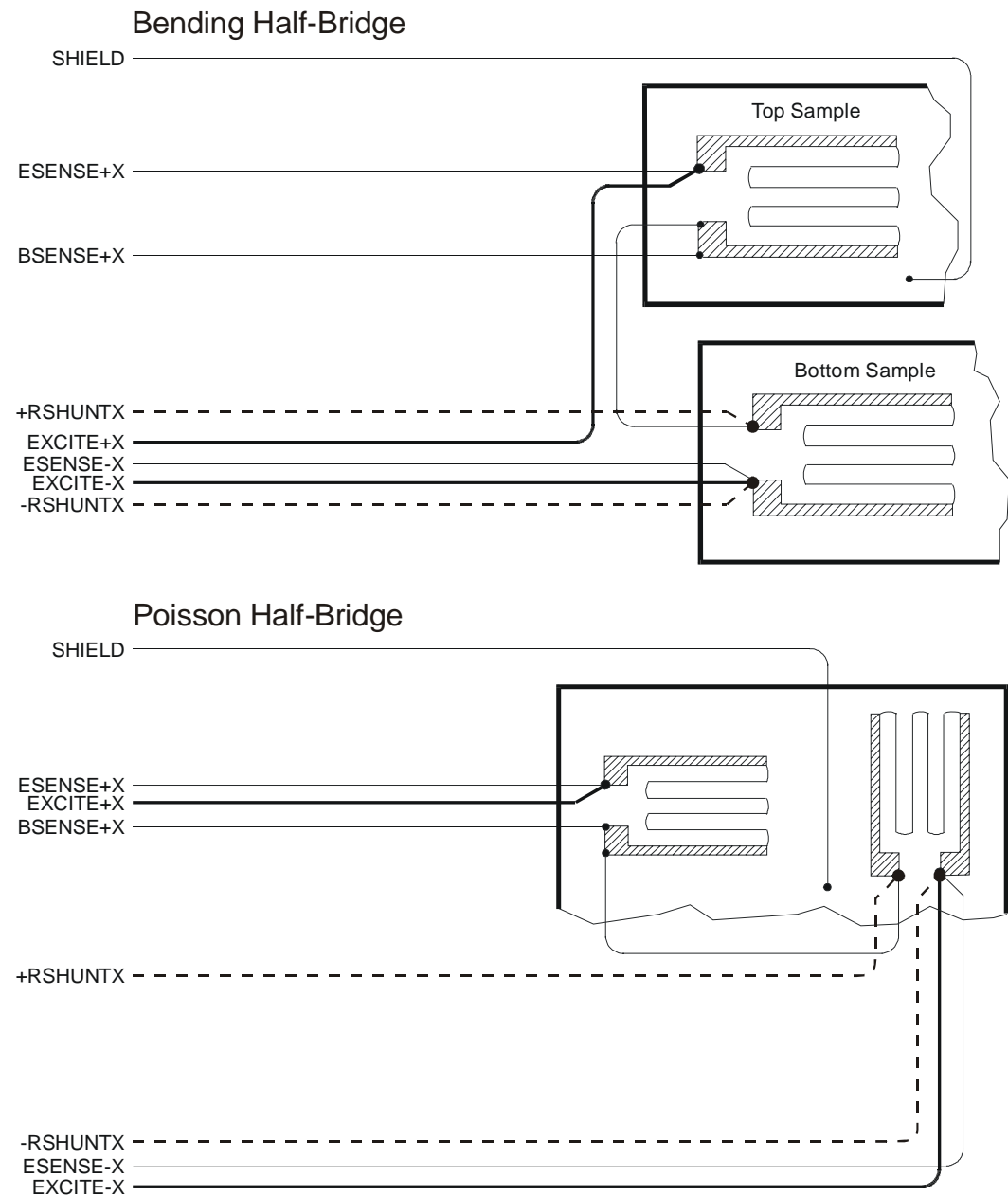


NOTE: The optional shunt resistor connection is shown by the dashed lines

FIGURE 2-6: TYPICAL QUARTER-BRIDGE CONNECTIONS

Half-Bridge Connections

Use Figure 2-7 for half-bridge connections to the terminal module. Remove or be sure the quarter-bridge jumper(s) is not installed in the quarter-bridge configuration for all channels that are to make half-bridge measurements (see Table 2-1 and Figure 2-3).

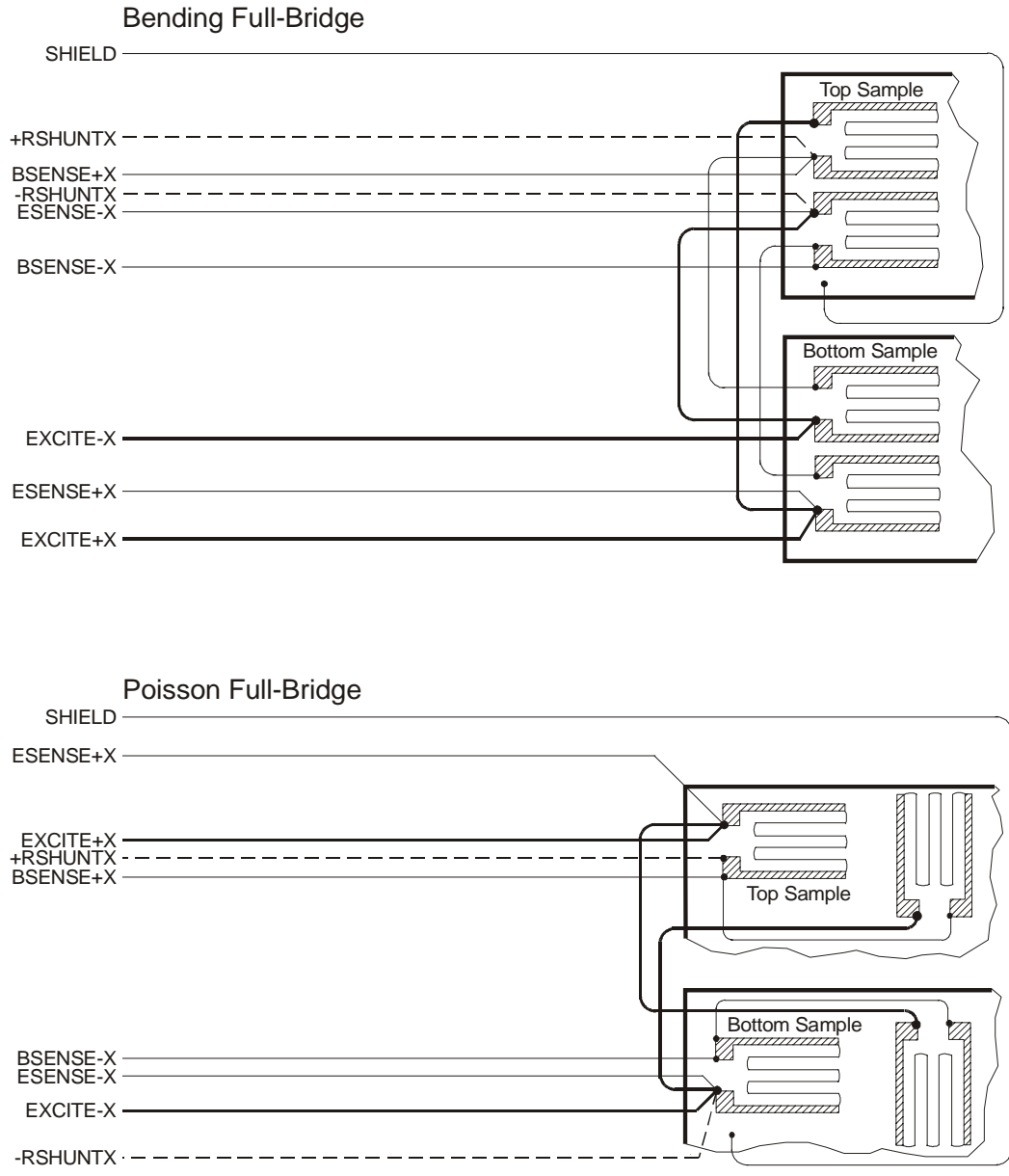


Note: The optional shunt resistor connection is shown by the dashed lines

FIGURE 2-7: TYPICAL HALF-BRIDGE CONNECTIONS

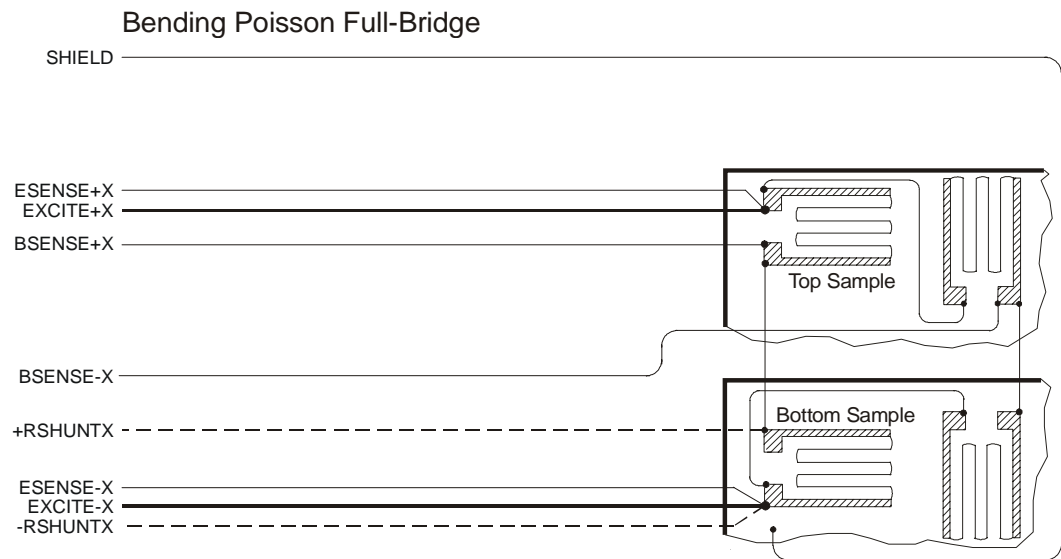
Full-Bridge Connections

Use Figure 2-8 and Figure 2-9 for full-bridge connections to the terminal module. Remove or be sure the quarter-bridge jumper(s) is not installed in the quarter-bridge configuration for all channels that are to make full-bridge measurements (see Table 2-1 and Figure 2-3).



NOTE: The optional shunt resistor connection is shown by the dashed lines

FIGURE 2-8: TYPICAL FULL-BRIDGE CONNECTIONS



NOTE: The optional shunt resistor connection is shown by the dashed lines

FIGURE 2-9: TYPICAL FULL-BRIDGE CONNECTIONS (CONTINUED)