



The logo for verSI consists of a 3x4 grid of grey dots to the left of the word "verSI" in a blue sans-serif font, with a trademark symbol (TM) to the right.

The AirBorn verSI (versatile connectors with high-speed signal integrity) open-pin field product line is designed to meet the requirements for high-speed/high-density/signal integrity 100 Ω and 85 Ω differential serial bus applications while still delivering the reliability customers have come to expect from AirBorn.



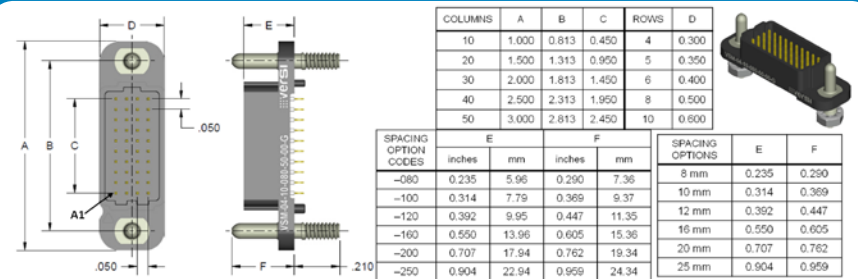


VSM – Vertical (Male)

Pitch: 1.27 mm

VSM signal-integrity connectors are used in vertical, PCB-mount applications where a male interface is required. Termination styles include press-fit, paste-in-hole, plated thru-hole, and surface-mount.

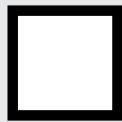
DIMENSIONS



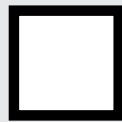
Sample Part Number Format: VSM-04-10-080-50-02-G



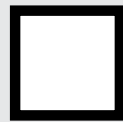
SERIES
Vertical (Male)
1.27 mm



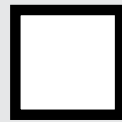
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



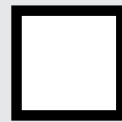
COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



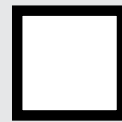
BOARD SPACING*
080 – 8 mm
100 – 10 mm
120 – 12 mm
160 – 16 mm
200 – 20 mm
250 – 25 mm



CONTACT PLATING
50 – 50 μ" Au



TERMINATION
00 – Press-fit
01 – Paste-In-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"
10¹ – SMT - SN63PB37
Solder Dipped
11¹ – SMT -
42Sn/57.6Bi/0.4Ag
lead free, solder
dipped



OPTIONS
Blank – No options[†]
G – Guide pin¹
G1 – Guide pin²
J – Turning jackscrew¹
J1 – Turning jackscrew²
L – Locking screw¹
L1 – Locking screw²
N – Fixed jacknut¹
N1 – Fixed jacknut²

NOTES

Connector potting is standard.

* Consult factory for additional board spacing options.

¹ Used for PC board thickness up to 0.125"

² Used for PC board thickness 0.125" up to 0.250"

[†] Surface Mount Termination only available on 4 Row vertical connectors.

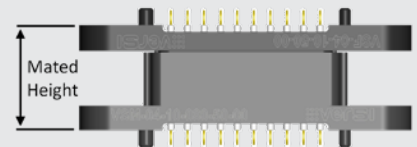
* No hardware supplied with blank hardware option connectors.

AirBorn can manufacture other configurations to your exact specifications.

RoHS Compliant (except for termination option 10); certificate of conformance available upon request with each shipment

BOARD SPACING		MATED HEIGHT (in)
VALUE	CODE	NOMINAL
8 mm	080	0.315
10 mm	100	0.394
12 mm	120	0.473
16 mm	160	0.630
20 mm	200	0.788
25 mm	250	0.985

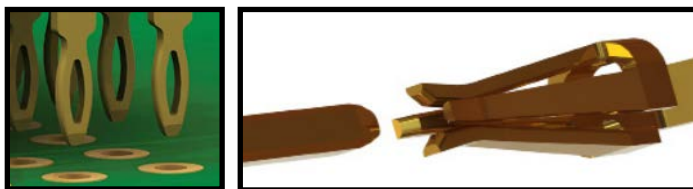
Max allowable separation between mating faces is 0.035 inches.



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FEATURES

verSI board-mount connectors feature low mating force/high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design. Guide hardware is optional.



MATERIALS and FINISHES

Pin Contacts: Phos bronze per ASTM B103 or BeCu per ASTM B768 (press-fit contact)
Contact Finish: Localized gold finish per ASTM B488 over nickel per ASTM B689 Type I, 50 μIN min

Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138

Potting Compound: Frey Eng. Co. insulating compound CF3003-80

Hardware (except washers): Stainless steel per ASTM A484/A484M, ASTM A582/A582M, or ASTM A320 passivated per SAE AMS-2700, Method 1, Type 2

Washers: Stainless steel per NASM35333 (ASTM A240), passivated per NASM35333 (SAE AMS-2700)

Solder Paste: Sn63Pb37 (PN WS483) and 42Sn/57.6Bi/0.4Ag (PN ALPHA CVP-520)

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm ±10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35–40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

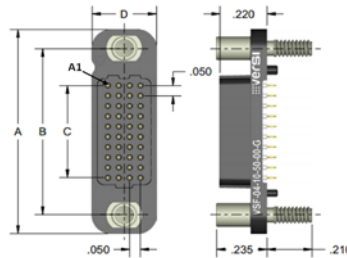


VSF – Vertical (Female)

Pitch: 1.27 mm

VSF signal-integrity connectors are used in vertical, PCB-mount applications where a female interface is required. Termination styles include press-fit, paste-in-hole, plated thru-hole, and surface-mount.

DIMENSIONS



VSF DIMENSIONS					
Columns	A	B	C	Rows	D
10	1.000	0.813	0.450	4	0.300
20	1.500	1.313	0.950	5	0.350
30	2.000	1.813	1.450	6	0.400
40	2.500	2.313	1.950	8	0.500
50	3.000	2.813	2.450	10	0.600

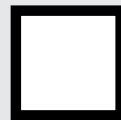
Sample Part Number Format: VSF-04-10-50-02



SERIES
Vertical (Female)
1.27 mm



ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



CONTACT PLATING
50 – 50 μ " Au



TERMINATION
00 – Press-fit
01 – Paste-in-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"
10[†] – SMT - SN63PB37
Solder Dipped
11[†] – SMT - 42Sn/57.6Bi/0.4Ag
lead free, solder dipped



OPTIONS
Blank – No hardware[†]
G – Guide socket[†]
G1 – Guide socket[†]
J – Turning jackscrew[†]
J1 – Turning jackscrew[†]
L – Locking screw[†]
L1 – Locking screw[†]
N – Fixed jacknut[†]
N1 – Fixed jacknut[†]

NOTES

Connector potting is standard.

¹ Used for PC board thickness up to 0.125"

² Used for PC board thickness 0.125" up to 0.250"

[†] Surface Mount Termination only available on 4 Row vertical connectors.

[‡] No hardware supplied with blank hardware option connectors.

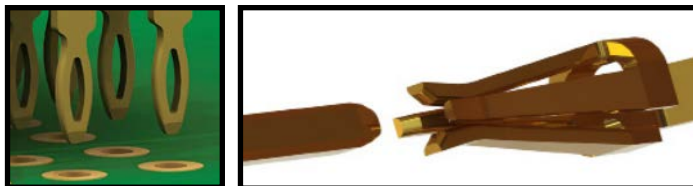
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FEATURES

verSI board-mount connectors feature low mating force / high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design. Guide hardware is optional.



MATERIALS and FINISHES

Socket Contacts: BeCu per ASTM B194
Contact Finish: Localized gold finish per ASTM B488 over nickel per ASTM B689 Type I, 50 μ N min
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Potting Compound: Frey Eng. Co. insulating compound CF3003-80
Hardware (except washers): Stainless steel per ASTM A484/A484M, ASTM A582/A582M, or ASTM A320 passivated per SAE AMS-2700, Method 1, Type 2
Washers: Stainless steel per NASM35333 (ASTM A240), passivated per NASM35333 (SAE AMS-2700)
Solder Paste: Sn63Pb37 (PN WS483) and 42Sn/57.6Bi/0.4Ag (PN ALPHA CVP-520)

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm $\pm$ 10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35–40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megaohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

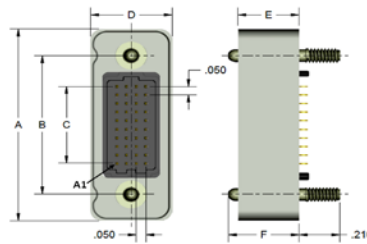


VRM – Vertical Rugged (Male)

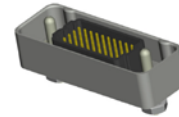
Pitch: 1.27 mm

VRM signal-integrity connectors are ruggedized versions of the standard VSM male connectors. These connectors can be used in extreme environmental conditions while maintaining high reliability and continuous performance.

DIMENSIONS



VRM DIMENSIONS					
Columns	A	B	C	Rows	D
10	1.125	0.813	0.450	4	0.425
20	1.625	1.313	0.950	5	0.475
30	2.125	1.813	1.450	6	0.525
40	2.625	2.313	1.950	8	0.625
50	3.125	2.813	2.450	10	0.725

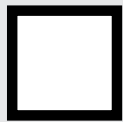


BOARD SPACING		
	E	F
8 mm	0.239	n/a
10 mm	0.319	0.374
12 mm	0.397	0.452
16 mm	0.555	0.610
20 mm	0.712	0.767
25 mm	0.909	0.964

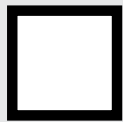
Sample Part Number Format: VRM-04-10-100-50-02-G



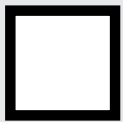
SERIES
Vertical Rugged
(Male)
1.27 mm



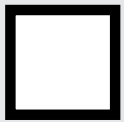
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



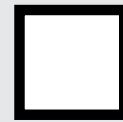
COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



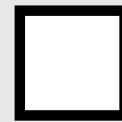
BOARD SPACING*
080 – 8 mm
100 – 10 mm
120 – 12 mm
160 – 16 mm
200 – 20 mm
250 – 25 mm



CONTACT PLATING
50 – 50 µ" Au



TERMINATION
00 – Press-fit
01 – Paste-in-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"
10[†] – SMT - SN63PB37
Solder Dipped
11[†] – SMT -
42Sn/57.6Bi/0.4Ag lead
free, solder dipped



OPTIONS
Blank – No options[‡]
G – Guide pin**[‡]
G1 – Guide pin**[‡]
J – Turning jackscrew**[‡]
J1 – Turning jackscrew**[‡]
L – Locking screw**[‡]
L1 – Locking screw**[‡]
N – Fixed jacknut**[‡]
N1 – Fixed jacknut**[‡]
E – No Hardware/EMI gasket[‡]
GE – Guide pin/EMI gasket**[‡]
G1E – Guide pin/EMI gasket**[‡]
JE – Turning jackscrew/EMI gasket**[‡]
J1E – Turning jackscrew/EMI gasket**[‡]
LE – Locking screw/EMI gasket**[‡]
L1E – Locking screw/EMI gasket**[‡]
NE – Fixed jacknut/EMI gasket**[‡]
N1E – Fixed jacknut/EMI gasket**[‡]

NOTES

Connector potting is standard.

* Consult factory for additional board spacing options.

** Not available with 8 mm board spacing

[†] Used for PC board thickness up to 0.125"

[‡] Used for PC board thickness 0.125" up to 0.250"

[†] Surface Mount Termination only available on 4 Row vertical connectors.

[‡] No hardware supplied with blank hardware option connectors.

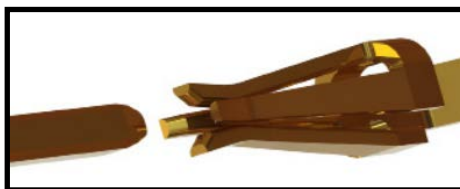
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FEATURES

verSI board-mount connectors feature low mating force / high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design. Guide hardware is optional.



MATERIALS and FINISHES

Shell: Aluminum alloy 6061-T6 per SAE AMS 4027 or 6061-T6511 per QQ-A-200/8
Finish: Electroless nickel per SAE AMS 2404, Class 3; 500 µin min
Pin Contacts: Phos bronze per ASTM B103 or BeCu per ASTM B768 (press-fit contact)
Contact Finish: Localized gold finish per ASTM B488 over nickel per ASTM B689 Type I, 50 µin min
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Potting Compound: Frey Eng. Co. insulating compound CF3003-80
Hardware (except washers): Stainless steel per ASTM A484/A484M, ASTM A582/A582M, or ASTM A320; passivated per SAE AMS-2700, Method 1, Type 2
Washers: Stainless steel per NASM35333 (ASTM A240), passivated per NASM35333 (SAE AMS-2700)
Solder Paste: Sn63Pb37 (PN WS483) and 42Sn/57.6Bi/0.4Ag (PN ALPHA CVP-520)

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm ±10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35–40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

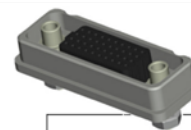
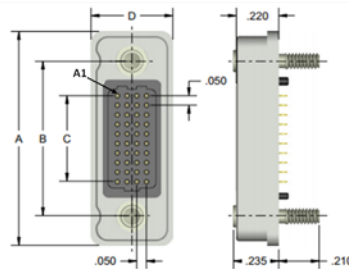


VRF – Vertical Rugged

Pitch: 1.27 mm

VRF signal-integrity connectors are ruggedized versions of the standard VSF female connectors. These connectors can be used in extreme environmental conditions while maintaining high reliability and continuous performance.

DIMENSIONS

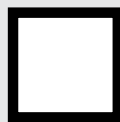


VRF DIMENSIONS					
Columns	A	B	C	Rows	D
10	1.125	0.813	0.450	4	0.425
20	1.625	1.313	0.950	5	0.475
30	2.125	1.813	1.450	6	0.525
40	2.625	2.313	1.950	8	0.625
50	3.125	2.813	2.450	10	0.725

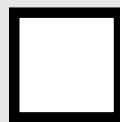
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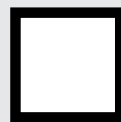
SERIES
Vertical Rugged
(Female)
1.27 mm



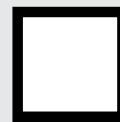
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



CONTACT PLATING
50 – 50 μ Au



TERMINATION
00 – Press-fit
01 – Paste-in-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"
10* – SMT - SN63PB37
Solder Dipped
11* – SMT - 42Sn/57.6Bi/0.4Ag
lead free, solder dipped



OPTIONS
Blank – No hardware†
G – Guide socket†
G1 – Guide socket†
J – Turning jackscrew†
J1 – Turning jackscrew†
L – Locking screw†
L1 – Locking screw†
N – Fixed jacknut†
N1 – Fixed jacknut†
E – No hardware/EMI gasket†
GE – Guide socket/EMI gasket†
G1E – Guide socket/EMI gasket†
JE – Turning jackscrew/EMI gasket†
J1E – Turning jackscrew/EMI gasket†
LE – Locking screw/EMI gasket†
L1E – Locking screw/EMI gasket†
NE – Fixed jacknut/EMI gasket†
N1E – Fixed jacknut/EMI gasket†

NOTES

Connector potting is standard.

* Used for PC board thickness up to 0.125"

* Used for PC board thickness 0.125" up to 0.250"

* Surface Mount Termination only available on 4 Row vertical connectors.

* No hardware supplied with blank hardware option connectors.

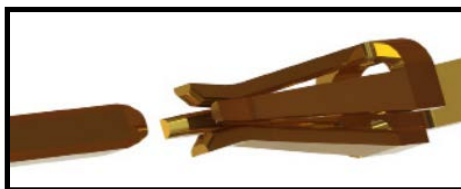
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FEATURES

verSI board-mount connectors feature low mating force / high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design. Guide hardware is optional.



MATERIALS and FINISHES

Shell: Aluminum alloy 6061-T6 per SAE AMS 4027 or 6061-T6511 per QQ-A-200/8
Finish: Electroless nickel per SAE AMS-2404, Class 3; 500 μ N min
Socket Contact: BeCu per ASTM B194
Contact Finish: Localized gold finish per ASTM B488 over nickel per ASTM B689 Type I, 50 μ N min
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Potting Compound: Frey Eng. Co. insulating compound CF3003-80
Hardware (except washers): Stainless steel per ASTM A484/A484M, A582/A582M or ASTM A320; passivated per SAE AMS-2700, Method 1, Type 2
Washers: Stainless steel per NASM35333 (ASTM A240), passivated per NASM35333 (SAE AMS-2700)
EMI Gasket (GE, G1E, NE and N1E options only): Conductive Elastomer per MIL-DTL-83528 Type D
Solder Paste: Sn63Pb37 (PN WS483) and 42Sn/57.6Bi/0.4Ag (PN ALPHA CVP-520)

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm $\pm$ 10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35–40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

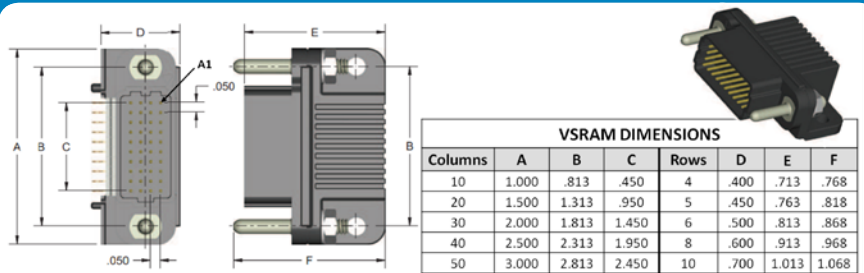


VSRAM – Right Angle (Male)

Pitch: 1.27 mm

VSRAM signal-integrity connectors are used in right angle, PCB-mount applications where a male interface is required. Termination styles include press-fit, paste-in-hole or plated thru-hole.

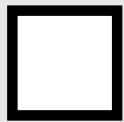
DIMENSIONS



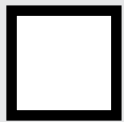
Sample Part Number Format: VSRAM-04-10-50-02-G



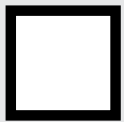
SERIES
Right Angle (Male)
1.27 mm



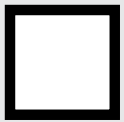
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



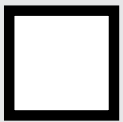
COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



CONTACT PLATING
50 – 50 μ " Au



TERMINATION
00 – Press-fit
01 – Paste-in-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"



OPTIONS
Blank – No options†
G – Guide pin
N – Fixed jacknut
J – Turning jackscrew
L – Locking screw

NOTES

Connector potting is standard.

† No hardware supplied with blank hardware option connectors.

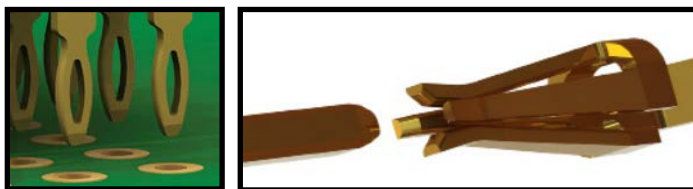
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FEATURES

verSI board-mount connectors feature low mating force / high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design. Guide hardware is optional.



MATERIALS and FINISHES

Pin Contacts (Mating Face): Phos bronze per ASTM B103
Pin Contacts (Termination): BeCu per ASTM B768 (press-fit contact) or brass alloy per ASTM B36 (PIH or PTH)
Contact Finish (Mating Face): Localized gold finish per ASTM B488, Type II, Code C over nickel per ASTM B689 Type I, 50 μ N min
Contact Finish (Termination): Localized gold finish per ASTM B488, Type II, Code C, 50 μ N min over nickel per ASTM B689 Type I, 50 μ N min (Press Fit) or Localized Gold per ASTM B488 Type I, Code A or C, 10-25 μ N over nickel per ASTM B689 Type I, 50 μ N min (PIH or PTH)
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Potting Compound: Frey Eng. Co. insulating compound CF3003-80
Hardware (except washers): Stainless steel per ASTM A484/A484M, A582/A582M, or ASTM A320; passivated per SAE AMS-2700, Method 1, Type 2
Washers: Stainless steel per NASM35333 (ASTM A240), passivated per NASM35333 (SAE AMS-2700)

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm $\pm$ 10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35-40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megaohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

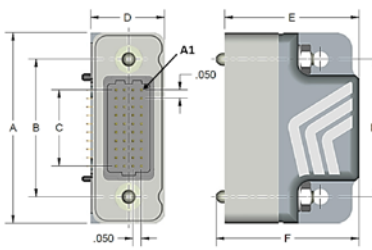


VRRAM – Rugged Right Angle (Male)

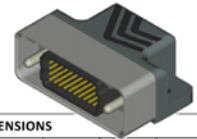
Pitch: 1.27 mm

VRRAM signal-integrity connectors are ruggedized versions of the standard VSRAM male connectors. These connectors can be used in extreme environmental conditions while maintaining high reliability and continuous performance.

DIMENSIONS



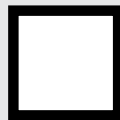
VRRAM DIMENSIONS							
Columns	A	B	C	Rows	D	E	F
10	1.125	0.813	0.450	4	0.438	0.798	0.847
20	1.625	1.313	0.950	5	0.488	0.848	0.897
30	2.125	1.813	1.450	6	0.538	0.898	0.947
40	2.625	2.313	1.950	8	0.638	0.998	1.047
50	3.125	2.813	2.450	10	0.738	1.098	1.147



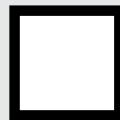
Sample Part Number Format: VRRAM-04-10-50-02-N



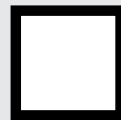
SERIES
Rugged Right
Angle (Male)
1.27 mm



ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



**CONTACT
PLATING**
50 – 50 μ Au



TERMINATION
00 – Press-fit
01 – Paste-in-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"



OPTIONS
Blank – Standard¹
G – Guide pin¹
N – Fixed jacknut¹
J – Turning jackscrew²
L – Locking screw²
E – Standard/EMI gasket¹
GE – Guide pin/EMI gasket¹
NE – Fixed jacknut/EMI gasket¹
JE – Turning jackscrew/EMI gasket²
LE – Locking screw/EMI gasket²

NOTES

¹ Shells & hardware supplied uninstalled.

² Connectors come pre-assembled with shells & hardware.

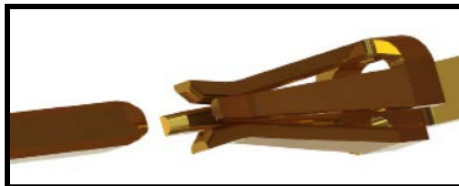
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FEATURES

verSI board-mount connectors feature low mating force / high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design. Guide hardware is optional.



MATERIALS and FINISHES

Shell: Aluminum alloy 6061-T6 per SAE AMS 4027 or 6061-T6511 per QQ-A-200/8

Finish: Electroless nickel per SAE AMS-2404, Class 3, 500 μ N min

Pin Contacts (Mating Face): Phos bronze per ASTM B103

Pin Contacts (Termination): BeCu per ASTM B768 (press-fit contact) or brass alloy per ASTM B36

(PIH or PTH)

Contact Finish (Mating Face): Localized gold finish per ASTM B488, Type II,

Code C, over nickel per ASTM B689 Type I 50 μ N min

Contact Finish (Termination Face): Localized gold finish per ASTM B488, Type II, Code C, 50 μ N

min over nickel per ASTM B689 Type I, 50 μ N min (Press Fit) or Localized Gold per ASTM B488,

Type 1, Code A or C, 10-25 μ N over nickel per ASTM B689 Type I, 50 μ N min (PIH or PTH)

Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138

Potting Compound: Frey Eng. Co. insulating compound CF3003-80

Hardware (except washers): Stainless steel per ASTM A484/A484M, A582/A582M, or ASTM A320;

passivated per SAE AMS-2700, Method 1, Type 2

Washers: Stainless steel per NASM35333 (ASTM A240), passivated per NASM35333

(SAE AMS-2700).

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm $\pm$ 10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum

Operating Temperature: -55° C to 125° C

Min. Contact Wipe: 1.27 mm (0.050")

Contact Normal Force: 35-40 grams

Max Recommended Voltage: 200 V, RMS, 60 Hz

Insulation Resistance: 5,000 megaohms minimum @ 500 VDC

Durability: 2500 connector mating cycles

Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)

Shock: 50 g (EIA-364-27, condition E)

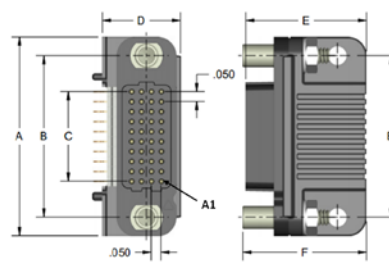


VSRAF – Right Angle (Female)

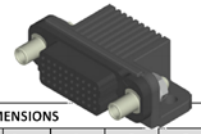
Pitch: 1.27 mm

VSRAF signal-integrity connectors are used in right angle, PCB-mount applications where a female interface is required. Termination styles include press-fit, paste-in-hole or plated thru-hole.

DIMENSIONS



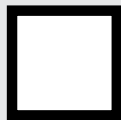
VSRAF DIMENSIONS						
Columns	A	B	C	Rows	D	E
10	1.000	.813	.450	4	.400	.619
20	1.500	1.313	.950	5	.450	.669
30	2.000	1.813	1.450	6	.500	.719
40	2.500	2.313	1.950	8	.550	.769
50	3.000	2.813	2.450	10	.600	.819



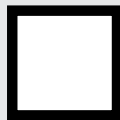
Sample Part Number Format: VSRAF-04-10-50-02-N



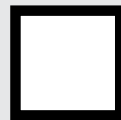
SERIES
Right Angle
(Female)
1.27 mm



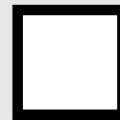
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



CONTACT PLATING
50 – 50 μ Au



TERMINATION
00 – Press-fit
01 – Paste-in-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"



OPTIONS
Blank – No options*
G – Guide socket
N – Fixed jacknut
J – Turning jackscrew
L – Locking screw

NOTES

Connector potting is standard.

*No hardware supplied with blank hardware option connectors.

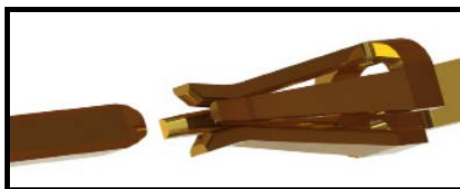
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FEATURES

verSI board-mount connectors feature low mating force / high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design. Guide hardware is optional.



MATERIALS and FINISHES

Socket Contact (Mating Face): BeCu per ASTM B194
Socket Contact (Termination): Brass alloy per ASTM B36 (PIH or PTH) or BeCu per ASTM B768 (press-fit contact)
Contact Finish (Mating Face): Localized gold finish per ASTM B488, Type II, Code C over nickel per ASTM B689 Type I, 50 μ N min
Contact Finish (Termination): Localized gold finish per ASTM B488, Type II, Code C, 50 μ N min over nickel per ASTM B689 Type I, 50 μ N min (Press Fit) or localized gold per ASTM B488, Type I, Code A or C, 10-25 μ N over nickel per ASTM B689 Type I, 50 μ N min (PIH or PTH)
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Potting Compound: Frey Eng. Co. insulating compound CF3003-80
Hardware (except washers): Stainless steel per ASTM A484/A484M, A582/A582M or ASTM A320; passivated per SAE AMS-2700, Method 1, Type 2
Washers: Stainless steel per NASM35333 (ASTM A240), passivated per NASM35333 (SAE AMS-2700).

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm $\pm$ 10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35-40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megaohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

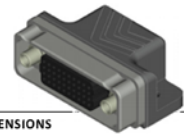
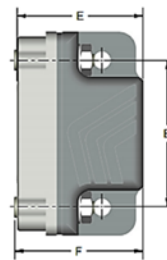
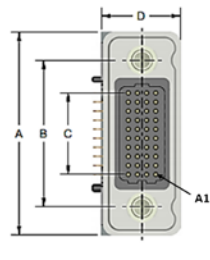


VRRAF – Rugged Right Angle (Female)

Pitch: 1.27 mm

VRRAM signal-integrity connectors are ruggedized versions of the standard VSRAF female connectors. These connectors can be used in extreme environmental conditions while maintaining high reliability and continuous performance.

DIMENSIONS

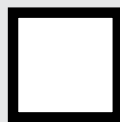


VRRAF DIMENSIONS							
Columns	A	B	C	Rows	D	E	F
10	1.125	0.813	0.450	4	0.438	0.698	0.714
20	1.625	1.313	0.950	5	0.488	0.748	0.764
30	2.125	1.813	1.450	6	0.538	0.798	0.814
40	2.625	2.313	1.950	8	0.638	0.898	0.914
50	3.125	2.813	2.450	10	0.738	0.998	1.014

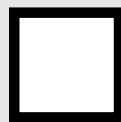
Sample Part Number Format: VRRAF-04-10-50-00-G



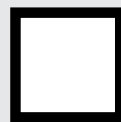
SERIES
Rugged Right Angle
(Female)
1.27 mm



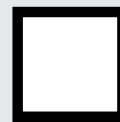
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



CONTACT PLATING
50 – 50 μ Au



TERMINATION
00 – Press-fit
01 – Paste-in-hole
02 – PTH 0.078"
03 – PTH 0.109"
04 – PTH 0.140"
05 – PTH 0.156"
06 – PTH 0.172"



OPTIONS
Blank – Standard¹
G – Guide socket¹
N – Fixed jacknut¹
J – Turning jackscrew²
L – Locking screw²
E – Standard/EMI gasket¹
GE – Guide socket/EMI gasket¹
NE – Fixed jacknut/EMI gasket¹
JE – Turning jackscrew/EMI gasket²
LE – Locking screw/EMI gasket²

NOTES

¹ Shells & hardware supplied uninstalled.

² Connectors come pre-assembled with shells & hardware.

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FEATURES

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MATERIALS and FINISHES

Shell: Aluminum alloy 6061-T6 per SAE AMS 4027 or 6061-T6511 per QQ-A-200/8
Finish: Electroless nickel per AMS-2404, Class 3; 500 μ N min
Socket Contact (Mating Face): BeCu per ASTM B194
Socket Contact (Termination): Brass alloy per ASTM B36 (PIH or PTH) or BeCu per ASTM B768 (press-fit contact)
Contact Finish (Mating Face): Localized gold finish per ASTM B488, Type II, Code C over nickel per ASTM B689, Type I, 50 μ N min
Contact Finish (Termination): Localized gold finish per ASTM B488, Type II, Code C, 50 μ N min over nickel per ASTM B689, Type I, 50 μ N min (Press Fit) or localized gold per ASTM B488, Type I, Code A or C, 10-25 μ N over nickel per ASTM B689 Type I, 50 μ N min (PIH or PTH)
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Potting Compound: Frey Eng. Co insulating compound CF3003-80
Hardware (except washers): Stainless steel per ASTM A484/A484M, A582/A582M or ASTM A320; passivated per SAE AMS-2700, Method 1, Type 2
Washers: Stainless steel & passivated per NASM35333
EMI Gasket (GE and NE options only): Conductive Elastomer per MIL-DTL-83528 Type D

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35-40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megaohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm $\pm$ 10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

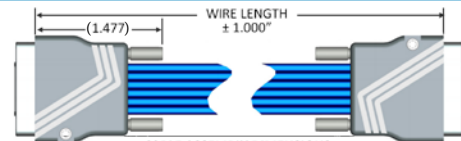
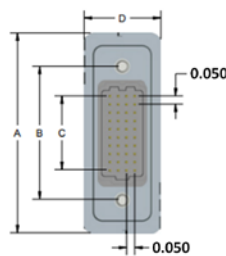


VRD – Differential Pair Twinax Cable Assembly

Pitch: 1.27 mm

VRD cable assemblies are designed for twinax applications. These cable assemblies come in standard lengths but custom lengths and configurations can also be requested. Ruggedized hoods are standard.

DIMENSIONS

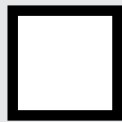


CABLE ASSEMBLY DIMENSIONS					
Columns	A	B	C	Rows	D
10	1.222	0.813	0.450	4	0.470
20	1.722	1.313	0.950	5	0.520
30	2.222	1.813	1.450	6	0.570
40	2.722	2.313	1.950	8	0.670
50	3.222	2.813	2.450	10	0.770

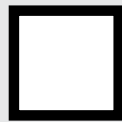
Sample Part Number Format: VRD-04-10-50-01-03-060



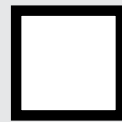
SERIES
Differential Pair
Twinax Cable
Assembly
1.27 mm



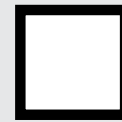
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



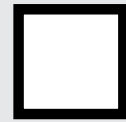
**CONTACT
PLATING**
50 – 50 μ Au



CONNECTOR 1
01G – Male with guide pins
01N – Male with threaded nut #2-56
01L – Male with locking screw #2-56
01J – Male with jackscrew #2-56
03G – Female with guide sockets
03N – Female with threaded nut #2-56
03L – Female with locking screw #2-56
03J – Female with jackscrew #2-56



CONNECTOR 2
000 – Flying Leads
01G – Male with guide pins
01N – Male with threaded nut #2-56
01L – Male with locking screw #2-56
01J – Male with jackscrew #2-56
03G – Female with guide sockets
03N – Female with threaded nut #2-56
03L – Female with locking screw #2-56
03J – Female with jackscrew #2-56



LENGTH*
030 – 0.30 M
040 – 0.40 M
050 – 0.50 M
060 – 0.60 M
070 – 0.70 M
080 – 0.80 M
090 – 0.90 M
100 – 1.00 M
150 – 1.50 M
200 – 2.00 M
300 – 3.00 M

NOTES

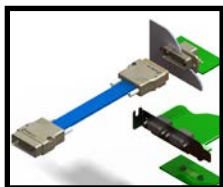
* Other cable lengths and configurations available.

AirBorn can manufacture other configurations to your exact specifications.

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FEATURES

VerSI connectors feature low mating force/high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design.



MATERIALS and FINISHES

Shell: Aluminum alloy 6061-T6 per QQ-A-250/11 or 6061-T6511 per QQ-A-200/8
Finish: Electroless nickel per SAE AMS-C-26074, Grade B, Class 3
Socket Contact: BeCu per ASTM B194
Pin Contacts: Phos bronze per ASTM B103
Contact Finish: Localized gold finish per ASTM B488 over nickel per ASTM B689 Type I
Wire: 30 AWG*; 19/42 silver-plated copper
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Hardware: Stainless steel per ASTM A582/A582M or ASTM A320; passivated per SAE AMS-2700
Embedment: Frey Eng. Co. insulating compound CF3003-80 and L-II-49 or equiv.

SI DATA – Simulated (Connectors Only)

1	Diff. Insertion Loss	-0.25 dB @ 5 GHz	-3dB @ 16 GHz
2	Diff. Return Loss	-20 dB @ 5 GHz	-6 dB @ 14 GHz
3	Diff. Impedance	100 ohm $\pm$ 10% @ 50 ps rise time	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35–40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megaohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)

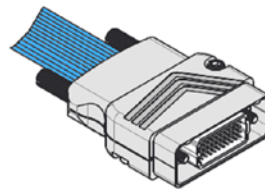


VRW – Discrete Wire Cable Assembly with Internal Solder Connection

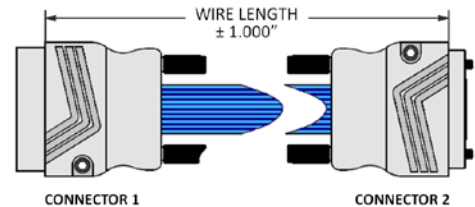
Pitch: 1.27 mm

VRW cable assemblies come in standard wire and lengths but custom wire and length options are available. Ruggedized shells are standard.

DIMENSIONS



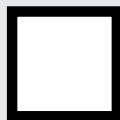
See next page for detailed drawings



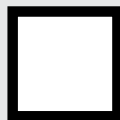
Sample Part Number Format: VRW-04-10-50-03J-01J-A030



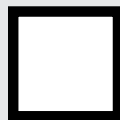
SERIES
Discrete Wire
Cable Assembly
1.27 mm



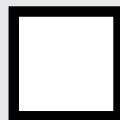
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



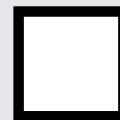
COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



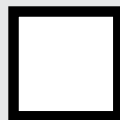
**CONTACT
PLATING**
50 – 50 µ" Au



CONNECTOR 1
01G – Male with guide pins
01N – Male with threaded nut #2-56
01L – Male with locking screw #2-56
01J – Male with jackscrew #2-56
03G – Female with guide sockets
03N – Female with threaded nut #2-56
03L – Female with locking screw #2-56
03J – Female with jackscrew #2-56



CONNECTOR 2
000 – Flying Leads
01G – Male with guide pins
01N – Male with threaded nut #2-56
01L – Male with locking screw #2-56
01J – Male with jackscrew #2-56
03G – Female with guide sockets
03N – Female with threaded nut #2-56
03L – Female with locking screw #2-56
03J – Female with jackscrew #2-56



WIRE CODE
XXXX
(Four characters
are required -- see
blue columns in
the chart below.)

NOTES

All VRW part numbers are non-RoHS-compliant.

Wire colors per M83513 are ten (10) solid colors, repeating.

Per M83513, corrosion has been experienced on connectors that are pre-wired with 22759/33 and stored in sealed environments. Caution should be exercised when using this wire.

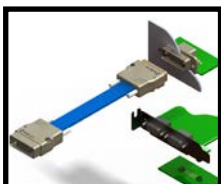
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FEATURES

Versi connectors feature low mating force/high-reliability contact system with four points of contact. The open pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design.

MATERIALS and FINISHES

Shell: Aluminum alloy 6061-T6 per QQ-A-250/11 or 6061-T6511 per QQ-A-200/8
Finish: Electroless nickel per SAE AMS-2404, Class 3; 500 µ", min.
Socket Contact: BeCu per ASTM B194
Pin Contacts: Phos bronze per ASTM B103
Contact Finish: Localized gold finish per ASTM B488 over nickel per ASTM B689 Type I
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Embedment: Frey Eng. Co. insulating compound CF3003-80 and L-II-49 or equiv.
Hardware: Stainless steel per ASTM A582/A582M or ASTM A320; passivated per SAE AMS-2700



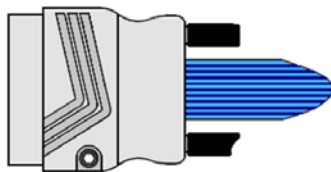
WIRE CODES

COLOR (per 83513) and GAGE		LENGTH		
			M	FT
NEMA HP3 EXBEB (24 AWG) – Multicolored	A			
White	B	010	0.10	0.328
NEMA HP3 EXBDB (26 AWG) – Multicolored	C	020	0.20	0.656
White	D	030	0.30	0.984
NEMA HP3 EXBCB (28 AWG) – Multicolored	E	040	0.40	1.312
White	F	050	0.50	1.640
NEMA HP3 EXBBB (30 AWG) – Multicolored	G	060	0.60	1.969
White	H	070	0.70	2.297
SAE AS22759/33-24 (AWG) – Multicolored	J	080	0.80	2.625
White	K	090	0.90	2.953
SAE AS22759/33-26 (AWG) – Multicolored	L	100	1.00	3.281
White	M	150	1.50	4.921
SAE AS22759/33-28 (AWG) – Multicolored	N	200	2.00	6.562
White	P	300	3.00	9.843
SAE AS22759/33-30 (AWG) – Multicolored	R			
White	S			

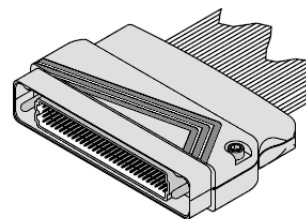
* AirBorn can manufacture special configurations to your exact specifications. *

VRW DIMENSIONS

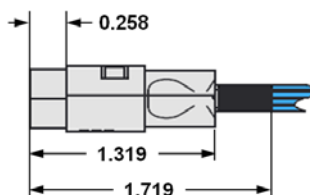
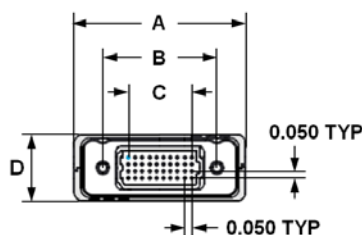
Male (Connector 1)



(Dimensional drawings shown with turning hardware)



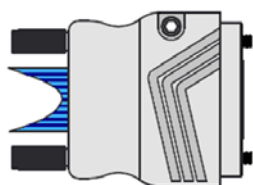
(Connector with guide pin hardware)



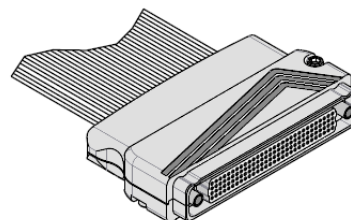
Columns	A	B	C	Rows	D
10	1.222	0.813	0.450	4	0.470
20	1.722	1.313	0.950	5	0.520
30	2.222	1.813	1.450	6	0.570
40	2.722	2.313	1.950	8	0.670
50	3.222	2.813	2.450	10	0.770

Tolerances (unless otherwise specified): ± 0.010 "

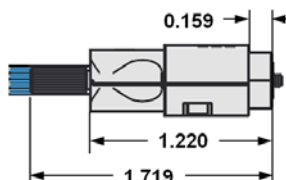
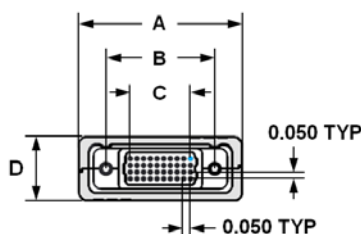
Female (Connector 2)



(Dimensional drawings shown with turning hardware)



(Connector with guide socket hardware)



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VRW PINOUTS

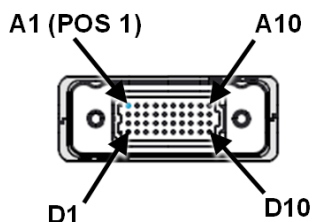
1-TO-1 WIRE CHART FOR JUMPER ASSEMBLIES

(Table illustrates connections for a 4-row, 10-column connector)

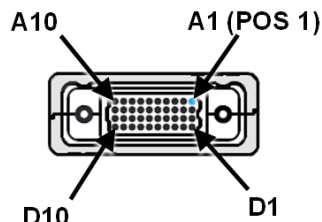
Connector 1	Connector 2	Connector 1	Connector 2	Connector 1	Connector 2	Connector 1	Connector 2
A1 — BLK — A1	B1 — BLK — B1	C1 — BLK — C1	D1 — BLK — D1				
A2 — BRN — A2	B2 — BRN — B2	C2 — BRN — C2	D2 — BRN — D2				
A3 — RED — A3	B3 — RED — B3	C3 — RED — C3	D3 — RED — D3				
A4 — ORN — A4	B4 — ORN — B4	C4 — ORN — C4	D4 — ORN — D4				
A5 — YEL — A5	B5 — YEL — B5	C5 — YEL — C5	D5 — YEL — D5				
A6 — GRN — A6	B6 — GRN — B6	C6 — GRN — C6	D6 — GRN — D6				
A7 — BLU — A7	B7 — BLU — B7	C7 — BLU — C7	D7 — BLU — D7				
A8 — VIO — A8	B8 — VIO — B8	C8 — VIO — C8	D8 — VIO — D8				
A9 — GRY — A9	B9 — GRY — B9	C9 — GRY — C9	D9 — GRY — D9				
A10 — WHT — A10	B10 — WHT — B10	C10 — WHT — C10	D10 — WHT — D10				

Wire colors per M83513 are ten (10) solid colors, repeating when there are more than 10 columns.

MALE



FEMALE



Sample part number:
VRW-04-10-30-01G-03G-A030

PLEASE CONSULT THE AIRBORN WEBSITE FOR THE LATEST REVISION OF THIS DOCUMENT PRIOR TO BEGINNING ANY DESIGN WORK.

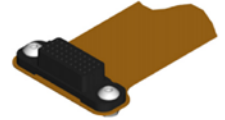
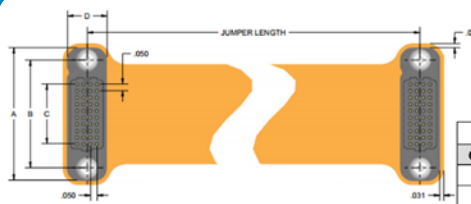


VSX – Flexible Circuit Jumper Assembly

Pitch: 1.27 mm

VSX flexible circuit jumpers come in standard lengths and wiring configurations, but custom specifications can be requested.

DIMENSIONS



FLEX JUMPER DIMENSIONS					
Columns	A	B	C	Rows	D
10	1.000	0.813	0.450	4	0.300
20	1.500	1.313	0.950	5	0.350
30	2.000	1.813	1.450	6	0.400
40	2.500	2.313	1.950	8	0.500
50	3.000	2.813	2.450	10	0.700

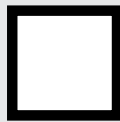
Sample Part Number Format: VSX-04-10-50-01G-03A-030



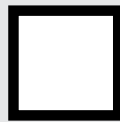
SERIES
Flexible Circuit Jumper
1.27 mm



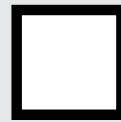
ROWS
04 – 4 Rows
05 – 5 Rows
06 – 6 Rows
08 – 8 Rows
10 – 10 Rows



COLUMNS
10 – 10 Columns
20 – 20 Columns
30 – 30 Columns
40 – 40 Columns
50 – 50 Columns



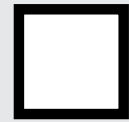
CONTACT PLATING
50 – 50 μ " Au



CONNECTOR 1
01A – Male; no hardware
03A – Female
01G – Male; guide pin
03G – Female; guide socket



CONNECTOR 2
01A – Male; no hardware
03A – Female
01G – Male; guide pin
03G – Female; guide socket



LENGTH*
015 – 0.15 M
030 – 0.30 M
045 – 0.45 M

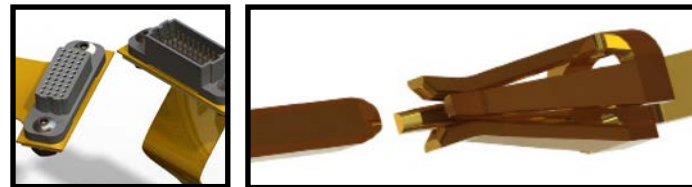
NOTES

* Other cable lengths and configurations available.
AirBorn can manufacture other configurations to your exact specifications.

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FEATURES

verSI connectors feature low mating force/high-reliability contact system with four points of contact. The open-pin field design allows for flexibility in termination schemes. Single-ended, differential pair, power, and ground are all available in one connector design.



MATERIALS and FINISHES

Socket Contact: BeCu per ASTM B194
Pin Contacts: Phos bronze per ASTM B103 or per BeCu ASTM B768 (press-fit contact)
Contact Finish: Localized gold finish per ASTM B488 over nickel per ASTM B689 Type I
Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM D5138
Hardware: Stainless steel per ASTM A582/A582M or ASTM A320; passivated per ASTM A967, SAE AMS-QQ-P-35

SI DATA – Simulated (Connectors Only)

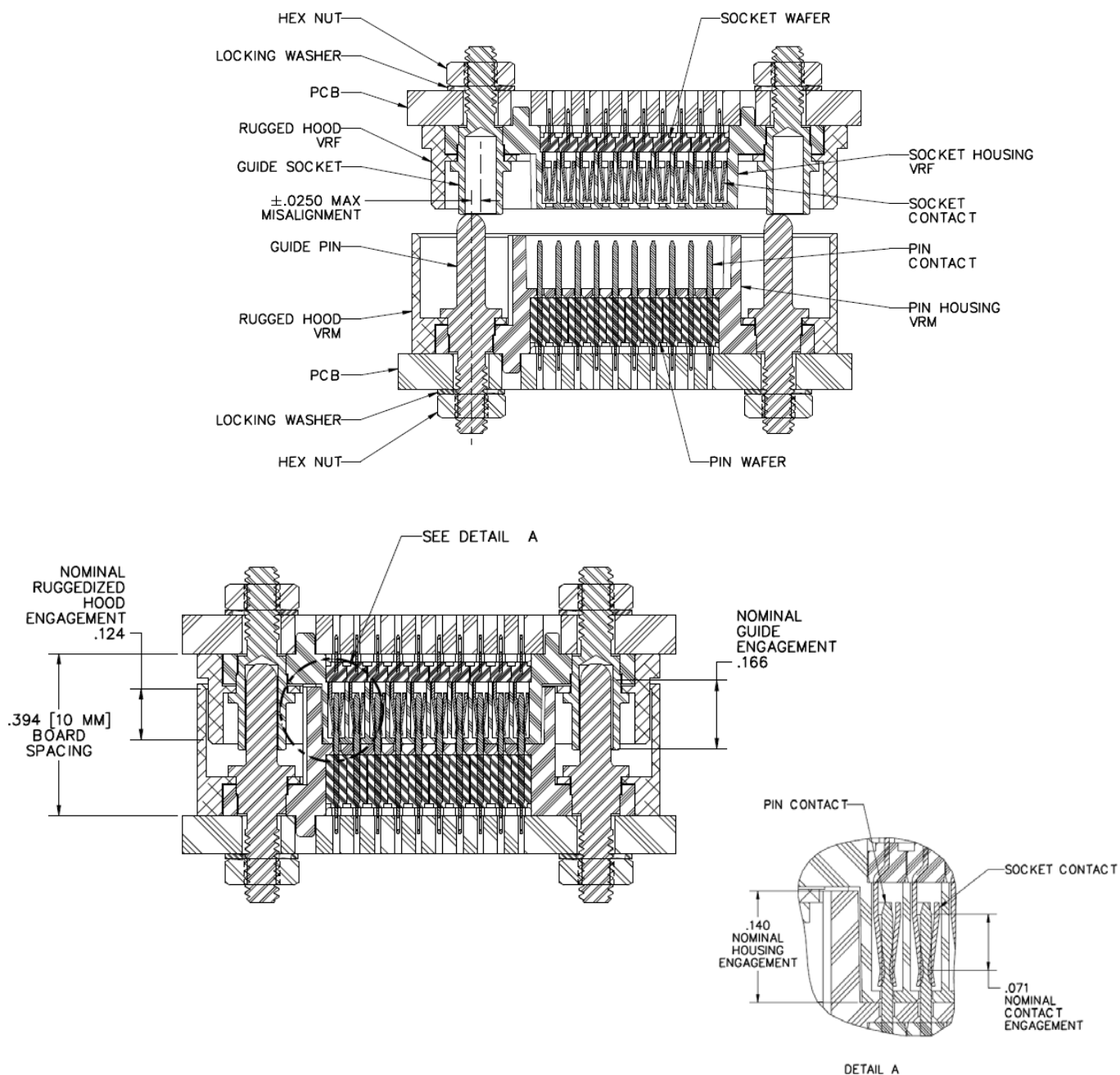
1	Diff. Insertion Loss	22 GHz @ -2 db	
2	Diff. Return Loss	7.5 GHz @ -20 db	17.5 GHz @ -10 db
3	Diff. Impedance	100 ohm $\pm$ 10%	
4	Diff. Skew	< 2 psec	

PERFORMANCE

Contact Rating: 2 amperes maximum
Operating Temperature: -55° C to 125° C
Min. Contact Wipe: 1.27 mm (0.050")
Contact Normal Force: 35–40 grams
Max Recommended Voltage: 200 V, RMS, 60 Hz
Insulation Resistance: 5,000 megaohms minimum @ 500 VDC
Durability: 2500 connector mating cycles
Sinusoidal Vibration: 20 g (EIA-364-28, condition IV)
Shock: 50 g (EIA-364-27, condition E)



verSI VERTICAL MISALIGNMENT AND ENGAGEMENT DIAGRAM



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