AirBorn

AN INTEGRATED SOLUTIONS PROVIDER

PRODUCT TECHNICAL BULLETIN #96

verSI twinax cable conductor and shield termination change

Product Lines: verSI™

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Purpose:

Notification detailing change to the verSI twinax cable product family (VRD). Changes are internal enhancements/improvements and do not affect form, fit, or function.

Material for the cable conductor termination and shield terminations are changing from a PCB strip and copper bus wire to a stamped tin/lead plated C15000 strip overmolded with LCP (same as existing verSI insulators).

Chemical etching of the twinax jacket is being replaced by laser ablation for epoxy retention.

Implementation will begin June 23, 2025.

Scope:

The stamped and overmolded termination construction improves geometry consistency and increases manufacturing capacity. The product enhancements do not affect the contact interface or overall size of the connector and do not reduce electrical performance. The changes will be drop-in replacements for existing parts.

Background:

Traditional verSI twinax cables were soldered to connector contacts using a PCB strip and copper bus wire. While the process has proven to be effective, it does not allow for manufacturing growth/scaling. The stamped and overmolded strip eliminates manually formed bus wire connections for each shield and provides increased reference ground consistency.

Testing and Qualification:

Qualification testing was completed and all samples passed. See below for summary of the testing. See ABS0016 for results.

Test Group I									
Test Sequence	**Type of Test**	**Test Facility**	**Requirement Spec/Para**	**Test Method Spec**	**Associated Spec**	**Parameters**	**Product Condition**	**Special Instructions**	**Pass/Fail Criteria**
1	SI testing at room temp.	AirBorn	N/A	N/A	N/A	TDR Rise time = 7 ps	Cable Assembly mated at each end to a mating connector on an SI test fixture which provides SMA connection to TDR	Area of interest is the board into the verSI connectors through the cable termination area	Measure and record. Meet or exceed reference TDR data of existing construction.
2	Contact Resistance	AirBorn	N/A	N/A	EIA-364-06	test current =1 amp	Mated to Test cables with 4-wire connection just s behind the contacts	Measure and record readings 100% of differential conductors plus end-to-end common shield	Baseline, Measure and Record
3	Temperature Cycling	AirBorn	MIL-DTL-83513 PARA 3.5.8	MIL-DTL-83513 PARA 4.5.10	EIA-364-32	High Extreme= 125°C +3/-0 Low Extreme= -55°C +0/-3	Unmated	Condition I, 5 cycles, except that maximum temperature shall be 125°C +3°C, -0°C. At the completion of the last cycle the connectors shall be returned to room temperature and shall meet the requirements of MIL-DTL-83513G paragraph 3.5.8.	PASS: No visible damage detrimental to the operation of the connector. FAIL: Visible damage detrimental to the operation of the connector.
4	Contact Resistance	AirBorn	N/A	N/A	EIA-364-06	test current =1 amp	Mated to Test cables with 4-wire connection just s behind the contacts	Measure and record readings 100% of differential conductors plus end-to-end common shield	PASS: No readings larger than 10 milliohm increase from baseline measurement FAIL: Any reading larger than 10 milliohm increase from baseline measurement

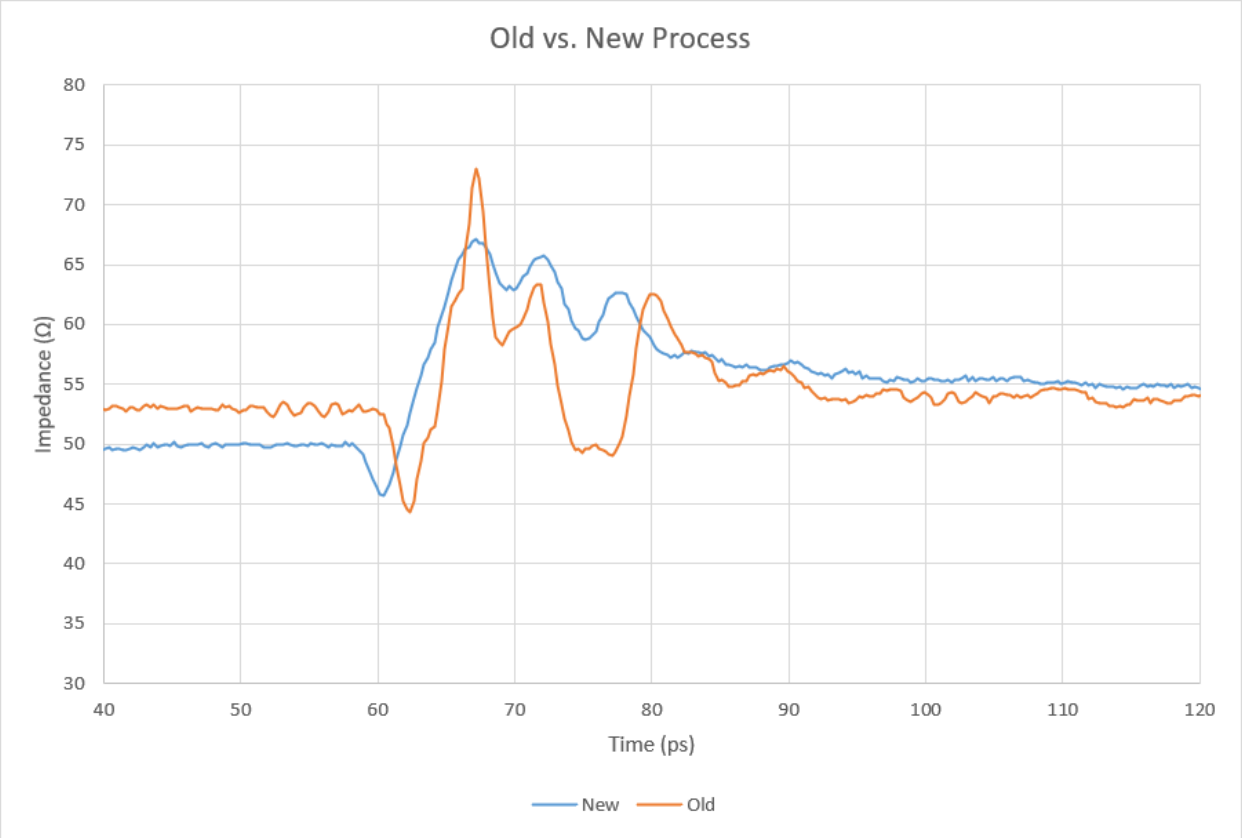
5	Vibration	AirBorn	MIL-DTL-83513 PARA 3.5.12	MIL-DTL-83513 PARA 4.5.14	EIA-364-28 Condition IV	Frequency Range = 10 to 2,000 Hz Peak level = 20 g_n , 196.1 m/s^2	Mated to connectors, which are mounted to test boards	Contacts wired in series for monitoring	PASS: Mated connectors are not damaged and no loosening of parts due to vibration has occurred. Counterpart connectors shall be retained and there shall be no interruption of electrical continuity or current flow longer than 1 microsecond. FAIL: Mated connectors are damaged or loosening of parts due to vibration has occurred. Counterpart connectors are no longer retained or interruption of electrical continuity or current flow longer than 1 microsecond.
7	Shock	AirBorn	MIL-DTL-83513 PARA 3.5.13	MIL-DTL-83513 PARA 4.5.15	EIA-364-27 Condition E	Peak Acceleration = 50 g's , 490 m/s^2 Duration = 11 ms Velocity Change= Saw tooth 2.68 m/s, 8.8 ft/s	Mated to connectors, which are mounted to test boards	One shock shall be applied to each direction of the three major axes of the connectors. Contacts wired in series for monitoring	PASS: Mated connectors are not damaged and no loosening of parts due to vibration has occurred. Counterpart connectors shall be retained and there shall be no interruption of electrical continuity or current flow longer than 1 microsecond. FAIL: Mated connectors are damaged or loosening of parts due to vibration has occurred. Counterpart connectors are no longer retained or interruption of electrical continuity or current flow longer than 1 microsecond.
8	Contact Resistance	AirBorn	N/A	N/A	EIA-364-06	test current =1 amp	Mated to Test cables with 4-wire connection just s behind the contacts	Measure and record readings 100% of differential conductors plus end-to-end common shield	PASS: No readings larger than 10 milliohm increase from baseline measurement FAIL: Any reading larger than 10 milliohm increase from baseline measurement

9	SI testing at room temp.	AirBorn	N/A	N/A	N/A	TDR Rise time = 7 ps	Cable Assembly mated at each end to a mating connector on an SI test fixture which provides SMA connection to TDR	Area of interest is the board into the verSI connectors through the cable termination area	PASS: TDR impedance profile difference ≤ 5% FAIL: TDR impedance profile difference > 5%

Test Group II									
Test Sequence	**Type of Test**	**Test Facility**	**Requirement Spec/Para**	**Test Method Spec**	**Associated Spec**	**Parameters**	**Product Condition**	**Special Instructions**	**Pass/Fail Criteria**
1	Temperature Cycling	AirBorn	MIL-DTL-83513 PARA 3.5.8	MIL-DTL-83513 PARA 4.5.10	EIA-364-32	High Extreme= 125°C +3/-0 Low Extreme= -55°C +0/-3	Unmated	Condition I, 5 cycles, except that maximum temperature shall be 125°C +3°C, -0°C. At the completion of the last cycle the connectors shall be returned to room temperature and shall meet the requirements of MIL-DTL-83513G paragraph 3.5.8.	PASS: No visible damage detrimental to the operation of the connector. FAIL: Visible damage detrimental to the operation of the connector.
2	Wire Retention	AirBorn	MIL-DTL-83513 Paragraph 3.5.3	MIL-DTL-83513 Paragraph 4.5.5	EIA-364-29	Axial load = 5 pounds Rate ~ 1 pound/second Maintain load for 5 seconds.	Not Mated	load shall be applied by pulling on the twinax. After standard retention has passed, pull to failure.	PASS: contact displacement ≤ .005 inches during and after removal of specified force. Wire breakage outside the connector is not a failure. Test to failure force ≥ control samples FAIL: contact displacement > .005 inches during and after removal of specified force. Test to failure force < control samples

Signal Integrity Testing:

TDR measurements with a rise time of 7 ps show the new construction has an impedance that is smoother and more consistent than before, including a smaller impedance drop at the soldered termination and a smaller initial impedance spike at the verSI connection.



Visual Changes:

None

Dimensional Changes:

None