

AMPHENOL TCS

TB-2150

GENERAL PRODUCT SPECIFICATION FOR XCede® PRODUCT FAMILY INTERCONNECT SYSTEMS

REVISION “AB”

Specification Revision Status

Revision	SCR No.	Description	Initial	Date
M	S2730	Added XCede 6 Pair Ortho Mated Bulk Resistance	M. Spacone	2/12/14
N	S2765	Update Section 7.0 separation/engagement forces	E. Lukin	2/26/14
P	S2868	Add Angle mate spec	E. Lukin	4/25/14
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T	S3351	Updated Section 5.0 Electrical ratings. Broke into Specific groupings	D Smith	2/26/15
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1 SCOPE

1.1 Content

- 1.1.1 This specification covers the performance, test and quality requirements for XCede product family interconnect systems.
- 1.1.2 The XCede product family encompasses XCede, XCede Plus, and X2 product lines, and their corresponding product derivatives including; daughtercard, backplane, mezzanine, right-angle-male (RAM), orthogonal, right-angle-male direct-attach orthogonal (RAM DA ortho), and cable backplane interconnect systems.
- 1.1.3 Unless stated otherwise, "XCede" refers to any product or derivative within the XCede product family.

1.2 Function

- 1.2.1 The function of the XCede connector is to provide a separable electro-mechanical interface between two subsystems of an electronic system without an unacceptable effect on the performance of the system. The customers' electronic performance requirements, application, and electro-mechanical constraints are translated into functional requirements, and used to determine the appropriate XCede connector or connector configuration that effectively satisfies all needs of the customer.
- 1.2.2 The XCede connector is a two-part device, consisting of receptacle and pin header pieces. Terminations from the receptacle and pin header pieces are available in the following forms:
 - Through hole, eye-of-the-needle, compliant contacts.
 - Cable connectors, mating to either receptacle or pin connector, via cable harness.

1.3 Testing

- 1.3.1 When tests are performed on subject product line, procedures specified in EIA-364-B shall be used per the test sequences outlined in Amphenol TCS Technical Bulletin TB-2023. All inspections shall be performed using applicable inspection plan and product drawings.

2 REFERENCE DOCUMENTS

The following documents form a part of this specification to the extent specified herein.

2.1 Amphenol TCS Documents

- 2.1.1 TB-2023 Amphenol TCS Commercial Connector Qualification Plan
- 2.1.2 TB-2149 XCede Routing Guidelines
- 2.1.3 TB-2224 XCede Interchangeability Control Dimension Specification

2.2 Commercial Standards

- 2.2.1 EIA-364-B Electrical Connector Test Procedure Including Environmental Classifications
- 2.2.2 GR-1217-CORE-Generic Requirements for Separable Electrical Connectors used in Telecommunications Hardware
- 2.2.3 IEC-512-Electromechanical components for electronic equipment – Basic testing procedures and measuring methods, IEC-60352-6 international standards, solderless connections, press fit connections, general requirements, test method and practical guidance.

3 **MATERIAL FINISHES**

3.1 **Contacts**

- 3.1.1 Backplane signal blades are 0.28 mm thick high performance copper alloy. Contacts are plated per EGS205.
- 3.1.2 Backplane shield blades are 0.28 mm thick high performance copper alloy. Contacts are plated per EGS205.
- 3.1.3 Backplane signal blades and shield blades are lubricated.
- 3.1.4 Receptacle signal and shield contacts are 0.23 mm thick high performance copper alloy. Contacts are plated per EGS205.
- 3.1.5 Power Blades are 0.30 mm thick high performance copper alloy. Contacts shall be plated per EGS205.
- 3.1.6 Power Receptacle shall be 0.30 mm thick high performance copper alloy. Contacts are plated per EGS205.

Note - All contacts meet lead free requirements, refer to EGS205.

3.2 **Sub Components**

Component	Material	Specification
Insulator	Glass reinforced polyester (LCP)	UL 94V-0 Rating, Color Grey
Stiffener	Stainless steel, Type 301	N/A
Backplane Guide Pins and Keys	Stainless steel	QQ-S-764, CL 303 or 303 SE Condition A
Daughtercard Key Bushing	Sintered stainless steel	Material Power Industries Federation Standard 35, SS 316NI-25

4 **MATED BULK RESISTANCE**

4.1 **XCede 2 Pair Connector**

Wafer A		Wafer B	
Contact row	Resistance, milli ohms	Contact row	Resistance, milli ohms
Mechanical length, mm		Mechanical length, mm	
Row A, 18.1	9.4	Ground 1, 17.1	6.1
Row B, 19.2	11.0	Row A, 20.0	11.5
Ground 1, 20.6	6.9	Row B, 21.2	11.6
Row C, 23.4	14.0	Ground 2, 22.1	6.3
Row D, 24.8	13.3	Row C, 24.8	14.3
Ground 2, 28.3	6.1	Row D, 26.2	14.5
		Ground 3, 28.1	8.8

4.2 **XCede 3 Pair Connector**

Wafer A		Wafer B	
Contact row	Resistance, milli ohms	Contact row	Resistance, milli ohms
Mechanical length, mm		Mechanical length, mm	
Row A, 18.9	9.9	Ground 1, 17.4	6.0
Row B, 19.4	11.3	Row A, 21.4	13.8
Ground 1, 20.8	4.6	Row B, 22.2	13.0

Row C, 24.0	14.5	Ground 2, 23.5	5.3
Row D, 25.4	14.0	Row C, 27.0	16.2
Ground 2, 28.8	5.3	Row D, 27.9	16.4
Row E, 30.4	18.4	Ground 3, 29.6	5.9
Row F, 31.7	18.2	Row E, 32.4	19.3
Ground 3, 33.7	6.3	Row F, 33.9	19.0
		Ground 4, 35.6	10.5

4.3 XCede 4 Pair Connector

Wafer A		Wafer B	
Contact row Mechanical length, mm	Resistance, milli ohms	Contact row Mechanical length, mm	Resistance, milli ohms
Row A, 19.9	10.8	Ground 1, 18.2	5.9
Row B, 20.7	11.1	Row A, 23.0	13.8
Ground 1, 21.0	5.0	Row B, 24.0	13.6
Row C, 25.0	14.3	Ground 2, 24.6	5.3
Row D, 26.3	13.7	Row C, 28.5	17.2
Ground 2, 27.8	5.5	Row D, 29.4	16.3
Row E, 31.0	17.5	Ground 3, 30.3	5.9
Row F, 32.3	17.0	Row E, 34.5	20.9
Ground 3, 33.9	6.0	Row F, 35.4	19.7
Row G, 37.5	21.3	Ground 4, 36.7	6.5
Row H, 38.8	21.0	Row G, 40.9	24.2
Ground 4, 40.6	7.0	Row H, 41.7	23.3
		Ground 5, 43.0	12.0

4.4 XCede 5 Pair Connector

Wafer A		Wafer B	
Contact row Mechanical length, mm	Resistance, milli ohms	Contact row Mechanical length, mm	Resistance, milli ohms
Row A, 20.0	12.3	Ground 1, 19.0	5.3
Row B, 23.2	12.4	Row A, 23.1	15.0
Ground 1, 22.7	5.0	Row B, 24.0	16.5
Row C, 25.0	16.5	Ground 2, 25.2	5.6
Row D, 26.4	16.1	Row C, 28.8	17.3
Ground 2, 28.1	5.7	Row D, 30.3	18.5
Row E, 31.1	20.0	Ground 3, 31.0	6.3
Row F, 32.4	20.0	Row E, 34.6	21.3
Ground 3, 33.9	6.3	Row F, 35.5	22.4
Row G, 37.5	24.0	Ground 4, 37.0	7.0
Row H, 39.0	25.0	Row G, 41.0	24.5
Ground 4, 41.1	7.0	Row H, 42.0	26.1
Row I, 44.6	27.7	Ground 5, 43.8	7.1
Row J, 45.9	28.8	Row I, 47.9	28.3
Ground 5, 48.4	8.0	Row J, 48.7	30.6
		Ground 6, 50.2	15.0

4.5 XCede 6 Pair Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Row A, 19.1	11.4	Ground 1, 18.6	6.3
Row B, 20.6	12.8	Row A, 23.0	13.6
Ground 1, 21.1	5.4	Row B, 24.0	13.9
Row C, 24.9	15.3	Ground 2, 24.6	5.7
Row D, 26.3	14.4	Row C, 29.4	16.5
Ground 2, 27.7	5.6	Row D, 29.4	16.5
Row E, 31.0	18.9	Ground 3, 30.5	6.0
Row F, 32.3	17.6	Row E, 34.5	19.5
Ground 3, 33.8	6.4	Row F, 35.4	20.4
Row G, 37.5	22.8	Ground 4, 38.1	6.5
Row H, 38.9	22.5	Row G, 40.9	23.4
Ground 4, 40.8	6.6	Row H, 41.8	24.2
Row I, 44.6	26.4	Ground 5, 43.5	6.79
Row J, 45.9	26.3	Row I, 47.8	26.8
Ground 5, 47.9	7.2	Row J, 48.6	28.3
Row K, 52.1	31.1	Ground 6, 50.8	7.4
Row L, 53.4	30.6	Row K, 55.3	31.8
Ground 6, 55.4	8.4	Row L, 56.0	32.8
		Ground 7, 57.9	10.0

4.6 XCede 4 Pair Mezzanine Connector

- 4.6.1 Height 44 mm
 - Signals – 26.4 milli ohms
 - Large Grounds – 5.8 milli ohms
 - Small Grounds – 8.5 milli ohms
- 4.6.2 Height 40 mm
 - Signals – 22.5 milli ohms
 - Large Grounds – 5.5 milli ohms
 - Small Grounds – 8.0 milli ohms
- 4.6.3 Height 30 mm
 - Signals – 17.6 milli ohms
 - Large Grounds – 4.9 milli ohms
 - Small Grounds – 7.5 milli ohms
- 4.6.4 Height 22 mm
 - Signals – 15 milli ohms
 - Large Grounds – 4.3 milli ohms
 - Small Grounds – 5.1 milli ohms
- 4.6.5 Height 15 mm
 - Signals – 8.0 milli ohms
 - Large Grounds – 3.9 milli ohms
 - Small Grounds – 5.1 milli ohms

4.7 XCede RAM 2 Pair Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Row A, 16.5	11.5	Ground 1, 17.3	8.4
Row B, 18.1	14.7	Row A, 18.0	16.7
Ground 1, 21.0	6.7	Row B, 19.5	17.3
Row C, 22.5	15.8	Ground 2, 22.6	8.6
Row D, 23.9	19.7	Row C, 23.9	22.8
Ground 2, 26.5	6.6	Row D, 25.7	21.5
		Ground 3, 28.1	11.44

4.8 XCede RAM 2 Pair Extended Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Row A, 22.6	13.5	Ground 1, 22.2	8.8
Row B, 23.7	16.7	Row A, 26.2	18.3
Ground 1, 26.2	6.4	Row B, 27.1	19.1
Row C, 31.7	23.6	Ground 2, 30.1	7.4
Row D, 32.5	24.1	Row C, 34.0	26.6
Ground 2, 35.4	8.4	Row D, 35.0	23.7
		Ground 3, 37.0	15.0

4.9 XCede RAM 4 Pair Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Row A, 17.1	14.6	Ground 1, 18.4	8.6
Row B, 18.4	16.6	Row A, 20.0	21.6
Ground 1, 20.0	5.9	Row B, 21.7	21.0
Row C, 22.5	23.7	Ground 2, 23.2	7.2
Row D, 24.2	21.0	Row C, 25.8	27.5
Ground 2, 26.2	6.9	Row D, 27.4	28.0
Row E, 28.6	33.4	Ground 3, 29.1	8.0
Row F, 30.3	31.1	Row E, 31.7	34.2
Ground 3, 32.9	7.8	Row F, 33.4	34.4
Row G, 35.0	37.8	Ground 4, 35.5	9.7
Row H, 36.7	38.2	Row G, 37.3	41.3
Ground 4, 39.7	8.7	Row H, 39.0	42.3
		Ground 5, 41.7	16.8

4.10 XCede Plus 4 Pair Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Ground, 20.7	6.4		
Row A, 18.3	6.0	Ground 1, 18.3	7.7
Row B, 20.2	12.8	Row A, 22.1	8.9
Ground 1, 21.7	12.2	Row B, 23.3	5.4
Row C, 25.4	6.0	Ground 2, 24.8	5.5
Row D, 26.9	16.5	Row C, 29.2	15.6
Ground 2, 29.0	16.4	Row D, 30.2	5.7
Row E, 31.6	6.3	Ground 3, 31.2	5.0
Row F, 33.1	19.4	Row E, 35.4	16.9
Ground 3, 34.5	19.2	Row F, 36.4	6.8
Row G, 38.1	6.3	Ground 4, 37.6	6.4
Row H, 39.7	22.8	Row G, 41.3	20.6
Ground 4, 41.5	21.8	Row H, 42.7	8.1
		Ground 5, 44.1	7.7

4.11 XCede Plus 5 Pair Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Ground, 20.6	9.2		
Row A, 18.4	9.7	Ground 1, 18.9	7.9
Row B, 20.1	11.1	Row A, 20.6	13.7
Ground 1, 22.0	6.7	Row B, 23.7	16.7
Row C, 25.4	16.1	Ground 2, 24.4	7.5
Row D, 27.0	15.6	Row C, 29.2	18.9
Ground 2, 28.6	6.6	Row D, 30.2	18.3
Row E, 31.6	19.5	Ground 3, 31.3	8.7
Row F, 33.1	19.3	Row E, 35.4	21.9
Ground 3, 34.9	7.9	Row F, 36.4	21.7
Row G, 38.1	23.1	Ground 4, 37.6	8.4
Row H, 39.8	22.1	Row G, 41.3	25.8
Ground 4, 41.5	8.2	Row H, 42.6	23.9
Row I, 45.5	27.0	Ground 5, 44.2	9.5
Row J, 47.0	25.0	Row I, 48.4	29.9
Ground 5, 48.6	8.9	Row J, 49.8	29.1
		Ground 6, 51.3	17.8

4.12 XCede Plus 6 Pair Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Ground, 19.7	9.33	Ground, 18.3	10.20
Row A, 20.3	10.36	Row A, 22.1	13.22
Row B, 21.9	10.80	Row B, 23.8	14.71
Ground 1, 22.1	6.58	Ground 1, 24.7	7.81
Row C, 26.0	13.42	Row C, 30.3	19.15
Row D, 27.4	14.42	Row D, 31.8	16.07
Ground 2, 29.7	6.09	Ground 2, 33.0	8.53
Row E, 34.6	15.35	Row E, 38.3	17.07
Row F, 34.9	15.04	Row F, 38.8	18.42
Ground 3, 36.5	6.30	Ground 3, 39.6	8.52
Row G, 40.8	17.53	Row G, 46.5	22.67
Row H, 41.9	18.06	Row H, 46.3	20.76
Ground 4, 44.2	7.05	Ground 4, 47.6	9.28
Row J, 49.2	22.12	Row J, 52.4	23.24
Row K, 49.5	20.55	Row K, 53.7	23.41
Ground 5, 52.1	6.09	Ground 5, 55.0	9.32
Row L, 57.2	24.56	Row L, 59.9	27.21
Row M, 57.4	21.03	Row M, 61.2	25.25
Ground 6, 59.3	8.50	Ground 2, 63.2	18.02

4.13 XCede Plus 6 Pair Ortho Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Small Ground, 17.9	10.68	Small Ground, 17.0	7.15
Row A, 19.3	11.43	Row A, 21.1	11.88
Row B, 21.1	11.42	Row B, 22.8	11.12
Ground 1, 21.7	6.43	Ground 1, 25.0	5.87
Row C, 25.5	14.85	Row C, 29.5	15.27
Row D, 26.9	12.60	Row D, 30.8	14.54
Ground 2, 28.9	6.18	Ground 2, 32.4	6.70
Row E, 32.6	16.70	Row E, 36.6	18.25
Row F, 33.7	16.00	Row F, 38.0	17.16
Ground 3, 36.0	7.75	Ground 3, 40.6	6.16
Row G, 39.6	20.05	Row G, 44.2	20.38
Row H, 39.6	19.71	Row H, 45.3	20.09
Ground 4, 43.9	7.75	Ground 4, 47.0	6.80
Row J, 47.7	22.64	Row J, 51.4	23.36
Row K, 48.7	22.19	Row K, 52.6	23.02
Ground 5, 51.3	9.67	Ground 5, 54.6	8.25
Row L, 55.1	25.79	Row L, 58.9	26.82
Row M, 56.6	24.25	Row M, 60.4	24.98

Ground 6, 59.4	12.85	Ground 6, 62.0	15.87

4.14 XCede Plus 8 Pair Connector

Wafer A		Wafer B	
Contact row		Contact row	
Mechanical length, mm	Resistance, milli ohms	Mechanical length, mm	Resistance, milli ohms
Ground, 17.4	7.90	Ground 1, 18.6	11.04
Row A, 20.2	10.63	Row A, 22.0	14.60
Row B, 20.7	9.62	Row B, 23.6	14.22
Ground 1, 22.6	6.25	Ground 1, 25.0	9.33
Row C, 26.1	14.44	Row C, 31.6	18.47
Row D, 27.5	11.95	Row D, 31.8	17.52
Ground 2, 29.1	5.80	Ground 2, 32.9	12.14
Row E, 33.2	15.27	Row E, 38.4	21.17
Row F, 34.5	15.55	Row F, 38.8	21.22
Ground 3, 36.4	6.65	Ground 3, 39.6	11.50
Row G, 40.5	18.73	Row G, 46.6	24.11
Row H, 41.7	18.26	Row H, 46.3	23.95
Ground 4, 43.5	6.76	Ground 4, 47.5	14.08
Row J, 48.0	21.11	Row J, 52.4	30.87
Row K, 49.4	20.33	Row K, 53.7	27.85
Ground 5, 51.3	7.17	Ground 5, 55.0	21.16
Row L, 55.8	25.63	Row L, 59.9	27.34
Row M, 57.3	23.25	Row M, 61.2	37.37
Ground 6, 59.2	7.86	Ground 6, 62.8	11.31
Row N, 64.0	27.43	Row N, 68.2	38.19
Row P, 65.4	26.50	Row P, 69.5	34.11
Ground 7, 67.5	7.56	Ground 7, 71.1	20.03
Row R, 72.4	30.20	Row R, 76.1	37.77
Row S, 73.6	29.07	Row S, 77.4	33.93
Ground 8, 76.6	8.60	Ground 2, 79.0	17.21

Notes:

- Mated bulk resistance values are typical values.
- They may range as much as 15mΩ higher or 5mΩ lower than the typical value.
- Mated mechanical lengths are taken from the DC board surface to the BP board surface.
- Allow 0.2 mm clearance between XCede Orthogonal BMA (or DA RAM module) and DC housing after mating

5 ELECTRICAL RATINGS

5.1 Resistance

Description	Value
Mating Interface Contact Resistance Change	10mΩ Maximum
Compliant Pin to Plated Through Hole Resistance	1 mΩ Maximum
Insulation Resistance	1000 MegaΩ

5.2 Voltage

Description	Agency	Working	DWV
Signal	UL < 30 VAC (RMS)	200 VAC (RMS)	600 VAC (RMS)
Power	UL 48 VAC (RMS)	250 VAC (RMS)	750 VAC (RMS)

5.3 Current

5.4 Description	5.5 Value
Signal Contact	1 Amp per contact ^(1,2)
Shield Contact	2 Amps per contact ^(1,2)
Power Contact	6 Amps per blade ^(1,2)

6 TEMPERATURE RATINGS

Description	Value
Maximum non-operating temperature rating (unmated)	125°C for 24 hours
Maximum operating temperature rating	105°C
Maximum operating temperature rating - Cable	Connector 105°C, Harness varies, see cable manufacturer specifications
Minimum operating temperature rating	-40° C

7 MECHANICAL RATINGS

XCede®	Value, per contact	
Description	Grams	Newtons
Signal Contact Normal Force (End of Life)	40 (EOL)	0.39 (EOL)
Shield Contact Normal Force (End of Life)	40 (EOL)	0.39 (EOL)
Signal and Small Shield Contact Engagement Force ⁵	60 max	0.59 max
Large Shield Contact Engagement Force ⁵	78 max	0.75 max
Signal and Small Shield Contact Separation Force ⁵	20 min	0.20 min
Large Shield Contact Separation Force ⁵	25 min	0.25 min
Power Contact Normal Force (End of Life)	90 End Of Life (EOL)	0.88 (EOL)
Power Contact Engagement Force ⁵	100 max	0.98 max
Power Contact Separation Force ⁵	47 min	0.46 min
Signal, Shield, and Power Contact Durability	Rated for 250 Mating Cycles	
Contact Mechanical Wipe Minimum Values	Signal 3.0mm/2.0mm/1.5mm Small Shield 3.0mm Large Shield 4.0mm/3.0mm	

XCede® Plus and X2	Value, per contact	
Description	Grams	Newtons
Signal Contact Normal Force (End of Life)	40 (EOL)	0.39 (EOL)
Shield Contact Normal Force (End of Life)	40 (EOL)	0.39 (EOL)
Signal and Shield Contact Engagement Force	60 max	0.59 max
Signal and Shield Contact Separation Force	20 min	0.20 min
Power Contact Normal Force	90 End Of Life (EOL)	0.88 (EOL)
Power Contact Engagement Force	100 max	0.98 max
Power Contact Separation Force	47 min	0.46 min
Signal, Shield, and Power Contact Durability	Rated for 250 Mating Cycles	
Contact Mechanical Wipe Minimum Values	Signal 3.0mm/2.0mm Shield 4.5mm/3.0mm	

XCede® and XCede® Plus	Value, per wafer	
Description	Lbs	Newtons
Front Housing Retention Force	6.6 min	29.4 min

8 COMPLIANT PIN INTERFACE

- 8.1.1 Radial hole deformation not to exceed 70µm (0.0015") measured from drilled hole
- 8.1.2 Axial hole deformation not to exceed 50µm (0.00197") per IEC 60352-5 measured in the vertical plane
- 8.1.3 Three insertions on Plated Through Holes (PTH)

Description	Value per Pin, lbs
0.033" Drill (XCede/XCede Plus Standard and Mini Power Pin)	
Power Compliant Pin Insertion	15 ⁽³⁾ Maximum
Power Compliant Pin Retention	2.0 Minimum ⁽⁴⁾
0.0225" Drill (XCede Standard DC Pin)	
Signal and Shield Compliant Pin Insertion	10.0 ⁽³⁾ Maximum
Signal and Shield Compliant Pin Retention	1.1 Minimum ⁽⁴⁾
0.0217" Drill (XCede Standard BMA Pin)	
Signal and Shield Compliant Pin Insertion	8 ⁽³⁾ Maximum
Signal and Shield Compliant Pin Retention	0.8 Minimum ⁽⁴⁾
0.0177" Drill (XCede/XCede Plus Nano DC/BMA Pin)	
Signal and Shield Compliant Pin Insertion	6 ⁽³⁾ Maximum
Signal and Shield Compliant Pin Retention	0.8 Minimum ⁽⁴⁾
0.0157" Drill (X2 Femto DC/BMA Pin)	
Signal and Shield Compliant Pin Insertion	5 ⁽³⁾ Maximum
Signal and Shield Compliant Pin Retention	0.5 Minimum ⁽⁴⁾⁽⁶⁾

**This is for all finishes*

Notes:

- Current has been de-rated per EIA-364-TP70
- Product was tested in worst-case conditions where the PCB did not have any power planes. For other test conditions please contact ATCS Application Engineering.
- Ensure press can reach maximum force required to press connector with a safety factor of 1.2 [Maximum force= (Max value per pin)(1.2) (Number of pins on connector)].
- Refer to technical bulletin TB-2149, XCede Routing Guidelines, for drilled and finished hole requirements.
- These values are maximum and minimum expected forces, averaged over the number of mating points (contacts) in a connector. This data is to be used for purposes of system mechanical sizing.
- The average compliant pin retention shall not be less than 0.5lbf with no more than 10% of retention values between 0.5lbf and 0.4lbf, and no retention values below 0.4lbf.
- All engagement/separation force values assume the connector is pressed on a sufficiently rigid PCB without excessive flexing during mating.

9 TESTING

9.1 Qualification Testing

- 9.1.1 Sample Selection: Refer to Section 13 for minimum recommended connector sample size.
- 9.1.2 Test Sequence: Qualification testing shall be performed per the sequences listed in Section 13 of this document.
- 9.1.3 The qualification for the XCede product line was performed with the 4 Pair interconnect and by similarity all other derivatives of the product line are considered qualified.

9.1.4 The qualification for the XCede Plus product line was performed with the 6x12 Pair interconnect and by similarity all other derivatives of the product line are considered qualified.

9.2 REQUALIFICATION TESTING

If changes affecting form, fit or function are made to the product or to the manufacturing process, Product Engineering and Mechanical Integrity Engineering shall coordinate re-qualification testing of all or part of the original testing sequence as required.

10 ACCEPTANCE

Acceptance is based on verification that the product meets the requirements of Section 12. Failures attributed to equipment, test set-up, or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Verification of corrective action is required before re-submittal.

11 SPECIFICATION SUMMARY

11.1 Material

Parameters	Specification	XCede / XCede Plus Value	Reference Document
Plating Integrity	Acceptable Porosity	3 Pores per cm ²	EIA-364-TP53 Exposed to nitric vapors
Contact Metallization	30µin Gold min over 50-150µin Ni or 10µin Gold min over 20-40µin NiW alloy	30µin Gold min over 50-150µin Ni or 10µin Gold min over 20-40µin NiW alloy	GR-1217-CORE Per paragraph 9.1.1.2 EIA-364-TP09
Durability	200 Cycles	250 Cycles	GR-1217-CORE Per paragraph 9.1.1.2 EIA-364-TP09
Base	Surface finish is 16 RMS or otherwise specified	16 RMS on mating surfaces	GR-1217-CORE
Lubrication	Must be present on all backplane blades/shields	Must be present on all backplane blades/shields	GR-1217-CORE R5-67
Flammability Rating	94V-0	Must Pass Requirement	UL94

11.2 Mechanical

Parameters	Specification	XCede / XCede Plus Value	Reference Document
Contact Normal Force	40 Grams End of Life (EOL)	40 Grams End of Life (EOL)	GR-1217-CORE EIA-364-TP04
Engagement Force	NA	SEE SECTION 7.0	EIA-364-TP37A
Contact Strength	Apply 0.25 lbs. Axial Force per contact	Apply 0.25 lbs. Axial Force per contact	GB-1217-CORE Per paragraph 6.1.7
Contact Wipe Distance	0.51 mm (0.020") min.	2.0 mm (0.039") min	GR-1217-CORE R5-28
Polarization Force	100 N (22.5 lbs)	Mate Samples 180° out of Phase	GR-1217-CORE Per paragraph 5.1.9
Compliant Pin Retention	N/A	SEE SECTION 8.0	GR-1217-CORE EIA-364-TP29
Contact Geometry	Minimum one curved surface in mating area	Minimum one curved surface in mating area	N/A
Hertzian Stress	N/A	Greater than 150 Kpsi	N/A
Angle Mate	+/-2°	+/-2°	See Figure 1 below

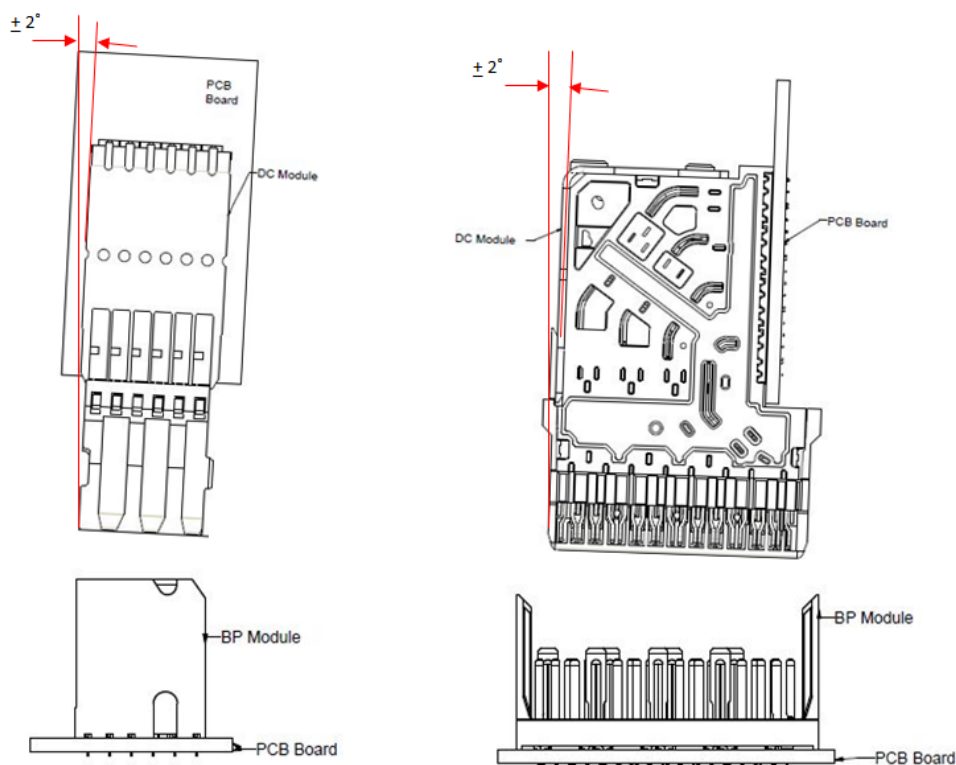


Figure 1. XCede and XCede Plus Angle Reference

11.3 Electrical

Parameters	Specification	XCede / XCede Plus Value	Reference Document
Contact Resistance Stability (LLCR)	Less than 10mΩ change from initial reading	Less than 10mΩ change from initial reading	GR-1217-CORE Per paragraph 6.2.1 EIA-364-TP23
Compliant Pin to PTH Resistance	1mΩ maximum Test current 100mA and 20mV open circuit	1mΩ maximum	GR-1217-CORE EIA-364-TP23
Mated Bulk Resistance	N/A	SEE SECTION 4.0	N/A
Signal Continuity	Less than 10 nanosecond interrupt	Less than 10 nanosecond interrupt	GR-1217-CORE
Current Rating	Less than 30°C Temperature Rise	SEE SECTION 6.0	GR-1217-CORE EIA-364-TP70
Insulation Resistance	1,000 MegaΩ	1,000 MegaΩ	GR-1217-CORE
Dielectric Withstanding Power	1,000 VAC (RMS)	750 VAC (RMS) De-rated value	GR-1217-CORE EIA-364-TP20
Dielectric Withstanding Signal	800 VAC (RMS)	600 VAC (RMS) De-rated value	GR-1217-CORE EIA-364-TP20

11.4 Environmental

Parameters	Specification	XCede / XCede Plus Value	Reference Document
Temperature Life	No Change in LLCR greater than 10m6	10m6 Maximum change	GR-1217-CORE EIA-364-TP17 Test condition 4 Per paragraph 6.3.2
Thermal Shock	No Change in LLCR greater than 10m6 5 cycles for -55°C to 85°C	Same as above	GR-1217-CORE Per paragraph 6.3.3 EIA-364-TP32
Humidity Cycling	No Change in LLCR greater than 10m6 Relative Humidity 90 to 95% For 500 hrs	Same as above	GR-1217-CORE EIA-364-TP31 Procedure II
Dust	No Change in LLCR greater than 10m6	Same as above	GR-1217-CORE Per paragraph 9.1.1.1 EIA-364-TP91
Vibration	No Change in LLCR greater than 10m6 Random Vibration 5.3 RMS	Same as above	GR-1217-CORE EIA-364-TP28 Per paragraph 9.1.2.1
Mechanical Shock	No Change in LLCR greater than 10m6 30 G's for 11 milliseconds Half Sine 3 axis	Same as above	GR-1217-CORE EIA-364-TP27
Mixed Flowing Gas	No Change in LLCR greater than 10m6 300 hrs at 105°C thermal conditioning also included	Same as above	GR-1217-CORE Per paragraph 9.1.3 EIA-364-TP65

12 TELCORDIA QUALIFICATION TEST GROUP SUMMARY

12.1 Test Groups

- Group 1: Vibration and mechanical shock with dust and durability
Group 2: Thermal shock and humidity with dust and durability
Group 3: Temperature life, 500 hrs @ 105°C
Group 4: Mixed flowing gas, 4 gases with durability-thermal conditioning included prior to test
Group 5: Porosity and plating thickness
Group 6: Compliant pin resistance with temperature life

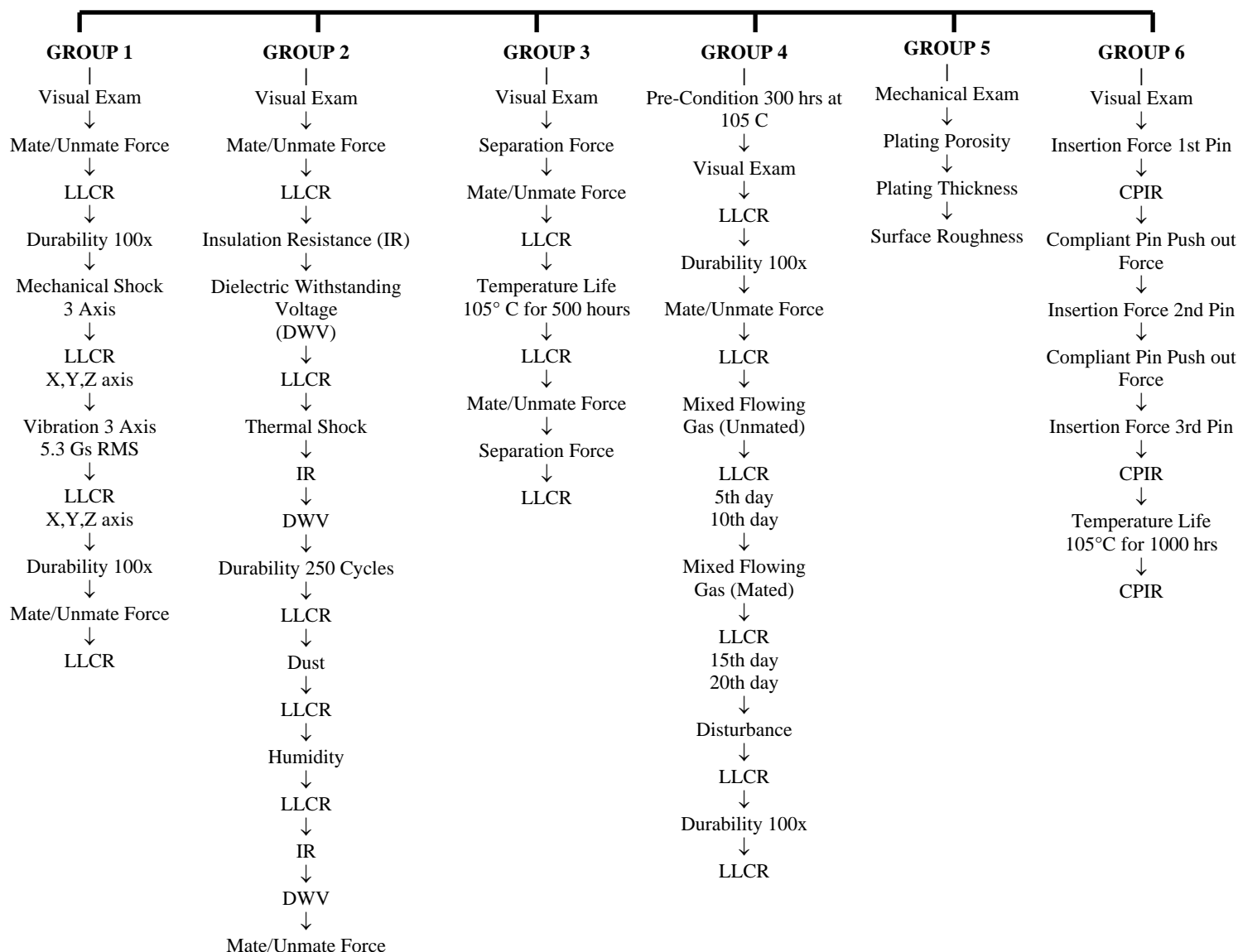


Figure 2. Telcordia Test Plan GR-1217-CORE, CENTRAL OFFICE

12.1.1 Each test group will have a minimum of 4 connectors and 200 LLCR-CPIR measurements.

12.1.2 Definitions

LLCR- Low Level Contact Resistance

CPIR- Compliant Pin Interface Resistance

DWV- Dielectric Withstanding Voltage
IR- Insulation Resistance

13 RESISTANCE MEASUREMENT SET-UP

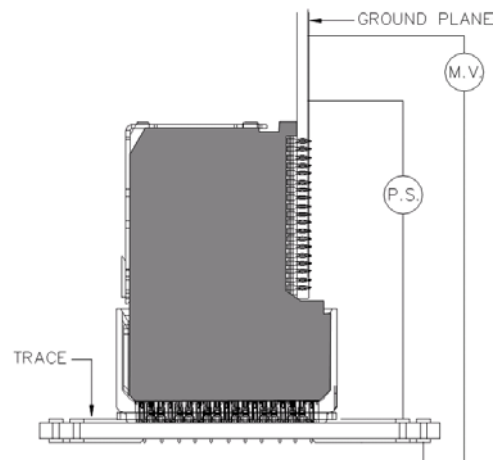


Figure 3. Shown above is an example of a typical contact resistance set-up. Kelvin 4 wire traces from connector hole to monitoring hole.

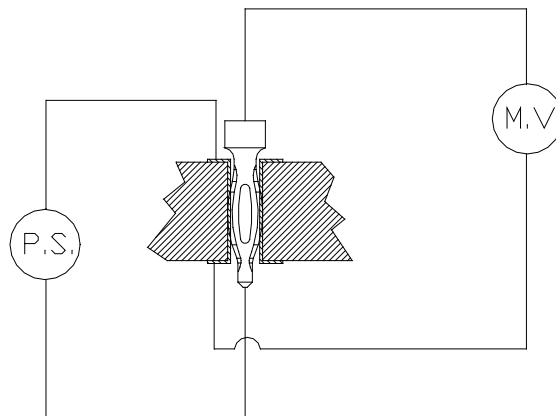


Figure 4. Typical compliant pin interface resistance (CPIR) set-up.