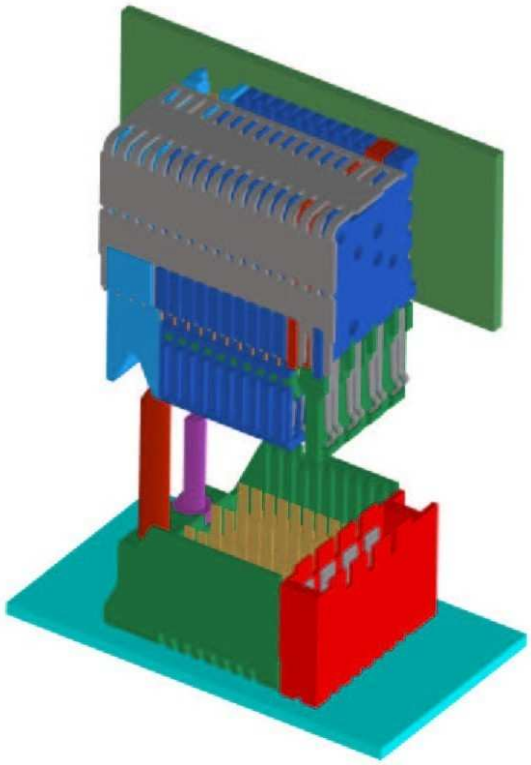
PRODUCT SPECIFICATION

PRODUCT SPECIFICATION FOR
GbX®
INTERCONNECT SYSTEMS



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D	EC No: **UCP2008-2335** DATE: **2008/03/24**	**PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS**	**1** of **12**

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1.0 SCOPE

This specification covers the performance requirements and test methods for the following products listed by series numbers:

* 75237, 75399	GbX 5 pair Backplane Signal Module
* 75235, 75398, 75823,	GbX 4 pair Backplane Signal Module
* 75433, 75434	GbX 3 pair Backplane Signal Module
* 75827, 75828	GbX 2 pair Backplane Signal Module
* 75954, 75959	GbX 5 pair Backplane Signal Module, Lead Free (LF)
* 75838, 75839, 75852, 75853	GbX 4 pair Backplane Signal Module, Lead Free (LF)
* 75836, 75837	GbX 3 pair Backplane Signal Module, Lead Free (LF)
* 75832, 75833	GbX 2 pair Backplane Signal Module, Lead Free (LF)
* 75848, 75849	GbX 5 pair Electrically Enhanced Backplane Signal Module
* 75830, 75831	GbX 4 pair Electrically Enhanced Backplane Signal Module
* 75843, 75844	GbX 3 pair Electrically Enhanced Backplane Signal Module
* 75647, 76332	GbX 2 pair Electrically Enhanced Backplane Signal Module
* 75850, 75851	GbX 5 pair Electrically Enhanced Backplane Signal Module, Lead Free (LF)
* 75840, 75841	GbX 4 pair Electrically Enhanced Backplane Signal Module, Lead Free (LF)
* 75845, 75846	GbX 3 pair Electrically Enhanced Backplane Signal Module, Lead Free (LF)
* 75834, 75835	GbX 2 pair Electrically Enhanced Backplane Signal Module, Lead Free (LF)
* 75866, 75867	GbX L-series 5 pair Backplane Signal Module (14 pin)
* 75465, 75466, 75937	GbX L-series 4 pair Backplane Signal Module (11 pin)
* 75649, 75467	GbX L-series 3 pair Backplane Signal Module (8 pin)
* 75861, 75862	GbX L-series 2 pair Backplane Signal Module (5 pin)
* 75868, 75869	GbX L-series 5 pair Backplane Signal Module (14 pin), (LF)
* 75854, 75855, 75856, 75857	GbX L-series 4 pair Backplane Signal Module (11 pin), (LF)
* 75858, 75859	GbX L-series 3 pair Backplane Signal Module (8 pin), (LF)
* 75863, 75864	GbX L-series 2 pair Backplane Signal Module (5 pin), (LF)
* 75500, 7551X, 7552X, 7553X	GbX 5 pair Backplane Power Module
* 75340, 75341, 75342, 75343	GbX 4 pair Backplane Power Module
* 75330, 75331, 75332, 75333	GbX 3 pair Backplane Power Module
* 75492	GbX 2 pair Backplane Power Module
* 75360	GbX 5 pair Daughtercard Assembly
* 75220	GbX 4 pair Daughtercard Assembly
* 75370	GbX 3 pair Daughtercard Assembly
* 75650	GbX 2 pair Daughtercard Assembly
* 75880	GbX 5 pair Daughtercard Assembly, Lead Free (LF)
* 75878	GbX 4 pair Daughtercard Assembly, Lead Free (LF)

* 75876	GbX 3 pair Daughtercard Assembly, Lead Free (LF)
* 75874	GbX 2 pair Daughtercard Assembly, Lead Free (LF)
* 75420	GbX L-series 4 pair Daughtercard Assembly (11 circuit)
* 75660	GbX L-series 3 pair Daughtercard Assembly (8 circuit)
* 75670	GbX L-series 2 pair Daughtercard Assembly (5 circuit)
* 75426	GbX 4 pair/L-series Hybrid Daughtercard Assembly
* 75666	GbX 3 pair/L-series Hybrid Daughtercard Assembly
* 75676	GbX 2 pair/L-series Hybrid Daughtercard Assembly
* 75879	GbX L-series 4 pair & Hybrid Daughtercard Assembly, (LF)
* 75877	GbX L-series 3 pair & Hybrid Daughtercard Assembly, (LF)
* 75875	GbX L-series 2 pair & Hybrid Daughtercard Assembly, (LF)
* 75717	GbX 4 pair Right Angle Male Assembly
* 75966	GbX 2 pair Right Angle Male Assembly
* 75234	GbX Free-Standing Guide Pin

The GbX backplane interconnect systems consist of 2, 3, 4 and 5 pair modular configurations with custom signal, power and guidance modules.
These connectors are two-piece devices, which connect two printed circuit boards.
The right angle receptacle connectors (daughtercard) and header pin connectors (backplane) are through hole devices with eye-of-the-needle compliant pin terminals.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAMES

GbX and GbX L-Series
Hybrid refers to a Daughercard Assembly with both GbX and GbX L-Series.

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Refer to the appropriate sales drawings for information on dimensions, materials, platings and markings.

2.3 SAFETY AGENCY APPROVALS

UL File Number: E29179

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Refer to the appropriate sales drawings and other sections of this specification for the necessary referenced documents and specifications.

4.0 RATINGS

4.1 CURRENT AND TEMPERATURE RATING

Voltage:	120 VAC RMS/DC max
Signal Contact:	1 Amp per contact
Shield Contact:	2 Amps per contact
Power Contact:	6 Amps per blade
Maximum operating temperature:	105°C
Non-operating temperature:	-55℃ to 85℃

4.2 ELECTRICAL RATINGS

Description	Value
Mating interface contact resistance change	10 milliohm maximum
Compliant pin to plated through hole resistance	1 milliohm maximum
Insulation resistance	1000 Megaohm
Dielectric Withstanding Voltage	750 Volts RMS

4.3 SIGNAL CONTACT MATED BULK RESISTANCE

4.3.1 GBX HIGH-SPEED

2 pair	Electrical Lengths(3) [mm]	Bulk Resistance(1) [milliohm]
A	22.4	10.8
B	24.2	11.7
D	28.0	12.9
E	29.8	13.9

3 pair	Electrical Lengths[3] [mm]	Bulk Resistance[1] [milliohm]
A	23.5	10.1
B	25.4	12.6
D	29.8	13.2
E	31.5	14.4
G	35.6	15.8
H	37.2	17.0

4 pair	Electrical Lengths[3] [mm]	Bulk Resistance[1] [milliohm]
A	23.5	7.9
B	25.4	9.6
D	30.5	12.8
E	32.1	14.0
G	35.6	15.0
H	38.2	15.7
J	42.1	17.7
K	44.4	19.1

5 pair	Electrical Lengths[3] [mm]	Bulk Resistance[1] [milliohm]
A	23.5	10.7
B	25.4	11.7
D	30.5	13.7
E	32.1	15.7
G	35.6	17.1
H	38.2	17.9
J	42.1	19.8
K	44.4	21.4
M	50.5	23.6
N	52.2	25.3

NOTES:

1. The resistance values are typical measured values.
2. All Shield rows typical mated bulk resistance is 7.6 milliohm.
3. Electrical lengths are measured from DC compliant to BP compliant.

4.3.2 GBX L-SERIES

2 pair	Electrical Lengths[2] [mm]	Bulk Resistance[3] [milliohm]
A	22.8	10.2
B	24.7	10.7
C	26.7	13.4
D	29.0	13.8
E	31.1	14.1

3 pair	Electrical Lengths[2] [mm]	Bulk Resistance[3] [milliohm]
A	21.7	9.9
B	24.0	10.9
C	26.5	12.1
D	28.6	13.0
E	30.5	13.9
F	32.6	14.9
G	34.8	15.9
H	37.0	16.9

4 pair	Electrical Lengths[2] [mm]	Bulk Resistance[1] [milliohm]
A	22.4	9.4
B	24.1	10.3
C	26.4	11.8
D	28.6	12.7
E	30.7	14.0
F	32.9	14.5
G	35.0	15.8
H	37.1	16.6
I	39.2	17.8
J	41.5	18.2
K	43.8	20.4

NOTES:

1. The resistance values are typical measured values.
2. Electrical lengths are measured from DC compliant to BP compliant.
3. Resistances shown are calculated values.

4.3.3 GBX RAM – RAF

2 pair	Electrical Lengths(3) [mm]	Bulk Resistance(1) [milliohm]
A	34.4	12.50
B	37.6	12.90
D	46.3	16.20
E	49.4	18.44

4 pair	Electrical Lengths(3) [mm]	Bulk Resistance(1) [milliohm]
A	33.7	14.6
B	37.2	16.5
D	46.4	20.7
E	51.2	21.6
G	58.0	25.5
H	62.2	27.3
J	72.8	31.4
K	74.6	32.9

NOTES:

1. The resistance values are typical measured values.
2. All Shield rows typical mated bulk resistance is 2.4 milliohm.
3. Electrical lengths are measured from DC compliant to BP compliant.

5.0 PERFORMANCE

5.1 ELECTRICAL PERFORMANCE

ITEM	TEST CONDITION	REQUIREMENT
CONTACT RESISTANCE (LOW LEVEL)	Mated,100mA max, 20mV per EIA-364-TP-23	10 milliohm maximum change
INSULATION RESISTANCE	Unmated, 500VDC per EIA-364-TP-21	1000 megaohm minimum
DIELECTRIC WITHSTANDING VOLTAGE	Unmated, 750VAC per EIA-364-TP-20	No breakdown or flashover
SIGNAL CONTINUITY	Mated per EIA-364-TP-87	No interrupts greater than 10 nanoseconds
COMPLIANT PIN INTERFACE RESISTANCE	Contact inserted into PCB per EIA-364-TP-23	1 milliohm maximum

5.2 MECHANICAL PERFORMANCE

ITEM	TEST CONDITION	REQUIREMENT
DURABILITY	200 Cycles, mated and unmated per EIA-364-TP-09	10 milliohm max change in LLCR
VIBRATION	Mated, 10-100Hz, 10g's, 24 hr, 3 axis per EIA-364-TP-28	10 milliohm max change in LLCR
MECHANICAL SHOCK	Mated, 30g half-sine,11ms, 3 axis per EIA-364-TP-27	10 milliohm max change in LLCR
NORMAL FORCE	Apply perpendicular force to terminal at rate of 25+/-6mm per minute	Signal: 40 g min (EOL) Shield: 40 g min (EOL) Power: 90 g min (EOL)
MATING FORCE PER PIN	N/A	35-65 g

5.3 ENVIRONMENTAL PERFORMANCE

ITEM	TEST CONDITION	REQUIREMENT
THERMAL SHOCK	Mated, 5 cycles from -55°C to 85°C per EIA-364-TP-32	10 milliohm max change in LLCR
TEMPERATURE LIFE	Mated, 85°C for 500 hours per EIA-364-TP-17	10 milliohm max change in LLCR
HUMIDITY CYCLING	Relative humidity 90 to 95% for 500 hrs per EIA-364-TP-31	10 milliohm max change in LLCR
DUST	Unmated per EIA-364-TP-50	10 milliohm max change in LLCR
MIXED FLOWING GAS	per EIA-364-TP-65	10 milliohm max change in LLCR

5.4 COMPLIANT PIN PERFORMANCE

5.4.1 Insertion Force for Various Plating Types (Typical)

COMPONENT	Immersion Sn Tin	Immersion Ag Silver	BARE Cu/OSP
	MAX	MAX	MAX
GbX Backplane Signal Pin	8 lbs	8 lbs	8 lbs
GbX Backplane Shield Pin	8 lbs	8 lbs	8 lbs
GbX Daughtercard Signal Pin	8 lbs	8 lbs	8 lbs
GbX Daughtercard Shield Pin	8 lbs	8 lbs	8 lbs
GbX Backplane/Daugthercard Power Contact	15 lbs	15 lbs	15 lbs

Note: "Maximum" columns reflect maximum expected values for insertion forces when tested in plated through holes drilled and plated as described in Section 5.4.3. Plating surface finish and PCB materials will impact actual values.

5.4.2 Retention Force for Various Plating Types (Typical)

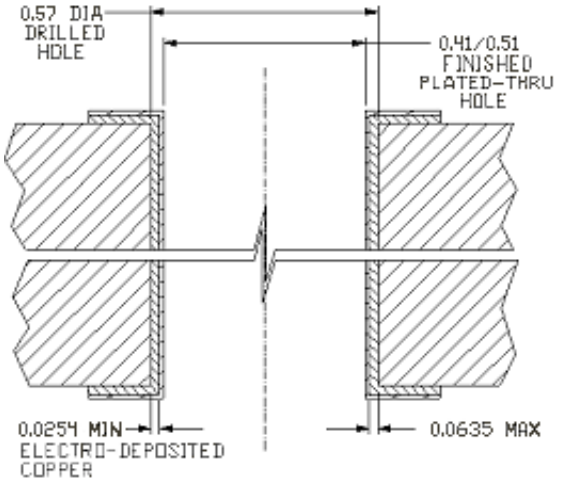
COMPONENT	Immersion Sn Tin	Immersion Ag Silver	BARE Cu/OSP
	MIN	MIN	MIN
GbX Backplane Signal Pin	1.5 lbs	1.5 lbs	1.1 lbs
GbX Backplane Shield Pin	1.5 lbs	1.5 lbs	1.1 lbs
GbX Daughtercard Signal Pin	1.5 lbs	1.5 lbs	1.1 lbs
GbX Daughtercard Shield Pin	1.5 lbs	1.5 lbs	1.1 lbs
GbX Backplane/Daugthercard Power Contact	3.5 lbs	3.5 lbs	3.5 lbs

Note: "Minimum" columns reflect minimum expected values for retention forces when tested in plated through holes drilled and plated as described in Section 5.4.3. Plating surface finish and PCB materials will impact actual values.

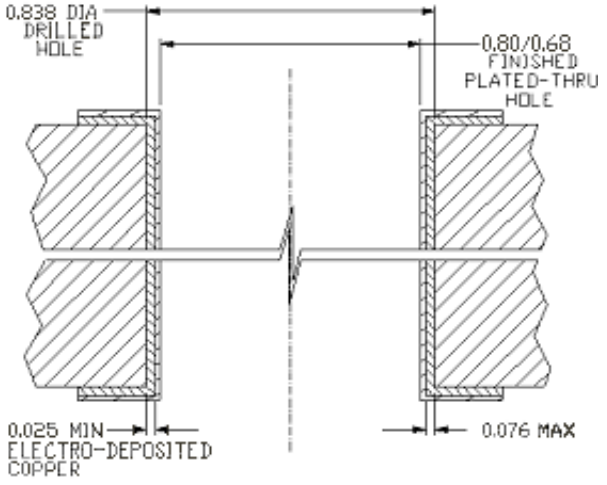
Radial hole deformation: 1.5 mils max Axial hole deformation: 1.0 mil max

5.4.3 Printed Circuit Board Specifications

Recommended Backplane PCB Thickness: 1.6mm minimum
Recommended Daughtercard PCB Thickness: 1.6mm minimum
Signal/Shield Primary Drilled Hole Size: 0.57 mm (#74 Drill)
Power Primary Drilled Hole Size: 0.838 mm (#66 Drill)



HOLE PLATING DETAIL
DAUGHTERCARD OR BACKPLANE
SIGNAL AND SHIELD CONTACTS



HOLE PLATING DETAIL
DAUGHTERCARD OR BACKPLANE
POWER CONTACTS

5.4.4 Torque Specification for Mounting Screws

Backplane and Daughtercard Screws: 2.5 in-lbs.