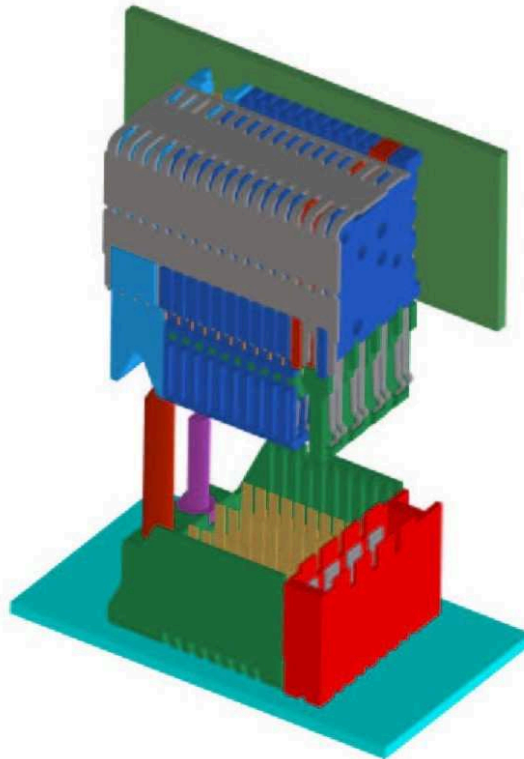




# PRODUCT SPECIFICATION

## PRODUCT SPECIFICATION FOR GbX<sup>®</sup> INTERCONNECT SYSTEMS



GbX is a registered trademark of Teradyne, Inc.

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>1 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

## 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)

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>2 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

- \* 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 Daughtercard 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.

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>3 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

## 4.0 RATINGS

### 4.1 CURRENT AND TEMPERATURE RATING

Voltage:	125 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°C to 85°C

### 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 <sup>(3)</sup> [mm]	Bulk Resistance <sup>(1)</sup> [milliohm]
A	22.4	10.8
B	24.2	11.7
D	28.0	12.9
E	29.8	13.9

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>4 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

3 pair	Electrical Lengths <sup>(3)</sup> [mm]	Bulk Resistance <sup>(1)</sup> [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 <sup>(3)</sup> [mm]	Bulk Resistance <sup>(1)</sup> [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

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>5 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

5 pair	Electrical Lengths <sup>(3)</sup> [mm]	Bulk Resistance <sup>(1)</sup> [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 <sup>(2)</sup> [mm]	Bulk Resistance <sup>(3)</sup> [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

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>6 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

3 pair	Electrical Lengths <sup>(2)</sup> [mm]	Bulk Resistance <sup>(3)</sup> [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 <sup>(2)</sup> [mm]	Bulk Resistance <sup>(1)</sup> [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.

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>7 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

## 4.3.3 GBX RAM – RAF

2 pair	Electrical Lengths <sup>(3)</sup> [mm]	Bulk Resistance <sup>(1)</sup> [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 <sup>(3)</sup> [mm]	Bulk Resistance <sup>(1)</sup> [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.

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>8 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>





# PRODUCT SPECIFICATION

## 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

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>9 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

## 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/Daughtercard 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.

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>10 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

## 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/Daughtercard Power Contact	3.5 lbs	3.5 lbs	3.5 lbs

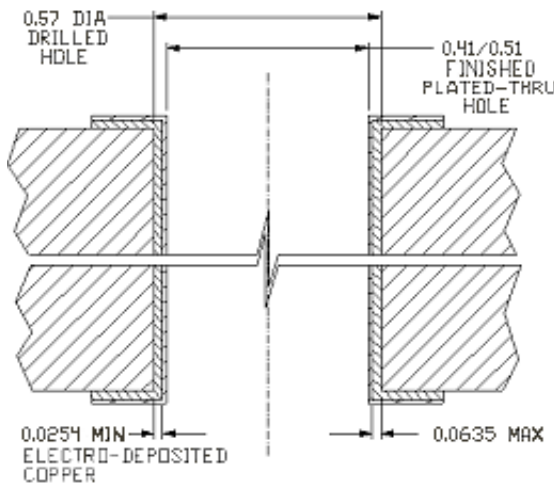
Note: "Minimum" columns reflect minimum expected values for retention forces when tested in plated through holes drilled and plated as described in Section 5.4.3. Plating surface finish and PCB materials will impact actual values.

Radial hole deformation: 1.5 mils max

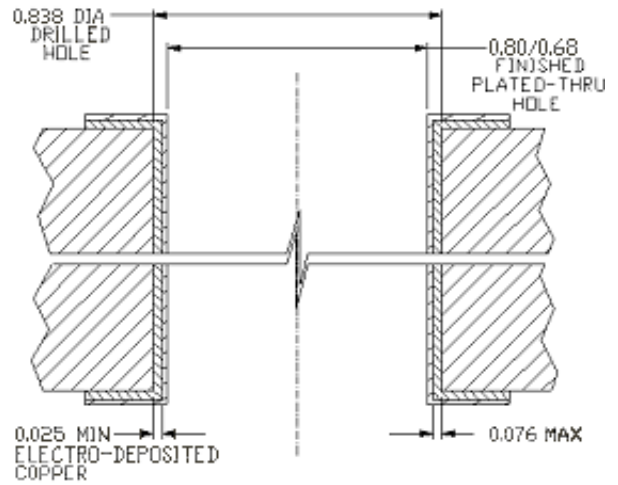
Axial hole deformation: 1.0 mil max

## 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

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>11 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>



# PRODUCT SPECIFICATION

## 5.4.4 Torque Specification for Mounting Screws

Backplane and Daughtercard Screws: 2.5 in-lbs.

REVISION: <b>E</b>	ECR/ECN INFORMATION: EC No: <b>UCP2013-4063</b> DATE: <b>2013/03/22</b>	TITLE: <b>PRODUCT SPECIFICATION FOR GbX INTERCONNECT SYSTEMS</b>	SHEET No. <b>12 of 12</b>
DOCUMENT NUMBER: <b>PS-75221-999</b>	CREATED / REVISED BY: <b>M. WOLFE</b>	CHECKED BY: <b>S. VANG</b>	APPROVED BY: <b>S. MILLER</b>