PRODUCT SPECIFICATION

	No. ER07-A055	Date Issued: March 26, 2007
Customer:	Revised:	Date Revised:
Title Subject: GHD CONNECTOR		Issued by: Osaka Engineering Center

This product specification contains the results of performance tests for GHD connector.

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Prepared by:	Checked by:	Reviewed by:	Approved by:

Title Subject: GHD CONNECTOR	No. ER07-A055	Revised:

1. PART NAME, PART NUMBER & DRAWING NUMBER

Part Name			Part Number	Drawing Number
Top entry type header	Loose piece product		BM∗B-GHDS-G (LF)(SN)	KRD-39931
	Taping product		BM∗B-GHDS-G-TF (LF)(SN)	KRD-39932
Applicable socket	Housing		GHDR-∗V-S	KRD-39933
	Contact	002 type	SGHD-002GA-P0.2	KRD-39934

Note$_1$: The number of circuits in two-digit figures is indicated in ∗.
Note$_2$: (LF) and (SN) as identification part number indicating lead-free product and tin-plated specification of lead-free product shall be displayed on a label until all products are shifted to the lead-free.

2. CONSTRUCTION, DIMENSIONS, MATERIAL & SURFACE FINISH

Construction and dimensions shall be in accordance with the referenced drawings.
Material and surface finish shall be as specified below.

Part Name		Material	Surface finish etc.
Header	Base contact	Phosphor bronze	Nickel-underplated Gold-plated
	Reinforcement	Brass	Copper-underplated Tin-plated
	Wafer	9T Nylon	Color: Natural Flammability: UL94V-0
Socket	Housing	PBT	Color: Natural Flammability: UL94V-0
	Contact	Phosphor bronze	Nickel-underplated Selective gold-plated
Tape	Carrier tape	Polyester	
	Cover tape	Polyester	
Reel	Flange	Polystyrene	
	Core	Polystyrene Polypropylene	

3. CHARACTERISTICS (CONNECTOR PART)

Items		Rated values	
Current rating		1.0A (AC, DC)	(Note$_3$)
Voltage rating		50V (AC, DC)	
Temperature range		-25 to +85 °C	(Note$_4$)
Applicable wire	Conductor spec.	Tin-plated annealed copper wire (stranded wire)	
	Conductor size	AWG#30 to AWG#26	
	Insulation O.D.	ϕ0.8 mm to ϕ1.0 mm	

Note$_3$: When AWG#26 applied.
Note$_4$: Including temperature rise in applying an electrical current.

4. ABOUT WHISKER

Although the lead-free plating of this product has performed re-flow tin plating which ensures maximum effectiveness for retarding whisker growth, it is not possible to completely eliminate the whisker problem.

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5. PACKAGING SPECIFICATION (Embossed-taping)

5.1 Packaging quantity

Quantity to be wound shall be 1,250 pieces per reel for top and side entry type as the standard quantity.

5.2 Packaging method

(1) Each product shall be put into the fixed position[*1] of the embossed carrier tape individually. The tape shall be sealed with cover tape by heat treatment.

(2) After sealed, carrier tape shall be wound[*2] to reel to be specified quantity and the end of cover tape[*3] shall be fixed to flange of reel by adhesive tape.

(3) The wound reel shall be packaged in a corrugated cardboard box for shipment.

*1: See the attached drawings.
*2: The direction to be wound; See the attached drawings.
*3: Corresponding to leader part in taking out the tape.
The treatment of the end of tape; See the attached drawings.

5.3 Marking

The label marked the following items shall be attached to the flange part of a reel.

(1) Part number
(2) Quantity
(3) Manufacturing lot No.
(4) Company name or its abbreviation
(5) Other necessary items

5.4 Storage

Store the products in a clean room under the JST packaging conditions.

Storage temperature: 5 to 35 °C
Storage humidity: 60% max.

6. SPECIMEN

Part Name			Part Number
Header	Top entry type		BM∗B-GHDS-G (LF)(SN)
Applicable socket	Housing		GHDR-∗V-S
	Contact	002 type	SGHD-002GA-P0.2

Note$_5$: The number of circuits in two-digit figures is indicated in ∗.

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7. TEST CONDITIONS

7.1 When tested in accordance with the test conditions and methods specified in each item, each requirement shall be met. Unless otherwise specified, the tests shall be conducted under the following ambient conditions specified in JIS C 60068-1 (IEC 60068-1) [Basic Environmental Testing Procedures General and Guidance].

Temperature: 15 to 35 °C
Relative humidity: 25 to 75 %

7.2 For environmental tests, as a rule, the specimen assembled for actual use and the wire of AWG#26 shall be used.

8. REQUIREMENTS, TEST METHODS & TEST RESULTS

8.1 Taping Part

8.1.1 Appearance

Requirement:

(1) Sprocket hole shall not be covered with cover tape.
(2) Cover tape shall not run out of carrier tape.
(3) Cover tape shall not be peeled.
(4) There shall be no other defects.

Test method: Visual inspection.

Test result: Good.

8.1.2 Tensile Strength of Tape

Requirement: There shall be no defects such as breakage.

Test method: Pulling load of 10N shall be applied to each of carrier and cover tapes. Pulling direction shall be its pulling-out direction.

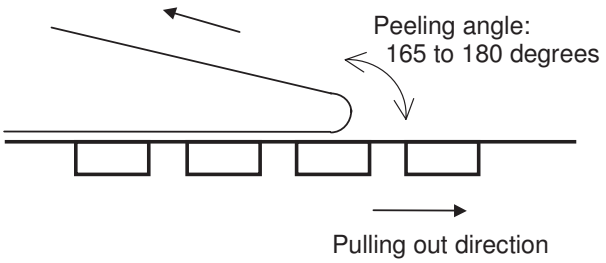
Test result: There was no defect.

8.1.3 Peel Strength of Cover Tape

Requirement: 0.1 to 1N

Test method: Cover tape shall be pulled as shown in the figure on the right side.
(Peeling speed: 300mm/min.)

Test result: 0.19 to 0.38 N n=20



8.2 Connector Part

8.2.1 Appearance

Requirement: There shall not be crack, deformation or discoloration which may affect the performance specified in this specification.

Test method: Visual inspection.

Test result: Good.

8.2.2 Mechanical Performance Test

8.2.2.1 Insertion Force (I.F.) & Withdrawal Force (W.F.)

Requirement:

No. of circuits	At initial		At 30th
	I.F. (N max.)	W.F. (N min.)	W.F. (N min.)
20	50	5	5

Test method: A socket and a header shall be mated and unmated on the mating axis. Initial insertion and withdrawal force and withdrawal force at 30th shall be measured. A housing lock shall be removed for the measurement. (Testing speed: 1 to 5mm/sec.)

Test result:

UNIT: N

No. of circuits	Items	Ave.	Max.	Min.
20	Initial I.F.	10.8	11.5	10.3
	Initial W.F.	9.8	10.6	9.4
	W.F. at 30th	9.6	10.6	8.9

n=10 (No. of connectors)

8.2.2.2 Base Contact Retention Force

Requirement: 3N min.

Test method: A base contact shall be pushed in the axial direction. The load to make the base contact start moving from the wafer shall be measured. (Testing speed: 1 to 5mm/sec.)

Test method:

Unit: N

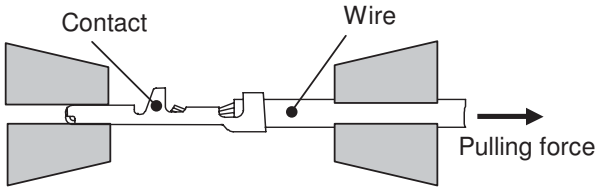
	Measured values		
	Ave.	Max.	Min.
Base contact retention force	5.3	6.8	4.7

n=20 (No. of pins)

8.2.2.3 Crimp Tensile Strength

Requirement:

Wire to be used	Requirement (N min.)
AWG #26	20
AWG #28	10
AWG #30	5



Test method: Pulling load shall be applied to a correctly crimped socket contact and a wire. The load to pull the wire out of the socket contact or break the wire shall be measured.
(Testing speed: 1 to 5mm/sec.)

Test result:

UNIT: N

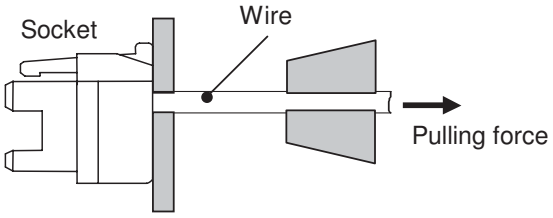
Wire size	Ave.	Max.	Min.
AWG #26	38.5	40.4	36.4
AWG #28	26.9	27.8	25.6
AWG #30	14.0	15.4	12.6

n=20 (No. of pins)

8.2.2.4 Socket Contact Retention Force

Requirement: 5N min. (When AWG#26 applied.)

Test method: A correctly crimped socket contact shall be mounted in a housing, and pulling load shall be applied between a housing and a socket contact. The load to pull the socket contact or wire out of the housing shall be measured. (Testing speed: 1 to 5mm/sec.)



Test method:

Unit: N

	Measured values		
	Ave.	Max.	Min.
Socket contact retention force	14.4	15.3	13.8

n=20 (No. of pins)

8.2.2.5 Locking Strength

Requirement: 20N min.

Test method: A socket housing and a header shall be mated. And then, the load shall be applied between them. The load to come them off each other or to break the housing shall be measured.
(Testing speed: 1～5 mm/sec.)

Test method:

Unit: N

	Measured values		
	Ave.	Max.	Min.
20-circuit	72.8	74.5	70.8

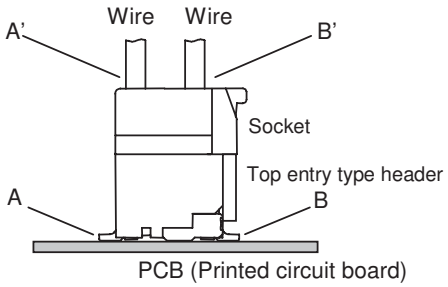
n=10 (No. of pins)

8.2.3 Electrical Performance Test

8.2.3.1 Contact Resistance

Requirement: Initial: 30 mΩ max.
After tests: 50 mΩ max.

Test method: Contact resistance between points A and A' and B and B' of a specimen assembled for actual use as shown in the figure on the right side shall be measured under the following conditions.



Test current: 1mA (DC)
Open voltage: 20mV max.
Wire to be used: AWG#26

Test result: See each environmental test item.

8.2.3.2 Current Continuity

Requirement: There shall be no current discontinuity longer than 1 microsecond during a vibration test.

Test method: Each circuit of a specimen assembled for actual use shall be connected in series and test current of 10mA (DC) shall be applied. Current discontinuity longer than 1 microsecond during the test shall be detected by a continuity meter.

Test result: See Vibration test item.

8.2.3.3 Insulation Resistance

Requirement: Initial: 100MΩ min.
After tests: 100MΩ min. (Humidity & thermal shock tests.)

Test method: 250V DC shall be applied between adjacent contacts of a mated specimen to measure insulation resistance. (A header shall not be soldered onto a PCB.)

Test result:

Items	Measured values
Initial	500MΩ min.
After humidity test	500MΩ min.
After thermal shock test	500MΩ min.

n=20 (No. of connectors)

8.2.3.4 Dielectric Withstanding Voltage

Requirement: There shall be no breakdown or flashover.

Test method: Testing voltage specified below shall be applied between adjacent contacts of a mated specimen for one minute. (A header shall not be soldered onto a PCB.)

Initial: 500V AC
After tests: 250V AC (Humidity & thermal shock tests.)

Test result:

Initial	Good
After humidity test	Good
After heat aging test	Good

n=20 (No. of connectors)

8.2.4 Environmental Test

8.2.4.1 Durability

Requirement: Contact resistance shall be 50 mΩ max. after the test.

Test method: A socket and a header shall be mated and unmated by the normal operation way. After repeated 30 cycles, contact resistance shall be measured.

Test result:

UNIT: mΩ

Test item	Initial			After the test		
Contact resistance	Ave.	Max.	Min.	Ave.	Max.	Min.
	12.1	16.1	10.7	11.8	16.4	10.6

n=40 (No. of pins)

8.2.4.2 Humidity

Requirement: Contact resistance shall be 50 mΩ max. after the test. Insulation resistance shall be 100 MΩ min. after the test. There shall be no breakdown or flashover on the dielectric withstanding voltage test.

Test method: The specimen shall be placed in a humidity chamber of the following conditions. After the test, contact resistance, insulation resistance and dielectric withstanding voltage shall be measured.

Temperature: 40 ± 2 °C
Relative humidity: 90 to 95 %
Period: 240 hours

Test result:

UNIT: mΩ

Test item	Initial			After the test		
Contact resistance	Ave.	Max.	Min.	Ave.	Max.	Min.
	13.0	17.6	11.7	13.8	16.6	11.9

n=40 (No. of pins)

8.2.4.3 Heat Aging

Requirement: Contact resistance shall be 50 mΩ max. after the test.

Test method: The specimen shall be placed in a heat oven of the following conditions. After the test, contact resistance shall be measured.

Temperature: 85 ± 2 °C
Period: 250 hours

Test result:

UNIT: mΩ

Test item	Initial			After the test		
Contact resistance	Ave.	Max.	Min.	Ave.	Max.	Min.
	13.0	17.3	11.6	12.7	17.4	11.6

n=40 (No. of pins)

8.2.4.4 Thermal Shock

Requirement: Contact resistance shall be 50 mΩ max. after the test. Insulation resistance shall be 100 MΩ min. after the test. There shall be no breakdown or flashover on the dielectric withstanding voltage test.

Test method: The specimen shall be subjected to a thermal shock test of the following conditions. After the test, contact resistance, insulation resistance and dielectric withstanding voltage shall be measured.

1 cycle consists of:
- 55 ± 3 °C for 30 minutes
+85 ± 2 °C for 30 minutes
Total cycles: 25 cycles

Test result:

UNIT: mΩ

Test item	Initial			After the test		
Contact resistance	Ave.	Max.	Min.	Ave.	Max.	Min.
	13.1	17.3	11.9	12.5	18.7	11.3

n=40 (No. of pins)

8.2.4.5 Sulfur Dioxide Gas

Requirement: Contact resistance shall be 50mΩ max. after the test.

Test method: The specimen shall be subjected to sulfur dioixde gas of the following conditions. After the test, contact resistance shall be measured.

Concentration: 10 ± 3 ppm
Temperature: 40 ± 2 ℃
Relative humidity: 80 ± 5 %
Period: 96 hours

Test result:

UNIT: mΩ

Test item	Initial			After the test		
Contact resistance	Ave.	Max.	Min.	Ave.	Max.	Min.
	13.0	15.9	12.1	13.8	16.6	11.0

n=40 (No. of pins)

8.2.4.6 Salt Spray

Requirement: Contact resistance shall be 50 mΩ max. after the test.

Test method: The specimen shall be subjected to a salt spray test of the following conditions. After the test, it shall be washed with running water and dried naturally before the measurement of contact resistance.

Temperature: 35 ± 2 °C
Concentration: 5 % in weight
Period: 48 hours

Test result:

UNIT: mΩ

Test item	Initial			After the test		
Contact resistance	Ave.	Max.	Min.	Ave.	Max.	Min.
	12.8	16.6	11.4	13.6	17.7	11.4

n=40 (No. of pins)

8.2.4.7 Vibration

Requirement: Contact resistance shall be 50 mΩ max. after the test. There shall be no current discontinuity longer than 1 microsecond during the test.

Test method: The specimen shall be subjected to a vibration test of the following conditions. During the test, current continuity shall be checked. After the test, contact resistance shall be measured.

Frequency: 10-55-10 Hz/minute
Amplitude: 1.52 mm
Direction: Each of X,Y,Z-axis directions
∗Each axis shall be at right angles to others.
Period: 2 hours for each direction

Test result:

UNIT: mΩ

Test item	Initial			After the test		
Contact resistance	Ave.	Max.	Min.	Ave.	Max.	Min.
	13.8	18.3	12.2	12.9	18.1	11.9

Current continuity	There was no current discontinuity longer than 1 microsecond.

n=40 (No. of pins)

8.2.4.8 Ammonia Gas

Requirement: There shall be no stress corrosion cracking.

Test method: A mated specimen shall be subjected to an ammonia gas test of the following conditions. After the test, stress corrosion cracking shall be checked. (A header shall not be soldered.)

Ammonia solution: 3 % in weight
Solution volume: 25 ml per liter of volume
Period: 7 hours

Test result:

There was no stress corrosion cracking.

n=10 (No. of connectors)

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8.2.5 Solder Test

8.2.5.1 Solderability

Requirement: Plating surface of solder-dipping section of a specimen shall be covered with smooth solder.

Test method: Fluxed soldering section of the specimen shall be dipped in solder of the following conditions.

Solder:	Sn-3.0Ag-0.5Cu
Flux:	Activation flux (CF-110VH-2A)
Solder temperature:	245 ± 3 °C
Immersion period:	3 ± 0.5 seconds

Test result:

Good.

n=10 (No. of pins)

8.2.5.2 Resistance to Soldering Heat

Requirement: There shall be no deformation or damage which may affect the performance.

Test method:

[By soldering iron]

A specimen shall be soldered by soldering iron of the following conditions. After the test, the appearance shall be observed. No abnormal load such as lateral load shall be applied to the specimen during the test.

Temperature of the tip:	350 °C
Soldering period:	3 seconds

Test result:

There was no deformation or damage which may affect the performance.

n=10 (No. of connectors)

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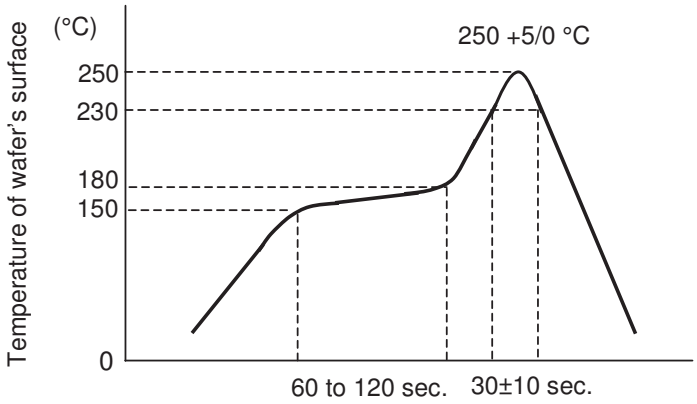
[By reflow soldering]

A specimen shall be subjected to reflow soldering of the condition shown in the graph below. After the test, the appearance shall be observed. Material of testing PCB shall be glass base epoxy resin and its thickness shall be 1.6 mm.



[Temperature profile for reflow soldering]

Test result:

There was no deformation or damage which may affect the performance.

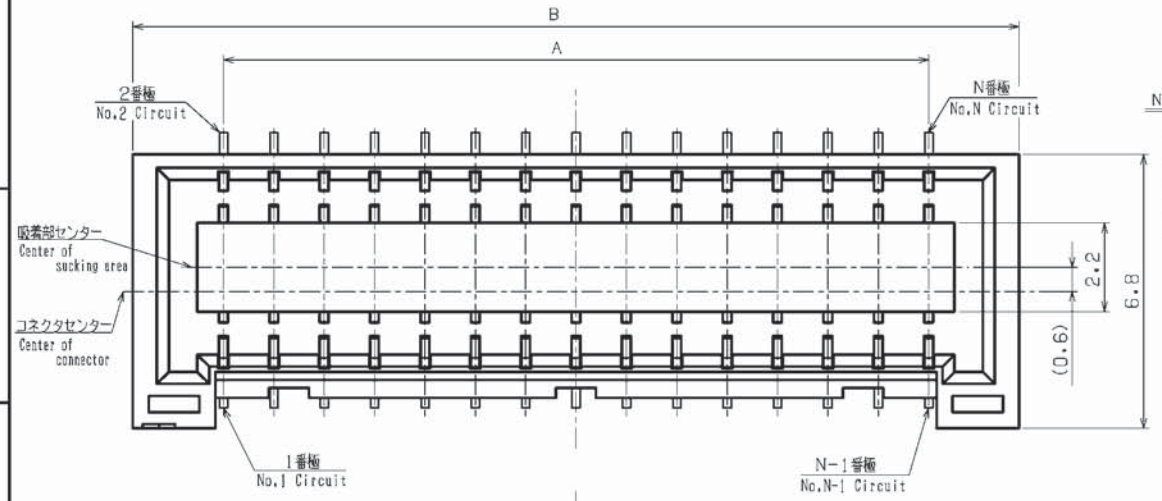
n=10 (No. of connectors)

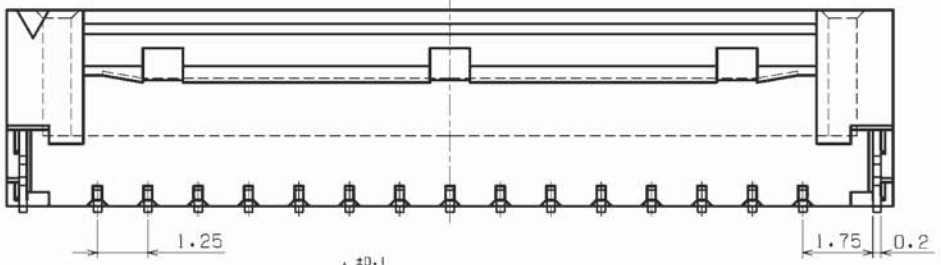
9. NOTICE

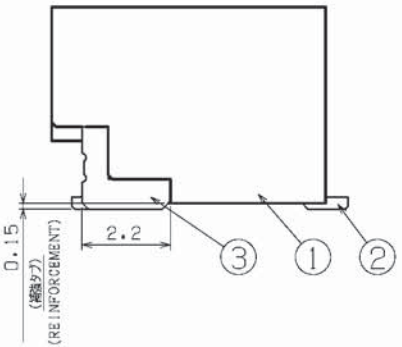
9.1 For blister

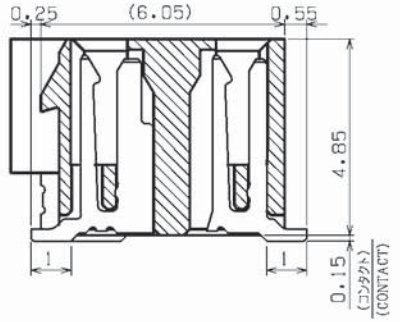
Considering handling of GHD connector in mating operation, tenacious heat-resistant nylon is used for the material of a wafer. But 'blister' may generate on the outer surface of the wafer during the process of reflow soldering, depending on the condition of water absorption of a wafer and the condition of reflow soldering.
In regard to this “blister”, the 'blister' is not caused by decomposition of resin, and it does not affect the performances of the connector.

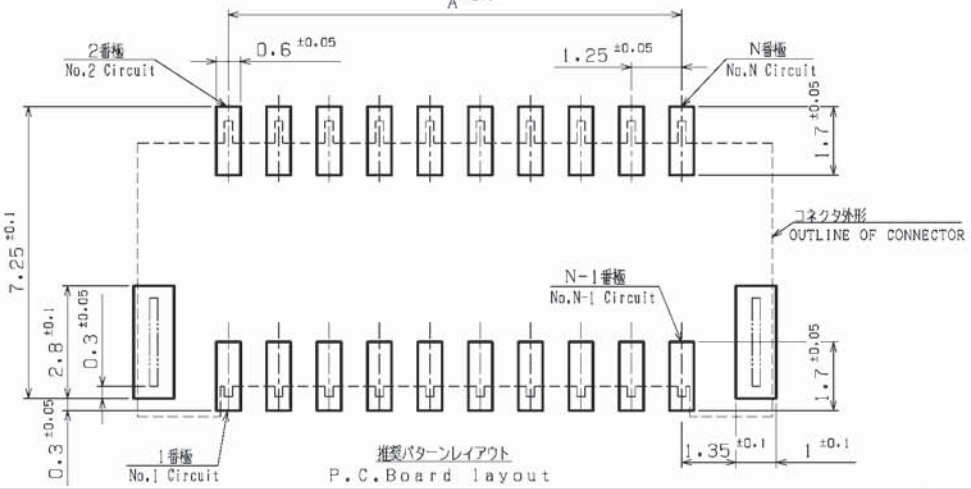
改訂 REV.	変更事項 DESCRIPTIONS	年月日 DATE	設計 DESIGNED
△			











NOTE

1. 指定外公差 : 0≦L≦1.0:±0.15
   1.0<L≦3.0:±0.2
   3.0<L :±0.3
2. はんだ付け部リードと補強タブの上下のバラつきは0.1以内とする。
3. 基板パターン寸法は、公差が累積しないこと。

極数 Circuits	寸法/Dimension A	B	
20	11.25	15.75	

NOTE

1. Unless otherwise specified, tolerances are
   0≦L≦1.0:±0.15
   1.0<L≦3.0:±0.2
   3.0<L :±0.3
2. Coplanarity of contact lead should be 0.1mmMAX.
3. Tolerance of pattern pitch on PCB are not cumulative.

品番 No.	部品名 PART NAME	材質 MATERIAL	処理 SURFACE FINISH	備考 REMARKS
3	補強タブ REINFORCEMENT	黄銅 BRASS	銅下地付すずめっき COPPER-UNDERPLATED TIN-PLATED	t0.2
2	コンタクト CONTACT	りん青銅 PHOSPHOR BRONZE	ニッケル下地付金めっき NICKEL-UNDERPLATED GOLD-PLATED	t0.2
1	ハウジング HOUSING	9Tナイロン 9T NYLON		UL94V-0, ナチュラル UL94V-0, NATURAL

サイズ SIZE	単位 UNIT	投影法 PROJECTION	作図年月日 DATE
A3	METRIC		NOV.1.2006

承認 APPROVED	検図 CHECKED	設計 DESIGNED	製図 DRAWN	尺度 SCALE
H.Y	T.F	K.S		8:1

JST 日本圧着端子製造株式会社 J.S.T.MFG.CO., LTD.

納入先 CUSTOMER	殿
品名 SERIES NAME	GHDコネクタ トップベース GHD CONNECTOR TOP BASE
形番 PART No.	BM()B-GHDS-G (LF)(SN)
図番 DRAWING No.	KRD-39931 RO

EC4120-1

REV.	変更事項 DESCRIPTIONS	年月日 DATE	設計 DESIGNED
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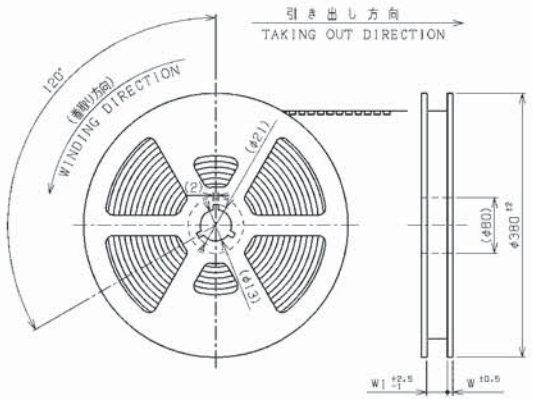
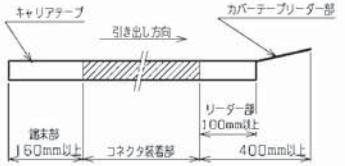
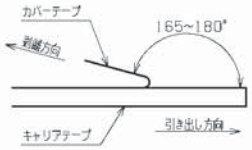


極数 Cir-cuits	寸法/Dimensions					
	B0	B1	F	S	W	W1
20	16.10	10.20	11.5	-	24.0	25.5

NOTE
1. コネクタ本体については単体の別図面を参照ください。
2. 梱包数量：1250個/リール。
3. リードテープ長さ

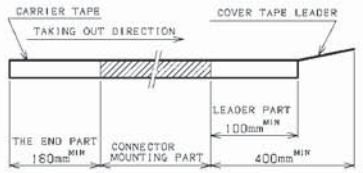


4. カバーテープの剥離強度：0.1～1N

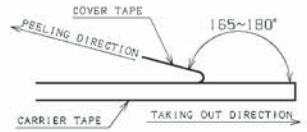


5. 材料：キャリアテープ：ポリエステル(PET)
カバーテープ　：ポリエステル(PET)
リール　：フランジ部－ポリスチレン(PS)
：コア部－ポリプロピレン(PP)
ポリスチレン(PS)
6. 一般公差：±0.3

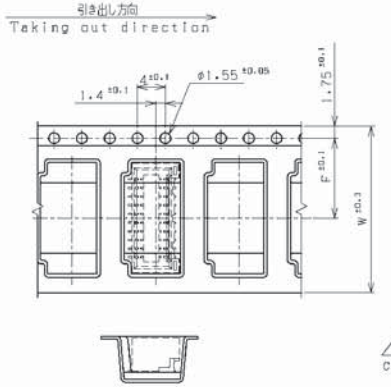
NOTE
1. Connector part: See the DWG. of GHD connector.
2. Quantity to be packaged: 1250pcs/reel
3. Leading tape length.



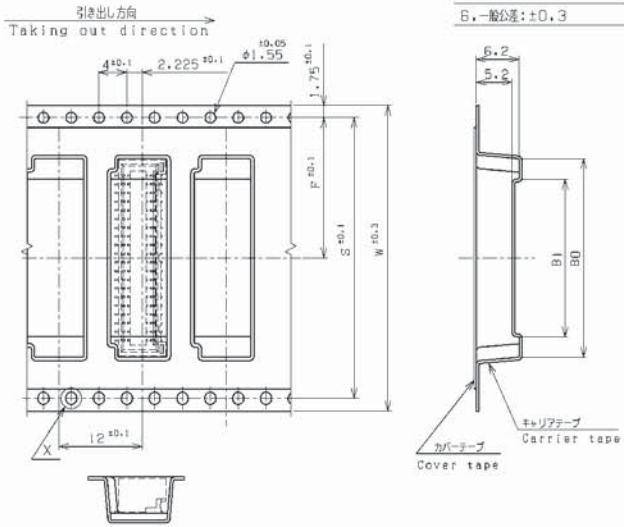
4. Cover tape peel strength: 0.1～1N



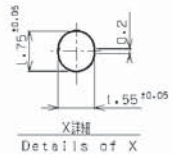
5. Material: Carrier tape: Polyester (PET)
Cover tape　: Polyester (PET)
Reel: Flange: Polystyrene (PS)
Core: Polypropylene (PP)
: Polystyrene (PS)
6. Unless otherwise specified, tolerances are ±0.3



テープ幅W24以下のとき
Tape width(W): 24 or less



テープ幅W32以上のとき
Tape width(W): 32 or more



X詳細
Details of X

品番 No.	部品名 PART NAME	材質 MATERIAL	表面処理 SURFACE FINISH	備考 REMARKS

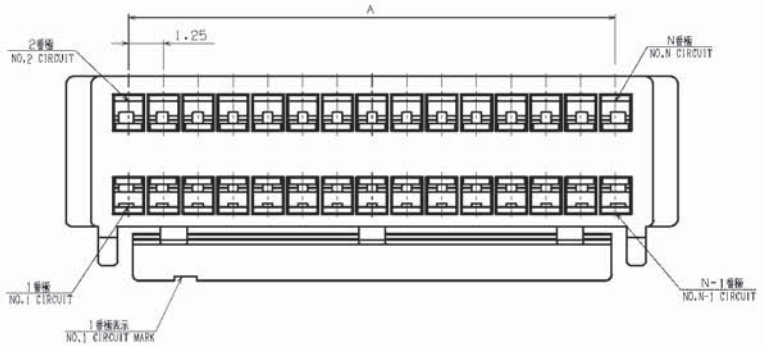
サイズ SIZE	単位 UNIT	投影法 PROJECTION	作成年月日 DATE	納入先 CUSTOMER	
A2	METRIC		AUG. 25. 2006		
承認 APPROVED: H.Y	照査 CHECKED: T.F	設計 DESIGNED: K.S	製図 DRAWN	尺度 SCALE: FREE	

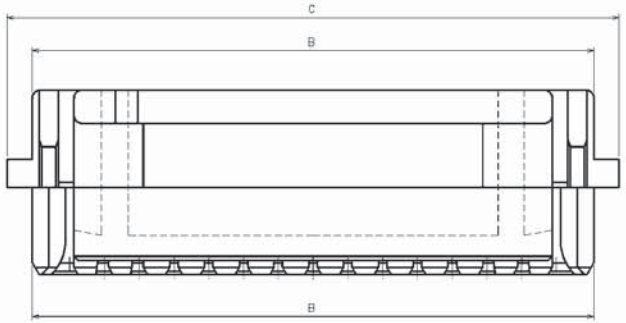
品名 SERIES NAME	GHDコネクタ トップベース用エンボステーピング / GHD CONNECTOR EMBOSS TAPE FOR TOP BASE
型番 PART No.	BM20B-GHDS-G-TF (LF) (SN)
図番 DRAWING No.	KRD-39932 RD

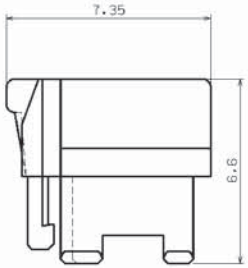
JST 日本圧着端子製造株式会社 J.S.T.MFG.CO., LTD.

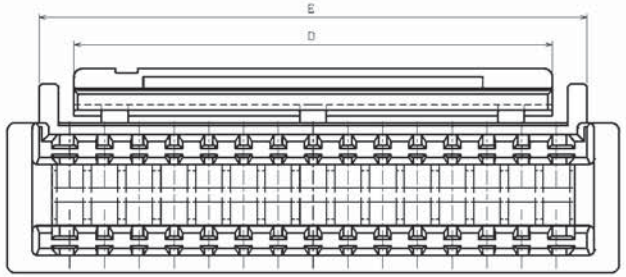
EC4119-1

改訂 REV.	変更事項 DESCRIPTIONS	年月日 DATE	設計 DESIGNED
△			









NOTE

1.指定外公差 : 0≦L≦1.0:±0.15
1.0<L≦3.0:±0.2
3.0<L :±0.3

NOTE

1.Unless otherwise specified,
tolerances are
0≦L≦1.0:±0.15
1.0<L≦3.0:±0.2
3.0<L :±0.3

極数 Cir-cuits	寸法/Dimension A	B	C	D	E
20	11.25	13.95	15.75	10.95	13.45

1	ソケットハウジング SOCKET HOUSING	PBT			UL94V-0, ナチュラル UL94V-0, NATURAL
品番 No.	部品名 PART NAME	材質 MATERIAL		処理 SURFACE FINISH	備考 REMARKS

サイズ SIZE	単位 UNIT	投影法 PROJECTION	作図年月日 DATE	納入先 CUSTOMER	
A2	METRIC		NOV.1.2006		
承認 APPROVED	検図 CHECKED	設計 DESIGNED	製図 DRAWN	尺度 SCALE	品名 SERIES NAME: GHDコネクタ ソケットハウジング / GHD CONNECTOR SOCKET HOUSING
H.Y	T.F	K.S		8:1	形番 PART No.: GHDR-()V-S
JST 日本圧着端子製造株式会社 J.S.T.MFG.CO., LTD.					図番 DRAWING No.: KRD-39933 RD

EC4119-1

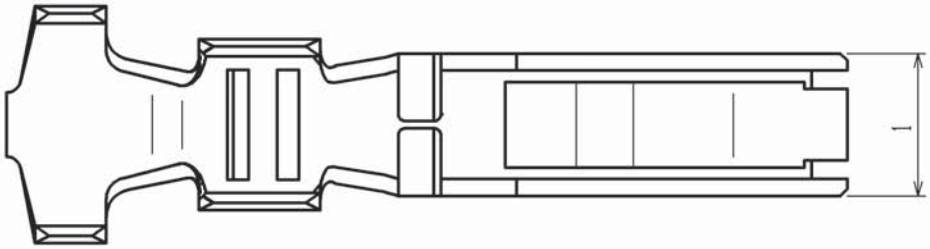
改訂 REV.	変更事項 DESCRIPTIONS	年月日 DATE	設計 DESIGNED
△			

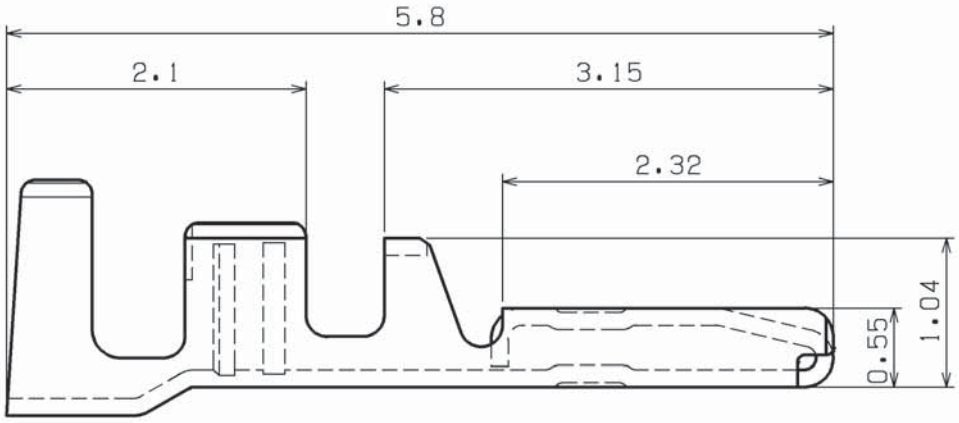
NOTE

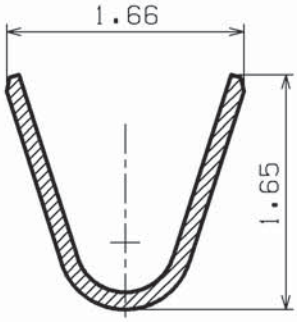
1.指定外公差 : 0≦L≦1.0:±0.15
1.0<L≦3.0:±0.2
3.0<L :±0.3

NOTE

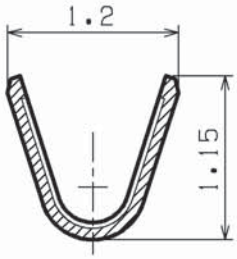
1.Unless otherwise specified,
tolerances are
0≦L≦1.0:±0.15
1.0<L≦3.0:±0.2
3.0<L :±0.3







インシュレーションバレル
INSULATION BARREL



ワイヤバレル
WIRE BARREL

品番 No.	部品名 PART NAME	材質 MATERIAL	処理 SURFACE FINISH	備考 REMARKS
1	ソケットコンタクト SOCKET CONTACT	りん青銅 PHOSPHOR BRONZE	ニッケル下地付部分金めっき NICKEL-UNDERPLATED SELECTIVE GOLD-PLATED	t0.12

サイズ SIZE	単位 UNIT	投影法 PROJECTION	作図年月日 DATE
A4	METRIC		NOV.1.2006

承認 APPROVED	検図 CHECKED	設計 DESIGNED	製図 DRAWN	尺度 SCALE
H.Y	T.F	K.S		20:1

JST 日本圧着端子製造株式会社 J.S.T.MFG.CO., LTD.

納入先 CUSTOMER	殿	
品名 PART NAME	GHDコネクタ ソケットコンタクト GHD CONNECTOR SOCKET CONTACT	
形番 PART No.	SGHD-002GA-P0.2	
図番 DRAWING No.	KRD-39934	R0

EC4121-1