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11. MSDS data
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1. GENERAL SPECIFICATIONS

Submit the approval certification of connector specification as follow :

1.1 Part Name : Board To Board 0.5mm Pitch Connector Series (Stacking Height 3.0t,3.5t ,4.0t,4.5t, 5.0t 5.5t,6.0t,6.5t,7.0t,7.5t,8.0t,8.5t)

1.2 Model Name

NLWBP05-00C-0.0

NLWBS05-00C-0.0

1.3 Manufactured by LINKWORK ELECTRONIC CO., LTD

1.4 Written by Manager, Quality Control, R&D Department.

2. CONTENTS

2.1 Scope

This specification cover the requirements for board to board connector manufactured by LINKWORK ELECTRONIC CO., LTD.

2.2 Numbering system of products (Ordering information of products)

Reference technical specification 1.2

2.3 Materials

Reference technical specification 1.3

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Reference technical specification 1.1

3. ATTACHEMENT

3.1 Technical specification

3.2 Safety specification

3.3 Quality control procedure chart

3.4 Product drawing

SPECIFICATION OF 0.5MM PITCH BOARD TO BOARD CONNECTOR

DOCUMENT STATUS AND SIGNATORIES FOR USE			
DATE	WRITER APPROVAL	SEI APPROVAL	QUALITY APPROVAL
1st July, 2012	W. D. Cho	W. D. Cho	S. K. Park

1. GENERAL SPECIFICATIONS

1.1 Design and construction

This connector is designed two contacts 0.5mm pitch board to board and used SMD

1.1.1 Products drawings title are : 0.5mm board to board connector

1.1.2 Packaging

- This connector is delivered in a tape & reel

1.1.2.1 Tape and reel

- In the case of delivery by tape & reel external diameter is 331mm and internal diameter is 13.6mm
- The quantity per reel is 1,500 pieces
- The drawing direction is defined in NLWBTB5-1/2

1.1.2.2 Marking on packaging

A label is stuck on the carton box with the following notes,

Maker name * Maker country * Customer name * Description * Quantity per box * Delivery date

1.2 Contents

1.2.1 Scope

This specification cover the requirements for board to board connector manufactured by LINKWORK ELECTRONIC CO., LTD.

1.2.2 Numbering systems of product (Ordering information of product)

NLWBP05-00C-H(0.0)

NLWBS05-00C-H(0.0)

* NLWBP05 : Linkwork Board to Board Plug 0.5mm Pitch

* NLWBS05 : Linkwork Board to Board Socket 0.5mm Pitch

* Stacking Height (H)

Stacking Height	Socket(H)	Plug(H)
3.0	2.2	0.8
3.5	2.2	1.3
4.0	3.0	1.0
4.5	3.5	1.0
5.0	4.0	1.0
5.5	4.5	1.0
6.0	4.0	2.0
6.5	4.5	2.0
7.0	3.0	4.0
7.5	3.5	4.0
8.0	4.0	4.0
8.5	4.5	4.0

* Number of contacts (C)

10 : 10 Contacts ~ 100 : 100 Contacts

1.3 List of materials used and coating

1.3.1 Heat Resistant Plastic (UL 94V-0), Natural Color

1.3.2 Contact in copper alloy

1.3.3 Contact coating plated Au over 0.03㎛ Nickel

1.3.4 Soldering pins are plated Au over 0.03㎛ Nickel

2. ELECTRICAL PERFORMANCES

2.1 Rated Current : Max. 0.5A (Each Pin), Max. 16A (All Pin can carry)

2.2 Rated Voltage : AC / DC 60 V

2.3 Contact Resistance : Max. 60 mohms

2.4 Insulation Resistance : Min. 1,000 mohms (Using 500V DC)

2.5 Breakdown Voltage : 250V AC for 1 minute

3. MECHANICAL PERFORMANCES

3.1 Ambient temperature

The connector is able to range of -55℃ to +85℃ (No freezing at low temperatures)

3.2 Storage temperature range

Applicable to the products kept in our standard packaging of -40℃ to +60℃

(No freezing at low temperatures)

3.3 Contact forces

- Composite force : Max. 0.785N (Number of contacts ; Initial)
- Composite removal force : Min. 0.25N (Number of contacts)

4. ENVIRONMENTAL PERFORMANCES

4.1 Terminal shock resistance (plug and socket mated)

After 5 cycles

- Contact Resistance Max, 60 mohms
- Insulation Resistance Min, 100 mohms
- Conditions : Confirmed to MIL-STD-202F method 107G

Order	Temperature(℃)	Time
1	-55 + (+0 / -3)	30
2	25 + (+10 / -5)	Max, 5
3	85 + (+3 / -0)	30
4	25 + (+10 / -5)	Max, 5

4.2 Humidity resistance (plug and socket mated) : After 120 hours

- Contact Resistance Max, 60 mohms
- Insulation Resistance Min, 100 mohms
- Conditions : Bath temperature 40±2℃, Humidity 90% to 95% R.H.

4.3 Salt water spray resistance (plug and socket mated) : After 24 hours

- Contact Resistance Max, 60 mohms
- Insulation Resistance Min, 100 mohms
- Conditions : Bath temperature 35±2℃, Salt water concentration 5±1%

4.4 H_2S resistance (plug and socket mated) : After 48 hours

- Contact Resistance Max, 60 mohms
- Conditions : Bath temperature 40±2℃, Gas concentration 3±1ppm, Humidity 75% to 80% R.H.

4.5 Soldering temperature resistance

- Max, Peak temperature of 260℃ (Infrared reflow soldering)
- 380℃ within 3second (Soldering iron)
- Solder paste thickness : Recommendation t = 0.15mm

4.6 Life time characteristics : 50 times

- Contact Resistance Max, 60 mohms

1. About Safety Remarks

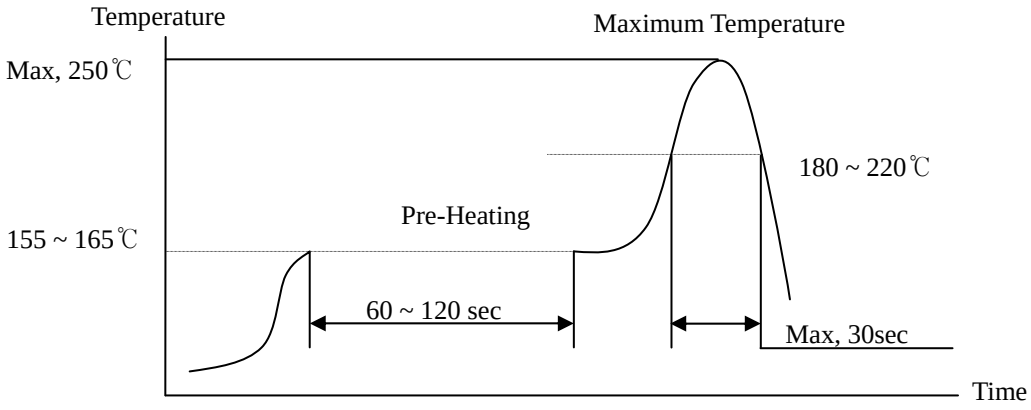
1. Do not use these connectors outside the specification ranges for the rates current breakdown voltage and other environmental conditions or the connectors may make damages to the circuit by generating an abnormal level of heat, giving off smoke or catching fire.
2. To prevent an accident, please refer specifications and / or the operation manuals before start using connectors. In the case connector has to be used outside the specification. Please consult us.

2. Remarks

1. Regarding PCB design
   Refer the recommended PCB pattern for keeping the strength of soldering.
2. Connector placement
   When the placement machine has excessive keeping force the housing will be transformation.
   Please check the placement machine.
3. When soldering by hand or reworking, do not put solder flux to connector terminal portion and PC board. Doing so may cause contact problems by flux.
4. Soldering
   4.1 Manual soldering
   - These connector is low profile type. When too many solder is provided by hand, solder goes up to contact area. Please pay attentions.
   - Please use the soldering iron under specification's temperature and times.
   - In case of exercise care not to contaminate the card contacts with solder flux from the soldering iron tip. And make sure that the card contacts are not contaminated to dispersed solder flux with a magnifying Glass and so on.
   - Please pay attentions. Not to deform terminals when mating or unmating connectors without mounting to PCBs. Do not apply an excessive force to terminals or the connection between terminals and a housing may lose.
   - Please soldering iron is cleaning

   4.2 Reflow soldering
   - Please use screen soldering regarding cream solder printing.
   - When use screen soldering, open window of screen is smaller than recommended PCB pattern (Open window area is 80% of recommended PCB pattern)

- When applying the different thickness of a screen, Please consult us.
- There may be a case of difficult self-alignment depending on the connector size. In that case, Please pay attentions to align terminals solder pads.
- The following diagram shows the recommended reflow soldering temperature profile.



The recommended conditions for the reflow temperature profile

- Infrared reflow soldering is able to passed two times.
- The temperature measured on the PCB surface near connector terminals.
- After reflow soldering, in case of PCB surface the reverse side using reflow soldering for example an adhesive and so on connector of fixed disposition.

4.3 Rework of soldering portion

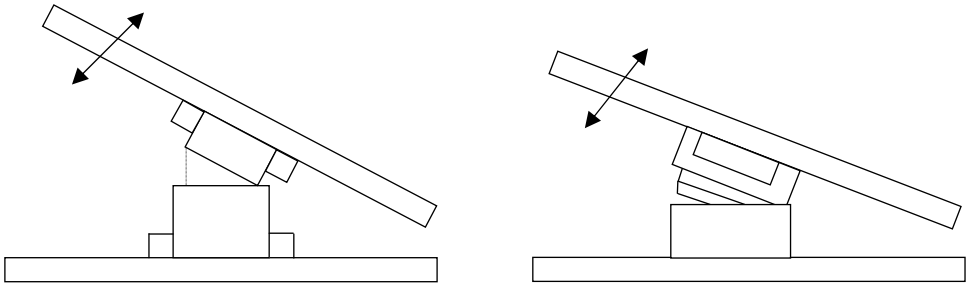
- Rework is one time.
- In case of soldering rework of bridges. Please use a flat-head soldering iron and do not use supplementary solder flux.
- Please use the soldering iron under specification's temperature.

5. Preventing vibration and shock

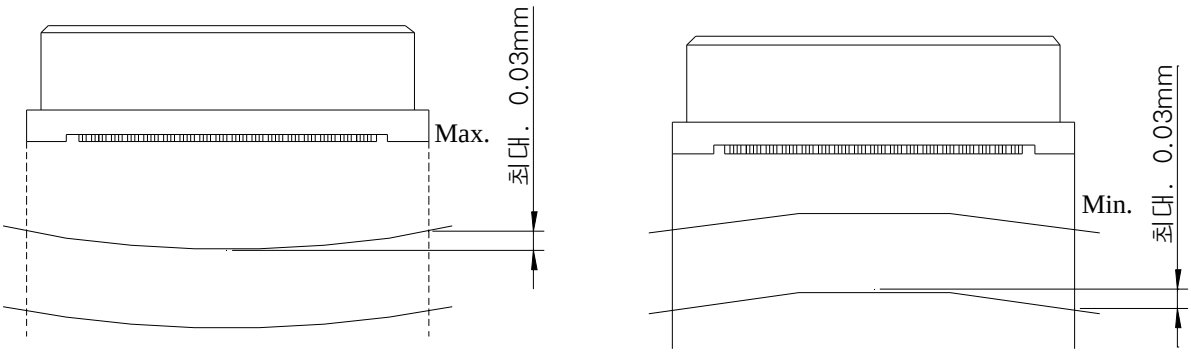
In order to secure the PCB connection even when a shock applied. Please keep a connector away from the influence of the shock by fixing the PCB to the enclosure or any other means.

6. Since excessive force on the terminals will cause deformation and the integrity of the soldering will be lost during reflow soldering, avoid dropping or rough handing of the product.

7. Be careful not to deform the terminals or brackets when inserting or removing the connector before soldering. Do not put excessive force to terminals. Doing so may loosen the fixation of terminals and molding parts.
8. These models are made very thin so that they may be smaller in size and light in weight than before. Take care not to give than excessive force and insert by sliding when mating them together or unmating them ; Otherwise, breakage may result. To prevent damage from incorrect insertions, Please confirm correct position before mating connector.

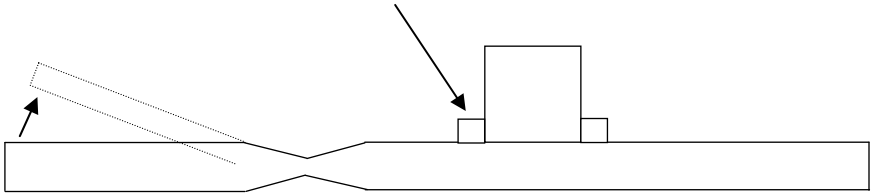


9. Keep the PCB warp 0.03mm or below as against the overall length of the connector.



10. Applied the connector with positioning projection. Though this connector has positioning tab for outline setting, Please recommend to assemble by an automatic placement machine.
11. When cutting the PCB after mounting the connector, Please assure soldered terminals are not affected by the stress.

The stress should not affect the terminals soldered



12. When mounting connectors FPC Board : Due to it is flexibility, a FPC board may make the connector terminal soldering connection weak. In order to strengthen the connection and prevent the peeling off of terminal soldering, a stiffener is strongly recommended to be attached to backside or the connector are The size of stiffener should be bugger than the recommended PCB pattern area shown in the drawing. (Out dimension +3mm Min) In case glass-finer PCB thickness is 0.3mm Min. The force to the connector occurred by drop, shock or wiring of FPC may make the connector disconnected.
13. Other cautions
    - After soldering is no coating. In case of using coating, Please Do not stick to the terminal.
    - Connector does not have switching fundamentally.

3. We declare the following

In the manufacturing process for the products being provided to your company,

The following materials are not used at all.

1. OZONE – Depleting materials ;
    - CFC : 11, 12, 13, 111, 112, 113, 114, 115, 211, 212, 213, 214, 215, 216, 217
    - Haron : 1211, 1301, 2402
    - Carbon : Tetrachloride
    - Methyl : Chloroform
2. Polybrominated flame retardants ;
    - PBBOs, PBDO, PBDPO, PBDPE, DBDO, BODO, TBDO, PBBs
3. Heavy metal ;
    - Mercury, Cadmium, Hexahydric, Chromium. Lead (Excluding solder)

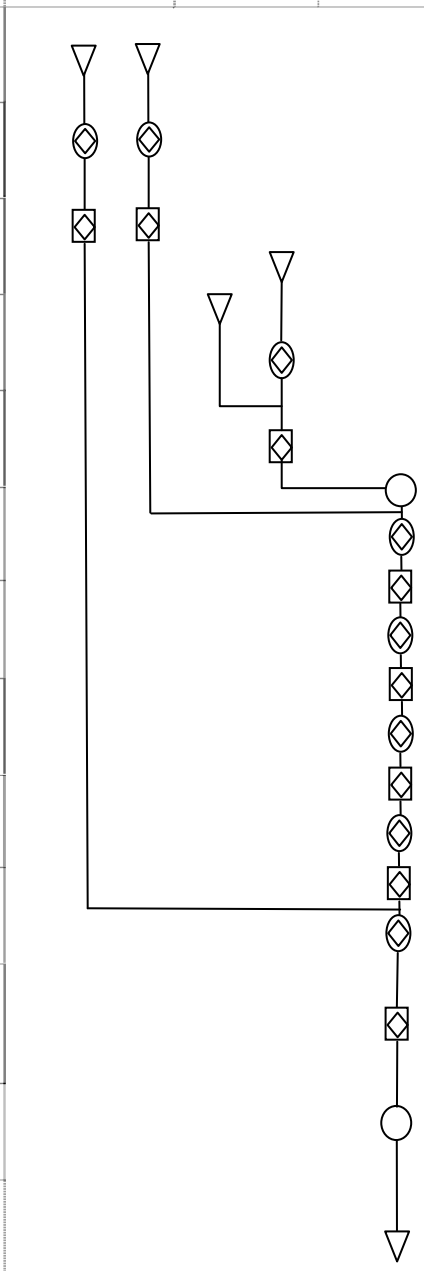
4. Note

Although the best attention will be paid for the quality controls of the products,

Please consider the followings ;

1. To prevent unexpected failures as much as possible under the conditions not shown in this specifications, Please let us know the detailed informations on the application, such as the environmental, operational and mounting condition.
2. By any chance, if the failure of the product is considered to cause a personal injury or death or property damage, the safety rate should be added to the specified values shown in this specifications and the dual safety structure or circuit is recommended to be taken from the stand point of the product liability indemnity.
3. We will either repair or replace any products or parts there of which prove to be defective against only the items written in this specifications within 1 year from the date of products acceptance at the site of delivery.
4. The following cases are exclusive from the indemnity.
   - The case of other damage caused by the failure or defect of the product.
   - The case that the product condition changed by handling, storage and / or transportation after delivery.
   - The case caused by the phenomenon which has never been discovered and is impossible to be foreknown with the existing technologies.
   - The case of force majeure, such as acts of got, public enemy or war, fires floods and any other causes beyond the control of the people concerned

QUAILTY CONTROL PROCEDURE CHART

No.	Flow Sheet			Process	Material	Inspection
	Mold	Press	Main			
1				Income	PA6T	Weight
2				Molding	-	Surface (Burr, Color), Dimension
3				Income	C5210H	Weight, Surface
4				Pressing	-	Surface, Dimension
5				Plating (Au - Ni)	-	Plating thickness (Manufacture Certification)
6				Ass'y	-	Surface, Dimension
7				1st Pressing	-	Surface, Dimension
8				Lead Cutting	-	Surface
9				2nd Pressing	-	Surface, Dimension
10				Cap Ass'y	-	Surface, Dimension, Position
11				Final product Inspection	-	Surface , Dimension, Electrical
12				Packing	-	Lot Control
13				Shipment Preparation		Surface

1. GENERAL SPECIFICATIONS

This specification describes the method of board to board connector.

2. PACKING SPECIFICATIONS

2.1 Reel Packing (bobbin, carrier tape, cover tape)

Quantity : 1,500pcs/reel

Bobbin Size : 331mm * 16mm ~47.7mm

Material : bleu/white plastic, clear polymer styrene, transparent film with adhesive

2.2 Inner bag

Quantity : 1,500pcs ~ 3,000pcs/bag

Bag Size : 460mm * 430mm

Material : transparent poly bag

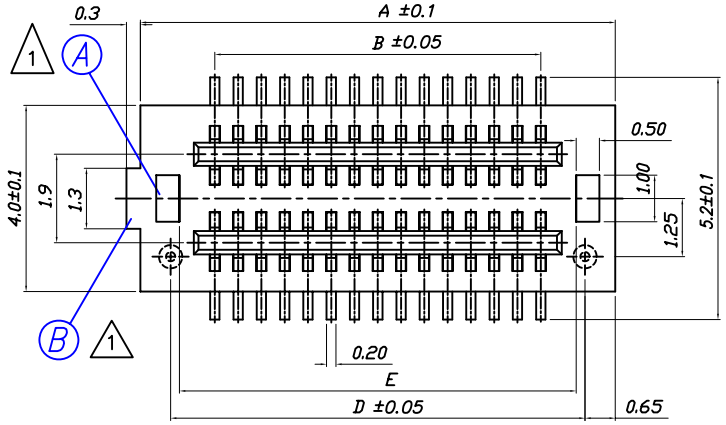
2.3 Outer Box

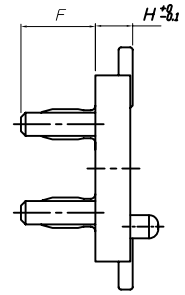
Quantity : 4,500pcs ~ 18,000pcs/box

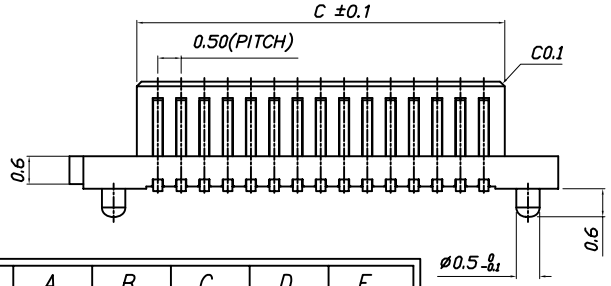
Box Size : 350mm * 350mm * 355mm

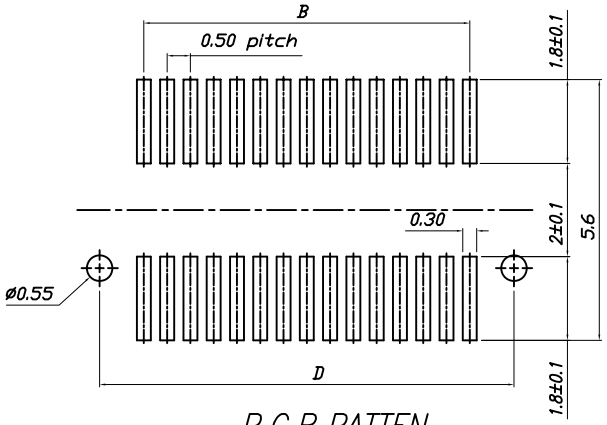
Material : paper

NO	변 경 사 항	수 정 내 용	비 고	수 정	일 시	승 인	일 시
1	2개소 형상 변경	변경점 통보서에 의거		2012.05.08	2012.05.08	C.W.O	2012.05.09
2							
3							









P.C.B PATTEN

HIGH	PLUG	SOCKET	F
3.0	0.8	2.2	1.6
3.5	1.3	2.2	1.6
4.0	1.0	3.0	1.9
4.5	1.0	3.5	1.9
5.0	1.0	4.0	1.9
5.5	1.0	4.5	1.9
6.0	2.0	4.0	1.9
6.5	2.0	4.5	1.9

	A	B	C	D	E
08P	4.70	1.50	2.40	3.40	3.02
10P	5.20	2.00	2.90	3.90	3.52
12P	5.70	2.50	3.40	4.40	4.02
14P	6.20	3.00	3.90	4.90	4.52
16P	6.70	3.50	4.40	5.40	5.02
18P	7.20	4.00	4.90	5.90	5.52
20P	7.70	4.50	5.40	6.40	6.02
22P	8.20	5.00	5.90	6.90	6.52
24P	8.70	5.50	6.40	7.40	7.02
26P	9.20	6.00	6.90	7.90	7.52
28P	9.70	6.50	7.40	8.40	8.02
30P	10.20	7.00	7.90	8.90	8.52
32P	10.70	7.50	8.40	9.40	9.02
34P	11.20	8.00	8.90	9.90	9.52

	A	B	C	D	E
36P	11.70	8.50	9.40	10.40	10.02
38P	12.20	9.00	9.90	10.90	10.52
40P	12.70	9.50	10.40	11.40	11.02
42P	13.20	10.00	10.90	11.90	11.52
44P	13.70	10.50	11.40	12.40	12.02
46P	14.20	11.00	11.90	12.90	12.52
48P	14.70	11.50	12.40	13.40	13.02
50P	15.20	12.00	12.90	13.90	13.52
60P	17.70	14.50	15.50	16.40	16.02
70P	20.20	17.00	18.00	18.90	18.52
80P	22.70	19.50	20.50	21.40	21.02
90P	25.20	22.00	23.00	23.90	23.52
100P	27.70	24.50	25.50	26.40	26.02

Min:0.03㎛ Gold plating over Min:1.2㎛ Nickel

	PLUG	PA 6T		C5210R-SH : t0.2(phosphor bronze)		
DRAWG NO	PART NAME	MATERIAL	QUANTITY	SPECIFICATION		TREATMENT	REFERENCE
5		THIRDANGLE PROJECTION	UNIT mm	SCALE N/S	TOLERANCE X.XX=±0.05	WK NAME	NO.5mm PLUG-LK
4		APPROVAL	CHECK	DESIGN	DRAW	PART NAME	0.5mm BOARD TO BOARD
3							
2							
1						DRAWG NO.	
MARK	DATE	REVISION	SIGN				

LinKworK

(A3-1)

NO	변 경 사 항	수 정 내 용	비 고	수 정	일 시	승 인	일 시
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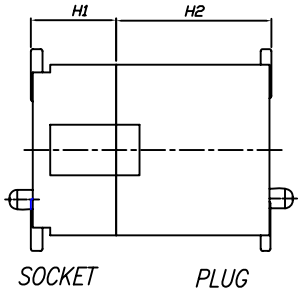
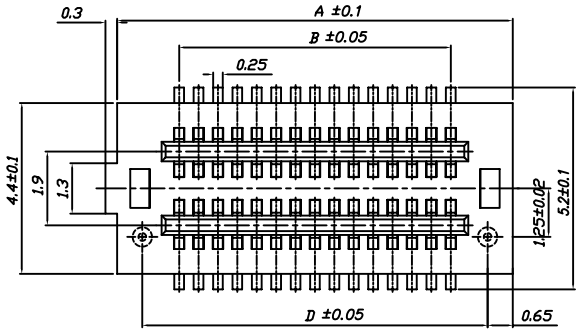
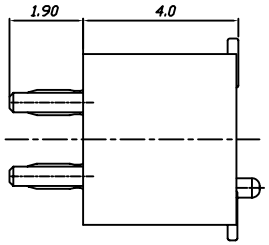
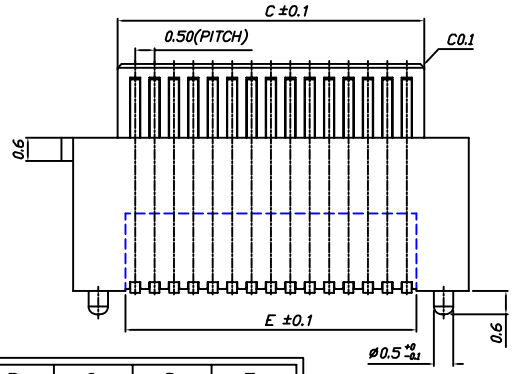
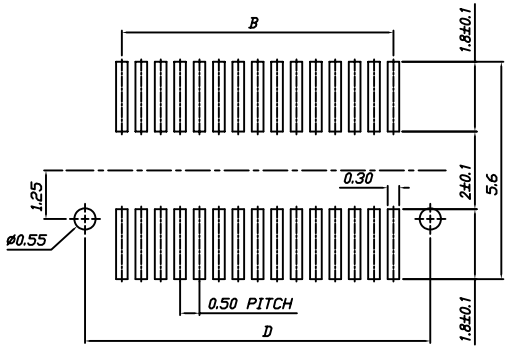
2							
3							











P.C.B PATTEN

HIGH	PLUG(H2)	SOCKET(H1)
7.0	4.0	3.0
7.5	4.0	3.5
8.0	4.0	4.0
8.5	4.0	4.5

	A	B	C	D	E
08P	4.70	1.50	2.40	3.40	2.00
10P	5.20	2.00	2.90	3.90	2.50
12P	5.70	2.50	3.40	4.40	3.00
14P	6.20	3.00	3.90	4.90	3.50
16P	6.70	3.50	4.40	5.40	4.00
18P	7.20	4.00	4.90	5.90	4.50
20P	7.70	4.50	5.40	6.40	5.00
22P	8.20	5.00	5.90	6.90	5.50
24P	8.70	5.50	6.40	7.40	6.00
26P	9.20	6.00	6.90	7.90	6.50
28P	9.70	6.50	7.40	8.40	7.00
30P	10.20	7.00	7.90	8.90	7.50
32P	10.70	7.50	8.40	9.40	8.00
34P	11.20	8.00	8.90	9.90	8.50

	A	B	C	D	E
36P	11.70	8.50	9.40	10.40	9.00
38P	12.20	9.00	9.90	10.90	9.50
40P	12.70	9.50	10.40	11.40	10.00
42P	13.20	10.00	10.90	11.90	10.50
44P	13.70	10.50	11.40	12.40	11.00
46P	14.20	11.00	11.90	12.90	11.50
48P	14.70	11.50	12.40	13.40	12.00
50P	15.20	12.00	12.90	13.90	12.50
60P	17.70	14.50	15.50	16.40	15.00
70P	20.20	17.00	18.00	18.90	17.50
80P	22.70	19.50	20.50	21.40	20.00
90P	25.20	22.00	23.00	23.90	22.50
100P	27.70	24.50	25.50	26.40	25.00

Min:0.03㎛ Gold plating over Min:1.2㎛ Nickel

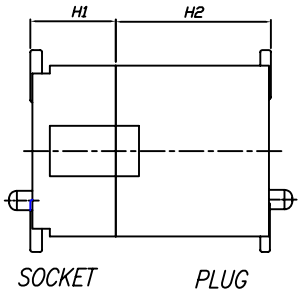
DRAWG NO	PART NAME	MATERIAL	QUANTITY	SPECIFICATION	TREATMENT	REFERENCE
	PLUG	PA 6T		C5210R-SH : t0.2(phosphor bronze)		

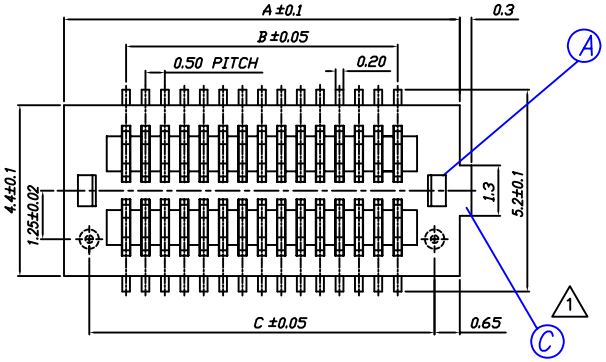
5				THIRDANGLE PROJECTION	UNIT mm	SCALE N/S	TOLERANCE X.XX=±0.05	LinKworK	WK NAME	NO.5mm PLUG-LK	
4				APPROVAL	CHECK	DESIGN	DRAW		PART NAME	0.5mm BOARD TO BOARD	
3									DRAWG NO.		
2											
1											
MARK	DATE	REVISION	SIGN								

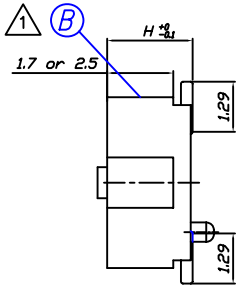
(A3-1)

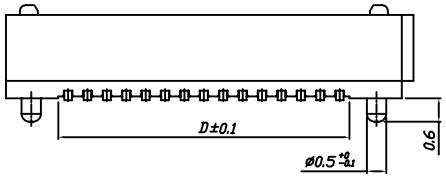
NO	변 경 사 항	수 정 내 용	비 고	수 정	일 시	승 인	일 시
1	3개소 형상 변경	변경점 통보서에 의거		2012.05.08	2012.05.08	C.W.O	2012.05.09
2							
3							

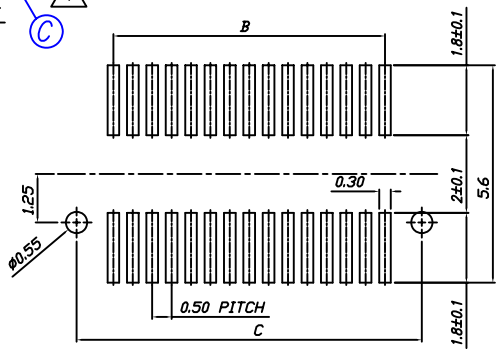
HIGH	SOCKET(H1)	PLUG(H2)
3.0	2.2	0.8
3.5	2.2	1.3
4.0	3.0	1.0
4.5	3.5	1.0
5.0	4.0	1.0
5.5	4.5	1.0
6.0	4.0	2.0
6.5	4.5	2.0
7.0	3.0	4.0
7.5	3.5	4.0
8.0	4.0	4.0
8.5	4.5	4.0











P.C.B PATTEN

	A	B	C	D
08P	4.70	1.50	3.40	2.00
10P	5.20	2.00	3.90	2.50
12P	5.70	2.50	4.40	3.00
14P	6.20	3.00	4.90	3.50
16P	6.70	3.50	5.40	4.00
18P	7.20	4.00	5.90	4.50
20P	7.70	4.50	6.40	5.00
22P	8.20	5.00	6.90	5.50
24P	8.70	5.50	7.40	6.00
26P	9.20	6.00	7.90	6.50
28P	9.70	6.50	8.40	7.00
30P	10.20	7.00	8.90	7.50
32P	10.70	7.50	9.40	8.00
34P	11.20	8.00	9.90	8.50

	A	B	C	D
36P	11.70	8.50	10.40	9.00
38P	12.20	9.00	10.90	9.50
40P	12.70	9.50	11.40	10.00
42P	13.20	10.00	11.90	10.50
44P	13.70	10.50	12.40	11.00
46P	14.20	11.00	12.90	11.50
48P	14.70	11.50	13.40	12.00
50P	15.20	12.00	13.90	12.50
60P	17.70	14.50	16.40	15.00
70P	20.20	17.00	18.90	17.50
80P	22.70	19.50	21.40	20.00
90P	25.20	22.00	23.90	22.50
100P	27.70	24.50	26.40	25.00

Min:0.03㎛ Gold plating over Min:1.2㎛ Nickel

DRAWG NO	PART NAME	MATERIAL	QUANTITY	SPECIFICATION	TREATMENT	REFERENCE
	SOCKET	PA 6T		C5210R-SH : t0.2(phosphor bronze)		

5				THIRDANGLE PROJECTION	UNIT mm	SCALE N/S	TOLERANCE X.XX=±0.05	LinKworK	WK NAME	NO.5mm SOCKET-LK
4				APPROVAL	CHECK	DESIGN	DRAW		PART NAME	0.5mm BOARD TO BOARD
3										
2										
1									DRAWG NO.	
MARK	DATE	REVISION	SIGN							

(A3-1)

LinKworK