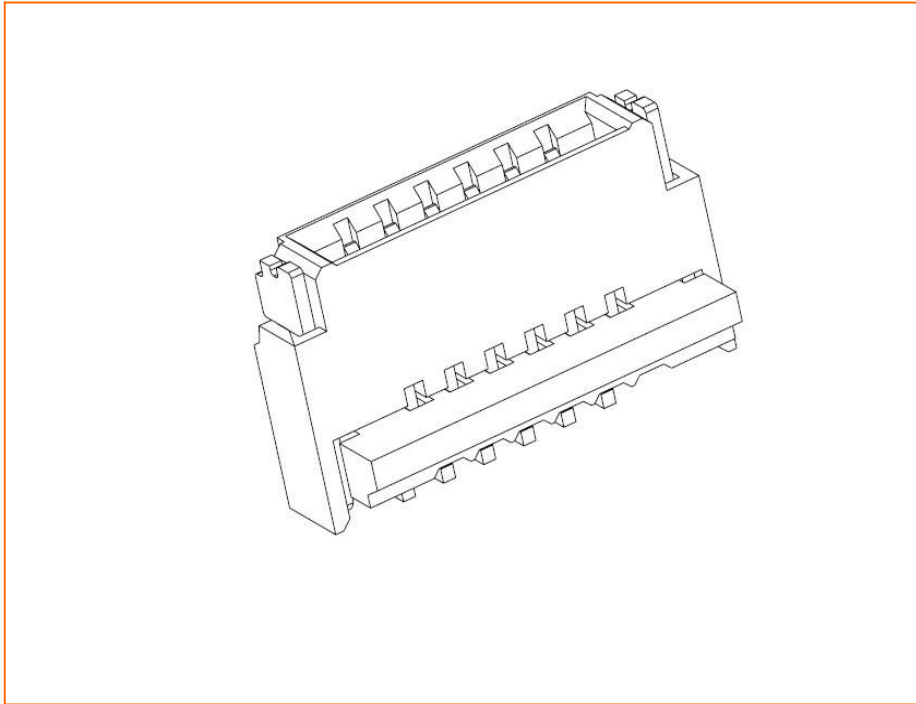


**Product Specification**

深圳臺華達科技有限公司

**SHENZHEN THD Electronics Co., Ltd.**



Product.No

**THD0509 – xxCL – GF**

**Pitch=0.50mm,H=0.9 mm FPC Connector (Front-Flip Lower Contact)**

|      |             |
|------|-------------|
| A    | Release     |
| Rev. | Description |

**Approved Signatures**

|                    |                   |
|--------------------|-------------------|
| ■Prepared By : JIM | ■Date: 2012.05.24 |
| ■Checked By : JIM  | ■Date: 2012.05.24 |
| ■Approved By : 黄德进 | ■Date: 2012.05.24 |

## ■ Scope

This specification covers the 0.5 mm Pitch FPC Connector THD0509 series.

## ■ Ordering information

### THD0509 - xx CL - GF

①                      ②                      ③                      ④

|   |   |   |   |
|---|---|---|---|
| ① | Series name : THD0509                               | ④ | Plating :<br>GF= 1μ"~3μ" Gold Flash<br>G3= 3μ" Gold over Nickel<br>G5= 5μ" Gold over Nickel<br>SN= Tin(Lead Free) over Nickel |
| ② | Number of contacts : 4 TO 60                        |   |   |
| ③ | Contact type : CL:Lower contact<br>CU:Upper contact |   |   |

## ■ Rating

| Item                        | Standard  |
|-----------------------------|---|
| Voltage Rating(Max.)        | 50V AC  |
| Current Rating(Max.)        | 0.5A DC   |
| Operating Temperature Range | -55°C ~ +85°C (Including terminal temperature rise) |

## ■ Material

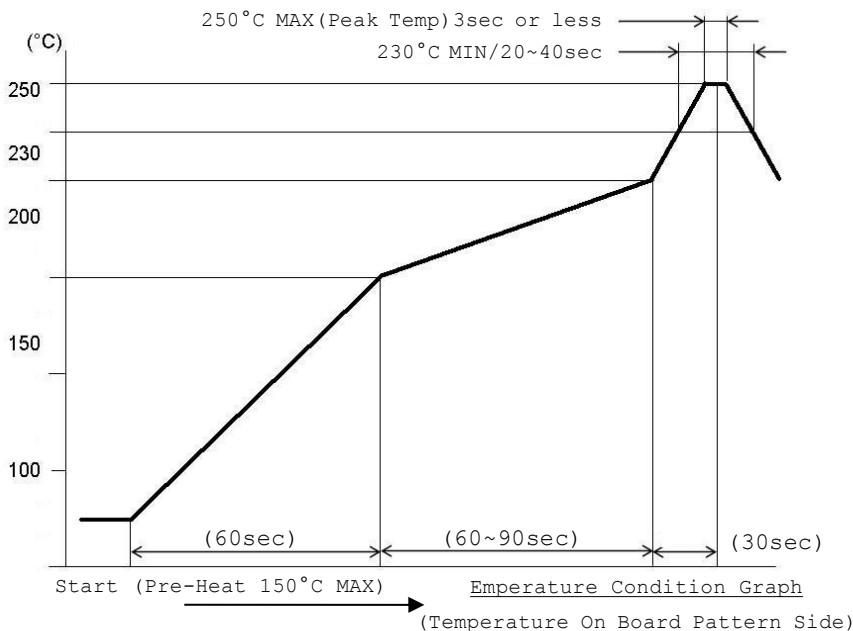
| Housing         | Actuator        | Terminal     | Solder pin   | Plating                     |
|-----------------|-----------------|--------------|--------------|-----------------------------|
| L.C.P (UL94V-0) | L.C.P (UL94V-0) | Copper alloy | Copper alloy | 1μ"~3μ"<br>Gold over Nickel |
| Color : White   | Color : Black   |              |              |                             |

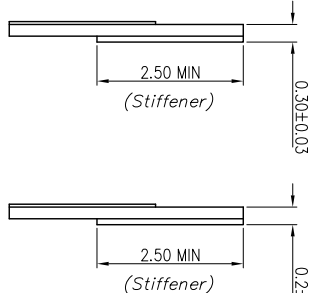
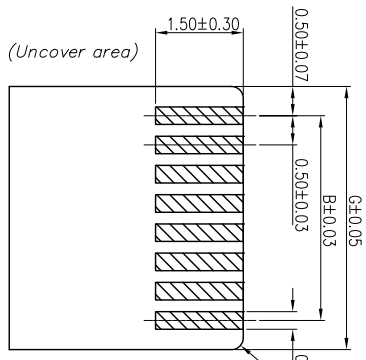
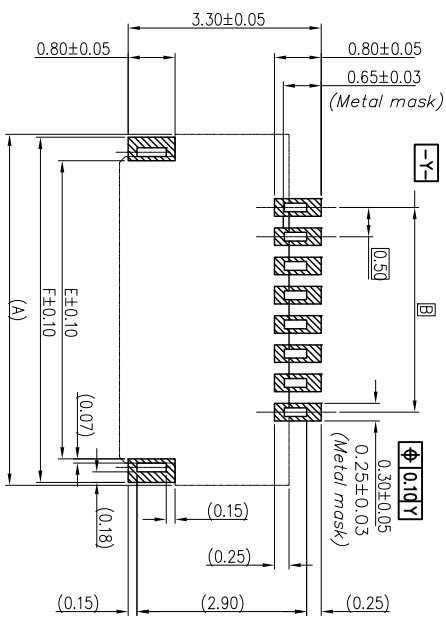
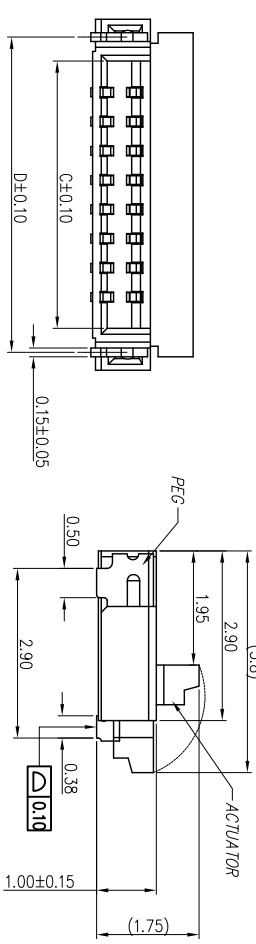
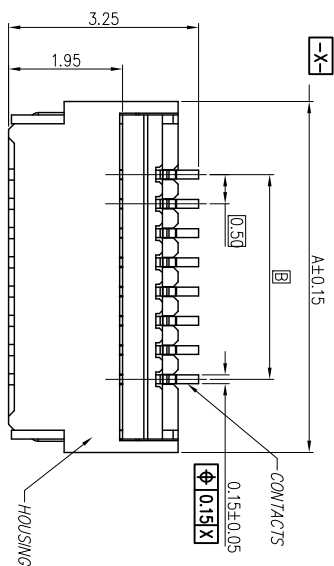
## ■ Performance

| Item                     | Test Condition  | Specification                 |             |
|--------------------------|---|-------------------------------|-------------|
| Contact Resistance       | Mate applicable FPC and measure by dry circuit, 20mV Max, 1mA.  | 100 mΩ Max.                   |             |
| Insulation Resistance    | Mate applicable FPC and apply 500V DC between adjacent terminal or ground.  | 50 MΩ Min.                    |             |
| Dielectric Strength      | Mate applicable FPC, apply 250V AC(rms) for 1 minute between adjacent terminal or ground.   | No Breakdown                  |             |
| FPC Retention Force      | Insert the actuator, pull the FPC at a rate of 25±3mm per minute.   | Per pin x 0.03Kgf (0.3N) Min. |             |
| Terminal Retention Force | Apply axial pull out force at the rate of 25±3 mm/minute on the terminal assembled in the housing.  | Per pin x 0.06Kgf (0.6N) Min. |             |
| Vibration                | Mate connectors and subject to the following vibration conditions, for period of 2 hours in each of 3 mutually perpendicular axes, passing DC 1mA during the test.<br><br>Amplitude : 1.5mm P-P<br>Frequency : 10~55~10 Hz in 1 minute.<br>Duration : 2 hours in each of X,Y,Z axes.  | Appearance                    | No Damage   |
|                          |   | Contact Resistance            | 100 mΩ Max. |
|                          |   | Discontinuity                 | 1 μsec Max. |
| Shock                    | Mate applicable FPC and subject to the following shock conditions. 3 times of shocks shall be applied for each 6 directions along 3 mutually perpendicular axes, passing DC 1 mA current during the test.<br><br>Peak value : 490m/s <sup>2</sup> {50G}   | Appearance                    | No Damage   |
|                          |   | Contact Resistance            | 100 mΩ Max. |
|                          |   | Discontinuity                 | 1 μsec Max. |
| Salt Spray               | Mate applicable FPC and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed.<br><br>NaCl solution<br>Concentration : 5 ± 1%<br>Spray time : 48 ± 4 hours<br>Ambient temperature : 35 ± 2°C | Appearance                    | No Damage   |
|                          |   | Contact Resistance            | 100 mΩ Max. |

| Item                    | Test Condition  | Specification         |   |
|-------------------------|---|-----------------------|---|
| Heat Resistance         | Mate applicable FPC and expose to 85±2°C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.  | Appearance            | No Damage   |
|                         |   | Contact Resistance    | 100 mΩ Max.   |
| Cold Resistance         | Mate applicable FPC and expose to -40±2°C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.   | Appearance            | No Damage   |
|                         |   | Contact Resistance    | 100 mΩ Max.   |
| Humidity                | Mate applicable FPC and expose to 60 ± 2°C, relative humidity 90 to 95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.   | Appearance            | No Damage   |
|                         |   | Contact Resistance    | 100 mΩ Max.   |
|                         |   | Dielectric Strength   | No Breakdown  |
|                         |   | Insulation Resistance | 50 MΩ Min.  |
| Temperature Rise        | Mate applicable FPC and measure the temperature rise of contact when the maximum AC rated current is passed.  | Temperature rise      | 30°C Max.   |
| Temperature Cycling     | Mate applicable FPC and subject to the following conditions for 5 cycles. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.<br>1 cycle<br>a) -55±3°C      30minutes<br>b) +85±3°C      30minutes<br>(Transit time shall be with in 3 minutes) | Appearance            | No Damage   |
|                         |   | Contact Resistance    | 100 mΩ Max.   |
| Solderability           | Tip of solder tails and fitting nails into the molten solder (held at 245±5°C) up to 0.1mm from the bottom of the housing for 3±0.5 seconds.  | Solder Wetting        | 95% of immersed area must show no voids, pin holes. |
| Resistance to Soldering | When reflowing refer to Infrared reflow condition <u>Soldering iron method</u><br>0.2mm from terminal tip and fitting nail tip.<br>Soldering time : 5 seconds Max.<br>Solder temperature : 370~400°C  | Appearance            | No Damage   |

### ■ Recommended Temperature Profile





Recommended PCB Layout (Top View)

Recommended FPC Dim.

Recommended metal mask pattern (thickness 0.1mm)

- NOTES: MATERIAL & FINISH
- MATERIAL:  
HOUSING: LCP(UL 94V-0)  
ACTUATOR: LCP(UL 94V-0)  
TERMINAL: COPPER ALLOY  
SOLDER PIN: COPPER ALLOY
  - PLATING:  
TERMINAL: GOLD FLASH OVER NICKEL  
SOLDER PIN: TIN OVER NICKEL(LEAD FREE)
  - RATING:  
voltage rating 50v AC  
CURRENT RATING 0.5A DC  
OPERATING TEMPERATURE RANGE -55°C ~85°C
  - ORDER INFORMATION  
THD0509 - XX CL - GF

NO. OF CONTACTS

|    |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|
| 50 | 27.00 | 24.50 | 25.57 | 26.39 | 26.10 | 26.90 | 25.50 |
| 40 | 22.00 | 19.50 | 20.57 | 21.39 | 21.10 | 21.90 | 20.50 |
| 34 | 19.00 | 16.50 | 17.57 | 18.39 | 18.10 | 18.90 | 17.50 |
| 32 | 18.00 | 15.50 | 16.57 | 17.39 | 17.10 | 17.90 | 16.50 |
| 30 | 17.00 | 14.50 | 15.57 | 16.39 | 16.10 | 16.90 | 15.50 |
| 26 | 15.00 | 12.50 | 13.57 | 14.39 | 14.10 | 14.90 | 13.50 |
| 24 | 14.00 | 11.50 | 12.57 | 13.39 | 13.10 | 13.90 | 12.50 |
| 23 | 13.50 | 11.00 | 12.07 | 12.89 | 12.60 | 13.40 | 12.00 |
| 22 | 13.00 | 10.50 | 11.57 | 12.39 | 12.10 | 12.90 | 11.50 |
| 20 | 12.00 | 9.50  | 10.57 | 11.39 | 11.10 | 11.90 | 10.50 |
| 18 | 11.00 | 8.50  | 9.57  | 10.39 | 10.10 | 10.90 | 9.50  |
| 16 | 10.00 | 7.50  | 8.57  | 9.39  | 9.10  | 9.90  | 8.50  |
| 14 | 9.00  | 6.50  | 7.57  | 8.39  | 8.10  | 8.90  | 7.50  |
| 12 | 8.00  | 5.50  | 6.57  | 7.39  | 7.10  | 7.90  | 6.50  |
| 11 | 7.50  | 5.00  | 6.07  | 6.89  | 6.60  | 7.40  | 6.00  |
| 10 | 7.00  | 4.50  | 5.57  | 6.39  | 6.10  | 6.90  | 5.50  |
| 8  | 6.00  | 3.50  | 4.57  | 5.39  | 5.10  | 5.90  | 4.50  |
| 7  | 5.50  | 3.00  | 4.07  | 4.89  | 4.60  | 5.40  | 4.00  |
| 6  | 5.00  | 2.50  | 3.57  | 4.39  | 4.10  | 4.90  | 3.50  |
| 4  | 4.00  | 1.50  | 2.57  | 3.39  | 3.10  | 3.90  | 2.50  |

Number of Contacts

|    | DIM A | DIM B | DIM C | DIM D | DIM E | DIM F | DIM G |
|----|-------|-------|-------|-------|-------|-------|-------|
| 50 | 27.00 | 24.50 | 25.57 | 26.39 | 26.10 | 26.90 | 25.50 |
| 40 | 22.00 | 19.50 | 20.57 | 21.39 | 21.10 | 21.90 | 20.50 |
| 34 | 19.00 | 16.50 | 17.57 | 18.39 | 18.10 | 18.90 | 17.50 |
| 32 | 18.00 | 15.50 | 16.57 | 17.39 | 17.10 | 17.90 | 16.50 |
| 30 | 17.00 | 14.50 | 15.57 | 16.39 | 16.10 | 16.90 | 15.50 |
| 26 | 15.00 | 12.50 | 13.57 | 14.39 | 14.10 | 14.90 | 13.50 |
| 24 | 14.00 | 11.50 | 12.57 | 13.39 | 13.10 | 13.90 | 12.50 |
| 23 | 13.50 | 11.00 | 12.07 | 12.89 | 12.60 | 13.40 | 12.00 |
| 22 | 13.00 | 10.50 | 11.57 | 12.39 | 12.10 | 12.90 | 11.50 |
| 20 | 12.00 | 9.50  | 10.57 | 11.39 | 11.10 | 11.90 | 10.50 |
| 18 | 11.00 | 8.50  | 9.57  | 10.39 | 10.10 | 10.90 | 9.50  |
| 16 | 10.00 | 7.50  | 8.57  | 9.39  | 9.10  | 9.90  | 8.50  |
| 14 | 9.00  | 6.50  | 7.57  | 8.39  | 8.10  | 8.90  | 7.50  |
| 12 | 8.00  | 5.50  | 6.57  | 7.39  | 7.10  | 7.90  | 6.50  |
| 11 | 7.50  | 5.00  | 6.07  | 6.89  | 6.60  | 7.40  | 6.00  |
| 10 | 7.00  | 4.50  | 5.57  | 6.39  | 6.10  | 6.90  | 5.50  |
| 8  | 6.00  | 3.50  | 4.57  | 5.39  | 5.10  | 5.90  | 4.50  |
| 7  | 5.50  | 3.00  | 4.07  | 4.89  | 4.60  | 5.40  | 4.00  |
| 6  | 5.00  | 2.50  | 3.57  | 4.39  | 4.10  | 4.90  | 3.50  |
| 4  | 4.00  | 1.50  | 2.57  | 3.39  | 3.10  | 3.90  | 2.50  |

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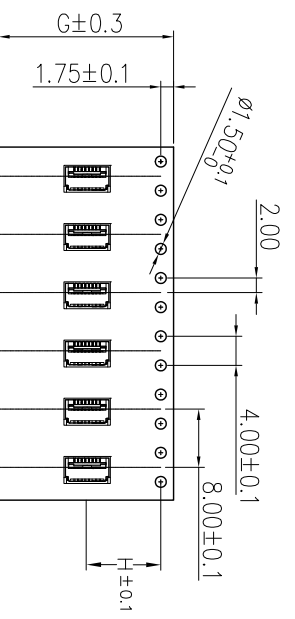
| REV. | REVISIONS | CHK | DATE       |
|------|-----------|-----|------------|
| A    | Release   | JJM | 2012/05/24 |

| GENERAL TOLERANCE          | DRAWN | PART NO.        |
|----------------------------|-------|-----------------|
| UNLESS OTHERWISE SPECIFIED | Jjm   | THD0509-XXCL-GF |
| X.X                        |       |                 |
| X.XXX                      |       |                 |
| X.XXX                      |       |                 |
| ANG.                       |       |                 |

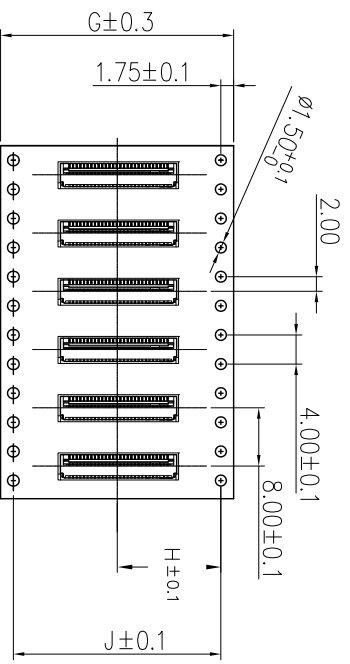
| APPROVED   | TITLE                 | UNIT | SCALE | SIZE | REV |
|------------|-----------------------|------|-------|------|-----|
| 黃德培        | 0.5 PITCH FPC CONN.   | MM   | 10:1  | A4   | A   |
| 2012.05.24 | LOWER CONTACT H=1.0mm |      |       |      |     |

SHEET 1/2

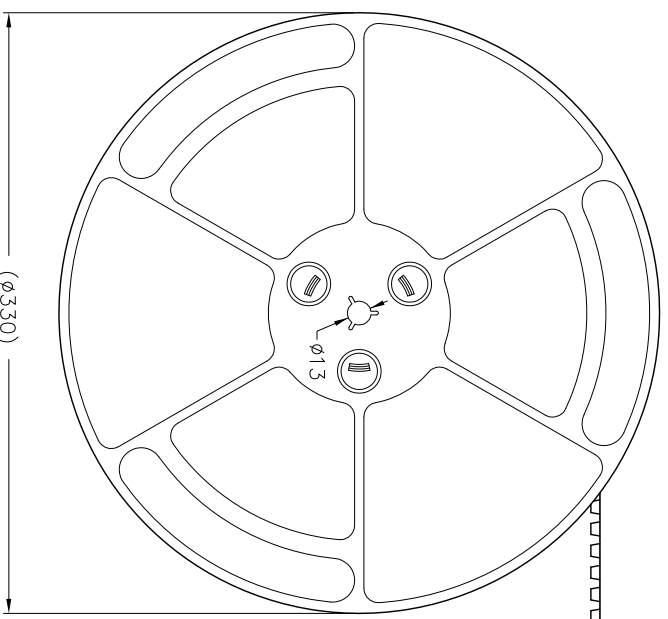
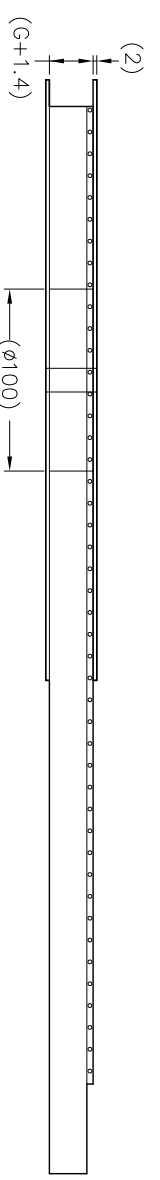
Tape width 12, 16 and 24 mm



Tape width 32 and 44 mm



REEL Dim



- Notes:
1. PER REEL : 4000pcs.
  2. Material : Black Conductive Polystyrene Alloy.
  3. Thickness : 0.3 ±0.05mm.
  4. All dimensions meet EIA-481-C requirements.

| No. of Contacts | DIM. |      |      |
|-----------------|------|------|------|
|                 | G    | H    | J    |
| 4               | 16   | 7.5  | —    |
| 14              | 24   | 11.5 | —    |
| 15              | 32   | 14.2 | 28.4 |
| 27              | 44   | 20.2 | 40.4 |
| 28              | —    | —    | —    |
| 39              | —    | —    | —    |
| 40              | —    | —    | —    |
| 50              | —    | —    | —    |

| REV. | REVISIONS | CHK   | DATE       |
|------|-----------|-------|------------|
| A    | Release   | Jacky | 2012/05/24 |

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**SHENZHEN THD ELECTRONICS CO., LTD.**

|                            |            |                     |                       |
|----------------------------|------------|---------------------|-----------------------|
| GENERAL TOLERANCE          | DRAWN      | PART NO.            | THD0509-XXCL-GF       |
| UNLESS OTHERWISE SPECIFIED | Jtm        | 2012.05.24          |                       |
| X.X                        | ±0.25      |                     |                       |
| X.XX                       | ±0.15      |                     |                       |
| X.XXX                      | ±0.1       |                     |                       |
| ANG.                       | ±3'        |                     |                       |
| APPROVED                   | CHECKED    | TITLE               | LOWER CONTACT H=1.0mm |
| 黃德達                        | Jtm        | 0.5 PITCH PFC CONN. |                       |
| 2012.05.24                 | 2012.05.24 | UNIT                | MM                    |
| SHEET                      | 2/2        | SCALE               | A4                    |
|                            |            | SIZE                | A                     |
|                            |            | REV                 |                       |