



**Delta Electronics Corp.**

## APPROVAL SHEET

**Customer Name .:** STD

**Model Name.:** Heatsink

**Delta Part No.:** FHS-A6025B02A

**Customer Part No.:** ---

**Spec Issue Date .:** 12/31/2015

**Spec Revision :** 01

PLEASE SEND ONE COPY OF THIS SPECIFICATION BACK AFTER YOU  
SIGNED APPROVAL FOR PRODUCTION PRE-ARRANGMENT.

**Approved By:** \_\_\_\_\_

**Date:** \_\_\_\_\_

| Approval  | Check     | Designer     |
|-----------|-----------|--------------|
| Alex-Hsia | Alex-Hsia | Charles Chen |



# Delta Electronics Corp.

| REV.                                                                             | Description                        | Drawn                    | Checked                 | Approved                | Issue Date |
|----------------------------------------------------------------------------------|------------------------------------|--------------------------|-------------------------|-------------------------|------------|
| 00                                                                               | ISSUE SPEC                         | Sheila Hu<br>8/15'12     | Charles Chen<br>8/15'12 | Charles Chen<br>8/15'12 |            |
| 01                                                                               | Change TIM from TC-1996 to TC-5630 | Charles Chen<br>12/31'15 | Alex-Hsia<br>12/31'15   | Alex-Hsia<br>12/31'15   |            |
|                                                                                  |                                    |                          |                         |                         |            |
| Description:<br><div style="text-align: center;">SAMPLE REVISION CODE LIST</div> |                                    |                          |                         |                         |            |
| Part No.                                                                         |                                    |                          |                         |                         | REV        |
| DELTA MODEL :<br><br>FHS-A6025B02A                                               |                                    |                          | TOTAL 22 PAGE           |                         | 01         |



**Delta Electronics Corp.**

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|             |                            |             |             |
|             |                            |             |             |
|             |                            |             |             |
|             |                            |             |             |
|             |                            |             |             |



## 1. SPECIFICATION

### 1.1 Characters

| Item                  | Description                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------|
| Scope                 | THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE FAN HEATSINK |
| Application           | INTEL LGA2011 CPU HEATSINK                                                                   |
| Specification         |                                                                                              |
| a: Thermal Resistance | 0.18 (°C/W)(REF.)                                                                            |
| b: total weight       | 535 g (REF.)                                                                                 |
| c: clip force         | 29.5 Kgf (REF.)                                                                              |

### 1.2 BOM

| Item | Part Name | Material      | Part NO.                             | Q'TY     | Remark |
|------|-----------|---------------|--------------------------------------|----------|--------|
| 1    | FAN       | PBT           | 3620936511                           | 1PCE     |        |
| 2    | FAN SCREW | SUS 302       | 3109182300                           | 2PCE     |        |
| 3    | FAN LABEL | POLYESTER     | 3267299800                           | 1PCE     |        |
| 4    | FIN       | A1050 / C1100 | 3346397100                           | 1PCE     |        |
| 5    | AL BASE   | ADC12         | 3346814700                           | 1PCE     |        |
| 6    | CU BASE   | CU 1100       | 3346397300                           | 1PCE     |        |
| 7    | HEATPIPE  | CU 1020       | 3460037000/<br>3460037600~3460037800 | 4PCE     |        |
| 8    | SOLDER    | SN / BI       | 4090207800                           | 14.5 g   |        |
| 9    | SCREW     | SUS 304       | 3105359900                           | 4PCE     |        |
| 10   | SPRING    | ASTM A228     | 3462028800                           | 4PCE     |        |
| 11   | E CLIP    | SK7           | 3110264700                           | 4PCE     |        |
| 12   | SPACER    | POM           | 3244747000                           | 4PCE     |        |
| 13   | COVER     | ABS           | 3321044300                           | 1PCE     |        |
| 14   | GREASE    | TC-5630       | 4021107300                           | 0.2 g    | Rev01  |
| 15   | BOX LABEL | PAPER         | 3261447400                           | 0.031PCE |        |
| 16   | TRAY      | PET           | 3503125200                           | 1PCE     |        |
| 17   | BOX       | PAPER         | 3518141900                           | 1PCE     |        |
| 18   | PAD PAPER | PAPER         | 3516275100                           | 0.125PCE |        |
| 19   | CARTON    | PAPER         | 3513743100                           | 0.042PCE |        |



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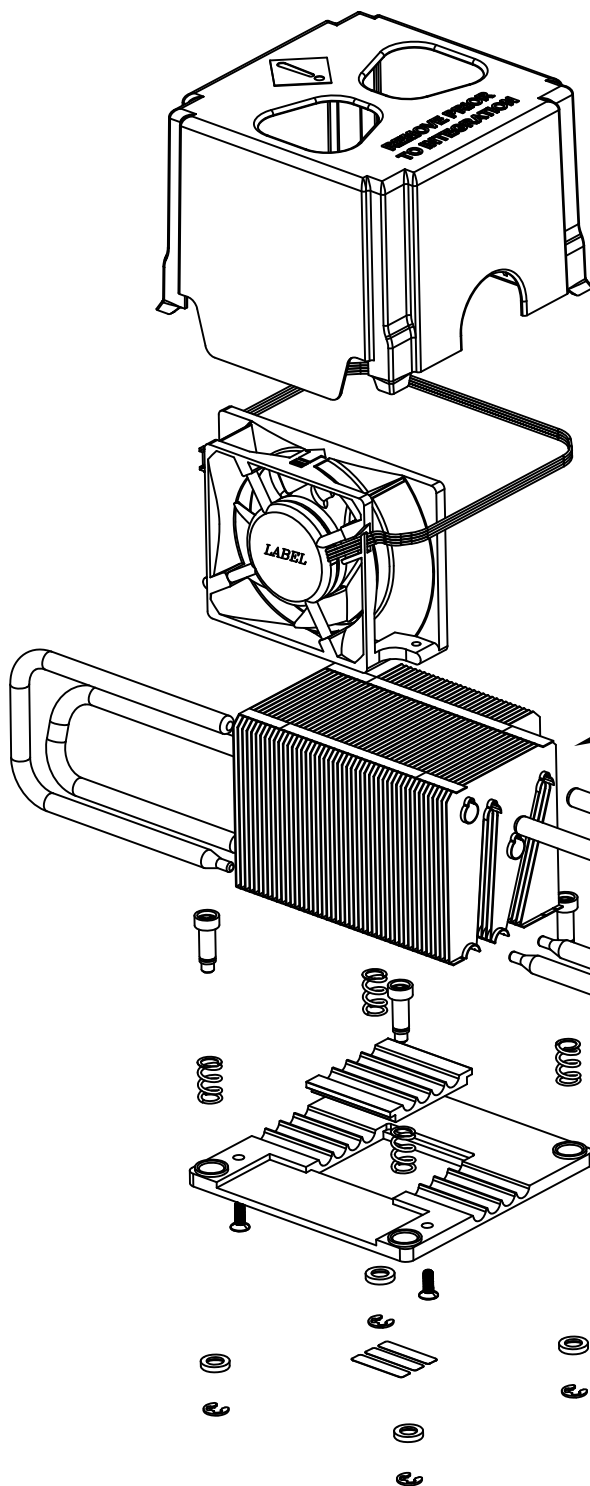
## **2. PRINT**

### **2.1 Assembly Drawing**

3

2

1

COVER  
3321044300FAN ASSY  
3620936511FAN LABEL  
3267299800FIN  
3346397100HEATPIPE (4X)  
3460037000/  
3460037600~  
3460037800SCREW (4X)  
3105359900SPRING (4X)  
3462028800CU BASE  
3346397300AL BASE  
3346814700FAN SCREW (2X)  
3109182300TC-5630   
4021107300SPACER (4X)  
3244747000E CLIP (4X)  
3110264700台達電子工業股份有限公司  
DELTA ELECTRONICS, INC.DELTA MODEL:  
FHS-A6025B02ADrawn:  
Charles ChenTHESE DRAWINGS AND SPECIFICATIONS ARE THE  
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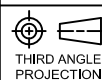
CUSTOMER NAME: STD

CUSTOMER P/N: - - -

## DIMENSIONAL TOLERANCES

HOLES:  $\pm 0.05$  ANGLES:  $10.5^\circ$ 

| ( )       | ( )   | ( )       | ( )     | ( )   | ( )           |               |
|-----------|-------|-----------|---------|-------|---------------|---------------|
| <30       | ±0.25 | DECIMALS  | UP~100  | ±0.2  | 250~300 ±0.4  | UP~600 ±1.5   |
| >30~100   | ±0.35 | X ±0.3    | 100~150 | ±0.25 | 300~350 ±0.45 | 600~900 ±2.4  |
| >100~300  | ±0.5  | X.X ±0.2  | 150~200 | ±0.3  | 350~400 ±0.5  | 900~OVER ±3.1 |
| ABOVE 300 | ±0.6  | X.XX ±0.1 | 200~250 | ±0.35 |               |               |

Description: PRODUCTION SPEC.  
(ASSEMBLY ORDER)A4  
SIZE

Part No. FHS-A6025B02A-AS

REV.

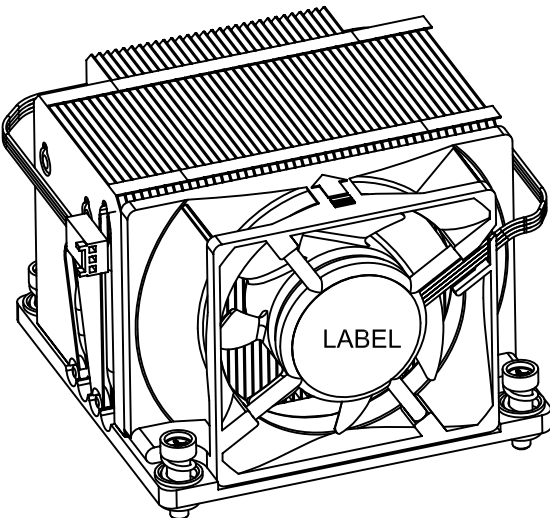
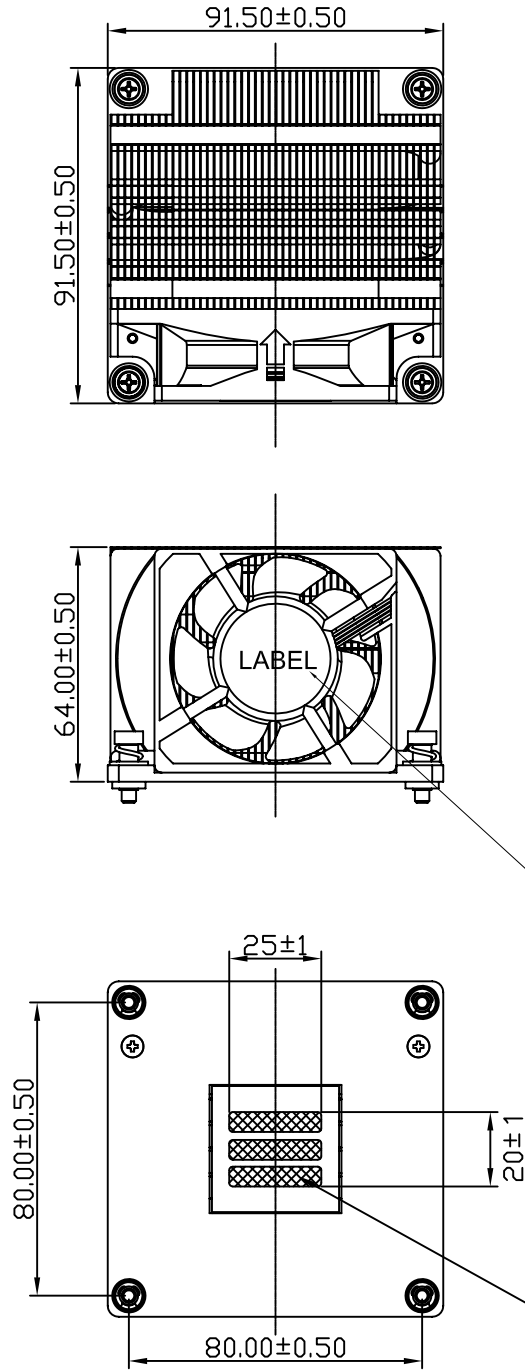
SHEET 1 OF 1 ISSUE DATE:

01

SCALE --- UNIT --- USED ON COOLER

DRAWING:

UNIT:  $\frac{\text{mm}}{\langle \text{INCH} \rangle}$



FAN LABEL P/N:3267299800

1  
Dow Corning TC-5630 P/N:4021107300  
TIM WEIGHT ON HSK MUST BE 200mg±30mg



台達電子工業股份有限公司  
DELTA ELECTRONICS, INC.

|                                                          |                        |
|----------------------------------------------------------|------------------------|
| DELTA MODEL:<br>FHS-A6025B02A                            | Drawn:<br>Charles Chen |
| CUSTOMER NAME:<br>STD                                    |                        |
| CUSTOMER P/N:<br>---                                     |                        |
| Description:<br>PRODUCTION SPEC.<br>(PHYSICAL DIMENSION) |                        |
| Part No.<br>FHS-A6025B02A-PD                             | REV.<br>01             |
| SHEET 1 OF 2                                             | ISSUE DATE:            |

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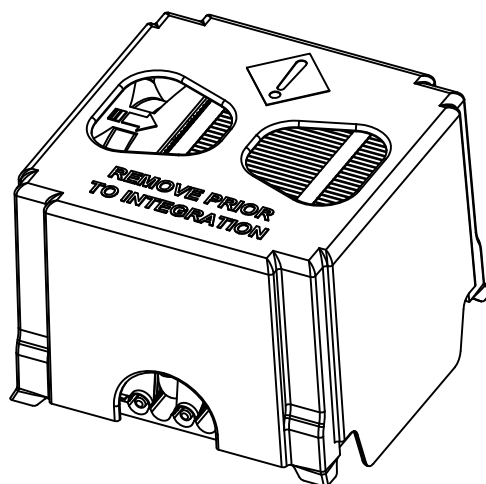
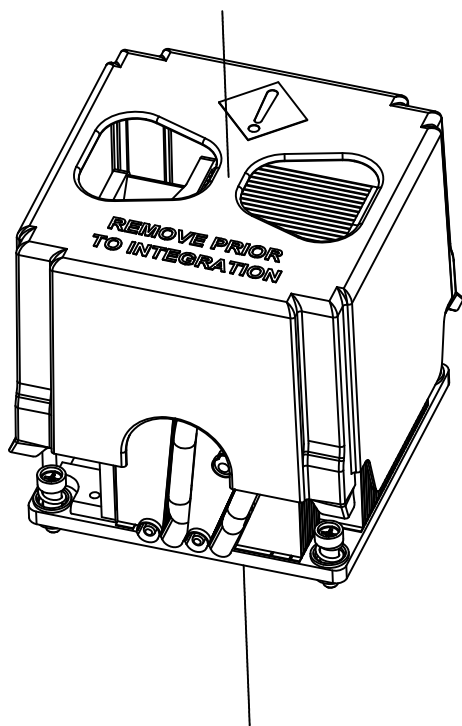
| DIMENSIONAL TOLERANCES |       |          | HOLES : ±0.05 |         | ANGLES : ±0.5 |         |        |          |      |
|------------------------|-------|----------|---------------|---------|---------------|---------|--------|----------|------|
| ( )                    | ( )   | ( )      | ( )           | ( )     | ( )           | ( )     |        |          |      |
| <30                    | ±0.25 | DECIMALS | UP-100        | ±0.2    | 250-300       | ±0.4    | UP-600 | ±1.5     |      |
| >30-100                | ±0.35 | X        | ±0.3          | 100-150 | ±0.25         | 300-350 | ±0.45  | 600-900  | ±2.4 |
| >100-300               | ±0.5  | X.X      | ±0.2          | 150-200 | ±0.3          | 350-400 | ±0.5   | 900-OVER | ±3.1 |
| ABOVE 300              | ±0.6  | X.XX     | ±0.1          | 200-250 | ±0.35         |         |        |          |      |

SCALE --- UNIT --- USED ON COOLER



A4  
SIZE

DRAWING:

UNIT:  $\frac{\text{mm}}{\text{INCH}}$ 台達電子工業股份有限公司  
DELTA ELECTRONICS, INC.

DELTA MODEL:

FHS-A6025B02A

Drawn:

Charles Chen

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CUSTOMER NAME:

STD

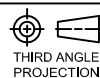
CUSTOMER P/N:

---

## DIMENSIONAL TOLERANCES

HOLES:  $\pm 0.05$  ANGLES:  $\pm 0.5^\circ$ 

| ( )       | ( )        | ( )            | ( )                |
|-----------|------------|----------------|--------------------|
| <30       | $\pm 0.25$ | DECIMALS       | UP-100 $\pm 0.2$   |
| >30~100   | $\pm 0.35$ | X $\pm 0.3$    | 100~150 $\pm 0.25$ |
| >100~300  | $\pm 0.5$  | X.X $\pm 0.2$  | 150~200 $\pm 0.3$  |
| ABOVE 300 | $\pm 0.6$  | X.XX $\pm 0.1$ | 200~250 $\pm 0.35$ |
|           |            |                | 250~300 $\pm 0.4$  |
|           |            |                | 300~350 $\pm 0.45$ |
|           |            |                | 350~400 $\pm 0.5$  |
|           |            |                | 400~600 $\pm 1.5$  |
|           |            |                | 600~900 $\pm 2.4$  |
|           |            |                | 900-OVER $\pm 3.1$ |

THIRD ANGLE  
PROJECTION

Description:

PRODUCTION SPEC.  
(PHYSICAL DIMENSION)A4  
SIZE

Part No.

FHS-A6025B02A-PD

REV.

01

SHEET 2 OF 2

ISSUE DATE:

SCALE

UNIT

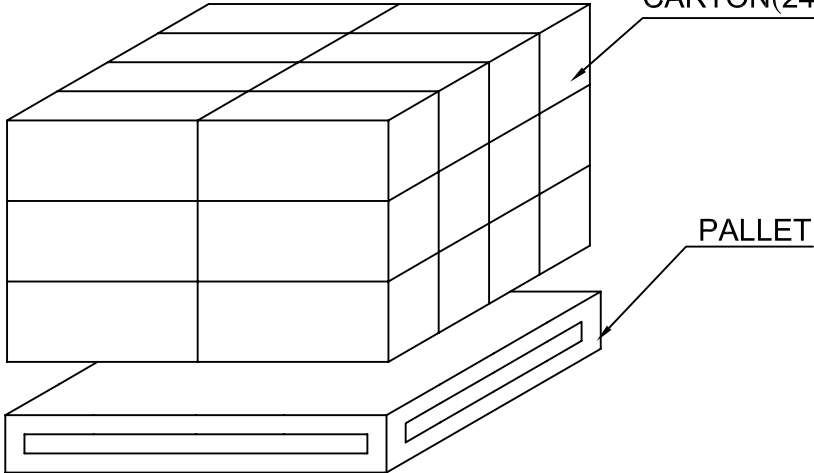
USED ON

COOLER



**Delta Electronics Corp.**

### **3. Packing Plan**

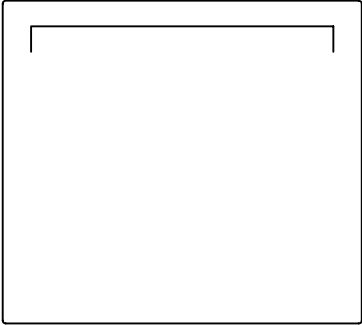
|                                                                                                                                                                                                                                   |                         |                             |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------|---------------|------------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------------------------------------------------------------------------------------------------------------------------|--|--------|--------|--------|--------|
| PART NO.                                                                                                                                                                                                                          | FHS-A6025B02A           |                             |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| BASIC DATA                                                                                                                                                                                                                        | QUANTITY/CARTON         |                             | 24 PCS        |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
|                                                                                                                                                                                                                                   | PRODUCTION NET WEIGHT   |                             | 14.7 Kg (REF) |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
|                                                                                                                                                                                                                                   | PRODUCTION GROSS WEIGHT |                             | 16.5 Kg (REF) |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| 20(ft)CONTAINER ILLUSTRATE                                                                                                                                                                                                        | SIZE                    | 5.889(L)*2.352(w)*2.386(H)m |               | PACKING QUANTITY | 20 PALLETS/CONTAINER |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
|                                                                                                                                                                                                                                   | CONTAINER               | STEEL                       |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| CONTAINER FORM<br>CONTAINER LOADING METHOD                                                                                                                                                                                        |                         |                             |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| <table border="1"> <tr> <td>PALLET</td> <td>PALLET</td> <td>PALLET</td> <td>PALLET</td> <td>PALLET</td> </tr> <tr> <td>PALLET</td> <td>PALLET</td> <td>PALLET</td> <td>PALLET</td> <td>PALLET</td> </tr> </table> <p>TOP VIEW</p> |                         |                             |               | PALLET           | PALLET               | PALLET | PALLET | PALLET | PALLET | PALLET | PALLET | PALLET | PALLET | <table border="1"> <tr> <td>PALLET</td> <td>PALLET</td> </tr> <tr> <td>PALLET</td> <td>PALLET</td> </tr> </table> <p>FRONT VIEW</p> |  | PALLET | PALLET | PALLET | PALLET |
| PALLET                                                                                                                                                                                                                            | PALLET                  | PALLET                      | PALLET        | PALLET           |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| PALLET                                                                                                                                                                                                                            | PALLET                  | PALLET                      | PALLET        | PALLET           |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| PALLET                                                                                                                                                                                                                            | PALLET                  |                             |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| PALLET                                                                                                                                                                                                                            | PALLET                  |                             |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| PALLET LOADING ILLUSTRATE                                                                                                                                                                                                         | SIZE                    | 120(L)*100(w)*13.5(H)cm     |               | PACKING QUANTITY | 24 CARTONS/PALLET    |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
|                                                                                                                                                                                                                                   | PALLET                  | WOOD                        |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |
| PALLET ILLUSTRATE<br>PALLET LOADING METHOD<br>                                                                                                |                         |                             |               |                  |                      |        |        |        |        |        |        |        |        |                                                                                                                                     |  |        |        |        |        |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                                                                                                  |        |                                               |         |         |         |          |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------|--------|-----------------------------------------------|---------|---------|---------|----------|--------|-------|---------|--------|---|-------|---------|--------|---------|--------|---------|-------|----------|-------|----|-------|---------|-------|---------|-------|----------|-------|-----------|-------|-----|-------|---------|--------|--|--|--|----------------------------------------------------------------------------------------------|--|-------------------------|--|------|
|  <b>台達電子工業股份有限公司</b><br>DELTA ELECTRONICS, INC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DELTA MODEL:   | FHS-A6025B02A                                                                                    |        | Drawn:                                        | SHEILA  |         |         |          |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CUSTOMER NAME: |                                                                                                  | STD    |                                               |         |         |         |          |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
| CUSTOMER P/N:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                | ---                                                                                              |        |                                               |         |         |         |          |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
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| DIMENSIONAL TOLERANCES<br>( ) ( ) ( ) ( )<br><table border="0"> <tr> <td>&lt;30</td> <td>:±0.25</td> <td>DECIMALS</td> <td>UP~100</td> <td>:±0.2</td> <td>250~300</td> <td>:±0.4</td> <td>UP~600</td> <td>:±1.5</td> </tr> <tr> <td>&gt;30~100</td> <td>:±0.35</td> <td>X</td> <td>:±0.3</td> <td>100~150</td> <td>:±0.25</td> <td>300~350</td> <td>:±0.45</td> <td>600~900</td> <td>:±2.4</td> </tr> <tr> <td>&gt;100~300</td> <td>:±0.5</td> <td>XX</td> <td>:±0.2</td> <td>150~200</td> <td>:±0.3</td> <td>350~400</td> <td>:±0.5</td> <td>900~OVER</td> <td>:±3.1</td> </tr> <tr> <td>ABOVE 300</td> <td>:±0.6</td> <td>XXX</td> <td>:±0.1</td> <td>200~250</td> <td>:±0.35</td> <td></td> <td></td> <td></td> </tr> </table> |                | <30                                                                                              | :±0.25 | DECIMALS                                      | UP~100  | :±0.2   | 250~300 | :±0.4    | UP~600 | :±1.5 | >30~100 | :±0.35 | X | :±0.3 | 100~150 | :±0.25 | 300~350 | :±0.45 | 600~900 | :±2.4 | >100~300 | :±0.5 | XX | :±0.2 | 150~200 | :±0.3 | 350~400 | :±0.5 | 900~OVER | :±3.1 | ABOVE 300 | :±0.6 | XXX | :±0.1 | 200~250 | :±0.35 |  |  |  |  Part No. |  | <b>FHS-A6025B02A-PA</b> |  | REV. |
| <30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | :±0.25         | DECIMALS                                                                                         | UP~100 | :±0.2                                         | 250~300 | :±0.4   | UP~600  | :±1.5    |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
| >30~100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | :±0.35         | X                                                                                                | :±0.3  | 100~150                                       | :±0.25  | 300~350 | :±0.45  | 600~900  | :±2.4  |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
| >100~300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | :±0.5          | XX                                                                                               | :±0.2  | 150~200                                       | :±0.3   | 350~400 | :±0.5   | 900~OVER | :±3.1  |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
| ABOVE 300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | :±0.6          | XXX                                                                                              | :±0.1  | 200~250                                       | :±0.35  |         |         |          |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
| SCALE ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                | UNIT ---                                                                                         |        | USED ON                                       |         | COOLER  |         |          |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |
| SIZE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                | SHEET 1 OF 2                                                                                     |        | ISSUE DATE:                                   |         | --      |         |          |        |       |         |        |   |       |         |        |         |        |         |       |          |       |    |       |         |       |         |       |          |       |           |       |     |       |         |        |  |  |  |                                                                                              |  |                         |  |      |

|                      |          |                          |                  |                 |
|----------------------|----------|--------------------------|------------------|-----------------|
| CARTON<br>ILLUSTRATE | SIZE     | 450(L)*337(w)*196(H)(mm) | PACKING QUANTITY | 2 LAYERS/CARTON |
|                      | MATERIAL | 3 LAYERS"AB" FLUTE       | CARTON WEIGHT    | 0.9 kg (REF.)   |

CARTON OUTSIDE DEMONSTRATE

FRONT

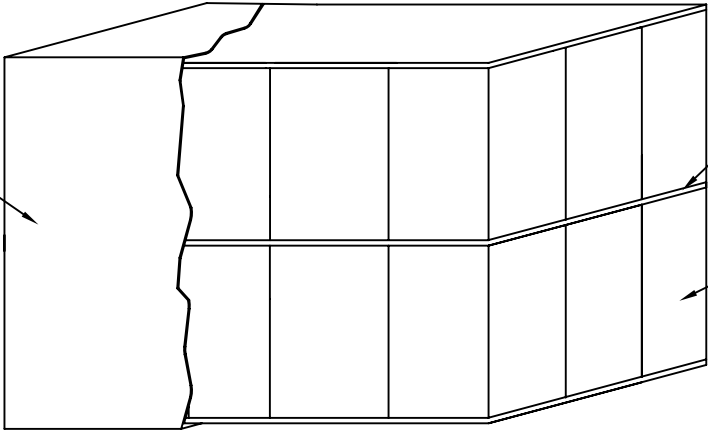


BACK

|                   |  |    |
|-------------------|--|----|
| RoHS Compliant    |  | CE |
| CUSTOMER PART NO. |  |    |
| DELTA PART NO.    |  |    |
| QUANTITY          |  |    |
| P/O NO.           |  |    |
| DATE CODE         |  |    |
| GROSS WEIGHT      |  |    |

|                              |          |                         |                  |            |
|------------------------------|----------|-------------------------|------------------|------------|
| BOX<br>PACKING<br>ILLUSTRATE | SIZE     | 109(L)*109(w)*83(H)(mm) | PACKING QUANTITY | 1 PCS/BOX  |
|                              | MATERIAL | PAPER                   | MATERIAL WEIGHT  | 40g (REF.) |

CARTON  
(3513743100)



PAPER PAD(3X)  
(3516275100)

BOX(24X)  
(3518141900)

|                                                                                                                                                                                                                                                                                                   |  |                                                                                                                                                                         |                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
|  <b>台達電子工業股份有限公司</b><br>DELTA ELECTRONICS, INC.                                                                                                                                                                |  | DELTA MODEL:<br>FHS-A6025B02A                                                                                                                                           | Drawn:<br>SHEILA                                         |
| THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF DELTA ELECTRONICS, INC. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SELL OF APPARATUSES OR DEVICES WITHOUT PERMISSION.                                                                                          |  | CUSTOMER NAME: STD                                                                                                                                                      |                                                          |
|                                                                                                                                                                                                                                                                                                   |  | CUSTOMER P/N: - - -                                                                                                                                                     |                                                          |
| DIMENSIONAL TOLERANCES<br>( ) ( ) ( ) ( )<br><30 :±0.25 DECIMALS UP~100 :±0.2 250~300 :±0.4 UP~600 :±1.5<br>>30~100 :±0.35 X :±0.3 100~150 :±0.25 300~350 :±0.45 600~900 :±2.4<br>>100~300 :±0.5 XX :±0.2 150~200 :±0.3 350~400 :±0.5 900~OVER :±3.1<br>ABOVE 300 :±0.6 X.XX :±0.1 200~250 :±0.35 |  | HOLES : ±0.05 ANGLES : ±0.5°<br> Description: PRODUCTION SPEC.<br>(PACKING ASSEMBLY) |                                                          |
| SCALE --- UNIT --- USED ON COOLER                                                                                                                                                                                                                                                                 |  | A4<br>SIZE                                                                                                                                                              | Part No. FHS-A6025B02A-PA<br>SHEET 2 OF 2<br>ISSUE DATE: |
|                                                                                                                                                                                                                                                                                                   |  |                                                                                                                                                                         | REV. --                                                  |



**Delta Electronics Corp.**

## **4. FAN**

### **4.1 Fan Specification**



Sample Issue Date AUG.13.2012

DATE :

FAX:886-(0)3-3591991

DELTA ELECTRONICS, INC.  
252, SHANG YING ROAD, KUEI SAN  
TAOYUAN HSIEN 333, TAIWAN, R. O. C.

TEL : 886-(0)3-3591968  
FAX : 886-(0)3-3591991

STATEMENT OF DEVIATION  
\*\*\*\*\*

☒ NONE

☐ DESCRIPTION :

DELTA ELECTRONICS, INC.  
 252, SHANG YING ROAD, KUEI SAN  
 TAOYUAN SHIEN 333, TAIWAN, R. O. C.

TEL : 886-(0)3-3591968  
 FAX : 886-(0)3-3591991

SPECIFICATION FOR APPROVAL  
 \*\*\*\*\*

|                    |                |                                   |
|--------------------|----------------|-----------------------------------|
| Customer:          | TMPBU          |                                   |
| Description:       | DC FAN         |                                   |
| Customer P/N:      | 3620936511     | REV:                              |
| Delta Model NO.:   | AFB0612DH-BC01 | <b>Delta Safety Model NO: N/A</b> |
| Sample Rev:        | 01             | Issue NO:                         |
| Sample Issue Date: | AUG.13.2012    | Quantity:                         |

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN. THE FAN MOTOR IS WITH SINGLE PHASES AND FOUR POLES.

2. CHARACTERS:

| ITEM                                       | DESCRIPTION                                                                        |
|--------------------------------------------|------------------------------------------------------------------------------------|
| RATED VOLTAGE                              | 12.0 VDC                                                                           |
| OPERATION VOLTAGE                          | 10.8 - 13.2 VDC                                                                    |
| INPUT CURRENT                              | 0.31 (MAX. 1.20) A<br>(CURRENT ON SAFETY LABEL 1.20A)                              |
| INPUT POWER                                | 3.72 (MAX. 14.40) W                                                                |
| SPEED (FAN ONLY)                           | 7300±10% R.P.M.                                                                    |
| SPEED (ON SINK)                            | 7200±10% R.P.M.                                                                    |
| MAX. AIR FLOW<br>(AT ZERO STATIC PRESSURE) | 0.878 (MIN. 0.790 ) M <sup>3</sup> /MIN.<br>31.01 (MIN. 27.91 ) CFM                |
| MAX. AIR PRESSURE<br>(AT ZERO AIRFLOW)     | 13.79 (MIN. 11.17 ) mmH <sub>2</sub> O<br>0.543 (MIN. 0.440 ) inchH <sub>2</sub> O |
| ACOUSTICAL NOISE<br>(AVG. ON SINK)         | 61.0 (MAX. 65.0) dB-A                                                              |
| INSULATION TYPE                            | UL: CLASS A                                                                        |

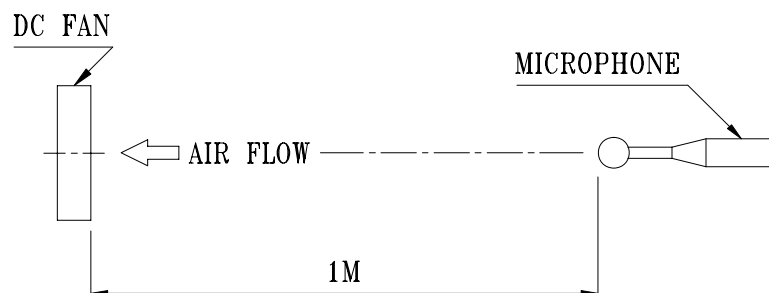
(continued)

PART NO: 3620936511

DELTA MODEL: AFB0612DH-BC01

|                                       |                                                                                                                                                    |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| INSULATION STRENGTH                   | 10 MEG OHM MIN. AT 500 VDC<br>(BETWEEN FRAME AND (+) TERMINAL)                                                                                     |
| DIELECTRIC STRENGTH                   | 5 mA MAX. AT 500 VAC 50/60 Hz<br>ONE MINUTE, (BETWEEN FRAME AND<br>(+) TERMINAL)                                                                   |
| EXTERNAL COVER                        | OPEN TYPE                                                                                                                                          |
| LIFE EXPECTANCE<br>(AT LABEL VOLTAGE) | 80,000 HOURS CONTINUOUS OPERATION<br>AT 45 °C WITH 15 ~ 65 %RH.                                                                                    |
| ROTATION                              | CLOCKWISE VIEW<br>FROM NAME PLATE SIDE                                                                                                             |
| OVER CURRENT SHUT DOWN                | THE CURRENT WILL SHUT DOWN WHEN<br>LOCKING ROTOR.                                                                                                  |
| LEAD WIRE                             | UL 10368 -F- AWG #24<br>BLACK WIRE:NEGATIVE (-)<br>YELLOW WIRE:POSITIVE (+)<br>GREEN WIRE:TACHOMETER OUTPUT (F00)<br>BLUE WIRE:SPEED CONTROL (PWM) |

- NOTES: 1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.  
2. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.  
3. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN ANECHOIC CHAMBER WITH B & K SOUND LEVEL METER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

-----  
PART NO: 3620936511  
-----

DELTA MODEL: AFB0612DH-BC01  
-----

3. MECHANICAL:

3-1. DIMENSIONS ----- SEE DIMENSIONS DRAWING

3-2. FRAME ----- PLASTIC UL: 94V-0  
(THE CONTACT OF HALOGEN LESS THAN 1500 PPM FOR USING EDX ...ETC)

3-3. IMPELLER ----- PLASTIC UL: 94V-0  
(THE CONTACT OF HALOGEN LESS THAN 1500 PPM FOR USING EDX ...ETC)

3-4. BEARING SYSTEM ----- TWO BALL BEARING

3-5. WEIGHT ----- 85 GRAMS

4. ENVIRONMENTAL:

4-1. OPERATING TEMPERATURE ----- -10 TO +70 DEGREE C

4-2. STORAGE TEMPERATURE ----- -30 TO +85 DEGREE C

4-3. OPERATING HUMIDITY --- 85% RELATIVE HUMIDITY WITH 55 DEGREE C

4-4. STORAGE HUMIDITY ----- 5 TO 95 % RH

5. PROTECTION:

5-1. LOCKED ROTOR PROTECTION

IMPEDANCE OF MOTOR WINDING PROTECTS MOTOR FROM FIRE IN 96  
HOURS OF LOCKED ROTOR CONDITION AT THE RATED VOLTAGE.

5-2. POLARITY PROTECTION

BE CAPABLE OF WITHSTANDING IF REVERSE CONNECTION FOR POSITIVE  
AND NEGATIVE LEADS.

6. RE OZONE DEPLETING SUBSTANCES:

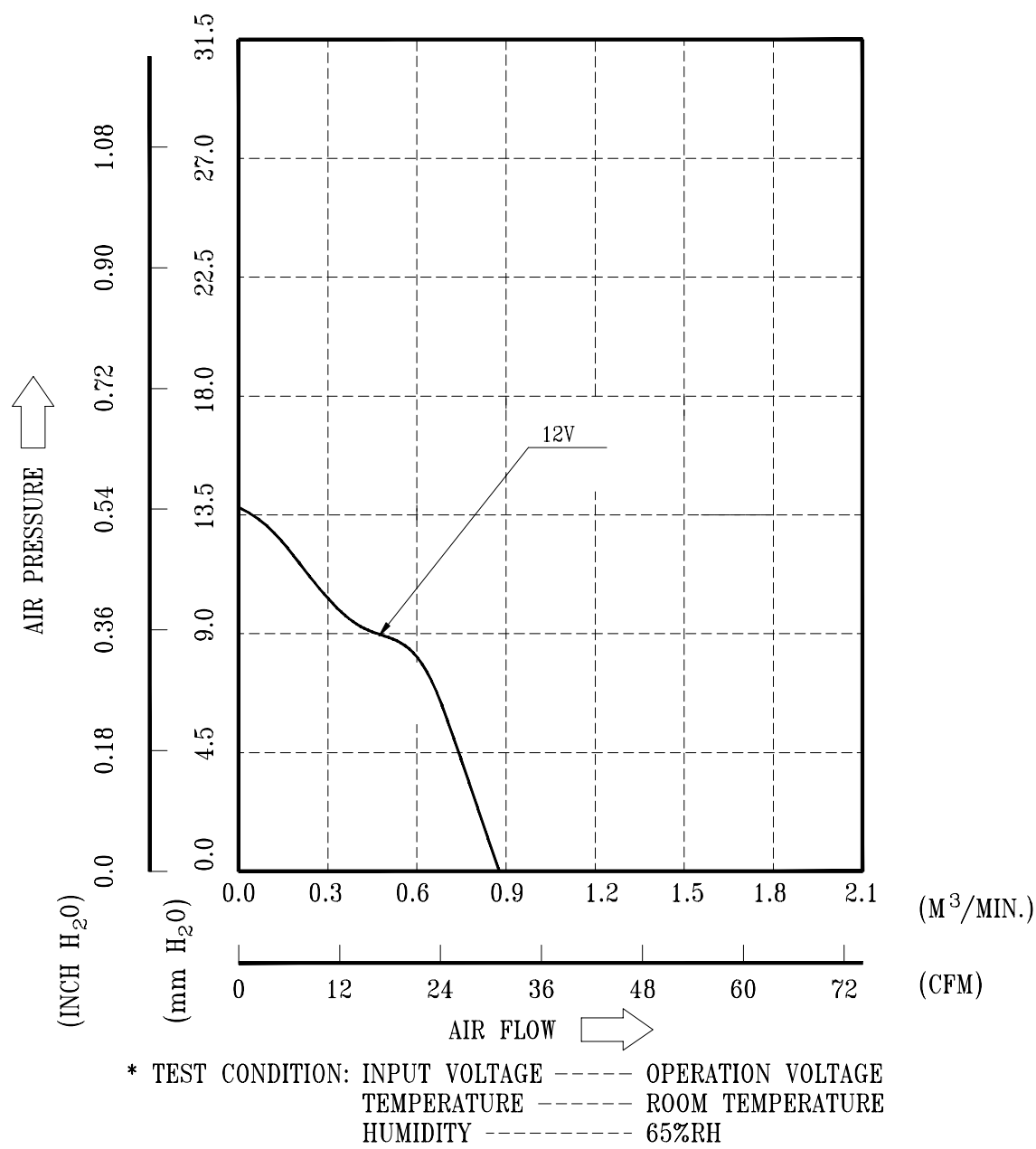
6-1. NO CONTAINING PBBs, PBBOs, CFCs, PBBEs, PBDPEs AND HCFCs.

7. PRODUCTION LOCATION

7-1. PRODUCTS WILL BE PRODUCED IN CHINA OR TAILAND OR TAIWAN.

|              |                |
|--------------|----------------|
| PART NO:     | 3620936511     |
| DELTA MODEL: | AFB0612DH-BC01 |

8. P & Q CURVE:

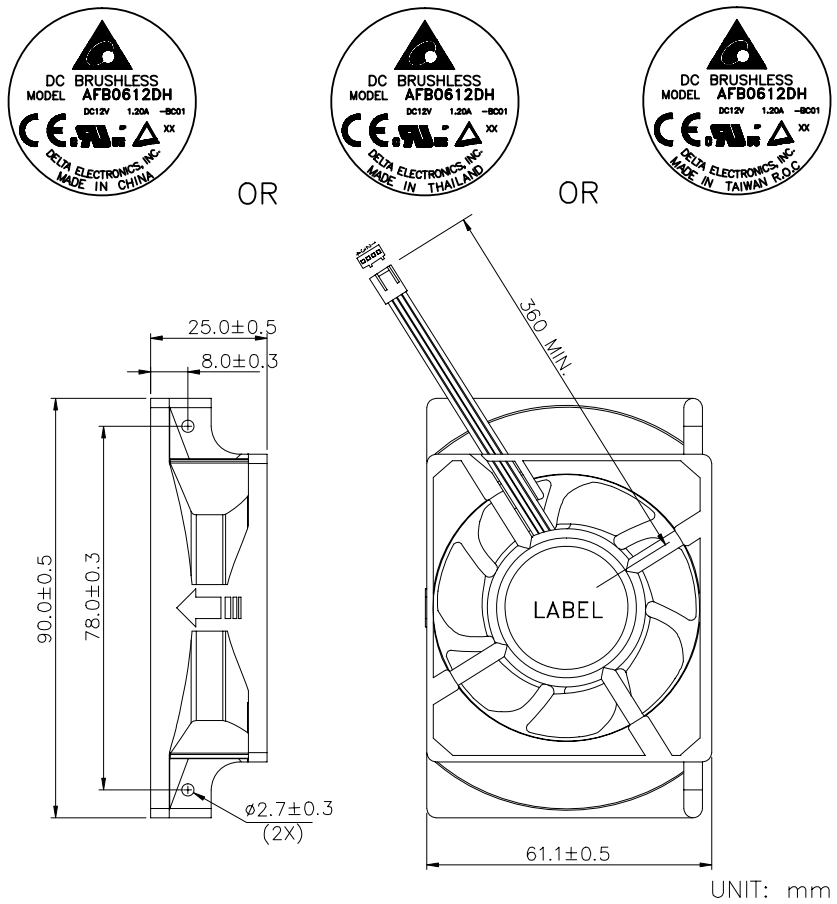


PART NO: 3620936511

DELTA MODEL: AFB0612DH-BC01

## 9. DIMENSION DRAWING:

LABEL:



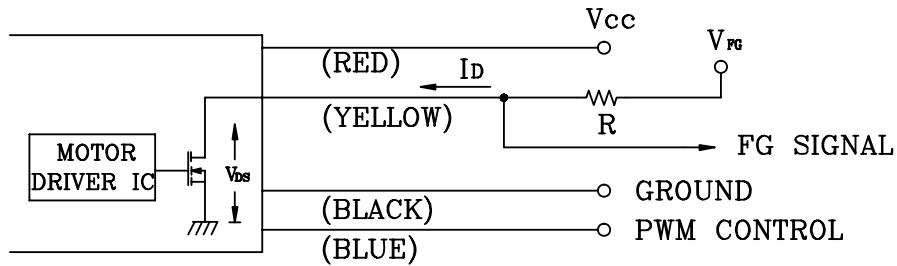
- NOTES :
1. LEAD WIRE: UL 10368 -F- AWG #24  
PIN 1: BLACK WIRE: NEGATIVE (-)  
PIN 2: YELLOW WIRE: POSITIVE (+)  
PIN 3: GREEN WIRE: TACHOMETER OUTPUT (F00)  
PIN 4: BLUE WIRE: SPEED CONTROL (PWM)
  2. HOUSING : MOLEX 47054-1000 OR EQUIVALENT
  3. TERMINAL : MOLEX 2759T 08-50-0113 OR EQUIVALENT
  4. THIS PRODUCT IS RoHS COMPLIANT
  5. DELTA'S RESTRICTIONS ON HALOGEN APPLY ONLY TO BROMINATED AND CHLORINATED COMPOUNDS. NO OTHER HALOGEN IS RESTRICTED.  
SUBSTANCES RESTRICTIONS FOR HALOGEN-FREE (INCLUDE FAN PLASTIC PARTS, PWB BOARD, IC, ELECTRICAL MATERIALS & CABLE ASSY),
    - a. BROMINE(Br) < 900 PPM,
    - b. CHLORINE(Cl) < 900 PPM
    - c. (Br) + (Cl) < 1500 PPM.

PART NO: 3620936511

DELTA MODEL: AFB0612DH-BC01

## 10. FREQUENCY GENERATOR (FG) SIGNAL:

### 10-1. OUTPUT CIRCUIT - OPEN DRAIN MODE:



CAUTION: THE FG SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM  
" + " LEAD WIRE & " - " LEAD WIRE.

### 10-2. SPECIFICATION:

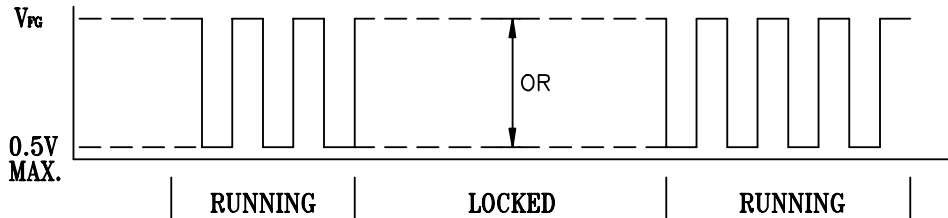
$V_{DS}$  (LINEAR) = 0.5V MAX.

$V_{FG}$  = 5.0V TYP. ( $V_{CC}$  MAX.)

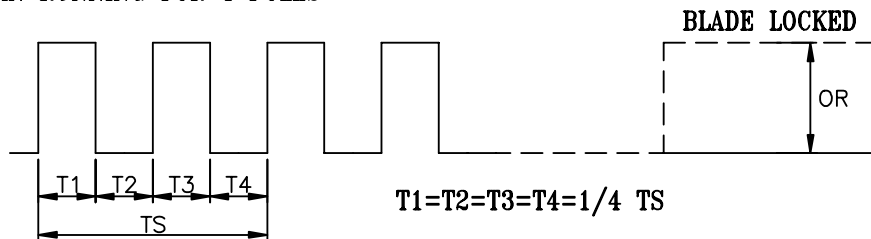
$I_D$  = 5mA MAX.

$R \geq V_{FG} / I_D$

### 10-3. FREQUENCY GENERATOR WAVEFORM:



### FAN RUNNING FOR 4 POLES



$N = R.P.M$

$TS = 60 / N (SEC)$

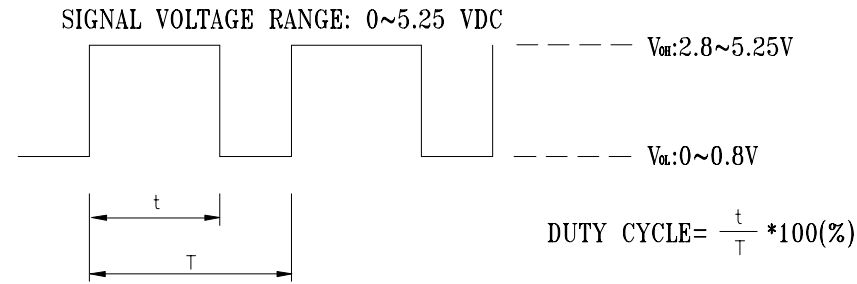
\*VOLTAGE LEVEL AFTER BLADE LOCKED

\*4 POLES

A00

|              |                |
|--------------|----------------|
| PART NO:     | 3620936511     |
| DELTA MODEL: | AFB0612DH-BC01 |

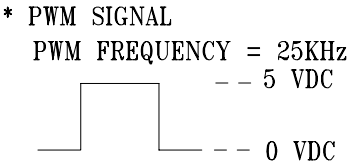
11. PWM CONTROL SIGNAL:



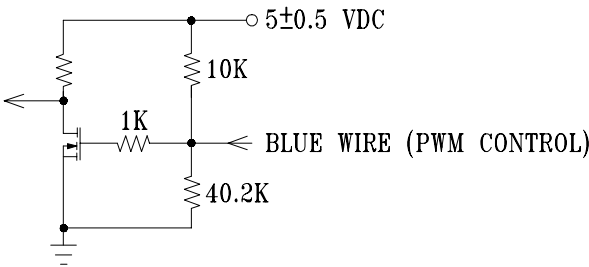
- THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT A 21KHZ~28KHZ.
- THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
- AT 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0~10% DUTY CYCLE,THE ROTOR WILL SPIN AT MINIMUM SPEED.
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.

12. SPEED VS PWM CONTROL SIGNAL:  
(AT 25°C, RATED VOLTAGE & PWM SIGNAL AS FOLLOW)

| DUTY CYCLE (%) | FAN ONLY       |                  | FAN ON SINK    |                  |
|----------------|----------------|------------------|----------------|------------------|
|                | SPEED (R.P.M.) | CURRENT (A) TYP. | SPEED (R.P.M.) | CURRENT (A) TYP. |
| 100            | 7300±10%       | 0.31             | 7200±10%       | 0.31             |
| 0~10           | 1000±250       | 0.03             | 1000±250       | 0.03             |



- MIN. START DUTY CYCLE : 30%.  
WHEN DUTY CYCLE IS SET FOR MORE THAN 30%, THE FAN WILL BE ABLE TO START FROM A DEAD STOP.
13. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:





## ***Application Notice***

- 1. Delta will not guarantee the performance of the products if the application condition falls outside the parameters set forth in the specification.**
- 2. A written request should be submitted to Delta prior to approval if deviation from this specification is required.**
- 3. Please exercise caution when handling fans. Damage may be caused when pressure is applied to the impeller, if the fans are handled by the lead wires, or if the fan was hard-dropped to the production floor.**
- 4. Except as pertains to some special designs, there is no guarantee that the products will be free from any such safety problems or failures as caused by the introduction of powder, droplets of water or encroachment of insect into the hub.**
- 5. The above-mentioned conditions are representative of some unique examples and viewed as the first point of reference prior to all other information.**
- 6. It is very important to establish the correct polarity before connecting the fan to the power source. Positive (+) and Negative (-). Damage may be caused to the fans if connection is with reverse polarity, if there is no foolproof method to protect against such error specifically mentioned in this spec.**
- 7. Delta fans without special protection are not suitable where any corrosive fluids are introduced to their environment.**
- 8. Please ensure all fans are stored according to the storage temperature limits specified. Do not store fans in a high humidity environment. We highly recommend performance testing is conducted before shipping, if the fans have been stored over 6 months.**
- 9. Not all fans are provided with the Lock Rotor Protection feature. If you impair the rotation of the impeller for the fans that do not have this function, the performance of those fans will lead to failure.**
- 10. Please be cautious when mounting the fan. Incorrect mounting of fans may cause excess resonance, vibration and subsequent noise.**
- 11. It is important to consider safety when testing the fans. A suitable fan guard should be fitted to the fan to guard against any potential for personal injury.**
- 12. Except where specifically stated, all tests are carried out at room (ambient) temperature and relative humidity conditions of 25°C, 65% RH. The test value is only for fan performance itself.**
- 13. Be certain to connect an “ 4.7μF or greater” capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.**