



APPROVAL SHEET

Customer Name : _____
Model Name : COOLER
Model Name : FHS-K8020S00
Customer Part No : _____
Spec Issue Date : 2011/10/07
Spec Revision : 00

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

Approved By: _____

Date: _____

Approval	Check	Designer
Alex-Hsia	Charles Chen	REEK.LI



Delta Electronics Corp.

REV.	Description	Drawn	Checked	Approved	Issue Date
00	ISSUE SPEC	REEK.LI _{2011/10/07}	Charles Chen _{2011/10/07}	Alex-Hsia _{2011/10/07}	2011/10/07
Description: SAMPLE REVISION CODE LIST					
Part No.					REV
DELTA MODEL : FHS-K8020S00			TOTAL <u>23</u> PAGE		00



Delta Electronics Corp.

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1. SPECIFICATION

Characters

Item	Description
Scope	THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE FAN HEATSINK
Application	INTEL LGA1155 CPU COOLER
Specification	
a: Thermal Resistance	0.37 (°C/W) (REF.)
b: total weight	320 g (REF.)
c: clip force	16 kgf (REF.)

BOM

Item	Part Name	Material	Part NO.	Q'TY	Remark
1	Screw	S18C	3105371800	2 pce	
2	Screw	S18C	3105374100	2 pce	
3	Screw	PEM QUICK	3107005700	4 pce	
4	Washer	SK7	3110264300	2 pce	
5	Insulator tape	Mylar	3244675000	2 pce	
6	Insulator tape	PC	3244680700	4 pce	
7	Label	PE	326-----	1 pce	
8	Fin	AL1100	3346911100	1 pce	
9	Copper base	C1100	3346935800	1 pce	
10	Heatpipe	C1020	3460027900	2 pce	
11	Heatpipe	C1020	3460028200	1 pce	
12	Bracket	SK7	3460457800	1 pce	
13	X-Clip	SK7	3460457900	1 pce	
14	Back plate	PBT	3470651300	1 pce	
15	Screw & bag	SAE1108 & PE	3534186200	1 pce	
16	Fan	PBT	3622849111	1 pce	
17	Solder	SN42/BI58	4090207000	5.8g	
18	TIM	TC-1996	4021101500	0.14g	
19					

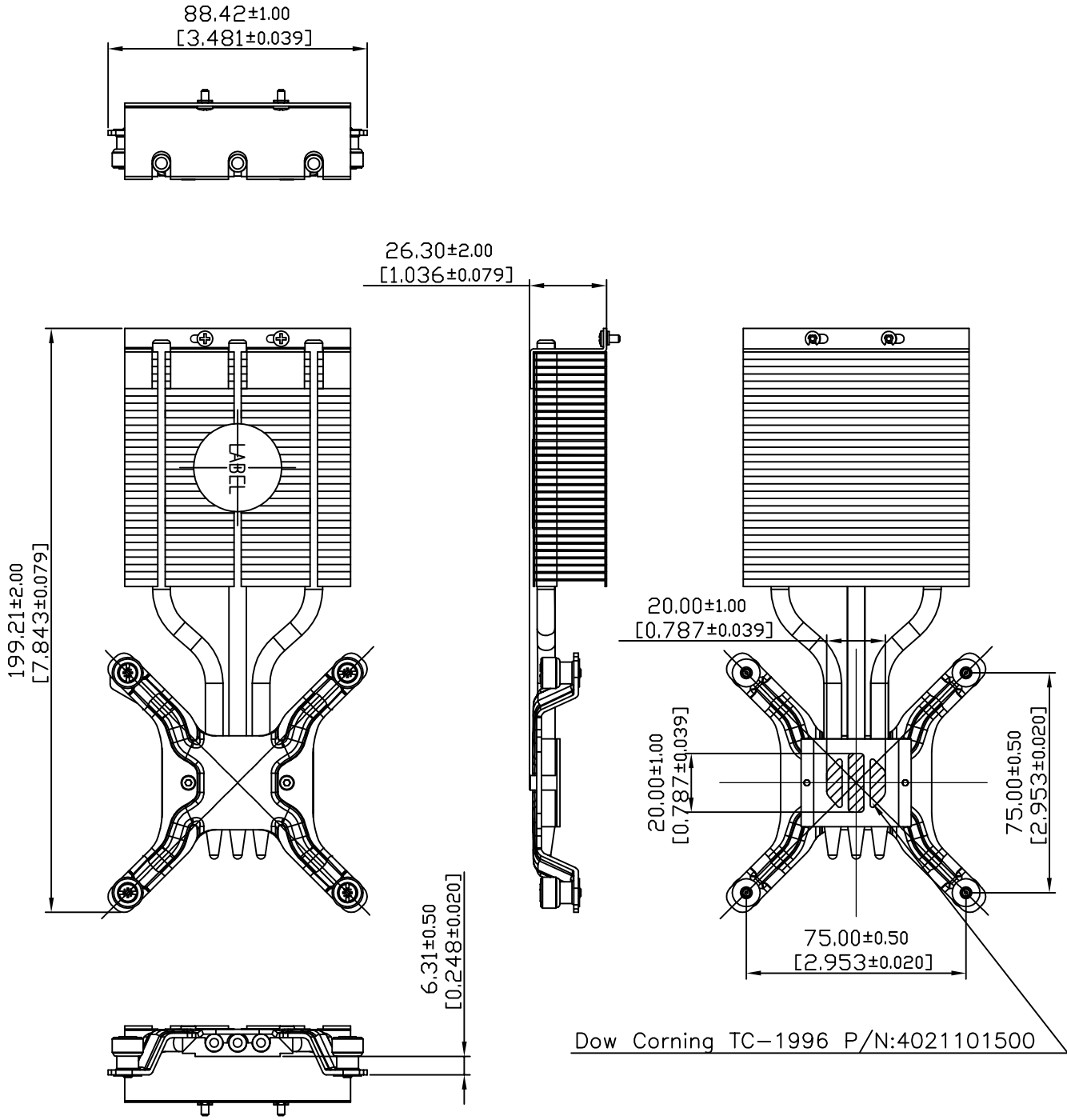


Delta Electronics Corp.



2. PRINT

Assembly Drawing

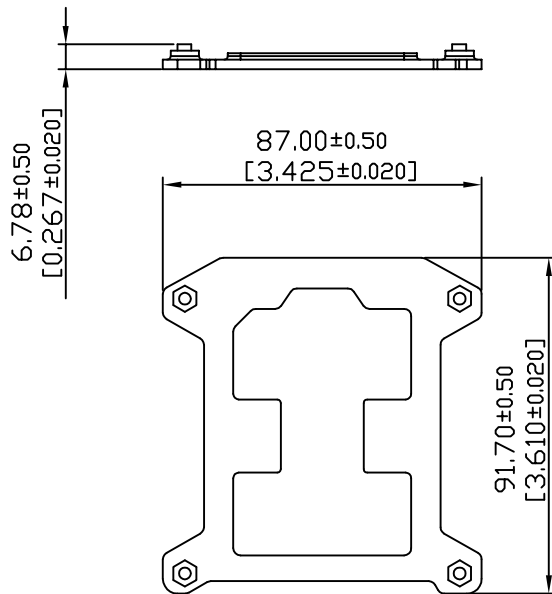
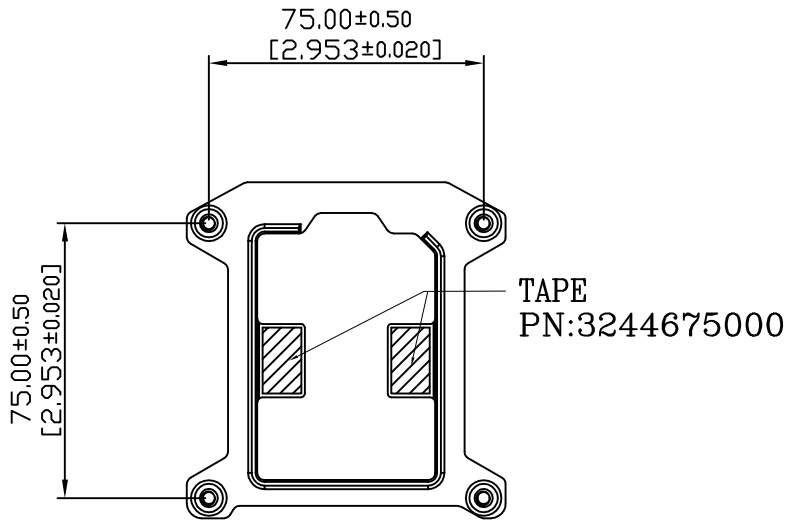
DRAWING:



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

 台達電子工業股份有限公司 DELTA ELECTRONICS, INC.	DELTA MODEL: FHS-K8020S00	Drawn: REEK.LI 10/6'11
	CUSTOMER NAME: STD	CUSTOMER P/N: ---
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.	Description: PRODUCTION SPEC. (PHYSICAL DIMENSION)	REV. 00
DIMENSIONAL TOLERANCES	HOLES : ± 0.05 ANGLES : $\pm 0.5^\circ$	
() () () () <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	A4 SIZE	Part No. FHS-K8020S00-PD ISSUE DATE:
SCALE ---	UNIT mm	USED ON COOLER

DRAWING: 3470651300



BOTTOM SIDE

UNIT: $\frac{\text{mm}}{\text{(INCH)}}$



台達電子工業股份有限公司
DELTA ELECTRONICS, INC.

DELTA MODEL:
FHS-K8020S00

Drawn:
REEK.LI 10/6'11

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CUSTOMER NAME: STD

CUSTOMER P/N: ---

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	XX :±0.1	150~200 :±0.3	350~400 :±0.5	900~OVER :±3.1
ABOVE 300	±0.6	XXX:±0.1	200~250 :±0.35		



Description: PRODUCTION SPEC.
(PHYSICAL DIMENSION)

A4
SIZE

Part No. FHS-K8020S00-PD

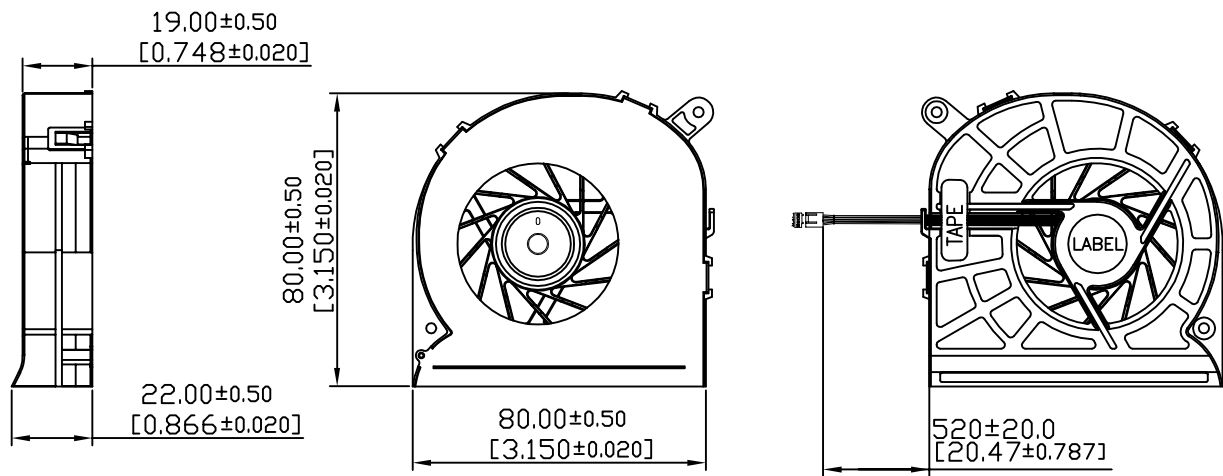
REV.

00

SCALE --- UNIT mm USED ON COOLER

SHEET 2 OF 4 ISSUE DATE:

DRAWING: 3622849111



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



台達電子工業股份有限公司
DELTA ELECTRONICS, INC.

DELTA MODEL:
FHS-K8020S00

Drawn:
REEK.LI 10/6'11

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CUSTOMER NAME: STD

CUSTOMER P/N: ---

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	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		



Description: PRODUCTION SPEC.
(PHYSICAL DIMENSION)

A4
SIZE

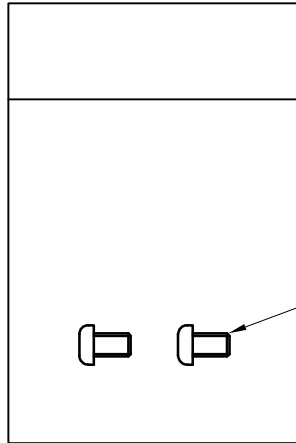
Part No. FHS-K8020S00-PD

REV.
00

SCALE --- UNIT mm USED ON COOLER

SHEET 3 OF 4 ISSUE DATE:

DRAWING: 3534186200



SCREW * 2PCS

UNIT: $\frac{\text{mm}}{\text{(INCH)}}$



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DELTA ELECTRONICS, INC.

DELTA MODEL:
FHS-K8020S00

Drawn:
REEK.LI 10/6'11

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CUSTOMER NAME: STD

CUSTOMER P/N: ---

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		



Description: PRODUCTION SPEC.
(PHYSICAL DIMENSION)

A4
SIZE

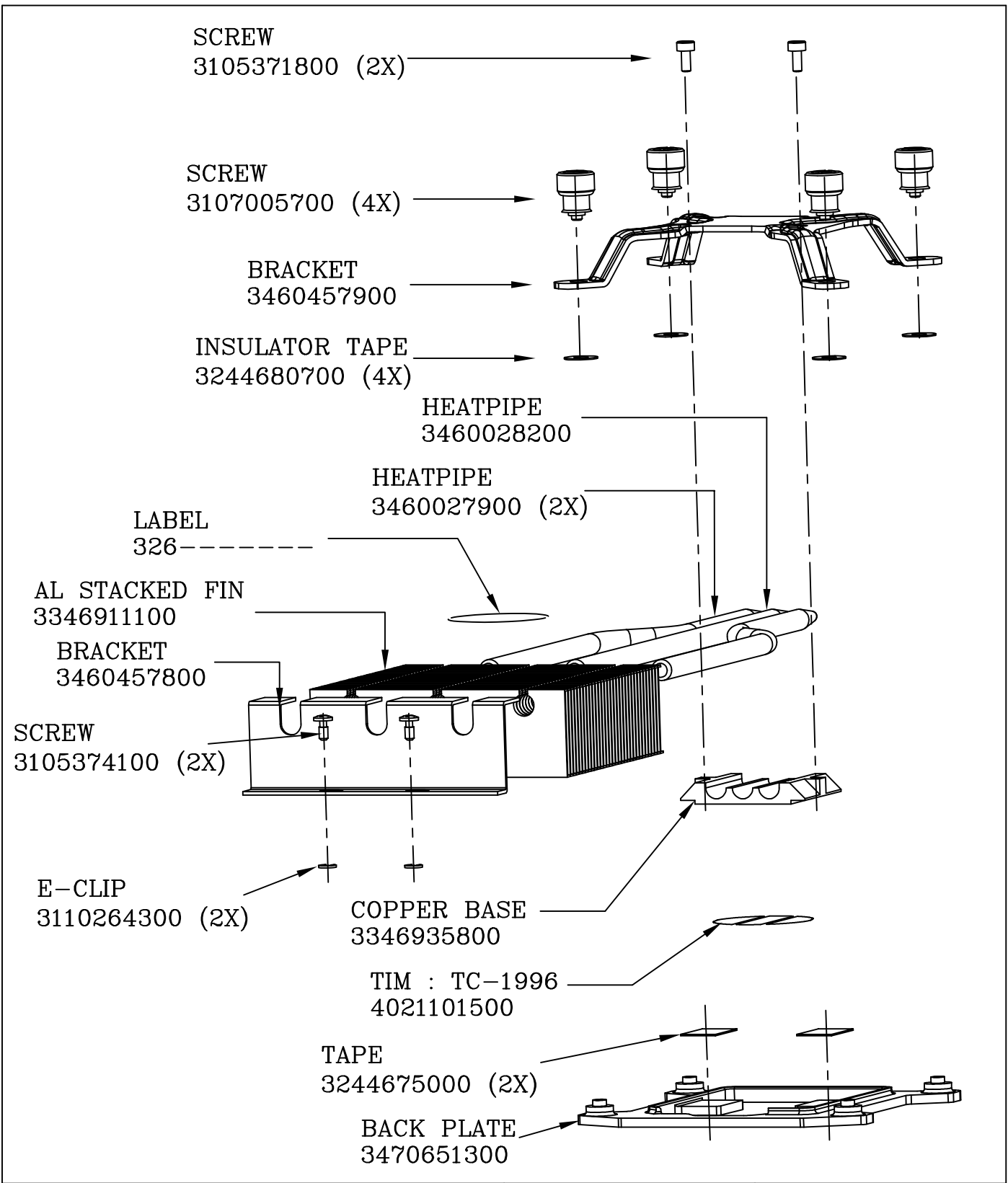
Part No. FHS-K8020S00-PD

REV.

00

SCALE --- UNIT mm USED ON COOLER

SHEET 4 OF 4 ISSUE DATE:



台達電子工業股份有限公司 DELTA ELECTRONICS, INC.	DELTA MODEL: FHS-K8020S00	Drawn: REEK.LI 10/6'11
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DIMENSIONAL TOLERANCES () () () () <30 :±0.25 X :±0.3 UP~100 :±0.2 250~300 :±0.4 UP~600 :±1.5 >30~100 :±0.35 100~150 :±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	HOLES : ±0.05 ANGLES : ±0.5° 	Description: PRODUCTION SPEC. (ASSEMBLY ORDER)
SCALE --- UNIT mm USED ON COOLER	Part No. FHS-K8020S00-AS	REV. 00
SIZE A4	SHEET 1 OF 1 ISSUE DATE:	



Delta Electronics Corp.

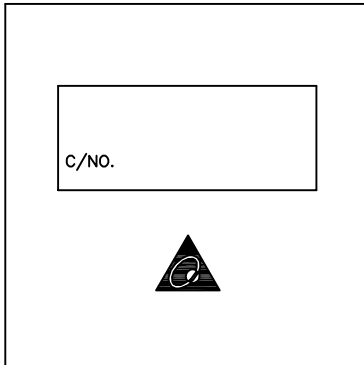
3. PACKING PLAN

Packing Specification

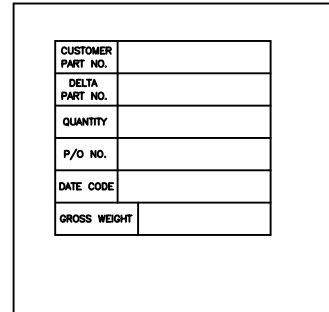
CARTON ILLUSTRATE	SIZE	498(L)*298(w)*270(H)(mm)	PACKING QUANTITY	6LAYERS/CARTON
	MATERIAL	3 LAYERS"AB" FLUTE	CARTON WEIGHT	0.62 kg (REF.)

CARTON OUTSIDE ILLUSTRATE

FRONT

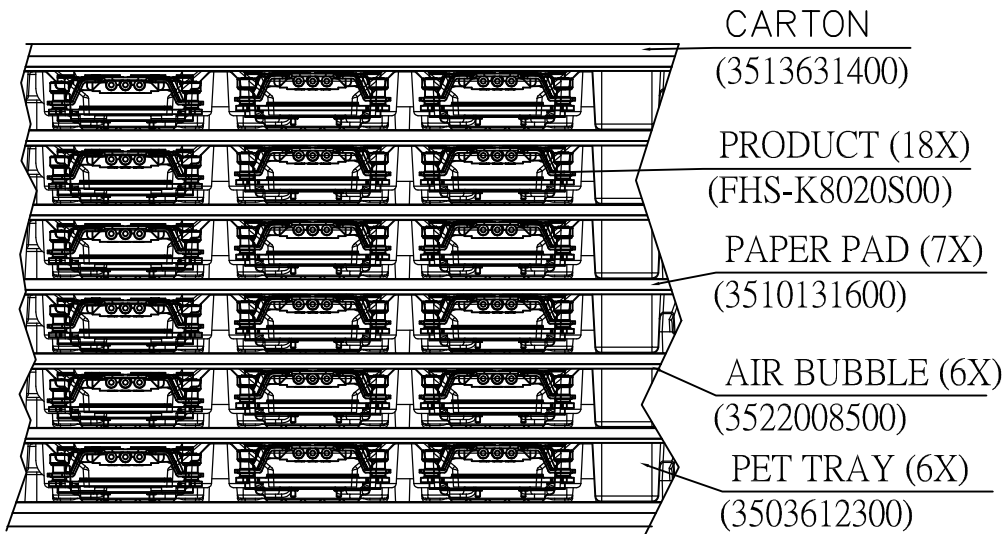


BACK



(ONE LABEL PER CARTON)

TRAY PACKING ILLUSTRATE	SIZE	490 (L)*290 (w)*33.8 (H)(mm)	PACKING QUANTITY	3PCS/TRAY
	MATERIAL	PET TRAY		
	MATERIAL WEIGHT	250g (REF.)		



CARTON

(3513631400)

PRODUCT (18X)

(FHS-K8020S00)

PAPER PAD (7X)

(3510131600)

AIR BUBBLE (6X)

(3522008500)

PET TRAY (6X)

(3503612300)



台達電子工業股份有限公司
DELTA ELECTRONICS, INC.

DELTA MODEL:
FHS-K8020S00

Drawn:
REEK.LI 10/6'11

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CUSTOMER NAME: STD

CUSTOMER P/N: ---

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>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.
(PACKING ASSMEBLY)

A4
SIZE

Part No.
FHS-K8020S00-PA

REV.

SHEET 1 OF 2 ISSUE DATE:

SCALE --- UNIT mm USED ON COOLER



Delta Electronics Corp.

4. FAN

Fan Specification



SPECIFICATION FOR APPROVAL

Customer T M P B U

Description D C B L O W E R

Customer P/N: 3 6 2 2 8 4 9 1 1 1 R E V.

Delta Model No. KDB0712HB-BD22 REV. 00

Sample Issue No.

Sample Issue Date JUL.28.2011

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

APPROVED BY:

DATE :

DELTA ELECTRONICS, INC.
TAOYUAN PLANT
252, SHANG YING ROAD, KUEI SAN INDUSTRIAL ZONE TAOYUAN
SHIEN, TAIWAN, R.O.C.
TEL:886-(0)3-3591968
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

SPECIFICATION FOR APPROVAL

Customer: TMPBU

 Description: DC BLOWER

 Customer P/N: **3622849111** REV:

 Delta Model NO.: KDB0712HB-BD22 **Delta Safety Model NO.: KDB0712HB**

 Sample Rev: 00 Issue NO:

 Sample Issue Date: **JUL.28.2011** Quantity:

1. SCOPE:

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

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12.0 VDC
OPERATION VOLTAGE	10.8 - 12.6 VDC
INPUT CURRENT	0.23 (MAX. 0.45) A (SAFETY CURRENT 0.45 A)
INPUT POWER	2.76 (MAX. 5.40) W
SPEED	3400±10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.357 (MIN. 0.314) M ³ /MIN. 12.61 (MIN. 10.32) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	10.99 (MIN. 8.424) mmH ₂ O 0.433 (MIN. 0.351) inchH ₂ O
ACOUSTICAL NOISE (AVG.)	42.5 (MAX. 46.5) dB-A (AT 50CM)
INSULATION TYPE	UL: CLASS A

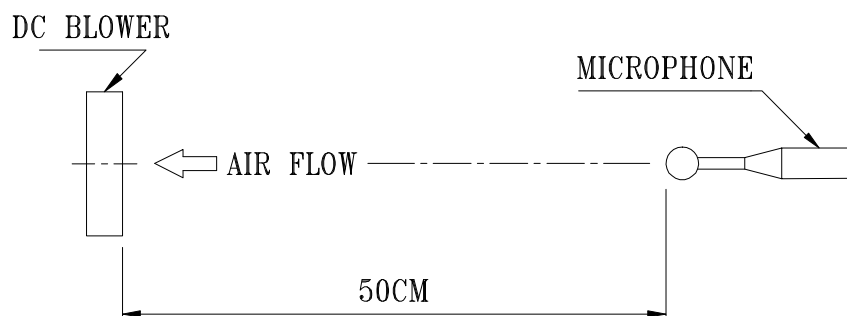
(continued)

PART NO: 3622849111

DELTA MODEL: KDB0712HB-BD22

INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 50/60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL)
LIFE EXPECTANCE	30,000 HOURS CONTINUOUS OPERATION AT 50 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM TOP SIDE VIEW
OVER CURRENT SHUT DOWN	THE CURRENT WILL SHUT DOWN WHEN LOCKING ROTOR
LEAD WIRE	UL1061 AWG#28 BLACK WIRE: (-) YELLOW WIRE: (+) GREEN WIRE: (FOO) BLUE WIRE: (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: **3622849111**

DELTA MODEL: KDB0712HB-BD22

3. MECHANICAL:

- 3-1. DIMENSIONS ----- SEE DIMENSIONS DRAWING
- 3-2. FRAME ----- PLASTIC UL: 94V-0
- 3-3. IMPELLER ----- PLASTIC UL: 94V-0
- 3-4. COVER ----- SECC
- 3-5. BEARING SYSTEM ----- FDB BEARING
- 3-6. WEIGHT ----- 44.50 GRAMS

4. ENVIRONMENTAL:

- 4-1. OPERATING TEMPERATURE ----- 0 TO +60 DEGREE C
- 4-2. STORAGE TEMPERATURE ----- -10 TO +75 DEGREE C
- 4-3. OPERATING HUMIDITY ----- 5 TO 90 % RH
- 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.

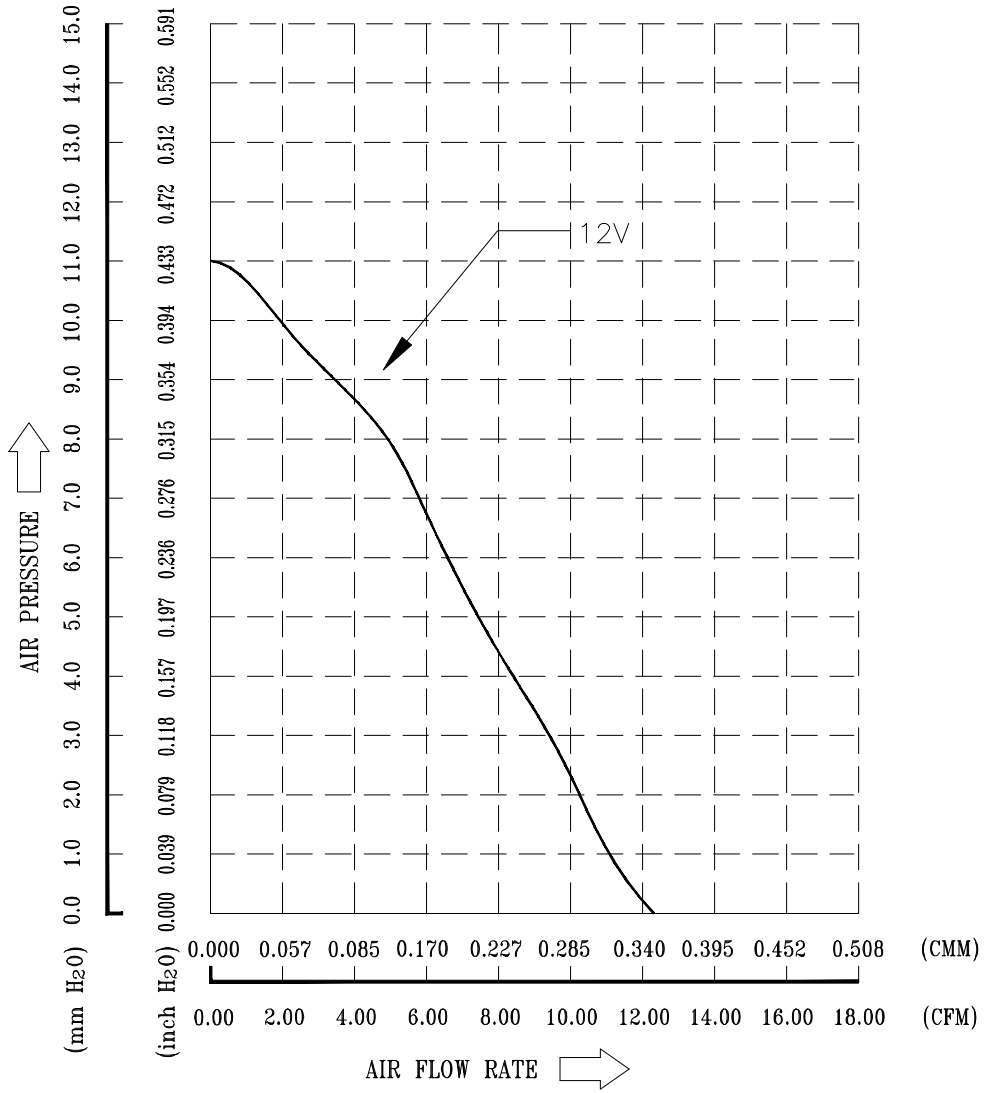
7. PRODUCTION LOCATION

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

PART NO: 3622849111

DELTA MODEL: KDB0712HB-BD22

8. PQ CURVE:



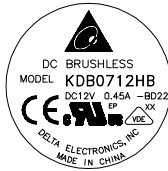
* TEST CONDITION: INPUT VOLTAGE ----- OPERATION VOLTAGE
TEMPERATURE ----- ROOM TEMPERATURE
HUMIDITY ----- 65%RH

PART NO: 3622849111

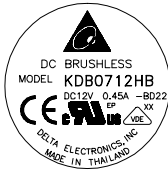
DELTA MODEL: KDB0712HB-BD22

9. DIMENSION DRAWING:

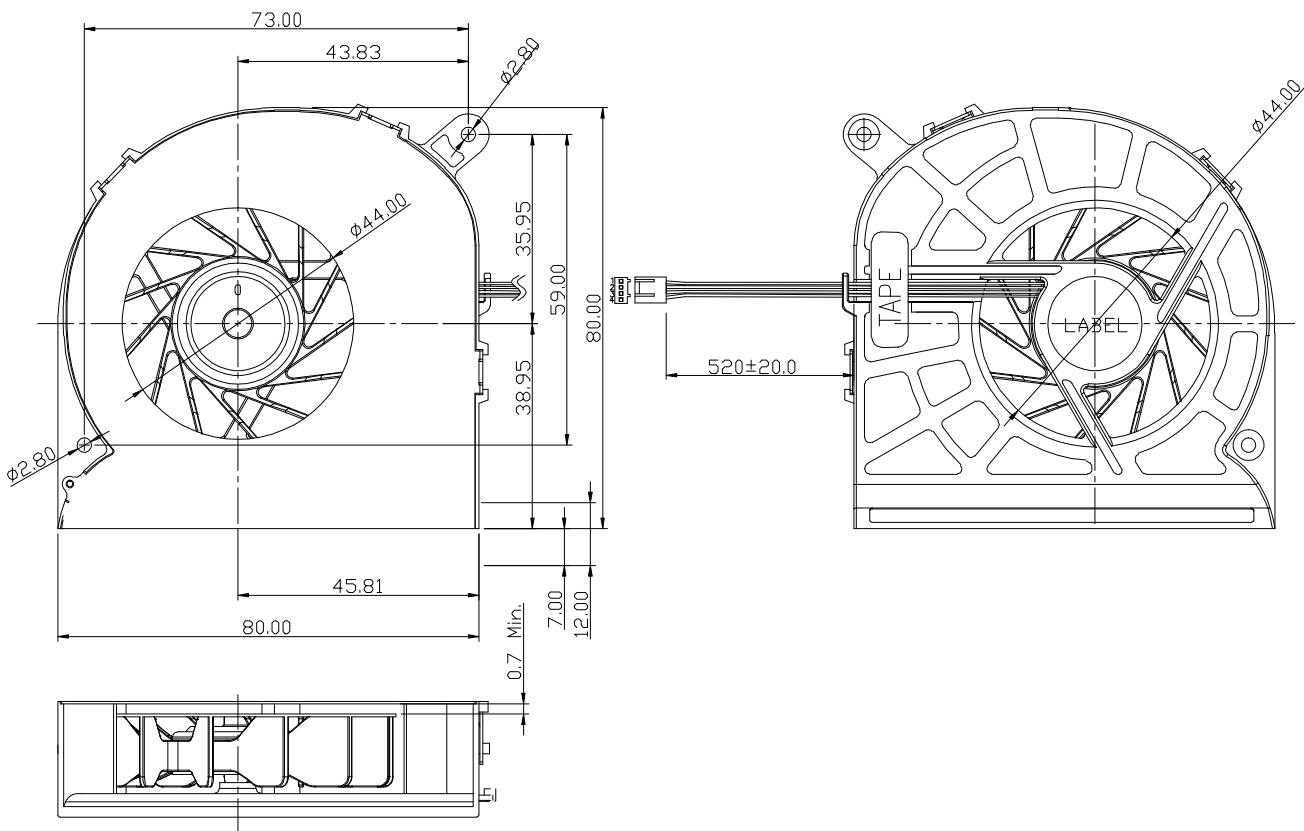
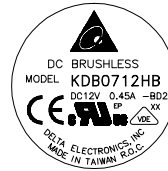
LABEL:



OR



OR



NOTES:

UNIT: mm

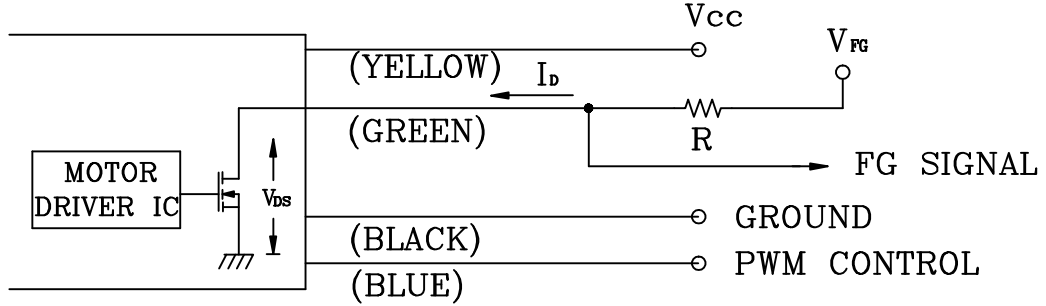
- 1.LEAD WIRE: UL1061 AWG#28
PIN 1: BLACK WIRE: NEGATIVE(-)
PIN 2: YELLOW WIRE: POSITIVE(+)
PIN 3: GREEN WIRE: TACHOMETER OUTPUT (F00)
PIN 4: BLUE WIRE: SPEED CONTROL (PWM)
- 2.HOUSING: MOLEX 47054-1000 OR EQUIVALENT
- 3.TERMINAL: MOLEX 2759T 08-50-0113 OR EQUIVALENT
- 4.INSULATOR: TAPE ACETATE
- 5.THIS PRODUCT IS RoHS COMPLIANT

PART NO: 3622849111

DELTA MODEL: KDB0712HB-BD22

10. FREQUENCY GENERATOR (FG) SIGNAL:

10-1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



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

10-2. SPECIFICATION:

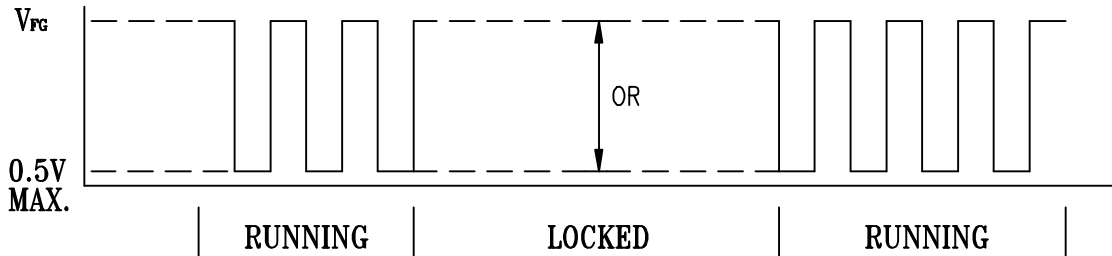
V_{DS} (linear) = 0.5V MAX.

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

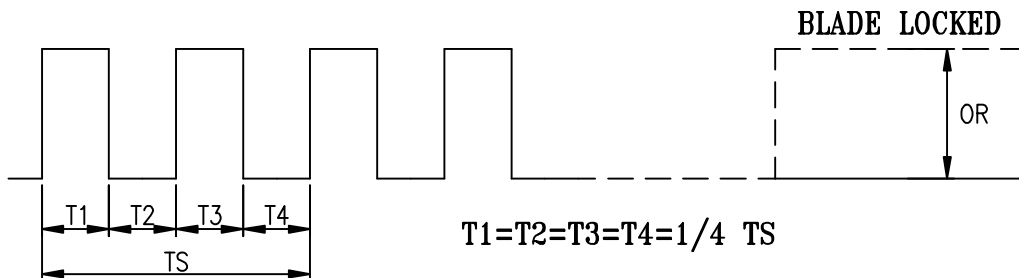
I_b = 5mA MAX.

$R \geq V_{FG} / I_b$

10-3. FREQUENCY GENERATOR WAVEFORM:



FAN RUNNING FOR 4 POLES



$N = R.P.M$

$TS = 60 / N (SEC)$

*VOLTAGE LEVEL AFTER BLADE LOCKED

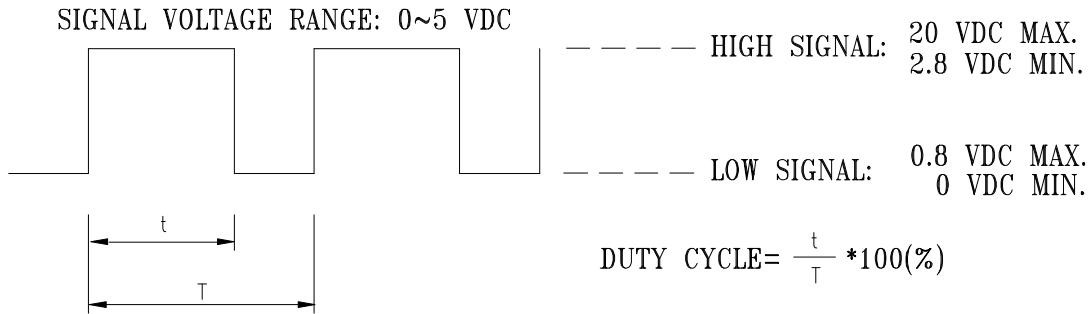
*4 POLES

A00

PART NO: 3622849111

DELTA MODEL: KDB0712HB-BD22

11. PWM CONTROL SIGNAL:



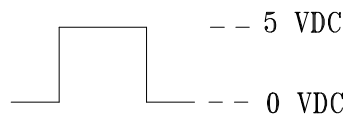
- THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT A 30HZ~300KHZ.
- THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
- AT 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0% ~ 20% DUTY CYCLE,THE ROTOR WILL SPIN AT MINIMUM SPEED.
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.

12. SPEED VS PWM CONTROL SIGNAL:

(AT 25°C, RATED VOLTAGE & PWM SIGNAL AS FOLLOW)

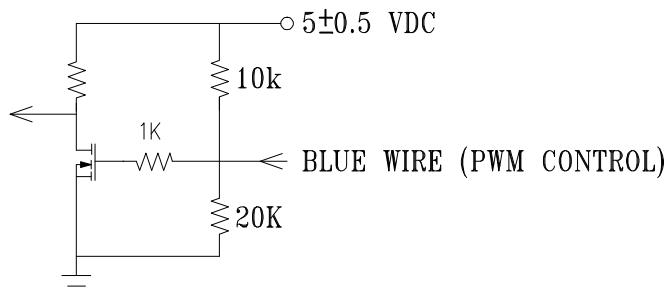
DUTY CYCLE (%)	SPEED R.P.M.	CURRENT (A) TYP.
100	3400±10%	0.23
0~20	1200±300	0.03

* PWM SIGNAL
PWM FREQUENCY = 25KHz



- MIN. START DUTY CYCLE : 20%.
WHEN DUTY CYCLE IS SET FOR MORE THAN 20%, 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.**