



## SPECIFICATION FOR APPROVAL

Customer : MITSUBISHI

Description : DC FAN

Customer Part No. \_\_\_\_\_ REV. : \_\_\_\_\_

Delta Model No. : QFR0824UHESS REV. : 00

Sample Issue No. : \_\_\_\_\_

Sample Issue Date : JAN.22 2019

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

APPROVED BY:

DATE :

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TAOYUAN SHIEN, TAIWAN, R.O.C.  
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## STATEMENT OF DEVIATION

NONE

DESCRIPTION:

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## **SPECIFICATION FOR APPROVAL**

Customer : MITSUBISHI

Description : DC FAN

Customer P/N :

rev. :

Delta model no. : QFR0824UHESS

Delta Safety Model No.: QFR0824UH

Sample revision. : 00

Issue no.:

Sample issue date : JAN.22 2019

Quantity :

### 1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN.

### 2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	24 VDC
OPERATION VOLTAGE	20.4 - 27.6 VDC
INPUT CURRENT(AVG.) (AT RATED VOLTAGE)	0.26 (MAX. 0.36) A SAFETY CURRENT ON LABEL : 0.44A
STARTUP CURRENT (MAX.)	MAX. 0.8A
INPUT POWER(AVG.) (AT RATED VOLTAGE)	6.24 (MAX. 8.64) W
SPEED (AT RATED VOLTAGE)	5400 ± 10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	1.897 (MIN. 1.707 ) M <sup>3</sup> /MIN. 66.98 (MIN. 60.28 ) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	13.46 (MIN. 10.90 ) mmH <sub>2</sub> O 0.530 (MIN. 0.429 ) inchH <sub>2</sub> O
ACOUSTICAL NOISE (AVG.)	50.0 (MAX. 54.0) dB-A
INSULATION TYPE	UL: CLASS A
INSULATION STRENGT	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)
INGRESS PROTECTION	IP51 (IEC60529 STANDARD)

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PART NO:

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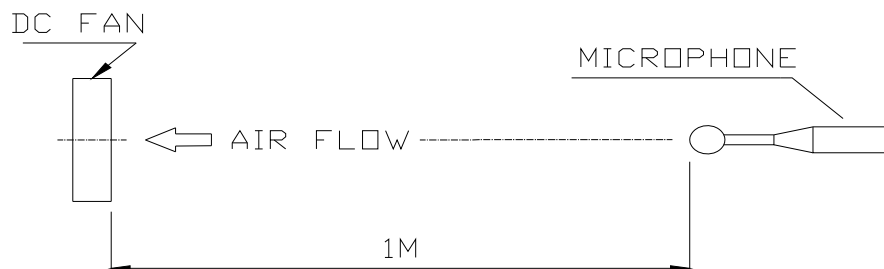
DELTA MODEL: QFR0824UHESS

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LIFE EXPECTANCE (L10) (AT LABEL VOLTAGE)	100,000 HOURS CONTINUOUS OPERATION AT 60 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM NAME PLATE SIDE.
LOCKED ROTOR PROTECTION	THE CURRENT WILL SHUT DOWN, WHEN ROTOR LOCKED AND FIXED.

NOTES:

1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 2 MINUTES.
2. STANDARD AIR PROPERTY IS AIR AT (Td) 25°C TEMPERATURE, (RH) 65% RELATIVE HUMIDITY , AND (Pb) 760 mmHg BAROMETRIC PRESSURE.
3. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.
4. 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.

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PART NO:

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DELTA MODEL: QFR0824UHESS

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3. MECHANICAL:

- 3-1. DIMENSIONS----- SEE DIMENSIONS DRAWING
- 3-2. FRAME----- PLASTIC UL: 94V-0
- 3-3. IMPELLER----- PLASTIC UL: 94V-0
- 3-4. BEARING SYSTEM----- TWO BALL BEARINGS
- 3-5. WEIGHT-----88.0 GRAMS(REF.)

4. ENVIRONMENTAL:

- 4-1. OPERATING TEMPERATURE----- -20 TO +85 DEGREE C
- 4-2. STORAGE TEMPERATURE----- -40 TO +85 DEGREE C
- 4-3. OPERATING HUMIDITY----- 5 TO 95 % 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.
- 6-2. ALL MATERIALS MUST FOLLOW DELTA'S SPECIFICATION 10000-0162  
(ENVIRONMENT MANAGEMENT STANDARD)

7. PRODUCTION LOCATION

- 7-1. PRODUCTS WILL BE PRODUCED IN CHINA.

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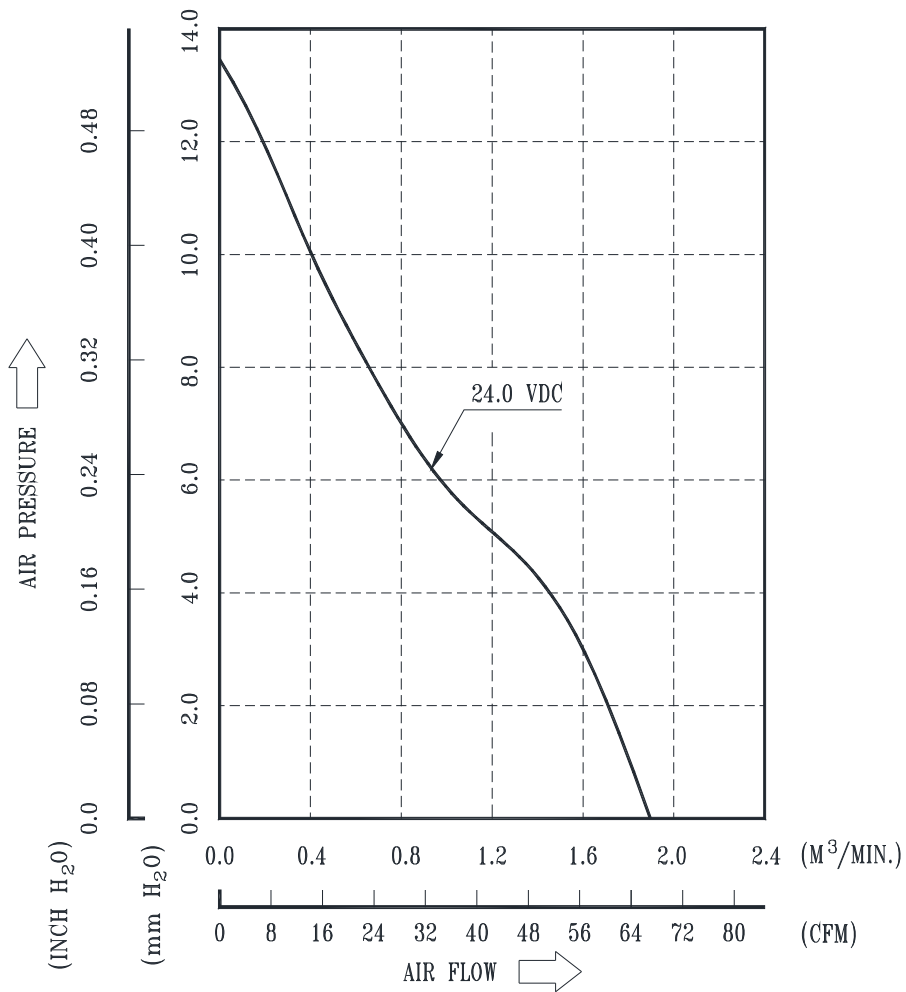
PART NO:

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DELTA MODEL: QFR0824UHSS

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8. P & Q CURVE:

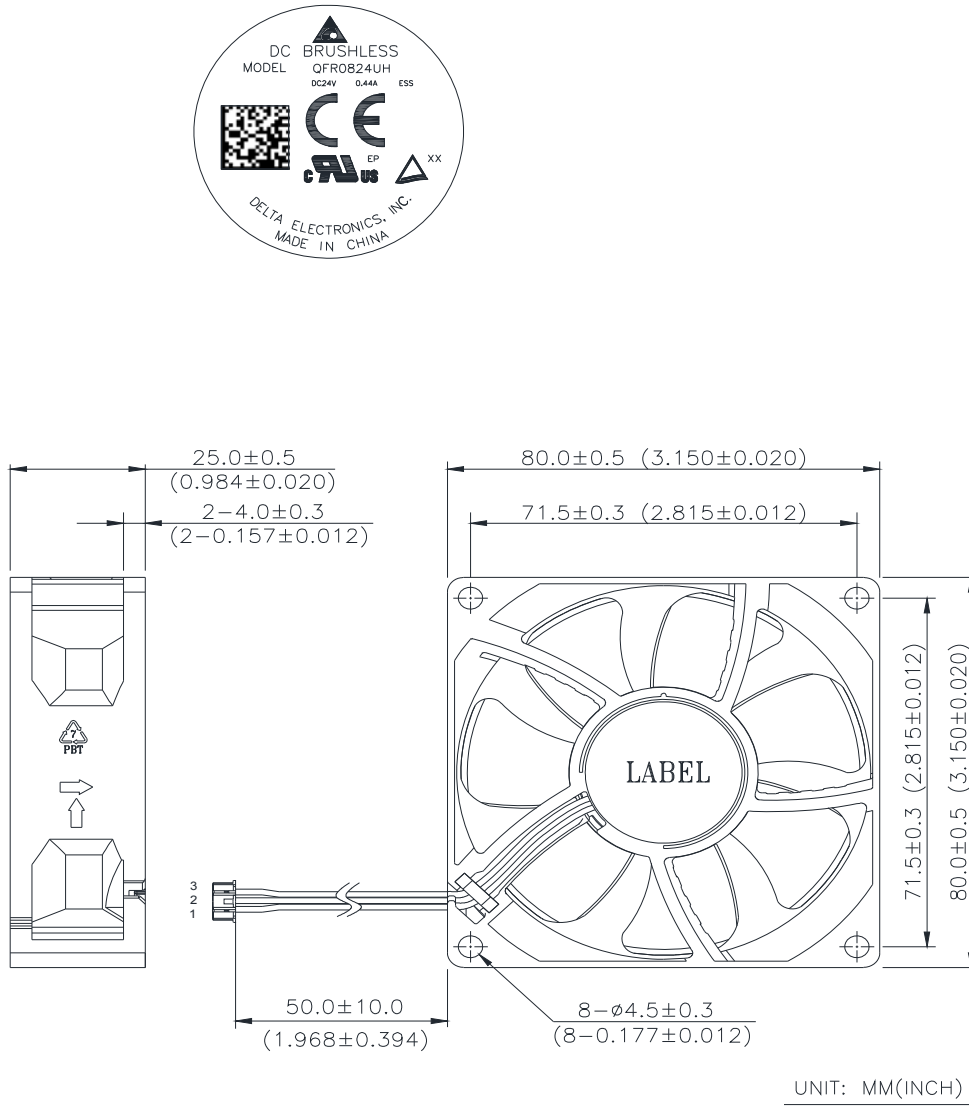


\*TEST CONDITION: INPUT VOLTAGE-----OPERATION VOLTAGE  
TEMPERATURE-----ROOM TEMPERATURE  
HUMIDITY-----65%RH

PART NO:

DELTA MODEL: QFR0824UHSS

9. DIMENSION DRAWING:



NOTES:

1. CABLE WIRE: UL3443 AWG#24  
PIN 1: RED WIRE----(+)  
PIN 2: BLACK WIRE----(-)  
PIN 3: YELLOW WIRE ----- (F00)
2. HOUSING: JST PAP-03V-S
3. TERMINAL: JST SPHD-001T-P0.5
4. THIS PRODUCT IS RoHS COMPLIANT

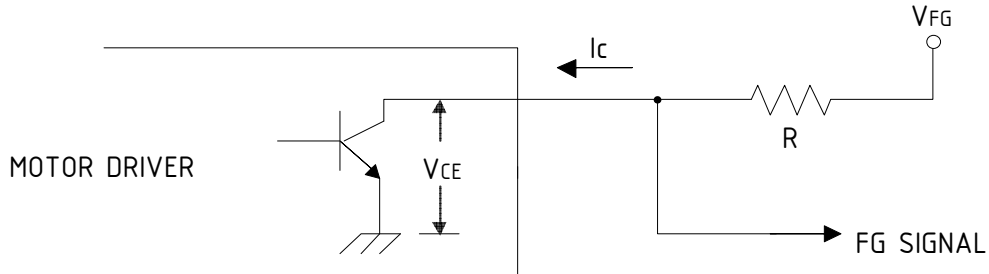


PART NO:

DELTA MODEL: QFR0824UHSS

10. FREQUENCY GENERATOR (FG) SIGNAL:

10-1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



CAUTION:

THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH THE LEAD WIRE OF POSITIVE OR NEGATIVE.

10-2. SPECIFICATION:

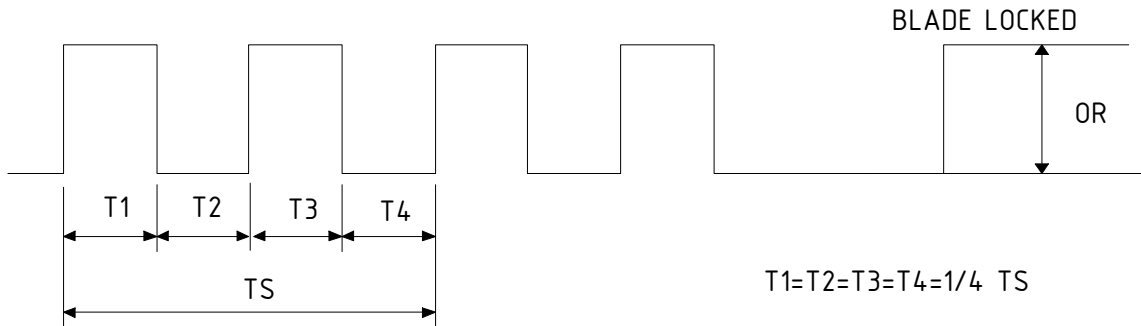
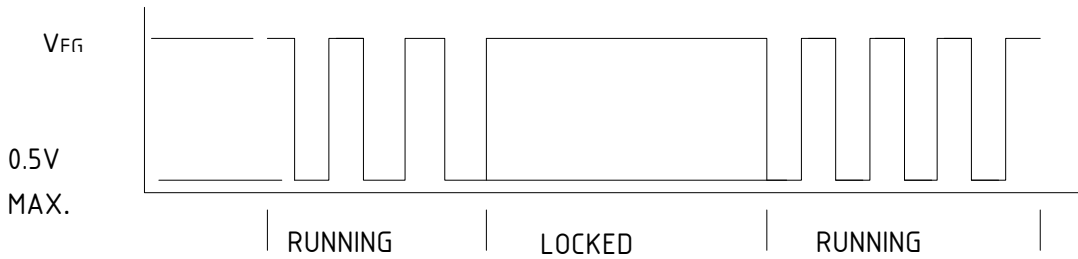
$V_{FG} = 5.0V$  (30V MAX.)

$I_c = 10mA$  MAX.

$V_{CE} = 0.5V$  MAX.

$R \geq V_{FG} / I_c$

11. FREQUENCY GENERATOR WAVEFORM:



$N = R.P.M$

$TS = 60/N$  (SEC)

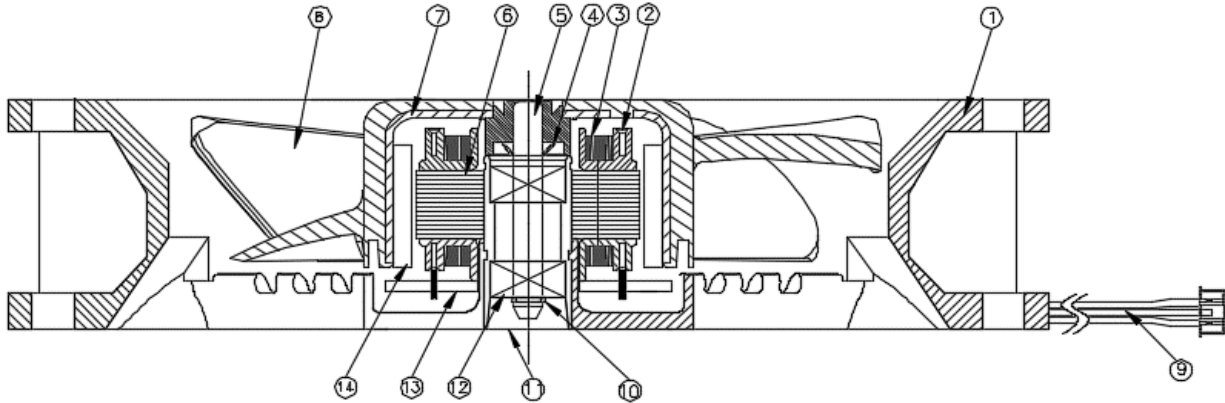
\*VOLTAGE LEVEL AFTER BLADE LOCKED

\*4 POLES

PART NO:

DELTA MODEL: QFR0824UHSS

12. COMPONENT BOM LIST:



SYM NO.	SYM.Name	COMMON	RATING & SPEC	VENDOR	DESCRIPTION
1	FRAME	N/A	N/A	N/A	PBT+30%GF V-0
2	FASTENER	N/A	N/A	N/A	METAL, BLACK, SK5-M
3	LABEL	N/A	N/A	N/A	SPEC PE 24mm T0.1
4	BEARING	N/A	N/A	N/A	SUJ
5	P.C.BOARD	N/A	N/A	N/A	FR-4
6	COVER	N/A	N/A	N/A	PBT V-0 & PA66 V-0
7	CABLE ASSY	N/A	N/A	N/A	UL3443 #24 ; JST PAP-03V-S
8	SI-STEEL	N/A	N/A	N/A	50A800, T0.50
9	CU-WIRE	N/A	N/A	N/A	2UEWN MW-80C
10	IMPELLER	N/A	N/A	N/A	PBT 30% GF V-0
11	CASE	N/A	N/A	N/A	SPCC
12	SHAFT	N/A	N/A	N/A	SUS
13	SPRNG	N/A	N/A	N/A	SUS
14	MAGNET	N/A	N/A	DONGGUAN FUCI ELECTRONIC CO.LTD. GUANGZHOU GOLDEN SOUTH PLASTIC MAGNET.	RUBBER
15	RESISTOR	R17,R18	1/4W 0.75ohm	TA-I TECHNOLOGY CO.,LTD. WALSIN TECHNOLOGY CORPORATION YAGEO CORPORATION	RES SMD CS 1/4W 0.75ohm F 0805
		R11,R12	1/10W 200ohm		RES SMD 1/10W 200ohm F 0603
		R5	1/10W 510ohm		RES SMD 1/10W 510ohm F 0603
		R24	1/10W 4.7Kohm		RES SMD 1/10W 4.7Kohm F 0603
		R25	1/10W 10Kohm		RES SMD 1/10W 10Kohm F 0402
		R10	1/10W 20Kohm		RES SMD 1/10W 20Kohm F 0603
		R27	1/10W 24.9Kohm		RES SMD 1/10W 24.9Kohm F 0603
		R1,R2,R3,R4,R6, R7,R8,R9	1/8W 2.2Kohm		RES SMD 1/8W 2.2Kohm F 0805
		R14,R15	1/16W 510ohm		RES SMD 1/16W 510ohm F 0402
		R26,R32	1/16W 1Kohm		RES SMD 1/16W 1Kohm F 0402
		R28	1/16W 4.7Kohm		RES SMD 1/16W 4.7Kohm F 0402
		R16,R19,R20,R30,R31	1/16W 10Kohm		RES SMD 1/16W 10Kohm F 0402
		R22,R29	1/16W 20Kohm		RES SMD 1/16W 20Kohm F 0402
		R23	1/16W 49.9Kohm		RES SMD 1/16W 49.9Kohm F 0402
R33	1/16W 0ohm	RES SMD 1/16W 0ohm J 0402			
16	FUSE	F1	1.5A 63VDC	AEM, INC. LITTELFUSE FAR EAST PTE LTD.	FUSE F 1.5A 63VDC SMD 0603
17	CAPACITOR	C8	50V 470pF	SAMSUNG ELECTRO-MECHANICS CO., LTD. WALSIN TECHNOLOGY CORPORATION YAGEO CORPORATION	CAP MC SMD 50V 470pF K X7R 0603
		C5,C7	50V 1000pF		CAP MC SMD 50V 1000pF K X7R 0603 0.87
		C9	50V 1uF		CAP MC SMD 50V 1uF K X7R 0603 0.8 0%
		C1	50V 4.7uF		CAP MC SMD 50V 4.7uF K X7R 1206
		C4	16V 0.47uF		CAP MC SMD 16V 0.47uF K X7R 0603
		C6	25V 1uF		CAP MC SMD 25V 1uF K X7R 0603 0.8
18	DIODE	D2,D3,D4	500mA 30V	ROHM CO.,LTD. NEXPERIA B.V.	DIO SBD 500mA 30V UMD2-2P SMD
		D1	2A 30V	VISHAY SEMICONDUCTOR TAIWAN SEMICONDUCTOR CO.,LTD.	DIO SBD 2A 30V POWERDI323-2P SMD
		ZD1	0.5W 11.4-12.6V	ON Semiconductor Corporation VISHAY SEMICONDUCTOR	DIO ZEN 0.5W 11.4-12.6V SOD-123-2P SMD
19	TR	Q3	60V 1A	NEXPERIA B.V. DIODES INC.	TR 60V 1A SOT-23-3P 250 SMD
20	MOSFET	Q4	60V 300mA 2ohm	NEXPERIA B.V. DIODES INC.	FET 60V 300mA 2ohm LL SOT-23-3P SMD
		Q5	60V 200mA 2.4ohm	VISHAY SEMICONDUCTOR ROHM CO.,LTD.	FET 60V 200mA 2.4ohm LL SMT-6P N*2 SMD
		Q1,Q2	60V 3.6A 65mohm	Sinopower Semiconductor, Inc. ON Semiconductor Corporation	FET 60V 3.6A 65mohm LL DFN33-8P N+P SMD
21	IC DRIVER	U1	BD69730FV-GE2	ROHM CO.,LTD.	IC DRIVER MOTOR 20V S5OP-16P SMD
22	IC HALL	U2	F-RANK	Asahi Kasei Microdevices Corporatio Nippon Ceramic Co., LTD	IC HALL ELEMENT F-RANK SOP-4P SMD



## ***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.**

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