



SPECIFICATION FOR APPROVAL

Customer : STD

Description : DC FAN

Customer Part No. _____ REV. : _____

Delta Model No. : GFB0412ES-E REV. : 00

Sample Issue No. : _____

Sample Issue Date : JAN.21 2020

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, SHANGYING ROAD, GUISHAN INDUSTRIAL ZONE,
TAOYUAN CITY 33341, TAIWAN
TEL:886-(0)3-3591968
FAX:886-(0)3-3591991

DELTA ELECTRONICS, INC.
252, SHANGYING ROAD, GUISHAN INDUSTRIAL ZONE,
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TEL : 886-(0)3-3591968
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STATEMENT OF DEVIATION

NONE

DESCRIPTION:

DELTA ELECTRONICS, INC.

252, SHANGYING ROAD, GUISHAN INDUSTRIAL ZONE TEL : 886-(0)3-3591968

TAOYUAN CITY 33341, TAIWAN

FAX : 886-(0)3-3591991

Specification For Approval

Customer : STD

Description : DC FAN

Customer P/N :

rev. :

Delta model no. :

GFB0412ES-E

Delta Safety Model No.:

GFB0412ES-E

Sample revision. :

00

Issue no.:

Sample issue date :

JAN.21 2020

Quantity :

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN. THE FAN MOTORS ARE WITH THREE PHASES AND FOUR POLES.

2. CHARACTERS:

*THE PERFORMANCE IS DEFINED BY ONE RAW FAN ALONE.

ITEM	DESCRIPTION
RATED VOLTAGE	12V
OPERATION VOLTAGE	10.8 - 13.2 VDC
INPUT CURRENT (AVG.) (TEST UNDER FREE AIR)	3.25 (MAX. 3.90) A SAFETY CURRENT ON LABEL : 4.50 A
INPUT POWER(AVG.) (TEST UNDER FREE AIR)	39.0 (MAX. 46.8) W
MAX. CURRENT UNDER PRESSURE(AVG)	MAX 4.40 A
SPEED	FRONT 29500 ±10% R.P.M. REAR 26500 ±10% R.P.M.
START UP TIME (BRAKE TIME+SOFTSTART TIME)	< 15 SECOND (FROM STOP WITH BRAKE TIME TO FULL SPEED)
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.960 (MIN. 0.864) M ³ /MIN. 33.90 (MIN. 30.51) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	163.58 (MIN. 132.49) mmH ₂ O 6.44 (MIN. 5.216) inchH ₂ O
ACOUSTICAL NOISE (AVG.)	73.0 (MAX. 77.0) dB-A

(continued)

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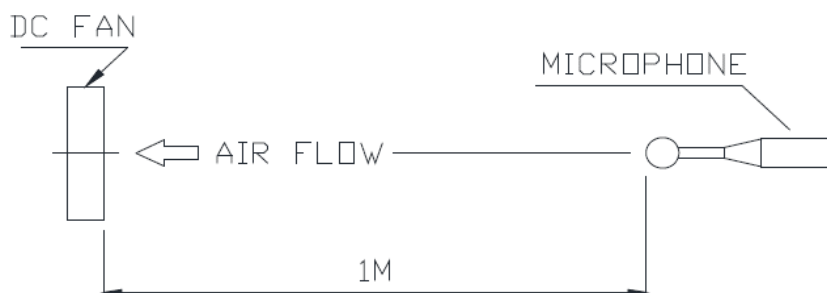
PART NO:

DELTA MODEL: GFB0412ES-E

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 (L10) (AT LABEL VOLTAGE)	30,000 HOURS CONTINUOUS OPERATION AT 55° C WITH 15 ~ 65 %RH.
ROTATION	TWO FANS ROTATE IN COUNTER DIRECTIONS SHOWED IN THE NAME PLATE SIDE
OVER CURRENT SHUT DOWN	THE CURRENT WILL SHUT DOWN,WHEN ROTOR LOCKED AND FIXED.

NOTES:

1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 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. THE CHARACTERS SHOWED IN PAGE 1 IS THE CONDITION OF BOTH FANS RUN.
5. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN SEMI-ANECHOIC CHAMBER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

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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----- 110 GRAMS (REF)

4. ENVIRONMENTAL:

- 4-1. OPERATING TEMPERATURE----- -10 TO +70 DEGREE C
- 4-2. STORAGE TEMPERATURE----- -40 TO +75 DEGREE C
- 4-3. OPERATING HUMIDITY----- 5 TO 85 % 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.
- 5-3. INTERNAL FUSE IMPLEMENTED.

6. RE OZONE DEPLETING SUBSTANCES:

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

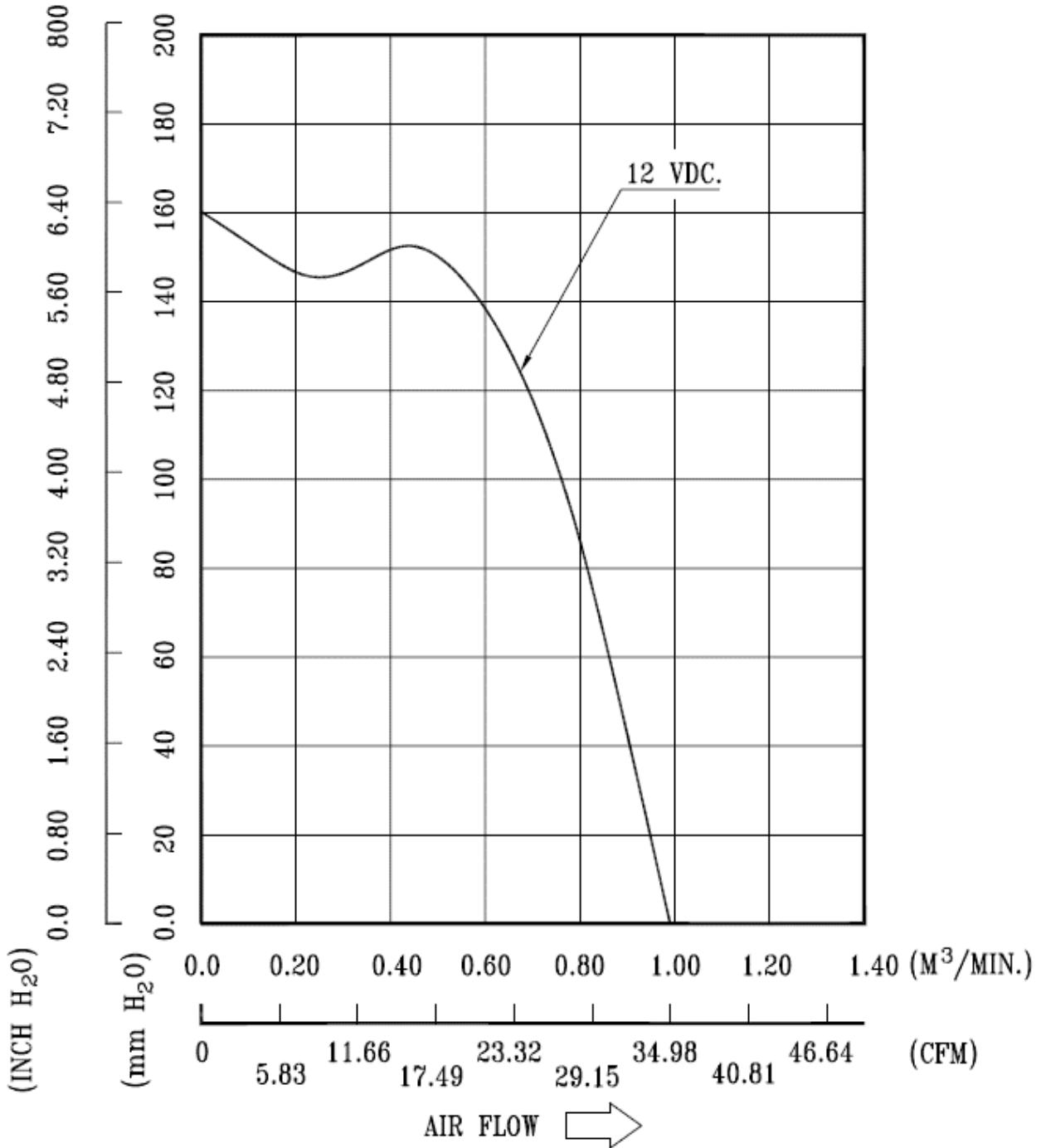
7. PRODUCTION LOCATION

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

PART NO:

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8. P & Q CURVE:

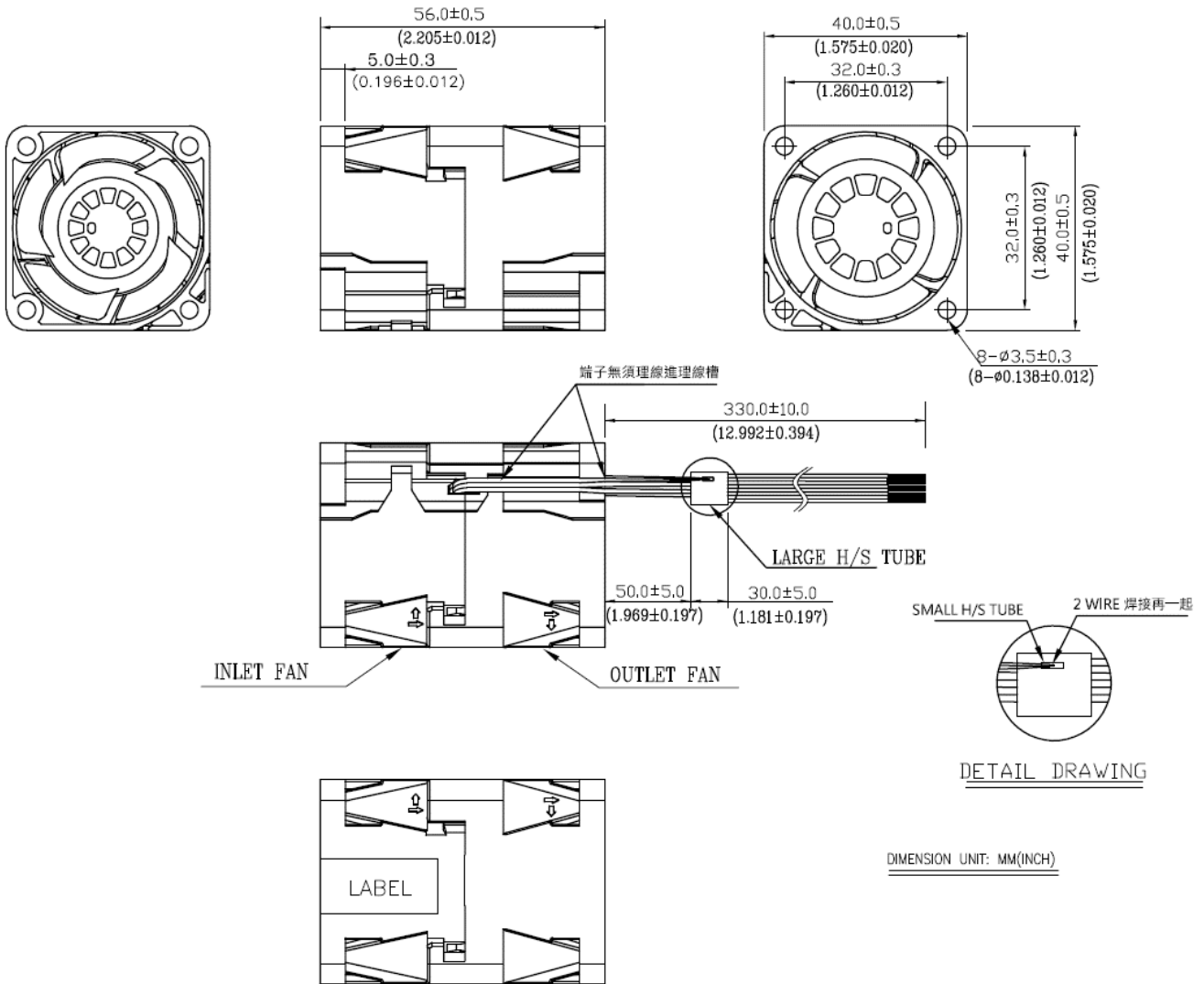
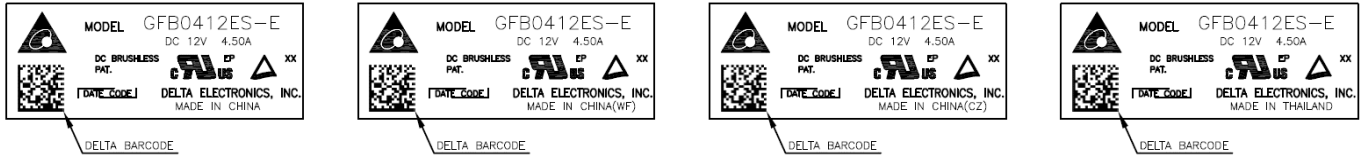


* TEST CONDITION: INPUT VOLTAGE ----- OPERATION VOLTAGE
TEMPERATURE ----- ROOM TEMPERATURE
HUMIDITY ----- 65%RH

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9. DIMENSION DRAWING :



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NOTE:

- 1.LEAD WIRE: UL 10368 -F- AWG #28
GREY WIRE -----(-) OUTLET FAN
BLACK WIRE -----(-) INLET FAN
RED WIRE -----(+) INLET FAN
ORANGE WIRE -----(+) OUTLET FAN
BLUE WIRE -----(PWM) INLET FAN
GREEN WIRE -----(PWM) OUTLET FAN
YELLOW WIRE ----- (F00) INLET FAN
WHITE WIRE -----(F00) OUTLET FAN
- 2.LARGE H/S TUBE: BLACK -----1PCE
- 3.SMALL H/S TUBE: BLACK -----1PCE
- 4.THIS PRODUCT IS RoHS2.0 COMPLIANT

PART NO:

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10. SUBSTANCES AND MATERIALS:

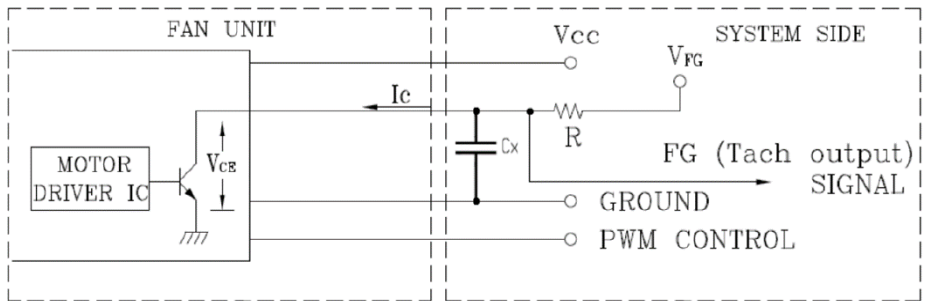
HAZARDOUS SUBSTANCES		ALLOWABLE CONTENT	REMARK
HEAVY METALS	CADMIUM(Cd) AND ITS COMPOUNDS	< 0.01 WT% (<100 PPM)	DIRECTIVE 2011/65/EU
	LEAD(Pb) AND ITS COMPOUNDS	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2011/65/EU
	MERCURY(Hg) AND ITS COMPOUNDS	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2011/65/EU
	HEXAVALENT CHROMIUM (CHROMIUM VI) (Cr6+) AND ITS COMPOUNDS	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2011/65/EU
BROMINATED FLAME RETARDANTS	POLYBROMINATED BIPHENYLS (PBBs)	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2011/65/EU
	POLYBROMINATED DIPHENYLS (PBDEs)	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2011/65/EU
PLASTICIZER	BIS (2-ETHYLHEXYL) PHTHALATE (DEHP)	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2015/863/EU
	BUTYL BENZYL PHTHALATE (BBP)	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2015/863/EU
	DIBUTYL PHTHALATE (DBP)	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2015/863/EU
	DIISOBUTYL PHTHALATE (DIBP)	< 0.1 WT% (<1000 PPM)	DIRECTIVE 2015/863/EU

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11.FREQUENCY GENERATOR (FG) SIGNAL:

11-1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



CAUTION:

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

11-2. SPECIFICATION:

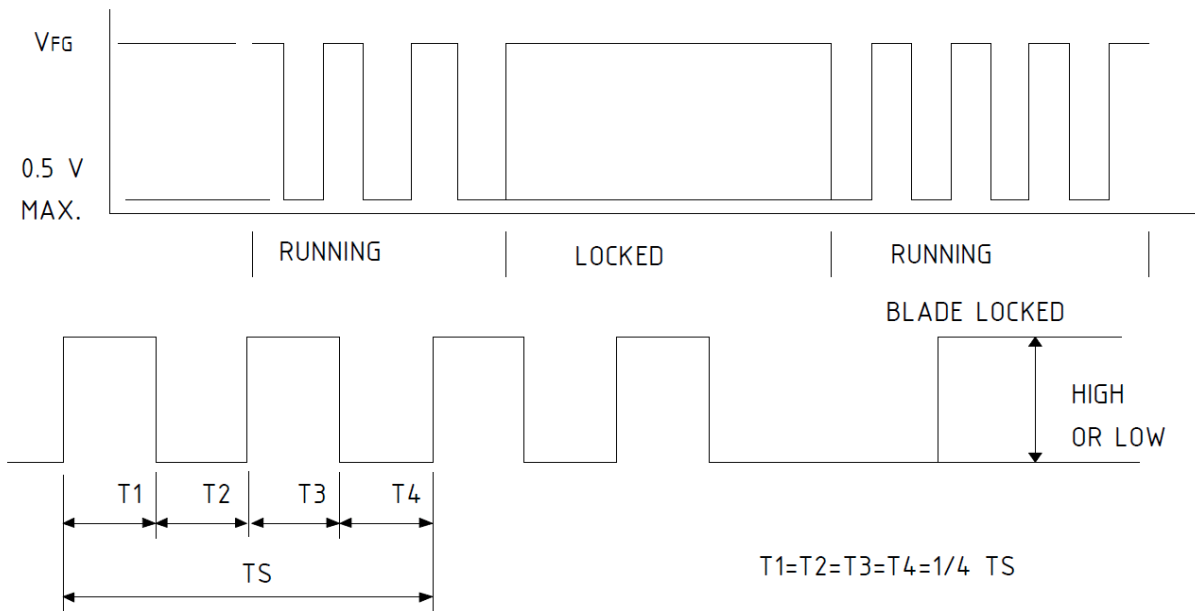
$V_{FG} = 13.2V \text{ MAX.}$

$I_c = 5mA \text{ MAX.}$

$V_{CE} = 0.5V \text{ MAX.}$

$R \geq V_{FG} / I_c$

11-3. FREQUENCY GENERATOR WAVEFORM:



$N = \text{R.P.M}$

$TS = 60/N(\text{SEC})$

*VOLTAGE LEVEL AFTER BLADE LOCKED

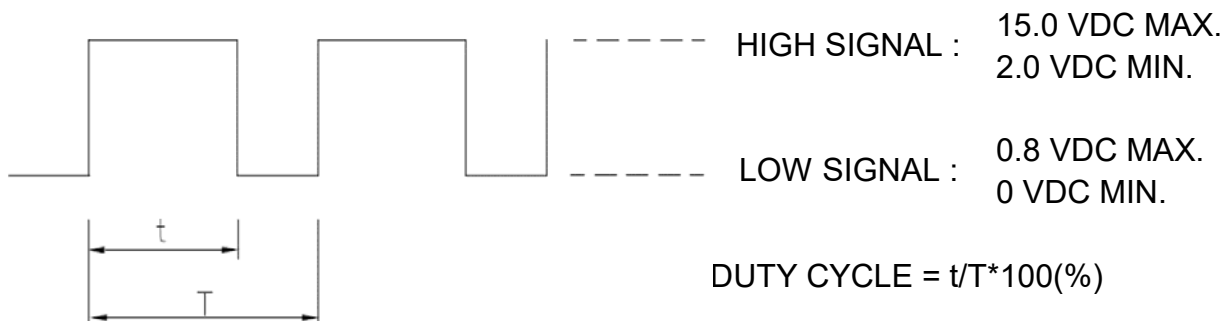
*4 POLES

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12. PWM CONTROL SIGNAL (NEGATIVE DUTY CYCLE)

SIGNAL VOLTAGE RANGE: 0~15.0VDC



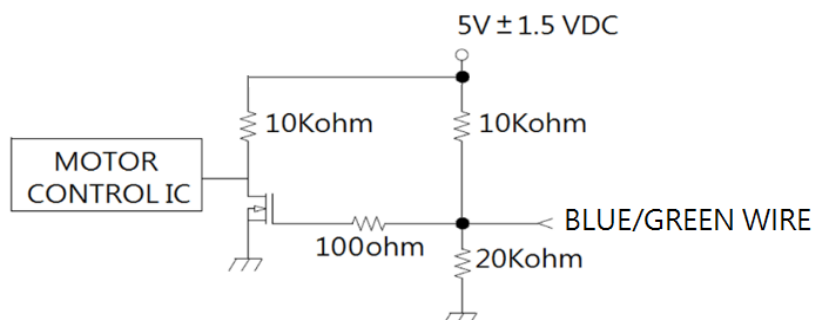
- *THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
- *AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- *AT 0% DUTY CYCLE, THE ROTOR WILL SPIN AT MINIMUM SPEED.
- *WITH CONTROL SIGNAL LEAD DISCONNECTED, THE FAN WILL SPIN AT MAXIMUM SPEED.
- *WHEN THE INLET FAN WILL FAIL, THE OUTFAN WILL EXECUT THE TURO MODE.
- *THE FAN SPEED CONTROL IS CLOSE LOOP

13. SPEED VS PWM CONTROL SIGNAL:

(AT RATED VOLTAGE & PWM FREQUENCY=25KHZ)

DUTY CYCLE (%)	SPEED R.P.M. (REF.)		CURRENT (A) TYP. TOTAL
	INLET	OUTLET	
100	29500±10%	26500±10%	3.25
50	17000±10%	15300±10%	0.75
0	2950±400	3200±500	0.12
TURO	FAIL	32000±10%	2.00

14. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:



14-1. THE FAN SPEED WILL DEFAULT TO MAXIMUM WHEN THE SPEED CONTROL INPUT IS LEFT UNCONNECTED.