JARO THERMAL

SPECIFICATION FOR APPROVAL

Customer :
Customer Part No. :
Description : Thermal module
JARO Model No. : JSC00120 REV.0
Sample Issue No. :
Sample Issue Date :
☑ Preliminary Specification
☐ Formal Specification

PREPARED BY :	Caleb Huang	DATE :	03/04/2021
CHECKED BY :	Chris Hsu	DATE :	03/04/2021
APPROVED BY :	Chris Hsu	DATE :	03/04/2021

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

By:_____ (printed)

Signature:_____

Date:_____

Jaro Thermal USA office
6600 Park of Commerce Blvd.
Boca Raton, Florida 33487
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Fx: +886-7-374-7403

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JARO MODEL NUMBER
JSC00120

Revision of Spec History

Revision	Change Content	Change page	DATE	BY
0	Created SPEC		03/04/2021	Caleb Huang

Notice:

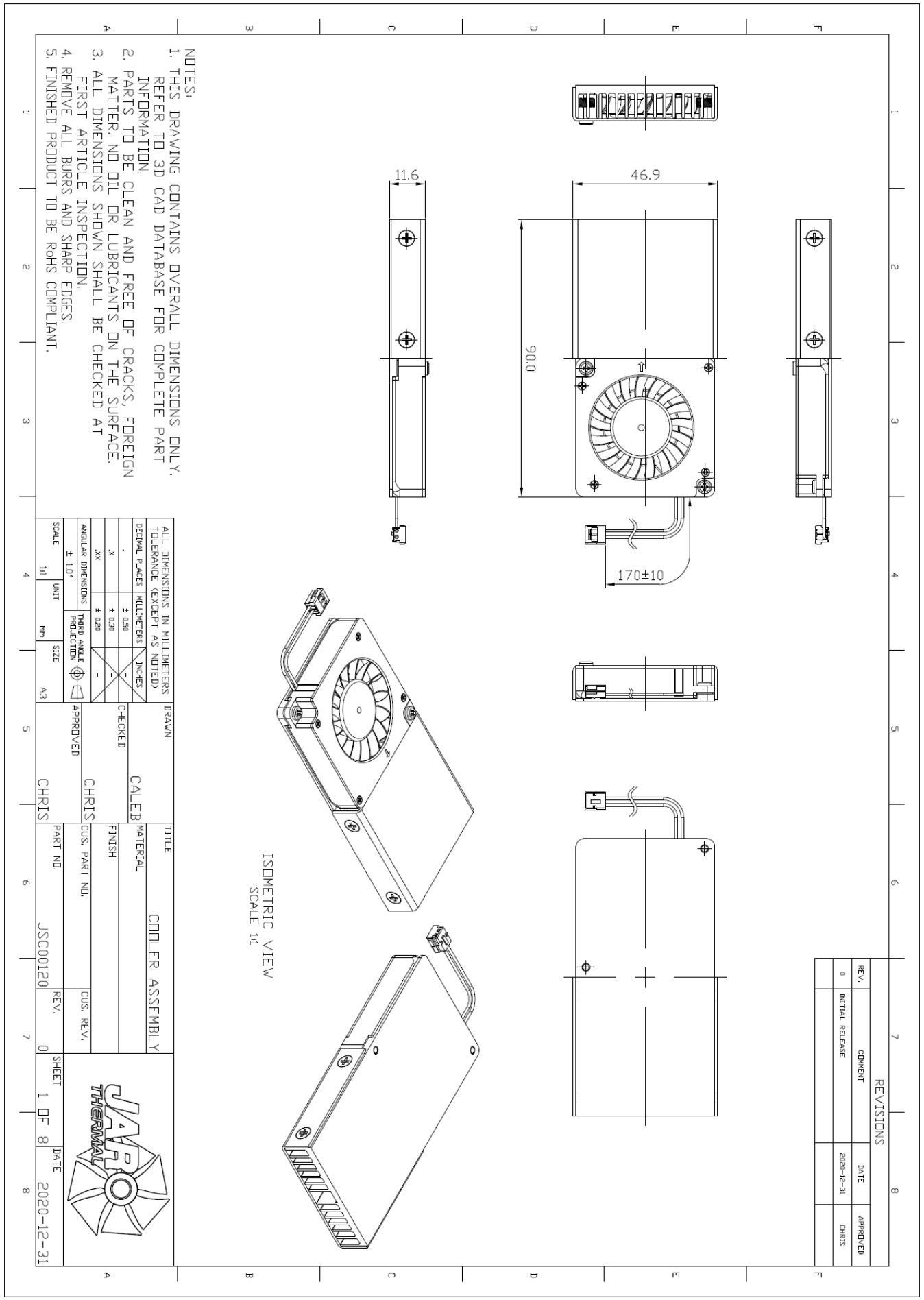
1. This specification will be changed base on Jaro Thermal ‘s notification. Please refer to update revision of spec by contacting Jaro Thermal.

2. This specification clarify all the mechanical & electrical characteristics of DC brushless fans & AC brushless fans & heat sink.

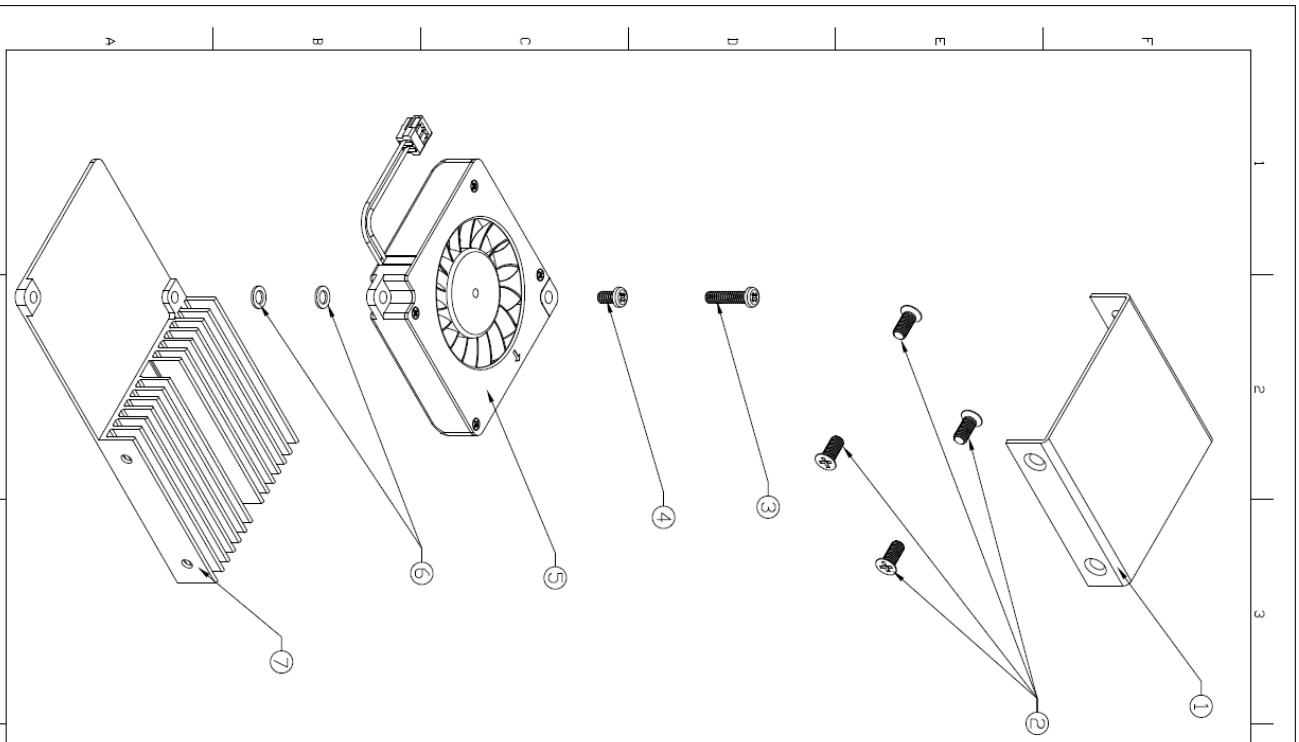
3. The specification of this product is described in detailed document. Please do not use the fan without proper usage. Please contact Jaro Thermal if you have special requirement which is not listed on this specification.

4. Any of change, please contact Jaro Thermal to change the new revision in order to make sure all technical data is up to date. Any ECN change will be followed by sending new update specification.

1. Assembly drawing



2. Exploded views



REVISIONS			
REV.	COMMENT	DATE	APPROVED
0	INITIAL RELEASE	2020-12-31	CHRIS

ITEM	QTY.	DESCRIPTION	MATERIAL	REMARK
7	1	HEAT SINK	AL 6063-T5	FINISH: BLACK ANODIZE
6	2	WASHER	TBD	COLOR: WHITE
5	1	FAN ASSEMBLY	-	JDB0451012HA0A11 (TEXPANA)-X(1856)
4	1	M2.6x4.9 SCREW	SAE 1018	FINISH: BLACK OXIDATION
3	1	M2.6x11.5 SCREW	SAE 1018	FINISH: BLACK OXIDATION
2	4	M3X6.0 TAPPING SCREW	SAE 1018	FINISH: BLACK OXIDATION
1	1	COVER	SPCC	FINISH: BLACK ELECTROPHORESIS

ALL DIMENSIONS IN MILLIMETERS
TOLERANCE (EXCEPT AS NOTED)

DECIMAL PLACES	MILLIMETERS	INCHES
.	± 0.50	-
.X	± 0.30	-
.XX	± 0.20	-
ANGULAR DIMENSIONS	THIRD ANGLE PROJECTION	
± 1.0°		

SCALE 1:1 | UNIT mm | SIZE A3

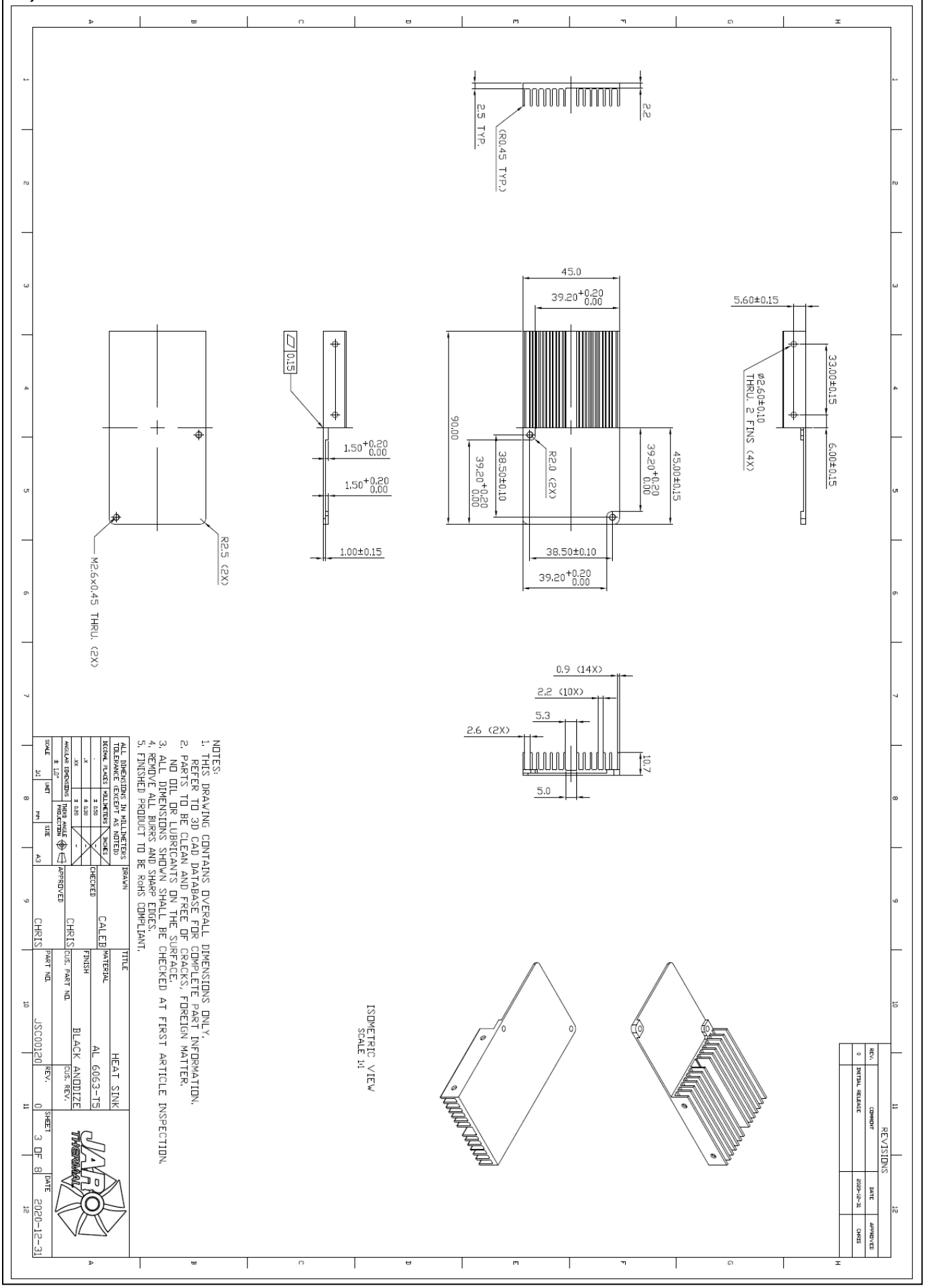
DRAWN CALEB
CHECKED
APPROVED CHRIS

TITLE EXPLODED VIEWS
MATERIAL SEE TABLE
FINISH SEE TABLE
CUS. PART NO.
CUS. REV.
PART NO. JSC00120
REV. 0
SHEET 2 OF 8
DATE 2020-12-31

JAPAN THERMAL

3. Individual component drawing

1) Heat sink



REVISIONS			
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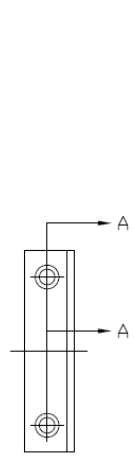
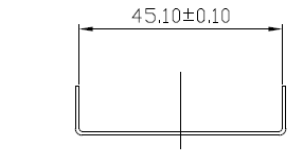
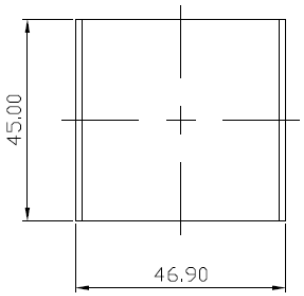
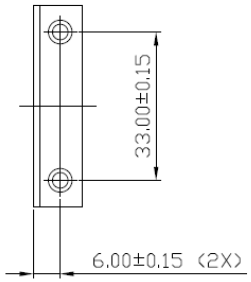
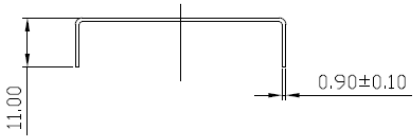
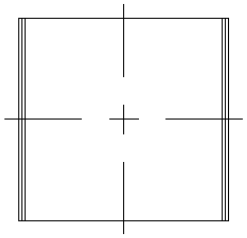


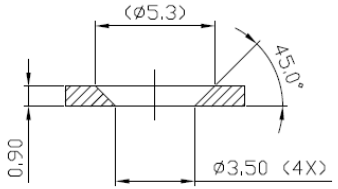




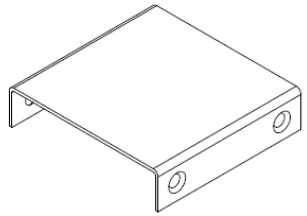


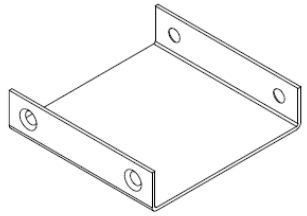






SECTION A-A
SCALE 5:1





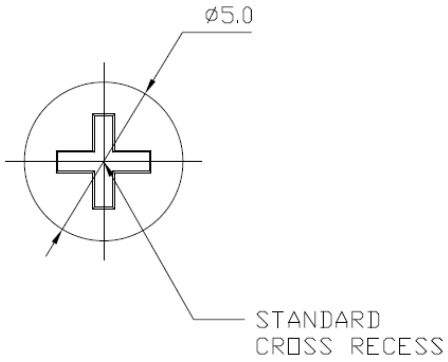
ISOMETRIC VIEW
SCALE 1:1

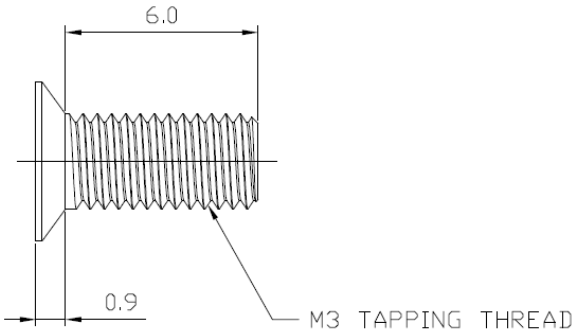
NOTES:
1. THIS DRAWING CONTAINS OVERALL DIMENSIONS ONLY.
   REFER TO 3D CAD DATABASE FOR COMPLETE PART INFORMATION.
2. PARTS TO BE CLEAN AND FREE OF CRACKS, FOREIGN MATTER.
   NO OIL OR LUBRICANTS ON THE SURFACE.
3. ALL DIMENSIONS SHOWN SHALL BE CHECKED AT FIRST ARTICLE INSPECTION.
4. REMOVE ALL BURRS AND SHARP EDGES.
5. FINISHED PRODUCT TO BE RoHS COMPLIANT.

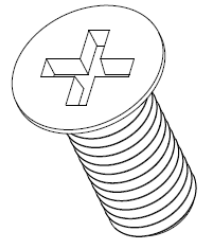
ALL DIMENSIONS IN MILLIMETERS TOLERANCE (EXCEPT AS NOTED)	DRAWN: CALEB	TITLE: COVER	JAR THERMAL
DECIMAL PLACES / MILLIMETERS / INCHES: . ± 0,50 -; .X ± 0,30 -; .XX ± 0,20 -	CHECKED: CHRIS	MATERIAL: BLACK ELECTROPHORESIS	
ANGULAR DIMENSIONS ± 1.0° / THIRD ANGLE PROJECTION	APPROVED: CHRIS	FINISH: SPCC	
SCALE: 1:1 / UNIT: mm / SIZE: A3		CUS. PART NO. / CUS. REV.	
		PART NO.: JSC00120 / REV.: 0	SHEET: 4 OF 8 / DATE: 2020-12-31

3) M3x6.0 Tapping screw

REVISIONS			
REV.	COMMENT	DATE	APPROVED
0	INITIAL RELEASE	2020-12-31	CHRIS







ISOMETRIC VIEW
SCALE 5:1

NOTES:
1. MATERIAL: SAE 1018 ; FINISH: BLACK OXIDATION
2. THIS DRAWING CONTAINS OVERALL DIMENSIONS ONLY.
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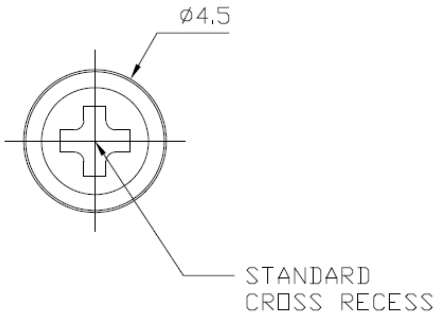
.X	± 0.30	-
.XX	± 0.20	-
ANGULAR DIMENSIONS	THIRD ANGLE PROJECTION	
± 1.0°		
SCALE 5:1	UNIT mm	SIZE A4

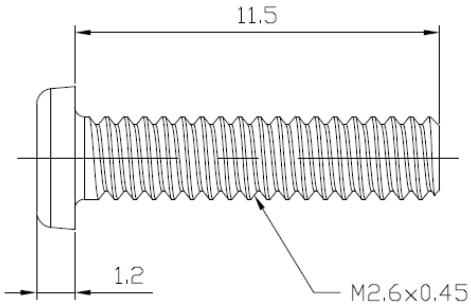
DRAWN	CALEB
CHECKED	CHRIS
APPROVED	CHRIS

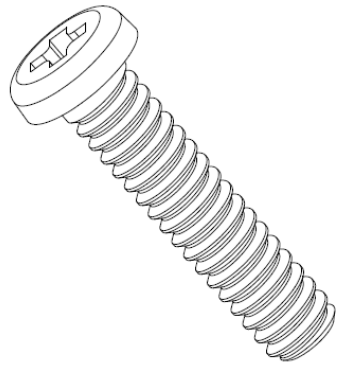
TITLE	M3x6.0 TAPPING SCREW		
MATERIAL	SEE NOTES		
FINISH	SEE NOTES		
CUS. PART NO.		CUS. REV.	
PART NO.	JSC00120	REV. 0	SHEET 5 OF 8 / DATE 2020-12-31

JAR THERMAL

REVISIONS			
REV.	COMMENT	DATE	APPROVED
0	INITIAL RELEASE	2020-12-31	CHRIS







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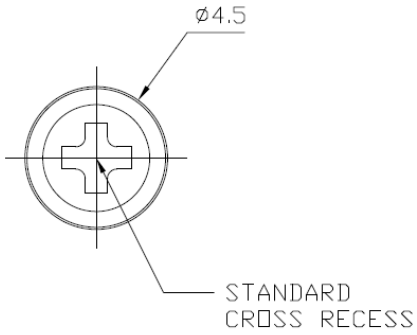
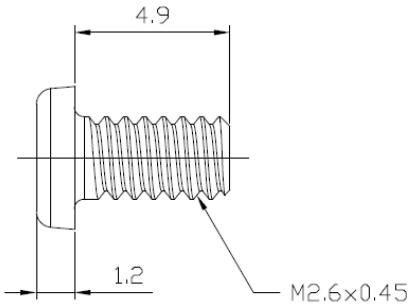
± 1.0°		
SCALE 5:1	UNIT mm	SIZE A4

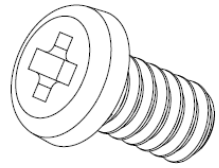
DRAWN	CALEB
CHECKED	CHRIS
APPROVED	CHRIS

TITLE	M2.6x11.5 SCREW	
MATERIAL	SEE NOTES	
FINISH	SEE NOTES	
CUS. PART NO.		CUS. REV.
PART NO. JSC00120	REV. 0	SHEET 6 OF 8 / DATE 2020-12-31

REVISIONS			
REV.	COMMENT	DATE	APPROVED
0	INITIAL RELEASE	2020-12-31	CHRIS







ISOMETRIC VIEW
SCALE 5:1

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.X	± 0.30	-
.XX	± 0.20	-
ANGULAR DIMENSIONS	THIRD ANGLE PROJECTION	
± 1.0°		
SCALE 5:1	UNIT mm	SIZE A4

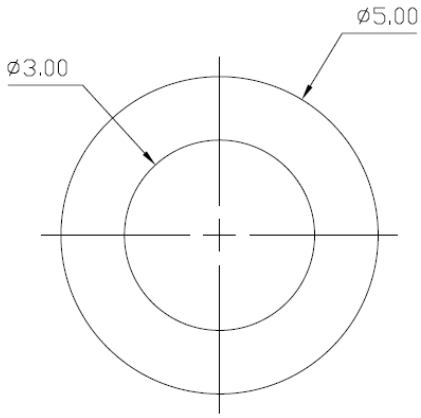
DRAWN	CALEB
CHECKED	CHRIS
APPROVED	CHRIS

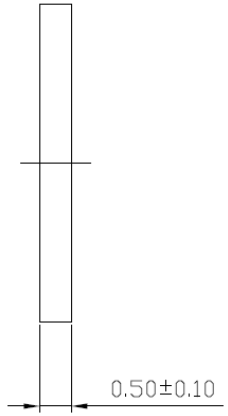
TITLE	M2.6x4.9 SCREW	
MATERIAL	SEE NOTES	
FINISH	SEE NOTES	
CUS. PART NO.		CUS. REV.
PART NO.	JSC00120	REV. 0
SHEET	7 OF 8	
DATE	2020-12-31	

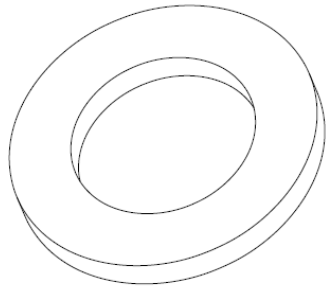
JAR THERMAL

5) M2.6x4.9 Screw

REVISIONS			
REV.	COMMENT	DATE	APPROVED
0	INITIAL RELEASE	2020-12-31	CHRIS







ISOMETRIC VIEW
SCALE 10:1

NOTES:
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.X	± 0.30	-
.XX	± 0.20	-
ANGULAR DIMENSIONS	THIRD ANGLE PROJECTION	
± 1.0°		
SCALE 10:1	UNIT mm	SIZE A4

DRAWN	CALEB
CHECKED	CHRIS
APPROVED	CHRIS

TITLE	WASHER		
MATERIAL	TBD		
COLOR	WHITE		
CUS. PART NO.		CUS. REV.	
PART NO.	JSC00120	REV. 0	SHEET 8 OF 8 / DATE 2020-12-31

JAR THERMAL

6) Washer

JARO THERMAL

SPECIFICATION FOR APPROVAL

Customer :
Customer Part No. :
Description : DC BLOWER
JARO Model No. : JDB0451012HA0A11(TEXPANA)-X(1856) REV.0
Sample Issue No. :
Sample Issue Date :
☐ **Preliminary Specification**
☑ **Formal Specification**

PREPARED BY :	Caleb Huang	DATE :	03/04/2021
CHECKED BY :	Caleb Huang	DATE :	03/04/2021
APPROVED BY :	Jay Su	DATE :	03/04/2021

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By:_____ (printed)

Signature:_____

Date:_____

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Fx: +886-7-374-7403

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JARO SPEC NUMBER	
SPEC	1856

Revision of Spec History

Revision	Change Content	Change page	DATE	BY
0	Created SPEC		03/04/2021	Caleb Huang

Notice:

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SPECIFICATION

Jaro Model	:	JDB0451012HA0A11(TEXPANA)-X(1856)
Samples attached	:	pcs
Safety Approval	:	CE

Description

DIMENSIONS	:	45 x 45 x 10 mm
BEARING TYPE	:	AEROSPACE FLUID BEARING
MOTOR PROTECTION	:	BY IC
RATED VOLTAGE	:	12.0 VDC
OPERATING VOLTAGE	:	10.8 VDC — 13.2 VDC
START—UP VOLTAGE	:	9.0 VDC , NORMAL
REAL CURRENT	:	0.10 Amp
REAL POWER	:	1.20 Watt
RATED CURRENT	:	0.20 Amp + 10 %MAX
RATED POWER	:	2.40 Watt
RATED SPEED	:	5800 RPM ± 10%

(IN FREE AIR AT RATED VOLTAGE)

AIR FLOW	:	2.700 CFM (min.: 2.430 CFM)
AIR FLOW	:	0.076 CMM (min.: 0.068 CMM)

(IN FREE AIR AT RATED VOLTAGE)

STATIC AIR PRESSURE	:	0.434 Inch H_2O (min.: 0.351 Inch H_2O)
STATIC AIR PRESSURE	:	11.023 mm H_2O (min.: 8.928 mm H_2O)

(IN FREE AIR AT RATED VOLTAGE)

NOISE LEVEL	:	35.3 dB (A) (max.: 39.3 dB(A))
LIFE EXPECTANCY	:	60000 Hours at 40℃ / 65%
NET WEIGHT	:	26 Gram.

The standard of Jaro Thermal's fan relative humidity is 65%, and the temperature is 25°C for the standard testing. If you have any question, pls refer to environmental condition on 5-0 first. Other special request pls contact Jaro Thermal for spec checking.

SPECIFICATION

JARO MODEL: JDB0451012HA0A11(TEXPANA)-X(1856)

1-0 MATERIAL

1-1 Frame Material - UL94V-0 Glass Filled polyester (P.B.T)

1-2 Fan Blade Material - UL94V-0 Glass Filled polyester (P.B.T)

1-3 Other material – See 8.0 Dimension Drawing

1-4 Environmental Standard

[V] ROHS

[V] Reach

[ ] Halogen Free

2-0 FAN VOLTAGE CURRENT, LOCK ROTOR, AIR FLOW, STATIC PRESSURE & NOISE DEFINITION

2-1 Start Voltage - By sudden switching ON fan is start to rotate.

2-2 Input Power - Input Power shall be measured after 3 minutes for continuing rotation by rated voltage.

2-3 Rated Current - Rated Current shall be measured after 3 minutes by continuing rotation by rated voltage.

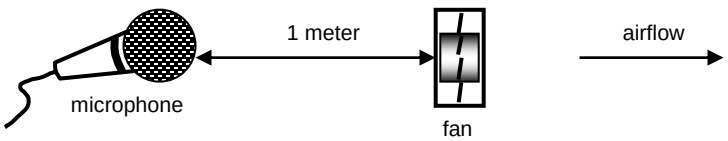
2-4 Rated Speed - Rated Speed shall be measured after 3 minutes for continuing rotation by rated voltage.

2-5 Locked Rotor Current：Locked current shall be measured within one minute of rotor locked, after 3 minutes by continuing rotation at rated voltage in clean air.

2-6 Air Flow & Static Pressure：The air flow data and static pressures should be determined in accordance with AMCA-210 standard or DIN24163 specification in chamber testing and record the test record.

2-7 Noise Level ：The measurement of noise level is carried out with reference to CNS8753 in an anechoic chamber with the microphone positioned 1 meter from the air intake. Testing fan shall be hung in clean air .

Noise Level Measure



SPECIFICATION

JARO MODEL: JDB0451012HA0A11(TEXPANA)-X(1856)

3-0 FAN FUNCTION DEFINITION

3-1 Rotation Direction - Counterclockwise from impeller side.

3-2 Lock Rotor Condition
No damage for winding or electronic in locked rotor condition. And no damage after 72hrs continuing for lock rotor condition.

3-3 Auto Restart
Fan will automatic restart without any abnormal usage.

3-4 Dead Angle
Switch the fan change from off to on condition. Restart the fan, it will automatic restart by fan power on.

3-5 Polarity
Check the voltage and polarity before turn on the power to the fan.

3-6 Insulation Resistance
Do not use < 10M ohm between housing and positive end of lead wire (red) at 500V DC.

3-7 Dielectric Strength
No damage should be found at 500 VAC for 60 seconds, measured with 1mA trip current between housing and positive end of lead wire.

4-0 FAN PACKAGE TEST

4-1 Free Drop Shock
Base on Jaro Thermal's standard package, the fan package will test and drops on any three faces - Test standard is 30cm height. The base is wood board for 10mm thick.

5-0 FAN ENVIRONMENTAL CONDITION

5-1 Operating Temperature / Humidity
-30℃ to +85℃ at humidity 65%+/-20% Relative humidity.
The range of -30 ~-0℃ is taken only as a guarantee of rated voltage . But speed ,Qmax ,noise ,vibration etc. are made into the outside of guarantee.
If the fan is stopped for some time, it may be unable to re-start operation due to icing or oil condensing.

- 5-2 Humidity
After 96 hours, 95% RH, 40+/-2℃ per MIL-STD-202F, method 103B humidity test, the measured data on insulation resistance and dielectric strength shall meet the specification.

5-3 Storage Temperature
All function shall be normal after 500 hours storage at -40℃ to +85 ℃ with a 24 hour recovery period at room temperature.

- 5-4 Do not store this fan in an environment with high humidity. This fan must be stored in accordance with the storage temperature. Do not store the fan for over 6 months; If this fan is stored for more than 6 months, JARO THERMAL recommends functional testing before using.

5-5 Improper way to disassembled fan will cause the fan get into dust or dip into water. Which will in defects is not covered in the warranty. Do not use the fan in the environment with corrosive air or liquid.

6-0 MASS PROUCTION SAMPLE PLAN INSPECTION

All fans shall meet the quality inspection under MIL-STD-105E standard list as follow:

Critical 0.25%

Major 1.00%

Minor 2.50%

7-0 FAN USAGE PRECAUTION

7-1 Please do not stick a grease and/or an oil to the fan housing or blade which may have a harmful influence by a chemical reaction at high humidity.

7-2 If the fan is reinstalled, please pay special attention to the noise due to the vibration (or resonance).

7-3 During the testing of the fan, please make sure the finger guard is use for your safety.

- 7-4 While the fan is running, please do not lock the fan intentionally for a long time. This will cause
- overheating by long period locking status. This action will damage the fan.

7-5 Please do not touch and push Fan Blade with fingers or others, fan blade and ball bearings may be damaged and it causes noise defect.

7-6 Do not carry the fan by its lead wires.

7-7 If the fan does not have the polarity protection function, the connection of the colored wires should be red + red, and black + black, or else the fan will be damaged in no time.

7-8 For the models without reverse connection of polarity protection, please do not connect the lead wire in reverse position.

7-9 Please don't install this fan in series with 2x voltage inputs. For example, if a single fan rated at 12V, then don't install two of them in series with 24V input.

7-10 Every specific fan is designed for its certain application (project). Therefore, if you want to use this fan in other application (project), please inform JARO first so that we can confirm whether there is any issue which might be incurred from the reason of this different application (project) or not.

7-11 The"Life Expectancy" of this fan has not been evaluated for use in combination with any end application. Therefore,the Life Expectancy in the Test Reports(L10 and MTTF Report) that relate to this fan is for reference only and shall not construe any kind of warranty of JARO to the life of any specific fan,either expressed or implied.

7-12 The period of product warranty,unless otherwise agreed by JARO in written,shall be 12 months staring from the date of production.

DIMENSION DRAWING

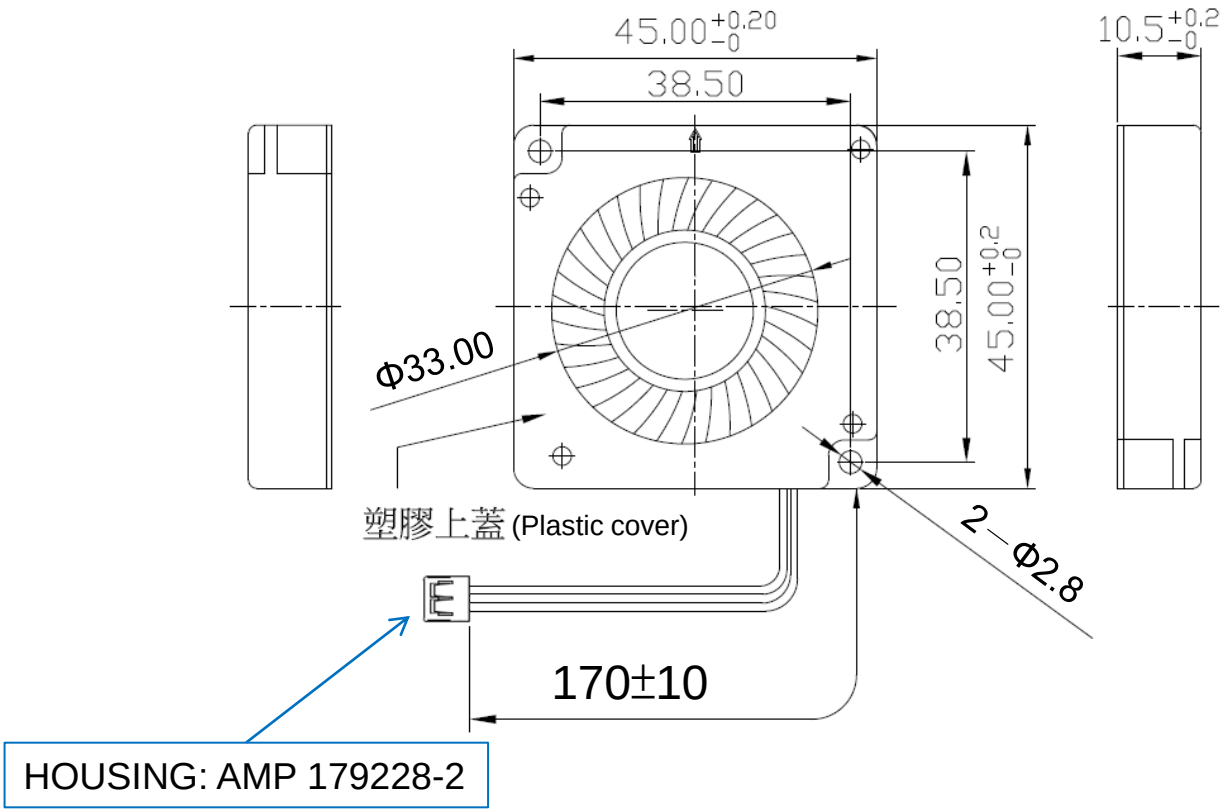
JARO MODEL: JDB0451012HA0A11(TEXPANA)-X(1856)

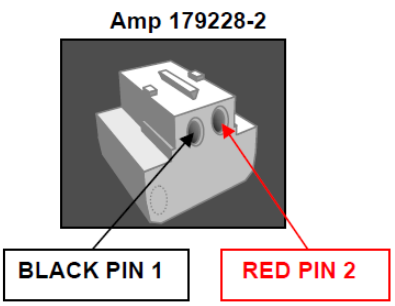
8-0 DIMENSIONS

All dimensions, Direction of rotation and air flow were specified as per drawing attached.

Description: DC Fan with:

Lead Wire ： UL3302 ， AWG#28 ，170 ±10 mm lead length





PIN 2 : RED WIRE (＋)
PIN 1 : BLACK WIRE (－)

DIAGRAM OF DIMENSIONS: Dimensions in millimeters
NOT TO SCALE. ALL COMPONENTS MUST BE ROHS COMPLIANT.

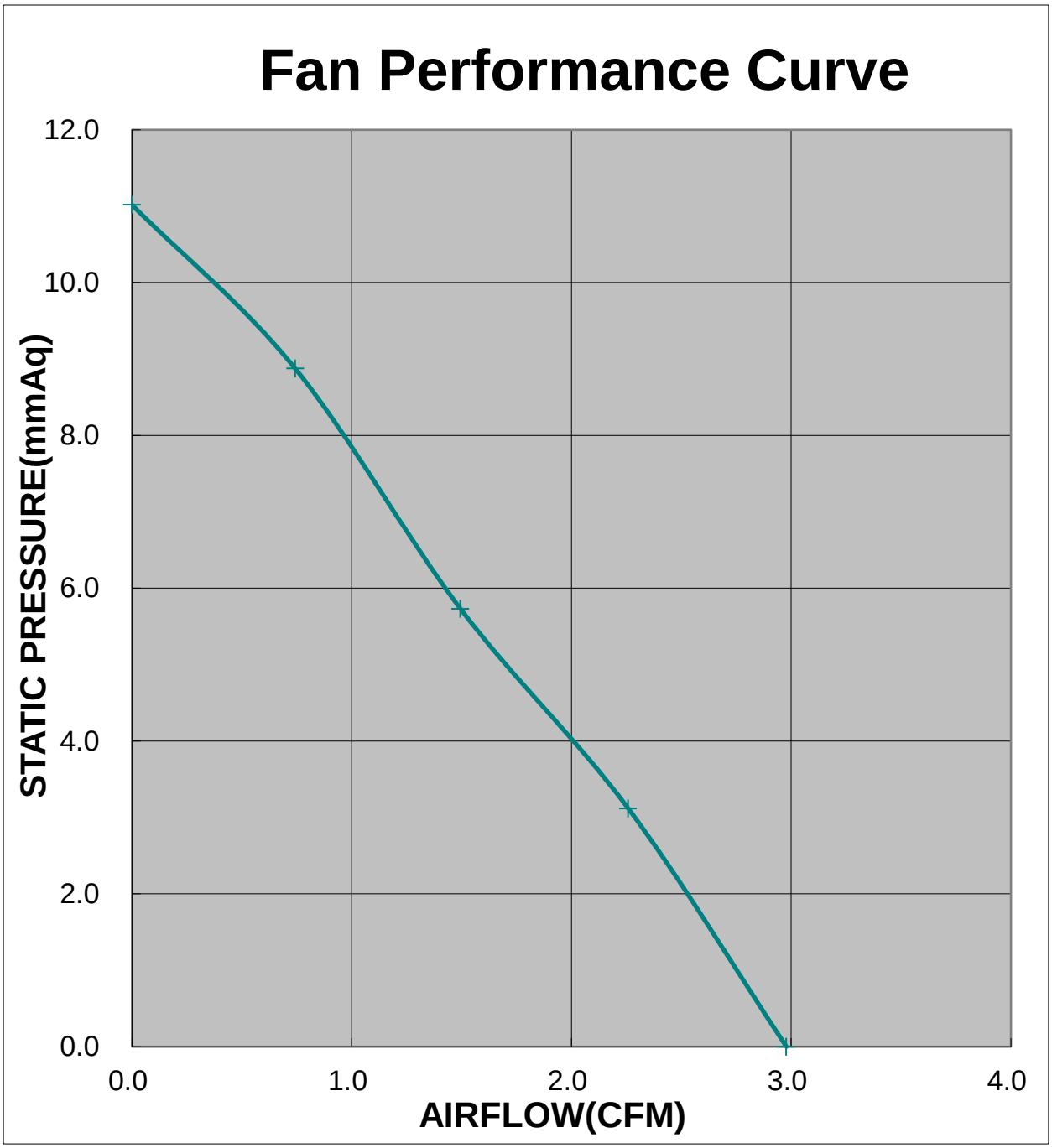
Drawing Note: N/A

Safety : CE

PERFORMANCE CURVE

JARO MODEL: JDB0451012HA0A11(TEXPANA)-X(1856)

9-0 Performance Curve



LIFE DATA

JARO MODEL: JDB0451012HA0A11(TEXPANA)-X(1856)

10-0 LIFE EXPENTANCY (Estimate)

故障定義
Product Specification & Faiure Definiton

1.風扇不轉 (Fan Not Work)

2.轉速超出規格30% (Speed Over 30% Origin)

3.電流超出規格30% (Current Over 30% Origin)

Description：

1.性能測試時點 The Time Of Check Point
Start： 0Hr, 500Hrs, 1000Hrs And Finshed

$$70℃\ \ MTTF = \frac{\text{Total test time (T)}}{\text{Total failure (r)}}$$

2.

GEM TABLE

Generalized Exponential Model (for Time-Terminated Test)

r	0	1	2	3	4	5
M	2.3026	3.8897	5.3223	6.6808	7.99364	9.2747
r	6	7	8	9	10	
M	10.5321	11.7709	12.9947	14.2060	15.4086	

試驗結果：包含故障時間、數據、統計、・・・等
Test Result：Including Time Of Failure、Datum、Statistics、... ect.

・溫度加速因子 TEMP A.F = $e^{(\Delta H/K)\times(\frac{1}{273+T1}-\frac{1}{273+Tn})}$

・總試驗時間 Total Test Time = 200000 HRS.

・查表得 (MTTF By GEM Table) MTTF = 86858 HRS.

・溫度 / TEMP. / MTTF / L10

溫度 TEMP.	信賴水準90% CONFIDENCE LEVEL	L10
30 ℃	1201625	126487
40 ℃	585046	61584
50 ℃	297829	31350
60 ℃	157890	16620
70 ℃	86858	9143

3.Herewith, we could assume as right on the basis of above test result. Besides, if the actual test time exceed the required, it comes out that those fans' L_{10} expectancy and MTTF are greater than the warrant.
MTTF: Mean Time To Failures. It should be used in a non-reqairable system setting. Now we show the MTTF in our life report, that's because we will not repair the failed fans during life experiment. MTBF: Mean Time Between Failures. It should be used in a repairable system setting. Basically, MTBF is equal to MTTF, they use same formula to work out a life data.