

# Product Data Sheets

Customer : \_\_\_\_\_

Part No. : \_\_\_\_\_

CoolerMaster Model No. : PC-08401-01-GP2

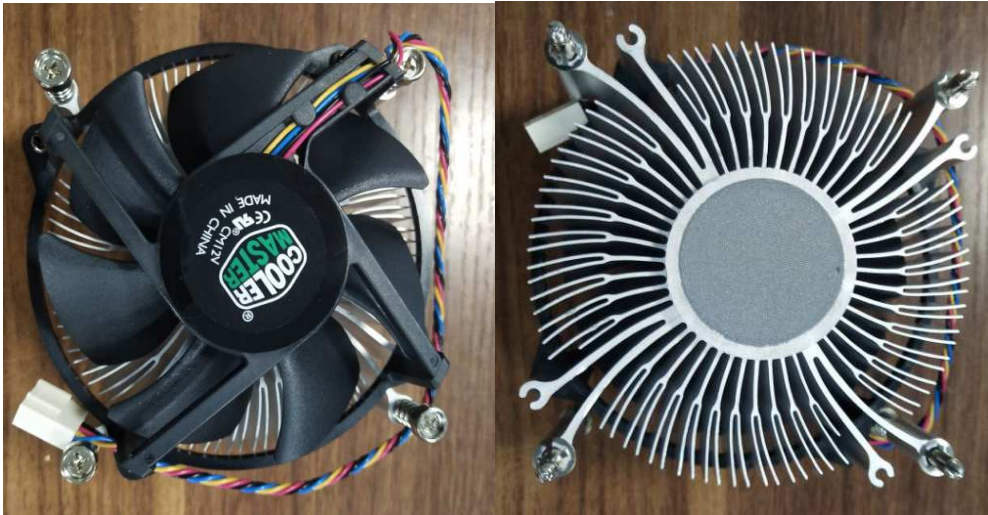
Edition: A1

Issued Date: 2022/04/21

Revision History :			
Date of Release	Revision No.	Description	
2022/04/21	A1	初版	
Customer		Cooler Master	
Approved by	Sales	Checked by	Drafted by
	Sylvia_Tai	Zhouhh	White_zhou
Date:	Date: 2022/04/21	Date: 2022/04/21	Date: 2022/04/21



## 2. Product photo



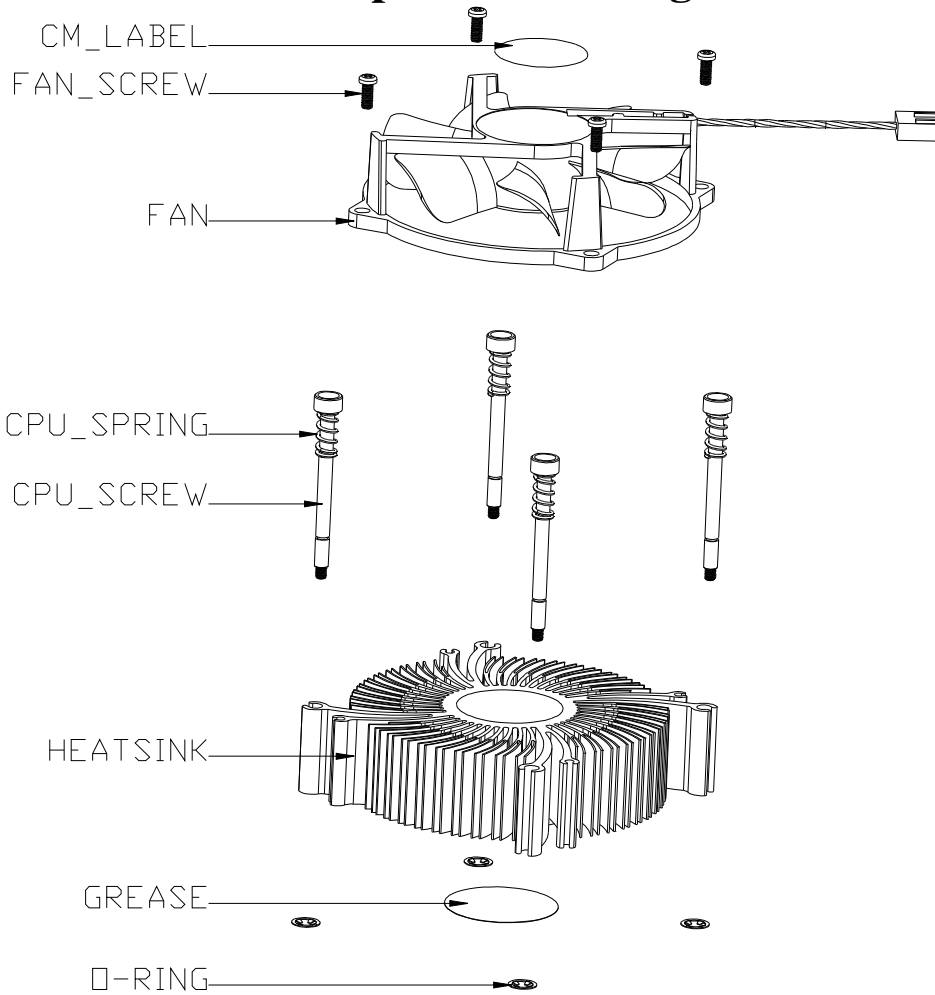
產品重量:0.368kg





## 4. Whole Set dimension

### 4.1 Exploded drawing



REV	DESCRIPTION	Section	Engineer	Checked	Date

2.54-4PIN-白色端子

FAN導線顏色針線在標型與彈簧線線之間的間隔內。

標型與彈簧線線之間的間隔內

2.54-4PIN端子

55.4±1

5±0.2

3.GREASE : X-23-7762  
厚度0.15~0.25mm

NOTE :

- 扣合壓力42±8磅;CPU高度7.03mm , 鉚柱凸出PCB=1.45mm
- 外觀按一般QA檢驗規範
- 風扇成品轉速:4500±15%RPM
- 標示 X 的為重點檢驗尺寸
- 料件需符合RoHS2.0 2015/863/EU 10項要求

序號	名稱	材質	數量	備注
8	CM_LABEL	25#消銀膠	1	O29mm
7	O-RING	SUS304	4	去油
6	SPRING	SWPB	4	鍍銀
5	CPU SCREW	AISI1018	4	鍍銀
4	FAN SCREW	AISI1018	4	鍍黑銀
3	GREASE	X-23-7762	0.25g	N.A
2	HEATSINK	AL6063-T5+CU100	1	抗氧化
1	FAN	PBT	1	731000120-GP2·臺灣

DRAWN	周興兵	TOL±	General tolerance:
DATE	2022.03.03	Range	Don't use the crossed items
ENGINEER	周興兵	0 ~ 10	0.1 0.1 0.15 0.2 0.3
DATE	2022.03.03	10 ~ 30	0.15 0.2 0.25 0.3 0.4
CHECKED	周慧華	30 ~ 50	0.2 0.3 0.35 0.4 0.6
DATE	2022.03.03	50 ~ 100	0.25 0.4 0.4 0.6 0.8
APPROVAL	周慧華	100 ~	0.3 0.5 0.6 0.8 1.0
DATE	2022.03.03	Angles	1° 2° 3° 5°
Scale	1/4	Sheet-unit	mm A4

	COOLER MASTER CO., LTD.
Part Name	
PC-07682-01-GP2	
File Name	
21R2166-2-COOLER-01-A1	

## 4.2 Cooler Assembly



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# 5. Component Drawing

## 5.1 HEAT SINK

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REV	DESCRIPTION	Section	Engineer	Checked	Date

熱塞圖

銅柱

技術要求:

一、鋁擠:

- 1.材質: AL 6063-T5,導電率53%以上
- 2.後處理: 洗白
- 3.硬度:68~75HV
- 4.尺寸標示處X為重點檢驗尺寸
- 5.理論單重:167g
- 6.外觀按一般QA檢驗規範
- 7.料件需符合RoHS2.0 2015/863/EU 10項要求

二、銅柱:

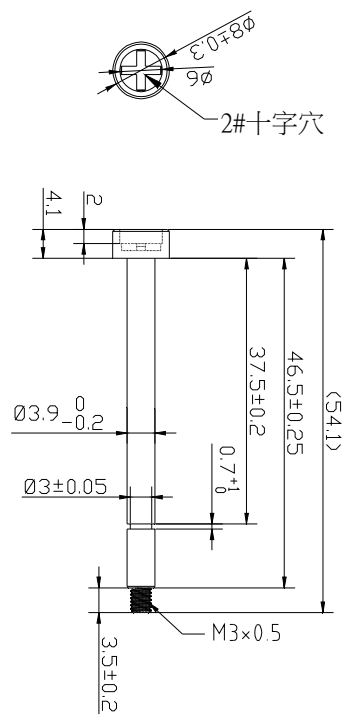
- 1.材質: CU1100
- 2.導電率需達95%以上
- 3.後處理: 抗氧化處理
- 4.尺寸標示X處為重點檢驗尺寸
- 5.理論單重:127g
- 6.外觀按一般QA檢驗規範
- 7.料件需符合RoHS2.0 2015/863/EU 10項要求
- 8.包裝方式依《物料包裝技術要求》,若不能達到請正式提報給採購&工程師,未收到回復視同供方認同此規範要求包裝方式依《物料包裝技術要求》,若不能達到請正式提報給採購&工程師,未收到回復視同供方認同此規範要求

DRAWN		TOL ±		General tolerance:		COOLER MASTER	COOLER MASTER CO., LTD.
周興兵	Range	Don't use the crossed items					
DATE	2021.11.03	0 - 10	0.1	0.1	0.15	0.2	0.3
ENGINEER	周興兵	10 - 30	0.15	0.2	0.25	0.3	0.4
DATE	2021.11.03	30 - 50	0.2	0.3	0.35	0.4	0.6
CHECKED	周慧華	50 - 100	0.25	0.4	0.4	0.6	0.8
DATE	2021.11.03	100 -	0.3	0.5	0.6	0.8	1.0
APPROVAL	周慧華	Angles	1°	2°	3°	3°	5°
DATE	2021.11.03	Scale	1:1	Sheet 2/8		mm	Size A4

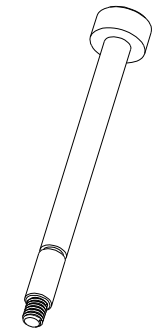
Part Name: HEATSINK  
File Name: 21R2166-1-H.S-01-A1

REV	DESCRIPTION	Section	Engineer	Checked	Date

A  
B  
C  
D



- 技术要求：
- 1.材質：AISI1018
  - 2.後處理：電鍍鎳,膜厚1.0um以上
  - 3.芯部硬度：280~360 Hv
  - 4.外部硬度：350~450 Hv
  - 5.破坏扭力測試需達18Kg f/mm
  - 6.鹽霧測試需達 8H
  - 7.未標注圓角之處為自然圓角R0.3
  - 8.標示符號 X 的為重點檢驗尺寸
  - 9.料件需符合RoHS2.0 2015/863/EU 10項要求
  - 10.外觀按一般QA檢驗規範
  - 11.包裝方式依《物料包裝技術要求》,若不能達到請正式提報給採購&工程師,未收到回復視同供方認同此規範要求



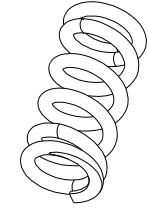
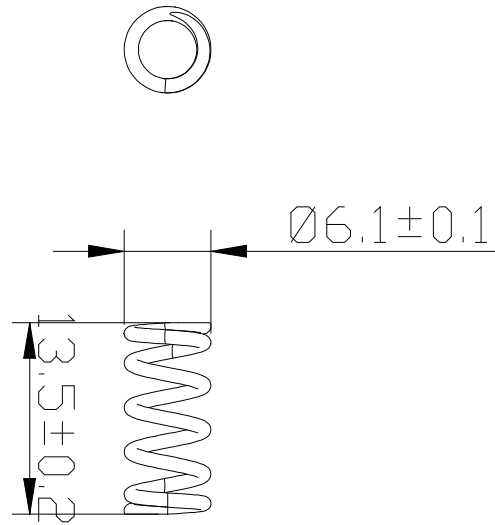
DRAWN 周興兵	TOL ± Range	General tolerance: Don't use the crossed items						COOLER MASTER CO., LTD.
DATE 2022.02.18	0 ~ 10	0.1	0.1	0.15	0.2	0.3		
ENGINEER 周興兵	10 ~ 30	0.15	0.2	0.25	0.3	0.4	Part Name CPU SCREW	
DATE 2022.02.18	30 ~ 50	0.2	0.3	0.35	0.4	0.6		
CHECKED 周慧華	50 ~ 100	0.25	0.4	0.4	0.6	0.8	File Name	
DATE 2022.02.18	100 ~	0.3	0.5	0.6	0.8	1.0		
APPROVAL 周慧華	Angles	1°	2°	3°	3°	5°	102211R075-SCREW-01-A1	
DATE 2022.02.18	Scale	Sheet 4/8		Unit mm	Size A4			

5.2 CPU SCREW



REV	DESCRIPTION	Section	Engineer	Checked	Date

A  
B  
C  
D



- NOTES :
- 1.材質:SWP-B
  - 2.線徑:1.0mm,
  - 3.旋向:左旋
  - 4.表處理:鍍鎳,膜厚1.0um以上
  - 5.有效圈數:4 ; 總圈數: 6
  - 6.兩端需磨平
  - 7.鹽霧測試需達8H以上
  - 8.K值 : 1.88±10%kgf/mm
  - 9.標示 X 的為重點檢驗尺寸
  - 10.理論單重 : 0.35g
  - 11.料件需符合RoHS2.0 2015/863/EU 10項要求
  - 12.外觀按一般QA檢驗規範
  - 13.包裝方式依《物料包裝技術要求》,若不能達到請正式提報給採購 & 工程師,未收到回復視同供方認同此規範要求

DRAWN 周興兵	TOL ±	General tolerance: Don't use the crossed items						COOLER MASTER CO., LTD.
DATE 2021.11.03	Range	0 ~ 10	0.1	0.1	0.15	0.2		
ENGINEER 周興兵		10 ~ 30	0.15	0.2	0.25	0.3	0.4	
DATE 2021.11.03		30 ~ 50	0.2	0.3	0.35	0.4	0.6	
CHECKED 周慧華		50 ~ 100	0.25	0.4	0.4	0.6	0.8	
DATE 2021.11.03		100 ~	0.3	0.5	0.6	0.8	1.0	
APPROVAL 周慧華	Angles	1°	2°	3°	3°	5°		
DATE 2021.11.03	Scale	Sheet	Unit	Size	Part Name			File Name
		5/8	mm	A4	SPRING			10203R019-SPRING-01-A1

2 1

5.3 SPRING



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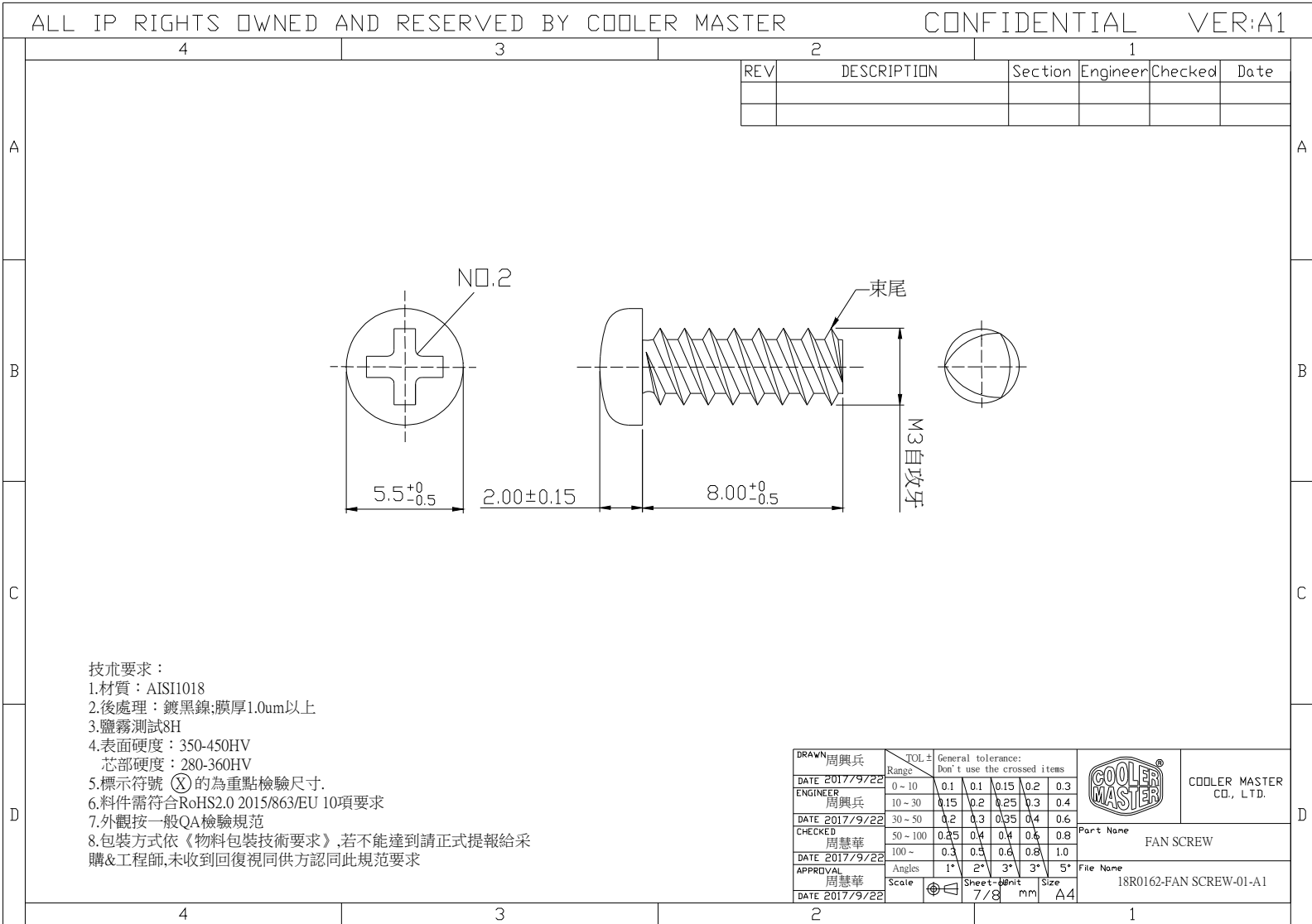
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5.4 FAN SCREW



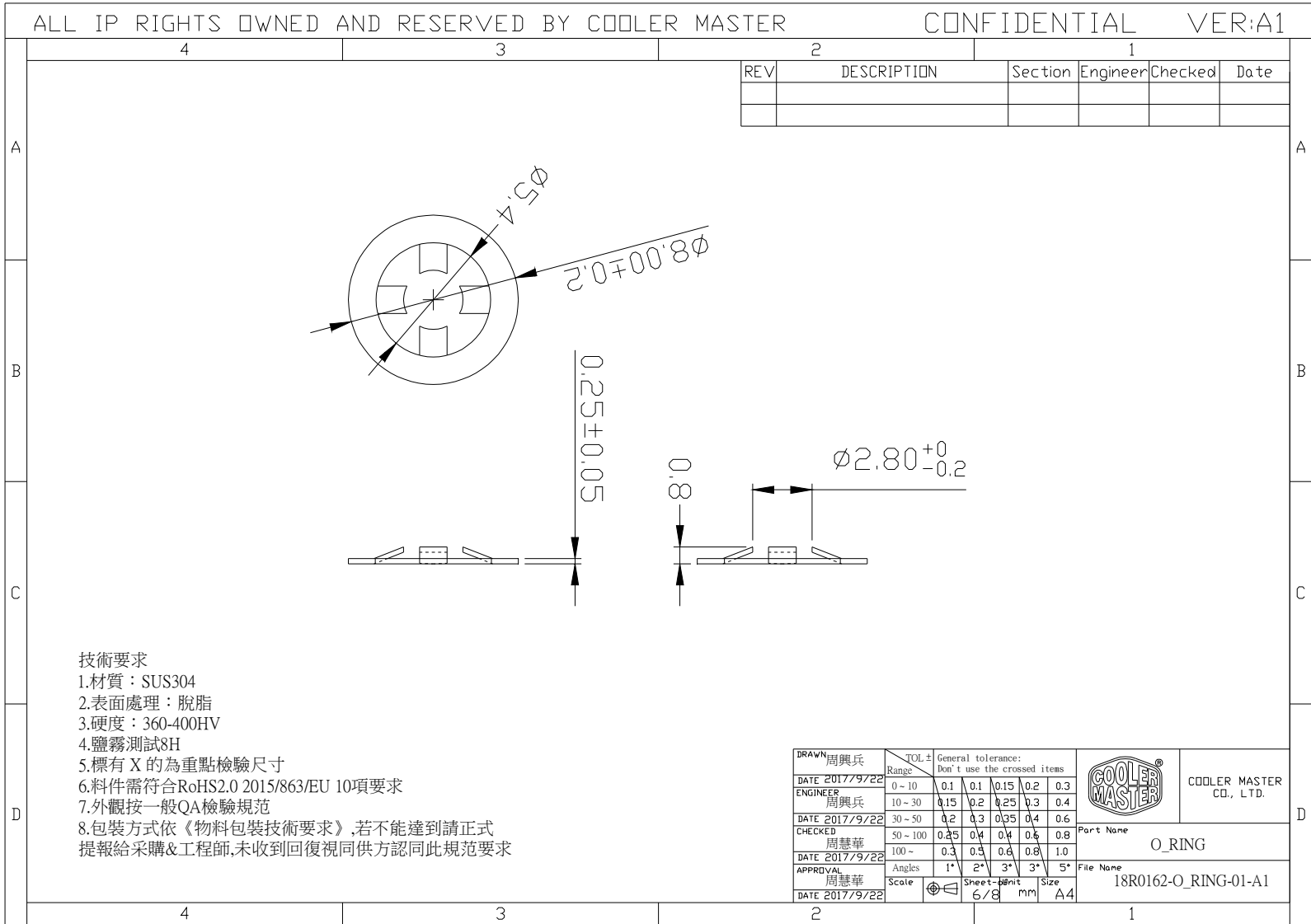




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5.5 O-RING





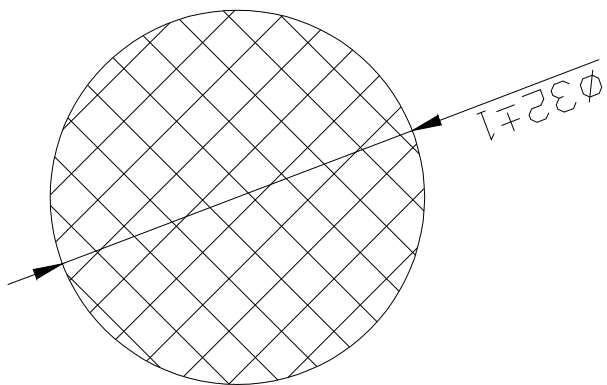
2		1			
REV	DESCRIPTION	Section	Engineer	Checked	Date

A

B

C

D



技术要求：

1.材質：X-23-7762

2.厚度:0.15~0.25mm

DRAWN 周興兵	TOL ± Range	General tolerance: Don't use the crossed items				
		0 - 10	0.1	0.15	0.2	0.3
DATE 2021.11.03	10 - 30	0.15	0.2	0.25	0.3	0.4
ENGINEER 周興兵	30 - 50	0.2	0.3	0.35	0.4	0.5
DATE 2021.11.03	50 - 100	0.25	0.4	0.4	0.5	0.6
CHECKED 周慧華	100 ~	0.3	0.5	0.6	0.8	1.0
DATE 2021.11.03	Angles	1°	2°	3°	3°	5°
APPROVAL 周慧華	Scale	Sheet 4/8		Unit mm	Size A4	
DATE 2021.11.03						



COOLER MASTER  
CO., LTD.

Part Name  
GREASE

File Name  
102211R075-GREASE-01-A1

### 5.7 Interface



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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: COOLER MASTER  
 -----  
 Description: DC FAN  
 -----  
 Customer P/N: 200007180-GP REV:  
 -----  
 Delta Model NO.: AFB0912VH-4E91 Delta Safety Model NO.:AFB0912VH  
 -----  
 Sample Rev: 07 Issue NO:  
 -----  
 Sample Issue Date: JUN-17-2022 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	7.0 - 12.5 VDC
INPUT CURRENT	0.40 (MAX. 0.60) A (SAFETY CURRENT 0.60A)
INPUT POWER	4.80 (MAX. 7.20) W
SPEED	4500±10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	1.634 (MIN. 1.471 ) M <sup>3</sup> /MIN. 57.70 (MIN. 51.93 ) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	8.60 (MIN. 6.97 ) mmH <sub>2</sub> O 0.338 (MIN. 0.274 ) inchH <sub>2</sub> O
ACOUSTICAL NOISE (AVG.)	47.5 (MAX. 51.5) dB-A
INSULATION TYPE	UL: CLASS A

(continued)

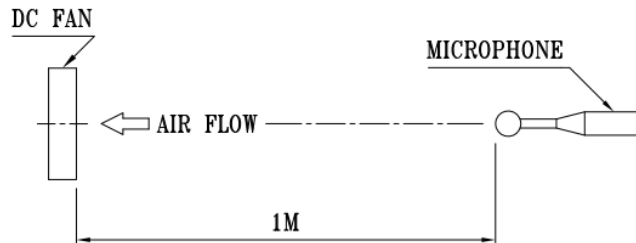


PART NO: 200007180-GP

DELTA MODEL: AFB0912VH-4E91

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)
EXTERNAL COVER	OPEN TYPE
LIFE EXPECTANCE	70,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM NAME PLATE SIDE
OVER CURRENT SHUT DOWN	THE CURRENT WILL SHUT DOWN WHEN LOCKING ROTOR
LEAD WIRE	UL 1061 -F- AWG #26 BLACK WIRE:NEGATIVE(-) RED WIRE:POSITIVE(+) YELLOW WIRE:TACHOMETER OUTPUT (FOO) BLUE WIRE:SPEED CONTROL (PWM)

- 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. 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: 200007180-GP  
-----

DELTA MODEL: AFB0912VH-4E91  
-----

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 ----- 90 GRAMS

4. ENVIRONMENTAL:

- 4-1. OPERATING TEMPERATURE ----- -10 TO +60 DEGREE C
- 4-2. STORAGE TEMPERATURE ----- -40 TO +70 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.

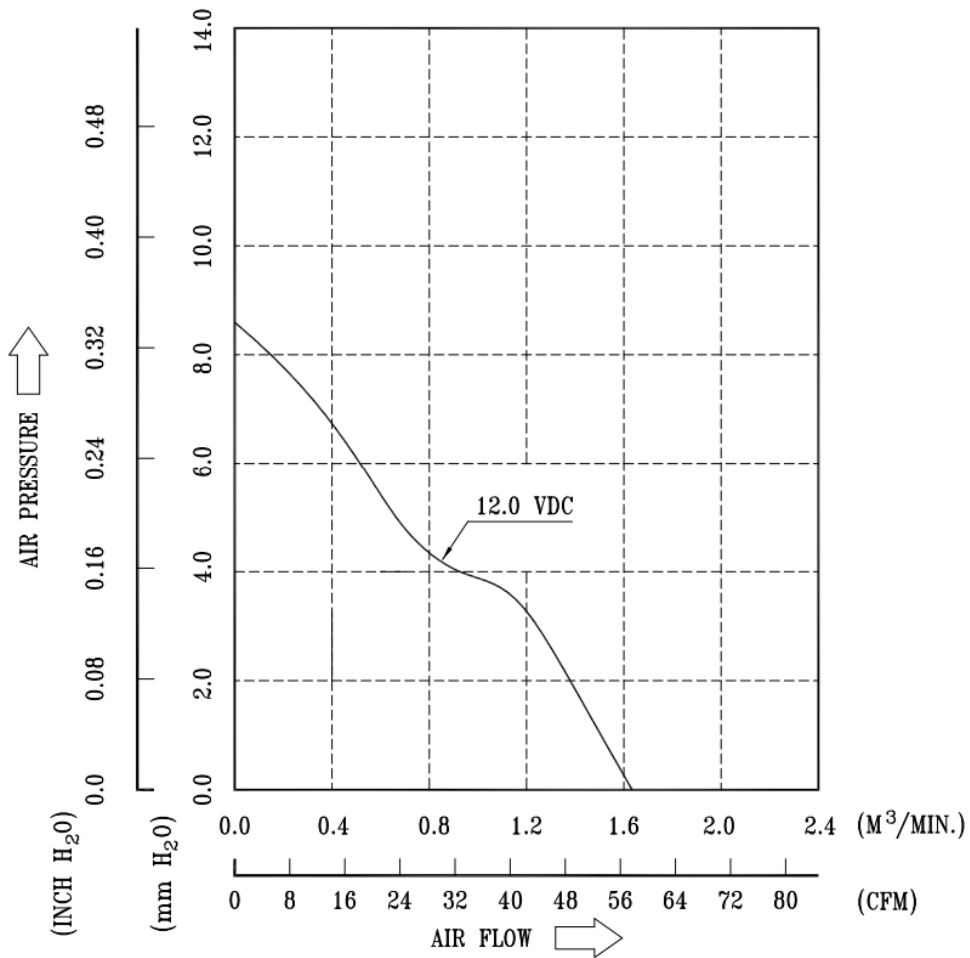
7. PRODUCTION LOCATION

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



PART NO: 200007180-GP  
DELTA MODEL: AFB0912VH-4E91

8. P & Q CURVE:



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



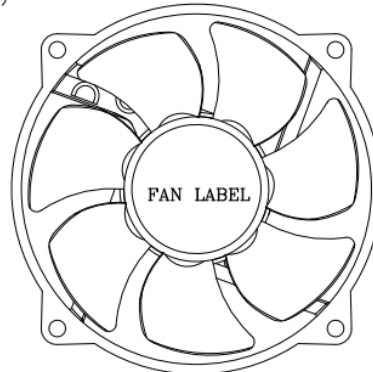
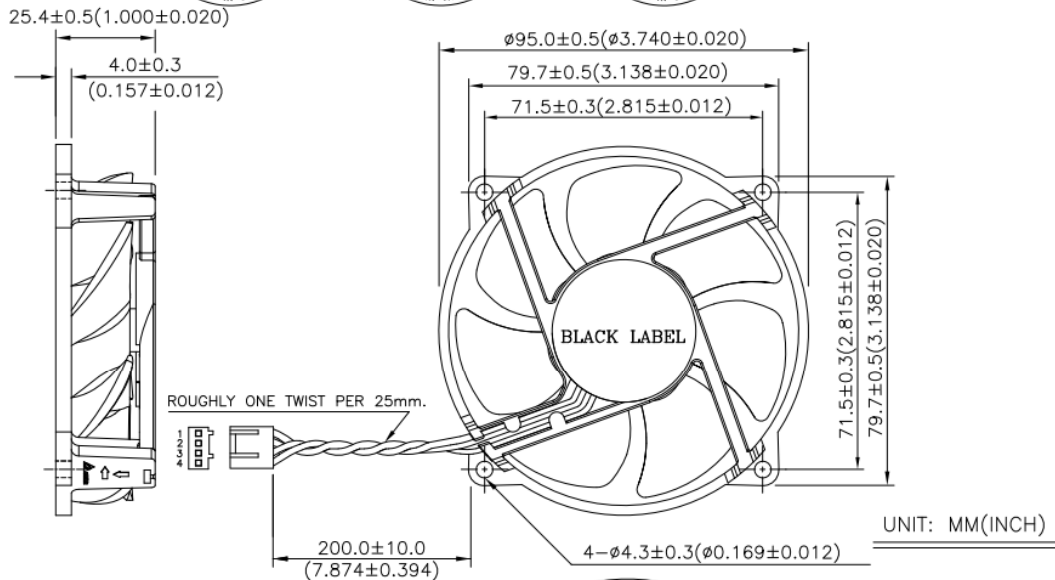


PART NO: 200007180-GP

DELTA MODEL: AFB0912VH-4E91

### 9. DIMENSION DRAWING:

LABEL:



1. UL 1061 -F- AWG #26  
 PIN 1 : BLACK WIRE: NEGATIVE(-)  
 PIN 2 : RED WIRE: POSITIVE(+)  
 PIN 3 : YELLOW WIRE: TACHOMETER OUTPUT (F00)  
 PIN 4 : BLUE WIRE: SPEED CONTROL (PWM)

2. HOUSING : CKM 25410108-04
3. TERMINAL : CKM 25410301
4. BALANCE MATERIAL : SUS FOIL
5. THIS PRODUCT IS RoHS COMPLIANT

A00

page: 5

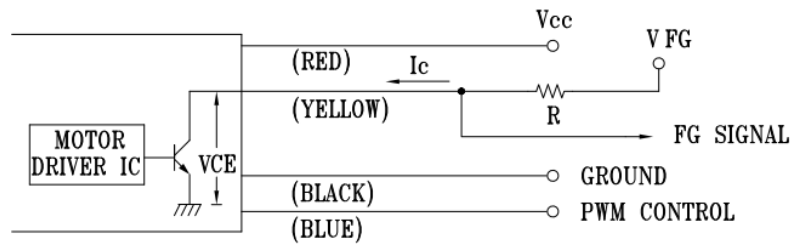


PART NO: 200007180-GP

DELTA MODEL: AFB0912VH-4E91

## 10. FREQUENCY GENERATOR (FG) SIGNAL:

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



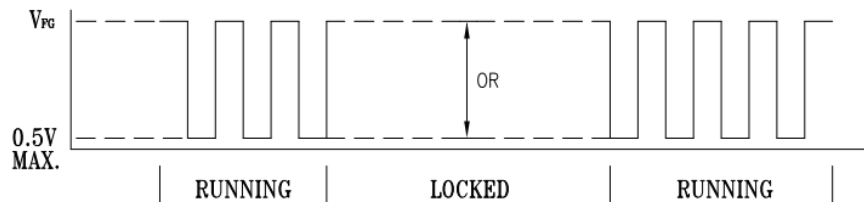
CAUTION: THE FG SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM "+" LEAD WIRE & "-" LEAD WIRE.

### 10-2. SPECIFICATION:

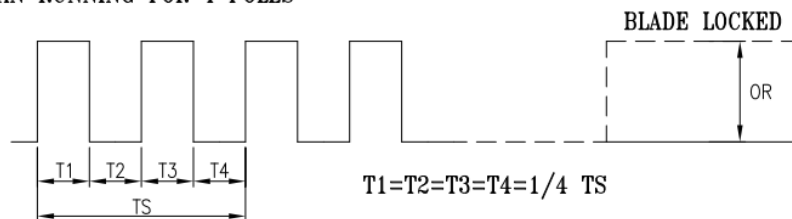
$V_{ce(sat)} = 0.5V$  MAX.  $V_{FG} = 5.0V$  TYP. ( $V_{cc}$  MAX.)

$I_c = 5mA$  MAX.  $R \geq V_{FG} / I_c$

### 10-3. FREQUENCY GENERATOR WAVEFORM:



### FAN RUNNING FOR 4 POLES



$N = R.P.M$

$TS = 60 / N (SEC)$

\*VOLTAGE LEVEL AFTER BLADE LOCKED

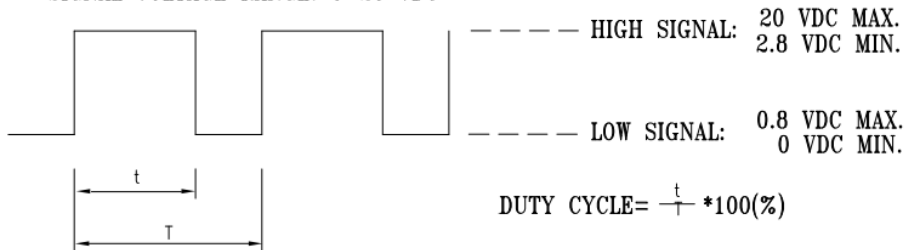
\*4 POLES



PART NO:	200007180-GP
DELTA MODEL:	AFB0912VH-4E91

### 11. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: 0~20 VDC



- THE PREFERRED OPERATING POINT FOR THE FAN IS 20K HZ.
- AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0% DUTY CYCLE, THE ROTOR WILL STOP SPIN.
- 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)

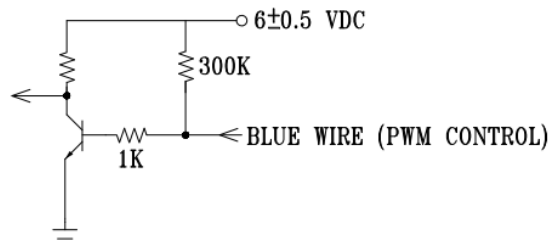
DUTY CYCLE (%)	SPEED R.P.M.	CURRENT (A) TYP.
100	4500±10%	0.40
75	3600±10%	0.22
50	2500±10%	0.10
25	1200±250	0.04
0	0	0.01

\* PWM SIGNAL  
PWM FREQUENCY = 20KHz



- MIN. START DUTY CYCLE : 30% (MAX.)  
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:





## 9. PERFORMANCE

<b>Cooler Master Co., Ltd.</b> www.coolermaster.com												
<b>Thermal Module Test Data Sheet ---Thermal Resistance Test Report</b>												
<b>Test Platform:</b> Intel 1700 TTV				<b>Test odd:</b> CMTC-A20220402-02								
<b>Testing Engineer:</b> wen				<b>Date:</b> 2022/4/2								
<b>Test Description:</b> 樣品效能測試												
<b>Heatsink/fan description</b>												
<b>1. Heatsink Change List</b>	Heatsink Rev.		Description & Change List									
	PC-05937		鋁擠									
	PC-05938		塞銅									
	PC-05963		高度降低									
<b>2. Heatsink Photo</b>												
<b>3. Test condition</b>	<b>Heatsink Vendor</b>		CoolerMaster									
	<b>Clip Force (lbf)</b>		35									
	<b>CPU</b>		Intel 1700 TTV									
	<b>Mainboard Model</b>		***									
	<b>Test environment</b>		open system									
	<b>Ambient Temp (°C)</b>		25°C									
	<b>Ambient Humidity (RH)</b>		60%									
	<b>Fan</b>		12V Fan									
<b>Heatsink grease</b>		ShinEtsu 7762										
<b>Test Result</b>												
<b>Item</b>	<b>T<sub>C</sub>(°C)</b>	<b>T<sub>a</sub> (°C)</b>	<b>Current1 (A)</b>	<b>Real Voltage1(V)</b>	<b>Current2 (A)</b>	<b>Real Voltage2(V)</b>	<b>Power<sub>w</sub></b>	<b>R<sub>ca(t/w)</sub></b>	<b>Ta1 (°C)</b>	<b>Ta2 (°C)</b>	<b>Ta3 (°C)</b>	<b>Ta4 (°C)</b>
PC-07682-01-GP2	44.41	24.91	1.23	26.45	1.21	26.76	64.913	0.3005	24.97	24.81	24.99	24.85
<b>Comments</b>												
<b>Mean:</b>												
<b>Max:</b>												
<b>Min:</b>												
<b>Range:</b>												
<b>Standard Dev:</b>												
<b>Testing Conclusion</b>												



## 10. FORCE TEST

1. CPU loading force: 42lbF±8

2. Test Result:

NO	TEST Result(lbF)
1	44.06
2	42.94
3	41.74

3. Test picture:

