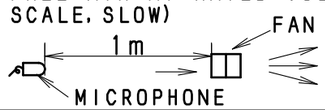
SPECIFICATIONS

THESE SPECIFICATIONS ARE DEFINED FOR MODEL:V80E12BS2NB5-07AA5
OF THE DC BRUSHLESS VANE AXIAL FAN.

1. MECHANICAL SPECIFICATIONS
   - 1-1 EXTERNAL DIMENSIONS :REFER TO DWG No. F982842500A (0A)
   - 1-2 HOUSING UPPER MATERIAL :PLASTIC (UL V-0)
     HOUSING LOWER MATERIAL :PLASTIC (UL V-0)
     IMPELLER MATERIAL :PLASTIC (UL V-0)
   - 1-3 BEARING :TWO BALL BEARINGS
   - 1-4 MASS :ABOUT 240g

2. ELECTRICAL SPECIFICATIONS

No	ITEMS	STANDARD	REMARKS
2-1	RATED VOLTAGE	12 VDC	
2-2	OPERATING RANGE	10.8~13.2VDC	(NOTE 4)
2-3	CONSUMING CURRENT	MAX. 6.07A 5.52 A(NOMINAL)	IN FREE AIR AT RATED VOLTAGE (NOTE 5)
2-4	CONSUMING POWER	MAX. 72.8 W 66.2 W(NOMINAL)	IN FREE AIR AT RATED VOLTAGE
2-5	RATED SPEED	MIN. 14850 min^{-1} 16500min^{-1}(NOMINAL) MAX. 18150 min^{-1}	IN FREE AIR AT RATED VOLTAGE INLET SIDE AND OUTLET SIDE (NOTE 3)
2-6	MAX. AIRFLOW	MIN. 3.53 m^3/min (124.6CFM) 4.13 m^3/min (145.8CFM) (NOMINAL)	AT RATED VOLTAGE AT ZERO STATIC PRESSURE (NOTE 3)
2-7	MAX. STATIC PRESSURE	MIN. 1067 Pa (4.28 inch-H2O) 1387 Pa (5.57 inch-H2O) (NOMINAL)	AT RATED VOLTAGE AT ZERO AIRFLOW (NOTE 3)
2-8	SOUND LEVEL	MAX. 76.5 dB(A) 72.0 dB(A) (NOMINAL)	IN FREE AIR AT RATED VOLTAGE (A SCALE, SLOW)  (NOTE 3)
2-9	OPERATING TEMPERATURE	-10℃~70℃ (NORMAL HUMIDITY)	
2-10	STORAGE TEMPERATURE	-40℃~70℃ (NORMAL HUMIDITY)	STANDARDS FOR ITEMS 2-3~2-8 SHOULD BE MET WHEN MEASURED AFTER HAVING SAT FOR 24 HOURS AT ROOM TEMPERATURE FOR FANS SUBJECTED TO SPECIFIED TEMPERATURE RANGE FOR 100 HOURS.
2-11	DIRECTION OF ROTATION	CLOCKWISE FROM LABEL SIDE	
2-12	DIRECTION OF AIRFLOW	LABEL SIDE DISCHARGE	
2-13	INSULATION RESISTANCE	MIN. 10 Mega Ohm	AT 500 VDC BETWEEN FRAME AND LEAD WIRES
2-14	DIELECTRIC STRENGTH	MUST WITHSTAND 500VAC 1min	MAX. 1mA BETWEEN FRAME AND LEAD WIRES (USUALLY INSPECT AT 600V AC, 1sec, 1mA)
2-15	PROTECTION	CURRENT LIMIT PROTECTION	(NOTE 2)
		REVERSE POLARITY PROTECTION	(NOTE 6)
		INRUSH CURRENT LIMIT PROTECTION	

REV			
	ISSUE	0A	Fig. 1
	ECO No.		
	APPROVED	T.TAKAOKA	2020-11-04
	DESIGNED	M. YAMADA	2020-11-03
APPROVED		S2. YAMAZAKI	2020-04-23
CHECKED		S2. YAMAZAKI	2020-04-23
DESIGNED		M2. YAMADA	2020-04-22
DRAWN		H. ISOZAKI	2020-04-22

No.	PART No.	PART NAME	NOTE	Q'ty	UNIT	MARKS/MTL

TOLERANCE
UNLESS OTHERWISE SPECIFIED
LINEAR
~ :±
~ :±
~ :±
ANGULAR :±
CORNER
OUTSIDE:C
INSIDE :R

TREAT.
FINISH
UNIT mm
SCALE M
A3

MTL.	
MODEL	V80E12BS2NB5-07AA5
PARTS	DC Fan DC Fan
DWG.	Specification of DC Fan Specification of DC Fan
DWG. No.	F982842600A

NOTE1: THE ABOVE STANDARD SHOULD BE THE SPECIFIED VALUE AT NORMAL TEMPERATURE(23℃) AND NORMAL HUMIDITY (60~65%) UNLESS OTHERWISE NOTICE.

NOTE2: IN THE CASE THAT POWER IS TURNED ON DURING FAN ROTOR IS LOCKED, THE FAN SHALL ATTEMPT TO RESTART AT A TYPICAL REPETITION RATE (TEMPERATURE RISE WILL BE PREVENTED).
THE FAN WILL AUTOMATICALLY RESTART WHEN THE LOCKED ROTOR CONDITION IS RELEASED.

NOTE3: PWM CONTROL(BLUE LEAD WIRE) SHOULD BE APPLIED 2.6 TO 6.0V, OR SHOULD BE OPEN.

NOTE4: 10.8V~13.2V OPERATING VOLTAGE RANGE IS FOR CONTINUOUS DC VOLTAGE. POWER SUPPLY VOLTAGE RIPPLE 5% MAXIMUM.

NOTE5: THE MAX VALUE OF CONSUMING CURRENT DOES NOT REPRESENT THE PEAK VALUE.

NOTE6: POWER SUPPLY VOLTAGE MUST NOT BE APPLIED BETWEEN SIGNAL OUTPUT LINE AND ANY OTHER LINE DIRECTLY. REVERSE POLARITY PROTECTION IS EFFECTIVE TO JUST SWITCH THE POSITIVE AND NEGATIVE POWER LINE.

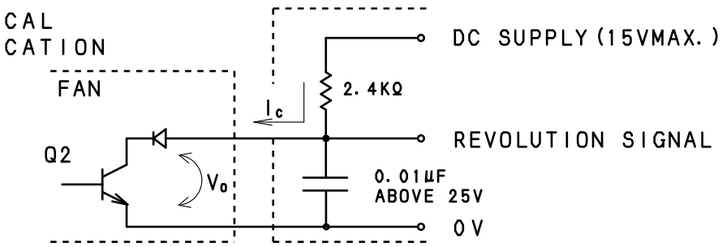
NOTE7: CLOSED LOOP CONTROL.

3. PROVISION OF REVOLUTION SIGNAL

3-1 OUTPUT OF REVOLUTION SIGNAL

·OUTPUT TYPE OPEN COLLECTOR TYPE

·ELECTRICAL SPECIFICATION



REMARK: As for measuring Vol, it is necessary to put CR Low Pass Filter which is contructed of R1 and C1. The time constant of R1 × C1 is to be more than 24us such as R1=2.4kΩ C1=10000pF.

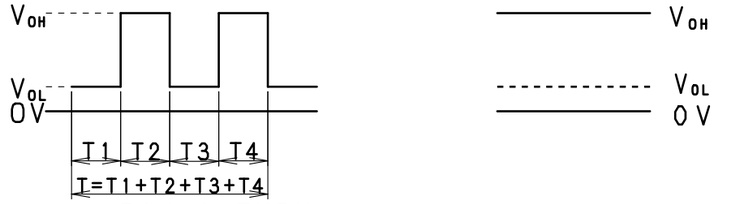
ABSOLUTE MAXIMUM SPECIFICATION

COLLECTOR CURRENT	I_C =5mA MAX.
RELEASE VOLTAGE	V_{OH} =15V MAX.

ELECTRICAL CHARACTERISTICS

SATURATION VOLTAGE AT I_C= 5mA	V_{OL} =0.8V MAX.

OUTPUT WAVEFORM



REMARK: AT LOCKED POSITION, OUTPUT BECOMES V_{OH} OR V_{OL}.

$T=T_1+T_2+T_3+T_4=60/N$ (SEC)

N:FAN SPEED(min^{-1})

$DUTY=\frac{T_1}{T_1+T_2}=50\pm10\%$

3-2 ⚠1 CAUTION

PLEASE BE CAREFUL THAT REVOLUTION SIGNAL LEAD WIRE (YELLOW) SHALL NOT HAVE ANY VOLTAGE DIRECTLY APPLIED. (IT SHOULD DAMAGE INNER CIRCUIT.)

REV			
ISSUE	0A	Fig.	0
ECO No.			
APPROVED	T.TAKAOKA	2020-11-04	
DESIGNED	M.YAMADA	2020-11-03	
APPROVED	S2.YAMAZAKI	2020-04-23	
CHECKED	S2.YAMAZAKI	2020-04-23	
DESIGNED	M2.YAMADA	2020-04-22	
DRAWN	H.ISOZAKI	2020-04-22	

No.	PART No.	PART NAME	NOTE	Q'ty	UNIT	MARKS/MTL

TOLERANCE UNLESS OTHERWISE SPECIFIED
LINEAR ~ :± ~ :± ~ :±
ANGULAR :±
CORNER OUTSIDE:C INSIDE :R

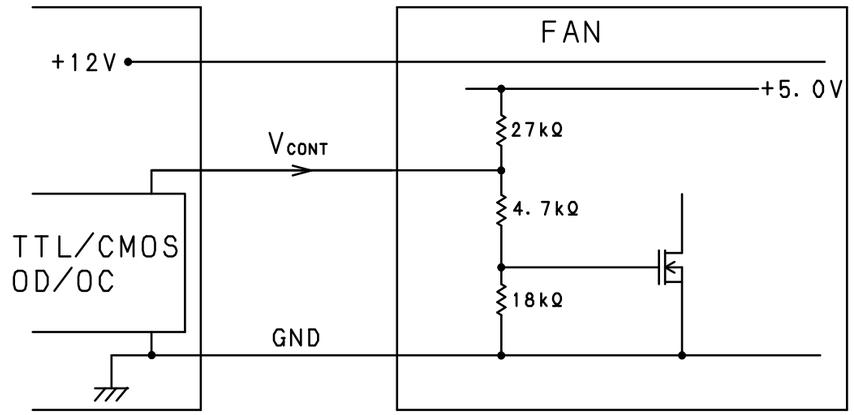
TREAT. FINISH

MTL.
MODEL V80E12BS2NB5-07AA5
PARTS DC Fan DC Fan
UNIT mm SCALE ⋈ A3
DWG. Specification of DC Fan Specification of DC Fan
DWG. No. F98284260 0A

4. PWM CONTROL

4-1 TYPE

THE METHOD OF ACTIVE/INACTIVE DRIVE MOSFET FOR SPEED CONTROL.



※OD/OC:OPEN DRAIN/OPEN COLLECTOR

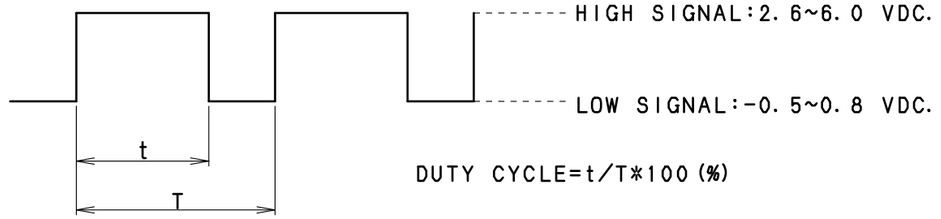
V_{CONT} IS ABOVE 2.6V·····FAN SHOULD RUN FULL SPEED.
V_{CONT} IS BELOW 0.8V·····FAN SHOULD RUN LOW SPEED.

THE WIRE OF V_{CONT} IS OPEN···FAN SHOULD RUN FULL SPEED.

CONTROL SIGNAL SHOULD ACCEPT PWM CONTROL,
PWM FREQUENCY IS FROM 20kHz TO 30kHz.

4-2 PWM CONTROL SIGNAL

SIGNAL VOLTAGE RANGE: -0.5~6.0VDC



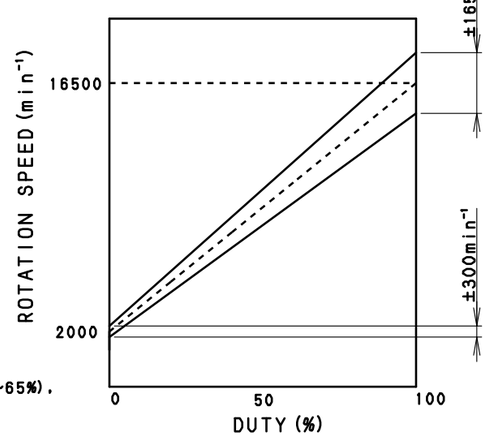
THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT AT 20kHz-30kHz.
THE PREFERRED HIGH SIGNAL IS 3.3 VDC TTL OR CMOS LEVEL.

AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT FULL SPEED.
IF THE PWM CONTROL WIRE OPEN, THE ROTOR WILL SPIN AT FULL SPEED.

4-3 SPEED VS PWM CONTROL SIGNAL, AT RATED VOLTAGE

DUTY CYCLE(POSITIVE) (%)	SPEED min^{-1}
0	2000±500
100	16500±1650

(AT NORMAL TEMPERATURE(23℃), NORMAL HUMIDITY(60~65%), FREE AIR AND 12V 25kHz)



DUTY VS SPEED

DETAIL OF PWM CURVE(AT 0~100%)

REV					
	ISSUE	0A	Fig.	0	
	ECO No.				
	APPROVED	T.TAKAOKA		2020-11-04	
	DESIGNED	M.YAMADA		2020-11-03	
	APPROVED	S2.YAMAZAKI		2020-04-23	
	CHECKED	S2.YAMAZAKI		2020-04-23	
	DESIGNED	M2.YAMADA		2020-04-22	
	DRAWN	H.ISOZAKI		2020-04-22	

No.	PART No.	PART NAME	NOTE	Q'ty	UNIT	MARKS/MTL

TOLERANCE
UNLESS OTHERWISE SPECIFIED
LINEAR
~ :±
~ :±
~ :±
ANGULAR :±
CORNER
OUTSIDE:C
INSIDE :R

TREAT.
FINISH
UNIT mm
SCALE ⋈
A3

MTL.	
MODEL	V80E12BS2NB5-07AA5
PARTS	DC Fan DC Fan
DWG.	Specification of DC Fan Specification of DC Fan
DWG. No.	F98284260 0A

5. SPECIAL TEST

5-1 LIFE EXPECTANCY

MORE THAN 90% MUST RUN AFTER CONTINUOUS OPERATION OF 70,000 HOURS AT RATED VOLTAGE, 40℃ AMBIENT TEMPERATURE AND 65% RELATIVE HUMIDITY.
LIFE IS DEFINED WHEN THE MOTOR SPEED DECREASES MORE THAN 30% AGAINST ITS INITIAL SPEED.

5-2 VIBRATION TEST

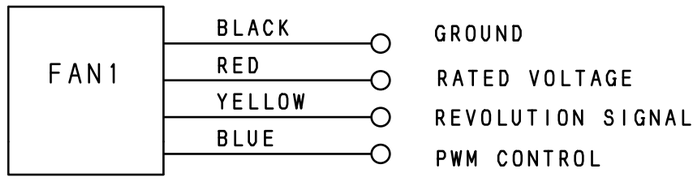
STANDARDS FOR ITEMS 2-3~2-8 AND 6-2 SHOULD BE MET AFTER 30 MINUTES 0.2mm AMPLITUDE, 55Hz VIBRATION IN EACH DIRECTION: UP-DOWN, RIGHT-LEFT, FORWARD-BACK.

5-3 SHOCK TEST

STANDARDS FOR ITEMS 2-3~2-8 AND 6-2 SHOULD BE MET IF THE FANS FALL NATURALLY FROM A HEIGHT OF 30cm IN THE PACKING BOX FOR EACH DIRECTION.

6. OTHERS

6-1 CONNECTION



6-2 LOCKED ROTOR

NO DAMAGE SHALL BE FOUND FOR CONTINUOUS 1 HOUR AT LOCKED ROTOR.

6-3 ⚠ CAUTIONS IN INSTALLATION OF FAN MOTORS

PLEASE CONSIDER SYSTEM LAYOUT NOT TO PLACE ANY OBSTACLES WITHIN 3mm FROM THE FAN HOUSING EDGE OF INLET SIDE(IMPELLER SIDE).

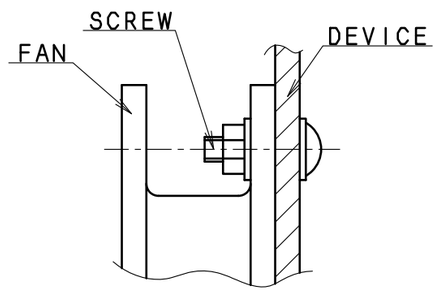
IN CASE OF SCREWING THE FAN HOUSING, FLATNESS OF INSTALLATION SURFACE SHOULD BE MAX. 0.1, OTHERWISE THE HOUSING MAY TRANSFORM AND INTERFERE WITH THE IMPELLER.

THE FAN SHOULD NOT GET ANY IMPACT OR VIBRATION DURING ROTATION. WHEN VIBRATION OR IMPACT IS APPLIED TO THE FAN DURING ROTATION, THE FAN MAY BREAK BY INTERFERING WITH OBSTACLE IN THE SYSTEM.

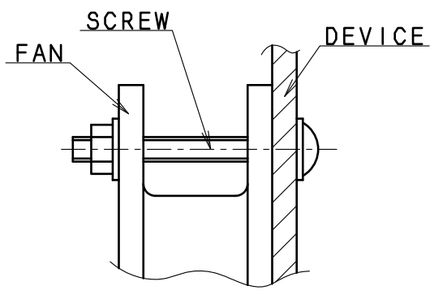
PLEASE FIX THE FAN IN THE SYSTEM SO THAT IT WILL NOT RATTLE. VIBRATION OF THE FAN MAY CAUSE CONTACT BETWEEN THE FAN AND THE SYSTEM, WHICH WILL GENERATE NOISE.

PLEASE DO NOT PLACE ANY OBSTACLE NEAR OUTLET AND INLET SIDE OF THE FAN.
THIS MODEL IS DESIGNED TO BE INSTALLED AS THE SCREW IN FLANGE ONE SIDE(REFER TO FIGURE(a)). IN CASE OF INSTALLATIONS AS THE SCREW THROUGH BOTH FLANGES(REFER TO FIGURE(b)), IT MAY CAUSE DAMAGES ON THE HOUSING AND/OR INTERFERENCE BETWEEN THE IMPELLER AND THE HOUSING BECAUSE OF THE HOUSING DEFORM.
PLACING OBSTACLES NEAR THE FAN MAY DETERIORATE AIR FLOW. IT MAY CAUSE COOLING PERFORMANCE REDUCTION AS WELL AS FAN MOTOR LIFE DETERIORATION DUE TO HEAVY LOAD ON THE BEARINGS.

FOR ANY USAGE THAT DOES NOT MEET ABOVE CONDITIONS, PLEASE EVALUATE AT USER'S SIDE OR CONSULT WITH US.



(a)



(b)

REV				No.	PART No.	PART NAME	NOTE	Q'ty	UNIT	MARKS/MTL
	ISSUE	0A	Fig. 0	TOLERANCE UNLESS OTHERWISE SPECIFIED						
	ECO No.			LINEAR					TREAT.	MTL.
	APPROVED	T.TAKAOKA	2020-11-04	~ :±						MODEL V80E12BS2NB5-07AA5
	DESIGNED	M. YAMADA	2020-11-03	~ :±					FINISH	PARTS DC Fan / DC Fan
APPROVED		S2. YAMAZAKI	2020-04-23	~ :±						
CHECKED		S2. YAMAZAKI	2020-04-23	ANGULAR :±					UNIT mm SCALE ⋈ A3	DWG. Specification of DC Fan / Specification of DC Fan
DESIGNED		M2. YAMADA	2020-04-22	CORNER OUTSIDE:C INSIDE :R					DWG. No.	F9828426 00A
DRAWN		H. ISOZAKI	2020-04-22							4 OF 5 SHEETS

6-4 ⚠ USAGE OF FAN MOTOR

PLEASE DO NOT PUT RESISTORS OR OTHER ELECTRONIC COMPONENTS ON THE EXTENTION OF THE FAN MOTOR LEAD WIRES FOR THE PURPOSE OF FAN MOTOR SPEED REDUCTION.
IT MAY MAKE THE VOLTAGE TO THE FAN FLUCTUATE AND BECOME LOWER THAN LOWER LIMIT OF OPERATING VOLTAGE RANGE. IN THIS CASE, THERE MAY BE SUCH FAILURES LIKE NO START OR UNSTABLE ROTATION OF FAN MOTOR.

6-5 ⚠ EARTH·ELECTROSTATIC PROTECTION

ELECTRIFICATION AND LEAKAGE CAN CAUSE MOTOR CIRCUIT OR SEMICONDUCTOR FAILURE.
PROPER GROUNDING IS REQUIRED FOR SOLDERING IRON AND CONVEYER BELT DURING MOTOR TERMINAL OR LEAD WIRE SOLDERING TO MECHANISM OR SET. (±200V OR LESS)

7 SPECIAL ITEMS

7-1 SPECIFICATION CHANGE
ANY CHANGE TO THE PARAMETERS SPECIFIED IN THIS DOCUMENT SHALL BE DETERMINED BY MUTUAL AGREEMENT ON BOTH PARTIES.

7-2 UNCERTAINTY
IN THE EVENT THAT A QUESTION MAY ARISE ABOUT THIS DOCUMENT OR AN AREA NOT SPECIFIED IN THIS DOCUMENT, BOTH PARTIES SHALL DISCUSS AND DETERMINE A SOLUTION IN GOOD FAITH.

7-3 WARRANTY
OUR WARRANTY IS LIMITED TO THE REPLACEMENT OF FAILED FAN AT FREE OF CHARGE, IF AND ONLY IF THE FAILURE IS FOUND WITHIN TWO YEARS AFTER IT WAS SHIPPED OUT FROM OUR PRODUCTION FACILITY, AND IF THE CAUSE OF THE FAILURE IS PROVEN TO BE ATTRIBUTABLE TO THE SUPPLIER.
OUR LIABILITY DOES NOT EXTEND TO THE CONSEQUENTIAL DAMAGES CAUSED BY THE FAILED FAN.

7-4 PRODUCTION LOCATION
NIDEC (DONGGUAN) LIMITED :CHINA (DONGGUAN)
OR
NIDEC (SHAOGUAN) LIMITED :CHINA (SHAOGUAN)
OR
NIDEC VIETNAM CORPORATION :VIETNAM (HO CHI MINH CITY)
IN CASE OF PRODUCTION FACTORY CHANGE, WE SHALL GET APPROVAL FROM CUSTOMERS BEFOREHAND.

7-5 NOTE
PLEASE CONSIDER HAVING AN INDEPENDENT PROTECTION SYSTEM IN THE CUSTOMER'S INSTRUMENTS IN THE EVENT THAT THE FAN SHOULD STOP OPERATING.

7-6 POWER SOURCE
BRUSHLESS DC FANS ARE DESIGNED TO BE USED AT DC POWER SOURCE WITH BYPASS CAPACITOR. WE WOULD RECOMMEND YOU TO USE DC POWER SOURCE WHICH IS FILTERED RIPPLE AND NOISE.
- FANS ARE DESIGNED TO PERFORM AS EXPECTED WHEN STABLE VOLTAGE IS SUPPLIED.
- FLUCTUATION OF THE VOLTAGE BETWEEN Vcc(+) AND GND WHILE THE FAN IS POWERED MUST BE WITHIN THE SPECIFIED OPERATING VOLTAGE RANGE.
- FLUCTUATION CYCLE OF THE VOLTAGE BETWEEN Vcc(+) AND GND WHILE THE FAN IS POWERED MUST BE LONGER THAN THE FAN'S ROTATION CYCLE.
- GND OF THE FAN MUST BE KEPT BELOW THE VOLTAGE OF ITS Vcc(+) WHEN THE VOLTAGE IS SWITCHED ON/OFF OR THE FAN IS NOT RUNNING.
- DEVICES THAT USE THE FANS ARE SUPPOSED TO BE DESIGNED SO THAT THE VOLTAGE APPLIED ON THE REVOLUTION SIGNAL IS NOT AFFECTED BY POWER ON/OFF.

7-7 ENVIRONMENT-RELATED SUBSTANCES
BASED ON RoHS, CADMIUM, LEAD, MERCURY, AND, COMPOUND OF THESE SUBSTANCES AND HEXAVALENT CHROMIUM COMPOUND, POLYBROMO BI-PHENYL(PBB) AND POLYBROMO DI-PHENYL ETHER(PBDE) ARE NOT INCLUDED IN THIS PRODUCT.

REV			
	ISSUE	0A	Fig. 0
	ECO No.		
	APPROVED	T.TAKAOKA	2020-11-04
	DESIGNED	M.YAMADA	2020-11-03
APPROVED		S2.YAMAZAKI	2020-04-23
CHECKED		S2.YAMAZAKI	2020-04-23
DESIGNED		M2.YAMADA	2020-04-22
DRAWN		H.ISOZAKI	2020-04-22

No.	PART No.	PART NAME	NOTE	Q'ty	UNIT	MARKS/MTL

TOLERANCE
UNLESS OTHERWISE SPECIFIED
LINEAR
~ :±
~ :±
~ :±
ANGULAR :±
CORNER
OUTSIDE:C
INSIDE :R

TREAT.
FINISH
UNIT mm
SCALE ⋈
A3

MTL.	
MODEL	V80E12BS2NB5-07AA5
PARTS	DC Fan DC Fan
DWG.	Specification of DC Fan Specification of DC Fan

DWG. No. F98284260 0A