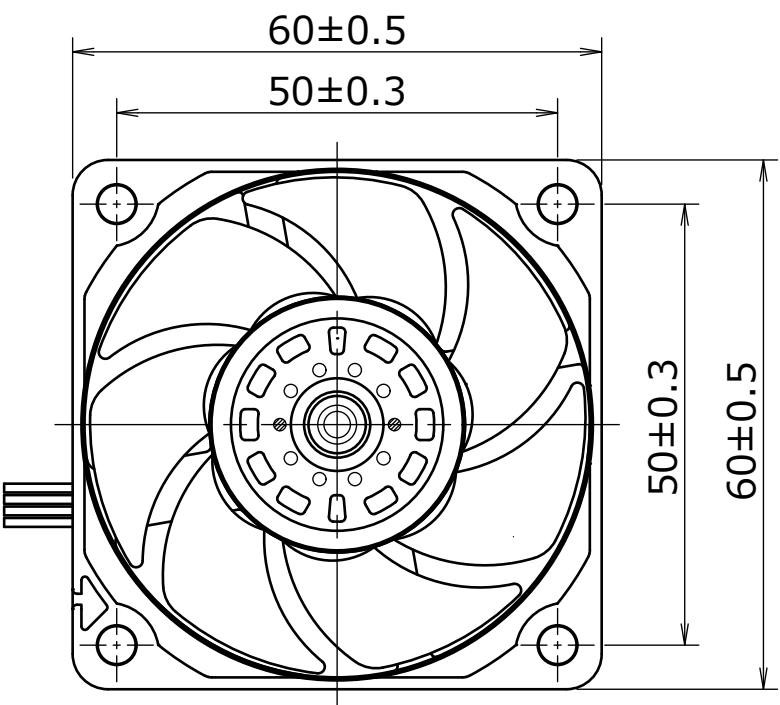
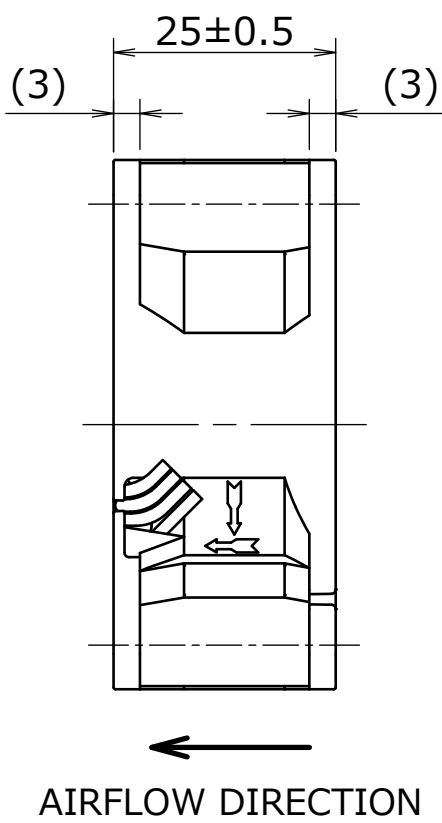
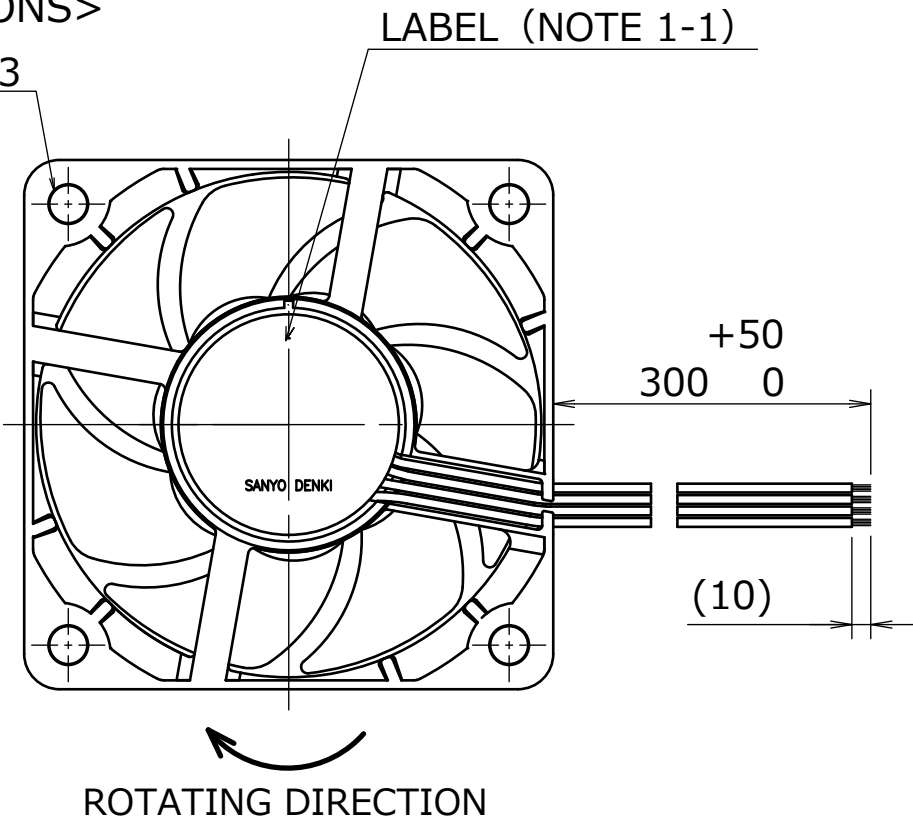


1. DIMENSIONS AND PARTS LIST

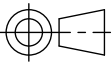
<DIMENSIONS>



NOTE 1-1. THE PRODUCT NAME, MODEL NO., MANUFACTURER, MANUFACTURE DATE, ETC. ARE PRINTED ON LABEL.
銘板上に品名, 型名, 製造会社名 及び 製造年月日等を表示する。

<LEAD WIRE CONNECTION TABLE>

FAN		
	LEAD WIRE	COLOR
+	UL1007 AWG26	RED
-	UL1007 AWG26	BLACK
SENSOR	UL1007 AWG26	YELLOW
CONTROL	UL1007 AWG26	BROWN

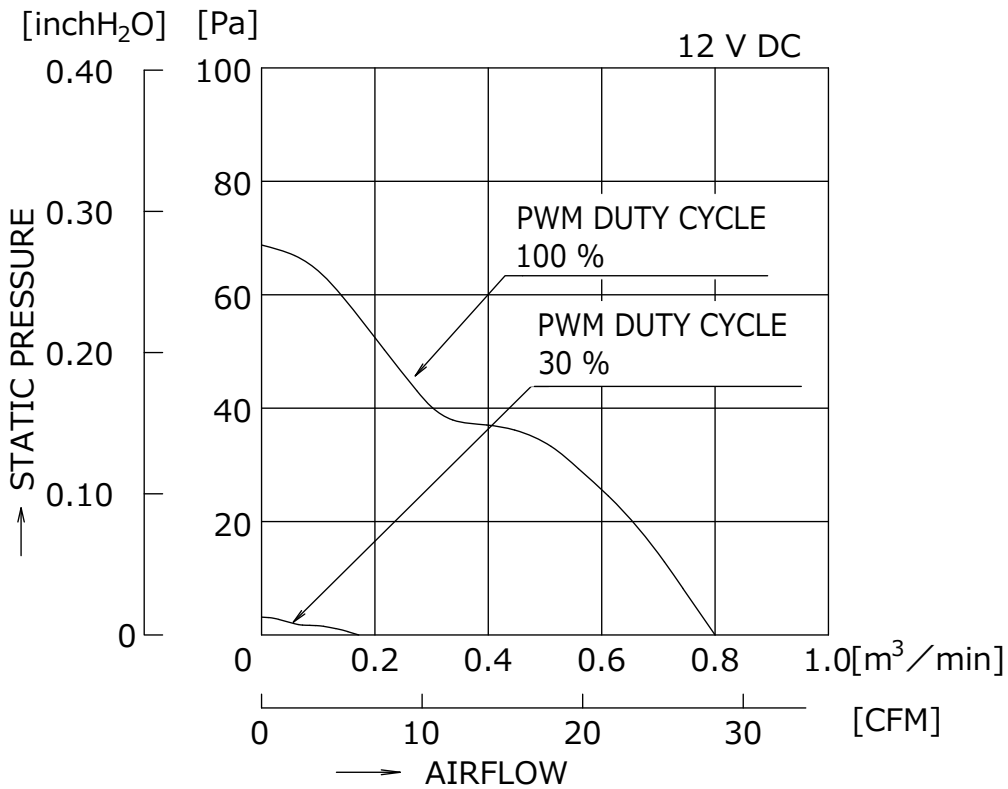
	ECN No.	名称 Title		
	E0230067	San Ace 60 (9RA)		
単位 Unit	新規 New Design	RIBBED/PULSE_SENSOR/PWM_CONTROL		
mm	C.SAYCO 22-02-21			
尺度 Scale	図面番号 Dwg. No.	9RA0612P4G001		Rev.
-		B		
SANYO DENKI		承認 Approved By	審査 Checked By	設計 Designed By
		M.WATANABE 26-03-14	A.NAKAYAMA 26-03-06	M.YAJIMA 26-03-02
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2. GENERAL SPECIFICATIONS

<CHARACTERISTICS>

ITEM	UNIT	CHARACTERISTICS		
PWM DUTY CYCLE	%	100	30	0
RATED VOLTAGE	V DC	12		
OPERATING VOLTAGE RANGE	V DC	10.8 ~ 13.2		
MAX. AIRFLOW	m ³ /min (CFM)	0.80 (28.2)	0.17 (6.0)	- -
MAX. STATIC PRESSURE	Pa (inchH ₂ O)	69 (0.28)	3.16 (0.01)	- -
RATED CURRENT	A	0.15	0.04	0.04 MAX.
RATED SPEED	min ⁻¹	5600±560	1200±360	NO ROTATION
INSULATION RESISTANCE (NOTE 2-2)	-	10M Ω MIN. AT 500 V DC		
DIELECTRIC STRENGTH (NOTE 2-2)	-	1 MINUTE AT 500 V AC, 50/60 Hz		
OPERATING TEMPERATURE	℃	-20 ~ +70		
STORAGE TEMPERATURE	℃	-30 ~ +70		
EXPECTED LIFE	-	60,000 h / 60 ℃ (L10, CONTINUOUS OPERATION)		
SOUND PRESSURE LEVEL (NOTE 2-3)	dB(A)	36	9	-
MASS	g	APPROX. 70		
MATERIAL	-	FRAME, IMPELLER : PLASTICS		
BEARING SYSTEM	-	2 BALL BEARINGS		

<REFERENCE AIRFLOW-STATIC PRESSURE CHARACTERISTICS>



2-4. WITHIN THE OPERATING VOLTAGE RANGE, THE MOTOR IS PROTECTED FROM BURNOUT DUE TO LOCKED ROTOR. DO NOT LOCK ROTOR OUTSIDE OF OPERATING VOLTAGE.
使用電圧範囲にてファン拘束時焼損の恐れはない。
使用電圧範囲外でファンを拘束しないこと。

2-5. FAN MIGHT NOT START UP NORMALLY IF THE IMPELLER IS ROTATING WHEN THE POWER IS TURNED ON. 電源投入時、羽根が空転していると正常に起動できない場合がある。

NOTE 2-1. ALL THE VALUES IN THE TABLE ARE TYPICAL VALUES MEASURED AFTER 30 MINUTES OF OPERATION AT ROOM TEMPERATURE AND NORMAL HUMIDITY.
表中の値はいずれも、常温、常湿、30分間動作後の標準値。

2-2. MEASURED BETWEEN LEAD WIRE CONDUCTORS AND FRAME.
リード線導体部とフレームとの間。

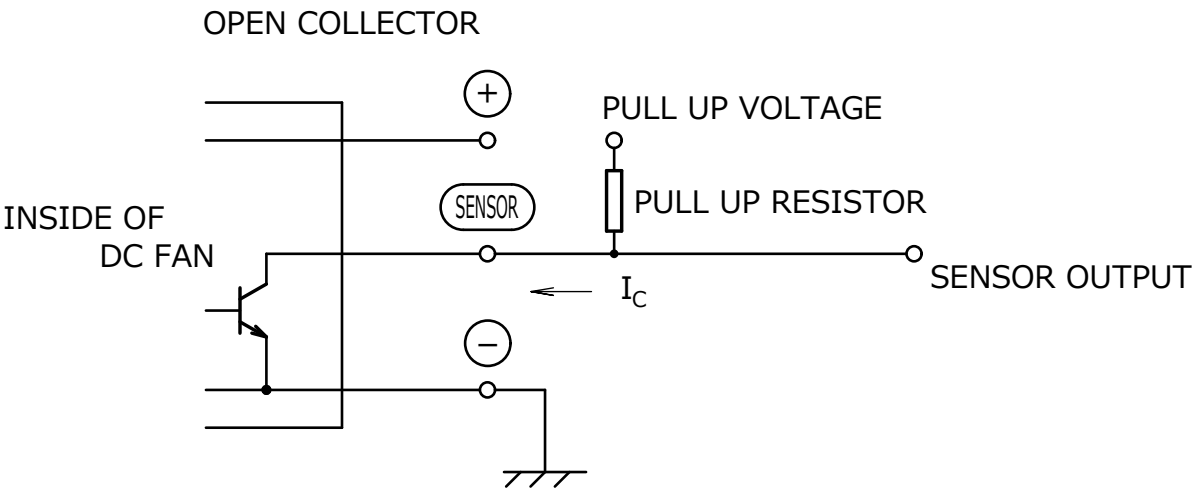
2-3. AT 1 m AWAY FROM THE AIR INLET.
ファン吸込側1 mにおける値。

	ECN No. E0230067	名称 Title San Ace 60 (9RA) RIBBED/PULSE_SENSOR/PWM_CONTROL	
	単位 Unit mm	新規 New Design C.SAYCO 22-02-21	
尺度 Scale -	図面番号 Dwg. No. 9RA0612P4G001		Rev. B
SANYO DENKI		承認 Approved By M.WATANABE 26-03-14	設計 Designed By M.YAJIMA 26-03-02
SANYO DENKI CO.,LTD. ISSUED		審査 Checked By A.NAKAYAMA 26-03-06	設計 Designed By M.YAJIMA 26-03-02
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3. SENSOR SPECIFICATIONS

<OUTPUT CIRCUIT>

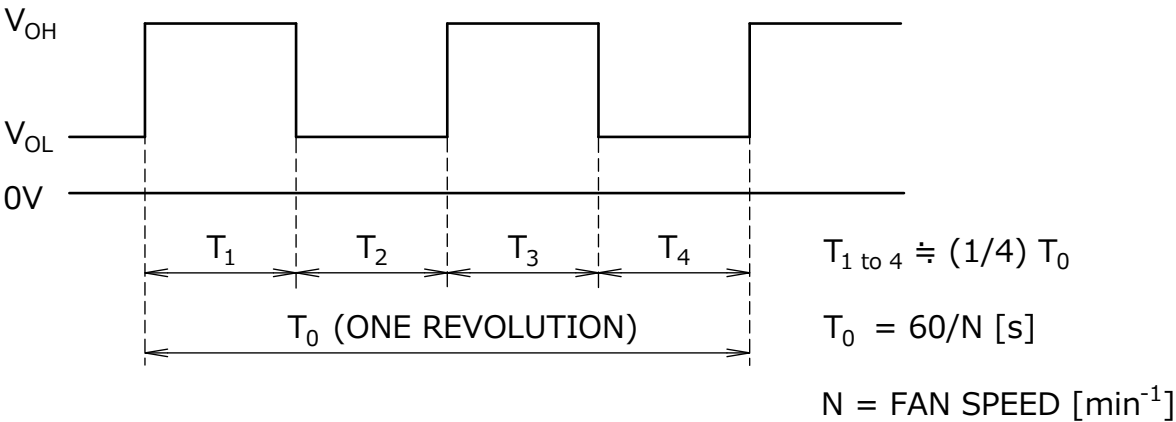


<SENSOR SPECIFICATIONS>

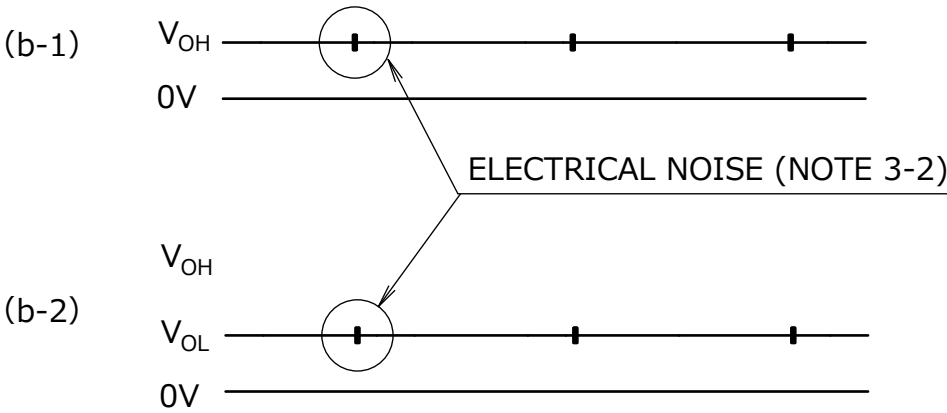
ITEM	SYMBOL	UNIT	MAX.
PULL UP VOLTAGE	-	V	15
COLLECTOR - EMITTER VOLTAGE (V_{CE})	V_{OH}	V	15
COLLECTOR CURRENT	I_C	mA	5
COLLECTOR SATURATION VOLTAGE ($V_{CE(SAT)}$)	V_{OL}	V	0.6

<OUTPUT WAVEFORM>

(a) IN CASE OF STEADY RUNNING (NOTE 3-1)



(b) IN CASE OF STEADY LOCKED ROTOR



NOTE 3-1. PWM CONTROL SWITCHING MAY AFFECT THE SENSOR OUTPUT.
PWM制御によるスイッチングがセンサ出力に影響する可能性がある。

3-2. ELECTRICAL NOISE MAY APPEAR ON V_{OH} OR V_{OL} WHEN THE MOTOR IS AUTO-RESTART.
モータの自動再起動動作にともない、 V_{OH} あるいは V_{OL} にノイズが載ることがある。

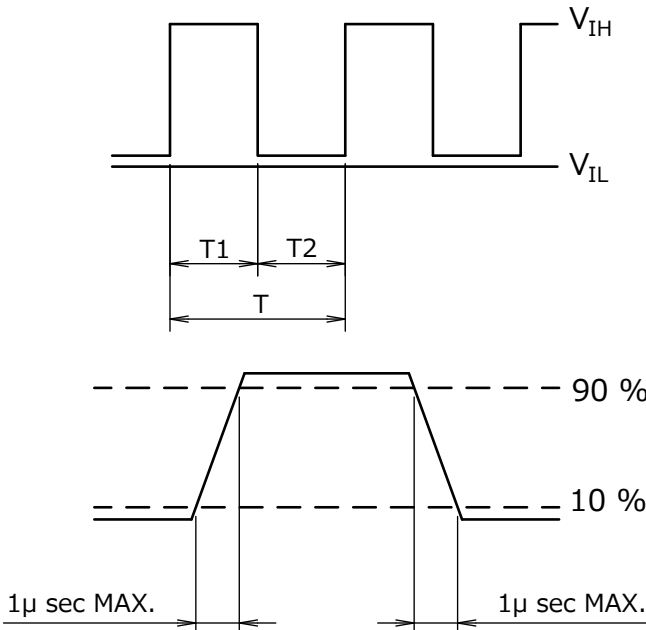
3-3. IF REQUIRED TO KEEP THE V_{OL} LOW, LOWER THE V_{OH} OR SET THE I_C SMALLER.
 V_{OL} を低くする場合は、 V_{OH} を下げるか I_C を小さく設定すること。

ECN No.	E0230067	名称 Title	San Ace 60 (9RA)
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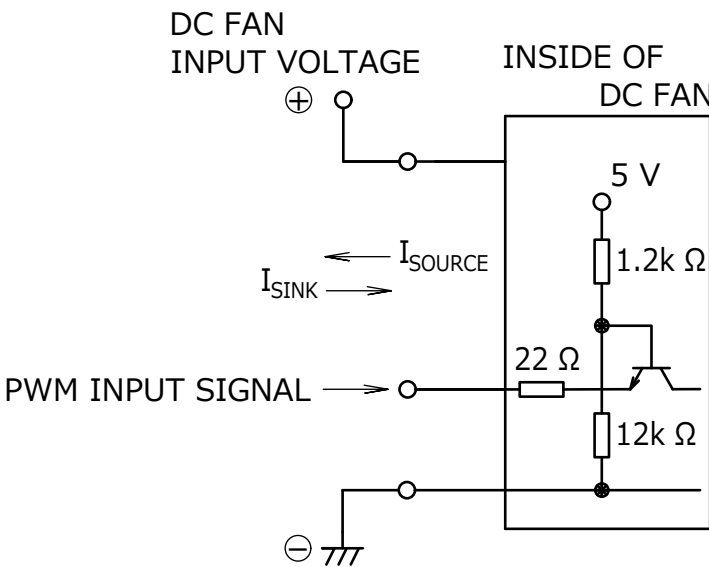
4. CONTROL SPECIFICATIONS

<PWM INPUT SIGNAL>

$\frac{T_1}{T} \times 100 = \text{PWM DUTY CYCLE [\%]}$



<EXAMPLE OF CONNECTION SCHEMATIC>



<PWM CONTROL SPECIFICATIONS>

ITEM	SYMBOL	UNIT	MIN.	PREFERRED	MAX.
PWM FREQUENCY	-	k Hz	20	25	30
PWM INPUT HIGH LEVEL	V _{IH}	V	4.75	5	5.25
PWM INPUT LOW LEVEL	V _{IL}	V	0	-	0.4
SOURCE CURRENT AT CONTROL VOLTAGE 0 V	I _{SOURCE}	mA	-	-	1.0
SINK CURRENT AT CONTROL VOLTAGE 5.25 V	I _{SINK}	mA	-	-	1.0
CONTROL TERMINAL VOLTAGE AT OPEN CIRCUIT	-	V	-	-	5.25

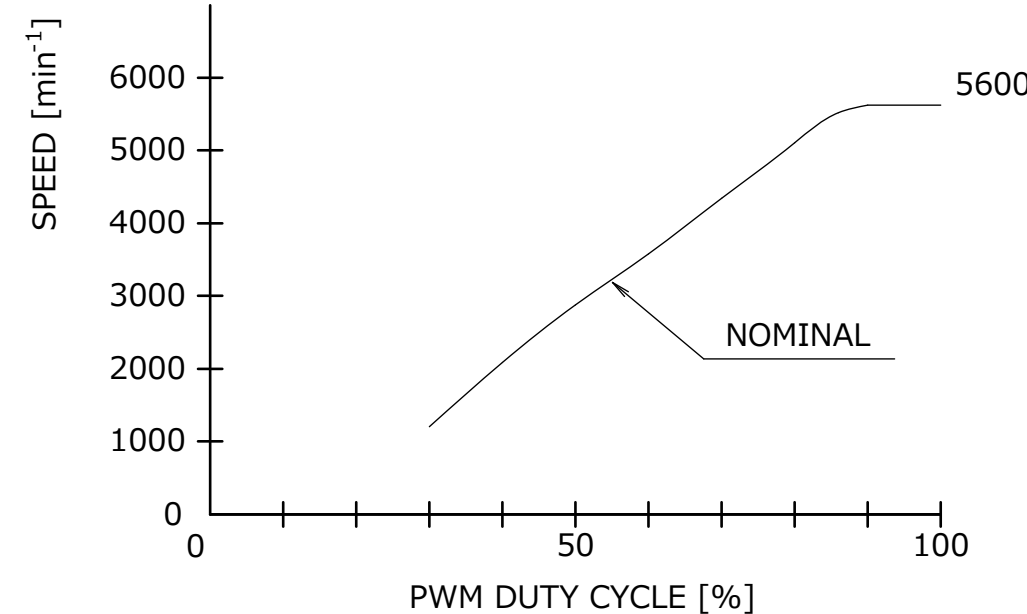
NOTE 4-1. REFER TO SECTION 2 FOR THE SPEED WITH PWM DUTY CYCLE OF 0, 30, 100 %.
PWMデューティサイクルが 0, 30, 100 %の時、回転速度は2項を参照のこと。

4-2. WHEN THE CONTROL TERMINAL IS OPEN,
FAN SPEED IS THE SAME AS WHEN PWM DUTY CYCLE IS 100 %.
PWM入力端子がオープン状態の時、回転速度はPWMデューティサイクル100 %と同じである。

4-3. THE PWM SIGNAL THAT SATISFIES THIS SPECIFICATION SHALL BE INPUT.
IT CAN BE USED WITH OPEN COLLECTOR OR DRAIN INPUT.
NOTE THAT WHEN USING AN OPEN COLLECTOR OR DRAIN INPUT,
OR INPUTTING A DIFFERENT VOLTAGE OR FREQUENCY,
THE ROTATION SPEED RELATIVE TO THE PWM DUTY MAY DIFFER FROM
THIS SPECIFICATION.
本仕様を満足するPWM信号を入力のこと。
オープンコレクタ、ドレイン入力でも使用できる。
オープンコレクタ、ドレイン入力で使用した場合、または異なる電圧、周波数を入力した場合には、
PWMデューティに対する回転速度が本仕様と異なる場合があるので注意のこと。

<REFERENCE PWM DUTY-SPEED CHARACTERISTICS>

VOLTAGE : 12 V DC
PWM FREQUENCY : 25k Hz
(AT ROOM TEMPERATURE,
NORMAL HUMIDITY)



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SANYO DENKI

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ISSUED

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Rev.
B

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