

Design Change Notification



March 2nd, 2022

To: Sanyo Denki America Cooling Distributors

Product: BLDC FAN MOTOR _____

Model: San Ace 120(S) 120mm sq. x 25mm thick
(Please refer Attached Sheet for a complete part number list.)

SANYO DENKI CO., LTD.
Design Dept., Cooling Systems Div.

Approved	Checked	Designed
		

SANYO DENKI America, Inc.
Cooling Systems Division

No.	Contents	Before Change	After Change	Description
1	Motor drive IC, electronic parts, Motor Windings and PWB	Use motor drive IC manufactured by ON-Semiconductor.	Use motor drive IC manufactured by Toshiba or New-Japan-Radio.	Change to the motor drive IC due to discontinuation of production by the semiconductor manufacturer. Also change to some electric parts except IC, Motor windings and PWB due to the change of the motor drive IC.
2	Specifications	See the Attached Sheet.	See the Attached Sheet.	
3	Implementation Date			Implementation Date: From February, 2023 production (Estimated). Please note that the changeover schedule to new IC may change according to the number of products in the inventory.

No. A0052822 - Attached Sheet 1 – 1/2

[MODEL LIST]

San Ace 120(S) – 120mm x 25mm thick

MODEL	Change contents
9S1212H401	Attached Sheet 2
9S1212H4011	
9S1212H402	
9S1212H4021	
9S1212H403	
9S1212H405	
9S1212H406	
9S1212H407-C	
9S1212H408	
9S1212H4D01	
9S1212H4D03	
9S1212H4D04	
9S1212H401-A01	
9S1212F401	
9S1212F4011	
9S1212F402	
9S1212F4021	
9S1212F4031	
9S1212F404	
9S1212F407	
9S1212F408	
9S1212F409	
9S1212F411	
9S1212F413	
9S1212F414	
9S1212F4D01	
9S1212F4D011	
9S1212F4D03	
9S1212F4D031	
9S1212F4D04	
9S1212F4D07	
9S1212F4D09	
9S1212F4D10	
9S1212E4031	Attached Sheet 4

MODEL	Change contents
9S1212M401	Attached Sheet 5
9S1212M4011	
9S1212M402	
9S1212M4021	
9S1212M4041	
9S1212M405	
9S1212M4061	
9S1212M4071	
9S1212M408	
9S1212M409	
9S1212M410	
9S1212M4D01	
9S1212M4D011	
9S1212M4D03	
9S1212M4D04	
9S1212M4D05	
9S1212M4D06	
9S1212L401	Attached Sheet 6
9S1212L4011	
9S1212L402	
9S1212L4021	
9S1212L404	
9S1212L4041	
9S1212L405	
9S1212L406	
9S1212L407	
9S1212L408	
9S1212L410	
9S1212L411	
9S1212L412	
9S1212L414	
9S1212L415	
9S1212L416	
9S1212L4D01	
9S1212L4D011	
9S1212L4D03	
9S1212L4D04	

No. A0052822 - Attached Sheet 1 – 2/2

[MODEL LIST]

San Ace 120 (S) – 120mm x 25mm thick

MODEL	Change contents
9S1212P4H01	Attached Sheet 7
9S1212P4H011	
9S1212P4H03	
9S1212P4H031	
9S1212P4H04	
9S1212P4H05	
9S1212P4H051	
9S1212P4H06	
9S1212P4H061	
9S1212P4H08	
9S1212P4H081	
9S1212P4H09	
9S1212P4H10	
9S1212P4H13	
9S1212P4HD01	
9S1212P4H041	Attached Sheet 8
9S1212P4F01	Attached Sheet 9
9S1212P4F011	
9S1212P4F04	
9S1212P4F05	
9S1212P4F06	
9S1212P4F061	
9S1212P4F07	
9S1212P4F081	
9S1212P4F09	
9S1212P4F101	
9S1212P4F11	
9S1212P4F111	
9S1212P4F12	
9S1212P4F131	
9S1212P4F14	
9S1212P4F15	
9S1212P4F16	
9S1212P4F121	Attached Sheet 10

MODEL	Change contents
9S1212P4M01	Attached Sheet 11
9S1212P4M011	
9S1212P4M03	
9S1212P4M031	
9S1212P4M071	
9S1212P4L011	Attached Sheet 12
9S1212P4L031	
9S1212P4L041	
9S1224M401	Attached Sheet 13
9S1224M4011	
9S1224M402	
9S1224M4021	
9S1224M404	
9S1224M405	
9S1224M4D01	
9S1224M4D011	
9S1224M4D03	

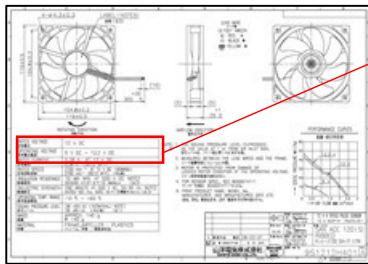
No. A0052822 - Attached Sheet 2 - 1/1

[MODEL]

9S1212H401, 9S1212H4011, 9S1212H402, 9S1212H4021, 9S1212H403, 9S1212H405, 9S1212H406,
9S1212H407-C, 9S1212H408, 9S1212H4D01, 9S1212H4D03, 9S1212H4D04, 9S1212H401-A01

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LA6584M	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		5 VDC to 13.2 VDC Refer to FIG.1	8 VDC to 13.2 VDC Refer to FIG.1
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		Non-applicable	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Non-applicable	
Sensor spec.		No change	

FIG.1**Before Change**

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	5 V DC ~ 13.2 V DC

**After Change**

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	8 V DC ~ 13.2 V DC

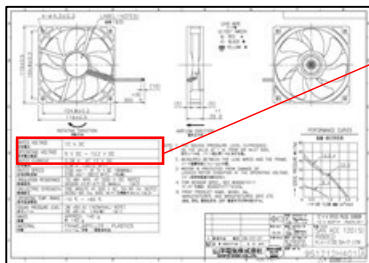
No. A0052822 - Attached Sheet 3 - 1/1

[MODEL]

9S1212F401, 9S1212F4011, 9S1212F402, 9S1212F4021, 9S1212F4031, 9S1212F404, 9S1212F407,
 9S1212F408, 9S1212F409, 9S1212F411, 9S1212F413, 9S1212F414, 9S1212F4D01, 9S1212F4D011,
 9S1212F4D03, 9S1212F4D031, 9S1212F4D04, 9S1212F4D07, 9S1212F4D09, 9S1212F4D10

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LA6584M	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		5 VDC to 13.8 VDC Refer to FIG.1	8 VDC to 13.8 VDC Refer to FIG.1
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		Non-applicable	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Non-applicable	
Sensor spec.		No change	

FIG.1**Before Change**

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	5 V DC ~ 13.8 V DC

**After Change**

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	8 V DC ~ 13.8 V DC

No. A0052822 - Attached Sheet 4 - 1/1

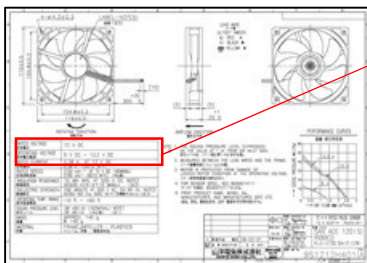
[MODEL]

9S1212E4031

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LA6584M	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		4.5 VDC to 13.2 VDC Refer to FIG.1	8 VDC to 13.2 VDC Refer to FIG.1
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		Non-applicable	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Non-applicable	
Sensor spec.		No change	

FIG.1



Before Change

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	4.5 V DC ~ 13.8 V DC



After Change

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	8 V DC ~ 13.8 V DC

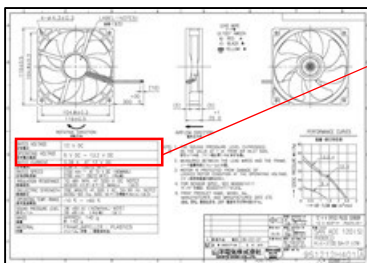
No. A0052822 - Attached Sheet 5 - 1/1

[MODEL]

9S1212M401, 9S1212M4011, 9S1212M402, 9S1212M4021, 9S1212M4041, 9S1212M405, 9S1212M4061,
 9S1212M4071, 9S1212M408, 9S1212M409, 9S1212M410, 9S1212M4D01, 9S1212M4D011, 9S1212M4D03,
 9S1212M4D04, 9S1212M4D05, 9S1212M4D06

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LA6584M	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		6 VDC to 13.8 VDC Refer to FIG.1	8 VDC to 13.8 VDC Refer to FIG.1
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		Non-applicable	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Non-applicable	
Sensor spec.		No change	

FIG.1**Before Change**

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	6 V DC ~ 13.8 V DC

**After Change**

RATED VOLTAGE 定格電圧	12 V DC
OPERATING VOLTAGE 使用電圧範囲	8 V DC ~ 13.8 V DC

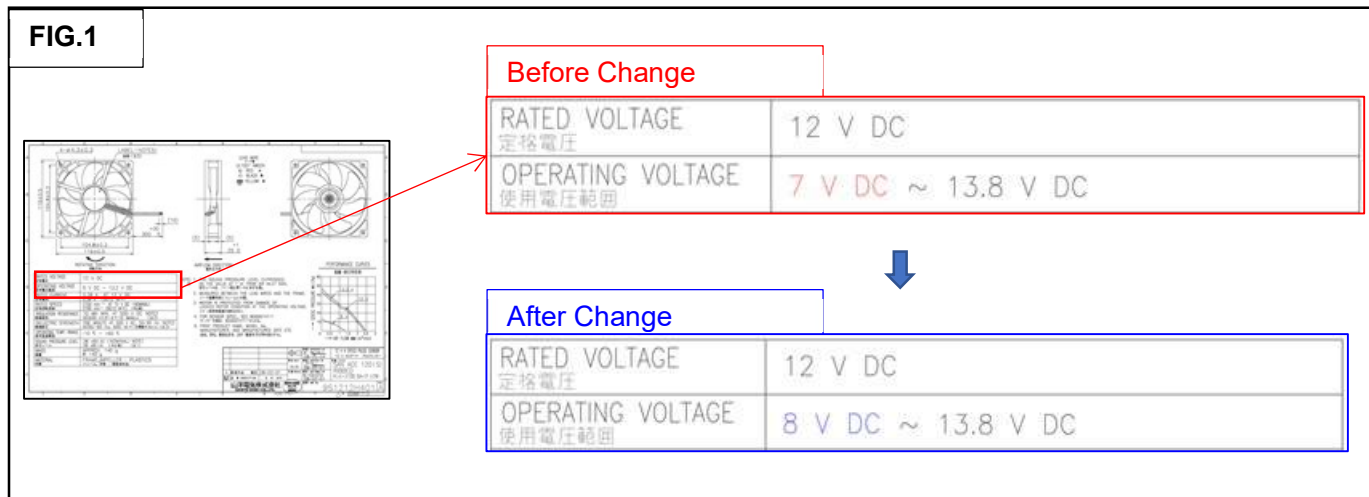
No. A0052822 - Attached Sheet 6 - 1/1

[MODEL]

9S1212L401, 9S1212L4011, 9S1212L402, 9S1212L4021, 9S1212L404, 9S1212L4041, 9S1212L405,
 9S1212L406, 9S1212L407, 9S1212L408, 9S1212L410, 9S1212L411, 9S1212L412, 9S1212L414, 9S1212L415,
 9S1212L416, 9S1212L4D01, 9S1212L4D011, 9S1212L4D03, 9S1212L4D04

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LA6584M	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		7 VDC to 13.8 VDC Refer to FIG.1	8 VDC to 13.8 VDC Refer to FIG.1
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		Non-applicable	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Non-applicable	
Sensor spec.		No change	



No. A0052822 - Attached Sheet 7 - 1/1

[MODEL]

9S1212P4H01, 9S1212P4H011, 9S1212P4H03, 9S1212P4H031, 9S1212P4H04, 9S1212P4H05,
 9S1212P4H051, 9S1212P4H06, 9S1212P4H061, 9S1212P4H08, 9S1212P4H081, 9S1212P4H09,
 9S1212P4H10, 9S1212P4H13,
 9S1212P4HD01

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LB11868	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		No change	
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		No change	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		No change	
Sensor spec.		No change	

No. A0052822 - Attached Sheet 8 - 1/2

[MODEL]

9S1212P4H041

[Contents of change]

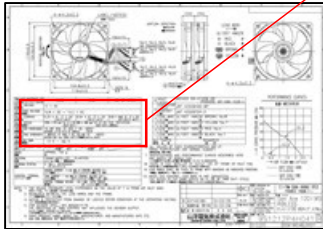
		Before Change	After Change
Motor drive IC	Type name	LB11868	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		No change	
Electrical current		0.04[A] @ PWM 20% Refer to Fig.1	0.04[A] @ PWM 25% Refer to Fig.1
Speed		800 +/- 400 [min ⁻¹] @ PWM 20% Refer to Fig.1	800 +/- 400 [min ⁻¹] @ PWM 25% Refer to Fig.1
Operating temp.		No change	
Sound pressure level		10[dBA(A)] @ PWM 20% Refer to Fig.1	10[dBA(A)] @ PWM 25% Refer to Fig.1
Control terminal		No change	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Refer to Fig.2	
Sensor spec.		No change	

No. A0052822 - Attached Sheet 8 - 2/2

FIG.1

Before Change

PWM DUTY INPUT(NOTE 10) 入力PWM デューティ率 (注10)	100%	20%	0% OR OPEN
RATED VOLTAGE 定格電圧	12 V DC		
OPERATING VOLTAGE 使用電圧範囲	10.8 V DC ~ 13.2 V DC		
RATED CURRENT 定格電流	0.33 A AT 12 V DC (DC12 Vにて)	0.04 A AT 12 V DC (DC12 Vにて)	0.03 A MAX AT 12 V DC 以下 (DC12 Vにて)
RATED SPEED 定格回転速度	2700 ± 270 min ⁻¹ AT 12 V DC (DC12 Vにて)	800 ± 400 min ⁻¹ AT 12 V DC (DC12 Vにて)	NO ROTATION 回転停止
INSULATION RESISTANCE 絶縁抵抗	10 MΩ MIN. AT 500 V DC NOTE2 DC500 Vメガーにて10 MΩ以上 (注2)		
DIELECTRIC STRENGTH 絶縁耐圧	1 MINUTE AT 500 V AC, 50/60 Hz NOTE2 AC50/60 Hz, 500 Vにて1分間耐えること (注2)		
OPERATING TEMP. 使用温度範囲	-10 °C ~ +60 °C		
SOUND PRESSURE LEVEL 音圧レベル	36 dB(A) (NOMINAL) (NOTE1) (中心値) (注1)	10 dB(A) (NOMINAL) (NOTE1) (中心値) (注1)	

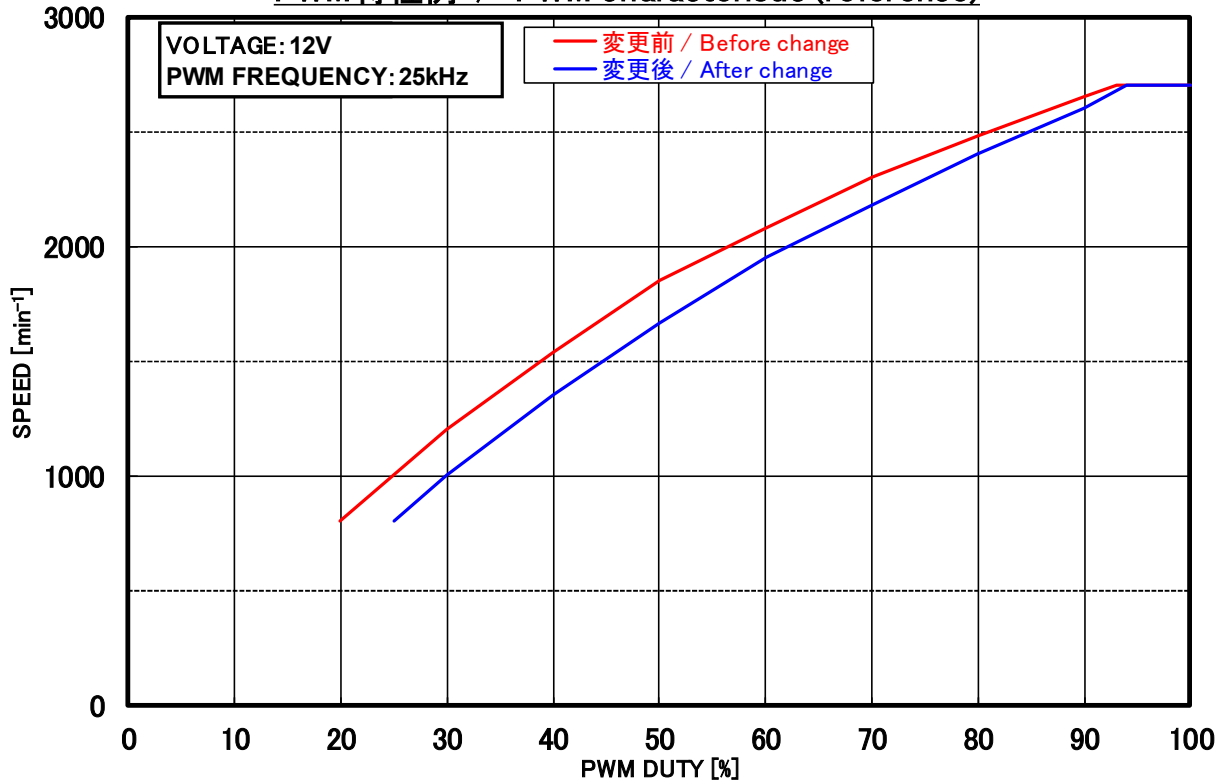


After Change

PWM DUTY INPUT(NOTE 10) 入力PWM デューティ率 (注10)	100%	25%	0% OR OPEN
RATED VOLTAGE 定格電圧	12 V DC		
OPERATING VOLTAGE 使用電圧範囲	10.8 V DC ~ 13.2 V DC		
RATED CURRENT 定格電流	0.33 A AT 12 V DC (DC12 Vにて)	0.04 A AT 12 V DC (DC12 Vにて)	0.03 A MAX AT 12 V DC 以下 (DC12 Vにて)
RATED SPEED 定格回転速度	2700 ± 270 min ⁻¹ AT 12 V DC (DC12 Vにて)	800 ± 400 min ⁻¹ AT 12 V DC (DC12 Vにて)	NO ROTATION 回転停止
INSULATION RESISTANCE 絶縁抵抗	10 MΩ MIN. AT 500 V DC NOTE2 DC500 Vメガーにて10 MΩ以上 (注2)		
DIELECTRIC STRENGTH 絶縁耐圧	1 MINUTE AT 500 V AC, 50/60 Hz NOTE2 AC50/60 Hz, 500 Vにて1分間耐えること (注2)		
OPERATING TEMP. 使用温度範囲	-10 °C ~ +60 °C		
SOUND PRESSURE LEVEL 音圧レベル	36 dB(A) (NOMINAL) (NOTE1) (中心値) (注1)	10 dB(A) (NOMINAL) (NOTE1) (中心値) (注1)	

FIG.2

PWM特性例 / PWM characteristic (reference)



No. A0052822 - Attached Sheet 9 - 1/1

[MODEL]

9S1212P4F01, 9S1212P4F011, 9S1212P4F04, 9S1212P4F05, 9S1212P4F06, 9S1212P4F061, 9S1212P4F07,
 9S1212P4F081, 9S1212P4F09, 9S1212P4F101, 9S1212P4F11, 9S1212P4F111, 9S1212P4F12,
 9S1212P4F131, 9S1212P4F14, 9S1212P4F15, 9S1212P4F16

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LB11970	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		No change	
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		No change	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		No change	
Sensor spec.		Vce: +18 [V DC] max.	Vce: +13.8 [V DC] max.
		Ic: 10 [mA] max.	Ic: 5 [mA] max.
		Vce(sat): 0.6 [V DC] max.	Vce(sat): 0.6 [V DC] max.

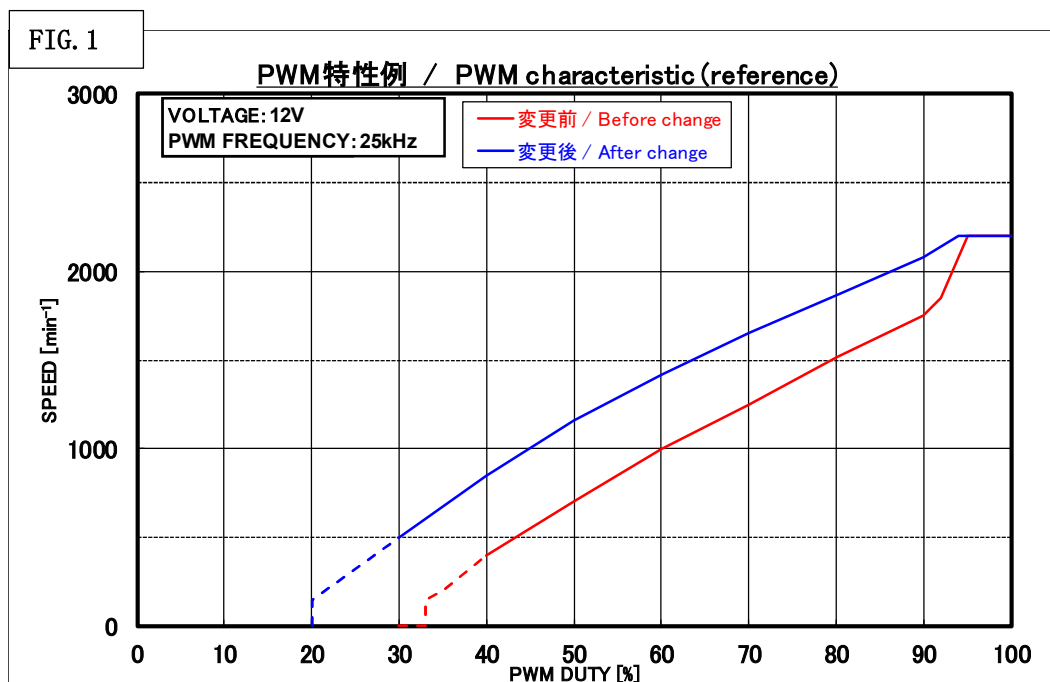
No. A0052822 - Attached Sheet 10 - 1/1

[MODEL]

9S1212P4F121

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LB11970	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		No change	
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		No change	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Refer to Fig.1	
Sensor spec.		Vce: +18 [V DC] max.	Vce: +13.8 [V DC] max.
		Ic: 10 [mA] max.	Ic: 5 [mA] max.
		Vce(sat): 0.6 [V DC] max.	Vce(sat): 0.6 [V DC] max.



No. A0052822 - Attached Sheet 11 - 1/1

[MODEL]

9S1212P4M01, 9S1212P4M011, 9S1212P4M03, 9S1212P4M031, 9S1212P4M071

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LB11970	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		No change	
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		No change	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		No change	
Sensor spec.		Vce: +18 [V DC] max.	Vce: +13.8 [V DC] max.
		Ic: 10 [mA] max.	Ic: 5 [mA] max.
		Vce(sat): 0.6 [V DC] max.	Vce(sat): 0.6 [V DC] max.

No. A0052822 - Attached Sheet 12 - 1/1

[MODEL]

9S1212P4L011, 9S1212P4L031, 9S1212P4L041

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LB11970	TC78B002FNG
	Manufacture	On-semiconductor	Toshiba
Operating voltage		No change	
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		No change	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		No change	
Sensor spec.		Vce: +18 [V DC] max.	Vce: +13.8 [V DC] max.
		Ic: 10 [mA] max.	Ic: 5 [mA] max.
		Vce(sat): 0.6 [V DC] max.	Vce(sat): 0.6 [V DC] max.

No. A0052822 - Attached Sheet 13 - 1/1

[MODEL]

9S1224M401, 9S1224M4011, 9S1224M402, 9S1224M4021, 9S1224M404, 9S1224M405,
 9S1224M4D01, 9S1224M4D011, 9S1224M4D03

[Contents of change]

		Before Change	After Change
Motor drive IC	Type name	LV8860	NJW4320
	Manufacture	On-semiconductor	New-Japan-Radio
Operating voltage		No change	
Electrical current		No change	
Speed		No change	
Operating temp.		No change	
Sound pressure level		No change	
Control terminal		Non-applicable	
Air flow – static pressure character		No change	
PWM duty cycle - Speed characteristic		Non-applicable	
Sensor spec.		No change	