

## GHA300F

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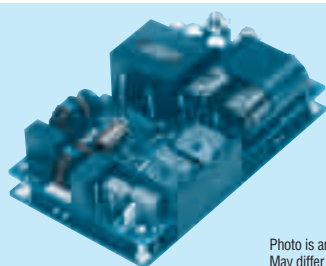


Photo is an image of the appearance.  
May differ from the actual product.

Recommended EMI/EMC Filter  
EAC-10-472

High voltage pulse noise type : EAP series  
Low leakage current type : EAM series

\*The EMI/EMC Filter is recommended to connect with several devices.

- ① Series name  
② Single output  
③ Output wattage  
④ Universal input  
⑤ Output voltage  
⑥ Optional \*6  
T3 : mounting hole M3  
J1 : VH(J.S.T.)connector type  
R3 : with Subfeatures  
(5VAUX,12VAUX,Remote, Power good)

Specification is changed at option, refer to Instruction manual.

## [Cautions]

- Forced air cooling is required for the maximum output power. Please see instruction manual.
  - This power supply requires mounting on metal standoffs 5mm in height. Insulation sheet is required if standoff is not used or less than 5mm clearance is needed.
  - Avoid applying stress to surface mount components.
  - De-rating is required if the applied input voltage is 90-115VAC.
  - The electrolytic capacitor has limited life span which is very much dependent on the actual operating conditions.
  - Operating in the presence of chemical vapors or harsh environment can affect the power supply life expectancy.
  - Please make sure to read the instruction manual carefully before using this product.
- It should be in the "Instruction Manual" not spec sheet.

MODEL	GHA300F-12	GHA300F-24	GHA300F-48
MAX OUTPUT WATTAGE[W]	300	300	302.4
DC OUTPUT	Forced air at 50°C	12V 25A	24V 12.5A
	at 40°C	12V 8.4A	24V 4.2A
	Convection at 50°C	12V 4.5A	24V 2.2A
			48V 6.3A
			48V 2.1A
			48V 1.1A

## SPECIFICATIONS

	MODEL	GHA300F-12	GHA300F-24	GHA300F-48
INPUT	VOLTAGE[V]	AC90 - 264 1 φ (output derating is required at AC90V -115V *3)		
	CURRENT[A]	ACIN 120V	3.3typ	
		ACIN 230V	1.8typ	
	FREQUENCY[Hz]	50 / 60 (47 - 63)		
	EFFICIENCY[%]	ACIN 120V	89typ	90typ
		ACIN 230V	91typ	92typ
	POWER FACTOR (Io=100%)	ACIN 120V	0.95typ	
		ACIN 230V	0.90typ	
OUTPUT	INRUSH CURRENT[A]	ACIN 120V	20typ (Io=100%) (At cold start) (Ta=25°C)	
		ACIN 230V	40typ (Io=100%) (At cold start) (Ta=25°C)	
	LEAKAGE CURRENT[ma]	0.125/0.250max (ACIN 120V/240V 60Hz,Io=100%, According to IEC60601-1)		
	VOLTAGE[V]	12	24	48
	CURRENT[A]	Forced air	25	12.5
		Convection	4.5	2.2
	LINE REGULATION[mV] *4	48max	96max	192max
	LOAD REGULATION[mV] *4	100max	150max	240max
	RIPPLE[mVp-p] *1	0 to +50°C	240max	300max
		-20 to 0°C	320max	400max
	RIPPLE NOISE[mVp-p]*1	0 to +50°C	300max	480max
		-20 to 0°C	360max	500max
PROTECTION CIRCUIT AND OTHERS	TEMPERATURE REGULATION[mV]	0 to +50°C	120max	240max
		-20 to +50°C	150max	290max
	DRIFT[mV] *2	48max	96max	192max
	START-UP TIME[ms]	500typ (ACIN 120V, Io=100%)		
	HOLD-UP TIME[ms]	16typ (ACIN 120V, Io=100%)		
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	10.80 to 13.20	21.60 to 26.40	43.20 to 52.80
	OUTPUT VOLTAGE SETTING[V]	12.00 to 12.48	24.00 to 24.96	48.00 to 49.92
	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically		
	OVERVOLTAGE PROTECTION[V]	13.80 to 16.80	27.60 to 33.60	55.20 to 67.20
	AUX1 (12V1A)	Optional		
ISOLATION	AUX2 (5V1A)	Optional		
	REMOTE ON/OFF	Optional		
	PowerGood	Optional		
	INPUT-OUTPUT · RC · AUX *7	AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
ENVIRONMENT	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT · RC · AUX-FG *7	AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-RC · AUX *7	AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)		
	OPERATING TEMP,HUMID.AND ALTITUDE	-20 to +70°C, 20 - 90%RH (Non condensing)		
SAFETY AND NOISE REGULATIONS	STORAGE TEMP,HUMID.AND ALTITUDE	-30 to +75°C, 20 - 90%RH (Non condensing)		
	VIBRATION	10 - 55Hz, 19.6m/s <sup>2</sup> (2G), 3minutes period, 60minutes each along X, Y and Z axis		
	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis		
	AGENCY APPROVALS	UL60950-1, ANSI/AMII ES60601-1, C-UL, EN60950-1, EN60601-1 Pending		
OTHERS	CONDUCTED NOISE	Complies with FCC-B, VCCI-B, CISPR11-B, CISPR22-B, EN55011-B, EN55022-B		
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2 (class A) *5		
	CASE SIZE/WEIGHT	76.2×35×127mm [3.0×1.4×5.0 inches] (W×H×D) / 400g max		
	COOLING METHOD	Convection, Forced air (Require external fan)		

\*1 This is the value that measured on measuring board with capacitor of 22μF at 150mm from output terminal.

Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).

\*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.

\*3 Derating is required.

\*4 Please contact us about dynamic load and input response.

\*5 Please contact us about another class.

\*6 Specification is changed at option, refer to Instruction Manual.

\*7 Applicable when AUX and remote control (optional) is added.

\* To meet the specifications. Do not operate over-loaded condition.

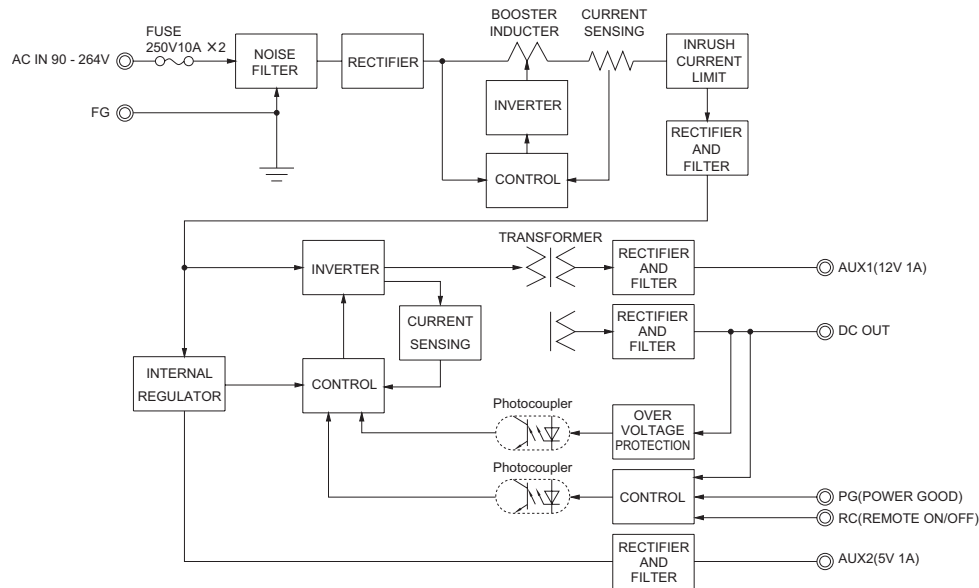
\* Sound noise may be generated by power supply in case of pulse load.

\* Parallel operation is not possible.

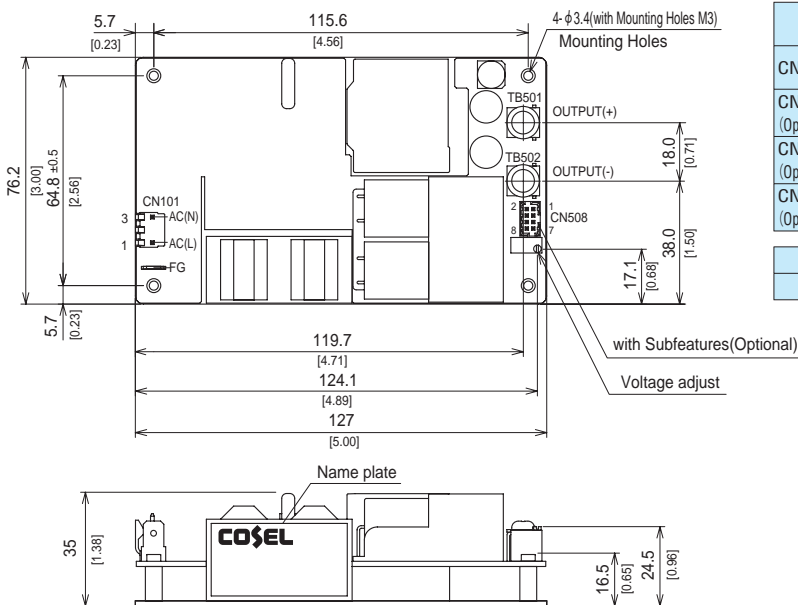
## Features

- High Power density: 14.3W/inch<sup>3</sup>
- High efficiency 92% typ (Input Voltage 230V, Output Voltage 24V)
- 3" × 5" standard footprint
- Fits 1U applications
- Industrial and Medical safety approvals
- Low leakage current
- With Remote On/Off (Optional)
- With AUX1 (5V), AUX2 (12V) (Optional)
- No minimum load is required

## Block diagram



## External view



- ※ Tolerance  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 400g max
- ※ There is a total of four attachment holes.
- ※ This power supply requires mounting on metal standoffs 8mm in height. (Insulating sheet is required if you do not use a spacer).
- ※ Dimensions in mm, [ ] = inches
- ※ Screw tightening torque : (TB501, 502) : 1.5N · m max
- ※ Mounting torque : 0.6N · m max
- ※ Avoid contact between TB501 and 502 wiring with mounting parts.
- ※ Option : -J1 : (J.S.T) connector type. Refer to Instruction Manual 5.

I/OConnector		Mating connector	Terminal	Mfr
CN101	A-41671-A03A197-2	09-50-8031	08-50-0105 08-65-0114	MOLEX
CN508 (Optional)	087831-0820	51110-0851	50394-8051	
CN101 (Optional)	B2P3-VH	VHR-3N	SVH-21T-P1.1	J.S.T.
CN508 (Optional)	B8B-PHDSS	PHDR-08VS	SPHD-002T-P0.5	

FG	Mating connector	Terminal	Mfr
-	250 Series	-	170603-2 Tyco Electronics

## &lt;Pin Assignments&gt;

## &lt;CN101&gt;

Pin No.	Input
1	AC(L)
2	
3	AC(N)

## &lt;CN508(Optional)&gt;

Pin No.	Function
1	AUX1 : AUX1 (12V1A)
2	AUX1G: AUX1 (GND)
3	RC1 : REMOTE ON/OFF
4	RCG : REMOTE ON/OFF (GND)
5	PG : Power good
6	PGG : Power good (GND)
7	AUX2 : AUX2 (5V1A)
8	AUX2G: AUX2 (GND)



# GHA500F

GH A 500 F -□□ -□

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RoHS



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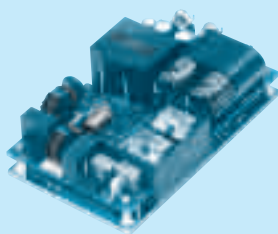


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Recommended EMI/EMC Filter  
EAC-10-472



High voltage pulse noise type : EAP series  
Low leakage current type : EAM series

\*The EMI/EMC Filter is recommended to  
connect with several devices.

- ① Series name
- ② Single output
- ③ Output wattage
- ④ Universal input
- ⑤ Output voltage
- ⑥ Optional \*6
- T3 : mounting hole M3
- J1 : VH(J.S.T.)connector type
- R3 : with Subfeatures  
(5VAUX,12VAUX,Remote,  
Power good)
- P : Pallarel Operation

Specification is changed at  
option, refer to Instruction  
manual.

## Cautions

- Forced air cooling is required for the maximum output power. Please see instruction manual.
- Avoid applying stress to surface mount components.
- De-rating is required if the applied input voltage is 90-115VAC.
- The electrolytic capacitor has limited life span which is very much dependent on the actual operating conditions.
- Operating in the presence of chemical vapors or harsh environment can affect the power supply life expectancy.
- Please make sure to read the instruction manual carefully before using this product.

It should be in the "Instruction Manual" not spec sheet.

MODEL	GHA500F-12	GHA500F-15	GHA500F-24	GHA500F-48
MAX OUTPUT WATTAGE[W]	500.8	501	504	504
DC OUTPUT	Forced air at 50°C	12V 41.7A	15V 33.4A	24V 21.0A
	Convection at 40°C	12V 12.5A	15V 10.0A	24V 6.3A
	at 50°C	12V 9.2A	15V 7.4A	24V 4.6A
	conduction cooling at 0°C	12V 30.0A	15V 24.0A	24V 15.0A
	at 50°C	12V 16.7A	15V 13.4A	24V 8.4A

## SPECIFICATIONS

	MODEL		GHA500F-12	GHA500F-15	GHA500F-24	GHA500F-48
INPUT	VOLTAGE[V]		AC90 - 264 1 φ (output derating is required at AC90V -115V *3)			
	CURRENT[A]	ACIN 120V	5.4typ			
		ACIN 230V	2.9typ			
	FREQUENCY[Hz]		50 / 60 (47 - 63)			
	EFFICIENCY[%]	ACIN 120V	88typ	90typ	90typ	90typ
		ACIN 230V	90typ	92typ	92typ	92typ
	POWER FACTOR (Io=100%)	ACIN 120V	0.95typ			
		ACIN 230V	0.90typ			
	ACIN 120V	20typ (Io=100%) (At cold start) (Ta=25℃)				
	ACIN 230V	40typ (Io=100%) (At cold start) (Ta=25℃)				
LEAKAGE CURRENT[ma]			0.125/0.250max (ACIN 120V/240V 60Hz,Io=100%, According to IEC60601-1)			
OUTPUT	VOLTAGE[V]		12	15	24	48
	CURRENT[A]	Forced air	41.7	33.4	21.0	10.5
		Convection	9.2	7.4	4.6	2.3
		conduction cooling	16.7	13.4	8.4	4.2
	LINE REGULATION[mV] *4		48max	60max	96max	192max
	LOAD REGULATION[mV] *4		100max	120max	150max	240max
	RIPPLE[mVp-p] *1	0 to +50℃	240max	240max	240max	300max
		-20 - 0℃	320max	320max	320max	400max
	RIPPLE NOISE[mVp-p]*1	0 to +50℃	300max	300max	300max	480max
		-20 - 0℃	360max	360max	360max	500max
	TEMPERATURE REGULATION[mV]	0 to +50℃	120max	120max	240max	480max
		-20 to +50℃	150max	150max	290max	600max
	DRIFT[mV] *2		48max	60max	96max	192max
	START-UP TIME[ms]		500typ (ACIN 120V, Io=100%)			
	HOLD-UP TIME[ms]		16typ (ACIN 120V, Io=100%)			
	PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		10.80 to 13.20	13.50 to 16.50	21.60 to 26.40
OUTPUT VOLTAGE SETTING[V]		12.00 to 12.48	15.00 to 15.30	24.00 to 24.96	48.00 to 49.92	
OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically				
OVERVOLTAGE PROTECTION[V]		13.80 to 16.80	17.25 to 21.00	27.60 to 33.60	55.20 to 67.20	
AUX1 (12V1A)		Optional				
AUX2 (5V1A)		Optional				
REMOTE ON/OFF		Optional				
PowerGood		Optional				
ISOLATION	INPUT-OUTPUT · RC · AUX *7		AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)			
	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)			
	OUTPUT · RC · AUX-FG *7		AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)			
	OUTPUT-RC · AUX *7		AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)			
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-20 to +80℃, 20 - 90%RH (Non condensing)			
	STORAGE TEMP.,HUMID.AND ALTITUDE		-30 to +80℃, 20 - 90%RH (Non condensing)			
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis			
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis			
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL60950-1, ANSI/AMII ES60601-1, C-UL, EN60950-1, EN60601-1 Pending			
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR11-B, CISPR22-B, EN55011-B, EN55022-B			
	HARMONIC ATTENUATOR		Complies with IEC61000-3-2 (class A) *5			
OTHERS	CASE SIZE/WEIGHT		76.2×35×127mm [3.0×1.4×5.0 inches] (W×H×D) / 420g max			
	COOLING METHOD		Convection, Forced air (Require external fan), Conduction cooling			

\*1 This is the value that measured on measuring board with capacitor of 22μF at 150mm from output terminal.

Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN: RM103).

\*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.

\*3 Derating is required.

\*4 Please contact us about dynamic load and input response.

\*5 Please contact us about another class.

\*6 Specification is changed at option, refer to Instruction Manual.

\*7 Applicable when AUX and remote control (optional) is added.

\* To meet the specifications. Do not operate over-loaded condition.

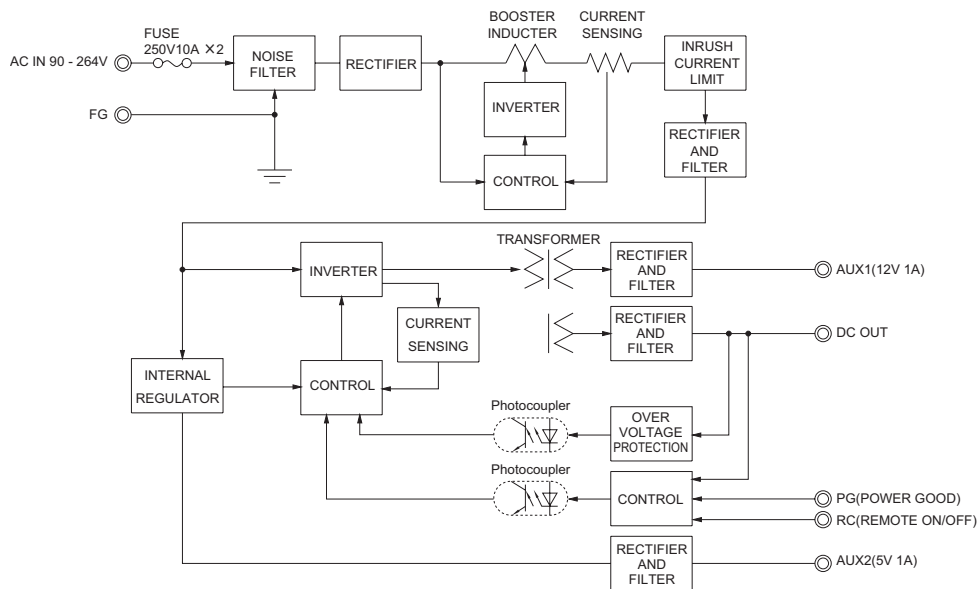
\* Sound noise may be generated by power supply in case of pulse load.

\* Parallel operation is not possible.

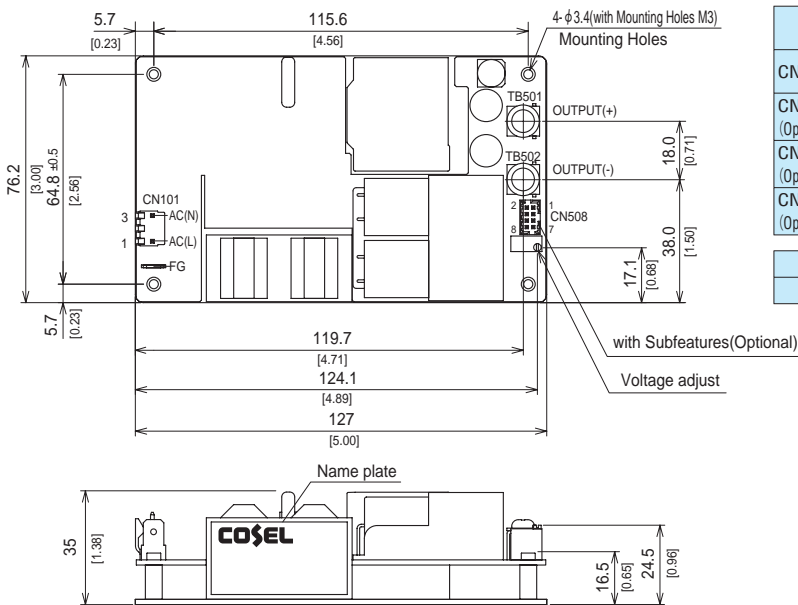
## Features

- **Wattage 500W max**
- **High Power density:24.1W/inch<sup>3</sup>**
- **High efficiency 92% typ (Input Voltage 230V,Output Voltage 24V)**
- **Conduction cooling**
- **3 "× 5 "standard footprint**
- **Fits 1U applications**
- **Industrial and Medical safety approvals**
- **Low leakage current**
- **With Remote On/Off (Optional)**
- **With AUX1 (5V), AUX2 (12V) (Optional)**
- **No minimum load is required**

## Block diagram



## External view



I/OConnector		Mating connector	Terminal	Mfr
CN101	A-41671-A03A197-2	09-50-8031	08-50-0105 08-65-0114	MOLEX
CN508 (Optional)	087831-0820	51110-0851	50394-8051	
CN101 (Optional)	B2P3-VH	VHR-3N	SVH-21T-P1.1	J.S.T.
CN508 (Optional)	B8B-PHDSS	PHDR-08VS	SPHD-002T-P0.5	

FG		Mating connector	Terminal	Mfr
-	250 Series	-	170603-2	Tyco Electronics

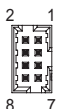
<Pin Assignments>

<CN101>

Pin No.	Input
1	AC(L)
2	
3	AC(N)

<CN508(Optional)>

Pin No.	Function
1	AUX1 : AUX1 (12V1A)
2	AUX1G: AUX1 (GND)
3	RC1 : REMOTE ON/OFF
4	RCG : REMOTE ON/OFF (GND)
5	PG : Power good
6	PGG : Power good (GND)
7	AUX2 : AUX2 (5V1A)
8	AUX2G: AUX2 (GND)



- ※ Tolerance  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 420g max
- ※ There is a total of four attachment holes.
- ※ Base Plate : Aluminum
- ※ Dimensions in mm, [ ] =inches
- ※ Screw tightening torque : (TB501, 502) : 1.5N · m max
- ※ Mounting torque : 0.6N · m max
- ※ Avoid contact between TB501 and 502 wiring with mounting parts.
- ※ Option : -J1 (J.S.T) connector type. Refer to Instruction Manual 5.