

# GHA300F

GH A 300 F -□□ -□  
 ① ② ③ ④ ⑤ ⑥



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.

This power supply is manufactured by SMD technology. The stress to P.C.B like twisting or bending causes the defect of the unit, please handle the unit with care

| 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 | 48V 6.3A   |  |
|                       |            | at 40°C | 12V 8.4A   | 24V 4.2A  | 48V 2.1A   |  |
|                       | Convection | at 50°C | 12V 4.5A   | 24V 2.2A  | 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          | 90typ  |
|                                    |   | ACIN 230V   | 91typ          | 92typ          | 92typ  |
|                                    | POWER FACTOR (lo=100%)  | ACIN 120V   | 0.95typ        |                |        |
|                                    |   | ACIN 230V   | 0.90typ        |                |        |
| INRUSH CURRENT[A]                  | ACIN 120V   | 20typ (lo=100%) (At cold start) (Ta=25°C)   |                |                |        |
|                                    | ACIN 230V   | 40typ (lo=100%) (At cold start) (Ta=25°C)   |                |                |        |
| LEAKAGE CURRENT[mA]                | 0.125/0.250max (ACIN 120V/240V 60Hz,lo=100%, According to IEC60601-1) |   |                |                |        |
| OUTPUT                             | VOLTAGE[V]  | 12  | 24             | 48             |        |
|                                    | CURRENT[A]  | Forced air  | 25             | 12.5           | 6.3    |
|                                    |   | Convection  | 4.5            | 2.2            | 1.1    |
|                                    | LINE REGULATION[mV] *4  | 48max   | 96max          | 192max         |        |
|                                    | LOAD REGULATION[mV] *4  | 100max  | 150max         | 240max         |        |
|                                    | RIPPLE[mVp-p] *1  | 0 to +50°C  | 240max         | 240max         | 300max |
|                                    |   | -20 to 0°C  | 320max         | 320max         | 400max |
|                                    | RIPPLE NOISE[mVp-p]*1   | 0 to +50°C  | 300max         | 300max         | 480max |
|                                    |   | -20 to 0°C  | 360max         | 360max         | 500max |
|                                    | TEMPERATURE REGULATION[mV]  | 0 to +50°C  | 120max         | 240max         | 480max |
|                                    |   | -20 to +50°C  | 150max         | 290max         | 600max |
|                                    | DRIFT[mV] *2  | 48max   | 96max          | 192max         |        |
|                                    | START-UP TIME[ms]   | 500typ (ACIN 120V, lo=100%)   |                |                |        |
|                                    | HOLD-UP TIME[ms]  | 16typ (ACIN 120V, lo=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 |        |
| PROTECTION CIRCUIT AND OTHERS      | 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  |                |                |        |
|                                    | AUX2 (5V1A)   | Optional  |                |                |        |
|                                    | REMOTE ON/OFF 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 +70°C, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max                          |                |                |        |
|                                    | STORAGE TEMP.,HUMID.AND ALTITUDE                                      | -30 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max                          |                |                |        |
|                                    | 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                                |                |                |        |
| SAFETY AND NOISE REGULATIONS       | AGENCY APPROVALS  | UL60950-1, ANSI/AAMI ES60601-1, C-UL(CSA60950-1, CAN/CSA60601-1), EN60950-1, EN60601-1 3rd  |                |                |        |
|                                    | 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 X 35 X 127mm [3.0 X 1.4 X 5.0 inches] (W X H X D) / 400g max                           |                |                |        |
|                                    | COOLING METHOD  | Convection, Forced air (Require external fan)   |                |                |        |

\*1 This is the value that measured on measuring board with capacitor of 22 μF 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.  
 \* Forced air cooling is required to output up to MAX OUTPUT WATTAGE.  
 \* Bottom layer P.C.B has electric potential which is required isolation from FG by clearance or creepage as the safety design issue.

## 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



| I/O Connector    | Mating connector  | Terminal   | Mfr    |
|------------------|-------------------|------------|--------|
| CN101            | A-41671-A03A197-2 | 09-50-8031 | MOLEX  |
| CN501 (Optional) | 087831-0820       | 51110-0851 |        |
| CN101 (Optional) | B2P3-VH           | VHR-3N     | J.S.T. |
| CN501 (Optional) | B8B-PHDSS         | PHDR-08VS  |        |

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

### <Pin Assignments>

#### <CN101>

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

#### <CN501(Optional)>

| Pin No. | Function                  |
|---------|---------------------------|
| 1       | AUX1 : AUX1 (12V1A)       |
| 2       | AUX1G: AUX1 (GND)         |
| 3       | RC : 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)         |

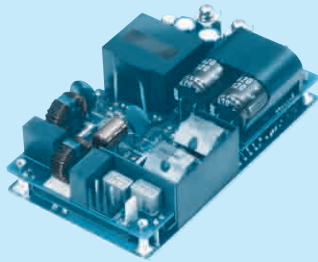


CN501

- ※ Tolerance ±1 [±0.04]
- ※ Weight : 400g max
- ※ There is a total of four attachment holes.
- ※ This power supply requires mounting on metal standoffs 5mm 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.

# GHA500F

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 ① ② ③ ④ ⑤ ⑥



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 Low leakage current type : EAM series  
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- 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.

This power supply is manufactured by SMD technology. The stress to P.C.B like twisting or bending causes the defect of the unit, please handle the unit with care

| MODEL                 | GHA500F-12         | GHA500F-15 | GHA500F-24 | GHA500F-30 | GHA500F-48 | GHA500F-56 |           |
|-----------------------|--------------------|------------|------------|------------|------------|------------|-----------|
| MAX OUTPUT WATTAGE[W] | 500.8              | 501        | 504        | 501        | 504        | 504        |           |
| DC OUTPUT             | Forced air         | at 50°C    | 12V 41.7A  | 15V 33.4A  | 24V 21.0A  | 30V 16.7A  | 48V 10.5A |
|                       |                    | at 40°C    | 12V 12.5A  | 15V 10.0A  | 24V 6.3A   | 30V 5.0A   | 48V 3.2A  |
|                       | Convection         | at 50°C    | 12V 9.2A   | 15V 7.4A   | 24V 4.6A   | 30V 3.7A   | 48V 2.3A  |
|                       |                    | at 0°C     | 12V 30.0A  | 15V 24.0A  | 24V 15.0A  | 30V 12.0A  | 48V 7.5A  |
|                       | conduction cooling | at 0°C     | 12V 30.0A  | 15V 24.0A  | 24V 15.0A  | 30V 12.0A  | 48V 7.5A  |
|                       |                    | at 50°C    | 12V 16.7A  | 15V 13.4A  | 24V 8.4A   | 30V 6.7A   | 48V 4.2A  |

## SPECIFICATIONS

|                                    | MODEL   | GHA500F-12  | GHA500F-15                                | GHA500F-24     | GHA500F-30     | GHA500F-48     | GHA500F-56     |                |  |
|------------------------------------|---|---|---|----------------|----------------|----------------|----------------|----------------|--|
| 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          | 90typ          | 90typ          |  |
|                                    |   | ACIN 230V   | 90typ                                     | 92typ          | 92typ          | 92typ          | 92typ          | 92typ          |  |
|                                    | POWER FACTOR (Io=100%)  | ACIN 120V   | 0.95typ                                   |                |                |                |                |                |  |
|                                    |   | ACIN 230V   | 0.90typ                                   |                |                |                |                |                |  |
|                                    | 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) |   |   |                |                |                |                |                |  |
| OUTPUT                             | VOLTAGE[V]  | 12  | 15  | 24             | 30             | 48             | 56             |                |  |
|                                    | CURRENT[A]  | Forced air  | 41.7                                      | 33.4           | 21.0           | 16.7           | 10.5           | 9.0            |  |
|                                    |   | Convection  | 9.2                                       | 7.4            | 4.6            | 3.7            | 2.3            | 1.9            |  |
|                                    |   | conduction cooling  | 16.7                                      | 13.4           | 8.4            | 6.7            | 4.2            | 3.6            |  |
|                                    | LINE REGULATION[mV] *4  | 48max   |   |                |                |                |                |                |  |
|                                    | LOAD REGULATION[mV] *4  | 100max  |   |                |                |                |                |                |  |
|                                    | RIPPLE[mVp-p] *1  | 0 to +50°C  | 240max                                    | 240max         | 240max         | 300max         | 300max         | 400max         |  |
|                                    |   | -20 - 0°C   | 320max                                    | 320max         | 320max         | 400max         | 400max         | 500max         |  |
|                                    | RIPPLE NOISE[mVp-p]*1   | 0 to +50°C  | 300max                                    | 300max         | 300max         | 480max         | 480max         | 500max         |  |
|                                    |   | -20 - 0°C   | 360max                                    | 360max         | 360max         | 500max         | 500max         | 580max         |  |
|                                    | TEMPERATURE REGULATION[mV]  | 0 to +50°C  | 120max                                    | 150max         | 240max         | 300max         | 480max         | 480max         |  |
|                                    |   | -20 to +50°C  | 150max                                    | 180max         | 290max         | 360max         | 600max         | 600max         |  |
|                                    | DRIFT[mV] *2  | 48max   |   |                |                |                |                |                |  |
|                                    | 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  |   | 13.50 to 16.50                            |                | 21.60 to 26.40 |                | 27.00 to 31.50 |                |  |
| OUTPUT VOLTAGE SETTING[V]          | 12.00 to 12.48  |   | 15.00 to 15.30                            |                | 24.00 to 24.96 |                | 30.00 to 31.20 |                |  |
| PROTECTION CIRCUIT AND OTHERS      | 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 |                | 34.50 to 42.00 |  |
|                                    | 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°C, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max                          |   |                |                |                |                |                |  |
|                                    | STORAGE TEMP.,HUMID.AND ALTITUDE                                      | -30 to +80°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max                          |   |                |                |                |                |                |  |
|                                    | 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                                |   |                |                |                |                |                |  |
| SAFETY AND NOISE REGULATIONS       | AGENCY APPROVALS  | UL60950-1, ANSI/AAMI ES60601-1, C-UL(CSA60950-1, CAN/CSA60601-1), EN60950-1, EN60601-1 3rd  |   |                |                |                |                |                |  |
|                                    | 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 22 μF 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 available with -P option. Refer to 5.1on the instruction manual.  
 \* Forced air cooling is required to output up to MAX OUTPUT WATTAGE.

## 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/O Connector    | Mating connector  | Terminal                 | Mfr            |            |
|------------------|-------------------|--------------------------|----------------|------------|
| CN101            | A-41671-A03A197-2 | 08-50-0105<br>08-65-0114 | MOLEX          |            |
| CN501 (Optional) | 087831-0820       | 51110-0851               |                | 50394-8051 |
| CN101 (Optional) | B2P3-VH           | VHR-3N                   | SVH-21T-P1.1   | J.S.T.     |
| CN501 (Optional) | B8B-PHDSS         | PHDR-08VS                | SPHD-002T-P0.5 |            |

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

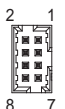
### <Pin Assignments>

#### <CN101>

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

#### <CN501 (Optional)>

| Pin No. | Function                  |
|---------|---------------------------|
| 1       | AUX1 : AUX1 (12V1A)       |
| 2       | AUX1G: AUX1 (GND)         |
| 3       | RC : 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)         |



CN501

- ※ 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.

# GHA500F-SNF

GH A 500 F -□□ -SNF□  
 ① ② ③ ④ ⑤ ⑥



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
  - J1 : CN501  
 VH(J.S.T.)connector type  
 P : Pallarell Operation
- Refer to the instruction manual 5.1.

| MODEL                 | GHA500F-12-SNF | GHA500F-15-SNF | GHA500F-24-SNF | GHA500F-30-SNF | GHA500F-48-SNF | GHA500F-56-SNF |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| MAX OUTPUT WATTAGE[W] | 450            | 501            | 504            | 501            | 504            | 504            |
| DC OUTPUT             | 12V 37.5A      | 15V 33.4A      | 24V 21.0A      | 30V 16.7A      | 48V 10.5A      | 56V 9.0A       |

## SPECIFICATIONS

| MODEL                                | GHA500F-12-SNF  | GHA500F-15-SNF  | GHA500F-24-SNF | GHA500F-30-SNF | GHA500F-48-SNF | GHA500F-56-SNF |                |        |
|--------------------------------------|---|---|----------------|----------------|----------------|----------------|----------------|--------|
| <b>INPUT</b>                         | AC90 - 264 1 φ (output derating is required at AC90V -115V *3)        |   |                |                |                |                |                |        |
| VOLTAGE[V]                           | ACIN 120V   | 4.8typ  | 5.4typ         |                |                |                |                |        |
|                                      | ACIN 230V   | 2.6typ  | 2.9typ         |                |                |                |                |        |
| CURRENT[A]                           |   |   |                |                |                |                |                |        |
| FREQUENCY[Hz]                        | 50 / 60 (47 - 63)   |   |                |                |                |                |                |        |
| EFFICIENCY[%]                        | ACIN 120V   | 87typ   | 89typ          | 89typ          | 89typ          | 89typ          |                |        |
|                                      | ACIN 230V   | 89typ   | 91typ          | 91typ          | 91typ          | 91typ          |                |        |
| POWER FACTOR (Io=100%)               | ACIN 120V   | 0.95typ   |                |                |                |                |                |        |
|                                      | ACIN 230V   | 0.90typ   |                |                |                |                |                |        |
| 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) |   |                |                |                |                |                |        |
| <b>OUTPUT</b>                        | VOLTAGE[V]  | 12  | 15             | 24             | 30             | 48             | 56             |        |
| CURRENT[A]                           | Forced air  | 37.5  | 33.4           | 21.0           | 16.7           | 10.5           | 9.0            |        |
|                                      |   |   |                |                |                |                |                |        |
| LINE REGULATION[mV]                  | *4  | 48max   | 60max          | 96max          | 120max         | 192max         | 192max         |        |
| LOAD REGULATION[mV]                  | *4  | 100max  | 120max         | 150max         | 180max         | 240max         | 240max         |        |
| RIPPLE[mVp-p]                        | *1  | 0 to +50°C  | 240max         | 240max         | 240max         | 300max         | 300max         | 400max |
|                                      |   | -20 - 0°C   | 320max         | 320max         | 320max         | 400max         | 400max         | 500max |
| RIPPLE NOISE[mVp-p]*1                |   | 0 to +50°C  | 300max         | 300max         | 300max         | 480max         | 480max         | 500max |
|                                      |   | -20 - 0°C   | 360max         | 360max         | 360max         | 500max         | 500max         | 580max |
| TEMPERATURE REGULATION[mV]           |   | 0 to +50°C  | 120max         | 150max         | 240max         | 300max         | 480max         | 480max |
|                                      |   | -20 to +50°C  | 150max         | 180max         | 290max         | 360max         | 600max         | 600max |
| DRIFT[mV]                            | *2  | 48max   | 60max          | 96max          | 120max         | 192max         | 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  | 13.50 to 16.50 | 21.60 to 26.40 | 27.00 to 31.50 | 43.20 to 52.80 | 52.00 to 56.00 |        |
| OUTPUT VOLTAGE SETTING[V]            |   | 12.00 to 12.48  | 15.00 to 15.30 | 24.00 to 24.96 | 30.00 to 31.20 | 48.00 to 49.92 | 55.00 to 56.00 |        |
| <b>PROTECTION CIRCUIT AND OTHERS</b> | OVERCURRENT PROTECTION  | Works over 105% of rating and recovers automatically *7                                     |                |                |                |                |                |        |
|                                      | OVERVOLTAGE PROTECTION[V]   | 13.80 to 16.80  | 17.25 to 21.00 | 27.60 to 33.60 | 34.50 to 42.00 | 55.20 to 67.20 | 60.00 to 69.00 |        |
|                                      | AUX1  | 12V 0.5A  |                |                |                |                |                |        |
|                                      | AUX2  | 5V 1A   |                |                |                |                |                |        |
|                                      | REMOTE ON/OFF   | Possible, AUX2 is available   |                |                |                |                |                |        |
|                                      | PowerGood   | Open corrector  |                |                |                |                |                |        |
| <b>ISOLATION</b>                     | INPUT-OUTPUT · RC · AUX   | 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  | AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)                |                |                |                |                |                |        |
|                                      | OUTPUT-RC · AUX   | AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)                |                |                |                |                |                |        |
| <b>ENVIRONMENT</b>                   | OPERATING TEMP., HUMID. AND ALTITUDE                                  | -20 to +70°C, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max *3                       |                |                |                |                |                |        |
|                                      | STORAGE TEMP., HUMID. AND ALTITUDE                                    | -30 to +80°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max                          |                |                |                |                |                |        |
|                                      | 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                                |                |                |                |                |                |        |
| <b>SAFETY AND NOISE REGULATIONS</b>  | AGENCY APPROVALS  | UL60950-1, ANSI/AAMI ES60601-1, C-UL(CSA60950-1, CAN/CSA60601-1), EN60950-1, EN60601-1 3rd  |                |                |                |                |                |        |
|                                      | 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   |                |                |                |                |                |        |
| <b>OTHERS</b>                        | CASE SIZE/WEIGHT  | 85.2 × 41 × 165.3mm [3.35 × 1.61 × 6.5 inches] (W × H × D) / 660g max                       |                |                |                |                |                |        |
|                                      | COOLING METHOD  | Forced air  |                |                |                |                |                |        |

\*1 This is the value that measured on measuring board with capacitor of 22 μF 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.

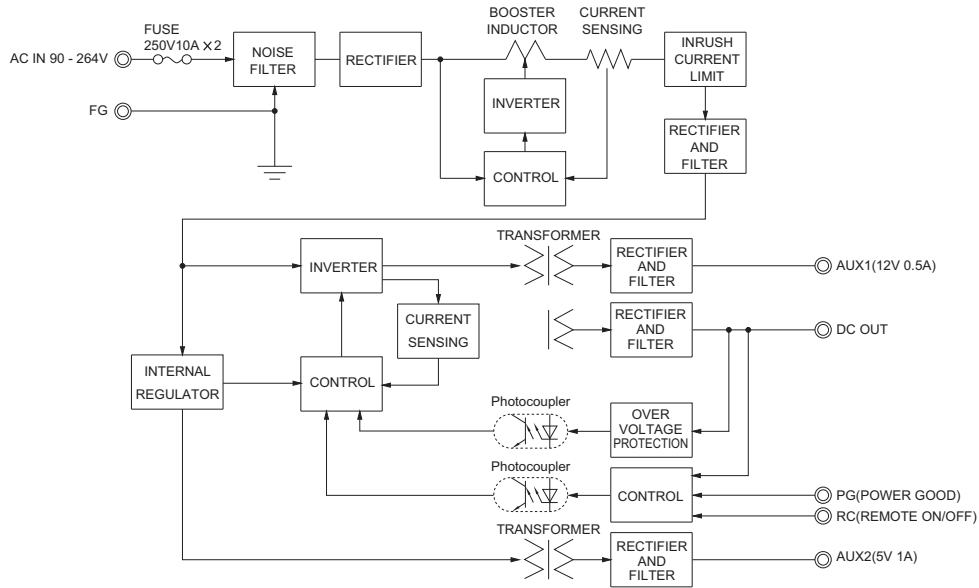
\*6 Specification is changed at option, refer to Instruction Manual.  
 \*7 When output current more than rated, output will shut down after 5 seconds or more. Recycle input after 3 minutes to reset the protection.  
 \* To meet the specifications. Do not operate over-loaded condition.  
 \* Sound noise may be generated by power supply in case of pulse load.  
 \* Parallel operation is available with -P option. Refer to 5.1 on the instruction manual.



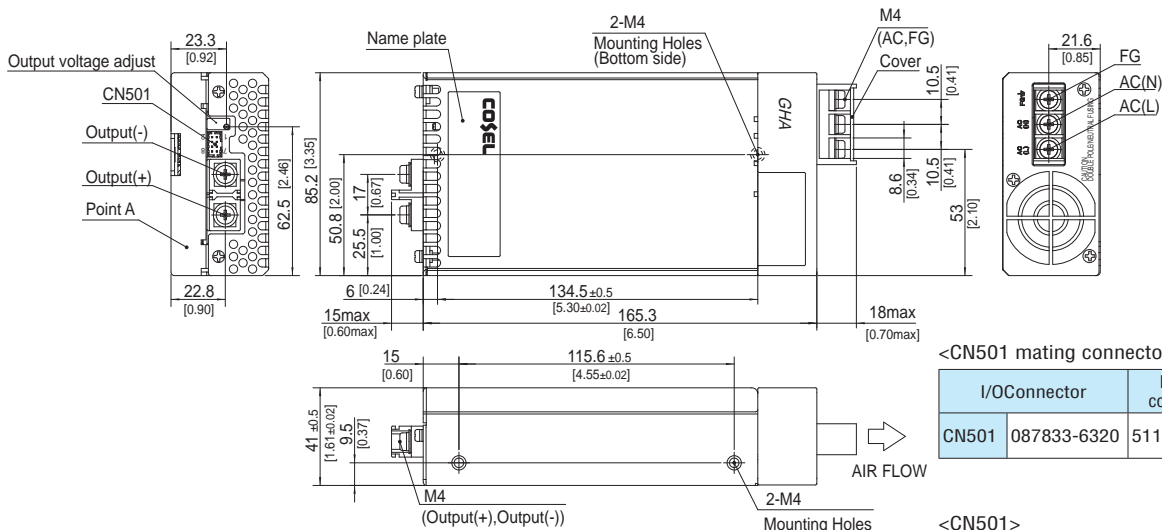
## Features

- Full packaged design united with GHA's features and additional robustness..
- High efficiency 91% typ (Input voltage 230V, Output voltage 24V)
- 50% minimized size compare with previous products.
- Optical for 1U applications
- Medical and Industrial safety approvals
- Low leakage current
- Conformal coating
- Single remote ON/OFF control for DC output, AUX1 and Fan.
- Isolated dual AUX (AUX1 12V 0.5A, AUX2 5V 1A)

## Block diagram



## External view



<CN501 mating connector and terminal>

| I/O Connector | Mating connector | Terminal   |
|---------------|------------------|------------|
| CN501         | 087833-6320      | 50394-8051 |

(Mfr : Molex)

<CN501>

| Pin No. | Function                  |
|---------|---------------------------|
| 1       | AUX1 : AUX1 (12V0.5A)     |
| 2       | AUX1G: AUX1 (GND)         |
| 3       | RC : 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 : 660g max
- ※ Upper PCB Material/thickness : FR-4/1.6mm
- ※ Lower PCB Material/thickness : AL/1.5mm
- ※ Chassis Material/thickness : Aluminum/1.5mm
- ※ Cover Material/thickness : Aluminum/1.2mm
- ※ Fan cover Material : PBT
- ※ Mounting torque : 1.5N · m (14.7kgf · cm) max
- ※ Screw tightening torque M4 : 1.6N · m (16.9kgf · cm) max
- ※ Dimensions in mm, [ ]=inches



# Mouser Electronics

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Cosel:

[GHA500F-48-SNF](#) [GHA500F-12-SNF](#) [GHA500F-24-SNF](#) [GHA500F-15-SNF](#)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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