

GHA300F

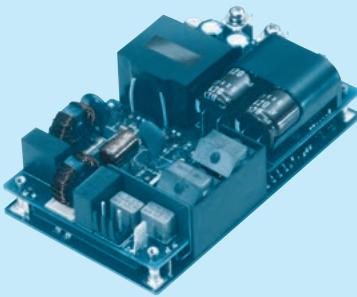
Ordering information

GH A 300 F -□□ -□

① ② ③ ④ ⑤ ⑥ ⑦ ⑧



RoHS

Example recommended EMI/EMC filter
EAC-10-472

High voltage pulse noise type : EAP series
Low leakage current type : EAM series
* A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

- 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
J3 : Horizontal input connector
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.
* Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

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
	Convection at 40°C	12V 8.4A	24V 4.2A
	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 1φ (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 ACIN 230V 91typ	90typ 92typ	90typ 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)		
	VOLTAGE[V]	12	24	48
	CURRENT[A]	Forced air 25.0 Convection 4.5	12.5 2.2	6.3 1.1
	LINE REGULATION[mV] *4	48max	96max	192max
OUTPUT	LOAD REGULATION[mV] *4	100max	150max	240max
	RIPPLE[mVp-p] *1	0 to +50°C 240max -20 to 0°C 320max	240max 320max	300max 400max
	RIPPLE NOISE[mVp-p] *1	0 to +50°C 300max -20 to 0°C 360max	300max 360max	480max 500max
	TEMPERATURE REGULATION[mV]	0 to +50°C 120max -20 to +50°C 150max	240max 290max	480max 600max
	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		
PROTECTION CIRCUIT AND OTHERS	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	Optional		
ISOLATION	PowerGood	Optional		
	INPUT-OUTPUT · RC · AUX *7	AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 2MOPP		
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 1MOPP		
	OUTPUT · RC · AUX-FG *7	AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)		
ENVIRONMENT	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), 3,000m (10,000feet) max *3		
	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 ² (2G), 3minutes period, 60minutes each along X, Y and Z axis		
SAFETY AND NOISE REGULATIONS	IMPACT	196.1m/s ² (20G), 11ms, once each X, Y and Z axis		
	AGENCY APPROVALS	UL60950-1, ANSI/AAMI ES60601-1, C-UL(CSA60950-1, CAN/CSA60601-1), EN60950-1, EN60601-1 3rd, Complies with DEN-AN, IEC60601-1-2 4th Ed.		
	CONDUCTED NOISE	Complies with FCC-B, VCCI-B, CISPR11-B, CISPR22-B, EN55011-B, EN55022-B		
OTHERS	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.

* 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.

GHA500F

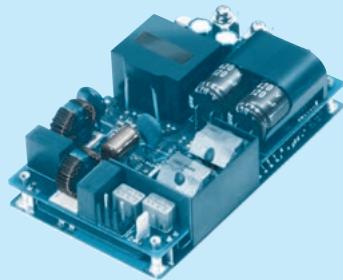
Ordering information

GH A 500 F -□□ □ -□

① ② ③ ④ ⑤ ⑥



RoHS

Example recommended EMI/EMC filter
EAC-10-472

High voltage pulse noise type : EAP series

Low leakage current type : EAM series

* A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

- 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
J3 : Horizontal input connector
VH(J.S.T.)connector type
R3 : with Subfeatures
(5VAUX,12VAUX,Remote,Power good)
P : Parallel 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.

* Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	GHA500F-12	GHA500F-15	GHA500F-24	GHA500F-30	GHA500F-48	GHA500F-56
MAX OUTPUT WATTAGE[W]	500.4	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
	Convection at 40°C	12V 12.5A	15V 10.0A	24V 6.3A	30V 5.0A	48V 3.2A
	at 50°C	12V 9.2A	15V 7.4A	24V 4.6A	30V 3.7A	48V 2.3A
	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 1φ (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)					
OUTPUT	LEAKAGE CURRENT[mA]	0.125/0.250max (ACIN 120V/240V 60Hz, Io=100%, According to IEC60601-1)					
	VOLTAGE[V]	12	15	24	30	48	56
	CURRENT[A]	Forced air 41.7 Convection 9.2 conduction cooling 16.7	33.4 7.4 13.4	21.0 4.6 8.4	16.7 3.7 6.7	10.5 2.3 4.2	9.0 1.9 3.6
	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 -20 - 0°C 320max	240max 320max	240max 320max	300max 400max	300max 400max	400max 500max
	RIPPLE NOISE[mVp-p] *1	0 to +50°C 300max -20 - 0°C 360max	300max 360max	300max 360max	480max 500max	480max 500max	500max 580max
	TEMPERATURE REGULATION[mV]	0 to +50°C 120max -20 to +50°C 150max	150max 180max	240max 290max	300max 360max	480max 600max	480max 600max
	DRIFT[mV] *2	48max	60max	96max	120max	192max	192max
	START-UP TIME[ms]	500typ (ACIN 120V, Io=100%)					
PROTECTION CIRCUIT AND OTHERS	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
	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	55.20 to 67.20	60.00 to 69.00
ISOLATION	AUX1 (12V1A)	Optional					
	AUX2 (5V1A)	Optional					
	REMOTE ON/OFF	Optional					
	PowerGood	Optional					
ENVIRONMENT	INPUT-OUTPUT · RC · AUX *7	AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 2MOPP					
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 1MOPP					
	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)					
SAFETY AND NOISE REGULATIONS	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/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					
OTHERS	AGENCY APPROVALS	UL60950-1, ANSI/AAMI ES60601-1, C-UL(CSA60950-1, CAN/CSA60601-1), EN60950-1, EN60601-1 3rd, Complies with DEN-AN, IEC60601-1-2 4th Ed.					
	CONDUCTED NOISE	Complies with FCC-B, VCCI-B, CISPR11-B, CISPR22-B, EN55011-B, EN55022-B					
OTHERS	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) / 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.

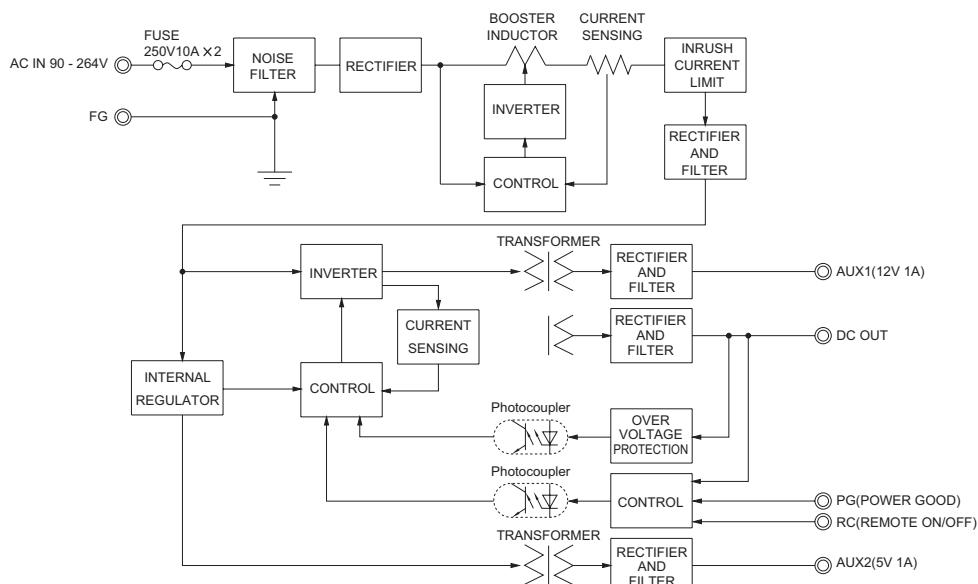
* Parallel operation is available with -P option. Refer to 5.1 on the instruction manual.

* Forced air cooling is required to output up to MAX OUTPUT WATTAGE.

Features

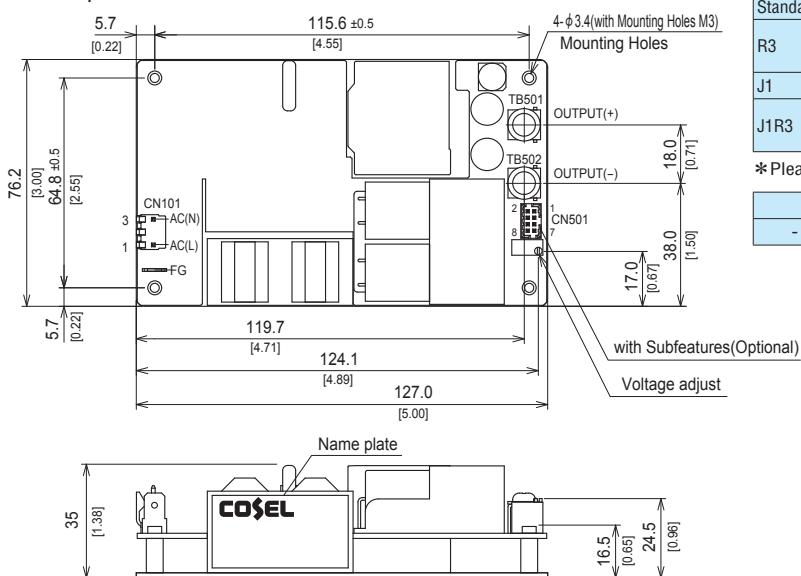
- Wattage 500W max
- High Power density: 24.1W/inch³
- High efficiency 92% typ (Input Voltage 230V, Output Voltage 24V)
- Conduction cooling
- 3" x 5" standard footprint
- Fits 1U applications
- Industrial and Medical safety approvals
- Low leakage current
- With Remote On/Off (Optional)
- With AUX1 (12V), AUX2 (5V) (Optional)
- No minimum load is required

Block diagram



External view

*External size of option J3 is different from standard model and refer to 5 Option and Others of instruction manual for details.



※ Tolerance ± 1 [± 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.

	Connector	Mating connector	Terminal	Mfr
Standard	CN101	A-41671-A03A197-2	09-50-0105	Molex *
	CN101		08-65-0114	
	CN501	087831-0820	51110-0851	
J1	CN101		50394-8051	J.S.T.
	CN101	B2P3-VH	VHR-3N	
J1R3	CN501	B8B-PHDSS	SPHD-002T-P0.5	J.S.T.
	CN501			

* Please note the pin position No.1 is different from Molex.

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

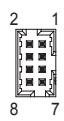
<Pin Assignments>

<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

GHA300F-SNF

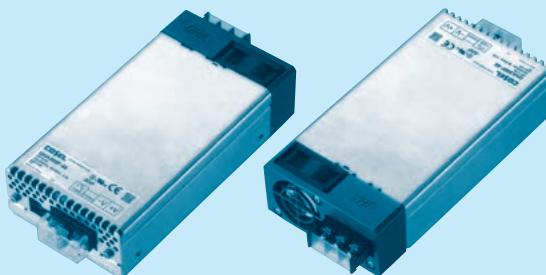
Ordering information

GH A 300 F -□□ -SNF□

① ② ③ ④ ⑤ ⑥



RoHS

Example recommended EMI/EMC filter
EAC-10-472High voltage pulse noise type : EAP series
Low leakage current type : EAM series* A higher current rating EMI/EMC filter
may be recommended in view of the
other devices that could be connected
in parallel with the power supply.

- ① Series name
- ② Single output
- ③ Output wattage
- ④ Universal input
- ⑤ Output voltage
- ⑥ Optional *6

J1 : CN501
PH(J.S.T.)connector typeRefer to the instruction manual
5.1.

* Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	GHA300F-12-SNF	GHA300F-24-SNF	GHA300F-48-SNF
MAX OUTPUT WATTAGE[W]	300	300	302.4
DC OUTPUT	Forced air +50°C	12V 25.0A	24V 12.5A

SPECIFICATIONS

	GHA300F-12-SNF	GHA300F-24-SNF	GHA300F-48-SNF
INPUT	VOLTAGE[V]	AC90 - 264 1φ (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 88typ ACIN 230V 90typ	89typ 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)	
	VOLTAGE[V]	12	24
	CURRENT[A]	Forced air 25.0	12.5
	LINE REGULATION[mV] *4	48max	96max
OUTPUT	LOAD REGULATION[mV] *4	100max	150max
	RIPPLE[mVp-p] *1	0 to +50°C 240max -20 - 0°C 320max	240max 320max
	RIPPLE NOISE[mVp-p] *1	0 to +50°C 300max -20 - 0°C 360max	300max 360max
	TEMPERATURE REGULATION[mV]	0 to +50°C 120max -20 to +50°C 150max	240max 290max
	DRIFT[mV] *2	48max	96max
	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
	OUTPUT VOLTAGE SETTING[V]	12.00 to 12.48	24.00 to 24.96
	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically *7	
PROTECTION CIRCUIT AND OTHERS	OVERVOLTAGE PROTECTION[V]	13.80 to 16.80	27.60 to 33.60
	AUX1	10V 0.5A	
	AUX2	5V 1A	
	REMOTE ON/OFF	Possible, AUX2 is available	
ISOLATION	PowerGood	Open corrector	
	INPUT-OUTPUT · RC · AUX	AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 2MOPP	
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 1MOPP	
	OUTPUT · RC · AUX-FG	AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)	
ENVIRONMENT	OUTPUT-RC · AUX	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), 3,000m (10,000feet) max *3	
	STORAGE TEMP., HUMID. AND ALTITUDE	-30 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max	
	VIBRATION	10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis	
SAFETY AND NOISE REGULATIONS	IMPACT	196.1m/s² (20G), 11ms, once each X, Y and Z axis	
	AGENCY APPROVALS	UL60950-1, ANSI/AAMI ES60601-1, C-UL(CSA60950-1, CAN/CSA60601-1), EN60950-1, EN60601-1 3rd, Complies with DEN-AN, IEC60601-1-2 4th Ed.	
	CONDUCTED NOISE	Complies with FCC-B, VCCI-B, CISPR11-B, CISPR22-B, EN55011-B, EN55022-B	
OTHERS	HARMONIC ATTENUATOR	Complies with IEC61000-3-2 (class A) *5	
	CASE SIZE/WEIGHT	85.2×41×165.3mm [3.35×1.61×6.5 inches] (W×H×D) / 620g max	
	COOLING METHOD	Forced air	

*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 When output current more than rated, output will shut down after 5 seconds or more.

Recycle input after 3 minutes to reset the protection.

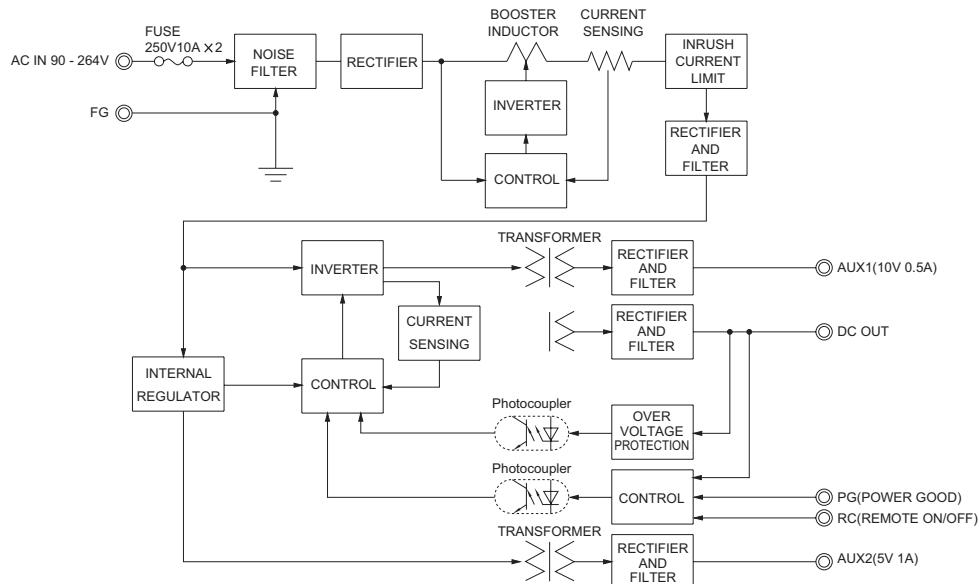
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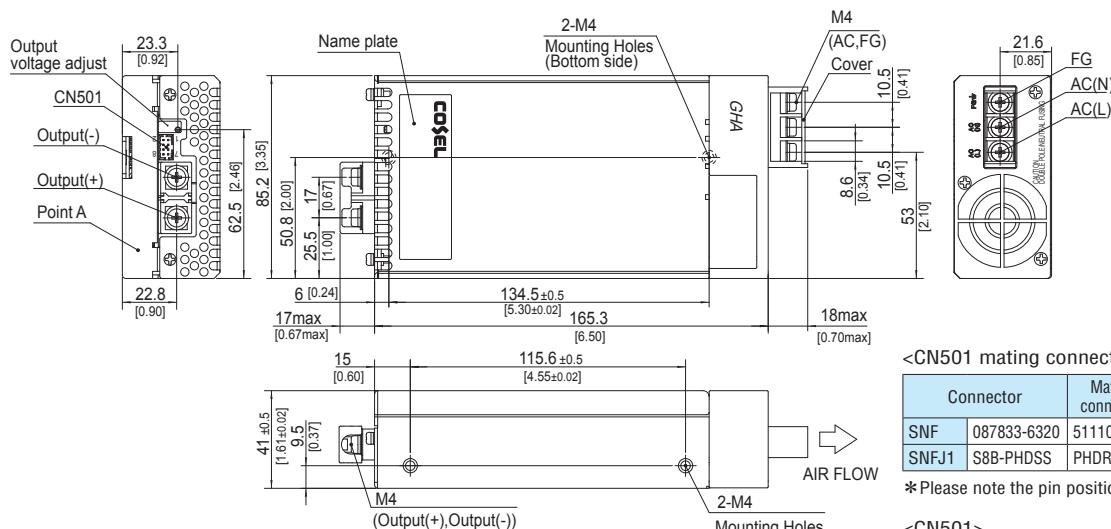
Features

- Full packaged design united with GHA's features and additional robustness..
- High efficiency 91% typ (Input voltage 230V, Output voltage 24V)
- 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 10V 0.5A, AUX2 5V 1A)

Block diagram



External view



※ Tolerance ± 1 [± 0.04]
 ※ Weight : 620g max
 ※ Upper PCB Material/Thickness : FR-4/1.6mm
 ※ Lower PCB Material/Thickness : FR-4/1.6mm
 ※ Chassis Material/Thickness : Aluminum/1.5mm
 ※ Cover Material/Thickness : Aluminum/1.2mm
 ※ Fan cover Material : PBT
 ※ Mounting torque : $1.5N \cdot m$ (14.7kgf · cm) max
 ※ Screw tightening torque M4 : $1.6N \cdot m$ (16.9kgf · cm) max
 ※ Dimensions in mm, []=inches

<CN501 mating connector and terminal>

Connector	Mating connector	Terminal	Mfr
SNF	087833-6320	51110-0851	50394-8051
SNFJ1	S8B-PHDSS	PHDR-08VS	SPHD-002T-P0.5

*Please note the pin position No.1 is different from Molex.

<CN501>

Pin No.	Function
1	AUX1 : AUX1 (10V 0.5A)
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 (5V 1A)
8	AUX2G : AUX2 (GND)

GHA500F-SNF

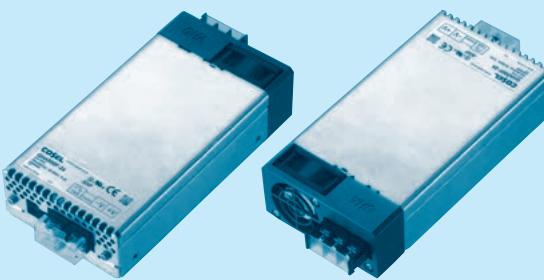
Ordering information

GH A 500 F -□□ -SNF□

① ② ③ ④ ⑤ ⑥



RoHS

Example recommended EMI/EMC filter
EAC-10-472

High voltage pulse noise type : EAP series
Low leakage current type : EAM series
* A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

* Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

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	Forced air +50°C	12V 37.5A	15V 33.4A	24V 21.0A	30V 16.7A	48V 10.5A

SPECIFICATIONS

	MODEL	GHA500F-12-SNF	GHA500F-15-SNF	GHA500F-24-SNF	GHA500F-30-SNF	GHA500F-48-SNF	GHA500F-56-SNF
INPUT	VOLTAGE[V]	AC90 - 264 1φ (output derating is required at AC90V -115V *3)					
	CURRENT[A]	ACIN 120V 4.8typ ACIN 230V 2.6typ	5.4typ 2.9typ				
	FREQUENCY[Hz]	50 / 60 (47 - 63)					
	EFFICIENCY[%]	ACIN 120V 87typ ACIN 230V 89typ	89typ 91typ	89typ 91typ	89typ 91typ	89typ 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)					
	VOLTAGE[V]	12	15	24	30	48	56
	CURRENT[A]	Forced air 37.5 Forced air 33.4	21.0	16.7	10.5	9.0	
	LINE REGULATION[mV] *4	48max	60max	96max	120max	192max	192max
OUTPUT	LOAD REGULATION[mV] *4	100max	120max	150max	180max	240max	240max
	RIPPLE[mVp-p] *1	0 to +50°C 240max -20 - 0°C 320max	240max 320max	240max 320max	300max 400max	300max 400max	400max 500max
	RIPPLE NOISE[mVp-p] *1	0 to +50°C 300max -20 - 0°C 360max	300max 360max	300max 360max	480max 500max	480max 500max	500max 580max
	TEMPERATURE REGULATION[mV]	0 to +50°C 120max -20 to +50°C 150max	150max 180max	240max 290max	300max 360max	480max 600max	480max 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
	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically *7					
PROTECTION CIRCUIT AND OTHERS	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					
ISOLATION	PowerGood	Open corrector					
	INPUT-OUTPUT · RC · AUX	AC4,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 2MOPP					
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature) 1MOPP					
	OUTPUT · RC · AUX-FG	AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)					
ENVIRONMENT	OUTPUT-RC · AUX	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), 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/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis					
SAFETY AND NOISE REGULATIONS	IMPACT	196.1m/s² (20G), 11ms, once each X, Y and Z axis					
	AGENCY APPROVALS	UL60950-1, ANSI/AAMI ES60601-1, C-UL(CSA60950-1, CAN/CSA60601-1), EN60950-1, EN60601-1 3rd, Complies with DEN-AN, IEC60601-1-2 4th Ed.					
	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	85.2 X 41 X 165.3mm [3.35 X 1.61 X 6.5 inches] (W X H X D) / 660g max					
	COOLING METHOD	Forced air					

*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 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.

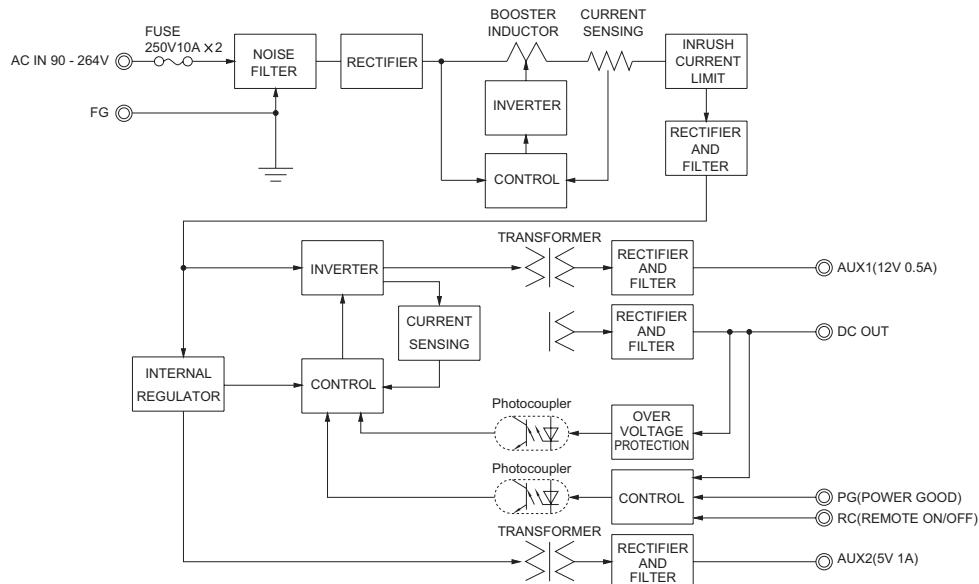
* Sound noise may be generated by power supply in case of pulse load.

* Parallel operation is available with -P option. Refer to 5.1 on the instruction manual.

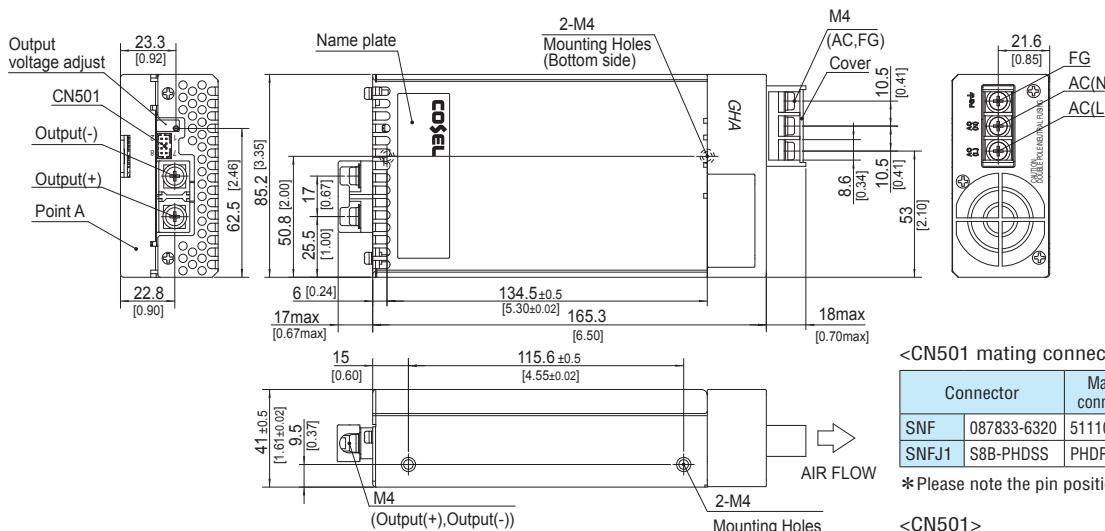
Features

- Full packaged design united with GHA's features, and additional robustness..
- High efficiency 91% typ (Input voltage 230V, Output voltage 24V)
- 50% minimized size compares 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



※ Tolerance ±1 [±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

<CN501 mating connector and terminal>

Connector	Mating connector	Terminal	Mfr
SNF	087833-6320	51110-0851	50394-8051
SNFJ1	S8B-PHDSS	PHDR-08VS	SPHD-002T-P0.5

*Please note the pin position No.1 is different from 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)