

## PMA15F

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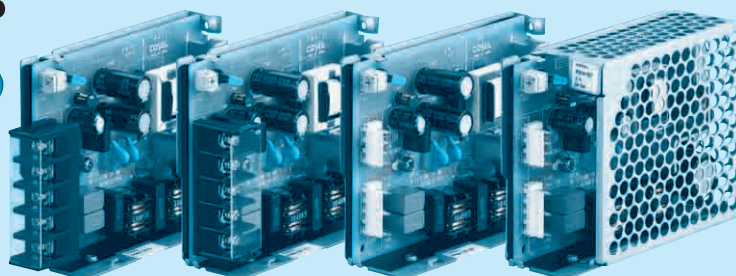
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RoHS

Horizontal terminal block  
(option : -T1)Vertical terminal block  
(option : -T)

Standard type

with Cover  
(option : -N)Recommended EMI/EMC Filter  
NAM-04-000

Low leakage current type : NAM 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 \*5  
T : Vertical terminal block  
T1 : Horizontal terminal block  
N : with Cover  
J1 : VH(J.S.T.)connector type

Specification is changed at  
option, refer to Instruction  
Manual.

| MODEL                 | PMA15F-3R3 | PMA15F-5 | PMA15F-12 | PMA15F-15 | PMA15F-24 |
|-----------------------|------------|----------|-----------|-----------|-----------|
| MAX OUTPUT WATTAGE[W] | 9.9        | 15       | 15.6      | 15        | 16.8      |
| DC OUTPUT             | 3.3V 3A    | 5V 3A    | 12V 1.3A  | 15V 1A    | 24V 0.7A  |

## SPECIFICATIONS

|                                     | MODEL                                |                                                                        | PMA15F-3R3                                                                                                                                | PMA15F-5          | PMA15F-12      | PMA15F-15      | PMA15F-24      |
|-------------------------------------|--------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|----------------|----------------|
| INPUT                               | VOLTAGE[V]                           |                                                                        | AC85 - 264 1ϕ (Refer to the Instruction Manual 1.1 and 3.2) *3                                                                            |                   |                |                |                |
|                                     | CURRENT[A]                           | ACIN 100V                                                              | 0.30typ (Io=100%)                                                                                                                         | 0.40typ (Io=100%) |                |                |                |
|                                     |                                      | ACIN 200V                                                              | 0.15typ (Io=100%)                                                                                                                         | 0.20typ (Io=100%) |                |                |                |
|                                     | FREQUENCY[Hz]                        |                                                                        | 50 / 60 (47 - 440)                                                                                                                        |                   |                |                |                |
|                                     | EFFICIENCY[%]                        | ACIN 100V                                                              | 66typ                                                                                                                                     | 70typ             | 74typ          | 76typ          | 76typ          |
|                                     |                                      | ACIN 200V                                                              | 67typ                                                                                                                                     | 74typ             | 78typ          | 79typ          | 79typ          |
|                                     | INRUSH CURRENT[A]                    | ACIN 100V                                                              | 15typ (Io=100%) (At cold start)                                                                                                           |                   |                |                |                |
| ACIN 200V                           |                                      | 30typ (Io=100%) (At cold start)                                        |                                                                                                                                           |                   |                |                |                |
| LEAKAGE CURRENT[ma]                 |                                      | 0.05/0.10max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60601-1) |                                                                                                                                           |                   |                |                |                |
| OUTPUT                              | VOLTAGE[V]                           |                                                                        | 3.3                                                                                                                                       | 5                 | 12             | 15             | 24             |
|                                     | CURRENT[A]                           |                                                                        | 3.0                                                                                                                                       | 3.0               | 1.3            | 1.0            | 0.7            |
|                                     | LINE REGULATION[mV]                  |                                                                        | 20max                                                                                                                                     | 20max             | 48max          | 60max          | 96max          |
|                                     | LOAD REGULATION[mV]                  |                                                                        | 40max                                                                                                                                     | 40max             | 100max         | 120max         | 150max         |
|                                     | RIPPLE[mVp-p]                        | 0 to +50℃                                                              | 80max                                                                                                                                     | 80max             | 120max         | 120max         | 120max         |
|                                     |                                      | *1<br>-10 - 0℃                                                         | 140max                                                                                                                                    | 140max            | 160max         | 160max         | 160max         |
|                                     | RIPPLE NOISE[mVp-p]                  | 0 to +50℃                                                              | 120max                                                                                                                                    | 120max            | 150max         | 150max         | 150max         |
|                                     |                                      | *1<br>-10 - 0℃                                                         | 160max                                                                                                                                    | 160max            | 180max         | 180max         | 180max         |
|                                     | TEMPERATURE REGULATION[mV]           | 0 to +50℃                                                              | 50max                                                                                                                                     | 50max             | 120max         | 150max         | 240max         |
|                                     |                                      | -10 to +50℃                                                            | 60max                                                                                                                                     | 60max             | 150max         | 180max         | 290max         |
|                                     | DRIFT[mV]                            |                                                                        | *2<br>20max                                                                                                                               | 20max             | 48max          | 60max          | 96max          |
|                                     | START-UP TIME[ms]                    |                                                                        | 200typ (ACIN 100V, Io=100%) *Start-up time is 700ms typ for less than 1minute of applying input again from turning off the input voltage. |                   |                |                |                |
|                                     | HOLD-UP TIME[ms]                     |                                                                        | 20typ (ACIN 100V, Io=100%)                                                                                                                |                   |                |                |                |
| OUTPUT VOLTAGE ADJUSTMENT RANGE[V]  |                                      | 2.85 to 3.60                                                           | 4.50 to 5.50                                                                                                                              |                   | 10.00 to 13.20 | 13.20 to 18.00 | 19.20 to 27.00 |
| OUTPUT VOLTAGE SETTING[V]           |                                      | 3.30 to 3.40                                                           | 5.00 to 5.15                                                                                                                              |                   | 12.00 to 12.48 | 15.00 to 15.60 | 24.00 to 24.96 |
| PROTECTION<br>CIRCUIT AND<br>OTHERS | OVERCURRENT PROTECTION               |                                                                        | Works over 105% of rating and recovers automatically                                                                                      |                   |                |                |                |
|                                     | OVERVOLTAGE PROTECTION[V]            |                                                                        | 4.00 to 5.25                                                                                                                              | 5.75 to 7.00      | 15.00 to 18.00 | 20.00 to 25.00 | 30.00 to 37.00 |
|                                     | OPERATING INDICATION                 |                                                                        | LED (Green)                                                                                                                               |                   |                |                |                |
|                                     | REMOTE ON/OFF                        |                                                                        | Not provided                                                                                                                              |                   |                |                |                |
| ISOLATION                           | INPUT-OUTPUT                         |                                                                        | 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-FG                            |                                                                        | AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)                                                              |                   |                |                |                |
| ENVIRONMENT                         | OPERATING TEMP., HUMID. AND ALTITUDE |                                                                        | -10 to +70℃, 20 - 90%RH (Non condensing), 3,000m (10,000 feet) max *3                                                                     |                   |                |                |                |
|                                     | STORAGE TEMP., HUMID. AND ALTITUDE   |                                                                        | -20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000 feet) 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                                                                                          |                   |                |                |                |
| SAFETY AND<br>NOISE<br>REGULATIONS  | AGENCY APPROVALS                     |                                                                        | UL60601-1, C-UL (CSA-C22.2 No.601.1), EN60601-1                                                                                           |                   |                |                |                |
|                                     | 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) *6 (Not built-in to active filter *4)                                                                |                   |                |                |                |
| OTHERS                              | CASE SIZE/WEIGHT                     |                                                                        | 31×78×103mm [1.22×3.07×4.06 inches] (W×H×D) / 230g max (with cover : 265g max)                                                            |                   |                |                |                |
|                                     | COOLING METHOD                       |                                                                        | Convection                                                                                                                                |                   |                |                |                |

\*1 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN: RM101).

\*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.

\*3 Derating is required.

\*4 When two or more units are used, they may not comply with the harmonic attenuator. Please contact us for details.

\*5 Please contact us about safety approvals for the model with option.

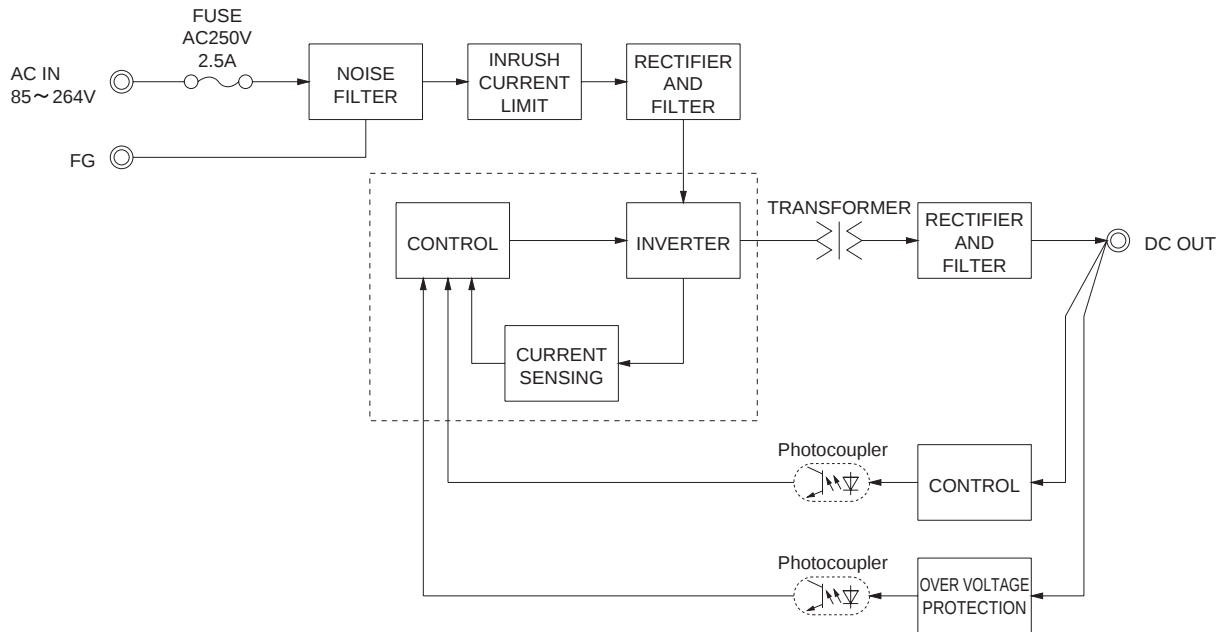
\*6 Please contact us about another class.

\* Parallel operation with other model is not possible.

\* Derating is required when operated with cover.

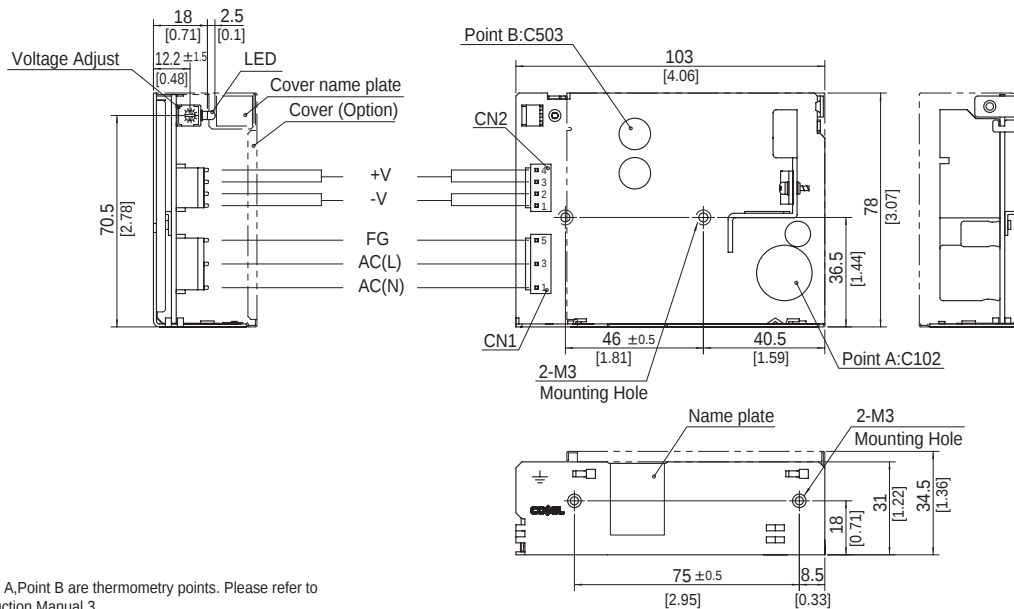
\* A sound may occur from power supply at peak loading.

## Block diagram



## External view

※ External size of option T, T1 and N is different from standard model and refer to 4 Option of instruction manual for details.



※ Point A, Point B are thermometry points. Please refer to Instruction Manual 3.

| I/O Connector | Mating Connector | Terminal    |                 |
|---------------|------------------|-------------|-----------------|
| CN1           | 1-1123724-3      | 1-1123722-5 | Chain 1123721-1 |
|               |                  | Loose       | 1318912-1       |
| CN2           | 1-1123723-4      | 1-1123722-4 | Chain 1123721-1 |
|               |                  | Loose       | 1318912-1       |

(Mfr : Tyco Electronics AMP)

※ I/O Connector is Mfr. Tyco Electronics AMP

※ Option : -J1 : (J.S.T) connector type

-T : Vertical terminal block type

-T1 : Horizontal terminal block type

Refer to Instruction Manual 4.

## &lt;PIN CONNECTION&gt;

| CN1     |       | CN2     |        |
|---------|-------|---------|--------|
| Pin No. | Input | Pin No. | Output |
| 1       | AC(N) | 1, 2    | -V     |
| 2       |       |         |        |
| 3       | AC(L) | 3, 4    | +V     |
| 4       |       |         |        |
| 5       | FG    |         |        |

※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]

※ Weight : 230g max (with cover : 265g max)

※ PCB Material/thickness : CEM-3 / 1.6mm [0.06inches]

※ Chassis material : Electric galvanizing steel board

※ Keep drawing current per pin below 5A of CN2.

※ Dimensions in mm, [ ]=inches

※ Mounting torque : 0.6N · m (6.3kgf · cm) max

※ Please connect safety ground to the unit in 2-M3 holes.

## PMA30F

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RoHS

Horizontal terminal block  
(option : -T1)Vertical terminal block  
(option : -T)

Standard type

with Cover  
(option : -N)Recommended EMI/EMC Filter  
NAM-04-000

Low leakage current type : NAM 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 \*5  
T : Vertical terminal block  
T1 : Horizontal terminal block  
N : with Cover  
J1 : VH(J.S.T.)connector type

Specification is changed at  
option, refer to Instruction  
Manual.

| MODEL                 | PMA30F-3R3 | PMA30F-5 | PMA30F-12 | PMA30F-15 | PMA30F-24 |
|-----------------------|------------|----------|-----------|-----------|-----------|
| MAX OUTPUT WATTAGE[W] | 19.8       | 30       | 30        | 30        | 31.2      |
| DC OUTPUT             | 3.3V 6A    | 5V 6A    | 12V 2.5A  | 15V 2A    | 24V 1.3A  |

## SPECIFICATIONS

|                                     | MODEL                                |                                                                          | PMA30F-3R3                                                                                                                                | PMA30F-5          | PMA30F-12      | PMA30F-15      | PMA30F-24      |
|-------------------------------------|--------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|----------------|----------------|
| INPUT                               | VOLTAGE[V]                           |                                                                          | AC85 - 264 1ϕ (Refer to the Instruction Manual 1.1 and 3.2) *3                                                                            |                   |                |                |                |
|                                     | CURRENT[A]                           | ACIN 100V                                                                | 0.50typ (Io=100%)                                                                                                                         | 0.70typ (Io=100%) |                |                |                |
|                                     |                                      | ACIN 200V                                                                | 0.30typ (Io=100%)                                                                                                                         | 0.40typ (Io=100%) |                |                |                |
|                                     | FREQUENCY[Hz]                        |                                                                          | 50 / 60 (47 - 440)                                                                                                                        |                   |                |                |                |
|                                     | EFFICIENCY[%]                        | ACIN 100V                                                                | 67typ                                                                                                                                     | 71typ             | 76typ          | 77typ          | 77typ          |
|                                     |                                      | ACIN 200V                                                                | 69typ                                                                                                                                     | 74typ             | 78typ          | 80typ          | 80typ          |
|                                     | INRUSH CURRENT[A]                    | ACIN 100V                                                                | 15typ (Io=100%) (At cold start)                                                                                                           |                   |                |                |                |
| ACIN 200V                           |                                      | 30typ (Io=100%) (At cold start)                                          |                                                                                                                                           |                   |                |                |                |
| LEAKAGE CURRENT[ma]                 |                                      | 0.05 / 0.10max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60601-1) |                                                                                                                                           |                   |                |                |                |
| OUTPUT                              | VOLTAGE[V]                           |                                                                          | 3.3                                                                                                                                       | 5                 | 12             | 15             | 24             |
|                                     | CURRENT[A]                           |                                                                          | 6.0                                                                                                                                       | 6.0               | 2.5            | 2.0            | 1.3            |
|                                     | LINE REGULATION[mV]                  |                                                                          | 20max                                                                                                                                     | 20max             | 48max          | 60max          | 96max          |
|                                     | LOAD REGULATION[mV]                  |                                                                          | 40max                                                                                                                                     | 40max             | 100max         | 120max         | 150max         |
|                                     | RIPPLE[mVp-p]                        | 0 to +50℃                                                                | 80max                                                                                                                                     | 80max             | 120max         | 120max         | 120max         |
|                                     |                                      | *1<br>-10 - 0℃                                                           | 140max                                                                                                                                    | 140max            | 160max         | 160max         | 160max         |
|                                     | RIPPLE NOISE[mVp-p]                  | 0 to +50℃                                                                | 120max                                                                                                                                    | 120max            | 150max         | 150max         | 150max         |
|                                     |                                      | *1<br>-10 - 0℃                                                           | 160max                                                                                                                                    | 160max            | 180max         | 180max         | 180max         |
|                                     | TEMPERATURE REGULATION[mV]           | 0 to +50℃                                                                | 50max                                                                                                                                     | 50max             | 120max         | 150max         | 240max         |
|                                     |                                      | -10 to +50℃                                                              | 60max                                                                                                                                     | 60max             | 150max         | 180max         | 290max         |
|                                     | DRIFT[mV]                            |                                                                          | *2<br>20max                                                                                                                               | 20max             | 48max          | 60max          | 96max          |
|                                     | START-UP TIME[ms]                    |                                                                          | 200typ (ACIN 100V, Io=100%) *Start-up time is 700ms typ for less than 1minute of applying input again from turning off the input voltage. |                   |                |                |                |
|                                     | HOLD-UP TIME[ms]                     |                                                                          | 20typ (ACIN 100V, Io=100%)                                                                                                                |                   |                |                |                |
| OUTPUT VOLTAGE ADJUSTMENT RANGE[V]  |                                      | 2.85 to 3.60                                                             | 4.50 to 5.50                                                                                                                              | 10.00 to 13.20    | 13.20 to 18.00 | 19.20 to 27.00 |                |
| OUTPUT VOLTAGE SETTING[V]           |                                      | 3.30 to 3.40                                                             | 5.00 to 5.15                                                                                                                              | 12.00 to 12.48    | 15.00 to 15.60 | 24.00 to 24.96 |                |
| PROTECTION<br>CIRCUIT AND<br>OTHERS | OVERCURRENT PROTECTION               |                                                                          | Works over 105% of rating and recovers automatically                                                                                      |                   |                |                |                |
|                                     | OVERVOLTAGE PROTECTION[V]            |                                                                          | 4.00 to 5.25                                                                                                                              | 5.75 to 7.00      | 15.00 to 18.00 | 20.00 to 25.00 | 30.00 to 37.00 |
|                                     | OPERATING INDICATION                 |                                                                          | LED (Green)                                                                                                                               |                   |                |                |                |
|                                     | REMOTE ON/OFF                        |                                                                          | Not provided                                                                                                                              |                   |                |                |                |
| ISOLATION                           | INPUT-OUTPUT                         |                                                                          | 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-FG                            |                                                                          | AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)                                                              |                   |                |                |                |
| ENVIRONMENT                         | OPERATING TEMP., HUMID. AND ALTITUDE |                                                                          | -10 to +70℃, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max *3                                                                      |                   |                |                |                |
|                                     | STORAGE TEMP., HUMID. AND ALTITUDE   |                                                                          | -20 to +75℃, 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<br>NOISE<br>REGULATIONS  | AGENCY APPROVALS                     |                                                                          | UL60601-1, C-UL (CSA-C22.2 No.601.1), EN60601-1                                                                                           |                   |                |                |                |
|                                     | 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) *6 (Not built-in to active filter *4)                                                                |                   |                |                |                |
| OTHERS                              | CASE SIZE/WEIGHT                     |                                                                          | 31 × 82 × 120mm [1.22 × 3.23 × 4.72 inches] (W × H × D) / 240g max (with cover : 280g max)                                                |                   |                |                |                |
|                                     | COOLING METHOD                       |                                                                          | Convection                                                                                                                                |                   |                |                |                |

\*1 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN: RM101).

\*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃.

\*3 Derating is required.

\*4 When two or more units are used, they may not comply with the harmonic attenuator. Please contact us for details.

\*5 Please contact us about safety approvals for the model with option.

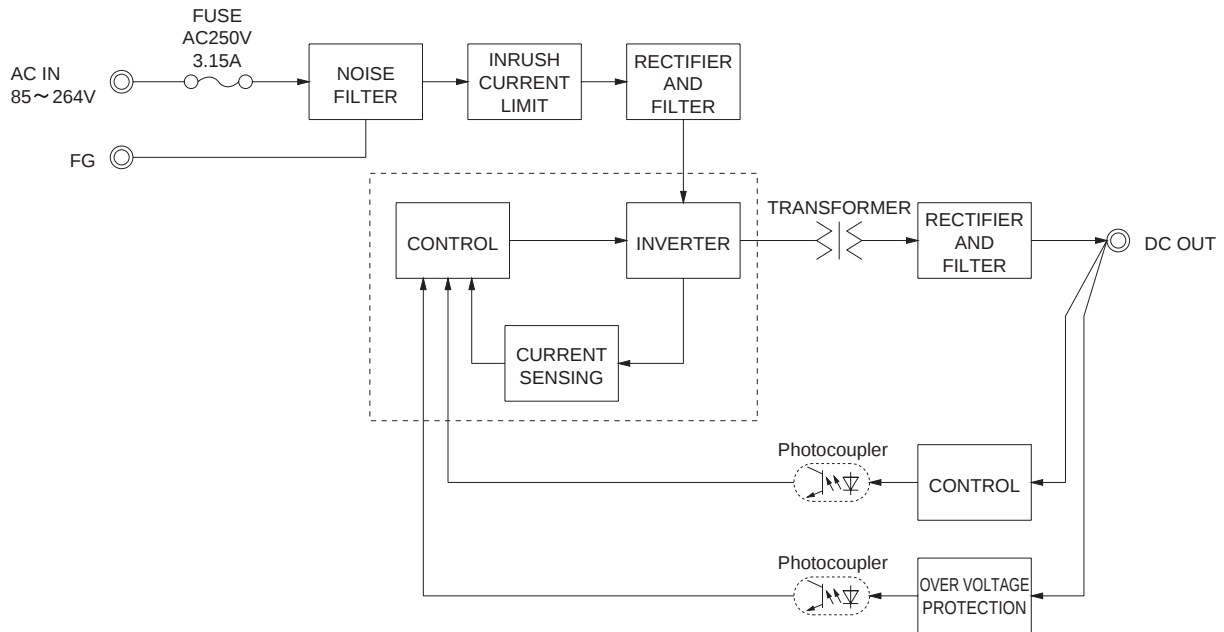
\*6 Please contact us about another class.

\* Parallel operation with other model is not possible.

\* Derating is required when operated with cover.

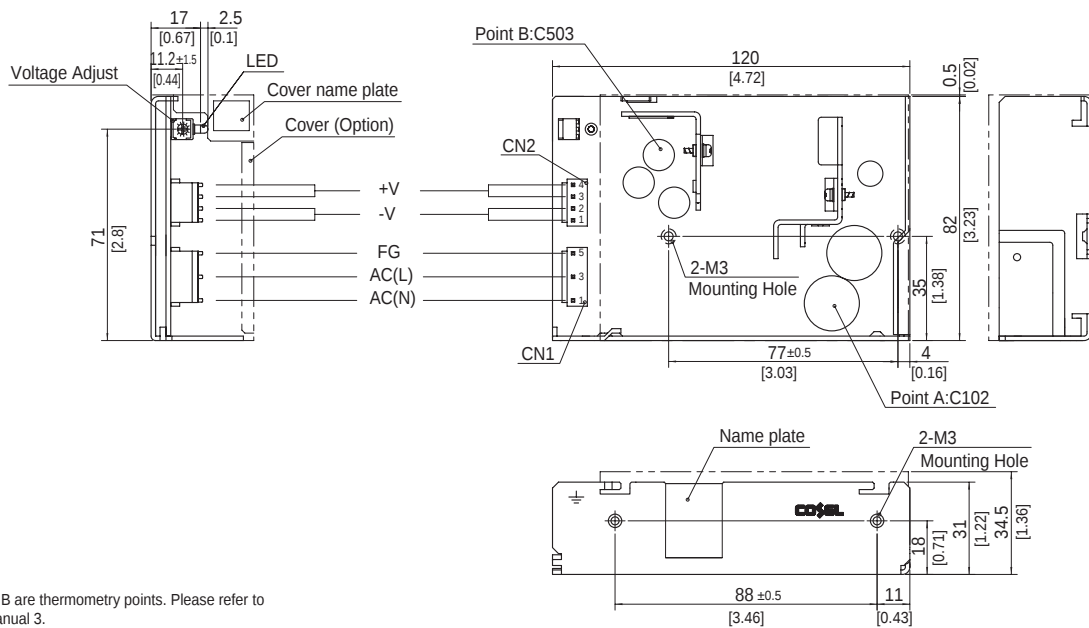
\* A sound may occur from power supply at peak loading.

## Block diagram



## External view

※ External size of option T,T1 and N is different from standard model and refer to 4 Option of instruction manual for details.



※ Point A, Point B are thermometry points. Please refer to Instruction Manual 3.

| I/O Connector | Mating Connector | Terminal                           |
|---------------|------------------|------------------------------------|
| CN1           | 1-1123724-3      | Chain 1123721-1<br>Loose 1318912-1 |
| CN2           | 1-1123723-4      | Chain 1123721-1<br>Loose 1318912-1 |

(Mfr: Tyco Electronics AMP)

※ I/O Connector is Mfr. Tyco Electronics AMP  
 ※ Option: -J1: (J.S.T) connector type  
 -T: Vertical terminal block type  
 -T1: Horizontal terminal block type  
 Refer to Instruction Manual 4.

## &lt;PIN CONNECTION&gt;

## CN1

| Pin No. | Input |
|---------|-------|
| 1       | AC(N) |
| 2       |       |
| 3       | AC(L) |
| 4       |       |
| 5       | FG    |

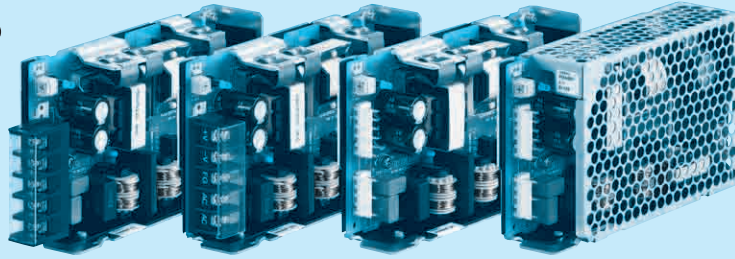
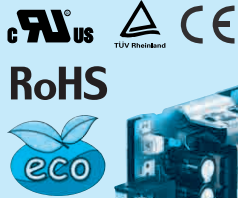
## CN2

| Pin No. | Output |
|---------|--------|
| 1, 2    | -V     |
| 3, 4    | +V     |

※ Tolerance:  $\pm 1$  [ $\pm 0.04$ ]  
 ※ Weight: 240g max (with cover: 280g max)  
 ※ PCB Material/thickness: CEM-3 / 1.6mm [0.06inches]  
 ※ Chassis material: Aluminum  
 ※ Keep drawing current per pin below 5A of CN2.  
 ※ Dimensions in mm, [ ] = inches  
 ※ Mounting torque: 0.49N · m (5kgf · cm) max  
 ※ Please connect safety ground to the unit in 2-M3 holes.

# PMA60F

PM A 60 F -□ -□  
① ② ③ ④ ⑤ ⑥



Horizontal terminal block (option : -T1)  
Vertical terminal block (option : -T)  
Standard type  
with Cover (option : -N)

Recommended EMI/EMC Filter  
NAM-04-000



Low leakage current type : NAM 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 \*5
- T : Vertical terminal block
- T1: Horizontal terminal block
- N : with Cover
- J1: VH(J.S.T.)connector type
- R : with Remote ON/OFF

Specification is changed at option, refer to Instruction Manual.

| MODEL                 | PMA60F-3R3 | PMA60F-5 | PMA60F-12 | PMA60F-15 | PMA60F-24 |
|-----------------------|------------|----------|-----------|-----------|-----------|
| MAX OUTPUT WATTAGE[W] | 39.6       | 60       | 60        | 60        | 60        |
| DC OUTPUT             | 3.3V 12A   | 5V 12A   | 12V 5A    | 15V 4A    | 24V 2.5A  |

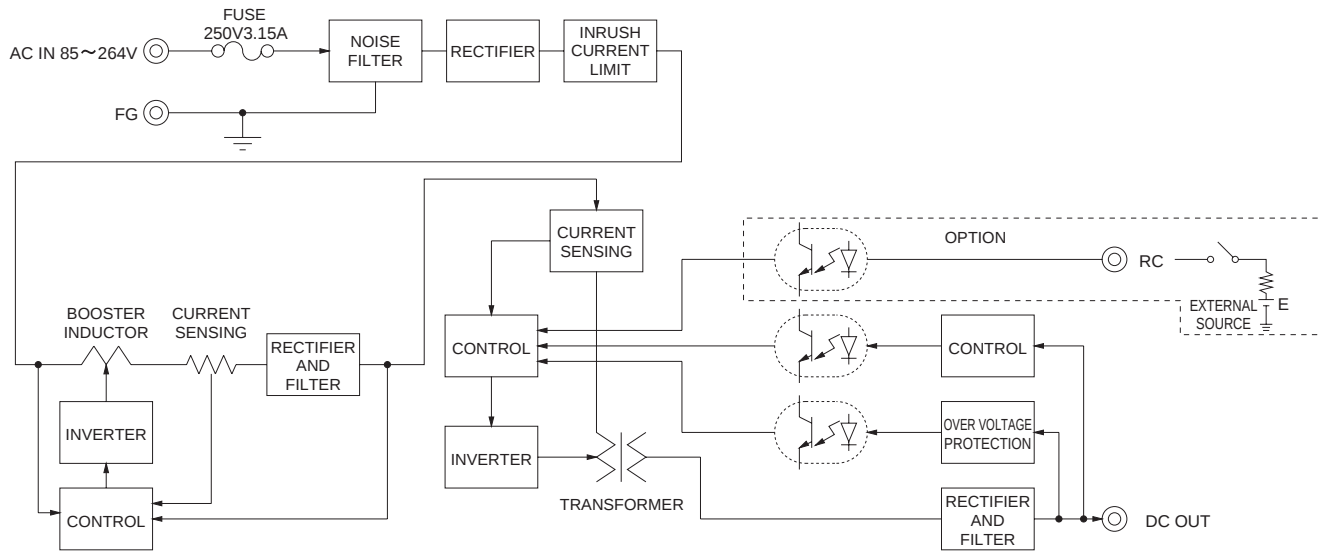
## SPECIFICATIONS

|                                     | MODEL                              |                            | PMA60F-3R3                                                                                 | PMA60F-5         | PMA60F-12      | PMA60F-15      | PMA60F-24      |
|-------------------------------------|------------------------------------|----------------------------|--------------------------------------------------------------------------------------------|------------------|----------------|----------------|----------------|
| INPUT                               | VOLTAGE[V]                         |                            | AC85 - 264 1 φ (Refer to the Instruction Manual 1.1)                                       |                  |                |                |                |
|                                     | CURRENT[A]                         | ACIN 100V                  | 0.7typ (Io=100%)                                                                           | 0.8typ (Io=100%) |                |                |                |
|                                     |                                    | ACIN 200V                  | 0.4typ (Io=100%)                                                                           | 0.5typ (Io=100%) |                |                |                |
|                                     | FREQUENCY[Hz]                      |                            | 50 / 60 (47 - 63)                                                                          |                  |                |                |                |
|                                     | EFFICIENCY[%]                      | ACIN 100V                  | 77typ                                                                                      | 80typ            | 80typ          | 81typ          | 81typ          |
|                                     |                                    | ACIN 200V                  | 78typ                                                                                      | 83typ            | 82typ          | 83typ          | 83typ          |
|                                     | POWER FACTOR<br>(Io=100%)          | ACIN 100V                  | 0.98typ                                                                                    |                  |                |                |                |
|                                     |                                    | ACIN 200V                  | 0.85typ                                                                                    | 0.90typ          |                |                |                |
|                                     | INRUSH CURRENT[A]                  | ACIN 100V                  | 15typ (Io=100%) (At cold start)                                                            |                  |                |                |                |
|                                     |                                    | ACIN 200V                  | 30typ (Io=100%) (At cold start)                                                            |                  |                |                |                |
|                                     | LEAKAGE CURRENT[ma]                |                            | 0.09 / 0.18max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60601-1)                   |                  |                |                |                |
| OUTPUT                              | VOLTAGE[V]                         |                            | 3.3                                                                                        | 5                | 12             | 15             | 24             |
|                                     | CURRENT[A]                         |                            | 12.0                                                                                       | 12.0             | 5.0            | 4.0            | 2.5            |
|                                     | LINE REGULATION[mV]                |                            | 20max                                                                                      | 20max            | 48max          | 60max          | 96max          |
|                                     | LOAD REGULATION[mV]                |                            | 40max                                                                                      | 40max            | 100max         | 120max         | 150max         |
|                                     | RIPPLE[mVp-p]                      | 0 to +50℃                  | 80max                                                                                      | 80max            | 120max         | 120max         | 120max         |
|                                     |                                    | *1<br>-10 - 0℃             | 140max                                                                                     | 140max           | 160max         | 160max         | 160max         |
|                                     | RIPPLE NOISE[mVp-p]                | 0 to +50℃                  | 120max                                                                                     | 120max           | 150max         | 150max         | 150max         |
|                                     |                                    | *1<br>-10 - 0℃             | 160max                                                                                     | 160max           | 180max         | 180max         | 180max         |
|                                     | TEMPERATURE REGULATION[mV]         | 0 to +50℃                  | 50max                                                                                      | 50max            | 120max         | 150max         | 240max         |
|                                     |                                    | *1<br>-10 to +50℃          | 60max                                                                                      | 60max            | 150max         | 180max         | 290max         |
|                                     | DRIFT[mV]                          |                            | *2<br>20max                                                                                | 20max            | 48max          | 60max          | 96max          |
|                                     | START-UP TIME[ms]                  |                            | 250typ (ACIN 100V, Io=100%)                                                                |                  |                |                |                |
| HOLD-UP TIME[ms]                    |                                    | 20typ (ACIN 100V, Io=100%) |                                                                                            |                  |                |                |                |
| PROTECTION<br>CIRCUIT AND<br>OTHERS | OUTPUT VOLTAGE ADJUSTMENT RANGE[V] |                            | 2.85 to 3.60                                                                               | 4.50 to 5.50     | 10.00 to 13.20 | 13.20 to 18.00 | 19.20 to 27.00 |
|                                     | OUTPUT VOLTAGE SETTING[V]          |                            | 3.30 to 3.40                                                                               | 5.00 to 5.15     | 12.00 to 12.48 | 15.00 to 15.60 | 24.00 to 24.96 |
|                                     | OVERCURRENT PROTECTION             |                            | Works over 105% of rating and recovers automatically                                       |                  |                |                |                |
|                                     | OVERVOLTAGE PROTECTION[V]          |                            | 4.00 to 5.25                                                                               | 5.75 to 7.00     | 15.00 to 18.00 | 20.00 to 25.00 | 30.00 to 37.00 |
| ISOLATION                           | OPERATING INDICATION               |                            | LED (Green)                                                                                |                  |                |                |                |
|                                     | REMOTE ON/OFF                      |                            | Optional (Required external power source)                                                  |                  |                |                |                |
|                                     | INPUT-OUTPUT-RC                    |                            | *3<br>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)             |                  |                |                |                |
| ENVIRONMENT                         | OUTPUT-RC-FG                       |                            | *3<br>AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)         |                  |                |                |                |
|                                     | OPERATING TEMP.,HUMID.AND ALTITUDE |                            | -10 to +70℃, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max *4                       |                  |                |                |                |
|                                     | STORAGE TEMP.,HUMID.AND ALTITUDE   |                            | -20 to +75℃, 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<br>NOISE<br>REGULATIONS  | IMPACT                             |                            | 196.1m/s² (20G), 11ms, once each X, Y and Z axis                                           |                  |                |                |                |
|                                     | AGENCY APPROVALS                   |                            | UL60601-1, C-UL (CSA-C22.2 No.601.1), EN60601-1                                            |                  |                |                |                |
|                                     | CONDUCTED NOISE                    |                            | Complies with FCC-B, VCCI-B, CISPR11-B, CISPR22-B, EN55011-B, EN55022-B                    |                  |                |                |                |
|                                     | HARMONIC ATTENUATOR                |                            | Complies with IEC61000-3-2 *6                                                              |                  |                |                |                |
| OTHERS                              | CASE SIZE/WEIGHT                   |                            | 32 X 82 X 135mm [1.26 X 3.23 X 5.31 inches] (W X H X D) / 350g max (with cover : 395g max) |                  |                |                |                |
|                                     | COOLING METHOD                     |                            | Convection                                                                                 |                  |                |                |                |

\*1 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN: RM101).  
\*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃.  
\*3 Applicable when Remote ON/OFF (optional) is added. RC is insulated with input, output and FG.  
\*4 Derating is required.  
\*5 Please contact us about safety approvals for the model with option.

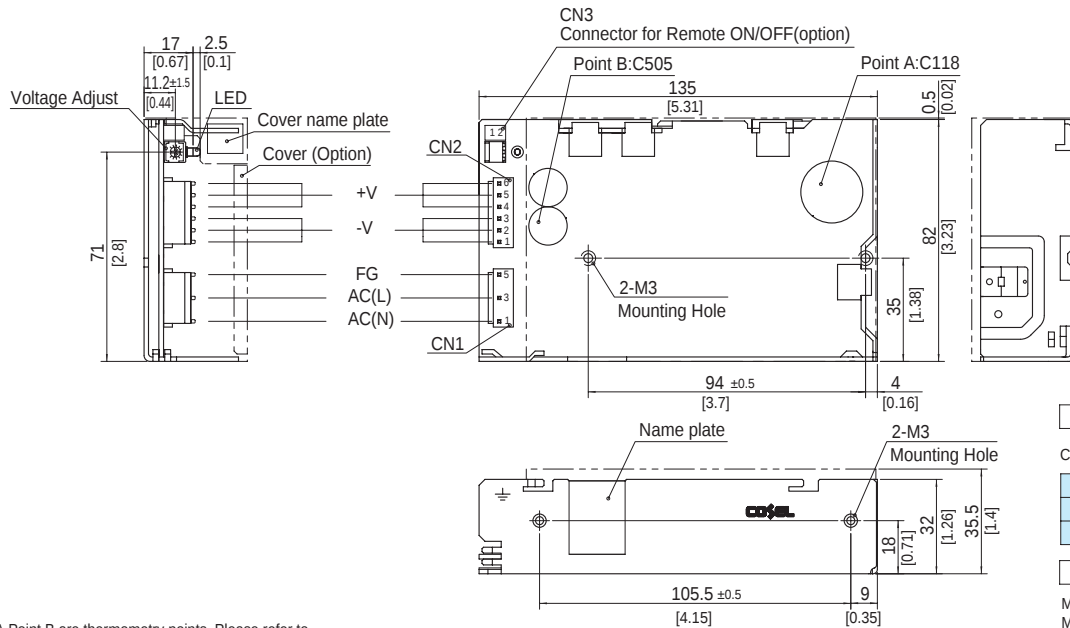
\*6 Please contact us about class C.  
\* Parallel operation with other model is not possible.  
\* Derating is required when operated with cover.  
\* A sound may occur from power supply at peak loading.

## Block diagram



## External view

※ External size of option T, T1, R and N is different from standard model and refer to 4 Option of instruction manual for details.



※ Point A, Point B are thermometry points. Please refer to Instruction Manual 3.

| I/O Connector | Mating Connector | Terminal        |
|---------------|------------------|-----------------|
| CN1           | 1-1123724-3      | 1-1123722-5     |
|               |                  | Chain 1123721-1 |
|               |                  | Loose 1318912-1 |
| CN2           | 1-1123723-6      | 1-1123722-6     |
|               |                  | Chain 1123721-1 |
|               |                  | Loose 1318912-1 |

(Mfr: Tyco Electronics AMP)

※ I/O Connector is Mfr. Tyco Electronics AMP

※ Option: -J1: (J.S.T) connector type

-T: Vertical terminal block type

-T1: Horizontal terminal block type

Refer to Instruction Manual 4.

## &lt;PIN CONNECTION&gt;

| Pin No. | Input |
|---------|-------|
| 1       | AC(N) |
| 2       |       |
| 3       | AC(L) |
| 4       |       |
| 5       | FG    |

| Pin No. | Output |
|---------|--------|
| 1 - 3   | -V     |
| 4 - 6   | +V     |

※ Tolerance:  $\pm 1$  [ $\pm 0.04$ ]

※ Weight: 350g max (with cover: 395g max)

※ PCB Material/thickness: CEM-3 / 1.6mm [0.06inches]

※ Chassis material: Aluminum

※ Keep drawing current per pin below 5A of CN2.

※ Dimensions in mm, [ ] = inches

※ Mounting torque: 0.49N · m (5kgf · cm) max

※ Please connect safety ground to the unit in 2-M3 holes.

## Connector type

CN3 Option (Mfr: J.S.T)

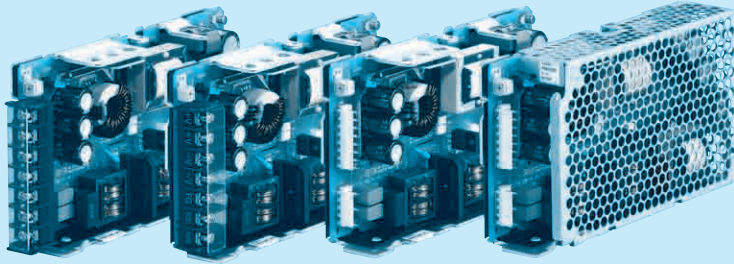
| PIN No. | Contents |
|---------|----------|
| 1       | RC(+)    |
| 2       | RC(-)    |

## Barrier strip type

Model B2B-XH-A  
Mating Connector (Terminal)  
XHP-2  
(BXH-001T-P0.6  
or SXH-001T-P0.6)

# PMA100F

PM A 100 F -□ -□  
① ② ③ ④ ⑤ ⑥



Horizontal terminal block (option : -T1)    Vertical terminal block (option : -T)    Standard type    with Cover (option : -N)

Recommended EMI/EMC Filter  
NAM-06-000



Low leakage current type : NAM 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 \*5
- T : Vertical terminal block
- T1: Horizontal terminal block
- N: with Cover
- J1: VH(J.S.T.)connector type
- R: with Remote ON/OFF

Specification is changed at option, refer to Instruction Manual.

| MODEL                 | PMA100F-3R3 | PMA100F-5 | PMA100F-12 | PMA100F-24 | PMA100F-48 |
|-----------------------|-------------|-----------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 66          | 100       | 102        | 108        | 100.8      |
| DC OUTPUT             | 3.3V 20A    | 5V 20A    | 12V 8.5A   | 24V 4.5A   | 48V 2.1A   |

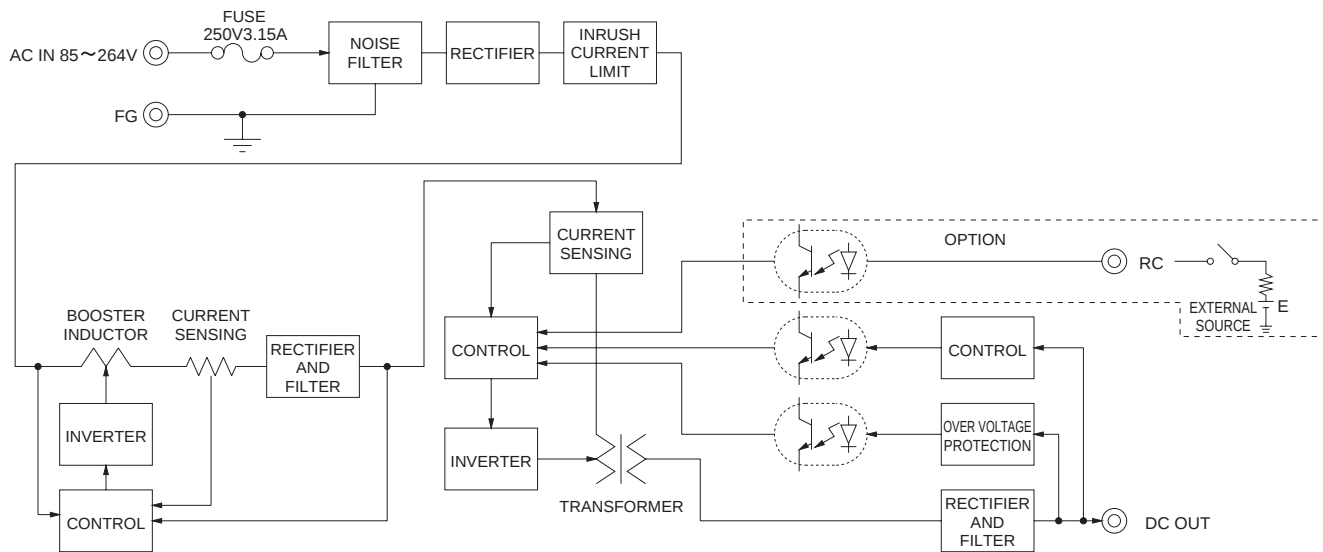
## SPECIFICATIONS

|                               | MODEL                              |                                                                                   | PMA100F-3R3                                                                                 | PMA100F-5        | PMA100F-12     | PMA100F-24     | PMA100F-48     |
|-------------------------------|------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------|----------------|----------------|----------------|
| INPUT                         | VOLTAGE[V]                         |                                                                                   | AC85 - 264 1 φ (Refer to the Instruction Manual 1.1)                                        |                  |                |                |                |
|                               | CURRENT[A]                         | ACIN 100V                                                                         | 0.9typ (Io=100%)                                                                            | 1.3typ (Io=100%) |                |                |                |
|                               |                                    | ACIN 200V                                                                         | 0.5typ (Io=100%)                                                                            | 0.7typ (Io=100%) |                |                |                |
|                               | FREQUENCY[Hz]                      |                                                                                   | 50 / 60 (47 - 63)                                                                           |                  |                |                |                |
|                               | EFFICIENCY[%]                      | ACIN 100V                                                                         | 77typ                                                                                       | 81typ            | 82typ          | 84typ          | 84typ          |
|                               |                                    | ACIN 200V                                                                         | 78typ                                                                                       | 83typ            | 83typ          | 86typ          | 86typ          |
|                               | POWER FACTOR (Io=100%)             | ACIN 100V                                                                         | 0.98typ                                                                                     |                  |                |                |                |
|                               |                                    | ACIN 200V                                                                         | 0.85typ                                                                                     | 0.90typ          |                |                |                |
|                               | ACIN 100V                          | 20typ (Io=100%) (At cold start)                                                   |                                                                                             |                  |                |                |                |
|                               | ACIN 200V                          | 40typ (Io=100%) (At cold start)                                                   |                                                                                             |                  |                |                |                |
| LEAKAGE CURRENT[mA]           |                                    | 0.09 / 0.18max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC60601-1)          |                                                                                             |                  |                |                |                |
| OUTPUT                        | VOLTAGE[V]                         |                                                                                   | 3.3                                                                                         | 5                | 12             | 24             | 48             |
|                               | CURRENT[A]                         |                                                                                   | 20.0                                                                                        | 20.0             | 8.5            | 4.5            | 2.1            |
|                               | LINE REGULATION[mV]                |                                                                                   | 20max                                                                                       | 20max            | 48max          | 96max          | 192max         |
|                               | LOAD REGULATION[mV]                |                                                                                   | 40max                                                                                       | 40max            | 100max         | 150max         | 240max         |
|                               | RIPPLE[mVp-p]                      | 0 to +50℃                                                                         | 80max                                                                                       | 80max            | 120max         | 120max         | 150max         |
|                               |                                    | *1 -10 - 0℃                                                                       | 140max                                                                                      | 140max           | 160max         | 160max         | 200max         |
|                               | RIPPLE NOISE[mVp-p]                | 0 to +50℃                                                                         | 120max                                                                                      | 120max           | 150max         | 150max         | 250max         |
|                               |                                    | *1 -10 - 0℃                                                                       | 160max                                                                                      | 160max           | 180max         | 180max         | 300max         |
|                               | TEMPERATURE REGULATION[mV]         | 0 to +50℃                                                                         | 50max                                                                                       | 50max            | 120max         | 240max         | 480max         |
|                               |                                    | -10 to +50℃                                                                       | 60max                                                                                       | 60max            | 150max         | 290max         | 600max         |
|                               | DRIFT[mV]                          |                                                                                   | *2 20max                                                                                    | 20max            | 48max          | 96max          | 192max         |
|                               | START-UP TIME[ms]                  |                                                                                   | 250typ (ACIN 100V, Io=100%)                                                                 |                  |                |                |                |
|                               | HOLD-UP TIME[ms]                   |                                                                                   | 20typ (ACIN 100V, Io=100%)                                                                  |                  |                |                |                |
|                               | OUTPUT VOLTAGE ADJUSTMENT RANGE[V] |                                                                                   | 2.85 to 3.60                                                                                | 4.50 to 5.50     | 10.00 to 13.20 | 19.20 to 27.00 | 39.00 to 53.00 |
| OUTPUT VOLTAGE SETTING[V]     |                                    | 3.30 to 3.40                                                                      | 5.00 to 5.15                                                                                | 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]          |                                                                                   | 4.00 to 5.25                                                                                | 5.75 to 7.00     | 15.00 to 18.00 | 30.00 to 37.00 | 58.00 to 65.00 |
|                               | OPERATING INDICATION               |                                                                                   | LED (Green)                                                                                 |                  |                |                |                |
|                               | REMOTE ON/OFF                      |                                                                                   | Optional (Required external power source)                                                   |                  |                |                |                |
| ISOLATION                     | INPUT-OUTPUT-RC                    | *3 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-FG                       | *3 AC500V 1minute, Cutoff current = 25mA, DC500V 50MΩ min (At Room Temperature)   |                                                                                             |                  |                |                |                |
| ENVIRONMENT                   | OPERATING TEMP.,HUMID.AND ALTITUDE |                                                                                   | -10 to +70℃, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max *4                        |                  |                |                |                |
|                               | STORAGE TEMP.,HUMID.AND ALTITUDE   |                                                                                   | -20 to +75℃, 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                   |                                                                                   | UL60601-1, C-UL (CSA-C22.2 No.601.1), EN60601-1                                             |                  |                |                |                |
|                               | CONDUCTED NOISE                    |                                                                                   | Complies with FCC-B, VCCI-B, CISPR11-B, CISPR22-B, EN55011-B, EN55022-B                     |                  |                |                |                |
|                               | HARMONIC ATTENUATOR                |                                                                                   | Complies with IEC61000-3-2 *6                                                               |                  |                |                |                |
| OTHERS                        | CASE SIZE/WEIGHT                   |                                                                                   | 34 X 93 X 168mm [1.34 X 3.66 X 6.61 inches] (W X H X D) / 560g max (with cover : 625g max)  |                  |                |                |                |
|                               | COOLING METHOD                     |                                                                                   | Convection                                                                                  |                  |                |                |                |

\*1 Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN: RM101).  
 \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃.  
 \*3 Applicable when Remote ON/OFF (optional) is added. RC is insulated with input, output and FG.  
 \*4 Derating is required.  
 \*5 Please contact us about safety approvals for the model with option.

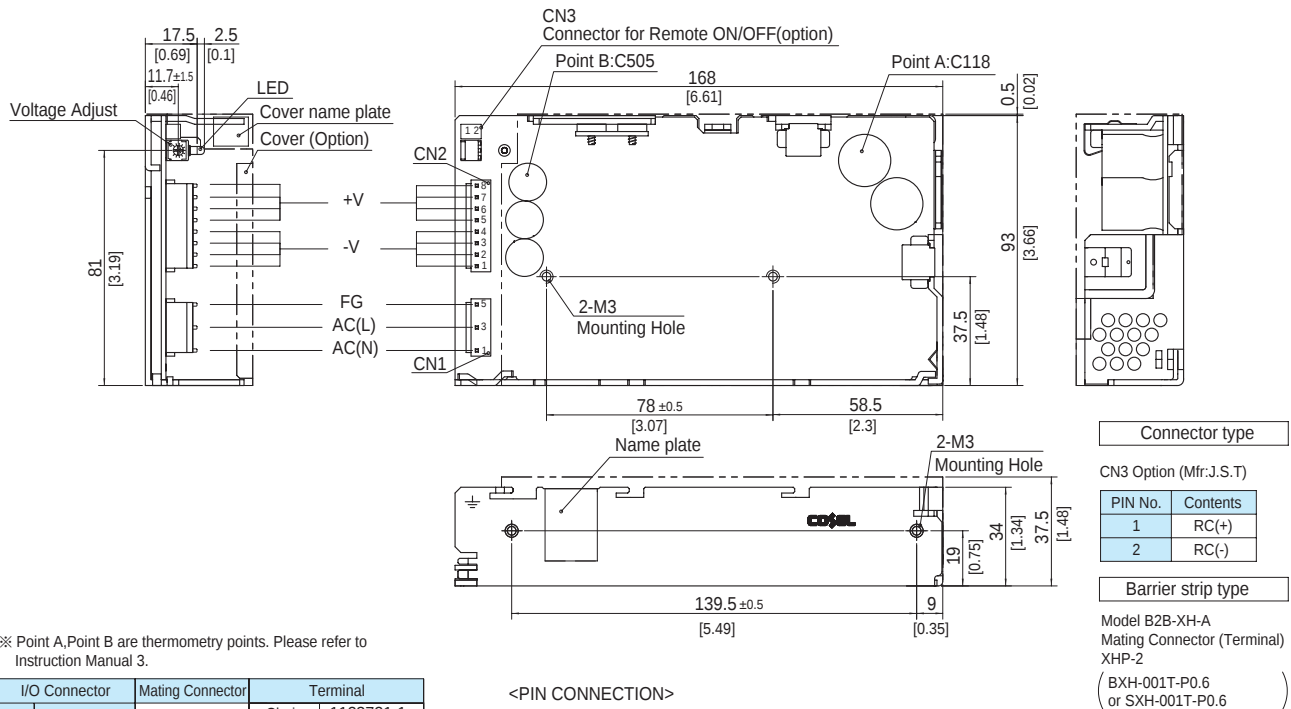
\*6 Please contact us about class C.  
 \* Parallel operation with other model is not possible.  
 \* Derating is required when operated with cover.  
 \* A sound may occur from power supply at peak loading.

## Block diagram



## External view

※ External size of option T,T1,R and N is different from standard model and refer to 4 Option of instruction manual for details.



| I/O Connector |             | Mating Connector | Terminal |           |
|---------------|-------------|------------------|----------|-----------|
| CN1           | 1-1123724-3 | 1-1123722-5      | Chain    | 1123721-1 |
|               |             |                  | Loose    | 1318912-1 |
| CN2           | 1-1123723-8 | 1-1123722-8      | Chain    | 1123721-1 |
|               |             |                  | Loose    | 1318912-1 |

(Mfr : Tyco Electronics AMP)

※ I/O Connector is Mfr.Tyco Electronics AMP  
 ※ Option : -J1 : (J.S.T) connector type  
           -T : Vertical terminal block type  
           -T1 : Horizontal terminal block type  
 Refer to Instruction Manual 4.

## <PIN CONNECTION>

| Pin No. | Input |
|---------|-------|
| 1       | AC(N) |
| 2       |       |
| 3       | AC(L) |
| 4       |       |
| 5       | FG    |

| Pin No. | Output |
|---------|--------|
| 1 - 4   | -V     |
| 5 - 8   | +V     |

- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 560g max (with cover : 625g max)
- ※ PCB Material/thickness : CEM-3 / 1.6mm [0.06inches]
- ※ Chassis material : Aluminum
- ※ Keep drawing current per pin bellow 5A of CN2.
- ※ Dimensions in mm, [ ]=inches
- ※ Mounting torque : 0.49N · m (5kgf · cm) max
- ※ Please connect safety ground to the unit in 2-M3 holes.

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

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- 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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