POWER

# CSU550AP

## 550 Watts Distributed Power System

**Data Sheet**

**Front-end Bulk Power**
**Total Output Power:**
550 W continuous
**Wide Input Voltage:**
90 - 264 Vac; 164 - 320 Vdc

PMBus® Power Management. Defined.

## SPECIAL FEATURES

- 550 W output power
- High power and short form factor
- 1U power supply
- High density design: 17 W/in³
- Active Power Factor Correction
- EN61000-3-2 Harmonic compliance
- Inrush current control
- 80plus Platinum efficiency
- N+M redundant N+M ≤ 4
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus compliant
- Accurate inut power reporting
- Reverse airflow option

## COMPLIANCE

- Conducted/Radiated EMI Class A
- EN61000-4-11

## SAFETY

- UL/cUL
- UL + CB Report
- CE Mark
- CCC
- BSMI
- KC
- TÜV

## Electrical Specifications

| Input | |
|---|---|
| Input range | 90 - 264 Vac; 164 - 320 Vdc |
| Frequency | 47 Hz to 63 Hz |
| Efficiency | 80plus Platinum efficiency |
| Max input current | 8.0 Arms @ 90 Vac |
| Inrush current | 10 Apk |
| Conducted EMI | Class A -6 dB |
| Radiated EMI | Class A -6 dB |
| Power factor | >0.89 beginning at 10% load |
| ITHD | <10% beginning at 20% load |
| Leakage current | 0.85 mA |
| Hold-up time | 13 ms at full load |

**Output**

| | Main DC Output | | | Standby DC Output | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| Nominal setting (12 V / 1 A, 12 VSB / 0.1 A) | 12.05 | 12.15 | 12.25 | 12.05 | 12.2 | 12.35 |
| Total output regulation range | 11.4 V | | 12.6 V | 11.4 V | | 12.6 V |
| Dynamic load regulation range | 11.4 V | | 12.6 V | 11.4 V | | 12.6 V |
| Output ripple | | | 120 mV | | | 120 mV |
| Output current | 0 | | 45 A | 0 | | 2.5 A |
| Current sharing | Within ±5% @ full load rating | | | N/A | | |
| Capacitive loading | 500 µF | | 25000 µF | 100 µF | | 3100 µF |
| Start-up from AC to output | | | 3000 ms | | | 1500 ms |
| Output rise time | 5 ms | | 70 ms | 1 ms | | 25 ms |

ARTESYN™ EMBEDDED TECHNOLOGIES

## Electrical Specifications

### Protections (Main Output)

| | Minimum | Nominal | Maximum | Units | Comment |
|---|---|---|---|---|---|
| Peak current | | | 54 | A | |
| Output OCP | 55 | | 62 | A | |
| Dynamic loading setup | 11.4 | | 12.6 | V | 60% rated load step, 0.5 A/µs slew rate; 2000 µF / 1 A min |
| Output OVP | 13.3 | | 14.5 | V | Latch |
| Overtemperature protection | | Yes | | | |
| Fan fault protection | | Yes | | | |
| **Standby Output** | | | | | |
| Peak current | | | 2.75 | A | |
| Output OCP | 3.0 | | 4.5 | A | |
| Output OVP | 13.3 | | 14.5 | V | |
| Dynamic loading setup | | | ±5 | % | Load step 1A, Slew rate: 0.5 A / µs / 100 µF |

## Electrical Specifications

### LED Indicators

| POWER SUPPLY CONDITION | LED STATE |
|---|---|
| Normal work | GREEN |
| No AC power to all power supplies | OFF |
| AC present / Only 12 VSB on (PS off) or PS in CR state | 1 Hz Blink GREEN |
| AC cord unplugged; with a second power supply in parallel still with AC input power | RED |
| Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan, input voltage lower than 90 Vac (not warning above 90 V condition, must be warning state below 85 V condition) | 1 Hz Blink RED |
| Power supply critical event causing a shutdown; failure, OCP, OVP, fan fail | RED |

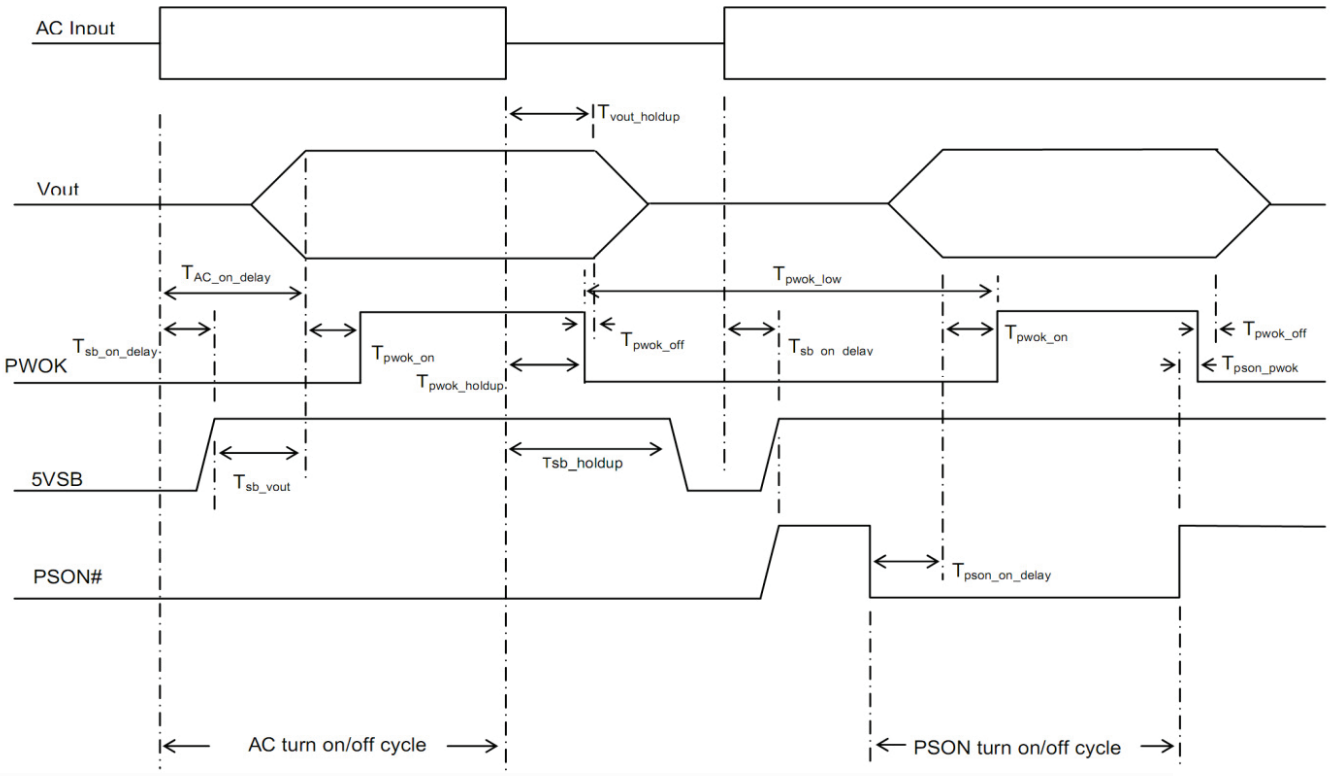
### Firmware Reporting And Monitoring

| | Accuracy Range | | |
|---|---|---|---|
| Output loading | 10% to 30% | > 30% to 50% | > 50% to 100% |
| READ_PIN and READ_EIN | ±6 W | ±3% | ±2% |
| READ_IOUT | ±0.4 A | ±2% | ±2% |
| READ_TEMPERATURE | ±3 °C | | |

## Timing Specifications

| | Description | Min | Max | Unit |
|---|---|---|---|---|
| $T_{vout\_rise}$ | 12 V main output voltage rise time | 5.0 | 70 | ms |
| | 12 VSB output voltage rise time | 1 | 25 | ms |
| $T_{sb\_on\_delay}$ | Delay from AC being applied to 12 Vsb being within regulation | | 1500 | ms |
| $T_{ac\_on\_delay}$ | Delay from AC being applied to all output voltages being within regulation | | 3000 | ms |
| $T_{vout\_holdup}$ | Time 12 VI output voltage stay within regulation after loss of AC | 13 | | ms |
| $T_{pwok\_holdup}$ | Delay from loss of AC to de-assertion of PWOK | 12 | | ms |
| $T_{pson\_on\_delay}$ | Delay from PSON# active to output voltages within regulation limits | 5 | 400 | ms |
| $T_{pson\_pwok}$ | Delay from PSON# deactivate to PWOK being de-asserted | | 5 | ms |
| $T_{pwok\_on}$ | Delay from output voltages within regulation limits to PWOK asserted at turn on | 100 | 500 | ms |
| $T_{pwok\_off}$ | Delay from PWOK de-asserted to output voltages dropping out of regulation limits | 1 | | ms |
| $T_{pwok\_low}$ | Duration of PWOK being in the de-asserted state during an off/on cycle using AC or the PSON signal | 100 | | ms |
| $T_{sb\_vout}$ | Delay from 12VSB being in regulation to O/Ps being in regulation at AC turn on | 50 | 1000 | ms |
| $T_{12VSB\_holdup}$ | Time the 12VSB output voltage stays within regulation after loss of AC | 70 | | ms |

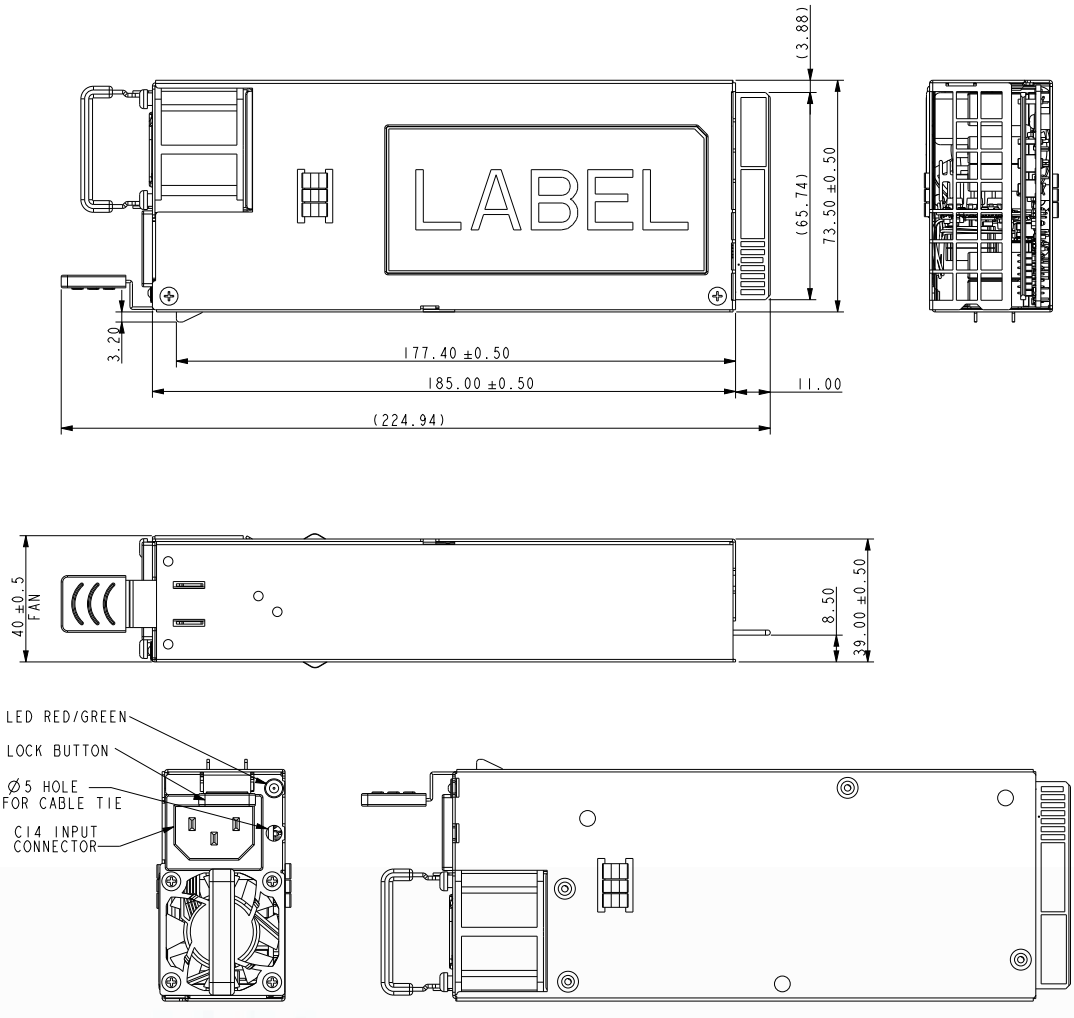
## Timing Diagram



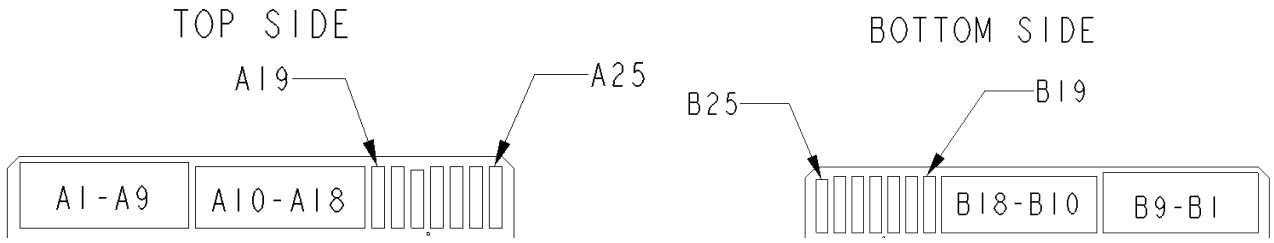
## Environmental Specifications

| | |
|---|---|
| **Operating temperature** | 0 to 50 °C, the maximum operating temperature (50 °C) is to be derated by 1 °C per 300 m above 2000 m |
| **Operating altitude** | up to 5000 m |
| **Operating humidity** | +5% to +85% non-condensing |
| **Storage temperature** | -40 °C to +70 °C, non-condensing |
| **Storage humidity** | +5% to +95% non-condensing |
| **Non-operating altitude** | up to 15,200 meters |
| **Vibration and shock** | Standard operating/non-operating random shock and vibration |
| **RoHS compliance** | Yes |
| **MTBF** | 250,000 hours per Telcordia Issue 2, Method 1, Case 3 at 25 °C ambient at full load |

## Mechanical Outline



## Power Supply Output Card Edge




## Connector Definitions

| | |
|---|---|
| Output connector part number | Card-edge |
| Mating connector part number | 2x25 pin configuration of the FCI power card connector 10035388-102LF |

**Output Connector Pin Configuration**

| Pin | Name | Pin | Name |
|---|---|---|---|
| A1-A9 | GND | B1-B9 | GND |
| A10-A18 | +12 V | B10-B18 | +12 V |
| A19 | SDA | B19 | A0 (SMBus address) |
| A20 | SCL | B20 | A1 (SMBus address) |
| A21 | PSON | B21 | 12 VSB |
| A22 | SMBAlert# | B22 | CR_BUS# |
| A23 | -VSENSE | B23 | 12 V load share |
| A24 | +VSENSE | B24 | Present |
| A25 | PWOK | B25 | Reserved |

Note: PSON connect to GND for power up.

## Ordering Information

| Model number | Airflow | Nominal Output Voltage | Set Point | Regulation Band | Minimum Current | Maximum Current | Output Ripple P/P | Standby |
|---|---|---|---|---|---|---|---|---|
| CSU550AP-3 | Normal fan | 12.0 Vdc | 11.9 - 12.1 Vdc | 11.4 - 12.6 Vdc | 0 A | 45 A | 120 mV | 12.0 V @ 2.5 A |
| CSU550AP-3-001 | Reverse fan | 12.0 Vdc | 11.9 - 12.1 Vdc | 11.4 - 12.6 Vdc | 0 A | 45 A | 120 mV | 12.0 V @ 2.5 A |


### WORLDWIDE OFFICES

**Americas**
2900 S.Diablo Way
Tempe, AZ 85282
USA
+1 888 412 7832

**Europe (UK)**
Waterfront Business Park
Merry Hill, Dudley
West Midlands, DY5 1LX
United Kingdom
+44 (0) 1384 842 211

**Asia (HK)**
14/F, Lu Plaza
2 Wing Yip Street
Kwun Tong, Kowloon
Hong Kong
+852 2176 3333

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For more information: **www.artesyn.com/power**
For support: **productsupport.ep@artesyn.com**