

## Features

- High Efficiency up to 92%
- Excellent Thermal Performance up to 65°C ambient Temperature
- No Load Power Consumption  $\leq 0.15W$
- Comply with DOE & CEC Level VI and ErP Lot 7
- Input Surge Protection: DM 10 kV , CM 10 kV
- All-Around Protection: OCP, OVP, OTP, SCP
- Class I Power Supply
- Comply with Limited Power Source(LPS)
- Withstand 10G Vibration Test
- Operating Altitude up to 5,000m
- 5 Years Warranty



## Description

The CUV-090S036SP is a 90W, constant-voltage power supply that operates from 90-305 Vac input with excellent power factor and harmonic. It is created for outdoor telecommunication and security equipment requiring industry safety compliance. The high efficiency of the power supply and compact metal case enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against input surge, over current, output over voltage, over temperature, and short circuit.

## Models

Output Voltage	Input Voltage Range(1)	Output Current Range	Max. Output Power	Typical Efficiency (2)	Typical Power Factor		Model Number
					120Vac	220Vac	
36 V	90 ~ 305 Vac	0 ~ 2.5 A	90 W	92.0%	0.99	0.96	CUV-090S036SP

**Notes:** (1) Certified input Voltage range: 100-240Vac.

(2) Measured at 100% load and 220Vac input (see below "General Specifications" for details).

## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90 Vac	-	305 Vac	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.25 mA	264Vac/60Hz
Input AC Current	-	-	1.16 A	Measured at 100% load and 100Vac input.
	-	-	0.5 A	Measured at 100% load and 220Vac input.
Inrush Current(I <sup>2</sup> t)	-	-	2.29 A <sup>2</sup> s	At 220Vac input, 25°C cold start, duration=680 $\mu$ s, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.

## Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
PF	0.9	-	-	At 100-240Vac, 50-60Hz, 60%-100%Load (54-90W)
THD	-	-	20%	

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Voltage Tolerance	-2.5%Vo	-	2.5%Vo	At 100% load condition
Total Output Voltage Ripple (pk-pk)	-	-	1%Vo	At 100% load condition. Measured by 20 MHz bandwidth oscilloscope and the output paralleled a 0.1 uF ceramic capacitor and a 10 uF electrolytic capacitor.
Startup Overshoot / Undershoot	-	-	5%Vo	At 100% load condition
Line Regulation	-	-	±0.5%	Measured at 100% load
Load Regulation	-	-	±1.0%	
Turn-on Delay Time	-	0.5 s	1.0 s	Measured at 120Vac input, 100%Load
	-	0.3 s	0.5 s	Measured at 220Vac input, 100%Load
Hold up Time	20 ms	-	-	Measured at 230Vac input, 100%Load
Load Dynamic Response	Output Deviation	-	5%Vo	R/S: 1 A/μs Load: 25% ~ 100% load
	Settling Time	-	10 ms	
Temperature Coefficient of Vo	-	0.03%/°C	-	Case temperature = 0°C~Tc max

## General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input:	88.0%	90.0%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 220Vac input:	90.0%	92.0%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
No Load Power	-	-	0.15 W	Measured at 115Vac & 230Vac
MTBF	-	698,000 Hours	-	Measured at 220Vac input, 80%load and 25°C ambient temperature (MIL-HDBK-217F)

## General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Lifetime	-	107,000 Hours	-	Measured at 120Vac input, 80%load and 50°C ambient temperature; See lifetime vs. Ta curve for the details
Operating Temperature	-40 °C	-	+70 °C	
Operating Ambient Temperature for Safety Ta_s	-40 °C	-	+50 °C	
Operating Ambient Temperature for Warranty Ta_w	-40 °C	-	+40 °C	Case temperature for 5 years warranty. Humidity: 5%RH to 95%RH; No condensation
Operating Altitude	-	-	5000 m	The ambient temperature derating of 3.5°C /1000m is needed for operating altitude greater than 2000m (6500ft).
Storage Temperature	-40 °C	-	+85 °C	Humidity: 5%RH to 95%RH; No condensation
Dimensions Inches (L x W x H) Millimeters ((L x W x H)	6.85 x 2.66 x 1.44 174 x 67.5 x 36.5			With mounting ear 7.91 x 2.66 x 1.44 201 x 67.5 x 36.5
Net Weight	-	800 g	-	

## Safety & EMC Compliance

Safety Category	Standard
UL/CUL	UL 62368-1, CAN/CSA C22.2 No. 62368-1
TUV & CE	EN 62368-1
CB	IEC 62368-1
CCC	GB 4943-1
KC	K 60950-1
EMI Standards	Notes
EN 55032 <sup>(1)</sup> , GB/T 9254	Conducted emission Test & Radiated emission Test
EN 61000-3-2, GB 17625.1	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
FCC Part 15 <sup>(1)</sup>	ANSI C63.4 Class B
	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation.

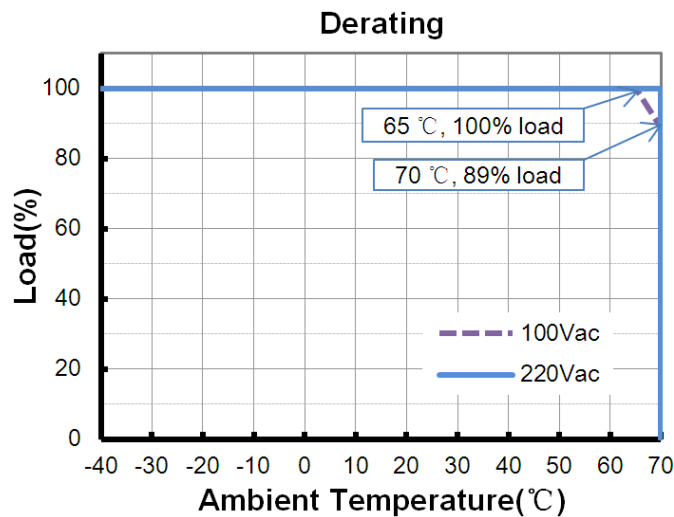
## Safety & EMC Compliance (Continued)

EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 15 kV air discharge, 8 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient / Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: Differential Mode 10 kV, Common Mode 10 kV <sup>(2)</sup>
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
EN 55024	Electromagnetic Immunity Requirements Applies To ITE

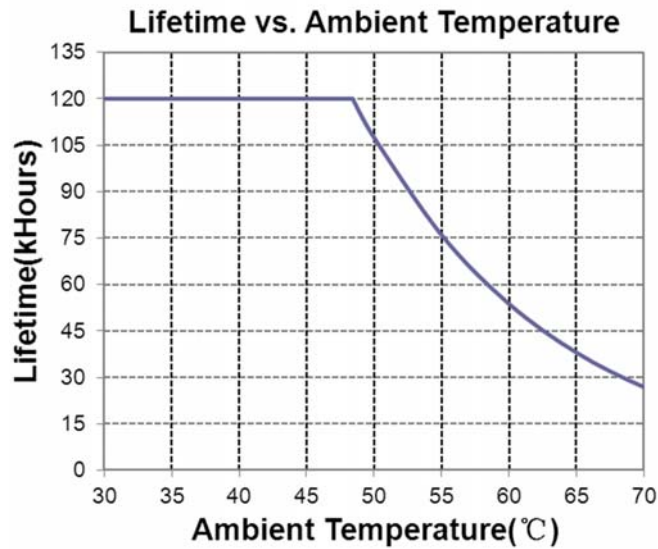
**Notes:** (1) This power supply meets the EMI specifications above, but EMI performance of a system that contains it depends also on the other devices connected to the Power Supply and on the system itself.

(2) To perform electric strength (hi-pot) testing, the “GDT ground disconnect” (nut and metal lock sheet) on the power supply end-cap should be removed temporarily to prevent the internal gas discharge tube from conducting (as allowed by IEC 62368-1 Clause 5.4.9). After testing is completed, these items must be reinstalled to restore line-to-earth surge protection and secure the end cap.

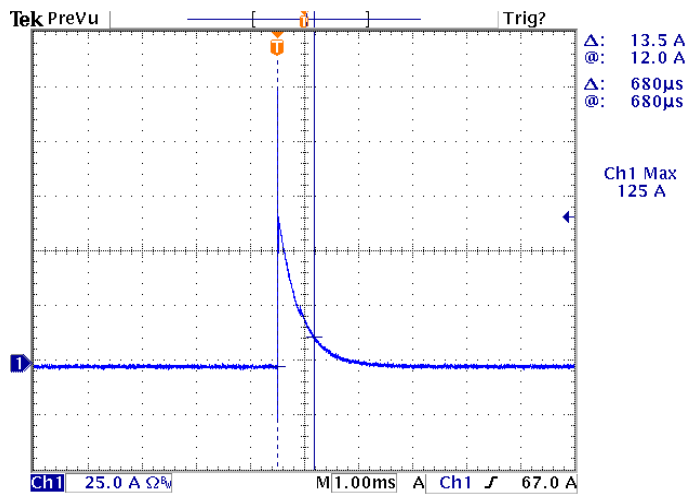
## Derating



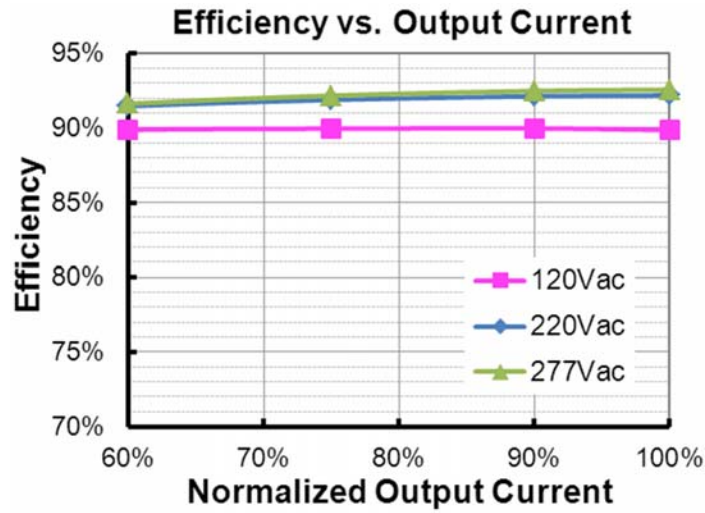
## Lifetime vs. Ambient Temperature



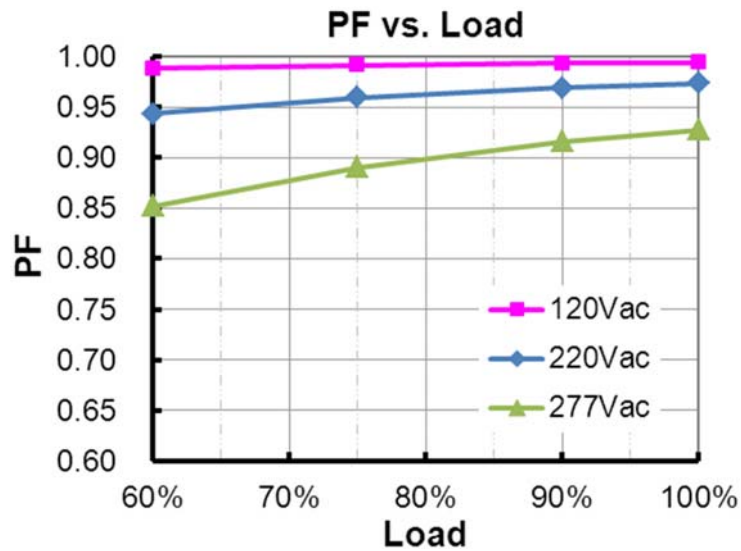
## Inrush Current Waveform



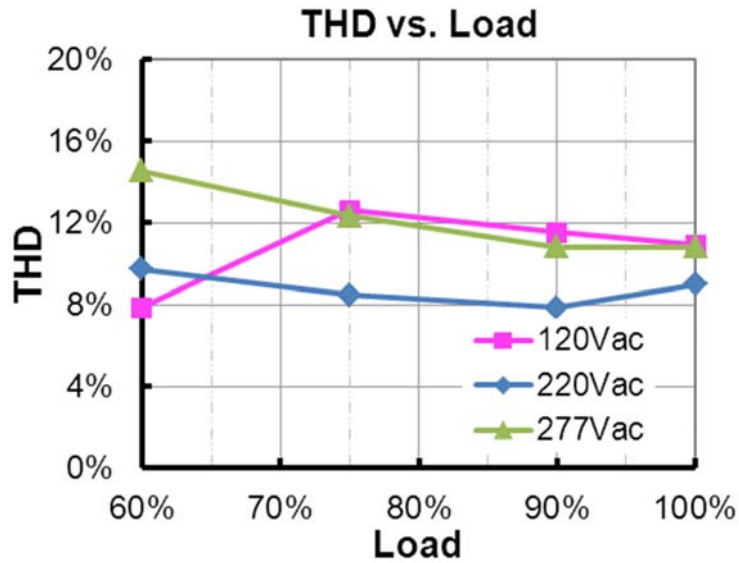
## Efficiency vs. Load



## Power Factor



## Total Harmonic Distortion



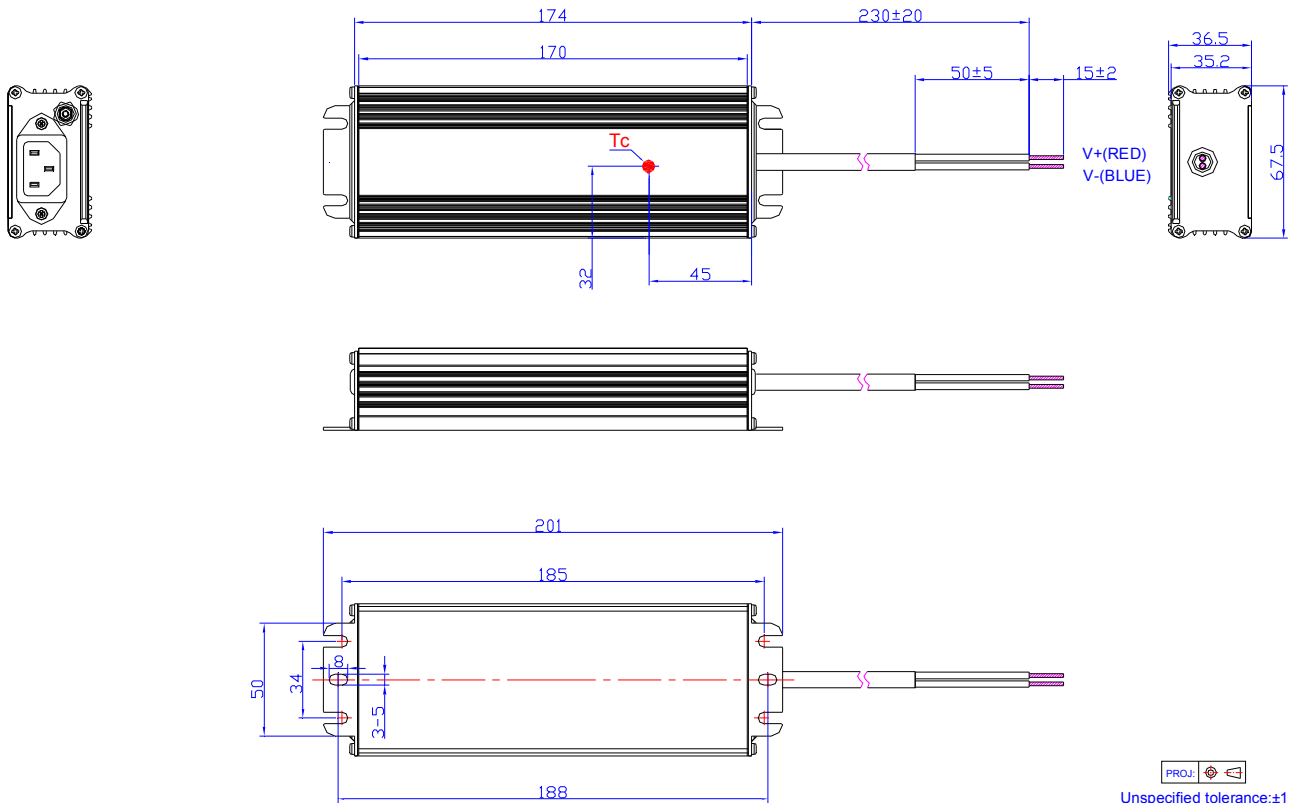
## Protection Functions

Parameter	Notes
Over Current Protection	Auto Recovery. The power supply shall be self-recovery when the fault condition is removed.
Over Temperature Protection	Auto Recovery. Returning to normal after over temperature is removed.
Short Circuit Protection	Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed.
Over Voltage Protection	Limits output voltage at no load and in case the normal voltage limit fails.

## Mechanical Outline

INPUT (SOCKET 10A/250V 3P)

OUTPUT (UL SJTW 2\*18AWG  $\varnothing$ 7.3)



## RoHS Compliance

Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.



## Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2018-03-06	A	Datasheet Release	/	/
2021-11-19	B	CCC Logo	/	Updated
		Format	/	Updated
		Input Surge Protection	/	Updated
		Operating Ambient Temperature for Warranty Ta_w	/	Updated
		Safety & EMC Compliance(UL/CUL, CE)	/	Updated
		Safety & EMC Compliance(TUV, CB)	/	Added
		Safety & EMC Compliance	EN 61000-4-5	Updated
		Safety & EMC Compliance	Note (2)	Updated
		RoHS Compliance	/	Updated