

FEATURES

- RoHS Compliant
- Intelligent LED Indicators
- High Efficiency up to 91%
- +5V/0.5A Auxiliary Output
- 1U Profile, High Power Density
- Universal AC Input with Active PFC
- Power OK Signal (Power Good, Logic low)
- Remote On/Off and Remote Sense Function
- Forced Current Sharing at Parallel Operation
- Programmable Output Current (20% ~ 105%)
- Programmable Output Voltage (30% ~ 105%)
- Protection: OVP, OLP, OTP, SCP, Fan Failure



DESCRIPTION

The PSAK650 series of AC/DC switching power supplies provides up to 652 Watts of continuous output power in an enclosed design. All models have a single output and a universal input range with active PFC. Some features include efficiency up to 91%, 0.99 typical power factor, remote on/off, and forced current sharing at parallel operation. These supplies have over load, over voltage, over temperature, and short circuit protection.

SPECIFICATIONS: PSAK650 Series	
All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted. We reserve the right to change specifications based on technological advances.	
INPUT SPECIFICATIONS	
Input Voltage Range (See Note 3)	90 ~ 264VAC (127~370VDC)
Input Frequency	47 to 63Hz
AC Current (typical)	6.4A @ 115VAC; 3.2A @ 230VAC
Inrush Current (typical)	20A @ 115VAC; 30A @ 230VAC
Leakage Current	< 2.0mA @ 240VAC
Remote ON/OFF	External switch or NPN Transistor to turn ON/OFF
Power Factor (typical)	EN61000-3-2 (0.99 @ 115VAC and full load; 0.98 @ 230VAC and full load)
OUTPUT SPECIFICATIONS	
Output Voltage	See Table
Output Power	See Table
Voltage Adjustment Range	±5.0% typical adjustment by potentiometer
Voltage Tolerance (See Note 2)	±1.0%
Output Voltage Trim	Adjustment of output voltage is between 30%~105% of rated output.
Output Current Trim	Adjustment of output current is between 20%~105% of rated output.
Line Regulation	±0.5%
Load Regulation	±0.5%
Output Current	See Table
Ripple & Noise (See Note 1)	150mVp-p max.
Setup, Rise Time	800ms, 50ms at full load
Hold-Up Time (typical)	16ms @ 230VAC and full load
PROTECTION	
Over Voltage Protection	See Table Protection Type: Latch-style (recovery after reset AC power ON or inhibit)
Over Load Protection	105% ~ 125% rated output power Protection Type: Total power limiting, Latch-style (recovery after reset AC power ON or inhibit)
Over Temperature Protection	90°C ±5°C detect on heatsink of primary side, 85°C ±5°C detect on heatsink of secondary side Protection Type: Shutdown output voltage (automatically recovers after temperature goes down)
GENERAL SPECIFICATIONS	
Efficiency	See Table
Withstand Voltage	3KVAC (input to output); 1.5KVAC (input to FG); 0.5KVAC (output to FG)
Isolation Resistance	100MΩ/500VDC (input to output, input to FG, output to FG)
Auxiliary Power	5V @ 0.5A (±3%)
Power OK Signal	Open drain signal low when PSU turns on. Max sink current: 20mA, Max drain voltage: 40V.
Parallel Current Sharing (See Note 4)	Refer to Page 5
ENVIRONMENTAL SPECIFICATIONS	
Working Temperature	-25°C to +60°C (refer to derating curve)
Storage Temperature	-40°C to +85°C
Working Humidity	20% to 90% RH (non-condensing)
Storage Humidity	10% to 95% RH
Vibration	Compliance to IEC 68-2-6, IEC 68-2-64
Cooling	Controlled by power rating and temperature (Internal ball bearing fan)
Temperature Coefficient	±0.02% / °C (0 ~ 50°C)
MTBF	166,200 hours (MIL-HDBK-217F)
PHYSICAL SPECIFICATIONS	
Packing	3.97 lbs (1.8kg)
Dimensions (See page 6)	9.80(L) x 5.00(W) x 1.61(H) inches; 249(L) x 127(W) x 40.9(H) mm
SAFETY & EMC (See Note 5)	
Safety Standards	Meet UL/cUL 60950-1, TUV EN60950-1 approved
EMI Conduction & Radiation	Compliance to EN55022 (CISPR22) Class B
Harmonic Current	Compliance to EN61000-3-2,-3
EMS Immunity	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A

MODEL SELECTION TABLE

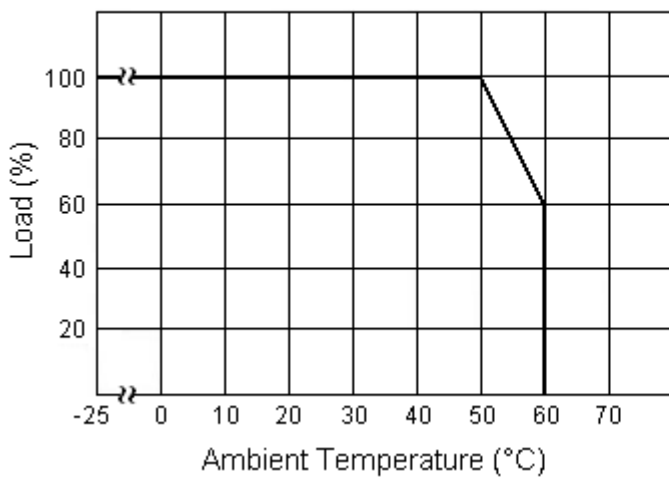
Model Number	Input Voltage Range	Output Voltage	Output Current	Over Voltage Protection	Output Power	Efficiency
PSAK-650-5	90 ~ 264VAC (127 ~ 370VDC)	5 VDC	100A	5.75 ~ 6.25VDC	500W	83%
PSAK-650-12		12 VDC	54A	13.8 ~ 15.0VDC	648W	88%
PSAK-650-15		15 VDC	43A	17 ~ 19.0VDC	645W	88%
PSAK-650-24		24 VDC	27A	27.6 ~ 30.0VDC	648W	90%
PSAK-650-27		27 VDC	24A	31 ~ 33.75VDC	648W	90%
PSAK-650-48		48 VDC	13.6A	55.2 ~ 60.0VDC	652W	91%

NOTES

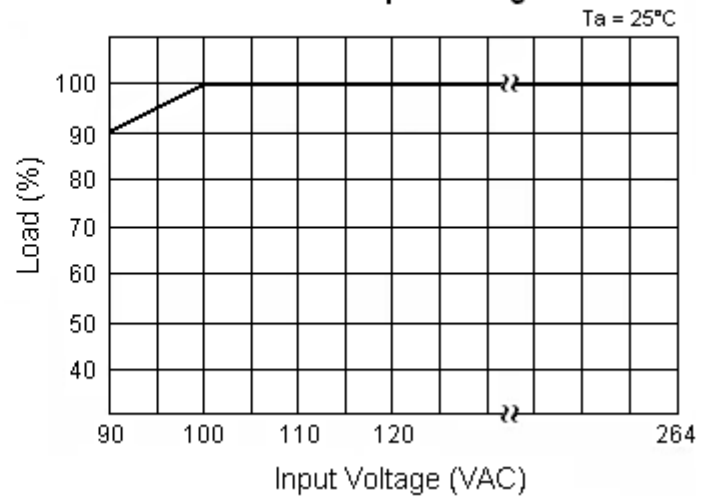
1. Ripple & noise is measured at 20MHz bandwidth by using a 12" twisted pair-wire terminated with a 0.1µF capacitor and a 47µF capacitor in parallel.
2. Tolerances include set up tolerance, line regulation, and load regulation.
3. Derating may be needed under low input voltages. Please check the derating curve for more details.
4. When in parallel connection only one unit might operate if the total output load is less than 5% of rated load condition.
5. The power supply is considered a component, which will be installed into final equipment. The final equipment must be re-confirmed that it still meets EMC directives.

DERATING CURVES

Load vs Temperature

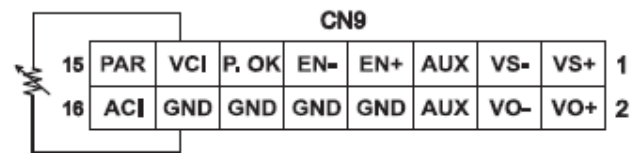
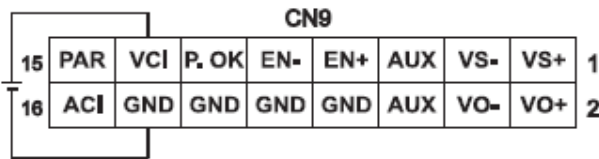
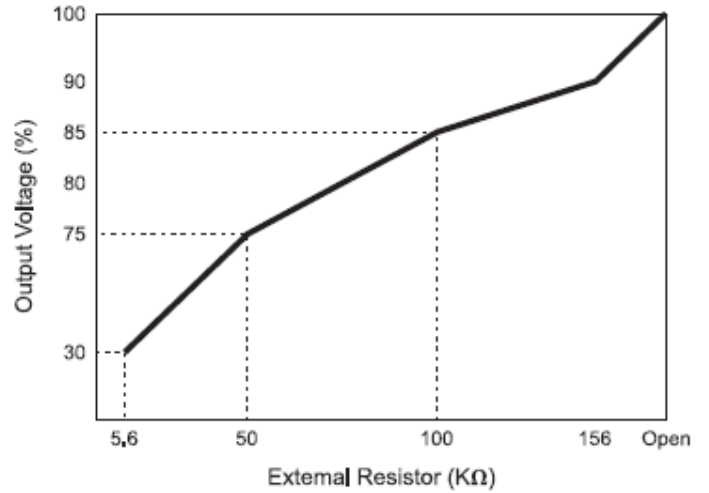
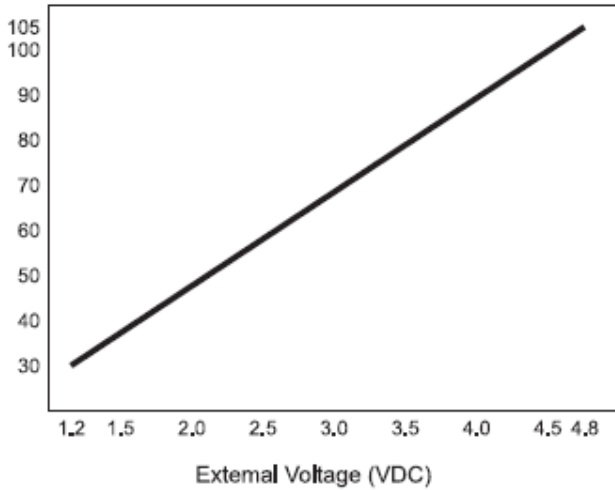


Load vs Input Voltage

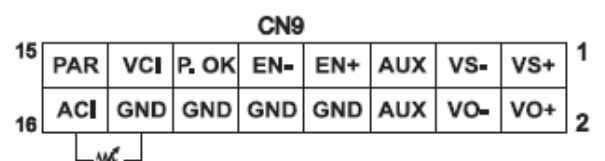
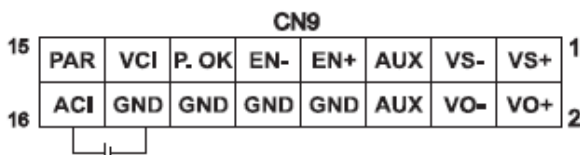
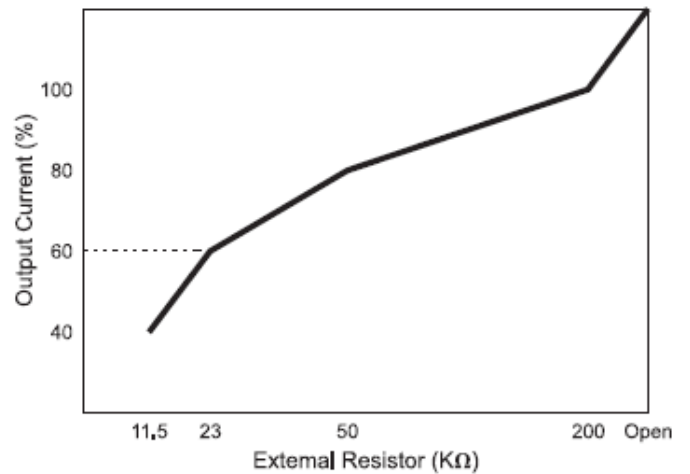
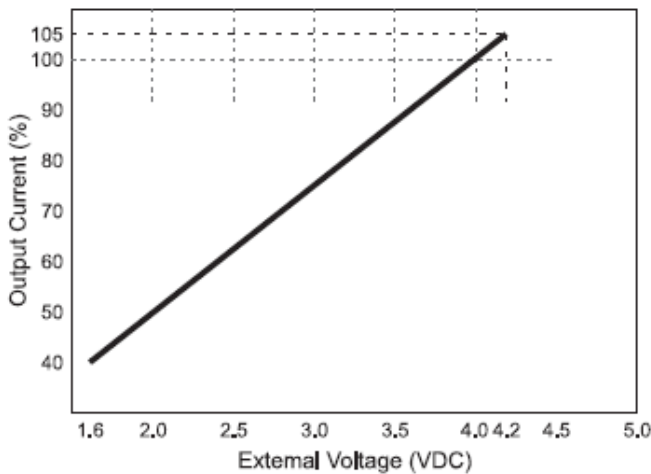


FUNCTION MANUAL

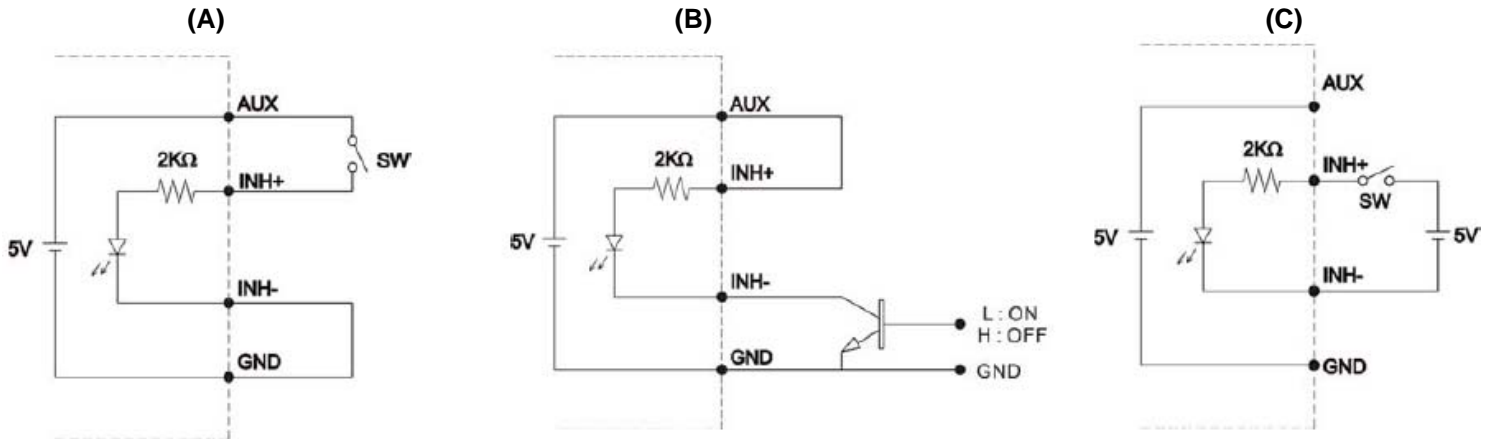
1. OUTPUT VOLTAGE TRIM



2. OUTPUT CURRENT TRIM



3. REMOTE ON/OFF

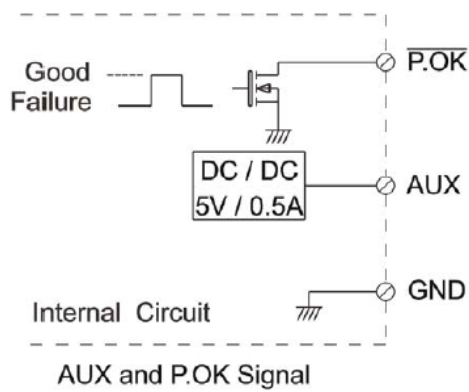


(A): Using internal 5V auxiliary source

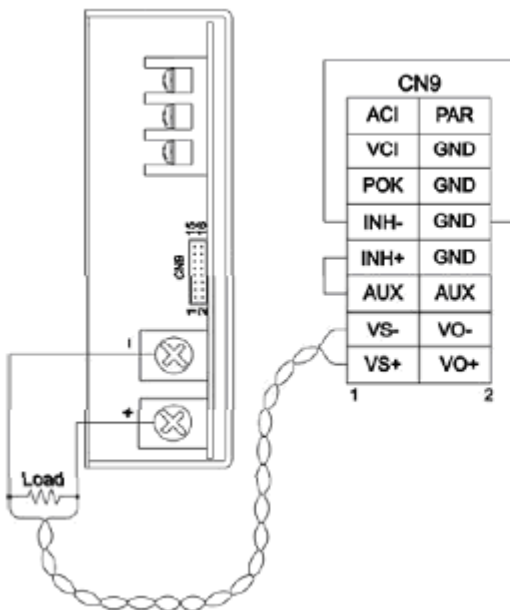
(B): ON/OFF Control by NPN transistor

(C): Using external voltage source

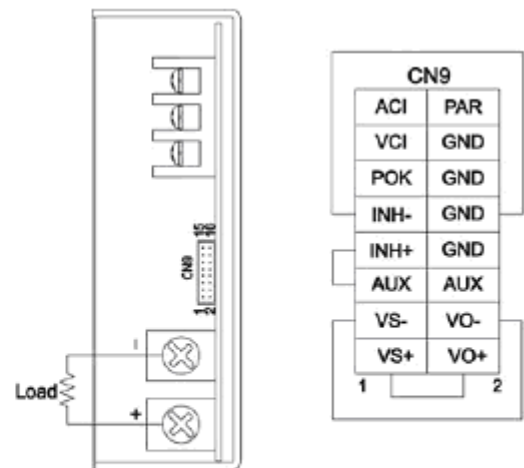
4. POWER OK SIGNAL



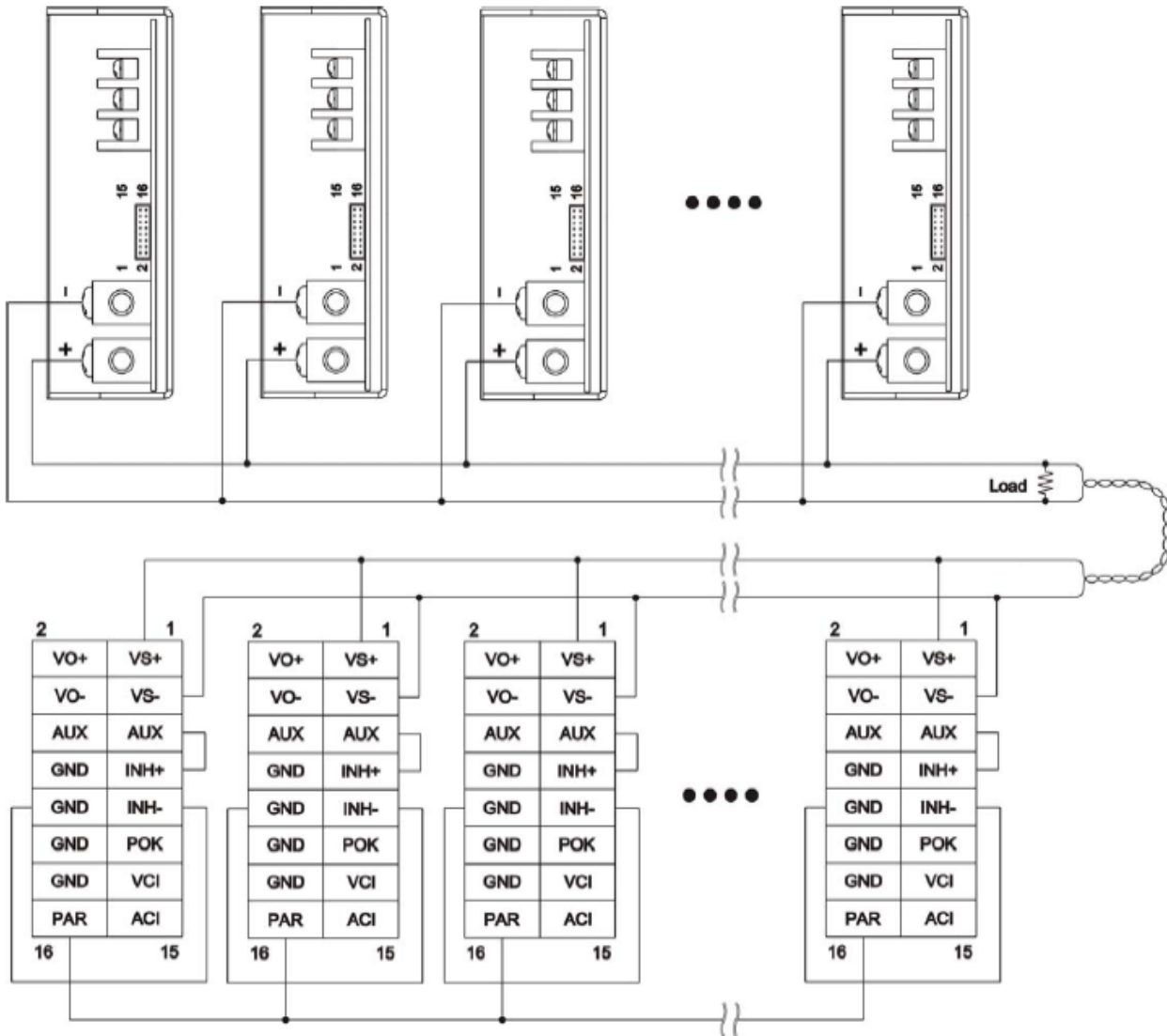
5. REMOTE SENSE



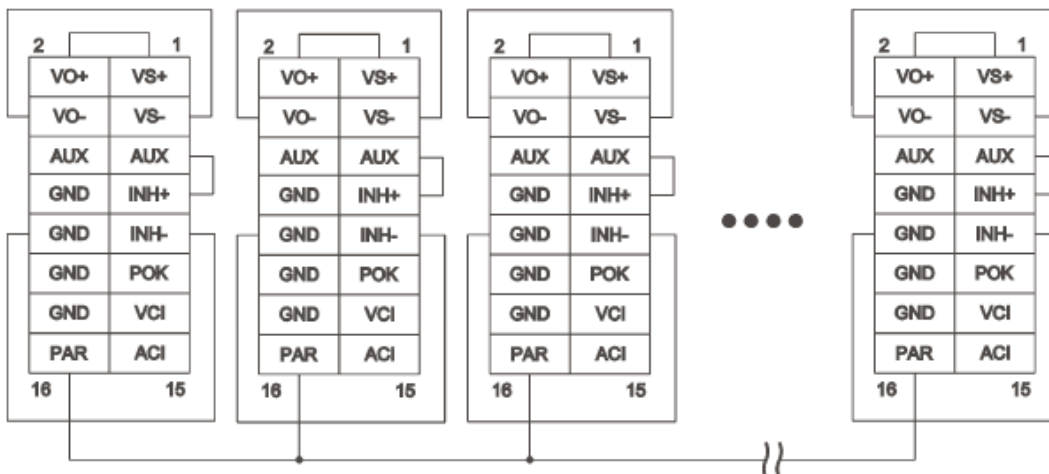
6. LOCAL SENSE



7. CURRENT SHARING WITH REMOTE SENSING

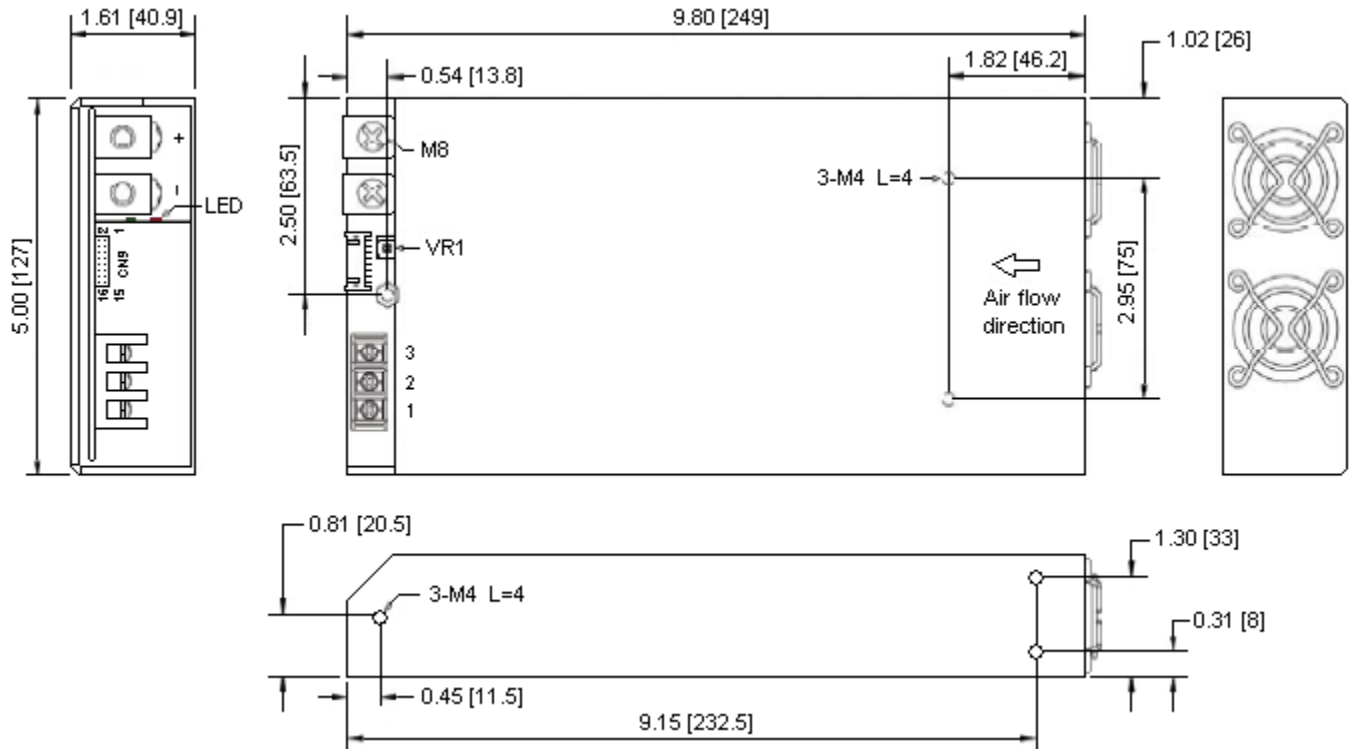


8. CURRENT SHARING WITH LOCAL SENSING



MECHANICAL DRAWING

Unit: inches [mm]



AC INPUT TERMINAL	
Pin	Assignment
1	AC(L)
2	AC(N)
3	⊥

CONTROL PIN ASSIGNMENT (CN9): JST S16B-PHDSS OR EQUIVALENT				
Pin	Assignment	Function	Mating Housing	Terminal
1	VS+	Remote voltage sense (+)	PHDR-16VS	SPHD-002T-P05
2	VO+	Local output voltage sense (+)		
3	VS-	Remote voltage sense (-)		
4	VO-	Local output voltage sense (-)		
5	AUX	+5V / 0.5A auxiliary power		
6	AUX	+5V / 0.5A auxiliary power		
7	INH+	Inhibit ON/OFF (+)		
8	GND	Ground		
9	INH-	Inhibit ON/OFF (-)		
10	GND	Ground		
11	POK	Power OK		
12	GND	Ground		
13	VCI	V Program		
14	GND	Ground		
15	ACI	I Program		
16	PAR	Parallel Operation current share		

LED STATUS

Green LED	LED Signal	Status
Solid		Power OK
Slow Blink		Power Standby
Red LED	LED Signal	Status
Fast Blink		Over Voltage Protection (OVP)
Solid		Over Load Protection (OLP)
		Output Short Circuit Protection (SCP)
		Under Voltage Protection (UVP)
Slow Blink		Over Temperature Protection (OTP)
Intermittent link		Fan Failure
Interlace Blink		Power Failure