



PHIHONG TECHNOLOGY



World Class
Power Solutions





PHIHONG

POWER SUPPLIES AND ADAPTERS

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About Phihong

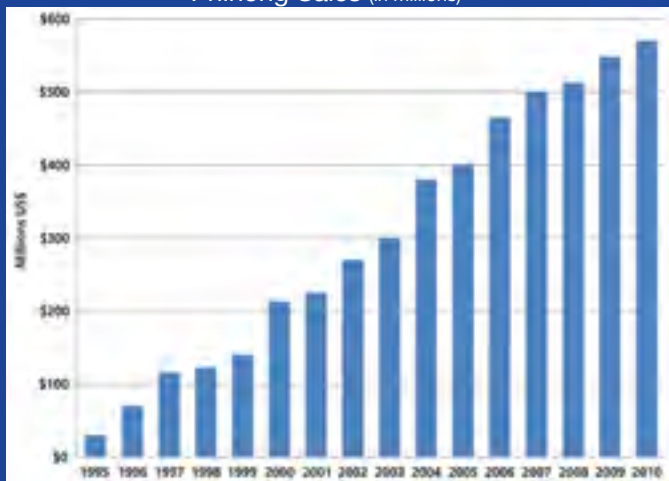
Since 1972, Phihong has been at the forefront of technological innovation in power electronics manufacture and design. By employing the latest in technology and research and development, Phihong's customers have continued to expect and receive the best possible products with on-time delivery and exceeding worldwide standards in efficiency and safety.

With a truly international span covering North America, Europe, and Asia, Phihong has design labs and local sales support centers in California, New York, The Netherlands, China, Japan, and Taiwan; Phihong is a top choice for OEMs serving datacom, telecom, personal electronics, networking, lighting, and industrial markets.

Focusing on engineering excellence, product reliability, and a commitment to customer service, sales have continued to grow proving a continued dominance in the power adapter industry with a broad line of cost competitive highly efficient products that comply with international standards.

OEMs also choose Phihong to partner on custom projects to meet the needs of very special programs not satisfied by the standard product offerings. With a long history in both standard and custom power designs, Phihong has one of the market's broadest lines of cost-competitive and highly reliable power solutions.

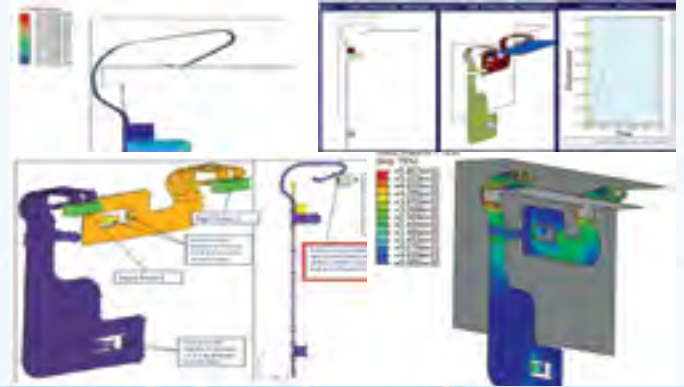
Phihong Sales (in millions)



QUALITY

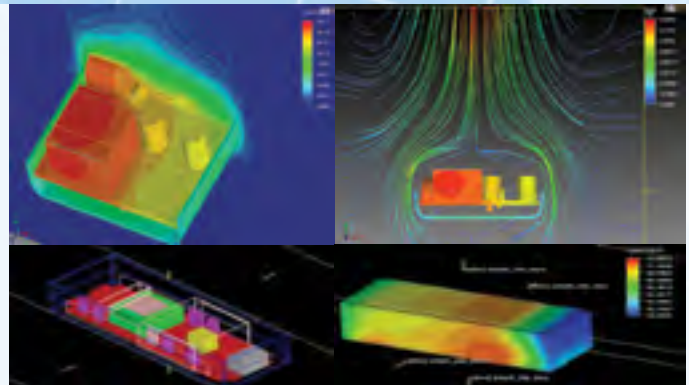
TECHNOLOGY

DEMONSTRATING ENGINEERING EXCELLENCE



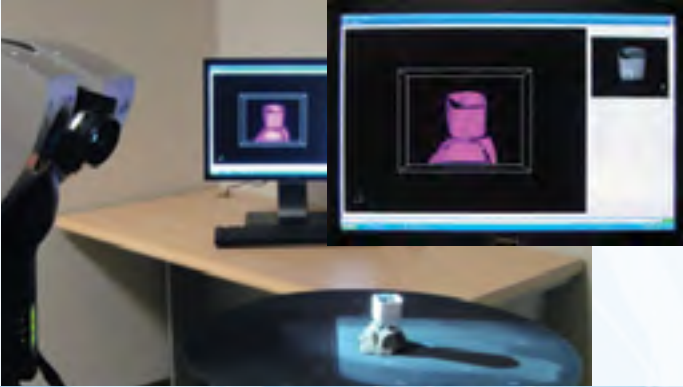
Finite Element Analysis

- Virtually stress test materials in the design
- Reduce the number of prototypes
- Dramatically increase speed from development to production



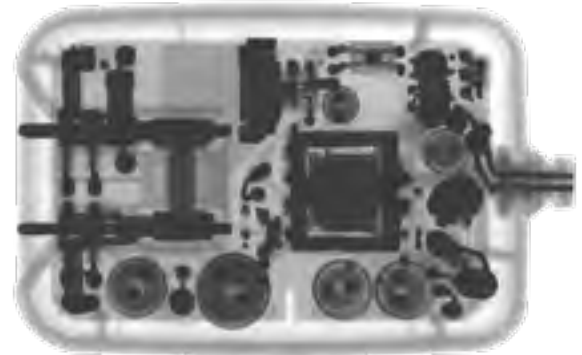
Thermal Simulation

- Virtually simulate thermal stress tests for individual parts to full PCBs
- Analyze the heating and cooling of parts in relation to each other to accurately diagnose conflicts before they occur
- Reduce the number of prototypes needed for real time thermal stress tests



3D Scanning

- Verify prototype case tooling matches design
- Monitor structural changes accurately following stress tests for more detailed analysis
- Enhances integration with complex parts



Non-Destructive Failure Analysis

- Analyze internal structure for quality without damage to external packaging
- Verify soldering and component connections are accurate and appropriate



Process Automation

- Increases production speeds, capacity, and overall product quality
- Minimizes costs as the cost of labor increases and reducing the need for manual processes



Automated Optical Inspection

- All defects found; nothing overlooked by human error
- Quantitative measure instead of operator judgement using a complex algorithm to detect faults

PERSONAL ELECTRONICS

Offering a broad range of solutions and services that enable you to reduce your cost and time to market, Phihong is the strategic partner you need when it comes to high-volume OEM programs. Our global sales, manufacturing, and R&D network provides localized service and just-in-time delivery, so you can rely on us for comprehensive turn-key in-box and accessory solutions to retail packaging and blister packing. Whether it involves power, audio or data, Phihong has the solution and ability to ramp up production when you need it.



Cradles and Docking Stations

- Charging
- Spare battery charging
- Data interface capability



Battery Chargers

- Lithiumion/Lithiumpolymerchargers
- Spare battery charging
- AC or DC input
- Auxiliary handset charging



Small/Thin Adapters

- Constant-Current/ConstantVoltage
- USB output
- Level V efficient
- Low cost
- Five-star standby





Fixed Blade Wall Plugs

- Constant Current/Constant Voltage
- Custom connectors
- EISA compliant



International Travel Chargers

- Accessories or in-box
- Worldwide compliance with limited SKUs



Vehicle Power Adapters

- High efficiency
- Robust design
- Compliant with European vehicle standards



Data Cables

- USB serial
- Combination charging
- Handset data cables
- Proposition 65 compliant

NETWORK POWER

Phihong products are used in many of the world's leading OEM networking systems. With our expertise in network power solutions, including power supplies, adapters, Power-over-Ethernet single and multi-port (8 to 48) midspans, and PoE and Data extenders, we can customize a number of different power products to suit your needs. Whether you choose standard or custom, external or internal, AC or RPS inputs, all our products have demonstrated MTBF exceeding millions of hours to guarantee reliability.

Phihong has the right power solution for your specific networking requirements.



Power Supplies for Switches and PoE Midspans

- 125-1kW
- AC and DC (RPS) input
- 8-48 ports IEEE802.3af
- Selected high power ports
- 12C or serial interface



Redundant Power Solutions - RPS

- Low cost 1U 500-3.3kW n+1
- SELV and 1500VAC isolated outputs
- 85-264VAC operation
- Alarms and signals
- 1U battery packs



Features of Phihong's networking products:

- Network expertise
- 1U Power supplies produce up to 3kW
- Long calculated product life 24/7 operation
- Leading high power PoE technology
- Member of UNH



IP SECURITY

Phihong offers a broad line of Power-over-Ethernet solutions, including single-port and multi-port IEEE802.3af and IEEE802.3at compliant midspans, high-power ULTRA and MEGA PoE injectors, passive midspans, splitters, and extenders for the latest requirements as well as legacy products for the security market. Full power on every port means no power management is required and users may implement the latest in SNMP management for secure remote access to enterprise class midspans.



Extenders and Accessories

- Extend PoE and data beyond IEEE limits
- Enhanced compatibility
- Install and test PoE locally
- Power multiple devices from a single Ethernet cable
- Worldwide compliance



High Density Mid and High Power Supplies

- 120-1kW 1U
- AC and DC inputs
- High efficiency
- 12C diagnostic interfaces



Low Cost SOHO Power Supplies

- 15-160W
- Single and multiple output
- 1U
- Worldwide compliance



PoE Midspans

- 1-24 ports IEEE802.3af and at compliant
- Full power every port
- SNMP
- 15.4-95W per port
- 14-60W splitters
- Indoor/Outdoor PoE extenders

HOME ENTERTAINMENT

Phihong manufactures a wide variety of products that reduce power consumption and enhance the efficiency and ease of use in home entertainment systems. Uniquely designed for each application, Phihong provides cost-effective custom solutions and turnkey programs to fit your exact needs.



Wall Plug and Desktop Adapters

- Color cases
- IEC60065 safety compliance
- Long life
- No AM/FM interference
- CE and worldwide compliance
- Low cost
- Level V efficiency

Our universal input adapters, specifically designed for LCD TV, home entertainment, networking, and gaming applications decrease heat through an ultra-high efficiency topology in a tiny, low-profile package that meets the US Energy Independence and Security Act of 2007 and the European Union's newly required Ecodesign ErP Directive 2009/125/EC standards for external power supplies. For cost-effective, high-efficiency adapters and power supplies, Phihong can deliver the right solution for your home entertainment applications.



Set-Top Box Power Supplies

- Up to 10 outputs
- Standby power
- Low cost
- Low standby power



Custom Power Supplies

- Low profile
- No fans
- High efficiency
- Low standby power
- Very low noise

BATTERY CHARGERS

Phihong has extensive experience in consumer and commercial charger applications. We design and build a variety of fast, medium, and slow chargers for NiMH/NiCd and Li-Ion chemistries. Charging solutions for Smart Battery Packs identify battery type, critical charging, and charge termination parameters and feature our micro-controlled charge control that can be used for any battery chemistry.



Charging solutions for rechargeable Lithium-Ion and Lithium-Polymer battery types

- Supports 4.2 and 4.4 volt technologies
- Thermal qualification
- IEEE P1725



Battery protection incorporated into each design includes:

- Over voltage / under voltage
- Over current
- Over temperature / under temperature
- Battery ID and cryptography identification



Charging solutions for rechargeable Nickel Metal Hydride and Nickel Cadmium battery types

- Temperature and voltage termination
- Advanced micro controller algorithms
- Charge maintenance

LIGHTING SOLUTIONS

Phihong produces several different solutions for lighting including high efficiency electronic ballasts and highly reliable LED drivers for commercial, industrial, and residential applications. Backed by a solid warranty program, rigorous quality standards, 100% burn-in testing, and advanced life testing, our products meet the requirements for UL and CE markings as well as other industry safety and efficiency standards. Our commitment to quality, cost control, developing environmentally responsible power technologies, and customer service is supported by an extensive network of worldwide manufacturing, warehousing and service support centers.



LED Drivers

- Available in Constant Current/Constant Voltage
- Indoor/Outdoor or open frame design
- Standard dimming on outdoor units
- Low profile design for ease of integration
- Dimming via 0-10V, Dali, Zigbee, Zwave or 802.11 wireless



Bulb Replacement LED Drivers

- Incandescent and CFL bulb retrofits
- Universal AC input
- Low profile PCB design for ease of integration
- Minimizes need for extra components



Fluorescent Ballasts

- Available for both fluorescent and compact fluorescent fixtures
- T5, T8, and T12 ballasts available
- Parallel or serial wiring
- High ballast factor
- Dimming options
- Instant, rapid or programmable start
- Meets UL and NEMA and enables fixtures to comply with ENERGY STAR standards

Down Light Fixtures

- Available for compact fluorescent or LED fixtures
- Directional or diffuse styles
- Housing may be recessed or externally surface mounted



Linear Fluorescent Replacement

- Retrofit kits for existing lamp fixtures
- 2 foot, 4 foot, and 8 foot T10 replacement bulbs available
- Warm or cool lamp colors
- Universal input compatible

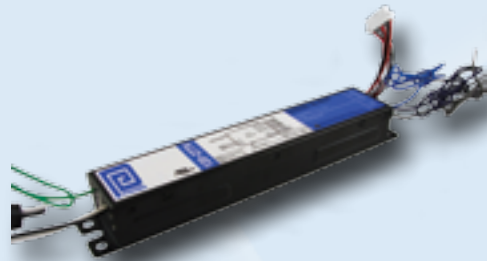
STANDARD CONSTANT CURRENT LED DRIVERS

108 to 132VAC Input LED Driver Triac Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
10W	25.96V	28.92V	30.02V	319mA	336mA	353mA	>0.90	>75%	65	PDA010N-336G

90 to 304VAC Input 4 Channel Output LED Driver 0-10V Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
31W	22V	24.5V	26.5V	250mA	264mA	278mA	>0.90	>81%	65	PDA031W-264G
45W	22V	24.5V	26.5V	366mA	387mA	407mA	>0.90	>83%	65	PDA045W-387G
49W	22V	24.5V	26.5V	430mA	453mA	476mA	>0.90	>82%	65	PDA049W-445G

100 to 136 VAC Input Non-Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
12W	10V	-	43V	330mA	350mA	370mA	>0.50	>77%	20	PDA012B-350C
12W	10V	-	43V	330mA	350mA	370mA	>0.50	>77%	20	PDA012B-350C-H*

Notes: *This unit is available as a higher reliability model from the base model. Average lifespan increased to 100,000 hours.

90 to 132 VAC Input Non-Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
6W	2.5V	-	7.5V	650mA	700mA	750mA	>0.70	>70%	20	PDA006B-700C
10W	7.5V	-	12V	650mA	700mA	750mA	>0.95	>70%	20	PDA010B-700C
15W	17.5V	-	42V	300mA	350mA	400mA	>0.90	>78%	20	PDA015B-350C
30W	15V	-	42V	650mA	700mA	750mA	>0.95	>82%	20	PDA030B-700C

211 to 264 VAC Input Non-Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
6W	2.5V	-	7.5V	650mA	700mA	750mA	>0.70	>70%	20	PDA006A-700C
10W	7.5V	-	12V	650mA	700mA	750mA	>0.70	>70%	20	PDA010A-700C
15W	17.5V	-	42V	300mA	350mA	400mA	>0.90	>77%	20	PDA015A-350C
30W	15V	-	42V	650mA	700mA	750mA	>0.95	>82%	20	PDA030A-700C

185 to 304 VAC Input Non-Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
12W	10V	-	43V	330mA	350mA	370mA	>0.50	>77%	20	PDA012A-350C
12W	10V	-	43V	330mA	350mA	370mA	>0.50	>77%	20	PDA012A-350C-H*

Notes: *This unit is available as a higher reliability model from the base model. Average lifespan increased to 100,000 hours.

STANDARD HIGH-VOLTAGE / CONSTANT CURRENT DRIVERS

90 to 304VAC Input LED Driver Non-Dimming High Voltage Output



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
100W	70V	-	142V	665mA	700mA	735mA	>0.90	>87%	66	PDA100E-700G
100W	47V	-	95V	1000mA	1050mA	1100mA	>0.90	>87%	66	PDA100E-1A0G
100W	35V	-	71V	1330mA	1400mA	1470mA	>0.90	>87%	66	PDA100E-1A4G
125W	90V	-	178V	665mA	700mA	735mA	>0.90	>87%	66	PDA125E-700G
125W	60V	-	119V	1000mA	1050mA	1100mA	>0.90	>87%	66	PDA125E-1A0G
125W	45V	-	89V	1330mA	1400mA	1470mA	>0.90	>87%	66	PDA125E-1A4G

90 to 304VAC Input LED Driver 0-10V Dimming High Voltage Output



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Product Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
100W	70V	-	142V	665mA	700mA	735mA	>0.90	>87%	66	PDA100W-700G
100W	47V	-	95V	1000mA	1050mA	1100mA	>0.90	>87%	66	PDA100W-1A0G
100W	35V	-	71V	1330mA	1400mA	1470mA	>0.90	>87%	66	PDA100W-1A4G
125W	90V	-	178V	665mA	700mA	735mA	>0.90	>87%	66	PDA125W-700G
125W	60V	-	119V	1000mA	1050mA	1100mA	>0.90	>87%	66	PDA125W-1A0G
125W	45V	-	89V	1330mA	1400mA	1470mA	>0.90	>87%	66	PDA125W-1A4G

STANDARD CONSTANT VOLTAGE LED DRIVERS

90 to 304VAC Input Open Frame LED Driver Non-Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
90W	22.8V	24V	25.2V	0.2A	-	3.75A	>0.90	>85%	-	PSM090-240P

90 to 304VAC Input LED Driver Non-Dimming



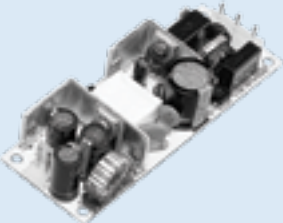
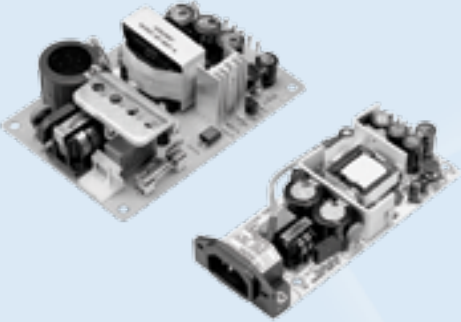

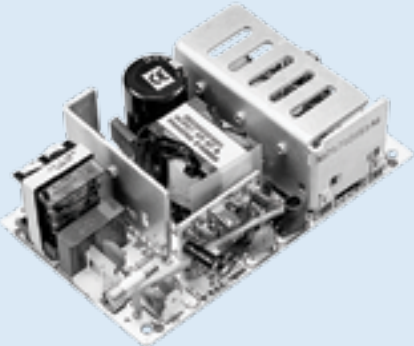
Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
72W	-	24V	-	2.74A	3.0A	3.15A	>0.90	>86%	66	PDA072E-3A0G
80W	-	48V	-	1.58A	1.67A	1.75A	>0.90	>86%	66	PDA080E-1A6G
100W	-	48V	-	1.98A	2.08A	2.19A	>0.90	>86%	66	PDA100E-2A1G

90 to 304VAC Input LED Driver 0-10V Dimming



Rated Wattage	DC Output Voltage			Output current			Power Factor	Efficiency	IP Rating	Model Name
	Min.	Typ.	Max.	Min.	Typ.	Max.				
72W	-	24V	-	2.74A	3.0A	3.15A	>0.90	>86%	66	PDA072W-3A0G
80W	-	48V	-	1.58A	1.67A	1.75A	>0.90	>86%	66	PDA080W-1A6G
100W	-	48V	-	1.98A	2.08A	2.19A	>0.90	>86%	66	PDA100W-2A1G

STANDARD POWER SUPPLIES

Product Image	Output Power	Output Voltage	Load Max.	Model Name
	10W	3.3VDC	3.0A	PSA15LN3-033
	15W	5VDC	3.0A	PSA15LN3-050
		9VDC	1.67A	PSA15LN3-090 †
		12VDC	1.25A	PSA15LN3-120
		15VDC	1.0A	PSA15LN3-150 †
		18VDC	0.83A	PSA15LN3-180 †
		24VDC	0.63	PSA15LN3-240
	16.5W	3.3VDC	5.0A	PSA25L-033 †
	20W	5VDC	4.0A	PSA25L-050 †
	25W	12VDC	2.0A	PSA25L-120
		15VDC	1.7A	PSA25L-150
		5VDC	2.6A (3.0A pk)	PSA25L-201
		12VDC	1.0A (1.5A pk)	
		5VDC	2.0A	PSA25L-301
		12VDC	1.0A (1.5A pk)	
		-12VDC	0.3A (0.5A pk)	
		3.3VDC	5.0A	PSA25LS-033 †
		5VDC	5.0A	PSA25LS-050 †
	33W*	3.3VDC	10.0A*	PSA45-033 †
	50W*	5VDC	10.0A*	PSA45-050
	60W	12VDC	5.0A*	PSA45-120
		15VDC	4.0A*	PSA45-150 †
		24VDC	2.5A*	PSA45-240
		5VDC	5.0A* (7.0A pk)	PSA4531
		12VDC	2.5A* (4.0A pk)	
		-12VDC	0.5A* (1.0A pk)	
		5VDC	5.0A* (7.0A pk)	PSA4534
		15VDC	2.0A* (3.0A pk)	
		-15VDC	0.5A* (1.0A pk)	PSA4541
		5VDC	5.0A* (7.0A pk)	
	12VDC	2.0A* (4.0A pk)		
	-12VDC	0.5A* (1.0A pk)		
	-5VDC	0.5A* (1.0A pk)		
	50W	5VDC	10.0A	PSA60-105 †
	60W	12VDC	5.0A	PSA60-112
		15VDC	4.0A	PSA60-115 †
		24VDC	2.5A	PSA60-124
		48VDC	1.25A	PSA60-148 †
		5VDC	6.0A	PSA60-202 †
		24VDC	1.3A	
		5VDC	4.0A	PSA60-203
		12VDC	3.5A	
		5VDC	6.0A	PSA60-301 †
		12VDC	2.2A	
		-12VDC	0.3A	
		5VDC	6.0A	PSA60-303 †
		12VDC	2.2A	
		-5VDC	0.5A	PSA60-304 †
	5VDC	6.0A		
	15VDC	1.5A		
		-15VDC	0.5A	

Notes: * Rating with forced air cooling

† Indicates special order model; minimum order quantity applies

Product Image	Output Power	Output Voltage	Load Max.	Model Name
	65W	12VDC	5.42A*	PSA065-120 ‡
		24VDC	2.71A*	PSA065-240 ‡
		48VDC	1.36A*	PSA065-480 ‡
	55W	5VDC	11.0A*	PSA075-050
	75W	12VDC	6.25A*	PSA075-120
		24VDC	3.125A*	PSA075-240
	75W	5VDC	15.0A*	PSA120-050
	20W	12VDC	10.0A*	PSA120-120
		24VDC	5.0A*	PSA120-240
	160W	12VDC	13.3A*	PSA160-210
		12VDC <i>f</i>	0.4A*	
		24VDC	6.67*	PSA160-212
		12VDC <i>f</i>	0.4A*	
		48VDC	3.34A*	PSA160-218
		12VDC <i>f</i>	0.4A*	
		56VDC	2.86A*	PSA160-216
		12VDC <i>f</i>	0.4A*	
	500W	50VDC	10.A	PSM500-210
		12VDC ^{sb}	1.5A	
		56VDC	9.0A	PSM500-216
		12VDC ^{sb}	1.5A	
	1100W	56VDC	19.65A*	PSM1000-210
		12VDC ^{sb}	0.5A	

Standard Power Supply Specifications

EMI	Class B
Input Line Voltage	90-264 VAC
AC Input Frequency	47-63 Hz
Hold-up Time	10-16mS @ Full Load, 115VAC
Over-Voltage Protection	Yes
Overload Protection	Short-circuit protection, with auto-restart
Operation Temperature	0 to +50°C*

Safety approvals may vary on certain models. See specific datasheet for exact information.
 *Some models feature higher operating temperature. See specific datasheet for exact specifications.

Notes: * Rating with forced air cooling

‡ Add 'M' to part number when ordering medical version

† Indicates special order model; minimum order quantity applies

f Indicates fan output

^{sb} Indicates standby






LOW-COST FIXED WALL PLUG ADAPTERS

STANDARD FIXED WALL PLUGS

FEATURES

- Universal input compatibility 90-264VAC
- Ecodesign ErP Directive 2009/125/EC compliant
- Customizable for OEMs
- Double insulated
- DC/USB tips may be changed to users' needs
- Compliance for Level V efficiency
- Lowest cost
- Class B EMI
- Over-voltage, over-current, and short-circuit protections

Product Image	Output Power	Output Voltage	Output Current	AC Prong Style	Model Name
	5W	5V	1.00A	US	PSAA05A-050-R*
				EU	PSAA05E-050-R* †
				UK	PSAA05K-050-R* †
				AU	PSAA05S-050-R* †
	10W	5V	2.00A	US	PSC12A-050-R †
				China	PSC12C-050-R †
				EU	PSC12E-050-R †
				UK	PSC12K-050-R †
				AU	PSC12S-050-S †
	10W	9V	1.11A	US	PSC12A-090-R †
				China	PSC12C-090-R †
				EU	PSC12E-090-R †
				UK	PSC12K-090-R †
				AU	PSC12S-090-R †
	12W	12V	1.00A	US	PSA12A-120-R
				EU	PSA12E-120-R †
	24W	12V	2.00A	US	PSA24A-120(P)-R
				EU	PSA24E-120(P)-R †

Notes:

† - Refers to special order model; minimum order quantity applies

* - This unit is terminated with Mini-USB in place of standard DC Cable



VEHICLE POWER ADAPTERS FOR PERSONAL ELECTRONICS

Features

- Robust design
- US and EU compatibility
- High efficiency
- Battery charging
- DC input voltage 10 to 30V

Output Power	Output Voltage	Output Current	Model Name
5W	5V	1.0A	CLA05D-050(A)-R
10W	5V	2.0A	CLM10D-050(A)-R
10W	5V/5V	1.0A	CLM10D-203(M)-R*

* Dual output model has 5V, 1A outputs via USB port and DC cable



SMALL/THIN USB ADAPTERS

3W MOBILE USB ADAPTER

FEATURES

- 5-Star standby rating
- IEEE1725 approved for mobile phone charging
- Level V energy efficient
- Ecodesign ErP Directive 2009/125/EC compliant
- Halogen free (European models only)
- No Y caps
- Class B EMI
- CC/CV charge function
- Fixed blade for lowest cost
- Over-voltage/current and short-circuit protections
- Standard USB-A output
- Compact design - 21mm thick

Product Image	Output Power	Output Voltage	Output Current	AC Prong Style	Model Name
	2.75W	5V	0.55A	US	PSM03A-050Q-R
				EU	PSM03E-050Q-H †
				UK	PSM03K-050Q-H †

Notes: † - Refers to special order model; minimum order quantity applies



F-SERIES LOW PROFILE USB ADAPTER

FEATURES

- 5-Star standby rating
- IEEE1725 approved for mobile phone charging
- Level V energy efficient
- Ecodesign ErP Directive 2009/125/EC compliant
- Halogen free
- Over-voltage/current and short-circuit protections
- Class B EMI
- CC/CV charge function
- Folding prong fixed blade
- International field interchangeable clips
- Standard USB-A output
- Compact design - 15mm thick

Product Image	Output Power	Output Voltage	Output Current	Model Name
	5W	5V	1.00A	PSA05F-050Q-H



F-SERIES

CLIPS



Australia/
New Zealand
Clip



Europe Clip



UK Clip



Model:	Description
FP-Kit:	FPE, FPK, FPS
FPE:	Europe
FPK:	UK
FPS:	AUS/NZ

USB CABLES

Description	Model	Length	Product Image
USB A to Mini-B USB Cable	IPUSB1CS	1.5m	
USB A to Micro-B USB Cable	IPUSB1MS	1.5m	

Devices that require USB cables: PSM03X, PSA05F, and PSB05R

For more specific information including product datasheets please visit www.phihong.com

WORLDWIDE WALL ADAPTERS WITH INTERCHANGEABLE AC CLIPS

FEATURES

- Universal input compatibility 90-264VAC
- Ecodesign ErP Directive 2009/125/EC compliant
- Customizable for OEMs
- Field interchangeable AC clips for worldwide compatibility
- Double insulated
- SELV compliant
- Compliance for Level V efficiency
- DC / USB tips may be changed to user's needs
- Class B EMI
- Over-voltage, over-current, and short-circuit protections
- No load power saving
- WEEE, REACH, and RoHS compliant

R-SERIES AC INPUT CLIPS



PSB05R with RPK attachment

Model: Description

RP Bag: RPA, RPE, RPK, and RPS clips bundled	
RPA: N. America	RPI: India
RPB: Brazil	RPK: UK
RPC: China	RPN: Argentina
RPE: Europe	RPS: AUS/NZ
RPH: Korea	RPX: IEC320 C8

Safety Approvals

All Models:



Select Models:



User Customizable USB Connectors



Connector P/N	USB Type
C10	Straight USB Mini-B
C11	Straight Micro-USB

North America Clip



India Clip



Brazil Clip



UK Clip



China Clip



Argentina Clip



Europe Clip



Australia/New Zealand Clip



Korea clip



Two Wire Input Clip (C8)



Product Image	Output Power	Output Voltage	Output Current	Model Name
	5W	5V	1.00A	PSB05R-050Q-R
	5W	5V	1.00A	PSAC05R-050(P)-R
				PSAC05R-050(MB)-R *
		9V	0.56A	PSA05R-090-R
	9W	5V	1.80A	PSAC09R-050-R **
	10W	5V	2.00A	PSC12R-050-R
		9V	1.11A	PSC12R-090-R
12W	12V	1.00A	PSC12R-120-R	
	15W	5V	3.00A	PSA15R-050PV-R
		6V	2.50A	PSA15R-060PV-R
		9V	1.66A	PSA15R-090PV-R
		12V	1.25A	PSA15R-120PV-R
		15V	1.00A	PSA15R-150PV-R
		24V	0.62A	PSA15R-240PV-R
		48V	0.31A	PSA15R-480PV-R
	16W	7.5V	2.00A	PSA15R-075PV-R
	18W	12V	1.50A	PSA18R-120-R †
		10W	3.3V	3.00A
15W		5V	3.00A	PSAA20R-050-R
20W		12V	1.67A	PSAA20R-120-R
		24V	0.83A	PSAA20R-240-R
		48V	0.42A	PSAA20R-480-R
	30W	12V	2.50A	PSAA30R-120-R
		15V	2.00A	PSAA30R-150-R
		24V	1.25A	PSAA30R-240-R
		56V	0.536A	PSAA30R-560-R
		12V	2.50A	PSAM30R-120-R ^M
		24V	1.25A	PSAM30R-240-R ^M
60W	12V	5.00A	PSA60R-120-R	
	24V	2.50A	PSA60R-240-R	
	56V	1.07A	PSA60R-560-R	

Notes:

- * - This unit is terminated with Mini-USB in place of standard DC cable
- ** - This unit is terminated with Micro-USB in place of standard DC cable
- † - Refers to special order model; minimum order quantity applies
- M - Refers to medical power supply; exempt from standard efficiency regulations

International clips are available for North America, Continental Europe, the United Kingdom, Australia/New Zealand, China, Korea, Brazil, Argentina, and India. For all other AC plug standards an IEC320 C8 clip for connection to a two-wire AC cord is available.

For more specific information including product datasheets please visit www.phihong.com

UNIVERSAL INPUT DESKTOP ADAPTERS

FEATURES

- Universal input compatibility 90-264VAC
- Double insulated
- Customizable for OEMS
- Ecodesign ErP Directive 2009/125/EC compliant
- Non-vented/spill-proof case
- Output range 18W to 120W
- Compliant for WEEE, RoHS, and REACH
- All models are compliant for Level V efficiency
- DC tips may be changed to user requirements
- Class B EMI
- Over-voltage, over-current, and short-circuit protections
- SELV compliant
- Fully isolated
- Operating temperature range 0 to +40°C

Safety Approvals

All Models:



Select Models:



AC INPUT POWER CORDS



From left to right: AC30UEU, AC30UNA, AC30UUK

COMPATIBILITY GUIDE

AC Input	Description	Connector	Connecting Cable	Description
	Two-wire Input (C8)		AC15WNA	C7 North America power cord
			AC15WEU	C7 Continental Europe power cord
			AC15WUK	C7 United Kingdom power cord
	Three-wire Input (C6)		AC30MNA	C5 North America power cord "Mickey Mouse"
	Three-wire Input (C14)		AC30UNA	C13 North America power cord
			AC30UEU	C13 Continental Europe power cord
			AC30UUK	C13 United Kingdom power cord

USER CUSTOMIZABLE DC TIPS



Phihong offers customers the in-house capability to change USB and DC output connectors with no minimum order quantity requirement.

Straight Barrel Connectors

Connector P/N	Center Positive	Connector P/N	Center Negative
C1	2.1mm x 5.5mm x 10mm	CN1	2.1mm x 5.5mm x 10mm
C2	2.5mm x 5.5mm x 10mm	CN2	2.5mm x 5.5mm x 10mm
C3	1.7mm x 4.0mm x 10mm	CN3	1.7mm x 4.0mm x 10mm
C4	1.35mm x 3.5mm x 10mm	CN4	1.35mm x 3.5mm x 10mm
C5	0.7mm x 2.5mm x 10mm	CN5	0.7mm x 2.5mm x 10mm

Right Angle Connectors

Connector P/N	Center Positive	Connector P/N	Center Negative
CR1	2.1mm x 5.5mm x 10mm	CNR1	2.1mm x 5.5mm x 10mm
CR2	2.5mm x 5.5mm x 10mm	CNR2	2.5mm x 5.5mm x 10mm
CR3	1.7mm x 4.0mm x 10mm	CNR3	1.7mm x 4.0mm x 10mm
CR4	1.35mm x 3.5mm x 10mm	CNR4	1.35mm x 3.5mm x 10mm
CR5	0.7mm x 2.5mm x 10mm	CNR5	0.7mm x 2.5mm x 10mm

www.phihong.com

Product Image	Output Power	AC Input	Output Voltage	Output Current	Model Name
	18W	C14	9V	2.00A	PSAA18U-090-R
			12V	1.50A	PSAA18U-120-R
			15V	1.20A	PSAA18U-150-R
			24V	0.75A	PSAA18U-240-R
			48V	0.38A	PSC18U-480(P)-R
	20W	C14	5V	4.00A	PSAC30U-050-R
	30W		12V	2.50A	PSAC30U-120-R
			24V	1.25A	PSAC30U-240-R
			56V	0.54A	PSAC30U-560-R
	36W	C8	12V	3.00A	PSM36W-120TW2-R
	38W	C14	5V 12V	4.00A 1.50A	PSA45U-201-R ‡
	60W	C6	12V	5.00A	PSAC60M-120-R
			24V	2.50A	PSAC60M-240-R
			48V	1.25A	PSAC60M-480-R
			56V	1.07A	PSAC60M-560-R
		C8	12V	5.00A	PSAC60W-120-R
			24V	2.50A	PSAC60W-240-R
			48V	1.25A	PSAC60W-480-R
			56V	1.07A	PSAC60W-560-R
	75W	C14	48V	1.50A	PSC75U-480-R †
			56V	1.34A	PSC75U-560-R
	120W	C14	12V	10.0A	PSA120U-120V-R
			24V	5.00A	PSA120U-240V-R
			48V	2.50A	PSA120U-480V-R
			56V	2.15A	PSA120U-560V-R

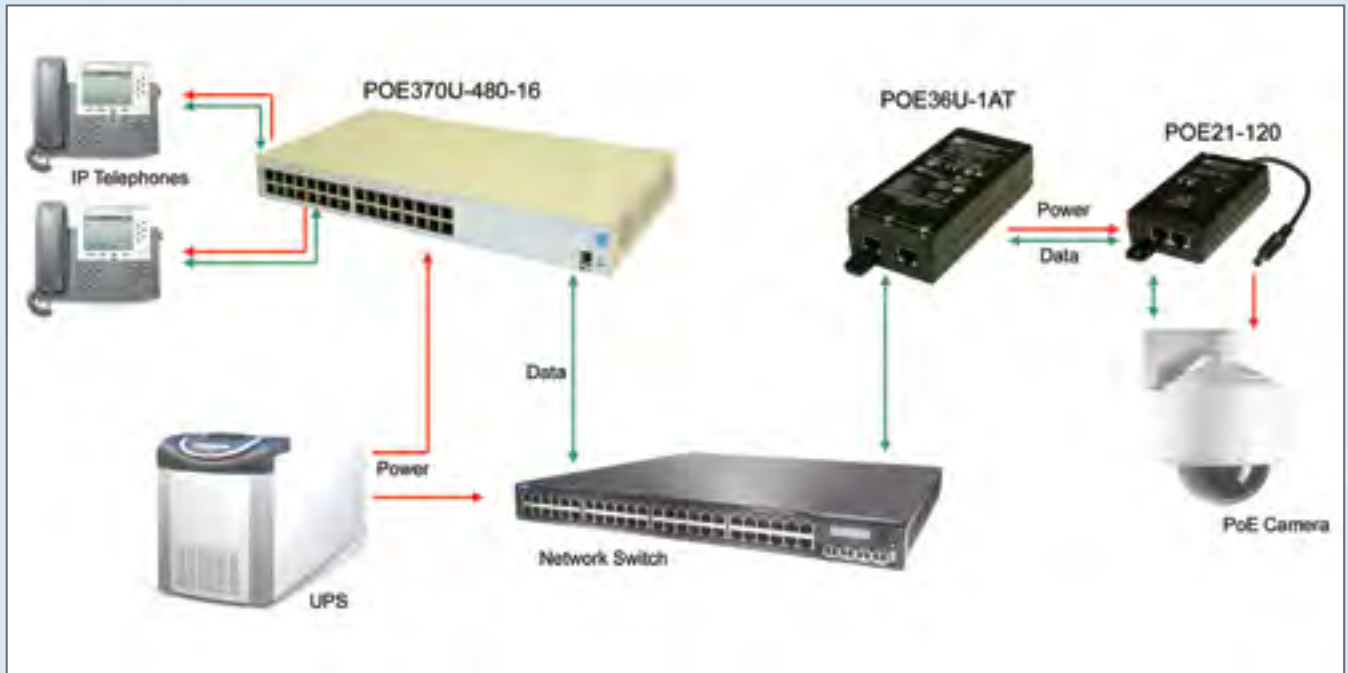
Notes:




† - Refers to special order model; minimum order quantity applies


‡ - Refers to dual output model; exempt from standard efficiency regulations

IEEE802.3af (15.4W PER PORT)

MIDSPANS AND SPLITTERS



Midspans	Number of Ports	Cisco Legacy	Gigabit	SNMP	Model Name
	1	No	No	No	PSA16U-480(POE)
		No	No	No	POE16R-1AF*
		Yes	Yes	No	POE20D-1AF**
		Yes	Yes	No	POE20U-560(G)
	8	No	Yes	No	POE125U-8
		Yes	Yes	Yes	POE125U-8N
		Yes	Yes	No	POE125U-8C
	8	Yes	Yes	No	POE370U-480-8
		Yes	Yes	Yes	POE370U-480-8N
	16	Yes	Yes	No	POE370U-480-16
		Yes	Yes	Yes	POE370U-480-16N
	24	Yes	Yes	No	POE370U-480-24
		Yes	Yes	Yes	POE370U-480-24N

Splitters	Output Power	Isolated	Regulated	Voltage	Current	Model Name
	8.25W	Yes	Yes	3.3V	2.5A	POE14-033
	12.5W	Yes	Yes	5V	2.5A	POE14-050
	14W	Yes	Yes	12V	1.17A	POE14-120
	14W	Yes	Yes	13.7V	1.0A	POE14-137***

Notes: * This model features interchangeable AC Clips

** This model features DC Input in place of AC input

*** This model has an output voltage with battery charging capability



IEEE802.3at (33.6W PER PORT)





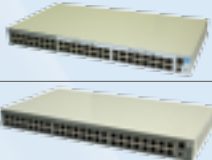
MIDSPANS AND SPLITTERS


Applications

- IP telephones
- Security cameras
- Bluetooth access points
- Wireless access points
- IP print servers
- Security systems
- RFID readers

Features

- Limited lifetime warranty on select models
- Compliant for detection, disconnect, and voltage control per IEEE802.3
- SELV and LPS compliant
- Multiport midspans are rack mountable
- Over-voltage/current, short-circuit protections
- Diagnostic LEDs
- UNH-IOL test report
- Optional port management on select models

Midspans	Number of Ports	Cisco Legacy	Gigabit	SNMP	Model Name
	1	Yes	Yes	No	POE30U-560(G)-HT*
		No	Yes	No	POE31U-1AT
		No	Yes	No	POE31W-1AT
		Yes	Yes	No	POE36D-1AT**
		Yes	Yes	No	POE36U-1AT
	1	Yes	Yes	No	POE33U-1AT***
	4	Yes	Yes	No	POE125U-4AT
		Yes	Yes	Yes	POE125U-4ATN
	8	Yes	Yes	No	POE576U-8AT
		Yes	Yes	Yes	POE576U-8ATN
	16	Yes	Yes	No	POE576U-16AT
		Yes	Yes	Yes	POE576U-16ATN
	24	Yes	Yes	No	POE576U-24AFAT
		Yes	Yes	Yes	POE576U-24AFATN
		Yes	Yes	No	POE806U-24AT
		Yes	Yes	Yes	POE806U-24ATN

Splitters	Output Power	Isolated	Regulated	Voltage	Current	Model Name
	21W	Yes	Yes	12V	1.75A	POE21-120
		Yes	Yes	24V	0.875A	POE21-240
	10W POE	Yes	Yes	44-57V	180mA	POE21-120H
	12W DC Out			12V	1.00A	

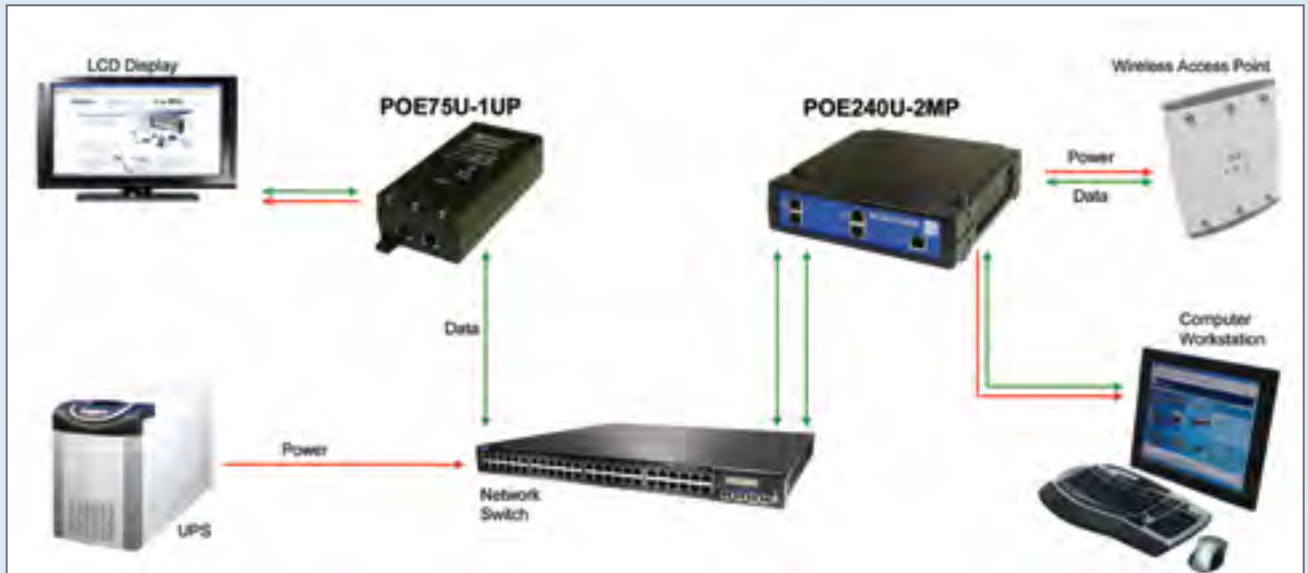
*This device operates under a wide temperature range.

**This device is powered by DC input in place of an AC input.

***This device is rated IP67 for waterproof outdoor operation.



ULTRA PoE (60-80W PER PORT) MIDPANS AND SPLITTERS



Midspans	Output Power	Number of Ports	Cisco Legacy	Gigabit	SNMP	Model Name
	60W	1	No	Yes	No	POE60U-560(G)
	75W		Yes	Yes	No	POE75U-1UP
			Yes	Yes	Yes	POE75U-1UPN
			No	Yes	No	POE75D-1UP*
80W	No	Yes	No	POE80U-560(G)		
	60W	4	Yes	Yes	Yes	POE240U-4UPN
	60W	4	Yes	Yes	No	POE480U-4UP
		8	Yes	Yes	No	POE480U-8UP
	75W	8	Yes	Yes	Yes	POE576U-8UPN

Splitters	Output Power	Isolated	Regulated	Voltage	Current	Model Name
	60W	No	No	50-57V	1.1A	POE60D-560
	30W POE	Yes	Yes	42.5-57V	600mA	POE21-120F
	21W DC Out			12V	1.75A	
	45W	Yes	Yes	12V	3.75A	POE45-120
		Yes	Yes	15V	1.67A	POE45-150

Note: * This unit requires DC input in place of AC input



MEGA PoE (95W PER PORT)




MIDSPANS

Applications

- Computer workstations
- Kiosks
- LCD displays
- Security systems
- High definition IP cameras
- Magnetic locks
- Biometric equipment
- Medical devices
- High power wireless radios

Features

- Limited lifetime warranty on select models
- Compliant for detection, disconnect, and voltage control per IEEE802.3
- Most units require 12.5K detection for full functionality, select units may operate at limited power with 25K Detection.
- Multiport midspans are rack mountable
- Over-voltage/current, short-circuit protections
- Diagnostic LEDs
- Most powerful PoE available
- Standard SNMP port management on all multiport models

Midspans	OutputPower	NumberofPorts	Cisco Legacy	Gigabit	SNMP	Model Name
	95W	2	Yes	Yes	Yes	POE240U-2MPN
		4	Yes	Yes	Yes	POE576U-4MPN
		8	Yes	Yes	Yes	POE806U-8MPN





PASSIVE POE INJECTORS

Passive Injector Features

- IEEE802.3af (15.4W) to Ultra PoE (60W per port) output power options at the lowest cost
- Level V Efficiency compliant
- Very low leakage
- Green LED "ON"
- Over-voltage/current, short-circuit protections
- For use in dedicated situations where there is little to no chance of misconnection
- Continuous power with no detection
- Cannot be used with non-PoE compliant equipment
- Non-vented case



LowestCostPassiveInjector	Output Power	Input	Gigabit	Output Voltage	Model Name
	15.4W	AC Clips - Wall Mount	No	56V DC at 0.28A	POE16R-560
	30W	3 - Wire	Yes	56V DC at 0.27A	POE31U-560DO *
		3 - Wire	No	24V DC at 1.25A	POE31U-240
		2 - Wire	No	24V DC at 1.25A	POE31W-240
		3 - Wire	No	56V DC at 0.54A	POE31U-560
	60W	2 - Wire	No	56V DC at 0.54A	POE31W-560
		3 - Wire	Yes	56V DC at 1.07A	POE61U-560DG
		2 - Wire	Yes	56V DC at 1.07A	POE61W-560DG
		3 - Wire	No	56V DC at 1.07A	POE61U-560D
		2 - Wire	No	56V DC at 1.07A	POE61W-560D

Note: * Indicates dual output of 15W on both ports



PoE AND ETHERNET EXTENDERS




Multiport Extender Features

- Able to power up to four devices from a single CAT5e Ethernet cable
- 15.4W of output per port with Ultra PoE input
- POE60S-4AF may be used in conjunction with POE16S-1AF to extend data further than 200m
- Diagnostic LEDs
- Protects against data disintegration
- May be powered by an Ultra PoE midspan or optional DC input: PSC75U-560 (Page 26)
- Outdoor version features waterproof case rated IP67

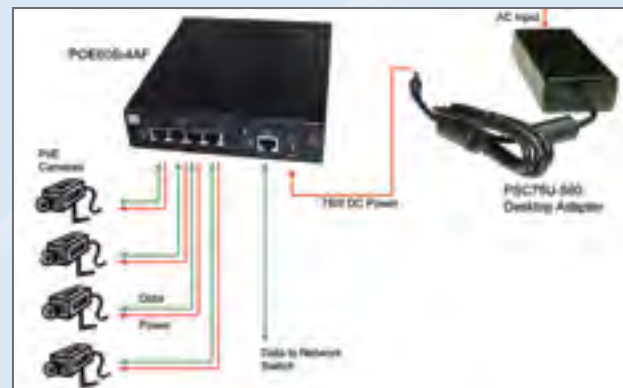
Single Port Extender Features

- May be used in multiple unit tracks to extend data beyond 200 meters
- Diagnostic LEDs
- Protects against data disintegration
- Must be powered by PoE for functionality
- Gigabit compatible
- Operates in a wide temperature range up to 55°C

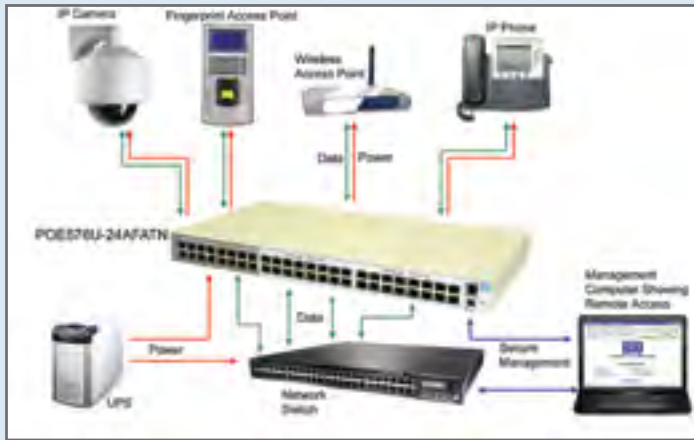


PoE Extenders	NumberofPorts	Input	Output	OptionalDCPower	Gigabit	Model Name
	1	IEEE802.3at (33W) or greater	IEEE802.3af (19.6W)	No	Yes	POE16S-1AFG
	1	Ultra PoE (60W) or greater	IEEE802.3at (30W)	No	Yes	POE30S-1ATG
	4	Ultra PoE (75W) or greater (12.5K detection)	IEEE802.3af (15.4W per port max/62W total)	Yes	No	POE60S-4AF
	4	Ultra PoE (75W) or greater (12.5K detection)	IEEE802.3af (15.4W per port max/62W total)	Yes	No	POE61S-4AF*

* This model is designed for outdoor use and features a waterproof case



MIDSPAN PORT MANAGEMENT



User Benefits

- No need to manage power across ports
- Full power on every port
- Reset PoE end devices
- Review power consumption and parametric information
- Label ports to identify PoE end devices quickly
- Works with SNMP for optional future upgrades
- The most secure encryptions available over LAN for user access control

Phihong's multiport midspans are available with port control options with select models offering local USB-Serial connections via GUI software or via SNMP NIC port control which may be operated locally or remotely through the GUI software or http:// access. Both management access paths offer parametric information and the ability to reset ports individually or the midspan as a whole. Advantages to using the SNMP access is the ability to use MIB functions to integrate midspans into enterprise networks, enhanced security including SSL/TLS encryption, and no need to install software. Support for Phihong's GUI including the local software, user manuals, and midspan specific firmware can be found online at www.midspans.com.

Remote Access Features

- Remote access from any computer via an internet browser such as Mozilla Firefox, Internet Explorer 9, or Safari
- Upload firmware, review parametric information, and reset ports individually or as an entire midspan through an internet browser
- Set IP address to dynamic to be assigned automatically by your LAN, or set to static to customize
- Incorporate into enterprise networks with MIB controls available on www.midspans.com
- Use Phihong's management software with any version of SNMP

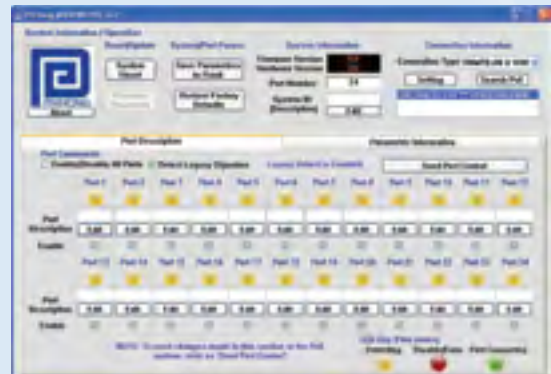
Local Access Features

- Increased security including more secure authentication and privacy encryption
- Complete parametric information including output wattage, voltage, and amperes
- Edit port description to help user identify end devices connected to each port
- Upload new firmware to a unit via the GUI software
- No need for an SNMP card to manage port control
- Cisco legacy detection enable/disable
- Ability to save settings to Flash
- Support available online at www.midspans.com
- Complete system reset
- Diagnostic LEDs for port control



Units That May Use Remote Port Management (SNMPv2, v3)

- POE125U-8N
- POE370U-480-8N
- POE370U-480-16N
- POE370U-480-24N
- POE576U-8ATN
- POE576U-16ATN
- POE576U-24AFATN
- POE806U-24ATN





Units That May Use Local Port Management (USB)

- POE370U Series
- POE576U-AT Series
- POE576U-24AFAT Series
- POE806U-AT Series



RPS AND PoE ACCESSORIES

Redundant Power Source Selection Guide

	Output Power	DCOutputVoltage	Features	Model
	500W (DC)	50V (10A)	<ul style="list-style-type: none"> Input voltage: 85-264V AC Hot plug N + 1 Diagnostics Full protection 	PSM500-210
		56V (9A)		PSM500-216
	1000W (DC)	56V (17.85A)		PSM1000-216
	Rack accommodates 500W to 1500W (DC) up to (3) PSM500 power supplies		<ul style="list-style-type: none"> Accommodates up to 3 power supplies Hot plug N + 1 Powers up to 4 individual midspans 4 individually current limited outputs to protect wiring 	PSA1554-605
	Rack accommodates 1000W to 3000W (DC) up to (3) PSM1000 power supplies			PSA3000-611



Features

- 500W-3000W
- AC or DC Input
- Supports 32-194 ports of 802.3af PoE, depending on the number of RPS power supplies installed.
- Supports 16-97 ports of 802.3at PoE, depending on the number of RPS power supplies installed.

Accessories

ACCY125X-R	Dongle to Operate Cisco Aironet Access Point with 'AT' Enterprise Class Midspans	
POE-CIT-R	PoE Camera Installation Tool	
POE370U-ACCY01-R	Connect 1 Midspan to Redundant Power Source	
POE370U-ACCY02-R	Connect 2 Midspans to Redundant Power Source	
POE125U-ACCY01-R	Mounting Bracket Kit to Connect 1 or 2 Plastic Case Multiport Midspans to 1U 19" Rack	

For more specific information including product datasheets please visit www.midspans.com

EISA Energy Independence & Security Act of 2007

Mandatory requirement July 1, 2008

On December 19, 2007, President Bush signed into law the Energy Independence and Security Act of 2007. The primary purpose of the act is to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government. One of the key provisions included energy efficiency and it revised the standards for many appliances, including external single voltage AC-DC power supplies, and lighting.

EISA Standards for External Power Supplies $\leq 250W$

MARK*	Performance	
	Maximum Energy Consumption in No-Load Mode	
IV**	Nameplate Power Output (Pno)	No-Load Power
	$\leq 250W$	$\leq 0.5W$
	Nameplate Power Output (Pno)	Minimum Efficiency in Active Mode
	0 to <1W	$\geq 0.5 * Pno$
	1 to $\leq 51W$	$\geq 0.09 * \ln(Pno) + 0.5$
	$> 51W$ to $\leq 250W$	≥ 0.85

Pno is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

*The international efficiency marking protocol provides a system for power supply manufacturers to designate the minimum efficiency performance of an external power supply so that finished product manufacturers and government representatives can easily determine a unit's efficiency. The mark does not serve as a consumer information label, but rather demonstrates the performance of the external power supply when tested to the internationally supported test method.

** Minimum marking required. Only needs to comply at 115VAC / 60Hz. IV marking may be immediately followed by 115V to denote compliance at 115VAC / 60Hz only.

Korea MEPS

Mandatory requirement January 1, 2009

On July 31, 2008, the Ministry of Knowledge & Economy (MKE) amended the "Regulations on Energy Efficiency and Labeling & Standards" to both extend the scope of products covered, to include adapters-chargers among other products, and to further improve the efficiency standards of products already covered. The scope of adapters-chargers is: *All AC-DC or AC-AC external power supplies for use with mobile phones, notebooks, speakers for computers, LCD monitors, printers, PDA camcorders, digital cameras, audio equipment, DVD players, MP3 players, PMPs, portable CD players, set-top boxes, wire-wireless phones, and modems. *An adapter under 150W (nameplate output power) and a charger or input 20W with Li-Ion Battery as a single voltage external power supply.

MEPS Standards for Adapters (External Power Supplies without charging)

Performance	
Maximum Energy Consumption in No-Load Mode	
Nameplate Power Output (Pno)	No-Load Power
0 to <10W	$\leq 0.5W$
10W to $\leq 150W$	$\leq 0.75W$
Nameplate Power Output (Pno)	Minimum Efficiency in Active Mode
0 to <1W	$\geq 0.49 * Pno$
1 to $\leq 49W$	$\geq 0.09 * \ln(Pno) + 0.49$
$> 49W$ to $\leq 150W$	≥ 0.84

Pno is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

MEPS Standards for Adapters (External Power Supplies with charging function for Li-Ion batteries)

Performance	
Maximum Energy Consumption in No-Load Mode	
Nameplate Power Output (Pno)	No-Load Power
0 to <10W	$\leq 0.5W$
10W to $\leq 150W$	$\leq 0.75W$

ENERGY STAR

Effective January 1, 2011, the EPA decided to sunset its Energy Star program for external power supplies. Replacing this program is the International Efficiency Marking Protocol that has been adopted by efficiency regulators and governments around the world. See the global standards on pages 35-37 of this catalogue for regulations that may apply to your region.

www.phihong.com/green



Australian / New Zealand MEPS

Mandatory requirement June 9, 2011

A plan to regulate external power supplies was included under the National Appliance and Equipment Energy Efficiency Program in 2004. In 2007, in order to bring about a reduction in energy consumption and greenhouse gas emissions from the use of specific types of external power supplies, to below the level they are otherwise projected to reach under a business as usual scenario, through improving their energy efficiency and standby energy losses, the Equipment Energy Efficiency Committee of the Australian and New Zealand governments, recommended introducing mandatory minimum level of energy efficiency for external power supply units with nominal 230VAC main supply input and a single DC output at a low voltage (ELV) and a maximum output of 250W that these products would need to meet in order to be sold on the Australian and New Zealand markets.

MEPS Required Minimum Efficiency Level

MARK*	Performance	
	Maximum Energy Consumption in No-Load Mode	
III**	Nameplate Power Output (Pno)	No-Load Power
	0 to <10W	≤ 0.5W
	10W to ≤250W	≤ 0.75W
	Nameplate Power Output (Pno)	Minimum Efficiency in Active Mode
	0 to <1W	≥ 0.49*Pno
	1 to ≤ 51W	≥ 0.09*Ln(Pno)+0.49
>51W to ≤250W	≥ 0.84	

Pno is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

*The international efficiency marking protocol provides a system for power supply manufacturers to designate the minimum efficiency performance of an external power supply so that finished product manufacturers and government representatives can easily determine a unit's efficiency. The mark does not serve as a consumer information label, but rather demonstrates the performance of the external power supply when tested to the internationally supported test method.

**Minimum marking required. Only need to comply at 230VAC/50Hz. Roman numeral marking may be immediately followed by 230V to denote compliance at 230VAC/50Hz only for all 3 tables (Mark III, Mark IV, and Mark V) listed under Australian / New Zealand MEPS.

MEPS Voluntary High Efficiency Level

MARK*	Performance	
	Maximum Energy Consumption in No-Load Mode	
IV**	Nameplate Power Output (Pno)	No-Load Power
	≤250W	≤ 0.5W
	Nameplate Power Output (Pno)	Minimum Efficiency in Active Mode
	0 to <1W	≥ 0.5*Pno
	1 to ≤ 51W	≥ 0.09*Ln(Pno)+0.5
	>51W to ≤250W	≥ 0.85

Pno is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

*The international efficiency marking protocol provides a system for power supply manufacturers to designate the minimum efficiency performance of an external power supply so that finished product manufacturers and government representatives can easily determine a unit's efficiency. The mark does not serve as a consumer information label, but rather demonstrates the performance of the external power supply when tested to the internationally supported test method.

**Minimum marking required. Only need to comply at 230VAC/50Hz. Roman numeral marking may be immediately followed by 230V to denote compliance at 230VAC/50Hz only for all 3 tables (Mark III, Mark IV, and Mark V) listed under Australian / New Zealand MEPS.

MEPS Voluntary High Efficiency Level

MARK*	Performance			
	Maximum Energy Consumption in No-Load Mode			
V**	Nameplate Power Output (Pno)	No-Load Power (AC-AC)	No-Load Power (AC-DC)	
	0 to <50W	≤0.5W	≤0.3W	
	≥ 50W to 250W	≤0.5W	≤0.5W	
	Output Voltage <6V and Output Current ≥ 0.550A	Nameplate Power Output (Pno)	Minimum Efficiency in Active Mode	
		0 to <1W	≥ 0.497*Pno+0.067	
		1 to ≤49W	≥ 0.075*Ln(Pno)+0.561	
	All Other Models	>49W to ≤250W	≥ 0.86	
		0 to <1W	≥ 0.480*Pno+0.140	
		1 to 49W	≥ 0.0626*Ln(Pno)+0.622	
	>49W to ≤250W	≥ 0.87		

Pno is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

*The international efficiency marking protocol provides a system for power supply manufacturers to designate the minimum efficiency performance of an external power supply so that finished product manufacturers and government representatives can easily determine a unit's efficiency. The mark does not serve as a consumer information label, but rather demonstrates the performance of the external power supply when tested to the internationally supported test method.

**Minimum marking required. Only need to comply at 230VAC/50Hz. Roman numeral marking may be immediately followed by 230V to denote compliance at 230VAC/50Hz only for all 3 tables (Mark III, Mark IV, and Mark V) listed under Australian / New Zealand MEPS.

Canadian Standards Association

Mandatory Requirement July 1, 2010

In November 2008, the Canadian Standards Association published standards CSA 381.1 and 381.2, which defined test methods for measuring the efficiency of external power supplies. In 2010, Natural Resources Canada (NRCAN), which develops policies and programs that enhance the contribution of the natural resources sector to the economy and improve the quality of life for all Canadians, published its own set of efficiency regulations setting the minimum requirements for the sale of external power supplies in Canada to deliver greenhouse gas and related emissions reductions as per Canada's Clean Air Regulatory Agenda (CARA). In an effort to harmonize North American emissions standards and regulations, the CSA has adopted the minimum efficiency regulations from the USEISA program for which all Phihong products comply.

NRCAN Standard for all External Power Supplies

MARK*	Performance	
	Maximum Energy Consumption in No-Load Mode	
IV**	Nameplate Power Output (Pno)	No-Load Power
	Any Output	≤ 0.5W
	Nameplate Power Output (Pno)	Minimum Efficiency in Active Mode
	0 to <1W	≥ 0.5*Pno
	1 to ≤ 51W	≥ 0.09*Ln(Pno)+0.5
>51W to ≤ 250W	≥ 0.85	

Pno is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

*The international efficiency marking protocol provides a system for power supply manufacturers to designate the minimum efficiency performance of an external power supply so that finished product manufacturers and government representatives can easily determine a unit's efficiency. The mark does not serve as a consumer information label, but rather demonstrates the performance of the external power supply when tested to the internationally supported test method.

** Minimum marking required. Only needs to comply at 115VAC / 60Hz. IV marking may be immediately followed by 115V to denote compliance at 115VAC / 60Hz only.

EU Ecodesign Directive 2009/125/EC

Mandatory requirement April 2011

On July 6, 2005 the European Parliament and of the Council adopted Directive 2005/32/EC. The Ecodesign Framework Directive 2005/32/EC establishes a framework for the setting of Ecodesign requirements for energy-using products. It is a key instrument of EU policy for improving the energy efficiency and other environmental performances of products in the European Market. The Directive lists products identified by the Council and the European Parliament as priorities for the Commission for implementation, including consumer electronics and office equipment. The power conversion efficiency of external power supplies is an important aspect for the energy performance of primary load products, thus external power supplies are one of the priority products groups considered for implementing measures under the Ecodesign Directive. The directive was later expanded into the Energy-related-Products (ErP) Directive 2009/125/EC making the deadline for Level V efficiency compliance April 1, 2011.

ErP Directive for all External Power Supplies

	Performance	
	Maximum Energy Consumption in No-Load Mode	
Nameplate Power Output (Pno)	No-Load Power (AC-AC)	No-Load Power (AC-DC)
0 to <50W	≤ 0.5W	≤ 0.3W
≥ 50W to 250W	≤ 0.5W	≤ 0.5W
Low Voltage EPS, Where Output Voltage < 6V and Output Current ≥ 0.550A	Nameplate Power Output (Pno)	Minimum Efficiency in Active Mode
	0 to <1W	≥ 0.497*Pno+0.067
	1 to ≤ 49W	≥ 0.075*Ln(Pno)+0.561
All Other Models	>49W to ≤ 250W	≥ 0.86
	0 to <1W	≥ 0.480*Pno+0.140
	1 to 49W	≥ 0.0626*Ln(Pno)+0.622
	>49W to ≤ 250W	≥ 0.87





EPS is External Power Supply





Pno is the nameplate output power of the unit under test. Ln refers to the natural logarithm.





Low Voltage EPS is EPS where output voltage < 6V and output current is ≥ 0.550A







Worldwide Safety Compliance

				
AGENCIES	PSB	PSE	E-Mark	UL/CUL
APPLICATIONS	Adapter Power Supply	Adapter Power Supply	Vehicular Charger	Power Supply
COUNTRY	Singapore	Japan	Europe	USA

				
AGENCIES	TUV GS Mark	CSA	CE	KTL
APPLICATIONS	Adapter	Adapter Power Supply	Adapter	Adapter Power Supply
COUNTRY	Germany	Canada	Europe	Korea

				
AGENCIES	C-Tick N136	TUV S Mark	IRAM	UL/CUL
APPLICATIONS	Adapter Power Supply	Power Supply	Adapter Power Supply	Adapter Power Supply
COUNTRY	Australia EMI	Japan	Argentina	USA

				
AGENCIES	FCC	BSMI	CCC	SABS
APPLICATIONS	Adapter	Adapter Power Supply	Adapter Power Supply	Adapter Power Supply
COUNTRY	USA	Taiwan	China	South Africa

WORLDWIDE SAFETY COMPLIANCE

EMC AND RoHS

As of 2006, all electrical/electronic equipment needs to be RoHS compliant.

CE and EMC Compliance

The EU requires that electrical products sold in that region be constructed so that they do not cause nor are they susceptible to specified levels of electromagnetic interference. To comply with these EMC (electromagnetic compatibility) regulations, products undergo a comprehensive series of tests to avoid or reduce the influence of electromagnetic phenomena on the product itself, and/or on living or inert matter.

Virtually all of Phihong's products meet EMC Directive 89/336/EEC and are marked for CE compliance. The CE marking indicates that the product meets the Low Voltage Directive 73/23/EEC and the EMC Directive, requirements. While Phihong's open frame power supplies are regarded as components that perform "no direct function and are not intended to be placed on the market for distribution and final use" - and as such are exempt from the EMC Directive - many of the open frame power supplies nevertheless meet the majority or all of the Directive's requirements for stand-alone products.

RoHS

The European Reduction of Hazardous Substances (RoHS) Directive restricts the level of lead, cadmium, mercury, hexavalent chromium, PBB, or PBDE that can be contained in new electrical and electronic equipment.

Phihong has been manufacturing many products lead-free for five years even before the RoHS directive took effect. Every single standard product manufactured by Phihong is RoHS compliant. This is a tangible demonstration of Phihong's dedication to stay ahead of the curve with products that both exceed customer expectations and comply with demanding environmental regulations. Combined with high efficiency ratings, Phihong continues to be at the forefront of environmentally responsible product design.

REACH

REACH (EC 1907/2006) is a European Community regulation on chemicals and their safe use that entered force on June 1, 2007. It deals with the Registration, Evaluation, Authorization, and Restriction of Chemical substances. Phihong's products are free of hazardous chemicals.

Halogen Free

While not yet a requirement for compliance with European standards the EU is moving forward initiatives to encourage the use of halogen free materials in new product design as a way to enhance current REACH and WEEE directives governing the use of restricted substances in product manufacture and recycling. Phihong has begun to implement this design strategy in select small USB adapter products and indoor LED drivers as we continue to implement environmentally responsible practices into research, design and production.



CE EMC Requirements

To comply with the EMC Requirements, there are a comprehensive series of tests that apply to our products, including:

Susceptibility*

EN61000-4-2	Electrostatic Discharge
EN61000-4-3	Radiated Susceptibility
EN61000-4-4	Burst/Fast Transients
EN61000-4-5	Surge/Lightning Strike
EN61000-4-6	Conducted Susceptibility
EN61000-4-8	Power Frequency Magnetic Field
EN61000-4-11	Dips and Brown-outs

Emissions

EN61000-3-2	Harmonic Input Current
EN61000-3-3	Flicker
EN55022/CISPR 22	Radiated and Conducted Emissions

*Please note that for each of these tests there are various test levels that are specific to the application. For specific levels, please consult the product datasheets or your local Pihong Sales Engineer. Note also that the standards allow for various acceptance criteria, including whether the product fails in a safe manner. All Pihong products are designed to operate through an event with the exception of some battery charging products, which will automatically recover after the event.



QUALITY

Phihong employs quality measurements in every aspect of the organization, including the design and manufacturing processes, supplier management and employee selection and training.



Design Quality

Design Philosophy

We evaluate every design for long-term performance with component derating, statistical tolerance checks, reliability prediction, and application abuse survival prediction. This has a significant impact on the dependability of each product.

Design qualifications

ALT (Accelerated Life Test) is performed by an independent design audit department to validate conformance to specification and design quality prior to release to production.

Failure Mode Effects Analysis

FEMA is a systematic process used for identifying potential design and process failures before they occur, with the intent to eliminate or minimize the risk associated with them.

Production Control

Outgoing Quality Control

During OQC, boxes are opened at random and products are inspected before shipment.

Statistical Process Controls

These controls, such as Cpk analysis, measure in real time the performance of all manufacturing design processes.

Training & Certification

We achieve consistent manufacturing quality through proper employee selection and training. Employees are thoroughly trained and certified in the manufacturing process and procedures and each employee is re-certified on an ongoing basis.

Statistical Process Controls

Our company culture requires us to "do it right the first time." We shut the line down if two failures in a process occur consecutively. We then identify and address the root cause before resuming production.





Supplier Management

Material Controls

Controls include IQC, FIFO, shelf life control and a material review board (MRB), which quarantines incoming materials and drives corrective action from suppliers.

Preferred Supplier Program

Requires vendors to adhere to strict standards in order to qualify for our "preferred" list and to take corrective action to maintain preferred status.

Customer Relationships

Product Specification and Definition

Detailed product specifications and terms are defined through mutual agreement with the customer, ensuring products meet customer needs exactly.

Root Cause Analysis

This is performed using failure tree and problem solving process to identify, correct and eliminate the recurrence of quality problems.

Customer Audits

We encourage our customers to audit and make recommendations on how to improve. We continue to learn and adopt the best practices.

Certifications
and approvals:
ISO/TL9000



MANUFACTURING

We build more power supplies in a month than most companies make in a lifetime. Pihong capitalizes on low manufacturing cost and low cost, high quality suppliers to remain competitive in today's global business environment. With major manufacturing facilities in China, Pihong's employees produce several million units per month, most at 50ppm quality levels or better.



Process Automation

Pihong automates the manufacturing process as much as possible to ensure the highest possible product quality and to expedite production. Our SMD and auto insertion process lines enable Pihong to place more than 100 million components per month. Because we understand how difficult it is for our customers to forecast demand, we have developed the ability to ramp up or shift down quickly without sacrificing quality.

Production Control

We perform a battery of automatic tests on each product to verify conformity to performance specifications and validate that the manufacturing process is in control. All products undergo 100% burn-in at elevated temperature and cycled input line conditions. An AQL procedure is applied to reduce burn-in with demonstrated zero defects.





Supplier Management

All incoming material is inspected for conformance to specification, then date-coded and entered into a FIFO inventory system with environmentally- and ESD-controlled storage. We also carefully manage and select our suppliers, keeping them close to our facilities and insisting on lower cost, faster delivery, and highest quality.

Customer Relationships

Phihong uses 5S management to maintain our facilities so they are kept immaculately clean and well organized. "5S" refers to five Japanese words that translate as: classified (SEIRI), organized (SEITON), clean (SEISO), clear (SETKTSU), and cultivated (SHITSUKE). Our facilities are continuously monitored and checked according to these principles. Employees are rewarded and recognized for helping to maintain these standards.



Engineered for Your Success

CHANGEABLE
CLIP WALL PLUGS



USB ADAPTERS



WALL PLUGS



DESKTOP
ADAPTERS



BATTERY
CHARGERS



CRADLES AND
DOCKING STATIONS



LED
DRIVERS



OPEN FRAME
POWER SUPPLIES



NETWORK POWER
SUPPLIES



ETHERNET AND
POE EXTENDERS



POE MIDSPANS



SINGLE
PORT POE



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