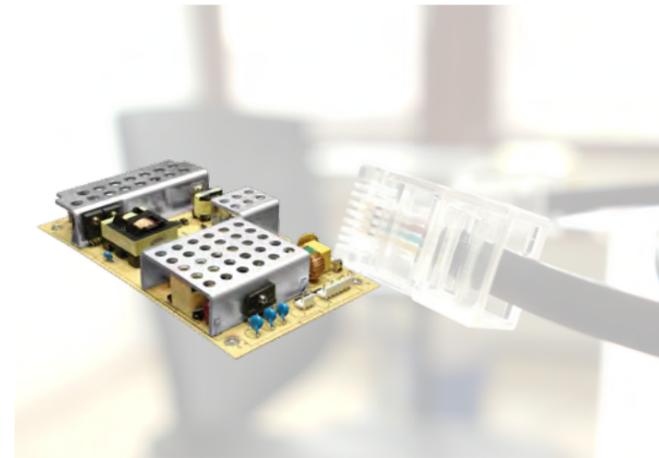




Engineered Power



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ENERGY EFFICIENCY

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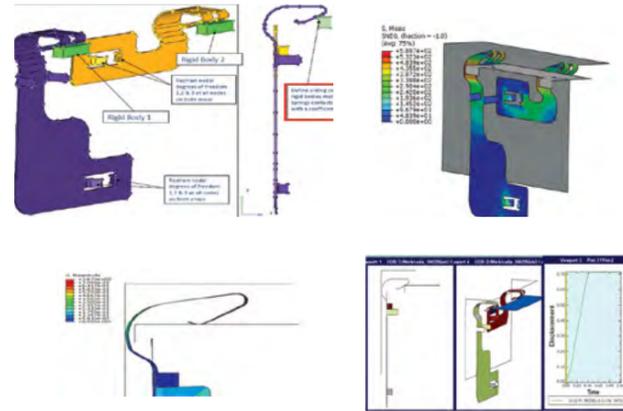
Engineering Excellence

Since 1972, Phihong has been at the forefront of technological innovation in power electronics manufacturing 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 providing 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.



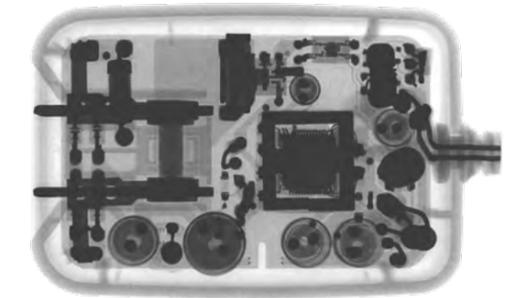
FINITE ELEMENT ANALYSIS

- Virtual stress test on materials in the design
- Reduce the number of prototypes
- Increase speed from development to production



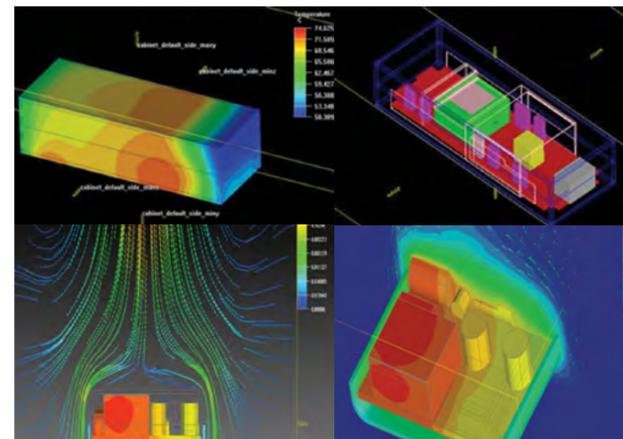
3D SCANNING

- Verify prototype matches the 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 the external packaging
- Verify soldering and component connections are accurate



THERMAL SIMULATION

- Virtually simulate thermal stress tests for individual parts to full PCB's
- 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



PROCESS AUTOMATION

- Increases production speeds, capacity and product quality
- Minimize 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. You can rely on us for comprehensive turn-key solutions to retail packaging. Whether it involves power, audio or data, Phihong has the solution and ability to ramp up production when you need it.



CRADLES/DOCKING STATIONS

- Application Charging
- Battery Charging
- Data Interference Capability



BATTERY CHARGERS

- Lithium Ion/Lithium Polymer Chargers
- Spare Battery Charging
- AC or DC Input
- AuxWilliary Handset Charging



FIXED BLADE WALL PLUGS

- Constant Current/Constant Voltage
- Custom Connectors
- DOE Level VI
- CoC Version 5, Tier 2



DATA CABLES

- USB Serial
- Combination Charging
- Handset Data Cables
- Proposition 65 Compatible



USB ADAPTERS

- Constant Current/Constant Voltage
- Power Delivery
- USB Type-C
- USB Output
- Low Cost
- Five-Star Standby



INTERNATIONAL CHARGERS

- Accessories or In-Box
- Worldwide Compliance
- Low Cost

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.

Our universal input adapters are specifically designed for home entertainment, networking and gaming applications. They decrease heat through an ultra-high efficiency topology in a tiny, low-profile package that are compliant with the latest US Department of Energy(DoE) Efficiency Level VI and European Code of Conduct(CoC) energy efficiency standards. For cost-effective, high-efficiency adapters and power supplies, Phihong can deliver the right solution for your home entertainment applications.



WALL PLUG & DESKTOP ADAPTERS

- IEC60065 safety compliance
- Long life
- No AM/FM interference
- CEC & worldwide compliance
- Low cost



CUSTOM POWER SUPPLIES

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



SET-TOP BOX POWER SUPPLIES

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

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, our products have demonstrated mean time between failures(MTBF) exceeding millions of hours to guarantee reliability. Phihong has the right power solution for your specific networking requirements.

FEATURES

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



POWER SUPPLIES FOR SWITCHES & 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

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

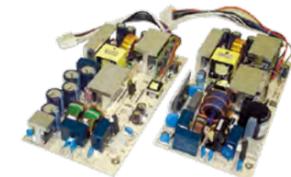
IP SECURITY

Phihong offers a broad line of Power-over-Ethernet solutions, including single-port and multi-port 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 managements for secure remote access to enterprise class midspans.



POE MIDSPANS

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



HIGH DENSITY MID & HIGH POWER SUPPLIES

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



EXTENDERS & ACCESSORIES

- Extend PoE & data beyond IEEE limits
- Enhanced compatibility
- Install and test POE locally

EV CHARGERS

As a top notch manufacturer in the power supply field for over 40 years, Phihong is recognized as a trustworthy brand by our customers around the world. We constantly create innovative products and at the same time insist on quality and safety. With an eye to the international trend of environmental protection and carbon reduction, Phihong successfully develops a family of highly efficient EV charging solutions for OEM.



FREE STANDING DC CHARGERS

- An ideal DC EV charging solution for EV bus or similar EV
- Vehicles with 200V-700V battery modules
- Models to include 80kW/160kW discrete type and 20kW-120kW integrated type with single/dual charging guns
- Intelligent RFID card reader
- 10.4" touch screen and user-friendly interface
- Ethernet based connection for central office integration
- Charging gun has electronic lock function which ensures safety during charging process
- High charging voltage (max 700Vdc) and high charging current (max 160A x 2)
- High efficiency and power factor customization available
- Easy installation and maintenance

MOVABLE DC CHARGERS

- 20kW/40kW EV DC quick charging solution for electric bus and electric city utility car with 200-700V battery system
- Narrow range charging voltage (200-500V) & low charging voltage (30-100V) models are available
- High charging voltage (max 700Vdc) and high charging current (max 200A)
- Intelligent RFID card reader
- 10.4" or 7" touch screen and user-friendly interface
- Charging gun has electronic lock function which ensures safety during charging process
- Digital and high frequency controlled power module with modular design and compact size
- Active PFC to achieve 0.99 power factor
- Easy installation and maintenance



PORTABLE DC CHARGERS

- Designed for EV roadside assistance
- 10kW DC quick charger
- 6kWh Lifepo4 battery pack, expandable to 12kWh (with 20kW output)
- Compact and portable design
- Functions as energy storage system, providing 3.5kW back-up AC output power
- User-friendly interface
- High-efficiency and high-reliability



AC CHARGERS

- Ideal choices for residential and commercial AC charger of electric vehicles
- Input: 200Vac-245Vac
- IP54 waterproof rating for indoor/outdoor uses
- Wired/wireless connection for central office management
- Stylish ergonomic design
- Optional RFID card reader
- Charging interface: IEC 62196-2 Type 1, Type 2 or SAEJ1772 AC or GB/T 20234-2

OEM SOLUTIONS FOR THE POWER TOOL INDUSTRY

Phihong has complete ODM design and manufacturing capabilities to produce electronic power modules and control sub-assemblies, inverters, job-site radios, lighting and fabric heating solutions. With strong research and development design capabilities and solid manufacturing experience, Phihong can also provide customized products based on your specific needs.



MODULES & SUB-ASSEMBLIES

- Electronic power & control sub-assemblies
- Electrical assembly & testing
- Potting & conformal coating

INVERTERS

- 100-4kW Sine & modified Sinewave
- High peak currents for Motorstart
- Robust designs for rugged environment

AUDIO

- AM/FM & digital radio
- Bluetooth
- NFC
- Digital Radio Certification(Tick)
- Integrated charge & battery operation



LIGHTING

- LED high lumen
- Dimming and zone control
- Remote control
- Weatherproof

FABRIC HEATING

- Patented safety & control
- Temperature control
- Safety protection
- For outdoor clothing
- Auto-shutdown & extended battery operation
- Washing machine tested



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.

BATTERY PROTECTION

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



CHARGING SOLUTIONS FOR AGM OR GEL BATTERIES

- RESNA compliant
- OVP, OTP, SCP
- USB Charger
- LED indicators charge state
- Consumer Electric Control(CEC)



CHARGING SOLUTIONS FOR RECHARGEABLE LITHIUM-ION & LITHIUM-POLYMER BATTERIES

- Supports 4.2 & 4.4 volt technologies
- Thermal qualification
- IEEE1725



CHARGING SOLUTIONS FOR RECHARGEABLE NI-MH AND NI-CD BATTERIES

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

USB TYPE-C POWER DELIVERY ADAPTERS

- Type-C Power Delivery adapters feature output powers up to 45W
- Compact form factors with reversible Type-C output receptacle, which allows better end-user experience
- Type-C Power Delivery 2.0 defaults to 5V/3A output and can change to higher voltages depending on the negotiation with Sink



Output Power (W)	Output Voltage (V)	Output Current (A)	Prong Style	Efficiency	PD Version	Model Name
18	5/9	3/2	US	VI	2.0	AQ18A-59A
18	5/9/12/15	3/2/1.5/1.2	US	VI	2.0	AQ18A-59CFA†



Output Power (W)	Output Voltage (V)	Output Current (A)	Prong Style	Efficiency	PD Version	Model Name
36	5/12	3/3	US	VI	2.0	AQ36A-5CA
36	5/12	3/3	EU	VI	2.0	AQ36E-5CA
36	5/12/15	3/3/2.4	US	VI	2.0	AQ36A-5CFA†
36	5/12/15	3/3/2.4	EU	VI	2.0	AQ36E-5CFA†
36	5/9/15	3/3/2.4	US	VI	2.0	AQ36A-59FA†
36	5/9/15	3/3/2.4	EU	VI	2.0	AQ36E-59FA†
36	5/9/15	3/3/2.4	US	VI	3.0	AQ36A-59FB
36	5/9/15	3/3/2.4	EU	VI	3.0	AQ36E-59FB
45	5/12/20	3/3/2.25	US	VI	2.0	AQ45A-5CKA
45	5/12/20	3/3/2.25	EU	VI	2.0	AQ45E-5CKA
45	5/9/15	3/3/3	US	VI	2.0	AQ45A-59FA†
45	5/9/15	3/3/3	EU	VI	2.0	AQ45E-59FA†
45	5/9/15	3/3/3	US	VI	3.0	AQ45A-59FB
45	5/9/15	3/3/3	EU	VI	3.0	AQ45E-59FB



Output Power (W)	Output Voltage (V)	Output Current (A)	Prong Style	Efficiency	PD Version	Model Name
27	5/9	3/3	US	VI	3.0	AQ27A-59A
27	5/9	3/3	US	VI	3.0	AQ27E-59A



Output Power (W)	Output Voltage (V)	Output Current (A)	Prong Style	Efficiency	PD Version	Model Name
36	5/9/15	3/3/2.4	US	VI	3.0	AA36A-59FKA
36	5/9/15	3/3/2.4	EU	VI	3.0	AA36E-59FKA
45	5/9/15	3/3/3	US	VI	3.0	AA45A-59FKA
45	5/9/15	3/3/3	EU	VI	3.0	AA45E-59FKA



Description	Length	Model Name
USB TYPE C CABLE	1m	UES-1001A160

NOTE: † - special order qty

QUALCOMM® QUICKCHARGE™

- QuickCharge™ 2.0 supports three voltages 5V/9V/12V with up to 15W of power
- QuickCharge™ 3.0 allows more granular range of voltages to provide optimum power transfer while maximizing efficiency



Qualcomm® is a registered trademark of Qualcomm Incorporated

Output Power(W)	Output Voltage (V)	Output Current (A)	Case Color	Prong Style	Efficiency	QC Version	Model Name
15	5/9/12	1.67/1.67/1.25	Black	US	VI	2.0	PSA15A-308Q
15	5/9/12	1.67/1.67/1.25	White	US	VI	2.0	PSA15A-308QW
15	5/9/12	1.67/1.67/1.25	Black	EU	VI	2.0	PSA15E-308Q
15	5/9/12	1.67/1.67/1.25	White	EU	VI	2.0	PSA15E-308QW
15	5/9/12	1.67/1.67/1.25	Black	UK	VI	2.0	PSA15K-308Q
15	5/9/12	1.67/1.67/1.25	White	UK	VI	2.0	PSA15K-308QW
18	3.6-6/9/12	3/2/1.25	Black	US	VI	3.0	AQ18A-308A†
18	3.6-6/9/12	3/2/1.25	White	US	VI	3.0	AQ18A-308AW†
18	3.6-6/9/12	3/2/1.25	Black	EU	VI	3.0	AQ18E-308A†
18	3.6-6/9/12	3/2/1.25	White	EU	VI	3.0	AQ18E-308AW†
18	3.6-6/9/12	3/2/1.25	Black	KOREA	VI	3.0	AQ18H-308A†
18	3.6-6/9/12	3/2/1.25	White	KOREA	VI	3.0	AQ18H-308AW†
18	3.6-6/9/12	3/2/1.25	Black	UK	VI	3.0	AQ18K-308A†
18	3.6-6/9/12	3/2/1.25	White	UK	VI	3.0	AQ18K-308AW†

NOTE: † - special order qty

USB-A ADAPTERS

- 5-star standby rating
- No Y caps
- Eco design ERP directive 2009/125/EC compliant
- Class B EMI
- Standard USB-A output
- Fixed blade for lowest cost



Output Power(W)	Output Voltage(V)	Output Current(A)	Prong Style	Efficiency	Case Color	Model Name
2.75	5	0.55	US	VI	Black	PSM03A-050Q
2.75	5	0.55	US	VI	White	PSM03A-050Q-3W
2.75	5	0.55	China	VI	Black	PSM03C-050Q-3 †
2.75	5	0.55	China	VI	White	PSM03C-050Q-3W
2.75	5	0.55	EU	VI	Black	PSM03E-050Q
2.75	5	0.55	EU	VI	White	PSM03E-050Q-3W
2.75	5	0.55	UK	V	Black	PSM03K-050Q
2.75	5	0.55	UK	V	White	PSM03K-050Q-3W
2.75	5	0.55	Aus/Nz	V	Black	PSM03S-050Q
2.75	5	0.55	Aus/Nz	V	White	PSM03S-050Q-3W
5	5	1	US	VI	Black	PSA05A-050QL6A
5	5	1	US	VI	White	PSA05A-050QL6W
5	5	1	China	VI	Black	PSA05C-050QL6 †
5	5	1	EU	VI	Black	PSA05E-050QA †
5	5	1	EU	V	White	PSA05E-050QW †
5	5	1	UK	V	Black	PSA05K-050QA †
5	5	1	UK	V	White	PSA05K-050QW †
5	5	1	Aus/Nz	V	Black	PSA05S-050QA †
5	5	1	Aus/Nz	V	White	PSA05S-050QW †

NOTE: † - special order qty

USB-A ADAPTERS



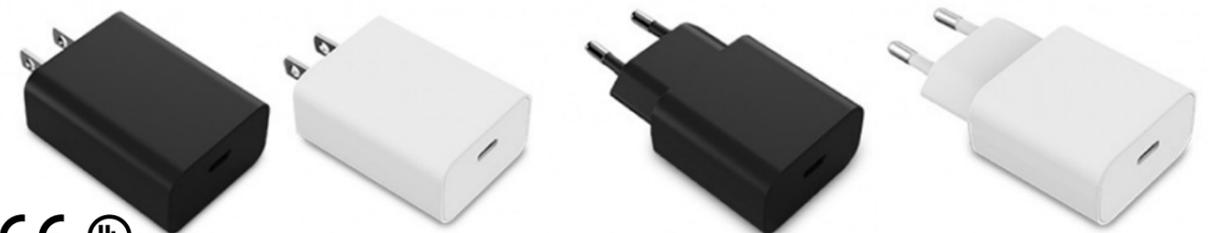
Output Power(W)	Output Voltage(V)	Output Current(A)	Efficiency	Case Color	Model Name
10	5.1	2	VI	Black	PSAA10A-050QL6A
10	5.1	2	VI	White	PSAA10A-050QL6W



*clips sold separately

Output Power(W)	Output Voltage(V)	Output Current(A)	Efficiency	Output Connector	Model Name
5	5	1	VI	USB A	PSAI05R-050QL6

USB TYPE-C ADAPTERS



Output Power(W)	Output Voltage(V)	Output Current (A)	Prong Style	Efficiency	Case Color	Model Name
15	5	3	US	VI	Black	AQ15A-050A
15	5	3	US	VI	White	AQ15A-050AW
15	5	3	EU	VI	Black	AQ15E-050A
15	5	3	EU	VI	White	AQ15E-050AW

F-SERIES CLIPS



MODEL	DESCRIPTION
FPBAG	FPE, FPK, FPS
FPB	BRAZIL CLIP
FPC	CHINA CLIP
FPE	EUROPE CLIP
FPH	KOREA CLIP
FPI	INDIA CLIP
FPK	UK CLIP
FPN	ARGENTINA CLIP
FPS	AUSTRALIA CLIP

Individual product information including datasheets and specifications are available online at www.phihong.com

FOLDING BLADE USB ADAPTER

- 5-star standby rating
- IEEE1725 approved for mobile phone charging
- Eco design ErP directive 2009/125/EC compliant
- International field interchangeable clips
- OVP, OCP & SCP
- Folding prong fixed blade
- Class B EMI
- CC/CV charge function
- Halogen free(5W model)
- Standard USB-A output
- Compact design - 15mm thick
- Clips sold separately



Output Power(W)	Output Voltage(V)	Output Current(A)	Prong Style	Efficiency	Output Connector	Model Name
2.75	5	0.55	US	VI	USB A	PSA03F-050Q1
5	5	1	US	VI	USB A	PSA05F-050QAL6
5	5	1	US	VI	USB A	PSA05F-050QAL6D ¹
10	5	2	US	VI	DC Cord -Micro USB	PSA10F-050
10	5	2	China	VI	DC Cord- Micro USB	PSA10FC-050
10	5	2	US	VI	DC Cord	PSA10F-050(P)
10	5	2	US	VI	USB A	PSA10F-050Q
10	5	2	China	VI	USB A	PSA10FC-050Q
10	5	2	US	VI	USB A	PSA10F-050Q(D) ²
10	5	2	US	VI	USB A	PSA10F-050Q(S) ³ †
10	5	2	US	VI	DC Cord	PSA10F-050(P)†

NOTES:

† - special order model: minimum order quantity

1 - boosts output by 180mV at full load to compensate for wire drops over a USB cable

2 - boosts output by 400mV at full load to compensate for wire drops over a USB cable

3 - boosts output by 400mV at full load to compensate for wire drops over a USB cable for use with touchscreen tablets

WORLDWIDE WALL ADAPTERS WITH INTERCHANGEABLE AC CLIPS*

- Universal input compatibility 90-264VAC
- Eco design ErP directive 2009/125/EC compliant
- Customizable for OEMs
- AC clips for worldwide compatibility
- Double insulated
- SELV compliant
- DC/USB tips may be customized to user needs
- Class B EMI
- DOE Level VI
- Over-voltage, over-current and short-circuit protections
- No load power saving
- Clips sold separately*



MODEL	DESCRIPTION
RPBAG	RPA, RPE, RPK, RPS
RPA	N. AMERICA CLIP
RPB	BRAZIL CLIP
RPC	CHINA CLIP
RPE	EUROPE CLIP
RPH	KOREA CLIP
RPI	INDIA CLIP
RPK	UK CLIP
RPN	ARGENTINA CLIP
RPS	AUS/NZ CLIP
RPX	IEC320 C8



Output Power (W)	Output Voltage(V)	Output Current(A)	Efficiency	Output Connector	Model Name
5	5	1	VI	USB A	PSAI05R-050QL6
5	5	1	VI	Barrel	PSAC05R-050L6
5	5	1	VI	Micro-B	PSAC05R-050L6M
5	5	1	VI	Mini-B	PSAC05R-050L6B
10	5	2	VI	Barrel	PSM10R-050A
12	5	2.4	VI	Barrel	PSAC12R-050
12	6	2	VI	Barrel	PSAC12R-060
12	7.5	1.6	VI	Barrel	PSAC12R-075
12	9	1.33	VI	Barrel	PSAC12R-090
12	12	1	VI	Barrel	PSAC12R-120
12	15	0.8	VI	Barrel	PSAC12R-150
12	24	0.5	VI	Barrel	PSAC12R-240
12	48	0.25	VI	Barrel	PSAC12R-480
15	5	3	VI	Barrel	PSC15R-050
15	5.9	2.5	VI	Barrel	PSC15R-060
15	7.5	1.66	VI	Barrel	PSC15R-075
15	9	1.25	VI	Barrel	PSC15R-090
15	12	1.25	VI	Barrel	PSA15R-120P6
15	15	1	VI	Barrel	PSA15R-150P6
15	24	0.62	VI	Barrel	PSA15R-240P6
15	48	0.31	VI	Barrel	PSA15R-480P6
20	5	4	VI	Barrel	PSAA20R-050L6
20	12	1.67	VI	Barrel	PSAA20R-120L6
20	24	0.83	VI	Barrel	PSAA20R-240L6
20	48	0.42	VI	Barrel	PSAA20R-480L6
30	12	2.5	VI	Barrel	PSAA30R-120
30	15	2	VI	Barrel	PSAA30R-150
30	24	1.25	VI	Barrel	PSAA30R-240
30	56	0.536	VI	Barrel	PSAA30R-560

LOW-COST FIXED WALL PLUG ADAPTERS

- Universal input compatibility 90-264VAC
- Eco design ErP directive 2009/125/EC compliant
- Customizable for OEMs
- Double insulated
- DC/USB tips may be customized to user needs
- Lowest cost
- Class B EMI
- OVP, OCP, SCP



Output Power(W)	Output Voltage(V)	Output Current(A)	Efficiency	DC Cord	Model Name
2.75	5	0.55	VI	Barrel	PSM03A-050
2.75	5	0.55	VI	Micro B	PSM03A-050(M)
2.75	7.5	0.366	VI	Barrel	PSM03A-075
2.75	9	0.305	VI	Barrel	PSM03A-090
2.75	12	0.23	VI	Barrel	PSM03A-120



Output Power(W)	Output Voltage(V)	Output Current(A)	Prong Style	Efficiency	DC Cord	Model Name
5	5	2	US	VI	Barrel	PSAC05A-050L6
5	5	1	US	VI	Micro B	PSAC05A-050L6M
5	5	1	US	VI	Mini B	PSAC05A-050L6B
5	5	1	US	VI	USB A	PSAA05A-050QL6
6	12	1	US	VI	Barrel	PSAA06A-120L6
12	12	1	US	VI	Barrel	PSAA12A-120L6
12	12	1	EU	VI	Barrel	PSAA12E-120L6
12	12	1	EU	V	Barrel	PSA12E-120 †
24	12	2	US	VI	Barrel	PSAC24A-120L6
24	12	2	EU	VI	Barrel	PSAC24E-120L6 †



Output Power(W)	Output Voltage(V)	Output Current(A)	Prong Style	Efficiency	DC Cord	Model Name
10	5	2	US	VI	Barrel	PSM10A-050A
10	5	2	China	V	Barrel	PSC12C-050
10	5	2	EU	V	Barrel	PSC12E-050
10	5	2	UK	V	Barrel	PSC12K-050
10	5	2	AU	V	Barrel	PSC12S-050
10	9	1.11	China	V	Barrel	PSC12C-090
10	9	1.11	EU	V	Barrel	PSC12E-090
10	9	1.11	UK	V	Barrel	PSC12K-090
10	9	1.11	AU	V	Barrel	PSC12S-090
12	5	2.4	US	VI	Barrel	PSAC12A-050
12	6	2	US	VI	Barrel	PSAC12A-060
12	7.5	1.6	US	VI	Barrel	PSAC12A-075
12	9	1.33	US	VI	Barrel	PSAC12A-090
12	12	1	US	VI	Barrel	PSAC12A-120
12	15	0.8	US	VI	Barrel	PSAC12A-150
12	24	0.5	US	VI	Barrel	PSAC12A-240
12	48	0.25	US	VI	Barrel	PSAC12A-480
15	5	3	US	VI	Barrel	PSC15A-050
15	6	2.5	US	VI	Barrel	PSC15A-060
15	7.5	2	US	VI	Barrel	PSC15A-075
15	9	1.66	US	VI	Barrel	PSC15A-090
15	12	1.25	US	VI	Barrel	PSA15A-120P6
15	15	1	US	VI	Barrel	PSA15A-150P6
15	24	0.62	US	VI	Barrel	PSA15A-240P6
15	48	0.31	US	VI	Barrel	PSA15A-480P6

UNIVERSAL INPUT DESKTOP ADAPTERS

- Universal input compatibility 90-264VAC
- Customizable for OEMs
- Compliant for WEEE, RoHS, and REACH
- Eco design Erp directive 2009/125/EC compliant
- Non-vented/spill-proof case
- Output range 18W to 120W
- Operating temperature range 0 to +400C
- DC tips may be changed to user requirements
- Class B EMI
- OVP, OCP, SCP
- SELV compliant
- Fully isolated



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
15	5	3	C8	VI	PSAA15W-050L6
15	12	1.25	C8	VI	PSAA15W-120L6
15	18	0.83	C8	VI	PSAA15W-180L6
15	24	0.63	C8	VI	PSAA15W-240L6
15	48	0.31	C8	VI	PSAA15W-480L6



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
18	12	1.5	C14	VI	PSAA18U-120L6
18	15	1.2	C14	VI	PSAA18U-150L6
18	24	0.75	C14	VI	PSAA18U-240L6
18	48	0.38	C14	VI	PSAA18U-480L6



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
36	12	3	C8	VI	PSM36W-120L6



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
20	5	4	C14	VI	PSAC30U-050L6
27	9	3	C14	VI	PSAC30U-090L6
30	12	2.5	C14	VI	PSAC30U-120L6
30	24	1.25	C14	VI	PSAC30U-240L6
30	48	0.625	C14	VI	PSAC30U-480L6
30	56	0.54	C14	VI	PSAC30U-560L6



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
45	12	3.75	C8	VI	PSAC45W-120
45	18	2.5	C8	VI	PSAC45W-180
45	24	1.875	C8	VI	PSAC45W-240
45	48	0.938	C8	VI	PSAC45W-480
45	56	0.804	C8	VI	PSAC45W-560



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
60	12	5	C8	VI	PSAC60M-120
60	18	3.33	C8	VI	PSAC60M-180
60	24	2.5	C8	VI	PSAC60M-240
60	48	1.25	C8	VI	PSAC60M-480
60	56	1.07	C8	VI	PSAC60M-560



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
60	12	5	C6	VI	PSAC60W-120
60	18	3.33	C6	VI	PSAC60W-180
60	24	2.5	C6	VI	PSAC60W-240
60	48	1.25	C6	VI	PSAC60W-480
60	56	1.07	C6	VI	PSAC60W-560



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
72	48	1.5	C14	VI	PSC75U-480
75	56	1.34	C14	VI	PSC75U-560



Output Power (W)	Output Voltage (V)	Output Current (A)	AC Input	Efficiency	Model Name
100	12	9	C14	VI	PSA120U-120L6
120	24	5	C14	VI	PSA120U-240L6
120	48	2.5	C14	VI	PSA120U-480L6
120	54	2.22	C14	VI	PSA120U-540L6
120	56	2.14	C14	VI	PSA120U-560L6

USB CABLES



Description	Length	Model Name	Description	Length	Model Name
USB A to Mini-B USB cable	1.5m	IPUSB1CS	USB A TO MICRO-B USB CABLE	1M	IPUSB1(C10)S
			USB A TO MICRO-B USB CABLE	1.5M	IPUSB1MS
			USB A TO MICRO-B USB CABLE (24AWG)	1.5M	IPUSB1M5LD

AC INPUT POWER CORDS

Part No.	Description	Part No.	Description	Part No.	Description
AC30UEU	EU 3-wire	AC30UNA	US 3-wire	AC30UUK	UK 3-wire

COMPATIBILITY GUIDE

AC Input	Connecting Cable	Description
3-wire(C6)	AC30MNA	C6 North America power cord "Mickey Mouse"

AC Input	Connecting Cable	Description
2-wire(C8)	AC15WNA	C8 North America power cord
2-wire(C8)	AC15WEU	C8 Continental Europe power cord
2-wire(C8)	AC15WUK	C8 United Kingdom power cord

AC Input	Connecting Cable	Description
3-wire(C14)	AC30UNA	C14 North America power cord
3-wire(C14)	AC30UEU	C14 Continental Europe power cord
3-wire(C14)	AC30UUK	C14 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.



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

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 5.5 mm 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 x10mm	CN5	0.7mm x 2.5mm x10mm

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 5.5 mm 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 x10mm	CNR5	0.7mm x 2.5mm x10mm

2 PIN TIP CONNECTORS

Connector P/N	Connector ID	Pitch	Overmold O.D.
C9	1.6mm	4.0mm	10.7mm

MEDICAL GRADE ADAPTERS

- Meets DoE Level VI and CoC V5 Tier2
- Field changeable AC clips(R-series only)
- IEC60601-1-1:2005+a:2012 2xMOPP approved
- IEC60601-1-1-2 Ed4 2014 compliant

- Meets type BF requirements
- LPS compliant
- OVP, OCP, SCP, OTP, brown-in/out protection
- DOE Level VI



Output Power (W)	Output Voltage (V)	Output Current (A)	Efficiency Level	Model Name
10	5	2	VI	PMA10R-050AW

Output Power (W)	Output Voltage (V)	Output Current (A)	Efficiency	Model Name
18	12	1.5	VI	PMA18A-120PHW

MEDICAL GRADE ADAPTER AC CLIPS*

- Universal input compatibility 90-264VAC
- Eco design ErP directive 2009/125/EC
- Customizable for OEMs
- Worldwide compatibility
- Double insulated
- SELV compliant
- DC/USB tips may be customized to user needs
- Class B EMI
- DOE Level VI
- OVP, OCP, SCP
- No load power saving
- Clips sold separately*

65W 2" X 4" OPEN FRAME POWER SUPPLY FOR MEDICAL APPLICATIONS



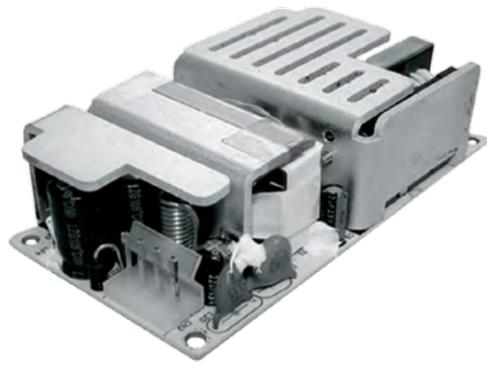
Output Power	Output Voltage	Max Load	Model Name
65W	12VDC	5.42A	PSA065-120M
65W	24VDC	2.71A	PSA065-240M
65W	48VDC	1.36A	PSA065-480M



MODEL	DESCRIPTION
RPA-MADW	N. AMERICA CLIP - WHITE
RPB-MADW	BRAZIL CLIP - WHITE
RPE-MADW	EUROPE CLIP - WHITE
RPH-MADW	KOREA CLIP - WHITE
RPK-MADW	UK CLIP - WHITE
RPN-MADW	ARGENTINA CLIP - WHITE
RPS-MADW	AUS/NZ CLIP - WHITE



65W 2" X 4" 1U



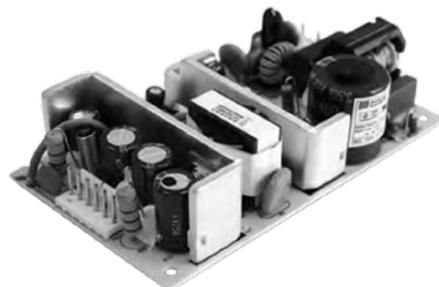
Output Power	Output Voltage	Max Load	Model Name
65W	12VDC	5.42A	PSA065-120
65W	24VDC	2.71A	PSA065-240
65W	48VDC	1.36A	PSA065-480

65W 2" X 4" FOR MEDICAL APPLICATIONS



Output Power	Output Voltage	Max Load	Model Name
65W	12VDC	5.42A	PSA065-120M
65W	24VDC	2.71A	PSA065-240M
65W	48VDC	1.36A	PSA065-480M

55W & 75W 3" X 5" 1U



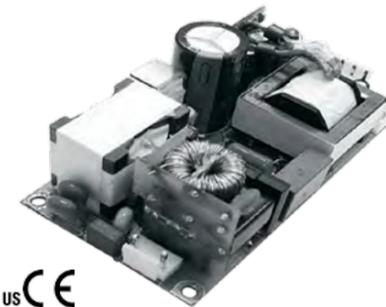
Output Power	Output Voltage	Max Load	Model Name
55W	5VDC	11A	PSA075-050
75W	12VDC	6.25A	PSA075-120
75W	24VDC	3.125A	PSA075-240

75W & 120W 3" X 5" 1U



Output Power	Output Voltage	Max Load	Model Name
75W	5V	15A	PSA120-050
120W	12V	10A	PSA120-120
120W	24V	5A	PSA120-240

160W 2" X 4" 1U



Output Voltage	Min Load	Max Load	Model Name
12V	50mA	13.3A	PSA160-210
12V-fan	50mA	0.4A	
24V	50mA	6.67A	PSA160-212
12V-fan	50mA	0.4A	
48V	50mA	3.34A	PSA160-218
12V-fan	50mA	0.4A	
56V	50mA	2.86A	PSA160-216
12V-fan	50mA	0.4A	

REDUNDANT POWER SUPPLIES
500-1100W



Output Power	Output Voltage	Max Load	Model Name
500W	50V	10A	PSM500-210
500W	12V-standby	1.5A	
500W	56V	9.0A	PSM500-216
500W	12V-standby	1.5A	
1100W	56V	19.65A	PSM1000-216
1100W	12V-standby	0.5A	



REDUNDANT POWER SOURCE
RACK MOUNTING GUIDE

- Accommodates up to 3 power supplies
- Hot plug N+1
- Powers up to 4 individual midspans
- 4 individually current limited outputs to protect wiring

IEEE802.3AF (15.4W PER PORT)

- Limited lifetime warranty on select models
- Compliant for detection, disconnect per IEEE802.3
- Over-voltage/current, short-circuit protections
- Diagnostic LEDs
- Optional port management on select models

APPLICATIONS

- VOIP phones
- IP cameras
- Wireless access points
- IP print servers
- RFID readers
- Security systems



Ports	Input Connector	Gigabit	SNMP	Model Name
1	C6	Yes	No	POE15M-1AF
1	C8	Yes	No	POE15W-1AF



Ports	DC Input	Cisco Legacy	Gigabit	SNMP	Model Name
1	18-72V	Yes	Yes	No	POE20D-1AF



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
1	No	No	No	POE16R-1AF*
1	No	Yes	No	POE16R-1AFG*



Ports	Input Connector	Cisco Legacy	Gigabit	SNMP	Model Name
1	C14	Yes	Yes	Yes	POE21U-1AF
1	C8	Yes	Yes	Yes	POE21W-1AF

*CLIPS SOLD SEPARATELY



Ports	Input Connector	Gigabit	SNMP	Model Name
1	C14	Yes	No	POE29U-1AF
1	C8	Yes	No	POE29W-1AF



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
8	Yes	Yes	No	POE370U-480-8
8	Yes	Yes	Yes	POE370U-480-8-N
16	Yes	Yes	No	POE370U-480-16
16	Yes	Yes	Yes	POE370U-480-16-N
24	Yes	Yes	No	POE370U-480-24
24	Yes	Yes	Yes	POE370U-480-24-N



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
8	Yes	Yes	Yes	POE125U-8-N
8	Yes	Yes	No	POE125U-8-C

SPLITTERS



Output Power	Voltage	Current	Model Name
8.25W	3.3V	2.5A	POE14-033
12.5W	5V	2.5A	POE14-050
14W	12V	1.17A	POE14-120
14W	13.7V	1A	POE14-137

IEEE802.3AT (30W PER PORT)

- 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
- Optional port management on select models

APPLICATIONS

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



Ports	Input Connector	Cisco Legacy	Gigabit	SNMP	Model Name
1	C14	Yes	Yes	No	POE29U-1AT
1	C8	Yes	Yes	No	POE29W-1AT
1	-	Yes	No	No	POE36D-1AT



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
4	Yes	Yes	No	POE125U-4-AT
4	Yes	Yes	Yes	POE125U-4-AT-N



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
8	Yes	Yes	No	POE576U-8AT
8	Yes	Yes	Yes	POE576U-8AT-N
16	Yes	Yes	No	POE576U-16AT
16	Yes	Yes	Yes	POE576-16AT-N



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
1	Yes	Yes	No	POE33U-1AT*

*Outdoor PoE w/waterproof case



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
24	Yes	Yes	No	POE576U-24AFAT
24	Yes	Yes	Yes	POE576U-24AFAT-N



Ports	Cisco Legacy	Gigabit	SNMP	Model Name
24	Yes	Yes	No	POE806U-24AFAT
24	Yes	Yes	Yes	POE806U-24AFAT-N

SPLITTERS



Output Power	Voltage	Current	Model Name
21W	12V	1.75A	POE21-120
21W	24V	0.875A	POE21-240
10W PoE	44-57V	180mA	POE21-120H
12W DC out	12V	1A	

IEEE802.3BT (60W-90W PER PORT)

As applications for PoE connected devices continue to proliferate, Phihong has joined the IEEE task force to evaluate these needs and define a new standard referenced as IEEE802.3bt. The IEEE802.3bt standard, which is expected to be released sometime between Q1-Q2 of 2018, will define the specifications for high power PoE applications which can require up to 90W of power per port. Unlike the IEEE802.3af and IEEE802.3at standards, which only use two pairs of wire within the Ethernet cable for power, the IEEE802.3bt standard will utilize all four pairs of wire within the Ethernet cable to ensure safe and reliable power.

APPLICATIONS

- Multi-radio access points
- Computer Workstations
- LCD display panels



Ports	Power/Port	Input Connector	SNMP	Model Name
1	60W	C14	No	POE60U-1BT

Ports	Power/Port	Input Connector	SNMP	Model Name
1	90W	C14	No	POE90U-1BT
1	90W	C14	Yes	POE90U-1BT-N



SPLITTERS



Ports	Power/Port	SNMP	Model Name
1	60W	No	POE62U-1BT

Output Power	Voltage	Current	Model Name
90W	44-57V	1.6A	POE90D-560SS

*Outdoor PoE w/waterproof case

PROPRIETARY

ULTRA POE (60-80W PER PORT)

- Limited lifetime warranty on select models
- Compliant for detection, disconnect and voltage control per IEEE802.3
- Multiport midspans are rack mountable
- Over-voltage/current, short-circuit protections
- Diagnostic LEDs
- 12.5K detection unless otherwise stated

APPLICATIONS

- LCD displays
- Security systems
- High definition IP cameras
- Biometric equipment
- Medical devices
- High power wireless radios



Power/Port	Ports	Cisco Legacy	Gigabit	SNMP	Model Name
80W	1	No	Yes	No	POE80U-560(G)



Power/Port	# of Ports	Cisco Legacy	Gigabit	SNMP	Model Name
75W	1	Yes	Yes	No	POE75U-1UP
75W	1	Yes	Yes	Yes	POE75U-1UP-N
75W	1	No	Yes	No	POE75D-1UP
75W	1	No	Yes	No	POE75D-1UP(PD)
75W	1	No	Yes	No	POE75U-1UP(PD)*

(PD) - 25K DETECTION; * - SINGLE PORT INJECTOR

Power/Port	Ports	Cisco Legacy	Gigabit	SNMP	Model Name
60W	4	Yes	Yes	No	POE480U-4UP
60W	8	Yes	Yes	No	POE480U-8UP
72W	8	Yes	Yes	Yes	POE576U-8UP-N

SPLITTERS



Output Power	Voltage	Current	Model Name
60W	50-57V	1.1A	POE60D-560
30W PoE	42.5-57V	600mA	POE21-120F
21W DC Out	12V	1.75A	
45W	12V	3.75A	POE45-120



Power/Port	Ports	Cisco Legacy	Gigabit	SNMP	Model Name
60W	4	Yes	Yes	Yes	POE240U-4UP-N

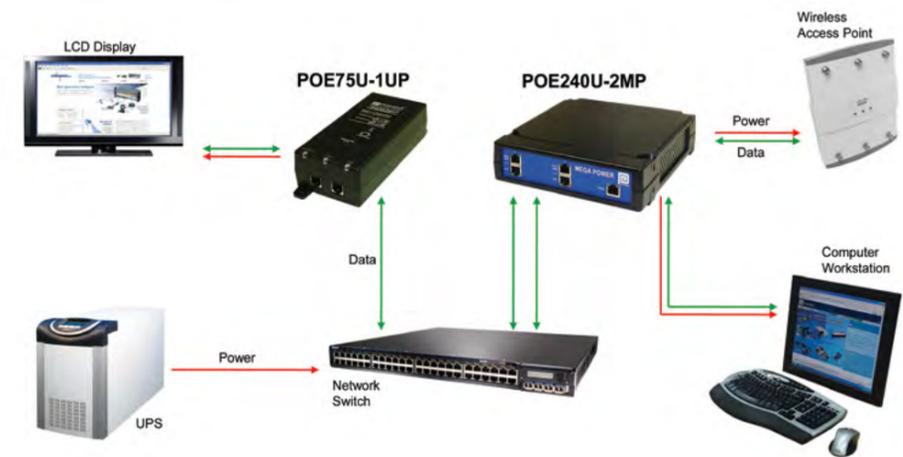
PROPRIETARY

MEGA POE (95W PER PORT)

- 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

APPLICATIONS

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



Power/Port	Ports	Cisco Legacy	Gigabit	SNMP	Model Name
95W	2	Yes	Yes	Yes	POE240U-2MP-N

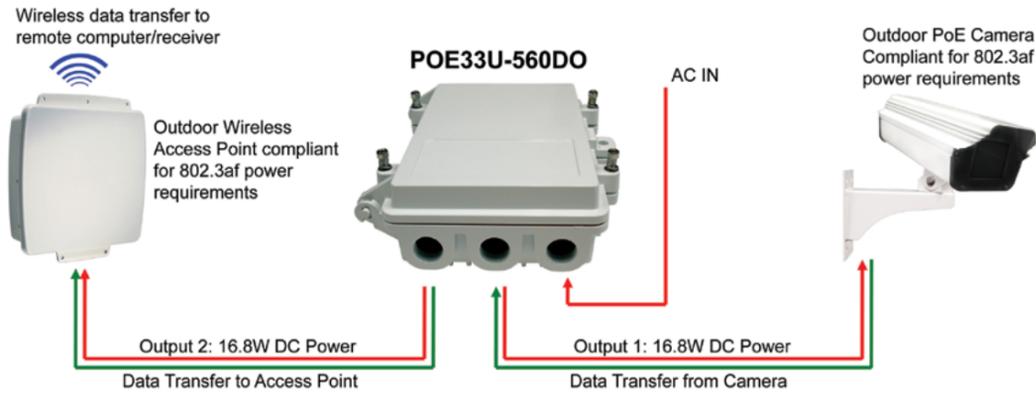
Power/Port	Ports	Cisco Legacy	Gigabit	SNMP	Model Name
95W	4	Yes	Yes	Yes	POE576U-4MP-N



Power/Port	Ports	Cisco Legacy	Gigabit	SNMP	Model Name
95W	8	Yes	Yes	Yes	POE806U-8MP-N

PASSIVE INJECTORS

- 15.4W to Ultra Poe (60W per port) output power options at the lowest cost
- Very low leakage
- Green LED "ON"
- OVP, OCP, SCP
- For use in dedicated situations where there is little to no chance of misconnection
- Cannot be used with PoE compliant equipment
- Non-vented case
- Continuous power with no detection
- Output voltage 56V
- Indoor models meet DOE Level VI efficiency



Power/Port	Input	Gigabit	Model Name
15.4W	C8	Yes	POE15W-560
15.4W	C6	Yes	POE15M-560



Power/Port	Input	Gigabit	Model Name
30W	C14	Yes	POE29U-560
30W	C8	Yes	POE29W-560
60W	C14	No	POE61U-560D
60W	C14	Yes	POE61U-560DG
60W	C8	No	POE61W-560D
60W	C8	Yes	POE61W-560DG



Power/Port	Input	Gigabit	Model Name
33.6W	screw	Yes	POE33U-560DO

MULTI-PORT 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-1AFG to extend data further than 200m
- Diagnostic LEDs
- May be powered by ultra PoE midspan(4 port only)
- Outdoor version case rated IP67

SINGLE PORT EXTENDER FEATURES

- May be used in multiple unit tracks to extend data beyond 200 meters
- Diagnostic LEDs
- Must be powered by PoE for functionality
- Gigabit compatible
- POE16S-1AFG & PE30S-1ATG operates in a wide temperature range up to 550C
- POE33S-1AT-N operates in a wide temperature range up to 600C

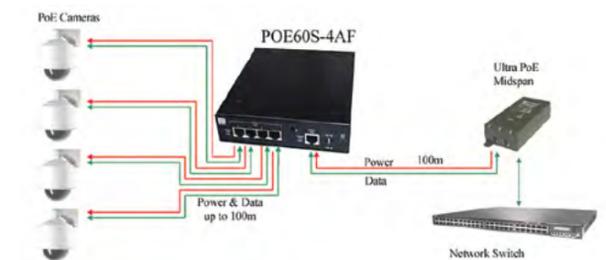
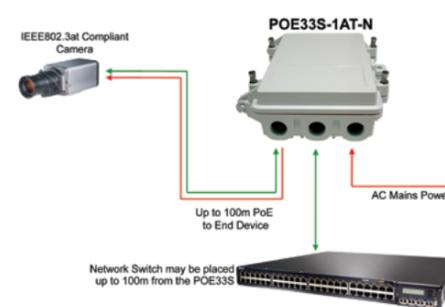


Ports	Input	Output	Optional DC Power	Gigabit	Model Name
1	IEEE802.3at (30W) or greater	IEEE802.3af (19.6W)	No	Yes	POE16S-1AFG
1	Ultra PoE (60W) or greater	IEEE802.3at (30W)	No	Yes	POE30S-1ATG

Ports	Input	Output	Optional DC Power	Gigabit	Model Name
1	120V-240VAC 3-WIRE	IEEE802.3at (30W)	No	Yes	POE33S-1AT-N (W/SNMP)

Ports	Input	Output	Optional DC Power	Gigabit	Model Name
4	Ultra PoE (75W) or greater (12.5k detection)	IEEE802.3af (15.4W per port max/62W total)	Yes	No	POE60S-4AF

Ports	Input	Output	Optional DC Power	Gigabit	Model Name
4	Ultra Poe (75W) or greater (12.5k detection)	IEEE802.3af (15.4W per port max/62W total)	Yes	No	POE61S-4AF (outdoor use/waterproof case)



OUTDOOR CABLE GLANDS

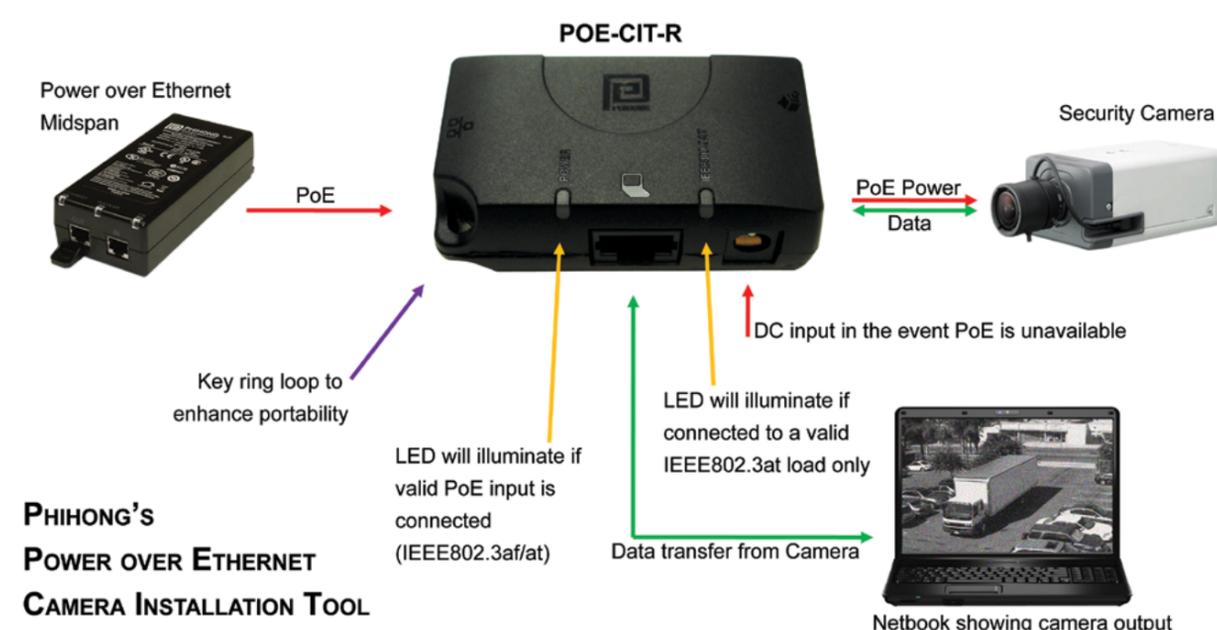
Phihong offers an accessory cable gland to purchasers of the outdoor Power-over-Ethernet range. As demonstrated to the right, the cable gland will ensure watertight operation to an ingress protection rating of 67 in combination with outdoor compliant AC mains cables and outdoor CAT5e Ethernet cables.



For ordering, please use part numbers: PGLAND750 for single cable glands and PGLAND750-2 for double cable glands.

ACCESSORIES

- 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



PHIHONG'S POWER OVER ETHERNET CAMERA INSTALLATION TOOL

POE-CIT-R

- Redirects data from camera to Ethernet enabled display including netbooks or tablets
- Optional 56V DC In port if no PoE is available
- Network port detects PoE and PoE type
- Layer 1 classification for IEEE802.3at compliant powered devices
- Shirt pocket sized
- Camera port has no detection and may not be connected to non-PoE ready devices
- Diagnostic LEDs
- Key ring loop
- Use network port to detect if Ethernet cable is connected to a valid load

POE TYPE DETECTION

Connect the POE-CIT-R to an Ethernet cable to determine if the other end is connected to a midspan or PoE enabled switch. Powered devices may be operated up to 100 meters from a network switch, which makes tracing cables time consuming and difficult. Not only will the POE-CIT-R detect power, but also the power level indicating if the output is 802.3af or 802.3at compliant for connecting appropriate devices.



Power LED illuminates when connected to compliant IEEE802.3af load.



Power LED and IEEE802.3at LED illuminate when connected to compliant IEEE802.3at load.



POE370U-ACCY01 & POE370U-ACCY02



Description	Model Name
PoE camera installation tool	POE-CIT-R



Description	Model Name
Connect 1 midspan to redundant power source	POE370U-ACCY01



Description	Model Name
Connect 2 midspans to redundant power source	POE370U-ACCY02



Description	Model Name
Mounting bracket kit to connect 1 or 2 plastic case multiport midspans to 1U 19" rack	POE125U-ACCY01

ENERGY EFFICIENCY STANDARDS

US DEPARTMENT OF ENERGY (DOE): ENERGY CONSERVATION PROGRAM

Mandatory requirement February 10, 2016

US Department of Energy has created a new standard governing the efficiency in external power adapters. The Energy Policy and Conservation Act (EPCA) covers a wide range of consumer, commercial and industrial equipment and external power supplies. The new EPCA would expand the 2007 EISA program to include a much wider variety of a power supplies including multiple output EPSs. Energy Policy and Conservation Act

Maximum Energy Consumption in No-Load Mode			
Output Power (P _{no})	AC-DC, Low Voltage EPS	AC-DC, Basic-Voltage EPS	Multi-Voltage EPS
0 to ≤1W	≤ 0.10W	≤ 0.10W	≤ 0.30W
>1 to ≤49W	≤ 0.10W	≤ 0.10W	≤ 0.30W
>49 to ≤250W	≤ 0.21W	≤ 0.21W	≤ 0.30W
>250W	≤ 0.50W	≤ 0.50W	≤ 0.30W

Minimum Average Efficiency in Active Mode			
Output Power (P _{no})	AC-DC, Low Voltage EPS	AC-DC, Basic-Voltage EPS	Multi-Voltage EPS
0 to ≤1W	> 0.517*P _{no} + 0.087	> 0.5*P _{no} + 0.16	≥0.497*ln(P _{no}) + 0.067
>1 to ≤49W	≥0.0834*ln(P _{no}) - 0.0014*P _{no} + 0.609	≥0.071*ln(P _{no}) - 0.0014*P _{no} + 0.67	≥0.075*ln(P _{no}) + 0.561
>49 to ≤250W	≥0.870	≥0.880	≥0.860
>250W	≥0.875	≥0.875	≥0.860

EPS is External Power Supply

P_{no} is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

Low Voltage EPS is an EPS where the output voltage <6V and output current ≥550mA

This specification is accepted as Level VI under the International Efficiency Marking Protocol.

The following are exempt from this regulation: open frame power supplies, LED drivers, active POE power supplies, power supplies for medical applications, power supplies with output <3V and >1A.

CANADIAN STANDARDS ASSOCIATION

Mandatory Requirement July 1, 2010

In November 2008, the Canadian Standards Association published standards CSA381.1 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 US EISA program for which all Phihong products comply.

NRCAN Standard for all External Power Supplies

MARK*	Maximum Energy Consumption in No-Load	
IV**	Output Power (P _{no}) Any output	No-Load Power ≤0.5W

MARK*	Minimum Efficiency in Active Mode	
IV**	Output Power (P _{no}) 0 to <1W	Minimum Efficiency ≥0.5 x P _{no}
	1 to ≤51W	≥0.09 x ln(P _{no}) + 0.5
	>51W to ≤250W	≥ 0.85

P_{no} 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 manufactures 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 ECO DESIGN(ERP) 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 Eco design Framework Directive 2005/32/EC establishes a framework for the setting of Eco design 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 Eco design 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

Maximum Energy Consumption in No-Load Mode			
Output Power (P _{no})	No-Load Power (AC-AC)	No-Load Power (AC-DC Basic Voltage EPS)	No-Load Power (Low Voltage EPS)
≤51W	≤0.5W	≤0.3W	≤0.3W
>51W	≤0.5W	≤0.5W	--

Minimum Average Efficiency in Active Mode			
Output Power (P _{no})	AC-AC, Basic Voltage EPS	AC-DC, Basic-Voltage EPS	Low-Voltage EPS
≤1W	≥ 0.480 x P _{no} + 0.140	≥ 0.480 x P _{no} + 0.140	≥0.497 x P _{no} + 0.067
>1 to ≤51W	≥ 0.063 x ln(P _{no}) + 0.622	≥ 0.063 x ln(P _{no}) + 0.622	≥0.075 x ln(P _{no}) + 0.561
>51W	≥0.870	≥0.870	≥0.860

EPS is External Power Supply

P_{no} is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

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

EU CODE OF CONDUCT(VERSION 5)

Voluntary Standard January 2014

In an effort to curb rising energy consumption by European households, the European Commission has announced a new voluntary standard for energy efficiency aiming to minimize the energy consumption of external power supplies in both no-load and load conditions. As a result of the new Code of Conduct, the EU will experience energy savings projected at 1.04TWh in 2020. The scope is to apply to single-voltage, external, AC-DC and ac-ac power supplies not exceeding outputs of 250W for electronic and electrical appliances. These applications are to include AC adapters, battery chargers for mobile phones, domestic appliances, power tools as well as IT equipment. A voluntary two tier system to let manufacturers replace and/or upgrade existing products with more energy efficient designs is scheduled to start in January 2014 with the final tier taking effect in January 2016.

EU CODE OF CONDUCT FOR EXTERNAL POWER SUPPLIES

Maximum Energy Consumption in No-Load Mode		
Output Power (P _{no})	Tier 1	Tier 2
≥ 0.3W to <49W	0.150W	0.075W
≥ 49W to <250W	0.250W	0.150W
Mobile handheld battery driven and <8W	0.075W	0.075W

Minimum Four Point Average Efficiency in Active Mode			
	Output Power (P _{no})	Tier 1	Tier 2
Basic Voltage EPS	0.3 ≤ W ≤ 1	≥ 0.5 x P _{no} + 0.146	≥ 0.5 x P _{no} + 0.169
	1 < W ≤ 49	≥ 0.0626 x ln(P _{no}) + 0.646	≥ 0.071 x ln(P _{no}) - 0.00115 x P _{no} + 0.670
	49 < W ≤ 250	≥0.890	≥0.890
Low Voltage EPS	0.3 ≤ W ≤ 1	≥ 0.5 x P _{no} + 0.086	≥ 0.517 x P _{no} + 0.091
	1 < W ≤ 49	≥ 0.0755 x ln(P _{no}) + 0.586	≥ 0.0834 x ln(P _{no}) - 0.0011 x P _{no} + 0.609
	49 < W ≤ 250	≥0.880	≥0.880

Minimum 10% Load Efficiency in Active Mode			
	Output Power (P _{no})	Tier 1	Tier 2
Basic Voltage EPS	0.3 ≤ W ≤ 1	≥ 0.500 x P _{no} + 0.046	≥ 0.500 x P _{no} + 0.060
	1 < W ≤ 49	≥ 0.0626 x ln(P _{no}) + 0.546	≥ 0.071 x ln(P _{no}) - 0.00115 x P _{no} + 0.570
	49 < W ≤ 250	≥0.790	≥0.790
Low Voltage EPS	0.3 ≤ W ≤ 1	≥ 0.500 x P _{no}	≥ 0.517 x P _{no}
	1 < W ≤ 49	≥ 0.072 x ln(P _{no}) + 0.500	≥ 0.0834 x ln(P _{no}) - 0.00127 x P _{no} + 0.518
	49 < W ≤ 250	≥0.780	≥0.780

EPS is External Power Supply

P_{no} is the nameplate output power of the unit under test. Ln refers to the natural logarithm.

Low Voltage EPS is an EPS where the output voltage <6V and output current ≥550mA

AUSTRALIAN / NEW ZEALAND MEPS(NOW GEMS)

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 levels 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 230 VAC mains supply input and a single DC output at extra 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(NOW GEMS) REQUIRED MINIMUM EFFICIENCY LEVEL

MARK*	Maximum Energy Consumption in No-Load	
	Output Power (Pno)	No-Load Power
III**	0 to <10W	≤0.5W
	10W to ≤250W	≤0.75W

MARK*	Minimum Average Efficiency in Active Mode	
	Output Power (Pno)	Minimum Efficiency
III**	0 to 1W	≥0.49 x Pno
	>1 to ≤49W	≥0.09 x Ln(Pno) + 0.49
	>49W 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 manufactures 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 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(NOW GEMS) VOLUNTARY HIGH EFFICIENCY LEVEL

MARK*	Maximum Energy Consumption in No-Load	
	Output Power (Pno)	No-Load Power
IV**	≤250W	≤ 0.5W

MARK*	Minimum Average Efficiency in Active Mode	
	Output Power (Pno)	Minimum Efficiency
IV**	0 to 1W	≥ 0.5 x Pno
	>1 to ≤51W	≥ 0.09 x 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 manufactures 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 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.

MARK*	Maximum Energy Consumption in No-Load Mode		
	Output Power (Pno)	No-Load Power (AC-AC)	No-Load Power (AC-DC)
V**	0 to <50W	--	≤0.3W
	≥ 50W to 250W	--	≤0.5W

MARK*	Minimum Average Efficiency in Active Mode	
	Output Power (Pno)	Output Voltage <6V & Output Current ≥0.550A
V**	0 to ≤1W	≥ 0.497*Pno+0.067
	>1 to ≤49W	≥ 0.075*Ln(Pno)+0.561
	>49W to ≤250W	≥ 0.86
	Output Power (Pno)	All Other Models
	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 manufactures 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 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.

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, PDAs 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), 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)

	Maximum Energy Consumption in No-Load	
	Output Power (Pno)	No-Load Power
	0 to <10W	≤0.5W
	10W to ≤150W	≤0.75W

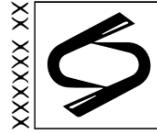
	Minimum Average Efficiency in Active Mode	
	Output Power (Pno)	Minimum Efficiency
	0 to 1W	≥0.49 x Pno
	>1 to ≤49W	≥0.09 x Ln(Pno) + 0.49
	>49W to ≤150W	≥ 0.84

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)

	Maximum Energy Consumption in No-Load Mode	
	Output Power (Pno)	No-Load Power
	0 to <10W	≤ 0.5W
	10W to ≤20W	≤ 0.75W

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

				
QAS	SEMKO	FIMKO	NEMKO	TUV
Adapter Power Supply	Adapter Power Supply	Adapter Power Supply	Adapter Power Supply	Adapter
Australia	Sweden	Finland	Norway	Brazil

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

			
DEMKO	BSI	NOM	VDE
Adapter Power Supply	Adapter Power Supply	Adapter Power Supply	Adapter Power Supply
Denmark	UK	Mexico	Germany

				
AGENCIES	RCM*	TUV Bauart Mark	IRAM	UL/CUL Listed
APPLICATIONS	Adapter Power Supply	Component	Adapter Power Supply	Adapter Power Supply
COUNTRY	Australia & Nz	Germany	Argentina	USA

				
SEV	NF	KEMA	CEBEC	BIS
Adapter Power Supply	Adapter Power Supply	Adapter Power Supply	Adapter Power Supply	Adapter
Switzerland	France	Netherlands	Belgium	India

*may need registratoin by in-country local representative

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

			
OVE	PCBC	EAC	SASO
Adapter Power Supply	Adapter Power Supply	Adapter	Adapter Power Supply
Austria	Poland	Russia + Belarus +Kazakhstan	Saudi Arabia

EMC AND ROHS

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

Conflict Minerals Free

The Dodd-Frank Wall Street Reform and Consumer Protection Act mandates that electronics manufacturers disclose the sourcing for select mined materials, termed conflict minerals, that are part of essential components in electrical equipment. These conflict materials are defined to include gold, wolframite, columbite-tantalite (coltan) and cassiterite as well as their derivative products tungsten, tin and tantalum. In an effort to curb funding to armed groups in the Democratic Republic of Congo (DRC) believed to have committed human rights violations, all conflict minerals from the DRC and nine surrounding nations are to be disclosed to the SEC in compliance with the Dodd-Frank Act. Pihong is committed to compliance with this law and its products are free of conflict minerals.

ROHS

The European Reduction of Hazardous Substances (RoHS) Directive restricts the levels of Bis phthalate (DEHP), Benzyl butyle phthalate (BBP), Dibutyl phthalate (DBP), Diisobutyl phthalate (DIBP), lead, cadmium, mercury, hexavalent chromium, PBB, or PBDE that can be contained in new electrical and electronic equipment.

Pihong has been manufacturing many products lead-free for five years even before the RoHS directive took effect. Every single standard product manufactured by Pihong is RoHS compliant. This is a tangible demonstration of Pihong'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, Pihong 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. Pihong'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. Pihong 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 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 Pihong's products meet EMC Directive 2014/30/EU and are marked for CE compliance. The CE marking indicates that the product meets the Low Voltage Directive 2006/95/EC and the EMC Directive, requirements. While Pihong'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.

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

Accelerated Life Test (ALT) 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)

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(OQC)

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

STATISTICAL PROCESS CONTROLS

These controls, such as process capability 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 on-going 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, which quarantines incoming materials and drivers 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 & 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 the failure tree and problem solving process in order 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.

MANUFACTURING

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

PROCESS AUTOMATION

Phihong automates the manufacturing process to ensure the highest possible product quality while still being able to expedite production. Our surface-mount device(SMD) and auto insertion process lines enable Phihong 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.

SUPPLIER MANAGEMENT

All incoming material is inspected for conformance to specification, then date-coded and entered into a first-in-first-out(FIFO) inventory system with environmentally, and electrostatic discharge(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.



