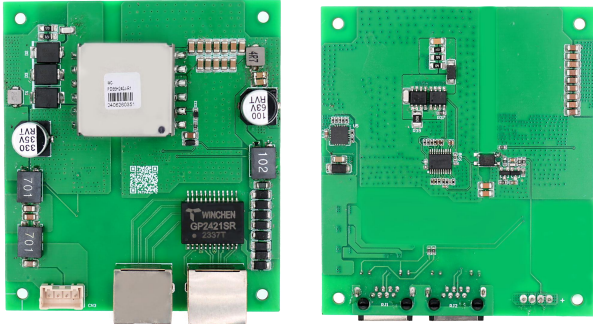


## 85W PD-24V



## Product characteristics

- Compliance with IEEE802.3BT&IEEE802.3at,af standard
- 42V~57V wide operating voltage range.
- Maximum output power up to 85W; Rated output: 24V/3.54A
- The output ripple is less than 200 mV
- Conversion efficiency can be as high as 88% (input: 48V output: 24V@3.54A)
- It has excellent reliability and circuit protection such as over current, short circuit, under voltage and surge
- PCB standard size: 90\*80\*16.75mm
- Class 8 IEEE802.3 PD
- Input/Output: isolate 1500Vdc
- High reliability: The design meets the 5 million hour average failure interval

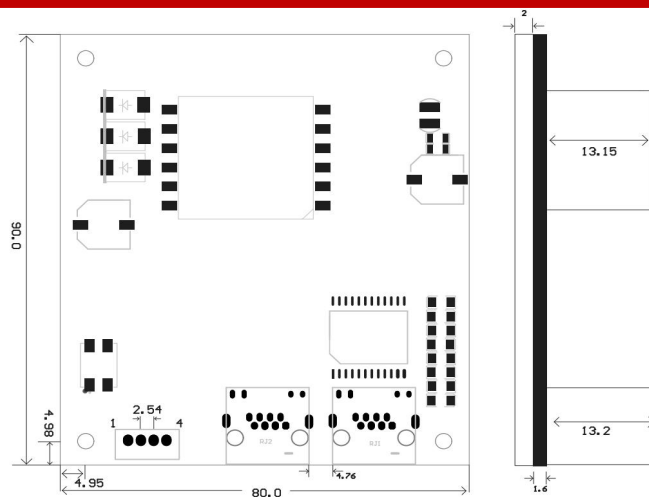
## Scope of application

- Video and VoIP Phone
- RFID Reader
- Multiband Access Point
- Surveillance camera
- Multiband Access Point

## Describe

- The WC-PD85H240J-R1 PoE (power over Ethernet) module is a traditional Category 5 and Category 6 twisted pair Ethernet power supply module based on the IEEE 802.3BT PoE standard
- Designed to extract power from power supply equipment (PSE) through conventional twisted pair cables over Category 5 and Category 6 Ethernet cables. Module inputs comply with IEEE803.2BT signature recognition and classification standards
- Pre configured as a Type 2, Level 4 device, allowing the module to obtain class 8 power from the PSE with a rated output voltage of 24V. Efficient DC/DC converters can achieve an efficiency of about 88% and operate over a wide input voltage range, with low ripple and low noise outputs. The DC/DC converter also has built-in output overload and short circuit protection, and provides 1500Vdc (input/output) isolation barrier

## Mechanical dimensions



Unit: mm ;

Unmarked tolerances: ±0.5

## pin definition

Pin	Name	describe
1,2	Vout+	This module will output the positive power source pole
3,4	Vout-	This module shall output a negative power source
RJ1	RJ45-1	Meet the IEEE802.3BT standard, with a 100 / 1000Mbps transmission rate input port
RJ2	RJ45-2	100 / 1000Mbps transmission rate output po

## Electrical Characteristics

### Absolute maximum rating parameter

No	parameter	Symbol	MIN	MAX	Units
1	Input DC voltage	VCC	42	57	V
2	DC Voltage Surge 1ms	VSURGE	-0.6	80	V
3	ambient temperature	TS	-40	80	°C

- Exceeding the above rating may cause permanent damage to the product. Functional operations under these conditions are not recommended

### Recommended working conditions

No	parameter	Symbol	MIN	TYP	MAX	Units
1	Input DC voltage	VIN	42	48	57	V
2	Low pressure input threshold	VLOCK	37	-	-	V
3	Ambient Temperature	TOP	-40	25	80	°C

- Applicable only to WC-PD85H240J-R1 maximum operating temperature

### DC Characteristic

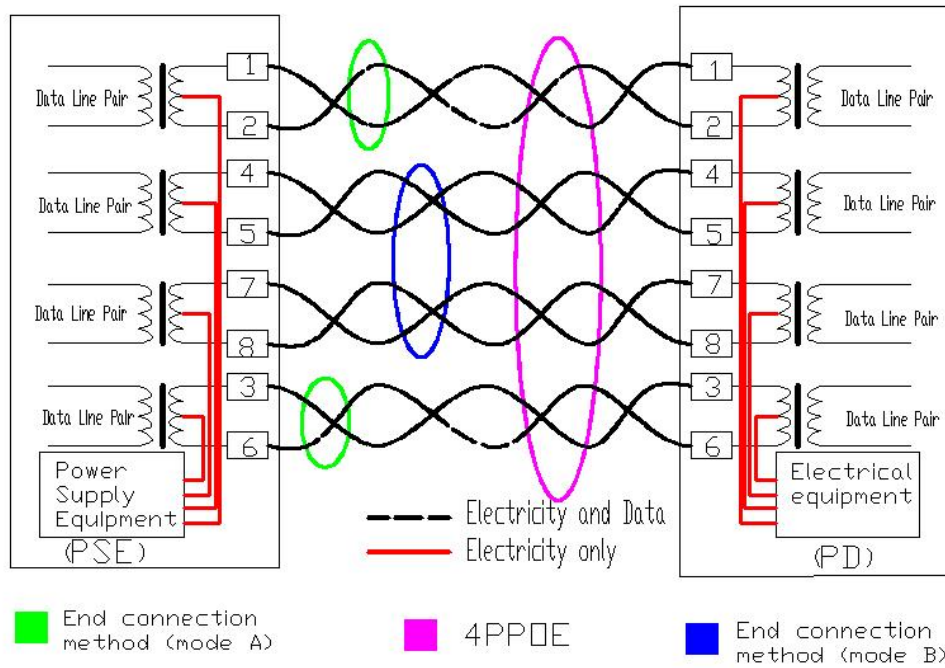
No	parameter	Symbol	MIN	TYP	MAX	Units	Test conditions
1	Standard Output Voltage	VDC	23.6	24	24.3	V	VIN=48v Tc: 25°C
2	Output Current (VIN=48V)	PWR	-	3.54	-	A	Wide voltage input 42-57V
3	Power adjustment rate	VLINE	-	0.1	-	%	@50% Load
4	Load Adjustment Rate	VLOAD	-	1	-	%	@VIN=48V
5	Ripple Output Noise	VRN	-	200	-	mVp-p	@Maximum Load
6	Minimum Load	RLOAD	10	-	-	mA	
7	Short circuit duration	TSC	-	-	∞	sec	
8	Efficiency (load 80%)	EFF	86	88	-	%	
9	Isolation Voltage (I/O)	VISO	-	-	1500	VPK	
10	temperature coefficient	Tc	-	0.02		%	Per °C
11	transient response	Ts	-	100	200	ms	VIN=48V VOUT=max

- Typical number is 25 C, nominal voltage is 48V, for auxiliary design only
- Output ripple and noise can be reduced by an external filter, see the application instructions
- If operated under the specified minimum load, the module will emit sound noise, which may cause repeated hiccups in the PSE

## Functional Description

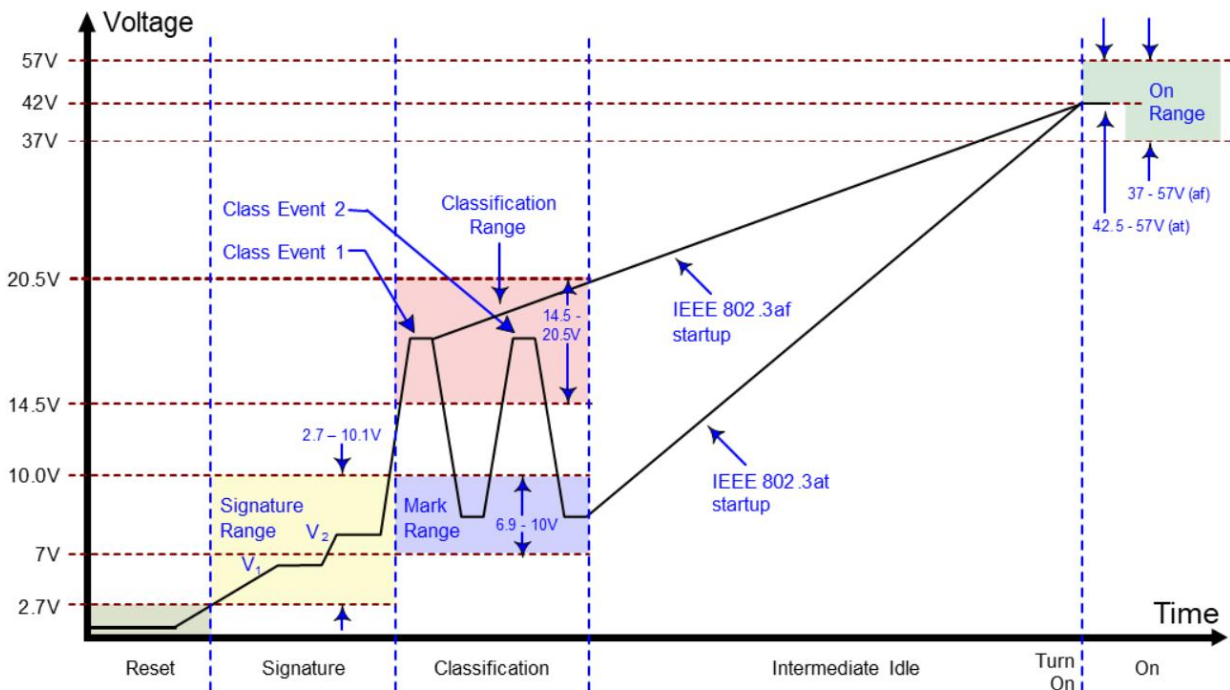
### input:

- WC-PD85H240J-R1 input end with bridge stack ensures input polarity protection, user can choose the connection mode as needed



### PD Power Supply Agreement

- When the module is connected to the cable, it will automatically provide the Power Device (PD) signature to the PSE when needed. The PSE recognizes that the PD is connected to that line and provides power.

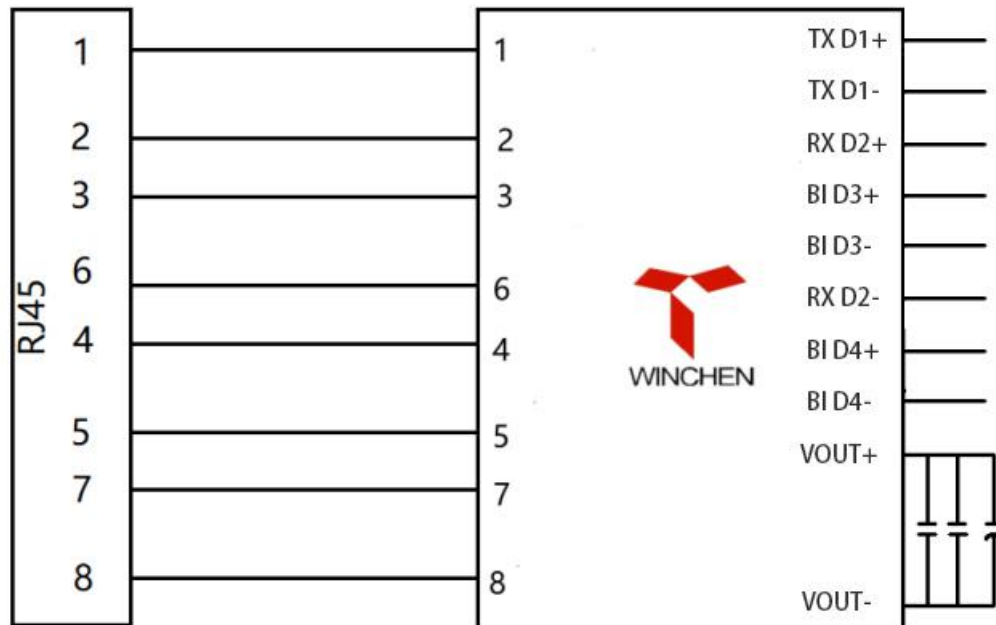


**Power Classification:**

- WC-PD85H240J-R uses IEEE802.3BT standard and runs with Class 8 (POE++85W) power rating by default
- When using standard Category 6 network cables, under the class 4 condition of 10m, the rated power will gradually decrease with the length of the input conductor

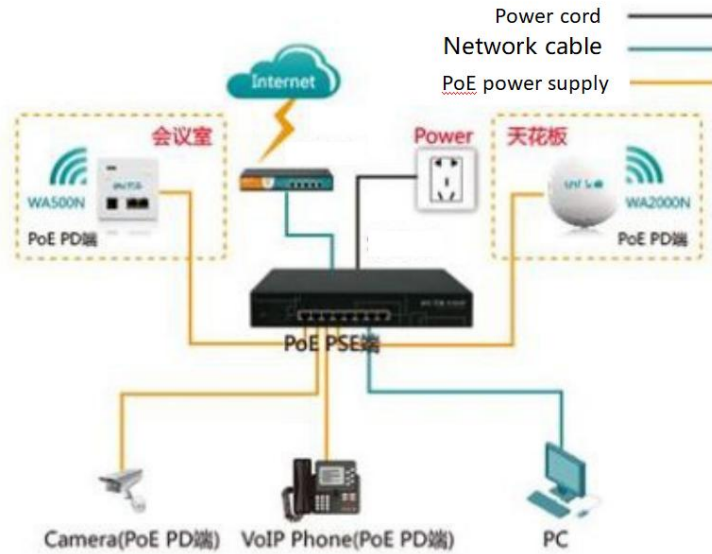
Define criteria	Cable requirements	Grading parameters	Power Supply Characteristics
IEEE802.3at (PoE Plus)	CAT5 cable or CAT6 cable	Maximum power required for Class4 devices is 13W~25.5W	1. The DC voltage ranges from 42 to 57V, with a typical value of 48V. 2. Typical operating current is 10~600mA; typical output power: 25.5W. 3. Class4 rating supported by electrical equipment.
IEEE802.3bt (PoE++)	CAT5 cable or CAT6 cable	The maximum power required for level 5 equipment is 40W	1. DC voltage range 42 V to 57 V, typical value 52V. 2. Typical working current is 10 ~ 1300 mA; typical output power: 71W;
		The maximum power required for level 6 equipment is 51W	
		The maximum power required for level 7 equipment is 62W	
		The maximum power required for level 8 equipment is 71W	

**Typical Connection Diagram**



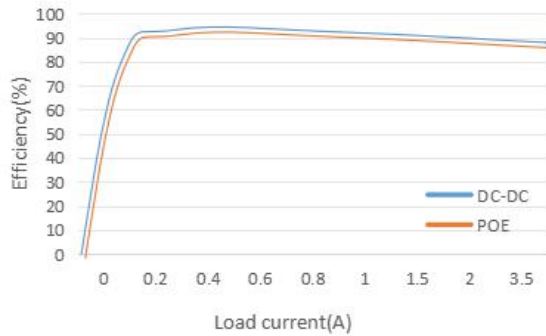
## Typical applications

- This module is used in PSE network cable to convert electric energy to DC-DC to the required voltage of equipment without affecting data signal transmission. It conforms to IEEE 802.3bt standard and is used by all equipment terminals

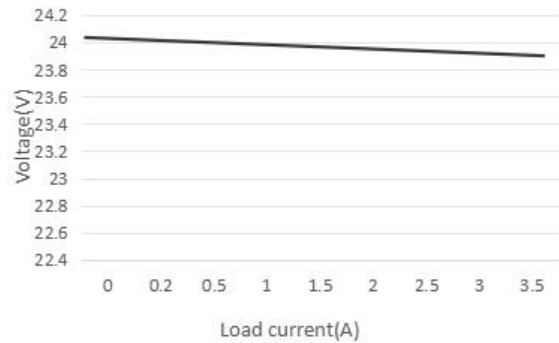


## Test waveform diagram

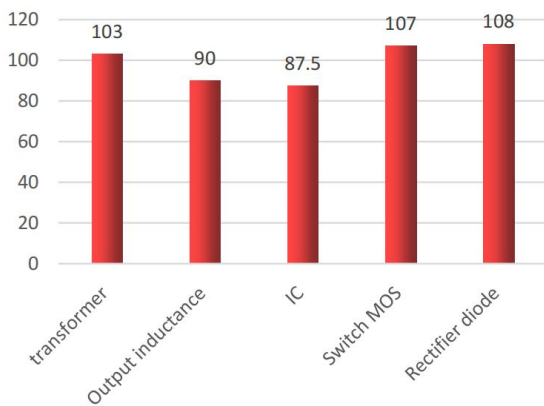
Typical features: Output voltage=24V



Efficiency (Vout = 24V)

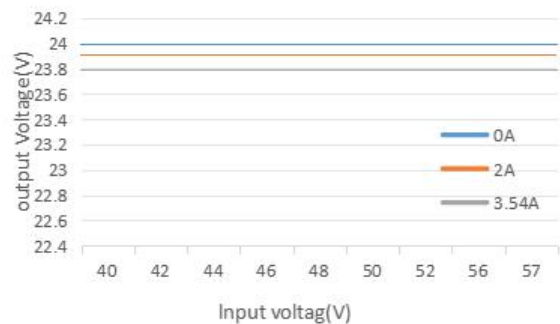


Output current voltage (input 48V)



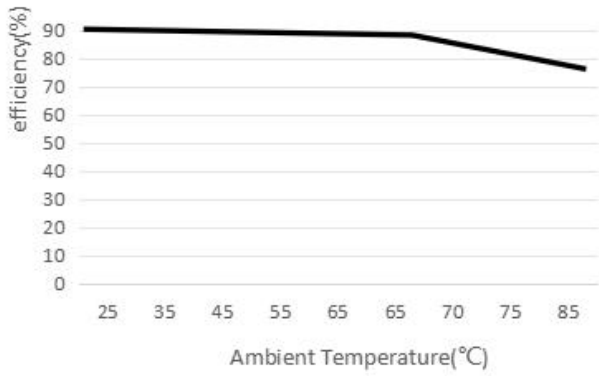
Maximum temperature of components

Conditions (ambient temperature: 25 °C; output power: 24V / 3.54A; frequency: 3H)

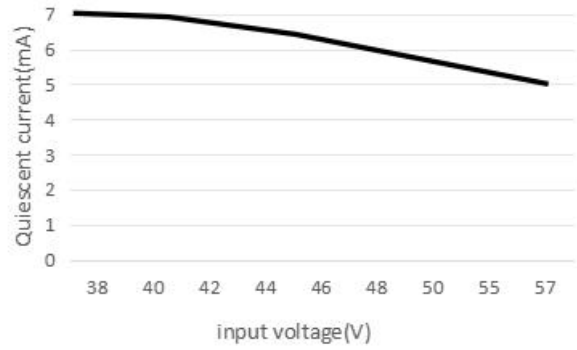


Input voltage & output voltage

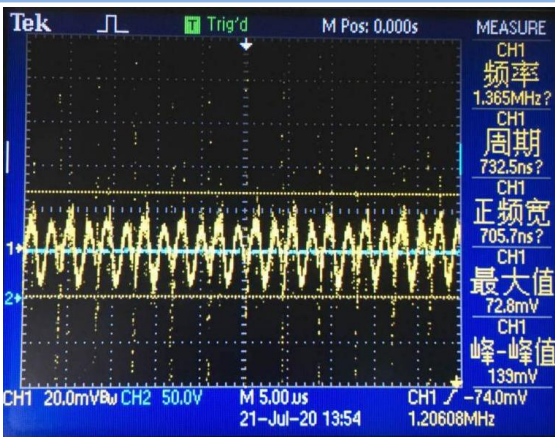




derate



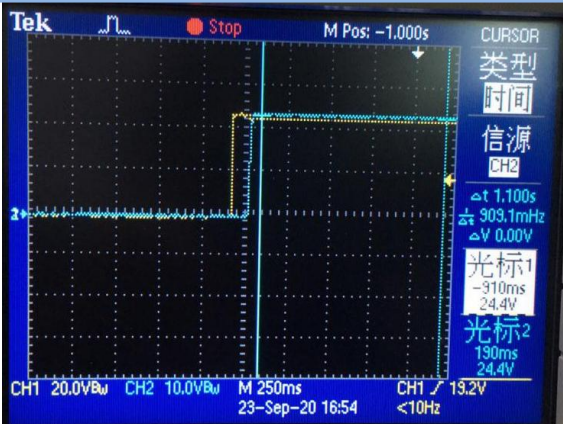
quiescent current



Waves (VIN = 48 V, IO = 3.5 A, 5-20 MHz bandwidth)



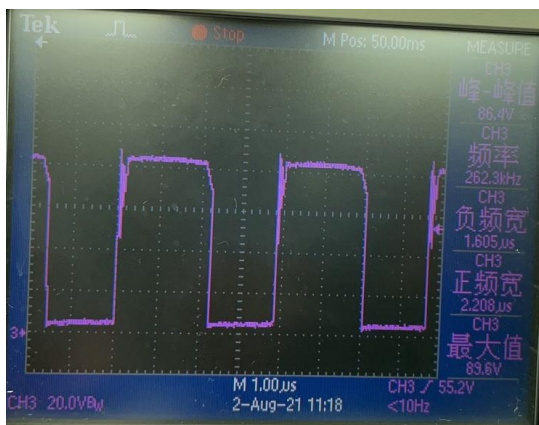
On the agreement to shake hands



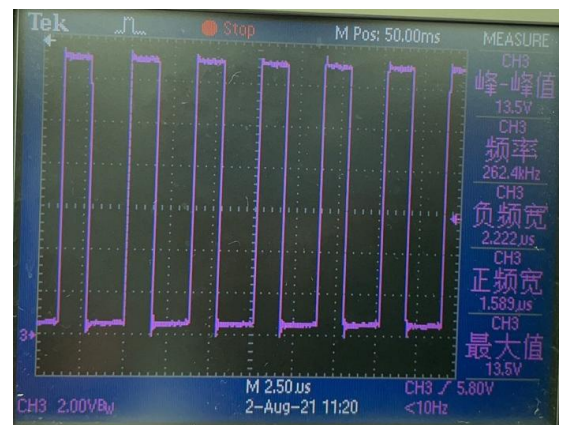
Power on



Power failure



SW switch waveform



PWM