

# Advanced Fully Integrated Embedded PoE<sup>+</sup> PD Module AHPD Module



## 1. Description

The AHPD module is designed as an embedded isolated and advanced PoE<sup>+</sup> (IEEE802.3at compliant) PD solution. AHPD module is fully integrated and ultra high DC/DC converting efficiency (92% @ full load condition) PD module. AHPD improves thermal effect more efficiently and power saving that is caused by its ultra high DC/DC converting efficiency.

The AHPD module is compliant with IEEE 802.3at power classification (type 1 and type 2), Class 0 to Class 4 signature and support PSE Alternative A / B connections. Maximum output power can reach 25.5W (12V/2.125A). Maximum peak output power can be up to 30W (12V/2.5A). The size is 75mm (L) x 30mm (W) X15.5mm (H), input voltage range is from 37Vdc to 60Vdc and less external components, only one output decoupling capacitor is needed. Operating temperature range is from -25°C to 70°C, @ Full load.

AHPD module is designed by a more advanced concept to reach higher efficiency reliability, and AHPD module has same pin definition with THPD module.

## 2. Feature

- IEEE802.3at compliant and backward compatible with IEEE802.3af
- Support PoE<sup>+</sup> applications in both of Fast / Gigabit Ethernet environments
- Support wide input voltage range - 37Vdc to 60Vdc.
- Thermal cut off
- Short circuit protection
- Over current protection
- High DC/DC converting efficiency (92%)
- Less external component – one output decoupling capacitor
- Isolation level 1.5KVrms
- On board thermal pads
- Enhanced surge protection and output filter
- Internal build in 2 channel bridge rectifiers support end-point and mid-span mode

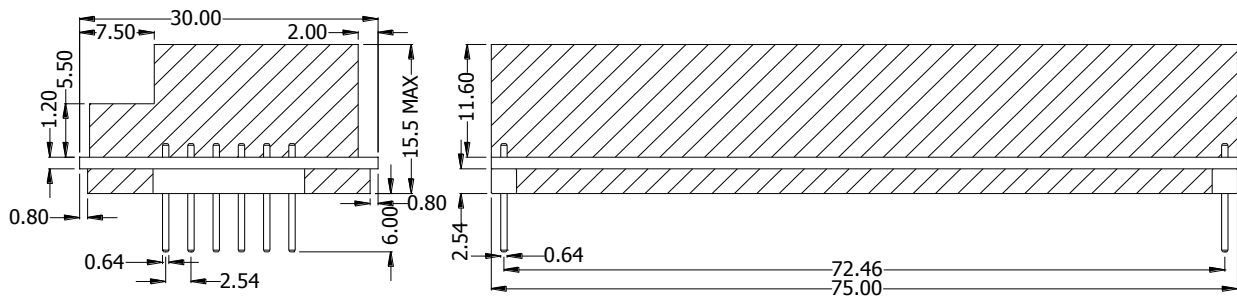
## 3. Applications

- Wireless Access Point (AP)
- VoIP Phone
- Surveillance System
- IP Camera
- PTZ Camera
- Security System
- Fingerprint Identification
- WiMAX Base Station
- PoE Clock
- Network Attached Storage (NAS)
- Remote Display Board
- Point of Sale (POS) System
- Media Converter
- Stand Alone PoE<sup>+</sup> Splitter
- Isolated DC/DC Converter

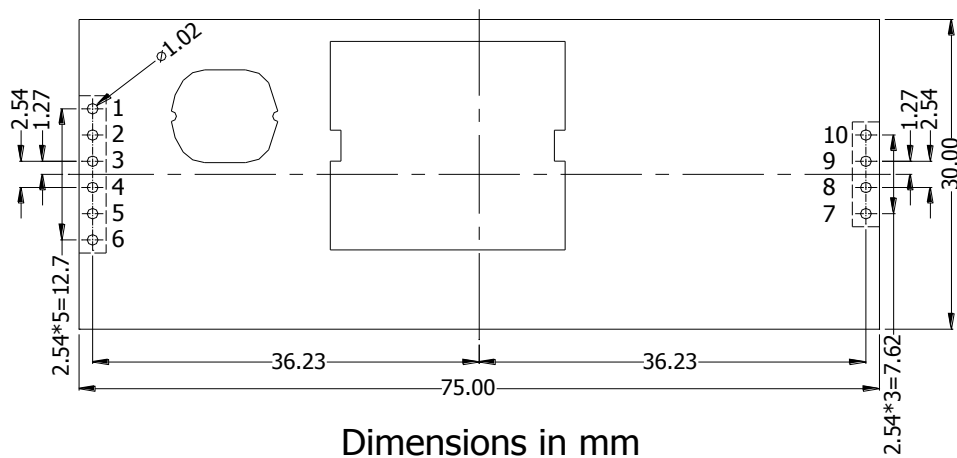
#### 4. AHPD Series Product List

Part Number	Nominal Output Voltage / Current	Maximum Output Power	Nominal Input Voltage	Marking
AHPD-12	12Vdc / 2.125A	25.5W @ 25°C	48Vdc	AHPD-12

#### 5. Package



Dimensions in mm

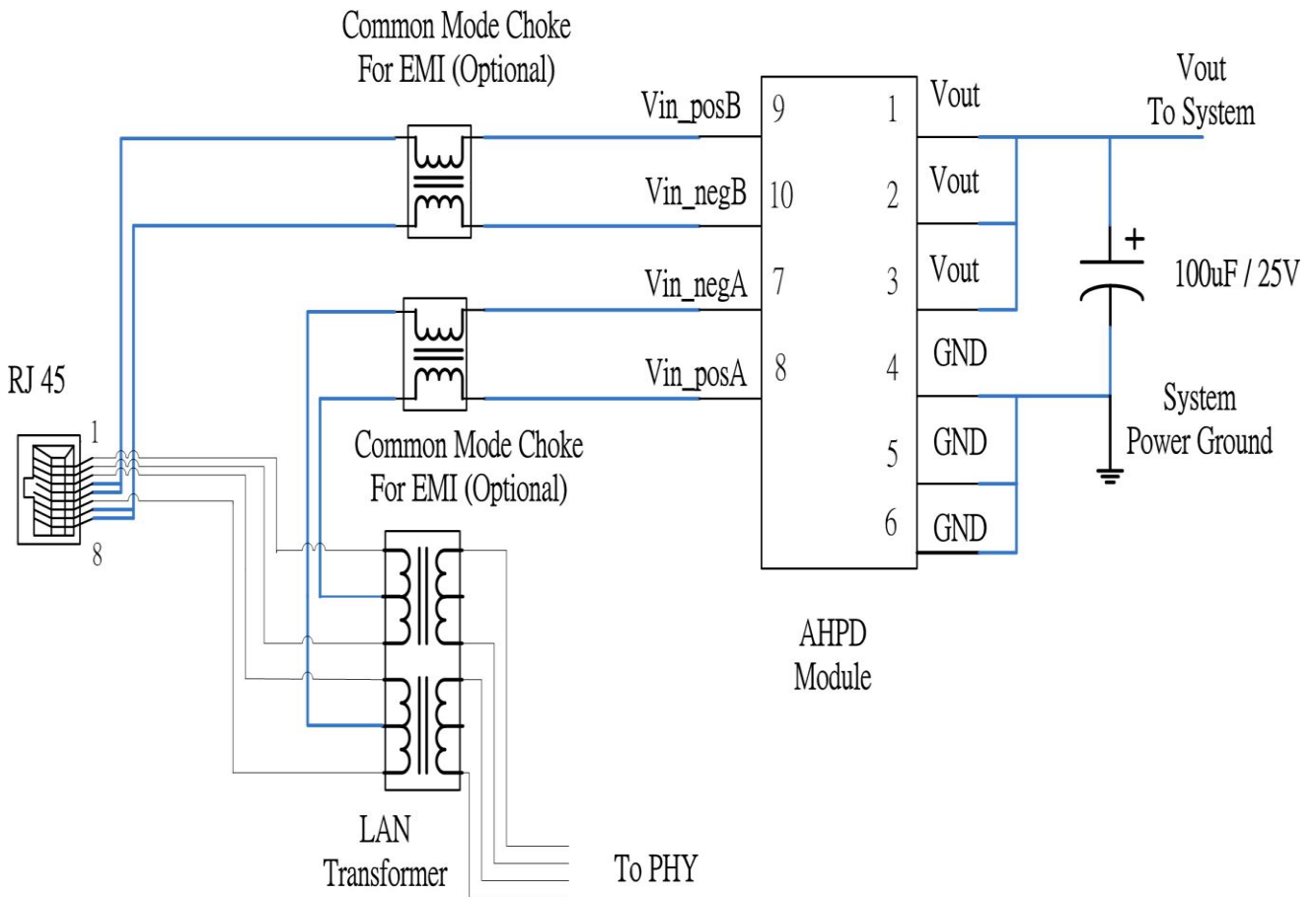


Dimensions in mm

## 6. Pin Definition

Pin Number	Symbol	Description
1	Vout	<b>Regulated DC Output.</b> AHPD (secondary side) DC power output pin (12Vdc). Connect to system positive power input.
2	Vout	<b>Regulated DC Output.</b> AHPD (secondary side) DC power output pin (12Vdc). Connect to system positive power input.
3	Vout	<b>Regulated DC Output.</b> AHPD (secondary side) DC power output pin (12Vdc). Connect to system positive power input.
4	GND	<b>AHPD Power Ground.</b> AHPD (secondary side) power ground. Connect to system power ground.
5	GND	<b>AHPD Power Ground.</b> AHPD (secondary side) power ground. Connect to system power ground.
6	GND	<b>AHPD Power Ground.</b> AHPD (secondary side) power ground. Connect to system power ground.
7	Vin_negA	<b>Power Interface Negative Input A (Alternative A mode).</b> AHPD high voltage (primary side) negative voltage input A. Connect to central tap (primary side) of LAN transformer which is connected to pin 3 & 6 of the RJ45 connector. Vin_negA and Vin_posA are not polarity sensitive.
8	Vin_posA	<b>Power Interface Positive Input A (Alternative A mode).</b> AHPD high voltage (primary side) positive voltage input A. Connect to central tap (primary side) of LAN transformer which is connected to pin 1 & 2 of the RJ45 connector. Vin_negA and Vin_posA are not polarity sensitive.
9	Vin_posB	<b>Power Interface Positive Input B (Alternative B mode).</b> AHPD high voltage (primary side) positive voltage input B. Connect to pin 4 & 5 of the RJ45 connector. Vin_negB and Vin_posB are not polarity sensitive.
10	Vin_negB	<b>Power Interface Negative Input B (Alternative B mode).</b> AHPD high voltage (primary side) negative voltage input B. Connect to pin 7 & 8 of the RJ45. Vin_negB and Vin_posB are not polarity sensitive.

## 7. Fast Ethernet Typical Application



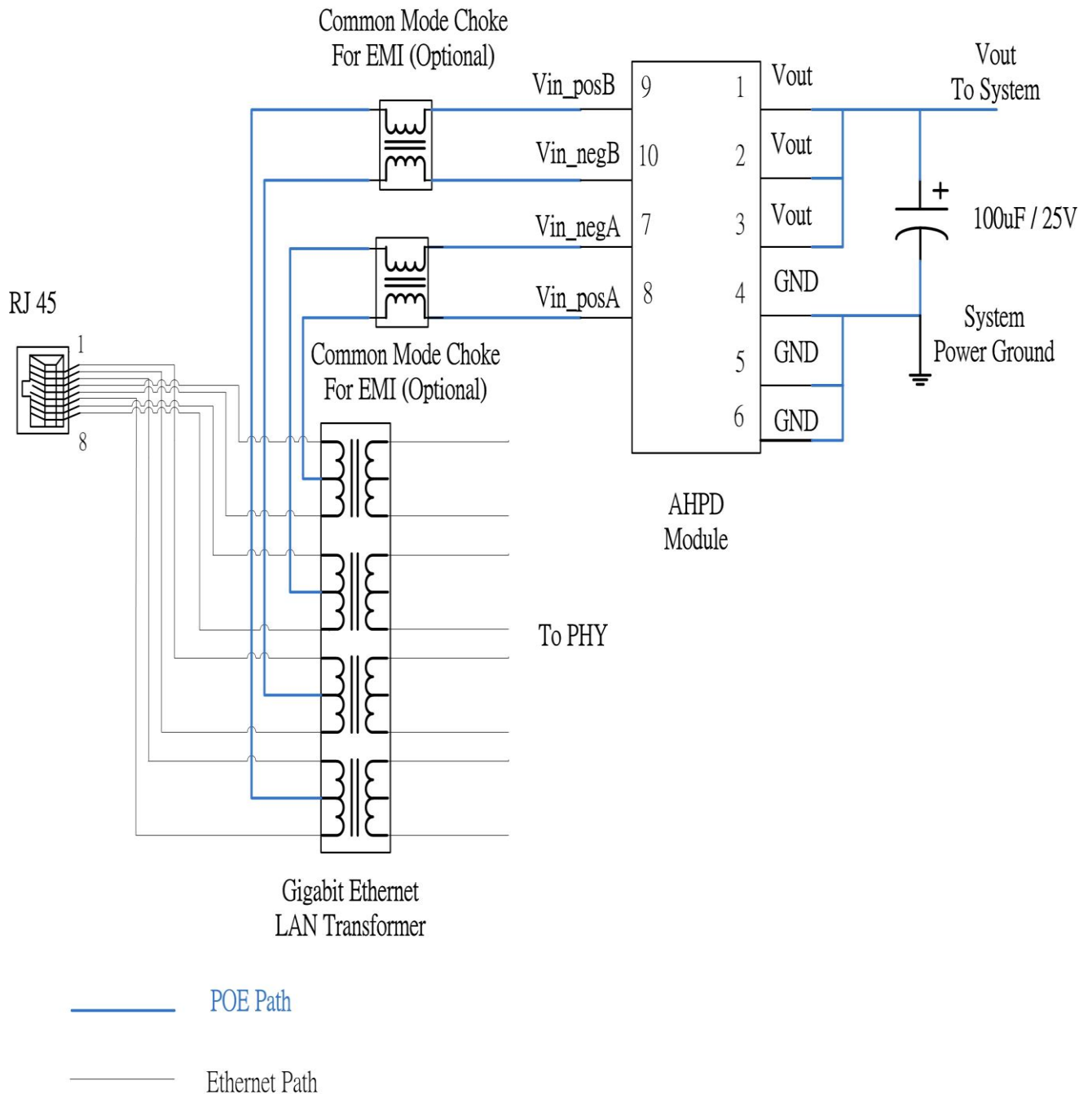
— POE Path

— Ethernet Path

### Note

Common mode choke can eliminate EMI effect which is optional component.

## 8. Gigabit Ethernet Typical Application



### Note

Common mode choke can eliminate EMI effect which is optional component.

## 9. Electrical Characteristics

Item	DC Characteristic	Symbol	Min.	Typ.	Max.	Unit	Comment
1	Power Interface input Voltage	V <sub>in_pos</sub> – V <sub>in_neg</sub>	37	48	60	V	
2	Under Voltage Lockout	V <sub>Lock out</sub>	33		37	V	
3	Output Voltage	V <sub>out</sub>	11.4	12	12.6	V	
4	Maximum Output Power (V <sub>in</sub> = 48Vdc)	P <sub>out</sub>			25.5	W	
5	Maximum Output Current (V <sub>in</sub> = 48Vdc)	I <sub>out</sub>			2.125	A	
6	Maximum Input Current Consumption (V <sub>in</sub> = 48Vdc)	I <sub>in_max</sub>			1100	mA	@Full Load
7	V <sub>out</sub> Reverse Voltage	V <sub>r</sub>			20	V	
8	DC/DC Converter Efficiency	EFF		92%			AHPD-12 @Full Load
9	Isolation Level	ISO		1.5		KV	
10	Primary Side Soft Start Delay	t <sub>ss</sub>		3.9		ms	
11	Operating Temperature	T <sub>OP</sub>	-25		70	°C	@Full Load
12	Storage Temperature	T <sub>Storage</sub>	-30	25	85	°C	

### Note

1. Test ambient condition is 25°C.
2. Maximum output power and efficiency depends on ambient temperature. Maximum output power and efficiency maybe decay in high ambient temperature environment.