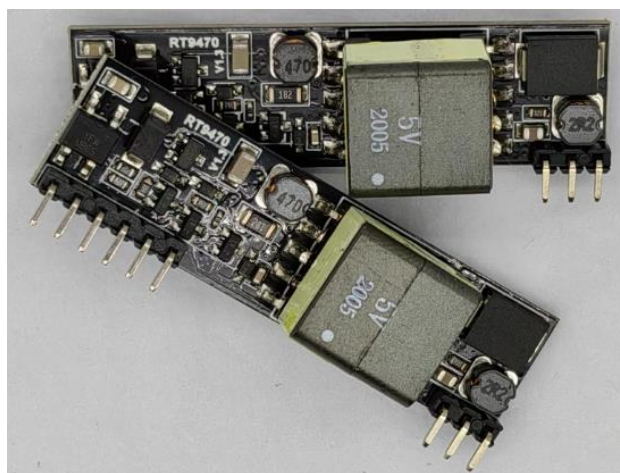


RT9470

POE PD Module (Isolation Model)

Product Description



Version	Date	Author	Approved By	Remarks
V1.0	2017/10/14	LI xiao yan	Rock	
V1.1	2018/8/16	LI xiao yan	Rock	

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Features:

- IEEE802.3af compliant
- Input voltage range 36V to 57V
- Integral high efficiency DC/DC converter.
- Low output ripple and noise
- High performance with low price
- Short-circuit protection
- Industrial temperature range and thermal protection
- Adjustable Output
- Optional multi-voltage output 3.3V 5V 12V 24V
- Transformer isolation ,1500V isolation (input to output)
- Easy to use, with a minimum number of external components.
- Rohs compliant
- High performance option available with classification programming, industrial temperature range and thermal protection



Applications:

- IP Cameras
- Wireless access point
- Security and alarm systems
- VOIP telephone
- Point of sale network terminal equipment

Description:

The RT9470 series of modules are designed to extract power from a conventional twisted pair Category 5 Ethernet cable, conforming to the IEEE 802.3af Power-over-Ethernet(PoE) standard.

The RT9470 signature and control circuit provides the PoE compatibility signature and power classification required by the Power Sourcing Equipment (PSE) before applying up to 15W power to the port. The RT9470 provides a Class classification programming.

The DC/DC converter operates over a wide input voltage range and provides a regulated output. The DC/DC converter also has built-in short-circuit output protection.

● RT9470 Product Selector

Part Number	Nominal Output Voltage	Nominal Output current	Maximum Output Power*	Marking	Package
RT9470-3.3V RT9470S-3.3V	3.3V	2A	6W**	3.3V	SIL
RT9470 -5V RT9470S -5V	5V	2A	9W**	5V	SIL
RT9470 -12V RT9470S -12V	12V	1A	12W**	12V	SIL
RT9470 -24V RT9470S -24V	24V	0.5A	12W**	24V	SIL

*At 25°C with VIN = 48V

** Maximum Output Power: means it not could be operated in continuous stage .only short-term of Boot up/Heavy loading

● Absolute Maximum Ratings

	Parameter	Symbol	Min	Max	Units
1	DC Supply Voltage	VCC	-0.3	60	V
2	DC Supply Voltage Surge for 1ms	VSURGE	-0.6	80	V
3	Storage Temperature	TS	-40	100	°C

Note 1: Exceeding the above ratings may cause permanent damage to the product. Functional operation under these conditions is not implied. Maximum ratings assume free airflow.

● Recommended Operating Conditions

	Parameter	Symbol	Min	Typ	Max	Units
1	Input Supply Voltage1	VIN	36	48	57	V
2	Under Voltage Lockout	VLOCK	30		36	V
3	Operating Temperature2	TOP	-40	25	85	Ta / °C

Note 1: With minimum load

2: See Section Operating Temperature Range

** Extended use close to, or at the maximum operating temperature can reduce the life time of the device.

● Pin Description:

Pin #	Name	Description
1	VA1	RX Input (1). This input pin is used in conjunction with VA2 and connects to the centre tap of the transformer connected to pins 1&2 of the RJ45 connector (RX) - it is not polarity sensitive. RT9470S this pin is direct Input +. This pin connects to the positive (+) output of the input bridge rectifier.
2	VA2	TX Input (2). This input pin is used in conjunction with VA1 and connects to the centre tap of the transformer connected to pins 3&6 of the RJ45 connector (TX) - it is not polarity sensitive. RT9470S this pin is direct Input -. This pin connects to the negative (-) output of the input bridge rectifier.
3	VB1	Direct Input (1). This input pin is used in conjunction with VB2 and connects to pin 4 & 5 of the RJ45 connector - it is not polarity sensitive. RT9470S this pin is direct Input +. This pin connects to the positive (+) output of the input bridge rectifier.
4	VB2	Direct Input (2). This input pin is used in conjunction with VB1 and connects to pin 7 & 8 of the RJ45 connector - it is not polarity sensitive. RT9470S this pin is direct Input -. This pin connects to the negative (-) output of the input bridge rectifier
5	CR+	Class Programming . external resistor will change the current class of the module (see Poe classification programming table). If with no resistor fitted will default to Class 0.
6	CR-	
7	-VDC	DC Return. This pin is the return path for the +VDC output.
8	+VDC	DC Output. This pin provides the regulated output from the DC/DC converter.
9	ADJ	Output Adjust. The output voltage can be adjusted from is nominal value, by connecting an external resistor from this pin to either the +VDC pin or the -VDC pin.

● DC Electrical Characteristics

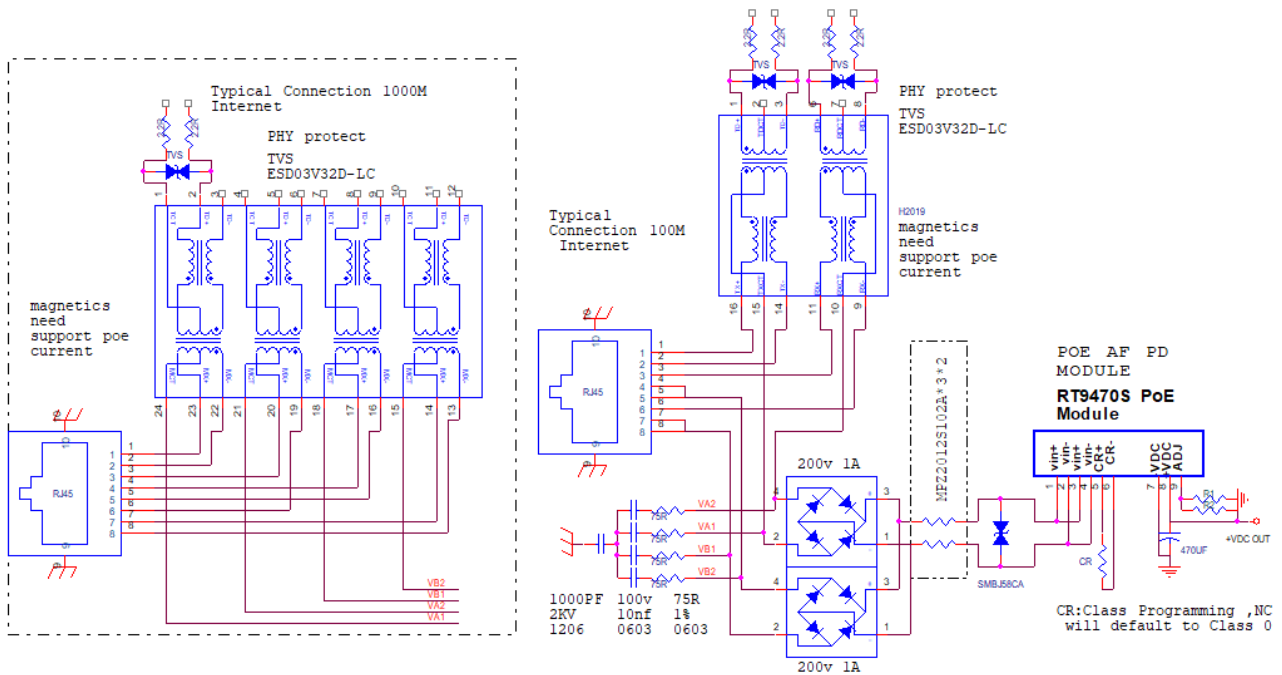
	DC Characteristic	Sym	Min	Typ1	Max	Units	Test Comments
1	Nominal Output Voltage	+VDC	3.1	3.3	3.5	V	RT9470-3.3V
			4.75	5.0	5.25	V	RT9470-5V
			11.5	12.0	12.5	V	RT9470-12V
			23.5	24.0	24.5	V	RT9470-24V
2	Output Current (V _{IN} = 48V)	PWR			2	A	RT9470-3.3V
					2	A	RT9470-5V
					1.0	A	RT9470-12V
					0.5	A	RT9470-24V
3	Line Regulation	VLINE		0.1		%	@ 50% Load
4	Load Regulation	VLOAD		1		%	@ VIN=48V
5	Output Ripple and Noise	VRN		100		mVp-p	@ Max load2
6	Minimum Load	RLOAD	200			mA	RT9470-3.3V
			200			mA	RT9470-5V
			100			mA	RT9470-12V
			50			MA	RT9470-24V
7	Short-Circuit Duration ³	TSC			∞	sec	
8	Efficiency @ 80% Load	EFF		76		%	RT9470-3.3V
				80		%	RT9470-5V
				84		%	RT9470-12V
				85		%	RT9470-24V
9	Isolation Voltage (I/O)	VISO		1500		V _{PK}	Impulse Test
10	Temperature Coefficient	TC		0.02		%	Per °C

Note 1: Typical figures are at 25°C with a nominal 48V supply and are for design aid only. Not Guaranteed

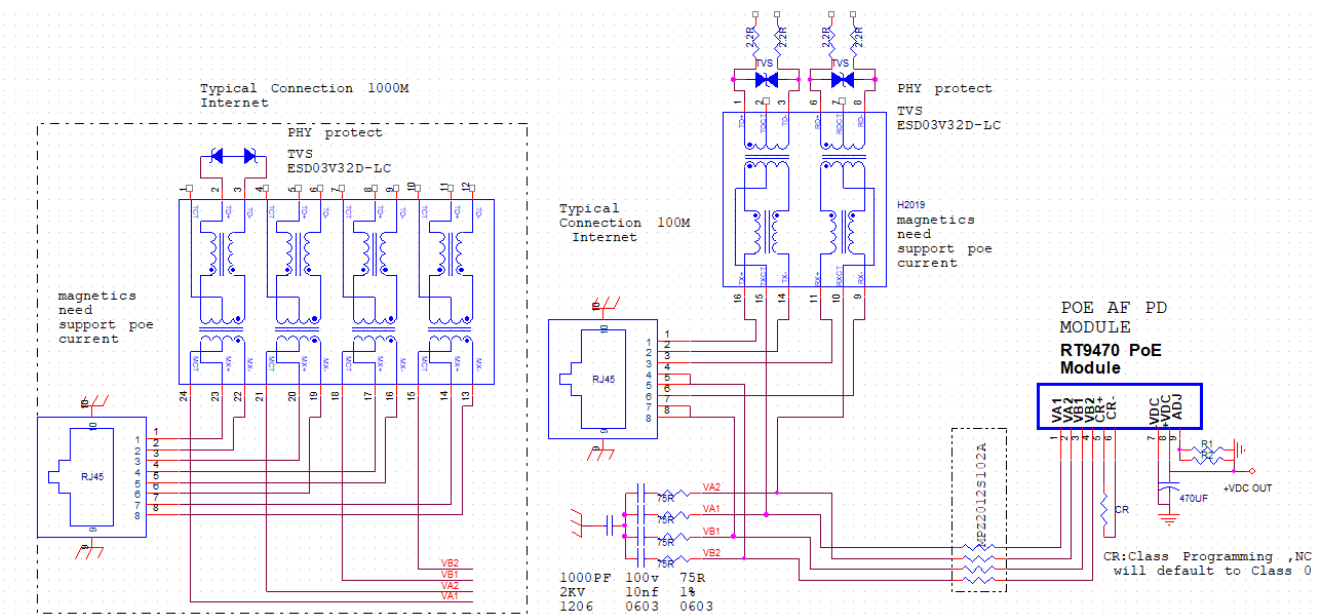
2: The output ripple and noise can be reduced with an external filter, see application note.

3: Continuous short circuit duration is applicable at 25°C ambient temperature in free air. At higher temperatures or with restricted airflow (e.g. in a sealed enclosure) the duration will need to be limited to avoid overheating.

● RT9470S Typical Connection Diagram:



● RT9470 Typical Connection Diagram :



Reducing the output voltage, connect R2 between ADJ and +VDC				
	R2 Value	output voltage	R2 Value	output voltage
RT9470-3.3V	open	3.3V	0R	2.8V
RT9470-5V	open	5V	0R	4.4V
RT9470-12V	open	12V	0R	9.9V
RT9470-24V	open	24V	30K	18.2V
Increasing the output voltage, connect R1 between ADJ and -VDC				
	R1 Value	output voltage	R1 Value	output voltage
RT9470-3.3V	open	3.3V	0R	3.7V
RT9470-5V	open	5V	0R	5.7V
RT9470-12V	open	12V	0R	12.8V
RT9470-24V	open	24V	0R	25.5V

● Poe classification programming table .

CLASS	Programming Resistance (Ohms)	Min Power (W)	Max Power (W)
0	Do not fit	0.44	12.95
1	698	0.44	3.84
2	383	3.84	6.49
3	243	6.49	12.95
4	TBD	Reserved	Reserved

● Reliability MTBF:

About the life time ,we design according to the following:

- 1) life time of RT9470 : 100,000 hours @ 25°C

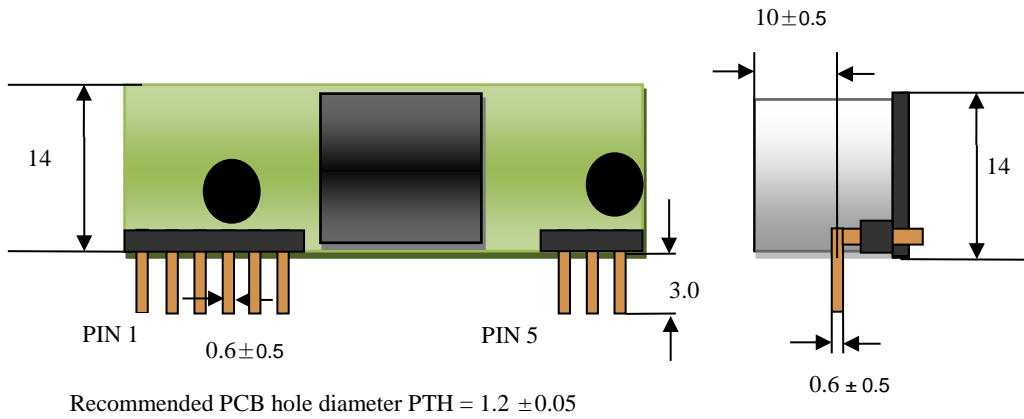
● Safety test items & test report

Test Requested	Test result
Electric strength -1500Vrms at 50 to 60Hz for 60s, applied as specified in subclaususe 5.2.2 of IEC 60950	Pass

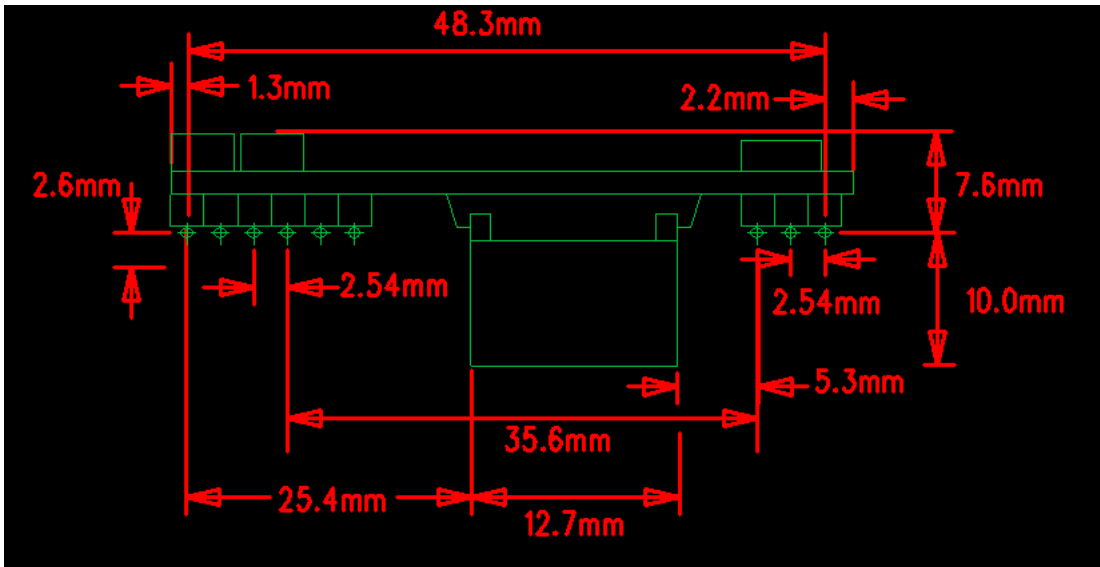
● Mechanical / Environmental Performance data

Mechanical / Environmental Performance data		
	Item	Requirement and Standard
1	Resistance to Wave Soldering Heat	max Preheat Temp range & time 120 °C / 180S max soldering temp & time: 265 °C / 4S
2	Solder ability	Solder able area shall have minimum of 95% solder coverage. And then into solder bath, Temperature at 245 ±5 °C , for 4-5sec.
3	Hand Soldering Temperature Resistance	T > =350 °C , 3sec at least.
4	Thermal Shock	subject to follow condition for 5 cycles. 1 cycles: -55 °C , 30 minutes +85 °C , 30 minutes
5	Humidity(Temp Cycling)	less than 95% (non-condensing) (-20 to 70 °C)
6	Temperature Life	temperature life at 85°C for 96 hours.
7	Salt Spray	connectors to 5% salt-solution concentration, 35 °C Gold flash for 8 hours there will be no change in the gold layer

● RT9470 Package Size: (mm)



● RT9470 PCB Decal : (mm)



● Packaging type & Quantity

EPE or BLASTIC Packaging,
 55pcs/ dish
 550pcs/box Box size 30*35*20cm 7KG/box