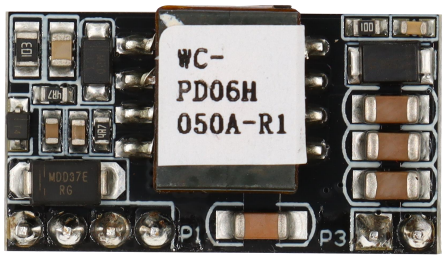
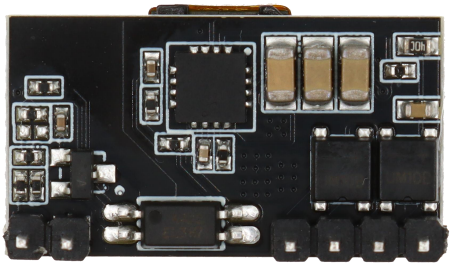
6W PD-5V





Product Features

- Compliance with IEEE802.3af standard
- 39V~57V wide operating voltage range
- Maximum output power up to 6W; Rated output: 5V/1.2A
- The output ripple is less than 200 mV
- Conversion efficiency can be as high as 82% (input: 48V output: 5V@1.2A)
- It has excellent reliability and circuit protection such as over current, short circuit, under voltage and surge
- PCBA standard size: 25.4*14*8.9mm
- Input/Output: isolate 1500Vdc
- Class 3 IEEE802.3 PD
- High reliability: The design meets the 5 million hour average failure interval

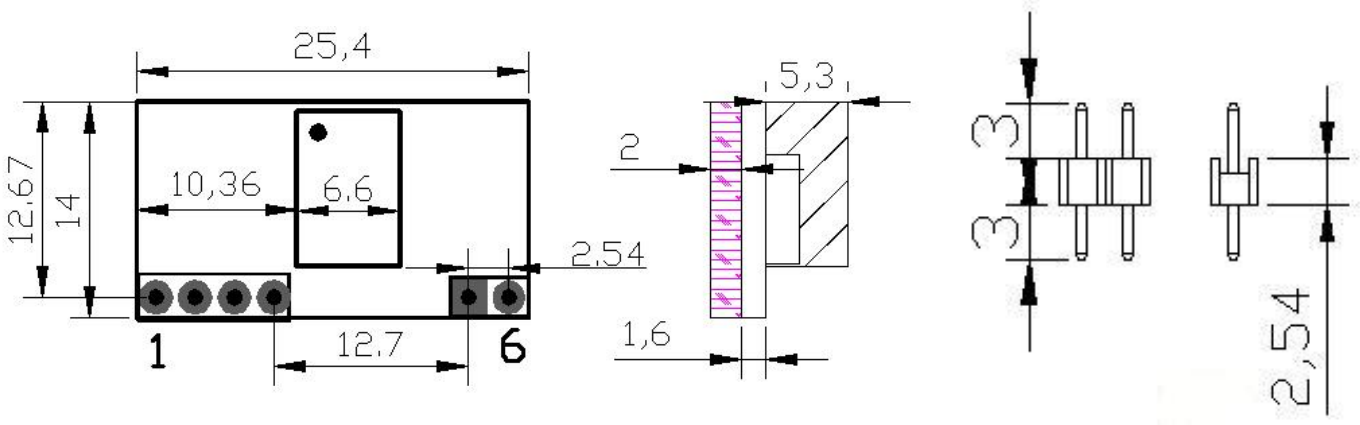
Scope of Application

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

Describe

- The module is designed to extract power from conventional Class 5 Ethernet cable twisted pairs and meets the IEEE 802.3af Power-Ethernet (PoE) the same time, the module allows the power supply category to select "Intermediate Overlap" and "End Overlap" power supply without distinguishing polarity
- Based on the IEEE 802.3af standard, this paper establishes information connection about the connection status, device type, power consumption level of the receiving device PD, and then applies power supply to port compatible devices based on PSE to power the PD through ethernet
- This module DC/DC converter works in a wide input voltage range and low ripple low noise output.The DC/DC converter also has built-in output overload, output short circuit and overtemperature protection, and provides a 1500Vdc (input/output) electrical isolation

Mechanical Dimensions



Unit: mm ; Unmarked tolerances: ±0.5

Pin Definition

Pin	Name	Describe
1	VA1	Connect to RJ45 network port (TX) 1 and 2 pin network transformer central taps. (The module carries two sets of rectifier bridges to suit different PSE power supply directions)
2	VA2	Connect to RJ45 network port (TX) 3 and 6 pin network transformer center taps. (The module carries two sets of rectifier bridges to suit different PSE power supply directions)
3	VB1	Connect to RJ45 network port 4 and 5 pins (100Mbps), or connect to RJ45 network port (BI) 4 and 5 pins network transformer center tap (1000Mbps) (the module is equipped with two sets of rectifier bridges to adapt to different PSE power supply directions)
4	VB2	Connect to RJ45 network port 7 and 8 pins (100Mbps), or connect to RJ45 network port (BI) 7 and 8 pins network transformer center tap (1000Mbps) (the module is equipped with two sets of rectifier bridges to adapt to different PSE power supply directions)
5	Vout-	This pin is the module output negative pole
6	Vout+	This pin is the module output positive pole

Electrical Characteristics

Absolute Maximum Rating Parameter

No	Parameter	Symbol	Min	Max	Unit
1	Input DC Voltage	VCC	39	58	V
2	DC Voltage Surge 1ms	VSURGE	-0.6	80	V
3	Ambient Temperature	TS	-40	80	℃

- 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	Unit
1	Input DC Voltage	VIN	39	48	58	V
2	Low Pressure Input Threshold	VLOCK	37	-	-	V
3	Ambient Temperature	TOP	-40	25	80	℃

- Applicable only to WC-PD06H050B-R1 maximum operating temperature

DC Characteristic

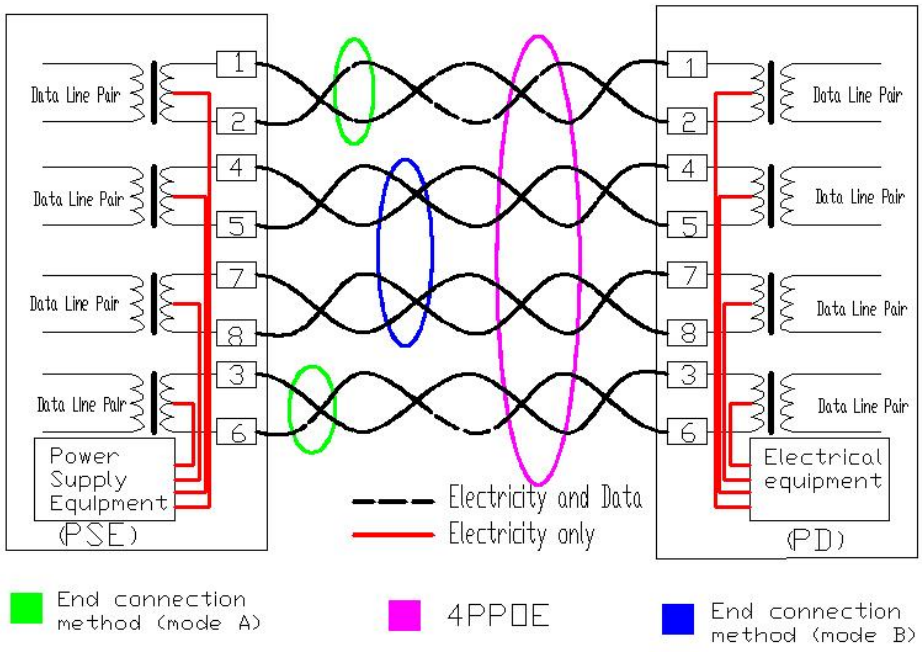
No	Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
1	Standard Output Voltage	VDC	4.75	5.1	5.2	V	VIN=48V
2	Output Current (VIN=48V)	PWR	-	-	1.2	A	Wide voltage input 39-57V
3	Power Adjustment Rate	VLINE	-	0.1	-	%	@50% Load
4	Load Adjustment Rate	VLOAD	-	1	-	%	@V_{IN}=48V
5	Ripple Output Noise	VRN	-	200	250	mVp-p	@Maximum Load
6	Minimum Load	RLOAD	10	-	-	mA	
7	Short Circuit Duration	TSC	-	-	∞	sec	
8	Efficiency (load 80%)	EFF	75	82	-	%	
9	Isolation Voltage (I/O)	VISO	-	-	1500	VPK	
10	Temperature Coefficient	Tc	-	0.02		%	Per ℃
11	Transient Response	Ts	-	200	250	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

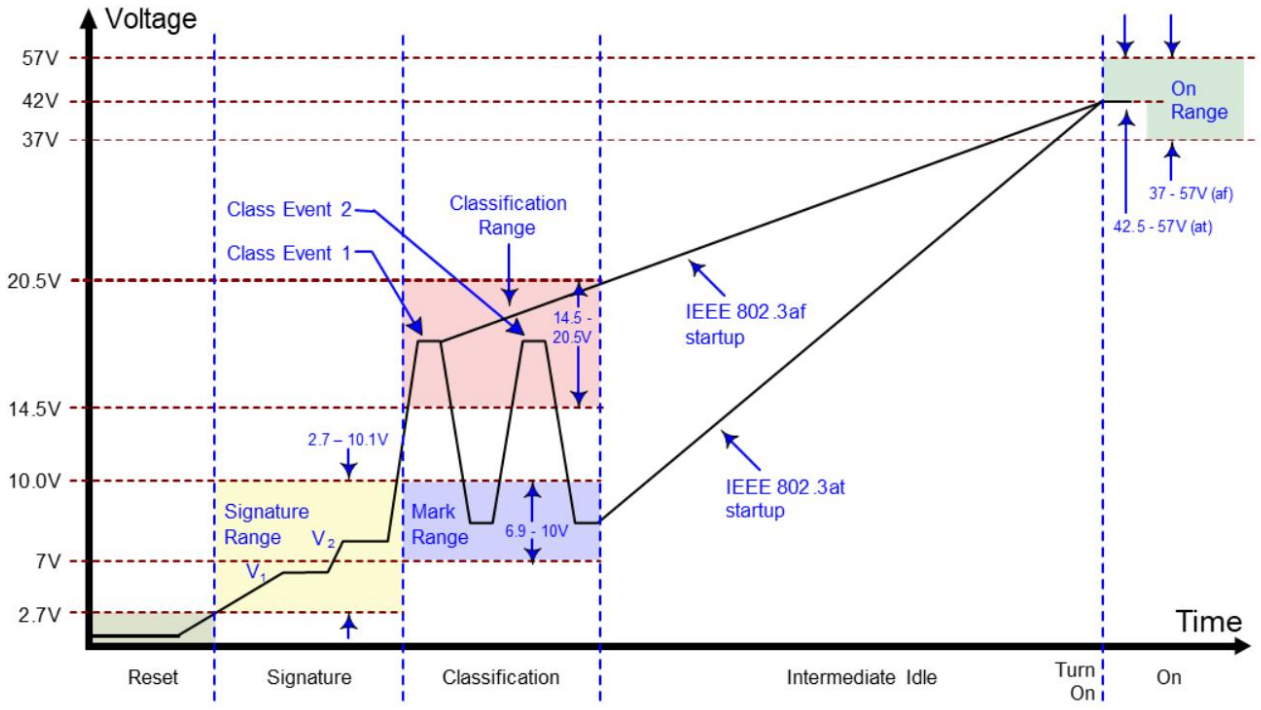
Input:

- WC-PD06H050B-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

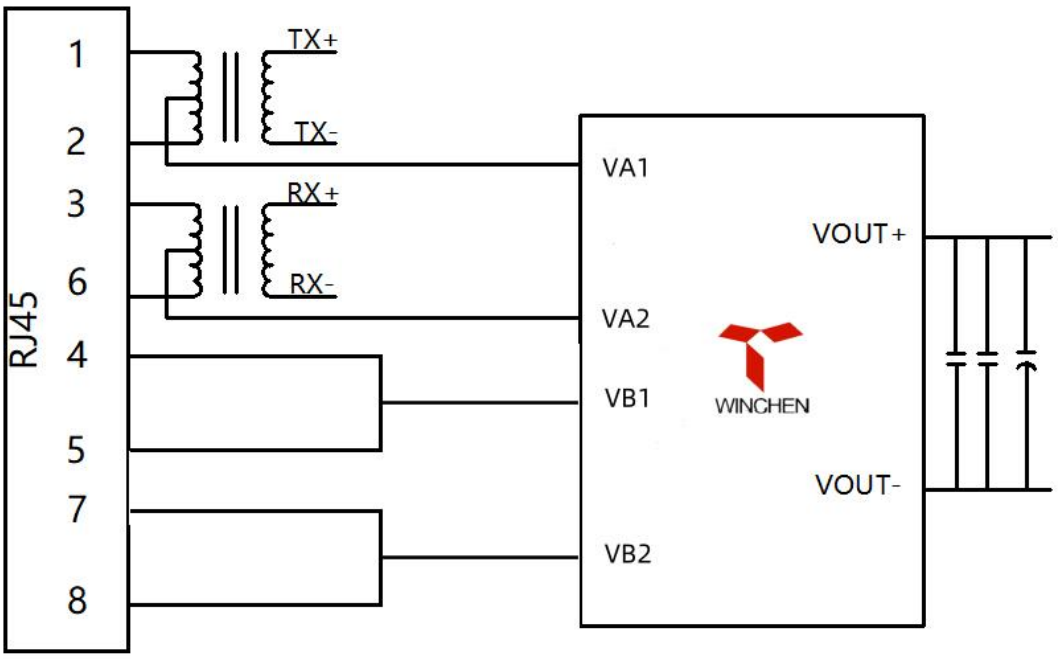


Power Classification:

➢ WC-PD06H050B-R1 uses IEEE802.3af standard and runs with Class 3 (6W) power rating by default

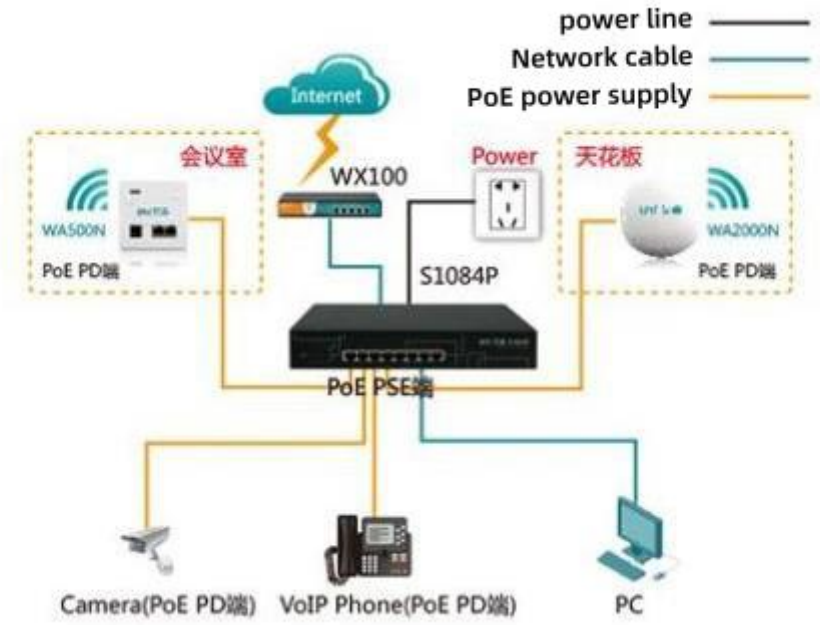
Define Criteria	Cable Requirements	Grading Parameters	Power Supply Characteristics
IEEE802.3at (PoE Plus)	CAT5 cable or CAT6 cable	Maximum power required for Class4 devices is 13W~25.5W	1. The DC voltage ranges from 42 to 57V, with a typical value of 48V. 2. Typical operating current is 10~600mA; typical output power: 25.5W. 3. Class4 rating supported by electrical equipment.
IEEE802.3af (PoE)	CAT5 cable	Maximum power required for Class0 devices is 0~12.95W	1. The DC voltage ranges from 38 to 57V, with a typical value of 48V. 2. Typical operating current is 10~350mA; typical output power: 15.4W; 3. The overload detection current is 350~500mA. 4. Provide 4 Class Power Requests for PD Devices ranging from 3.84 to 12.95W
		The maximum power required for Class1 devices is 0~3.84W	
		The maximum power required for Class2 devices is 3.85W~6.49W	
		The maximum power required for Class3 devices is 6.5W~12.95W	

Typical Connection Diagram



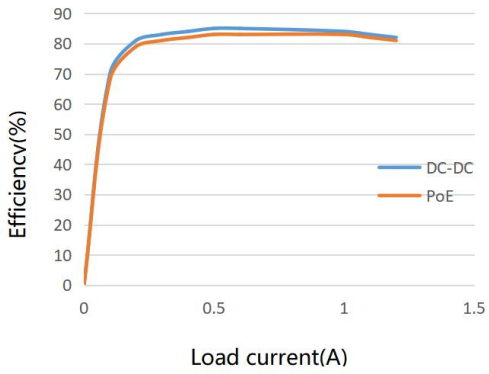
Typical Applications

- 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 ieee802.3af standard and is used by all equipment terminals

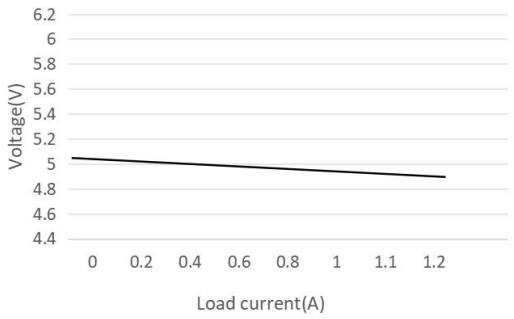


Test Waveform Diagram

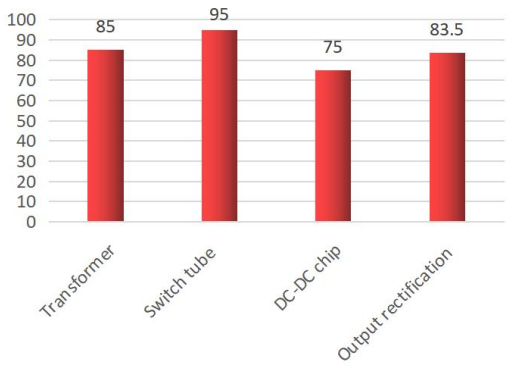
Typical Features: Output Voltage=5V



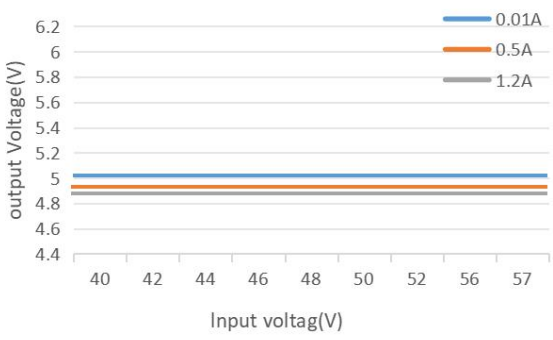
Efficiency (Vout =5V)



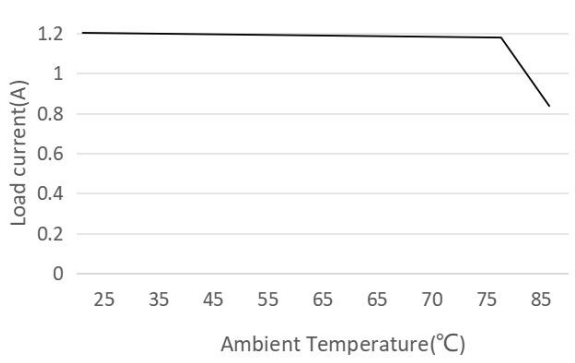
Output current and voltage(input 48V)



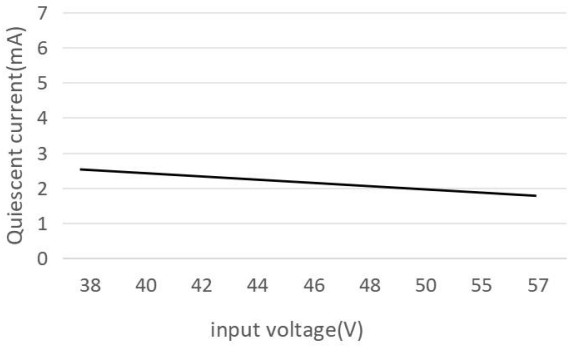
Maximum temperature of components Conditions ambient temperature: 27℃; output power: 5V / 1.2A; frequency: 2H



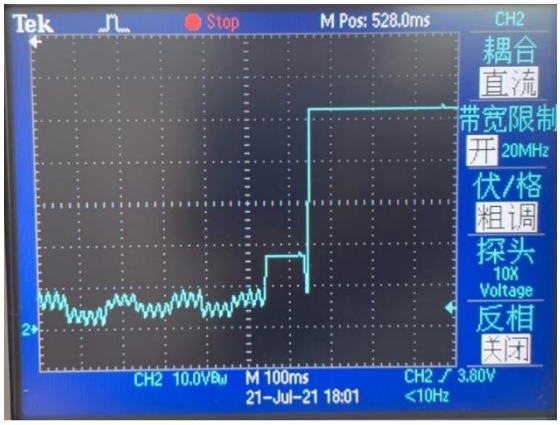
Input voltage & Output voltage



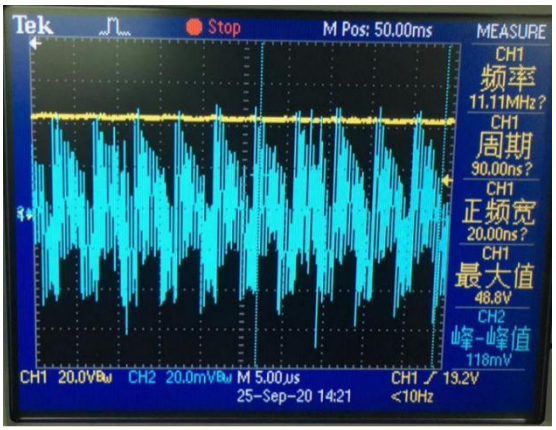
Derating



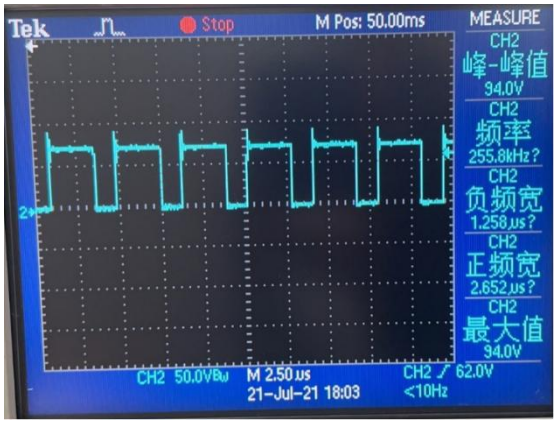
Quiescent current



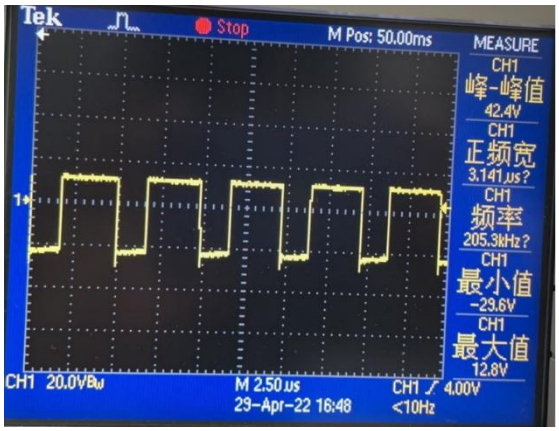
Power on handshake protocol



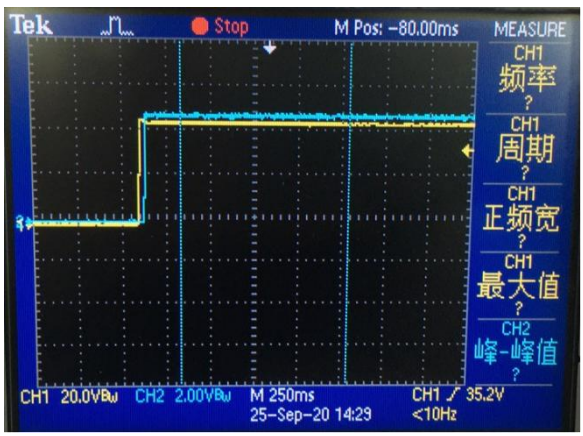
Output ripple (5V/1.2A&100uF)



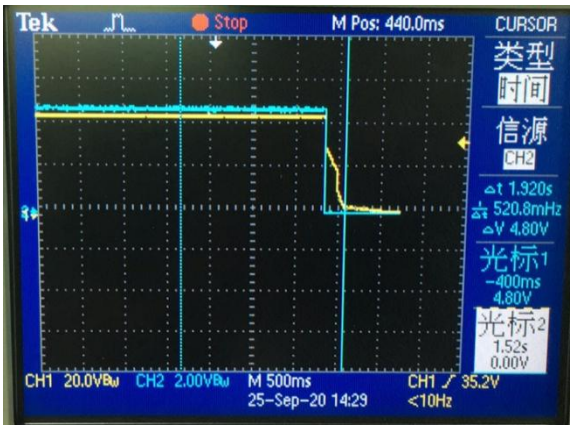
SW switch waveform



Output rectifier diode



Power On



Power Down