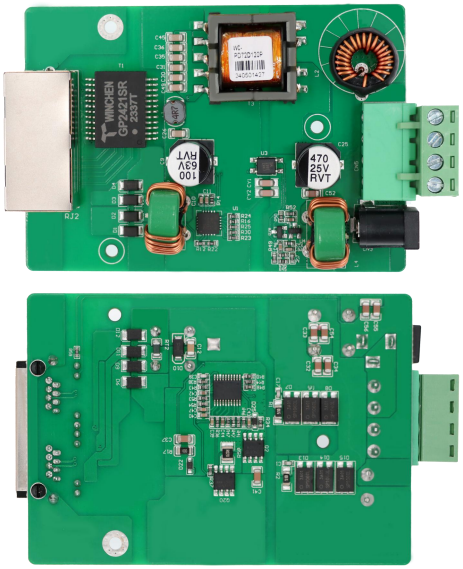
72W PD-12V



Product characteristics

- Compliant with IEEE802.3BT standard (backward compatible with AT/AF)
- Wide operating voltage range of 42V to 57V
- The maximum output power is up to 72W; Rated output: 12V/6A
- Output ripple and noise ≤ 200mV
- Efficient DCDC converter with an efficiency of 90% (input: 48V output) 12V@6A)
- It has excellent reliability and circuit protection such as over current, short circuit, under voltage and surge
- PCB standard size: 90 * 63 * 18.6mm
- Class 8 IEEE802.3 PD
- 1500Vdc isolation voltage (input/output)
- High reliability: This design meets an average failure interval of 5 million hours

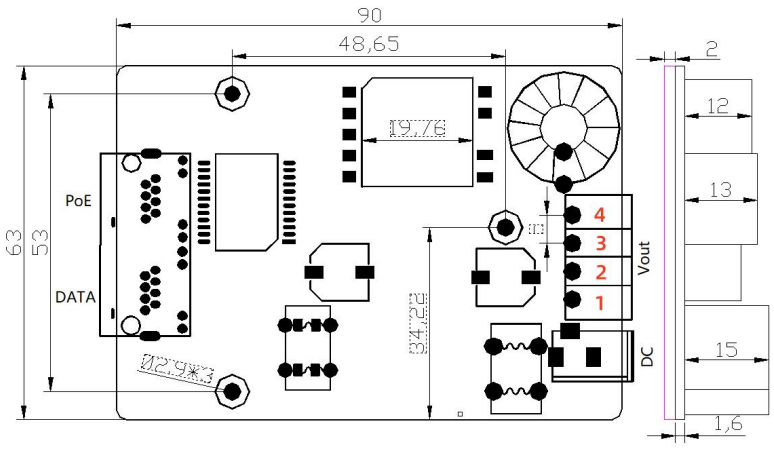
Scope of application

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

Describe

- The WC-PD72D120P PoE (power over Ethernet) module is a traditional Category 5, 6 twisted pair Ethernet power supply module based on the IEEE 802.3bt PoE standard
- Designed to extract power from power equipment (PSE) through conventional twisted pair Category 5e and 6 Ethernet cables. Module input complies with IEEE803.2bt signature recognition and grading standards
- Pre configured as a Type 4 Class 8 device, allowing the module to obtain Class 8 power from PSE, with a rated output voltage of 12V. A high-efficiency DC/DC converter can achieve an efficiency of over 90% and operate over a wide input voltage range, with low ripple and low-noise output. The DC/DC converter also has built-in output overload and output short circuit protection, and provides a 1500Vdc (input-output) isolation barrier

Mechanical dimensions



Unit: mm ; Unmarked tolerances: ±0.5

pin definition

Pin	Name	describe
PoE	PoE	Compliant with IEEE802.3bt standard, with 10/1000Mbps transmission rate input port
DTAT	DTAT	This port supports 10/1000M and 10/1000Mbps data transmission for data output
Vout	1，2	This pin is the module output negative pole
	3，4	This pin is the module output positive pole
DC	DC	Module output power DC port

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	℃

- 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	39	-	-	V
3	Ambient Temperature	TOP	-40	25	80	℃

- Applicable only to WC-PD72D120P maximum operating temperature

DC Characteristic

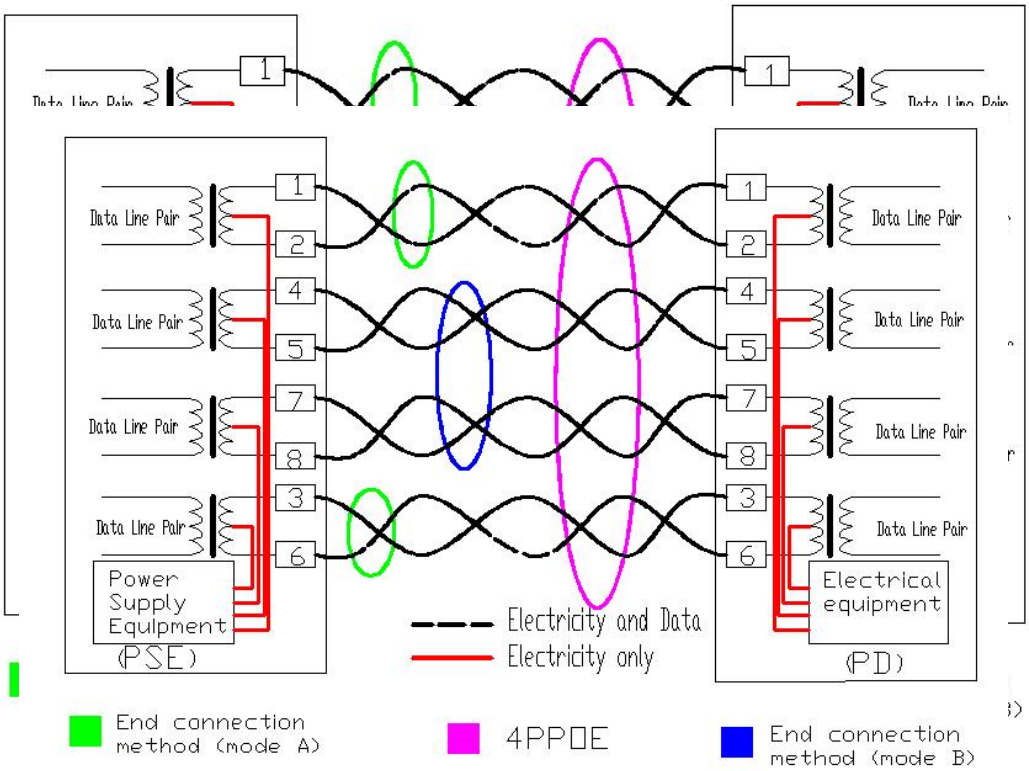
No	parameter	Symbol	MIN	TYP	MAX	Units	Test conditions
1	Standard Output Voltage	VDC	11.75	12	12.2	V	VIN=48v Tc：25℃
2	Output Current (VIN=48V)	PWR	-	6		A	Wide voltage input 42-57V
3	Power adjustment rate	VLINE	-	0.1	-	%	@50% Load
4	Load Adjustment Rate	VLOAD	-	1	-	%	@V_{IN}=48V
5	Ripple Output Noise	VRN	-	200	250	mVp-p	@Maximum Load
6	Minimum Load	RLOAD	10	-	-	mA	
7	Short circuit duration	TSC	-	-	∞	sec	
8	Efficiency (load 80%)	EFF	85	90	-	%	
9	Isolation Voltage (I/O)	VISO	-	-	1500	VPK	
10	temperature coefficient	Tc	-	0.02		%	Per ℃
11	transient response	Ts	-	10	-	mA	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

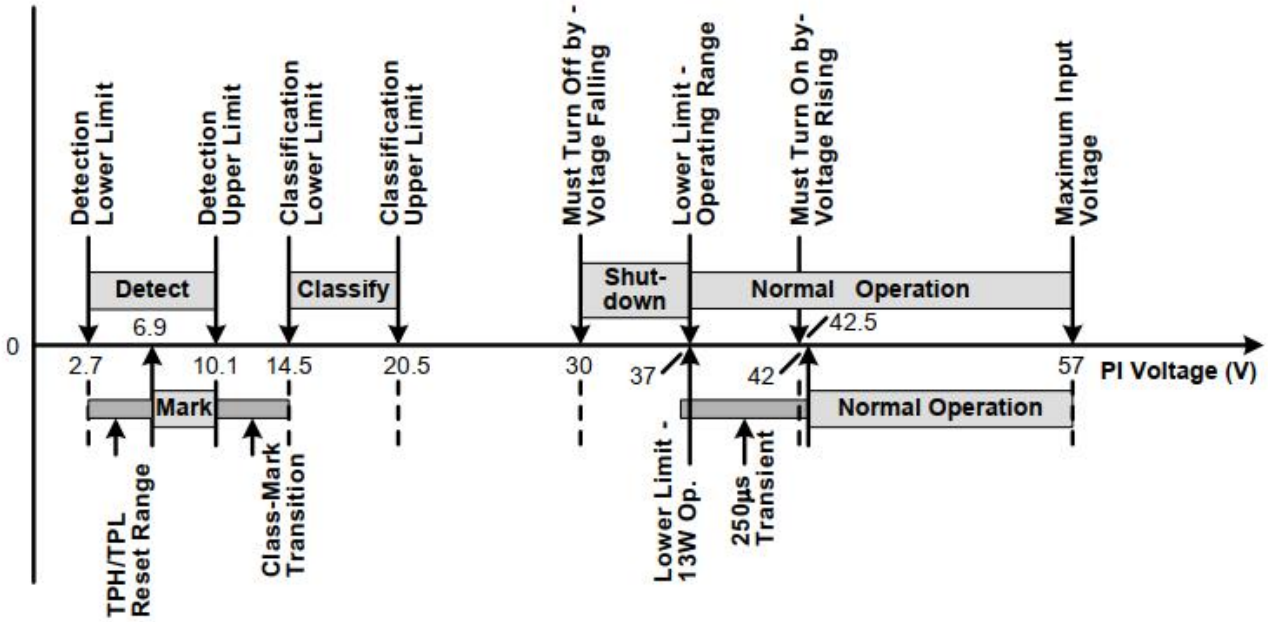
input:

- WC-PD72D120P 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。

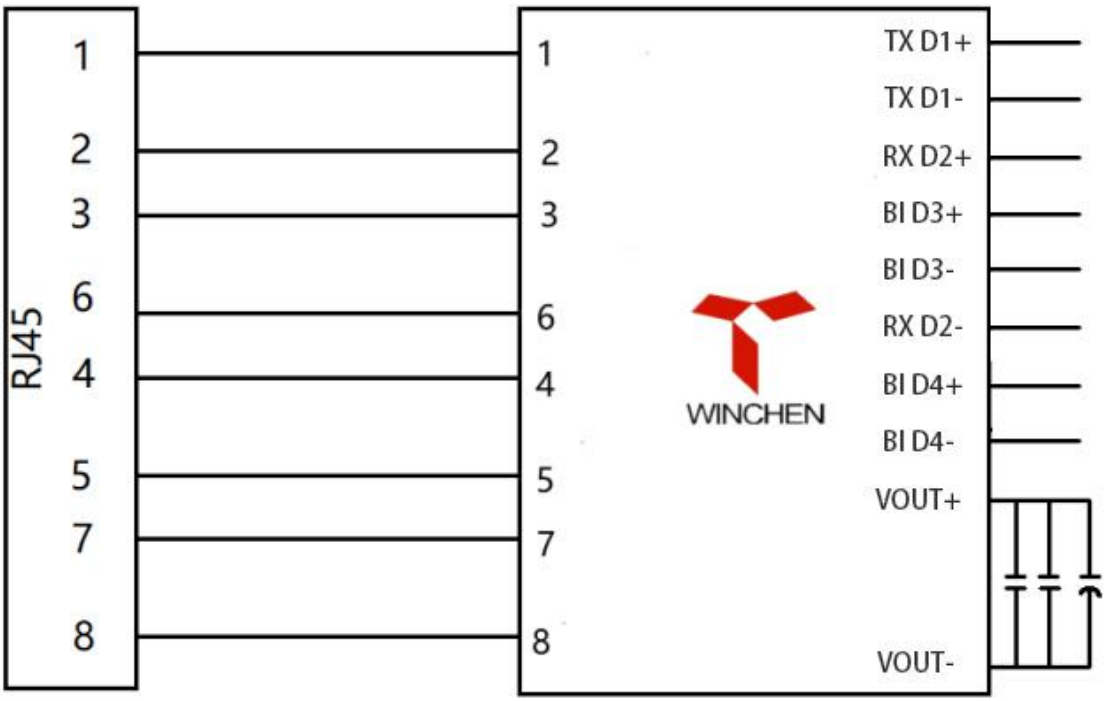


Power Classification:

- WC-PD72D120P uses IEEE802.3bt standard and runs with Class 8 (72W) power rating by default

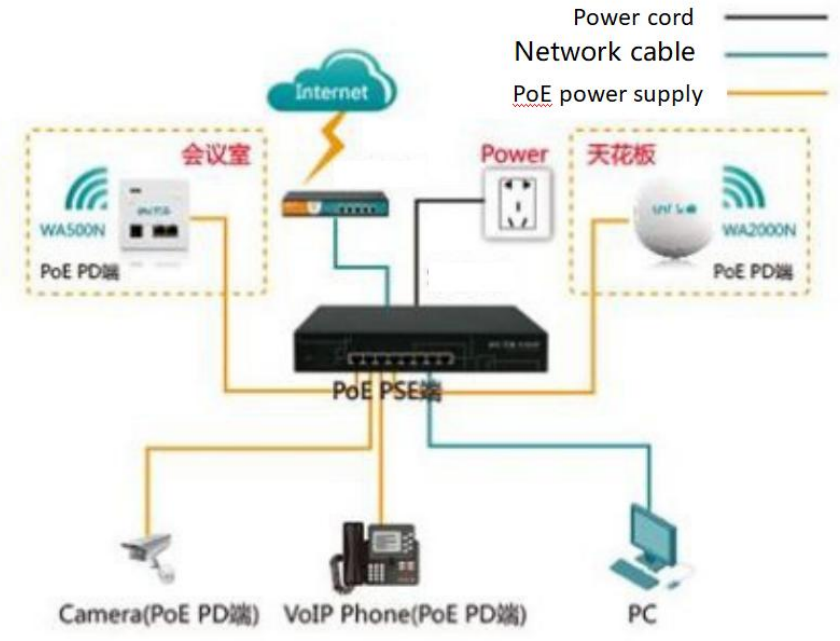
Define criteria	Cable requirements	Grading parameters	Power Supply Characteristics
IEEE802.3at (PoE Plus)	CAT5 cable or CAT6 cable	Maximum power required for Class4 devices is 13W~25.5W	1. The DC voltage ranges from 42 to 57V, with a typical value of 48V. 2. Typical operating current is 10~600mA; typical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



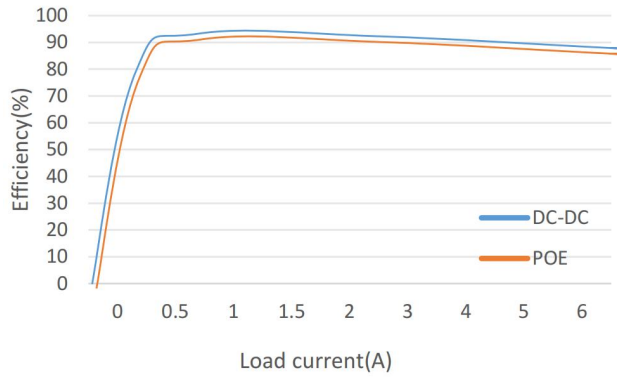
Typical applications

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

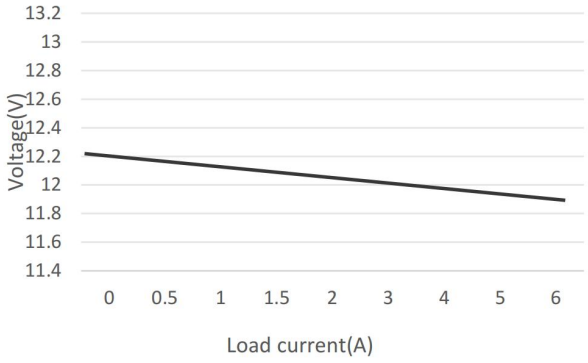


Test waveform diagram

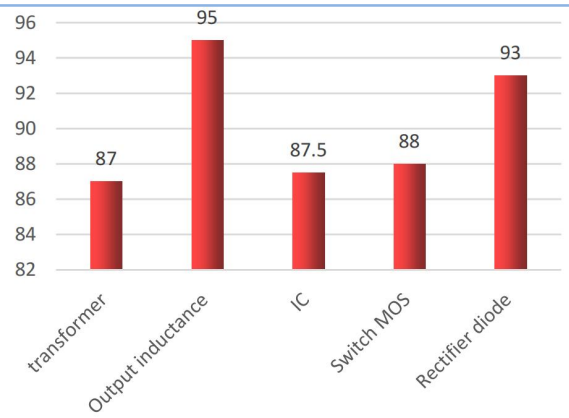
Typical features: Output voltage=12V



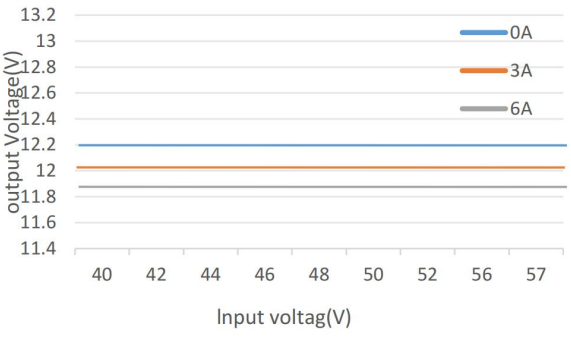
Efficiency (Vout =12V)



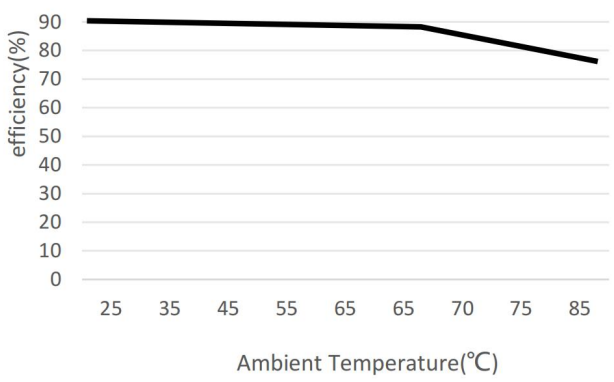
Output current voltage (input 48V)



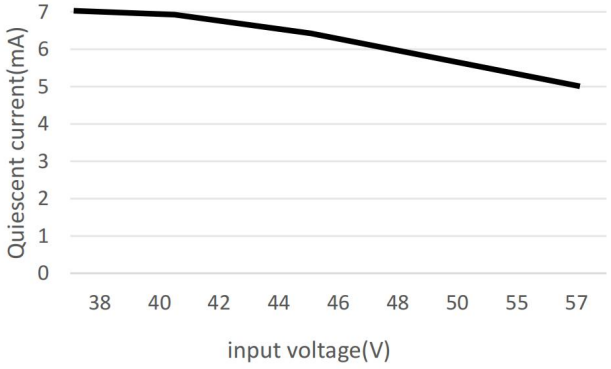
Maximum temperature of components Conditions (ambient temperature: 27 ℃; output power: 12V / 6A; frequency: 3H)



Input voltage & output voltage

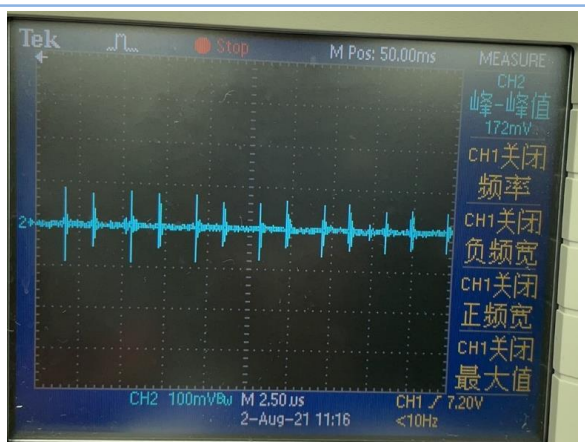


Derating

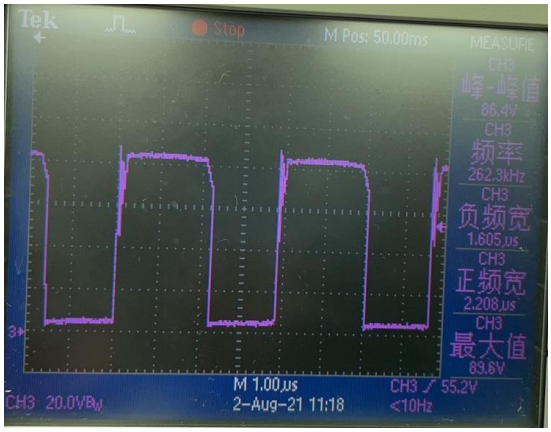


Quiescent current

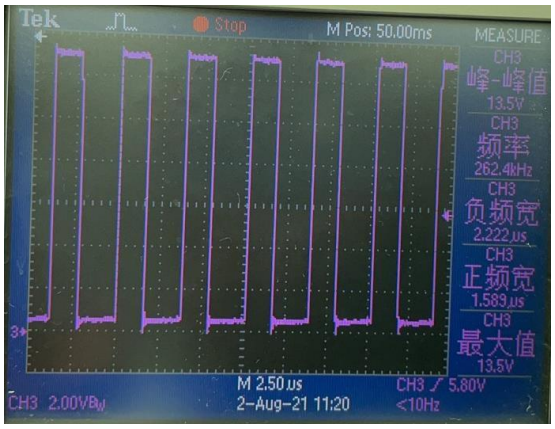
Power on protocol handshake



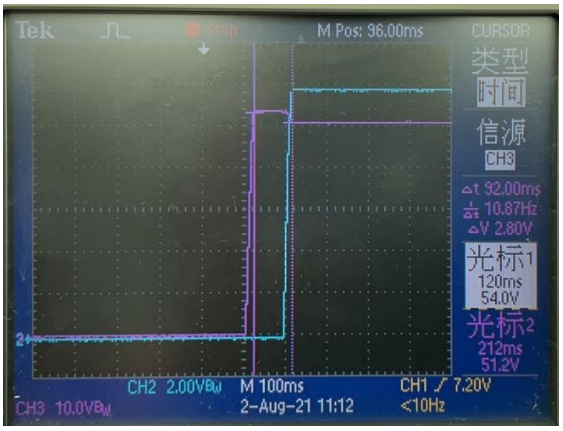
Noise (VIN = 48V, IO = 6A, 5~20MHz bandwidth)



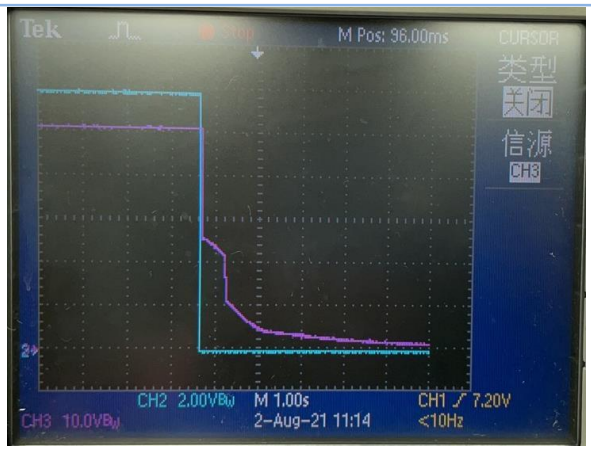
Switching Waveform



PWM



Power On



Power Down