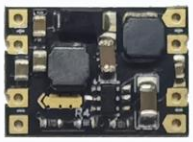
Fy1300-12.0V-1712

Imax:700mA，Vin:3.3V~20V，1.7cm*1.2cm，Buck-Boost

➢ Description



The Fy1300-12.0V module adopts Buck-Boost DC-DC scheme, which can provide 12V power output under a wide voltage input of **3.3V-20V**, with a maximum output current of 700mA, low static current of 270uA @ (Vin=20V), and a working frequency of up to 1.2MHz. The module has a small size, high stability, high cost-effectiveness, and a sinking gold and half hole process, which is both beautiful and convenient for SMT. It can also be inserted into bread boards or hole boards, making it convenient for DIY players to use.

➢ Application Scenarios

Microcontroller power system, CNC power supply, communication equipment, toys, aircraft models, home appliances, security monitoring, field collection, street lights, DIY production, etc. Before using the module, please refer to the "Precautions" section to avoid damaging the module due to incorrect operations.

➢ Electrical Characteristics

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	Vin	_	3.3	_	20①	V
Output Voltage	Vout	Iout=0 mA	19.8	12.0	12.2	V
Output Current	Iout1	Vin=3.3V	_	_	200	mA
	Iout2	Vin=5.0V	_	_	400	mA
	Iout3	20V≥Vin≥9.0V	_	_	700	mA

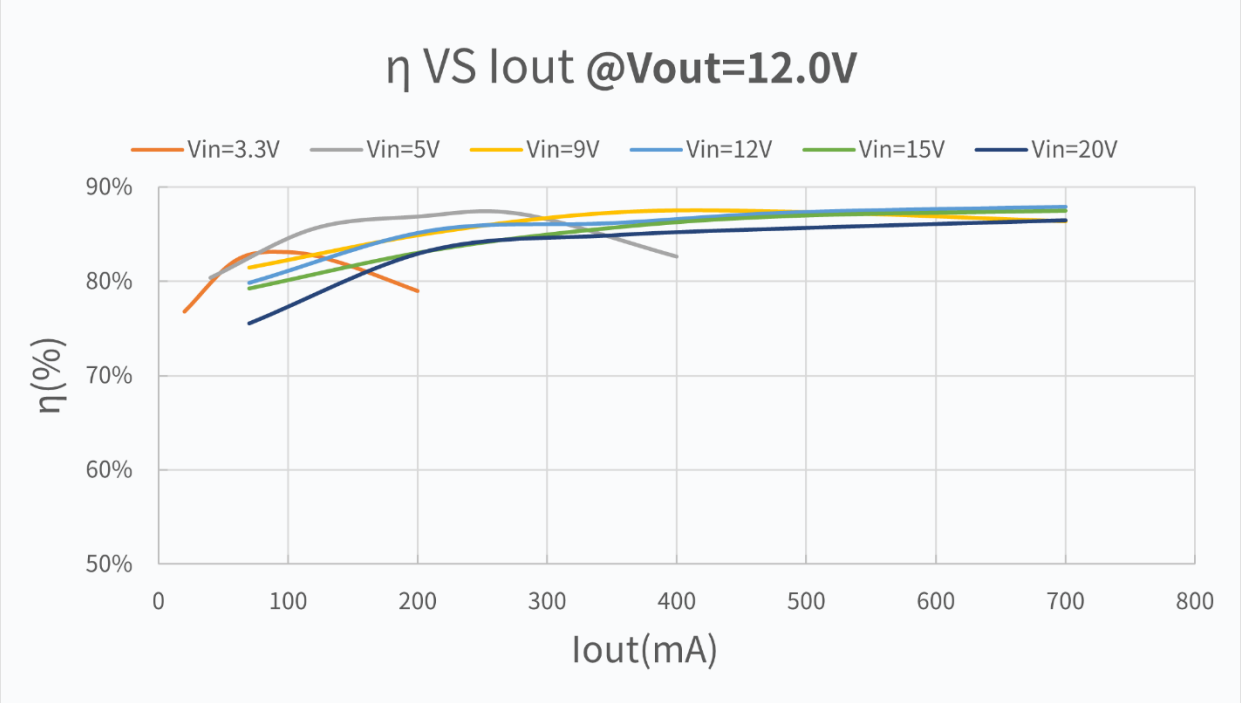
① The recommended working voltage is less than 20V, and the maximum input voltage of the module is 24V. Once exceeded, the module is easily burned.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Efficiency	η	_	_	_	86	%
Ripple Voltage②	Vpp1	Vin=3.3V / Iout=100mA	_	45	-	mV
	Vpp2	Vin=3.3V / Iout=200 mA	_	70	-	mV
	Vpp3	Vin=5.0V / Iout=200 mA	_	53	_	mV
	Vpp4	Vin=5.0V / Iout=400 mA	_	72	_	mV
	Vpp5	20V≥Vin≥5.0V / Iout=350 mA	_	65	_	mV
	Vpp6	20V≥Vin≥5.0V / Iout=700 mA	_	80	_	mV
QuiescentCurrent	Id1	Vin=3.3V / Iout=0mA	_	730	760	uA
	Id2	Vin=5.0V / Iout=0mA	_	460	500	uA
	Id3	Vin=9.0V / Iout=0mA	_	350	400	uA
	Id4	20V≥Vin>9.0V / Iout=0mA	_	350	400	uA
Input Current	Iin	20V≥Vin≥3.3V	_	_	1.2	A
Load Regulation	–	|Vout(full load)- Vout(no load)|*100% /Vout(no load)	–	–	2	%
Line Regulation	–	|Vout(max)- Vout(min)|③ *100% /Vout(no load)	–	–	1	%
Temperature Rise	ΔT	@25 °C room temperature without external heat dissipation Run at full load for 10 minutes	–	–	50	°C
Storage Temperature	–	–	-10	–	+50	°C
Operating Temperature	–	–	-40	–	+105	°C

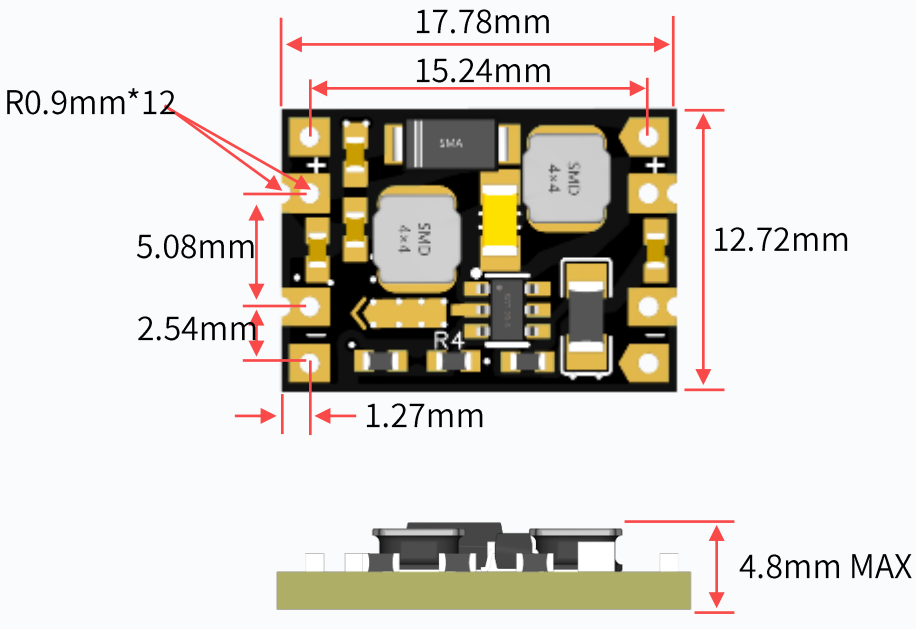
② Using an oscilloscope for testing, use a grounding spring to measure the output terminal. During the test, turn on the 20MHz bandwidth display with a time base of 20ms or 10ms, and measure its peak to peak value.

③ Vout(max)：When fully loaded, adjust the input voltage to slowly change within the full voltage range, and record the maximum output voltage value. Similarly, Vout (min) is the minimum output voltage value recorded.

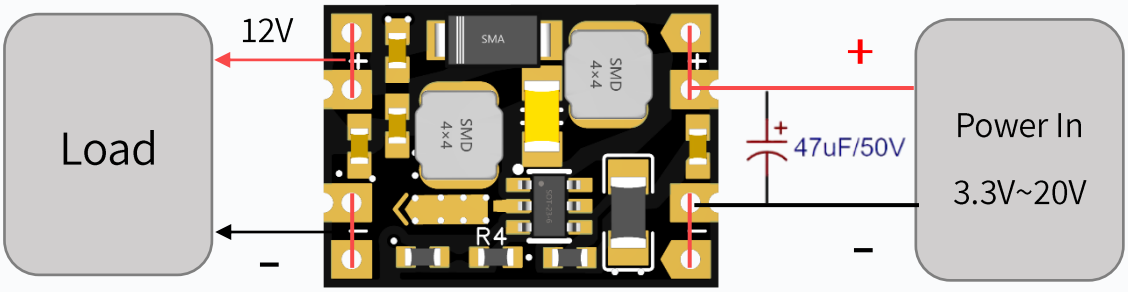
Efficiency VS Iout



Size



➢ Typical applications



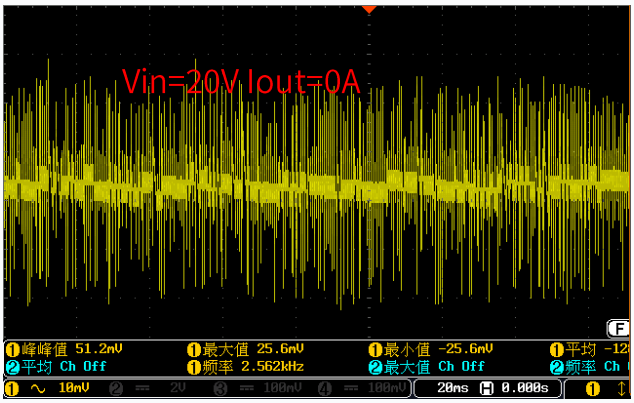
➢ Precautions

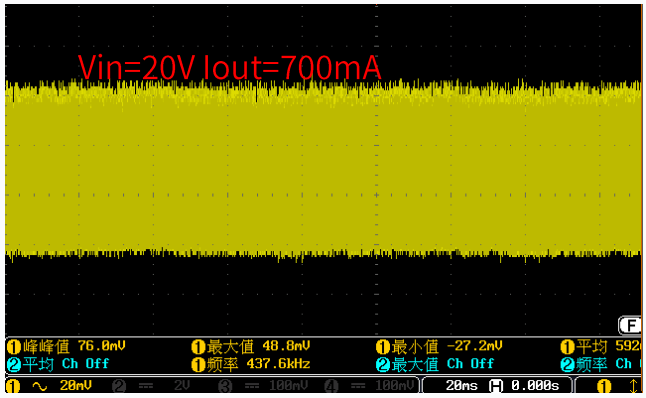
In actual use, improper power on operation may lead to module burnout. The reason for this is that the voltage at the moment of power on is too high, such as hot insertion, live contact with the access module, and switch on/off connection, which can all cause such problems. If the power quality is poor or the subsequent load is large, it can also exacerbate such situations.

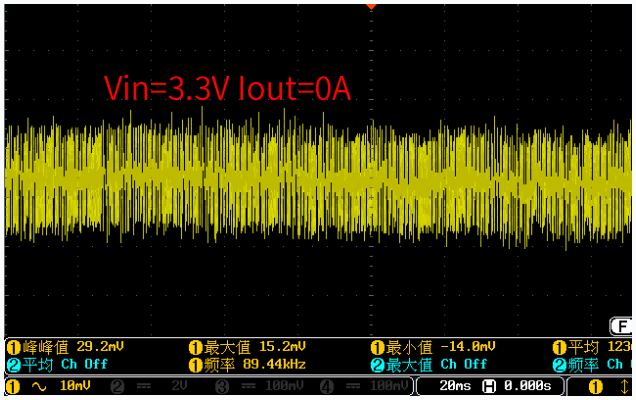
To effectively avoid such problems, it is necessary to limit the voltage during power on.

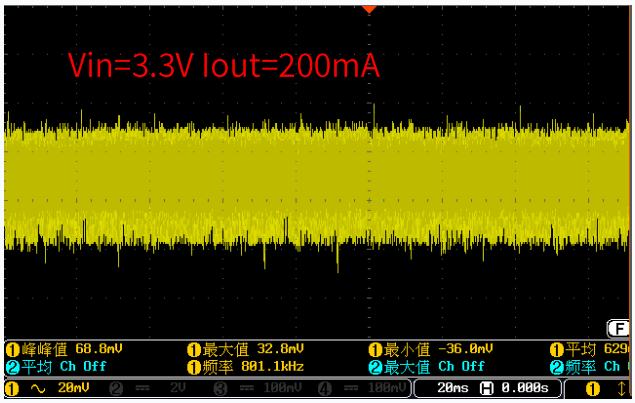
- ✧ Method 1 : Parallel connection of a 47uF electrolytic capacitor at the power input terminal.
- ✧ Method 2 : Add self recovery fuses and TVS devices to the power input terminal.

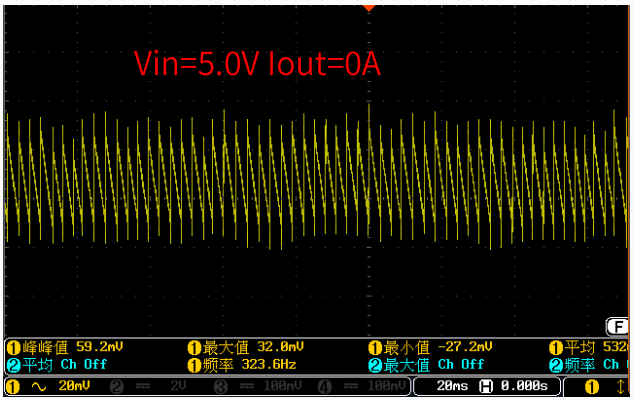
➢ Test Waveform ---Vout=12V

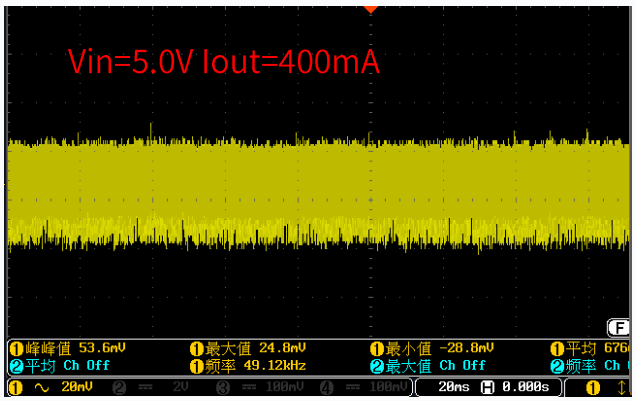


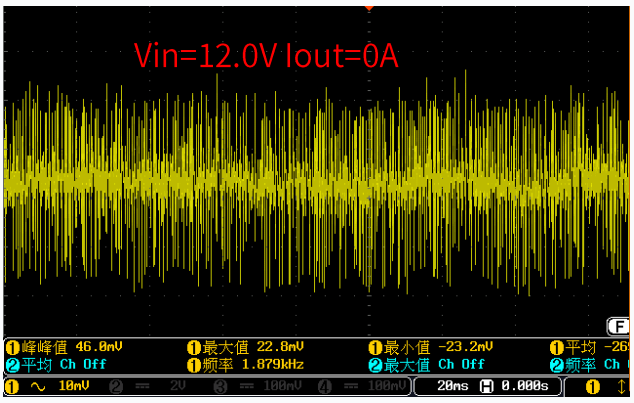


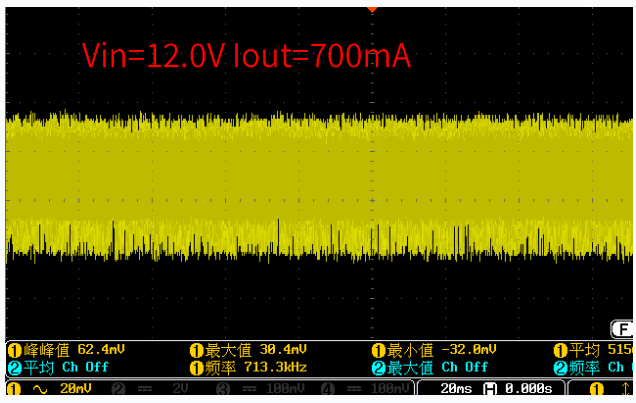

Vin=3.3V Iout=0A
峰峰值 29.2mV
最大值 15.2mV
最小值 -14.0mV
平均 123
平均 Ch Off
频率 89.44kHz
最大值 Ch Off
频率 Ch
10mV
20ms 0.000s

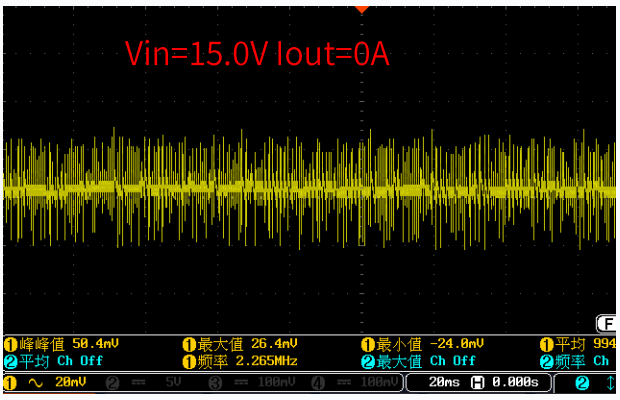

Vin=3.3V Iout=200mA
峰峰值 68.8mV
最大值 32.8mV
最小值 -36.0mV
平均 629
平均 Ch Off
频率 801.1kHz
最大值 Ch Off
频率 Ch
20mV
20ms 0.000s

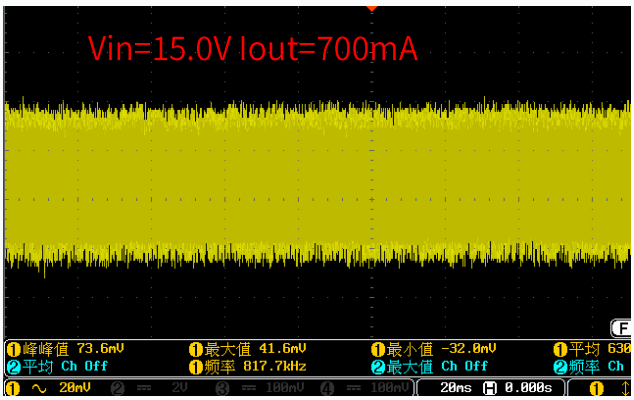

Vin=5.0V Iout=0A
峰峰值 59.2mV
最大值 32.0mV
最小值 -27.2mV
平均 532
平均 Ch Off
频率 323.6Hz
最大值 Ch Off
频率 Ch
20mV
20ms 0.000s

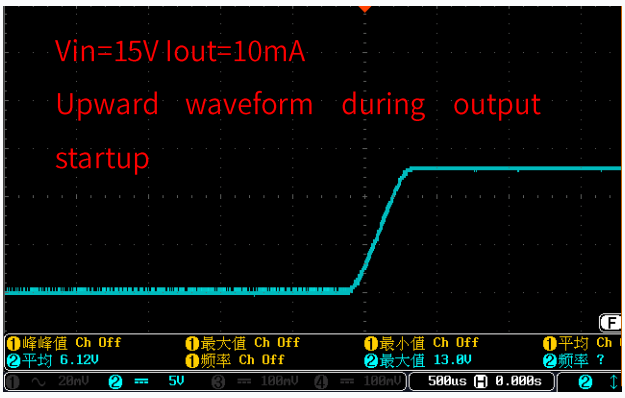

Vin=5.0V Iout=400mA
峰峰值 53.6mV
最大值 24.8mV
最小值 -28.8mV
平均 676
平均 Ch Off
频率 49.12kHz
最大值 Ch Off
频率 Ch
20mV
20ms 0.000s

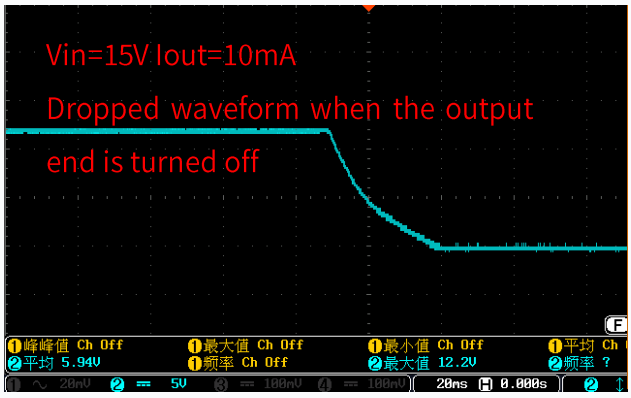

Vin=12.0V Iout=0A
峰峰值 46.0mV
最大值 22.8mV
最小值 -23.2mV
平均 -26
平均 Ch Off
频率 1.879kHz
最大值 Ch Off
频率 Ch
10mV
20ms 0.000s


Vin=12.0V Iout=700mA
峰峰值 62.4mV
最大值 30.4mV
最小值 -32.0mV
平均 515
平均 Ch Off
频率 713.3kHz
最大值 Ch Off
频率 Ch
20mV
20ms 0.000s

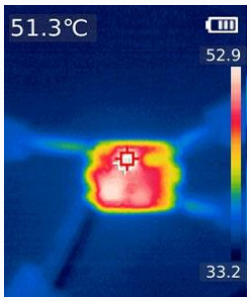

Vin=15.0V Iout=0A
峰峰值 50.4mV
最大值 26.4mV
最小值 -24.0mV
平均 994
平均 Ch Off
频率 2.265MHz
最大值 Ch Off
频率 Ch
20mV
20ms 0.000s


Vin=15.0V Iout=700mA
峰峰值 73.6mV
最大值 41.6mV
最小值 -32.0mV
平均 630
平均 Ch Off
频率 817.7kHz
最大值 Ch Off
频率 Ch
20mV
20ms 0.000s

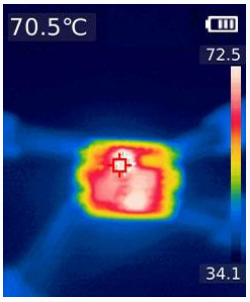




➢ Thermal imaging image

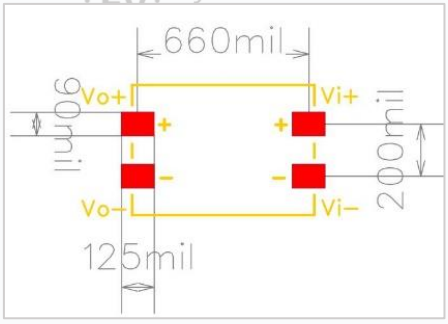


Vo = 12V / Vi = 3V3 / Io = 200mA



Vo = 12V / Vi = 20V / Io = 700mA

➢ PCB packaging reference



Product Selection

Fy1300-3.3V-1712
Fy1300-4.5V-1712④
Fy1300-5.0V-1712
Fy1300-6.2V-1712⑤
Fy1300-9.0V-1712
Fy1300-12.0V-1712

The pin sizes of the above models are fully compatible and can be replaced with each other.

④ Customized version for 3.3V LDO

⑤ Customized version for 5.0V LDO