Shenzhen Vkinging Electronics Co., Ltd

Vk10x-mul charge amplifier

Vk10x mul channel precision charge amplifier

——Precision Precision Reliability

Introduction:

Vk10x mul is a high-precision multichannel charge amplifier. This product adopts high-precision charge conversion unit, low-noise amplification unit, optimized power supply of low-noise power supply, etc., so that this product has the advantages of high precision, ultra-low noise, high suppression ratio, wide measurement range and low-temperature drift. It is suitable for various occasions of precision charge measurement..

The product adopts slot design. Users can flexibly select the required charge range and specific frequency response sub card between each channel, which is more convenient for mixed design and use.

Vk10x-mul ch charge amplifier adopts various measures of all metal shielding and separate shielding of internal core unit to isolate interference. The power supply unit adopts the design of wide input range and high reliability. This product can be used in occasions with strong industrial interference, and has the advantages of moisture-proof and shockproof.

characteristic:

- **High precision, low noise and small frequency response error**
- **It adopts precision devices with high stability**
- **Metal shielding shell, strong anti-interference ability**
- **Adjustable gain, four gain settings**
- **Slot design, flexible channel number configuration**
- **Multi seed card optional (input range / measurement frequency range)**
- **BNC input and output, which can be easily connected to various instruments**

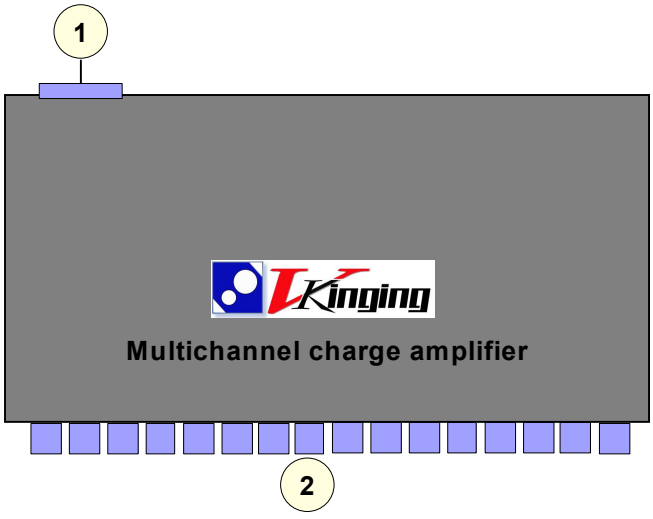
Application:

- Charge detection
- Measurement of piezoelectric effect and photoelectric effect
- Application of acceleration sensor
- Electrostatic detection

Basic parameters

Charge input range	104 sub card: 0 ~ ± 500000 PC 103 sub card: 0 ~ ± 50000pc 102 sub card: 0 ~ ± 5000pc 101 sub card: 0 ~ ± 500pc 100 sub card: 0 ~ ± 50pc
Supply voltage	AC 110V/220V
Frequency response	Type C: 1Hz ~ 10kHz Type H: 10kHz ~ 600kHz VH type: 10kHz ~ 10MHz
Measurement accuracy	<1%
Input impedance	>1TΩ
Residual noise	<1mV

Port diagram

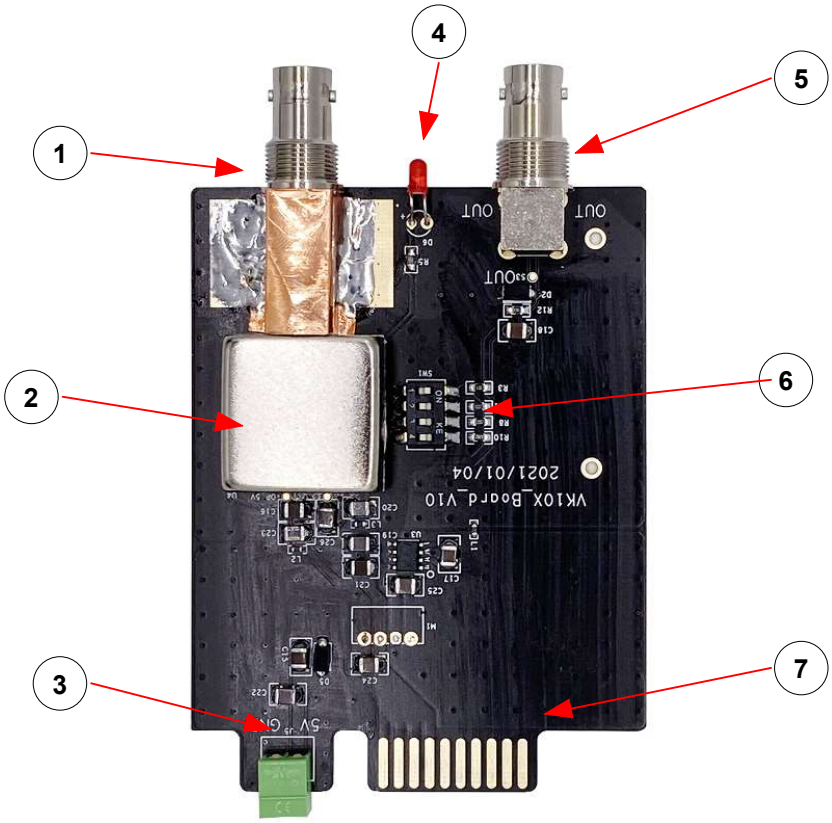


1 Power supply 110V / 220V input

2 BNC input / output

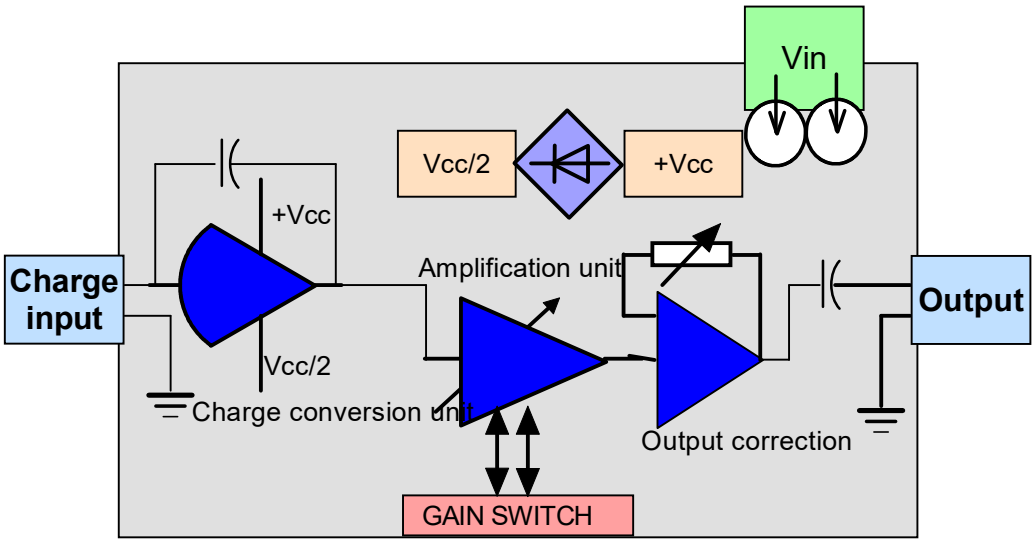
Sub card interface definition

Our daughter cards are inserted into the card slot of the chassis in the form of horizontal direct insertion. If you need to dial out, you can also dial out directly.
If the customer has special application requirements, it can be used as a single amplifier only by supplying power to the sub card separately.
The following figure shows the physical object and related interface definitions of our sub card:

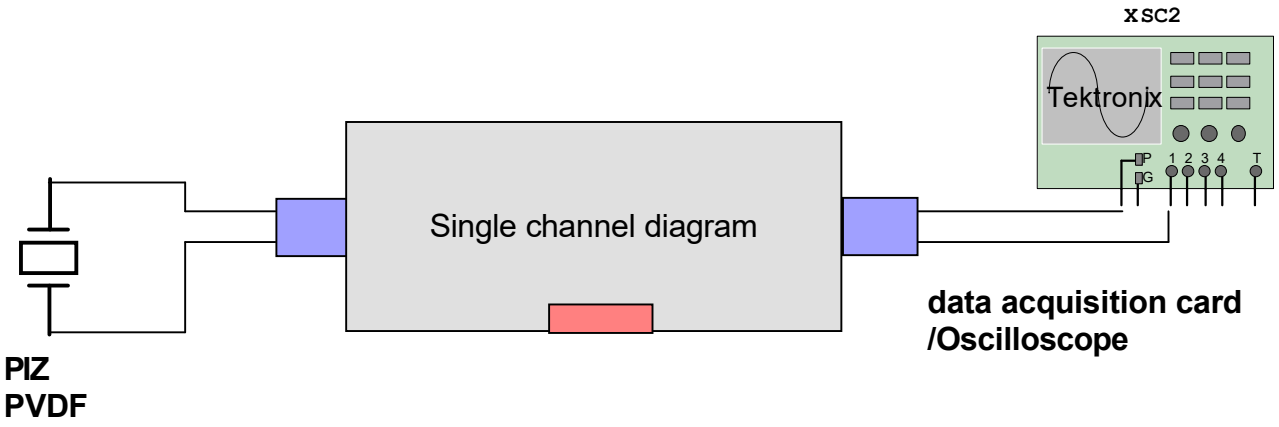


	Name	Function description	Note
1	BNC charge input	Charge / sensor input interface BNC interface: the inner core is signal and the outer layer is GND	
2	Charge amplification module	The core unit of the sub card converts charge into voltageoutput;	
3	Power input	Internal DC 6V power input	Sub card is supports 4 ~ 6V power supply
4	Power indicator	Red LED power indicator	
5	BNC signal output	Voltage signal output BNC interface: the inner core is signal and the outer layer is GND	
6	Gain switch	4-bit toggle switch can change different voltage gain corresponding to different charge sensitivity through 4-bit switching	Factory default is 1 times; The user needs to manually adust the adjustment
7	Card insertion gold finger	Insert the sub card into the card slot for fixing / power supply and test	

Single channel system block diagram



Typical wiring application diagram



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Comprehensive electrical parameters

Item	Unit	Typical	Range
Supply voltage	V	AC 110V/220V	AC85~250
Supply current	A	0.1A	0.1~0.3A
Single card supply current	mA	Type C: 5 Type H: 10 VH type: 75	Type C: 2 ~ 10 Type H: 5 ~ 30 VH type: 50 ~ 150
Input mode		BNC single ended input	
Input charge range		Type 104: ± 500000 PC Type 103: ± 50000pc Type 102: ± 5000pc Type 101: ± 500pc Type 100: ± 50pc	
Input charge frequency response range		Common type C 1Hz ~ 10kHz High frequency h 10kHz ~ 600kHz UHF VH 10kHz ~ 10MHz	
Input impedance	Ω	1T	
Output mode		BNC single ended output	
Output impedance	Ω	75	
Output voltage range	V	-5.5 ~ +5.5V	
Output bias voltage	mV	<0.1	
Dial switch gain accuracy		<0.5%	
Toggle switch gain range		Common type C 1 ~ 101 times High frequency H 1 ~ 11 times UHF VH 1 ~ 6x	
Operating temperature:	Centigrade		-30~ 85
Physical dimensions (length, width and height)	mm	485*245*90	Please refer to the last page of the manual for more details

Safe use value

Item	Unit		
Supply voltage	V	AC250V	***If the safety value is exceeded, the device may be damaged and irreparable damage may be caused**
Charge input port	V	+-2000 (with internal protection circuit)	
Output port	V	-1 ~ + 35V (internal protection circuit)	
All ports electrostatic input (ESD)	V	4000	

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Sub card gain switching selection

The charge amplifier is provided with a charge conversion stage and a voltage amplification stage. When the charge output converts the output voltage, the second stage amplification gain preset by us can be used for re amplification

Shift switch corresponding secondary gain

Type C daughter card

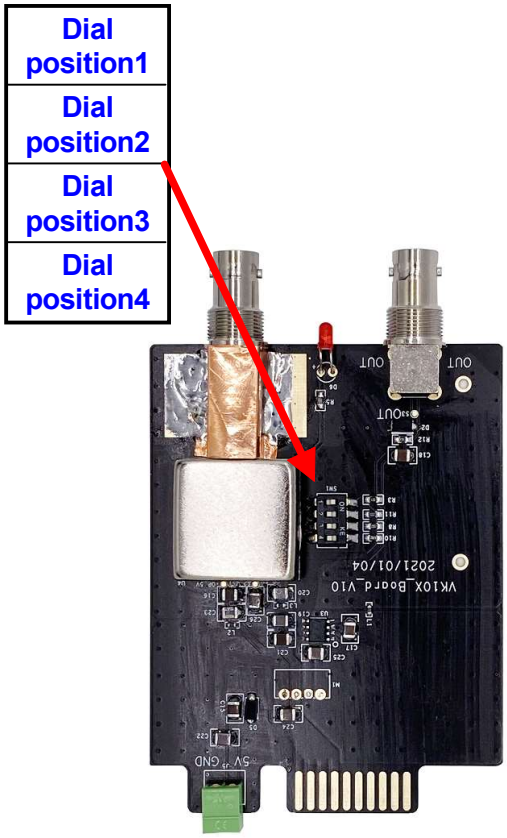
Gain	Dial position1	Dial position2	Dial position3	Dial position4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
10	OFF	OFF	ON	OFF
25	OFF	OFF	OFF	ON
101	OFF	OFF	OFF	OFF

H-type daughter card

Gain	Dial position1	Dial position2	Dial position3	Dial position4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
4	OFF	OFF	ON	OFF
8	OFF	OFF	OFF	ON
11	OFF	OFF	OFF	OFF

VH daughter card

Gain	Dial position1	Dial position2	Dial position3	Dial position4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	OFF	OFF	ON	OFF
4	OFF	OFF	OFF	ON
6	OFF	OFF	OFF	OFF



*Factory default is 1 times

Charge vs voltage output

The charge conversion sensitivity AC is:
Type 100: input range 0 ~ ± 50pc, sensitivity AC = 1pc / 100mV
Type 101: input range 0 ~ ± 500pc, sensitivity AC = 10pc / 100mV
Type 102: input range 0 ~ ± 5000pc, sensitivity AC = 100pc / 100mV
Type 103: input range 0 ~ ± 50000pc, sensitivity AC = 1000pc / 100mV
Type 104: input range 0 ~ ± 500000 PC, sensitivity AC = 10000 PC / 100mV
Type 105: input range 0 ~ ± 5000000pc, sensitivity AC = 100000pc / 100mV

Then the charge CIN is equal to the output voltage Vout times the sensitivity AC
Cin = Vout * Ac
If the gain is set, the gain gain must be calculated. The value of the charge conversion stage is the output voltage divided by the gain

$$Cin = \frac{Vout \cdot Ac}{Gain}$$

CIN: amount of charge
AC: charge conversion sensitivity
Gain: set magnification
Vout: amplifier output voltage value

Taking vk103 as an example, the output measured to 800mv peak, the amplifier sensitivity AC = 1000pc / 100mV, gain = 2, then the charge is 4000pc

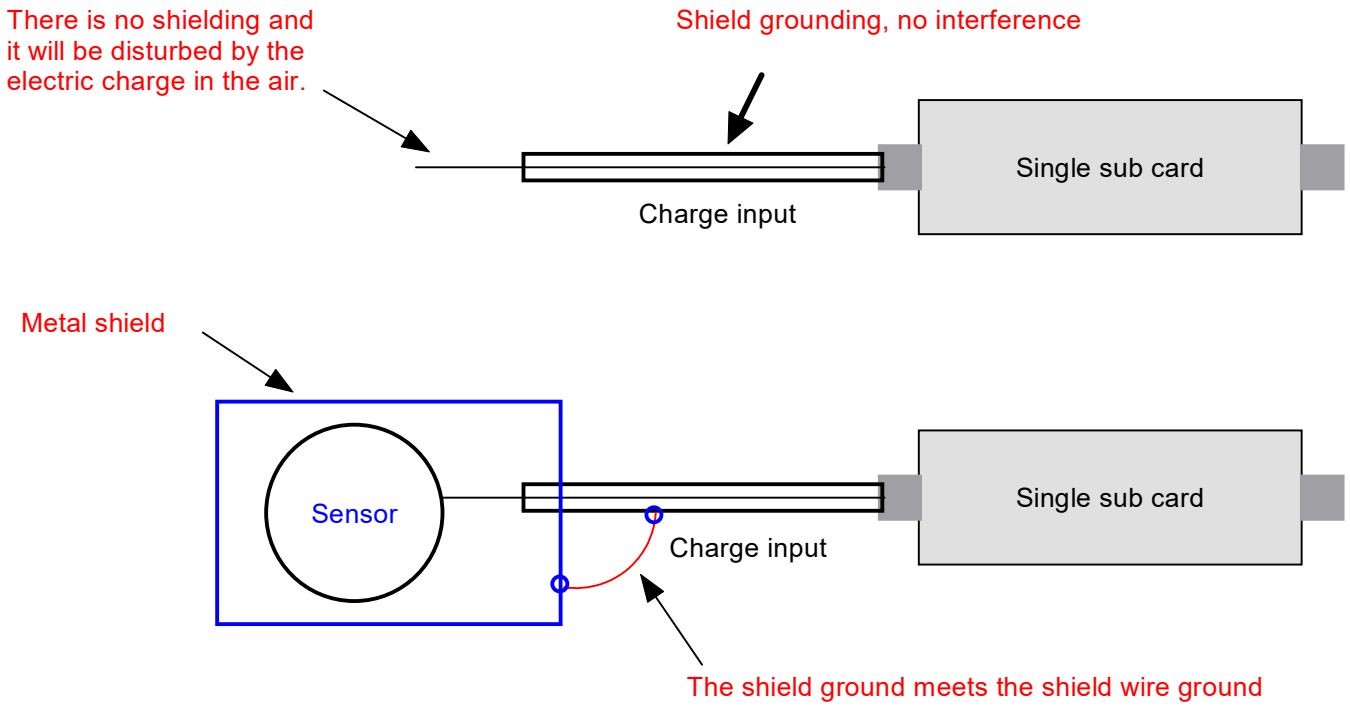
Notes for use

Charge input processing

The input of the charge amplifier is the charge signal, and the unit is coulomb(C), 1 Coulomb(C) = 1,000,000 Micro coulomb(uC)

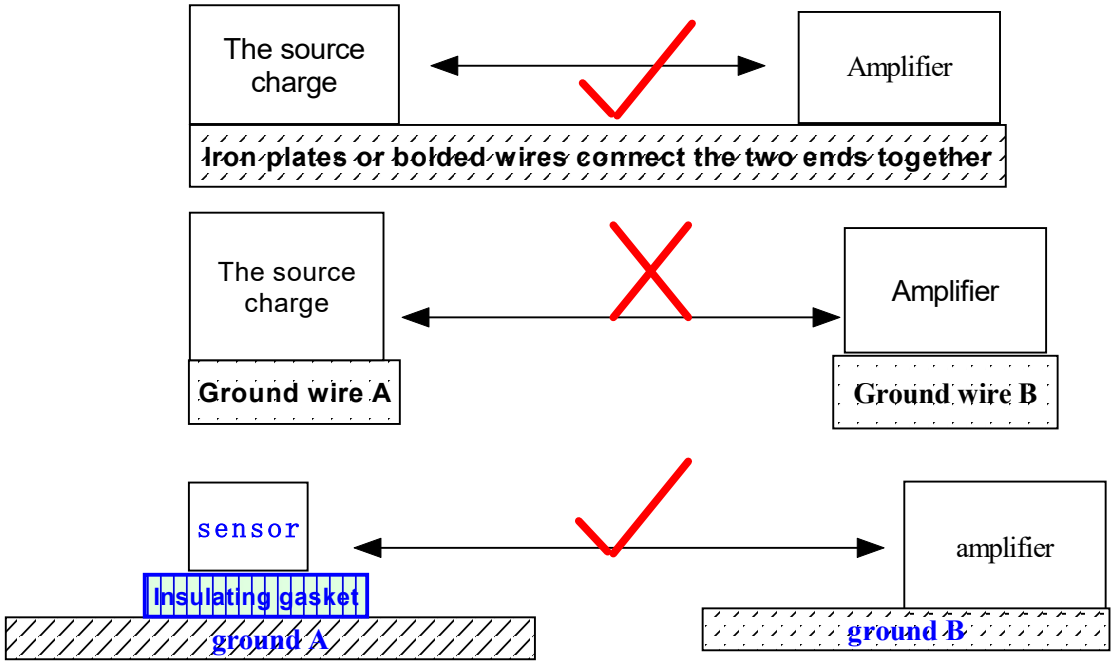
1 uC = 1000 nC = 1,000,000 pC

Charge for limited unit electronic components of the weak signal, so extremely vulnerable to air humidity, temperature and the influence of space charge distribution in. Especially when there are strong electric field in the space, electric conduction through the air charge to charge input resulting in interference. So charge input shielding input wire or the input source device as far as possible, try to avoid input directly exposed to the air.



Reference processing of charge input

If be measured between charge and charge amplifier, if the ground plane is not very strong, there will be a weak electric potential difference. In charge measurements, weak electric potential difference will lead to the output of the strong interference. So if the measurement between the source and amplifier or far altogether to poor circumstances, try to improve the total conditions in order to achieve good results.



Physical drawing and dimension drawing

Front view

Back view

***The physical appearance is subject to change without notice, and the company reserves all the right of interpretation**