INTRODUCTION

Thank you for buying SG1634N&SG1638N series function generator/counter.

Please read this manual carefully before operation and keep it well.

Suggest to use an oscilloscope to watch the waveform when operation.

In order to ensure the product's specification, please use it in stated working condition.

Please contact with our market department or service center if there's something wrong with the instrument, you'll get efficient help.

Safe warning

Instrument's AC power supply should be fit for the given request (AC220V±10% 50Hz /110V±10% 60Hz switchable)

Please select the real input voltage by the voltage selector

Instrument's AC power supply should have safe GND.

Changing fuse should be fit for given request.

Each output, input port should not contact AC power supply.

Each output, input port should not contact over ±35V AC or DC power.

Output port should try to avoid long-time short circuit. (≤1m)

In order to ensure instrument's accuracy, please avoid strong magnetoelectricity.

Contents

1. Description

SG1634N&SG1638N series function generator/counter is a new-type high accuracy function generator. It is new, beautiful panel and easily operation. It has the function of frequency display/ counter display (SG1638N). Each port has protection function, efficiently prevent the damage by output short circuit and out circuit current devise. And all that improves the instrument's liability. The instrument can be used for experiments or inspections in factories, schools or scientific researches and so on.

Main characters:
- Multi waveforms: sine, triangle, square, ramp, pulse and etc.
- Separate TTL, 50Hz sine and single output.
- DC offset and symmetry continuously adjustable.
- VCF input.
- Built-in 6 digits counter up to 30MHz equal accuracy (SG1638N).

2. Specifications:

2.1 Main output:

Model	SG1634N	SG1638N
Output frequency	0.2Hz～2MHz	
Frequency step	six-step, decimalism	
Frequency adjustment ratio	Rate: 0.1～1 Range: 0.2~2	
Output waves	sine、square、triangle、pulse、ramp、and 50Hz sine	
Output impedance	50Ω±10%	
Output signal type	single、VCF	
VCF	0～5V VCF≥100:1	
External FM voltage	0～3Vp-p	
Output amplitude	20Vp-p (1MΩ) 10Vp-p (50Ω)	
Output protection	short circuit, resist input voltage: ±35V (1M)	
Distortion of sine waves	≤100k 2% > 100k 30dB	
Frequency response	≤100KHz ±0.5dB > 100KHz±1dB	

Linearity of triangle wave	≤100kHz： 98%
	> 100kHz : 95%
Duty adjustment	20%～80%
DC offset	±10V (1MΩ) ±5V (50Ω)
Rising time of square wave	100ns
	5Vp-p 1MHz
Attenuation accuracy	≤±3%
Effect of duty on frequency	±10%
50Hz sine output	About 2Vp-p

2.2 TTL/CMOS out

Model	SG1634N	SG1638N
Output amplitude	"0":≤0.6V;　"1"：≥2.8V	
Output impedance	600Ω	
Output protect	Short circuit, resist input voltage: ±35V (1M)	

2.3 Frequency counter:

Model	SG1634N	SG1638N
Measurement accuracy	---	6digits±1% ±1word
Resolution	---	0.1Hz
Gate time	---	10s (≤8kHz) 1s (8kHz to 200kHz) 0.1s (200kHz to 15MHz)
Ext measurement frequency range	---	1Hz～15MHz
Ext measurement frequency sensitivity	---	200mV
Range of counter	---	6(999999)

2.4 Power:

- Voltage: 220±10%V /110±10%V (Switchable)
- Frequency: 50±2Hz/60±2Hz
- Visual power: 10VA prox.;
- Fuse: 0.5A

2.5 Physical characteristics:

- Weight: Appro. 3kg
- Dimensions: 225(W)×105(H)×285(D)(mm)

2.6 Environment conditions:

- Working temperature: 0～40°C
- Storage temperature: -40～60°C
- Max working humidity: 90%(40°C)
- Max storage humidity: 90%(50°C)
- Other demands: continually vibrate and impact should be avoided. No acid、alkali、and hydrochloric air

3. Operation:

3.1 Working environment and power should be agreeable with the given demands in the specification.

3.2 The instrument should be put in the place where is ventilative and dry for several hours and turn on for 1-2 hours, then it can be used if it is used the fist time or storage for a long time.

3.3 In order to get super-quality small signal (mV) please put the switch of "EXT measurement" on "EXT" to reduce the disturbance of the wave of digital signal.

3.4 Please choice high measurement range first when use external measurement, then choice appropriate measurement range according to the measurement value to ensure measurement accuracy.

3.5 Voltage output amplitude、TTL/CMOS output should try to avoid long-time short circuit or current devise.

3.6 Each input terminal or input voltage should not be over ±35V

3.7 In order to watch correct function wave, oscilloscope's belt width should be twice times than maximum frequency on this instrument.

3.8 If the instrument can not work normally, check the operating procedures again. It is certain that there is something wrong with the machine, please contact with the nearest service center.
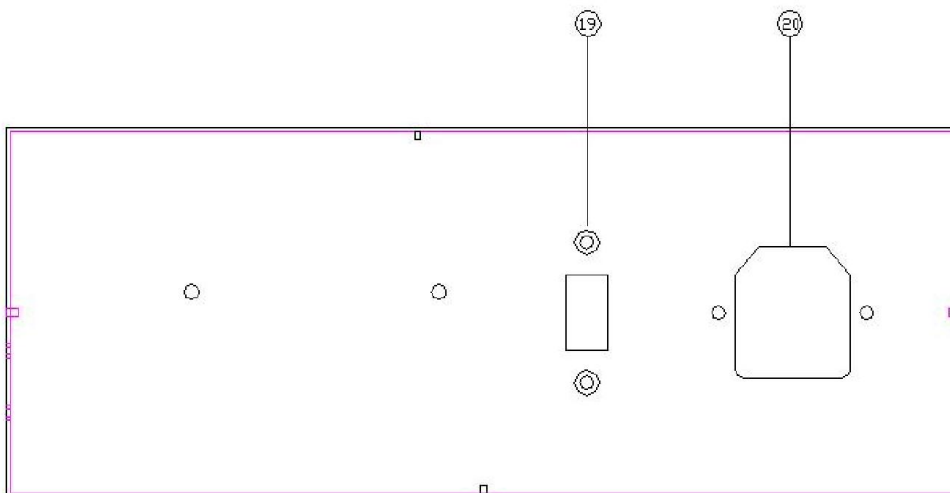
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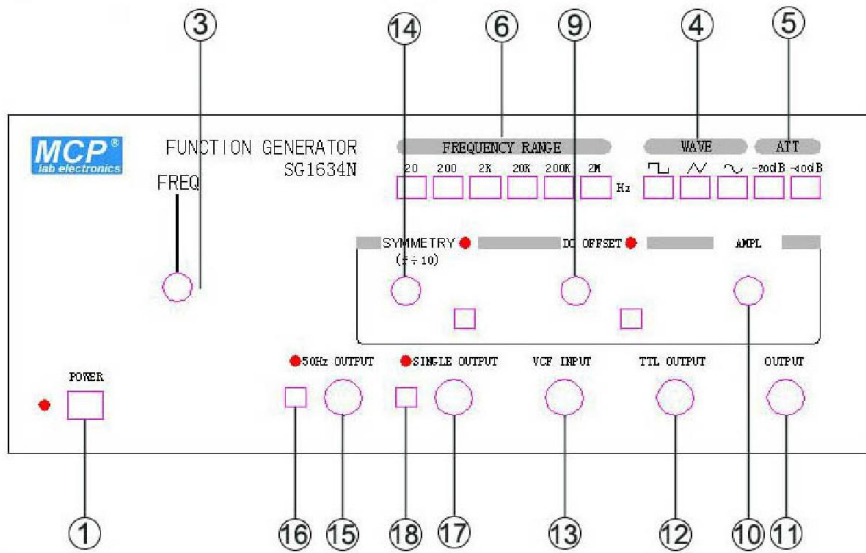
SG1634N Function Generator Front Panel
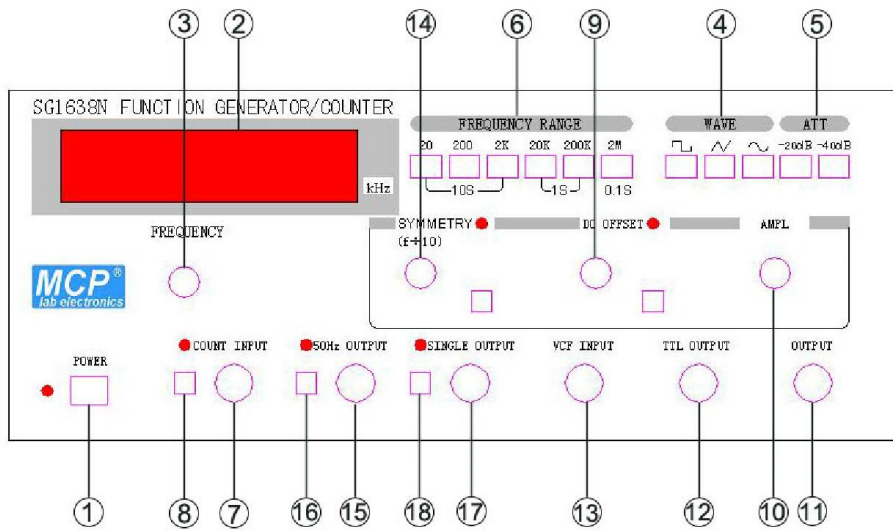
SG1638N Function Generator Front Panel

SG1634N&SG1638N Function Generator Back Panel

(1) Power: spring out means "off". Connect the power line. Push down the knob and power is on.

(2) LED window: this window indicates the frequency of output signal, when "EXT" is on, it displays frequency of external signal. If over the measurement range, the light "overflow" is on.

(3) Frequency: adjust this rotary to change output frequency signal, the frequency will be big while turn it clockwise.

(4) Wave form: choose the wave you need if you press the correspondence key.

(5) ATTE: The voltage output attenuate switch, two-switch combination is 20db, 40db, 60db.

(6) Frequency range selector: (frequency counter gate switch): Press one key according the needed frequency.

(7) Counter/Frequency terminal: Counter, EXT frequency input terminal.

(8) EXT frequency switch: Press this switch, LED window will display EXT signal frequency or counter value.

(9) Level adjustment: Press level adjustment switch, the light "level" is on, then adjusting level adjustment rotary can change DC level offset.

(10) Amplitude: The voltage output amplitude will be big while turning it clockwise, and the value will be small while turning it counterclockwise.

(11) Voltage out: voltage is out via this terminal.

(12) TTL/CMOS out: TTL/CMOS is out via this terminal.

(13) VCF: Voltage controlling frequency change input is via this terminal.

(14) SYMMETRY: sym switch, duty adjustable rotary, press duty switch, the light "SYM" is on; adjusting duty rotary can change the duty of wave.

(15) 50Hz sine output: 50Hz about 2Vp-p sine wave deliver via this terminal.

(16) Press the switch: 50Hz sine out

(17) Single sine output

(18) Press the switch: single sine output

(19) 110V/220V voltage selector

(20) AC 220V input socket.

5. BASIC OPERATION METHODS:

Before power is on, fist check the input voltage, insert the power line into the AC socket in the rear panel. Set each controlling knob as the following table:

POWER Knob	Spring out
ATTE Knob	Spring out
COUNTER Knob	Spring out
LEVEL Knob	Spring out
SWEEP Knob	Spring out
DUTY Knob	Spring out

After that, turn on the switch. The function signal generator acquiesce 10k sine wave, LED window display it's out signal frequency.

5.1 Deliver the voltage out signal to oscilloscope Y input terminal via amplitude terminal.

5.2 Triangle、square、sine wave form:

5.2.1 Press sine、square、triangle wave, the screen of oscilloscope will display sine、square、and triangle.

5.2.2 Press frequency range selector and rotate the frequency rotation, the waveform on the oscilloscope's screen and frequency on LED window will change evidently.

5.2.3 Turn the amplitude rotary to maximum, the wave amplitude on the oscilloscope's screen will be ≥20Vp-p

5.2.4 Press "LEVEL", turn the "level" rotary to max, wave on oscilloscope will move upside, and vise visa. The max change should be ±10V or more.
NOTICE: when signal is over ±10V or ±5V (50Ω),the amplitude is limited.

5.2.5 Press "ATTE", the out waveform will be attenuated.

5.3 COUNTER.

5.3.1 Press "COUNTER", when the counter/frequency input terminal input signal, LED display "begin to counter".

5.3.2 Choose agreeable frequency range; choose the agreeable and efficient digits from high measurement range to low measurement range. Ensure the measurement accuracy. (NOTICE: when the light "overflow" is on, please advance one measurement range.) The count should be measured based on the frequency of stalls suitable choice. 10s (20, 200, 2 k), 1s (20k, 200k), 0.1s (2M)

5.4 RAMP:

5.4.1 Put the wave switch on "TRIANGLE".

5.4.2 Press "DUTY", the indicator is on.

5.4.3 Adjusting the duty rotary, the triangle wave will change Ramp wave.

5.5 TTL OUT:

5.5.1 TTL/CMOS connect with oscilloscope's Y axis input terminal (DC input)

5.5.2 Oscilloscope will display square wave or pulse wave, it can be used as clock signal generator on TTL/CMOS digital circuit experiment.

5.6 VCF: Input $0\sim5V$ AM signal via VCF input terminal, and the output signal controls by voltage.

5.8 50Hz sine wave: Output 50Hz about 2Vp-p sine wave via AC output terminal.

5.9 Single sine output: output 0~4.5V single pulse

6. INSTRUMENT ACCESSORIES:

The standard accessories are as following:

(1) Function Signal Generator	1 set
(2) Connect cable	1 piece
(3) Operation manual	1copy
(4) Fuse	1piece
(5) Power cord	1piece