CA1641/CA1641P

Function generator/counter

Operation Guide

1、Introduction of the instrument

Reliable circuitry Insure high stability and accuracy.This instrument has such signal generating function as dual_channel function,linear sweep frequency、logarithmic sweep frequency, FSK、AM、FM,ect,and any counts generation function for function singals.It is an ideal device for electronic engineers,lab,production lines,teaching,scientific research,ect.

2、Main features

1.Large scale integrated circuits,high_speed micro_processor technique are adopted into the instrument;

2.With the functions such as sine wave,square wave,pulse wave,triangle wave,;

3. Internal linear,long sweeping function,FM,AM,FSK;External FM,AM;

4.With digital frequency meter and counter;

5.The cabinet design is artistic,key operation is eary and comfortable;

3、Technical index

●Technical index of signal generator

Item		Technical index
Frequency range		CA1641-02:0.2Hz~2MHz seven steps; CA1641P-02:0.2Hz~2MHz seven steps; CA1641-20:0.2Hz~20MHz eight steps; CA1641P-20:0.2Hz~20MHz eight steps; Each step were finetuning the frequency offrequency adjustment potentiometer;
Impedance	Function	50Ω
	TTL	600Ω
Output waveform	Function output	Sine、Triangle、Square waves
	Synchronous output	Pulse wave
Output singnal amplitude	Function output	≥20Vp-p±10% (No Load) : (fo≤15MHz,no attenuation) ≥10Vp-p±10% (No Load) : (15MHz ≤fo≤20MHz,no attenuation)

(续上表)

Output singnal amplitude	Synchronous output	TTL level:"0"level: ≤0.8V, "1"level: ≥1.8V(Load≥600Ω) CMOS level:"0"level: ≤4.5V, "1"level: 5V~≥13.5V adjuetale(fo≤2MHz)
	Single pulse	"0": level ≤0.5V, "1": level ≥3V
DC (offset)		±10V(1MΩ),±5V(50Ω);
Output signal attenuation		0dB、20dB、40dB and 60dB(0dB is no attenuation)
Output signal type		Single-frequency signal、FSK、AM、FM、Frequency sweeping signal
Duty of frequency output		20%~80%; error:≤2%
Internal sweep	Sweep mode	Linear/logarithmic sweep
	Sweep time	10ms~5ms±10%
	Sweep width	≥1 freq.rule

（续上表）

Modulation mode:internal	FSK	Modulation frequency:1kHz;error:0~≥5 %
	FM	Modulation frequency:1kHz;error:0~≥5 %
	AM	Modulation depth:0~100 % ±5 % ;Modulation frequency:1kHz; Carrier wave frequency:1、10、10M no AM;
Modulation mode:external	FM	Input amplitude:0V~2V; impedance:≈100kΩ Input cycle:10ms~5s;error:0~≥5%
	AM	Input amplitude:0V~2V; impedance :约 100kΩ Input cycle:10ms~5s;Modulation depth:0~100 % ±5 % Carrier wave frequency:1、10、10M no AM;
Waveform feature	Sine wave distortion	<1 % (fo=1kHz、Uo= 10Vp-p)
	Triangle wave linearty	>90 % (Amplitude range: 10 % ~90 %)
	Pulse wave rising&falling time	≤30ns(test condition:fo=1MHz、Uo= 10Vp-p)

（续上表）

Output worng linking detection voltage		≥±15V;Maximum input reverse voitage is±30V (test condition:DC"OFF")
Output frequency stability		±0.1 %/min(testing condition: 1k steps,warm-up 15min)
Amplitude display	Display digit	three
	units	Vp-p or mVp-p、Vrms or mVrms
	error	V_o±20 % (Load=50Ω, V_o=2V_o)
	prequency (50ΩLoad)	0.1Vp-p(0dB),10mVp-p(20dB), 1mVp-p(40dB),0.1mVp-p(60dB)
	Range	0.200Hz~20000kHz
	digit	Five (10.000Hz~20000kHz) Four (0.200Hz~9.999kHz)
Frequency displaying	Range	0.200Hz~20000kHz
	digit	Five (10.000Hz~20000kHz) Four (0.200Hz~9.999kHz)

（续上表）

50Hz output (options)	Output wave	Sine wave
	Output frequency	50Hz
Power output (options)	Output power	≥10W(4ΩLoad)
	Output wave	Sine wave
	Frequency range	20Hz~40kHz

●Techncal index of frequency/counter

Item	Technical index
Frequency measuring range	0.200Hz~100000kHz
Input voltage(0dB)	50mV~2V (10Hz~20000kHz)
	100mV~2V (0.2Hz~10Hz、20000kHz~100000kHz)
Input impedance	500kΩ/30pF

（续上表）

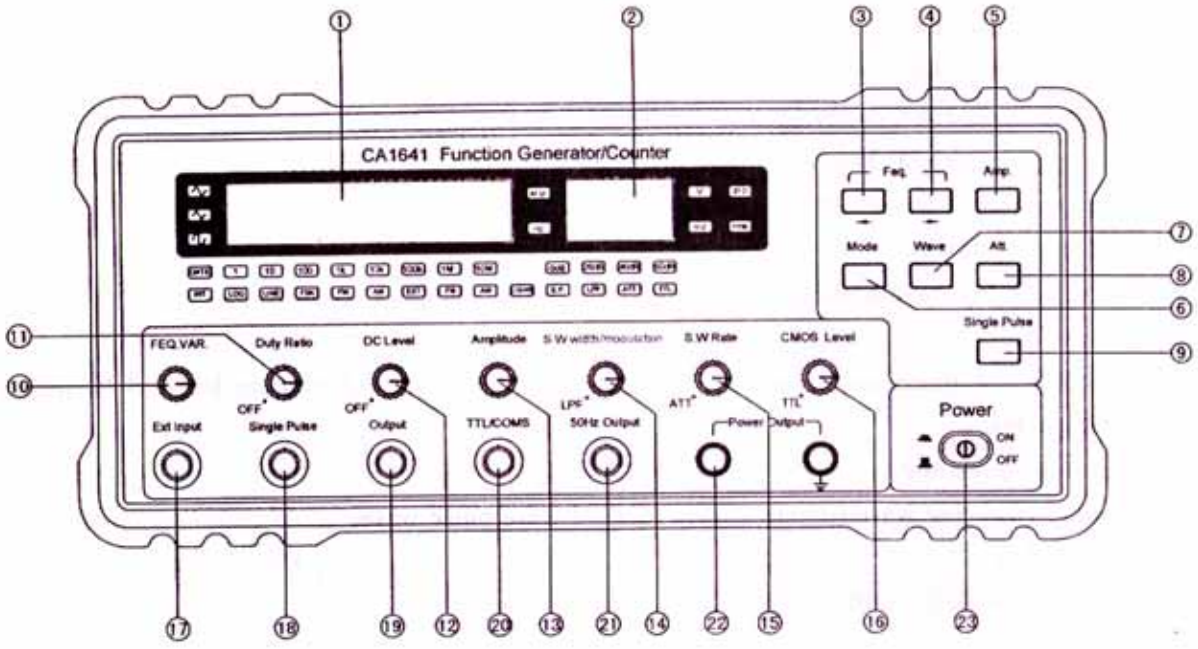
waveforms		Sine wave、square wave
Filter:frequency ending		≈100kHz(internal attenuator)
Measuring gate time		0.1S(fi>10Hz)
		Measured single signal cycle(fi<10Hz)
Display mode	Display range	0.200Hz~100000kHz
	digits	eight
Measuring error		Time base error±spring error
Time base	frequency	10MHz
	frequency stability	±5×10-5/d

●Other technical index

Item		Technical index
Electric source	voltage	220V±10 %
	frequency	50Hz±5 %
	power	≤30VA
Dimension (L×W×H)		300×265×110(mm)
weight		≈3.5kg
Working environment		Ⅱ group(0℃~+40℃)

4、Using instruction

● The front panel instruction



1.Ferquency displaying

2.Amplitude displaying

3.Choose ferquency (left) key

You can choose ferquency by moving direction keys.

4.Choose ferquency(right) key

You can choose ferquency by moving direction keys.

5.Choose amplitude key

Conversion function of showing the amplitude of the voltage.

6.Mode key

It can choose more sweep mode、internal and external modulation modes and frequency measuring modes.

7.Choose waveforms key

It can choose sine wave,sequarre wave,triangle wave,pulse wave.

8.attenuation key

It can choose 0dB、20dB、40dB、60dB.

9.Single pulse

Control single pulse output.

10.FEQ.VAR

By using switch,you can change ferquency.

11.Duty of frequency output

12.DC offset

Adjust range:-10V~+10V(No load),-5V~+5V(50Ω load),

13.Amplitude

Adjust range 20dB。

14.Sweep width adjust knob

When frequency measuring,the counterclockwise rotation in the end (LPF-light), After measuring signal input, low-pass switch into the measurement system.It can adjust modulation depth.

15.Sweep rate

It can change in the length of the time scanning, When the Frequency Measurement, Anti-clockwise rotation in the end(ATT-light),after the input signal attenuation measurement, " 20 dB" to enter the system.

16.CMOS level

Anti-clockwise rotation in the end (TTL lights), the output standard TTL Level.

17.External input

18.Single pulse output

19.Function signal output

Sine wave,square wave,triangle wave,etc,amplitude 20VP-P(No load),10VP-P(50ΩLoad)。

20.Synchronizing output terminal

When (CMOS level adjust) Anti-clockwise rotation in the end,output TTL, impedance (impedance 600Ω);When (CMOS level adjust)turn it,CMOS level adjustable (5V~≥13.5V)。

21.50Hz output(options)

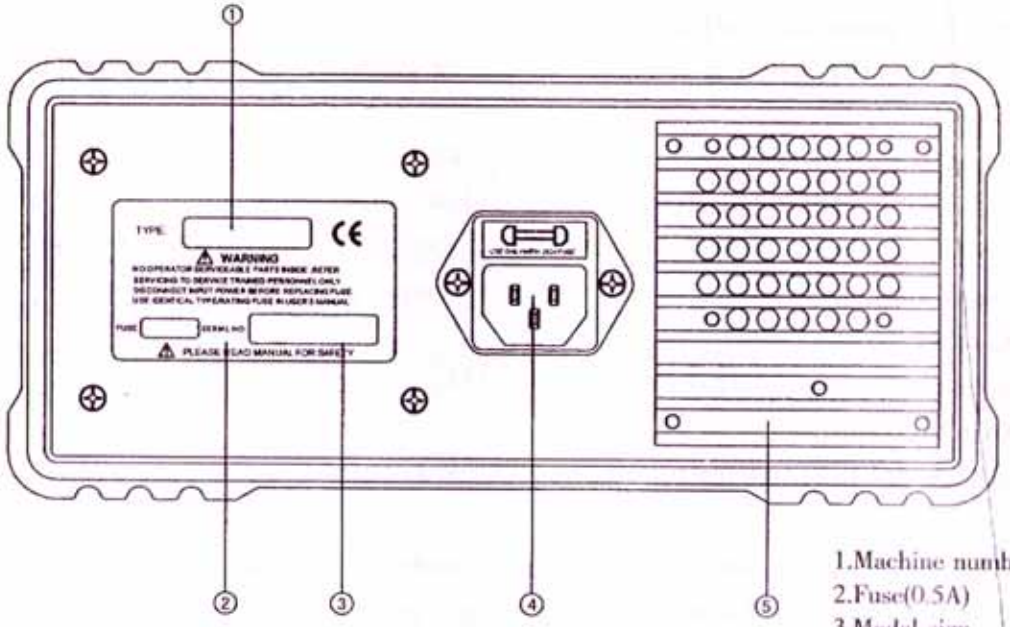
50Hz(sine wave)

22.Power output(options)

Power output≥10W

23.Power switch

●Back the panel instruction



1.Machine number
2.Fuse(0.5A)
3.Model sign
4.Electrical source socket
5.Radiator

Function signal output

50Ωfunction generator output

1.To connect 50Ω matching terminals for testing cable,the front panel socket(19)output function signal;

2.Through frequency selection button (3)and (4)selected output function signal in the frequency band,and through frequency regulator(10)adjust output frequency;

3.Wave button choice(7)choose waveforms:sine wave,square wave,triangle wave,pulse wave;

4.Through selector(13)and(8)choose and adjust output signal amplitude;

5. DC offset;

6.The output waveform duty cycle regulation(11);

Synchronizing output

Synchronizing output terminal(20)output TTL/CMOS signal。

Single pulse output

1.Q9(terminals without 50Ω matching device),single pulse output(18)output single pulse;

2.output level≤0.5V。When using Choose single pulse key(9),the single pulse output reversed a level;

50Hz output(options)

1.Through Q9-Q9(terminals without 50Ω matching device),50Hz output terminals(21)output single;

2.Output sine wave(frequency:50Hz);

Power output(options)

1.Through Q9-Q9(terminals without 4Ω matching device),power output terminals(22)output power single;

2.output power≥10W(4Ωload,sine wave)

Sweeping and modulation mode output:internal

1.Internal modulation and internal sweeping selects by direction key(6);

2.Through changed regulators(14)and(15),its output internal sweeping and modulation singles;

3.The function terminals(19)and the synchronization(20)output internal sweeping and modulation singles;

Modulation mode output:external

1:External modulation selects by direction key(6)too;

2.Input external control single by external input terminals (17),the terminals(20)output

modulation singles;

● Frequency/counter

1.Frequency measuring selects by direction key (6);

2.Through external input terminals (17),you can input function singles ,then you can get results by LED displaying;

5、Points for attention and Maintenance

● Points for attention

1.Large scale integrated cricuits is adopted into the instrument,when calibration tests,measuring equipment should be a good cover to prevent accidental damage;

2.When you change fuse,please you cut power to ensure personal safety;

3.Major failure and serious damage,please tell us or returned to the factory repairs;

● Maintenance

Faults	Methods
Showing no after rebooting machines	Inspect and change A.C fuse
If A.C fuse good,but the machine work not normally	Check the line ,check it did not disconnect, check it whether good gounding

6、Complete set of instrument and auxiliary

CA1641 series of function generator/counter	1 set
Q9–Q9	1 pc
Q9–double wires	1 pc
Power cable	1 pc
fuse	1 pc
user's manual	1 book

Omxie Corp

125 Business Center Dr. Unit G

Corona, CA 92880

USA

(909)498-4682

http://www.smtmax.com