

The CD-951V3 is a 360°-voltage controlled phase shifter in the frequency range of 100 Hz to 200 kHz, and adopts CMOS-level(0/+5 V) square wave for input and output. This is composed of the ±100°-variable voltage controlled phase circuit and 50 %-duty circuit with 0/180° switch. The combination use of the ±100° -phase shifter and 0/180° -selector enables the output of 50 %-duty square wave that phase is shifted in the 360° range to the phase shifter input signal.

Double frequency is produced by the 50 %-duty input signal if 2f mode is placed through the connection with the specified pin.

The CD-951V3 is in a 6-surface shielded 20-pin single in-line package(SIP), which is a great contributor to the implementation of high precision signal processing and high density mounting.

### ▼ Absolute maximum ratings

Supply voltage (±Vs)	±18 V
Phase control DC input voltage (Vc IN)	±Vs
Phase shifter input voltage (SHIFTER IN)	-0.5 V to +5.5 V
Logic control input voltage	-0.5 V to +5.5 V

### ▼ 50%-duty output/voltage controlled phase shifter

#### ● I/O Setting

I/O pin	Input:Pin 14 , Output:Pin 18
Setting	Pins 15-16 shorted, Pin 17 open
I/O characteristics	The square wave of duty ratio 50 % which did phase shifting by Vc IN is output based on the edge chosen by the polarity switch (13 pin).

#### ● Frequency range

Frequency range	100 Hz to 200 kHz
Range switch	Pin 12 Open or +5 V:100 Hz to 20 kHz 0 V:1 kHz to 200 kHz

#### ● Phase shifter input characteristics

Input pin (SHIFTER IN)	Pin 14
Input circuit	CMOS schmitt trigger input, pulled up by 50 kΩ resistor
Trip point	+3.5 V / +1.5 V
Input voltage	CMOS (0/5 V) level
single edge (1f) mode	A rising or falling edge is regarded as a reference
Polarity switch input circuit	CMOS schmitt trigger input, pulled up at 50 kΩ
Polarity switch (SHIFTER IN POL)	Pin13 Open or +5 V:The rising edge regarded as a reference 0 V:The falling edge regarded as a reference
Pulse duration	≥50 ns
Input frequency range	100 Hz to 200 kHz
dual edge (2f) mode	Both rising and falling edge are regarded as a reference
Mode setting	Connected SHIFTER IN(Pin 14) and SHIFTER IN POL(Pin 13)

#### ● Input frequency waveform

Input frequency waveform	Duty ratio 50%
Input frequency range	100 Hz to 100 kHz

#### ● Voltage control characteristics

Control input pin(Vc IN)	Pin 1
Control method	Phase shift is specified in the proportion to Vc IN
Input resistance	100 kΩ±3% @DC
Control range	100°(typ.) (-100° /+5 V, +100° /-5 V)
Linear control range	±90°
Voltage control sensitivity	-20°/V
Sensitivity accuracy	±1°/V

#### ● Phase shifter output characteristics

Output pin(DUTY50 OUT)	Pin 18
Output circuit	HCMOS output, 100 Ω series resistor
Output voltage	CMOS(0/5 V)level, load ≥10 kΩ
Duty	50 %±0.1 % (typ.) @20 kHz 50 %±0.2 % (typ.) @200 kHz
0/180° switch	Pin 20 Open or +5 V:-180° 0 V:0°
-180° accuracy	-180°±0.2 % (typ.) @20 kHz -180°±0.2 % (typ.) @200 kHz

Phase offset	100 Hz to 20 kHz range:±0.5 deg. (typ.) @100 Hz -0.4±1 deg. (typ.) @20 kHz 1 kHz to 200 kHz range:±0.5 deg. (typ.) @1 kHz -3.4±1 deg. (typ.) @200 kHz
Phase offset adjustment	Adjustment available by a 20 kΩ-external potentiometer.(Pin 2)
Adjustment range	±5°(typ.)
Settling time	When Vc IN is changed:Approx. 20 s When SHIFTER IN is turned on:Approx. 20 s When SHIFTER IN frequency is changed:Approx. 5 s

### ▼ Reference voltage

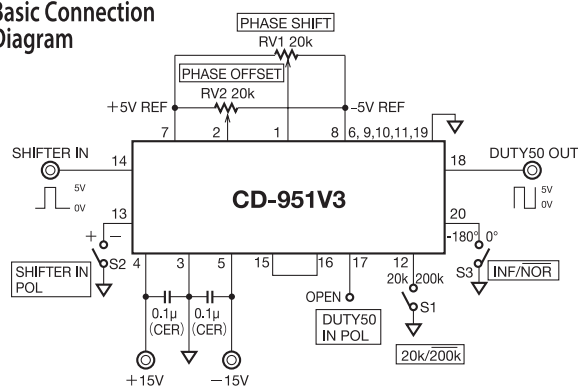
Output pin	+5 V:Pin 7, -5 V:Pin 8
Output voltage/accuracy	±5 V±3 %
Temperature stability	±100 ppm/°C (typ.)
Max. output current	±1 mA

Operating voltage range	±15 V±1 V
Quiescent current	+25 mA (max.), +18 mA(typ.) -20 mA (max.), -12 mA (typ.)

### ▼ General

Specified temperature	23°C±5°C
Operating environment	-20°C to 70°C, 10 %RH to 90 %RH
Storage environment	-30°C to 80°C, 10 %RH to 80 %RH
Package type	Type SS20(20-pin shielded SIP)
Dimensions	66.7×10.5×19.0 mm(not including protrusions)
Weight (NET)	Approx. 20 g
RoHS	Directive 2011/65/EU

### Basic Connection Diagram



### Block Diagram

