Hybrid IC Isolation Amplifiers 20 Series

ISOLATION AMPLIFIER

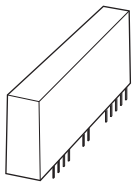
(high speed response, 3-port isolation)

Functions & Features

- Being used for printed wiring board installation
- High-linearity
- High speed response 50 µsec.
- Isolating between input, output and power
- Isolation between input, output and power supply up to 3000 V AC
- Power 15 V DC

Typical Applications

- Isolating the field and input circuit of microprocessor to reduce noise from field
- Available for manufacturers of small-lot products to omit the development of isolation circuit



MODEL: 20VS1A-4W4W[1]-U

ORDERING INFORMATION

- Code number: 20VS1A-4W4W[1]-U

Specify a code from below for [1]
(e.g. 20VS1A-4W4WA-U)

INPUT / OUTPUT

4W4W: -10 - +10 V DC (Input resistance 1 MΩ min.)
/ -10 - +10 V DC (Load resistance 2 kΩ min.)

[1] LINEARITY

A: ±0.025 %
B: ±0.012 %
C: ±0.008 %

POWER INPUT

DC Power
U: 15 V DC

GENERAL SPECIFICATIONS

Construction: Hybrid IC
Housing material: Flame-resistant resin (black)
Isolation: Input to output to power

INPUT SPECIFICATIONS

■ **DC Voltage**
Input : -10 – +10 V DC
Input resistance: 1 MΩ (10 kΩ in power failure)
Overload input voltage: ±15 V DC continuous
Input offset voltage: ±2 mV @ G = 1
Input bias current: 25 pA TYP. (@25°C)

OUTPUT SPECIFICATIONS

■ **DC Voltage**: -10 – +10 V DC
Load resistance: ≥ 2 kΩ
Output impedance: ≤ 1 Ω

REFERENCE VOLTAGE SOURCE

■ **FOR INPUT**
Output voltage: ±16.5 V DC ±2.5 V (when power supply is 15 V DC)
Load current: ≤ 2 mA
■ **FOR OUTPUT**
Output voltage: ±16.5 V DC ±2.5 V (when power supply is 15 V DC)
Load current: ≤ 2 mA

INSTALLATION

Power input
•**DC**: Rating ±5 %; approx. 50 mA with no load
Operating temperature: -25 to +85°C (-13 to +185°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Soldering to the printed wiring board
Weight: 20 g (0.71 oz)

PERFORMANCE in percentage of span

Unless otherwise specified, G = 1.
Linearity:
±0.025 % (20VS1A-4W4WA)
±0.012 % (20VS1A-4W4WB)
±0.008 % (20VS1A-4W4WC)
Temp. coefficient:
±25 ppm/°C (0°C - 70°C; 32 - 158°F)
±50 ppm/°C (-25°C - +85°C; -13 - +185°F)
Frequency characteristics: Approx. 20 kHz, -3 dB
Response time: ≤ 50 µsec. (0 – 90 %)
Conversion gain: ×1 ±1.5 %
Gain adjustable range: × 1 to × 100
Line voltage effect: ±0.01 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 3000 V AC @1 minute (input or reference voltage source for input to output or reference

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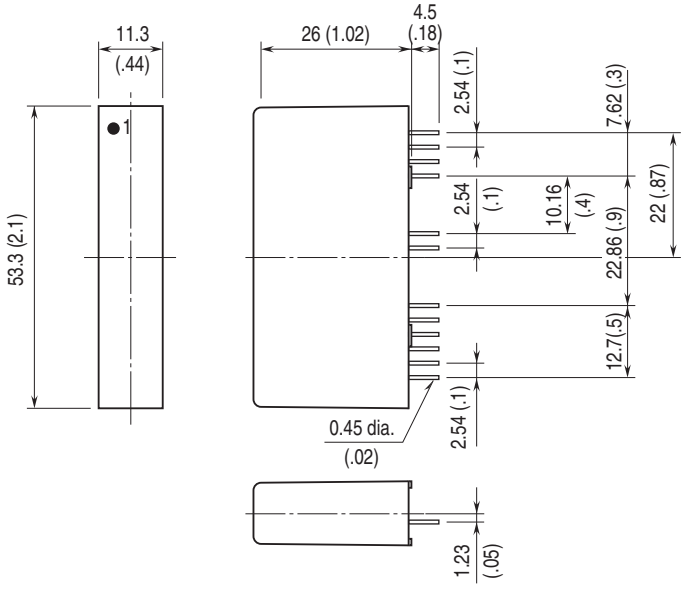
voltage source for output to power)
CMRR: ≥ 120 dB (500 V AC 50/60 Hz)

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)

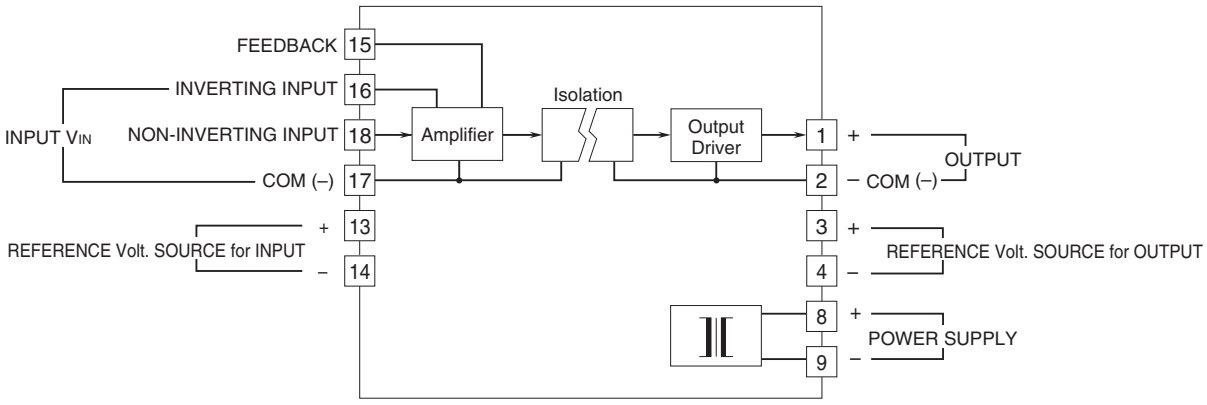


PIN ASSIGNMENTS

1	OUTPUT (+)
2	OUTPUT COM (–)
3	REF. VOLT. SOURCE for OUTPUT (+)
4	REF. VOLT. SOURCE for OUTPUT (–)
8	POWER SUPPLY (+)
9	POWER SUPPLY (–)
13	REF. VOLT. SOURCE for INPUT(+)
14	REF. VOLT. SOURCE for INPUT (–)
15	FEEDBACK
16	INVERTING INPUT
17	INPUT COM (–)
18	NON-INVERTING INPUT

(BOTTOM VIEW)

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

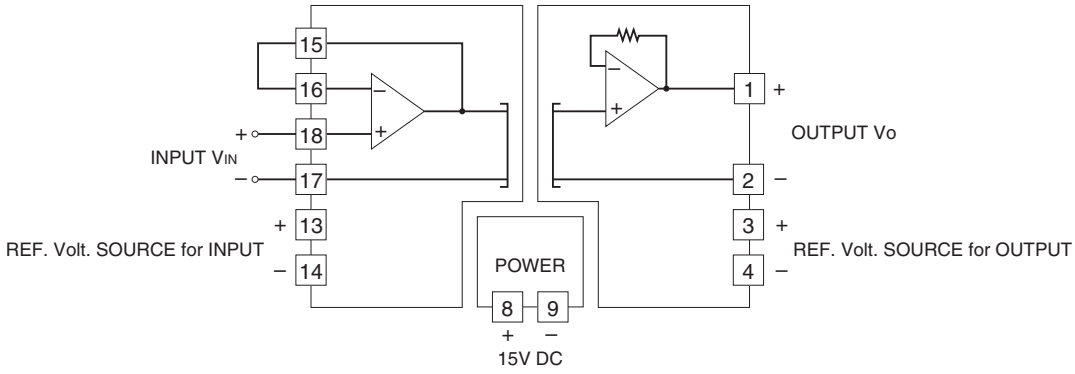


Note. The reference voltage source for input is common to the input COM (–)
The reference voltage source for output is common to the output COM (–)

APPLICATION EXAMPLE

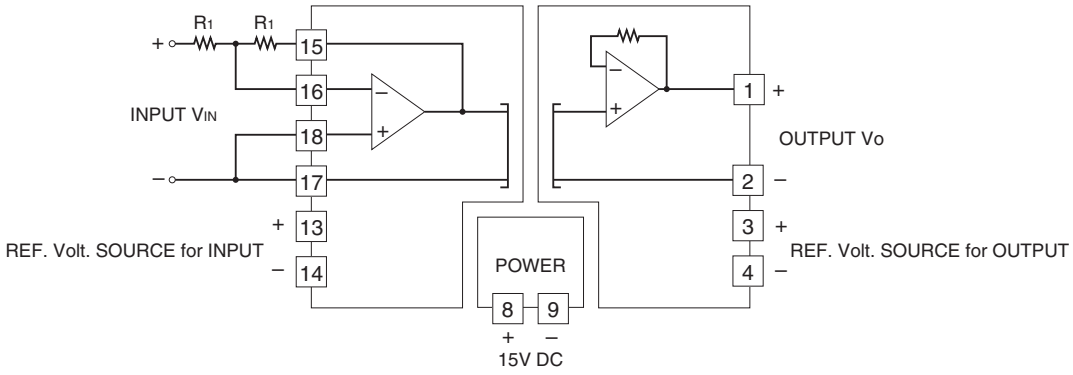
10 kΩ ≤ (R_1 + R_2) ≤ 200 kΩ

■ Non-inverting amplifier circuit: Basic example of G = 1



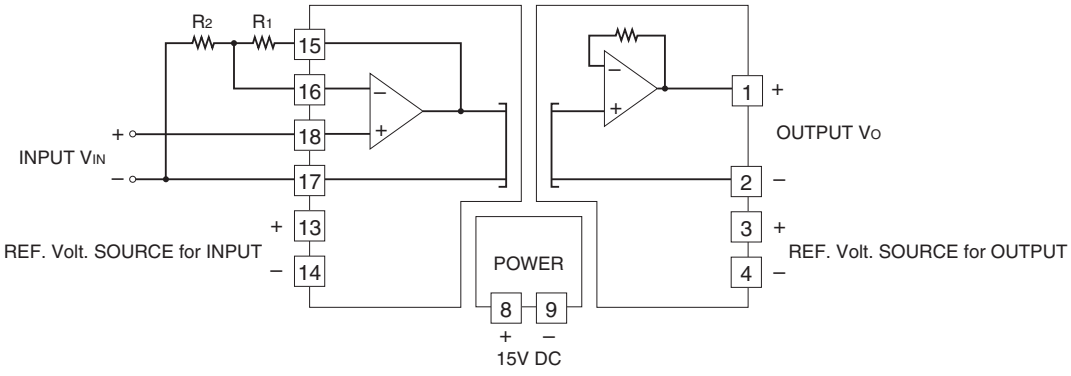
Non-inverting circuit G = 1

■ Inverting amplifier circuit: Basic example of G = -1 (output inverted to the input)



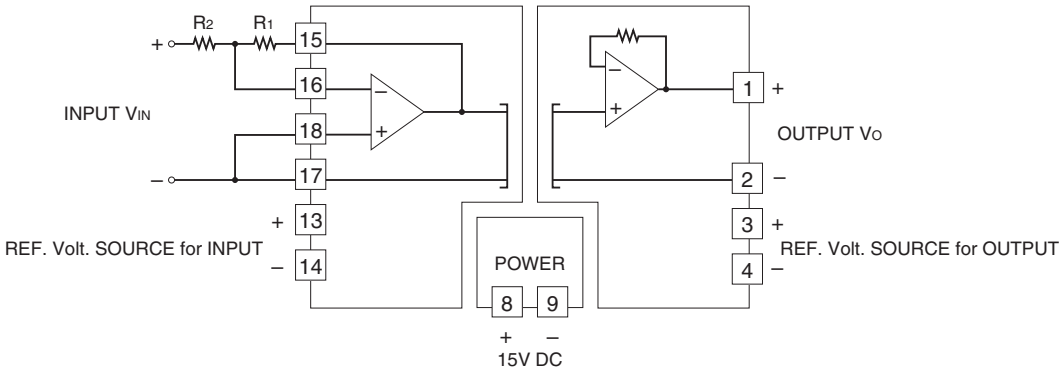
Inverting circuit G = -1

■ Non-inverting amplifier circuit: Example of G = 1 + R_1 / R_2



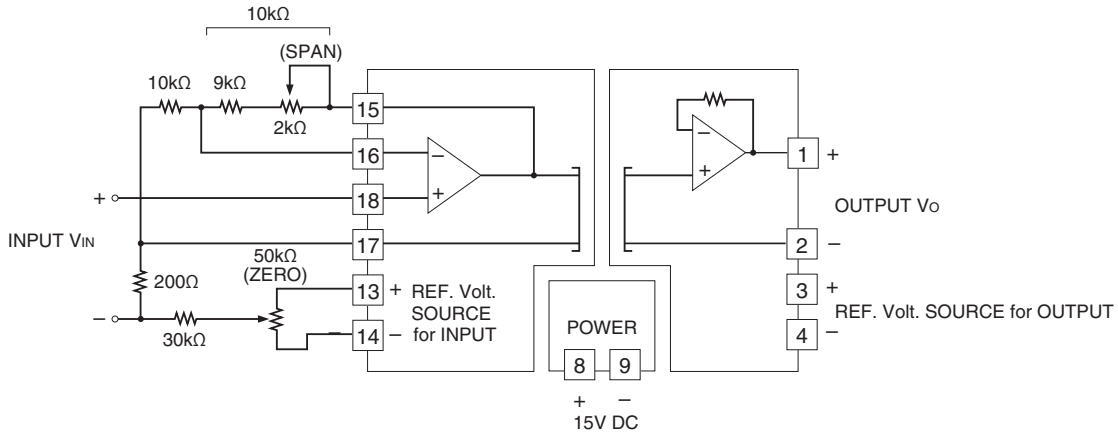
Non-inverting amplifier circuit G = 1 + R_1 / R_2

■ Inverting amplifier circuit: Example of G = -R1 / R2 (output inverted to the input)



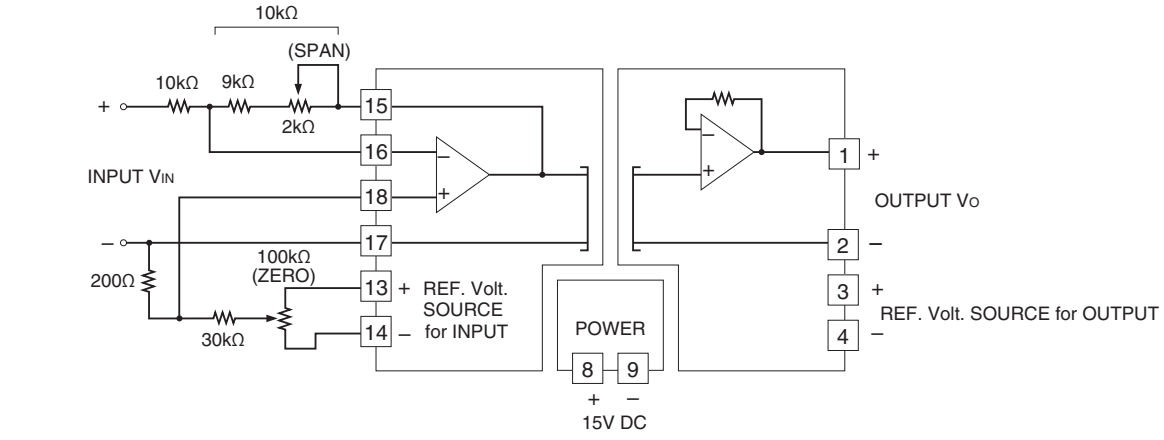
Inverting amplifier circuit G = -R1 / R2

■ Non-inverting amplifier circuit with external adjustments: Example of G = 2



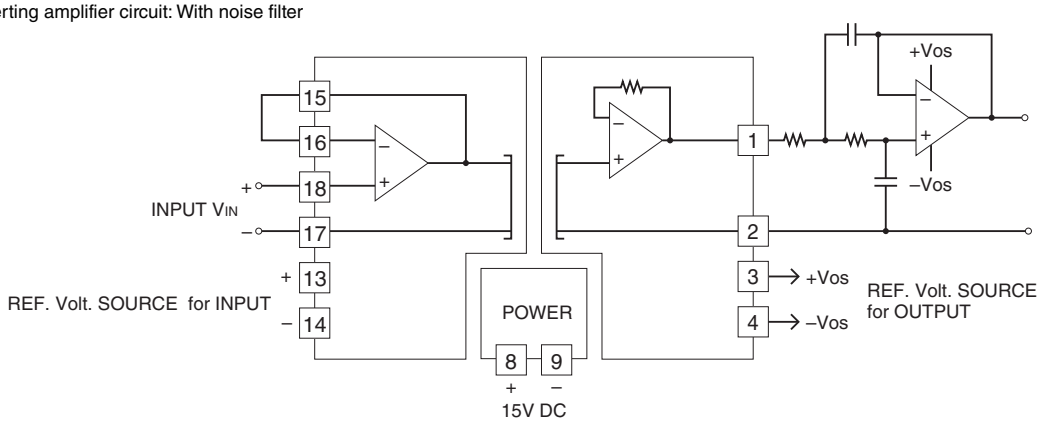
Non-inverting amplifier circuit zero/span adjustments

■ Inverting amplifier's circuit with external adjustments: Example of G = -1 (output inverted to the input)



Inverting amplifier circuit zero/span adjustments

■ Non-inverting amplifier circuit: With noise filter



⚠ Specifications are subject to change without notice.