Hybrid IC Isolation Amplifiers 20 Series

ISOLATION AMPLIFIER

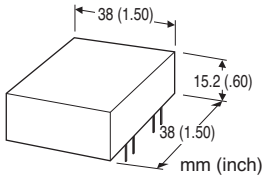
(5 kV input isolation)

Functions & Features

- Being used for printed wiring board installation
- Up to 5 kV isolation between input to output or power input
- High CMRR
- Small installation area in printed wiring board
- Gain adjustable range, × 1 to × 10
- Power 15 V DC

Typical Applications

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



MODEL: 20VS4–384–U

ORDERING INFORMATION

- Code number: 20VS4-384-U

INPUT RANGE -5 – +5 V DC
OUTPUT RANGE -5 – +5 V DC

POWER INPUT

DC Power
U: 15 V DC

GENERAL SPECIFICATIONS

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

INPUT SPECIFICATIONS

■ **DC Voltage**
Input : -5 – +5 V DC
Input resistance: ≥ 1 MΩ (10 kΩ in power failure)
Overload input voltage: 240 V AC continuous
Input offset voltage: ±15 mV
Input bias current: 0.5 nA TYP. (@25°C)

OUTPUT SPECIFICATIONS

■ **DC Voltage**: -5 – +5 V DC
Load resistance: ≥ 2 kΩ
Output impedance: ≤ 1 Ω

REFERENCE VOLTAGE SOURCE

Output voltage:
±7.5 V DC TYP. (+15 V power supply)
±7.0 V DC TYP. (+14 V power supply)
Load current: ≤ 5 mA

INSTALLATION

Power input
•**DC**:
Operational voltage range 13 – 16 V;
ripple 2 %p-p max.; approx. 7 mA with no load
Operating temperature: -10 to +70°C (14 to 158°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

Linearity: ±0.05 %
Temp. coefficient:
Offset drift 10 ppm/°C TYP. @G = 1 (20 ppm/°C max.)
span drift 20 ppm/°C TYP. @G = 1 (50 ppm/°C max.)
Frequency characteristics: Approx. 1 kHz, -3 dB
Response time: ≤ 450 µsec. (0 – 90 %)
Conversion gain: ×1 ±1 %
Gain adjustable range: × 1 to × 10
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 5000 V AC @3 minute (input or reference voltage source to output or power)
CMRR: 114 dB TYP. (500 V AC 50/60 Hz)

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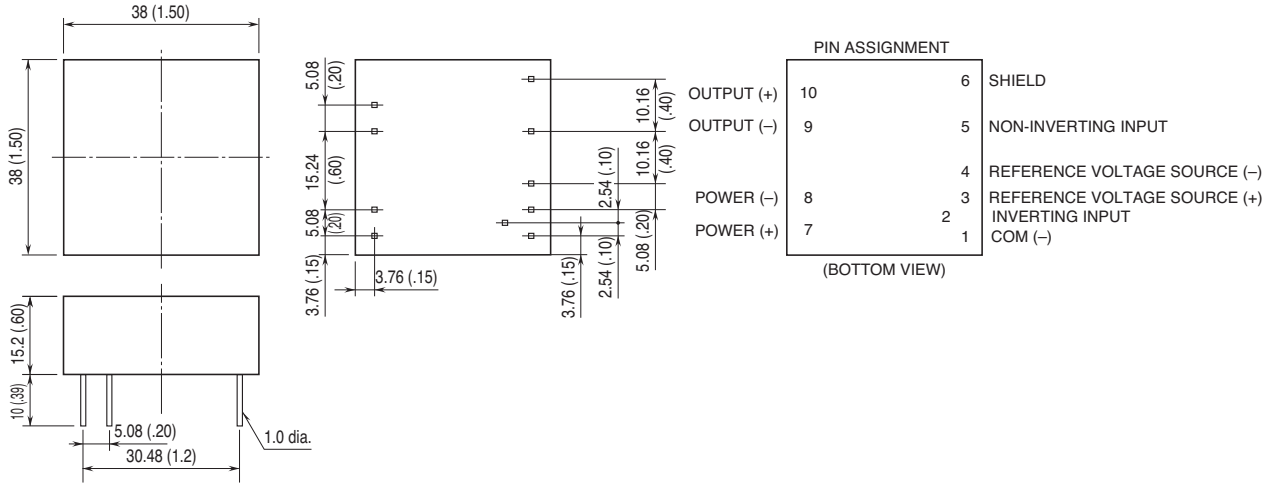
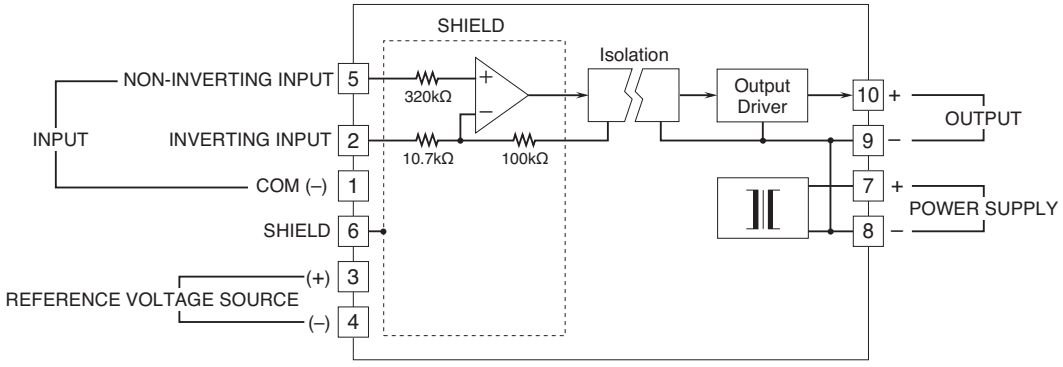
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



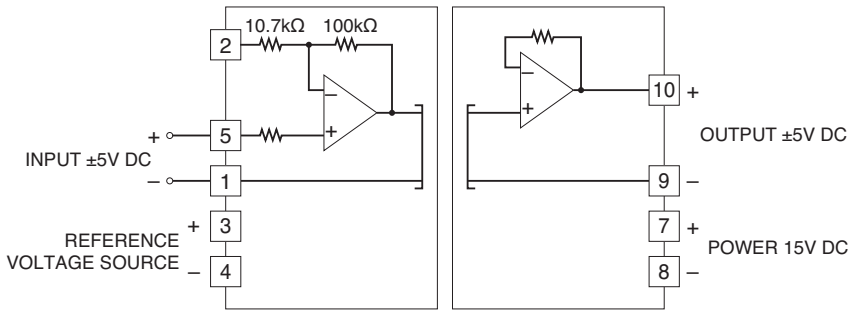
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



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

APPLICATION EXAMPLE

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



Non-inverting circuit G = 1

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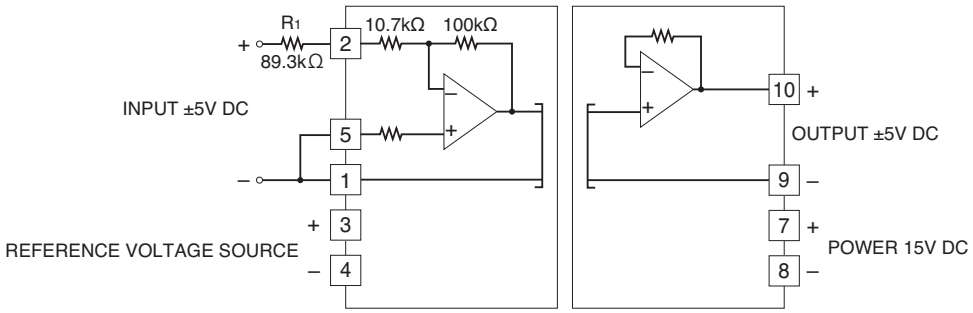
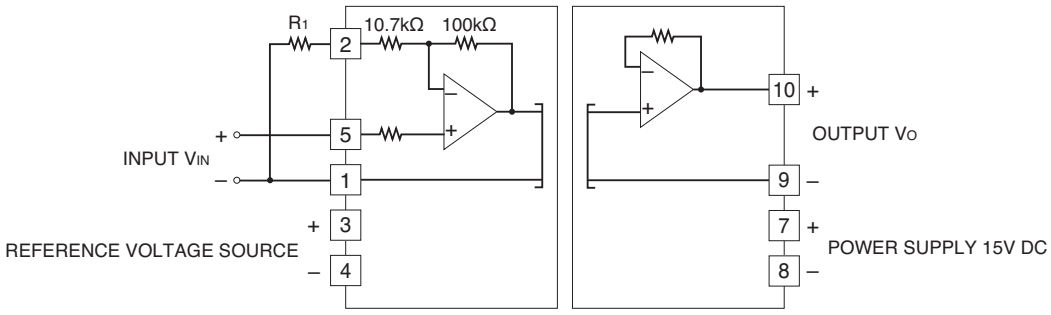
■ Inverting amplifier circuit: Basic example of G = -1 (output inverted to the input)



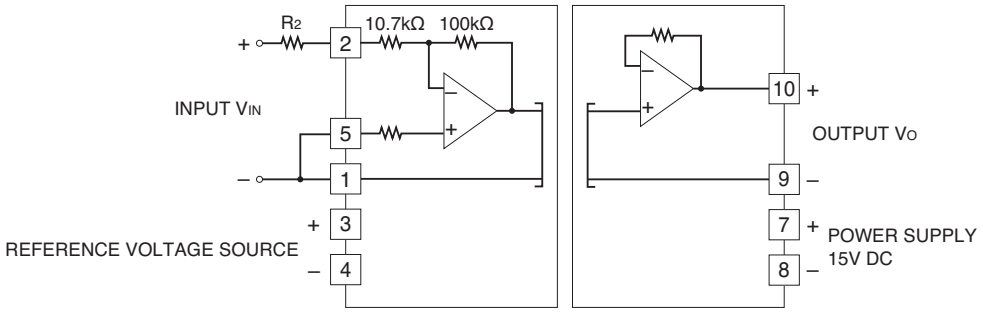
Inverting circuit G = -1

■ Non-inverting amplifier circuit: Example of G = 1 + 100kΩ / (10.7kΩ + R_1)



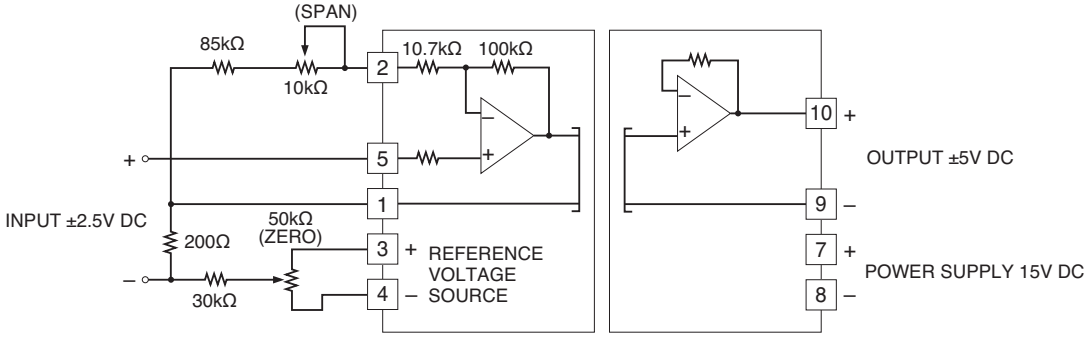
Non-inverting amplifier circuit G = 1 + 100kΩ / (10.7kΩ + R_1)

■ Inverting amplifier circuit: Example of G = -100kΩ / (10.7kΩ + R_2) (output inverted to the input, G: -0.5 to -9.3)



Inverting amplifier circuit G = -100kΩ / (10.7kΩ + R_2)

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



Non-inverting amplifier circuit zero/span adjustments (input ±2.5V, output ±5V)

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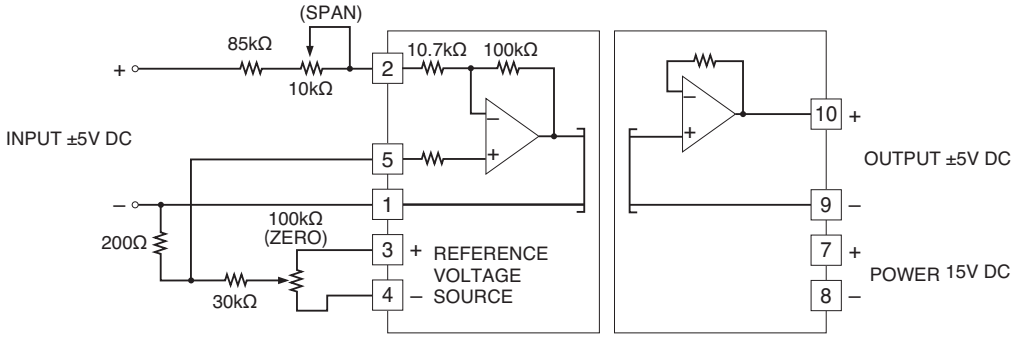
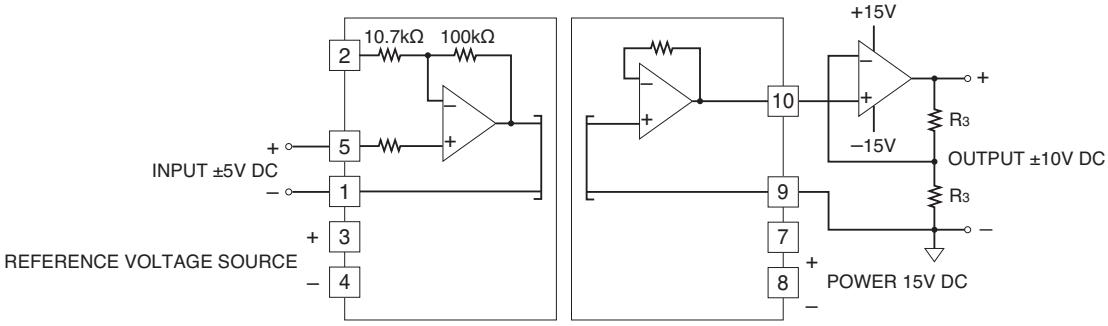
■ Inverting amplifier's circuit with external adjustments: Example of G = -1 (output inverted to the input)



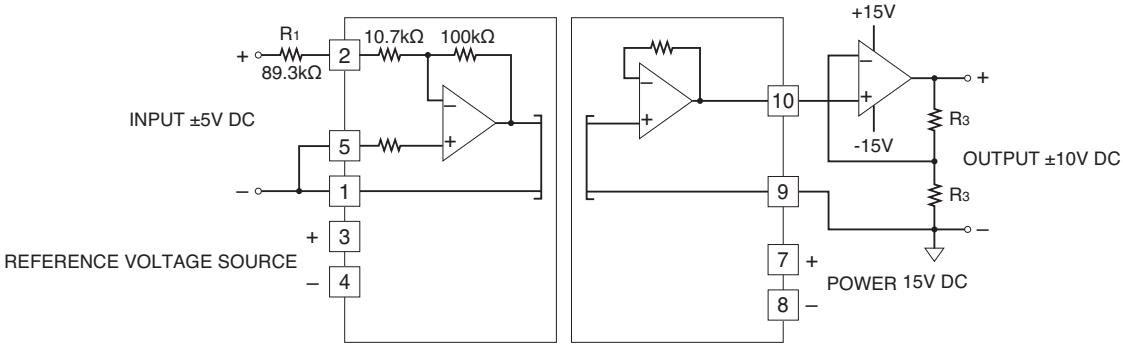
Inverting amplifier circuit zero/span adjustments (input ±5V, output ±5V)

■ Non-inverting amplifier circuit: Example of ±10V DC output (±10V DC to the input ±5V DC)



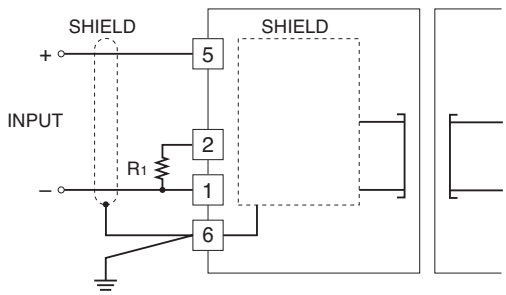
Non-inverting circuit G = 1 + R_3 / R_3 =2

■ Inverting amplifier circuit: Example of ±10V DC output (output inverted to the input)



Inverting circuit G = -(1 + R_3 / R_3) = -2

• Shield Cable Wiring



⚠ Specifications are subject to change without notice.

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