

# PGA849

## Input and Output Range Design Calculator

# PGA849 Input and Output Range Design Calculator

## “PGA849 Vin CM vs Vout Diff Plot”

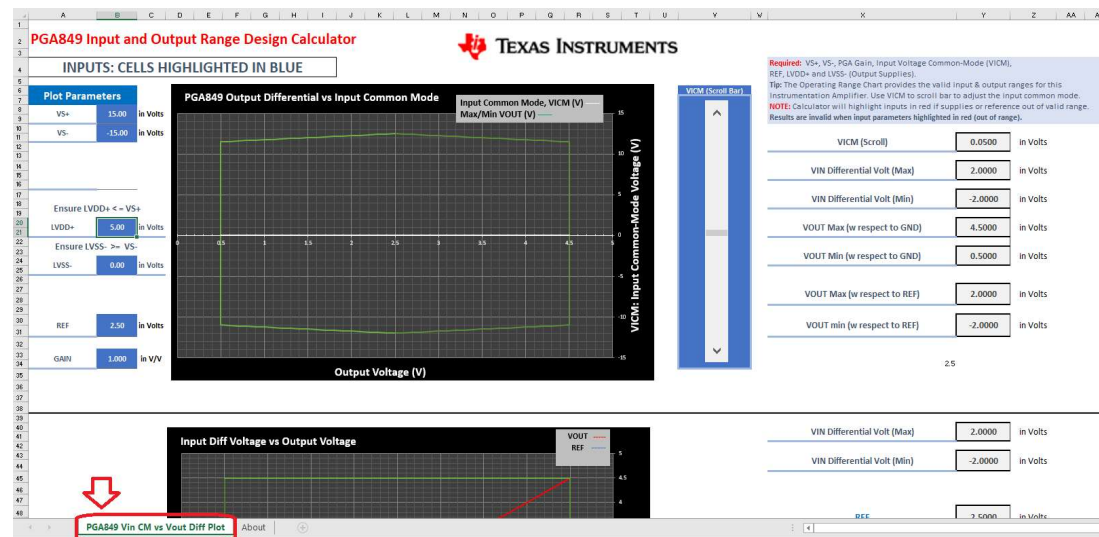
On sheet:

### “PGA849\_Vin CM vs Vout Diff Plot”

- User fills the highlighted cells in blue. **Required:** Input supplies VS+, VS-, Gain, REF voltage, Output supplies LVDD+ and LVSS-.
- The Operating Range Chart provides the valid input & output ranges for this Programmable Gain Amplifier. Use VICM to scroll bar to adjust the input common mode.
- The input common-mode voltage (VICM) represents the average voltage between the inputs.

$$V_{ICM} = \frac{(IN+) + (IN-)}{2}$$

- The absolute voltage at the PGA inputs requires at least 3V above VS- negative supply and at least 2.5V below the VS+ positive supply.



# PGA849 Input and Output Range Design Calculator

## “PGA849 Vin CM vs Vout Diff Plot”

On sheet:

### “PGA849\_Vin CM vs Vout Diff Plot”

- The calculator highlights in red any invalid input parameters when out of range.
- **NOTE:** Calculator will highlight inputs in red if supplies, or reference voltage are outside of the valid range. **Results are invalid if any of the input parameters are highlighted in red.**

**PGA849 Input and Output Range Design Calculator**

IN PUTS: CELLS HIGHLIGHTED IN BLUE

**Plot Parameters**

VS+	15.00	in Volts
VS-	-15.00	in Volts
LVDD+	5.00	in Volts
LVSS-	0.00	in Volts
REF	5.00	in Volts
GAIN	1.000	--V/V

**PGA849 Output Differential vs Input Common Mode**

Input Common Mode, VICM (V)  
Max/Min VOUT (V)

Output Voltage (V)

Input Common-Mode Voltage (V)

VCM (Scroll Bar)

**Required:** VS+, VS-, PGA Gain, Input Voltage Common-Mode (VICM), REF, LVDD+ and LVSS- (Output Supplies).  
**Tip:** The Operating Range Chart provides the valid input & output ranges for this Instrumentation Amplifier. Use VICM to scroll bar to adjust the Input common mode.  
**NOTE:** Calculator will highlight inputs in red if supplies or reference out of valid range. Results are invalid when input parameters highlighted in red (out of range).

VICM (Scroll)	0.0500	in Volts
VIN Differential Volt (Max)	-0.5000	in Volts
VIN Differential Volt (Min)	-4.5000	in Volts
VOUT Max (w respect to GND)	4.5000	in Volts
VOUT Min (w respect to GND)	0.5000	in Volts
VOUT Max (w respect to REF)	-0.5000	in Volts
VOUT Min (w respect to REF)	-4.5000	in Volts

Voltage Reference is outside of range, exceeding output supply. Tool highlights input in RED to highlight error.

Results are invalid if the REF, or supply voltages are out of range.

Results are invalid if the REF, or supply voltages are out of range.

**Input Diff Voltage vs Output Voltage**

VOUT  
REF

VIN Differential Volt (Max) -0.5000 in Volts  
VIN Differential Volt (Min) -4.5000 in Volts

REF 5.0000 in Volts

PGA849 Vin CM vs Vout Diff Plot

TEXAS INSTRUMENTS

# PGA849 Input and Output Range Design Calculator

Sheet: "PGA849 Vin CM vs Vout Diff Plot"

**PGA849 Input and Output Range Design Calculator**

INPUTS: CELLS HIGHLIGHTED IN BLUE

Plot Parameters	
VS+	15.00 in Volts
VS-	-15.00 in Volts
Ensure LVDD+ <= VS+	
LVDD+	5.00 in Volts
Ensure LVSS- >= VS-	
LVSS-	0.00 in Volts
REF	2.50 in Volts
GAIN	1.000 V/V

**PGA849 Output Differential vs Input Common Mode**

Y axis: Input CM Voltage ( $V_{ICM}$ )

X axis: Output differential voltage ( $\pm V_{OUT\_Diff}$ )

Input Common Mode, VICM (V)

Max/Min VOUT (V)

VICM (Scroll Bar)

**Required:** VS+, VS-, PGA Gain, Input Voltage Common-Mode (VICM), REF, LVDD+ and LVSS- (Output Supplies).

**Tip:** The Operating Range Chart provides the valid input & output ranges for this Instrumentation Amplifier. Use VICM to scroll bar to adjust the input common mode.

**NOTE:** Calculator will highlight inputs in red if supplies or reference out of valid range. Results are invalid when input parameters highlighted in red (out of range).

VICM (Scroll)	0.0500 in Volts
VIN Differential Volt (Max)	2.0000 in Volts
VIN Differential Volt (Min)	-2.0000 in Volts
VOUT Max (w respect to GND)	4.5000 in Volts
VOUT Min (w respect to GND)	0.5000 in Volts
VOUT Max (w respect to REF)	2.0000 in Volts
VOUT min (w respect to REF)	-2.0000 in Volts

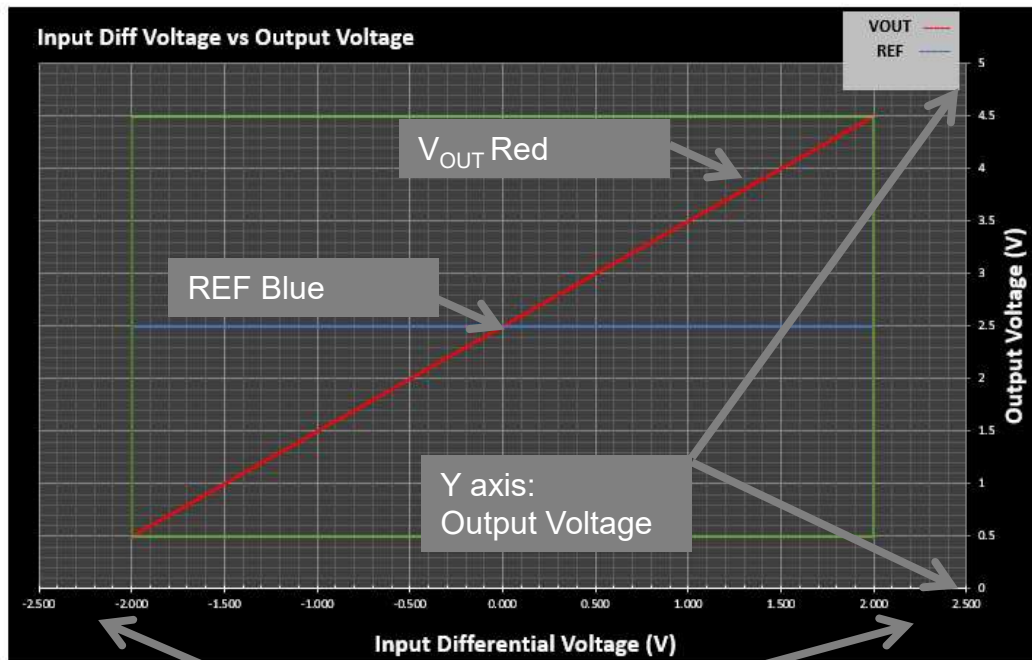
Enter the Input supplies, Output voltage supplies, Gain, and REF voltage.

Scroll to the desired input common mode voltage. White line represents  $V_{ICM}$  level

Check input / output voltage range

# PGA849 Input and Output Range Design Calculator

Second (Bottom) Plot: "Input Diff Voltage vs Output Voltage"



X axis:  
Input differential voltage  
( $\pm V_{\text{Input\_Diff}}$ )

VIN Differential Volt (Max)	2.0000	in Volts
VIN Differential Volt (Min)	-2.0000	in Volts
REF	2.5000	in Volts
VOUT (Max)	4.5000	in Volts
VOUT (Min)	0.5000	in Volts

Check input / output voltage range

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