

PGA849

Input and Output Range Design Calculator

Luis Chioye

PGA849 Input and Output Range Design Calculator

“PGA849 Vin CM vs Vout Diff Plot”

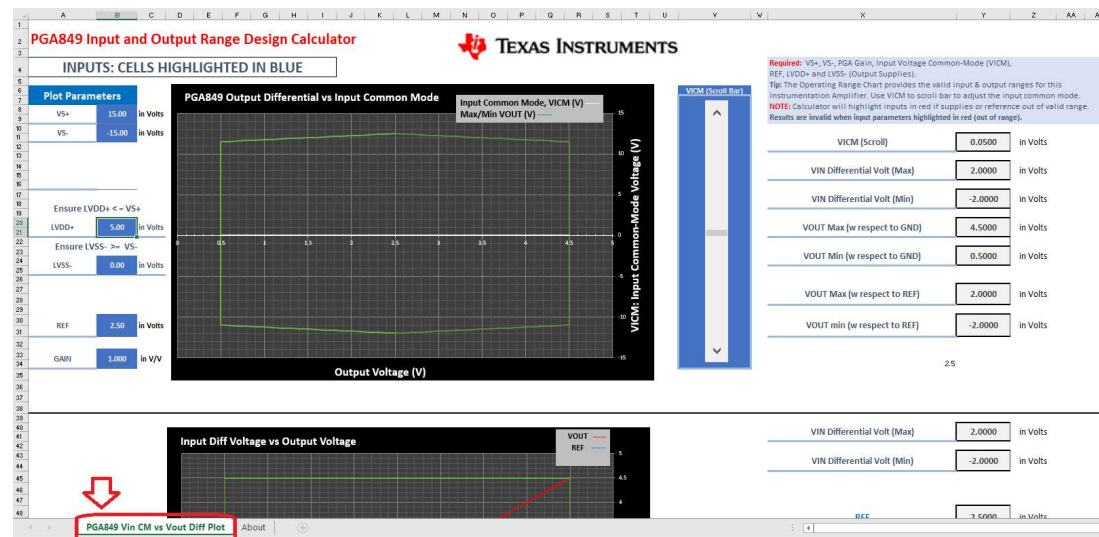
On sheet:

“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

TEXAS INSTRUMENTS

INPUTS: 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

Ensure LVDD+ <= VS+

Ensure LVSS- >= VS-

PGA849 Output Differential vs Input Common Mode

Input Common Mode, VICM (V)

Max/Min VOUT (V)

Output Voltage (V)

Input Common-Mode Voltage (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)	-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.

Input Diff Voltage vs Output Voltage

VOUT

REF

PGA849 Vin CM vs Vout Diff Plot

About

REF 5.0000 in Volts

TEXAS INSTRUMENTS

PGA849 Input and Output Range Design Calculator

Sheet: "PGA849 Vin CM vs Vout Diff Plot"

PGA849 Input and Output Range Design Calculator

TEXAS INSTRUMENTS

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 voltage

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

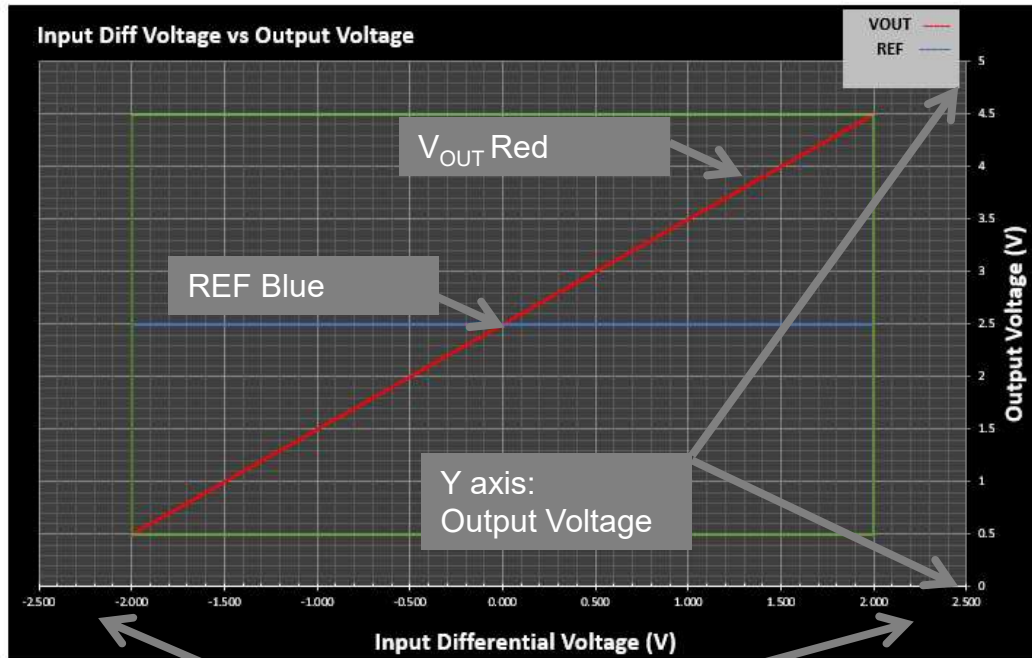
Enter the Input supplies, Output voltage supplies, Gain, and REF voltage.

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

Important notice and disclaimer

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to [TI’s Terms of Sale](#) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.