calculatoratoz.com

unitsconverters.com

Schmitt Trigger Formulas

Calculators! Examples! Conversions!

Bookmark **calculatoratoz.com**, **unitsconverters.com**

Widest Coverage of Calculators and Growing - **30,000+ Calculators!**
Calculate With a Different Unit for Each Variable - **In built Unit Conversion!**
Widest Collection of Measurements and Units - **250+ Measurements!**

Feel free to SHARE this document with your friends!

Please leave your feedback here...

List of 15 Schmitt Trigger Formulas

Schmitt Trigger

1) Component Resistance of Controller

Open Calculator

fx $$R_{comp} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$$

ex $$3.421053k\Omega = \frac{1}{\frac{1}{10k\Omega} + \frac{1}{5.2k\Omega}}$$

2) Final Voltage of Schmitt Trigger

Open Calculator

fx $$V_{fi} = A_v \cdot (V_+ - V_-)$$

ex $$1.03974V = -1.677 \cdot (0.97V - 1.59V)$$

3) Hysteresis Loss of Non-Inverting Schmitt Trigger

Open Calculator

fx $$H = 2 \cdot V_{sat} \cdot \left(\frac{R_2}{R_1}\right)$$

ex $$1.248V = 2 \cdot 1.2V \cdot \left(\frac{5.2k\Omega}{10k\Omega}\right)$$

4) Input Current of Schmitt Trigger

Open Calculator

fx $$i_n = \frac{V_{in}}{R_{in}}$$

ex $$1.120879\text{mA} = \frac{10.2\text{V}}{9.1\text{k}\Omega}$$

5) Input Voltage of Inverting Schmitt Trigger

Open Calculator

fx $$V_- = V_{fi} \cdot \left(\frac{R_1 + R_2}{R_1}\right)$$

ex $$1.5808\text{V} = 1.04\text{V} \cdot \left(\frac{10\text{k}\Omega + 5.2\text{k}\Omega}{10\text{k}\Omega}\right)$$

6) Input Voltage of Non-Inverting Schmitt Trigger

Open Calculator

fx $$V_+ = \left(\frac{R_1}{R_1 + R_2}\right) \cdot V_o$$

ex $$0.973684\text{V} = \left(\frac{10\text{k}\Omega}{10\text{k}\Omega + 5.2\text{k}\Omega}\right) \cdot 1.48\text{V}$$

7) Lower Threshold Voltage of Inverting Schmitt Trigger

Open Calculator

fx $$V_f = -V_{sat} \cdot \left(\frac{R_2}{R_1 + R_2}\right)$$

ex $$-0.410526\text{V} = -1.2\text{V} \cdot \left(\frac{5.2\text{k}\Omega}{10\text{k}\Omega + 5.2\text{k}\Omega}\right)$$

8) Lower Threshold Voltage of Non Inverting Schmitt Trigger

Open Calculator

fx $$V_{lt} = -V_{sat} \cdot \left(\frac{R_2}{R_1} \right)$$

ex $$-0.624\text{V} = -1.2\text{V} \cdot \left(\frac{5.2\text{k}\Omega}{10\text{k}\Omega} \right)$$

9) Negative Saturation Voltage of Srchmitt Trigger

Open Calculator

fx $$V_{sat} = -V_{ee} + V_{drop}$$

ex $$1.2\text{V} = -0.7\text{V} + 1.90\text{V}$$

10) Open Loop Gain of Schmitt Trigger

Open Calculator

fx $$A_v = \frac{V_{fi}}{V_+ - V_-}$$

ex $$-1.677419 = \frac{1.04\text{V}}{0.97\text{V} - 1.59\text{V}}$$

11) Positive Saturation Voltage of Schmitt Trigger

Open Calculator

fx $$V_{sat} = +V_{cc} - V_{drop}$$

ex $$1.2\text{V} = +3.1\text{V} - 1.90\text{V}$$

12) Resistance of Schmitt Trigger

Open Calculator

$$R_{in} = \frac{V_{in}}{i_n}$$

$$9.107143\text{k}\Omega = \frac{10.2\text{V}}{1.12\text{mA}}$$

13) Upper Treshold Voltage of Inverting Schmitt Trigger

Open Calculator

$$V_{ut} = +V_{sat} \cdot \frac{R_2}{R_1 + R_2}$$

$$0.410526\text{V} = +1.2\text{V} \cdot \frac{5.2\text{k}\Omega}{10\text{k}\Omega + 5.2\text{k}\Omega}$$

14) Voltage Change of Controller

Open Calculator

$$\Delta V = \frac{2 \cdot V_{sat} \cdot R_1}{R_2 + R_1}$$

$$1.578947\text{V} = \frac{2 \cdot 1.2\text{V} \cdot 10\text{k}\Omega}{5.2\text{k}\Omega + 10\text{k}\Omega}$$

15) Voltage Transfer Equation for Inverting Schmitt Trigger

Open Calculator

$$V_{-} = V_{off} \cdot \left(\frac{R_2}{R_1 + R_2}\right) + V_o \cdot \left(\frac{R_1}{R_1 + R_2}\right)$$

ex

$$1.596316\text{V} = 1.82\text{V} \cdot \left(\frac{5.2\text{k}\Omega}{10\text{k}\Omega + 5.2\text{k}\Omega}\right) + 1.48\text{V} \cdot \left(\frac{10\text{k}\Omega}{10\text{k}\Omega + 5.2\text{k}\Omega}\right)$$

Variables Used

- A_v Open Loop Gain
- H Hysteresis Loss *(Volt)*
- i_n Input Current *(Milliampere)*
- R_1 Resistance 1 *(Kilohm)*
- R_2 Resistance 2 *(Kilohm)*
- R_{comp} Component Resistance of Controller *(Kilohm)*
- R_{in} Input Resistance *(Kilohm)*
- V_- Inverting Input Voltage *(Volt)*
- V_+ Non-Inverting Input Voltage *(Volt)*
- V_{cc} Supply Voltage of Op Amp *(Volt)*
- V_{drop} Small Voltage Drop *(Volt)*
- V_{ee} Emitter Voltage *(Volt)*
- V_f Feedback Threshold Voltage *(Volt)*
- V_{fi} Final Voltage *(Volt)*
- V_{in} Input Voltage *(Volt)*
- V_{lt} Lower Threshold Voltage *(Volt)*
- V_o Output Voltage *(Volt)*
- V_{off} Input Offset Voltage *(Volt)*
- V_{sat} Saturation Voltage *(Volt)*
- V_{ut} Upper Threshold Voltage *(Volt)*
- ΔV Voltage Change *(Volt)*

Constants, Functions, Measurements used

- Measurement: **Electric Current** in Milliampere (mA)
  Electric Current Unit Conversion
- Measurement: **Electric Resistance** in Kilohm (kΩ)
  Electric Resistance Unit Conversion
- Measurement: **Electric Potential** in Volt (V)
  Electric Potential Unit Conversion

Check other formula lists

- **MOS IC Fabrication Formulas**
- **Schmitt Trigger Formulas**

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

4/30/2024 | 3:55:29 AM UTC *Please leave your feedback here...*