calculatoratoz.com

unitsconverters.com

Transducers 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 24 Transducers Formulas

Transducers

1) Area of Detector

Open Calculator

fx $$A = \frac{D_n^2}{D_t^2 \cdot \Delta f}$$

ex $$4.231405\text{m}^2 = \frac{(2)^2}{(1.375)^2 \cdot 0.5\text{Hz}}$$

2) Capacitance of Amplifier

Open Calculator

fx $$C_{amp} = C_g - C_t - C_{cable}$$

ex $$0.04\text{F} = 0.08\text{F} - 0.03\text{F} - 0.01\text{F}$$

3) Capacitance of Cable

Open Calculator

fx $$C_{cable} = C_g - (C_t + C_{amp})$$

ex $$0.01\text{F} = 0.08\text{F} - (0.03\text{F} + 0.04\text{F})$$

4) Capacitance of Transducer

Open Calculator

fx $$C_t = C_g - (C_{amp} + C_{cable})$$

ex $$0.03\text{F} = 0.08\text{F} - (0.04\text{F} + 0.01\text{F})$$

5) Change in Irradiation

Open Calculator

fx $$\Delta H = \frac{\Delta R}{\Delta S}$$

ex $$30.17241 W/m^2 = \frac{35\Omega}{1.16}$$

6) Change in Resistance

Open Calculator

fx $$\Delta R = \Delta H \cdot \Delta S$$

ex $$34.8\Omega = 30 W/m^2 \cdot 1.16$$

7) Current Generator Capacitance

Open Calculator

fx $$C_g = C_t + C_{amp} + C_{cable}$$

ex $$0.08F = 0.03F + 0.04F + 0.01F$$

8) Detectivity

Open Calculator

fx $$D_t = \frac{R_d}{E_n}$$

ex $$1.375228 = \frac{15.1 A/W}{10.98V}$$

9) Detectivity of Transducer

Open Calculator

fx $$D_t = \frac{snr}{D}$$

ex $$1.37741 = \frac{15}{10.89m}$$

10) Efficiency of transducer

Open Calculator

fx $$\eta_{tr} = \frac{\Delta T}{\Delta T_{rise}}$$

ex $$1.25 = \frac{20K}{16K}$$

11) Input Signal of Transducer

Open Calculator

fx $$D = \frac{V_o}{R_t}$$

ex $$10.89595m = \frac{18.85V}{1.73V/m}$$

12) Noise Equivalent of Bandwidth

Open Calculator

fx $$\Delta f = \frac{D_n^2}{D_t^2 \cdot A}$$

ex $$0.503739Hz = \frac{(2)^2}{(1.375)^2 \cdot 4.2m^2}$$

13) Normalized Detectivity

Open Calculator

fx $$D_n = (A \cdot \Delta f)^{0.5} \cdot D_t$$

ex $$1.992564 = (4.2\text{m}^2 \cdot 0.5\text{Hz})^{0.5} \cdot 1.375$$

14) Output Signal of Transducer

Open Calculator

fx $$V_o = D \cdot R_t$$

ex $$18.8397\text{V} = 10.89\text{m} \cdot 1.73\text{V/m}$$

15) Responsivity of Detector

Open Calculator

fx $$R_d = \frac{V_{rms}}{P_{rms}}$$

ex $$15.11111\text{A/W} = \frac{81.6\text{V}}{5.4\text{W}}$$

16) Responsivity of Transducer

Open Calculator

fx $$R_t = \frac{V_o}{D}$$

ex $$1.730946\text{V/m} = \frac{18.85\text{V}}{10.89\text{m}}$$

17) Rise in Temperature

Open Calculator

fx $$\Delta T_{rise} = \frac{\Delta T}{\eta_{tr}}$$

ex $$16K = \frac{20K}{1.25}$$

18) RMS Incident Power of Detector

Open Calculator

fx $$P_{rms} = \frac{V_{rms}}{R_d}$$

ex $$5.403974W = \frac{81.6V}{15.1A/W}$$

19) RMS Noise Voltage of Cell

Open Calculator

fx $$E_n = \frac{R_d}{D_t}$$

ex $$10.98182V = \frac{15.1A/W}{1.375}$$

20) RMS output Voltage Detector

Open Calculator

fx $$V_{rms} = R_d \cdot P_{rms}$$

ex $$81.54V = 15.1A/W \cdot 5.4W$$

21) Sensitivity of LVDT

Open Calculator

fx $$S_{lvdt} = \frac{V_o}{D}$$

ex $$1.730946\text{V/m} = \frac{18.85\text{V}}{10.89\text{m}}$$

22) Sensitivity of Photoresistive Transducer

Open Calculator

fx $$\Delta S = \frac{\Delta R}{\Delta H}$$

ex $$1.166667 = \frac{35\Omega}{30\text{W/m}^2}$$

23) Size of Output Signal

Open Calculator

fx $$V = \frac{snr}{D_t}$$

ex $$10.90909\text{V} = \frac{15}{1.375}$$

24) Temperature Difference

Open Calculator

fx $$\Delta T = \Delta T_{rise} \cdot \eta_{tr}$$

ex $$20\text{K} = 16\text{K} \cdot 1.25$$

Variables Used

- **A** Detector Area *(Square Meter)*
- **C_{amp}** Amplifier Capacitance *(Farad)*
- **C_{cable}** Cable Capacitance *(Farad)*
- **C_g** Current Generator Capacitance *(Farad)*
- **C_t** Transducer Capacitance *(Farad)*
- **D** Input Displacement Signal *(Meter)*
- **D_n** Normalized Detectivity
- **D_t** Transducer Detectivity
- **E_n** Root Mean Square Noise Voltage of Cell *(Volt)*
- **P_{rms}** Root Mean Square Incident Power of Detector *(Watt)*
- **R_d** Detector Responsivity *(Ampere per Watt)*
- **R_t** Transducer Responsivity *(Volt per Meter)*
- **S_{lvdt}** LVDT Sensitivity *(Volt per Meter)*
- **snr** Signal to Noise Ratio of Output Signal
- **V** Output Signal Size *(Volt)*
- **V_o** Transducer Output Signal *(Volt)*
- **V_{rms}** Root Mean Square Voltage Output *(Volt)*
- **Δf** Noise Equivalent Bandwidth *(Hertz)*
- **ΔH** Irradiation Change *(Watt per Square Meter)*
- **ΔR** Resistance Change *(Ohm)*
- **ΔS** Photoresistive Transducer Sensitivity
- **ΔT** Temperature Difference *(Kelvin)*

- ΔT_{rise} Temperature Rise *(Kelvin)*
- η_{tr} Transducer Efficiency

Constants, Functions, Measurements used

- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Temperature** in Kelvin (K)
  Temperature Unit Conversion
- Measurement: **Area** in Square Meter (m²)
  Area Unit Conversion
- Measurement: **Power** in Watt (W)
  Power Unit Conversion
- Measurement: **Frequency** in Hertz (Hz)
  Frequency Unit Conversion
- Measurement: **Capacitance** in Farad (F)
  Capacitance Unit Conversion
- Measurement: **Electric Resistance** in Ohm (Ω)
  Electric Resistance Unit Conversion
- Measurement: **Temperature Difference** in Kelvin (K)
  Temperature Difference Unit Conversion
- Measurement: **Electric Field Strength** in Volt per Meter (V/m)
  Electric Field Strength Unit Conversion
- Measurement: **Electric Potential** in Volt (V)
  Electric Potential Unit Conversion
- Measurement: **Potential Gradient** in Volt per Meter (V/m)
  Potential Gradient Unit Conversion
- Measurement: **Irradiation** in Watt per Square Meter (W/m²)
  Irradiation Unit Conversion
- Measurement: **Responsivity** in Ampere per Watt (A/W)
  Responsivity Unit Conversion

Check other formula lists

- **Transducers Formulas**

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

6/24/2024 | 6:08:46 AM UTC *Please leave your feedback here...*