# Capacitor codes

Turn 104, 473J or 2A into a value in pF, nF and µF, a tolerance and a voltage.

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## Reading a 3-digit code

1 0 4

**1 0** are the first two digits.
**4** is how many zeros follow.
The answer is in **picofarads (pF)**.

104 = 10 and 4 zeros = 100,000 pF = **100 nF = 0.1 µF**

- **473** = 47,000 pF = 47 nF
- **222** = 2,200 pF = 2.2 nF
- **101** = 100 pF
- A third digit of **9** means divide by ten: **109** = 1.0 pF.
- Just two digits, like **22** or **47**, is the value in pF.

## pF, nF and µF

pF ÷ 1000 → nF ÷ 1000 → µF

1 µF = 1000 nF = 1,000,000 pF

Other ways to write it: **4n7** = 4.7 nF, **2p2** = 2.2 pF, **µ47** or **u47** = 0.47 µF. On older parts a plain **.1** or **0.047** is in µF.

## Common codes

| Code | pF | nF | µF |
|---|---|---|---|
| **100** | 10 pF | 0.01 nF | 0.00001 µF |
| **220** | 22 pF | 0.022 nF | 0.000022 µF |
| **101** | 100 pF | 0.1 nF | 0.0001 µF |
| **221** | 220 pF | 0.22 nF | 0.00022 µF |
| **471** | 470 pF | 0.47 nF | 0.00047 µF |
| **102** | 1,000 pF | 1 nF | 0.001 µF |
| **222** | 2,200 pF | 2.2 nF | 0.0022 µF |
| **472** | 4,700 pF | 4.7 nF | 0.0047 µF |
| **103** | 10,000 pF | 10 nF | 0.01 µF |
| **223** | 22,000 pF | 22 nF | 0.022 µF |
| **473** | 47,000 pF | 47 nF | 0.047 µF |
| **104** | 100,000 pF | 100 nF | 0.1 µF |
| **224** | 220,000 pF | 220 nF | 0.22 µF |
| **474** | 470,000 pF | 470 nF | 0.47 µF |
| **105** | 1,000,000 pF | 1,000 nF | 1 µF |
| **225** | 2,200,000 pF | 2,200 nF | 2.2 µF |
| **475** | 4,700,000 pF | 4,700 nF | 4.7 µF |
| **106** | 10,000,000 pF | 10,000 nF | 10 µF |

104 (100 nF) is the one by every chip's power pin.

## Tolerance letters

| | | | |
|---|---|---|---|
| **B** | ±0.1 pF | **J** | ±5% |
| **C** | ±0.25 pF | **K** | ±10% |
| **D** | ±0.5 pF | **M** | ±20% |
| **F** | ±1% | **Z** | +80% / −20% |
| **G** | ±2% | | |

B, C and D are for capacitors under about 10 pF.

## Voltage codes

| | | | |
|---|---|---|---|
| **0J** | 6.3 V | **1J** | 63 V |
| **1A** | 10 V | **2A** | 100 V |
| **1C** | 16 V | **2D** | 200 V |
| **1E** | 25 V | **2E** | 250 V |
| **1V** | 35 V | **2G** | 400 V |
| **1H** | 50 V | **2J** | 630 V |

## Electrolytics




Value and voltage are printed in full, like 470 µF 25 V. The **stripe marks the − leg**, and the longer leg is +.

## Reading a capacitor, step by step

1. **A can with a stripe** is an electrolytic: read the value and voltage as printed.
2. **Three digits** on a ceramic or film capacitor: read the value in pF, then move to nF or µF.
3. **A letter straight after the digits** is the tolerance.
4. **A digit-and-letter pair** like 1H or 2A elsewhere on the body is the voltage.

So **2A104J** is 100 nF, ±5%, rated 100 V. Pick a rating comfortably above the supply: 16 V on a 12 V supply is fine, 10 V will fail.

## Common values

Capacitors usually come in the E6 series: **1, 1.5, 2.2, 3.3, 4.7 and 6.8** in each decade.

The ones you'll reach for most: 22 pF, 100 pF, 1 nF, 10 nF, 100 nF, 1 µF, 10 µF, 100 µF and 470 µF.