



The Secret Language of Resistors

A tiny component carries an entire number without printing a single digit.

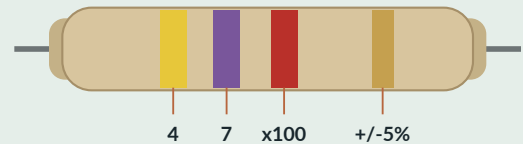
THE STORY IN ONE MINUTE

Open an early radio and you find dozens of small components packed tightly together. Each resistor had a precise job, but technicians still needed a fast way to identify its value. Tiny printed labels were difficult to fit and read on a curved body, and inconsistent markings made repairs slower.

By the early 1930s, the Radio Manufacturers Association had established a shared color code. A 1931 trade journal described the RMA system as already in practically universal use. Each color represented a digit, while its position revealed whether that digit was part of the value, a multiplier, or the allowed tolerance.

Early resistors sometimes used a body-end-dot system: the body supplied one digit, the painted end another, and a dot the multiplier. Later, colored bands wrapped around the component. The code crossed manufacturers and borders, became an IEC standard in 1952, and still survives in today's IEC 60062 system.

ONE RESISTOR, FOUR CLUES



YELLOW - VIOLET - RED - GOLD

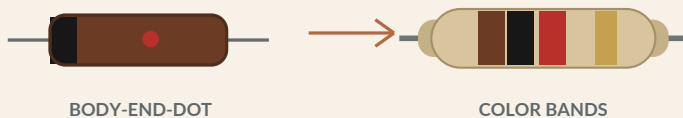
$47 \times 100 = 4,700 \text{ ohms, } +/- 5\%$

THE COLOR ALPHABET

0	1	2	3	4	5	6	7	8	9
BLACK	BROWN	RED	ORANGE	YELLOW	GREEN	BLUE	VIOLET	GRAY	WHITE

The first bands carry digits. The next band scales the number. A final band often shows tolerance.

HOW THE LANGUAGE EVOLVED



EARLY 1930s: RMA common code | 1952: IEC 62 | TODAY: IEC 60062

WHY COLOR WORKED

- It fit tiny, curved components.
- Bands could be seen around the body.
- Technicians could identify values quickly.
- One code could work across manufacturers.

DID YOU KNOW?

Many flat surface-mount resistors use printed alphanumeric codes instead. The old color language remains especially familiar on leaded resistors used in repair, learning, and prototyping.



ATOMIC OBSERVATION

"The stripes are not decoration. They are a number written in color."

CONTINUE THE STORY

Watch the Atomic 29 video, then explore resistors, wire, and electronic components at atomic-29.com.

SC-004: The tiny switch that changed the world.