

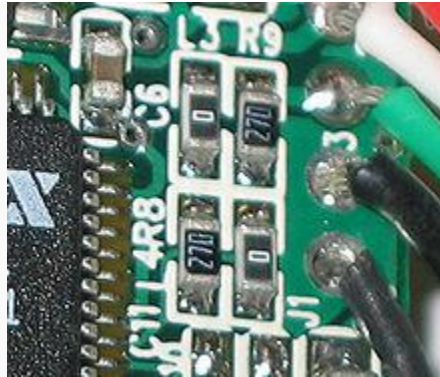
ELECTRONIC COLOR CODE

The electronic color code is used to indicate the values or ratings of electronic components, very commonly for resistors, but also for capacitors, inductors, and others. A separate code, the 25-pair color code, is used to identify wires in some telecommunications cables.

The electronic color code was developed in the early 1920s by the Radio Manufacturers Association (now part of Electronic Industries Alliance[1] (EIA)), and was published as EIA-RS-279. The current international standard is IEC 60062.[2]

Colorbands were commonly used (especially on resistors) because they were easily printed on tiny components, decreasing construction costs. However, there were drawbacks, especially for color blind people. Overheating of a component, or dirt accumulation, may make it impossible to distinguish brown from red from orange. Advances in printing technology have made printed numbers practical for small components, which are often found in modern electronics.

Printed numbers



0Ω and 27Ω (27×10^0) surface-mount resistors.

Color-coding of this form is becoming rarer. In newer equipment, most passive components come in surface mount packages. Many of these packages are unlabeled and, those that are, normally use alphanumeric codes, not colors.

In one popular marking method, the manufacturer prints 3 digits on components: 2 value digits followed by the power of ten multiplier. Thus the value of a resistor marked 472 is $4,700\ \Omega$, a capacitor marked 104 is $100\ \text{nF}$ ($10 \times 10^4\ \text{pF}$), and an inductor marked 475 is $4.7\ \text{H}$ ($4,700,000\ \mu\text{H}$). This can be confusing; a resistor marked 270 might seem to be a $270\ \Omega$ unit, when the value is actually $27\ \Omega$ (27×100). A similar method is used to code precision surface mount resistors by using a 4-digit code which has 3 significant figures and a power of ten multiplier.

Using the same example as above, 4701 would represent a $470 \times 10^1 = 4700 \Omega$, 1% resistor. Another way is to use the "kilo-" or "mega-" prefixes in place of the decimal point:

$$\begin{aligned}1K2 &= 1.2 \text{ k}\Omega = 1,200 \Omega \\M47 &= 0.47 \text{ M}\Omega = 470,000 \Omega \\68R &= 68 \Omega\end{aligned}$$

For some 1% resistors, a three-digit alphanumeric code is used, which is not obviously related to the value but can be derived from a table of 1% values. For instance, a resistor marked 68C is $499(68) \times 100(C) = 49,900 \Omega$. In this case the value 499 is the 68th entry of a table of 1% values between 100 and 999.

Source: http://web.ua.es/docivis/magnet/electronic_color_code.html