SMD RESISTOR & CAPACITOR

SIZE CHARTS

MATRIC GROUP

MATRIC | DYNAMIC MANUFACTURING | WINDURANCE

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A QUICK INTRODUCTION

Getting specifications right on a printed circuit board -- especially as components continue to shrink -- is a challenge. Best to have all the tools and reference you need right by your side!

For those looking to buy or design with SMD resistors and capacitors, **we've created this SMD size chart, along with a visual size comparison** for easy reference.

Those parts can be quite a hassle, so check out these charts to **save you time and potentially a costly misstep.**

Feel free to either save these charts to your computer or print a physical version.

A quick note on what SMD means vs. SMT:

- SMT stands for surface mount technology, the entire technology of mounting and soldering surface mount components onto your printed circuit board (PCB).
- SMD stands for surface mount device. It's a device assembled using surface mount technology (SMT) and parts.

HOW & WHY TO USE THESE CHARTS

These charts are a great way to catch any pin pitch, width, and size **mismatch between your footprint and the actual part.**

They're also handy in schematic layout and examining the tradeoff between size and cost. Many designers and purchasers ask for tiny components when they don't really need to. There's no reason to waste all that empty space on your board! **Smaller parts are more expensive** because your vendor needs more precision to make them correctly.

Components are getting so small that you can't physically place a surface mount marking on some of them. Many companies have used this as an excuse to stop printing numbers on bigger components, too.

In the Eagle free PCB design software, it's hard to tell a component's true size. After a while, they become so small that they all look the same.

Your parts may use measurements and power ratings that slightly differ from what's in these charts. **Use our numbers as general guidelines.**

ON TO THE CHARTS →

SMD RESISTOR & CAPACITOR SIZES

INCH CASE CODE	INCH (METRIC) CASE CODE	METRIC DIMENSIONS	INCH DIMENSIONS
008004	0201	0.25 x 0.125	0.010x 0.005
009005	03015	0.30 x 0.15	0.012 x 0.006
01005	0402	0.40 x 0.20	0.016 x 0.008
0201	0603	0.06 x 0.30	0.020 x 0.010
0402	1005	1.00 x 0.50	0.040 x 0.020
0603	1608	1.60 x 0.80	0.060 x 0.030
0805	2012	2.00 x 1.25	0.080 x 0.050
1008	2520	2.50 x 2.00	0.100 x 0.080
1206	3216	3.20 x 1.60	0.125 x 0.060
1210	3225	3.20 x 2.50	0.125 x 0.100
1806	4516	4.50 x 1.60	0.180 x 0.060
1812	4532	4.50 x 3.20	0.180 x 0.125
1825	4564	4.50 x 6.40	0.180 x 0.250
2010	5025	5.00 x 2.50	0.200 x 0.100
2512	6332	6.30 x 3.20	0.250 x 0.125
2920	7451	7.40 x 5.10	0.290 x 0.200

The above table lists the dimensions and specifications of commonly used surface mount packages.

Resistors' shapes and sizes are **standardized**. The size of SMD resistors is indicated by a numerical code, such as 0603. In most cases you can sniff out the near-exact width and height of the package. So in the example of 0603 Imperial code, this indicates a length of 0.060" and a width of 0.030".

An SMD resistor's size depends mainly on the required power rating.

COMPARISON	METRIC CODE		IMPERIAL CODE	COMPARISON
0.1 x 0.1 mm	0402		01005	0.01 x 0.01 in (10x10) mils
	0603		0201	
	1005		0402	
	1608		0603	0.1 x 0.1 in (100 x 100 mils)
1 x 1 mm	2012		0805	
	2520		1008	
	3261		1206	
	3225		1210	0.5 x 0.5 (500 x 500 mils)
1 x 1 cm	4516		1806	
	4532		1812	
	5025		2010	
	6332		2512	

ACTUAL SIZE

Sometimes a simple visual comparison helps, too. Above is a size comparison visual for SMD resistors. Note this image is blown up and is **not to scale** (so you can see the little guys at the top).

ANY QUESTIONS?

If you have questions about your design, get in touch with a full-service contract manufacturer.

Ones that handle design as well as assembly and testing will be able to decipher whether your product is manufacturable and will work in the real world.
If you're not already, you may be better off outsourcing PCB services altogether. If you want to enjoy extra benefits like obsolescence management and design help, make sure that partner is an all-in-1 manufacturer. The peace of mind will be worth it, no question.

More resources on PCB design layout:

Buyer's Guide to PCB Layout

PCB Layout Design for Manufacturability: 5 Mistakes

Beware These 6 Printed Circuit Board Layout Pitfalls

Your Go-To Guide to Reducing PCB Assembly Cost

Worth It to Outsource PCB Assembly Ser-vices? Definitely

Matric Group provides Surface Mount Technology assemblies. We've invested in state-of-the-art machinery to improve the speed, accuracy, and reliability of SMT products.

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