

Resistor E Series

What is the E-series

Resistor (and other component) values are organised into a set of preferred values or standard resistor values known as the E-series.

These standard resistor values have a logarithmically based sequence and this enables the different values to be spaced in such a way that they relate to the component tolerance or accuracy.

Resistor tolerances are generally $\pm 20\%$, $\pm 10\%$, $\pm 5\%$, $\pm 2\%$ and $\pm 1\%$. More accurate tolerances are available for some resistors, but these are not as widely available and costs are higher.

By having these standard resistor values, electronic components from a variety of manufacturers can be chosen, making sourcing much easier and the cost of the components much less.

E-Series Properties

E SERIES	TOLERANCE (SIG FIGS)	NUMBER OF VALUES IN EACH DECADE
E3	>20%	3
E6	20%	6
E12	10%	12
E24	5% [normally also available in 2% tolerance]	24
E48	2%	48
E96	1%	96
E192	0.5%, 0.25% and higher tolerances	192

E3, E6, E12 & E24 Series Values

E3 STANDARD RESISTOR SERIES

1.0	2.2	4.7
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E6 STANDARD RESISTOR SERIES

1.0	1.5	2.2
3.3	4.7	6.8

E12 STANDARD RESISTOR SERIES

1.0	1.2	1.5
1.8	2.2	2.7
3.3	3.9	4.7
5.6	6.8	8.2

E24 STANDARD RESISTOR SERIES

1.0	1.1	1.2
1.3	1.5	1.6
1.8	2.0	2.2
2.4	2.7	3.0
3.3	3.6	3.9
4.3	4.7	5.1
5.6	6.2	6.8
7.5	8.2	9.1

For E48 and E96 values please visit my website: https://www.electronics-notes.com/articles/electronic_components/resistors/standard-resistor-values-e-series-e3-e6-e12-e24-e48-e96.php