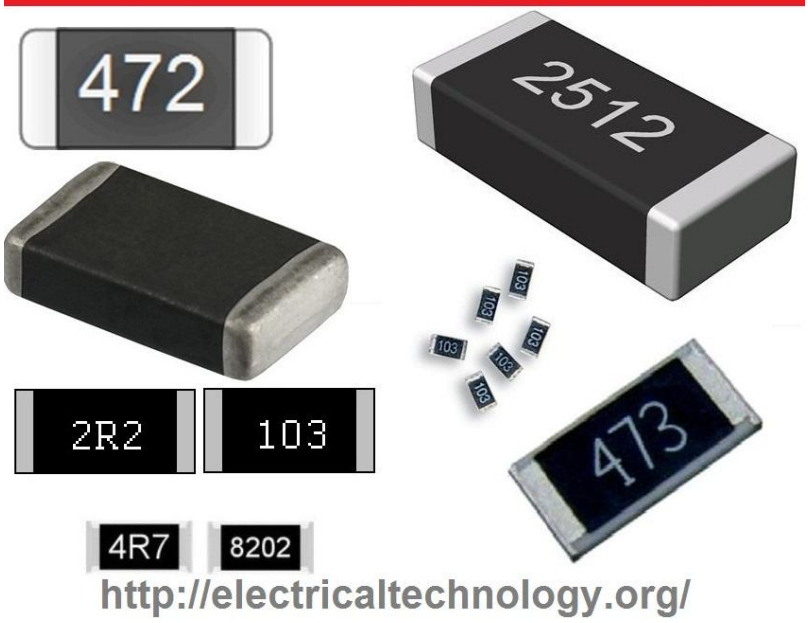
SMD Resistor Codes

How to calculate or Find the value of SMD Resistors?



SMD resistor: Surface Mount Technology

SMD Resistor stands for “Surface Mount device” (Taken out from SMT = Surface Mount Technology) Resistor. These tiny chips are marked with three (3) or four (4) digit codes which is called SMD Resistor codes to indicate their resistance values. Below are the roles to follow for that how to read SMD Resistor codes and values?
Also read:

- How to find the value of burnt Resistor (by three handy methods)
- How to calculate the value of resistor for LED’s (with different types of LED’s circuits)

Reading 3-Digit SMD Resistor Codes (for SMD Resistors)

- The first, Two (2) digits or numbers will indicate the significant digits or numbers
- The third one will be multiplier (in Power of Ten i.e. 10^ something) and then must be multiply by the first Two (2) significant digits or number or the third one will indicate that how many Zeros should be add to the first Two (2) significant digits or number
- The letter “R” is used for Decimal Point “.” i.e. 1.1 Ω = 1R1 Ω
- Resistances below 10 ohms (Ω) do not have a multiplier

Examples of 3-Digit SMD Resistor Codes

250 = 25 x 10^0 = 25 x 1 = 25 Ω (This is only and only 25Ω not 250 Ω)
100 = 10 x 10^0 = 10x 1 = 10 Ω
721 = 72 x 10^1 = 72 x 10 = 720 Ω
102 = 10 × 10^2 =10 x 100 = 1000Ω or 1kΩ
915 = 91 x 10^5 = 91 x 100000 = 9,100,000 Ω = 9.1MΩ

4R7 = 4.7Ω
R12 = 0.12 Ω

- Required Value of Resistor for LED's Circuit Calculator
- Standard Resistor Closest Value Calculator

Reading 4-Digit SMD Resistor Codes (for SMD Resistors)

There is nothing new but this is the same method to read the value of SMD resistors. The only difference is that with the significant numbers. I copied the above method (3-Digit Codes) and then past here so you can see that only First one is changed and other three rules are same.

- The first, Two (3) digits or numbers will indicate the significant digits or numbers
- The fourth one will be multiplier (in Power of Ten i.e. 10^ something) and then must be multiply by the first Two (3) significant digits or number or the fourth one will indicate that how many Zeros should be add to the first Two (2) significant digits or number
- The letter "R" is used for Decimal Point "." i.e. 11.5 Ω = 11R5 Ω (4-digit SMD resistors (E96 series)
- Resistances below 10 ohms (Ω) do not have a multiplier
- *Also read: Resistor & Types of Resistors*

Examples of 4-Digit SMD Resistor Codes

2500 = 250 x 10^0 = 250 x 1 = 250 Ω (This is only and only 250Ω not 2500 Ω)
1000 = 100 x 10^0 = 100x 1 = 100 Ω
7201 = 720 x 10^1 = 720 x 10 = 7200 Ω or 7.2kΩ
1001 = 100 × 10^1 =100 x 10 = 1000 Ω or 1kΩ
1004 = 100 × 10^4 =100 x 10000 = 1000,000 Ω or 1MΩ
R102 =0.102 Ω (4-digit SMD resistors (E96 series)
0R10 =0.1 x 10^0 = 0.1 x 1 = 0.1 Ω (4-digit SMD resistors (E24 series)
25R5 = 25.5Ω (4-digit SMD resistors (E96 series))

Reading EIA-96 SMD Resistor Codes (for SMD Resistors)

EIA-96 SMD Resistor Codes marking method is a new method which appeared on 1% of all SMD resistors. It consists on 3- Character codes.

Below are the rules to follow for reading the value of EIA-96 SMD resistors.

- The first, Two (2) digits or numbers will indicate the significant digits or numbers
- The third one "Letter" is a multiplier (in Power of Ten i.e. 10^ something) and then must be multiply by the first Two (2) significant digits.
- Must follow the codes in Table (1) and (2)

Below is the table (1) to shows the multiplier values of different Letters using in EIA-96 coding system for SMD Resistor Codes.

Table (1)

Letters	Multipliers
Z	0.001
R or Y	0.01
S or X	0.1
A	1
B or H	10

C	100
D	1000
E	10000
F	100000

Also, look in the examples of reading EIA-96 SMD Resistor Codes for importance the use of table (2)

Table (2)…

Table (2)

Code	Value	Code	Value	Code	Value	Code	Value
01	**100**	**25**	**178**	**49**	**316**	**73**	**562**
02	**102**	**26**	**182**	**50**	**324**	**74**	**576**
03	**105**	**27**	**187**	**51**	**332**	**75**	**590**
04	**107**	**28**	**191**	**52**	**340**	**76**	**604**
05	**110**	**29**	**196**	**53**	**348**	**77**	**619**
06	**113**	**30**	**200**	**54**	**357**	**78**	**634**
07	**115**	**31**	**205**	**55**	**365**	**79**	**649**
08	**118**	**32**	**210**	**56**	**374**	**80**	**665**
09	**121**	**33**	**215**	**57**	**383**	**81**	**681**
10	**124**	**34**	**221**	**58**	**392**	**82**	**698**
11	**127**	**35**	**226**	**59**	**402**	**83**	**715**
12	**130**	**36**	**232**	**60**	**412**	**84**	**732**
13	**133**	**37**	**237**	**61**	**422**	**85**	**750**
14	**137**	**38**	**243**	**62**	**432**	**86**	**768**
15	**140**	**39**	**249**	**63**	**442**	**87**	**787**
16	**143**	**40**	**255**	**64**	**453**	**88**	**806**
17	**147**	**41**	**261**	**65**	**464**	**89**	**825**
18	**150**	**42**	**267**	**66**	**475**	**90**	**845**
19	**154**	**43**	**274**	**67**	**487**	**91**	**866**
20	**158**	**44**	**280**	**68**	**499**	**92**	**887**
21	**162**	**45**	**287**	**69**	**511**	**93**	**909**
22	**165**	**46**	**294**	**70**	**523**	**94**	**931**
23	**169**	**47**	**301**	**71**	**536**	**95**	**953**
24	**174**	**48**	**309**	**72**	**549**	**96**	**976**

Examples of EIA-96 SMD Resistor Codes

01F = 10M

01E = 1MΩ

01C= 10kΩ

01B = 1kΩ

01A = 100Ω

01X = 10Ω

01Y = 1Ω

66X = 475 x 0.1 = 47.5 …→ (in table (2), 66 = 475 and in table (1), X = 0.1. so 475 x 0.1 = 47.1Ω)

85Z = 750 x 0.001 = 0.75Ω → (in table (2), 85 = 750 and in table (1), Z = 0.001. so 750 x 0.001 = 0.75Ω)

36H = 232 x10 = 2320Ω = 2.32kΩ → (in table (2), 36 = 232 and in table (1), H = 10. so 232 x 10= 2.32kΩ)