Innovative Service Around the Globe YAGEO

DATA SHEET

CHIP RESISTORS

Marking



YAGEO Phicomp

Product Specification – Apr 02, 2008 V.1



MARKING

RESISTANCE CODE

Wherever it is possible, chip resistors are provided with a resistance code.

The resistance code includes the first two or three significant digits of the resistance value (Ω) followed by the number of zeros; see Table 1.

Whether two or three significant values are represented depends on the tolerance:

- ±5% requires two digits (E24 series)
  - For example: 244 = 24 × 10^4 = 240,000 = 240 kΩ
- ±1% and lower requires three digits (E24/E96 series)
  - For example: 3160 = 316 × 10^0 = 316 Ω

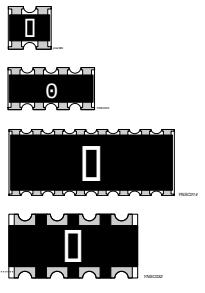
Table 1 Resistance value indication

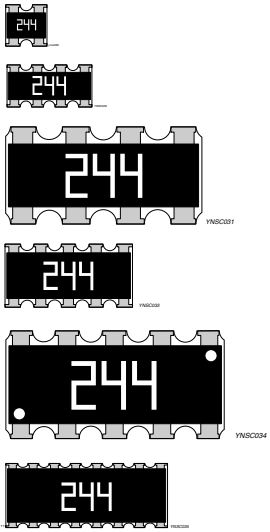
Indicator	Tol. ≥ 5%	Tol. ≤ 1%
R (1)	0.001 to 9.1 Ω	0.001 to 97.6 Ω
0	10 to 91 Ω	100 to 976 Ω
1	100 to 910 Ω	1 to 9.76 kΩ
2	1 to 9.1 kΩ	10 to 97.6 kΩ
3	10 to 91 kΩ	100 to 976 kΩ
4	100 to 910 kΩ	1 to 9.76 MΩ
5	1 to 9.1 MΩ	10 to 97.6 MΩ
6	10 to 91 MΩ	–

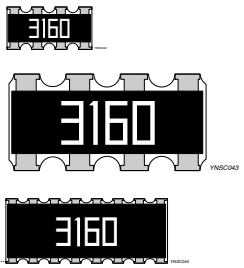
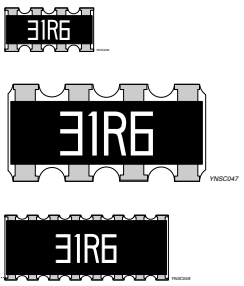
NOTE

1. R denotes the decimal point

GENERAL PRINCIPLES AND ILLUSTRATORS OF MARKING CODES

KINDS	FORMS	PRODUCT TYPES	RESISTANCE RANGE	ILLUSTRATORS & EXAMPLES
No marking	–	0201/0402 of all series	All	Fig. 1 No marking
		All sizes of TR series	All	
		RL0603	R < 100 mΩ except 10/20/30/40/50/60 mΩ	
		YC102/122	All	 Fig. 2 No marking
		TC122	All	 Fig. 3 No marking
		TC124	All	 Fig. 4 No marking
		ATV321	All	 Fig. 5 No marking (rectangle for position)
		Speciality	Out of standard resistance value	Based on type
1-Digit marking	0	All sizes of RC series	Jumper = 0 Ω	 Fig. 6 Value = 0 Ω
		YC162 YC124/164 YC248 TC164	Jumper = 0 Ω	 Fig. 7 Value = 0 Ω

KINDS	FORMS	PRODUCT TYPES	RESISTANCE RANGE	ILLUSTRATORS & EXAMPLES
3-Digit marking		RC0603 to RC2512	5% E24: R ≥ 10 Ω	
		All sizes of RV/AR/SR series	5% E24: R ≥ 10 Ω	**Fig. 8** 240 = 24 × 10^0 = 24 Ω
	XXX	YC162 YC124/164 YC324 YC158 YC358 YC248	5% E24: R ≥ 10 Ω	 **Fig. 9** 244 = 24 × 10^4 = 240 KΩ (dot for position)
		TC164	5% E24: R ≥ 10 Ω	 **Fig. 10** 244 = 24 × 10^4 = 240 KΩ
	XXX with short bar below	RC0603 AR0603 RT/RJ0603	1%, 0.5% E24 1% E24 1%, 0.5%, 0.25%, 0.1%, 0.05% E24 exception values 10/11/13/15/20/75 of E24 series	 **Fig. 11** 240 = 24 × 10^0 = 24 Ω
	XXX formed with 2 numerals + 1 letter	Size 0603 of RC Size 0603 of AR Size 0603 of RT/RJ	1%, 0.5% E96 1% E96 1%, 0.5%, 0.25%, 0.1%, 0.05% E96 including values 10/11/13/15/20/75 of E24 series	 **Fig. 12** 88A = 806 × 10^0 = 806 Ω
	XRX	Size 0603 to 2512 of RC/AR/SR series	5% E24: R < 10 Ω	 **Fig. 13** 2R2 = 2.2 Ω
	RXX	RL0603	5%, 1%: R = 10/20/30/40/50/60 mΩ 5%, 1% E24: R ≥ 100 mΩ, reference to Table 3	 **Fig. 14** R20 = 220 mΩ
	XmX with top bar	PR series	1.5 mΩ	 **Fig. 15** 1m5 = 0.0015 Ω = 1.5 mΩ

KINDS	FORMS	PRODUCT TYPES	RESISTANCE RANGE	ILLUSTRATORS & EXAMPLES
4-Digit marking		Size 0805 to 2512 of RC/RV/AR series	1% E24/E96: R ≥ 100 Ω	
		Size 0805 to 2512 of RT/RJ series	1%, 0.5%, 0.25%, 0.1% E24/E96: R ≥ 100 Ω	**Fig. 16** 1002 = 100 × 10^2 = 10 KΩ
	XXXX	YC124/164 YC248 YC324	1% E24/E96: R ≥ 100 Ω	
				Fig. 17 3160 = 316 × 10^0 = 316 Ω
		TC164	1% E24/E96: R ≥ 100 Ω	
				Fig. 18 3160 = 316 × 10^0 = 316 Ω
		Size 0805 to 2512 of RC/RV/AR series	1% E24/E96: R < 100 Ω	
		Size 0805 to 2512 of RT/RJ series	1%, 0.5%, 0.25%, 0.1% E24/E96: R < 100 Ω	**Fig. 19** 31R6 = 31.6 Ω
	XRXX, XXRX	YC124/164 YC248 YC324	1% E24/E96: R < 100 Ω	
				Fig. 20 31R6 = 31.6 Ω
		TC164	1% E24/E96: R < 100 Ω	
				Fig. 21 31R6 = 31.6 Ω

KINDS	FORMS	PRODUCT TYPES	RESISTANCE RANGE	ILLUSTRATORS & EXAMPLES
4-Digit marking	RXXX	RL0805 to 2512	5%, 1% E24, reference to Table 4	 Fig. 22 R020 = 0.02 Ω = 20 mΩ
		All sizes of PF series	20 mΩ/25 mΩ/50 mΩ	
	RXXX with top bar	All sizes of PR series	1/2/3/4/5 mΩ	 Fig. 23 R001 = 0.001 Ω = 1 mΩ
		All sizes of PF series	6/7/10 mΩ	

NOTE

1. Please contact with local sales force for unavailable resistance

Table 2 EIA-96 marking rule

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

Table 1. shows the first two digits of the three-digit EIA-96 part-marking scheme.
The third character is a letter multiplier:

$X = 10^{-1}$, $Y = 10^{-2}$, $A = 10^{0}$, $B = 10^{1}$, $C = 10^{2}$, $D = 10^{3}$, $E = 10^{4}$, $F = 10^{5}$

Table 3 EIA-24 marking rule for RL0603 (LRC21/22)

CODE	VALUE (mΩ)
R01	10
R02	20
No marking	25 (2)
R03	30
R04	40 (2)
R05	50 (2)
R06	60 (2)
R10	100
R11	110
R12	120
R13	130
R15	150
R16	160
R18	180
R20	200
R22	220
R24	240
R25	250 (2)
R27	270
R30	300
R33	330
R36	360
R39	390
R40	400 (2)
R43	430
R47	470
R50	500 (2)
R51	510
R56	560
R62	620
R68	680
R75	750
R82	820
R91	910

NOTE

1. All above values for E24 series are marked with a 3-digit code (RXX)
2. The partial values of 25/40/50/60/250/400/500 mΩ are belonged to non-E series
3. Except customer special requirement, values for E96 series are no marking
4. 5% and 1% follow the same marking rules.

Table 4 EIA-24 marking rule for RL0805 to RL2512

CODE	VALUE (mΩ)	CODE	VALUE (mΩ)
R010	10	R100	100
R011	11	R110	110
R012	12	R120	120
R013	13	R130	130
R015	15	R150	150
R016	16	R160	160
R018	18	R180	180
R020	20	R200	200
R022	22	R220	220
R024	24	R240	240
R025	25 (2)	R250	250 (2)
R027	27	R270	270
R030	30	R300	300
R033	33	R330	330
R036	36	R360	360
R039	39	R390	390
R040	40 (2)	R400	400 (2)
R043	43	R430	430
R047	47	R470	470
R050	50 (2)	R500	500 (2)
R051	51	R510	510
R056	56	R560	560
R060	60 (2)	R620	620
R062	62	R680	680
R068	68	R750	750
R075	75	R820	820
R082	82	R910	910
R091	91	-	-

NOTE

1. All above values for E24 series are marked with a 4-digit code (RXXX)
2. The partial values of 25/40/50/60/250/400/500 mΩ are belonged to non-E series
3. Except customer special requirement, values for E96 series are no marking
4. 5% and 1% follow the same marking rules.

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 1	Apr 02, 2008	-	- Marking kinds added according to range extended.
Version 0	Dec 17, 2004	-	- Yageo/Phycomp brand new data sheet of "Marking".