

High Precision Chip Resistors

1. Scope

This specification applies to all sizes of rectangular-type fixed chip resistors with Ni/Cr as material.

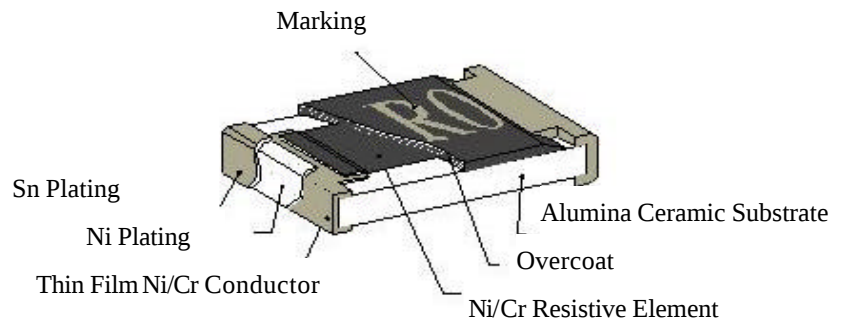
2. Features

- Tolerance from $\pm 0.01\%$ 1%
- Thin film & Ni/Cr Resistor
- TCR from $\pm 5\text{ppm}$ $\pm 50\text{ppm}$ for thin film chip R

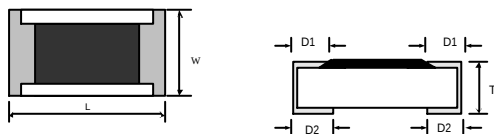
3. Applications

- Medical Equipment
- Measure Instrument
- Communication Device
- Converters
- Printer equipment
- Consumer

4. Construction



5. Dimensions



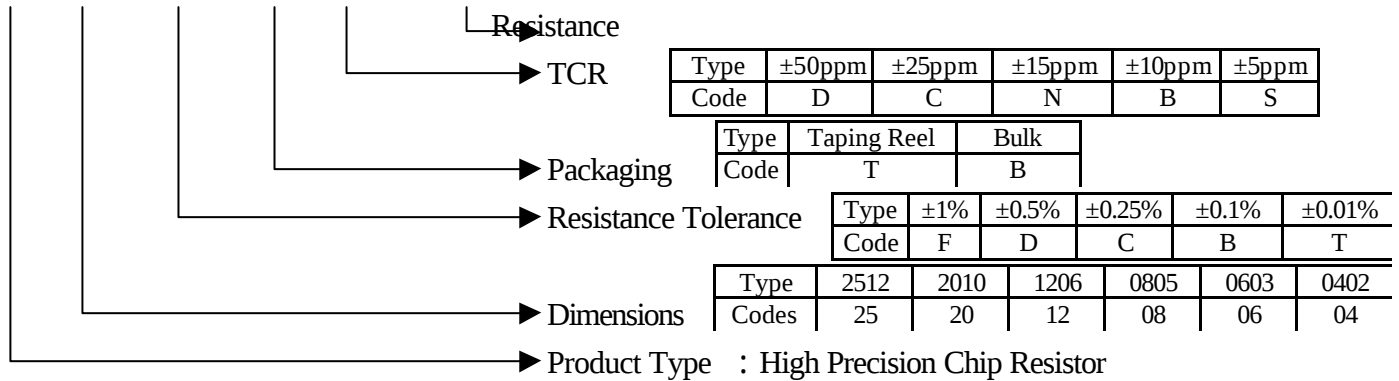
Unit : mm

SIZE	STYLE	L	W	T	D1	D2
2512	RP25	6.3 $\pm$ 0.15	3.1 $\pm$ 0.15	0.6 $\pm$ 0.10	0.6 $\pm$ 0.30	0.5 $\pm$ 0.25
2010	RP20	4.9 $\pm$ 0.15	2.4 $\pm$ 0.15	0.6 $\pm$ 0.10	0.6 $\pm$ 0.30	0.5 $\pm$ 0.25
1206	RP12	3.0 $\pm$ 0.10	1.5 $\pm$ 0.10	0.55 $\pm$ 0.10	0.45 $\pm$ 0.20	0.40 $\pm$ 0.20
0805	RP08	2.0 $\pm$ 0.15	1.25 $\pm$ 0.15	0.5 $\pm$ 0.10	0.3 $\pm$ 0.20	0.4 $\pm$ 0.20
0603	RP06	1.6 $\pm$ 0.10	0.8 $\pm$ 0.10	0.45 $\pm$ 0.10	0.3 $\pm$ 0.20	0.3 $\pm$ 0.20
0402	RP04	1.0 $\pm$ 0.05	0.5 $\pm$ 0.05	0.30 $\pm$ 0.05	0.20 $\pm$ 0.10	0.2 $\pm$ 0.10

6. Product Identification

RP XX X X XXXX

RP ?? ? ? ? ????



7. Electrical Characteristics

Item Type	Power Rating	Operating Temp. Range	Max Operating Voltage	Max Overloading Voltage	Resistance Tolerance	Resistance Range	TCR
PR25	1/2W	-55 ~ +155	150V	300V	±0.1% ±0.25% ±0.5%	4.7O~1MO	±25ppm ±50ppm
RP20	1/4W	-55 ~ +155	150V	300V	±0.1% ±0.25% ±0.5%	4.7O~1MO	±25ppm ±50ppm
RP12	1/8W	-55 ~ +155	150V	300V	±0.1% ±0.25% ±0.5%	4.7O~1MO	±25ppm ±50ppm
RP08	1/10W	-55 ~ +155	100V	200V	±0.1% ±0.25% ±0.5%	4.7O~1MO	±25ppm ±50ppm
RP06	1/16W	-55 ~ +155	50V	100V	±0.1% ±0.25% ±0.5%	10O~332KO	±25ppm ±50ppm
RP04	1/16W	-55 ~ +155	25V	50V	±0.1% ±0.25% ±0.5%	10O~100KO	±25ppm ±50ppm

Operating Voltage $V = \sqrt{P \cdot R}$

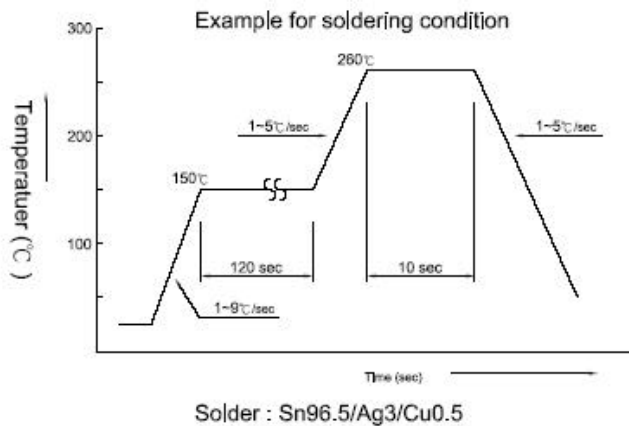
Operating Voltage $V = 2.5 \cdot \sqrt{P \cdot R}$

TRC has the ability to manufacture following options based on customer's requirement.

Tighter tolerance: ±0.05%, ±0.01%; Resistance: 1 10 Ω;

TCR :5ppm,10ppm,15ppm Other size.

8. Reflow



9. Environmental Characteristics

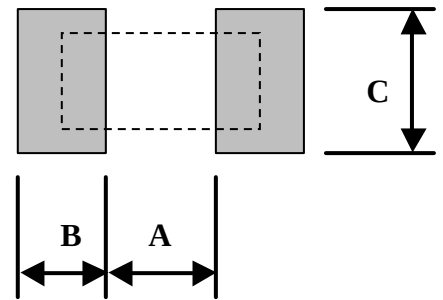
Item		Specification		Test Method
		±0.05%	> ±0.05%	
1	Temperature Coefficient of Resistance	As Spec		MIL-STD-202,Method 304 +25/-55/+25/+125/+25
2	Short Time Overload	?R±0.05%	?R±0.5%	JIS-C-5205-5.5 RCWV*2.5 or Max Overloading Voltage , 5 seconds
3	Dielectric Withstand Voltage	By type		MIL-STD-202F Method 301 Apply Max Overload Voltage for 1 minute
4	Insulation Resistance	>1000M?		MIL-STD-202F Method 302 Apply 100V _{DC} for 1 minute
5	Thermal Shock	?R±0.05%	?R±0.2%	MIL-STD-202F Method 107G -55 ~150 ,100 cycles
6	Load Life	?R±0.05%	?R±0.2%	MIL-STD-202F Method 108A RCWV, 70 , 1.5 hours ON , 0.5 hours OFF, total 1000~1048 hours
		7k? Min ?R±0.5%		
7	Humidity(Steady State)	?R±0.05%	?R±0.3%	MIL-STD-202F Method 103B 40 , 90~95%RH,RCWV 1.5 hours ON,0.5 hours OFF, total 1000~1048 hours
8	Resistance to dry heat	?R±0.05%	?R±0.2%	JIS-C-5202-7.2 96 hours@+155 without load
9	Low Temperature Operation	?R±0.05%	?R±0.2%	JIS-C-5202-7.1 1 hours,-65 ,followed by 45minutes of RCWV
10	Bending Strength	?R±0.05%	?R±0.2%	JIS-C-5202-6.1.4 Bending Amplitude 3mm for 10 seconds
11	Solder ability	95%min coverage		MIL-STD-202F Method 208H 260 ±5 , 2±0.5 (sec)
12	Resistance to Soldering Heat	?R±0.05%	?R±0.2%	MIL-STD-202F Method 210E 260±5 , 10±1 second

* Storage Temperature :25 ± 3 ;<80%RH

10. Recommend Land Pattern

Unit : mm

SIZE	STYLE	A	B	C
2512	AR12	4.9	1.60	3.00±0.2
2010	AR10	3.6	1.40	2.40±0.2
1206	AR06	2.0	1.15	1.70±0.2
0805	AR05	1.0	1.00	1.35±0.2
0603	AR03	0.8	0.70	0.90±0.2
0402	AR02	0.5	0.50	0.60±0.2



11. Marking



3digit marking for Example: 14C=13K7 O 13C=13K3 O

68B=4K99 O 68X=49.9 O

1.Remark: 0603 3digit marking

Marking Table

Code	E96	Code	E96	Code	E96	Code	E96
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

Code	A	B	C	D	E	F	G	H	X	Y	Z
Multiplier	10 ⁰	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁷	10 ⁻¹	10 ⁻²	10 ⁻³

11-2 Remark: 0603 3digit marking for E24 Example: 101=100O 102=1KO

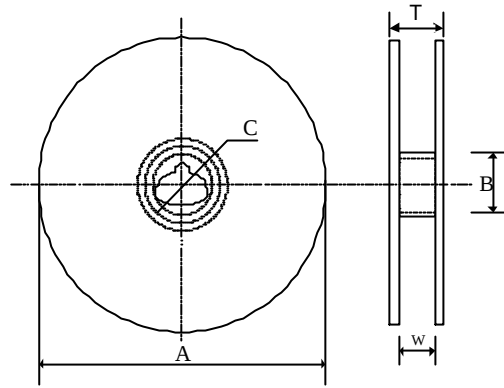
E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91
-----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

11-3 Remark: 0805~2512 4digit marking for Example:

Resistance	100Ω	2.2KΩ	10KΩ	49.9KΩ	100KΩ
marking	1000	2201	1002	4992	1003

12. Packaging

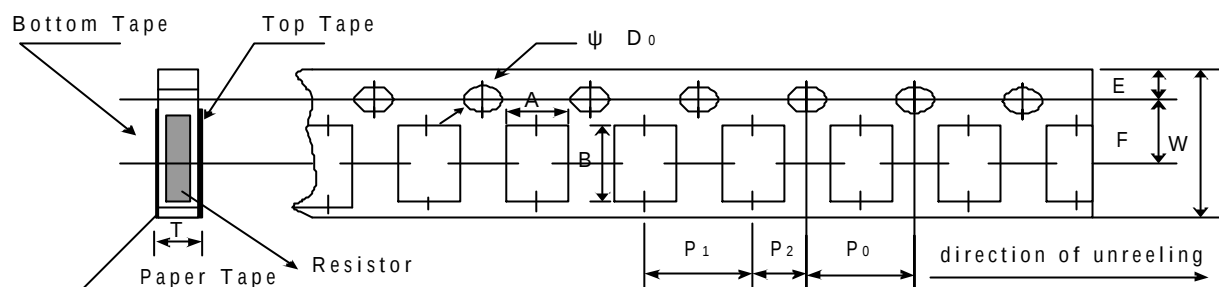
12-1-1 Reel Specifications & Package Quantity



Unit :mm

Codes	F A	F B	F C	W	T	Paper Tape (ea)	Emboss Plastic Tape (ea)
RP25	178±1	60.0+0.5	13.0±0.20	9.00±0.5	12.0±0.15	10,000	-
RP20	178±1	60.0+0.5	13.0±0.20	9.00±0.5	12.0±0.15	5,000	-
RP12	178±1	60.0+0.5	13.0±0.20	9.00±0.5	12.0±0.15	5,000	-
RP08	178±1	60.0+0.5	13.0±0.20	9.00±0.5	12.0±0.15	5,000	-
RP06	178±1	60.2±0.5	13.0±0.50	14.0±0.50	16.40±1.00	-	4,000
RP04	178±1	60.2±0.5	13.0±0.50	13.2±1.50	16.0±0.20	-	4,000

12-1-2 Paper Tape Specifications



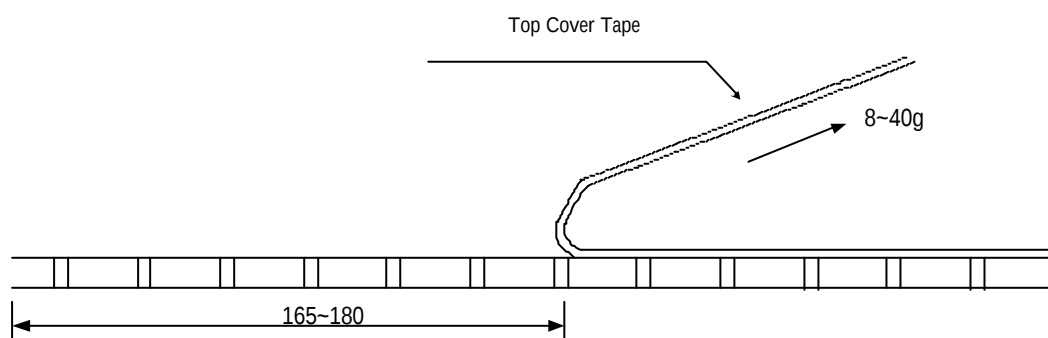
Unit: mm

Series	A	B	W	F	E	P_1	P_2	P_0	ψ D_0	T
02	0.67 ± 0.03	1.15 ± 0.03	8.00 ± 0.10	1.75 ± 0.05	3.5 ± 0.05	4.00 ± 0.10	2.00 ± 0.05	2.00 ± 0.05	1.54 ± 0.03	0.40 ± 0.03
03	1.10 ± 0.05	1.90 ± 0.05	8.00 ± 0.10	1.75 ± 0.05	3.5 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.55 ± 0.03	0.60 ± 0.05
05	1.60 ± 0.05	2.37 ± 0.05	8.00 ± 0.10	1.75 ± 0.05	3.5 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.55 ± 0.05	0.75 ± 0.05
06	2.00 ± 0.05	3.55 ± 0.05	8.00 ± 0.10	1.75 ± 0.05	3.5 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.55 ± 0.05	0.75 ± 0.05

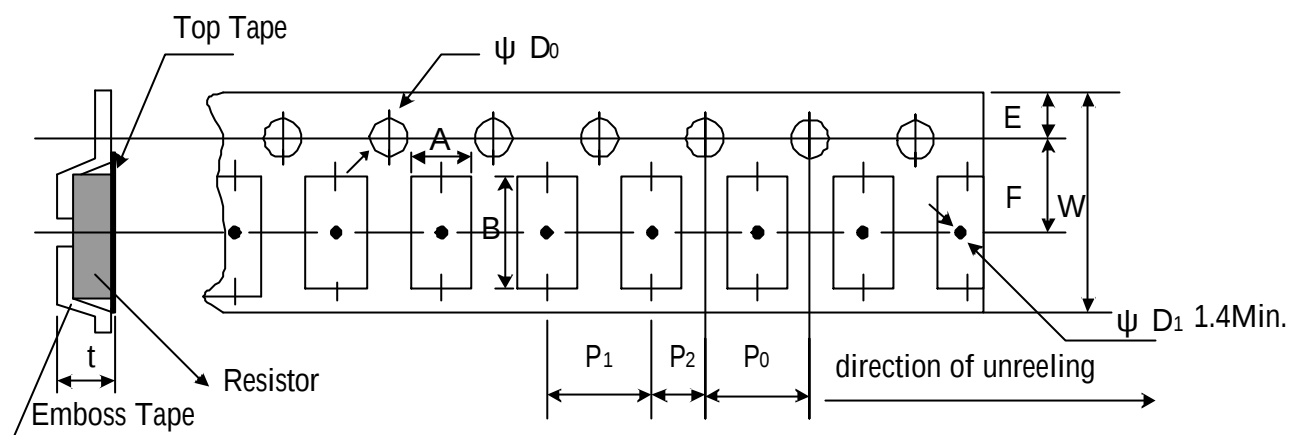
Peel force of top cover tape

The peel speed shall be about 300mm/min $\pm 5\%$

The peel force of top cover tape shall be between 8to 40g



12-1-4 Emboss Plastic Tape Specifications



Unit: mm

Series	A	B	W	E	F	P ₁	P ₂	P ₀	ψ D ₀	t
10	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	0.85±0.05
12	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	0.80±0.05

Peel force of top cover tape

The peel speed shall be about 300mm/min±5%

The peel force of top cover tape shall be between 20to80g

