Data Sheet

Customer：	
Product :	Thin Film Precision Chip Resistor - AR Series
Size:	0201/0402/0603/0805/1206/1210/2010/2512
Issued Date:	9-Sep-26
Edition :	REV.G1

RoHS Compliant

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9-Sep-26	9-Sep-26	9-Sep-26		
Chun	***Ben Chang***	***Ben Chang***		

Thin Film Precision Chip Resistor
(AR Series)



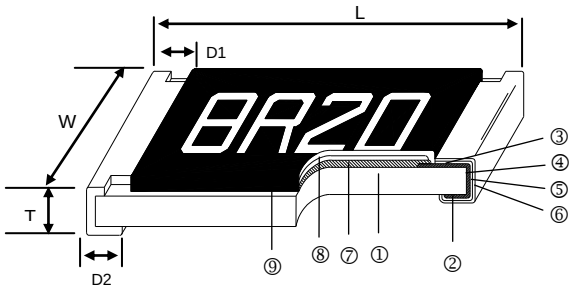
■Features

- Advanced thin film technology
- Very tight tolerance down to ±0.01%
- Extremely low TCR down to ±1PPM/°C
- Wide resistance range 1ohm ~ 3Mega ohm
- Miniature size 0201 available
- AEC-Q200 Compliance (0201 product is excluded)
- Test proven immunity to Biased humidity(85°C/ 85% RH)
- RoHS (Pb)-free without exemption

■Applications

- Medical Equipment
- Testing / Measurement Equipment
- Printer Equipment
- Automatic Equipment Controller
- Converters
- Communication Device, Cell Phone, GPS, PDA

■Construction



①	Alumina Substrate	④	Edge Electrode	⑦	Resistor Layer
②	Bottom Electrode	⑤	Barrier Layer	⑧	Overcoat
③	Top Electrode	⑥	External Electrode	⑨	Marking

■Dimensions

Unit: mm

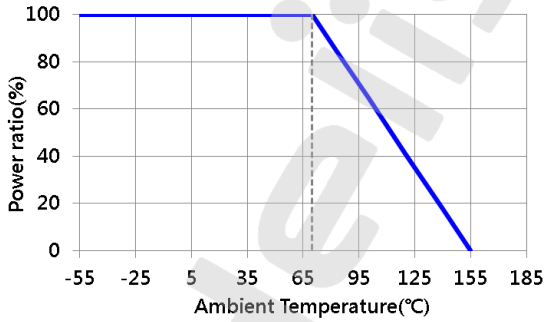
Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
AR01	0201	0.58±0.05	0.29±0.05	0.23±0.05	0.12±0.05	0.15±0.05	0.14
AR02	0402	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.15	0.20±0.10	0.54
AR03	0603	1.55±0.10	0.80±0.10	0.45±0.10	0.30±0.25	0.30±0.20	1.83
AR05	0805	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.25	0.40±0.20	4.71
AR06	1206	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.30	0.35±0.25	9.02
AR13	1210	3.10±0.15	2.40±0.15	0.55±0.10	0.40±0.30	0.55±0.25	10
AR10	2010	4.90±0.15	2.40±0.15	0.55±0.10	0.60±0.40	0.50±0.25	23.61
AR10(1/2W)	2010(1/2W)	4.90±0.15	2.40±0.15	0.55±0.10	0.60±0.40	2.20±0.25	26.68
AR12	2512	6.30±0.15	3.10±0.15	0.55±0.10	0.60±0.40	0.50±0.25	38.06
AR12(1W)1~100Ω	2512(1W)	6.30±0.15	3.10±0.15	0.55±0.10	0.60±0.40	0.50±0.25	44.65
AR12(1W)101Ω above	2512(1W)	6.30±0.15	3.10±0.15	0.55±0.10	0.60±0.40	2.50±0.25	44.65

■Part Numbering

AR	03	B	T	B	X	1001	
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking Code
	01: 0201 02: 0402 03: 0603 05: 0805 06: 1206 13: 1210 10: 2010 12: 2512	T: ±0.01% A: ±0.05% B: ±0.1% C: ±0.25% D: ±0.5% F: ±1%	T: Taping Reel B: Bulk V:10"Taping Reel W:13"Taping Reel	5: ±1 X: ±2 O:±3 S: ±5 B: ±10 N: ±15 C: ±25 D: ±50	: Standard (see Remark) N: 1/20W Y: 1/16W X: 1/10W W: 1/8W M: 1/6W P: 1/5W V: 1/4W O: 1/3W U: 1/2W Q: 3/4W T: 1W	0010: 1Ω 4R70: 4.7Ω 1001: 1KΩ 1004: 1MΩ	: Standard Marking for E96 / E24 N: No Marking

*Remark: Standard part no need for power rating code.

■Derating Curve



■Standard Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/°C)
					±0.05%	±0.1%	±0.25%	±0.5%	±1%	
AR01 (0201)	1/32W	-55 ~ +155°C	15V	30V	—	22Ω - 75KΩ				±25,±50
AR02 (0402)	1/16W	-55 ~ +155°C	50V	100V	49.9Ω - 12KΩ	4Ω - 511KΩ				±25,±50
AR03 (0603)	1/16W	-55 ~ +155°C	50V	100V	4.7Ω -332KΩ	1Ω - 1MΩ				±25,±50
AR05 (0805)	1/10W	-55 ~ +155°C	100V	200V	4.7Ω -1MΩ	1Ω - 2MΩ				±25,±50
AR06 (1206)	1/8W	-55 ~ +155°C	150V	300V	1Ω - 1MΩ	1Ω - 3MΩ				±25,±50
AR13 (1210)	1/4W	-55 ~ +155°C	150V	300V	1Ω - 1MΩ	1Ω - 3MΩ				±25,±50
AR10 (2010)	1/4W	-55 ~ +155°C	150V	300V	1Ω - 1MΩ	1Ω - 3MΩ				±25,±50
AR12 (2512)	1/2W	-55 ~ +155°C	150V	300V	4.7Ω - 1MΩ	1Ω - 3MΩ				±25,±50

■Lower Resistance:1~10Ω

■Special Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range						TCR (PPM/°C)
					±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	±1%	
AR01 (0201)	1/32W	-55 ~ +155°C	15V	30V	—		22Ω - 7KΩ				±10,±15
					—		7.01KΩ - 75KΩ				**±10***,±15
AR02 (0402)	1/16W	-55 ~ +155°C	50V	100V	49.9Ω - 4.99KΩ			—			±1, ±2,±3
					49.9Ω - 20KΩ						±5
					49.9Ω - 20KΩ		49.9Ω - 100KΩ				±10, ±15
AR03 (0603)	1/16W	-55 ~ +155°C	50V	100V	24.9Ω - 15KΩ			—			±1, ±2,±3
					24.9Ω - 60KΩ						±5
					24.9Ω - 100KΩ	4.7Ω-332KΩ	4.7Ω - 511KΩ				±10, ±15
AR05 (0805)	1/10W	-55 ~ +155°C	100V	200V	24.9Ω - 30KΩ			—			±1, ±2,±3
					24.9Ω - 150KΩ						±5
					24.9Ω - 200KΩ	4.7Ω – 1MΩ					±10, ±15
AR06 (1206)	1/8W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ			—			±1, ±2,±3
					24.9Ω - 300KΩ						±5
					24.9Ω - 499KΩ	4.7Ω – 1.5MΩ					±10, ±15
AR13 (1210)	1/ 4W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ			—			±1, ±2,±3
					24.9Ω - 300KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10, ±15
AR10 (2010)	1/4W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ			—			±1, ±2,±3
					24.9Ω - 300KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10, ±15
AR12 (2512)	1/2W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ			—			±1, ±2,±3
					24.9Ω - 300KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10, ±15

***TCR(25°C/-55°C): -15 ~ +10 PPM/°C**

■High Power Rating Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range						TCR (PPM/°C)
					±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	±1%	
AR01 (0201)	1/20W	-55 ~ +155°C	25V	50V	—		22Ω - 7KΩ				±10,±15 ±25,±50
							7.01KΩ - 75KΩ				±10*,±15 ±25,±50
AR02 (0402)	1/10W	-55 ~ +155°C	50V	100V	49.9Ω - 4.99KΩ			—			±1, ±2,±3
					49.9Ω - 20KΩ						±5
					49.9Ω - 12KΩ		49.9Ω - 100KΩ				±10, ±15
					—	49.9Ω - 12KΩ	4.7Ω~255KΩ				±25,±50
AR03 (0603)	1/10W	-55 ~ +155°C	75V	150V	24.9Ω - 15KΩ			—			±1, ±2,±3
					24.9Ω - 60KΩ						±5
					24.9Ω - 100KΩ	4.7Ω - 332KΩ	4.7Ω - 511KΩ				±10,±15
							1Ω -1MΩ				±25,±50
	1/6W(Ultra)	-55 ~ +155°C	100V	150V	—	10Ω - 332KΩ					±25,±50
AR05 (0805)	1/8W	-55 ~ +155°C	150V	300V	24.9Ω - 30KΩ			—			±1, ±2,±3
					24.9Ω -150KΩ						±5
					24.9Ω - 200KΩ	4.7Ω -511KΩ	4.7Ω -1MΩ				±10, ±15
							1Ω - 2MΩ				±25,±50
	1/4W(Ultra)	-55 ~ +155°C	150V	300V	—	10Ω - 499KΩ					±25,±50
AR06 (1206)	1/4W	-55 ~ +155°C	200V	400V	24.9Ω - 49.9KΩ			—			±1, ±2,±3
					24.9Ω - 300KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10,±15
						1Ω - 1MΩ	1Ω - 3MΩ				±25,±50
	1/3W(Ultra)	-55 ~ +155°C	200V	400V	—	10Ω ~1MΩ					±25,±50
AR13 (1210)	1/3W	-55 ~ +155°C	200V	400V	24.9Ω – 49.9KΩ			—			±1, ±2,±3
					24.9Ω - 300KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10,±15
						1Ω - 1MΩ	1Ω - 3MΩ				±25,±50
AR10(2010)	1/3W	-55 ~ +155°C	200V	400V	24.9Ω - 49.9KΩ			—			±1, ±2,±3
					24.9Ω - 300KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10,±15
						1Ω - 1MΩ	1Ω - 3MΩ				±25,±50
	1/2W(Ultra)	-55 ~ +155°C	200V	400V	24.9Ω - 2KΩ	4.7Ω –1MΩ			1Ω –1MΩ		±10,±15
					24.9Ω - 2KΩ	4.7Ω –1MΩ	4.7Ω – 3MΩ		1Ω –3MΩ		±25,±50
AR12(2512)	3/4W	-55 ~ +155°C	200V	400V	24.9Ω - 2KΩ	4.7Ω – 2KΩ			1Ω – 2KΩ		±10,±15
					24.9Ω - 2KΩ	4.7Ω – 2KΩ	4.7Ω – 3MΩ		1Ω – 3MΩ		±25,±50
	1W(Ultra)	-55 ~ +155°C	200V	400V	24.9Ω - 2KΩ	4.7Ω –1MΩ			1Ω –1MΩ		±10,±15
					24.9Ω - 2KΩ	4.7Ω –1MΩ	4.7Ω – 3MΩ		1Ω – 3MΩ		±25,±50

Operating Voltage=$\sqrt{(P*R)}$ or Max. operating voltage listed above, whichever is lower.
Overload Voltage=2.5*$\sqrt{(P*R)}$ or Max. overload voltage listed above, whichever is lower.
■Viking is capable of manufacturing the optional spec based on customer's requirement.
(Lower Resistance:1~10Ω ; High Power Rating)
***TCR(25°C/-55°C): -15 ~ +10 PPM/°C**

■Environmental Characteristics

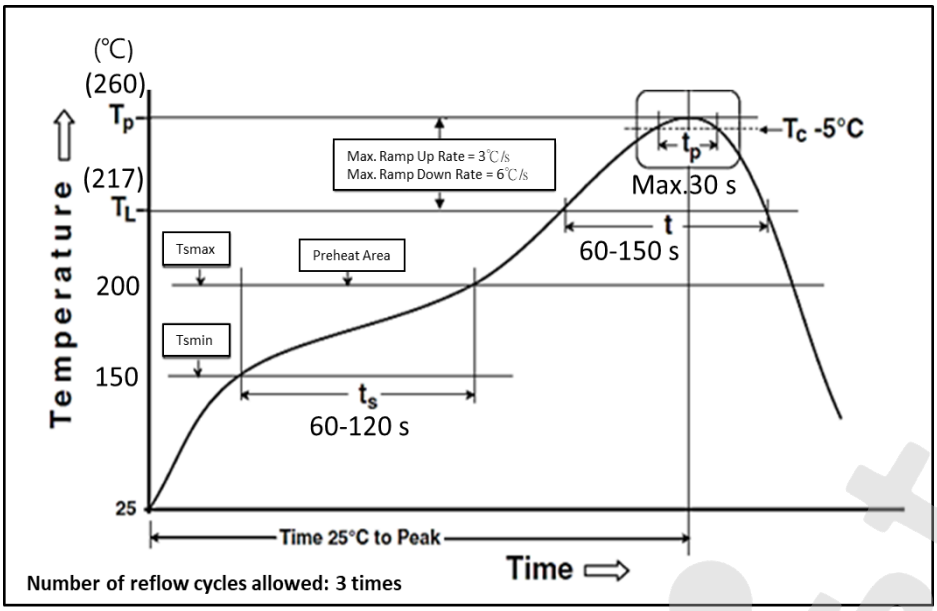
Item	Requirement		Test Method
	Tol. ≦ 0.05%	Tol. > 0.05%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		**MIL-STD-202 Method 304** +25/-55/+25/+125/+25°C
Short Time Overload	ΔR±0.05%	ΔR±0.1% ΔR ± 0.2% for 0201	**JIS-C-5201-1 4.13** RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
	ΔR±0.2% for Ultra high power rating		
Insulation Resistance	>9999 MΩ		**MIL-STD-202 Method 302** Apply 100V_{DC} for 1 minute
Endurance	ΔR±0.05%	ΔR±0.1%	**MIL-STD-202 Method 108A** 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	ΔR±0.5% for Ultra high power rating		
	0201: >7kΩ →ΔR±0.5% ≦7kΩ→ΔR±0.2%		
Bending Strength	ΔR±0.05%	ΔR±0.1%	**JIS-C-5201-1 4.33** Bending amplitude 3 mm for 60 seconds 2010 2512 sizes: 2 mm Other sizes: 3 mm
Damp Heat with Load(for 0201 size)	ΔR±0.3%		**MIL-STD-202 Method 103B** 40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	95% min. coverage		**MIL-STD-202 Method 208H** 245±5°C for 3 seconds
Resistance to Soldering Heat	ΔR±0.05%	ΔR±0.1%	**MIL-STD-202 Method 210E** 260±5°C for 10 seconds
Dielectric Withstand Voltage	By Type		**MIL-STD-202 Method 301** Max. overload voltage for 1 minute
Low Temperature Operation	ΔR±0.05%	ΔR±0.2%	**JIS-C-5201-1 4.36** 1 hour, -65°C, followed by 45 minutes of RCWV
	ΔR±0.5% for high power & Ultra Power rating		
High Temperature Exposure	ΔR±0.5% 0402 ≧255.01K 0603 ≧402.01K 0805 ≧1.01M 1206 ≧1.01M 1210 ≧1.01M 2010 ≧1.01M 2512 ≧1.01M ΔR±0.2% for the other		**MIL-STD-202 Method 108** at +155°C for 1000 hrs
Temperature Cycling	ΔR±0.2% (0201 product is excluded)		**JESD22 Method JA-104** -55°C to +125°C, 1000 cycles
ESD	ΔR±0.5% (0201 product is excluded)		**AEC-Q200-002** Human body model AR02 AR03 200V AR05 AR06 1000V AR10、AR12、AR13 2000V
Sulfur Test	ΔR±2% (0201 product is excluded)		**ASTM-B-809-95 Modified** 105±2 °C no power rating for **1000** hrs.
Biased Humidity	ΔR±0.1% (0201 product is excluded)		**MIL-STD-202 Method 103** 1000 hrs 85°C/85%RH 10% of operating power.

RCWV(Rated continuous working voltage)= √(P*R) or Max. Operating voltage whichever is lower

■**Storage Temperature: 15~28℃; Humidity < 80%RH**

■**Shelf Life: 2 years from production date.**

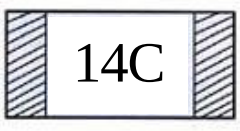
■Soldering Condition(IPC/JEDEC J-STD-020)



Reflow Profiles	
Profile Feature	**Pb-Free Assembly**
Preheat Min. Temperature (T_{smin}) Max Temperature (T_{smax}) Preheating time (t_s) from (T_{smin} to T_{smax})	 150 °C 200 °C 60-120 seconds
Ramp-up rate (T_L to Tp)	3 °C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217 °C 60-150 seconds
Min. Peak temperature (Tp min)	235°C
Max. Peak temperature (Tp max)	260°C
Time (tp) within 5 °C of the specified classification temperature (Tc)	30 seconds max.
Ramp-down rate (Tp to T_L)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.

■Marking

0603 3digit marking in E96



3digit marking for Example: 14C=13K7Ω 13C=13K3Ω

68B=4K99Ω 68X=49.9Ω

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}

0603 3digit marking for E24, but when E24 and E96 share the same resistance, E96 marking shall take priority

Example:

Resistance	100Ω	11KΩ	12KΩ	27KΩ
Marking	01A	05C	123	273

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

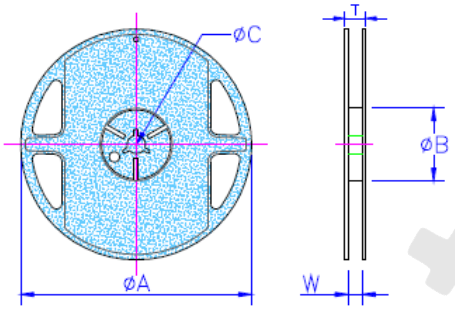
0805~2512 4digit marking

Example

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

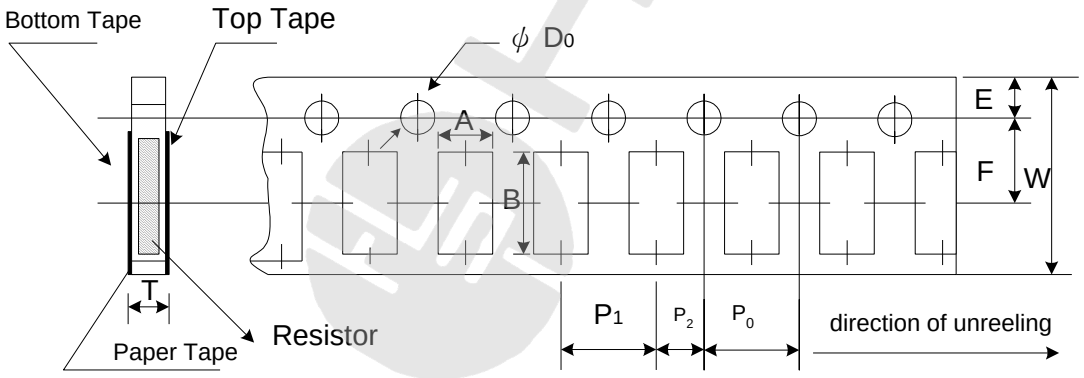
■Packaging

Packing Quantity & Reel Specifications



Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
AR01 AR02	Paper	10K	8mm	7 inch	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0
		20K	8mm	10 inch	254±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
		40K	8mm	13 inch	330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
AR03 AR05 AR06 AR13	Paper	5K	8mm	7 inch	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0
		10K	8mm	10 inch	254±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
		20K	8mm	13 inch	330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
AR10 AR12	Embossed	4K	12mm	7 inch	178.0±1.0	60.0+1.0	13.5±0.7	13.5±1.0	15.5±1.0
		8K	12mm	10 inch	254±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5

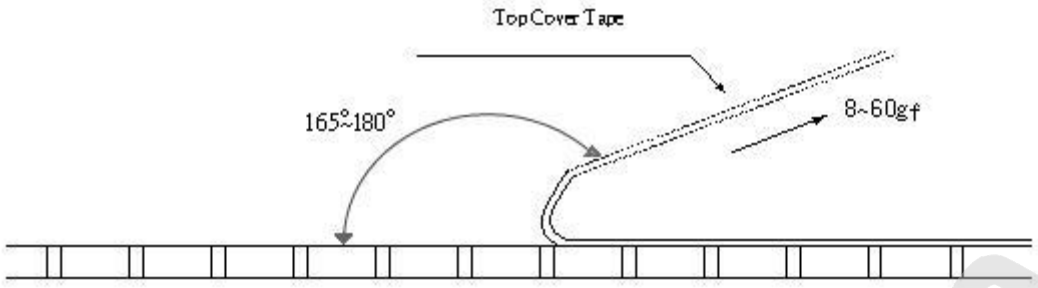
Paper Tape Specifications



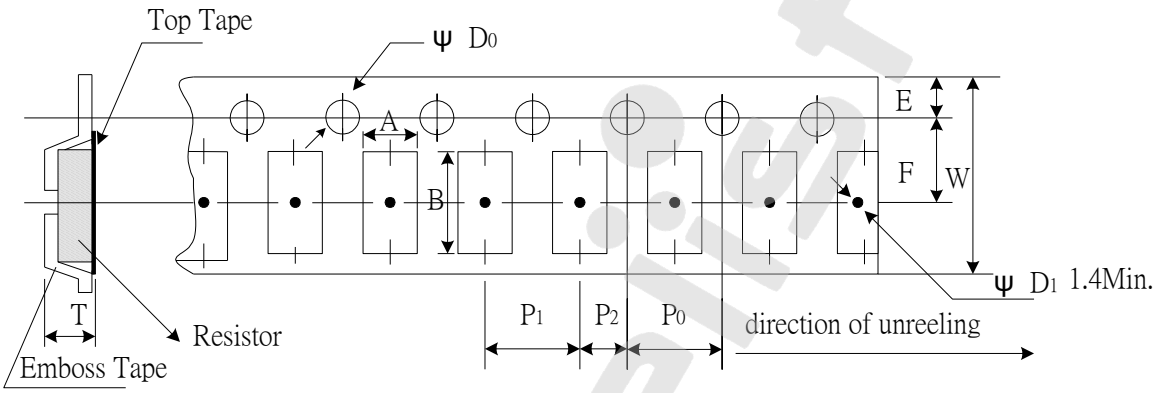
Unit: mm

Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
AR01	0.40±0.05	0.70±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.03	0.42±0.02
AR02	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
AR03	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±0.05	0.60±0.03
AR05	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
AR06	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
AR13	2.75±0.05	3.40±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.05	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±5%
■ The peel force of top cover tape shall be between 8gf to 60gf



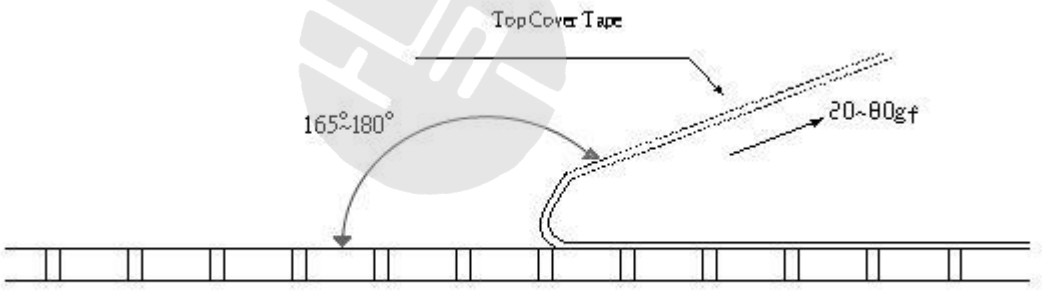
Emboss Plastic Tape Specifications



Unit: mm

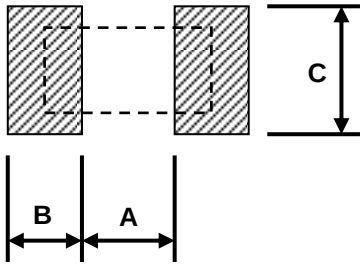
Type	A	B	W	E	F	P_0	P_1	P_2	$ØD_0$	T
AR10	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20
AR12	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20

■ 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 20gf to 80gf



■Recommend Land Pattern

Unit: mm



Type	A	B	C
AR01	0.25	0.30	0.40±0.2
AR02	0.50	0.50	0.60±0.2
AR03	0.80	1.00	0.90±0.2
AR05	1.00	1.00	1.35±0.2
AR06	2.00	1.15	1.70±0.2
AR13	2.00	1.15	2.50±0.2
AR10	3.60	1.40	2.50±0.2
AR10(1/2W)	1.00	2.70	2.50±0.2
AR12	4.90	1.60	3.10±0.2
AR12(1W) 1~100Ω	4.90	1.60	3.10±0.2
AR12(1W) 101Ω above	1.00	3.55	3.10±0.2

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version D3	Jan. 14, 2013	-	- Add resistance range for Special Electrical and High Power Rating Electrical Specifications. - Adjust the mockup.
Version D4	Apr. 10, 2013	-	- Add "RCWV" description in Environment Characteristic Test Method.
Version D5	Oct. 16, 2013	-	- Increase the resistance range of AR05, TCR15 product.
Version D6	Oct. 17, 2014	-	- Correct the specification of top cover tape peel force. - Update the resistance range of AR05 (Standard) to 4.7Ω -1MΩ
Version D7	Apr. 28, 2015	-	- Add TCR ±2ppm and ±3ppm products specification. - Increase the resistance range of the products below: • AR02 and AR03 of Standard Electrical Specifications. • AR02, AR03 and AR05 of Special Electrical Specifications. - Correct the element of Top Electrode.
Version D8	May. 02, 2016	-	- Modify Storage Temperature.
Version D9	Aug.04, 2016	-	- Update items and requirements of Environmental Characteristics. - Increase the resistance range of Special Electrical Specifications products.
Version E	Dec.14, 2016	-	- Add AR02 High Power Rating Electrical Specifications.
Version E1	Feb. 23, 2017	-	- Increase the resistance range of AR02 Standard Electrical Specifications.
Version E2	Apr. 05, 2017	-	- Add TCR ±1ppm and products specification.
Version E3	Nov.10, 2017	-	- Correct the reference standard in Environmental Characteristics.
Version E4	Dec.26, 2017	-	- Correct the reference standard in Environmental Characteristics.

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version E5	Feb. 06, 2018	-	- Correct the reference standard in Environmental Characteristics.
Version E6	Jul. 24, 2018	-	- Update Environment Characteristics item.
Version E7	May. 02,2019	-	- Increase the AR01 0.1% & 0.25% Precision resistance.
Version E8	Oct. 29,2019	-	- Increase the resistance range of Standard, Special and High Power Rating Electrical Specifications.
Version E9	Jan. 07,2020	-	- Define the Dimensions specifications for AR10(1/2W) and AR12(1W). - Add the part number code “N” for 1/20W Power rating. - Extend the resistance range of AR01 (Standard Electrical Specifications). - Add products specifications for AR01(1/20W) and AR10(1/2W). - Update products specifications for AR12(1W). - Define the Recommend Land Pattern for AR10(1/2W) and AR12(1W).
Version F	Apr. 27,2020	-	- Modify the Max. Operating Voltage of AR02 from 25V to 50V. - Modify the Max. Overload Voltage of AR02 from 50V to 100V. - Correct Recommend Land Pattern Dimension A/B of AR10(1/2W) from 0.5mm/2.8mm to 1.00mm/2.70mm.
Version F1	Dec. 08, 2020	-	- Extend the resistance range of AR01 Standard and High Power Rating Electrical Specifications. - Modify the test time of Bending Strength.
Version F2	Jan. 22,2022	-	- Correct the dimension specifications of D2 and land pattern for AR12. - Modify IR reflow profile to comply IPC/JEDEC J-STD-020. - Add shelf life description.

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version F3	Feb. 10,2022	-	- Modify the temperature (low temperature) of Derating Curve from 0°C to -55°C.
Version F4	Nov. 10,2023	-	- Resistance range of Standard Electrical: AR06/AR13 0.1%~1% up to 3MΩ. - Resistance range of High Power Electrical: AR05 TCR25/50 0.1%~1% up to 2MΩ. - Resistance range of High Power Electrical: AR06~AR12 TCR25/50 0.1%~1% up to 3MΩ. - Update Reflow Profiles.
Version F5	May. 22,2024	-	- Add AEC-Q200 Compliance and Biased humidity descriptions in Features. -Modify the tolerance of dimension D1 for AR02~AR12. -Add “Ultra” description for AR03~AR12. -Update Environmental Characteristics: ˙Add the requirement of Ultra high power rating product for Short Time Overload and Endurance Tests. ˙Only keep AR01 requirement for Damp Heat with Load Test. ˙Add High Temperature Exposure, Temperature Cycling, ESD, Sulfur and Biased Humidity Tests.
Version F6	Apr. 07,2025	-	-Add AR0201 in Special Electrical Specifications and add note: “*TCR(25°C/-55°C): -15 ~ +10 PPM/°C”. -Add AR0201 TCR ±10ppm and ±15ppm in High Power Rating Electrical Specifications and add note: “*TCR(25°C/-55°C): -15 ~ +10 PPM/°C”.
Version F7	Sep. 25,2025	-	- Modify the resistance range of AR06/AR13/AR10, ±0.05% in Standard Electrical Specifications.
Version F8	Jun. 01,2026	-	- Add new rule for 0603 3digit marking: When E24 and E96 share the same resistance, E96 marking shall take priority.

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version F9	Jul.09,2026	-	- Add new description “RoHS (Pb)-free without exemption” to Features.
Version G	Jul.27,2026	-	- Update the AR13 entry in the Paper Tape Specifications table by changing ΦD0 from 1.60±0.10mm to 1.55±0.05mm
Version G1	Sep.09,2026	-	- Add V:10” Taping Reel and W:13” Taping Reel to the Packaging Code in Part Numbering. -Update the Packing Quantity & Reel Specifications table in Packaging.