Data Sheet

Customer：	
Product :	Aluminum Nitride Thin Film Precision Chip Resistor – ARN Series
Size:	0603/0805/1206/2512
Issued Date:	29-Jul-26
Edition :	REV.A9

RoHS Compliant

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29-Jul-26	29-Jul-26	29-Jul-26		
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Aluminum Nitride Thin Film Precision Chip Resistor (ARN Series)



Features

- High thermal conductivity aluminum nitride substrate
- Power rating up to 6.0W
- Resistance 50Ω ~ 30.1KΩ
- Resistor tolerance to ± 0.1%
- TCR to ± 25ppm/ ° C
- RoHS (Pb)-free without exemption

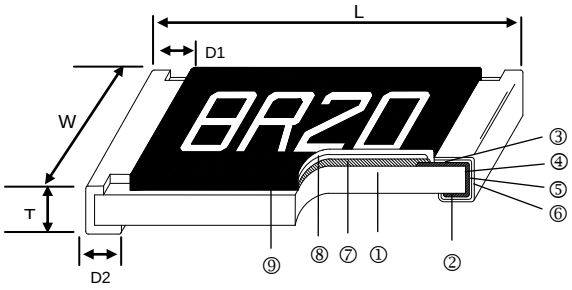
Applications

- Power Supplies
- Power Switching

Typical Performance

- TCR. 25 ppm/℃
- TOL. 0.1 %

Construction



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

Dimensions

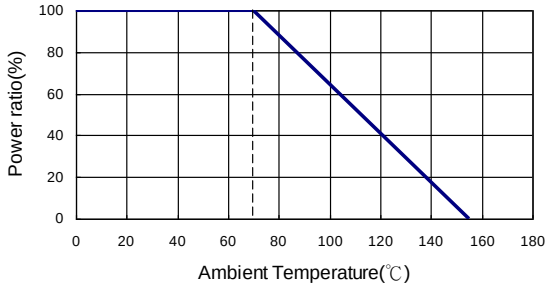
Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
ARN03	0603	1.55±0.10	0.80±0.10	0.43±0.15	0.30±0.15	0.50±0.20	1.73
ARN05	0805	2.00±0.15	1.25±0.15	0.43±0.15	0.35±0.15	0.60±0.20	3.95
ARN06	1206	3.05±0.20	1.55±0.20	0.43±0.15	0.50±0.15	1.20±0.20	10.98
ARN12	2512	6.30±0.20	3.10±0.20	0.43±0.15	0.70±0.25	1.60±0.25	42.32

Part Numbering

ARN	06	C	T	C	S	1000	N
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking Code
	03: 0603 05: 0805 06: 1206 12: 2512	B: ±0.1% C: ±0.25% D: ±0.5% F: ±1%	T: Taping Reel B: Bulk	C: ±25 D: ±50	U : 1/2W T : 1W S : 2W I : 6W	0500: 50Ω 1000: 100Ω 5000: 500Ω 1002: 10KΩ	:Standard Marking N: No Marking

■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)
					±0.1%	±0.25%	±0.5%	±1%	
ARN03 (0603)	1/2W (1)	-55°C ~ +155°C	75V	150V	50Ω~30.1KΩ				±25 ±50
ARN05(0805)	1.0W (1)	-55°C ~ +155°C	100V	200V	50Ω~30.1KΩ				±25 ±50
ARN06 (1206)	2.0W (1)	-55°C ~ +155°C	100V	200V	50Ω~30.1KΩ				±25 ±50
ARN12 (2512)	6.0W (1)	-55°C ~ +155°C	100V	200V	50Ω~30.1KΩ				±25 ±50

(1) Dependant on component mounting by user.

Operating Voltage=√(P*R) or Max. operating voltage listed above, whichever is lower.

■Viking is capable of manufacturing the optional spec based on customer's requirement.

■Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	**MIL-STD-202 Method 304** +25/-55/+25/+125/+25°C
Short Time Overload	ΔR ± 0.5 %	Please refer to (2)
Insulation Resistance	>9999MΩ	**MIL-STD-202 Method 302** Apply 100V_{DC} for 1 minute
Endurance	ΔR ± 1%	**MIL-STD-202 Method 108** 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	ΔR ± 0.4 %	**MIL-STD-202 Method 103** 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 208** 245±5°C for 3 seconds
Resistance to Soldering Heat	ΔR ± 0.2 %	**MIL-STD-202 Method 210** 260±5°C for 10 seconds
Low Temperature Operation	ΔR ± 0.2 %	**JIS-C-5201-1 4.36** 1 hour ,-65°C, followed by 45 minutes of RCWV
High Temperature Exposure	ΔR ± 0.2 %	**MIL-STD-202 Method 108** At + 155°C for 1000hrs
Thermal Shock	ΔR ± 0.2 %	**MIL-STD-202F Method 107** -55°C ~150°C, 100 cycles

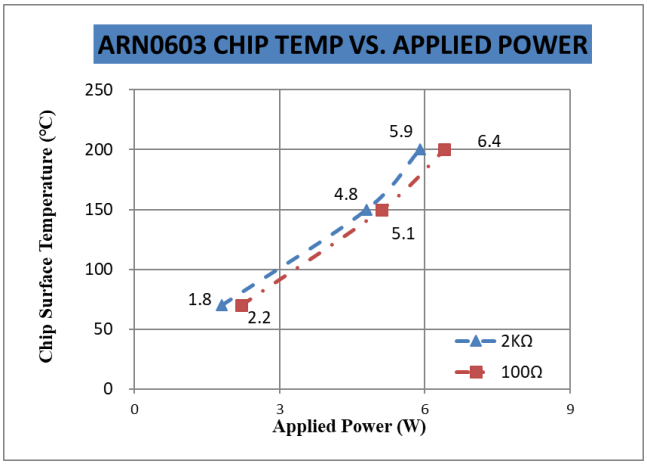
RCWV(Rated continuous working voltage)= √(P*R) or Max. Operating voltage whichever is lower

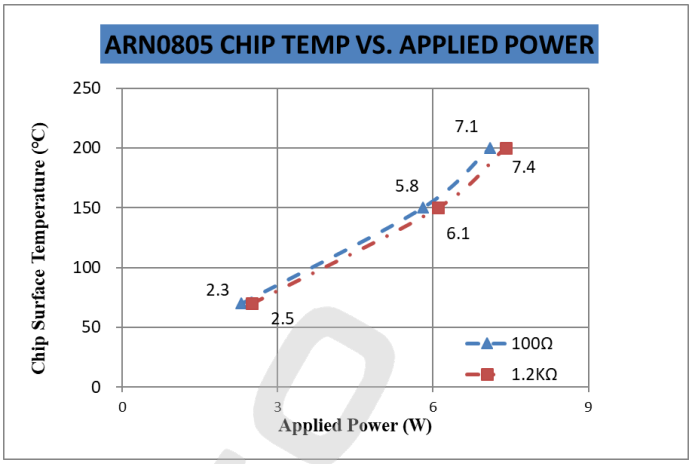
■ **Reference Standards: MIL-STD-202, JIS-C 5201**

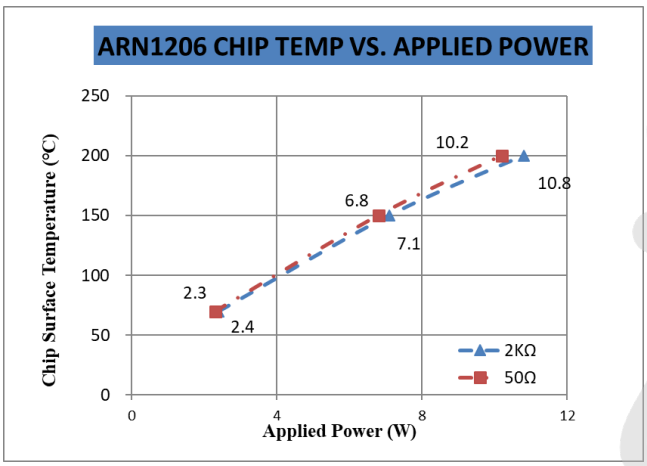
■ **Storage Temperature: 15~28℃; Humidity < 80%RH**

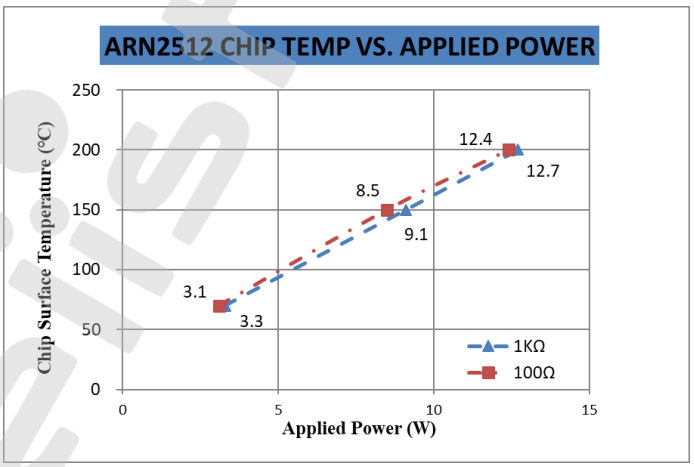
■ **Shelf Life: 2 years from production date.**

■ Chip Temp Vs. APPLIED POWER







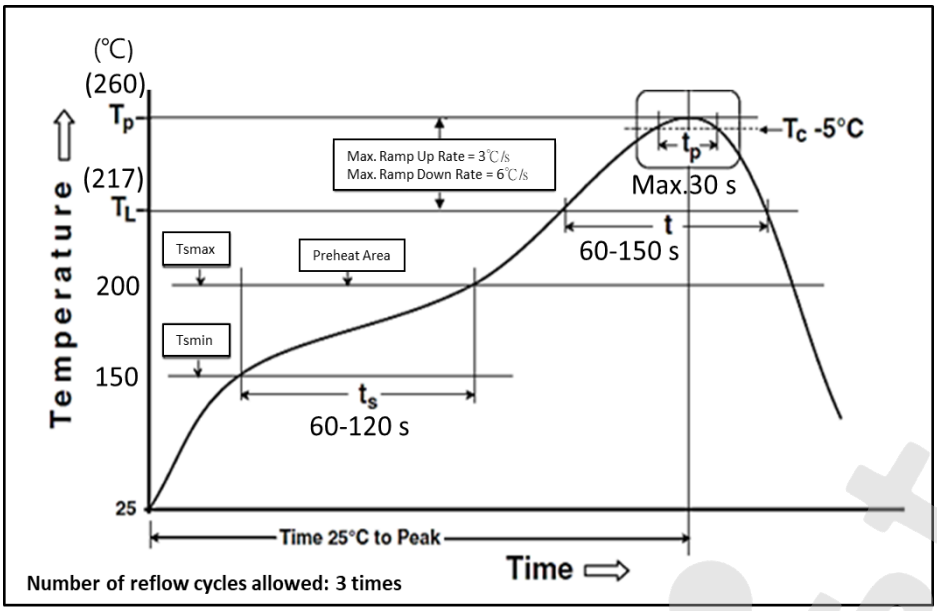


(2) The graphs show the chip surface temperatures measured using a FLIR ETS-320 thermal imaging system after 5 seconds of power application with a test card. Actual power handling capability depends on the end user's PCB design and mounting process.

The ability to dissipate heat is critical to the overall performance of high-power chip resistors. Please refer to the "Chip Temperature vs. Applied Power" graphs above for reference.

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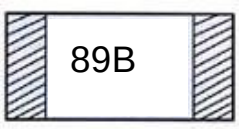
■Soldering Condition(IPC/JEDEC J-STD-020)



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

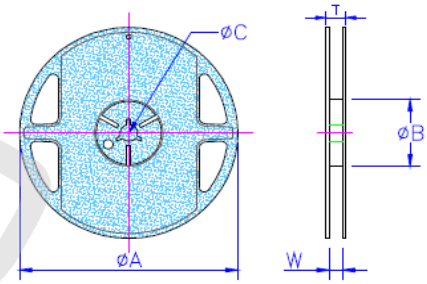
Resistance	500Ω	2.2KΩ	10KΩ	12.5KΩ
marking	5000	2201	1002	1252

■Packaging

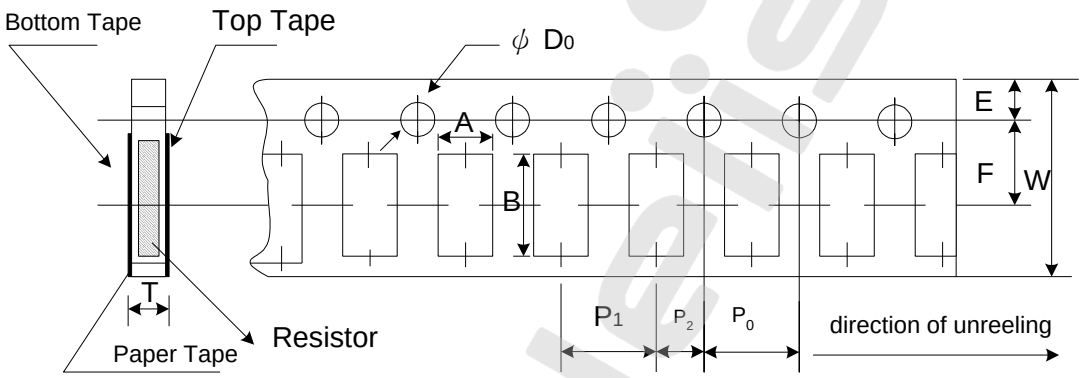
Packing Quantity & Reel Specifications

Unit :mm

Type	ØA	ØB	ØC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
ARN03	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
ARN05	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
ARN06	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
ARN12	178.0±1.0	60.0+1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000



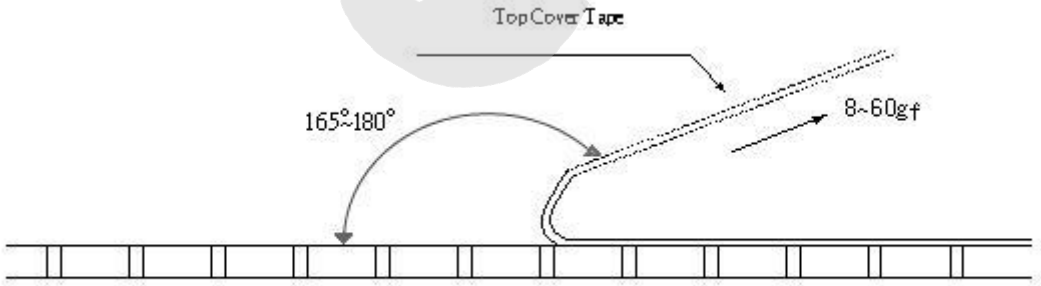
Paper Tape Specifications



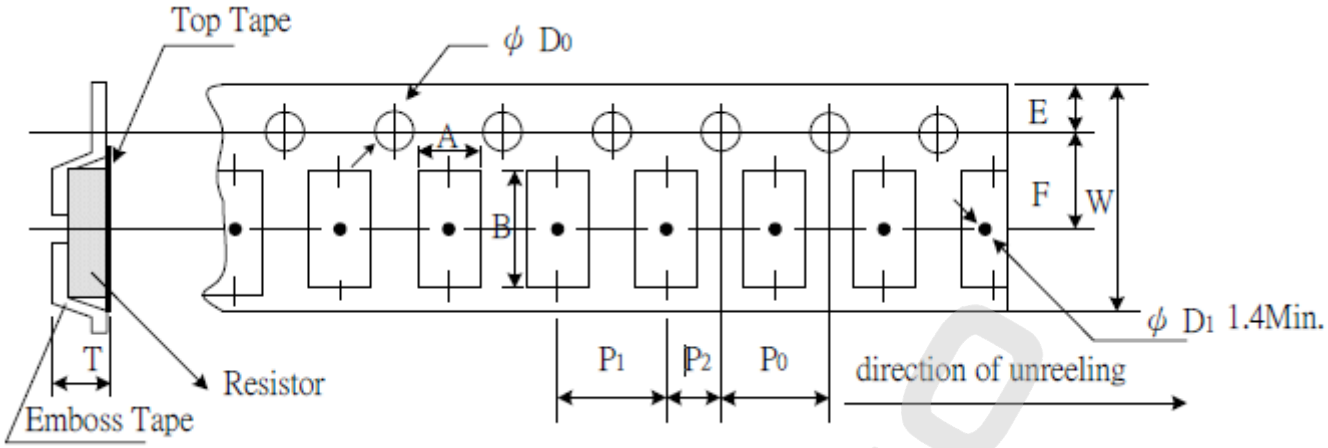
Unit: mm

Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
ARN03	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
ARN05	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
ARN06	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±5%
■ The peel force of top cover tape shall be between 8gf to 60gf

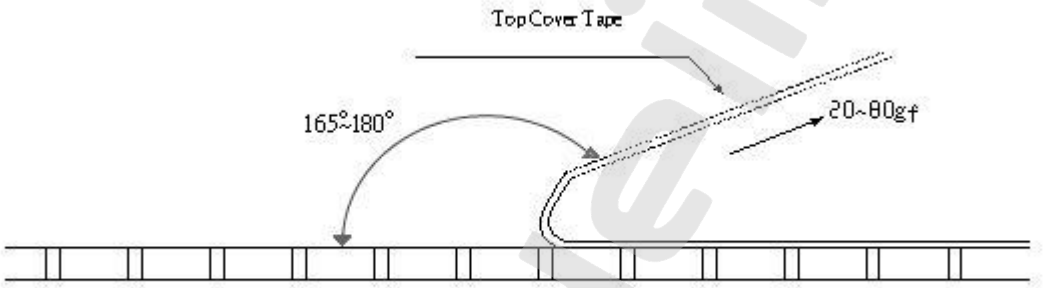


Emboss Plastic Tape Specifications



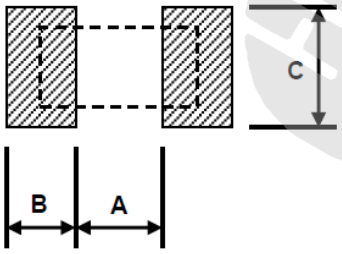
Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
ARN12	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20

- 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
ARN03	0.37	0.99	0.86±0.1
ARN05	0.50	1.08	1.32±0.1
ARN06	0.60	1.90	1.80±0.1
ARN12	2.77	2.31	3.20±0.2

- Use a board with a copper thickness of two ounces

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A7	Jun 01,2026	-	- Add new rule for 0603 3digit marking: When E24 and E96 share the same resistance, E96 marking shall take priority.
Version A8	Jul 09,2026	-	- Add new description “RoHS (Pb)-free without exemption” to Features. - Revise the Test Method of Short Time Overload for Environmental Characteristics. - Revise the description of $^{(2)}$ for Chip Temp Vs. APPLIED POWER.
Version A9	Jul 29,2026	-	- Revise the graphs for Chip Temp Vs. APPLIED POWER. - Update Reflow Profiles.