Data Sheet

Customer：	
Product :	Automotive Grade Professional Thin Film Chip Resistor– ART..A Series
Size:	0402/0603/0805/1206
Issued Date:	9-Jul-26
Edition :	REV.A7

RoHS Compliant

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9-Jul-26	9-Jul-26	9-Jul-26		
Chun	***Ben Chang***	***Ben Chang***		

Automotive Grade Professional Thin Film Chip Resistor
(ART..A Series)



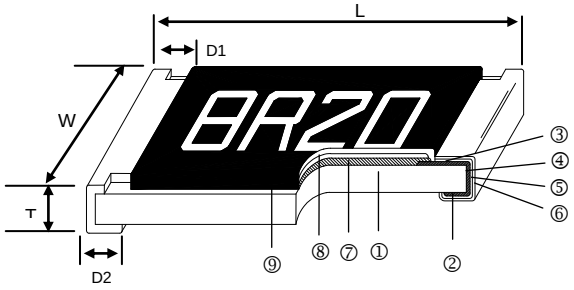
■Features

- Operating temperature up to 175℃ for 1000 h
- Rated dissipation P_{85} up to 0.4W for size 1206
- AEC-Q200 Qualified (<10Ω is excluded)
- Superior temperature cycling robustness
- Advanced sulfur resistance verified according to ASTM B 809
- Total Lead(Pb)-free without RoHS exemptions

■Applications

- Automotive
- Telecommunication
- Medical equipment
- Industrial equipment

■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)
ART02	0402	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.10	0.20±0.10	0.54
ART03	0603	1.55±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	1.83
ART05	0805	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.20	4.71
ART06	1206	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25	9.02

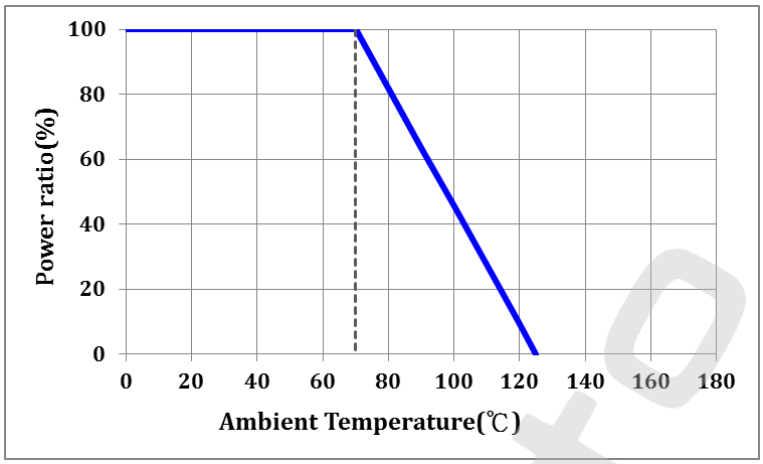
■Part Numbering

ART	03	B	T	C		1001	A
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/℃)	Power Rating	Resistance	Marking Code
	02: 0402 03: 0603 05: 0805 06: 1206	B: ±0.1% D: ±0.5% F: ±1%	T: Taping Reel B: Bulk	C: ±25 D: ±50	: Standard* (See Remark)	0100: 10Ω 10R2: 10.2Ω 1000:100Ω 1001: 1KΩ 1002: 10 KΩ 1003: 100KΩ 1004: 1M Ω	A: Automotive Grade NA:No Marking Automotive Grade

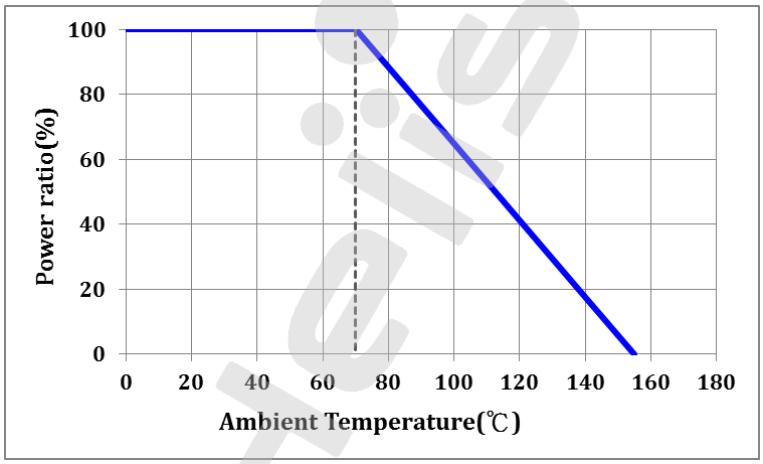
*Remark: Standard part no need for power rating code.

■Functional Performance

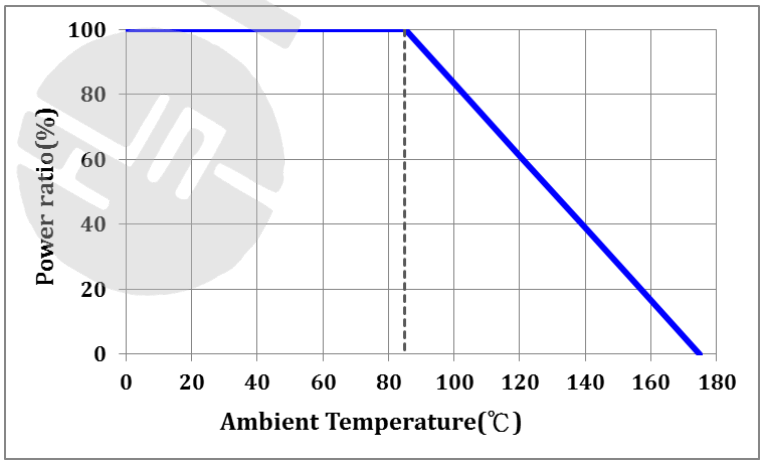
Derating-Standard Operation



Derating- Power Operation

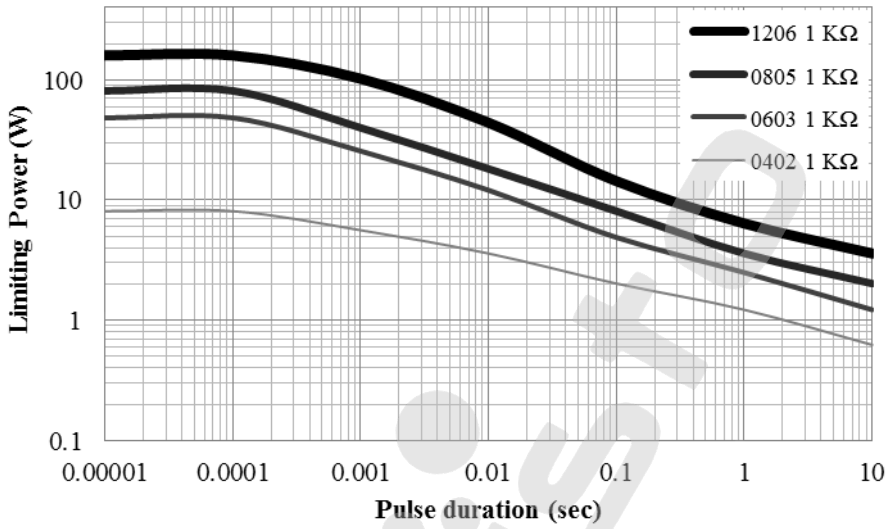


Derating- Advanced Power Operation

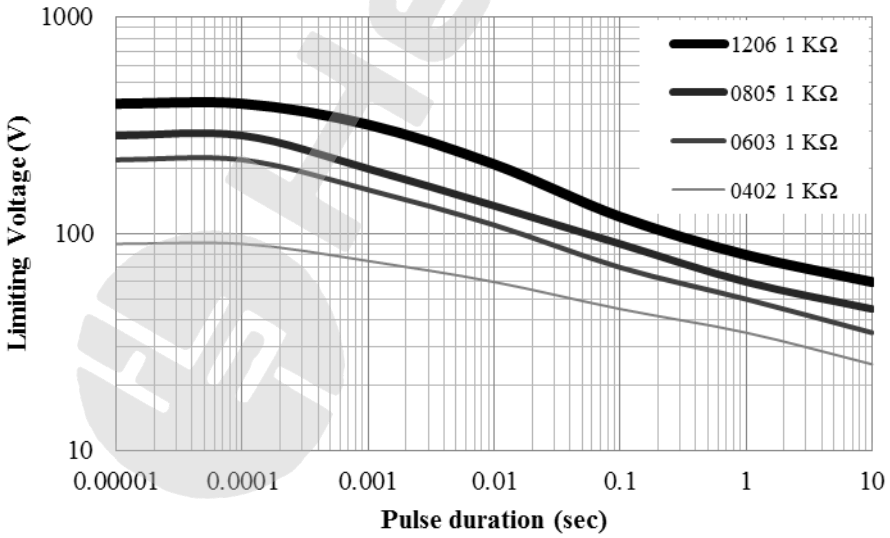


■Functional Performance

Single pulse



Pulse Voltage



■Standard Electrical Specifications

Item / Type	Power Rating at 85℃	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/℃)
					±0.1%	±0.5%	±1%	
ART02	0.13W	-55 ~ +175℃	50V	100V	10Ω – 221KΩ			±25,±50
ART03	0.21W	-55 ~ +175℃	75V	150V	4.7Ω – 511KΩ			±25,±50
ART05	0.26W	-55 ~ +175℃	150V	300V	4.7Ω – 1MΩ			±25,±50
ART06	0.52W	-55 ~ +175℃	200V	400V	4.7Ω – 1MΩ			±25,±50

■Maximum Resistance Change at Rated Dissipation

Operation Mode		Standard P_{70}	Power P_{70}	Advanced Temperature P_{85}
Rated dissipation	ART02	0.070W	0.105W	0.130W
	ART03	0.110W	0.170W	0.210W
	ART05	0.140W	0.220W	0.260W
	ART06	0.270W	0.420W	0.520W
Operating temperature range		-55 ~ 125℃	-55 ~ 155℃	-55 ~ 175℃
Permissible film temperature		125℃	155℃	175℃
Max. resistance change at rated dissipation for resistance range, |△R/R| after:	ART02	10Ω – 221KΩ	10Ω – 221KΩ	10Ω – 221KΩ
	ART03	4.7Ω – 511KΩ	4.7Ω– 511KΩ	4.7Ω– 511KΩ
	ART05	4.7Ω– 1MΩ	4.7Ω– 1MΩ	4.7Ω– 1MΩ
	ART06	4.7Ω– 1MΩ	4.7Ω– 1MΩ	4.7Ω– 1MΩ
	1000hr	≦ 0.15%	≦ 0.3%	≦ 0.5%
	8000hr	≦ 0.25%	≦ 0.5%	–

Operating Voltage=√(P*R) or Max. operating voltage listed above, whichever is lower.
Overload Voltage=2.5*√(P*R) or Max. overload 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 (Standard operation mode)	ΔR±0.10 %			**JIS-C-5201-1 4.13** RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
Short Time Overload (Power operation mode)	ΔR±0.25%			
Insulation Resistance	>1000 MΩ			**MIL-STD-202 Method 302** Apply 100V_{DC} for 1 minute
Endurance	Standard at 70℃	1000hrs	ΔR±0.15%	**MIL-STD-202 Method 108** RCWV with 1.5 hrs "ON" and 0.5 hrs "OFF"
		8000hrs	ΔR±0.25%	
	Power at 70℃	1000hrs	ΔR±0.3%	
		8000hrs	ΔR±0.5%	
	Advanced temperature at 85℃	1000hrs	ΔR±0.5%	
High Temperature Exposure	125℃	ΔR±0.15%		**EN 60115-1 CLAUSE 4.25.3** 1000 hrs
	155℃	ΔR±0.3%		
	175℃	ΔR±0.5%		
Temperature Cycling	<10Ω	ΔR±0.1%		**JESD22 Method JA-104** 30 min at -55 °C and 30 min at 125 °C; , 1000 cycles
	>10Ω	ΔR±0.25%		**JESD22 Method JA-104** 30 min at -55 °C and 30 min at 155 °C; , 1000 cycles
Biased Humidity	Standard operation mode ΔR±0.5%			**MIL-STD-202 Method 103** 1000hrs 85℃/85%RH 10% of operating power (≦100 V)
Bending Strength (Board Flex)	ΔR±0.1%			**JIS-C-5201-1 4.33** Bending once for 60 seconds Bending displacement: 0402 0603 0805 1206 sizes: 3 mm
Solderability	95% min. coverage			**JIS-C-5201-1 4.17** **IEC-60115-1 4.17** 245±5°C for 3 seconds
Resistance to Soldering Heat	ΔR±0.1%			**JIS-C-5201-1 4.18** **IEC-60115-1 4.18** 260±5°C for 10 seconds
Terminal strength	No broken			**AEC-Q200-006** 0402 0603: Force of 1kg for 60 seconds. Others: Force of 1.8kg for 60 seconds.
Mechanical Shock	ΔR±0.1%			**MIL-STD-202 Method 213** Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	ΔR±0.1%			**MIL-STD-202 Method 204** 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz
ESD	ΔR±0.5%			**AEC-Q200-002** Human body model AR02 0.4KV AR03 1KV AR05 1.5KV AR06 2KV
Resistance to solvents	Marking Unsmeared			**MIL-STD-202 Method 215** Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Sulfur Test	ΔR±1%			**ASTM-B-809-95 Modified** 105±2 °C no power rating for **1000** hrs.

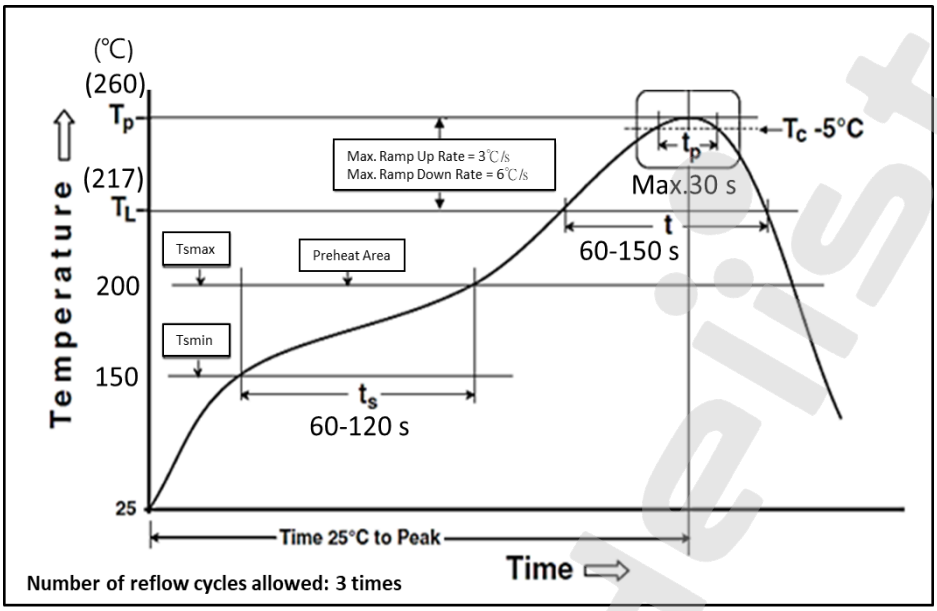
Flammability	No ignition of the tissue paper or scorching or the pinewood board	**UL-94** V-0 or V-1 are acceptable. Electrical test not required.
External Visual	No visible damage.	**MIL-STD-883 Method 2009** Electrical test not required. Inspect device construction, marking and workmanship.
Physical Dimension	As Spec.	**JESD22 Method JB-100** Verify physical dimensions to the applicable device detail specification. Note: User(s) and Suppliers Specification. Electrical test not required.

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.**

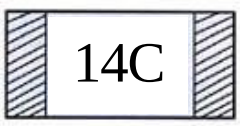
■Soldering Condition(IPC/JEDEC J-STD-020)



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

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

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}

0805~1206 4digit marking

Example

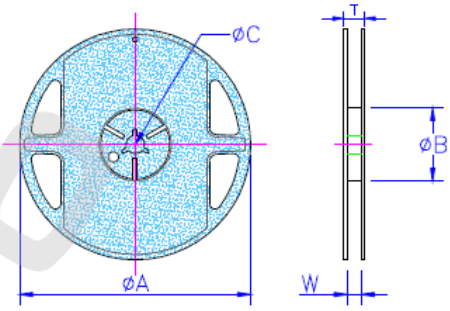
Resistance	100Ω	2.2KΩ	10KΩ	49.9KΩ	100KΩ
marking	1000	2201	1002	4992	1003

■Packaging

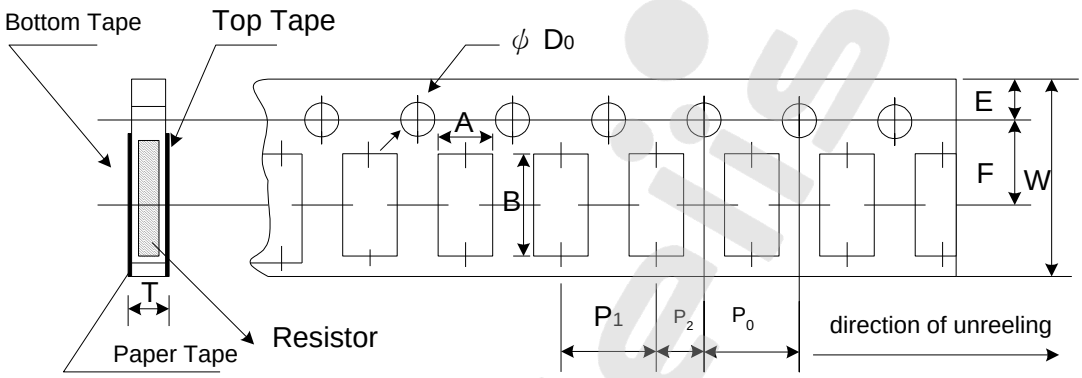
Packing Quantity & Reel Specifications

Unit :mm

Type	ØA	ØB	ØC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
ART02	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000	-
ART03	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
ART05	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
ART06	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-



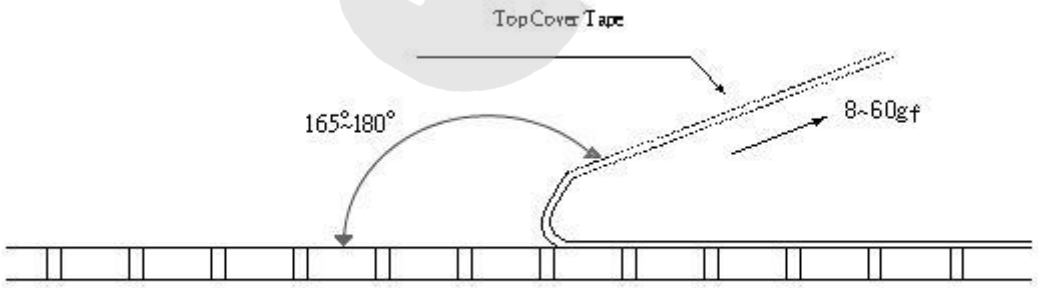
Paper Tape Specifications



Unit: mm

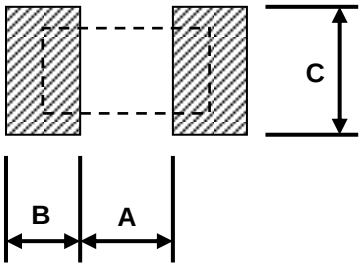
Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
ART02	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
ART03	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
ART05	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
ART06	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±0.10	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



■Recommend Land Pattern

Unit: mm



Type	A	B	C
ART02	0.50	0.50	0.60±0.2
ART03	0.80	1.00	0.90±0.2
ART05	1.00	1.00	1.35±0.2
ART06	2.00	1.15	1.70±0.2

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A	Apr 25,2022	-	- Correct the scheme.
Version A1	May 16,2024	-	- Modify the test conditions of reliability items, Temperature Cycling and ESD
Version A2	Jul 01,2024	-	- Modify the description in Features from “AEC-Q200 Compliance” to “AEC-Q200 Qualified
Version A3	May 20,2025	-	-Increase the product power rating
Version A4	Sep 18,2025	-	- Features: Adding AEC-Q200 Qualified (excluding <10 Ω) - Modify the resistance range of Standard Electrical Specifications. - Modify the resistance range of Maximum Resistance Change at Rated Dissipations - Environmental Characteristics: Add test conditions and specifications for <10 Ω in the Temperature Cycling
Version A5	Dec 22,2025	-	- Add Sulfur Test in Environmental Characteristics.
Version A6	Jun 01,2026	-	- Add new rule for 0603 3digit marking: When E24 and E96 share the same resistance, E96 marking shall take priority.
Version A7	Jul 09,2026	-	- Add new description “Total Lead(Pb)-free without RoHS exemptions” to Features.