Data Sheet

Customer：	
Product :	Automotive Grade Metal Thin Film Chip Resistors – ARM..A Series
Size:	0402/0603/0805/1206
Issued Date:	9-Jul-26
Edition :	REV. A8

RoHS Compliant

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Produced by (QC)	Checked (QC)	Approved by (QC)	Prepared by (Sales)	Accepted by (Customer)
9-Jul-26	9-Jul-26	9-Jul-26		
Chun	***Ben Chang***	***Ben Chang***		

Automotive Grade Metal Thin Film Chip Resistors



Features

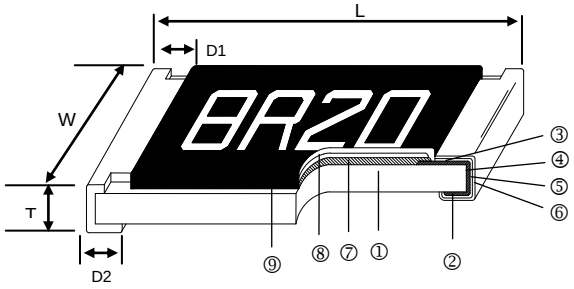
- AEC-Q200 Qualified
- High precision resistance tolerance: ±0.02%
- Low TCR down to ±5ppm/℃
- Advanced sulfur resistance verified according to ASTM B 809
- Total Lead(Pb)-free without RoHS exemptions

Applications

- Automotive
- Telecommunication
- Medical equipment
- Industrial equipment

Industrial measurement instrumentation, industrial machines
Various sensors, medical electronics

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

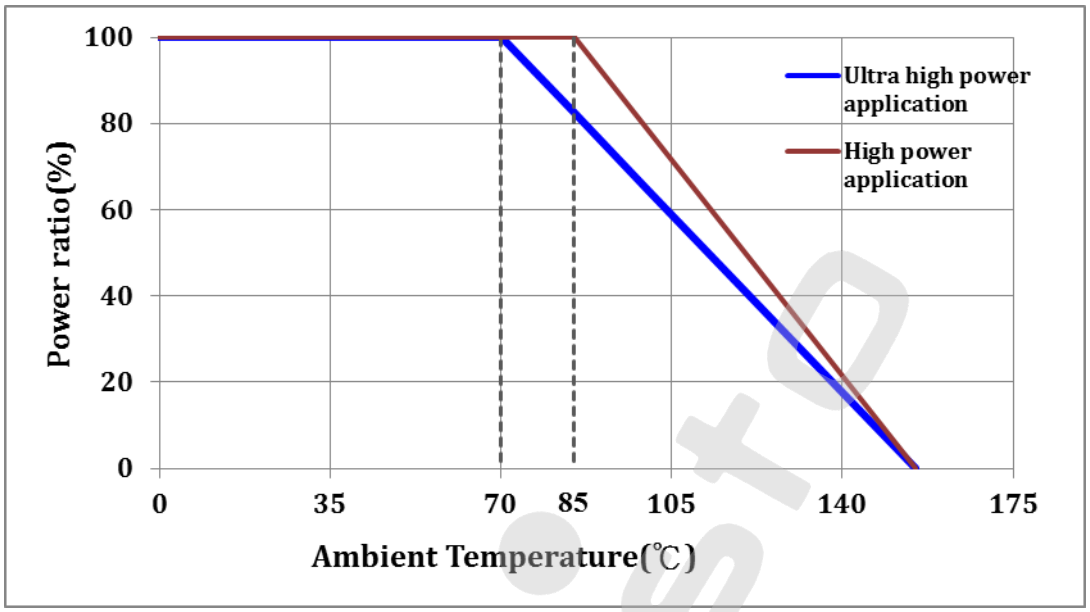
Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
ARM02	0402	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.10	0.20±0.10	0.54
ARM03	0603	1.55±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	1.83
ARM05	0805	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.20	4.71
ARM06	1206	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25	9.02

Part Numbering

ARM	06	F	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	Q: ±0.02% A: ±0.05% B: ±0.1% D: ±0.5%	T: Taping Reel B: Bulk	S: ±5 B: ±10 C: ±25 D: ±50 E: ±100	: Standard* (See Remark) Z: 1/32W Y: 1/16W X: 1/10W M: 1/6W W: 1/8W V: 1/4W	0100: 10Ω 10R2: 10.2Ω 1000:100Ω 1001: 1KΩ 1004: 1MΩ	A: Automotive Grade NA: No Marking Automotive Grade

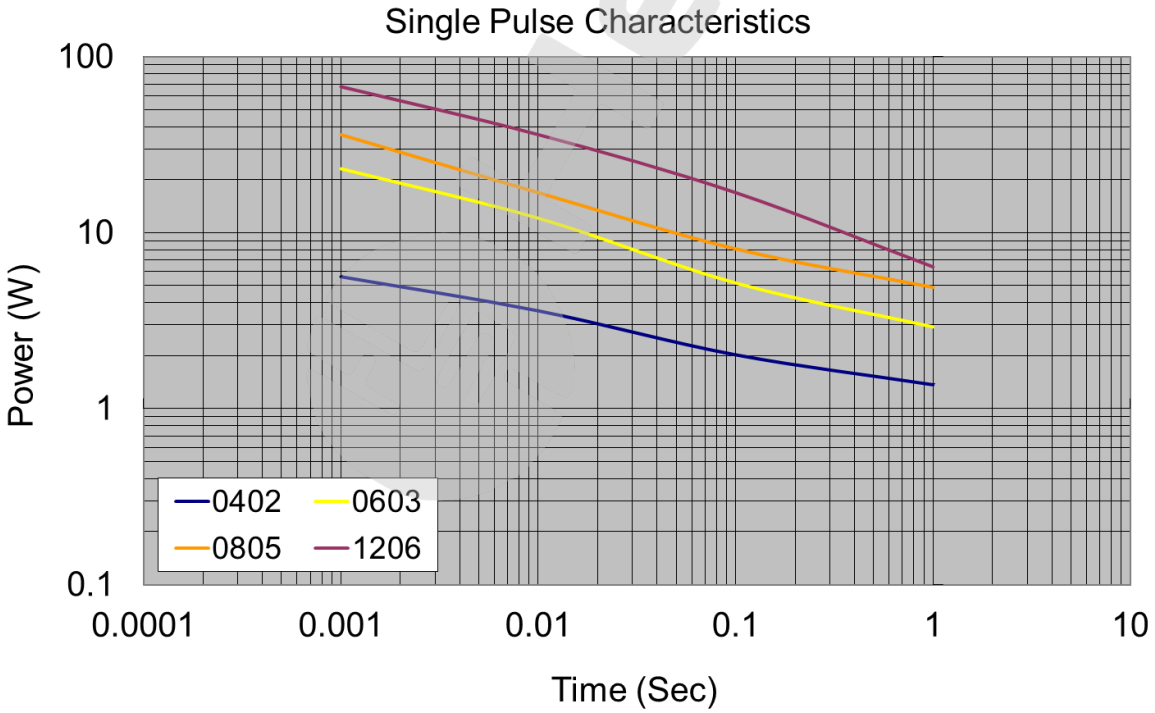
*Remark: Standard part no need for power rating code.

Derating Curve



Functional Performance

Maximum pulse power limit



■ Electrical Specifications

Item / Type	Power Rating			Max. Operating Voltage	Max. Overload Voltage	Resistance Range				TCR (PPM/℃)
	Standard	High	Ultra high			±0.02%	±0.05%	±0.1%	±0.5%	
ARM02 (0402)	1/32W	1/16W	1/8W	75V	100V	100Ω – 3KΩ				±5
						100Ω – 3KΩ	47Ω – 100KΩ			±10
						100Ω – 3KΩ	47Ω – 100KΩ		47Ω – 150KΩ	±25
						–	–	47Ω – 100KΩ	10Ω –150KΩ	±100
ARM03 (0603)	1/16W	1/10W	1/6W	100V	200V	100Ω – 5.1KΩ				±5
						100Ω – 5.1KΩ	47Ω – 270KΩ			±10
						100Ω – 5.1KΩ	47Ω – 270KΩ	47Ω – 332KΩ	47Ω – 1MΩ	±25
						–	–	47Ω – 332KΩ	10Ω –1MΩ	±50
ARM05 (0805)	1/10W	1/8W	1/4W	150V	300V	100Ω – 10.2KΩ				±5
						100Ω – 10.2KΩ	47Ω – 475KΩ			±10
						100Ω – 10.2KΩ	47Ω – 475KΩ	47Ω – 2.7MΩ		±25
						–	–	47Ω – 2.7MΩ	10Ω –2.7MΩ	±50
ARM06 (1206)	1/8W	1/4W	–	200V	400V	100Ω – 33.2KΩ				±5
						100Ω – 33.2KΩ	47Ω – 1MΩ			±10
						100Ω – 33.2KΩ	47Ω – 1MΩ	47Ω – 5.1MΩ		±25
						–	–	47Ω – 5.1MΩ	10Ω –5.1MΩ	±50

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.
Operating Temperature Range=-55 ~ +155℃
■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.		**JIS-C-5201-1 4.8** **IEC-60115-1 4.8** -55℃~+125℃, 25℃ is the reference temperature
Short Time Overload	≦47Ω ΔR±0.1% ≧47Ω ΔR±0.05% for Standard and High power rating		**JIS-C-5201-1 4.13** RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
	ΔR±0.1% for Ultra high power rating		
Endurance	Standard power rating at 85℃	ΔR±0.1%	**MIL-STD-202 Method 108** RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	High power rating at 85℃	ΔR±0.25%	
	Ultra high power rating at 70℃	ΔR±0.5%	
Biased Humidity	ΔR±0.1% for Standard power rating		**MIL-STD-202 Method 103** 1000 hrs 85℃/85%RH 10% of operating power.
	ΔR±0.25% for high power rating		
	ΔR±0.5% for Ultra high power rating		
High Temperature Exposure	≦47Ω ΔR±0.25% ≧47Ω ΔR±0.1% for 0603/0805/1206 size		**MIL-STD-202 Method 108** at +155℃ for 1000 hrs
	≦47Ω ΔR±0.25% ≧47Ω ΔR±0.2% for 0402 size		
Temperature Cycling	≦47Ω ΔR±0.25% ≧47Ω ΔR±0.1%		**JESD22 Method JA-104** -55℃ to +125℃, 1000 cycles
Resistance to soldering heat	ΔR±0.1%		**JIS-C-5201-1 4.18** **IEC-60115-1 4.18** 260±5℃ for 10 seconds
Insulation Resistance	>1000 MΩ		**JIS-C-5201-1 4.6** **IEC-60115-1 4.6** Apply 100V_{DC} for 1 minute
Bending Strength (Board Flex)	ΔR±0.1%		**JIS-C-5201-1 4.33** Bending once for 60 seconds Bending displacement: 1206 sizes: 3 mm
Solderability	95% min. coverage		**JIS-C-5201-1 4.17** **IEC-60115-1 4.17** 245±5℃ for 3 seconds
Terminal strength	No broken		**AEC-Q200-006** 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 ARM02、ARM03 0.2KV ARM05、ARM06 1KV
Resistance to solvents	Marking Unsmeared		**MIL-STD-202 Method 215** Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.

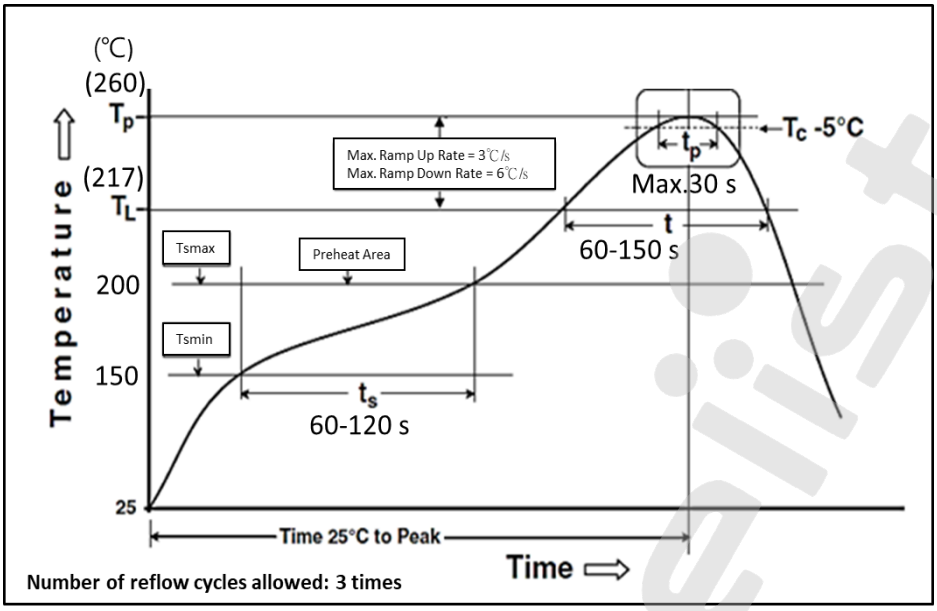
Sulfur Test	ΔR±1%	**ASTM-B-809-95 Modified** 105±2 °C no power rating for 1000 hrs.
Flammability	No ignition of the tissue paper or scorching or the pinewood board	**UL-94** V-0 or V-1 are acceptable. Electrical test not required.

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.**

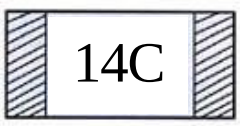
■Soldering Condition(IPC/JEDEC J-STD-020)



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

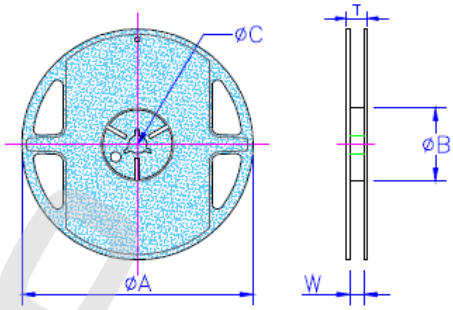
E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91

0805~2512 4digit marking

Example

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

Packaging

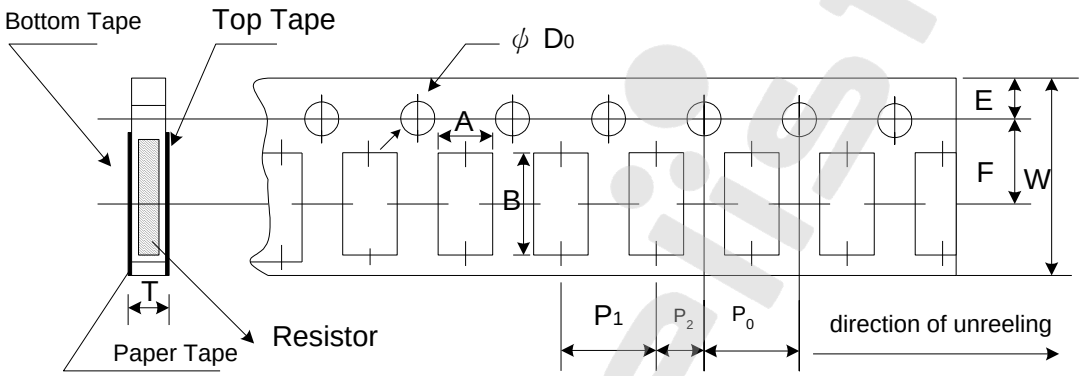


Packing Quantity & Reel Specifications

Unit :mm

Type	ØA	ØB	ØC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
ARM02	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000	-
ARM03	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
ARM05	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
ARM06	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-

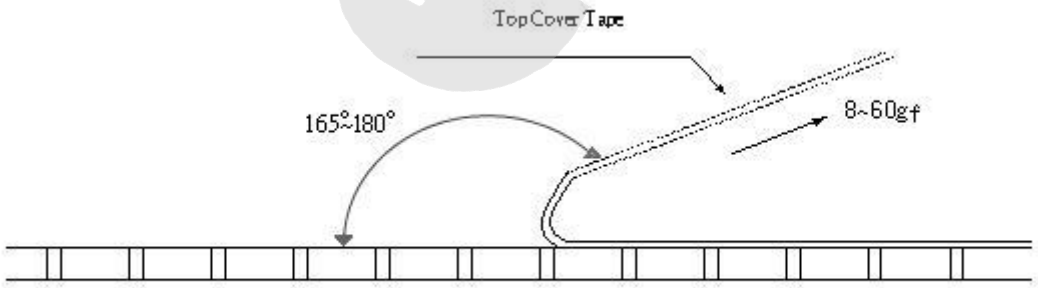
Paper Tape Specifications



Unit: mm

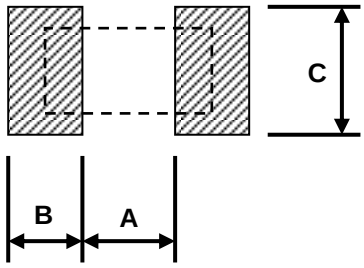
Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
ARM02	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
ARM03	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
ARM05	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
ARM06	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



Recommend Land Pattern

Unit: mm



Type	A	B	C
ARM02	0.50	0.50	0.60±0.2
ARM03	1.00	1.00	1.20±0.2
ARM05	1.20	1.40	1.65±0.2
ARM06	2.20	1.40	2.00±0.2

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A1	Jan 28 ,2022	-	- Add shelf life description. - Modify IR reflow profile to comply IPC/JEDEC J-STD-020. -Modify the Derating Curve.
Version A2	May 25 ,2022	-	- Add Part Numbering code “s” for TCR ±5 ppm product. - Add temperature for Endurance Test.
Version A3	Sep 01 ,2022	-	- Add the following contents 1. Marking Code “NA” in Part Numbering. 2. Operating Temperature Range. 3. Reflow Profiles Table.
Version A4	Aug 02 ,2023	-	1. Add 0.1% product specification for ARM02 TCR100, ARM03/05/06 TCR50ppm series. 2. Expand the resistance value range for 0.5% products. 3. Delete Safety Precautions.
Version A5	Jul 01 ,2024	-	- Modify the description in Features from “AEC-Q200 Compliance” to “AEC-Q200 Qualified”.
Version A6	Dec 22,2025	-	- Change the test duration of Sulfur Test from 750hrs to 1000hrs.
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 “Total Lead(Pb)-free without RoHS exemptions” to Features.