Last update: 2015.4.4 No.RGC-K-HTS-0001-11

Specification

Title: FIXED THICK FILM CHIP RESISTORS;

RECTANGULAR TYPE & PRECISION

Style: RGC1/32,1/20,1/16S,1/16,1/10,1/8

RoHS COMPLIANCE ITEM
Halogen and Antimony Free

Product specification contained in this specification are subject to change at any time without notice If you have any questions or a Purchasing Specification for any quality Agreement is necessary, please contact our sales staff.



Hokkaido Research Center Approval by: T. Sannomiya Drawing by: M. Shibuya

Note: Stock conditions

Temperature: $+5^{\circ}$ C ~ $+35^{\circ}$ C Relative humidity: 25% ~ 75%

The period of guarantee: Within 2 year from shipment by the company.

Solderability shall be satisfied.

Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 1/12

1. Scope

1.1 This specification covers the detail requirements for fixed thick film chip resistors; rectangular type & precision, style of RGC1/32,1/20,1/16S,1/16,1/10,1/8.

1.2 Applicable documents

JIS C 5201-1: 1998, JIS C 5201-8: 1998, JIS C 5201-8-1: 1998

IEC60115-1: 1999, IEC60115-8: 1989 Amendment 1: 1992, IEC60115-8-1: 1989

EIAJ RC-2134B-2002

2. Classification

Type designation shall be the following form.

(Example)

RGC	1/8	C	123	D	TP
1	2	3	4	5	6
Stv	le				

1 Fixed thick film chip resistors; rectangular type & precision

'____⊢ St

/11

2 Rated dissipation and / or dimension

3 Temperature coefficient of resistance

K	±100×10 ⁶ /°C
С	±50×10 ⁶ / °C

- 4 Rated resistance Example; $123 \rightarrow 12k\Omega$
- 5 Tolerance on rated resistance
- 6 Packaging form

3. Rating

3.1 The ratings shall be in accordance with Table-1.

Table-1

				· ·				
Style	Rated		e coefficient of	Rated resistance	Preferred number	Tolerance on		
Style	dissipation (W)	resistance	e (10⁴ / °C)	range(Ω)	series for resistors	rated resistance		
RGC1/32	0.03	C	±50	100~100k	E24,96	D(±0.5%)		
RGC1/20	0.05	C	±50	1k~1M	E34.06	B(±0.1%),		
KGC 1/20	0.05	K	±100	100~976	E24,96	D(±0.5%)		
		С	±50	100~1M		B(±0.1%),		
RGC1/16S	0.063	K	.400	1.02M~3.3M	E24,96	D(±0.5%)		
		r.	±100	10~97.6	,	F(±1%)		
	0.1	С	±50	100~1M	E24,96	B(±0.1%),		
DCC1/16		К	±100	1.02M~3.3M		D(±0.5%)		
RGC1/16				10~97.6		F(±1%)		
				3.3~9.76		F(±1%)		
						B(±0.1%),		
RGC1/10	0.125	0.125 C	. 50	±50 10~3.3M	E24,96	D(±0.5%)		
KGC 1/10			C ±50			F(±1%)		
				3.3~9.76		F(±1%)		
						B(±0.1%),		
RGC1/8	0.25	0.25 C	. 50	10~4.7M	E24,96	D(±0.5%)		
NGC 1/6	0.25		± 50		E24,90	F(±1%)		
							3.3~9.76	

Style	Limiting element voltage (V)	Isolation voltage (V)	Category temperature range(°C)
RGC1/32	15	50	-55~+125
RGC1/20	25	50	
RGC1/16S	50		
RGC1/16	50	100	<i>–</i> 55∼+155
RGC1/10	150	100	
RGC1/8	200		

Product specification contained in this specification are subject to change at any time without notice.

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 2/12

3.2 Climatic category

3.2.1 RGC1/32

55/125/56 Lower category temperature – 55 °C

Upper category temperature +125 °C

Duration of the damp heat, steady state test 56days

3.2.2 RGC1/20,1/16S,1/16,1/10,1/8

55/155/56 Lower category temperature – 55 °C

Upper category temperature +155 °C

Duration of the damp heat, steady state test 56days

3.3 Stability class

5% Limits for change of resistance:

- for long - term tests \pm (5%+0.1Ω) - for short - term tests \pm (1%+0.05Ω)

3.4 Derating

The derated values of dissipation at temperature in excess of 70 °C shall be as indicated by the following curve.

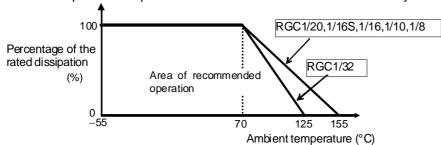


Figure-1 Derating curve

3.5 Rated voltage

d.c.or a.c.r.m.s.voltage calculated from the square root of the product of the rated resistance and the rated dissipation.

E: Rated voltage (V)

P: Rated dissipation (W)

R: Rated resistance
$$(\Omega)$$

Limiting element voltage can only be applied to resistors when the resistance value is equal to or higher than the critical resistance value.

At high value of resistance, the rated voltage may not be applicable.

4. Packaging form

The standard packaging form shall be in accordance with Table-2.

Table-2

Symbol	Pack	aging form	Standard packaging quantity / units	Application
В	Bulk (loose package)	Bulk (loose package)		RGC1/32,1/20,1/16S,1/16,1/10,1/8
PA	Press pocket taping	8mm width, 2mm pitches	20,000 pcs.	RGC1/32
PA	(paper taping)	ornin widin, zmin piiches	15,000 pcs.	RGC1/20
TH	Paper taping	8mm width, 2mm pitches	10,000 pcs.	RGC1/16S
TP	Paper taping	8mm width, 4mm pitches	5,000 pcs.	RGC1/16, 1/10, 1/8

KMY

Drawing No: RGC-K-HTS-0001 /11

Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 3/12

5. Dimensions

5.1 The resistor shall be of the design and physical dimensions in accordance with Figure-2 and Table-3.

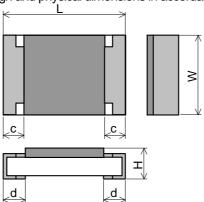


Figure-2

Table-3 Unit: mm

Style	L	W	Н	С	d
RGC1/32	0.4±0.02	0.2±0.02	0.13±0.02	0.08±0.03	0.1±0.03
RGC1/20	0.6±0.03	0.3±0.03	0.23±0.03	0.1±0.05	0.15±0.05
RGC1/16S	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	$0.25^{+0.05}_{-0.10}$
RGC1/16	1.6±0.1	0.8 +0.15 -0.05	0.45±0.10	0.25±0.10	0.3±0.1
RGC1/10	2.0±0.1	1.25±0.10	0.6±0.1	0.4±0.2	0.4±0.2
RGC1/8	3.1±0.1	1.6±0.15	0.6±0.1	0.5±0.25	0.5±0.25

5.2 Net weight (Reference)

Style	Net weight(mg)
RGC1/32	0.035
RGC1/20	0.16
RGC1/16S	0.6
RGC1/16	2
RGC1/10	5
RGC1/8	9

6. Marking

The Rated resistance shall be marked in 3 digits (E24) or 4 digits (E96) and marked on over coat side.

The Rated resistance of RGC1/16 should not be marked in 4 digits.

The Rated resistance of RGC1/32,1/20,1/16S should not be marked.

(Example) "123"
$$\rightarrow$$
 12×10³ $[\Omega]$ \rightarrow 12 $[k\Omega]$ "3R3" \rightarrow 3.3 $[\Omega]$

"5623"
$$\rightarrow$$
 562 \times 10³ [Ω] \rightarrow 562 [$k\Omega$]

"12R7" \rightarrow 12.7 [Ω]

KMY

Drawing No: RGC-K-HTS-0001 /11

Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 4/12

7. Performance

7.1 The standard condition for tests shall be in accordance with Sub-clause 4.2, JIS C 5201–1: 1998.

7.2 The performance shall be satisfied in Table-4.

Table-4(1)

No.	Test items	Condition of test (JIS C 5201–1)	Performance requirements
1	Visual examination	,	As in 4.4.1
1	Visual examination	Sub-clause 4.4.1	The marking shall be legible, as
		Checked by visual examination.	checked by visual examination.
2	Dimension	Sub-clause 4.4.2	As specified in Table–3 of this
_	Differsion	Sub-clause 4.4.2	specification.
	Resistance	Sub-clause 4.5	As in 4.5.2
	1 Colotal ICC	Sub-clause 4.5	The resistance value shall
			correspond with the rated resistance
			taking into account the specified
			tolerance.
3	Voltage proof	Sub-clause 4.7	No breakdown or flash over
		Method: 4.6.1.4(See Figure–5)	
		Test voltage: Alternating voltage with a peak	
		value of 1.42 times the insulation voltage.	
		Duration: 60 s ± 5 s	
		Insulation resistance	R≥1GΩ
		Test voltage: Insulation voltage	
		Duration: 1 min.	
4	Solderability	Sub-clause 4.17	As in 4.17.4.5
		Without ageing	The terminations shall be covered
		Flux: The resistors shall be immersed in a	with a smooth and bright solder
		non-activated soldering flux for 2s.	coating.
		Bath temperature: 235 °C ± 5 °C	
5	Mounting	Immersion time: 2 s ± 0.5 s	
5	Mounting	Sub-clause 4.31 Substrate material: Epoxide woven glass	
		•	
	Overload	Test substrate: Figure–3 Sub–clause 4.13	
	(in the mounted state)	The applied voltage shall be 2.5 times the	
	(rated voltage or twice the limiting element	
		voltage, whichever is the less severe.	
		Duration: 2 s	
		Visual examination	
		Resistance	No visible damage
		Sub-clause 4.30	$\Delta R \le \pm (1\% + 0.05\Omega)$
	Solvent resistance of the	Solvent: 2-propanol	Legible marking
	marking	Solvent temperature: 23 °C ± 5 °C	
		Method 1	
		Rubbing material: cotton wool	
		Without recovery	

KMY Drawing No: RGC-K-HTS-0001

FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 5/12

/11

Table-4(2)

No	Test items	Condition of test (JIS C 5201–1)	Performance requirements
6	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
		Test substrate: Figure-4	
	Bound strength of the end	Sub-clause 4.33	
	face plating	Bent value: 3 mm	
		Resistance	$\Delta R \le \pm (1\% + 0.05\Omega)$
	Final measurements	Sub-clause 4.33.6	
		Visual examination	No visible damage
7	Resistance to soldering heat	Sub-clause 4.18	
	_	Solder temperature: 260 °C ± 5 °C	
		Immersion time: $10 \text{ s} \pm 0.5 \text{ s}$	
		Visual examination	As in 4.18.3.4
			No sign of damage such as cracks.
		Resistance	$\Delta R \le \pm (1\% + 0.05\Omega)$
	Component solvent	Sub-clause 4.29	,
	resistance	Solvent: 2-propanol	
		Solvent temperature: 23 °C ± 5 °C	
		Method 2	
		Recovery: 48 h	
		Visual examination	No visible damage
		Resistance	$\Delta R \le \pm (1\% + 0.05\Omega)$
8	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
		Test substrate: Figure–3	
	Adhesion	Sub-clause 4.32	
		Force: 5 N(RGC1/32: 2N, RGC1/20: 3N)	
		Duration: 10 s ± 1 s	
		Visual examination	No visible damage
	Rapid change temperature	Sub-clause 4.19	
		RGC1/32	
		Lower category temperature: -55 °C	
		Upper category temperature: +125 °C	
		RGC1/20,1/16S,1/16,1/10,1/8	
		Lower category temperature: -55 °C	
		Upper category temperature: +155 °C	
		Duration of exposure at each temperature: 30	
		min.	
		Number of cycles: 5 cycles.	No visible damage
		Visual examination	•
L	[Resistance	$\Delta R \le \pm (1\% + 0.05\Omega)$

KMY Drawing No: RGC-K-HTS-0001

FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION Title:

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 6/12

/11

Table-4(3)

No	Test items	Condition of test (JIS C 5201–1)	Performance requirements
9	Climatic sequence	Sub-clause 4.23	
	-Dry heat	Sub-clause 4.23.2	
		RGC1/32	
		Test temperature: +125 °C	
		RGC1/20,1/16S,1/16,1/10,1/8:	
		Test temperature: +155 °C	
		Duration: 16 h	
	-Damp heat, cycle	Sub-clause 4.23.3	
	(12+12hour cycle)	Test method: 2	
	First cycle	Test temperature: 55 °C	
	,	[Severity(2)]	
	-Cold	Sub-clause 4.23.4	
		Test temperature –55 °C	
		Duration: 2h	
	-Damp heat, cycle	Sub-clause 4.23.6	
	(12+12hour cycle)	Test method: 2	
	Remaining cycle	Test temperature: 55 °C	
		[Severity (2)]	
		Number of cycles: 5 cycles	
	–D.C. load	Sub-clause 4.23.7	
		The applied voltage shall be the rated voltage	
		or the limiting element voltage whichever is the	
		smaller.	
		Duration: 1 min.	No visible dame on
		Visual examination	No visible damage
		Resistance	$\Delta R \le \pm (5\% + 0.1\Omega)$
10	Mounting	Sub-clause 4.31	
	_	Substrate material: Epoxide woven glass	
		Test substrate: Figure–3	
	Endurance at 70 °C	Sub-clause 4.25.1	
		Ambient temperature: 70 °C ± 2 °C	
		Duration: 1000 h	
		The voltage shall be applied in cycles of 1.5 h	
		on and 0.5 h.	
		The applied voltage shall be the rated voltage	
		or the limiting element voltage whichever is the	
		smaller.	
		Examination at 48 h, 500 h and	
		1000 h:	
		Visual examination	No visible damage
		Resistance	$\Delta R \le \pm (5\% + 0.1\Omega)$

KMY Drawing No: RGC-K-HTS-0001 /11

FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION Title:

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 7/12

Table-4(4)

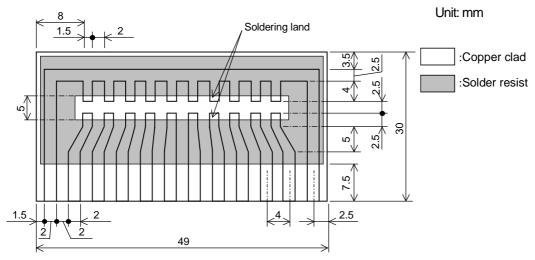
No	Test items	Condition of test (JIS C 5201–1)	Performance requirements
11	Mounting Variation of resistance with temperature	Sub-clause 4.31 Substrate material: Epoxide woven glass Test substrate: Figure–3 Sub-clause 4.8 RGC1/32: +20 °C / +125 °C RGC1/20,1/16S,1/16,1/10,1/8: +20 °C / +155 °C	As in Table–1
12	Mounting Damp heat, steady state	Sub-clause 4.31 Substrate material: Epoxide woven glass Test substrate: Figure–3 Sub-clause 4.24 Ambient temperature: 40 °C ± 2 °C Relative humidity: 93 ⁺² / ₋₃ % a) 1st group: without voltage applied. b) 2nd group: The d.c.voltage shall be applied continuously. The voltage shall be accordance with Sub-clause 4.24.2.1 b). without polarizing voltage [4.24.2.1, c)] Visual examination Resistance	No visible damage Legible marking ΔR ≤ ± (5%+0.1Ω)
13	Dimensions (detail) Mounting Endurance at upper category temperature	Sub-clause 4.4.3 Sub-clause 4.31 Substrate material: Epoxide woven glass Test substrate: Figure-3 Sub-clause 4.25.3 RGC1/32: Ambient temperature:125 °C ± 2 °C RGC1/20,1/16S,1/16,1/10,1/8: Ambient temperature:155 °C ± 2 °C Duration: 1000 h Examination at 48 h, 500 h and 1000 h: Visual examination Resistance	As in Table–3 No visible damage $\Delta R \le \pm (5\%+0.1\Omega)$

KMY Drawing No: RGC-K-HTS-0001 /11

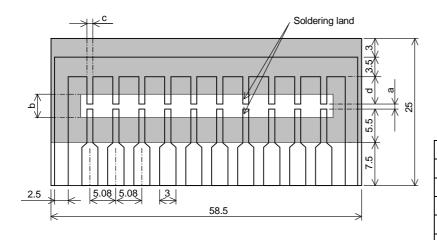
Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 8/12

8. Test substrate



RGC1/8 TEST SUBSTRATE



	Unit: r	nm
[:Copper clad
		:Solder resis

Style	а	b	С	d
RGC1/32	0.2	0.56	0.2	5.3
RGC1/20	0.3	1.5	0.45	5.2
RGC1/16S	0.6	1.9	0.7	4.9
RGC1/16	1.0	3.6	1.0	4.5
RGC1/10	1.2	4.0	1.5	4.3

RGC1/32,1/20,1/16S,1/16,1/10 TEST SUBSTRATE

Figure-3

Remark 1). Material: Epoxide woven glass

Thickness: 1.6mm Thickness of copper clad: 0.035mm

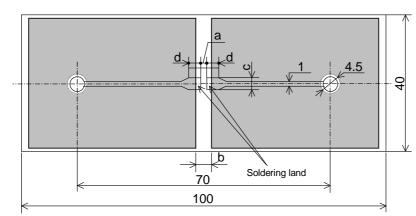
2). In the case of connection by connector, the connecting terminals are gold plated. However, the plating is not necessary when the connection is made by soldering.

KMY

Drawing No: RGC-K-HTS-0001 /11

Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

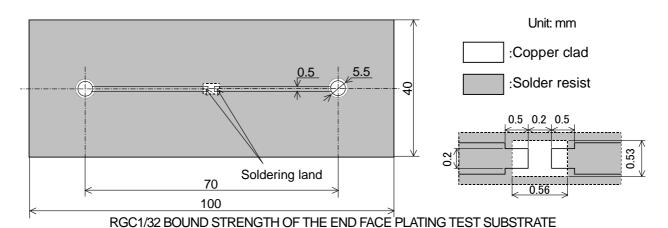
RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 9/12



Unit: mm		
	:Copper clad	
	:Solder resist	

Style	а	b	С	d
RGC1/20	0.3	1.1	0.45	2.15
RGC1/16S	0.6	1.9	0.7	2.0
RGC1/16	1.0	3.6	1.2	3.0
RGC1/10	1.2	4.0	1.65	3.0
RGC1/8	2.5	5.0	2.0	2.5

RGC BOUND STRENGTH OF THE END FACE PLATING TEST SUBSTRATE

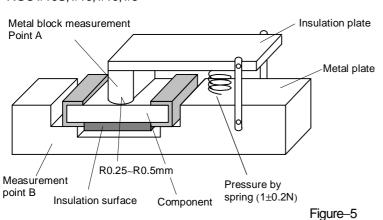


Figure–4

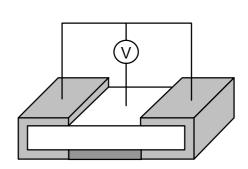
Remark 1). Material: Epoxide woven glass

Thickness: 1.6mm Thickness of copper clad: 0.035mm

• RGC1/16S,1/16,1/10,1/8



•RGC1/32,1/20



KMY Drawing No: RGC-K-HTS-0001 /11

Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 10/12

9. Taping

- 9.1 Applicable documents JIS C 0806–3: 1999, EIAJ ET–7103: 2004, EIAJ ET–7200B: 2003
- 9.2 Taping dimensions
- 9.2.1 Press pocket taping (Paper taping, 8mm width, 2mm pitches)

Taping dimensions shall be in accordance with Figure-6 and Table-5.

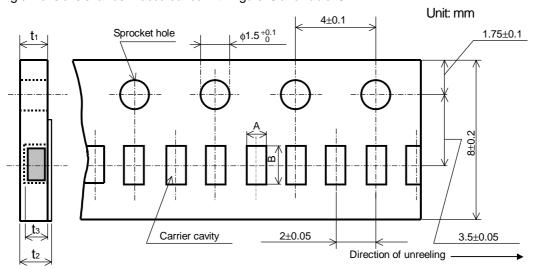
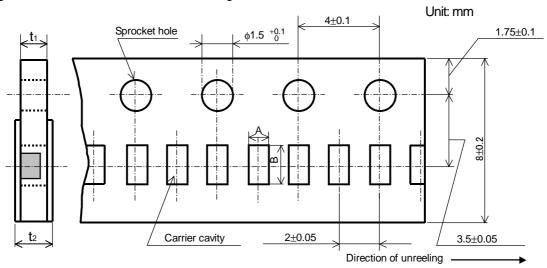


Figure-6 Table-5 Unit: mm В Style RGC1/32 0.24±0.03 0.45±0.03 0.31±0.03 0.36±0.02 0.15±0.02 RGC1/20 0.37±0.05 0.67±0.05 0.42±0.03 0.45±0.05 0.27±0.02

9.2.2 Paper taping (8mm width, 2mm pitches)

Taping dimensions shall be in accordance with Figure-7 and Table-6.



Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 11/12

9.2.3 Paper taping (8mm width, 4mm pitches)

Taping dimensions shall be in accordance with Figure-8 and Table-7.

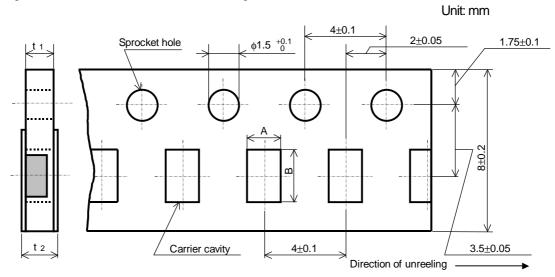
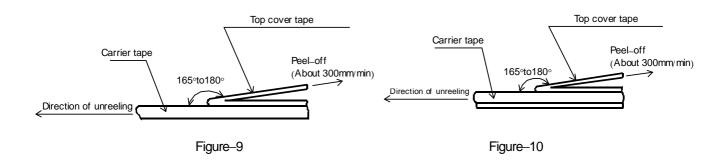


Figure-8

Table-7				Unit: mm
Style	Α	В	t 1	t 2
RGC1/16	1.15 ± 0.15	1.9 ± 0.2	0.6 ± 0.1	0.8max.
RGC1/10	1.65 ± 0.15	2.5 ± 0.2	0.8 ± 0.1	1.0max.
RGC1/8	2.00 ± 0.15	3.6 ± 0.2		

- 1). The cover tapes shall not cover the sprocket holes.
- 2). Tapes in adjacent layers shall not stick together in the packing.
- 3). Components shall not stick to the carrier tape or to the cover tape.
- 4). Pitch tolerance over any 10 pitches ±0.2mm.
- 5). The peel strength of the top cover tape shall be with in 0.1N to 0.5N on the test method as shown in the following RGC1/32,1/20: Figure–9, RGC1/16S, 1/16, 1/10, 1/8: Figure–10.
- 6). When the tape is bent with the minimum radius for 25 mm, the tape shall not be damaged and the components shall maintain their position and orientation in the tape.
- 7). In no case shall there be two or more consecutive components missing.

 The maximum number of missing components shall be one or 0.1%, whichever is greater.
- 8). The resistors shall be faced to upward at the over coating side in the carrier cavity.



FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & PRECISION

RGC1/32,1/20,1/16S,1/16,1/10,1/8 Page: 12/12

9.3 Reel dimension

Reel dimensions shall be in accordance with the following Figure-11 and Table-8. Plastic reel (Based on EIAJ ET-7200B) Unit: mm

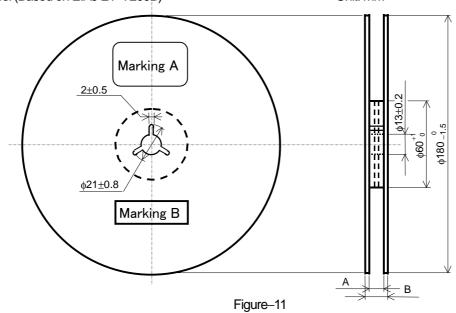


Table-8 Unit: mm В Note Α 11.4±1.0 Injection molding 9 +1.0 RGC1/32,1/20,1/16S,1/16,1/10,1/8 13±1.0 Vacuum forming

Note: Marking label shall be marked on a place of Marking A or two place of marking A and B.

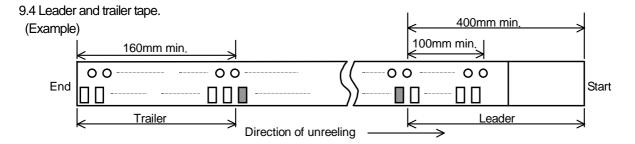


Figure-12

10. Marking on package

The label of a minimum package shall be legibly marked with follows.

Style

10.1 Marking A

(1) Classification

(Style, Temperature coefficient of resistance, Rated resistance, Tolerance on rated resistance, Packaging form)

(2) Quantity (3) Lot number (4) Manufacturer's name or trade mark

10.2 Marking B (KAMAYA control label)

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Common Mode Chokes / Filters category:

Click to view products by Walsin manufacturer:

Other Similar products are found below:

RGCMF1210900H3T B82722A2102N001 UAL21V07012500 UAL24VR06500CH UALSC0220G0000 UALSC058000000 UALSC058000000 UALSC0580J0000 UALSC1520JH000 UALSU10VR15019 UALSU10VR20010 UALSU16VD30030 UALSU16VD40010 UALSU9H0305000 UALSU9HF030600 UALSU9HF060300 UALSU9HR050340 UALSU9VD070100 UALSU9VR070170 5701610000 CM7060M132R-10 UALW21HS200290 UALW21HS072450 UALSU9VD070400 UALSU9V0701000 UALSU9HR030900 UALSU9HF050500 UALSU9H0701000 UALSU9H0208000 UALSU9H0110000 UALSCF25081300 UALSC0305GS000 UALSC0120G0000 UAL24VK06450CH UAL11VL1105000 RN112-3.6-02-0M4 RN114-1.2-02-10M RN122-0.6-02-47M RN122-3-02-4M5 RN142-1-02-33M RN214-2.5-02-3M3 RN112-2-02-1M0 RN143-6-02-1M8 RN214-0.8-02-27M RN242-1.4-02-27M EXC-X4CH120X DLW5BTM102TQ2L CMF16-153131 CMF23H-273141 744252510 B82793C0253N201