KAMAYA OHM

Spec. No.:	RAC–K–HTS–0006 /8
Date:	2017. 1. 10

Specification

Title: CHIP ATTENUATORS

Style: RAC101A

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.

釜屋電機株式會社
KAMAYA ELECTRIC CO., LTD.

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

Note: Stock conditions
Temperature: +5°C ~ +35°C
Relative humidity: 25% ~ 75%
The period of guarantee: Within 2 year from shipmen t by the company.
Solderability shall be satisfied.

1. Scope

1.1 This specification covers the detail requirements for chip attenuators, style of RAC10 1A.

2. Classification

Type designation shall be the following form.

(Example)

RAC	10	1	A	1	C	TH
1	2	3	4	5	6	7
			Style			

1 Chip attenuators

2 Size

3 Characteristic impedance

Symbol	1
Characteristic impedance	50Ω

4 Circuit

Symbol	A
Circuit	Unbalanced π type

5 Attenuation factor

Symbol	1	2	3	4	5	6	7	8	9	A
Attenuation factor	1dB	2dB	3dB	4dB	5dB	6dB	7dB	8dB	9dB	10dB

6 Terminal style

7 Packaging form

B	Bulk (loose package)
TH	Paper taping

3. Rating

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

Table–1

Style	Terminations style	Attenuation factor (dB)	Attenuation factor tolerance (dB)	Frequency range	Voltage standing wave ratio VSWR	Rated input power (at 85 °C)
RAC101A	C	1,2,3,4,5	±0.3	DC≤f≤3GHz	1.2 max.	100 mW/package
		6,7,8,9,10	±0.4			

Style	Working temperature range (°C)	Storage temperature range (Single unit) (°C)
RAC101A	–40~+125	–55~+125

4. Packaging form

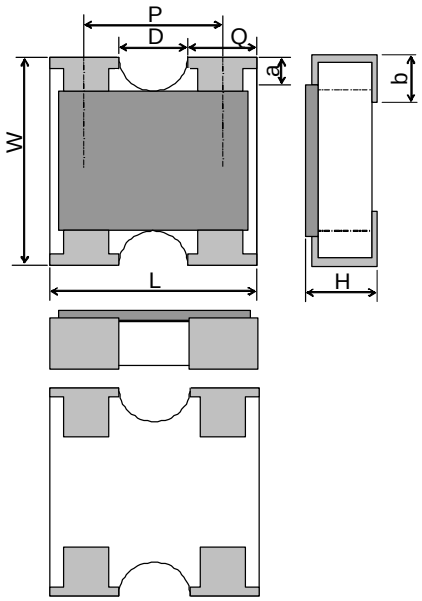
The standard packaging form shall be in accordance with Table–2.

Table–2

Symbol	Packaging form		Standard packaging quantity / units
B	Bulk (loose package)		1,000 pcs.
TH	Paper taping	(8mm width), 2mm pitches	10,000 pcs.

5. Dimensions

5.1 The resistor shall be of the design and physical dimensions in accordance with Figure−1 and Table−3.



Figure−1

Table−3 Unit: mm

Style	L	W	H	Q	a	b	∗P
RAC101A	1.0±0.1	$1.0^{+0.1}_{-0}$	0.35±0.10	0.33±0.10	0.15±0.10	0.25±0.10	0.65±0.10

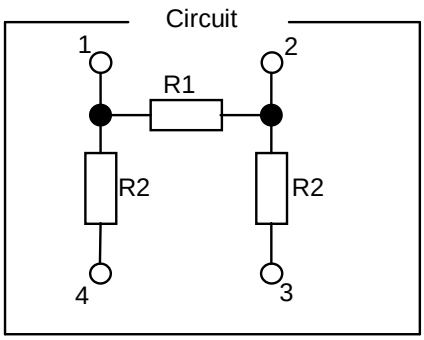
∗Reference

5.2 Net weight (Reference)

Style	Net weight(mg)
RAC101A	1.1

6. Circuit and DC resistance value

6.1 Unbalanced π type circuit



6.2 DC resistance value (Reference)

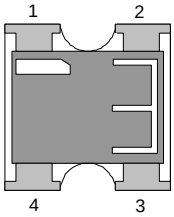
Attenuation factor	R1 (Ω)	R2 (Ω)
1dB	5.769	869.5
2dB	11.62	436.2
3dB	17.62	292.4
4dB	23.85	221.0
5dB	30.40	178.5
6dB	37.35	150.5
7dB	44.80	130.7
8dB	52.84	116.1
9dB	61.59	105.0
10dB	71.15	96.25

7. Marking

The following of marking items shall be marked on over coat side.

Marking items; 1. Dot mark
2. Attenuation factor
″1″ → 1dB
″3″ → 3dB
″A″ → 10dB

Example)

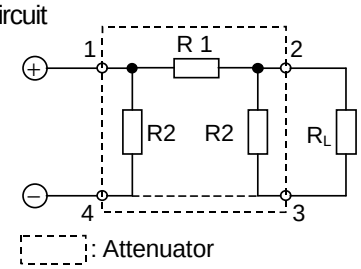


8. Performance

8.1 Unless otherwise specified, the standard range of atmospheric conditions for tests is as follows;
Ambient temperature: 5 °C to 35 °C, Relative humidity: 45 % to 85 %, Air pressure: 86 kPa to 106 kPa
If there is any doubt the results, measurements shall be made within the following;
Ambient temperature: 20 °C ± 2 °C, Relative humidity: 60 % to 70 %, Air pressure: 86 kPa to 106 kPa

8.2 The performance shall be satisfied in Table–4.

Table–4(1)

No.	Test items	Condition of test	Performance requirements
1	Characteristic impedance	Test circuit  : Attenuator R_L: 50 Ω	50 Ω
2	Frequency	The test device: Network analyzer HP8753D Agilent Technologies Inc. (Max. frequency: 6 GHz)	Within the specified tolerance of attenuation factor. VSWR: See Table-1.
3	Insulation resistance	Test condition: Between terminal to over coat. Test potential: 50Vdc Test period: 1min.	100 MΩ min.
4	Resistance to soldering heat	Test condition: 260 °C ± 5 °C 10 s ± 1 s	1dB ~ 2dB: Within ±0.1% 3dB ~ 5dB: Within ±0.2% 6dB ~ 10dB: Within ±0.3% No evidence of appearance damage.
5	Solderability	Flax: Rosin–Methanol Test condition: 235 °C ± 5 °C 2 s ± 0.5 s	The surface of terminal immersed shall be min. of 95 % covered with a new coating of solder.

Table–4(2)

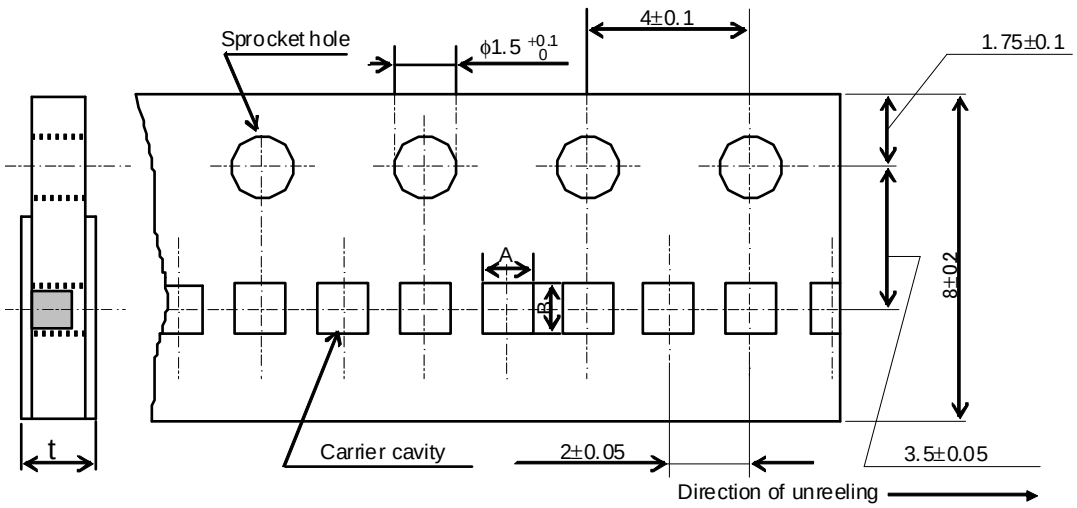
No.	Test items	Condition of test			Performance requirements
6	Temperature cycling	Test cycle: 5 cycles for duty cycle as specified below.			1dB ~ 2dB: Within ±0.1% 3dB ~ 5dB: Within ±0.2% 6dB ~ 10dB: Within ±0.3% No evidence of appearance damage.
		Step	Temperature (°C)	Time (min)	
		1	Room temp.	2~3	
		2	–55±3	30	
		3	Room temp.	2~3	
		4	125±2	30	
		Leaving at the room temp. for 30 min. or more, and then measure the attenuation factor.			
7	Load life	The test substrate: Glass fabric based epoxy resin. t: 1.6 mm Test circuit: See No. 1. Test temp. : 85 °C ± 2 °C Test voltage: Cycle of 1 h 30 min. ″ON″and 30 min. ″OFF″ at dc rated voltage. Test period: 1,000 $^{+48}_{0}$ h Leaving at the room temp. for 2h or more, and then measure the attenuation factor.			1dB ~ 2dB: Within ±0.1% 3dB ~ 5dB: Within ±0.2% 6dB ~ 10dB: Within ±0.3% No evidence of appearance damage.

9. Taping

9.1 Taping dimensions

Taping dimensions shall be in accordance with below.

Unit: mm



Figure–2

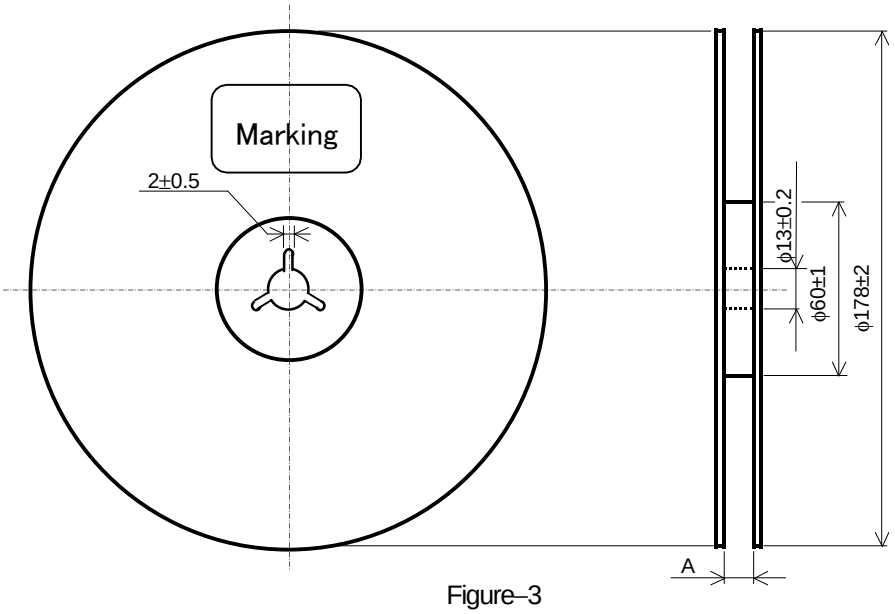
Table–5 Unit: mm

Style	A	B	t
RAC101A	1.2±0.05	1.2±0.05	0.55max.

9.2 Reel dimension

Reel dimensions shall be in accordance with the following Figure–3 and Table–6.

Unit: mm



Figure–3

Table–6 Unit: mm

Style	A
RAC101A	9±0.5

10. Marking on package

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

10.1 Marking A

(1) Classification (Kind, Size, Style, Characteristic impedance, Circuit, Attenuation factor, Terminal style, Packaging form)

(2) Lot number (3) Quantity (4) Manufacturer's name or trade mark (5) Others

10.2 Marking B(KAMAYA control label)