Spec. No.:	FCCR–K–HTS–0001 /5
Date:	2017. 1. 10

Specification

Title: CHIP FUSE; RECTANGULAR TYPE

Style: FCCR10,16

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.

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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 fuses; rectangular type, style of FCCR10,16.

1.2 Applicable documents

UL248–1–2000 Low–Voltage Fuses–Part1: General Requirements
UL248–14–2000 Low–Voltage Fuses–Part14: Supplemental Fuses
CSA C22.2 No.248.1–2000 Low–Voltage Fuses–Part1: General Requirements
CSA C22.2 No.248.14–2000 Low–Voltage Fuses–Part14: Supplemental Fuses
IEC60127–1 Miniature fuses–part 1: Definitions for miniature fuses and general requirements for miniature fuse–links
IEC60127–4 Miniature fuses–Part4: Universal modular fuse–links (UMF)

2. Classification

Type designation shall be the following form.

(Example)

FCCR	10	201	AB	PA
1	2	3	4	5

Style

1 Chip fuses; rectangular type
2 Size
Style

3 Rated current

201	201--> 0.2A

4 Optional code

Symbol	Content
AB	Standard

5 Packaging form

B	Bulk (loose package)
PA	Press pocket taping
TP	Paper taping

3. Safety standard approval

- UL248–1 and UL248–14
- CSA C22.2, No. 248.1–00 and CSA C22.2, No. 248.14–00

The file number to be designated by UL and C–UL shall be as follows: E176847

4. Rating

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

Table–1

Style	Rated current			Internal resistance value (mΩ max.)	Rated voltage (V)	Breaking capacity (A)	Time / current characteristic	
	Symbol	(A)	Marking symbol				Current	Pre–arcing time
FCCR10	151	0.15	∩	1850	DC24	35	200%	5 s max.
	201	0.2	Z	1250				
	251	0.25	C	880				
	321	0.315	D	600				
	401	0.4	E	400				
	501	0.5	F	300				
FCCR16	151	0.15	OB	2300	DC50	50	200%	5 s max.
	201	0.2	ZB	1350				
	251	0.25	CB	1000				
	321	0.315	DB	600				
	401	0.4	EB	450				
	501	0.5	FB	300				
	631	0.63	IB	220				
	751	0.75	AB	190				
	801	0.8	KB	165				
	102	1.0	LB	130				
	132	1.25	MB	110				
	152	1.5	HB	90				
	162	1.6	NB	75				
	202	2.0	SB	65				
	252	2.5	TB	40				

4.2 Working temperature range: –55 to +125(°C)

5. Packaging form

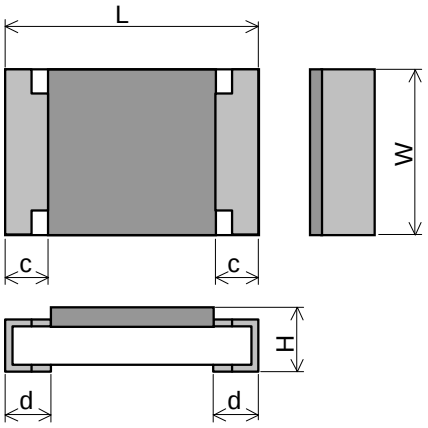
The standard packaging form shall be in accordance with Table–2.

Table–2

Symbol	Packaging form		Standard packaging quantity / units	Application
B	Bulk (loose package)		1,000 pcs.	FCCR10,16
PA	Press pocket taping (paper taping)	8mm width, 2mm pitches	10,000 pcs.	FCCR10
TP	Paper taping	8mm width, 4mm pitches	5,000 pcs.	FCCR16

6. Dimensions

6.1 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	c	d
FCCR10	1.0±0.05	0.5±0.05	0.4±0.05	0.2±0.1	0.25±0.10
FCCR16	1.6±0.1	$0.8^{+0.15}_{-0.05}$	0.45±0.10	0.3±0.15	0.3±0.1

6.2 Net weight (Reference)

Style	Net weight(mg)
FCCR10	0.8
FCCR16	2

7. Marking

The Marking symbol of Sub– clause 4.1 shall be marked on over coat side.

(Example)

Style	Optional code	Marking symbol	Content
FCCR10	AB	Z	FCCR10 201 AB
FCCR16	AB	EB	FCCR16 401 AB

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 presser: 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 presser: 86 kPa to 106 kPa

8.2 The performance shall be satisfied in Table–4.

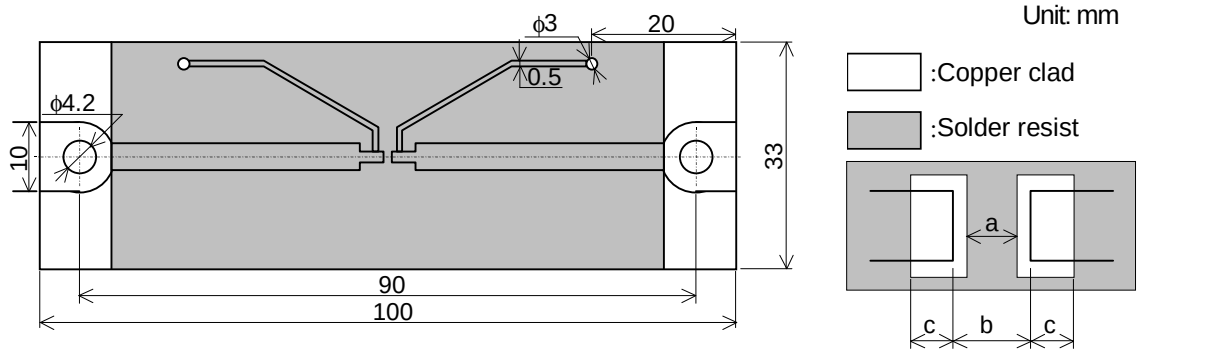
Table–4(1)

No.	Test items	Condition of test	Performance requirements
1	Temperature rise	The fuse shall be mounted on the test substrate as shown in Figure–2. Measurement temp.: 10 °C to 30 °C Test current: Rated current The temperature at the hottest point on the surface of the fuse shall be measured after temperature equilibrium has been attained.	75 °C max.
2	Current carrying capacity	The fuse shall be mounted on the test substrate as shown in Figure–2. Test current: 110 % of Rated current Test temp.: 70 °C ± 2 °C Test period: 1h	Without opening
3	Time / current characteristic	The fuse shall be mounted on the test substrate as shown in Figure–2. Test current shall be applied for continuously.	Optional code: AB Current: 200% Pre–arcing time: 5 s max.
4	Terminal bond strength of the face plating	JIS C 60068-2-21 Ue1 The fuse shall be mounted on the test substrate as shown in Figure–2. Bending value: 3 mm (Among the fulcrums: 90 mm) Duration: 10 s ± 1 s	Change of internal resistance: ±10% No evidence of mechanical damage.
5	Resistance to soldering heat	Test by a piece. Temp. of solder bath: 260 °C ± 5 °C Immersion time: 10 s ± 1 s After immersion into solder, leaving the room temp. for 1h or more, and then measure the internal resistance. • Reflow soldering Pre–heating: 150 °C ~ 180 °C, 120 s max. Peak: 260 °C ± 5 °C, 10 s max. Refrow cycle: 2 times After immersion into solder, leaving the room temp. for 1h or more, and then measure the internal resistance.	Change of internal resistance: ±10% No evidence of appearance damage
6	Solderability	JIS C 60068-2-58 Test by a piece Flux: Rosin–Methanol Temp. of solder: bath: 235 °C ± 5 °C Immersion time: 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
7	Rapid change temperature	JIS C 60068-2-14 Na The fuse shall be mounted on the test substrate as shown in Figure–2. Upper temperature: +125 °C Lower temperature: –55 °C Duration of exposure at each temperature: 30 min. Number of cycles: 5 cycles	Change of internal resistance: ±10% No evidence of appearance damage
8	Endurance test	The fuse shall be mounted on the test substrate as shown in Figure–2. Test condition: Nominal ambient temp. and Relative humidity. Test potential: 1. Cycle of 1 h "ON" and 15 min. "OFF" at 1.05 times rated current for 100 cycles. 2. After above the test , 1.25 times rated current for 1h.	The voltage drop across the fuse after the test shall not have increased by more than 10 % of the value measured before test.

9. Test substrate



Style	a	b	c
FCCR10	0.3	0.6	0.65
FCCR16	0.6	1.0	0.5

Figure–2 FCCR TEST SUBSTRATE

Remark 1). Material: Epoxide woven glass
Thickness: 1. 6mm Thickness of copper clad: 0. 035mm

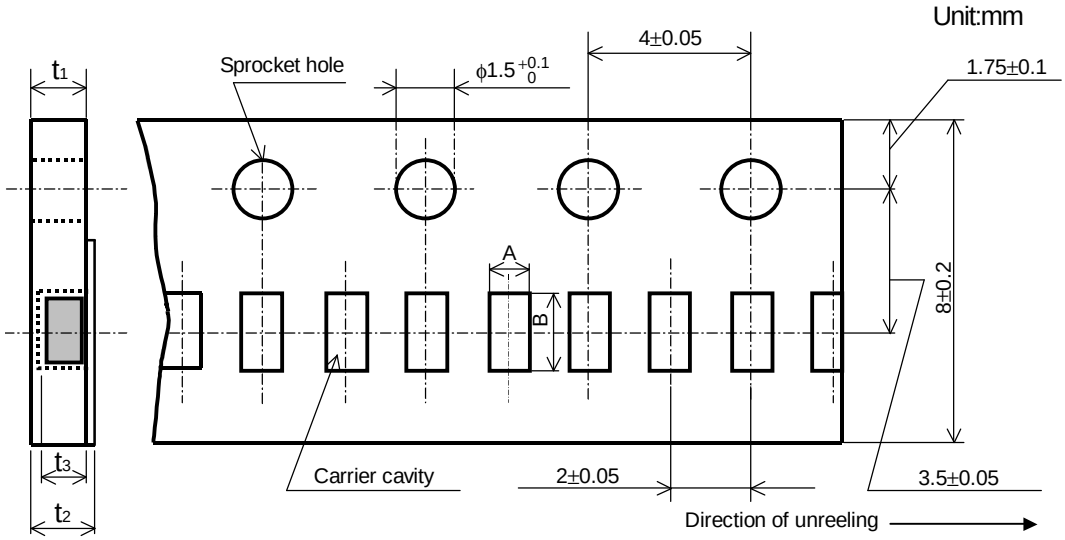
10. Taping

10.1 Applicable documents JIS C 0806–3: 2014, EIAJ ET–7200C: 2010

10.2 Taping dimensions

10.2.1 Press pocket taping(8mm width, 2mm pitches)

Taping dimensions shall be in accordance with Figure–3 and Table–5.



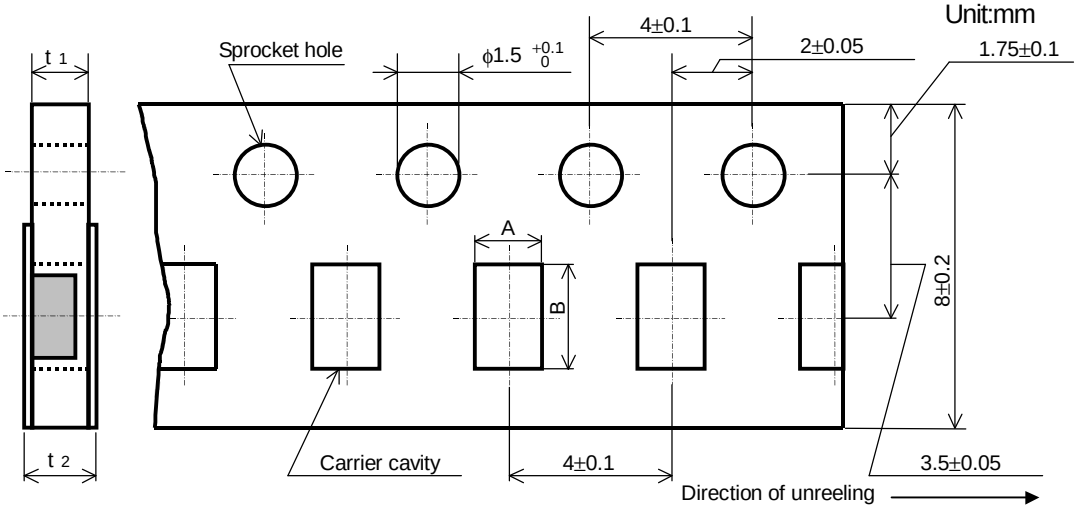
Figure–3

Table–5 Unit:mm

Style	A	B	t_1	t_2	t_3
FCCR10	0.65±0.1	1.15±0.1	0.6±0.05	0.7max.	0.5±0.05

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

Taping dimensions shall be in accordance with Figure–4 and Table–6.

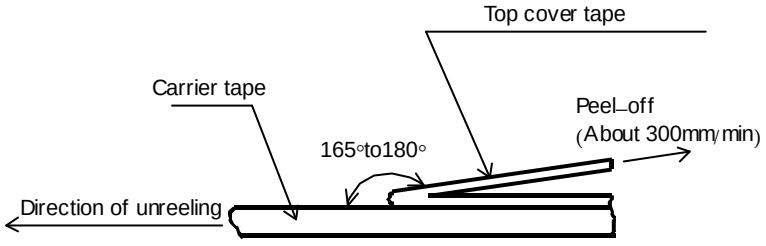


Figure–4

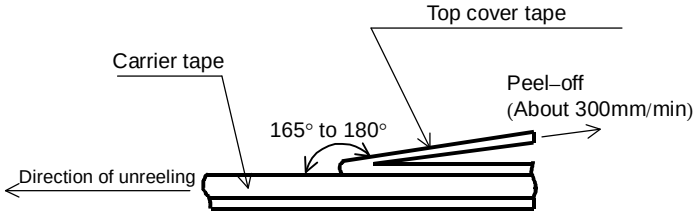
Table–6 Unit:mm

Style	A	B	t_1	t_2
FCCR16	1.15±0.15	1.9±0.2	0.6±0.1	0.8 max.

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 FCCR10:Figure–5,FCCR16: Figure–6.
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 fuses shall be faced to upward at the over coating side in the carrier cavity.



Figure–5



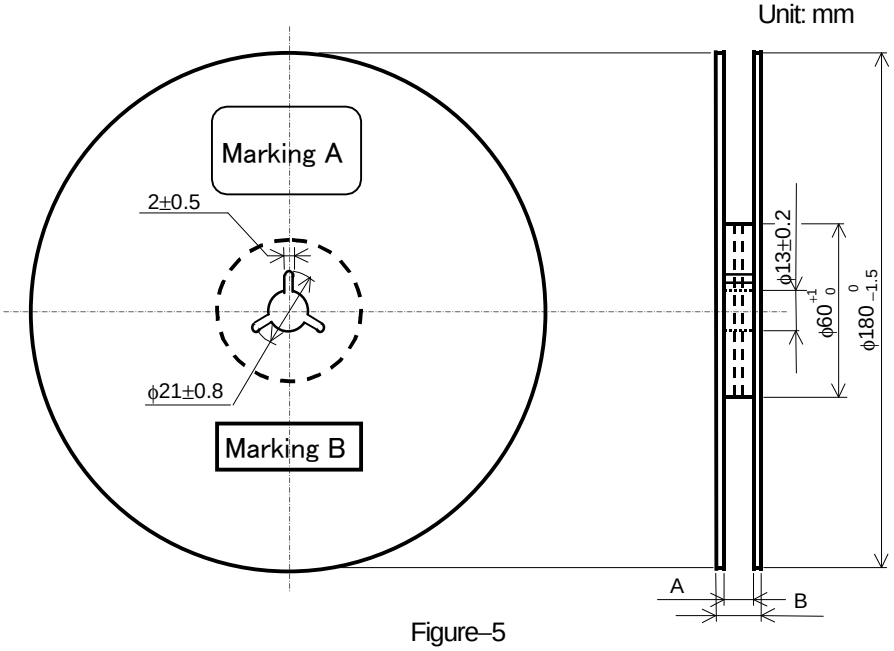
Figure–6

10.3 Reel dimension

Reel dimensions shall be in accordance with the following Figure–5 and Table–6.

Plastic reel (Based on EIAJ ET–7200C)

Unit: mm



Figure–5

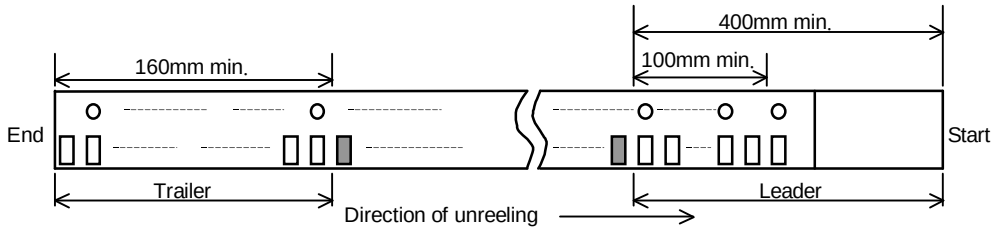
Table–6 Unit: mm

Style	A	B	Note
FCCR10,16	9 +1.0 0	11.4±1.0	Injection molding
		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.

10.4 Leader and trailer tape.

(Example)



Figure–8

11. Marking on package

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

11.1 Marking A

(1) Classification (Style, Rated current, Optional code, Packaging form) (2) Quantity (3) Lot number

(5) Manufacturer's name or trade mark (6) UL and /or C–UL recognized component mark (7) Others

11.2 Marking B (KAMAYA Control label)

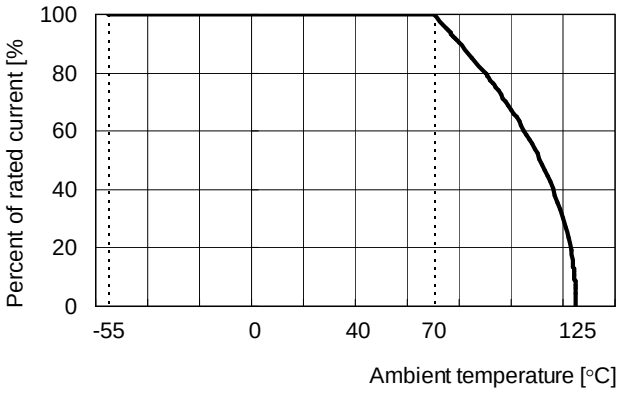
12. Recommended Derating for Rated Current

- Nominal Derating

  Option Code AB: Nominal Derating ≤ 75% of Rated Current

- Temperature Derating

  Please refer to the following graph regarding the current derating value for ambient temperature.



Ex.) • If Optional code: AB (Rated Current:0.5A) is used under ambient temperature 70°C
Kamaya recommends, less than the current value derated as below,
Rated Current: 0.5A × (Nominal Derating : 75% × Temperature Derating : 100%) =0.375A