

JIS

JAPANESE INDUSTRIAL STANDARD

**Fixed thick film chip resistors
rectangular type
for use in electronic equipment
(Form 72 and 73, characteristic
H, K and M, grade C)**

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Fixed thick film chip resistors
 rectangular type for use in electronic equipment
 (Form 72 and 73, characteristic H, K and M, grade C)

C 5223-1995

1. Scope This Japanese Industrial Standard specifies fixed thick film chip resistors rectangular type of style 72 and 73, characteristic H, K and M, grade C (hereafter referred to as "resistors") which are mainly used in electronic equipment, based on JIS C 5201.

- Remarks 1. This resistor is formed in such a manner that metallic film closely fixed on the surface of rectangular ceramic body is employed as the resistance element, no lead wire is provided, and electrodes for surface mounting are equipped on both ends of the element.
2. The following standards are cited in this Standard:
- | | |
|------------|---|
| JIS C 5201 | General rules of fixed resistors for use in electronic equipment |
| JIS C 5202 | Test methods of fixed resistors for electronic equipment |
| JIS C 5602 | Glossary of passive components for electronic equipment |
| JIS C 5603 | Terms and definitions for printed circuits |
| JIS C 6484 | Copper-clad laminates for printed wiring boards - Glass fabric base, epoxy resin |
| JIS K 1501 | Methanol |
| JIS K 5902 | Colophonium |
| JIS Z 3282 | Soft solder |
| JIS Z 9015 | Sampling inspection procedures and tables by attributes with severity adjustment (receiving inspection where a consumer can select suppliers) |

2. Definitions For the purpose of this Standard the definitions specified in JIS C 5201, JIS C 5602 and JIS C 5603 apply.

3. Type designation

3.1 Structure of type designation The type designation shall be structured by arranging the symbols as given below.

Symbol denoting kind of resistor 3.2.1	Symbol denoting style 3.2.2	Symbol denoting character- istic 3.2.3	Symbol denoting rated dissipa- tion 3.2.4	Symbol denoting nominal resistance 3.2.5	Symbol denoting tolerance on resist- ance 3.2.6
Example: RK	73	M	2B	221	J
Symbol denoting electrode construc- tion 3.2.7	Symbol denoting grade 3.2.8	Symbol denoting failure rate level 3.2.9	Symbol denoting taping 3.2.10		
D	C	X	T		

3.2 Symbols

3.2.1 Kind of resistor The symbol denoting kind of resistor shall be RK, based on 4.2.1 of JIS C 5201.

3.2.2 Style The symbol denoting style shall be 72 and 73, as given in Table 1, based on 4.2.2 of JIS C 5201.

Table 1. Style

Symbol	Style
72	Rectangular (chip) without enclosure, surface mounting electrodes on both ends
73	Rectangular (chip) with non-metallic enclosure, surface mounting electrodes on both ends

3.2.3 Characteristic The symbol denoting characteristic shall consist of one English capital letter based on 4.2.3 of JIS C 5201, and three kinds of letters i.e. H, K and M shall be employed as shown in Table 2.

Table 2. Characteristic

Characteristic		H			K				M			
Characteristic		H			K				M			
Rated dissipation (see 4.1)	Symbol	2A	2B	2E	1J	2A	2B	2E	1J	2A	2B	2E
	Dissipation W	0.1	0.125	0.25	0.063	0.1	0.125	0.25	0.063	0.1	0.125	0.25
Maximum working voltage V (see 4.1)		75	150	200	50	75	150	200	50	75	150	200
Maximum overload voltage V (see 4.1)		150	300	400	100	150	300	400	100	150	300	400
Rated ambient temperature (see 4.2)		70 °C										
Category temperature range (see 4.3)		−55 to +125 °C										
Temperature characteristic of resistance ppm/°C (see No. 2 of Table 10)		±100			±250				±500			
Allowable maximum variation of resistance	Short-time overload (see No. 3 of Table 10)	± (2 % +0.1 Ω)										
	Voltage proof (see No. 5 of Table 10)	± (1 % +0.05 Ω)										
	Robustness of electrode (see No. 1 of Table 11)											
	Resistance to soldering heat (see No. 2 of Table 11)											
	Change of temperature (see No. 1 of Table 12)											
	Endurance (loading under damp) (see No. 2 of Table 12)	± (3 % +0.1 Ω)										
	Endurance (rated load) (see No. 3 of Table 12)											
Tolerance on resistance % (see 4.5)		±1 (±2)			±2 ±5				±2 ±5 ±10			
Nominal resistance range (see Table 6)		100 Ω to1 MΩ			10 Ω to1 MΩ				2.2 Ω to10 MΩ			

Remarks: The tolerances on resistance in parentheses will be abolished in future.

3.2.4 Rated dissipation The symbols denoting rated dissipation shall be as given in Table 3, based on 4.2.4 of JIS C 5201.

Table 3. Rated dissipation

Symbol	Dis- sipation W
1J	0.063
2A	0.1
2B	0.125
2E	0.25

3.2.5 Nominal resistance The symbol denoting nominal resistance shall consist of three numerals (for E24 series) or four numerals (for E96 series), based on 4.2.5 of JIS C 5201. In the case of three numerals, the first and second numerals shall represent the significant figures of nominal resistance in the unit of ohm (Ω) and the third numeral shall represent the number of zeros following the significant figures.

In the case of four numerals, the first, second and third numerals shall represent the significant figures in the unit of ohm (Ω) and the fourth numeral shall represent the number of zeros following the significant figures. If there is a decimal point, it shall be expressed by an English capital letter R, and in this expression all the numerals shall be significant figures.

Table 4. Examples of symbols denoting nominal resistance

The case of three numerals (E24 series)	The case of four numerals (E96 series)
100.....10 Ω	10R0.....10 Ω
122.....1.2 k Ω	5112.....51.1 k Ω
103.....10 k Ω	1003.....100 k Ω

3.2.6 Tolerance on resistance The symbol denoting tolerance on resistance shall be as given in Table 5, based on 4.2.6 of JIS C 5201.

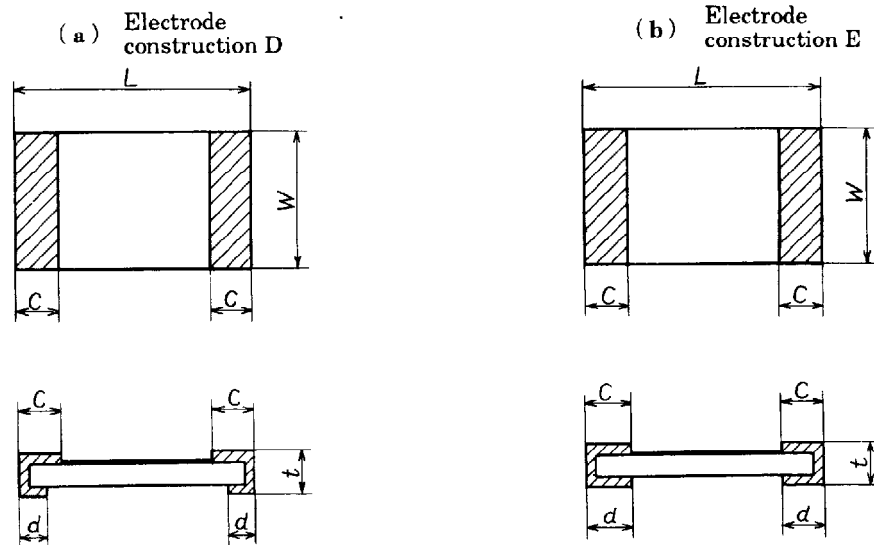
Table 5. Tolerance on resistance

Symbol	Unit: %			
	F	G	J	K
Tolerance on resistance	± 1	± 2	± 5	± 10

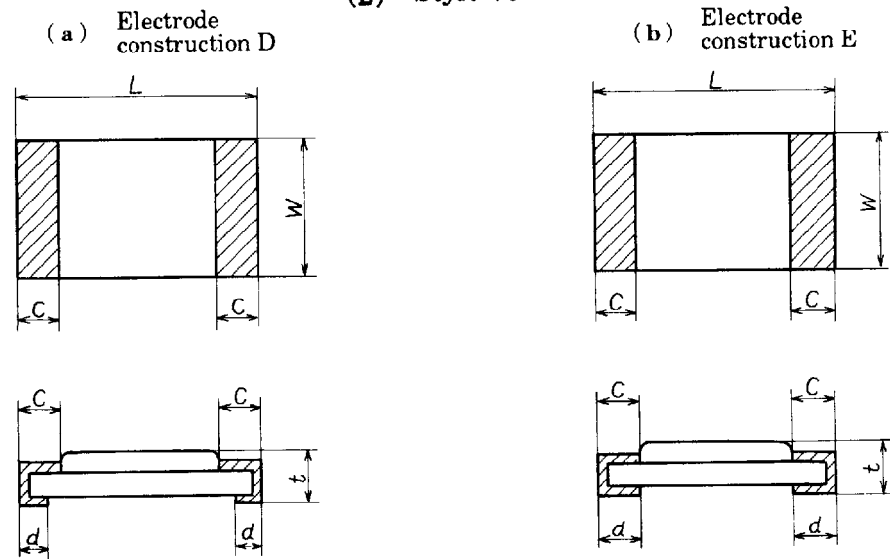
3.2.7 Electrode construction The symbol denoting electrode construction shall consist of an English capital letter D or E as illustrated in Fig. 1.

Fig. 1. Dimensions

(1) Style 72



(2) Style 73



Remarks: The hatched portion indicates the electrode.

Fig. 1 (continued)

Rated dissipation		Symbol of electrode construction	Dimension mm					Remarks
Symbol	Dissipation W		W	L	C	d	t	
1J	0.063	D	0.8 ± 0.2	1.6 ± 0.2	0.3 ± 0.2	0.3 max.	0.6 max.	Fig. 1 (a)
		E				0.3 ± 0.2		Fig. 1 (b)
2A	0.1	D	1.25 ± 0.2	2.0 ± 0.2	0.4 ± 0.2	0.4 max.	1.0 max.	Fig. 1 (a)
		E				0.4 ± 0.2		Fig. 1 (b)
2B	0.125	D	1.6 ± 0.2	3.2 ± 0.2	0.5 ± 0.3	0.5 max.		Fig. 1 (a)
		E				0.5 ± 0.3		Fig. 1 (b)
2E	0.25	D	2.5 ± 0.2			0.5 max.		Fig. 1 (a)
		E				0.5 ± 0.3		Fig. 1 (b)

3.2.8 Grade The symbol denoting grade shall consist of one English capital letter based on 4.2.7 of JIS C 5201, and the letter shall be C.

3.2.9 Failure rate level The symbol denoting failure rate level shall consist of one English capital letter based on 4.2.8 of JIS C 5201, and the letter shall be X (no failure rate level is specified).

3.2.10 Taping If taping is carried out, the symbol shall consist of one English capital letter based on 4.2.9 of JIS C 5201, and the letter shall be T.

4. Ratings

4.1 Rated dissipation The rated dissipation shall be as given in Table 6.

The rated ambient temperature is 70°C. However, for resistors with a resistance exceeding the critical resistance, it means the dissipation corresponding to the maximum working voltage.

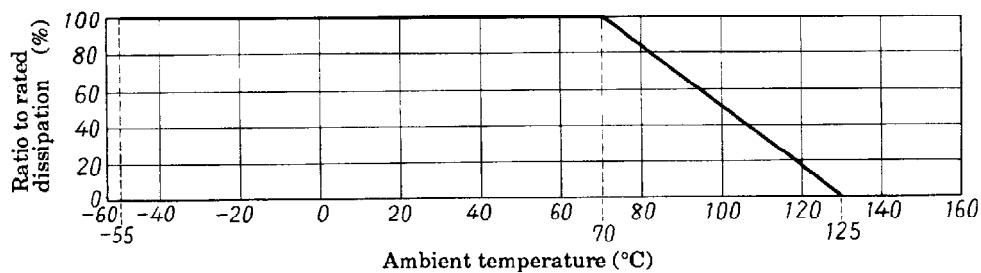
Table 6. Rating

Rated dissipation		Character- istic symbol	Maximum working voltage V	Maximum overload voltage V	Voltage proof V	Nominal resist- ance range	Tolerance on resistance %
Symbol	Dissipation W						
2A	0.1	H ± 100 ppm/ $^{\circ}\text{C}$	75	150	150	100 Ω to 1 M Ω	± 1 (F) [± 2 (G)]
2B	0.125		150	300	300		
2E	0.25		200	400	400		
1J	0.063	K ± 250 ppm/ $^{\circ}\text{C}$	50	100	100	10 Ω to 1 M Ω	± 2 (G) ± 5 (J)
2A	0.1		75	150	150		
2B	0.125		150	300	300		
2E	0.25		200	400	400		
1J	0.063	M ± 500 ppm/ $^{\circ}\text{C}$	50	100	100	2.2 Ω to 10 M Ω	± 2 (G) ± 5 (J) ± 10 (K)
2A	0.1		75	150	150		
2B	0.125		150	300	300		
2E	0.25		200	400	400		

Remarks: The tolerance on resistance in [] will be abolished in future.

4.2 Maximum dissipation The maximum dissipation at a temperature not exceeding the rated ambient temperature shall be equal to the rated dissipation. The maximum dissipation at a temperature exceeding the rated ambient temperature shall have a value obtained by derating the rated dissipation by means of the derating curve shown in Fig. 2.

Fig. 2. Derating curve



4.3 Category temperature range The category temperature range shall be -55°C to $+125^{\circ}\text{C}$.

4.4 Nominal resistance value The resistance shall be expressed in the unit of ohm (Ω), and the values shall be 10^n (n is an integer) times the numerical values given in Table 7 (E24 series) and Table 8 (E96 series).

The correlation between the characteristic and the nominal resistance range shall be as given in Table 6.