Distributeur : JBG-METAFIX

Data Sheet

Customer:	
Product:	**Thick Film Chip Resistor - CR Series**
Size:	**01005/0201/0402/0603/0805/1206/1210/2010/2512**
Issued Date:	**02-Sep-25**
Edition:	**REV.B**

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Produced by (QC)	Checked (QC)	Approved by (QC)	Prepared by (Sales)	Accepted by (Customer)
02-Sep-25	**02-Sep-25**	**02-Sep-25**	**02-Sep-25**	
Mandy Chang	***Ben Chang***	***Ben Chang***		

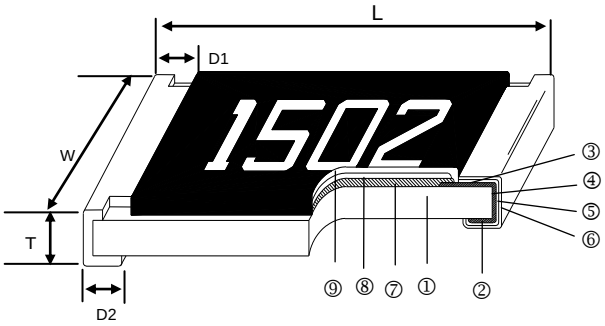
Distributeur : JBG-METAFIX

Thick Film Chip Resistor

■Features

- Small size and light weight
- Highly reliable multilayer electrode construction
- Compatible with all soldering process
- Long side terminations
- Moisture Sensitivity Level: Level 1

■Construction



①	Alumina Substrate	④	Edge Electrode	⑦	Resistor Layer
②	Bottom Electrode	⑤	Barrier Layer	⑧	Primary Overcoat
③	Top Electrode	⑥	External Electrode	⑨	Secondary Overcoat

■Applications

- Telecommunication Equipments
- Radio and Tape Recorders, TV Tuners
- Digital Cameras, Watches, Pocket Calculators
- Computers, Instruments
- Medical Equipment

■Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)	Weight (g) (1000pcs)
CR-E5	01005	0.40±0.02	0.20±0.02	0.13±0.03	0.10±0.03	0.10±0.03	0.037
CR-01	0201	0.60±0.03	0.30±0.03	0.23±0.03	0.15±0.05	0.15±0.05	0.150
CR-02	0402	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10	0.620
CR-03	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	2.042
CR-05	0805	2.00±0.10	1.25±0.15	0.50±0.10	0.30±0.20	0.40±0.20	4.368
CR-06	1206	3.20±0.20	1.60±0.15	0.55±0.10	0.50±0.20	0.50±0.20	8.947
CR-10	1210	3.20±0.20	2.50±0.20	0.55±0.10	0.50±0.20	0.50±0.20	15.959
CR-0A	2010	5.00±0.20	2.50±0.20	0.55±0.10	0.60±0.20	0.60±0.20	24.241
CR-12	2512	6.30±0.20	3.20±0.20	0.55±0.10	0.60±0.20	0.60±0.20	39.448

■Part Numbering

Part Number：CR-03FL7---10R
Part Number：CR-03JL7----0R

CR-	03	F	L	7	-	-	-	1	0	R
CR-	03	J	L	7	-	-	-	-	0	R

Product Type	Dimensions	Resistance Tolerance	Function Code	Packaging Code	Resistance
CR-	E5: 01005 01: 0201 02: 0402 03: 0603 05: 0805 06: 1206 10: 1210 0A: 2010 12: 2512	F: ±1% J: ±5%	L: Standard	0: 7” Reel 15Kpcs 4: 7” Reel 4Kpcs 5: 7” Reel 20Kpcs 6: 7” Reel 10Kpcs 7: 7” Reel 5Kpcs D: 13” Reel 20Kpcs G: 13” Reel 50Kpcs	- - - 1R2: 1.2Ω - - - 3K3: 3.3KΩ - - - 10K: 10KΩ - - 100K: 100KΩ “-“ to fill up 6 spaces

■Standard Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range		TCR (PPM/°C)
					±1%(E24、E96)	±5%(E24)	
CR-E5 (01005)	1/32W	-55 ~ +125°C	15V	30V	1Ω – 9.76Ω 10Ω – 97.6Ω 100Ω - 1MΩ		±400 ±250 ±200
CR-01 (0201)	1/20W	-55 ~ +155°C	25V	50V	1Ω – 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±300 ±200 ±200
CR-02 (0402)	1/16W	-55 ~ +155°C	50V	100V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±100
CR-03 (0603)	1/10W	-55 ~ +155°C	75V	150V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±100
CR-05 (0805)	1/8W	-55 ~ +155°C	150V	300V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±100
CR-06 (1206)	1/4W	-55 ~ +155°C	200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±100
CR-10 (1210)	1/2W	-55 ~ +155°C	200V	500V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±100
CR-0A (2010)	3/4W	-55 ~ +155°C	200V	500V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±100
CR-12 (2512)	1W	-55 ~ +155°C	200V	500V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±100

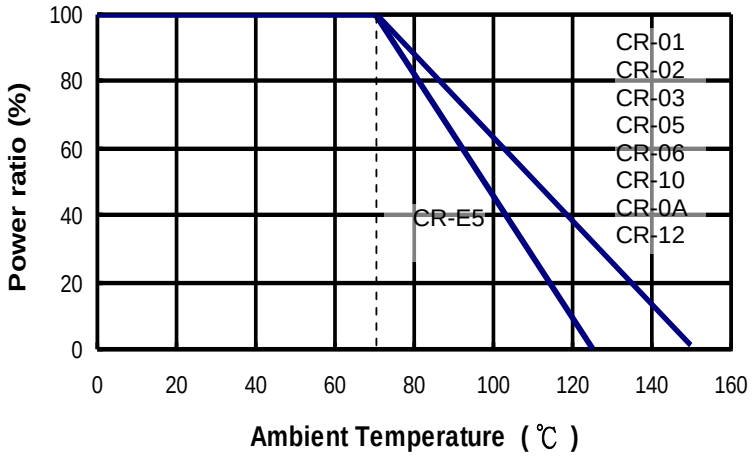
Rated Voltage=$\sqrt{}$(P*R) or Max. Operating Voltage listed above, whichever is lower.
Current of DC or AC RMS value

■Jumper(0Ω)

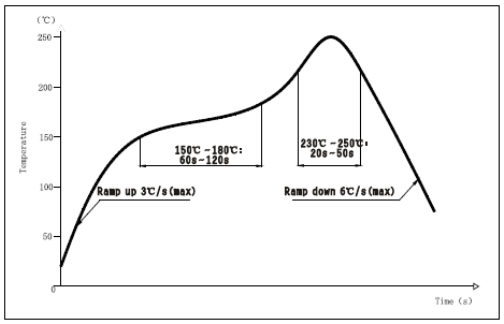
Item / Type	Rated Current at 70°C		Max. Overload Current		Resistance Range		Operating Temp. Range
	±1%	±5%	±1%	±5%	±1%	±5%	
CR-E5 (01005)	-	0.5A	-	1A	≤10mΩ	≤50mΩ	-55 ~ +125°C
CR-01 (0201)	-	0.5A	-	1A			-55 ~ +155°C
CR-02 (0402)	2A	1A	4A	2A			
CR-03 (0603)	3A	1A	6A	3A			
CR-05 (0805)	4A	2A	8A	5A			
CR-06 (1206)	5A	2A	10A	5A			
CR-10 (1210)	6A	2A	12A	5A			
CR-0A (2010)	6A	2A	12A	5A			
CR-12 (2512)	6A	2A	12A	5A			

Current of DC or AC RMS value

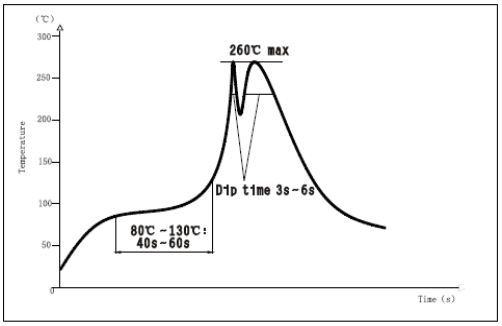
■Derating Curve



■Soldering Condition



IR Reflow Soldering



Wave Soldering (Flow Soldering)

■Environmental Characteristics

Item	Requirement		Test Method
	±1%	±5%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		**IEC-60115-1 4.8** +20°C /-55°C/+20°C/+125°C/+20°C
Short Time Overload	01005 size: ±(2.0%+0.05Ω)		**IEC-60115-1 4.13** Rated voltage*2.5 or Max. Overload Voltage whichever is lower for 5 seconds Jumper: Max. overload current for 5 seconds
	Other sizes: ±(1.0%+0.05Ω) Jumper(0Ω): ≤10mΩ	Other sizes: ±(2.0%+0.05Ω) Jumper(0Ω): ≤50mΩ	
Insulation Resistance	>1000MΩ		**IEC-60115-1 4.6** Apply DC100V±15V between substrate and terminations for 1 minute, then check insulation resistance
Endurance	01005 size: ±(3.0%+0.05Ω)		**IEC-60115-1 4.25.1** 70±2°C, rated voltage or operating voltage whichever is lower(Jumper : Rated current) for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
	Other sizes: ±(1.0%+0.05Ω) Jumper(0Ω): ≤20mΩ	Other sizes: ±(2.0%+0.05Ω) Jumper(0Ω): ≤100mΩ	
Damp Heat with Load	01005 size: ±(3.0%+0.05Ω)		**IEC-60115-1 4.24** 40±2°C, 93±3% R.H., rated voltage or operating voltage whichever is lower (Jumper : Rated current) for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
	Other sizes: ±(1.0%+0.05Ω) Jumper(0Ω): ≤20mΩ	Other sizes: ±(2.0%+0.05Ω) Jumper(0Ω): ≤100mΩ	
Endurance at Upper Category Temperature	01005 size: ±(3.0%+0.05Ω)		**IEC-60115-1 4.25.3** 01005 size: at +125±2°C for 1000 hrs Other sizes: at +155±2°C for 1000 hrs
	Other sizes: ±(1.0%+0.05Ω) Jumper(0Ω): ≤20mΩ	Other sizes: ±(2.0%+0.05Ω) Jumper(0Ω): ≤100mΩ	
Bending Strength	±(1.0%+0.05Ω) Jumper(0Ω): ≤10mΩ	±(1.0%+0.05Ω) Jumper(0Ω): ≤50mΩ	**IEC-60115-1 4.33** Bending once for 60±5 seconds 01005 size: 3mm； 0201, 0402, 0603, 0805 sizes: 5mm 1206, 1210 sizes: 4mm；2010, 2512 sizes: 2mm
Solderability	95% min. coverage		**IEC-60115-1 4.17** 245±5°C for 3±0.3 seconds
Resistance to Soldering Heat	±(1.0%+0.05Ω) Jumper(0Ω): ≤10mΩ	±(1.0%+0.05Ω) Jumper(0Ω): ≤50mΩ	**IEC-60115-1 4.18** 270±5°C for 10±1 seconds
Voltage Proof	No breakdown or flashover		**IEC-60115-1 4.7** Apply max. overload of AC RMS at a rated of approximately 100V/s between substrate and terminations for 60±5 seconds
Shear Test	No mechanical damage		**IEC-60115-1 4.32** Applying force: 0201 size: 2N；0402, 0603 sizes: 5N 0805 size: 9N , 1206, 1210 sizes: 25N 2010, 2512 sizes: 45N Duration: 10±1 seconds
Rapid Change of Temperature	01005 size: ±(1.0%+0.05Ω)		**IEC-60115-1 4.19** 01005 size: -55°C to +125°C, 300 cycles Other sizes: -55°C to +155°C, 300 cycles
	Other sizes: ±(0.5%+0.05Ω) Jumper(0Ω): ≤10mΩ	Other sizes: ±(1.0%+0.05Ω) Jumper(0Ω): ≤50mΩ	
Operation at Low Temperature	01005 size: ±(2.0%+0.05Ω)		**IEC-60115-1 4.36** -55±5°C, 1hr without load, rated voltage or operating voltage whichever is lower(Jumper: Rated current) for 45minute, 15minute without load
	Other sizes: ±(1.0%+0.05Ω) Jumper(0Ω): ≤10mΩ	Other sizes: ±(2.0%+0.05Ω) Jumper(0Ω): ≤50mΩ	
Component Solvent Resistance	±(1.0%+0.05Ω)	±(1.0%+0.05Ω)	**IEC-60115-1 4.29** Iso-propyl alcohol (IPA), 23±5°C, 10hrs

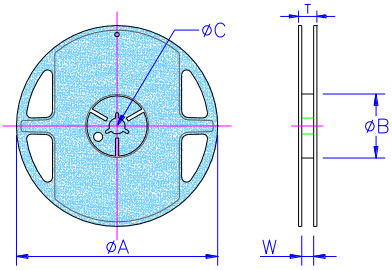
■Storage Temperature: 5~30°C; Humidity: 30~70%RH

■Shelf Life: 1 years Max

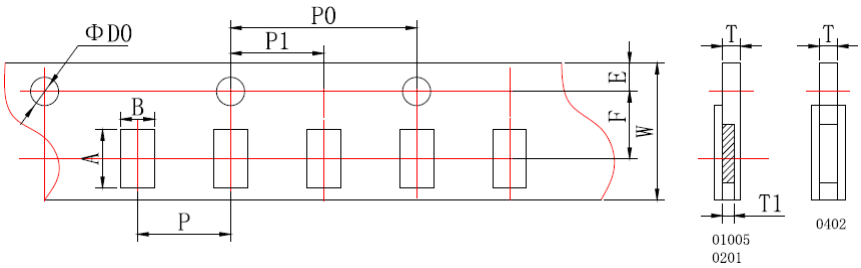
■Packaging

Reel Specifications & Packaging Quantity

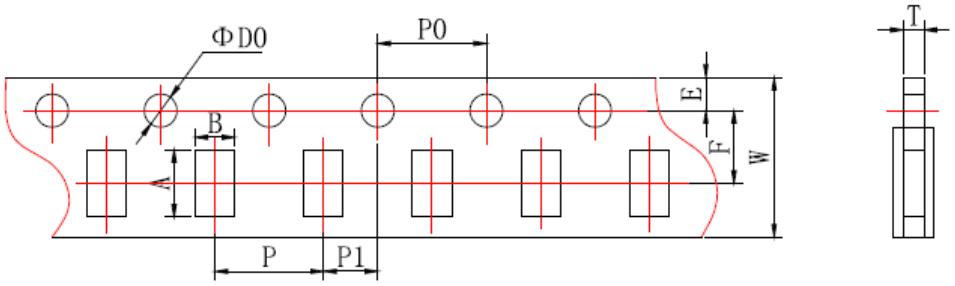
Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
CR-E5	Paper	20K	8mm	7 inch	178±2	58.0±2	13.0±0.5	9.5±1.0	12.5±1.5
CR-01	Paper	15K	8mm	7 inch	178±2	58.0±2	13.0±0.5	9.5±1.0	12.5±1.5
		50K	8mm	13 inch	330±1	100.0±1	13.5±0.5	10.0±0.5	13.5±0.5
CR-02	Paper	10K	8mm	7 inch	178±2	58.0±2	13.0±0.5	9.5±1.0	12.5±1.5
		50K	8mm	13 inch	330±1	100±1	13.5±0.5	10.0±0.5	13.5±0.5
CR-03 CR-05 CR-06	Paper	5K	8mm	7 inch	178±2	58.0±2	13.0±0.5	9.5±1.0	12.5±1.5
		20K	8mm	13 inch	330±1	100±1	13.5±0.5	10.0±0.5	13.5±0.5
CR-10	Paper	5K	8mm	7 inch	178±2	58.0±2	13.0±0.5	9.5±1.0	12.5±1.5
CR-0A CR-12	Embossed	4K	12mm	7 inch	178±2	57.0±2	13.0±0.5	13.0±0.5	15.5±1.5



Paper Tape Specifications

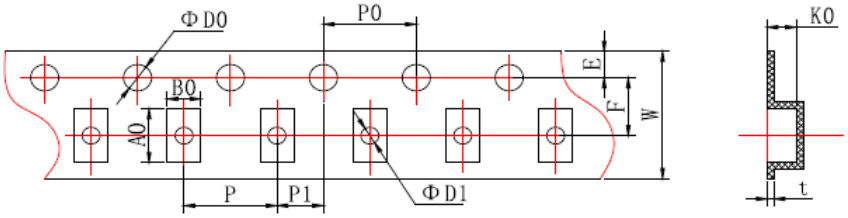


Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P (mm)	P_0 (mm)	P_1 (mm)	$ΦD_0$ (mm)	T (mm)	T1 (mm)
CR-E5	0.45±0.02	0.25±0.02	8.0±0.02	1.75±0.05	3.50±0.05	2.00±0.05	4.00±0.10	2.00±0.05	1.55±0.02	0.31±0.20	0.17±0.02
CR-01	0.70±0.10	0.40±0.10	8.0±0.20	1.75±0.10	3.50±0.05	2.00±0.05	4.00±0.10	2.00±0.05	1.55±0.10	0.42±0.05	0.28±0.04
CR-02	1.15±0.10	0.65±0.10	8.0±0.20	1.75±0.10	3.50±0.05	2.00±0.05	4.00±0.10	2.00±0.05	1.55±0.10	0.44±0.05	-



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P (mm)	P_0 (mm)	P_1 (mm)	$ΦD_0$ (mm)	T (mm)
CR-03	1.80±0.10	1.05±0.10	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.60±0.10
CR-05	2.30±0.10	1.50±0.10	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10
CR-06	3.50±0.20	1.90±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10
CR-10	3.50±0.20	2.80±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10

Embossed Plastic Tape Specifications



Type	A0 (mm)	B0 (mm)	W (mm)	E (mm)	F (mm)	P (mm)	P_0 (mm)	P_1 (mm)	ΦD_0 (mm)	ΦD_1 (mm)	K0 (mm)	t (mm)
CR-0A	5.50±0.15	2.82±0.15	12.0±0.10	1.75±0.10	5.5±0.10	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1	1.50±0.10	0.84±0.10	0.25±0.05
CR-12	6.78±0.15	3.45±0.15	12.0±0.10	1.75±0.10	5.5±0.10	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1	1.50±0.10	0.81±0.10	0.25±0.05

■Marking

No Marking for 01005, 0201 and 0402

Jumper for all: Letter “0”

0603, 0805, 1206, 2512 for Example: 

1210, 2010 for Example: 

1% for 0805/1206/1210/2010/2512: 4 digits marking

Example:

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

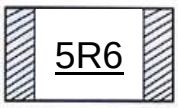
5% for 0603/0805/1206/1210/2010/2512: 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1^{st} and 2^{nd} are E24 code and 3^{rd} code is multiplier)

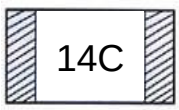
E24 code	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91

1% for 0603(E24): 3 digits marking in E24

Example: one short bar under marking letter



1% for 0603(E96): 3 digits marking in E96



3 digits marking for Example: 14C=13K7Ω 13C=13K3Ω

68B=4K99Ω 68X=49.9Ω

The decimal point should be expressed by “R”

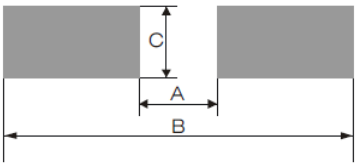
Example:

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	X	Y		
Multiplier	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^{-1}	10^{-2}		

■Recommend Solder Pad Size



Type	A (mm)	B (mm)	C (mm)
CR-E5	0.17±0.03	0.60±0.03	0.22±0.03
CR-01	0.23±0.05	0.84±0.05	0.38±0.05
CR-02	0.45±0.05	1.45±0.05	0.60±0.05
CR-03	0.80±0.05	2.50±0.05	0.95±0.05
CR-05	1.05±0.1	3.25±0.1	1.40±0.1
CR-06	1.90±0.1	4.50±0.1	1.75±0.1
CR-10	2.00±0.1	4.60±0.1	2.70±0.1
CR-0A	3.50±0.1	6.50±0.1	2.70±0.1
CR-12	4.80±0.1	7.80±0.1	3.40±0.1

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A9	18-Mar-2025		-Modify the TCR specifications for all sizes
Version B	02-Sep-2025		-Add Jumper 0Ω ±1% specification