

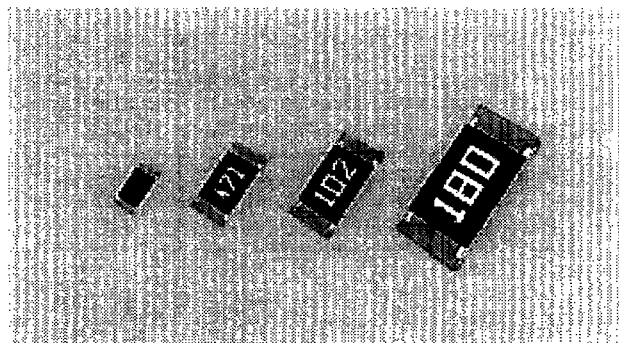
Thick Film Chip Resistors



CR05 / CR10 / CR21 / CR32 Series

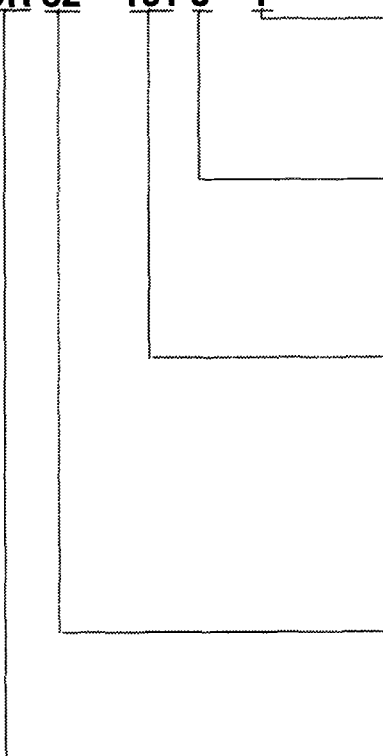
Features:

- 1) Wave, IR reflow and vapor phase soldering compatible.
- 2) Wrap-around nickel barrier terminations.
- 3) Suitable size & packaging for surface mount assembly.
- 4) Low noise.



How To Order:

CR 32 – 101 J – T



Packaging

- B = Bulk (1,000 pcs/bag)
- T = 7" Reel/Punched Paper Tape (5,000 pcs/reel) except CR05
- H = 7" Reel/Punched Paper Tape (10,000 pcs/reel, 2mm pitch taping) CR05 and CR10
- D = 10" Reel/Punched Paper Tape (10,000 pcs/reel) CR32, CR21, CR10
- S = 13" Reel/Punched Paper Tape (10,000 pcs/reel) except CR05 (optional)

Resistance Tolerance

- Blank = Jumper
- K = $\pm 10\%$
- J = $\pm 5\%$
- G = $\pm 2\%$
- F = $\pm 1\%$
- D = $\pm 0.5\%$

Resistance Code

- | | |
|---|---|
| For G, J, and K Tolerances | For D and F Tolerances |
| 3 digit code (E-24) | 4 digit code (E-96) |
| 2 significant digits plus number of zeros | 3 significant digits plus number of zeros |
| Examples: | Examples: |
| 2.2 Ω = 2R2 | 10 Ω = 10R0 |
| 10 Ω = 100 | 100 Ω = 1000 |
| 100 Ω = 101 | 1k Ω = 1001 |
| 1k Ω = 102 | |
| 0 Ω = 000 (Jumper) | |

Case Size

- 05 = 0402
- 10 = 0603
- 21 = 0805
- 32 = 1206

Style

- CR = Chip Resistor
- CJ = Zero Ohm Jumper

Dimensions:

	CR05 (CJ05)	CR10 (CJ10)	CR21 (CJ21)	CR32 (CJ32)
L	1.00 \pm 0.05 (.039 \pm .002)	1.60 \pm 0.10 (.063 \pm .004)	2.00 \pm 0.10 (.079 \pm .004)	3.10 \pm 0.10 (.122 \pm .004)
W	0.50 \pm 0.05 (.020 \pm .002)	0.80 $^{+0.15}_{-0.10}$ (.031 $^{+0.006}_{-0.004}$)	1.25 $^{+0.15}_{-0.10}$ (.049 $^{+0.006}_{-0.004}$)	1.55 $^{+0.15}_{-0.10}$ (.061 $^{+0.006}_{-0.004}$)
T	0.35 \pm 0.05 (.014 \pm .002)	0.50 \pm 0.10 (.020 \pm .004)	0.55 \pm 0.10 (.022 \pm .004)	0.55 $^{+0.10}_{-0.05}$ (.022 $^{+0.004}_{-0.002}$)
C	0.20 \pm 0.15 (.008 \pm .008)	0.25 \pm 0.20 (.010 \pm .008)	0.35 \pm 0.20 (.014 \pm .008)	0.45 \pm 0.20 (.018 \pm .008)
D	0.20 \pm 0.10 (.008 \pm .004)	0.20 $^{+0.20}_{-0.15}$ (.008 $^{+0.008}_{-0.006}$)	0.40 \pm 0.20 (.016 \pm .008)	0.45 \pm 0.20 (.018 \pm .008)

Thick Film Chip Resistors



CR05 / CR10 / CR21 / CR32 Series Performance Characteristics

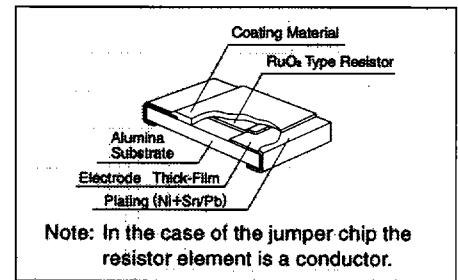
Chip Resistor Ratings

Spec	Style	CR05 (0402)				CR10 (0603)				CR21 (0805)				CR32 (1206)			
Power		0.063 (1/16) W				0.063 (1/16) W				0.100 (1/10) W				0.125 (1/8) W			
Voltage		50V				50V				100V				200V			
Tolerance		J (±5%)	K (±10%)	F (±1%)	G (±2%)	J (±5%)	K (±10%)	D (±0.5%)	F (±1%)	G (±2%)	J (±5%)	K (±10%)	D (±0.5%)	F (±1%)	G (±2%)	J (±5%)	K (±10%)
Value Range		10Ω 2.2 MΩ	2.2Ω 10 MΩ	10Ω 1 MΩ	10Ω 2.2 MΩ	1.0Ω 10 MΩ	1.0Ω 10 MΩ	10Ω 1 MΩ	10Ω 1 MΩ	10Ω 2.2 MΩ	1.0Ω 10 MΩ	0.47Ω 10 MΩ	10Ω 1 MΩ	10Ω 1 MΩ	10Ω 2.2 MΩ	1.0Ω 10 MΩ	0.36Ω 10 MΩ
Working Temperature		-55°C ~ +125°C															

Chip Zero Ohm Jumper Ratings

Spec	Style	CJ05 (0402)	CJ10 (0603)	CJ21 (0805)	CJ32 (1206)
Rated Current		1A (70°C)			2A (70°C)
Resistivity		50 mΩ Maximum			
Working Temperature		-55°C ~ +125°C			

Construction



Temperature Coefficient of Resistance

Tolerance	CR05					CR10						
	J (±5%)		K (±10%)			F (±1%)		G (±2%)		J (±5%)		K (±10%)
Resistance Range	10Ω 1MΩ	1MΩ 2.2MΩ	2.2Ω 10Ω	10Ω 1MΩ	1MΩ 10MΩ	10Ω 100Ω	100Ω 1MΩ	10Ω 1MΩ	1MΩ 2.2MΩ	1.0Ω 10Ω	10Ω 1MΩ	1MΩ 10MΩ
TCR (ppm/°C)	±250	-500 +300	-100 +600	±250	-500 +300	±200	±200	±200	-500 +300	-100 +600	±200	-500 +300

Tolerance	CR21				CR32						
	D (±0.5%)	F (±1%)	G (±2%)	J (±5%)	J (±5%)		K (±10%)				
Resistance Range	10Ω 1MΩ	10Ω 100Ω	100Ω 1MΩ	10Ω 1MΩ	1.0Ω 10Ω	10Ω 1MΩ	1MΩ 10MΩ	0.47Ω 1.0Ω	1.0Ω 10Ω	10Ω 1MΩ	1MΩ 10MΩ
TCR (ppm/°C)	±200*	±200*	±200*	±200	-500 +300	-100 +600	±200	-500 +1000	-100 +600	±200	-500 +300

*Optional for 1% and 0.5% tolerance ±100ppm/°C

Standard Decade Values

For ±10%, ±5%, ±2%, 1% and ±0.5% Tolerances (E-24)

1.0	1.1	1.2	1.3	1.5
1.6	1.8	2.0	2.2	2.4
2.7	3.0	3.3	3.6	3.9
4.3	4.7	5.1	5.6	6.2
6.8	7.5	8.2	9.1	

For ±1% and ±0.5% Tolerance (E-96)

10.0	10.2	10.5	10.7	11.0	11.3	11.5	11.8	12.1	12.4
12.7	13.0	13.3	13.7	14.0	14.3	14.7	15.0	15.4	15.8
16.2	16.5	16.9	17.4	17.8	18.2	18.7	19.1	19.6	20.0
20.5	21.0	21.5	22.1	22.6	23.2	23.7	24.3	24.9	25.5
26.1	26.7	27.4	28.0	28.7	29.4	30.1	30.9	31.6	32.4
33.2	34.0	34.8	35.7	36.5	37.4	38.3	39.2	40.2	41.2
42.2	43.2	44.2	45.3	46.4	47.5	48.7	49.9	51.1	52.3
53.6	54.9	56.2	57.6	59.0	60.4	61.9	63.4	64.9	66.5
68.1	69.8	71.5	73.2	75.0	76.8	78.7	80.6	82.5	84.5
86.6	88.7	90.9	93.1	95.3	97.6				

Marking

3 digit indication
 Ex. 47 X 10³ = 47000 Ω = 47 kΩ
 0 : 0 Ω (Jumper)
 100 : 10 Ω
 102 : 1 kΩ
 105 : 1 MΩ

Marking available as follows:
 Series: CR32, CJ32, CR21, CJ21, CR10, CJ10
 Tolerances: G (±2%), J (±5%), K (±10%)
 Note: CR05 and CJ05 - no marking
 4 digit marking on CR32 ±1% and ±0.5% tolerances.

Derating Curve

