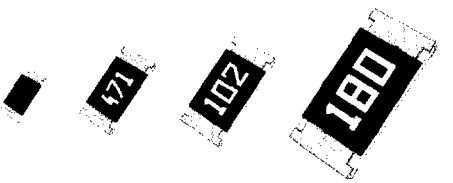
Thick Film Chip Resistors

AVX KYOCERA

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)
S = 13" Reel/Punched Paper Tape (10,000 pcs/reel) except CR05
SE = 13" Reel/Embossed Plastic Tape (10,000 pcs/reel) except CR05, CR10
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 only
UE = 7" Reel/Embossed Plastic Tape (4,000 pcs/reel) except CR05, CR10
Z = 13" Reel/Punched Paper Tape (50,000 pcs/reel) CR05 only

Resistance Tolerance

Blank = Jumper
K = ±10%
J = ±5%
G = ±2%
F = ±1% (available in case size CR21 and CR32 only)

Resistance Code

For G, J, and K Tolerances	For F Tolerance only
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:
2.2Ω = 2R2	10Ω = 10R0
10Ω = 100	100Ω = 1000
100Ω = 101	1kΩ = 1001
1kΩ = 102	
0Ω = 000 (Jumper)	

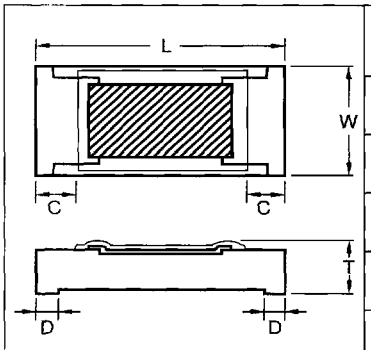
Case Size

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 ±0.05 (.040±.002)	1.60±0.10 (.060±.004)	2.00±0.10 (.080±.004)	3.10±0.10 (.120±.004)
W	0.50 ±0.05 (.020±.002)	$0.80^{+0.15}_{-0.10}$ ($.030^{+.006}_{-.004}$)	$1.25^{+0.15}_{-0.10}$ ($.050^{+.006}_{-.004}$)	$1.55^{+0.15}_{-0.10}$ ($.060^{+.006}_{-.004}$)
T	0.35±0.05 (.014±.002)	0.50±0.10 (.020±.004)	0.55±0.10 (.022±.004)	$0.55^{+0.10}_{-0.05}$ ($.022^{+.004}_{-.002}$)
C	0.20±0.15 (.008±.006)	0.25±0.20 (.010±.008)	0.35±0.20 (.014±.008)	0.45±0.20 (.018±.008)
D	0.20±0.10 (.008±.004)	$0.20^{+0.20}_{-0.15}$ ($.008^{+.008}_{-.006}$)	0.40±0.20 (.016±.008)	0.45±0.20 (.018±.008)

mm (inches)

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%)	J (±5%)	K (±10%)	F (±1%)	G (±2%)	J (±5%)	K (±10%)	F (±1%)	G (±2%)	J (±5%)	K (±10%)
Value Range	10Ω ∫ 2.2 MΩ	2.2Ω ∫ 2.2 MΩ	2.2Ω ∫ 10 MΩ		10Ω ∫ 1 MΩ	10Ω ∫ 2.2 MΩ	2.2Ω ∫ 10 MΩ	1.0Ω ∫ 10 MΩ	10Ω ∫ 1 MΩ	10Ω ∫ 2.2 MΩ	2.2Ω ∫ 10 MΩ	1.0Ω ∫ 10 MΩ
Working Temperature	−55°C ~ +125°C											

Temperature Coefficient of Resistance

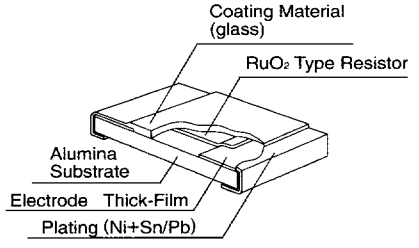
	CR05					CR10			CR21								CR32							
Tolerance	J (±5%)		K (±10%)			J, K (±5%) (±10%)			F (±1%)		G (±2%)		J (±5%)		K (±10%)		F (±1%)	G (±2%)		J (±5%)			K (±10%)	
Resistance Range	10Ω ∫ 1MΩ	1MΩ ∫ 2.2MΩ	2.2Ω ∫ 10Ω	10Ω ∫ 1MΩ	1MΩ ∫ 2.2MΩ	2.2Ω ∫ 10Ω	10Ω ∫ 1MΩ	1MΩ ∫ 10MΩ	10Ω ∫ 100Ω	100Ω ∫ 1MΩ	10Ω ∫ 1MΩ	1MΩ ∫ 2.2MΩ	2.2Ω ∫ 10Ω	10Ω ∫ 1MΩ	1MΩ ∫ 10MΩ	1.0Ω ∫ 10Ω	10Ω ∫ 1MΩ	1MΩ ∫ 10MΩ	10Ω ∫ 1MΩ	10Ω ∫ 1MΩ	1MΩ ∫ 2.2MΩ	2.2Ω ∫ 10Ω	10Ω ∫ 1MΩ	1MΩ ∫ 10MΩ	1.0Ω ∫ 10Ω	10Ω ∫ 1MΩ	1MΩ ∫ 10MΩ
TCR (ppm/°C)	±300	-500 ∫ +300	-100 ∫ +600	±250	-500 ∫ +300	-100 ∫ +1000	±200	-500 ∫ +300	±200	±200*	±100	-500 ∫ +300	-100 ∫ +1000	±200	-500 ∫ +300	-100 ∫ +1000	±200	-500 ∫ +300	±100*	±200	-500 ∫ +300	-100 ∫ +1000	±200	-500 ∫ +300	-100 ∫ +1000	±200	-500 ∫ +300

*Optiona nonstandard ±100ppm/°C

Chip Zero Ohm Jumper Ratings

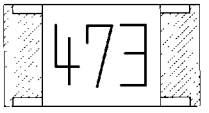
Spec \ Style	CJ05 (0402)	CJ10 (0603)	CJ21 (0805)	CJ32 (1206)
Rated Current	1A (70°C)			2A (70°C)
Resistivity	50 mΩ Maximum			
Working Temperature	−55°C ~ +125°C			

Construction



Note: In the case of the jumper chip the resistor element is a conductor.

Marking



3 digit indication
Ex. 47 X 10^3 = 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% tolerance only (option)

Standard Decade Values

For ±10%, ±5%, ±2%, and 1% 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% Tolerance only (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				

Derating Curve

Under high temperature, power must not exceed derating curve.