

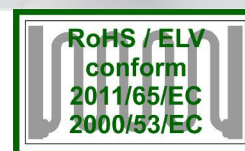
# CRA-Series

## Trimmable Chip Resistors

Sizes: 0603, 0805, 1206, 1210, 1216, 1216H

### Features:

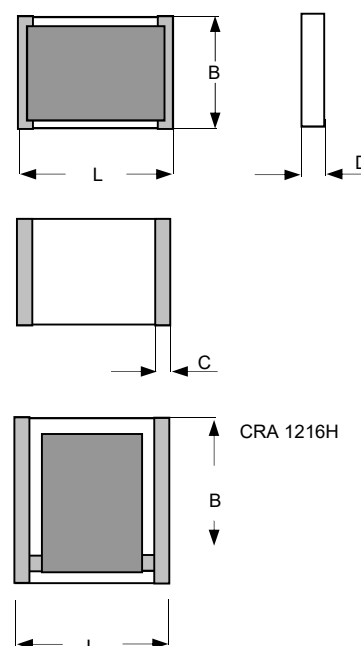
- Trimmable chip resistors in thick film technology (without pre-trimm/no trimm cut)
- Nickel-barrier / matte Tin terminations
- Resistance element glass-passivated
- Suitable for Laser and air-abrasive trimming
- High trimming ratios by special geometries
- Suitable for high vacuum applications – no organics



### Dimensions:

| Size  | L                  | B                  | D                  | C               |
|-------|--------------------|--------------------|--------------------|-----------------|
| 0603  | 1.50 $+0.15/-0.05$ | 0.80 $+0.15/-0.05$ | 0.40 $+0.15/-0.05$ | 0.2 $+0.2/-0.1$ |
| 0805  | 2.00 $+0.15/-0.05$ | 1.25 $+0.15/-0.05$ | 0.40 $+0.15/-0.05$ | 0.3 $+0.2/-0.1$ |
| 1206  | 3.20 $+0.15/-0.05$ | 1.50 $+0.2/-0.05$  | 0.40 $+0.15/-0.05$ | 0.3 $+0.2/-0.1$ |
| 1210  | 3.20 $+0.15/-0.05$ | 2.50 $+0.2/-0.05$  | 0.50 $+0.15/-0.05$ | 0.8 $\pm 0.2$   |
| 1216  | 3.2 $+0.2/-0.05$   | 4.1 $+0.2/-0.05$   | 0.5 $+0.2/-0.1$    | 0.4 $\pm 0.2$   |
| 1216H | 3.2 $+0.2/-0.05$   | 4.1 $+0.2/-0.05$   | 0.5 $+0.2/-0.1$    | 0.4 $\pm 0.2$   |

L = Length, B = Width, D = Thickness, C = Width of wrap around (in mm)



### Packaging:

Bulk in plastic bags – minimum order quantity 100 pcs/value (500 pcs. for new manufacturing runs)  
 Blister tape acc. to IEC 60286-3 – minimum 1000 pcs/value  
 Reel diameter 180 mm or 330 mm

### Ordering Data:

Type – value – tolerance – temperature coefficient TK

Example: CRA 1216 100R  $\pm 20\%$  - TK50

Without requirement for the temperature coefficient TK, the standard value (highest value in table) will be supplied.

# CRA-Series

## Trimmable Chip Resistors

Sizes: 0603, 0805, 1206, 1210, 1216, 1216H

### Technical data – depending on size:

| Size                                                  | 0603 | 0805 | 1206 | 1210 | 1216 | 1216H |
|-------------------------------------------------------|------|------|------|------|------|-------|
| Power rating $P_{70}$ (mW)<br>( $P_{155} = 0$ mW)     | 100  | 125  | 250  | 350  | 400  | 400   |
| Working voltage $U_{-}$ , $U_{eff}$ (V) <sup>3)</sup> |      |      |      |      |      |       |
| trimmed (trimming by user)                            | 75   | 100  | 200  | 200  | 200  | 200   |
| untrimmed (as delivered)                              | 220  | 300  | 600  | 600  | 600  | 600   |
| Trimming ratios (single cut) <sup>1)</sup>            | 1,5  | 1,5  | 2    | 3    | 4    | 8     |

| Ranges / Tolerances <sup>4)</sup> / Temperature coefficient TK <sup>2)</sup> |                         |                         |                         |                         |                         |                         |
|------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1R – < 10R                                                                   | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      |
| 10R – 10M                                                                    | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 |

<sup>1)</sup> Detailed information on request.

<sup>2)</sup> Temperature coefficient TK: in ppm/K; +25°C...+125°C; TK below standard TK (highest value): +25°C...+85°C; TK50 not in the resistance range R<100R

<sup>3)</sup> Continuous operating voltage ( $U_{-}$ ,  $U_{eff}$ ):  $V \leq \sqrt{P \cdot R}$  or max. working voltage (the lower value)

<sup>4)</sup> Non-symmetric tolerances also available (e.g. -0/+20%)

### Technical data – general:

|                                                                  |                    |
|------------------------------------------------------------------|--------------------|
| Operating temperature range                                      | - 55°C ... + 155°C |
| Climatic category acc. to EN 60068-1                             | 55/155/56          |
| Solderability acc. EN 60068-2-58 (lead-free and lead-containing) | 250°C 3s           |
| Max. soldering temperature acc. EN 60068-2-58                    | 260°C 10s          |

| Long term stability      | 10R – 10M | <10R |
|--------------------------|-----------|------|
| Storage 125°C/1000h      | <0,5%     | <1%  |
| Storage 155°C/1000h      | <1%       | <2%  |
| Load $P_{70}$ 70°C/1000h | <1%       | <2%  |
| Damp heat (56d/40°C/96%) | <0,5%     | <1%  |

Other data according to EN 140401-802 (CECC 40401-802).

# CRB-Series

## Trimmable Chip Resistors

Sizes: 0603, 0805, 1206, 1210, 1216, 1216H

### Features:

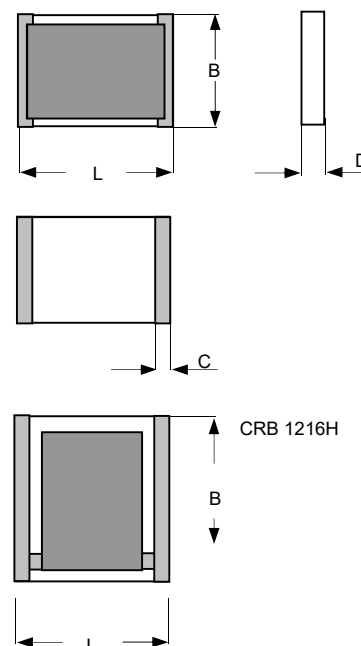
- Trimmable chip resistors in thick film technology (without pre-trimm; no trim cut)
- PtAg terminations for soldering and conductive gluing
- Suitable for Laser and air-abrasive trimming
- High trimming ratios by special geometries
- High temperature application up to 300°C possible (CRB-HT)
- Suitable for high vacuum applications – no organics
- Non-magnetic



### Dimensions:

| Size  | L                  | B                  | D                  | C               |
|-------|--------------------|--------------------|--------------------|-----------------|
| 0603  | 1.50 $+0.15/-0.05$ | 0.80 $+0.15/-0.05$ | 0.40 $+0.15/-0.05$ | 0.2 $+0.2/-0.1$ |
| 0805  | 2.00 $+0.15/-0.05$ | 1.25 $+0.15/-0.05$ | 0.40 $+0.15/-0.05$ | 0.3 $+0.2/-0.1$ |
| 1206  | 3.20 $+0.15/-0.05$ | 1.50 $+0.2/-0.05$  | 0.40 $+0.15/-0.05$ | 0.3 $+0.2/-0.1$ |
| 1210  | 3.20 $+0.15/-0.05$ | 2.50 $+0.2/-0.05$  | 0.50 $+0.15/-0.05$ | 0.8 $\pm 0.2$   |
| 1216  | 3.2 $+0.2/-0.05$   | 4.1 $+0.2/-0.05$   | 0.5 $+0.2/-0.1$    | 0.4 $\pm 0.2$   |
| 1216H | 3.2 $+0.2/-0.05$   | 4.1 $+0.2/-0.05$   | 0.5 $+0.2/-0.1$    | 0.4 $\pm 0.2$   |

L = Length, B = Width, D = Thickness, C = Width of wrap around (in mm)



### Packaging:

Bulk in plastic bags – minimum order quantity 100 pcs./value  
(500 pcs. for new manufacturing runs)

Blistertape acc. to IEC 60286-3 – minimum 500 pcs./value

Reel diameter 180 mm or 330 mm

### Ordering Data:

Type – value – tolerance – temperature coefficient TK

Example: CRB 1216 100R  $\pm 20\%$  - TK50

Without requirement for the temperature coefficient TK,  
the standard value (highest value in table) will be supplied.

# CRB-Series

## Trimmable Chip Resistors

Sizes: 0603, 0805, 1206, 1210, 1216, 1216H

### Technical data – depending on size:

| Size                                                  | 0603 | 0805 | 1206 | 1210 | 1216 | 1216H |
|-------------------------------------------------------|------|------|------|------|------|-------|
| Power rating $P_{70}$ (mW)<br>( $P_{155} = 0$ mW)     | 100  | 125  | 250  | 350  | 400  | 400   |
| Working voltage $U_{-}$ , $U_{eff}$ (V) <sup>3)</sup> |      |      |      |      |      |       |
| trimmed (trimming by user)                            | 75   | 100  | 200  | 200  | 200  | 200   |
| untrimmed (as delivered)                              | 220  | 300  | 600  | 600  | 600  | 600   |
| Trimming ratios (single cut) <sup>1)</sup>            | 1,5  | 1,5  | 2    | 3    | 4    | 8     |

| Ranges / Tolerances <sup>4)</sup> / Temperature coefficient TK <sup>2)</sup> |                         |                         |                         |                         |                         |                         |
|------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1R – < 10R                                                                   | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      | 10/20/30%<br>TK250      |
| 10R – 10M                                                                    | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 | 5/10/20/30%<br>TK50/100 |

<sup>1)</sup> Detailed information on request.

<sup>2)</sup> Temperature coefficient TK: in ppm/K; +25°C...+125°C; TK below standard TK (highest value): +25°C...+85°C; TK50 not in the resistance range R<100R

<sup>3)</sup> Continuous operating voltage ( $U_{-}$ ,  $U_{eff}$ ):  $V \leq \sqrt{P \cdot R}$  or max. working voltage (the lower value)

<sup>4)</sup> Non-symmetric tolerances also available (e.g. -0/+20%)

### Technical data – general:

|                                                                                |                    |
|--------------------------------------------------------------------------------|--------------------|
| Operating temperature range                                                    | - 55°C ... + 155°C |
| Climatic category acc. to EN 60068-1                                           | 55/155/56          |
| Solderability acc. EN 60068-2-58 (lead-free and lead-containing) <sup>5)</sup> | 250°C 3s           |
| Max. soldering temperature acc. EN 60068-2-58                                  | 260°C 10s          |

Extended temperature range up to 300°C possible (CRB-HT) - see datasheet: High temperature chip resistors

| Long term stability      | 10R – 10M | <10R |
|--------------------------|-----------|------|
| Storage 125°C/1000h      | <0,5%     | <1%  |
| Storage 155°C/1000h      | <1%       | <2%  |
| Load $P_{70}$ 70°C/1000h | <1%       | <2%  |
| Damp heat (56d/40°C/96%) | <0,5%     | <1%  |

<sup>5)</sup> Up to 6 months after shipment (air, 30°C/60%rH) or  
up to 12 months at storage in Nitrogen or in evacuated dry packs.

Other data according to EN 140401-802 (CECC 40401-802).