



Tantalum Chip Capacitors

B45196E, B45198E

Standard



Construction

- Polar tantalum capacitors with solid electrolyte
- Conventional Ta-MnO₂ technology
- Flame-retardant plastic case (UL 94 V-0)
- Optionally tinned or gold-plated terminals

Features

- High volumetric efficiency
- Excellent solderability
- Stable temperature and frequency characteristics
- Low leakage current, low dissipation factor
- Low self-inductance
- High resistance to shock and vibration
- Suitable for use without series resistor
(recommended operating voltage see "General Technical Information", page 111, 4.4)

Applications

- Telecommunications (e.g. mobile phones, private branch exchanges)
- Data processing (e.g. laptops, main frames)
- Measuring and control engineering
- Automotive electronics
- Medical engineering
- DC/DC converters

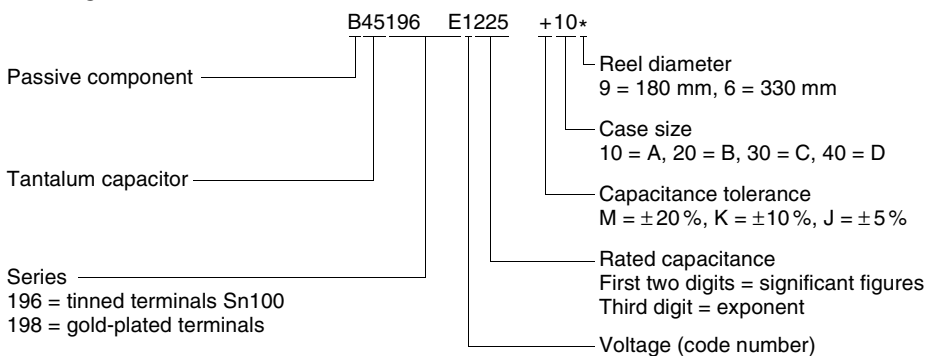
Soldering

Suitable for reflow soldering (IR and vapor phase) and wave soldering

Delivery mode

Taped and reeled in accordance with IEC 60286-3

Ordering code structure





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Specifications and characteristics in brief

For characteristic curves see "General Technical Information", page 107 ff.

| | Standard | |
|--|---|---------------------|
| Series | B45196E | B45198E |
| Technology | Ta-MnO ₂ | Ta-MnO ₂ |
| Terminals | Tinned | Gold-plated |
| Rated voltage V_R (up to 85 °C) | 4 ... 50 Vdc | |
| Rated capacitance C_R | 0,10 ... 100 μ F | |
| Capacitance tolerance | $\pm 10\%$, $\pm 20\%$ $\pm 5\%$ (on request) | |
| Operating temperature | -55 ... +125 °C | |
| Failure rate | At 40 °C; $\leq V_R$, $R_S \geq 3 \Omega/V$ (1 fit = $1 \cdot 10^{-9}$ failures/h) | |
| $C_R \cdot V_R \leq 330 \mu F \cdot V$ | ≤ 3 fit | |
| $C_R \cdot V_R > 330 \mu F \cdot V$ | ≤ 10 fit | |
| Service life | > 500 000 h | |
| Leakage current (V_R , 5 min, 20 °C) | 10 nA/ μ C | |
| Detail specification (tinned terminals) | CECC 30801-801 | |
| IEC climatic category | To IEC 60068-1 55/125/56 (-55/+125 °C; 56 days damp heat test) | |

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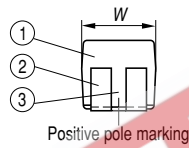
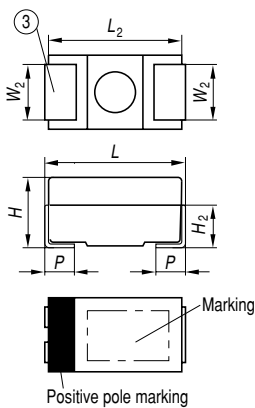
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Dimensional drawing



KTA0254-9-E

- ① Encapsulation: molded epoxy resin
- ② NiFe; tinned surface Sn100 or gold-plated
- ③ Reduced slot length for case size A

| Case size | Dimensions in mm (inches) | | | | | | |
|-----------|------------------------------|------------------------------|------------------------------|---------------|------------------------------|---------------|----------------------------|
| | L | W | H | L_2 typ. | $W_2 \pm 0,1$ $\pm(.004)$ | H_2 typ. | $p \pm 0,3$ $\pm(.012)$ |
| A (10) | $3,2 \pm 0,2$ (,126±,008) | $1,6 \pm 0,2$ (,063±,008) | $1,6 \pm 0,2$ (,063±,008) | 3,0 (,118) | 1,2 (,047) | 1,0 (,039) | 0,8 (,031) |
| B (20) | $3,5 \pm 0,2$ (,138±,008) | $2,8 \pm 0,2$ (,110±,008) | $1,9 \pm 0,2$ (,075±,008) | 3,3 (,130) | 2,2 (,087) | 1,2 (,047) | 0,8 (,031) |
| C (30) | $6,0 \pm 0,3$ (,236±,012) | $3,2 \pm 0,3$ (,126±,012) | $2,5 \pm 0,3$ (,098±,012) | 5,8 (,228) | 2,2 (,087) | 1,5 (,059) | 1,3 (,051) |
| D (40) | $7,3 \pm 0,3$ (,287±,012) | $4,3 \pm 0,3$ (,169±,012) | $2,8 \pm 0,3$ (,110±,012) | 7,1 (,280) | 2,4 (,094) | 1,6 (,062) | 1,3 (,051) |



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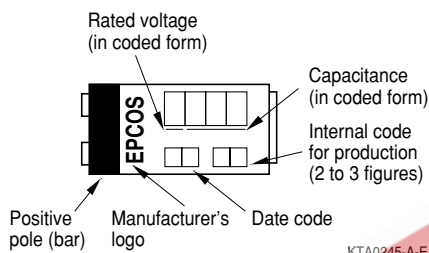
B45196E, B45198E

Standard



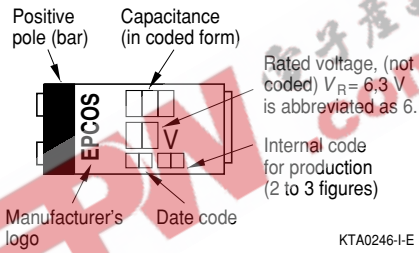
Marking

Case size A

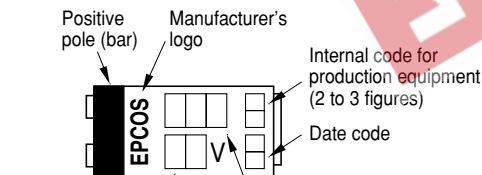


KTA0245-A-E

Case size B



KTA0246-I-E



KTA0244-2-E

Case sizes C, D

Voltage coding for case size A

| | | | | | | | | |
|---------------|---|-----|----|----|----|----|----|----|
| Rated voltage | 4 | 6,3 | 10 | 16 | 20 | 25 | 35 | 50 |
| Code letter | G | J | A | C | D | E | V | T |

Capacitance coding

| | |
|-------------------|--|
| 1st and 2nd digit | Capacitance in pF |
| 3rd digit | Multiplier: 4 = 10^4 pF 5 = 10^5 pF 6 = 10^6 pF 7 = 10^7 pF |

Date coding

| Year | Month | |
|----------|--------------|---------------|
| M = 2000 | 1 = January | 7 = July |
| N = 2001 | 2 = February | 8 = August |
| P = 2002 | 3 = March | 9 = September |
| R = 2003 | 4 = April | O = October |
| S = 2004 | 5 = May | N = November |
| T = 2005 | 6 = June | D = December |

In addition to the year and month of manufacture, the stamp includes another two or three figures which internally allow us an assignment to production equipment.



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Overview of available types

| Series | B45196E, tinned terminals B45198E, gold-plated terminals | | | | | | | |
|---------------------------|---|-----|----|----|----|----|----|----|
| V_R (Vdc) up to 85°C | 4 | 6,3 | 10 | 16 | 20 | 25 | 35 | 50 |
| C_R (µF) | | | | | | | | |
| 0,10 | | | | | | | A | A |
| 0,15 | | | | | | | A | B |
| 0,22 | | | | | | | A | B |
| 0,33 | | | | | | | A | B |
| 0,47 | | | | | | A | B | C |
| 0,68 | | | | | A | A | B | C |
| 1,0 | | | | A | A | | B | C |
| 1,5 | | | A | A | | B | C | D |
| 2,2 | | A | A | | B | B | C | D |
| 3,3 | A | A | | B | B | C | C | D |
| 4,7 | A | | B | B | C | C | D | D |
| 6,8 | | B | B | C | C | D | D | |
| 10 | B | B | C | C | | D | D | |
| 15 | B | C | C | | D | D | | |
| 22 | C | C | | D | D | | | |
| 33 | C | | D | D | | | | |
| 47 | | D | D | | | | | |
| 68 | D | D | | | | | | |
| 100 | D | | | | | | | |



Tantalum Chip Capacitors

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Standard



Technical data and ordering codes

| V_R up to 85°C (up to 125°C) Vdc | C_R μF | Case size | $\tan \delta_{max}$ (20°C, 120 Hz) | $I_{k, max}$ (20°C, V_R , 5 min) μA | Z_{max} (20°C, 100 kHz) Ω | Ordering code ¹⁾ Tinned terminals |
|---|-----------------|--------------|--|--|--------------------------------------|---|
| 4 (2,5) | 3,3 | A | 0,06 | 0,5 | 9,0 | B45196E0335+10* |
| | 4,7 | A | 0,06 | 0,5 | 7,0 | B45196E0475+10* |
| | 10 | B | 0,06 | 0,5 | 4,5 | B45196E0106+20* |
| | 15 | B | 0,06 | 0,6 | 3,5 | B45196E0156+20* |
| | 22 | C | 0,06 | 0,9 | 2,4 | B45196E0226+30* |
| | 33 | C | 0,06 | 1,3 | 2,0 | B45196E0336+30* |
| | 68 | D | 0,06 | 2,7 | 1,1 | B45196E0686+40* |
| | 100 | D | 0,08 | 4,0 | 0,8 | B45196E0107+40* |
| 6,3 (4) | 2,2 | A | 0,06 | 0,5 | 10 | B45196E1225+10* |
| | 3,3 | A | 0,06 | 0,5 | 7,0 | B45196E1335+10* |
| | 6,8 | B | 0,06 | 0,5 | 4,5 | B45196E1685+20* |
| | 10 | B | 0,06 | 0,6 | 3,5 | B45196E1106+20* |
| | 15 | C | 0,06 | 1,0 | 2,4 | B45196E1156+30* |
| | 22 | C | 0,06 | 1,4 | 2,0 | B45196E1226+30* |
| | 47 | D | 0,06 | 3,0 | 1,1 | B45196E1476+40* |
| | 68 | D | 0,06 | 4,3 | 0,8 | B45196E1686+40* |
| 10 (6,3) | 1,5 | A | 0,06 | 0,5 | 10 | B45196E2155+10* |
| | 2,2 | A | 0,06 | 0,5 | 7,0 | B45196E2225+10* |
| | 4,7 | B | 0,06 | 0,5 | 4,5 | B45196E2475+20* |
| | 6,8 | B | 0,06 | 0,7 | 3,5 | B45196E2685+20* |
| | 10 | C | 0,06 | 1,0 | 2,4 | B45196E2106+30* |
| | 15 | C | 0,06 | 1,5 | 2,0 | B45196E2156+30* |
| | 33 | D | 0,06 | 3,3 | 1,1 | B45196E2336+40* |
| | 47 | D | 0,06 | 4,7 | 0,8 | B45196E2476+40* |
| 16 (10) | 1,0 | A | 0,04 | 0,5 | 10 | B45196E3105+10* |
| | 1,5 | A | 0,06 | 0,5 | 8,0 | B45196E3155+10* |
| | 3,3 | B | 0,06 | 0,6 | 5,0 | B45196E3335+20* |
| | 4,7 | B | 0,06 | 0,8 | 3,5 | B45196E3475+20* |
| | 6,8 | C | 0,06 | 1,1 | 2,4 | B45196E3685+30* |
| | 10 | C | 0,06 | 1,6 | 2,0 | B45196E3106+30* |
| | 22 | D | 0,06 | 3,6 | 1,1 | B45196E3226+40* |
| | 33 | D | 0,06 | 5,3 | 1,0 | B45196E3336+40* |

1) Replace 196E by 198E for gold-plated terminals
+ Code letter for capacitance tolerance: M = ± 20 %, K = ± 10 % (J = ± 5 % upon request)
* Code number for reel diameter: 9 = 180 mm, 6 = 330 mm



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| V_R up to 85°C (up to 125°C) Vdc | C_R μF | Case size | $\tan \delta_{max}$ (20°C, 120 Hz) | $I_{lk, max}$ (20°C, V_R , 5 min) μA | Z_{max} (20°C, 100 kHz) Ω | Ordering code 1) Tinned terminals |
|---|-----------------|--------------|--|---|--------------------------------------|--|
| 20 (13) | 0,68 | A | 0,04 | 0,5 | 12 | B45196E4684+10* |
| | 1,0 | A | 0,04 | 0,5 | 9,0 | B45196E4105+10* |
| | 2,2 | B | 0,06 | 0,5 | 6,0 | B45196E4225+20* |
| | 3,3 | B | 0,06 | 0,7 | 4,5 | B45196E4335+20* |
| | 4,7 | C | 0,06 | 1,0 | 2,4 | B45196E4475+30* |
| | 6,8 | C | 0,06 | 1,4 | 2,0 | B45196E4685+30* |
| | 15 | D | 0,06 | 3,0 | 1,2 | B45196E4156+40* |
| | 22 | D | 0,06 | 4,4 | 1,0 | B45196E4226+40* |
| 25 (16) | 0,47 | A | 0,04 | 0,5 | 13 | B45196E5474+10* |
| | 0,68 | A | 0,04 | 0,5 | 10 | B45196E5684+10* |
| | 1,5 | B | 0,06 | 0,5 | 7,0 | B45196E5155+20* |
| | 2,2 | B | 0,06 | 0,6 | 5,0 | B45196E5225+20* |
| | 3,3 | C | 0,06 | 0,9 | 2,8 | B45196E5335+30* |
| | 4,7 | C | 0,06 | 1,2 | 2,3 | B45196E5475+30* |
| | 6,8 | D | 0,06 | 1,7 | 1,8 | B45196E5685+40* |
| | 10 | D | 0,06 | 2,5 | 1,2 | B45196E5106+40* |
| 35 (23) | 0,10 | A | 0,04 | 0,5 | 28 | B45196E6104+10* |
| | 0,15 | A | 0,04 | 0,5 | 23 | B45196E6154+10* |
| | 0,22 | A | 0,04 | 0,5 | 19 | B45196E6224+10* |
| | 0,33 | A | 0,04 | 0,5 | 15 | B45196E6334+10* |
| | 0,47 | B | 0,04 | 0,5 | 11 | B45196E6474+20* |
| | 0,68 | B | 0,04 | 0,5 | 8,0 | B45196E6684+20* |
| | 1,0 | B | 0,04 | 0,5 | 7,0 | B45196E6105+20* |
| | 1,5 | C | 0,06 | 0,6 | 4,8 | B45196E6155+30* |
| | 2,2 | C | 0,06 | 0,8 | 3,2 | B45196E6225+30* |
| | 3,3 | C | 0,06 | 1,2 | 2,4 | B45196E6335+30* |
| | 4,7 | D | 0,06 | 1,7 | 1,5 | B45196E6475+40* |
| | 6,8 | D | 0,06 | 2,4 | 1,2 | B45196E6685+40* |
| | 10 | D | 0,06 | 3,5 | 1,0 | B45196E6106+40* |

1) Replace 196E by 198E for gold-plated terminals
+ Code letter for capacitance tolerance: M = ± 20 %, K = ± 10 % (J = ± 5 % upon request)
* Code number for reel diameter: 9 = 180 mm, 6 = 330 mm



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| V_R up to 85°C (up to 125°C) Vdc | C_R μF | Case size | $\tan \delta_{max}$ (20°C, 120 Hz) | $I_{lk, max}$ (20°C, V_R , 5 min) μA | Z_{max} (20°C, 100 kHz) Ω | Ordering code 1) Tinned terminals |
|---|-----------------|--------------|--|---|--------------------------------------|--|
| 50 (33) | 0,10 | A | 0,04 | 0,5 | 27 | B45196E7104+10* |
| | 0,15 | B | 0,04 | 0,5 | 22 | B45196E7154+20* |
| | 0,22 | B | 0,04 | 0,5 | 18 | B45196E7224+20* |
| | 0,33 | B | 0,04 | 0,5 | 14 | B45196E7334+20* |
| | 0,47 | C | 0,04 | 0,5 | 7,2 | B45196E7474+30* |
| | 0,68 | C | 0,04 | 0,5 | 6,4 | B45196E7684+30* |
| | 1,0 | C | 0,04 | 0,5 | 4,8 | B45196E7105+30* |
| | 1,5 | D | 0,06 | 0,8 | 4,0 | B45196E7155+40* |
| | 2,2 | D | 0,06 | 1,1 | 2,8 | B45196E7225+40* |
| | 3,3 | D | 0,06 | 1,7 | 1,6 | B45196E7335+40* |
| 4,7 | D | 0,06 | 2,4 | 1,2 | B45196E7475+40* | |

1) Replace 196E by 198E for gold-plated terminals
 + Code letter for capacitance tolerance: M = ± 20%, K = ± 10% (J = ± 5% upon request)
 * Code number for reel diameter: 9 = 180 mm, 6 = 330 mm

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