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Construction

- Polar tantalum capacitors with solid electrolyte
- 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

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

B45196-E1225-+10*

Passive component

Tantalum capacitor

Series
196 = tinned terminals Sn90/Pb10
198 = gold-plated terminals

Voltage (code number)
Code 0 is omitted

Rated capacitance
First two digits = significant figures
Third digit = exponent

Capacitance tolerance
M = ± 20 %, K = ± 10 %, J = ± 5 %

Case size
10 = A, 20 = B, 30 = C, 40 = D

Reel diameter
9 = 180 mm, 6 = 330 mm

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Specifications and characteristics in brief

For characteristic curves see page 73.

	Standard	
Series	B45196-E	B45198-E
Terminals	tinned	gold-plated
Rated voltage V_R (up to 85 °C)	4 … 50 Vdc	
Rated capacitance C_R	0,10 … 100 µF	
Capacitance tolerance	± 10 %, ± 20 % ± 5 % (on request)	
Failure rate $C_R \cdot V_R \leq 330$ µF · V $C_R \cdot V_R > 330$ µF · V	at 40 °C; ≤ V_R, $R_S \geq 3$ Ω/V (1 fit = 1 · 10^{-9} failures/h) ≤ 3 fit ≤ 10 fit	
Service life	> 500 000 h	
Leakage current (V_R, 5 min, 20 °C)	10 nA/µC	
Detail specification (tinned terminals)	IEC-QC300801/ US0001 CECC 30801-801	
IEC climatic category	in accordance with IEC 60068-1 55/125/56 (–55/+125 °C; 56 days damp heat test)	

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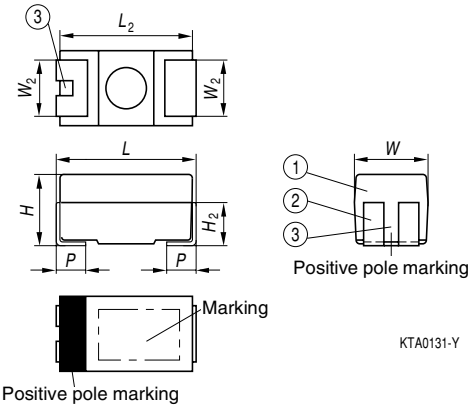
Dimensional drawing



① Encapsulation: molded epoxy resin
② NiFe; surface Sn90/Pb10 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 ± 0,2 (,126±,008)	1,6 ± 0,2 (,063±,008)	1,6 ± 0,2 (,063±,008)	3,0 (,118)	1,2 (,047)	1,0 (,039)	0,8 (,031)
B (20)	3,5 ± 0,2 (,138±,008)	2,8 ± 0,2 (,110±,008)	1,9 ± 0,2 (,075±,008)	3,3 (,130)	2,2 (,087)	1,2 (,047)	0,8 (,031)
C (30)	6,0 ± 0,3 (,236±,012)	3,2 ± 0,3 (,126±,012)	2,5 ± 0,3 (,098±,012)	5,8 (,228)	2,2 (,087)	1,5 (,059)	1,3 (,051)
D (40)	7,3 ± 0,3 (,287±,012)	4,3 ± 0,3 (,169±,012)	2,8 ± 0,3 (,110±,012)	7,1 (,280)	2,4 (,094)	1,6 (,062)	1,3 (,051)

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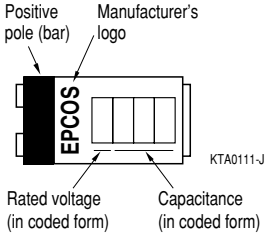
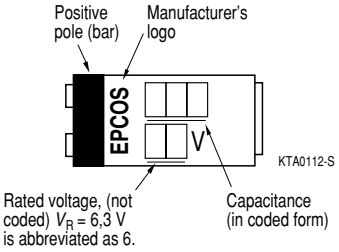
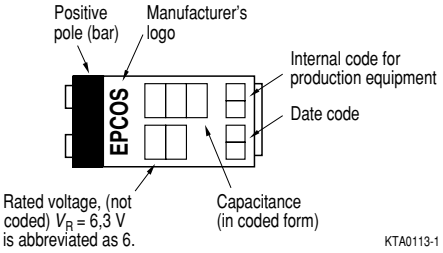
Marking

Case size A



Case size B





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	
K = 1998	1 = January	7 = July
L = 1999	2 = February	8 = August
M = 2000	3 = March	9 = September
N = 2001	4 = April	O = October
P = 2002	5 = May	N = November
R = 2003	6 = June	D = December

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

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Overview of available types

Series	B45196-E, tinned terminals (Sn90/Pb10) B45198-E, 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							

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Technical data and ordering codes

V_R up to 85 °C (up to 125 °C) Vdc	C_R µF	Case size	tan δ_{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 (Sn90/Pb10)
4	3,3	A	0,06	0,5	9,0	B45196-E335-+10*
(2,5)	4,7	A	0,06	0,5	7,0	B45196-E475-+10*
	10	B	0,06	0,5	4,5	B45196-E106-+20*
	15	B	0,06	0,6	3,5	B45196-E156-+20*
	22	C	0,06	0,9	2,4	B45196-E226-+30*
	33	C	0,06	1,3	2,0	B45196-E336-+30*
	68	D	0,06	2,7	1,1	B45196-E686-+40*
	100	D	0,08	4,0	0,8	B45196-E107-+40*
6,3	2,2	A	0,06	0,5	10	B45196-E1225-+10*
(4)	3,3	A	0,06	0,5	7,0	B45196-E1335-+10*
	6,8	B	0,06	0,5	4,5	B45196-E1685-+20*
	10	B	0,06	0,6	3,5	B45196-E1106-+20*
	15	C	0,06	1,0	2,4	B45196-E1156-+30*
	22	C	0,06	1,4	2,0	B45196-E1226-+30*
	47	D	0,06	3,0	1,1	B45196-E1476-+40*
	68	D	0,06	4,3	0,8	B45196-E1686-+40*
10	1,5	A	0,06	0,5	10	B45196-E2155-+10*
(6,3)	2,2	A	0,06	0,5	7,0	B45196-E2225-+10*
	4,7	B	0,06	0,5	4,5	B45196-E2475-+20*
	6,8	B	0,06	0,7	3,5	B45196-E2685-+20*
	10	C	0,06	1,0	2,4	B45196-E2106-+30*
	15	C	0,06	1,5	2,0	B45196-E2156-+30*
	33	D	0,06	3,3	1,1	B45196-E2336-+40*
	47	D	0,06	4,7	0,8	B45196-E2476-+40*
16	1,0	A	0,04	0,5	10	B45196-E3105-+10*
(10)	1,5	A	0,06	0,5	8,0	B45196-E3155-+10*
	3,3	B	0,06	0,6	5,0	B45196-E3335-+20*
	4,7	B	0,06	0,8	3,5	B45196-E3475-+20*
	6,8	C	0,06	1,1	2,4	B45196-E3685-+30*
	10	C	0,06	1,6	2,0	B45196-E3106-+30*
	22	D	0,06	3,6	1,1	B45196-E3226-+40*
	33	D	0,06	5,3	1,0	B45196-E3336-+40*

1) Replace 196-E by 198-E 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 δ_{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 (Sn90/Pb10)
20	0,68	A	0,04	0,5	12	B45196-E4684-+10*
(13)	1,0	A	0,04	0,5	9,0	B45196-E4105-+10*
	2,2	B	0,06	0,5	6,0	B45196-E4225-+20*
	3,3	B	0,06	0,7	4,5	B45196-E4335-+20*
	4,7	C	0,06	1,0	2,4	B45196-E4475-+30*
	6,8	C	0,06	1,4	2,0	B45196-E4685-+30*
	15	D	0,06	3,0	1,2	B45196-E4156-+40*
	22	D	0,06	4,4	1,0	B45196-E4226-+40*
25	0,47	A	0,04	0,5	13	B45196-E5474-+10*
(16)	0,68	A	0,04	0,5	10	B45196-E5684-+10*
	1,5	B	0,06	0,5	7,0	B45196-E5155-+20*
	2,2	B	0,06	0,6	5,0	B45196-E5225-+20*
	3,3	C	0,06	0,9	2,8	B45196-E5335-+30*
	4,7	C	0,06	1,2	2,3	B45196-E5475-+30*
	6,8	D	0,06	1,7	1,8	B45196-E5685-+40*
	10	D	0,06	2,5	1,2	B45196-E5106-+40*
	15	D	0,06	3,8	1,0	B45196-E5156-+40*
35	0,10	A	0,04	0,5	28	B45196-E6104-+10*
(23)	0,15	A	0,04	0,5	23	B45196-E6154-+10*
	0,22	A	0,04	0,5	19	B45196-E6224-+10*
	0,33	A	0,04	0,5	15	B45196-E6334-+10*
	0,47	B	0,04	0,5	11	B45196-E6474-+20*
	0,68	B	0,04	0,5	8,0	B45196-E6684-+20*
	1,0	B	0,04	0,5	7,0	B45196-E6105-+20*
	1,5	C	0,06	0,6	4,8	B45196-E6155-+30*
	2,2	C	0,06	0,8	3,2	B45196-E6225-+30*
	3,3	C	0,06	1,2	2,4	B45196-E6335-+30*
	4,7	D	0,06	1,7	1,5	B45196-E6475-+40*
	6,8	D	0,06	2,4	1,2	B45196-E6685-+40*
	10	D	0,06	3,5	1,0	B45196-E6106-+40*

1) Replace 196-E by 198-E 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

SMD

V_R up to 85 °C (up to 125 °C) Vdc	C_R µF	Case size	tan δ_{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 (Sn90/Pb10)
50	0,10	A	0,04	0,5	27	B45196-E7104-+10*
(33)	0,15	B	0,04	0,5	22	B45196-E7154-+20*
	0,22	B	0,04	0,5	18	B45196-E7224-+20*
	0,33	B	0,04	0,5	14	B45196-E7334-+20*
	0,47	C	0,04	0,5	7,2	B45196-E7474-+30*
	0,68	C	0,04	0,5	6,4	B45196-E7684-+30*
	1,0	C	0,04	0,5	4,8	B45196-E7105-+30*
	1,5	D	0,06	0,8	4,0	B45196-E7155-+40*
	2,2	D	0,06	1,1	2,8	B45196-E7225-+40*
	3,3	D	0,06	1,7	1,6	B45196-E7335-+40*
	4,7	D	0,06	2,4	1,2	B45196-E7475-+40*

1) Replace 196-E by 198-E 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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