

# SMD Solid Tantalum Chip Capacitors—CA45A Series



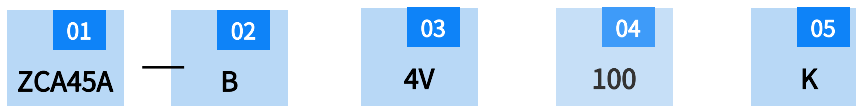
## FEATURES

- New monolithic structure, has high reliability.
- Small size, capacitors, fixed, chip.
- Leadless Surface Mount.
- RoHs compliance.

## APPLICATIONS

- use in avionics and industrial applications, tested to CECC Specification 30801-005 and 30801-011 (CTC4).

## PRODUCT IDENTIFICATION



01 Type	
ZCA45A	SMD Solid Tantalum Chip Capacitors

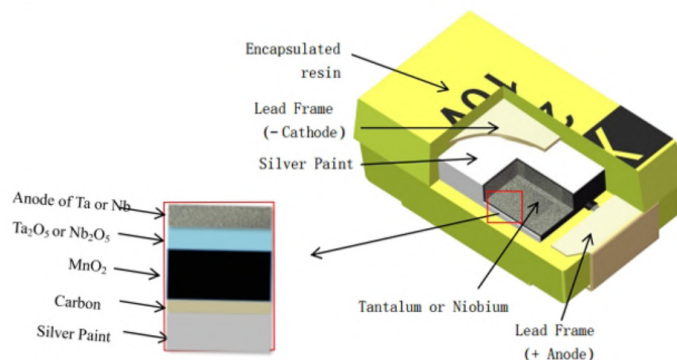
02 External Dimensions LxW(mm)	
P	2.0x 1.2
A	3.2x 1.6
B	3.5x 2.8
C	6.0 x 3.2
E	7.3 x 4.3
F	7.3 x 6.0

03 Rate Voltage	
4	4V
6.3	6.3V
10	10V
16	16V
20	25V
25	35V
35	50V

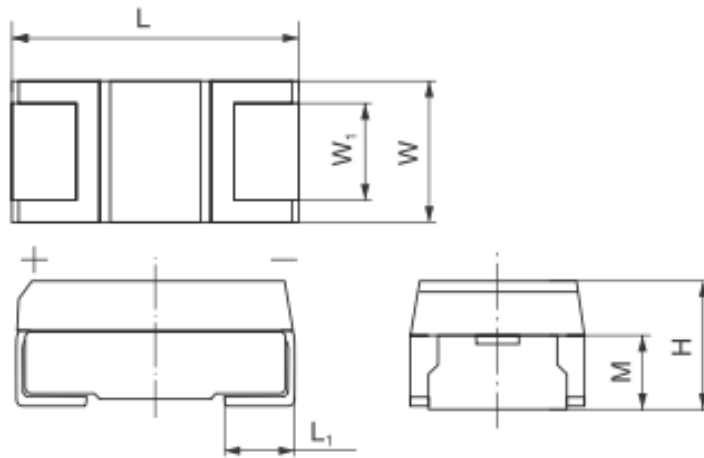
04 Nominal Capacitance	
Example	Nominal value
1.0	1uF
10	10uF
100	100uF

05 Tolerance	
J	±5%
K	±10%
M	±20%

## STRUCTURAL DIAGRAM



## SHAPE AND DIMENSIONS



Part Number	Dimensions(mm)					
	L	W	H	L1	W1	M
P	2.0±0.2	1.25±0.2	1.2±0.2	0.5±0.1	0.9±0.1	0.7±0.1
A	3.2±0.2	1.6±0.2	1.6±0.2	0.65±0.2	1.2±0.2	1.0±0.2
B	3.5±0.2	2.8±0.2	1.9±0.2	0.7±0.2	2.0±0.2	1.2±0.2
C	5.8±0.3	3.2±0.3	2.5±0.3	1.35±0.2	2.2±0.2	1.45±0.2
E(D)	7.3±0.3	4.3±0.3	2.8±0.3	1.35±0.2	3.0±0.2	1.6±0.2
H(E、X)	7.3±0.3	4.3±0.3	4.1±0.3	1.35±0.2	3.0±0.2	1.6±0.2
F	7.3±0.3	6.0±0.3	3.5±0.3	1.3±0.2	4.0±0.2	1.9±0.2

## Rate Voltage and Rate Capacitance

Rate Voltage	2		4		6.3		10		16		20		25		35	
Code	e		G		J		A		C		D		E		V	
Rate Capacitance	0.1	0.15	0.22	0.33	0.47	0.68	1.0	1.5	2.2	3.3	4.7	6.8	10	15	22	33
Code	104	154	224	334	474	684	105	155	225	335	475	685	106	156	226	336

## SPECIFICATIONS

Rate Capacitance uF	Shell Code	Equivalent series resistance MAX 100KHz 25°C	DC leakage current MAX uA			Capacitance Range %		Loss pin tangent Max %		
			+25°C	+85°C	+125°C	-55°C +85°C	+125°C	-55°C	+25°C	+85°C +125°C
<b>Rate Voltage 2V (Category Voltage 1.3V)</b>										
15	P	8.0	0.5	5	6.3	±10	±15	9	6	9
22	P	6.0	0.5	5	6.3	±10	±15	9	6	9
33	P	4.0	0.7	6.6	8.2	±15	±20	25	18	25
<b>Rate Voltage 4V (Category Voltage 2.5V)</b>										
3.3	A	8.0	0.5	5	6.3	±10	±12	8	6	8
3.3	P	20.0	0.5	5	6.3	±10	±15	9	6	9
4.7	A	6.0	0.5	5	6.3	±10	±12	8	6	8
4.7	P	12.0	0.5	5	6.3	±10	±15	9	6	9
6.8	A	6.0	0.5	5	6.3	±10	±12	8	6	8
6.8	P	10.0	0.5	5	6.3	±10	±15	9	6	9
10	B	3.5	0.5	5	6.3	±10	±12	8	6	8
10	A	6.0	0.5	5	6.3	±10	±12	8	6	8
10	P	8.0	0.5	5	6.3	±10	±15	9	6	9
15	B	3.5	0.6	6.0	7.5	±10	±12	8	6	8
15	A	4.0	0.6	6.0	7.5	±10	±12	8	6	8
15	P	8.0	0.6	6.0	7.5	±10	±15	9	6	9
22	C	1.8	0.9	8.8	11	±10	±12	8	6	8
22	B	3.5	0.9	8.8	11	±10	±12	8	6	8
22	A	4.0	0.9	8.8	11	±10	±15	8	6	8
22	P	4.0	0.9	8.8	11	±15	±20	25	18	25
33	C	1.8	1.3	13.2	16.5	±10	±12	8	6	8
33	B	2.5	1.3	13.2	16.5	±10	±12	8	6	8
33	A	4.0	1.3	13.2	16.5	±10	±15	9	6	8
33	P	4.0	1.3	13.2	16.5	±10	±15	25	18	25
47	C	1.0	1.9	18.8	23.5	±10	±12	8	6	8
47	B	3.0	1.9	18.8	23.5	±10	±15	9	6	8
47	A	2.5	1.9	18.8	23.5	±10	±15	15	10	12
68	E	0.8	2.7	27.2	34	±10	±12	8	6	8
68	C	1.2	2.7	27.2	34	±10	±12	8	6	8
68	B	3.5	2.7	27.2	34	±10	±15	8	6	8
68	A	4.0	2.7	27.2	34	±10	±15	22	15	18

Rate Capacitance uF	Shell Code	Equivalent series resistance MAX 100KHz 25°C	DC leakage current MAX uA			Capacitance Range %		Loss pin tangent Max %		
			+25°C	+85°C	+125°C	-55°C +85°C	+125°C	-55°C	+25°C	+85°C +125°C
100	E	0.7	4	40	50	±10	±12	10	8	10
100	C	1.0	4	40	50	±10	±12	10	8	10
100	B	0.9	4	40	50	±10	±15	15	10	12
100	A	4.0	4	40	50	±10	±15	30	20	24
150	F	0.5	6	60	75	±10	±12	12	10	12
150	E	0.5	6	60	75	±10	±12	10	8	10
150	C	1.0	6	60	75	±10	±15	10	8	10
150	B	2.0	6	60	75	±12	±15	15	12	15
220	F	0.4	13.2	132	165	±12	±18	15	12	15
220	E	0.5	13.2	132	165	±10	±12	12	10	12
220	C	0.5	13.2	132	165	±10	±12	12	10	12
220	B	0.9	13.2	132	165	±10	±15	15	10	12
330	F	0.4	13.2	132	165	±12	±18	15	12	15
330	H	0.5	13.2	132	165	±10	±12	12	10	12
330	E	0.5	13.2	132	165	±10	±12	12	10	12
330	C	0.9	13.2	132	165	±10	±15	15	10	12
470	F	0.3	18.8	188	235	±12	±18	15	12	15
470	H	0.5	18.8	188	235	±10	±12	12	10	12
470	E	0.5	18.8	188	235	±10	±15	12	10	12
680	F	0.2	27.2	272	340	±15	±20	20	14	20
680	E	0.5	27.2	272	340	±10	±15	15	12	15
680	H	0.5	27.2	272	340	±10	±15	21	14	17
1000	F	0.15	40	400	500	±15	±20	20	14	20
1000	H	0.5	40	400	500	±10	±12	21	14	17
<b>Rate Voltage 6.3(6)V (Category Voltage 4V)</b>										
2.2	A	8.0	0.5	5	6.3	±10	±12	8	6	8
2.2	P	20.0	0.5	5	6.3	±10	±15	9	6	9
3.3	A	8.0	0.5	5	6.3	±10	±12	8	6	8
3.3	P	12.0	0.5	5	6.3	±10	±15	9	6	9
4.7	A	6.0	0.5	5	6.3	±10	±12	8	6	8
4.7	P	10.0	0.5	5	6.3	±10	±15	9	6	9
6.8	B	3.5	0.5	5	6.3	±10	±12	8	6	8
6.8	A	6.0	0.5	5	6.3	±10	±12	8	6	8
6.8	P	8.0	0.5	5	6.3	±10	±15	9	6	9
10	B	3.5	0.6	6.3	7.9	±10	±12	8	6	8
10	A	4.0	0.6	6.3	7.9	±10	±12	8	6	8
10	P	6.0	0.6	6.3	7.9	±10	±15	9	6	9
15	C	1.8	0.9	9.4	11.8	±10	±12	8	6	8
15	B	3.5	0.9	9.4	11.8	±10	±12	8	6	8
15	A	3.5	0.9	9.4	11.8	±10	±15	8	6	8

Rate Capacitance uF	Shell Code	Equivalent series resistance MAX 100KHz 25°C	DC leakage current MAX uA			Capacitance Range %		Loss pin tangent Max %		
			+25°C	+85°C	+125°C	-55°C +85°C	+125°C	-55°C	+25°C	+85°C +125°C
<b>Rate Voltage 6.3V(Category Voltage 4V)</b>										
22	C	1.8	1.4	13.9	17.3	±10	±12	8	6	8
22	B	3.5	1.4	13.9	17.3	±10	±12	8	6	8
22	A	4.0	1.4	13.9	17.3	±10	±15	8	6	8
22	P	4.0	0.9	8.8	11	±15	±20	25	18	25
33	C	1.8	2.1	20.8	26	±10	±12	8	6	8
33	B	2.5	2.1	20.8	26	±10	±15	8	6	8
33	A	2.5	2.1	20.8	26	±10	±15	15	10	12
33	P	4.0	1.3	13.2	16.5	±10	±15	25	18	25
47	E	0.8	3	29.6	37	±10	±12	8	6	8
47	C	1.0	3	29.6	37	±10	±12	8	6	8
47	B	2.0	3	29.6	37	±10	±15	8	6	8
47	A	3.5	3	29.6	37	±10	±15	18	12	15
68	E	0.8	4.3	42.8	53.5	±10	±12	8	6	8
68	C	1.2	4.3	42.8	53.5	±10	±12	8	6	8
68	B	0.9	4.3	42.8	53.5	±10	±15	12	8	10
68	A	4.0	4.3	42.8	53.5	±15	±20	45	30	36
100	F	0.5	6.3	63	78	±10	±12	12	10	12
100	E	0.7	6.3	63	78.7	±10	±12	10	8	10
100	C	0.9	6.3	63	78.7	±10	±15	10	8	10
100	B	3.0	6.3	63	78.7	±10	±15	22	15	18
150	F	0.4	9.5	95	118	±10	±12	12	10	12
150	E	0.5	9.5	94.5	118	±10	±12	10	8	10
150	C	1.0	9.5	94.5	118	±10	±15	10	8	10
150	B	3.0	9.5	94.5	118	±15	±20	22	15	18
220	F	0.4	13.9	139	173	±10	±12	12	10	12
220	H	0.5	13.9	139	173	±10	±12	10	8	10
220	E	0.5	13.9	139	173	±10	±12	10	8	10
220	C	1.2	13.9	139	173	±10	±15	15	10	12
330	F	0.3	20.8	208	260	±12	±18	15	12	15
330	H	0.4	20.8	208	260	±10	±12	12	10	12
330	E	0.4	20.8	208	260	±10	±15	12	10	12
330	C	0.9	13.2	132	165	±10	±15	15	10	12
470	F	0.3	29.6	296	370	±12	±18	15	12	15
470	H	0.4	29.6	296	370	±10	±15	12	10	12
470	E	0.4	29.6	296	370	±10	±15	18	12	15
680	F	0.2	27.2	272	340	±15	±20	20	14	20
680	E	0.5	27.2	272	340	±10	±15	15	12	15
680	H	0.5	27.2	272	340	±10	±15	21	14	17
<b>Rate Voltage 10V (Category Voltage 6.3V)</b>										
1.5	A	8.0	0.5	5	6.3	±10	±12	8	6	8
1.5	P	20.0	0.5	5	6.3	±10	±15	9	6	9



Rate Capacitance uF	Shell Code	Equivalent series resistance MAX 100KHz 25°C	DC leakage current MAX uA			Capacitance Range %		Loss pin tangent Max %		
			+25°C	+85°C	+125°C	-55°C +85°C	+125°C	-55°C	+25°C	+85°C +125°C
2.2	B	3.5	0.5	5	6.3	±10	±12	8	6	8
2.2	A	8.0	0.5	5	6.3	±10	±12	8	6	8
2.2	P	12.0	0.5	5	6.3	±10	±15	9	6	9
3.3	B	3.5	0.5	5	6.3	±10	±12	8	6	8
3.3	A	6.0	0.5	5	6.3	±10	±12	8	6	8
3.3	P	10.0	0.5	5	6.3	±10	±15	9	6	9
4.7	C	2.0	0.5	5	6.3	±10	±12	8	6	8
4.7	B	3.5	0.5	5	6.3	±10	±12	8	6	8
4.7	A	5.0	0.5	5	6.3	±10	±12	8	6	8
4.7	P	8.0	0.5	5	6.3	±10	±15	9	6	9
6.8	B	3.5	0.7	6.8	8.5 8.5	±10	±12	8	6	8
6.8	A	4.0	0.7	6.8	8.5	±10	±15	8	6	8
6.8	P	6.0	0.7	6.8	8.5	±12	±18	9	6	9
10	C	1.8	1	10	12.5	±10	±12	8	6	8
10	B	3.5	1	10	12.5	±10	±12	8	6	8
10	A	4.0	1	10	12.5	±10	±15	8	6	8
10	P	6.0	1	10	12.5	±12	±18	22	18	22
15	C	1.8	1.5	15	18.7	±10	±12	8	6	8
15	B	2.8	1.5	15	18.7	±10	±12	8	6	8
15	A	6.0	1.5	15	18.7	±10	±15	12	8	10
22	C	1.8	2.2	22	27.5	±10	±12	8	6	8
22	B	2.4	2.2	22	27.5	±10	±15	8	6	8
22	A	6.0	2.2	22	27.5	±10	±15	15	10	12
22	P	4.0	0.9	22	11	±15	±20	25	18	25
33	E	0.8	3.3	33	41.2	±10	±12	8	6	8
33	C	1.6	3.3	33	41.2	±10	±12	8	6	8
33	B	1.8	3.3	33	41.2	±10	±15	8	6	8
33	A	4.0	1.3	33	16.5	±10	±15	25	18	25
47	E	0.8	4.7	47	59.7	±10	±12	8	6	8
47	C	1.0	4.7	47	59.7	±10	±12	8	6	8
47	B	1.0	4.7	47	59.7	±10	±15	12	8	10
47	A	3.5	3	47	37	±10	±15	18	12	15
68	F	0.5	6.8	68	85	±10	±12	12	10	12
68	E	0.8	6.8	68	85	±10	±12	8	6	8
68	C	1.2	6.8	68	85	±10	±15	8	6	8
68	B	3.0	6.8	68	85	±10	±15	15	10	12
100	F	0.4	10	100	125	±10	±12	12	10	12
100	E	0.7	10	100	125	±10	±12	10	8	10
100	C	1.2	10	100	125	±10	±15	10	8	10
100	B	3.0	10	100	125	±10	±15	22	18	22



Rate Capacitance uF	Shell Code	Equivalent series resistance MAX 100KHz 25°C	DC leakage current MAX uA			Capacitance Range %		Loss pin tangent Max %		
			+25°C	+85°C	+125°C	-55°C +85°C	+125°C	-55°C	+25°C	+85°C +125°C
150	F	0.4	15	150	187	±10	±12	12	10	12
150	H	0.5	15	150	187	±10	±12	10	8	10
150	E	0.5	15	150	187	±10	±15	10	8	10
150	C	0.9	15	150	187	±10	±15	15	10	12
220	F	0.3	22	150	187	±10	±12	12	10	12
220	H	0.5	22	150	187	±10	±12	10	8	10
220	E	0.5	22	150	187	±10	±15	10	8	10
220	C	1.2	13.9	139	173	±10	±15	15	10	12
330	F	0.3	33	330	412	±12	±18	15	12	15
330	H	0.5	33	330	412	±10	±15	12	10	12
330	E	0.5	33	330	412	±10	±15	15	10	12
330	C	0.9	13.2	132	165	±10	±15	15	10	12
470	F	0.2	47	470	588	±15	±20	20	14	20
470	H	0.2	47	470	587	±10	±15	15	10	12
470	E	0.4	29.6	296	370	±10	±15	18	12	15
<b>Rate Voltage 16V(15V) (Category Voltage 10V)</b>										
0.68	P	18.0	0.5	5	6.3	±10	±15	6	4	6
1.0	A	10.0	0.5	5	6.3	±10	±12	6	4	6
1.0	P	14.0	0.5	5	6.3	±10	±15	6	4	6
1.5	A	8.0	0.5	5	6.3	±10	±12	8	6	8
1.5	P	12.0	0.5	5	6.3	±10	±15	9	6	9
2.2	A	6.0	0.5	5	6.3	±10	±12	8	6	8
2.2	P	10.0	0.5	5	6.3	±10	±15	9	6	9
3.3	B	3.5	0.5	5.5	6.3	±10	±12	8	6	8
3.3	A	5.0	0.5	5.2	6.3	±10	±12	8	6	8
3.3	P	8.0	0.5	5.2	6.6	±10	±15	9	6	9
4.7	C	2.4	0.8	7.5	9.4	±10	±12	8	6	8
4.7	B	3.5	0.8	7.5	9.4	±10	±12	8	6	8
4.7	A	4.0	0.8	7.5	9.4	±10	±15	8	6	8
6.8	C	1.9	1.1	10.9	13.6	±10	±12	8	6	8
6.8	B	2.5	1.1	10.9	13.6	±10	±12	8	6	8
6.8	A	3.5	1.1	10.9	13.6	±10	±15	8	6	8
10	C	1.8	1.6	16	20	±10	±12	8	6	8
10	B	2.8	1.6	16	20	±10	±15	8	6	8
10	A	7.0	1.6	16	20	±10	±15	12	8	10
15	C	1.8	2.4	24	30	±10	±12	8	6	8
15	B	2.5	2.4	24	30	±10	±15	8	6	8
15	A	8.0	2.4	24	30	±12	±18	18	12	15



Rate Capacitance uF	Shell Code	Equivalent series resistance MAX 100KHz 25°C	DC leakage current MAX uA			Capacitance Range %		Loss pin tangent Max %		
			+25°C	+85°C	+125°C	-55°C +85°C	+125°C	-55°C	+25°C	+85°C +125°C
22	E	0.8	3.5	35.2	44	±10	±12	8	6	8
22	C	1.6	3.5	35.2	44	±10	±12	8	6	8
22	B	2.2	3.5	35.2	44	±10	±15	9	6	8
22	A	8.0	3.5	35	44	±12	±18	18	12	15
33	E	0.8	5.3	52.8	66	±10	±12	8	6	8
33	C	1.2	5.3	52.8	66	±10	±15	8	6	8
33	B	2.1	5.3	52.8	66	±12	±18	12	8	10
47	F	0.5	7.5	75	93	±10	±12	12	10	12
47	E	0.8	7.5	75.2	94	±10	±12	8	6	8
47	C	1.0	7.5	75.2	94	±10	±15	9	6	8
47	B	3.0	7.5	75.2	94	±15	±18	18	12	15
68	F	0.4	10.9	109	136	±10	±12	12	10	12
68	E	0.7	10.9	109	136	±10	±12	8	6	8
68	C	1.2	10.9	109	136	±10	±15	12	8	10
100	F	0.4	16	160	200	±10	±12	12	10	12
100	H	0.7	16	160	200	±10	±12	10	8	10
100	E	1.7	16	160	200	±10	±15	10	8	10
100	C	1.5	16	160	200	±15	±18	15	10	12
150	F	0.3	24	240	300	±10	±12	12	10	12
150	H	0.5	24	240	300	±10	±15	10	8	10
150	E	0.7	24	240	300	±10	±15	15	10	12
220	F	0.3	35.2	352	440	±10	±15	16	10	16
220	H	0.5	35.2	352	440	±10	±15	15	10	12
330	F	0.2	52.8	528	660	±15	±20	20	12	20
330	H	0.5	52.8	528	660	±15	±20	15	12	15



## Performance Characteristic of ZCA45 Series

Item		Performance			Test Conditions
Operating temperature		-55°C ~ 125°C			Above 85°C, use derated voltage
Rated voltage		2.5V ~ 50V			
Surge voltage		Refer to List of Surge Voltage			Temperature:85°C
Capacitance		0.1μF ~ 1000μF			Test frequency: 120Hz
Capacitance tolerance		±20%, ±10%			Test frequency: 120Hz
Tangent of loss angle (tanδ)		Refer to Spec Coding and Spec Table Specification Table			Test frequency: 120Hz
LC		Refer to Spec Coding and Spec Table			Five minutes after rated voltage charging
ESR		Refer to Spec Coding and Spec Table			Test frequency: 100KHz
		ΔC/C	tanδ	LC	
Surge voltage test		Lower than 10% initial specification	Below the initial specification	Below the initial specification	
Chanracteristic of temperature	-55°C	± 10% or ± 12%*1	Lower than 1.5 times initial specification		
	+85°C	Relative initial specification	Lower than 1.5 times initial specification	Lower than 10 times initial	
	+125°C	± 10% or ± 12%, ±20%*1	Lower than 1.2 times initial specification	Lower than 12.5 times initial specification	
Temperature cycle		Lower than 10% initial	Lower than 1.5 times initial specification	Lower than specification	-55°C~+125°C 5 cycle
Resistance to soldering heat		Lower than 10% initial	Lower than the specification before	Lower than the specification before	Solder dip: 260°C 10 second Solder reflow: Tmax=260°C
Damp		±20%	Lower than 1.5 times initial specification	Lower than initial specification	40°C 90~95%RH 500h
Endurance		±10%	Lower than initial specification	Lower than initial specification	85°C: Rated voltage 2000h 125°C: Reduced voltage 2000h
Failure rate		λ <sub>0</sub> =1%/1000hrs			

Note: \*1 Some specifications may be different, please consult our company for details.