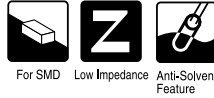


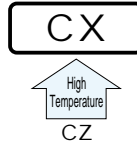
# ALUMINUM ELECTROLYTIC CAPACITORS



Chip Type, High Reliability  
Low temperature ESR specification  
series



- Chip type, high temperature range, for +135°C use.
- Added ESR specification after the test at -40°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

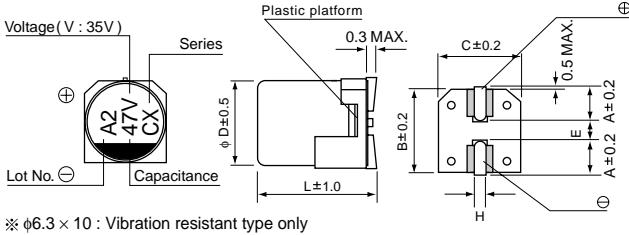


## Specifications

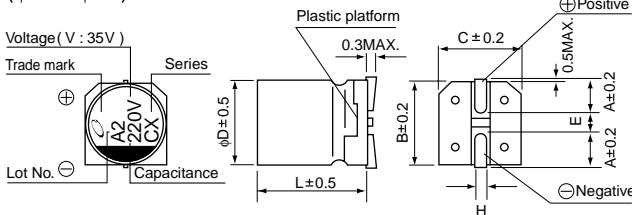
Item	Performance Characteristics						
Category Temperature Range	-40 to +135°C						
Rated Voltage Range	10 to 50V						
Rated Capacitance Range	47 to 3300μF						
Capacitance Tolerance	±20% at 120Hz, 20°C						
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3(μA), whichever is greater.						
Tangent of loss angle (tan δ)	Rated voltage (V)	10	16	25	35	50	Measurement frequency : 120Hz at 20°C
	tan δ (MAX.)	0.30	0.23	0.18	0.16	0.16	
Stability at Low Temperature	Rated voltage (V)	10	16	25	35	50	Measurement frequency : 120Hz
	Impedance ratio ZT / Z20 (MAX.)	Z-40°C / Z+20°C	12	8	6	4	
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 135°C.						
	Capacitance Change	Within ±30% of the initial capacitance value					
	tan δ	300% or less than the initial specified value					
Shelf Life	After storing the capacitors under no load at 135°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.						
	Capacitance Change	Within ±10% of the initial capacitance value					
	tan δ	Less than or equal to the initial specified value					
Resistance to soldering heat	The capacitors shall be kept on the hot plate for 30 seconds, which is maintained at 250°C. The capacitors shall meet the characteristic requirements listed at right when they are removed from the plate and restored to 20°C.						
	Capacitance Change	Within ±10% of the initial capacitance value					
	Leakage current	Less than or equal to the initial specified value					
Marking	Black print on the case top.						

## Radial Lead Type

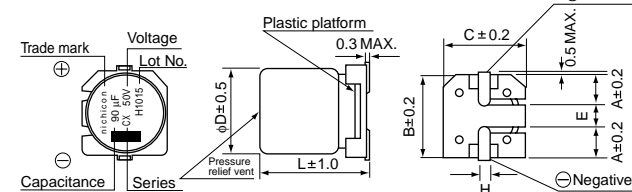
### (φ6.3)【Vibration Resistance】



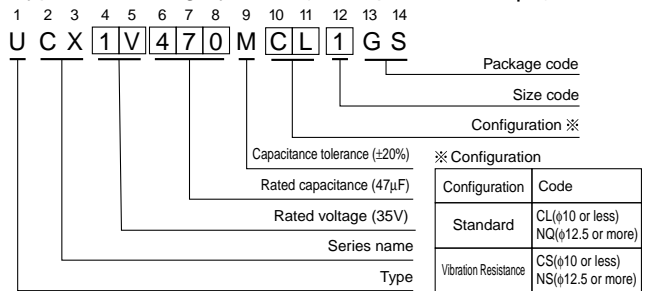
### (φ8 to φ10)【Standard】



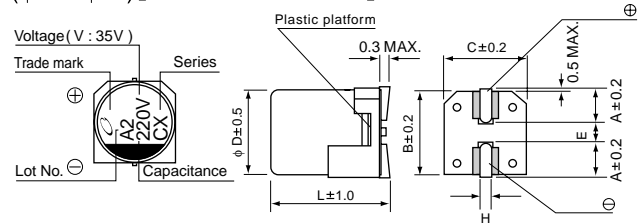
### (φ12.5 to φ18)【Standard】



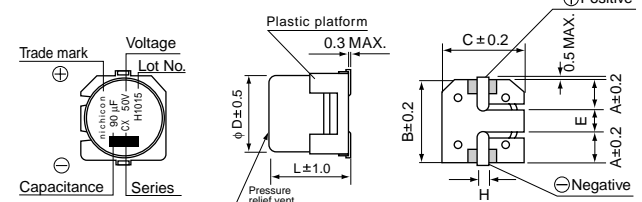
## Type numbering system (Example : 35V 47μF)



### (φ8 to φ10)【Vibration Resistance】



### (φ12.5 to φ18)【Vibration Resistance】



## Standard

	(mm)				
φD×L	8×10	10×10	12.5×13.5	16×16.5, 21.5	18×16.5, 21.5
A	2.9	3.2	4.8	5.4	6.4
B	8.3	10.3	13.6	17.1	19.1
C	8.3	10.3	13.6	17.1	19.1
E	3.1	4.5	4	6.3	6.3
L	10	10	13.5	16.5, 21.5	16.5, 21.5
H	0.8 to 1.1	0.8 to 1.1	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4

## Vibration Resistance

	(mm)					
φD×L	6.3×10	8×10	10×10	12.5×13.5	16×16.5, 21.5	18×16.5, 21.5
A	2.4	2.9	3.2	4.8	5.4	6.4
B	6.6	8.3	10.3	13.6	17.1	19.1
C	6.6	8.3	10.3	13.6	17.1	19.1
E	2.2	3.1	4.5	4	6.3	6.3
L	10.8	10	10	13.5	16.5, 21.5	16.5, 21.5
H	0.5 to 0.8	1.1 to 1.5	1.1 to 1.5	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4

■ Aid electrode

## Rated Voltage

V	10	16	25	35	50
Code	A	C	E	V	H

● Dimension table in next page.



## ■Dimensions

Cap.(μF)	V	Code	10				16				25				35				50			
			1A				1C				1E				1V				1H			
47	470														6.3 x 10   0.25   4   15   197 8 x 10   0.20   3   12   270	8 x 10   0.25   3.5   15   270						
68	680														8 x 10   0.20   3   12   270							
100	101						6.3 x 10   0.25   4   15   197 8 x 10   0.20   3   12   270	8 x 10   0.20   3   12   270	8 x 10   0.20   3   12   270	8 x 10   0.20   3   12   270	8 x 10   0.20   3   12   270	8 x 10   0.20   3   12   270	8 x 10   0.20   3   12   270	8 x 10   0.20   3   12   270	10 x 10   0.2   2.5   12   500							
220	221		8 x 10   0.20   3   12   270				8 x 10   0.20   3   12   270					10 x 10   0.15   2   10   500	10 x 10   0.15   2   10   500	10 x 10   0.15   2   10   500								
330	331		8 x 10   0.20   3   12   270 10 x 10   0.15   2   10   500				10 x 10   0.15   2   10   500					10 x 10   0.15   2   10   500	10 x 10   0.15   2   10   500									
390	391																	12.5 x 13.5   0.09   1.3   6.5   750				
470	471		10 x 10   0.15   2   10   500				10 x 10   0.15   2   10   500									12.5 x 13.5   0.07   1.0   5.0   750	16 x 16.5   0.07   0.70   3.5   1000					
560	561														12.5 x 13.5   0.07   1.0   5.0   750	16 x 16.5   0.07   0.70   3.5   1000						
680	681														12.5 x 13.5   0.07   1.0   5.0   750	18 x 16.5   0.07   0.70   3.5   1200						
820	821										12.5 x 13.5   0.07   1.0   5.0   750	16 x 16.5   0.05   0.50   2.5   1200	18 x 16.5   0.07   0.70   3.5   1200									
1000	102										12.5 x 13.5   0.07   1.0   5.0   750	16 x 16.5   0.05   0.50   2.5   1200	16 x 21.5   0.05   0.40   2.0   1600									
1200	122										16 x 16.5   0.05   0.50   2.5   1200	18 x 16.5   0.05   0.50   2.5   1400	18 x 21.5   0.04   0.32   1.6   1900									
1500	152										16 x 16.5   0.05   0.50   2.5   1200	16 x 21.5   0.04   0.32   1.6   1900 18 x 16.5   0.05   0.50   2.5   1400										
1800	182										16 x 16.5   0.05   0.50   2.5   1200	18 x 21.5   0.035   0.28   1.4   2200										
2200	222										18 x 16.5   0.05   0.50   2.5   1400	18 x 21.5   0.035   0.28   1.4   2200										
2700	272										16 x 21.5   0.04   0.32   1.6   1900					Case size φD×L (mm)   Initial 20   Initial -40   After endurance test 1000hours -40   Rated ripple ESR						
3300	332										18 x 21.5   0.035   0.28   1.4   2200											

MAX. ESR( ) at 20 / -40 100kHz, Rated ripple current(mArms) at 135 100kHz  
In this case, [6] will be put at 12th digit of type numbering system.

### Frequency coefficient of rated ripple current

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.