

# ALUMINUM ELECTROLYTIC CAPACITORS

**CX** 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).

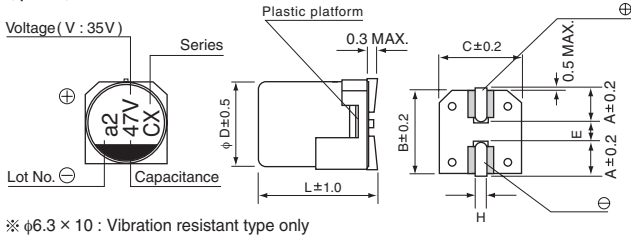


## Specifications

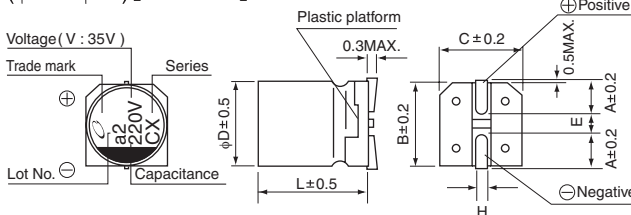
Item	Performance Characteristics						
Category Temperature Range	-40 to +135°C						
Rated Voltage Range	10 to 50V						
Rated Capacitance Range	47 to 3300μF						
Capacitance Tolerance	±20% at 120Hz, 20°C						
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more 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

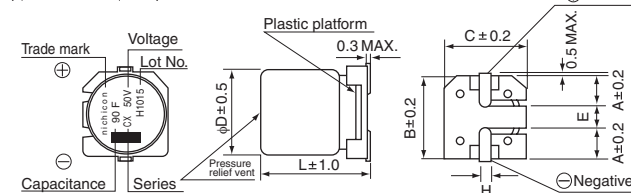
### (φ 6.3)【Vibration Resistance】



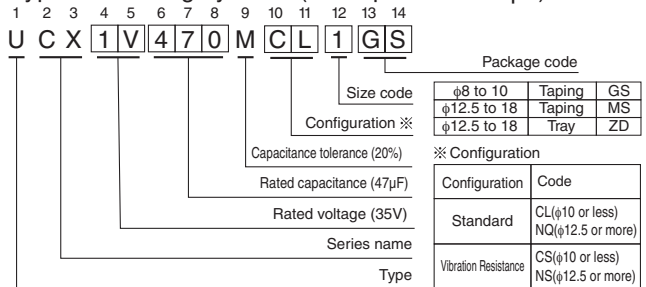
### (φ 8 to φ 10)【Standard】



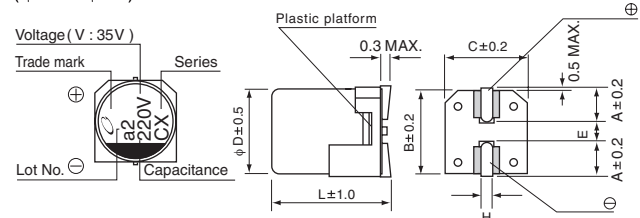
### (φ 12.5 to φ 18)【Standard】



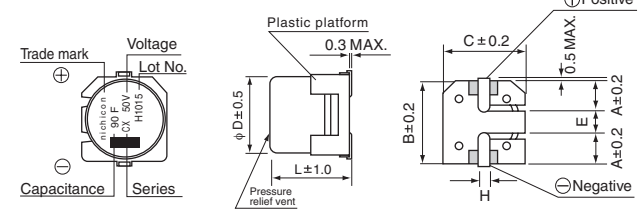
## Type numbering system (Example : 35V 47μF)



### (φ 8 to φ 10)【Vibration Resistance】



### (φ 12.5 to φ 18)【Vibration Resistance】



## Standard

	(mm)				
φDXL	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)					
φDXL	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	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.( $\mu$ F)	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   0.25   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			6.3 X 10   0.25   4   15   197	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				
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							
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				
1800	182								16 X 16.5   0.05   0.50   2.5   1200			18 X 16.5   0.05   0.50   2.5   1400				
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							
3300	332								18 X 21.5   0.035   0.28   1.4   2200							

MAX. ESR ( $\Omega$ ) at 20°C / -40°C 100kHz, Rated ripple current(mArms) at 135°C 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.