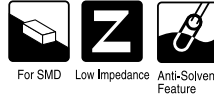


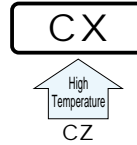
ALUMINUM ELECTROLYTIC CAPACITORS



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).

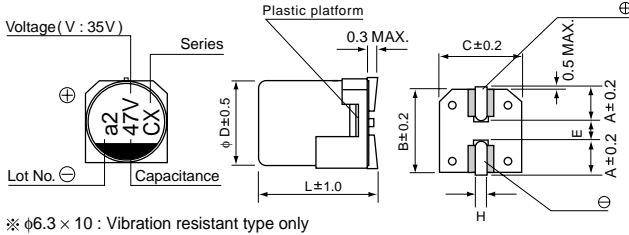


Specifications

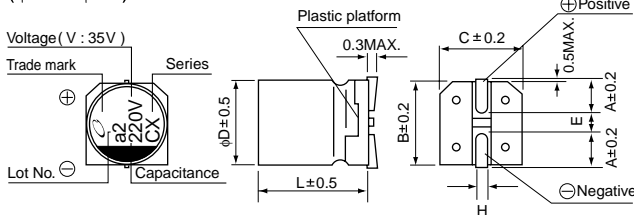
Item	Performance Characteristics	
Category Temperature Range	-40 to +135°C	
Rated Voltage Range	10 to 50V	
Rated Capacitance Range	47 to 3300μF	
Capacitance Tolerance	±20% at 120Hz, 20°C	
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3(μA), whichever is greater.	
Tangent of loss angle (tan δ)	Rated voltage (V)	10 16 25 35 50
	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
	Impedance ratio Z _T / Z ₂₀ (MAX.)	Z _{-40°C} / Z _{+20°C} 12 8 6 4 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.	
	Leakage current	Less than or equal to the initial specified value
	Capacitance Change	Within ±10% of the initial capacitance 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.	
	tan δ	Less than or equal to the initial specified value
	Leakage current	Less than or equal to the initial specified value
Marking	Black print on the case top.	

Radial Lead Type

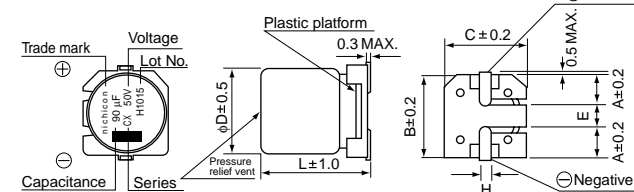
(φ 6.3) [Vibration Resistance]



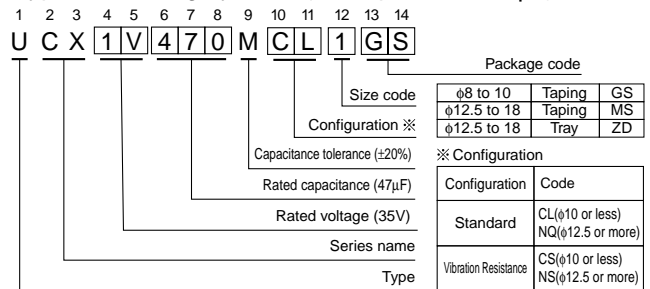
(φ 8 to φ 10) [Standard]



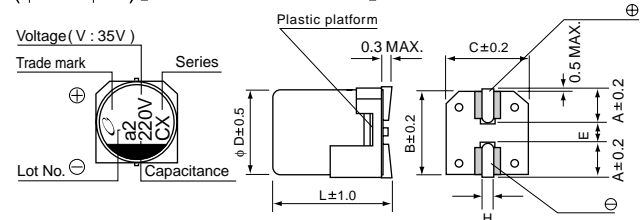
(φ 12.5 to φ 18) [Standard]



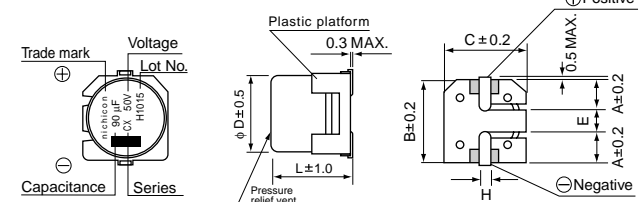
Type numbering system (Example : 35V 47μF)



(φ 8 to φ 10) [Vibration Resistance]



(φ 12.5 to φ 18) [Vibration Resistance]



Standard

	(mm)				
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	10		16		25		35		50	
		Code	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	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	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			
		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			
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.

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