



CLU Series

• 125°C 3000~5,000Hrs assured.

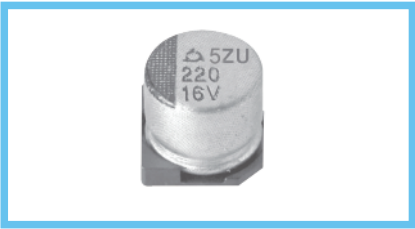
Solvent-proof

- Vertical SMD type.
- Wide Temp. Low ESR, Long Life
- Suitable to fit for automotive equipment.
- RoHS compliant.
- Halogen-free capacitors are also available.

CLS

CLU

Long Life



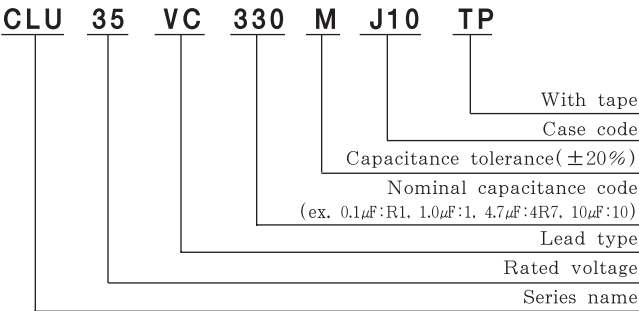
• AEC-Q200 compliant : Please contact us for more details, test data, information.

SPECIFICATIONS

Item	Characteristics																							
Rated Voltage Range	10 ~ 50 V _{DC}																							
Operating Temperature Range	-40 ~ +125 °C																							
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)																							
Leakage Current	I=0.01CV(μA) or 3μA, whichever is greater. Where, I:Max. Leakage current(μA) C:Nominal capacitance(μF) V:Rated voltage(V _{DC}) (at 20°C, 2 minutes)																							
Dissipation Factor(Tanδ)	<table><tr><td>Rated voltage(V_{DC})</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td>Tanδ(Max.)</td><td>0.30</td><td>0.23</td><td>0.18</td><td>0.16</td><td>0.16</td></tr></table> (at 20°C, 120Hz)						Rated voltage(V _{DC})	10	16	25	35	50	Tanδ(Max.)	0.30	0.23	0.18	0.16	0.16						
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Temperature Characteristics (Max. Impedance ratio)	<table><tr><td>Rated voltage(V_{DC})</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td>Z(-25°C)/Z(20°C)</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-40°C)/Z(20°C)</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td></tr></table> (at 120Hz)						Rated voltage(V _{DC})	10	16	25	35	50	Z(-25°C)/Z(20°C)	3	2	2	2	2	Z(-40°C)/Z(20°C)	4	3	3	3	3
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Z(-40°C)/Z(20°C)	4	3	3	3	3																			
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5,000hours(3,000hours for F80 size) at 125°C. Capacitance change ≤ ±30% of the initial value Tanδ ≤ 300% of the initial specified value Leakage current ≤ The initial specified value																							
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposin them for 1,000 hours at 125°C without voltage applied. The rated volage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. Capacitance change ≤ ±30% of the initial value Tanδ ≤ 300% of the initial specified value Leakage current ≤ The initial specified value																							
Others	Satisfied characteristics KS C IEC 60384-4																							

CLU Series

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap.(μF)	Freq.(Hz)	120	1K	10K	100K
47 ~ 100		0.40	0.75	0.90	1.00
220 ~ 680		0.50	0.85	0.94	1.00

DIMENSIONS OF CLU Series

Unit(mm)

DIMENSIONS

● Vibration Resistance

<Size code: F80~J10> <Size code: F80~J10>

①: Dummy terminals

Recommended solder land on PC board

■: Solder land on PC board

MARKING

Note 1 : L ± 0.5 for H10, J10

Case code	Ø D	L	A	B	C	W	P	a	b	c	a	b	c
F80	6.3	7.7	6.6	6.6	7.2	0.5~0.8	1.9	1.9	3.5	1.6			
H10	8	10	8.3	8.3	9.0	0.7~1.1	3.1	3.1	4.2	2.2	3.1	4.2	3.5
J10	10	10	10.3	10.3	11.0	0.7~1.1	4.5	4.5	4.4	2.2	4.5	4.4	3.5

● Vibration Resistance

RATINGS OF CLU Series

V _{DC}	Cap.(μ F)	Case Code	ESR ($\Omega_{max}/20^{\circ}C, 100Hz$)	Rated Ripple Current (mA _{rms} /125°C, 100Hz)
10	220	F80	0.30	240
	470	H10	0.20	350
	680	J10	0.15	550
16	220	F80	0.30	240
	330	H10	0.20	350
	680	J10	0.15	550
25	100	F80	0.30	240
	220	H10	0.20	350
	330	J10	0.15	550
35	100	F80	0.30	240
	220	H10	0.20	350
	330	J10	0.15	550
50	47	F80	0.50	190
	150	H10	0.30	320
	220	J10	0.20	500

PRECAUTIONS TO USERS

Soldering method

The capacitors of Alchip have no capability to withstand such dip or wave soldering as totally immerses a components into a solder bath.

Reflow soldering

Use the capacitors within the Recommended Reflow Soldering Conditions, and also make sure to check the temperature stress to the capacitors because the following makes a difference in the stress to the capacitors. If any other reflow soldering conditions are applied, please consult us.

- ① Location of components. (The edge sides of a PC board increases its temperature more than the center does.)
- ② Population of components. The less the component population is the more the temperature is increased.
- ③ Material of printed circuit board. As a ceramic board needs heating up more than a glass epoxy board to reach the same board temperature, the capacitors may be damaged.
- ④ Thickness of PC board. A thick PC board needs heating up more than a thin board. It may damage the capacitors.
- ⑤ Size of PC board. A large PC board needs heating up more than a small board, and it may damage the capacitors.
- ⑥ Location of infrared ray lamps. On IR reflow as well as hot plate reflow, heating only the reverse side of the PC board will reduce a stress to the capacitors.

Rework of soldering

Avoid soldering more than once by reflow. Use a soldering iron for rework of solder, and do not exceed an iron tip temperature of 300°C and a max. exposure time of 5 seconds.

Mechanical stress

Do not lift up or push the capacitor after soldering. Avoid curvature of the PC board. These may damage the capacitor.

Cleaning of assembly board

For the cleaning conditions, see page 58~59.

Immediately after solvent cleaning, evaporate a residual solvent for at least 10 minutes with a hot forced air. If the assembly board is inadequately dried after a washing process, the capacitors will keep suffering from a residual solvent for long periods of time, and will be corroded while in service.

Coating on assembly board

- ① Before coating, evaporate cleaning solvents from the assembly board.
- ② Before the conformal coating, using a buffer pre-coat which does not contain chloride is recommended to reduce stress to the capacitors.

Molding by resin

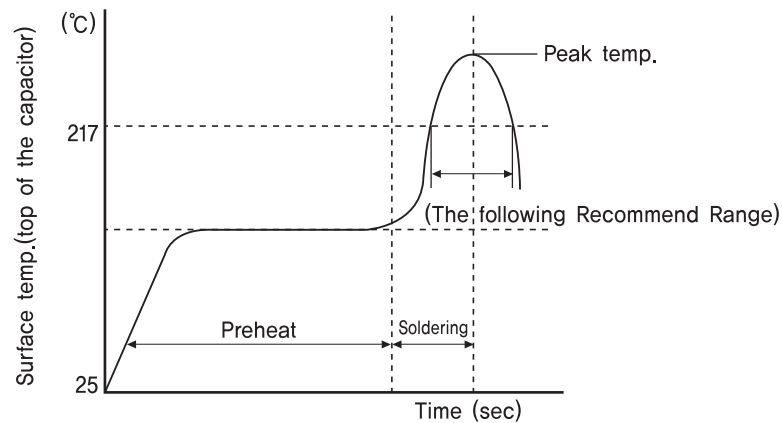
Inner pressure of a capacitor slowly increases over the service life of the capacitor with gas being produced by internal chemical reaction. If the end seal of the capacitor is completely be in danger. Also if the resin contains a large amount of chlorine ion, it will penetrate into the end seal, get into the inside element of the capacitor, and damage the capacitor while in service.

Others

The Precautions to Users for Aluminum Electrolytic Capacitors shall be applied. (page 56)

RECOMMENDED PB-FREE REFLOW SOLDERING CONDITIONS

The following conditions are recommended for air or infrared reflow soldering of the surface mount capacitors onto a glass epoxy circuit board of 90 × 50 × 0.8mm (with resist) by cream solder (eutectic solder) . The temperatures shown are the surface temperature values of the top of the capacitor.



TEMPERATURE PROFILE

CASE CODE	Time of Preheat temp. (from 150°C to 200°C)	Time to be Maintained Above 217°C	Time to be Maintained Above 230°C	Peak Temp.	Reflow Cycle
B55, D55, D56 E55, E56, F55, F56, F60, F80 H63, H10, J85, J10, K14	60 ~ 100 Sec	60 ~ 70 Sec	20 ~ 30 Sec	250°C (10 Sec ↓)	1 TIME
L17, L22 M17, M22	60 ~ 100 Sec	50 ~ 60 Sec	-	230°C (10 Sec ↓)	1 TIME