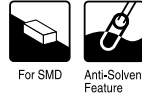


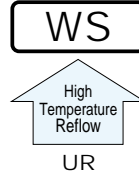
# ALUMINUM ELECTROLYTIC CAPACITORS

**WS** Chip Type, High CV  
High Temperature (260°C) Reflow series



- Corresponding with 260°C peak reflow soldering  
Recommended reflow condition : 260°C peak 5 sec. 230°C over 60 sec. 2 times  
( $\phi 8 \times 6.2$ ,  $\phi 10 \times 10$  : 1 time)
- Chip type higher capacitance in large case size.
- Applicable to automatic mounting machine using carrier tape.
- Adapted to the RoHS directive (2002/95/EC).

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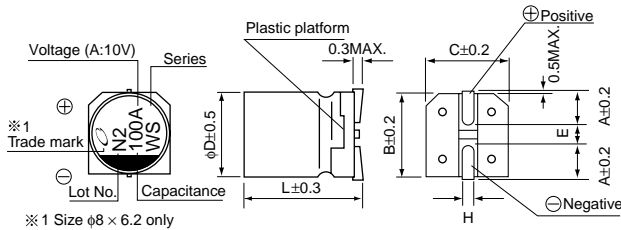


## Specifications

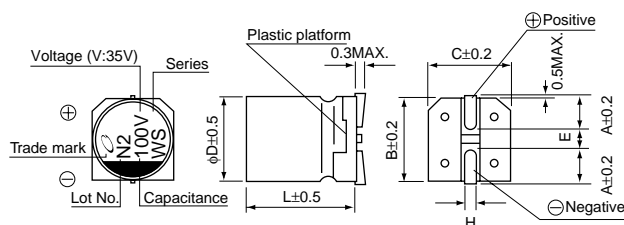
Item	Performance Characteristics							
Category Temperature Range	-40 to +85°C							
Rated Voltage Range	6.3 to 50V							
Rated Capacitance Range	22 to 1500 $\mu$ F							
Capacitance Tolerance	$\pm 20\%$ at 120Hz, 20°C							
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV ( $\mu$ A) .							
Tangent of loss angle (tan $\delta$ )	Measurement frequency : 120Hz, Temperature : 20°C							
	Rated voltage (V)	6.3    10    16    25    35    50						
	tan $\delta$ (MAX.)	0.28   0.24   0.20   0.16   0.14   0.12						
Stability at Low Temperature	Measurement frequency: 120Hz							
	Rated voltage (V)	6.3    10    16    25    35    50						
	Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C    5    4    3    2    2    2 Z-40°C / Z+20°C    10   8    6    4    3    3						
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 85°C.	<table border="1"> <tr> <td>Capacitance change</td> <td>Within <math>\pm 20\%</math> of initial value</td> </tr> <tr> <td>tan <math>\delta</math></td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Less than or equal to the initial specified value</td> </tr> </table>	Capacitance change	Within $\pm 20\%$ of initial value	tan $\delta$	200% or less of initial specified value	Leakage current	Less than or equal to the initial specified value
Capacitance change	Within $\pm 20\%$ of initial value							
tan $\delta$	200% or less of initial specified value							
Leakage current	Less than or equal to the initial specified value							
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours, and after performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they will meet the specified value for endurance characteristics listed above.							
Resistance to soldering heat	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate, the capacitors meet the characteristic requirements listed at right when they are restored to 20°C.	<table border="1"> <tr> <td>Capacitance change</td> <td>Within <math>\pm 10\%</math> of initial value</td> </tr> <tr> <td>tan <math>\delta</math></td> <td>Less than or equal to the initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Less than or equal to the initial specified value</td> </tr> </table>	Capacitance change	Within $\pm 10\%$ of initial value	tan $\delta$	Less than or equal to the initial specified value	Leakage current	Less than or equal to the initial specified value
Capacitance change	Within $\pm 10\%$ of initial value							
tan $\delta$	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.							

## Chip Type

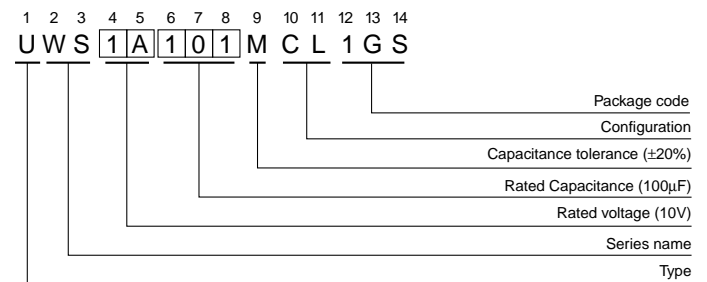
( $\phi 6.3$ ,  $\phi 8 \times 6.2$ )



( $\phi 8 \times 10$ ,  $\phi 10 \times 10$ )



## Type numbering system (Example : 10V 100 $\mu$ F)



$\phi D \times L$	(mm)				
	6.3 × 5.8	6.3 × 7.7	8 × 6.2	8 × 10	10 × 10
A	2.4	2.4	3.3	2.9	3.2
B	6.6	6.6	8.3	8.3	10.3
C	6.6	6.6	8.3	8.3	10.3
E	2.2	2.2	2.3	3.1	4.5
L	5.8	7.7	6.2	10	10
H	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

## Voltage

V	6.3	10	16	25	35	50
Code	j	A	C	E	V	H

● Dimension table in next page.

### ■ Dimensions

Cap. (μF)	Code	V		6.3		10		16		25		35		50	
		0J	1A	1C	1E	1V	1H								
22	220													6.3 × 5.8	45
33	330											6.3 × 5.8	55	8 × 6.2	95
47	470									6.3 × 5.8	65	8 × 6.2	105	8 × 10	140
100	101			6.3 × 5.8	70	8 × 6.2	125	8 × 6.2	145	8 × 10	175	10 × 10	195		
150	151			6.3 × 5.8	85	6.3 × 7.7	151	8 × 10	192	8 × 10	214	10 × 10	238		
220	221	8 × 6.2	160	8 × 6.2	175	8 × 10	215	10 × 10	250	10 × 10	265	10 × 10	289		
330	331	8 × 6.2	190	8 × 10	240	8 × 10	270	10 × 10	305	10 × 10	324				
470	471	8 × 10	265	8 × 10	290	10 × 10	330	10 × 10	393						
680	681	8 × 10	318	10 × 10	374	10 × 10	396								
1000	102	10 × 10	400	10 × 10	454										
1500	152	10 × 10	489											Case size φ D × L (mm)	Rated ripple

Rated Ripple (mArms) at 85°C 120Hz

### ● Frequency coefficient of rated ripple current

Cap. (μF)	Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Less than 47		0.80	1.00	1.15	1.40	1.67
100 to 1500		0.85	1.00	1.08	1.20	1.30

- 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.