



**THE DATASHEET OF  
UWD1A221MCL1GS**



# ALUMINUM ELECTROLYTIC CAPACITORS

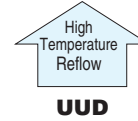
# UWD

Chip Type, Low Impedance  
High Temperature (260°C) Reflow



- Corresponding with 260°C peak reflow soldering  
Recommended reflow condition : 260°C peak 5 sec. 230°C over 60 sec.  
2 times ( $\phi 10 \times 10 : 1$  time)
- Chip type, low impedance temperature range up to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU,(EU)2015/863).
- AEC-Q200 Qualified. Please contact us for details.

**UWD**



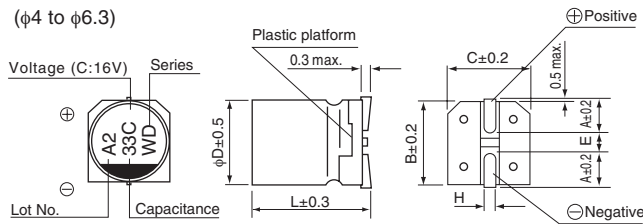
## Specifications

Item	Performance Characteristics																																
Category Temperature Range	-55 to +105°C																																
Rated Voltage Range	6.3 to 50V																																
Rated Capacitance Range	1 to 1500 $\mu$ F																																
Capacitance Tolerance	$\pm 20\%$ at 120Hz, 20°C																																
Leakage Current ※	After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01 CV or 3 ( $\mu$ A), whichever is greater.																																
Tangent of loss angle (tan $\delta$ )	<table border="1"> <thead> <tr> <th colspan="8">Measurement frequency : 120Hz at 20°C</th> </tr> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th></th> </tr> </thead> <tbody> <tr> <td>tan <math>\delta</math> (max.)</td> <td>0.26 (0.28)</td> <td>0.20 (0.24)</td> <td>0.16 (0.20)</td> <td>0.14 (0.16)</td> <td>0.12 (0.14)</td> <td>0.12 (0.14)</td> <td>( ) is <math>\phi 8</math> over</td> </tr> </tbody> </table>	Measurement frequency : 120Hz at 20°C								Rated voltage (V)	6.3	10	16	25	35	50		tan $\delta$ (max.)	0.26 (0.28)	0.20 (0.24)	0.16 (0.20)	0.14 (0.16)	0.12 (0.14)	0.12 (0.14)	( ) is $\phi 8$ over								
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Stability at Low Temperature	<table border="1"> <thead> <tr> <th colspan="8">Measurement frequency : 120Hz</th> </tr> <tr> <th colspan="2">Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Impedance ratio</td> <td>Z(-25°C) / Z(+20°C)</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT / Z20 (max.)</td> <td>Z(-55°C) / Z(+20°C)</td> <td>5</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Measurement frequency : 120Hz								Rated voltage (V)		6.3	10	16	25	35	50	Impedance ratio	Z(-25°C) / Z(+20°C)	3	2	2	2	2	2	ZT / Z20 (max.)	Z(-55°C) / Z(+20°C)	5	4	4	3	3	3
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Endurance	<p>The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 5000 hours (2000 hours for <math>\phi D = 4, 5</math> and 6.3) at 105°C.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within <math>\pm 30\%</math> of the initial capacitance value</td> </tr> <tr> <td>tan <math>\delta</math></td> <td>200% or less than 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 $\pm 30\%$ of the initial capacitance value	tan $\delta$	200% or less than the initial specified value	Leakage current	Less than or equal to the initial specified value																										
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Shelf Life	After storing the capacitors under no load at 105°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.																																
Resistance to soldering heat	<p>The capacitors are kept on a 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.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within <math>\pm 10\%</math> of the initial capacitance 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 the initial capacitance value	tan $\delta$	Less than or equal to the initial specified value	Leakage current	Less than or equal to the initial specified value																										
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Marking	Black print on the case top.																																

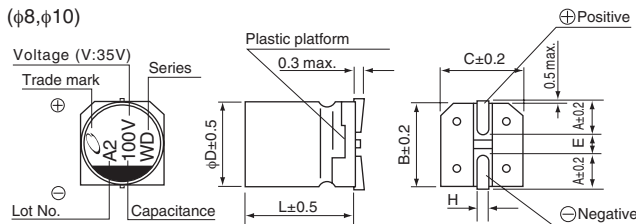
※ I : Leakage Current ( $\mu$ A), C : Rated Capacitance ( $\mu$ F), V : Rated Voltage (V)

## Chip Type

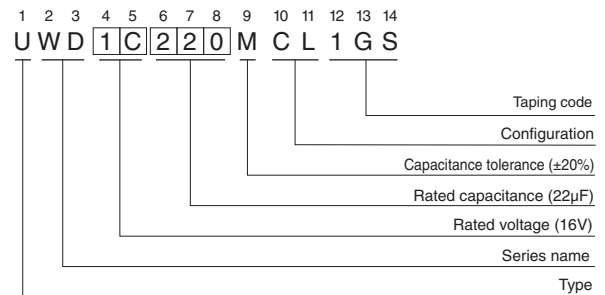
( $\phi 4$  to  $\phi 6.3$ )



( $\phi 8, \phi 10$ )



## Type numbering system (Example : 16V 22 $\mu$ F)



$\phi D \times L$	(mm)					
A	4 × 5.8	5 × 5.8	6.3 × 5.8	6.3 × 7.7	8 × 10	10 × 10
B	1.8	2.1	2.4	2.4	2.9	3.2
C	4.3	5.3	6.6	6.6	8.3	10.3
E	4.3	5.3	6.6	6.6	8.3	10.3
L	1.0	1.3	2.2	2.2	3.1	4.5
H	5.8	5.8	5.8	7.7	10	10
	0.5 to 0.8	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

## Frequency coefficient of rated ripple current

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

● Dimension table in next page.

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## ■ Dimensions

Rated Voltage (V) (code)	Rated Capacitance (μF)	Case Size φD×L (mm)	tan δ	Leakage Current (μA) (at 20°C after 2 minutes)	Impedance (Ω) max. (20°C/100kHz)	Rated Ripple (mArms) (105°C/100kHz)	Part Number
6.3 (0J)	27	4×5.8	0.26	3	1.80	80	UWD0J270MCL1GS
	33	5×5.8	0.26	3	0.76	150	UWD0J330MCL1GS
	47	5×5.8	0.26	3	0.76	150	UWD0J470MCL1GS
	56	5×5.8	0.26	3.528	0.76	150	UWD0J560MCL1GS
	68	6.3×5.8	0.26	4.284	0.44	230	UWD0J680MCL1GS
	100	6.3×5.8	0.26	6.3	0.44	230	UWD0J101MCL1GS
	150	6.3×5.8	0.26	9.45	0.44	230	UWD0J151MCL1GS
	220	6.3×5.8	0.26	13.86	0.44	230	UWD0J221MCL1GS
	330	6.3×7.7	0.26	20.79	0.34	280	UWD0J331MCL1GS
	470	8×10	0.28	29.61	0.17	450	UWD0J471MCL1GS
	680	8×10	0.28	42.84	0.17	450	UWD0J681MCL1GS
	1000	10×10	0.28	63	0.09	670	UWD0J102MCL1GS
	1500	10×10	0.28	94.5	0.09	670	UWD0J152MCL1GS
10 (1A)	22	4×5.8	0.20	3	1.80	80	UWD1A220MCL1GS
	27	5×5.8	0.20	3	0.76	150	UWD1A270MCL1GS
	33	5×5.8	0.20	3.3	0.76	150	UWD1A330MCL1GS
	47	6.3×5.8	0.20	4.7	0.44	230	UWD1A470MCL1GS
	56	6.3×5.8	0.20	5.6	0.44	230	UWD1A560MCL1GS
	68	6.3×5.8	0.20	6.8	0.44	230	UWD1A680MCL1GS
	100	6.3×5.8	0.20	10	0.44	230	UWD1A101MCL1GS
	150	6.3×5.8	0.20	15	0.44	230	UWD1A151MCL1GS
	220	6.3×7.7	0.20	22	0.34	280	UWD1A221MCL1GS
	330	8×10	0.24	33	0.17	450	UWD1A331MCL1GS
	470	8×10	0.24	47	0.17	450	UWD1A471MCL1GS
	680	10×10	0.24	68	0.09	670	UWD1A681MCL1GS
1000	10×10	0.24	100	0.09	670	UWD1A102MCL1GS	
16 (1C)	15	4×5.8	0.16	3	1.80	80	UWD1C150MCL1GS
	22	5×5.8	0.16	3.52	0.76	150	UWD1C220MCL1GS
	27	5×5.8	0.16	4.32	0.76	150	UWD1C270MCL1GS
	33	6.3×5.8	0.16	5.28	0.44	230	UWD1C330MCL1GS
	47	6.3×5.8	0.16	7.52	0.44	230	UWD1C470MCL1GS
	56	6.3×5.8	0.16	8.96	0.44	230	UWD1C560MCL1GS
	68	6.3×5.8	0.16	10.88	0.44	230	UWD1C680MCL1GS
	100	6.3×5.8	0.16	16	0.44	230	UWD1C101MCL1GS
	150	6.3×7.7	0.16	24	0.34	280	UWD1C151MCL1GS
	220	6.3×7.7	0.16	35.2	0.34	280	UWD1C221MCL1GS
	330	8×10	0.20	52.8	0.17	450	UWD1C331MCL1GS
	470	8×10	0.20	75.2	0.17	450	UWD1C471MCL1GS
	680	10×10	0.20	108.8	0.09	670	UWD1C681MCL1GS

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## ■ Dimensions

Rated Voltage (V) (code)	Rated Capacitance (μF)	Case Size φD×L (mm)	tan δ	Leakage Current (μA) (at 20°C after 2 minutes)	Impedance (Ω) max. (20°C/100kHz)	Rated Ripple (mA <sub>rms</sub> ) (105°C/100kHz)	Part Number
25 (1E)	10	4×5.8	0.14	3	1.80	80	UWD1E100MCL1GS
	15	5×5.8	0.14	3.75	0.76	150	UWD1E150MCL1GS
	22	5×5.8	0.14	5.5	0.76	150	UWD1E220MCL1GS
	27	6.3×5.8	0.14	6.75	0.44	230	UWD1E270MCL1GS
	33	6.3×5.8	0.14	8.25	0.44	230	UWD1E330MCL1GS
	47	6.3×5.8	0.14	11.75	0.44	230	UWD1E470MCL1GS
	56	6.3×5.8	0.14	14	0.44	230	UWD1E560MCL1GS
	68	6.3×5.8	0.14	17	0.44	230	UWD1E680MCL1GS
	100	6.3×7.7	0.14	25	0.34	280	UWD1E101MCL1GS
	150	8×10	0.16	37.5	0.17	450	UWD1E151MCL1GS
	220	8×10	0.16	55	0.17	450	UWD1E221MCL1GS
	330	10×10	0.16	82.5	0.09	670	UWD1E331MCL1GS
	470	10×10	0.16	117.5	0.09	670	UWD1E471MCL1GS
35 (1V)	4.7	4×5.8	0.12	3	1.80	80	UWD1V4R7MCL1GS
	10	5×5.8	0.12	3.5	0.76	150	UWD1V100MCL1GS
	15	5×5.8	0.12	5.25	0.76	150	UWD1V150MCL1GS
	22	5×5.8	0.12	7.7	0.76	150	UWD1V220MCL1GS
	27	6.3×5.8	0.12	9.45	0.44	230	UWD1V270MCL1GS
	33	6.3×5.8	0.12	11.55	0.44	230	UWD1V330MCL1GS
	47	6.3×5.8	0.12	16.45	0.44	230	UWD1V470MCL1GS
	56	6.3×7.7	0.12	19.6	0.34	280	UWD1V560MCL1GS
	68	6.3×7.7	0.12	23.8	0.34	280	UWD1V680MCL1GS
	100	8×10	0.14	35	0.17	450	UWD1V101MCL1GS
	150	8×10	0.14	52.5	0.17	450	UWD1V151MCL1GS
	220	10×10	0.14	77	0.09	670	UWD1V221MCL1GS
	330	10×10	0.14	115.5	0.09	670	UWD1V331MCL1GS
50 (1H)	1	4×5.8	0.12	3	5.00	30	UWD1H010MCL1GS
	2.2	4×5.8	0.12	3	5.00	30	UWD1H2R2MCL1GS
	3.3	4×5.8	0.12	3	5.00	30	UWD1H3R3MCL1GS
	4.7	5×5.8	0.12	3	1.52	85	UWD1H4R7MCL1GS
	10	6.3×5.8	0.12	5	0.88	165	UWD1H100MCL1GS
	15	6.3×5.8	0.12	7.5	0.88	165	UWD1H150MCL1GS
	22	6.3×5.8	0.12	11	0.88	165	UWD1H220MCL1GS
	27	6.3×7.7	0.12	13.5	0.68	185	UWD1H270MCL1GS
	33	6.3×7.7	0.12	16.5	0.68	185	UWD1H330MCL1GS
	47	6.3×7.7	0.12	23.5	0.68	185	UWD1H470MCL1GS
	56	8×10	0.14	28	0.34	300	UWD1H560MCL1GS
	68	8×10	0.14	34	0.34	300	UWD1H680MCL1GS
	100	8×10	0.14	50	0.34	300	UWD1H101MCL1GS
	150	10×10	0.14	75	0.18	670	UWD1H151MCL1GS
220	10×10	0.14	110	0.18	670	UWD1H221MCL1GS	

• For taping specifications, recommended land size/soldering by reflow and minimum order quantity, please refer to the Guidelines for Aluminum Electrolytic Capacitors.

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