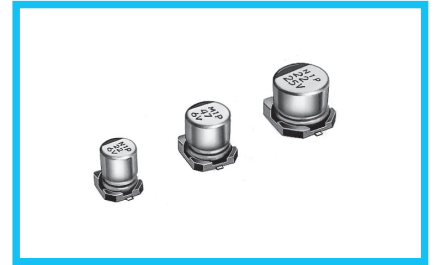
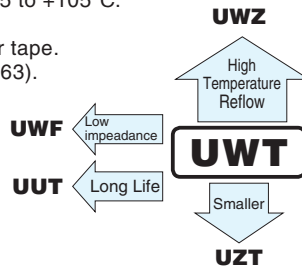


## UWT Chip Type, Wide Temperature Range



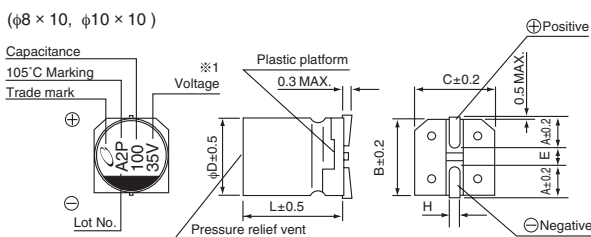
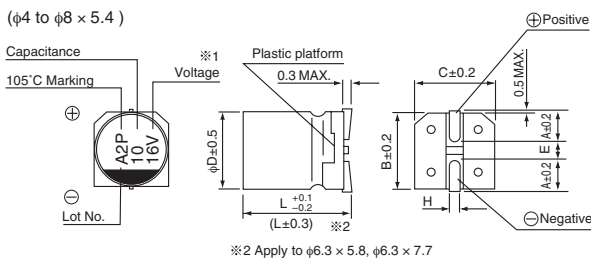
- Chip type operating over wide temperature range of to  $-55$  to  $+105^{\circ}\text{C}$ .
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU, (EU)2015/863).
- AEC-Q200 compliant. Please contact us for details.



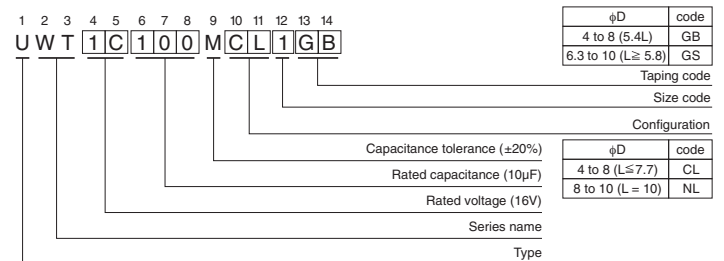
### Specifications

Item	Performance Characteristics																												
Category Temperature Range	$-55$ to $+105^{\circ}\text{C}$																												
Rated Voltage Range	4 to 50V																												
Rated Capacitance Range	1 to 1500 $\mu\text{F}$																												
Capacitance Tolerance	$\pm 20\%$ at 120Hz, $20^{\circ}\text{C}$																												
Leakage Current	After 2 minutes' application of rated voltage at $20^{\circ}\text{C}$ , leakage current is not more than $0.01\text{CV}$ or $3$ ( $\mu\text{A}$ ), whichever is greater.																												
Tangent of loss angle ( $\tan \delta$ )	Measurement frequency : 120Hz at $20^{\circ}\text{C}$ <table border="1"> <tr> <th>Rated voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> <tr> <td><math>\tan \delta</math> (MAX.)</td> <td>0.40</td> <td>0.30</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.14</td> </tr> </table>		Rated voltage (V)	4	6.3	10	16	25	35	50	$\tan \delta$ (MAX.)	0.40	0.30	0.24	0.20	0.16	0.14	0.14											
Rated voltage (V)	4	6.3	10	16	25	35	50																						
$\tan \delta$ (MAX.)	0.40	0.30	0.24	0.20	0.16	0.14	0.14																						
Stability at Low Temperature	Measurement frequency : 120Hz <table border="1"> <tr> <th colspan="2">Rated voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> <tr> <td>Impedance ratio</td> <td>Z<math>-25^{\circ}\text{C}</math> / Z<math>+20^{\circ}\text{C}</math></td> <td>7</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT / Z20 (MAX.)</td> <td>Z<math>-40^{\circ}\text{C}</math> / Z<math>+20^{\circ}\text{C}</math></td> <td>15</td> <td>8</td> <td>8</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table>		Rated voltage (V)		4	6.3	10	16	25	35	50	Impedance ratio	Z $-25^{\circ}\text{C}$ / Z $+20^{\circ}\text{C}$	7	4	3	2	2	2	2	ZT / Z20 (MAX.)	Z $-40^{\circ}\text{C}$ / Z $+20^{\circ}\text{C}$	15	8	8	4	4	3	3
Rated voltage (V)		4	6.3	10	16	25	35	50																					
Impedance ratio	Z $-25^{\circ}\text{C}$ / Z $+20^{\circ}\text{C}$	7	4	3	2	2	2	2																					
ZT / Z20 (MAX.)	Z $-40^{\circ}\text{C}$ / Z $+20^{\circ}\text{C}$	15	8	8	4	4	3	3																					
Endurance	The specifications listed at right shall be met when the capacitors are restored to $20^{\circ}\text{C}$ after the rated voltage is applied for 1000 hours at $105^{\circ}\text{C}$ .	<table border="1"> <tr> <td>Capacitance change</td> <td>Within <math>\pm 25\%</math> of the initial capacitance value for capacitors of 16V or less. Within <math>\pm 20\%</math> of the initial capacitance value for capacitors of 25V or more.</td> </tr> <tr> <td><math>\tan \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 $\pm 25\%$ of the initial capacitance value for capacitors of 16V or less. Within $\pm 20\%$ of the initial capacitance value for capacitors of 25V or more.	$\tan \delta$	200% or less than the initial specified value	Leakage current	Less than or equal to the initial specified value																					
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$\tan \delta$	200% or less than the initial specified value																												
Leakage current	Less than or equal to the initial specified value																												
Shelf Life	After storing the capacitors under no load at $105^{\circ}\text{C}$ for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at $20^{\circ}\text{C}$ , they shall meet the specified values for the endurance characteristics listed above.																												
Resistance to soldering heat	The capacitors are kept on a hot plate for 30 seconds, which is maintained at $250^{\circ}\text{C}$ . The capacitors shall meet the characteristic requirements listed at right when they are removed from the plate and restored to $20^{\circ}\text{C}$ .	<table border="1"> <tr> <td>Capacitance change</td> <td>Within <math>\pm 10\%</math> of the initial capacitance value</td> </tr> <tr> <td><math>\tan \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																					
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																												
Marking	Black print on the case top.																												

### Chip Type



### Type numbering system (Example : 16V 10 $\mu\text{F}$ )



$\phi\text{D} \times \text{L}$	(mm)							
	4 × 5.4	5 × 5.4	6.3 × 5.4	6.3 × 5.8	6.3 × 7.7	8 × 5.4	8 × 10	10 × 10
A	1.8	2.1	2.4	2.4	2.4	3.3	2.9	3.2
B	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3
C	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3
E	1.0	1.3	2.2	2.2	2.2	2.3	3.1	4.5
L	5.4	5.4	5.4	5.8	7.7	5.4	10	10
H	0.5 to 0.8	0.5 to 0.8	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

### Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

● Dimension table in next page.

## UWT

### ■ Dimensions

Rated Voltage (V) (code)	Rated Capacitance (μF)	Case Size φD×L (mm)	tan δ	Leakage Current (μA) (at 20°C after 2 minutes)	Rated Ripple (mArms) (105°C/120Hz)	Part Number
4 (0G)	22	4×5.4	0.40	3	22	UWT0G220MCL1GB
	33	5×5.4	0.40	3	30	UWT0G330MCL1GB
	47	5×5.4	0.40	3	36	UWT0G470MCL1GB
	100	6.3×5.4	0.40	4	60	UWT0G101MCL1GB
	150	6.3×5.8	0.40	6	86	UWT0G151MCL1GS
	220	8×5.4	0.40	8.8	102	UWT0G221MCL1GB
	220	6.3×5.8	0.40	8.8	91	UWT0G221MCL6GS
	330	6.3×7.7	0.40	13.2	105	UWT0G331MCL1GS
	470	8×10	0.40	18.8	210	UWT0G471MNL1GS
	680	8×10	0.40	27.2	210	UWT0G681MNL1GS
	1000	8×10	0.40	40	230	UWT0G102MNL1GS
1500	10×10	0.40	60	310	UWT0G152MNL1GS	
6.3 (0J)	22	4×5.4	0.30	3	22	UWT0J220MCL1GB
	33	5×5.4	0.30	3	30	UWT0J330MCL1GB
	47	5×5.4	0.30	3	36	UWT0J470MCL1GB
	100	6.3×5.4	0.30	6.3	60	UWT0J101MCL1GB
	150	6.3×5.8	0.30	9.45	86	UWT0J151MCL1GS
	220	8×5.4	0.30	13.86	102	UWT0J221MCL1GB
	220	6.3×5.8	0.30	13.86	91	UWT0J221MCL6GS
	330	6.3×7.7	0.30	20.79	105	UWT0J331MCL1GS
	470	8×10	0.30	29.61	210	UWT0J471MNL1GS
	680	8×10	0.30	42.84	210	UWT0J681MNL1GS
	1000	8×10	0.30	63	230	UWT0J102MNL1GS
1500	10×10	0.30	94.5	310	UWT0J152MNL1GS	
10 (1A)	22	5×5.4	0.24	3	27	UWT1A220MCL1GB
	33	5×5.4	0.24	3.3	35	UWT1A330MCL1GB
	47	6.3×5.4	0.24	4.7	46	UWT1A470MCL1GB
	100	6.3×5.4	0.24	10	60	UWT1A101MCL1GB
	150	6.3×5.8	0.24	15	86	UWT1A151MCL1GS
	220	6.3×7.7	0.24	22	105	UWT1A221MCL1GS
	330	8×10	0.24	33	195	UWT1A331MNL1GS
	470	8×10	0.24	47	210	UWT1A471MNL1GS
	680	10×10	0.24	68	310	UWT1A681MNL1GS
1000	10×10	0.24	100	310	UWT1A102MNL1GS	
16 (1C)	10	4×5.4	0.20	3	18	UWT1C100MCL1GB
	22	5×5.4	0.20	3.52	30	UWT1C220MCL1GB
	33	6.3×5.4	0.20	5.28	40	UWT1C330MCL1GB
	47	6.3×5.4	0.20	7.52	50	UWT1C470MCL1GB
	100	6.3×5.4	0.20	16	60	UWT1C101MCL1GB
	150	6.3×7.7	0.20	24	95	UWT1C151MCL1GS
	220	6.3×7.7	0.20	35.2	105	UWT1C221MCL1GS
	330	8×10	0.20	52.8	195	UWT1C331MNL1GS
	470	8×10	0.20	75.2	230	UWT1C471MNL1GS
680	10×10	0.20	108.8	310	UWT1C681MNL1GS	

UWT

## ■ Dimensions

Rated Voltage (V) (code)	Rated Capacitance (μF)	Case Size φD×L (mm)	tan δ	Leakage Current (μA) (at 20°C after 2 minutes)	Rated Ripple (mArms) (105°C/120Hz)	Part Number
25 (1E)	4.7	4×5.4	0.16	3	13	UWT1E4R7MCL1GB
	10	5×5.4	0.16	3	23	UWT1E100MCL1GB
	22	6.3×5.4	0.16	5.5	38	UWT1E220MCL1GB
	33	6.3×5.4	0.16	8.25	48	UWT1E330MCL1GB
	47	8×5.4	0.16	11.75	66	UWT1E470MCL1GB
	47	6.3×5.8	0.16	11.75	59	UWT1E470MCL6GS
	100	6.3×7.7	0.16	25	91	UWT1E101MCL1GS
	150	8×10	0.16	37.5	140	UWT1E151MNL1GS
	220	8×10	0.16	55	155	UWT1E221MNL1GS
	330	8×10	0.16	82.5	190	UWT1E331MNL1GS
470	10×10	0.16	117.5	300	UWT1E471MNL1GS	
35 (1V)	4.7	4×5.4	0.14	3	15	UWT1V4R7MCL1GB
	10	5×5.4	0.14	3.5	25	UWT1V100MCL1GB
	22	6.3×5.4	0.14	7.7	42	UWT1V220MCL1GB
	33	8×5.4	0.14	11.55	59	UWT1V330MCL1GB
	33	6.3×5.8	0.14	11.55	52	UWT1V330MCL6GS
	47	6.3×5.8	0.14	16.45	63	UWT1V470MCL1GS
	100	6.3×7.7	0.14	35	84	UWT1V101MCL1GS
	150	8×10	0.14	52.5	155	UWT1V151MNL1GS
	220	8×10	0.14	77	190	UWT1V221MNL1GS
	330	10×10	0.14	115.5	300	UWT1V331MNL1GS
50 (1H)	1	4×5.4	0.14	3	6.2	UWT1H010MCL1GB
	2.2	4×5.4	0.14	3	11	UWT1H2R2MCL1GB
	3.3	4×5.4	0.14	3	14	UWT1H3R3MCL1GB
	4.7	5×5.4	0.14	3	19	UWT1H4R7MCL1GB
	10	6.3×5.4	0.14	5	30	UWT1H100MCL1GB
	22	8×5.4	0.14	11	51	UWT1H220MCL1GB
	22	6.3×5.8	0.14	11	45	UWT1H220MCL6GS
	33	6.3×7.7	0.14	16.5	60	UWT1H330MCL1GS
	47	6.3×7.7	0.14	23.5	63	UWT1H470MCL1GS
	100	8×10	0.14	50	140	UWT1H101MNL1GS
	150	10×10	0.14	75	180	UWT1H151MNL1GS
	220	10×10	0.14	110	220	UWT1H221MNL1GS

- Taping specifications are given in page 20.
- Recommended land size, soldering by reflow are given in page 16, 17.
- Please select UUX(p.174), UUU(p.184) series if high C/V products are required.
- Please refer to page 3 for the minimum order quantity.