

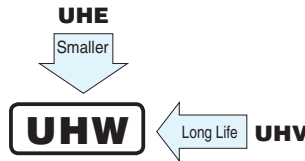
# ALUMINUM ELECTROLYTIC CAPACITORS

**UHW** Miniature Sized, High Ripple Current, High Reliability



Expanded

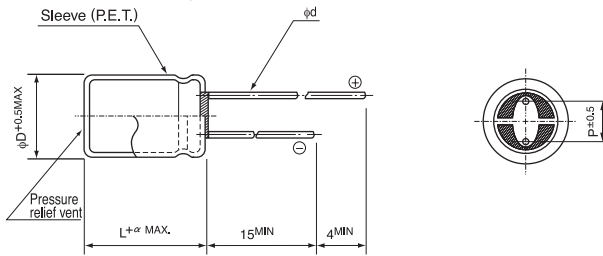
- Lower impedance at high frequency range.
- Smaller case size and high ripple current.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

Item	Performance Characteristics											
Category Temperature Range	-40 to +105											
Rated Voltage Range	6.3 to 100V											
Rated Capacitance Range	82 to 15000µF											
Capacitance Tolerance	±20% at 120Hz, 20°C											
Leakage Current	After 2 minute's application of rated voltage at 20°C, leakage current is not more than 0.01 CV(µA)											
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100	Measurement frequency : 120Hz, Temperature : 20°C	
	tan δ (MAX.)	0.21	0.18	0.15	0.13	0.11	0.10	0.09	0.09	0.08		
For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF.												
Stability at Low Temperature	Rated voltage (V)		6.3	10	16	25	35	50	63	80	100	Measurement frequency : 120Hz
	Impedance ratio Z-25°C / Z+20°C		2	2	2	2	2	2	2	2	2	
ZT / Z20 (MAX.)		Z-40°C / Z+20°C	3	3	3	3	3	3	3	3	3	
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 10000 hours at 105°C, the peak voltage shall not exceed the rated voltage.											
	Capacitance Change	Within ±25% of the initial capacitance value (6.3V 10V: ±30%)										
	tan δ	200% or less than the initial specified value										
Marking	Printed with white color letter on black sleeve.											
	Leakage current	Less than or equal to the initial specified value										

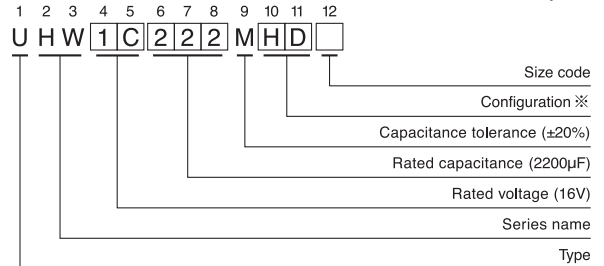
## Radial Lead Type



		(mm)			
α	(L < 20)	1.5			
	(L ≥ 20)	2.0			
	φD	10	12.5	16	18
	P	5.0	5.0	7.5	7.5
	φd	0.6	0.6※	0.8	0.8

※ In case L > 25 for the φ12.5 dia. unit, lead dia. φ d = 0.8mm.

## Type numbering system (Example : 16V 2200µF)



※ Configuration	
φ D	Pb-free lead finishing Pb-free PET sleeve
10	PD
12.5 to 18	HD

## Frequency coefficient of rated ripple current

Cap. (µF)	Frequency	120Hz	1kHz	10kHz	10kHz or more
82 to 180		0.40	0.75	0.90	1.00
220 to 560		0.50	0.85	0.94	1.00
680 to 1800		0.60	0.87	0.95	1.00
2200 to 3900		0.75	0.90	0.95	1.00
4700 to 15000		0.85	0.95	0.98	1.00

## UHW

### ■ Dimensions

V (Code) Item Cap.(μF) Code		6.3 (0J)				10 (1A)			
		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
1200	122					10 × 16	0.030	0.090	2000
1500	152					10 × 16	0.030	0.090	2000
1800	182	10 × 16	0.030	0.090	2000	10 × 20	0.020	0.060	2500
2200	222	10 × 20	0.020	0.060	2500	10 × 25	0.017	0.051	2900
2700	272	10 × 20	0.020	0.060	2500	12.5 × 20	0.017	0.051	2600
3300	332	10 × 25	0.017	0.051	2900	12.5 × 20	0.017	0.051	2600
3900	392	12.5 × 20	0.017	0.051	2600	12.5 × 25	0.015	0.045	3200
4700	472	12.5 × 25	0.015	0.045	3200	12.5 × 31.5	0.012	0.036	3795
						▲ 16 × 20	0.015	0.045	3575
5600	562	12.5 × 31.5	0.012	0.036	3795	12.5 × 35.5	0.011	0.033	4120
		▲ 12.5 × 25	0.015	0.045	3200	▲ 16 × 25	0.013	0.039	3810
6800	682	12.5 × 31.5	0.011	0.033	3795	16 × 25	0.013	0.039	3810
		▲ 16 × 20	0.015	0.045	3575				
8200	822	16 × 25	0.013	0.039	3810	16 × 31.5	0.011	0.033	4000
10000	103	16 × 25	0.013	0.039	3810	16 × 31.5	0.011	0.033	4000
12000	123	16 × 31.5	0.011	0.033	4000	16 × 35.5	0.010	0.030	4200
15000	153	16 × 35.5	0.010	0.030	4200				

V (Code) Item Cap.(μF) Code		16 (1C)				25 (1E)			
		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
680	681					10 × 16	0.030	0.090	2000
820	821	10 × 16	0.030	0.090	2000	10 × 20	0.020	0.060	2500
						▲ 10 × 16	0.030	0.090	2000
1000	102	10 × 16	0.030	0.090	2000	10 × 20	0.020	0.060	2500
1200	122	10 × 20	0.020	0.060	2500	10 × 25	0.017	0.051	2900
		▲ 10 × 16	0.030	0.090	2000				
1500	152	10 × 20	0.020	0.060	2500	12.5 × 20	0.017	0.051	2600
1800	182	10 × 25	0.017	0.051	2900	12.5 × 25	0.015	0.045	3200
2200	222	12.5 × 20	0.017	0.051	2600	12.5 × 25	0.015	0.045	3200
						▲ 16 × 20	0.015	0.045	3575
2700	272	12.5 × 25	0.015	0.045	3200	12.5 × 31.5	0.012	0.036	3795
						▲ 16 × 20	0.015	0.045	3576
3300	332	12.5 × 25	0.015	0.045	3200	12.5 × 35.5	0.011	0.033	4120
		▲ 16 × 20	0.015	0.045	3575	▲ 16 × 25	0.013	0.039	3810
3900	392	12.5 × 31.5	0.012	0.036	3795	16 × 25	0.013	0.039	3810
		▲ 16 × 20	0.015	0.045	3575				
4700	472	12.5 × 35.5	0.011	0.033	4120	16 × 31.5	0.011	0.033	4000
		▲ 16 × 25	0.013	0.039	3810				
5600	562	16 × 25	0.013	0.039	3810	16 × 35.5	0.010	0.030	4200
6800	682	16 × 31.5	0.011	0.033	4000				
8200	822	16 × 35.5	0.010	0.030	4200				

▲ : In this case, [6] will be put at 12th digit of type numbering system.

## UHW

### ■ Dimensions

Cap.(μF) Code		V (Code) Item	35 (1V)			50 (1H)				
			Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C /100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C /100kHz
				20°C /100kHz	-10°C /100kHz			20°C /100kHz	-10°C /100kHz	
220	221					10 × 16	0.042	0.126	1650	
270	271					10 × 20	0.030	0.090	2060	
330	331					10 × 20	0.030	0.090	2060	
390	391	10 × 16	0.030	0.090	2000	10 × 25	0.028	0.084	2420	
						▲10 × 20	0.030	0.090	2060	
470	471	10 × 16	0.030	0.090	2000	10 × 25	0.028	0.084	2420	
						▲12.5 × 20	0.027	0.081	2300	
560	561	10 × 20	0.020	0.060	2500	12.5 × 20	0.027	0.081	2300	
680	681	10 × 25	0.017	0.051	2900	12.5 × 25	0.023	0.069	2800	
		▲10 × 20	0.020	0.060	2500					
820	821	10 × 25	0.017	0.051	2900	12.5 × 25	0.023	0.069	2800	
		▲12.5 × 20	0.017	0.051	2600	▲16 × 20	0.023	0.069	3070	
1000	102	12.5 × 20	0.017	0.051	2600	12.5 × 31.5	0.020	0.060	3500	
						▲16 × 25	0.021	0.063	3270	
1200	122	12.5 × 25	0.015	0.045	3200	16 × 25	0.021	0.063	3270	
1500	152	16 × 20	0.015	0.045	3575	12.5 × 35.5	0.019	0.057	3810	
						▲16 × 25	0.021	0.063	3270	
1800	182	12.5 × 31.5	0.012	0.036	3795	16 × 31.5	0.019	0.057	3430	
		▲16 × 25	0.013	0.039	3810					
2200	222	12.5 × 35.5	0.011	0.033	4120	16 × 31.5	0.019	0.057	3430	
		▲16 × 25	0.013	0.039	3810					
2700	272					16 × 35.5	0.018	0.054	3600	
3300	332	16 × 31.5	0.011	0.033	4000					
3900	392	16 × 35.5	0.010	0.030	4200					

Cap.(μF) Code		V (Code) Item	63 (1J)			80 (1K)				
			Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C /100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C /100kHz
				20°C /100kHz	-10°C /100kHz			20°C /100kHz	-10°C /100kHz	
120	121					10 × 16	0.115	0.47	1040	
180	181	10 × 16	0.115	0.47	1200	10 × 20	0.088	0.34	1430	
						▲12.5 × 15	0.115	0.47	1430	
220	221					10 × 25	0.072	0.28	1620	
270	271	10 × 20	0.088	0.34	1570	10 × 31.5	0.063	0.18	1750	
						▲12.5 × 20	0.065	0.18	1750	
330	331	10 × 25	0.072	0.28	1990					
390	391	10 × 31.5	0.063	0.18	2050					
		▲12.5 × 20	0.065	0.18	1990	12.5 × 25	0.049	0.14	2210	
470	471					12.5 × 31.5	0.044	0.13	2400	
						▲16 × 20	0.050	0.15	1950	
560	561	12.5 × 25	0.049	0.14	2460	12.5 × 35.5	0.038	0.11	2600	
						▲18 × 20	0.047	0.14	2270	
680	681	12.5 × 31.5	0.044	0.13	2760	12.5 × 40	0.033	0.095	2860	
		▲16 × 20	0.050	0.15	2380	▲16 × 25	0.040	0.12	2430	
820	821	12.5 × 35.5	0.038	0.11	3040	16 × 31.5	0.033	0.095	2640	
		▲18 × 20	0.047	0.14	2460	▲18 × 25	0.038	0.11	2500	
1000	102	12.5 × 40	0.033	0.095	3100					
		▲16 × 25	0.040	0.12	2890	16 × 35.5	0.030	0.086	2860	
1200	122	16 × 31.5	0.025	0.072	2930	16 × 40	0.028	0.081	3510	
		▲18 × 25	0.038	0.11	2930	▲18 × 31.5	0.031	0.090	2860	
1500	152	16 × 35.5	0.023	0.066	3100					
		▲18 × 31.5	0.024	0.069	3100	18 × 35.5	0.028	0.081	3510	
1800	182	16 × 40	0.021	0.060	3510					
		▲18 × 35.5	0.022	0.063	3510	18 × 40	0.027	0.076	3860	
2200	222	18 × 40	0.020	0.057	3860					

▲ : In this case, [6] will be put at 12th digit of type numbering system.

## UHW

### ■ Dimensions

Cap.( $\mu$ F)	Code	V (Code)	Item	100 (2A)			
				Case size $\phi$ D $\times$ L (mm)	Impedance ( $\Omega$ ) MAX.		Rated ripple (mArms) 105°C /100kHz
					20°C /100kHz	-10°C /100kHz	
82	82		10 $\times$ 16	0.115	0.47	1040	
100	101		10 $\times$ 20	0.088	0.34	1430	
			▲12.5 $\times$ 15	0.115	0.47	1430	
120	121		10 $\times$ 25	0.072	0.28	1620	
180	181		12.5 $\times$ 20	0.065	0.18	1750	
220	221		12.5 $\times$ 25	0.049	0.14	2210	
270	271		12.5 $\times$ 31.5	0.044	0.13	2400	
			▲ 16 $\times$ 20	0.050	0.15	1950	
390	391		12.5 $\times$ 35.5	0.038	0.11	2600	
			▲ 16 $\times$ 25	0.040	0.12	2430	
			※ 18 $\times$ 20	0.047	0.14	2270	
470	471		12.5 $\times$ 40	0.033	0.095	2860	
			▲ 18 $\times$ 25	0.038	0.11	2500	
560	561		16 $\times$ 31.5	0.033	0.095	2640	
680	681		16 $\times$ 35.5	0.030	0.086	2860	
			▲ 18 $\times$ 31.5	0.031	0.090	2860	
820	821		16 $\times$ 40	0.028	0.081	3510	
			▲ 18 $\times$ 35.5	0.028	0.081	3510	
1000	102		18 $\times$ 40	0.027	0.076	3860	

▲: In this case, [6] will be put at 12th digit of type numbering system.

※: In this case, [3] will be put at 12th digit of type numbering system.