

# UHW

Miniature Sized, High Ripple Current, High Reliability



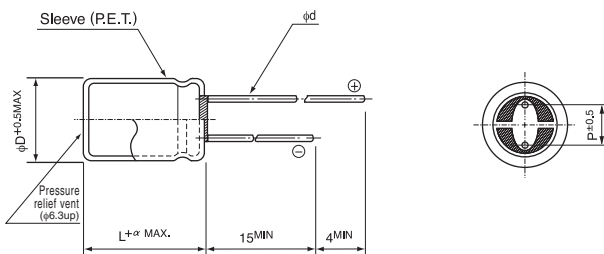
- Lower impedance at high frequency range.
- Smaller case size and high ripple current.
- Compliant to the RoHS directive (2011/65/EU,(EU)2015/863).



## Specifications

Item	Performance Characteristics											
Category Temperature Range	-40 to +105°C											
Rated Voltage Range	6.3 to 100V											
Rated Capacitance Range	8.2 to 15000µF											
Capacitance Tolerance	±20% at 120Hz, 20°C											
Leakage Current	After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01CV (µA)											
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100	120Hz	
	tan δ (MAX.)	0.21	0.18	0.15	0.13	0.11	0.10	0.09	0.09	0.08	20°C	
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	120Hz	
	Impedance ratio (MAX.)	Z-25°C / Z+20°C	2	2	2	2	2	2	2	2	2	
		Z-40°C / Z+20°C	5	5	4	4	4	4	3	3	3	
The following specifications shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied at 105°C, the peak voltage shall not exceed the rated voltage.												
Endurance	Case size	φD ≤ 6.3	8×11.5	8×15, 8×20	φD ≥ 10							
	Rated voltage (V)	6.3V	6000 hours	8000 hours	9000 hours	10000 hours						
		10 to 50V	7000 hours	9000 hours	10000 hours	10000 hours						
		63 to 100V	8000 hours	10000 hours	11000 hours	12000 hours						
	Capacitance change	Within ±25% of the initial capacitance value (6.3V 10V : ±30%)										
	tan δ	200% or less than the initial specified value										
Leakage current	Less than or equal to the initial specified value											
Marking	Printed with white color letter on black sleeve.											

## Radial Lead Type



α	(L < 20)		(L ≥ 20)							
	1.5	2.0	φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	5.0	3.5	5.0	5.0	7.5	7.5	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.8

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

• Please refer to page 20 about the end seal configuration.

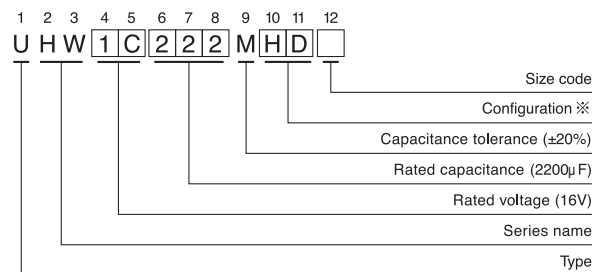
### Frequency coefficient of rated ripple current

Cap. (µF)	Frequency	120Hz	1kHz	10kHz	10kHz or more
8.2 to 33		0.40	0.70	0.90	1.00
39 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

Please refer to page 20, 21, 22 about the formed or taped product spec.  
Please refer to page 4 for the minimum order quantity.

• Dimension table in next page.

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



※ Configuration

φ D	Pb-free leadwire Pb-free PET sleeve
5	DD
6.3	ED
8 - 10	PD
12.5 to 18	HD

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### ■ Dimensions

Cap.(μF) Code		V (Code) Item		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	
150	151										
220	221	5 × 11		0.47	1.50	450		0.47	1.50	450	
330	331						6.3 × 11	0.20	0.66	700	
470	471	6.3 × 11		0.20	0.66	700					
560	561						8 × 11.5	0.10	0.36	1200	
680	681										
820	821	8 × 11.5		0.10	0.36	1200	8 × 15	0.054	0.17	1600	
1000	102	8 × 15		0.054	0.17	1600	10 × 12.5	0.048	0.15	1700	
1200	122	10 × 12.5		0.048	0.15	1700	▲8 × 20	0.038	0.12	1960	
							10 × 16	0.030	0.090	2000	
1500	152	8 × 20		0.038	0.12	1960	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		0.012	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					

Cap.(μF) Code		V (Code) Item		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	
68	680										
120	121	5 × 11		0.47	1.50	450		0.47	1.50	450	
150	151						6.3 × 11	0.20	0.66	700	
180	181						6.3 × 11	0.20	0.66	700	
270	271	6.3 × 11		0.20	0.66	700					
330	331						8 × 11.5	0.10	0.36	1200	
390	391						8 × 15	0.054	0.17	1600	
470	471	8 × 11.5		0.10	0.36	1200	10 × 12.5	0.048	0.15	1700	
560	561	8 × 15		0.054	0.17	1600	8 × 20	0.038	0.12	1960	
680	681	10 × 12.5		0.048	0.15	1700	10 × 16	0.030	0.090	2000	
820	821	▲8 × 20		0.038	0.12	1960	10 × 20	0.020	0.060	2500	
		10 × 16		0.030	0.090	2000	▲10 × 16	0.030	0.090	2000	
1000	102	▲8 × 20		0.038	0.12	1960	10 × 20	0.020	0.060	2500	
		10 × 16		0.030	0.090	2000					
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	3575	
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					

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### ■ Dimensions

Cap.( $\mu$ F)	Code	V (Code)	Item	35 (1V)			50 (1H)				
				Case size $\phi$ D $\times$ L (mm)	Impedance ( $\Omega$ ) MAX.		Rated ripple (mArms) 105°C /100kHz	Case size $\phi$ D $\times$ L (mm)	Impedance ( $\Omega$ ) MAX.		Rated ripple (mArms) 105°C /100kHz
					20°C /100kHz	-10°C /100kHz			20°C /100kHz	-10°C /100kHz	
27	270						5 $\times$ 11	0.47	1.50	450	
47	470			5 $\times$ 11	0.47	1.50					
56	560						6.3 $\times$ 11	0.20	0.66	700	
100	101			6.3 $\times$ 11	0.20	0.66	8 $\times$ 11.5	0.10	0.36	1200	
120	121						8 $\times$ 11.5	0.10	0.36	1200	
150	151						8 $\times$ 15	0.054	0.17	1600	
180	181			8 $\times$ 11.5	0.10	0.36	10 $\times$ 12.5	0.048	0.15	1700	
220	221			8 $\times$ 15	0.054	0.17	▲10 $\times$ 12.5	0.048	0.15	1700	
						10 $\times$ 16	0.042	0.126	1650		
270	271			8 $\times$ 15	0.054	0.17	▲8 $\times$ 20	0.038	0.12	1960	
				▲10 $\times$ 12.5	0.048	0.15	1700	10 $\times$ 20	0.030	0.090	2060
330	331			10 $\times$ 12.5	0.048	0.15	1700	10 $\times$ 20	0.030	0.090	2060
390	391			▲8 $\times$ 20	0.038	0.12	1960	10 $\times$ 25	0.028	0.084	2420
				10 $\times$ 16	0.030	0.090	2000	▲10 $\times$ 20	0.030	0.090	2060
470	471			10 $\times$ 16	0.030	0.090	2000	10 $\times$ 25	0.028	0.084	2420
							▲12.5 $\times$ 20	0.027	0.081	2300	
560	561			10 $\times$ 20	0.020	0.060	2500	12.5 $\times$ 20	0.027	0.081	2300
680	681			10 $\times$ 25	0.017	0.051	2900	12.5 $\times$ 25	0.023	0.069	2800
				▲10 $\times$ 20	0.020	0.060	2500				
820	821			10 $\times$ 25	0.017	0.051	2900	12.5 $\times$ 25	0.023	0.069	2800
				▲12.5 $\times$ 20	0.017	0.051	2600	▲16 $\times$ 20	0.023	0.069	3070
1000	102			12.5 $\times$ 20	0.017	0.051	2600	12.5 $\times$ 31.5	0.020	0.060	3500
							▲16 $\times$ 25	0.021	0.063	3270	
1200	122			12.5 $\times$ 25	0.015	0.045	3200	16 $\times$ 25	0.021	0.063	3270
1500	152			16 $\times$ 20	0.015	0.045	3575	12.5 $\times$ 35.5	0.019	0.057	3810
							▲16 $\times$ 25	0.021	0.063	3270	
1800	182			12.5 $\times$ 31.5	0.012	0.036	3795	16 $\times$ 31.5	0.019	0.057	3430
				▲16 $\times$ 25	0.013	0.039	3810				
2200	222			12.5 $\times$ 35.5	0.011	0.033	4120	16 $\times$ 31.5	0.019	0.057	3430
				▲16 $\times$ 25	0.013	0.039	3810				
2700	272						16 $\times$ 35.5	0.018	0.054	3600	
3300	332			16 $\times$ 31.5	0.011	0.033	4000				
3900	392			16 $\times$ 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	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	
12	120					5 × 11	1.20	5.40	310	
18	180		5 × 11	1.20	5.40					
27	270					6.3 × 11	0.46	2.10	500	
39	390		6.3 × 11	0.46	2.10					
47	470		6.3 × 11	0.46	2.10	8 × 11.5	0.29	1.30	950	
68	680		8 × 11.5	0.29	1.30	8 × 15	0.20	0.90	1230	
82	820		8 × 11.5	0.29	1.30	10 × 12.5	0.17	0.66	1280	
100	101		8 × 15	0.20	0.90	8 × 20	0.16	0.66	1580	
120	121		8 × 15	0.20	0.90	10 × 16	0.115	0.47	1040	
		▲10 × 12.5	0.17	0.66	1280					
150	151		8 × 20	0.16	0.66					
		▲10 × 12.5	0.17	0.66	1280					
180	181		▲8 × 20	0.16	0.66	10 × 20	0.088	0.34	1430	
			10 × 16	0.115	0.47	1200	▲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 × 25	0.049	0.14	2210
			▲12.5 × 20	0.065	0.18	1990				
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 × 35.5	0.030	0.086	2860
			▲16 × 25	0.040	0.12	2890				
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 × 35.5	0.028	0.081	3510
			▲18 × 31.5	0.024	0.069	3100				
1800	182		16 × 40	0.021	0.060	3510	18 × 40	0.027	0.076	3860
			▲18 × 35.5	0.022	0.063	3510				
2200	222		18 × 40	0.020	0.057	3860				

Cap.(μF)	Code	Item	100 (2A)			
			Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C /100kHz
				20°C /100kHz	-10°C /100kHz	
8.2	8R2		5 × 11	1.20	5.40	310
18	180		6.3 × 11	0.46	2.10	500
33	330		8 × 11.5	0.29	1.30	950
47	470		8 × 15	0.20	0.90	1230
56	560		10 × 12.5	0.17	0.66	1280
68	680		8 × 20	0.16	0.66	1580
82	820		10 × 16	0.115	0.47	1040
100	101		10 × 20	0.088	0.34	1430
			▲12.5 × 15	0.115	0.47	1430
120	121		10 × 25	0.072	0.28	1620
180	181		12.5 × 20	0.065	0.18	1750
220	221		12.5 × 25	0.049	0.14	2210
270	271		12.5 × 31.5	0.044	0.13	2400
			▲16 × 20	0.050	0.15	1950
390	391		12.5 × 35.5	0.038	0.11	2600
			▲16 × 25	0.040	0.12	2430
470	471		●18 × 20	0.047	0.14	2270
			12.5 × 40	0.033	0.095	2860
560	561		▲18 × 25	0.038	0.11	2500
			16 × 31.5	0.033	0.095	2640
680	681		16 × 35.5	0.030	0.086	2860
			▲18 × 31.5	0.031	0.090	2860
820	821		16 × 40	0.028	0.081	3510
			▲18 × 35.5	0.028	0.081	3510
1000	102		18 × 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.