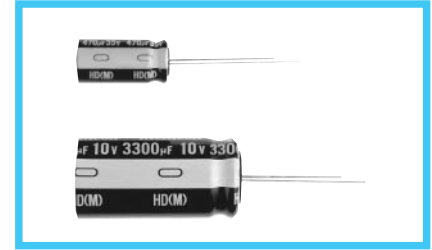
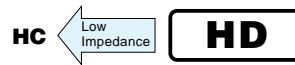


**HD** High Ripple Low Impedance series



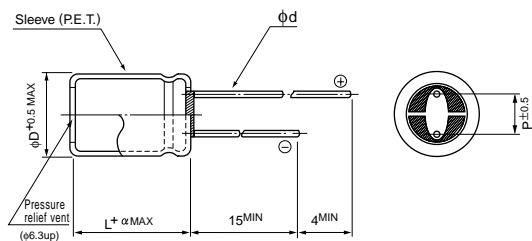
- Lower impedance at high frequency range.
- Smaller case size and high ripple current.



## Specifications

Item	Performance Characteristics							
Category Temperature Range	-40 ~ +105°C							
Rated Voltage Range	6.3 ~ 50V							
Rated Capacitance Range	22 ~ 6800µF							
Capacitance Tolerance	±20% at 120Hz, 20°C							
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (µA), whichever is greater.							
tan δ	Rated voltage (V)	6.3	10	16	25	35	50	120Hz 20°C
	tan δ (MAX.)	0.22	0.19	0.16	0.14	0.12	0.10	
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	120Hz
	Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C	2	2	2	2	2	
		Z-40°C / Z+20°C	3	3	3	3	3	3
Endurance	After an application of D.C. bias voltage plus the rated ripple current for 5000 hours (φD ≤ 6.3 : 2000 hours, φD=8 : 3000 hours, φD=10 : 4000 hours) at 105°C the peak voltage shall not exceed the rated D.C. voltage, capacitors meet the characteristic requirements listed below.							
	Capacitance change	Within ± 25% of initial value						
	tan δ	200% or less of initial specified value						
	Leakage current	Initial specified value or less						
Marking	Printed with white color letter on black sleeve.							

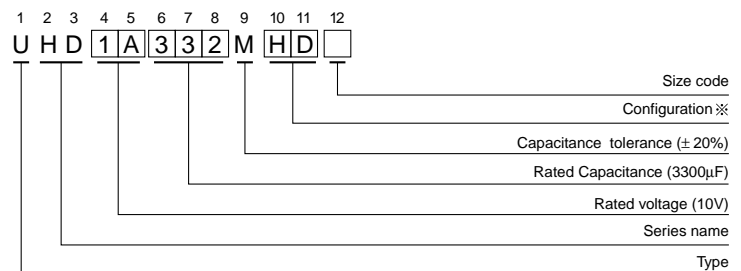
## Radial Lead Type



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

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

## Type numbering system (Example : 10V 3300µF)



### ※ Configuration

φ D	Pb free lead finishing Pb free PET sleeve	Sn-Pb lead finishing PVC sleeve contain Pb
5	DD	DH
6.3	ED	EH
8 - 10	PD	PH
12.5 - 16	HD	HH

※ Please contact to us if other configurations are required.

The laminated case is also available upon request.  
Please refer to page 19, 20, 21 about the formed or taped product spec.  
Please refer to page 3 for the minimum order quantity.

- Dimension table in next page.

## Standard ratings

V (Code)		6.3 (0J)				10 (1A)			
Cap. (μF)	Item Code	Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
100	101					5 × 11	0.30	1.0	250
150	151	5 × 11	0.30	1.0	250				
220	221					6.3 × 11	0.13	0.41	405
330	331	6.3 × 11	0.13	0.41	405				
470	471					8 × 11.5	0.072	0.22	760
560	561	8 × 11.5	0.072	0.22	760				
680	681					8 × 15	0.056	0.17	995
		▲10 × 12.5	0.053	0.16	1030				
820	821	8 × 15	0.056	0.17	995				
1000	102	10 × 12.5	0.053	0.16	1030	8 × 20	0.041	0.13	1250
		▲10 × 16	0.038	0.12	1430	▲10 × 16	0.038	0.12	1430
1200	122	8 × 20	0.041	0.13	1250	10 × 20	0.023	0.069	1820
		▲10 × 16	0.038	0.12	1430				
1500	152	10 × 20	0.023	0.069	1820	10 × 25	0.022	0.066	2150
2200	222	10 × 25	0.022	0.066	2150	12.5 × 20	0.021	0.053	2360
3300	332	12.5 × 20	0.021	0.053	2360	12.5 × 25	0.018	0.045	2770
3900	392	12.5 × 25	0.018	0.045	2770	12.5 × 31.5	0.016	0.041	3290
		▲16 × 20	0.018	0.045	3140	▲16 × 20	0.018	0.045	3140
4700	472	12.5 × 31.5	0.016	0.041	3290	12.5 × 35.5	0.015	0.039	3400
5600	562	12.5 × 35.5	0.015	0.039	3400	16 × 25	0.016	0.043	3460
		▲16 × 20	0.018	0.045	3140				
6800	682	16 × 25	0.016	0.043	3460				

V (Code)		16 (1C)				25 (1E)			
Cap. (μF)	Item Code	Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
47	470					5 × 11	0.30	1.0	250
56	560	5 × 11	0.30	1.0	250				
100	101					6.3 × 11	0.13	0.41	405
120	121	6.3 × 11	0.13	0.41	405				
220	221					8 × 11.5	0.072	0.22	760
330	331	8 × 11.5	0.072	0.22	760	8 × 15	0.056	0.17	995
		▲10 × 12.5	0.053	0.16	1030	▲10 × 12.5	0.053	0.16	1030
470	471	8 × 15	0.056	0.17	995	8 × 20	0.041	0.13	1250
		▲10 × 12.5	0.053	0.16	1030	▲10 × 16	0.038	0.12	1430
680	681	8 × 20	0.041	0.13	1250	10 × 20	0.023	0.069	1820
		▲10 × 16	0.038	0.12	1430				
820	821				10 × 25	0.022	0.066	2150	
1000	102	10 × 20	0.023	0.069	1820	12.5 × 20	0.021	0.053	2360
1200	122	10 × 25	0.022	0.066	2150				
1500	152	12.5 × 20	0.021	0.053	2360	12.5 × 25	0.018	0.045	2770
1800	182					12.5 × 31.5	0.016	0.041	3290
		▲16 × 20	0.018	0.045	3140	▲16 × 20	0.018	0.045	3140
2200	222	12.5 × 25	0.018	0.045	2770	12.5 × 35.5	0.015	0.039	3400
2700	272	12.5 × 31.5	0.016	0.041	3290	16 × 25	0.016	0.043	3460
		▲16 × 20	0.018	0.045	3140				
3300	332	12.5 × 35.5	0.015	0.039	3400				
3900	392	16 × 25	0.016	0.043	3460				

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

## Standard ratings

V (Code) Item Cap. (μF) Code		35 (1V)				50 (1H)			
		Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
22	220					5 × 11	0.34	1.18	238
33	330	5 × 11	0.30	1.0	250				
56	560	6.3 × 11	0.13	0.41	405				
100	101					8 × 11.5	0.074	0.22	724
120	121					8 × 15	0.061	0.18	950
150	151	8 × 11.5	0.072	0.22	760	10 × 12.5	0.061	0.18	979
180	181					8 × 20	0.046	0.14	1190
220	221	8 × 15	0.056	0.17	995	10 × 16	0.042	0.12	1370
		▲10 × 12.5	0.053	0.16	1030				
270	271	8 × 20	0.041	0.13	1250	10 × 20	0.030	0.090	1580
330	331	10 × 16	0.038	0.12	1430	10 × 25	0.028	0.085	1870
470	471	10 × 20	0.023	0.069	1820	12.5 × 20	0.027	0.068	2050
560	561	10 × 25	0.022	0.066	2150	12.5 × 25	0.023	0.059	2410
680	681	12.5 × 20	0.021	0.053	2360	12.5 × 31.5	0.021	0.052	2860
820	821					12.5 × 35.5	0.019	0.051	2960
		▲16 × 20	0.023	0.059	2730				
1000	102	12.5 × 25	0.018	0.045	2770	16 × 25	0.021	0.056	3010
1200	122	12.5 × 31.5	0.016	0.041	3290				
		▲16 × 20	0.018	0.045	3140				
1500	152	12.5 × 35.5	0.015	0.039	3400				
1800	182	16 × 25	0.016	0.043	3460				

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

## Frequency coefficient of rated ripple current

Cap. (μF)	Frequency	50Hz	120Hz	1kHz	10kHz	100kHz
22 ~ 33		0.45	0.55	0.75	0.90	1.00
39 ~ 330		0.60	0.70	0.85	0.95	1.00
390 ~ 1000		0.65	0.75	0.90	0.98	1.00
1200 ~ 6800		0.75	0.80	0.95	1.00	1.00