ALUMINUM ELECTROLYTIC CAPACITORS

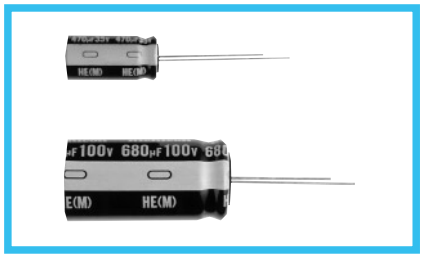
nichicon

HE series

Miniature Sized, Low Impedance,High Reliability

Smaller | Low Impedance | Long Life | Anti-Solvent Feature

- Low impedance and high reliability withstanding 4000 hours to 10000 hours.
- Compliant to the RoHS directive (2002/95/EC).

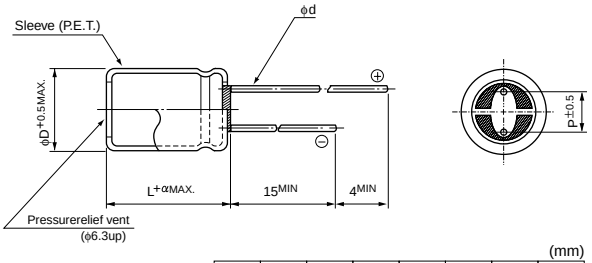


HE ← Long Life — HD

■Specifications

Item	Performance Characteristics									
Category Temperature Range	–40 to +105˚C									
Rated Voltage Range	6.3 to 100V									
Rated Capacitance Range	0.47 to 18000µF									
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.									
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	120Hz 20˚C
	tan δ (MAX.)	0.22	0.19	0.16	0.14	0.12	0.10	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	100	120Hz
	Impedance ratio ZT / Z20 (MAX.) Z–25˚C / Z+20˚C	4	3	2	2	2	2	2	2	
	Z–40˚C / Z+20˚C	8	6	4	3	3	3	3	3	
Endurance	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.									
	Case size	φD ≦ 6.3	φD = 8 , 10	φD ≧ 12.5						
	Rated voltage (V) 6.3 to 10WV	4000 hours	6000 hours	8000 hours						
	Rated voltage (V) 16 to 100WV	5000 hours	7000 hours	10000 hours						
	Capacitance change	Within ±25% of the initial capacitance value								
	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) 1.5
	(L ≧ 20) 2.0

(mm)

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6※	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 configulation.

Type numbering system (Example : 10V 1000µF)

1	2	3	4	5	6	7	8	9	10	11	12
U	H	E	1	A	1	0	2	M	P	D	

Size code
Configuration ※
Capacitance tolerance (±20%)
Rated capacitance (1000µF)
Rated voltage (10V)
Series name
Type

※ Configuration

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

●Frequency coefficient of rated ripple current

Cap. (µF) \ Frequency	50Hz	120Hz	300Hz	1kHz	10kHz or more
0.47 to 33	0.45	0.55	0.70	0.90	1.00
39 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 18000	0.75	0.80	0.95	1.00	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.

HE series

Standard Ratings

V (Code) / Item / Cap.(μF) / Code	6.3 (0J)				10 (1A)			
	Case size φD × L (mm)	Impedance (Ω) MAX. 20˚C / 100kHz	Impedance (Ω) MAX. –10˚C / 100kHz	Rated ripple (mArms) 105˚C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX. 20˚C / 100kHz	Impedance (Ω) MAX. –10˚C / 100kHz	Rated ripple (mArms) 105˚C / 100kHz
100 101					5 × 11	0.58	2.3	210
150 151	5 × 11	0.58	2.3	210				
220 221					6.3 × 11	0.22	0.87	340
330 331	6.3 × 11	0.22	0.87	340				
470 471					8 × 11.5	0.13	0.52	640
680 681	8 × 11.5	0.13	0.52	640	8 × 15	0.087	0.35	840
					▲ 10 × 12.5	0.080	0.32	865
820 821	10 × 12.5	0.080	0.32	865				
1000 102	8 × 15	0.087	0.35	840	8 × 20	0.069	0.27	1050
					▲ 10 × 16	0.060	0.24	1210
1200 122	8 × 20	0.069	0.27	1050	10 × 20	0.046	0.18	1400
	▲10 × 16	0.060	0.24	1210				
1500 152	10 × 20	0.046	0.18	1400	10 × 25	0.042	0.17	1650
					▲ 12.5 × 15	0.049	0.16	1450
1800 182	12.5 × 15	0.049	0.16	1450				
2200 222	10 × 25	0.042	0.17	1650	10 × 31.5	0.031	0.12	1910
					▲ 12.5 × 20	0.035	0.12	1900
					● 16 × 15	0.042	0.12	1940
2700 272	▲10 × 31.5	0.031	0.12	1910	18 × 15	0.043	0.11	2210
	16 × 15	0.042	0.12	1940				
3300 332	12.5 × 20	0.035	0.12	1900	12.5 × 25	0.027	0.089	2230
3900 392	12.5 × 25	0.027	0.089	2230	12.5 × 31.5	0.024	0.078	2650
	▲18 × 15	0.043	0.11	2210	▲ 16 × 20	0.027	0.078	2530
4700 472	12.5 × 31.5	0.024	0.078	2650	12.5 × 35.5	0.020	0.065	2880
5600 562	12.5 × 35.5	0.020	0.065	2880	12.5 × 40	0.017	0.056	3350
	▲16 × 20	0.027	0.078	2530	▲ 16 × 25	0.021	0.060	2930
					● 18 × 20	0.026	0.067	2860
6800 682	12.5 × 40	0.017	0.056	3350	16 × 31.5	0.017	0.050	3450
	▲16 × 25	0.021	0.060	2930				
	●18 × 20	0.026	0.067	2860	▲ 18 × 25	0.019	0.049	3140
8200 822	16 × 31.5	0.017	0.050	3450	16 × 35.5	0.015	0.044	3610
					▲ 18 × 31.5	0.015	0.040	4170
10000 103	16 × 35.5	0.015	0.044	3610	16 × 40	0.013	0.038	4080
	▲18 × 25	0.019	0.049	3140	▲ 18 × 35.5	0.014	0.038	4220
12000 123	16 × 40	0.013	0.038	4080	18 × 40	0.012	0.032	4280
	▲18 × 31.5	0.015	0.040	4170				
15000 153	18 × 35.5	0.014	0.038	4220				
18000 183	18 × 40	0.012	0.032	4280				

▲: In this case, 6 will be put 12th digit type numbering system.
●: In this case, 3 will be put 12th digit type numbering system.

HE series

Standard Ratings

Cap.(μF)	Code	16 (1C) Case size φD × L (mm)	16 (1C) Impedance (Ω) MAX. 20˚C / 100kHz	16 (1C) Impedance (Ω) MAX. –10˚C / 100kHz	16 (1C) Rated ripple (mArms) 105˚C / 100kHz	25 (1E) Case size φD × L (mm)	25 (1E) Impedance (Ω) MAX. 20˚C / 100kHz	25 (1E) Impedance (Ω) MAX. –10˚C / 100kHz	25 (1E) Rated ripple (mArms) 105˚C / 100kHz
47	470					5 × 11	0.58	2.3	210
56	560	5 × 11	0.58	2.3	210				
100	101					6.3 × 11	0.22	0.87	340
120	121	6.3 × 11	0.22	0.87	340				
220	221					8 × 11.5	0.13	0.52	640
330	331	8 × 11.5	0.13	0.52	640	8 × 15	0.087	0.35	840
						▲ 10 × 12.5	0.080	0.32	865
470	471	8 × 15	0.087	0.35	840	8 × 20	0.069	0.27	1050
		▲ 10 × 12.5	0.080	0.32	865	▲ 10 × 16	0.06	0.24	1210
680	681	8 × 20	0.069	0.27	1050	10 × 20	0.046	0.18	1400
		▲ 10 × 16	0.060	0.24	1210	▲ 12.5 × 15	0.049	0.16	1450
820	821					10 × 25	0.042	0.17	1650
1000	102	10 × 20	0.046	0.18	1400	10 × 31.5	0.031	0.12	1910
		▲ 12.5 × 15	0.049	0.16	1450	▲ 12.5 × 20	0.035	0.12	1900
						● 16 × 15	0.042	0.12	1940
1200	122	10 × 25	0.042	0.17	1650	18 × 15	0.043	0.11	2210
1500	152	10 × 31.5	0.031	0.12	1910	12.5 × 25	0.027	0.089	2230
		▲ 12.5 × 20	0.035	0.12	1900				
		● 16 × 15	0.042	0.12	1940				
1800	182					12.5 × 31.5	0.024	0.078	2650
						▲ 16 × 20	0.027	0.078	2530
2200	222	12.5 × 25	0.027	0.089	2230	12.5 × 35.5	0.020	0.065	2880
		▲ 18 × 15	0.043	0.11	2210	▲ 18 × 20	0.026	0.067	2860
2700	272	12.5 × 31.5	0.024	0.078	2650	12.5 × 40	0.017	0.056	3350
		▲ 16 × 20	0.027	0.078	2530	▲ 16 × 25	0.021	0.060	2930
3300	332	12.5 × 35.5	0.020	0.065	2880	16 × 31.5	0.017	0.050	3450
						▲ 18 × 25	0.019	0.049	3140
3900	392	12.5 × 40	0.017	0.056	3350	16 × 35.5	0.015	0.044	3610
		▲ 16 × 25	0.021	0.060	2930				
		● 16 × 20	0.026	0.067	2860	▲ 18 × 31.5	0.015	0.040	4170
4700	472	16 × 31.5	0.017	0.050	3450	16 × 40	0.013	0.038	4080
		▲ 18 × 25	0.019	0.049	3140	▲ 18 × 35.5	0.014	0.038	4220
5600	562	16 × 35.5	0.015	0.044	3610	18 × 40	0.012	0.032	4280
		▲ 18 × 31.5	0.015	0.040	4170				
6800	682	16 × 40	0.013	0.038	4080				
8200	822	18 × 35.5	0.014	0.038	4220				
10000	103	18 × 40	0.012	0.032	4280				

▲: In this case, 6 will be put 12th digit type numbering system.
●: In this case, 3 will be put 12th digit type numbering system.

HE series

Standard Ratings

Cap.(μF)	Code	35 (1V) Case size φD × L (mm)	35 (1V) Impedance (Ω) MAX. 20˚C / 100kHz	35 (1V) Impedance (Ω) MAX. –10˚C / 100kHz	35 (1V) Rated ripple (mArms) 105˚C / 100kHz	50 (1H) Case size φD × L (mm)	50 (1H) Impedance (Ω) MAX. 20˚C / 100kHz	50 (1H) Impedance (Ω) MAX. –10˚C / 100kHz	50 (1H) Rated ripple (mArms) 105˚C / 100kHz
0.47	R47					5 × 11	5.5	22	17
1	010					5 × 11	4	16	30
2.2	2R2					5 × 11	2.5	10	43
3.3	3R3					5 × 11	2.2	8.8	53
4.7	4R7					5 × 11	1.9	7.6	88
10	100					5 × 11	1.5	6	100
22	220					5 × 11	0.70	2.8	180
33	330	5 × 11	0.58	2.3	210				
47	470								
56	560	6.3 × 11	0.22	0.87	340	6.3 × 11	0.30	1.2	295
100	101					8 × 11.5	0.17	0.68	555
120	121					8 × 15	0.12	0.48	730
150	151	8 × 11.5	0.13	0.52	640	10 × 12.5	0.12	0.48	760
180	181					8 × 20	0.091	0.36	910
220	221	8 × 15	0.087	0.35	840	10 × 16	0.084	0.34	1050
		▲10 × 12.5	0.080	0.32	865				
270	271	8×20	0.069	0.27	1050	10 × 20	0.060	0.24	1220
						▲12.5 × 15	0.061	0.20	1260
330	331	10 × 16	0.060	0.24	1210	10 × 25	0.055	0.22	1440
470	471	10 × 20	0.046	0.18	1400	10 × 31.5	0.043	0.17	1690
		▲12.5 × 15	0.049	0.16	1450	▲12.5 × 20	0.045	0.15	1660
						● 16 × 15	0.055	0.17	1690
560	561	10 × 25	0.042	0.17	1650	12.5 × 25	0.034	0.11	1950
						▲18 × 15	0.054	0.15	1930
680	681	10 × 31.5	0.031	0.12	1910	12.5 × 31.5	0.030	0.10	2310
		▲12.5 × 20	0.035	0.12	1900				
		● 16 × 15	0.042	0.12	1940				
820	821					12.5 × 35.5	0.025	0.083	2510
						▲16 × 20	0.034	0.10	2210
1000	102	12.5 × 25	0.027	0.089	2230	12.5 × 40	0.021	0.069	2920
		▲18 × 15	0.043	0.11	2210	▲16 × 25	0.025	0.075	2555
						●18 × 20	0.036	0.097	2490
1200	122	12.5 × 31.5	0.024	0.078	2650	16 × 31.5	0.022	0.066	3010
		▲16 × 20	0.027	0.078	2530	▲18 × 25	0.026	0.070	2740
1500	152	12.5 × 35.5	0.020	0.065	2880	16 × 35.5	0.019	0.057	3150
1800	182	12.5 × 40	0.017	0.056	3350	16 × 40	0.016	0.048	3710
		▲16 × 25	0.021	0.060	2930				
		●18 × 20	0.026	0.067	2860	▲18 × 31.5	0.021	0.057	3635
2200	222	16 × 31.5	0.017	0.050	3450	▲ 18 × 35.5	0.017	0.046	3680
		▲18 × 25	0.019	0.049	3140				
2700	272	16 × 35.5	0.015	0.044	3610	18 × 40	0.014	0.038	3800
		▲18 × 31.5	0.015	0.040	4170				
3300	332	16 × 40	0.013	0.038	4080				
		▲18 × 35.5	0.014	0.038	4220				
3900	392	18 × 40	0.012	0.032	4280				

▲ : In this case, 6 will be put 12th digit type numbering system.
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HE series

Standard Ratings

Cap.(μF)	Code	63 (1J) Case size φD × L (mm)	63 (1J) Impedance (Ω) MAX. 20°C / 100kHz	63 (1J) Impedance (Ω) MAX. –10°C / 100kHz	63 (1J) Rated ripple (mArms) 105°C / 100kHz	100 (2A) Case size φD × L (mm)	100 (2A) Impedance (Ω) MAX. 20°C / 100kHz	100 (2A) Impedance (Ω) MAX. –10°C / 100kHz	100 (2A) Rated ripple (mArms) 105°C / 100kHz
6.8	6R8					5 × 11	2.3	9.3	62
15	150	5 × 11	2.3	9.3	62	6.3 × 11	1.2	5.0	126
27	270					8 × 11.5	0.63	2.8	260
33	330	6.3 × 11	1.2	5.0	126				
39	390					8 × 15	0.45	2.1	335
47	470					10 × 12.5	0.43	1.8	325
56	560	8 × 11.5	0.63	2.8	260	8 × 20	0.33	1.6	408
68	680					10 × 16	0.31	1.5	400
82	820	8 × 15	0.45	2.1	335	10 × 20	0.21	0.94	518
		▲10 × 12.5	0.43	1.8	325	▲12.5 × 15	0.23	1.1	527
100	101					10 × 25	0.20	0.84	595
120	121	8 × 20	0.33	1.6	408	10 × 31.5	0.15	0.71	740
		▲10 × 16	0.31	1.5	400	▲12.5 × 20	0.16	0.64	765
150	151					16 × 15	0.14	0.66	895
180	181	10 × 20	0.21	0.94	518	12.5 × 25	0.12	0.45	875
		▲12.5 × 15	0.23	1.1	527	▲18 × 15	0.12	0.50	1030
220	221	10 × 25	0.20	0.84	595	12.5 × 31.5	0.10	0.42	1010
						▲16 × 20	0.091	0.38	1130
270	271	10 × 31.5	0.15	0.71	740	12.5 × 35.5	0.083	0.35	1140
		▲12.5 × 20	0.16	0.64	765				
		● 16 × 15	0.14	0.66	895	▲16 × 25	0.073	0.27	1350
330	331	12.5 × 25	0.12	0.45	875	12.5× 40	0.071	0.30	1280
						▲18 × 20	0.080	0.30	1300
390	391	18 × 15	0.12	0.50	1030	16 × 31.5	0.054	0.20	1650
						▲18 × 25	0.057	0.21	1560
470	471	12.5 × 31.5	0.10	0.42	1010	16 × 35.5	0.045	0.17	1900
		▲16 × 20	0.091	0.38	1130	▲18 × 31.5	0.047	0.17	1720
560	561	12.5 × 35.5	0.083	0.35	1140	16 × 40	0.040	0.15	2130
		▲16 × 25	0.073	0.27	1350				
680	681	12.5 × 40	0.071	0.30	1280	18 × 35.5	0.040	0.15	1890
		▲18 × 20	0.080	0.30	1300				
820	821	16 × 31.5	0.054	0.20	1650	18 × 40	0.036	0.13	2470
		▲18 × 25	0.057	0.21	1560				
1000	102	16 × 35.5	0.045	0.17	1900				
		▲18 × 31.5	0.047	0.17	1720				
1200	122	16 × 40	0.040	0.15	2130				
		▲18 × 35.5	0.040	0.15	1890				
1500	152	18 × 40	0.036	0.13	2470				

▲ : In this case, 6 will be put 12th digit type numbering system.
● : In this case, 3 will be put 12th digit type numbering system.