

Series NHE

Series NHE is not recommended for new design.
Select series NHG as alternative.

Specifications

Item	Performance Characteristics											
Rated Working Voltage Range	6.3 to 100 V DC	160 to 450 V DC										
Operating Temperature Range	-55 to +105 °C	-25 to +105 °C										
Nominal Capacitance Range	0.1 to 15000 μF	1 to 220 μF										
Capacitance Tolerance	±20% (120 Hz, +20 °C)											
Leakage Current	$I \leq 0.01 CV$ or 3 [μA]	$I \leq 0.06 CV + 10$ [μA]										
	whichever is greater after 2 minutes application of rated working voltage at +20 °C											
tan δ (120 Hz, +20 °C)	Working voltage [V]	6.3	10	16	25	35	50	63	100			
	tan δ max.	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.07			
	Working voltage [V]	160	200	250	350	400	450					
	tan δ max.	0.15	0.15	0.15	0.20	0.24	0.24					
For capacitance value >1000 μF, add 0.02 per every 1000 μF												
Maximum Permissible Ripple Current	Refer to standard products table (120 Hz, +105 °C) Correction factor for frequency:											
			Freq. [Hz]					60	120	1k	10k	100k
	W.V. [V.DC]	Cap. [μF]										
	6.3 - 50	0.1 - 330	0.85	1	1.30	1.40	1.55					
		470 - 3300	0.95	1	1.15	1.20	1.25					
		≥ 4700	0.95	1	1.10	1.20	1.20					
	63 - 100	0.47 - 33	0.75	1	1.55	1.65	1.80					
		47 - 220	0.75	1	1.40	1.60	1.65					
		≥ 330	0.80	1	1.30	1.35	1.40					
	≥ 160	1 - 220	0.70	1	1.30	1.70	1.70					
Low Temperature Characteristics	Impedance ratio max. at 120 Hz.											
	Working voltage [V]	6.3	10	16	25	35	50	63	100			
	-25 °C/+20 °C	4	3	2	2	2	2	2	2	2		
	-40 °C/+20 °C	8	6	4	3	3	3	3	3	3		
	-55 °C/+20 °C	12	10	8	6	6	6	6	6	6		
	Working voltage [V]	160	200	250	350	400	450					
	-25 °C/+20 °C	3	3	3	6	6	15					
For capacitance value >1000 μF: Add 0.5 per every 1000 μF for -25 °C/+20 °C. Add 1.0 per every 1000 μF for -40 °C/+20 °C. Add 2.0 per every 1000 μF for -55 °C/+20 °C.												

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Specifications

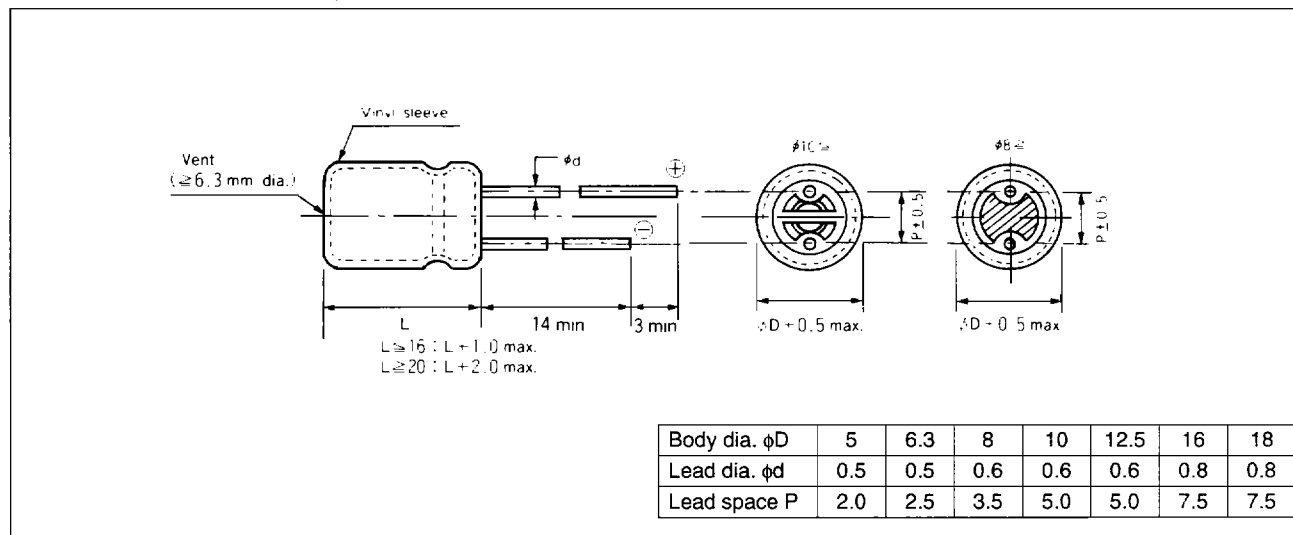
Item	Performance Characteristics
Endurance	Test conditions Duration : 2000 hours (1000 hours for $\leq \phi 8$ mm products) Ambient temperature : +105 °C Applied voltage : DC voltage with maximum permissible ripple current specified at +105 °C (Sum of the DC voltage and super-imposed peak AC voltage for maximum permissible ripple current should be equal to rated DC working voltage.)
	Post test requirements at +20 °C Leakage current : \leq Initial specified value Capacitance change : ± 20 % of initial measured value tan δ : ≤ 200 % of initial specified value
Shelf Life	Test conditions Duration : 1000 hours Ambient temperature : +105 °C Applied voltage : (None)
	Post test requirements at +20 °C Same limits for "Endurance".

Radial lead
Series NHE

Explanation of Part Numbers



Dimensions in mm (not to scale)



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Aluminum Electrolytic Capacitors Radial Lead Type

Series NHE

Case Size

φD × L [mm]

W.V.[V.DC] Cap.[μF]	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)	63 (1J)	100 (2A)
0.1 (0R1)						5 × 11		
0.22 (R22)						5 × 11		
0.33 (R33)						5 × 11		
0.47 (R47)						5 × 11		5 × 11
1 (010)						5 × 11		5 × 11
2.2 (2R2)						5 × 11		5 × 11
3.3 (3R3)						5 × 11		5 × 11
4.7 (4R7)						5 × 11		5 × 11
10 (100)						5 × 11	5 × 11	6.3 × 11.2
22 (220)						5 × 11	6.3 × 11.2	8 × 11.5
33 (330)					5 × 11	6.3 × 11.2	6.3 × 11.2	10 × 12.5
47 (470)			5 × 11	5 × 11	6.3 × 11.2	6.3 × 11.2	8 × 11.5	10 × 16
100 (101)	5 × 11	5 × 11	6.3 × 11.2	6.3 × 11.2	8 × 11.5	8 × 11.5	10 × 12.5	12.5 × 20
220 (221)	6.3 × 11.2	6.3 × 11.2	8 × 11.5	8 × 11.5	10 × 12.5	10 × 16	10 × 20	16 × 25
330 (331)	6.3 × 11.2	8 × 11.5	8 × 11.5	10 × 12.5	10 × 16	10 × 20	12.5 × 20	16 × 25
470 (471)	8 × 11.5	8 × 11.5	10 × 12.5	10 × 16	10 × 20	12.5 × 20	12.5 × 25	16 × 31.5
1000 (102)	10 × 12.5	10 × 16	10 × 20	12.5 × 20	12.5 × 25	16 × 25	16 × 31.5	
2200 (222)	12.5 × 20	12.5 × 20	12.5 × 25	16 × 25	16 × 31.5	18 × 35.5		
3300 (332)	12.5 × 20	12.5 × 25	16 × 25	16 × 31.5	18 × 35.5			
4700 (472)	16 × 25	16 × 25	16 × 31.5	18 × 35.5				
6800 (682)	16 × 25	16 × 31.5	18 × 35.5					
10000 (103)	16 × 31.5	18 × 35.5						
15000 (153)	18 × 35.5							

W.V.[V.DC] Cap.[μF]	160 (2C)	200 (2D)	250 (2E)	350 (2V)	400 (2G)	450 (2W)
1 (010)	6.3 × 11.2	6.3 × 11.2	6.3 × 11.2	10 × 12.5	10 × 12.5	10 × 16
2.2 (2R2)	6.3 × 11.2	6.3 × 11.2	8 × 11.5	10 × 16	10 × 16	10 × 20
3.3 (3R3)	8 × 11.5	8 × 11.5	10 × 12.5	10 × 16	10 × 20	12.5 × 20
4.7 (4R7)	8 × 11.5	10 × 12.5	10 × 12.5	10 × 20	10 × 20	12.5 × 20
10 (100)	10 × 12.5	10 × 16	10 × 20	12.5 × 20	12.5 × 25	16 × 25
22 (220)	10 × 20	10 × 20	12.5 × 25	16 × 25 ^Z	16 × 25	16 × 31.5
33 (330)	12.5 × 20	12.5 × 25	12.5 × 25	16 × 25	16 × 31.5	
47 (470)	12.5 × 25	12.5 × 25	16 × 25	16 × 31.5 ^W	18 × 31.5	
100 (101)	16 × 25	16 × 31.5	18 × 31.5 ^W			
220 (221)	18 × 31.5 ^W					

() indicates W.V. and capacitance code.

* W and Z in case size table indicates the suffix code of part number.

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Standard Products

W.V. [V.DC]	Cap. [μF]	Part No.	Cap. tol. [%] (120 Hz/+20 °C)	D.C.L. (+20 °C/2 min) [μA] max.	tan δ (120 Hz/+20 °C) max.	Ripple current (120 Hz/+105 °C) [mA] rms max.	Dimensions [mm]	
							φD	L
6.3	100	ECEA0JGE101	±20	6.3	0.22	91	5	11
	220	ECEA0JGE221		13.8	0.22	150	6.3	11.2
	330	ECEA0JGE331		20.7	0.22	230	6.3	11.2
	470	ECEA0JGE471		29.6	0.22	250	8	11.5
	1000	ECEA0JGE102		63.0	0.22	450	10	12.5
	2200	ECEA0JGE222		138.6	0.24	780	12.5	20
	3300	ECEA0JGE332		207.9	0.26	920	12.5	20
	4700	ECEA0JGE472		296.1	0.28	1150	16	25
	6800	ECEA0JGE682		428.4	0.32	1440	16	25
	10000	ECEA0JGE103		630.0	0.40	1700	16	31.5
	15000	ECEA0JGE153		945.0	0.50	1910	18	35.5
10	100	ECEA1AGE101	±20	10.0	0.19	110	5	11
	220	ECEA1AGE221		22.0	0.19	160	6.3	11.2
	330	ECEA1AGE331		33.0	0.19	230	8	11.5
	470	ECEA1AGE471		47.0	0.19	270	8	11.5
	1000	ECEA1AGE102		100.0	0.19	500	10	16
	2200	ECEA1AGE222		220.0	0.21	850	12.5	20
	3300	ECEA1AGE332		330.0	0.23	1080	12.5	25
	4700	ECEA1AGE472		470.0	0.25	1270	16	25
	6800	ECEA1AGE682		680.0	0.29	1530	16	31.5
	10000	ECEA1AGE103		1000.0	0.37	1870	18	35.5
16	47	ECEA1CGE470	±20	7.5	0.16	77	5	11
	100	ECEA1CGE101		16.0	0.16	120	6.3	11.2
	220	ECEA1CGE221		35.2	0.16	210	8	11.5
	330	ECEA1CGE331		52.8	0.16	260	8	11.5
	470	ECEA1CGE471		75.2	0.16	330	10	12.5
	1000	ECEA1CGE102		160.0	0.16	600	10	20
	2200	ECEA1CGE222		352.0	0.18	1010	12.5	25
	3300	ECEA1CGE332		528.0	0.20	1210	16	25
	4700	ECEA1CGE472		752.0	0.22	1490	16	31.5
6800	ECEA1CGE682	1088.0	0.26	1740	18	35.5		
25	47	ECEA1EGE470	±20	11.7	0.14	91	5	11
	100	ECEA1EGE101		25.0	0.14	130	6.3	11.2
	220	ECEA1EGE221		55.0	0.14	220	8	11.5
	330	ECEA1EGE331		82.5	0.14	300	10	12.5
	470	ECEA1EGE471		117.5	0.14	410	10	16
	1000	ECEA1EGE102		250.0	0.14	720	12.5	20
	2200	ECEA1EGE222		550.0	0.16	1110	16	25
	3300	ECEA1EGE332		825.0	0.18	1380	16	31.5
	4700	ECEA1EGE472		1175.0	0.20	1690	18	35.5
35	33	ECEA1VGE330	±20	11.5	0.12	84	5	11
	47	ECEA1VGE470		16.4	0.12	98	6.3	11.2
	100	ECEA1VGE101		35.0	0.12	160	8	11.5
	220	ECEA1VGE221		77.0	0.12	260	10	12.5
	330	ECEA1VGE331		115.5	0.12	360	10	16
	470	ECEA1VGE471		164.5	0.12	480	10	20

Radial lead
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Standard Products

W.V. [V.DC]	Cap. [μF]	Part No.	Cap. tol. [%] (120 Hz/+20 °C)	D.C.L. (+20 °C/2 min) [μA] max.	tan δ (120 Hz/+20 °C) max.	Ripple current (120 Hz/+105 °C) [mA] rms max.	Dimensions [mm]	
							φD	L
35	1000	ECEA1VGE102	±20	350.0	0.12	840	12.5	25
	2200	ECEA1VGE222		770.0	0.14	1270	16	31.5
	3300	ECEA1VGE332		1155.0	0.16	1540	18	35.5
50	0.1	ECEA1HGE0R1	±20	3.0	0.10	1.1	5	11
	0.22	ECEA1HGER22		3.0	0.10	2.3	5	11
	0.33	ECEA1HGER33		3.0	0.10	3.5	5	11
	0.47	ECEA1HGER47		3.0	0.10	5	5	11
	1	ECEA1HGE010		3.0	0.10	10	5	11
	2.2	ECEA1HGE2R2		3.0	0.10	18	5	11
	3.3	ECEA1HGE3R3		3.0	0.10	22	5	11
	4.7	ECEA1HGE4R7		3.0	0.10	26	5	11
	10	ECEA1HGE100		5.0	0.10	39	5	11
	22	ECEA1HGE220		11.0	0.10	70	5	11
	33	ECEA1HGE330		16.5	0.10	91	6.3	11.2
	47	ECEA1HGE470		23.5	0.10	100	6.3	11.2
	100	ECEA1HGE101		50.0	0.10	170	8	11.5
	220	ECEA1HGE221		110.0	0.10	330	10	16
	330	ECEA1HGE331		165.0	0.10	440	10	20
470	ECEA1HGE471	235.0	0.10	580	12.5	20		
1000	ECEA1HGE102	500.0	0.10	940	16	25		
2200	ECEA1HGE222	1100.0	0.12	1490	18	35.5		
63	10	ECEA1JGE100	±20	6.3	0.09	51	5	11
	22	ECEA1JGE220		13.8	0.09	84	6.3	11.2
	33	ECEA1JGE330		20.7	0.09	98	6.3	11.2
	47	ECEA1JGE470		29.6	0.09	130	8	11.5
	100	ECEA1JGE101		63.0	0.09	210	10	12.5
	220	ECEA1JGE221		138.6	0.09	400	10	20
	330	ECEA1JGE331		207.9	0.09	550	12.5	20
	470	ECEA1JGE471		296.1	0.09	700	12.5	25
1000	ECEA1JGE102	630.0	0.09	1130	16	31.5		
100	0.47	ECEA2AGER47	±20	3.0	0.07	9	5	11
	1	ECEA2AGE010		3.0	0.07	14	5	11
	2.2	ECEA2AGE2R2		3.0	0.07	21	5	11
	3.3	ECEA2AGE3R3		3.3	0.07	31	5	11
	4.7	ECEA2AGE4R7		4.7	0.07	38	5	11
	10	ECEA2AGE100		10.0	0.07	61	6.3	11.2
	22	ECEA2AGE220		22.0	0.07	98	8	11.5
	33	ECEA2AGE330		33.0	0.07	130	10	12.5
	47	ECEA2AGE470		47.0	0.07	160	10	16
	100	ECEA2AGE101		100.0	0.07	280	12.5	20
	220	ECEA2AGE221		200.0	0.07	510	16	25
	330	ECEA2AGE331		330.0	0.07	650	16	25
470	ECEA2AGE471	470.0	0.07	880	16	31.5		
160	1	ECEA2CGE010	±20	19.6	0.15	17	6.3	11.2
	2.2	ECEA2CGE2R2		31.1	0.15	25	6.3	11.2

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Standard Products Table

W.V. [V.DC]	Cap. [μF]	Part No.	Cap. tol. [%] (120 Hz/+20 °C)	D.C.L. (+20 °C/2 min) [μA] max.	tan δ (120 Hz/+20 °C) max.	Ripple current (120 Hz/+105 °C) [mA] rms max.	Dimensions [mm]	
							φD	L
160	3.3	ECEA2CGE3R3	±20	41.6	0.15	36	8	11.5
	4.7	ECEA2CGE4R7		55.1	0.15	43	8	11.5
	10	ECEA2CGE100		106.0	0.15	70	10	12.5
	22	ECEA2CGE220		221.2	0.15	130	10	20
	33	ECEA2CGE330		326.8	0.15	180	12.5	20
	47	ECEA2CGE470		461.2	0.15	220	12.5	25
	100	ECEA2CGE101		970.0	0.15	330	16	25
	220	ECEA2CGE221W		2122.0	0.15	500	18	31.5
200	1	ECEA2DGE010	±20	22.0	0.15	17	6.3	11.2
	2.2	ECEA2DGE2R2		36.4	0.15	25	6.3	11.2
	3.3	ECEA2DGE3R3		49.6	0.15	36	8	11.5
	4.7	ECEA2DGE4R7		66.4	0.15	50	10	12.5
	10	ECEA2DGE100		130.0	0.15	80	10	16
	22	ECEA2DGE220		274.0	0.15	140	10	20
	33	ECEA2DGE330		406.0	0.15	190	12.5	25
	47	ECEA2DGE470		574.0	0.15	220	12.5	25
	100	ECEA2DGE101		1210.0	0.15	335	16	31.5
250	1	ECEA2EGE010	±20	25.0	0.15	17	6.3	11.2
	2.2	ECEA2EGE2R2		43.0	0.15	29	8	11.5
	3.3	ECEA2EGE3R3		59.5	0.15	42	10	12.5
	4.7	ECEA2EGE4R7		80.5	0.15	50	10	12.5
	10	ECEA2EGE100		160.0	0.15	88	10	20
	22	ECEA2EGE220		340.0	0.15	155	12.5	25
	33	ECEA2EGE330		505.0	0.15	190	12.5	25
	47	ECEA2EGE470		715.0	0.15	230	16	25
	100	ECEA2EGE101W		1510.0	0.15	340	18	31.5
350	1	ECEA2VGE010	±20	31.0	0.20	18	10	12.5
	2.2	ECEA2VGE2R2		56.2	0.20	31	10	16
	3.3	ECEA2VGE3R3		79.3	0.20	38	10	16
	4.7	ECEA2VGE4R7		108.7	0.20	49	10	20
	10	ECEA2VGE100		220.0	0.20	82	12.5	20
	22	ECEA2VGE220Z		472.0	0.20	130	16	25
	33	ECEA2VGE330		703.0	0.20	175	16	25
	47	ECEA2VGE470W		997.0	0.20	230	16	31.5
400	1	ECEA2GGE010	±20	34.0	0.24	18	10	12.5
	2.2	ECEA2GGE2R2		62.8	0.24	30	10	16
	3.3	ECEA2GGE3R3		89.2	0.24	40	10	20
	4.7	ECEA2GGE4R7		122.8	0.24	45	10	20
	10	ECEA2GGE100		250.0	0.24	79	12.5	25
	22	ECEA2GGE220		538.0	0.24	145	16	25
	33	ECEA2GGE330		802.0	0.24	185	16	31.5
	47	ECEA2GGE470		1138.0	0.24	230	18	31.5
450	1	ECEA2WGE010	±20	37.0	0.24	18	10	16
	2.2	ECEA2WGE2R2		69.4	0.24	29	10	20
	3.3	ECEA2WGE3R3		99.1	0.24	41	12.5	20
	4.7	ECEA2WGE4R7		136.9	0.24	49	12.5	20
	10	ECEA2WGE100		280.0	0.24	75	16	25
	22	ECEA2WGE220		604.0	0.24	115	16	31.5
	33	ECEA2WGE330W		901.0	0.24	145	18	31.5

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