

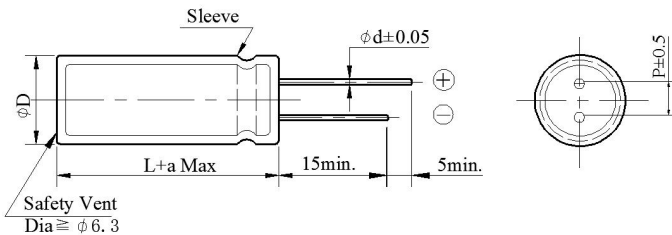
HE Series

- High-temperature 125°C, High reliability.
- Load life 2,000~ 5,000 hours at 125°C.

◆ SPECIFICATIONS

Item	Performance Characteristics										
Category Temperature Range	-40~ +125℃					-25~ +125℃					
Working Voltage Range	10~400Vdc					450Vdc					
Capacitance Range	2.2~4700 μF					1~100 μF					
Capacitance Tolerance	±20% (at 20℃ and 120Hz)										
Dissipation Factor (tan δ) (at 20℃, 120Hz)	Rated Voltage (V)	10	16	25	35	50	63	100	160 ~ 250	350 ~ 450	
	tan δ (Ma×)	0.20	0.16	0.14	0.12	0.10	0.10	0.09	0.20	0.24	
	the above values should be increased by 0.02 for every additional 1000μF										
Leakage Current	I≤0.01CV or 3μA whichever is greater(10 to 100Vdc) I≤0.02CV+10(160 to 450Vdc) I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Apply rated voltage the rated voltage for 2 minutes.										
Low Temperature Characteristics Impedance Ratio(MA×)	Rated Voltage (V)	10	16	25	35	50	63	100	160 ~ 250	350 ~ 450	(at 120Hz)
	Z(-25℃)/Z(+25℃)	3	3	3	5	5	2	2	6	6	
	Z(-40℃)/Z(+20℃)	6	6	6	6	6	3	3	10	18	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000~5,000 hours at 125℃.										
	Capacitance change		≒±25% of the initial value					Size		Life time (hours)	
	Dissipation factor(tan δ)		≒ 200% of the specified value					≒ 6.3Φ		2,000	
	Leakage current		≒specified value					8 Φ		3,000	
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 125℃ without voltage applied.										
	After test : UR to be applied for 30 minutes, 24 to 48 hours before measurement.										
	Capacitance change		≒±25% of the initial value								
	Dissipation factor(tan δ)		≒ 200% of the specified value								
Leakage current		≒ 200% of the specified value									
Others	Conforms to JIS-C-5101-4 (1998) and IEC 60384-4										

◆ DIMENSIONS(mm)



	5	6.3	8	10	12.5/13	16	18
ΦD	$\Phi D \pm 0.5 \text{ Max}$						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	$< 20 L \pm 1.5 \text{Max}$ $\geq 20 L \pm 2.0 \text{Max}$						

◆ PART NUMBER SYSTEM(E×ample :35V 1200 μ F)

E	H	E	0	3	5	M	1	2	2	G	3	0	L	O	5	0	A	A	
																			Special Request
																			Lead size
																			Lead type
																			Height code (L: 30mm)
																			Diameter code (G: $\Phi 10$)
																			Capacitance code (1200 μF)
																			Capacitance tolerance code (M: $\pm 20\%$)
																			Voltage code (35V)
																			Series code (HE)
																			Category code

HE Series

◆ Case size & Permissible rated ripple current: (mA rms) at 125°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)
10	47	5×11	95	16	33	5×11	80
	100	6.3×11	150		47	5×11	95
	220	8×12	300		100	6.3×11	170
	330	10×13	420		220	6.3×11	230
	470	10×13	510		470	6.3×15	300
	1000	10×16	880		680	8×14	520
	1500	10×20	1100		1000	10×20	870
	2200	13×20	1350		1500	12.5×20	980
	3300	13×25	1450		2200	10×25	1080
	4700	16×20	1680		3300	13×25	1800
25					4700	16×32	2100
	22	5×11	70	35	22	5×11	60
	47	5×11	100		33	5×11	70
	100	8×11	200		47	6.3×11	110
	220	6.3×12	200		100	6.3×12	180
	330	8×14	400		220	8×12	320
	470	8×15	490		470	10×16	590
	680	10×14	650		680	10×16	710
	1000	10×16	840		1000	10×25	990
	1500	13×25	1300		1500	16×26	1450
	2200	16×26	1500		2200	18×26	1650
50	3300	13×25	1900		6800	18×50	3200
	3.3	5×11	25	63	47	6.3×12	120
	4.7	5×11	35		100	10×16	270
	10	5×11	45		220	10×20	490
	22	5×11	60		330	13×20	700
	100	8×12	180		470	13×20	830
	220	10×13	360		680	13×25	1100
	330	10×16	550		1000	16×26	1500
	470	13×20	800				
	1000	16×26	1400				
	2200	18×40	2600				
100	4.7	5×11	30	160	6.8	6.3×11	50
	10	5×11	40		10	6.3×12	60
	22	6.3×11	60		22	10×16	120
	33	10×13	150		33	10×20	180
	47	10×13	180		47	10×20	210
	100	13×20	300		68	13×25	280
	220	16×25	500		100	16×21	400
	330	18×20	850		220	16×25	640
					330	18×30	800

HE Series

◆ Case size & Permissible rated ripple current: (mA rms) at 125°C / 120Hz

WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)	WV(V)	Nominal capacitance (uF)	Case Size ΦD×L (mm)	Max. Rated ripple current @125°C/120Hz (mA rms)
200	4.7	8×11	50	250	2.2	6.3×11	35
	8.2	8×12	60		3.3	8×12	50
	10	8×16	70		4.7	10×13	60
	15	10×16	100		6.8	10×16	80
	33	10×20	180		10	10×16	90
	47	13×20	250		22	10×20	120
	68	16×26	370		33	13×20	200
	82	16×26	410		47	16×21	280
	100	18×20	430		68	16×26	350
	150	18×26	580		100	16×26	460
	220	18×30	820		150	18×35	780
350	2.2	6.3×11	25	400	2.2	8×12	30
	3.3	10×13	55		3.3	8×12	36
	4.7	10×16	70		4.7	8×12	43
	5.6	10×20	80		5.6	10×16	60
	6.8	13×20	90		6.8	10×16	60
	10	10×20	80		10	8×16	70
	22	13×25	170			10×20	90
	33	16×26	230		15	8×17	80
	47	16×32	320			10×16	90
	68	18×26	360		22	10×18	125
	100	18×35	500		33	13×20	170
					47	12.5×35	280
					68	18×25	320
					100	18×40	450
					220	22×40	650
450	3.3	8×12	30	450	3.3	8×12	30
	4.7	8×12	38		4.7	8×12	38
	5.6	10×13	48		5.6	10×13	48
	6.8	10×13	50		6.8	10×13	50
	8.2	10×20	70		8.2	10×20	70
	10	10×20	80		10	10×20	80
	15	10×20	90		15	10×20	90
	22	12.5×25	140		22	12.5×25	140
		13×20	130			13×20	130
	27	13×20	145		27	13×20	145
	33	13×20	160		33	13×20	160
		16×20	180			16×20	180
	39	16×20	200		39	16×20	200
	47	16×20	220		47	16×20	220
	56	18×20	250		56	18×20	250
	68	18×30	320		68	18×30	320
	100	18×30	360		100	18×30	360
	120	18×30	380		120	18×30	380

◆ RIPPLE CURRENT MULTIPLIERS
Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		50/60	120	1K	≥10K
10 ~ 100	<100	0.65	1.00	1.57	2.00
	100 ~ 470	0.60	1.00	1.34	1.50
	>470	0.55	1.00	1.10	1.15
16 ~ 450	<33	0.60	1.00	1.15	1.30
	>33	0.55	1.00	1.10	1.15