

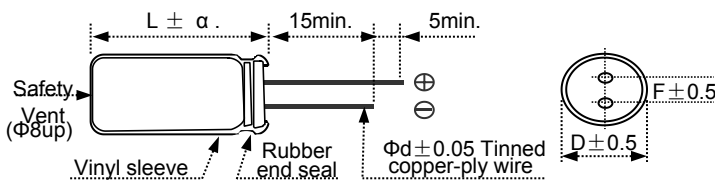
HE Series

- Endurance with ripple current: 125°C 2000 hours
- RoHS2.0 Compliant

◆ 规格表 Specifications

项目 Items	特性参数 Characteristics	
使用温度范围 Category Temperature Range	-40 ~ +125°C (6.3 ~ 100V.DC)	-25 ~ +125°C (160~450V.DC)
额定工作电压范围 Rated Voltage Range	10 ~ 450V.DC	
静电容量允许偏差 Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)	
漏电流 Leakage Current	10 ~ 100V.DC	160 ~ 450V.DC
	$I \leq 0.01CV$ or $3\mu A$, 二者取最大值 (施加额定工作电压2分钟后) Whichever is greater (After 2 minutes application of rated voltage)	$I \leq 0.02CV + 10(\mu A)$ (施加额定工作电压2分钟后) (After 2 minute application of rated voltage)
Note: I=Max.leakage current (μA), C=Nominal capacitance(μF), V=Rated voltage(V) (at 20°C)		
损耗角正切值 tan δ Dissipation Factor	Rated voltage(V)	10 16 25 35 50 63 80 100 160 ~ 250 350~450
	tan δ (Max.)	0.20 0.16 0.14 0.12 0.10 0.10 0.08 0.08 0.20 0.24
标称容量超过1000 μF , 则每增加1000 μF , 损耗角正切值增加0.02 When nominal capacitance exceeds 1000 μF , add 0.02 to the value above for each 1000 μF increase. (at 20°C, 120Hz)		
低温特性 LOW Temperature Characteristics (Max.Impedance Ratio)	阻抗比值不得超过下表中列出的值 The impedance ratio shall not exceed the values listed in the below table. (at 120Hz)	
	Rated voltage(V)	10 16 25 35 50 63 80 100 160 ~ 250 350~450
	Z(-25°C)/Z(+20°C)	4 3 2 2 2 2 2 2 3 6
Z(-40°C)/Z(+20°C)	8 6 4 4 4 4 4 4 6 -	
耐久性 Endurance	在125°C环境中, 不超过额定电压的范围内叠加最大允许纹波电流, 连续2000小时, 经恢复到20°C后电容器满足以下各项要求。 The following specifications shall be satisfied when the capacitors are restored to 20°C after applied within maximum allowable ripple current and not over rated voltage range for 2000 hours at 125°C.	
	Capacitance change	$\leq \pm 20\%$ of the initial value
	D.F.(tan δ)	$\leq 200\%$ of the initial specified value
	Leakage current	\leq The initial specified value
高温储存特性 Shelf Life	在125°C环境中, 不施加电压条件下储存1000小时(350~450V为500小时), 经恢复到20°C后, 电容器满足以下各项要求。 The following specifications shall be satisfied when the capacitors are restored at 20°C after exposing them for 1000 hours at 125°C (500hours to 350~450V) without voltage applied.	
	Rated voltage	10 ~ 100V.DC 160 ~ 450V.DC
	Capacitance change	$\leq \pm 30\%$ of the initial value $\leq \pm 20\%$ of the initial value
	D.F.(tan δ)	$\leq 300\%$ of the initial specified value $\leq 200\%$ of the initial specified value
	Leakage current	\leq The initial specified value $\leq 200\%$ of the initial specified value

◆ 尺寸图 (单位: mm) DIMENSIONS (Unit:mm)



ΦD	8	10	13	16
F	3.5	5.0	5	7.5
Φd	0.5	0.6	0.6	0.8

α	(L < 20) 1.5
	(L ≥ 20) 2.0

◆ 纹波电流修正系数 Rated Ripple Current Coefficient

● 频率系数 Frequency Coefficient

Rated Voltage(V)	Frequency(Hz)	120	1K	10K	100K
	Capacitance(μF)				
10~100	4.7~100	0.20	0.66	0.90	1.00
	220~470	0.40	0.76	0.93	1.00
	1000	0.60	0.84	0.96	1.00
	2200~3300	0.20	0.60	0.88	1.00
	4700	0.30	0.65	0.90	1.00
160 ~ 450	4.7~33	0.25	0.61	0.88	1.00
	47~150	0.35	0.66	0.89	1.00



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◆ 标准品一览表 Standard Ratings

WV(V) cap.(μF)	10(1A)			16(1C)			25(1E)			35(1V)		
	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)
22							5X11		120	5X11		205
33							5X11		206	6.3X11		175
47							5X11		220	6.3X11		200
100				8×12	0.31	345	8×12	0.31	345	8×12	0.30	344
										10×13	0.13	625
220	8×12	0.32	345	10×13	0.14	622	10×13	0.14	624	10×16	0.091	795
330	10×13	0.15	624	10×13	0.14	622	10×16	0.092	792	10×20	0.072	952
470	10×13	0.15	624	10×16	0.094	793	10×20	0.072	953	13×20	0.054	1,084
1,000	10×20	0.075	953	13×20	0.058	1,083	13×25	0.040	1,352	16×26	0.030	1,623
2,200	13×25	0.040	1,355	16×26	0.031	1,622	16×32	0.023	1,862			
3,300	16×26	0.031	1,622	16×32	0.025	1,863						
4,700	16×32	0.025	1,863									

WV(V) cap.(μF)	50(1H)			63(1J)			80(1K)			100(2A)		
	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum ESR at 20℃ /100kHz(Ω)	Maximum allowable ripple current at125℃/100kHz (mA.r.m.s)
4.7										8×12	2.0	132
10	8×12	0.74	180	8×12						8×12	1.48	153
22	8×12	0.49	249	8×12	1.6	120	8×12	1.49	152	10×13	0.79	482
33	8×12	0.49	278	8×12	1.4	152	10×13	0.79	483	10×13	0.79	482
47	8×12	0.49	298	10×13	0.57	534	10×13	0.79	483	10×16	0.54	632
100	10×13	0.18	518	10×16	0.40	692	10×20	0.38	792	13×20	0.24	991
220	10×20	0.098	878	13×20	0.15	1,053	13×25	0.16	1,242	16×26	0.10	1,502
330	13×20	0.080	987	13×25	0.11	1,292	13×30	0.14	1,392	16×32	0.078	1,792
470	13×25	0.057	1,148	13×30	0.097	1,462	16×26	0.10	1,502			
1,000	16×32	0.030	1,588	16×32	0.056	1,852						

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WV(V) cap.(μF)	160(2C)		200(2D)		250(2E)		350(2V)		400(2G)	
	Case size ΦD×L (mm)	Maximum allowable ripple current at125°C/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum allowable ripple current at125°C/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum allowable ripple current at125°C/100kHz (mA.r.m.s)	Case size ΦD×L (mm)	Maximum allowable ripple current (mA.r.m.s) at125°C,100kHz	Case size ΦD×L (mm)	Maximum allowable ripple current at125°C/100kHz (mA.r.m.s)
4.7							10×20	54	10×20	54
10			10×20	79	10×20	79	10×25	86	10×25	87
22	10×20	116	10×25	125	13×20	127	16×32	143	13×30	143
33	10×25	156	13×20	158	13×25	172	16×26	190	16×26	190
47	13×20	189	13×25	205	16×25	226	16×32	245	16×32	244
68	13×25	247	16×21	255	16×32	293				
100	16×26	329	16×26	330						
150	16×32	437								

WV(V) cap.(μF)	450(2W)	
	Case size ΦD×L (mm)	Maximum allowable ripple current at125°C/100kHz (mA.r.m.s)
4.7	10×25	59
10	13×20	88
22	16×26	155
33	16×32	205

※铝电解电容器由于在纹波电流叠加时自我发热、温度上升而老化，中心温度每升温5°C寿命减少一半。要想保持长寿命请在使用过程中降低纹波电流。
The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

