HA 系列 SERIES

High Temperature | Standard | RoHS

●全焊结构，确保可靠的电气接触性
All-welded construction ensures reliable electrical contact
●额定工作电压 600V 以下
Rated working voltage below 600V
●保证 105℃、2000 小时寿命。（叠加纹波电流）
Endurance with ripple current: 2000 hours at 105℃
●应用：变频器、专业电源和电焊机
Applications: Frequency converters, Professional power supplies and Electric welding machine

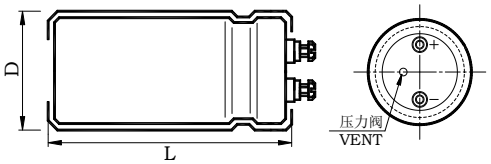
HR P140
↑ Long life
HA
↑ Increased to 105℃
TA P129

◆规格表 SPECIFICATIONS

项 目 Items	特 性 Characteristics										
工作温度范围 Operating Temperature Range	−40～+105℃						−25～+105℃				
额定工作电压范围 Rated Working Voltage Range	25～100V						160～600V				
静电容量范围 Capacitance Range	220～330000 μF										
静电容量允许偏差 Capacitance Tolerance	±20% (20℃,120Hz)										
损耗角正切值 Dissipation Factor（MAX） 20℃，120Hz	U_R(V)	25-100	160	200	250	350	400	450	500	550	600
	tanδ	见规格表	0.15							0.20	
漏电流 Leakage Current（MAX）	I＝0.01$C_R U_R$ 或 5mA 取小者 （20℃，施加额定电压 5 分钟后） I＝0.01$C_R U_R$ or 5mA whichever is minimum.（at 20℃，After 5 minutes application of rated voltage） I＝漏电流（μA） U_R＝额定电压（V） C_R＝静电容量（μF） Leakage Current Rated Voltage Rated Capacitance										

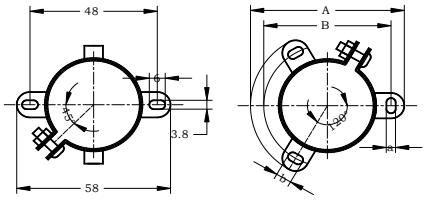
	使用寿命 Useful Life		负荷寿命 Load Life	耐久性特性 Endurance Test	高温无负荷特性 Shelf Life	
产品寿命 Life Time	4000h	>200000h	2000h	2000h	1000h U_R≤500V	500h U_R≥550V
漏电流 Leakage Current	≤规定值 ≤Specified value		≤规定值 ≤Specified value	≤规定值 ≤Specified value	≤规定值 ≤Specified value	
损耗角正切值变化率 tanδ Change	≤规定值的 300% ≤300% of specified value		≤规定值的 175% ≤175% of specified value	≤规定值的 130% ≤130% of specified value	≤规定值的 150% ≤150% of specified value	
静电容量变化率 Capacitance Change	初始值±30%以内 Within±30% of initial value		初始值±15%以内 Within±15% of initial value	初始值±10%以内 Within±10% of initial value	初始值±15%以内 Within±15% of initial value	
施加条件 Condition 施加电压 Applied Voltage 施加纹波电流 Applied Ripple Current 环境温度 Applied Temperature 失效率等级 Failure Rate Level	U_R I_R 105℃ ≤1% Failure Rate	U_R 1.2×I_R 40℃ ≤1% Failure Rate	U_R I_R 105℃ 0%	U_R I_R=0 105℃ 0%	U_R=0 I_R=0 105℃ 0%	Back up to 20 ℃ and placed more than 24 hours. U_R to be applied for 60 min before measurement.

◆尺寸图 Dimensions
●常用端子型式代码：Terminal Code



L-Type：Small terminal M5 thread
S-Type：Large terminal M6 thread

Ring Clip: T (Φ35 Standard) Ring Clip: S (Φ51~Φ89 Standard)



Ring Clip Dimensions:

ΦD	A	B	a	b
51	73.0	63.5	4.5	7
64	85.1	76.2	4.5	7
76	98.4	88.9	4.5	7
89	111.1	101.6	4.5	7

产品详细尺寸和公差请参照 P130
For detailed dimension & tolerance, please refer to P130

●记载以外的端子形状，请另行咨询。Please consult to us for the terminal type not displayed in content.

◆产品编码体系 PART NUMBER SYSTEM

●例如：Example HA 400V4700μF Φ76×130 ±20%

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
H	A	G	4	7	2	M	7	6	1	3	0	S	V	A

15 客户特殊要求 special requirement
14 套管材质代码 Sleeve Code
13 端子型式代码 Lead Form Code
10 11 12 高度代码（例：130→130）The height of the code（mm）
8 9 直径代码（例：64→64，76→76）Diameter code（mm）
7 容差代码（例：±20%→M） Capacitance Tolerance code
4 5 6 容量代码（例：4700→472，33000→333）Capacitance Code（μF）
3 电压代码（例：400V→G，500V→C）Rated Voltage Code（V）
1 2 产品系列代码（例：HA→HA） Series Code

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

●频率修正系数 Frequency coefficient

频率 Frequency（Hz）	50(60)	100(120)	300	1k	≥10k
系 数 Coefficient	0.80	1.00	1.18	1.30	1.40

●温度修正系数 Temperature coefficient

温度 Temperature（℃）	+40	+55	+70	+85	+105
系 数 Coefficient	3.30	2.85	2.40	2.00	1.00

HA SERIES

◆产品一览表 **Standard Ratings**

WV_{DC} (Surge Voltage) (V)	Cap (μF)	Size D×L (mm)	tanδ 20℃ 120Hz	ESRtyp 20℃ 120Hz mΩ	Ripple Current 105℃120Hz (Arms)	Catalog Part Number
25 (32)	10000	35×60	0.35	25.0	3.2	HAU103M35060□VA
	15000	35×80	0.35	22.0	4.8	HAU153M35080□VA
	22000	35×80	0.35	15.8	5.8	HAU223M35080□VA
	33000	35×100	0.40	11.0	7.2	HAU333M35100□VA
	47000	51×80	0.40	7.8	9.3	HAU473M51080□VA
	68000	51×115	0.50	5.8	11.5	HAU683M51115□VA
	100000	64×95	0.60	4.4	13.0	HAU104M64095□VA
	150000	64×115	0.80	3.4	17.9	HAU154M64115□VA
	220000	76×115	1.00	2.8	21.3	HAU224M76115□VA
	330000	89×130	1.00	2.3	23.4	HAU334M89130□VA
35 (44)	6800	35×60	0.30	32.0	2.8	HAT682M35060□VA
	10000	35×80	0.30	23.6	4.1	HAT103M35080□VA
	15000	35×80	0.30	17.0	5.2	HAT153M35080□VA
	22000	35×100	0.35	11.6	6.3	HAT223M35100□VA
	33000	51×80	0.40	9.0	8.7	HAT333M51080□VA
	47000	51×95	0.45	7.9	11.2	HAT473M51095□VA
	68000	51×150	0.50	6.0	14.3	HAT683M51150□VA
	100000	64×115	0.60	4.0	17.2	HAT104M64115□VA
	150000	76×115	0.70	3.6	20.7	HAT154M76115□VA
	220000	89×130	0.70	2.9	23.4	HAT224M89130□VA
50 (63)	3300	35×60	0.20	50.0	2.5	HAR332M35060□VA
	4700	35×60	0.25	36.0	3.7	HAR472M35060□VA
	6800	35×80	0.25	32.0	3.9	HAR682M35080□VA
	10000	35×80	0.25	22.0	4.7	HAR103M35080□VA
	15000	35×100	0.30	14.0	5.7	HAR153M35100□VA
	22000	51×80	0.35	10.0	8.1	HAR223M51080□VA
	33000	51×115	0.40	7.0	11.1	HAR333M51115□VA
	47000	64×95	0.40	6.0	13.9	HAR473M64095□VA
	68000	64×115	0.45	5.0	16.6	HAR683M64115□VA
	100000	76×115	0.50	4.0	19.5	HAR104M76115□VA
	150000	76×115	0.50	3.0	23.9	HAR154M76115□VA
63 (79)	2200	35×60	0.15	70.0	2.5	HAQ222M35060□VA
	3300	35×60	0.20	50.0	2.7	HAQ332M35060□VA
	4700	35×80	0.20	36.0	3.8	HAQ472M35080□VA
	6800	35×80	0.20	25.0	4.4	HAQ682M35080□VA
	10000	35×100	0.25	20.0	5.3	HAQ103M35100□VA
	15000	51×80	0.25	14.0	6.8	HAQ153M51080□VA
	22000	51×95	0.30	10.0	9.0	HAQ223M51095□VA
	33000	64×95	0.30	7.0	12.0	HAQ333M64095□VA
	47000	64×115	0.35	6.0	14.5	HAQ473M64115□VA
	68000	76×115	0.40	5.0	18.4	HAQ683M76115□VA
	100000	89×130	0.40	3.6	20.0	HAQ104M89130□VA
80 (100)	2200	35×60	0.15	57.0	2.8	HAP222M35060□VA
	3300	35×80	0.15	38.0	3.6	HAP332M35080□VA
	4700	35×80	0.15	27.0	4.3	HAP472M35080□VA
	6800	35×100	0.20	19.0	4.9	HAP682M35100□VA
	10000	51×80	0.20	17.0	6.4	HAP103M51080□VA
	15000	51×95	0.25	11.0	7.4	HAP153M51095□VA
	22000	64×95	0.25	8.0	11.0	HAP223M64095□VA
	33000	76×95	0.30	6.5	13.9	HAP333M76095□VA
	47000	76×115	0.30	4.9	16.5	HAP473M76115□VA
	68000	89×130	0.30	4.0	19.7	HAP683M89130□VA
100 (125)	1000	35×60	0.15	70.0	1.6	HAO102M35060□VA
	1500	35×60	0.15	55.0	2.0	HAO152M35060□VA
	2200	35×80	0.15	38.0	3.0	HAO222M35080□VA
	3300	35×80	0.15	25.0	4.2	HAO332M35080□VA
	4700	35×100	0.15	21.0	5.0	HAO472M35100□VA
	6800	51×80	0.15	19.0	5.8	HAO682M51080□VA

WV_{DC} (Surge Voltage) (V)	Cap (μF)	Size D×L (mm)	tanδ 20℃ 120Hz	ESRtyp 20℃ 120Hz mΩ	Ripple Current 105℃120Hz (Arms)	Catalog Part Number
100 (125)	10000	51×95	0.15	13.0	7.8	HAO103M51095□VA
	15000	64×95	0.20	9.0	10.4	HAO153M64095□VA
	22000	76×95	0.20	7.0	12.5	HAO223M76095□VA
	33000	76×130	0.25	5.5	15.2	HAO333M76130□VA
	47000	89×130	0.25	4.5	19.3	HAO473M89130□VA
160 (200)	470	35×60	0.15	265.0	1.2	HAN471M35060□VA
	680	35×60	0.15	186.0	1.3	HAN681M35060□VA
	1000	35×80	0.15	125.0	1.9	HAN102M35080□VA
	1500	35×80	0.15	85.0	2.4	HAN152M35080□VA
	2200	35×100	0.15	55.0	3.2	HAN222M35100□VA
	3300	51×80	0.15	38.0	4.2	HAN332M51080□VA
	4700	51×95	0.15	22.6	5.5	HAN472M51095□VA
	6800	64×95	0.15	15.6	7.1	HAN682M64095□VA
	10000	76×95	0.15	10.6	9.1	HAN103M76095□VA
	15000	76×130	0.15	7.1	11.8	HAN153M76130□VA
	22000	89×130	0.15	5.1	15.2	HAN223M89130□VA
200 (250)	330	35×60	0.15	375.0	0.9	HAL331M35060□VA
	470	35×60	0.15	262.0	1.2	HAL471M35060□VA
	680	35×80	0.15	180.0	1.4	HAL681M35080□VA
	1000	35×100	0.15	125.0	2.0	HAL102M35100□VA
	1500	35×80	0.15	75.0	2.5	HAL152M35080□VA
	2200	51×95	0.15	48.3	3.2	HAL222M51095□VA
	3300	51×95	0.15	32.2	4.3	HAL332M51095□VA
	4700	64×95	0.15	22.6	5.2	HAL472M64095□VA
	6800	64×115	0.15	15.6	7.3	HAL682M64115□VA
	10000	76×155	0.15	9.3	9.3	HAL103M76155□VA
	15000	89×157	0.15	6.0	12.5	HAL153M89157□VA
250 (300)	330	35×60	0.15	160.0	0.9	HAJ331M35060□VA
	470	35×60	0.15	120.0	1.1	HAJ471M35060□VA
	680	35×80	0.15	85.0	1.5	HAJ681M35080□VA
	1000	35×100	0.15	55.0	2.1	HAJ102M35100□VA
	1500	51×80	0.15	40.0	2.6	HAJ152M51080□VA
	2200	51×95	0.15	28.0	3.4	HAJ222M51095□VA
	3300	64×95	0.15	20.0	4.6	HAJ332M64095□VA
	4700	64×115	0.15	15.0	6.0	HAJ472M64115□VA
	6800	76×115	0.15	10.0	7.9	HAJ682M76115□VA
	10000	76×155	0.15	8.0	10.2	HAJ103M76155□VA
	15000	89×157	0.15	6.0	13.5	HAJ153M89157□VA
350 (400)	470	35×60	0.15	225.9	1.4	HAH471M35060□VA
	680	35×80	0.15	156.1	1.9	HAH681M35080□VA
	1000	35×120	0.15	106.2	2.8	HAH103M35120□VA
	1500	51×80	0.15	70.8	3.5	HAH152M51080□VA
	2200	51×115	0.15	48.3	4.8	HAH222M51115□VA
	3300	64×95	0.15	32.2	6.1	HAH332M64095□VA
	4700	76×115	0.15	22.6	8.3	HAH472M76115□VA
	6800	76×155	0.15	15.6	11.0	HAH682M76155□VA
	10000	89×157	0.15	10.6	14.6	HAH103M89157□VA
	15000	89×195	0.15	7.1	19.1	HAH153M89195□VA
400 (450)	1000	51×80	0.15	79.6	2.7	HAG102M51080□VA
	1200	51×95	0.15	66.3	3.2	HAG122M51095□VA
	1500	51×115	0.15	53.1	3.9	HAG152M51115□VA
	1800	51×130	0.15	44.2	4.4	HAG182M51130□VA
	2200	64×95	0.15	36.2	4.9	HAG222M64095□VA
	2700	64×115	0.15	29.5	5.7	HAG272M64115□VA
	3300	64×130	0.15	24.1	6.6	HAG332M64130□VA
	3900	76×115	0.15	20.4	7.5	HAG392M76115□VA
	4700	76×130	0.15	16.9	8.7	HAG472M76130□VA
	5600	76×155	0.15	15.4	10.3	HAG562M76155□VA

*产品编码中□内为产品端子引出型式代码
*□Enter the appropriate terminal code

HA SERIES

◆产品一览表 **Standard Ratings**

WV_{DC} (Surge Voltage) (V)	Cap (μF)	Size D×L (mm)	tanδ 20℃ 120Hz	ESRtyp 20℃ 120Hz mΩ	Ripple Current 105℃120Hz (Arms)	Catalog Part Number
400 (450)	6800	89×157	0.15	13.7	12.1	HAG682M89157□VA
	8200	89×157	0.15	11.3	13.2	HAG822M89157□VA
	10000	89×195	0.15	9.3	15.6	HAG103M89195□VA
	12000	89×195	0.15	8.0	17.1	HAG123M89195□VA
	15000	89×235	0.15	7.0	20.8	HAG153M89235□VA
450 (500)	220	35×60	0.15	410.2	1.1	HAE221M35060□VA
	330	35×100	0.15	273.4	1.5	HAE331M35100□VA
	470	51×80	0.15	192.0	2.1	HAE471M51080□VA
	680	51×95	0.15	132.7	2.7	HAE681M51095□VA
	1000	51×105	0.15	90.2	4.2	HAE102M51105□VA
	1500	51×130	0.15	54.0	5.7	HAE152M51130□VA
	2200	64×115	0.15	33.0	7.3	HAE222M64115□VA
	2700	64×130	0.15	29.5	8.3	HAE272M64130□VA
	3300	76×130	0.15	22.0	10.1	HAE332M76130□VA
	4700	76×155	0.15	16.9	12.6	HAE472M76155□VA
	5600	89×157	0.15	14.2	15.8	HAE562M89157□VA
	6800	89×157	0.15	12.7	18.0	HAE682M89157□VA
	8200	89×195	0.15	11.3	19.8	HAE822M89195□VA
	10000	89×195	0.15	10.0	22.0	HAE103M89195□VA
	12000	89×235	0.15	8.8	26.0	HAE123M89235□VA
	15000	89×250	0.15	7.5	29.0	HAE153M89250□VA
500 (550)	330	51×80	0.15	257.4	1.5	HAC331M51080□VA
	470	51×80	0.15	180.7	1.8	HAC471M51080□VA
	680	51×105	0.15	124.9	2.5	HAC681M51105□VA
	1000	51×115	0.15	84.9	3.1	HAC102M51115□VA
	1500	64×115	0.15	60.2	4.4	HAC152M64115□VA
	2200	64×130	0.15	41.0	5.6	HAC222M64130□VA
	3300	76×155	0.15	31.8	8.1	HAC332M76155□VA
	4700	89×157	0.15	24.6	10.6	HAC472M89157□VA

WV_{DC} (Surge Voltage) (V)	Cap (μF)	Size D×L (mm)	tanδ 20℃ 120Hz	ESRtyp 20℃ 120Hz mΩ	Ripple Current 105℃120Hz (Arms)	Catalog Part Number
500 (500)	5600	89×157	0.15	20.9	11.6	HAC562M89157□VA
	6800	89×170	0.15	17.2	13.3	HAC682M89170□VA
	8200	89×235	0.15	13.9	16.9	HAC822M89235□VA
	10000	89×250	0.15	10.0	18.1	HAC103M89250□VA
550 (600)	820	51×115	0.20	134.3	3.2	HAZ821M51115□VA
	1000	51×130	0.20	110.0	3.7	HAZ102M51130□VA
	1200	64×95	0.20	95.0	4.1	HAZ122M64095□VA
	1500	64×115	0.20	74.0	4.9	HAZ152M64115□VA
	1800	64×130	0.20	72.0	5.7	HAZ182M64130□VA
	2200	76×115	0.20	50.0	6.6	HAZ222M76115□VA
	2700	76×130	0.20	40.0	7.4	HAZ272M76130□VA
	3300	76×155	0.20	36.0	8.6	HAZ332M76155□VA
	3900	76×170	0.20	30.6	9.8	HAZ392M76170□VA
	4700	89×157	0.20	24.0	11.0	HAZ472M89157□VA
	5600	89×195	0.20	20.0	12.9	HAZ562M89195□VA
	6800	89×220	0.20	16.0	14.0	HAZ682M89220□VA
	8200	89×250	0.20	14.0	14.9	HAZ822M89250□VA
600 (650)	820	51×130	0.20	176.4	3.0	HAB821M51130□VA
	1000	64×95	0.20	144.6	3.5	HAB102M64095□VA
	1200	64×115	0.20	121.0	4.2	HAB122M64115□VA
	1500	64×130	0.20	112.0	5.0	HAB152M64130□VA
	1800	76×115	0.20	97.0	5.7	HAB182M76115□VA
	2200	76×130	0.20	81.0	6.6	HAB222M76130□VA
	2700	76×155	0.20	66.0	7.6	HAB272M76155□VA
	3300	76×170	0.20	49.0	8.4	HAB332M76170□VA
	3900	89×157	0.20	37.0	9.7	HAB392M89157□VA
	4700	89×195	0.20	31.0	11.4	HAB472M89195□VA
	5600	89×220	0.20	28.0	12.3	HAB562M89220□VA
	6800	89×250	0.20	23.0	14.0	HAB682M89250□VA

*产品编码中□内为产品端子引出型式代码
*□Enter the appropriate terminal code

*记载之外的体积，请另行咨询。
*Please ask for advice for other sizes.

*铝电解电容器由于承受纹波电流而发热，随着温升而发生性能劣化。请在使用中降低产品承受的纹波电流。
*Aluminum electrolytic capacitor will emit heat when ripple current is applied, the performance will deteriorate when temp. rises. Please reduce the ripple current when using capacitor.