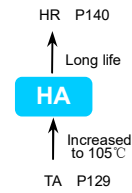


HA 系列 SERIES



- 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



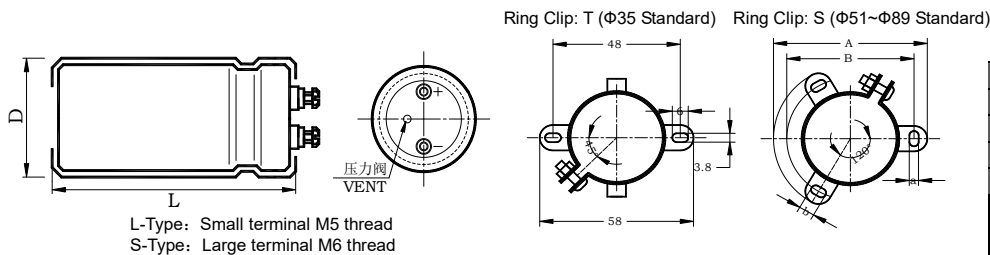
规格表 SPECIFICATIONS

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 = 0.01C _R U _R 或 5mA 取小者 (20℃, 施加额定电压 5 分钟后) I = 0.01C _R U _R or 5mA whichever is minimum. (at 20℃, After 5 minutes application of rated voltage)											
	I = 漏电流 (µA) Leakage Current	U _R = 额定电压 (V) Rated Voltage							C _R = 静电容量 (µF) 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	≤ 规定值的 150% ≤ 150% of specified	
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	初始值 ± 15% 以内 Within ± 15% of initial	
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



Ring Clip Dimensions:

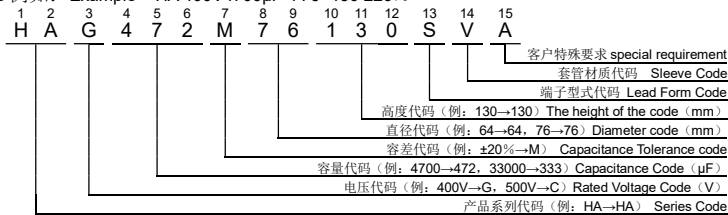
ΦD	A	B	a	b
51	73.0	63.5	4.5	7
64	85.1	76.2	4.5	7
76	98.4	88.9	4.5	7
89	111.1	101.6	4.5	7

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%



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

◆ 产品一览表 Standard Ratings

WV _{DC} (Surge Voltage) (V)	Cap (μ F)	Size D×L (mm)	tan δ 20°C/120Hz	Ripple Current 105°C/120Hz z (Amps)	Catalog Part Number
25 (32)	10000	35×60	0.35	3.2	HAU103M35060□VA
	15000	35×80	0.35	4.8	HAU153M35080□VA
	22000	35×80	0.35	5.8	HAU223M35080□VA
	33000	35×100	0.40	7.2	HAU333M35100□VA
	47000	51×80	0.40	9.3	HAU473M51080□VA
	68000	51×115	0.50	11.5	HAU683M51115□VA
	100000	64×95	0.60	13.0	HAU104M64095□VA
	150000	64×115	0.80	17.9	HAU154M64115□VA
	220000	76×115	1.00	21.3	HAU224M76115□VA
330000	89×130	1.00	23.4	HAU334M89130□VA	
35 (44)	6800	35×60	0.30	2.8	HAT682M35060□VA
	10000	35×80	0.30	4.1	HAT103M35080□VA
	15000	35×80	0.30	5.2	HAT153M35080□VA
	22000	35×100	0.35	6.3	HAT223M35100□VA
	33000	51×80	0.40	8.7	HAT333M51080□VA
	47000	51×95	0.45	11.2	HAT473M51095□VA
	68000	51×150	0.50	14.3	HAT683M51150□VA
	100000	64×115	0.60	17.2	HAT104M64115□VA
	150000	76×115	0.70	20.7	HAT154M76115□VA
220000	89×130	0.70	23.4	HAT224M89130□VA	
50 (63)	3300	35×60	0.20	2.5	HAR332M35060□VA
	4700	35×60	0.25	3.7	HAR472M35060□VA
	6800	35×80	0.25	3.9	HAR682M35080□VA
	10000	35×80	0.25	4.7	HAR103M35080□VA
	15000	35×100	0.30	5.7	HAR153M35100□VA
	22000	51×80	0.35	8.1	HAR223M51080□VA
	33000	51×115	0.40	11.1	HAR333M51115□VA
	47000	64×95	0.40	13.9	HAR473M64095□VA
	68000	64×115	0.45	16.6	HAR683M64115□VA
100000	76×115	0.50	19.5	HAR104M76115□VA	
150000	76×115	0.50	23.9	HAR154M76115□VA	
63 (79)	2200	35×60	0.15	2.5	HAQ222M35060□VA
	3300	35×60	0.20	2.7	HAQ332M35060□VA
	4700	35×80	0.20	3.8	HAQ472M35080□VA
	6800	35×80	0.20	4.4	HAQ682M35080□VA
	10000	35×100	0.25	5.3	HAQ103M35100□VA
	15000	51×80	0.25	6.8	HAQ153M51080□VA
	22000	51×95	0.30	9.0	HAQ223M51095□VA
	33000	64×95	0.30	12.0	HAQ333M64095□VA
	47000	64×115	0.35	14.5	HAQ473M64115□VA
68000	76×115	0.40	18.4	HAQ683M76115□VA	
100000	89×130	0.40	20.0	HAQ104M89130□VA	
80 (100)	2200	35×60	0.15	2.8	HAP222M35060□VA
	3300	35×80	0.15	3.6	HAP332M35080□VA
	4700	35×80	0.15	4.3	HAP472M35080□VA
	6800	35×100	0.20	4.9	HAP682M35100□VA
	10000	51×80	0.20	6.4	HAP103M51080□VA
	15000	51×95	0.25	7.4	HAP153M51095□VA
	22000	64×95	0.25	11.0	HAP223M64095□VA
	33000	76×95	0.30	13.9	HAP333M76095□VA
	47000	76×115	0.30	16.5	HAP473M76115□VA
68000	89×130	0.30	19.7	HAP683M89130□VA	
100 (125)	1000	35×60	0.15	1.6	HAO102M35060□VA
	1500	35×60	0.15	2.0	HAO152M35060□VA
	2200	35×80	0.15	3.0	HAO222M35080□VA
	3300	35×80	0.15	4.2	HAO332M35080□VA
	4700	35×100	0.15	5.0	HAO472M35100□VA
	6800	51×80	0.15	5.8	HAO682M51080□VA

WV _{DC} (Surge Voltage) (V)	Cap (μ F)	Size D×L (mm)	tan δ 20°C/120Hz	Ripple Current 105°C/120Hz z (Amps)	Catalog Part Number
100 (125)	10000	51×95	0.15	7.8	HAO103M51095□VA
	15000	64×95	0.20	10.4	HAO153M64095□VA
	22000	76×95	0.20	12.5	HAO223M76095□VA
	33000	76×130	0.25	15.2	HAO333M76130□VA
	47000	89×130	0.25	19.3	HAO473M89130□VA
160 (200)	470	35×60	0.15	1.2	HAN471M35060□VA
	680	35×60	0.15	1.3	HAN681M35060□VA
	1000	35×80	0.15	1.9	HAN102M35080□VA
	1500	35×80	0.15	2.4	HAN152M35080□VA
	2200	35×100	0.15	3.2	HAN222M35100□VA
	3300	51×80	0.15	4.2	HAN332M51080□VA
	4700	51×95	0.15	5.5	HAN472M51095□VA
	6800	64×95	0.15	7.1	HAN682M64095□VA
	10000	76×95	0.15	9.1	HAN103M76095□VA
15000	76×130	0.15	11.8	HAN153M76130□VA	
22000	89×130	0.15	15.2	HAN223M89130□VA	
200 (250)	330	35×60	0.15	0.9	HAL331M35060□VA
	470	35×60	0.15	1.2	HAL471M35060□VA
	680	35×80	0.15	1.4	HAL681M35080□VA
	1000	35×100	0.15	2.0	HAL102M35100□VA
	1500	35×80	0.15	2.5	HAL152M35080□VA
	2200	51×95	0.15	3.2	HAL222M51095□VA
	3300	51×95	0.15	4.3	HAL332M51095□VA
	4700	64×95	0.15	5.2	HAL472M64095□VA
	6800	64×115	0.15	7.3	HAL682M64115□VA
10000	76×155	0.15	9.3	HAL103M76155□VA	
15000	89×157	0.15	12.5	HAL153M89157□VA	
250 (300)	330	35×60	0.15	0.9	HAJ331M35060□VA
	470	35×60	0.15	1.1	HAJ471M35060□VA
	680	35×80	0.15	1.5	HAJ681M35080□VA
	1000	35×100	0.15	2.1	HAJ102M35100□VA
	1500	51×80	0.15	2.6	HAJ152M51080□VA
	2200	51×95	0.15	3.4	HAJ222M51095□VA
	3300	64×95	0.15	4.6	HAJ332M64095□VA
	4700	64×115	0.15	6.0	HAJ472M64115□VA
	6800	76×115	0.15	7.9	HAJ682M76115□VA
10000	76×155	0.15	10.2	HAJ103M76155□VA	
15000	89×157	0.15	13.5	HAJ153M89157□VA	
350 (400)	470	35×60	0.15	1.4	HAH471M35060□VA
	680	35×80	0.15	1.9	HAH681M35080□VA
	1000	35×120	0.15	2.8	HAH103M35120□VA
	1500	51×80	0.15	3.5	HAH152M51080□VA
	2200	51×115	0.15	4.8	HAH222M51115□VA
	3300	64×95	0.15	6.1	HAH332M64095□VA
	4700	76×115	0.15	8.3	HAH472M76115□VA
	6800	76×155	0.15	11.0	HAH682M76155□VA
	10000	89×157	0.15	14.6	HAH103M89157□VA
15000	89×195	0.15	19.1	HAH153M89195□VA	
400 (450)	1000	51×80	0.15	2.7	HAG102M51080□VA
	1200	51×95	0.15	3.2	HAG122M51095□VA
	1500	51×115	0.15	3.9	HAG152M51115□VA
	1800	51×130	0.15	4.4	HAG182M51130□VA
	2200	64×95	0.15	4.9	HAG222M64095□VA
	2700	64×115	0.15	5.7	HAG272M64115□VA
	3300	64×130	0.15	6.6	HAG332M64130□VA
	3900	76×115	0.15	7.5	HAG392M76115□VA
	4700	76×130	0.15	8.7	HAG472M76130□VA
5600	76×155	0.15	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

◆ 产品一览表 Standard Ratings

WV _{DC} (Surge Voltage) (V)	Cap (μ F)	Size D×L (mm)	$\tan\delta$ 20°C/120Hz	Ripple Current 105°C/120Hz z (Amps)	Catalog Part Number
400 (450)	6800	89×157	0.15	12.1	HAG682M89157□VA
	8200	89×157	0.15	13.2	HAG822M89157□VA
	10000	89×195	0.15	15.6	HAG103M89195□VA
	12000	89×195	0.15	17.1	HAG123M89195□VA
	15000	89×235	0.15	20.8	HAG153M89235□VA
450 (500)	220	35×60	0.15	1.1	HAE221M35060□VA
	330	35×100	0.15	1.5	HAE331M35100□VA
	470	51×80	0.15	2.1	HAE471M51080□VA
	680	51×95	0.15	2.7	HAE681M51095□VA
	1000	51×105	0.15	4.2	HAE102M51105□VA
	1500	51×130	0.15	5.7	HAE152M51130□VA
	2200	64×115	0.15	7.3	HAE222M64115□VA
	2700	64×130	0.15	8.3	HAE272M64130□VA
	3300	76×130	0.15	10.1	HAE332M76130□VA
	4700	76×155	0.15	12.6	HAE472M76155□VA
	5600	89×157	0.15	15.8	HAE562M89157□VA
	6800	89×157	0.15	18.0	HAE682M89157□VA
	8200	89×195	0.15	19.8	HAE822M89195□VA
	10000	89×195	0.15	22.0	HAE103M89195□VA
	12000	89×235	0.15	26.0	HAE123M89235□VA
15000	89×250	0.15	29.0	HAE153M89250□VA	
500 (550)	330	51×80	0.15	1.5	HAC331M51080□VA
	470	51×80	0.15	1.8	HAC471M51080□VA
	680	51×105	0.15	2.5	HAC681M51105□VA
	1000	51×115	0.15	3.1	HAC102M51115□VA
	1500	64×115	0.15	4.4	HAC152M64115□VA
	2200	64×130	0.15	5.6	HAC222M64130□VA
	3300	76×155	0.15	8.1	HAC332M76155□VA
	4700	89×157	0.15	10.6	HAC472M89157□VA

WV _{DC} (Surge Voltage) (V)	Cap (μ F)	Size D×L (mm)	$\tan\delta$ 20°C/120Hz	Ripple Current 105°C/120Hz z (Amps)	Catalog Part Number	
500 (500)	5600	89×157	0.15	11.6	HAC562M89157□VA	
	6800	89×170	0.15	13.3	HAC682M89170□VA	
	8200	89×235	0.15	16.9	HAC822M89235□VA	
	10000	89×250	0.15	18.1	HAC103M89250□VA	
	820	51×115	0.20	3.2	HAZ821M51115□VA	
550 (600)	1000	51×130	0.20	3.7	HAZ102M51130□VA	
	1200	64×95	0.20	4.1	HAZ122M64095□VA	
	1500	64×115	0.20	4.9	HAZ152M64115□VA	
	1800	64×130	0.20	5.7	HAZ182M64130□VA	
	2200	76×115	0.20	6.6	HAZ222M76115□VA	
	2700	76×130	0.20	7.4	HAZ272M76130□VA	
	3300	76×155	0.20	8.6	HAZ332M76155□VA	
	3900	76×170	0.20	9.8	HAZ392M76170□VA	
	4700	89×157	0.20	11.0	HAZ472M89157□VA	
	5600	89×195	0.20	12.9	HAZ562M89195□VA	
	6800	89×220	0.20	14.0	HAZ682M89220□VA	
	8200	89×250	0.20	14.9	HAZ822M89250□VA	
	600 (650)	820	51×130	0.20	3.0	HAB821M51130□VA
		1000	64×95	0.20	3.5	HAB102M64095□VA
		1200	64×115	0.20	4.2	HAB122M64115□VA
1500		64×130	0.20	5.0	HAB152M64130□VA	
1800		76×115	0.20	5.7	HAB182M76115□VA	
2200		76×130	0.20	6.6	HAB222M76130□VA	
2700		76×155	0.20	7.6	HAB272M76155□VA	
3300		76×170	0.20	8.4	HAB332M76170□VA	
3900		89×157	0.20	9.7	HAB392M89157□VA	
4700		89×195	0.20	11.4	HAB472M89195□VA	
5600		89×220	0.20	12.3	HAB562M89220□VA	
6800		89×250	0.20	14.0	HAB682M89250□VA	

*产品编码中□内为产品端子引出型式代码
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*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.