PRODUCT SPECIFICATION

No:HW15073120

CUSTOMER：资普电子	**DATE：2015-8-3**

PATNAME： **Aluminum Electrolytic Capacitors**

Series/Spec： **HP SERIES**

User
Approved by

CHANGZHOU HUAWEI ELECTRONICS CO.,LTD

Prepared	Checked	Approved
聂良娇	葛亚松	欧阳宏珍

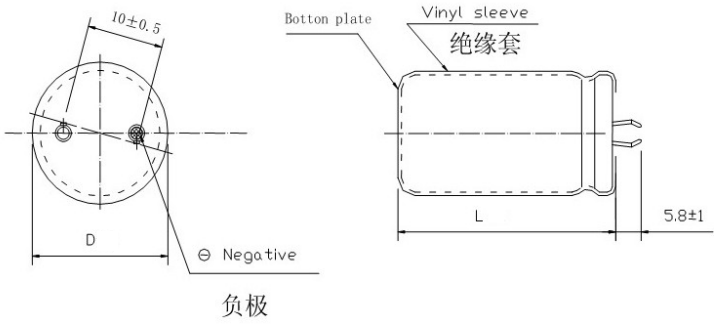
Table

Rated Voltage (VDC)	Capacitance (μF)	Dimension (D×L, mm)	tgδ	Leakage Current (μA)	Ripple Current at 105℃120Hz (A)
400	47	22*20	0.20	188	0.31
400	68	22*25	0.20	272	0.50
450	68	22*25	0.20	306	0.49
400	82	22*30	0.20	328	0.64
450	100	22*30	0.20	450	0.60
450	100	22*40	0.20	450	0.67
450	100	25*25	0.20	450	0.64
400	120	22*30	0.20	480	0.64
450	120	25*30	0.20	540	0.80
400	150	22*40	0.20	600	0.88
450	150	25*35	0.20	675	0.88
400	180	25*30	0.20	720	0.91
450	180	30*35	0.20	810	1.06
250	220	22*30	0.15	550	0.93
400	220	25*40	0.20	880	1.10
400	220	30*35	0.20	880	1.19
450	220	25*45	0.20	990	1.12
450	220	30*40	0.20	990	1.18
400	330	30*40	0.20	1320	1.47
400	330	35*35	0.20	1320	1.50
400	470	35*45	0.20	1500	1.99
450	470	35*50	0.20	1500	1.85
400	560	35*50	0.20	1500	2.21
250	680	25*50	0.15	1500	2.03
400	680	35*60	0.20	1500	2.59
450	680	35*60	0.20	1500	2.45
200	820	30*40	0.15	1500	2.15
250	820	30*45	0.15	1500	2.19
200	2200	35*60	0.15	1500	4.80

一、Scope

HP TYPE (Snap in)

二、Case size table



Unit：（mm）

ØD $^{+1}_{0}$	22	25	30	35
L $^{+2.0}_{0}$	20,25,30, 40	25,30, 35,40,45,50	35,40,45	35,40,60

ØD $^{+1}_{0}$	35
L $^{+3.0}_{0}$	50

三、Specifications

Item	Performance Characteristics	
Operating temperature	-40℃ ~ +105℃	-25℃ ~ +105℃
Rated voltage range	16 ~ 100 V	160 ~ 500 V
Capacitance tolerance (120Hz, +20℃)	±20% (120Hz, +20℃)	
Leakage current	I ≤0.01CV(μA)or 1.5mA 5mins 取较小值（after 5 minutes , Whichever is smaller）	

Dissipation factor（tg δ）(+20℃, 120Hz)

U_R (V)	16	25	35	50	63~100	160~250	350~450
tgδ	0.50	0.40	0.35	0.30	0.20	0.15	0.20

Temperature Characteristics (Impedance ratio at 120Hz)

U_R（V）	16~100	160~250	350~450
Z-25℃/+20℃	4	4	8
Z-40℃/+20℃	15	-	-

Surge voltage

W.V	10	16	25	35	50	63	100	160	200	250	400	450	500
S.V.	13	20	32	44	63	79	125	200	250	300	450	500	550

Load life	After applying rated voltage with specified ripple current for 2000 hours at +105℃ and then resumed 16 hours: Capacitance change ： ±20% Initial measured value Leakage current ： ≤ Initial specified value Dissipation factor ： ≤ 2times Initial specified value
Shelf life	After storage for 1000 hours at +105℃ , U_R to be applied for 30 minutes and then resumed 16 hours Capacitance change ： ±20% Initial measured value Leakage current ： ≤Initial specified value Dissipation factor ： ≤2times Initial specified value

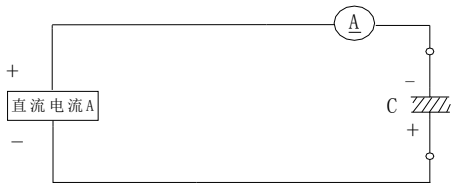
四、Ripple Current Multiplier

Frequency coefficient

Freq.(Hz) / U(V)	50	120	1K	10K	≥50K
10~100	0.90	1.00	1.15	1.25	1.35
160~500	0.80	1.00	1.30	1.41	1.43

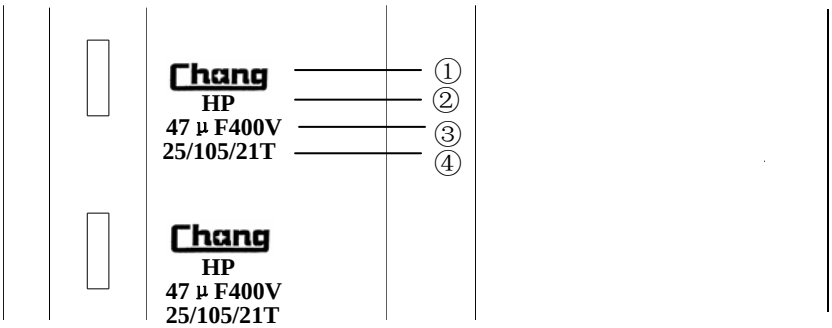
五、Tests

No	Item	Test Conditions	Requirements	
1	Surge Voltage	At 15~35℃, 1000 cycles of 30s on and 330s off.	No visible damage	
			Δ C/C	±15% Initial measured value
			tg δ	≤ Initial specified value
			I	≤ Initial specified value
2	Load Life	After applying rated voltage with specified ripple current for 2000 hours at +105℃and then resumed 16 hours.	Δ C/C	±20% Initial measured value
			tg δ	≤ 2times Initial specified value
			I	≤ Initial specified value
3	Shelf Life	After storage for 1000 hours at +105℃,U_R to be applied for 30 minutes and then resumed 16 hours.	Δ C/C	±20% Initial measured value
			tg δ	≤2times Initial specified value
			I	≤ Initial specified value
4	Tension Strength	IEC 60384 – 4 Test Ua Loading force 10N for 10S	Performance of capacitor shall not have changed and leads shall be undamaged.	
5	Solder ability	IEC 60384–4 Test Ta:Tank temperature：245±5℃; Impregnating depth:≥95% of the total lead wire; Impregnating depth:3±0.5s	The lead wire is coated by tin and wet; Impregnating coverage rate≥95%	
6	Resistance to soldering heat	IEC 603848 –4 Test Ta:Tank temperature:280±5 ℃for 10seconds; Tank temperature:380 ± 10 ℃ for 3seconds Impregnating depth: 1.5~2.0mm.	No visible damage; marking legible. Δ C/C≤±5%.	
			Δ C/C	≤±10% of Initial measured value
			Tg δ	≤Initial specified value
			I	≤Initial specified value
7	Stable Humidity	IEC 60384 –4 Test Ca:21 days at 40℃ ,RH 90 to 95 %,no voltage applied.	No visible damage; no leakage of electrolyte; marking legible.	
			Δ C/C	≤±20% Initial measured value.
			tg δ	≤1.2 Initial specified value
			I	≤1.2 Initial specified value
8	Resistance to vibration	IEC 60384 – 4 Test Fc : Frequency:10~55Hz,Sweep rate: 10Hz~55Hz~10Hz in about 1 minute;Amplitude:1.5mm;3 direction,2hours per direction.	No visible damage ; no leakage of electrolyte; marking legible.	

<table>
<tr>
<td>9</td>
<td>Safety vent</td>
<td>
DC Inverse voltage


Ⓐ 直流电流表 C:试验电容器
<table>
<tr><td>Diameter (mm)</td><td>DC Current (A)</td></tr>
<tr><td>22.4 1ess</td><td>1</td></tr>
<tr><td>22.4 more</td><td>10</td></tr>
</table>
</td>
<td>(1) Not appear detonate and be on fire
(2) Vent should be opened, the gas not be allowed be set free from rubber
(3) the case and the pistil of the capacitor can’t be splashed
It’s is not eligible if the vent can’t be open when the test be lasted out for 30 minutes.</td>
</tr>
</table>

六、 Marking



No.	Item
1	Brand
2	Products type
3	Products specification
4	Climate Category (PET Sleeve)

七、Guidelines For Using Aluminum Electrolytic Capacitor

Upon using Aluminum Electrolytic Capacitors，please proper handing and observing to following important points will insure optimum capacitor performance and long life.

1．DC electrolytic capacitors are polarized.
Make sure of the polarity. The polarity is marked on the body of the capacitor .Application of the reversed voltage cause a short circuit or damage to the capacitor. Use bipolar capacitors when the polarity is not determined or unknown. Note that DC electrolytic capacitors can not be used for AC application.

2．Do not apply voltage greater than rated voltage.
If a voltage exceeding the rated voltage is applied, the leakage current will increase, which damage the capacitor. Recommended working voltage is 70 to 80 percent of tatted voltage. Using capacitors at recommended working voltage prolongs capacitor life.

3．Do not allow excessive ripple current through the capacitor.
The flow of ripple current over permissible ripple current will cause heat of the capacitor, which may decrease the capacitance and damage the capacitor. Ripple current on the capacitor must be at or bellow allowable level.

4. Use specially designed capacitors for the circuits where charge and discharge are frequency repeated.
   In the circuit subjected to rapid charge cycles, capacitors may be damaged; its life may be shortened by capacitance decrease, heat rise, ect. Be sure and use special capacitors in these applications.
5. Operating temperature range.
   The characteristics of capacitors change with the operating temperature. The capacitance and leakage current increase and tgδ decrease at higher temperatures. The capacitance and leakage current decrease and tgδ at increase lower temperature. Usage at lower temperature will ensure longer life.
6. Check operating frequency.
   The capacitance of electrolytic capacitors is usually measured at 100Hz or 120Hz. However, remember that capacitance decrease and tgδ increase as the applied frequency becomes higher whereas the ambient temperature becomes higher.
7. To keep good solderbility,Please send the product storage period in one year of less than control.
8. The capacitor case is not insulated from the cathode terminal.
   The capacitor's case and cathode terminal connect through the electrolyte. If the case is to be completely insulated, that insulation must be at the capacitor's mounting point.
9. Do not apply excessive force to the terminals and leads.
   The excessive strong force applied to the terminals and lead wires may cause leads to break or terminals to separate and, in turn, cause the internal contact to fail.

Hazardous substances management table of contents

Type	Name(English)	Test result	
		Yes	No
Level A-I	Lead and its compounds		ND
	Cadmium and its compounds		ND
	Mercury and its compounds		ND
	Hexavalent chromium and its compounds		ND
	Polybrominated biphenyls		ND
	Polybrominated diphenylethers		ND
Level A-II	Polychlorinated biphenyls (PCB)		No
	Polychlorinated naphthalene (PCN)		No
	Polychlorinated terphenyls (PCT)		No
	Short-chain Chlorinated paraffin (SCCP)		No
	Asbestos and its compounds		No
	Ozone Depleting Substances		No
	Azo compounds		No
	Nickel and its compounds		No
	Specific Organic tin compounds		No
	Arsenic and its compounds		No
	Formaldehydes		No
Level B	Poly vinyl chloride(PVC)		YES
	Phthalates		ND
	Beryllium and its compounds		No
	Antimony and its compounds		No
	Selenium and its compounds		No
	Palladium and its compounds		No
	Bismuth and its compounds		No
	Other chlorinated flame retardants		No
	Other brominates flame retardants		No