ZH 系列 SERIES

High ripple　Low impedance　RoHS

●105℃高纹波，低阻抗品
105℃ High Ripple Current, Low Impedance
●保证 105℃、2000～4000 小时寿命。(叠加纹波电流)
Endurance with ripple current: 2000～4000hours at 105℃
●额定工作电压范围：6.3V～450V
Rated voltage range: 6.3V-450V

ZH
↑ High Ripple
RD　P14

◆规格表　SPECIFICATIONS

项　目 Items	特　性 Characteristics	
工作温度范围 Operating Temperature Range	−40～+105℃	−25～+85℃
额定工作电压范围 Rated Working Voltage Range	6.3～100V	160～450V
静电容量允许偏差 Capacitance Tolerance	±20%　(20℃,120Hz)	
损耗角正切值 Dissipation Factor（MAX） 20℃，120Hz	当容量大于 1000μF 时，容量每增加 1000μF，tgδ 增加 0.02。 When nominal capacitance over 1000μF, tgδ shall be added 0.02 to below listed value for each 1000μF increase.	

U_R(V)	6.3	10	16	25	35	50	63	100	160～250	350～450
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.20	0.24

阻抗比
Impedance Ratio（MAX）120Hz

U_R(V)	6.3	10	16	25	35	50	63	100	160～250	350～450
$Z_{-25℃}/Z_{+20℃}$	4	3	2	2	2	2	2	2	3	5
$Z_{-40℃}/Z_{+20℃}$	8	6	4	3	3	3	3	3	----	----

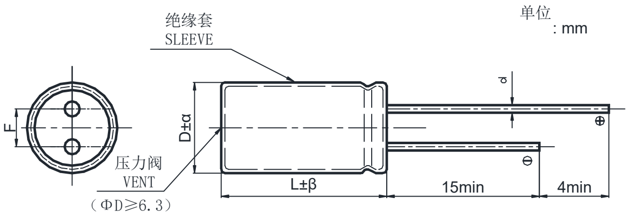
漏电流
Leakage Current（MAX）

U_R≤100V	I＝0.01C_RU_R 或 3μA 取大者　I＝0.01C_RU_R or 3μA whichever is greater.	at 20℃，After 2 minutes
U_R＞100V	I＝0.03C_RU_R+40μA	

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	ΦD5~6.3：3000h ΦD8~10：4000h ΦD＞10：5000h	>70000h	ΦD5~6.3：2000h ΦD8~10：3000h ΦD＞10：4000h	ΦD5~6.3：2000h ΦD8~10：3000h ΦD＞10：4000h	1000h	
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 Tgδ Change	≤规定值的 500% ≤500% of specified value		≤规定值的 200% ≤200% of specified value	≤规定值的 200% ≤200%of specified value	≤规定值的 200% ≤200%of specified value	
静电容量变化率 Capacitance Change	初始值±50%以内 Within±50% of initial value		初始值±25%以内 Within±20% of initial value	初始值±25%以内 Within±20%of initial value	初始值±25%以内 Within±20%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 1.4×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



D	5	6.3	8	10	13	16	18
F±0.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5
d±0.05	0.5			0.6		0.8	
β	L≤16：　β=1.5　　L≥20：　β=2.0						
α	0.5						

◆产品编码体系　PART NUMBER SYSTEM

●例如：Example　ZH　400V47μF Φ18×20±20%

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

- 客户特殊要求 Special requirement
- 套管材质代码　Sleeve Code
- 端子型式代码 Lead Form Code
- 高度代码（例：20→020）The height of the code（mm）
- 直径代码（例：18→18，6.3→06）Diameter code（mm）
- 容差代码（例：±20%→M，±10%→K） Capacitance Tolerance code
- 容量代码（例：47→470，2200→222）Capacitance Code（μF）
- 电压代码（例：400V→G，450V→E）Rated Voltage Code（V）
- 产品系列代码（例：ZH→ZH）　Series Code

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

频率（Hz）Frequency / 容量范围（μF）Capacitance（μF）	100 (120)	1K	10K	≥100k
≤180	0.40	0.75	0.90	1.00
220~560	0.50	0.85	0.94	1.00
680~1800	0.60	0.87	0.95	1.00
2200~3900	0.75	0.90	0.95	1.00
≥4700	0.85	0.95	0.98	1.00

ZH 系列 SERIES

◆产品一览表　**Standard Ratings**

WV$_{DC}$ (Surge Voltage) (V)	Cap (μF)	Size D×L (mm)	Impedance 20℃100KHz	Ripple Current 105℃100KHz (mArms)	Catalog Part Number
6.3 (7.2)	100	5×11	0.58	210	ZHX101M05011□VA
	220	6.3×11	0.22	340	ZHX221M06011□VA
	330	6.3×11	0.22	340	ZHX331M06011□VA
	470	8×12	0.13	640	ZHX471M08012□VA
	680	8×12	0.10	760	ZHX681M08012□VA
	1000	8×12	0.08	810	ZHX102M08012□VA
	1000	10×13	0.08	865	ZHX102M10013□VA
	1500	8×20	0.044	1050	ZHX152M08020□VA
	1500	10×16	0.046	1240	ZHX152M10016□VA
	2200	10×20	0.042	1460	ZHX222M10020□VA
	3300	10×25	0.032	2050	ZHX332M10025□VA
	3300	13×21	0.035	1900	ZHX332M13021□VA
	4700	10×30	0.026	2250	ZHX472M10030□VA
	4700	13×21	0.035	2040	ZHX472M13021□VA
	5600	13×25	0.022	2450	ZHX562M13025□VA
	6800	13×25	0.020	2720	ZHX682M13025□VA
10 (13)	100	5×11	0.58	210	ZHW101M05011□VA
	220	6.3×11	0.22	340	ZHW221M06011□VA
	330	6.3×11	0.22	390	ZHW331M06011□VA
	470	6.3×11	0.18	450	ZHW471M06011□VA
	470	8×12	0.13	640	ZHW471M08012□VA
	680	8×14	0.087	820	ZHW681M08014□VA
	1000	8×20	0.069	1050	ZHW102M08012□VA
	1000	10×16	0.06	1210	ZHW102M10016□VA
	1500	10×16	0.055	1380	ZHW152M10016□VA
	1500	10×20	0.042	1560	ZHW152M10020□VA
	2200	10×20	0.038	1650	ZHW222M10020□VA
	2200	10×25	0.035	1840	ZHW222M10025□VA
	3300	10×30	0.026	2140	ZHW332M10030□VA
	3300	13×21	0.035	2060	ZHW332M13021□VA
	4700	13×25	0.028	2355	ZHW472M13025□VA
	5600	16×25	0.028	2552	ZHW562M16025□VA
	6800	16×25	0.024	2640	ZHW682M16025□VA
16 (20)	47	5×11	0.58	210	ZHV470M05011□VA
	100	5×11	0.58	210	ZHV101M05011□VA
	220	6.3×11	0.22	340	ZHV221M06011□VA
	330	8×12	0.13	640	ZHV331M08012□VA
	470	8×12	0.10	705	ZHV471M08012□VA
	470	8×14	0.087	780	ZHV471M08014□VA
	680	8×16	0.069	1020	ZHV681M08016□VA
	680	10×13	0.070	1050	ZHV681M10013□VA
	1000	8×20	0.058	1230	ZHV102M08020□VA
	1000	10×16	0.052	1305	ZHV102M10016□VA
	1000	10×20	0.046	1400	ZHV102M10020□VA
	1500	10×20	0.040	1780	ZHV152M10020□VA
	1500	13×21	0.035	1900	ZHV152M13021□VA
	2200	10×25	0.035	1980	ZHV222M10025□VA
	2200	13×21	0.030	2095	ZHV222M13021□VA
	3300	10×32	0.022	2372	ZHV332M10032□VA
	3300	13×25	0.030	2510	ZHV332M13025□VA
	4700	16×30	0.022	3029	ZHV472M16030□VA
	4700	18×25	0.024	2771	ZHV472M18025□VA
	5600	16×30	0.020	2875	ZHV562M16030□VA
	6800	16×35	0.017	3720	ZHV682M16035□VA
25 (32)	47	5×11	0.58	210	ZHU470M05011□VA
	100	6.3×11	0.22	340	ZHU101M06011□VA
	220	8×12	0.13	640	ZHU221M08012□VA
	330	8×14	0.087	795	ZHU331M08014□VA
25 (32)	330	8×16	0.087	840	ZHU331M08016□VA
	470	8×14	0.069	905	ZHU471M08014□VA
	470	10×13	0.060	1120	ZHU471M10013□VA
	680	10×20	0.046	1400	ZHU681M10020□VA
	1000	10×20	0.035	1720	ZHU102M10020□VA
	1000	13×21	0.035	1900	ZHU102M13021□VA
	1500	13×21	0.030	2052	ZHU152M13021□VA
	2200	13×25	0.022	2560	ZHU222M13025□VA
	2200	16×20	0.034	2320	ZHU222M16020□VA
	3300	16×20	0.022	3029	ZHU332M16020□VA
	3300	18×25	0.022	2771	ZHU332M18025□VA
	4700	16×35	0.019	3260	ZHU472M16035□VA
	5600	16×35	0.017	3482	ZHU562M16035□VA
	6800	18×35	0.015	3960	ZHU682M18035□VA
35 (44)	22	5×11	0.58	210	ZHT220M05011□VA
	33	5×11	0.58	210	ZHT330M05011□VA
	47	6.3×11	0.22	340	ZHT470M06011□VA
	100	8×12	0.13	640	ZHT101M08012□VA
	220	8×12	0.10	680	ZHT221M08012□VA
	220	8×14	0.09	820	ZHT221M08012□VA
	330	8×20	0.069	1050	ZHT331M08020□VA
	330	10×13	0.072	980	ZHT331M10016□VA
	470	10×16	0.046	1326	ZHT471M10016□VA
	470	10×20	0.046	1400	ZHT471M10020□VA
	680	10×20	0.040	1595	ZHT681M10020□VA
	680	13×21	0.035	1780	ZHT681M13021□VA
	1000	10×25	0.030	2190	ZHT102M10025□VA
	1000	13×21	0.030	2235	ZHT102M13021□VA
	1500	13×25	0.022	2650	ZHT152M13025□VA
	2200	16×30	0.022	3498	ZHT222M16030□VA
	2200	18×25	0.024	3201	ZHT222M18025□VA
	3300	18×30	0.018	4090	ZHT332M18030□VA
	4700	18×35	0.015	4367	ZHT472M18035□VA
50 (63)	1	5×11	2.4	180	ZHR010M05011□VA
	2.2	5×11	1.3	180	ZHR2R2M05011□VA
	3.3	5×11	1.3	180	ZHR3R3M05011□VA
	4.7	5×11	1.3	180	ZHR4R7M05011□VA
	10	5×11	1.3	180	ZHR100M05011□VA
	22	5×11	1.3	180	ZHR220M05011□VA
	33	6.3×11	0.30	295	ZHR330M06011□VA
	47	6.3×11	0.30	295	ZHR470M06011□VA
	100	8×12	0.12	680	ZHR101M08012□VA
	220	10×16	0.060	1050	ZHR221M10016□VA
	330	10×16	0.055	1290	ZHR331M10016□VA
	330	10×20	0.050	1460	ZHR331M10020□VA
	470	10×20	0.043	1560	ZHR471M10020□VA
	470	13×21	0.034	1720	ZHR471M13021□VA
	680	13×21	0.030	2180	ZHR681M13021□VA
	1000	13×25	0.021	2640	ZHR102M13025□VA
	1000	16×25	0.025	2555	ZHR102M16025□VA
	1500	16×30	0.019	3040	ZHR152M16030□VA
	2200	18×30	0.017	3410	ZHR222M18030□VA
	2200	18×35	0.017	3680	ZHR222M18035□VA
	3300	18×35	0.015	4200	ZHR332M18035□VA
63 (79)	10	5×11	2.5	95	ZHQ100M05011□VA
	22	6.3×11	1.2	115	ZHQ220M06011□VA
	33	6.3×11	1.2	115	ZHQ330M06011□VA
	47	8×12	0.63	232	ZHQ470M08012□VA

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

ZH 系列 SERIES

◆产品一览表 **Standard Ratings**

WV_{DC} (Surge Voltage) (V)	Cap (μF)	Size D×L (mm)	Impedance 20℃100KHz	Ripple Current 105℃100KHz (mArms)	Catalog Part Number
63 (79)	100	8×16	0.45	300	ZHQ101M08016□VA
	100	10×13	0.43	288	ZHQ101M10013□VA
	220	10×20	0.21	466	ZHQ221M10020□VA
	220	10×25	0.20	531	ZHQ221M10025□VA
	220	13×21	0.16	690	ZHQ221M13021□VA
	330	10×20	0.15	580	ZHQ331M10020□VA
	470	13×21	0.10	860	ZHQ471M13021□VA
	680	13×25	0.083	980	ZHQ681M13025□VA
	1000	16×25	0.054	1380	ZHQ102M16025□VA
	1500	18×30	0.040	1620	ZHQ152M18030□VA
	2200	18×35	0.035	1890	ZHQ222M18035□VA
100 (125)	6.8	5×11	2.3	55	ZHO6R8M05011□VA
	10	6.3×11	2.0	105	ZHO100M06011□VA
	22	8×12	1.0	165	ZHO220M08012□VA
	33	8×14	0.8	210	ZHO330M08014□VA
	47	8×16	0.43	288	ZHO470M08016□VA
	47	10×13	0.43	288	ZHO470M10014□VA
	68	10×16	0.31	357	ZHO680M10016□VA
	100	10×20	0.20	490	ZHO101M10020□VA
	220	13×25	0.12	810	ZHO221M13025□VA
	330	16×25	0.080	1380	ZHO331M16025□VA
	470	18×30	0.045	1740	ZHO471M16030□VA
	680	18×30	0.040	1890	ZHO681M18030□VA
	1000	18×40	0.035	1920	ZHO102M18040□VA
160 (200)	1	5×11	19.6	25	ZHN010M05011□VA
	2.2	5×11	13.0	35	ZHN2R2M05011□VA
	3.3	6.3×11	10.7	50	ZHN3R3M06011□VA
	4.7	6.3×11	10.4	55	ZHN4R7M06011□VA
	6.8	8×12	7.80	70	ZHN6R8M08012□VA
	10	8×12	6.70	80	ZHN100M08012□VA
	22	10×13	3.25	180	ZHN220M10013□VA
	33	10×20	2.75	210	ZHN330M10020□VA
	47	13×21	2.28	320	ZHN470M13021□VA
	68	13×21	1.40	375	ZHN680M13021□VA
	100	16×25	1.18	500	ZHN101M16025□VA
	220	16×35	0.48	820	ZHN221M16035□VA
	330	18×35	0.40	950	ZHN331M18035□VA
200 (250)	1	6.3×11	19.4	45	ZHL010M06011□VA
	2.2	6.3×11	13.0	55	ZHL2R2M06011□VA
	3.3	6.3×11	10.6	60	ZHL3R3M06011□VA
	4.7	6.3×11	8.88	65	ZHL4R7M06011□VA
	6.8	8×12	6.78	85	ZHL6R8M08012□VA
	10	8×12	5.05	95	ZHL100M08012□VA
	22	10×16	3.00	195	ZHL220M110016□VA
	33	10×20	1.55	265	ZHL330M10020□VA
	47	13×21	1.28	360	ZHL470M13021□VA
	68	13×21	1.13	405	ZHL680M13021□VA

WV_{DC} (Surge Voltage) (V)	Cap (μF)	Size D×L (mm)	Impedance 20℃100KHz	Ripple Current 105℃100KHz (mArms)	Catalog Part Number
200 (250)	100	16×25	0.98	700	ZHL101M16025□VA
	220	16×30	0.35	900	ZHL221M16030□VA
	330	18×40	0.28	1100	ZHL331M18040□VA
250 (300)	1	6.3×11	16.4	50	ZHJ010M06011□VA
	2.2	6.3×11	10.3	60	ZHJ2R2M06011□VA
	3.3	6.3×11	9.63	65	ZHJ3R3M06011□VA
	4.7	8×12	7.13	70	ZHJ4R7M08012□VA
	6.8	10×13	4.65	95	ZHJ6R8M10013□VA
	10	10×13	3.5	125	ZHJ100M10013□VA
	22	10×20	3.25	185	ZHJ220M10020□VA
	33	13×21	2.25	260	ZHJ330M13021□VA
	47	13×25	1.13	405	ZHJ470M13025□VA
	68	13×25	0.95	450	ZHJ680M13025□VA
	100	16×25	0.75	750	ZHJ101M16025□VA
	220	18×35	0.33	860	ZHJ221M18035□VA
350 (400)	1	6.3×11	15.9	55	ZHH010M06011□VA
	2.2	6.3×11	10.1	65	ZHH2R2M06011□VA
	3.3	6.3×11	8.8	70	ZHH3R3M06011□VA
	4.7	8×12	5.68	95	ZHH4R7M08012□VA
	6.8	10×13	4.12	105	ZHH6R8M10013□VA
	10	10×13	3.38	145	ZHH100M10013□VA
	22	10×20	3.13	200	ZHH220M10020□VA
	33	13×21	2.15	290	ZHH330M13021□VA
	47	13×25	1.55	415	ZHH470M13025□VA
	68	13×25	1.40	465	ZHH680M13025□VA
	100	18×32	1.38	500	ZHH101M18032□VA
400 (450)	1	6.3×11	41.3	32	ZHG010M06011□VA
	2.2	8×12	24.0	45	ZHG2R2M08012□VA
	3.3	8×12	12.5	65	ZHG3R3M08012□VA
	4.7	10×13	12.1	75	ZHG4R7M10013□VA
	6.8	10×16	8.88	105	ZHG6R8M10016□VA
	10	10×20	8.30	115	ZHG100M10020□VA
	22	13×21	6.55	145	ZHG220M13021□VA
	33	16×25	3.03	277	ZHG330M16025□VA
	47	18×20	2.30	315	ZHG470M18020□VA
	68	18×25	1.88	385	ZHG680M18025□VA
	100	18×35	1.30	485	ZHG101M18035□VA
450 (500)	1	6.3×11	43.4	28	ZHE010M06011□VA
	2.2	8×12	25.6	38	ZHE2R2M08012□VA
	3.3	8×12	14.1	55	ZHE3R3M08012□VA
	4.7	10×13	12.5	65	ZHE4R7M10013□VA
	6.8	10×16	10.6	90	ZHE6R8M10016□VA
	10	10×20	9.45	100	ZHE100M10020□VA
	22	13×25	7.63	125	ZHE220M13025□VA
	33	16×25	5.50	205	ZHE330M16025□VA
	47	18×25	2.55	325	ZHE470M18025□VA
	68	18×30	1.95	405	ZHE680M18030□VA
	100	18×40	1.50	495	ZHE101M18040□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.