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HCAK55H型，双85THB，高可靠性系列

有失效率等级的片式高分子固体电解质钽电容器

HCAK55H High Reliability, Ultra Low ESR,

Polymer Electrolytic Tantalum Capacitors (THB Series)

特征与用途

- 树脂模压封装、密封性好、片式、体积小、重量轻、有极性;
- 电性能优良稳定、可靠性高、贮存稳定性好;
- 导电高分子聚合物电解质、超低ESR(等效串联电阻)、高频容量保持、 耐大纹波电流;
- 高击穿电压;
- 良性失效模式;
- 适用于飞行器、车辆、船舶、雷达、电子、通讯等领域有可靠性要 求的电子设备表面 贴装直流或脉动电路;
- 新增可选双85产品: 采用新技术，产品在保持原有性能基础上，具有在高温高湿下长时间(85℃、85%RH、1000h)贮存和工作的能力。
- 执行标准:GJB2283-95、QJ/PWV502-2012
- 注: 选购双85产品时，请在订货合同备注中注明"双85"字样

Features and Applications

- Resin molded package, excellent sealing, chip-type, compact size, lightweight, polarized;
- Superior and stable electrical performance, high reliability, excellent storage stability;
- Conductive polymer electrolyte, ultra-low ESR (Equivalent Series Resistance), High frequency capacitance retention, high ripple current;
- High breakdown voltage;
- 100% accelerated steady state aging;
- 100% surge current tested;
- Suitable for high reliability circuit in aircraft, vehicles, ships, radar, electronics, communications, and other military fields;
- THB requirement available on request; Utilizing new technology, improve long-term storage time and operation under high temperature and humidity (85°C, 85% RH, 1000 hours)
- Compliance military standards: GJB2283-95, QJ/PW/502-2012;
- Up screened options includes surge current testing of 10 cycles at +25°C and 10 cycles at -55°C/+85°C

◆How to order

HCAK55H	V	476	M	010	R	0050	T
↓	↓	↓	↓	↓	↓	↓	↓
Type	Case Size	Capacitance code	Tolerance	Rated DC Voltage	Package	ESR in mΩ	THB Series
HCAK55H	See size table	pF Code: 1st two digits represent significant figures 3rd digit represents mulitplier (number of zeros to follow) 106 = 10uF 476 = 47uF	K: +/-10% M: +/-20%	Code 035: 35VDC 006 = 6.3VDC 010 = 10VDC 025 = 25VDC 035 = 35VDC 050 = 50VDC	R: Tape and Reel	Code 0050: 50mΩ 0050 = 50mΩ 0100 = 100mΩ 1000 = 1000mΩ	T: THB Series

主要技术性能

- 使用温度范围：–55~125℃；降额设计见应用指导3.1；
- 额定电压、降额电压、标称电容量：见表2；
- 电容量允许偏差：K级：±10%；M级：±20%；
- 室温直流漏电流、室温损耗角正切：不超过表2规定；
- 等效串联电阻ESR（25℃、100KHz）：不超过表2规定；
- 标注“*”表示为默认发货ESR，未标注“*”的ESR值为
- 特殊定制，订货需在订单中备注；
- 外形尺寸及外壳代号：见图1和表1。

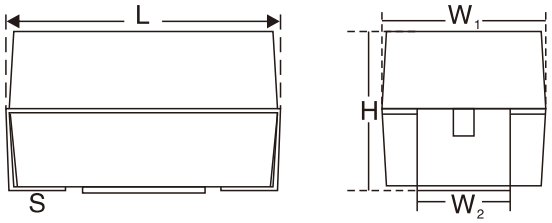
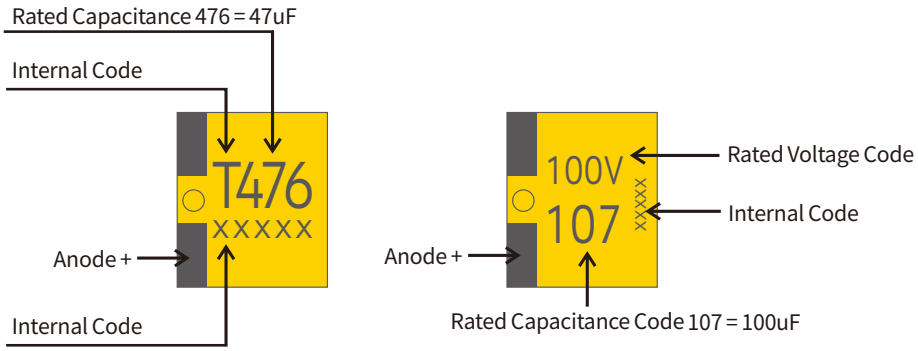


图1
Figure 1

Key Technical Specifications

- Operating temperature range: -55~125°C; Derating design refers to Application Guide 3.1;
- Rated voltage, derated voltage, nominal capacitance: See Table 2;
- Capacitance tolerance: K grade: ±10%; M grade: ±20%.
- Room temperature DC leakage current, room temperature dissipation factor: Not exceeding Table 2 specifications;
- Equivalent Series Resistance ESR (25°C, 100kHz): Not exceeding Table 2 specifications;
- Dimensions and case codes: See Figure 1 and Table 1.

◆ Marking on Chip Tantalum Capacitor Body



Body marking and capacitor colors may vary per batch and per order.

表1 电容器的外形尺寸（mm）

Table 1 Product Dimensions (mm)

外壳 Case	L	W_1	H	S	W_2
A	3.2 ± 0.3	1.6 ± 0.3	1.6 ± 0.3	0.8 ± 0.2	1.2 ± 0.2
B	3.5 ± 0.3	2.8 ± 0.3	1.9 ± 0.3	0.8 ± 0.2	2.2 ± 0.2
C	6.0 ± 0.3	3.2 ± 0.3	2.5 ± 0.3	1.3 ± 0.2	2.2 ± 0.2
H	7.3 ± 0.3	4.3 ± 0.3	2.1 ± 0.3	1.7 ± 0.2	2.4 ± 0.2
D	7.3 ± 0.3	4.3 ± 0.3	2.8 ± 0.3	1.5 ± 0.2	2.4 ± 0.2
E	7.3 ± 0.3	4.3 ± 0.3	4.1 ± 0.3	1.5 ± 0.2	2.4 ± 0.2
F	7.3 ± 0.3	6.1 ± 0.3	2.5 ± 0.3	1.35 ± 0.2	3.0 ± 0.2
V	7.3 ± 0.3	6.1 ± 0.3	3.6 ± 0.3	1.5 ± 0.2	3.0 ± 0.2
W	7.3 ± 0.3	6.1 ± 0.3	4.1 ± 0.3	1.5 ± 0.2	3.0 ± 0.2
X	7.3 ± 0.3	6.0 ± 0.3	6.0 ± 0.3	1.5 ± 0.2	4.0 ± 0.2
Z	7.3 ± 0.3	6.0 ± 0.3	8.0 ± 0.3	1.5 ± 0.2	4.0 ± 0.2
G	8.5 ± 0.3	7.5 ± 0.3	4.5 ± 0.3	1.8 ± 0.2	4.5 ± 0.2
S	11.0 ± 0.3	9.0 ± 0.3	4.5 ± 0.3	1.5 ± 0.2	10.5 ± 0.4
T	11.0 ± 0.3	12.5 ± 0.3	5.5 ± 0.3	2.1 ± 0.2	10.5 ± 0.4
Y	8.0 ± 0.3	12.0 ± 0.3	8.0 ± 0.3	1.4 ± 0.2	8.0 ± 0.4

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ / +25℃	+85℃	+125℃
额定电压（U_R）16V / Rated Voltage（U_R）16V												
1	A	0.500	0.28	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
1	B	0.300	0.54	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
1.5	A	0.500	0.28	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
1.5	B	0.300	0.54	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
2.2	A	0.500	0.28	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
2.2	B	0.300	0.54	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
3.3	A	0.500	0.28	5.3	42.2	52.8	-10~+10	-10~+30	-10~+50	10	12	15
3.3	B	0.300	0.54	5.3	42.2	52.8	-10~+10	-10~+30	-10~+50	10	12	15
4.7	A	0.500	0.28	7.5	60.2	75.2	-10~+10	-10~+30	-10~+50	10	12	15
4.7	B	0.300	0.54	7.5	60.2	75.2	-10~+10	-10~+30	-10~+50	10	12	15
4.7	C	0.100	1.07	7.5	60.2	75.2	-10~+10	-10~+30	-10~+50	10	12	15
6.8	A	0.500	0.28	10.9	87.0	108.8	-10~+10	-10~+30	-10~+50	10	12	15
6.8	B	0.300	0.54	10.9	87.0	108.8	-10~+10	-10~+30	-10~+50	10	12	15
6.8	C	0.100	1.07	10.9	87.0	108.8	-10~+10	-10~+30	-10~+50	10	12	15
10	A	0.500	0.28	16.0	128.0	160.0	-10~+10	-10~+30	-10~+50	10	12	15
10	B	0.300	0.54	16.0	128.0	160.0	-10~+10	-10~+30	-10~+50	10	12	15
10	C	0.100	1.07	16.0	128.0	160.0	-10~+10	-10~+30	-10~+50	10	12	15
15	B	0.300	0.54	24.0	192.0	240.0	-10~+10	-10~+30	-10~+50	10	12	15
15	C	0.100	1.07	24.0	192.0	240.0	-10~+10	-10~+30	-10~+50	10	12	15
15	D	0.060	1.62	24.0	192.0	240.0	-10~+10	-10~+30	-10~+50	10	12	15
18	C	0.100	1.07	28.8	230.4	288.0	-10~+10	-10~+30	-10~+50	10	12	15
18	D	0.060	1.62	28.8	230.4	288.0	-10~+10	-10~+30	-10~+50	10	12	15
18	E	0.060	1.69	28.8	230.4	288.0	-10~+10	-10~+30	-10~+50	10	12	15
22	B	0.300	0.54	35.2	281.6	352.0	-10~+10	-10~+30	-10~+50	10	12	15
22	C	0.150	0.87	35.2	281.6	352.0	-10~+10	-10~+30	-10~+50	10	12	15
22	D	0.060	1.62	35.2	281.6	352.0	-10~+10	-10~+30	-10~+50	10	12	15
22	E	0.060	1.69	35.2	281.6	352.0	-10~+10	-10~+30	-10~+50	10	12	15
33	B	0.300	0.54	52.8	422.4	528.0	-10~+10	-10~+30	-10~+50	10	12	15
33	C	0.150	1.07	52.8	422.4	528.0	-10~+10	-10~+30	-10~+50	10	12	15
33	D	0.060	1.62	52.8	422.4	528.0	-10~+10	-10~+30	-10~+50	10	12	15
33	E	0.060	1.69	52.8	422.4	528.0	-10~+10	-10~+30	-10~+50	10	12	15
47	C	0.150	1.07	75.2	601.6	752.0	-10~+10	-10~+30	-10~+50	10	12	15
47	D	0.060	1.62	75.2	601.6	752.0	-10~+10	-10~+30	-10~+50	10	12	15
47	E	0.060	1.69	75.2	601.6	752.0	-10~+10	-10~+30	-10~+50	10	12	15
68	C	0.100	1.07	108.8	870.4	1088.0	-10~+10	-10~+30	-10~+50	10	12	15
68	D	0.060	1.62	108.8	870.4	1088.0	-10~+10	-10~+30	-10~+50	10	12	15
68	E	0.060	1.69	108.8	870.4	1088.0	-10~+10	-10~+30	-10~+50	10	12	15
75	C	0.100	1.07	120.0	960.0	1200.0	-10~+10	-10~+30	-10~+50	10	12	15
75	D	0.080	1.4	120.0	960.0	1200.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ / +25℃	+85℃	+125℃
额定电压（U_R）16V / Rated Voltage（U_R）16V												
75	E	0.080	1.47	120.0	960.0	1200.0	-10~+10	-10~+30	-10~+50	10	12	15
85	C	0.100	1.07	136.0	1088.0	1360.0	-10~+10	-10~+30	-10~+50	10	12	15
85	D	0.080	1.40	136.0	1088.0	1360.0	-10~+10	-10~+30	-10~+50	10	12	15
85	E	0.080	1.47	136.0	1088.0	1360.0	-10~+10	-10~+30	-10~+50	10	12	15
100	C	0.100	1.07	160.0	1280.0	1600.0	-10~+10	-10~+30	-10~+50	10	12	15
100	D	0.080	1.40	160.0	1280.0	1600.0	-10~+10	-10~+30	-10~+50	10	12	15
100	E	0.080	1.47	160.0	1280.0	1600.0	-10~+10	-10~+30	-10~+50	10	12	15
100	V	0.080	1.62	160.0	1280.0	1600.0	-10~+10	-10~+30	-10~+50	10	12	15
100	S	0.080	2.32	160.0	1280.0	1600.0	-10~+10	-10~+30	-10~+50	10	12	15
150	D	0.080	1.40	240.0	1920.0	2400.0	-10~+10	-10~+30	-10~+50	10	12	15
150	E	0.080	1.47	240.0	1920.0	2400.0	-10~+10	-10~+30	-10~+50	10	12	15
150	V	0.060	1.87	240.0	1920.0	2400.0	-10~+10	-10~+30	-10~+50	10	12	15
150	W	0.060	1.89	240.0	1920.0	2400.0	-10~+10	-10~+30	-10~+50	10	12	15
220	D	0.080	1.40	352.0	2816.0	3520.0	-10~+10	-10~+30	-10~+50	10	12	15
220	E	0.080	1.47	352.0	2816.0	3520.0	-10~+10	-10~+30	-10~+50	10	12	15
220	V	0.060	1.87	352.0	2816.0	3520.0	-10~+10	-10~+30	-10~+50	10	12	15
220	W	0.060	1.89	352.0	2816.0	3520.0	-10~+10	-10~+30	-10~+50	10	12	15
330	E	0.080	1.47	528.0	4224.0	5280.0	-10~+10	-10~+30	-10~+50	10	12	15
330	E	0.025	2.62	528.0	4224.0	5280.0	-10~+10	-10~+30	-10~+50	10	12	15
330	V	0.080	1.62	528.0	4224.0	5280.0	-10~+10	-10~+30	-10~+50	10	12	15
330	W	0.080	1.63	528.0	4224.0	5280.0	-10~+10	-10~+30	-10~+50	10	12	15
470	V	0.080	1.62	752.0	6016.0	7520.0	-10~+10	-10~+30	-10~+50	10	12	15
470	W	0.060	1.89	752.0	6016.0	7520.0	-10~+10	-10~+30	-10~+50	10	12	15
470	X	0.080	1.98	752.0	6016.0	7520.0	-10~+10	-10~+30	-10~+50	10	12	15
470	T	0.060	2.67	752.0	6016.0	7520.0	-10~+10	-10~+30	-10~+50	10	12	15
680	W	0.080	1.63	1088.0	8704.0	10880.0	-10~+10	-10~+30	-10~+50	10	12	15
680	X	0.080	1.98	1088.0	8704.0	10880.0	-10~+10	-10~+30	-10~+50	10	12	15
680	T	0.040	3.28	1088.0	8704.0	10880.0	-10~+10	-10~+30	-10~+50	10	12	15
1000	T	0.080	2.31	1600.0	12800.0	16000.0	-10~+10	-10~+30	-10~+50	10	12	15
1500	T	0.080	2.31	2400.0	19200.0	24000.0	-10~+10	-10~+30	-10~+50	13	15	18
2200	T	0.080	2.31	3520.0	28160.0	35200.0	-10~+10	-10~+30	-10~+50	13	15	18
额定电压（U_R）20V / Rated Voltage（U_R）20V												
1	A	0.500	0.28	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
1	B	0.300	0.54	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
1.5	A	0.500	0.28	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	13	15	18
1.5	B	0.300	0.54	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	13	15	18
2.2	A	0.500	0.28	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	13	15	18
2.2	B	0.300	0.54	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	13	15	18
3.3	A	0.500	0.28	6.6	52.8	66.0	-10~+10	-10~+30	-10~+50	10	12	15
3.3	B	0.300	0.54	6.6	52.8	66.0	-10~+10	-10~+30	-10~+50	10	12	15
3.3	C	0.100	1.07	6.6	52.8	66.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ / +25℃	+85℃	+125℃
额定电压（U_R）20V / Rated Voltage（U_R）20V												
4.7	B	0.300	0.54	9.4	75.2	94.0	-10~+10	-10~+30	-10~+50	10	12	15
4.7	C	0.100	1.07	9.4	75.2	94.0	-10~+10	-10~+30	-10~+50	10	12	15
4.7	D	0.075	1.45	9.4	75.2	94.0	-10~+10	-10~+30	-10~+50	10	12	15
6.8	B	0.300	0.54	13.6	108.8	136.0	-10~+10	-10~+30	-10~+50	10	12	15
6.8	C	0.100	1.07	13.6	108.8	136.0	-10~+10	-10~+30	-10~+50	10	12	15
6.8	D	0.075	1.45	13.6	108.8	136.0	-10~+10	-10~+30	-10~+50	10	12	15
10	B	0.300	0.54	20.0	160.0	200.0	-10~+10	-10~+30	-10~+50	10	12	15
10	C	0.150	0.87	20.0	160.0	200.0	-10~+10	-10~+30	-10~+50	10	12	15
10	D	0.075	1.45	20.0	160.0	200.0	-10~+10	-10~+30	-10~+50	10	12	15
15	C	0.150	0.87	30.0	240.0	300.0	-10~+10	-10~+30	-10~+50	10	12	15
15	D	0.060	1.62	30.0	240.0	300.0	-10~+10	-10~+30	-10~+50	10	12	15
18	C	0.100	1.07	36.0	288.0	360.0	-10~+10	-10~+30	-10~+50	10	12	15
18	D	0.060	1.62	36.0	288.0	360.0	-10~+10	-10~+30	-10~+50	10	12	15
18	E	0.080	1.47	36.0	288.0	360.0	-10~+10	-10~+30	-10~+50	10	12	15
22	C	0.100	1.07	44.0	352.0	440.0	-10~+10	-10~+30	-10~+50	10	12	15
22	D	0.060	1.62	44.0	352.0	440.0	-10~+10	-10~+30	-10~+50	10	12	15
22	E	0.080	1.47	44.0	352.0	440.0	-10~+10	-10~+30	-10~+50	10	12	15
33	C	0.100	1.07	66.0	528.0	660.0	-10~+10	-10~+30	-10~+50	10	12	15
33	D	0.060	1.62	66.0	528.0	660.0	-10~+10	-10~+30	-10~+50	10	12	15
33	E	0.080	1.47	66.0	528.0	660.0	-10~+10	-10~+30	-10~+50	10	12	15
47	C	0.100	1.07	94.0	752.0	940.0	-10~+10	-10~+30	-10~+50	10	12	15
47	D	0.080	1.40	94.0	752.0	940.0	-10~+10	-10~+30	-10~+50	10	12	15
47	E	0.080	1.47	94.0	752.0	940.0	-10~+10	-10~+30	-10~+50	10	12	15
68	D	0.080	1.40	136.0	1088.0	1360.0	-10~+10	-10~+30	-10~+50	10	12	15
68	E	0.080	1.47	136.0	1088.0	1360.0	-10~+10	-10~+30	-10~+50	10	12	15
68	V	0.080	1.62	136.0	1088.0	1360.0	-10~+10	-10~+30	-10~+50	10	12	15
75	D	0.080	1.40	150.0	1200.0	1500.0	-10~+10	-10~+30	-10~+50	10	12	15
75	E	0.080	1.47	150.0	1200.0	1500.0	-10~+10	-10~+30	-10~+50	10	12	15
75	V	0.080	1.62	150.0	1200.0	1500.0	-10~+10	-10~+30	-10~+50	10	12	15
85	D	0.080	1.40	170.0	1360.0	1700.0	-10~+10	-10~+30	-10~+50	10	12	15
85	E	0.080	1.47	170.0	1360.0	1700.0	-10~+10	-10~+30	-10~+50	10	12	15
85	V	0.080	1.62	170.0	1360.0	1700.0	-10~+10	-10~+30	-10~+50	10	12	15
100	D	0.080	1.41	200.0	1600.0	2000.0	-10~+10	-10~+30	-10~+50	10	12	15
100	E	0.080	1.47	200.0	1600.0	2000.0	-10~+10	-10~+30	-10~+50	10	12	15
100	V	0.080	1.62	200.0	1600.0	2000.0	-10~+10	-10~+30	-10~+50	10	12	15
100	W	0.080	1.63	200.0	1600.0	2000.0	-10~+10	-10~+30	-10~+50	10	12	15
150	E	0.080	1.47	300.0	2400.0	3000.0	-10~+10	-10~+30	-10~+50	10	12	15
150	V	0.080	1.62	300.0	2400.0	3000.0	-10~+10	-10~+30	-10~+50	10	12	15
150	W	0.080	1.63	300.0	2400.0	3000.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω) +25℃	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A) +85℃	漏电流max (μA) Leakage Current max (μA) +25℃	+85℃	+125℃	电容量变化范围(%) Capacitance Variation Range (%) −55℃	+85℃	+125℃	损耗角正切max (%) Dissipation Factor max (%) −55℃/+25℃	+85℃	+125℃
额定电压（U_R）20V / Rated Voltage（U_R）20V												
220	E	0.080	1.47	440.0	3520.0	4400.0	−10~+10	−10~+30	−10~+50	10	12	15
220	V	0.080	1.62	440.0	3520.0	4400.0	−10~+10	−10~+30	−10~+50	10	12	15
220	W	0.080	1.63	440.0	3520.0	4400.0	−10~+10	−10~+30	−10~+50	10	12	15
220	X	0.080	1.97	440.0	3520.0	4400.0	−10~+10	−10~+30	−10~+50	10	12	15
330	V	0.080	1.62	660.0	5280.0	6600.0	−10~+10	−10~+30	−10~+50	10	12	15
330	W	0.060	1.89	660.0	5280.0	6600.0	−10~+10	−10~+30	−10~+50	10	12	15
330	X	0.080	1.97	660.0	5280.0	6600.0	−10~+10	−10~+30	−10~+50	10	12	15
470	X	0.080	1.97	940.0	7520.0	9400.0	−10~+10	−10~+30	−10~+50	10	12	15
470	T	0.040	3.28	940.0	7520.0	9400.0	−10~+10	−10~+30	−10~+50	10	12	15
680	T	0.080	2.31	1360.0	10880.0	13600.0	−10~+10	−10~+30	−10~+50	10	12	15
1000	T	0.080	2.31	2000.0	16000.0	20000.0	−10~+10	−10~+30	−10~+50	10	12	15
1000	T	0.040	3.28	2000.0	16000.0	20000.0	−10~+10	−10~+30	−10~+50	10	12	15
额定电压（U_R）25V / Rated Voltage（U_R）25V												
0.68	A	0.500	0.28	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.68	B	0.300	0.54	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	A	0.500	0.28	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	B	0.300	0.54	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	C	0.150	0.87	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1.5	B	0.300	0.54	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1.5	C	0.150	0.87	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	B	0.300	0.54	5.5	44.0	55.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	C	0.150	0.87	5.5	44.0	55.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	D	0.120	1.15	5.5	44.0	55.0	−10~+10	−10~+30	−10~+50	10	12	15
3.3	B	0.300	0.54	8.3	66.0	82.5	−10~+10	−10~+30	−10~+50	10	12	15
3.3	C	0.150	0.87	8.3	66.0	82.5	−10~+10	−10~+30	−10~+50	10	12	15
3.3	D	0.100	1.26	8.3	66.0	82.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	B	0.300	0.54	11.8	94.0	117.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	C	0.150	0.87	11.8	94.0	117.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	D	0.075	1.45	11.8	94.0	117.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	E	0.120	1.21	11.8	94.0	117.5	−10~+10	−10~+30	−10~+50	10	12	15
6.8	B	0.300	0.54	17.0	136.0	170.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	C	0.150	0.87	17.0	136.0	170.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	D	0.075	1.45	17.0	136.0	170.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	E	0.120	1.21	17.0	136.0	170.0	−10~+10	−10~+30	−10~+50	10	12	15
10	B	0.300	0.54	25.0	200.0	250.0	−10~+10	−10~+30	−10~+50	10	12	15
10	C	0.150	0.87	25.0	200.0	250.0	−10~+10	−10~+30	−10~+50	10	12	15
10	D	0.075	1.45	25.0	200.0	250.0	−10~+10	−10~+30	−10~+50	10	12	15
10	E	0.075	1.52	25.0	200.0	250.0	−10~+10	−10~+30	−10~+50	10	12	15
15	C	0.100	1.07	37.5	300.0	375.0	−10~+10	−10~+30	−10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω) +25℃	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A) +85℃	漏电流max (μA) Leakage Current max (μA) +25℃	+85℃	+125℃	电容量变化范围(%) Capacitance Variation Range (%) −55℃	+85℃	+125℃	损耗角正切max (%) Dissipation Factor max (%) −55℃/+25℃	+85℃	+125℃
额定电压（U_R）25V / Rated Voltage（U_R）25V												
15	D	0.060	1.62	37.5	300.0	375.0	−10~+10	−10~+30	−10~+50	10	12	15
15	E	0.075	1.52	37.5	300.0	375.0	−10~+10	−10~+30	−10~+50	10	12	15
18	C	0.100	1.07	45.0	360.0	450.0	−10~+10	−10~+30	−10~+50	10	12	15
18	D	0.060	1.62	45.0	360.0	450.0	−10~+10	−10~+30	−10~+50	10	12	15
18	E	0.060	1.69	45.0	360.0	450.0	−10~+10	−10~+30	−10~+50	10	12	15
22	C	0.100	1.07	55.0	440.0	550.0	−10~+10	−10~+30	−10~+50	10	12	15
22	D	0.080	1.40	55.0	440.0	550.0	−10~+10	−10~+30	−10~+50	10	12	15
22	E	0.060	1.69	55.0	440.0	550.0	−10~+10	−10~+30	−10~+50	10	12	15
33	D	0.080	1.40	82.5	660.0	825.0	−10~+10	−10~+30	−10~+50	10	12	15
33	E	0.080	1.47	82.5	660.0	825.0	−10~+10	−10~+30	−10~+50	10	12	15
33	V	0.090	1.53	82.5	660.0	825.0	−10~+10	−10~+30	−10~+50	10	12	15
47	D	0.080	1.40	117.5	940.0	1175.0	−10~+10	−10~+30	−10~+50	10	12	15
47	E	0.080	1.47	117.5	940.0	1175.0	−10~+10	−10~+30	−10~+50	10	12	15
47	V	0.080	1.62	117.5	940.0	1175.0	−10~+10	−10~+30	−10~+50	10	12	15
68	D	0.080	1.40	170.0	1360.0	1700.0	−10~+10	−10~+30	−10~+50	10	12	15
68	E	0.080	1.47	170.0	1360.0	1700.0	−10~+10	−10~+30	−10~+50	10	12	15
68	V	0.080	1.62	170.0	1360.0	1700.0	−10~+10	−10~+30	−10~+50	10	12	15
68	W	0.080	1.63	170.0	1360.0	1700.0	−10~+10	−10~+30	−10~+50	10	12	15
75	E	0.080	1.47	187.5	1500.0	1875.0	−10~+10	−10~+30	−10~+50	10	12	15
75	V	0.080	1.62	187.5	1500.0	1875.0	−10~+10	−10~+30	−10~+50	10	12	15
75	W	0.080	1.63	187.5	1500.0	1875.0	−10~+10	−10~+30	−10~+50	10	12	15
85	E	0.080	1.47	212.5	1700.0	2125.0	−10~+10	−10~+30	−10~+50	10	12	15
85	V	0.080	1.62	212.5	1700.0	2125.0	−10~+10	−10~+30	−10~+50	10	12	15
85	W	0.080	1.63	212.5	1700.0	2125.0	−10~+10	−10~+30	−10~+50	10	12	15
100	D	0.080	1.40	250.0	2000.0	2500.0	−10~+10	−10~+30	−10~+50	10	12	15
100	E	0.080	1.47	250.0	2000.0	2500.0	−10~+10	−10~+30	−10~+50	10	12	15
100	V	0.080	1.62	250.0	2000.0	2500.0	−10~+10	−10~+30	−10~+50	10	12	15
100	W	0.080	1.63	250.0	2000.0	2500.0	−10~+10	−10~+30	−10~+50	10	12	15
100	T	0.080	2.31	250.0	2000.0	2500.0	−10~+10	−10~+30	−10~+50	10	12	15
150	V	0.080	1.62	375.0	3000.0	3750.0	−10~+10	−10~+30	−10~+50	10	12	15
150	W	0.080	1.63	375.0	3000.0	3750.0	−10~+10	−10~+30	−10~+50	10	12	15
150	T	0.060	2.67	375.0	3000.0	3750.0	−10~+10	−10~+30	−10~+50	10	12	15
220	V	0.060	1.87	550.0	4400.0	5500.0	−10~+10	−10~+30	−10~+50	10	12	15
220	W	0.080	1.63	550.0	4400.0	5500.0	−10~+10	−10~+30	−10~+50	10	12	15
220	X	0.080	1.97	550.0	4400.0	5500.0	−10~+10	−10~+30	−10~+50	10	12	15
220	T	0.060	2.67	550.0	4400.0	5500.0	−10~+10	−10~+30	−10~+50	10	12	15
330	W	0.080	1.63	825.0	6600.0	8250.0	−10~+10	−10~+30	−10~+50	10	12	15
330	X	0.080	1.97	825.0	6600.0	8250.0	−10~+10	−10~+30	−10~+50	10	12	15
330	T	0.060	2.67	825.0	6600.0	8250.0	−10~+10	−10~+30	−10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω) +25℃	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A) +85℃	漏电流max (μA) Leakage Current max (μA) +25℃	+85℃	+125℃	电容量变化范围(%) Capacitance Variation Range (%) −55℃	+85℃	+125℃	损耗角正切max (%) Dissipation Factor max (%) −55℃/+25℃	+85℃	+125℃
额定电压（U_R）25V / Rated Voltage（U_R）25V												
470	X	0.080	1.97	1175.0	9400.0	11750.0	−10~+10	−10~+30	−10~+50	10	12	15
470	T	0.080	2.31	1175.0	9400.0	11750.0	−10~+10	−10~+30	−10~+50	10	12	15
680	T	0.080	2.31	1700.0	13600.0	17000.0	−10~+10	−10~+30	−10~+50	10	12	15
额定电压（U_R）35V / Rated Voltage（U_R）35V												
0.1	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.1	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.15	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.15	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.22	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.22	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.33	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.33	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.47	A	0.500	0.28	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.47	B	0.350	0.50	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.68	A	0.500	0.28	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.68	B	0.350	0.50	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.68	C	0.200	0.75	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	A	0.500	0.28	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	B	0.350	0.50	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	C	0.200	0.75	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1.5	B	0.350	0.50	5.3	42.0	52.5	−10~+10	−10~+30	−10~+50	10	12	15
1.5	C	0.200	0.75	5.3	42.0	52.5	−10~+10	−10~+30	−10~+50	10	12	15
2.2	B	0.350	0.50	7.7	61.6	77.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	C	0.200	0.75	7.7	61.6	77.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	D	0.120	1.15	7.7	61.6	77.0	−10~+10	−10~+30	−10~+50	10	12	15
3.3	B	0.350	0.50	11.6	92.4	115.5	−10~+10	−10~+30	−10~+50	10	12	15
3.3	C	0.200	0.75	11.6	92.4	115.5	−10~+10	−10~+30	−10~+50	10	12	15
3.3	D	0.100	1.26	11.6	92.4	115.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	B	0.350	0.50	16.5	131.6	164.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	C	0.200	0.75	16.5	131.6	164.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	D	0.120	1.15	16.5	131.6	164.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	E	0.120	1.20	16.5	131.6	164.5	−10~+10	−10~+30	−10~+50	10	12	15
6.8	C	0.200	0.75	23.8	190.4	238.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	D	0.075	1.44	23.8	190.4	238.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	E	0.120	1.20	23.8	190.4	238.0	−10~+10	−10~+30	−10~+50	10	12	15
10	C	0.200	0.75	35.0	280.0	350.0	−10~+10	−10~+30	−10~+50	10	12	15
10	D	0.090	1.32	35.0	280.0	350.0	−10~+10	−10~+30	−10~+50	10	12	15
10	E	0.075	1.51	35.0	280.0	350.0	−10~+10	−10~+30	−10~+50	10	12	15
10	V	0.120	1.33	35.0	280.0	350.0	−10~+10	−10~+30	−10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ / +25℃	+85℃	+125℃
额定电压（U_R）35V / Rated Voltage（U_R）35V												
15	D	0.090	1.32	52.5	420.0	525.0	-10~+10	-10~+30	-10~+50	10	12	15
15	E	0.075	1.51	52.5	420.0	525.0	-10~+10	-10~+30	-10~+50	10	12	15
15	V	0.100	1.46	52.5	420.0	525.0	-10~+10	-10~+30	-10~+50	10	12	15
18	D	0.075	1.44	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
18	E	0.075	1.51	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
18	V	0.100	1.46	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
22	H	0.090	1.14	77.0	616.0	770.0	-10~+10	-10~+30	-10~+50	10	12	15
22	D	0.090	1.32	77.0	616.0	770.0	-10~+10	-10~+30	-10~+50	10	12	15
22	E	0.075	1.51	77.0	616.0	770.0	-10~+10	-10~+30	-10~+50	10	12	15
22	V	0.070	1.74	77.0	616.0	770.0	-10~+10	-10~+30	-10~+50	10	12	15
22	W	0.120	1.34	77.0	616.0	770.0	-10~+10	-10~+30	-10~+50	10	12	15
33	D	0.090	1.32	115.5	924.0	1155.0	-10~+10	-10~+30	-10~+50	10	12	15
33	E	0.090	1.38	115.5	924.0	1155.0	-10~+10	-10~+30	-10~+50	10	12	15
33	E	0.075	1.51	115.5	924.0	1155.0	-10~+10	-10~+30	-10~+50	10	12	15
33	V	0.075	1.67	115.5	924.0	1155.0	-10~+10	-10~+30	-10~+50	10	12	15
33	W	0.080	1.64	115.5	924.0	1155.0	-10~+10	-10~+30	-10~+50	10	12	15
47	D	0.090	1.32	164.5	1316.0	1645.0	-10~+10	-10~+30	-10~+50	10	12	15
47	E	0.090	1.38	164.5	1316.0	1645.0	-10~+10	-10~+30	-10~+50	10	12	15
47	V	0.090	1.53	164.5	1316.0	1645.0	-10~+10	-10~+30	-10~+50	10	12	15
47	W	0.090	1.54	164.5	1316.0	1645.0	-10~+10	-10~+30	-10~+50	10	12	15
68	E	0.090	1.38	238.0	1904.0	2380.0	-10~+10	-10~+30	-10~+50	10	12	15
68	V	0.090	1.53	238.0	1904.0	2380.0	-10~+10	-10~+30	-10~+50	10	12	15
68	W	0.090	1.54	238.0	1904.0	2380.0	-10~+10	-10~+30	-10~+50	10	12	15
68	X	0.090	1.86	238.0	1904.0	2380.0	-10~+10	-10~+30	-10~+50	10	12	15
68	T	0.100	2.07	238.0	1904.0	2380.0	-10~+10	-10~+30	-10~+50	10	12	15
75	W	0.090	1.54	262.5	2100.0	2625.0	-10~+10	-10~+30	-10~+50	10	12	15
75	X	0.090	1.86	262.5	2100.0	2625.0	-10~+10	-10~+30	-10~+50	10	12	15
85	W	0.090	1.54	297.5	2380.0	2975.0	-10~+10	-10~+30	-10~+50	10	12	15
85	X	0.090	1.86	297.5	2380.0	2975.0	-10~+10	-10~+30	-10~+50	10	12	15
100	F	0.090	1.28	350.0	2800.0	3500.0	-10~+10	-10~+30	-10~+50	10	12	15
100	W	0.090	1.54	350.0	2800.0	3500.0	-10~+10	-10~+30	-10~+50	10	12	15
100	X	0.090	1.86	350.0	2800.0	3500.0	-10~+10	-10~+30	-10~+50	10	12	15
100	T	0.090	2.18	350.0	2800.0	3500.0	-10~+10	-10~+30	-10~+50	10	12	15
150	W	0.090	1.54	525.0	4200.0	5250.0	-10~+10	-10~+30	-10~+50	10	12	15
150	X	0.090	1.86	525.0	4200.0	5250.0	-10~+10	-10~+30	-10~+50	10	12	15
150	T	0.090	2.18	525.0	4200.0	5250.0	-10~+10	-10~+30	-10~+50	10	12	15
220	X	0.090	2.18	770.0	6160.0	7700.0	-10~+10	-10~+30	-10~+50	10	12	15
220	T	0.090	2.18	770.0	6160.0	7700.0	-10~+10	-10~+30	-10~+50	10	12	15
330	T	0.090	2.18	1155.0	9240.0	11550.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω) +25℃	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A) +85℃	漏电流max (μA) Leakage Current max (μA) +25℃	+85℃	+125℃	电容量变化范围(%) Capacitance Variation Range (%) −55℃	+85℃	+125℃	损耗角正切max (%) Dissipation Factor max (%) −55℃/+25℃	+85℃	+125℃
额定电压（U_R）35V / Rated Voltage (U_R) 35V												
470	T	0.090	2.18	1645.0	13160.0	16450.0	−10~+10	−10~+30	−10~+50	10	12	15
额定电压（U_R）40V / Rated Voltage (U_R) 40V												
100	W	0.100	1.46	400.0	4000.0	5000.0	−10~+10	−10~+30	−10~+50	10	12	15
额定电压（U_R）50V / Rated Voltage (U_R) 50V												
0.1	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.1	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.1	C	0.500	0.48	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.15	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.15	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.22	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.22	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.33	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.33	B	0.600	0.40	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.47	B	0.350	0.50	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.47	C	0.200	0.75	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.68	B	0.350	0.50	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
0.68	C	0.200	0.75	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	B	0.350	0.50	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	C	0.200	0.75	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1	D	0.120	1.15	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15
1.5	B	0.350	0.50	7.5	60.0	75.0	−10~+10	−10~+30	−10~+50	10	12	15
1.5	C	0.200	0.75	7.5	60.0	75.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	B	0.350	0.50	11.0	88.0	110.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	C	0.200	0.75	11.0	88.0	110.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	D	0.120	1.15	11.0	88.0	110.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	E	0.150	1.07	11.0	88.0	110.0	−10~+10	−10~+30	−10~+50	10	12	15
3.3	C	0.200	0.75	16.5	132.0	165.0	−10~+10	−10~+30	−10~+50	10	12	15
3.3	H	0.100	1.09	16.5	132.0	165.0	−10~+10	−10~+30	−10~+50	10	12	15
3.3	D	0.100	1.25	16.5	132.0	165.0	−10~+10	−10~+30	−10~+50	10	12	15
3.3	E	0.120	1.20	16.5	132.0	165.0	−10~+10	−10~+30	−10~+50	10	12	15
4.7	C	0.200	0.75	23.5	188.0	235.0	−10~+10	−10~+30	−10~+50	10	12	15
4.7	H	0.100	1.09	23.5	188.0	235.0	−10~+10	−10~+30	−10~+50	10	12	15
4.7	D	0.100	1.25	23.5	188.0	235.0	−10~+10	−10~+30	−10~+50	10	12	15
4.7	E	0.120	1.20	23.5	188.0	235.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	C	0.200	0.75	34.0	272.0	340.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	H	0.100	1.09	34.0	272.0	340.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	D	0.100	1.25	34.0	272.0	340.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	E	0.120	1.20	34.0	272.0	340.0	−10~+10	−10~+30	−10~+50	10	12	15
10	D	0.100	1.25	50.0	400.0	500.0	−10~+10	−10~+30	−10~+50	10	12	15
10	E	0.100	1.31	50.0	400.0	500.0	−10~+10	−10~+30	−10~+50	10	12	15
10	V	0.120	1.32	50.0	400.0	500.0	−10~+10	−10~+30	−10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω) +25℃	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A) +85℃	漏电流max (μA) Leakage Current max (μA) +25℃	+85℃	+125℃	电容量变化范围(%) Capacitance Variation Range (%) −55℃	+85℃	+125℃	损耗角正切max (%) Dissipation Factor max (%) −55℃ / +25℃	+85℃	+125℃
额定电压（U_R）50V / Rated Voltage（U_R）50V												
10	W	0.120	1.34	50.0	400.0	500.0	−10~+10	−10~+30	−10~+50	10	12	15
15	D	0.100	1.25	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
15	E	0.100	1.31	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
15	V	0.100	1.45	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
18	W	0.120	1.34	90.0	720.0	900.0	−10~+10	−10~+30	−10~+50	10	12	15
18	D	0.100	1.25	90.0	720.0	900.0	−10~+10	−10~+30	−10~+50	10	12	15
18	E	0.100	1.31	90.0	720.0	900.0	−10~+10	−10~+30	−10~+50	10	12	15
18	V	0.080	1.62	90.0	720.0	900.0	−10~+10	−10~+30	−10~+50	10	12	15
22	D	0.100	1.25	110.0	880.0	1100.0	−10~+10	−10~+30	−10~+50	10	12	15
22	E	0.100	1.31	110.0	880.0	1100.0	−10~+10	−10~+30	−10~+50	10	12	15
22	V	0.100	1.45	110.0	880.0	1100.0	−10~+10	−10~+30	−10~+50	10	12	15
22	W	0.100	1.46	110.0	880.0	1100.0	−10~+10	−10~+30	−10~+50	10	12	15
33	E	0.100	1.31	165.0	1320.0	1650.0	−10~+10	−10~+30	−10~+50	10	12	15
33	V	0.100	1.45	165.0	1320.0	1650.0	−10~+10	−10~+30	−10~+50	10	12	15
33	W	0.100	1.46	165.0	1320.0	1650.0	−10~+10	−10~+30	−10~+50	10	12	15
47	E	0.100	1.31	235.0	1880.0	2350.0	−10~+10	−10~+30	−10~+50	10	12	15
47	V	0.100	1.45	235.0	1880.0	2350.0	−10~+10	−10~+30	−10~+50	10	12	15
47	W	0.100	1.46	235.0	1880.0	2350.0	−10~+10	−10~+30	−10~+50	10	12	15
47	X	0.100	1.76	235.0	1880.0	2350.0	−10~+10	−10~+30	−10~+50	10	12	15
47	T	0.100	2.07	235.0	1880.0	2350.0	−10~+10	−10~+30	−10~+50	10	12	15
68	V	0.100	1.45	340.0	2720.0	3400.0	−10~+10	−10~+30	−10~+50	10	12	15
68	W	0.100	1.46	340.0	2720.0	3400.0	−10~+10	−10~+30	−10~+50	10	12	15
68	X	0.100	1.76	340.0	2720.0	3400.0	−10~+10	−10~+30	−10~+50	10	12	15
68	T	0.100	2.07	340.0	2720.0	3400.0	−10~+10	−10~+30	−10~+50	10	12	15
75	W	0.100	1.46	375.0	3000.0	3750.0	−10~+10	−10~+30	−10~+50	10	12	15
75	X	0.100	1.76	375.0	3000.0	3750.0	−10~+10	−10~+30	−10~+50	10	12	15
85	W	0.100	1.46	425.0	3400.0	4250.0	−10~+10	−10~+30	−10~+50	10	12	15
85	X	0.100	1.76	425.0	3400.0	4250.0	−10~+10	−10~+30	−10~+50	10	12	15
100	W	0.100	1.46	500.0	4000.0	5000.0	−10~+10	−10~+30	−10~+50	10	12	15
100	X	0.100	1.76	500.0	4000.0	5000.0	−10~+10	−10~+30	−10~+50	10	12	15
100	T	0.100	2.07	500.0	4000.0	5000.0	−10~+10	−10~+30	−10~+50	10	12	15
100	S	0.100	1.96	500.0	4000.0	5000.0	−10~+10	−10~+30	−10~+50	10	12	15
150	X	0.100	1.76	750.0	6000.0	7500.0	−10~+10	−10~+30	−10~+50	10	12	15
150	T	0.100	2.07	750.0	6000.0	7500.0	−10~+10	−10~+30	−10~+50	10	12	15
150	Y	0.100	2.08	750.0	6000.0	7500.0	−10~+10	−10~+30	−10~+50	10	12	15
220	X	0.100	1.76	1100.0	8800.0	11000.0	−10~+10	−10~+30	−10~+50	10	12	15
220	T	0.100	2.07	1100.0	8800.0	11000.0	−10~+10	−10~+30	−10~+50	10	12	15
330	T	0.100	2.07	1650.0	13200.0	16500.0	−10~+10	−10~+30	−10~+50	10	12	15
额定电压（U_R）63V / Rated Voltage（U_R）63V												
0.1	A	0.600	0.26	5.0	40.0	50.0	−10~+10	−10~+30	−10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ / +25℃	+85℃	+125℃
额定电压（U_R）63V / Rated Voltage（U_R）63V												
0.1	B	0.600	0.40	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.1	C	0.500	0.48	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.15	A	0.600	0.26	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.15	B	0.600	0.40	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.22	A	0.600	0.26	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.22	B	0.600	0.40	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.33	A	0.600	0.26	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.33	B	0.600	0.40	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.47	B	0.600	0.40	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.47	C	0.200	0.75	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.68	B	0.350	0.50	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.68	C	0.200	0.75	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
1	C	0.200	0.75	6.3	50.4	63.0	-10~+10	-10~+30	-10~+50	10	12	15
1	D	0.120	1.14	6.3	50.4	63.0	-10~+10	-10~+30	-10~+50	10	12	15
1.5	C	0.200	0.75	9.5	75.6	94.5	-10~+10	-10~+30	-10~+50	10	12	15
1.5	D	0.120	1.14	9.5	75.6	94.5	-10~+10	-10~+30	-10~+50	10	12	15
1.5	E	0.150	1.08	9.5	75.6	94.5	-10~+10	-10~+30	-10~+50	10	12	15
2.2	C	0.200	0.75	13.9	110.9	138.6	-10~+10	-10~+30	-10~+50	10	12	15
2.2	D	0.120	1.14	13.9	110.9	138.6	-10~+10	-10~+30	-10~+50	10	12	15
2.2	E	0.150	1.08	13.9	110.9	138.6	-10~+10	-10~+30	-10~+50	10	12	15
3.3	C	0.200	0.75	20.8	166.3	207.9	-10~+10	-10~+30	-10~+50	10	12	15
3.3	D	0.120	1.14	20.8	166.3	207.9	-10~+10	-10~+30	-10~+50	10	12	15
3.3	E	0.120	1.20	20.8	166.3	207.9	-10~+10	-10~+30	-10~+50	10	12	15
4.7	D	0.120	1.14	29.6	236.9	296.1	-10~+10	-10~+30	-10~+50	10	12	15
4.7	E	0.120	1.20	29.6	236.9	296.1	-10~+10	-10~+30	-10~+50	10	12	15
4.7	V	0.120	1.32	29.6	236.9	296.1	-10~+10	-10~+30	-10~+50	10	12	15
6.8	D	0.120	1.14	42.8	342.7	428.4	-10~+10	-10~+30	-10~+50	10	12	15
6.8	E	0.120	1.20	42.8	342.7	428.4	-10~+10	-10~+30	-10~+50	10	12	15
6.8	V	0.120	1.32	42.8	342.7	428.4	-10~+10	-10~+30	-10~+50	10	12	15
10	D	0.120	1.14	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
10	E	0.120	1.20	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
10	V	0.120	1.32	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
10	W	0.120	1.33	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
10	S	0.120	1.79	63.0	504.0	630.0	-10~+10	-10~+30	-10~+50	10	12	15
15	E	0.120	1.20	94.5	756.0	945.0	-10~+10	-10~+30	-10~+50	10	12	15
15	V	0.120	1.32	94.5	756.0	945.0	-10~+10	-10~+30	-10~+50	10	12	15
15	W	0.120	1.33	94.5	756.0	945.0	-10~+10	-10~+30	-10~+50	10	12	15
18	E	0.120	1.20	113.4	907.2	1134.0	-10~+10	-10~+30	-10~+50	10	12	15
18	V	0.120	1.32	113.4	907.2	1134.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ / +25℃	+85℃	+125℃
额定电压（U_R）63V / Rated Voltage（U_R）63V												
18	W	0.120	1.33	113.4	907.2	1134.0	-10~+10	-10~+30	-10~+50	10	12	15
22	V	0.120	1.32	138.6	1108.8	1386.0	-10~+10	-10~+30	-10~+50	10	12	15
22	W	0.120	1.33	138.6	1108.8	1386.0	-10~+10	-10~+30	-10~+50	10	12	15
22	X	0.120	1.62	138.6	1108.8	1386.0	-10~+10	-10~+30	-10~+50	10	12	15
22	T	0.120	1.89	138.6	1108.8	1386.0	-10~+10	-10~+30	-10~+50	10	12	15
33	W	0.120	1.33	207.9	1663.2	2079.0	-10~+10	-10~+30	-10~+50	10	12	15
33	X	0.120	1.62	207.9	1663.2	2079.0	-10~+10	-10~+30	-10~+50	10	12	15
33	T	0.120	1.89	207.9	1663.2	2079.0	-10~+10	-10~+30	-10~+50	10	12	15
47	V	0.120	1.32	296.1	2368.8	2961.0	-10~+10	-10~+30	-10~+50	10	12	15
47	W	0.120	1.33	296.1	2368.8	2961.0	-10~+10	-10~+30	-10~+50	10	12	15
47	X	0.120	1.62	296.1	2368.8	2961.0	-10~+10	-10~+30	-10~+50	10	12	15
47	G	0.120	1.64	296.1	2368.8	2961.0	-10~+10	-10~+30	-10~+50	10	12	15
47	T	0.120	1.89	296.1	2368.8	2961.0	-10~+10	-10~+30	-10~+50	10	12	15
68	W	0.120	1.33	428.4	3427.2	4284.0	-10~+10	-10~+30	-10~+50	10	12	15
68	X	0.090	1.86	428.4	3427.2	4284.0	-10~+10	-10~+30	-10~+50	10	12	15
68	T	0.120	1.89	428.4	3427.2	4284.0	-10~+10	-10~+30	-10~+50	10	12	15
75	W	0.120	1.33	472.5	3780.0	4725.0	-10~+10	-10~+30	-10~+50	10	12	15
85	X	0.100	1.76	535.5	4284.0	5355.0	-10~+10	-10~+30	-10~+50	10	12	15
100	X	0.100	1.76	630.0	5040.0	6300.0	-10~+10	-10~+30	-10~+50	10	12	15
100	T	0.120	1.89	630.0	5040.0	6300.0	-10~+10	-10~+30	-10~+50	10	12	15
100	Y	0.120	1.90	630.0	5040.0	6300.0	-10~+10	-10~+30	-10~+50	10	12	15
150	X	0.100	1.76	945.0	7560.0	9450.0	-10~+10	-10~+30	-10~+50	10	12	15
150	T	0.100	2.07	945.0	7560.0	9450.0	-10~+10	-10~+30	-10~+50	10	12	15
150	Y	0.100	2.08	945.0	7560.0	9450.0	-10~+10	-10~+30	-10~+50	10	12	15
220	X	0.100	1.76	1386.0	11088.0	13860.0	-10~+10	-10~+30	-10~+50	10	12	15
220	Z	0.100	1.88	1386.0	11088.0	13860.0	-10~+10	-10~+30	-10~+50	10	12	15
220	Y	0.100	2.08	1386.0	11088.0	13860.0	-10~+10	-10~+30	-10~+50	10	12	15
额定电压（U_R）75V / Rated Voltage（U_R）75V												
0.1	B	0.700	0.37	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.1	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.15	B	0.700	0.37	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.15	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.22	B	0.700	0.37	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.22	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.33	B	0.700	0.37	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.33	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.47	B	0.600	0.40	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.47	C	0.300	0.62	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.68	B	0.600	0.40	5.1	40.8	51.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω) +25℃	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A) +85℃	漏电流max (μA) Leakage Current max (μA) +25℃	+85℃	+125℃	电容量变化范围(%) Capacitance Variation Range (%) −55℃	+85℃	+125℃	损耗角正切max (%) Dissipation Factor max (%) −55℃/+25℃	+85℃	+125℃
额定电压（U_R）75V / Rated Voltage（U_R）75V												
0.68	C	0.300	0.62	5.1	40.8	51.0	−10~+10	−10~+30	−10~+50	10	12	15
1	C	0.250	0.67	7.5	60.0	75.0	−10~+10	−10~+30	−10~+50	10	12	15
1	D	0.120	1.14	7.5	60.0	75.0	−10~+10	−10~+30	−10~+50	10	12	15
1	E	0.150	1.08	7.5	60.0	75.0	−10~+10	−10~+30	−10~+50	10	12	15
1.5	C	0.250	0.67	11.3	90.0	112.5	−10~+10	−10~+30	−10~+50	10	12	15
1.5	D	0.120	1.14	11.3	90.0	112.5	−10~+10	−10~+30	−10~+50	10	12	15
1.5	E	0.150	1.08	11.3	90.0	112.5	−10~+10	−10~+30	−10~+50	10	12	15
2.2	C	0.250	0.67	16.5	132.0	165.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	D	0.120	1.14	16.5	132.0	165.0	−10~+10	−10~+30	−10~+50	10	12	15
2.2	E	0.150	1.08	16.5	132.0	165.0	−10~+10	−10~+30	−10~+50	10	12	15
3.3	D	0.120	1.14	24.8	198.0	247.5	−10~+10	−10~+30	−10~+50	10	12	15
3.3	E	0.120	1.20	24.8	198.0	247.5	−10~+10	−10~+30	−10~+50	10	12	15
3.3	V	0.150	1.19	24.8	198.0	247.5	−10~+10	−10~+30	−10~+50	10	12	15
3.3	W	0.150	1.19	24.8	198.0	247.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	D	0.120	1.14	35.3	282.0	352.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	E	0.120	1.20	35.3	282.0	352.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	V	0.120	1.32	35.3	282.0	352.5	−10~+10	−10~+30	−10~+50	10	12	15
4.7	W	0.150	1.19	35.3	282.0	352.5	−10~+10	−10~+30	−10~+50	10	12	15
6.8	D	0.120	1.14	51.0	408.0	510.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	E	0.120	1.20	51.0	408.0	510.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	V	0.120	1.32	51.0	408.0	510.0	−10~+10	−10~+30	−10~+50	10	12	15
6.8	W	0.150	1.19	51.0	408.0	510.0	−10~+10	−10~+30	−10~+50	10	12	15
10	E	0.120	1.20	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
10	V	0.120	1.32	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
10	W	0.120	1.33	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
10	S	0.150	1.60	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
10	T	0.120	1.89	75.0	600.0	750.0	−10~+10	−10~+30	−10~+50	10	12	15
15	E	0.120	1.20	112.5	900.0	1125.0	−10~+10	−10~+30	−10~+50	10	12	15
15	V	0.120	1.32	112.5	900.0	1125.0	−10~+10	−10~+30	−10~+50	10	12	15
15	W	0.120	1.33	112.5	900.0	1125.0	−10~+10	−10~+30	−10~+50	10	12	15
15	X	0.120	1.61	112.5	900.0	1125.0	−10~+10	−10~+30	−10~+50	10	12	15
15	T	0.120	1.89	112.5	900.0	1125.0	−10~+10	−10~+30	−10~+50	10	12	15
18	E	0.120	1.20	135.0	1080.0	1350.0	−10~+10	−10~+30	−10~+50	10	12	15
18	V	0.120	1.32	135.0	1080.0	1350.0	−10~+10	−10~+30	−10~+50	10	12	15
18	W	0.120	1.33	135.0	1080.0	1350.0	−10~+10	−10~+30	−10~+50	10	12	15
18	S	0.150	1.60	135.0	1080.0	1350.0	−10~+10	−10~+30	−10~+50	10	12	15
18	T	0.120	1.89	135.0	1080.0	1350.0	−10~+10	−10~+30	−10~+50	10	12	15
22	V	0.200	1.02	165.0	1320.0	1650.0	−10~+10	−10~+30	−10~+50	10	12	15
22	W	0.120	1.33	165.0	1320.0	1650.0	−10~+10	−10~+30	−10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ +25℃	+85℃	+125℃
额定电压（U_R）75V / Rated Voltage（U_R）75V												
22	X	0.120	1.61	165.0	1320.0	1650.0	-10~+10	-10~+30	-10~+50	10	12	15
22	T	0.120	1.89	165.0	1320.0	1650.0	-10~+10	-10~+30	-10~+50	10	12	15
33	W	0.120	1.33	247.5	1980.0	2475.0	-10~+10	-10~+30	-10~+50	10	12	15
33	X	0.120	1.61	247.5	1980.0	2475.0	-10~+10	-10~+30	-10~+50	10	12	15
33	T	0.120	1.89	247.5	1980.0	2475.0	-10~+10	-10~+30	-10~+50	10	12	15
47	X	0.120	1.61	352.5	2820.0	3525.0	-10~+10	-10~+30	-10~+50	10	12	15
47	T	0.120	1.89	352.5	2820.0	3525.0	-10~+10	-10~+30	-10~+50	10	12	15
47	Y	0.120	1.90	352.5	2820.0	3525.0	-10~+10	-10~+30	-10~+50	10	12	15
68	T	0.120	1.89	510.0	4080.0	5100.0	-10~+10	-10~+30	-10~+50	10	12	15
68	Y	0.120	1.90	510.0	4080.0	5100.0	-10~+10	-10~+30	-10~+50	10	12	15
75	T	0.120	1.89	562.5	4500.0	5625.0	-10~+10	-10~+30	-10~+50	10	12	15
85	T	0.120	1.89	637.5	5100.0	6375.0	-10~+10	-10~+30	-10~+50	10	12	15
100	T	0.120	1.89	750.0	6000.0	7500.0	-10~+10	-10~+30	-10~+50	10	12	15
额定电压（U_R）100V / Rated Voltage（U_R）100V												
0.1	B	0.700	0.36	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.1	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.15	B	0.700	0.37	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.15	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.22	B	0.700	0.37	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.22	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.33	B	0.700	0.37	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.33	C	0.600	0.44	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.47	B	0.600	0.40	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.47	C	0.300	0.62	5.0	40.0	50.0	-10~+10	-10~+30	-10~+50	10	12	15
0.68	C	0.300	0.62	6.8	54.4	68.0	-10~+10	-10~+30	-10~+50	10	12	15
0.68	D	0.150	1.02	6.8	54.4	68.0	-10~+10	-10~+30	-10~+50	10	12	15
1	C	0.300	0.62	10.0	80.0	100.0	-10~+10	-10~+30	-10~+50	10	12	15
1	D	0.150	1.02	10.0	80.0	100.0	-10~+10	-10~+30	-10~+50	10	12	15
1	E	0.150	1.07	10.0	80.0	100.0	-10~+10	-10~+30	-10~+50	10	12	15
1.5	D	0.150	1.02	15.0	120.0	150.0	-10~+10	-10~+30	-10~+50	10	12	15
1.5	E	0.150	1.07	15.0	120.0	150.0	-10~+10	-10~+30	-10~+50	10	12	15
2.2	E	0.150	1.07	22.0	176.0	220.0	-10~+10	-10~+30	-10~+50	10	12	15
2.2	V	0.150	1.18	22.0	176.0	220.0	-10~+10	-10~+30	-10~+50	10	12	15
3.3	V	0.150	1.18	33.0	264.0	330.0	-10~+10	-10~+30	-10~+50	10	12	15
3.3	W	0.150	1.19	33.0	264.0	330.0	-10~+10	-10~+30	-10~+50	10	12	15
4.7	V	0.150	1.18	47.0	376.0	470.0	-10~+10	-10~+30	-10~+50	10	12	15
4.7	W	0.150	1.19	47.0	376.0	470.0	-10~+10	-10~+30	-10~+50	10	12	15
6.8	V	0.150	1.18	68.0	544.0	680.0	-10~+10	-10~+30	-10~+50	10	12	15
6.8	W	0.150	1.19	68.0	544.0	680.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω) +25℃	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A) +85℃	漏电流max (μA) Leakage Current max (μA) +25℃	+85℃	+125℃	电容量变化范围(%) Capacitance Variation Range (%) -55℃	+85℃	+125℃	损耗角正切max (%) Dissipation Factor max (%) -55℃ +25℃	+85℃	+125℃
额定电压（U_R）100V / Rated Voltage（U_R）100V												
6.8	S	0.150	1.60	68.0	544.0	680.0	-10~+10	-10~+30	-10~+50	10	12	15
10	W	0.250	0.92	100.0	800.0	1000.0	-10~+10	-10~+30	-10~+50	10	12	15
10	S	0.250	1.24	100.0	800.0	1000.0	-10~+10	-10~+30	-10~+50	10	12	15
10	T	0.250	1.31	100.0	800.0	1000.0	-10~+10	-10~+30	-10~+50	10	12	15
15	X	0.150	1.44	150.0	1200.0	1500.0	-10~+10	-10~+30	-10~+50	10	12	15
15	S	0.150	1.60	150.0	1200.0	1500.0	-10~+10	-10~+30	-10~+50	10	12	15
15	T	0.150	1.69	150.0	1200.0	1500.0	-10~+10	-10~+30	-10~+50	10	12	15
18	T	0.150	1.69	180.0	1440.0	1800.0	-10~+10	-10~+30	-10~+50	10	12	15
22	X	0.150	1.44	220.0	1760.0	2200.0	-10~+10	-10~+30	-10~+50	10	12	15
22	T	0.150	1.69	220.0	1760.0	2200.0	-10~+10	-10~+30	-10~+50	10	12	15
22	Y	0.150	1.70	220.0	1760.0	2200.0	-10~+10	-10~+30	-10~+50	10	12	15
33	T	0.150	1.69	330.0	2640.0	3300.0	-10~+10	-10~+30	-10~+50	10	12	15
33	Y	0.150	1.70	330.0	2640.0	3300.0	-10~+10	-10~+30	-10~+50	10	12	15
47	T	0.150	1.69	470.0	3760.0	4700.0	-10~+10	-10~+30	-10~+50	10	12	15
47	Y	0.150	1.70	470.0	3760.0	4700.0	-10~+10	-10~+30	-10~+50	10	12	15
68	T	0.150	1.69	680.0	5440.0	6800.0	-10~+10	-10~+30	-10~+50	10	12	15
68	Y	0.150	1.70	680.0	5440.0	6800.0	-10~+10	-10~+30	-10~+50	10	12	15
75	T	0.150	1.69	750.0	6000.0	7500.0	-10~+10	-10~+30	-10~+50	10	12	15
85	T	0.150	1.69	850.0	6800.0	8500.0	-10~+10	-10~+30	-10~+50	10	12	15
100	T	0.150	1.69	1000.0	8000.0	10000.0	-10~+10	-10~+30	-10~+50	10	12	15
额定电压（U_R）125V / Rated Voltage（U_R）125V												
3.3	D	0.150	1.02	41.3	330.0	412.5	-10~+10	-10~+30	-10~+50	10	12	15
4.7	D	0.150	1.02	58.8	470.0	587.5	-10~+10	-10~+30	-10~+50	10	12	15
4.7	E	0.150	1.07	58.8	470.0	587.5	-10~+10	-10~+30	-10~+50	10	12	15
6.8	E	0.150	1.07	85.0	680.0	850.0	-10~+10	-10~+30	-10~+50	10	12	15
6.8	V	0.150	1.18	85.0	680.0	850.0	-10~+10	-10~+30	-10~+50	10	12	15
6.8	W	0.150	1.19	85.0	680.0	850.0	-10~+10	-10~+30	-10~+50	10	12	15
10	E	0.250	0.83	125.0	1000.0	1250.0	-10~+10	-10~+30	-10~+50	10	12	15
10	V	0.250	0.92	125.0	1000.0	1250.0	-10~+10	-10~+30	-10~+50	10	12	15
10	W	0.250	0.93	125.0	1000.0	1250.0	-10~+10	-10~+30	-10~+50	10	12	15
15	W	0.250	0.93	187.5	1500.0	1875.0	-10~+10	-10~+30	-10~+50	10	12	15
15	X	0.250	1.12	187.5	1500.0	1875.0	-10~+10	-10~+30	-10~+50	10	12	15
18	W	0.250	0.93	225.0	1800.0	2250.0	-10~+10	-10~+30	-10~+50	10	12	15
18	X	0.250	1.12	225.0	1800.0	2250.0	-10~+10	-10~+30	-10~+50	10	12	15
22	W	0.300	0.85	275.0	2200.0	2750.0	-10~+10	-10~+30	-10~+50	10	12	15
22	X	0.250	1.12	275.0	2200.0	2750.0	-10~+10	-10~+30	-10~+50	10	12	15
22	T	0.200	1.47	275.0	2200.0	2750.0	-10~+10	-10~+30	-10~+50	10	12	15
33	T	0.200	1.47	412.5	3300.0	4125.0	-10~+10	-10~+30	-10~+50	10	12	15
33	Y	0.200	1.48	412.5	3300.0	4125.0	-10~+10	-10~+30	-10~+50	10	12	15

表2 电容器的额定电压、纹波电流、标称电容量、等效串联电阻（ESR）、外壳代号及高低温特性

Table 2: Rated Voltage, Ripple Current, Nominal Capacitance, ESR, Case Codes, and Temperature Characteristics. Notice: Rated Voltage VDC at 85°C

标称电容量 C_R (μF) Nominal Capacitance C_R (μF)	壳号 Case	ESR max 100KHz (Ω)	交流纹波电流max 100KHz (A) Ripple Current max 100KHz (A)	漏电流max (μA) Leakage Current max (μA)			电容量变化范围(%) Capacitance Variation Range (%)			损耗角正切max (%) Dissipation Factor max (%)		
		+25℃	+85℃	+25℃	+85℃	+125℃	-55℃	+85℃	+125℃	-55℃ / +25℃	+85℃	+125℃
额定电压（U_R）125V / Rated Voltage（U_R）125V												
47	T	0.300	1.20	587.5	4700.0	5875.0	-10~+10	-10~+30	-10~+50	10	12	15
47	Y	0.300	1.21	587.5	4700.0	5875.0	-10~+10	-10~+30	-10~+50	10	12	15
68	T	0.200	1.47	850.0	6800.0	8500.0	-10~+10	-10~+30	-10~+50	10	12	15
68	Y	0.200	1.48	850.0	6800.0	8500.0	-10~+10	-10~+30	-10~+50	10	12	15
75	Y	0.200	1.48	937.5	7500.0	9375.0	-10~+10	-10~+30	-10~+50	10	12	15
85	Y	0.200	1.48	1062.5	8500.0	10625.0	-10~+10	-10~+30	-10~+50	10	12	15

◆Derated Design guide line:

3.1. Derating Recommendations

3.1.1:

The failure rate of tantalum capacitors is for the DC rating (85°C, rated voltage), and varies with usage conditions (ambient temperature, applied voltage, circuit resistance, etc.). In actual circuits, there are often voltage or current peak impulses and ripple currents, or other unexpected electrical impulses, so derating design is necessary in actual use. Only in this way can the safety and reliability of the circuit be

3.1.2: Rated voltage and derated voltage

The rated voltage (U_R) of tantalum capacitors refers to the maximum DC voltage allowed to be applied to the capacitor at a rated temperature of 85°C. If it is used beyond the rated voltage, the dielectric strength of the dielectric oxide film Ta.0. will be exceeded, which will lead to deterioration of the capacitor performance, and even dielectric breakdown and failure in severe cases.

The environment in which the actual circuit is used is very complex, so in the circuit design, derating design is generally adopted. According to the GJB/Z35 "Component Derating standard", the derating levels of tantalum capacitors are divided into I, II, and III., Class I derating is derated by 50% of the benchmark DC working voltage, class II derating is derated by 60% of the benchmark DC working voltage, and class III derating is derated by 70% of the benchmark DC working voltage.

When the ambient temperature is not more than 85°C, the derated reference DC working voltage is the rated voltage (Ur); when the ambient temperature is more than 85°C, the derated reference DC working voltage is the derated voltage specified in this manual for each model (U_R). Uc). In the derating design, non-solid electrolyte tantalum capacitors and conductive polymer electrolyte tantalum capacitors should be derated at least according to level III. When these two types of tantalum capacitors are used in circuits or filter circuits with high reliability requirements, it is recommended that they should be at least level II Derating; solid electrolyte (manganese dioxide) tantalum capacitors are derated at a minimum of 65% of the reference DC working voltage. When this type of tantalum capacitors are used in circuits or filter circuits with high reliability requirements, it is recommended to derate at least according to class I.

Under the conditions allowed by the design, the derating range should be increased as much as possible. For tantalum capacitors, the larger the derating range, the higher the reliability.

3.2. Reverse voltage

3.2.1:

The dielectric oxide film of tantalum capacitors has unidirectional conductivity and rectifying characteristics. When a reverse voltage is applied, a relatively large current will flow through, which tends to cause potential quality hazards, and in severe cases, may even lead to reverse breakdown and failure of the capacitor. Therefore, the reverse voltage must be strictly controlled during use. The reverse voltage resistance of various types of capacitors is shown in Table 2 below:

3.2.2:

In principle, it's forbidden to use the resistance range of multimeter to perform non-polarity testing on circuits containing tantalum capacitors or the capacitors themselves (reverse voltage can be easily applied). It should be able to withstand reverse testing of the 1.5V power supply of the multimeter if the circuit uses tantalum capacitors with voltage of 35V or above (including 35V), but 9V power supply should be absolutely not allowed.

3.2.3:

In the process of measurement and use, if the tantalum capacitor is accidentally applied to the reverse voltage exceeding the specified value. Even if its electrical parameters are still qualified, the capacitor should be scrapped.
Because the quality hidden danger caused by the reverse voltage of the capacitor has a certain latency period, it may not be manifested at that time.

Table 1 Recommended voltage for various types of products

Executive Standard	Product Type	Series	Recommended voltage	
			-55℃~85℃	85℃~125℃
GJB733	Non-Solid Electrolyte Tantalum Capacitors (Tantalum Case)	HCAK38,HCAK39, HCAK39H,HTHC1 etc.	65%U_R	42%U_R
	Non-solid Electrolyte Tantalum Capacitors (Silver Case)	HCAK35,HCAK86 etc.	65%U_R	42%U_R
GJB63	MnO. Solid Electrolyte Tantalum Capacitors (Metal Case)	HCAK,HCAK- 1 etc.	(50%-60%)U_R	40% U_R
	Polymer Solid Electrolyte Tantalum Capacitors (Metal Case)	HCAK66 etc.	(50%-60%)U_R	40% U_R
GJB2283	MnO. Chip Type Solid Electrolytic Tantalum Capacitor (Molded Plastic Package)	HCAK45,HCAK45L, HCAK45U,HCAK45M etc.	50%U_R	33%U_R
	Chip Polymer Solid Electrolyte Tantalum Capacitor (Molded Plastic Package)	HCAK55,HCAK55H etc.	50%U_R	33% U_R
GJB5437	MnO. Solid Electrolyte Tantalum Capacitors (Molded Plastic)	HCAK44,HCAK41 etc.	50%U_R	33% U_R

3.3. Influence factors of failure rate

3.3.1:

The lower the voltage across the actually added tantalum capacitor is lower than the rated voltage, the lower the failure rate of the tantalum capacitor. The failure rate of tantalum capacitors is evaluated under the maximum allowable load conditions at the rated voltage of 85°C.

3.3.2:

Another factor that affects the failure is the series resistance connected to the outer circuit of the capacitor. The greater the resistance in series with the capacitor in the outer circuit circuit, the lower the failure rate.

Failure rate grade: 2.0%/1000h is expressed as L; 1.0%/1000h is expressed as M; 0.1%/1000h is expressed as P; 0.01%/1000h is expressed as R, 0.001%/1000h is expressed as S.

Table 2 Reverse voltage resistance of various types of products

Executive Standard	Product Type		Series	Withstand reverse voltage
GJB733	Non-Solid Electrolyte Tantalum Capacitors	All tantalum capacitors with tantalum case	HCAK38, HCAK39, HCAK38T etc.	Resistant to 3V reverse voltage
		Hybrid Tantalum Capacitors	HTHC1, HTHC2, HTHC1W, HCAK36S1, HCAK36S1W etc.	Not resistant to reverse voltage
		Silver case	HCAK35, HCAK35X, HCAK86, HCAK81 etc.	Not resistant to reverse voltage
GJB63	Solid Electrolyte Tantalum Capacitors		HCAK, HCAK-1, HCAK-8, HGCA, HGCA411C etc.	Generally, reverse voltage is not allowed, let alone used in pure AC circuits. If it is unavoidable, it is allowed to apply a reverse voltage not greater than the following in a short period of time, and its value is: below 25°C: ≤10%U_R or 1V (whichever is smaller); below 85°C: ≤ 5%U_R or 0.5V (whichever is smaller); below 125°C: ≤1% U_R or 0.1V (whichever is smaller). Note: If the capacitor needs to work in a circuit with reverse voltage for a long time, please use a bipolar tantalum capacitor, but it can only be used in a DC or pulsating circuit with a low frequency of polarity change.
	Polymer Solid Electrolyte Tantalum Capacitors		HCAK66 etc.	Not resistant to reverse voltage
GJB5437	Solid Electrolyte Tantalum Capacitors		HCAK44, HCAK41 etc.	Not resistant to reverse voltage
GJB2283	Chip Tantalum Solid Electrolyte Tantalum Capacitors		HCAK45, HCAK45L, HCAK45U, HCAK45M etc.	Not resistant to reverse voltage
	Chip Polymer Solid Electrolyte Tantalum Capacitors		HCAK55, HCAK55H etc.	Not resistant to reverse voltage

3.4 Ripple Current

3.4.1 The sum of the DC bias and the peak value of the AC partial voltage must not exceed the rated voltage of the capacitor.

3.4.2 The sum of the AC negative peak value and the DC bias must not exceed the allowable reverse voltage of the capacitor.

3.4.3 When ripple current passes through the tantalum capacitor, it produces active power loss, which in turn increases the probability of thermal breakdown failure caused by the capacitor's own temperature rise. Therefore, it is necessary to limit the ripple current through the capacitor or the allowable power loss of the capacitor. The relationship between the power loss (P_{st}) and the ripple current (I_{rms}) is expressed by the following formula: $P_{st}=V\_\times I_{st}+I^2_{rms}\times R=I^2_{rms}\times Rs$

Where: V_ : DC bias (V); I_{st} : Leakage current (uA); Rs: Equivalent series resistance (Ω); I_{rms}: Ripple current (mA).

It can be seen from the above formula that the power loss increases when R_s or I_{rms} increases. Therefore, it is necessary to control the power loss of tantalum capacitors in high-frequency circuits.

3.4.3.1 The allowable power loss of various solid electrolyte tantalum capacitors according to the heat dissipation efficiency of the case size is shown in Table 3.

Table 3 Allowable Power Loss and Temperature Class Coefficient of Solid Electrolyte Tantalum Capacitors

Allowable Power Loss		Temperature Class Coefficient		
Product Structure	Case	Power loss (W)	Temperature (°C)	Class Coefficient
Hermetically Sealed Solid Tantalum Capacitors	A B C D	0.09 0.10 0.125 0.18	25 85 125	1.0 0.9 0.4
	0 1 2 3 4 5 6	0.09 0.09 0.10 0.115 0.12 0.17 0.20		

Allowable Power Loss		Temperature Class Coefficient		
Product Structure	Case	Power loss (W)	Temperature (°C)	Class Coefficient
Molded Chip Solid Tantalum Capacitors	A B C L H D E F V W X G Z S T Y	0.080 0.098 0.114 0.118 0.130 0.157 0.172 0.147 0.212 0.215 0.314 0.321 0.355 0.383 0.429 0.433	25 85 125	1.0 0.6 0.4

Note:
1) The allowable power loss of the capacitor is specified under the condition that the whole machine can normally dissipate heat naturally. When the whole machine is sealed with components, appropriate adjustments should be made due to the reduced heat dissipation conditions.
2) The allowable power loss of similar capacitors can be taken with reference to the case size corresponding to the same surface area.

3.4.3.2 The maximum effective value of ripple current allowed for various non-solid capacitors according to the case size (85°C, 40kHz, 0.66U_R) is shown in Tables 4 and 5. The ripple current coefficient values under different operating voltages, frequencies and temperature conditions are shown in Table 4.

Table 4 Maximum Ripple Current (Effective Value) of HCAK31, HCAK81, HCAK38, HCAK39, HCAK39 Capacitors

Series	HCAK31, HCAK81	HCAK38	HCAK39	HCAK39
Case	I_{rms}(mA)			
T1	50	415	700	1400
T2	200	755	1200	2200
T3	500	1130	1500	2700
T4	600	1800	1900	3400

Table 5 Maximum ripple current (Effective Value) of non-solid electrolytic capacitors

Case	0	1	2	3	4	5	6	7	8
I rms(mA)	40	50	105	280	380	500	600	750	850