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Hybrid Tantalum Capacitor - HTHC3 Series

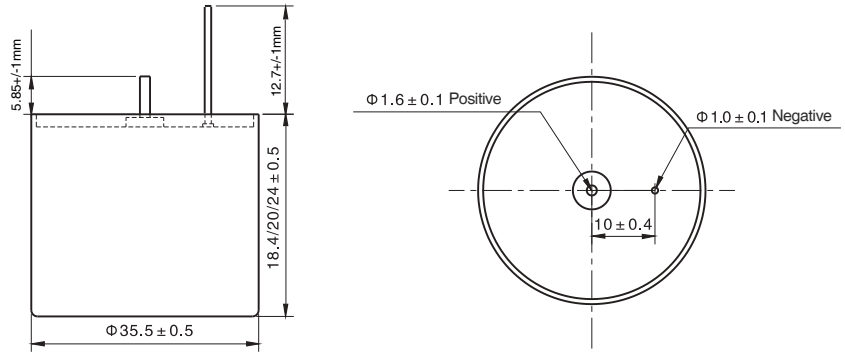
◆ Features

- Tantalum casing, hermetically sealed, cylindrical, axial leads, polarized, ultra-large capacitance;
- Small volume, large energy storage, excellent and stable electrical performance, high reliability, long lifespan; internal structure is multi-core parallel; capacitance is larger than HTHC2 series
- Provides energy storage and power interruption delay functions in DC or pulsed circuits of military electronic equipment in fields such as aerospace, aviation, weaponry, electronics, shipping, and communications;
- Standards: GJB733A - 96, QJ/PWV311-2009

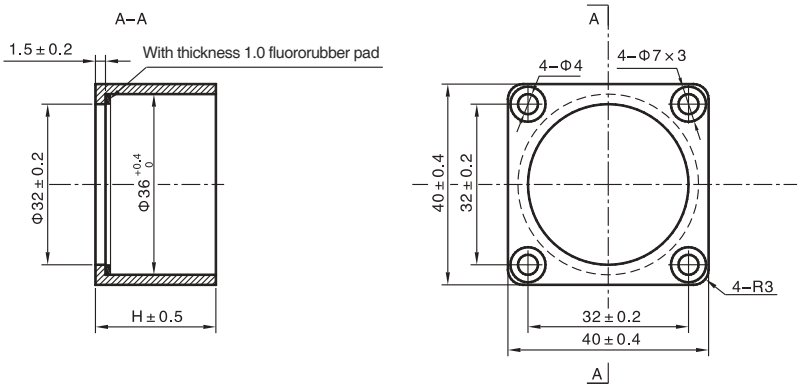
◆Specifications:

1. Operating Temperature Range: -55℃~ +125℃. For the Derated Design please see guide line on page 3~4
2. Capacitance Tolerance: Q: -10% ~ +30%, K: ± 10%, M: ± 20%
3. Dimensions, Maximum Weight: see Table 1
4. Structure and dimensions: see Figure 2

◆ Table 1 Dimensions and hstallation instruction



The structure and dimensions
HTHC3 Φ35.5 × 18.4/20/24



Dimensions mm	Height of fixing frame H +/-0.5mm
Φ35.5 × 18.4	18.5
Φ35.5 × 20	20
Φ35.5 × 24	24

Installation and fixing frame
HTHC3 Φ35.5 × 18.4/20/24

◆Electrical Characteristics

Rated Voltage, Category Voltage, Surge Voltage, Nominal Capacitance and Main Features

Rated Voltage(V)	Nominal Capacitance (μF)	tg δ (%) 100Hz	ESR (Ω) 1kHz	Leakage Current (μA)			Impedance 100Hz	Capacitance Variation(%)		Dimension D X H (mm)	Max Weight (g)
		25℃	25℃	25℃	85℃	125℃	-55℃	-55℃	+85℃		
10	200000 230000	190	0.025	300	1800		1	−80	+160	ϕ35.5×20 ϕ35.5×24	145 165
16	120000 140000	170	0.025	300	1800		1	−80	+160	ϕ35.5×20 ϕ35.5×24	145 165
25	70000 86000	140	0.025	300	1800		1	−75	+160	ϕ35.5×20 ϕ35.5×24	145 165
35	50000 60000	100	0.025	300	1800		1	−70	+160	ϕ35.5×20 ϕ35.5×24	145 165
50	30000 30000 32000 33000 33000	75	0.025	400	2400		1.2	−60	+160	ϕ35.5×18.4 ϕ35.5×20 ϕ35.5×20 ϕ35.5×20 ϕ35.5×24	115 145 145 145 165
63	16000 18000	55	0.035	400	2400		1.4	−50	+100	ϕ35.5×20 ϕ35.5×24	145 165
80	11000 13000	45	0.035	500	2500		1.6	−40	+100	ϕ35.5×20 ϕ35.5×24	145 165
100	4800 6000 7500	40	0.035	500	2500		1.8	−30	+80	ϕ35.5×20 ϕ35.5×20 ϕ35.5×24	145 145 165
125	2200 4500 4700 2800 4500 4700	35	0.050 0.050 0.050 0.050 0.050 0.050	500 500 500 500 500 500	2500 3000 3000 2500 3000 3000		2.4 2.5 2.4 2.4 2.0 2.0	−25 −25 −25 −20 −25 −25	+50 +50 +50 +40 +45 +45	ϕ35.5×20 ϕ35.5×20 ϕ35.5×20 ϕ35.5×24 ϕ35.5×24 ϕ35.5×24	145 145 145 165 165 165

P.S.: 1. It is forbidden to use a multimeter to measure tantalum capacitors regardless of polarity;

2. The test frequency of capacitance and loss tangent is 100Hz, $U_{-}=2.2^{0}_{-1.0}$V, $U_{\sim}=1.0^{0}_{-0.5}$V (effective value); the measurement method adopts series equivalent circuit;

3. When measuring the leakage current at 125°C, please apply a category voltage; the leakage current parameter is a 5-minute reading;

4. Products with large capacity or special sizes exceeding this standard can be produced through negotiation with our company.

◆Derated Design guide line:

1. Derating Recommendations

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

1.2: Rated voltage and derated voltage

The rated voltage (UR) 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 Criteria" standard, the derating levels of tantalum capacitors are divided into 1, 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 (Ur). 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.

2. Reverse voltage

2.1:

The rated voltage (UR) 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.

2.2:

In principle, it is forbidden to use a three-meter electrical barrier to test the circuit with tantalum capacitors or the capacitor itself regardless of polarity (it is easy to apply reverse electricity.

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.

When the circuit adopts all tantalum capacitors above 35V (including 35V), it should be able to withstand the reverse test of the 1.5V power supply of the three-meter, and the 9V power supply should be absolutely prohibited.

3. Influence factors of failure rate

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.

3.2:

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.