创 容 新 能 源

承 认 书
(APPROVE SHEET)

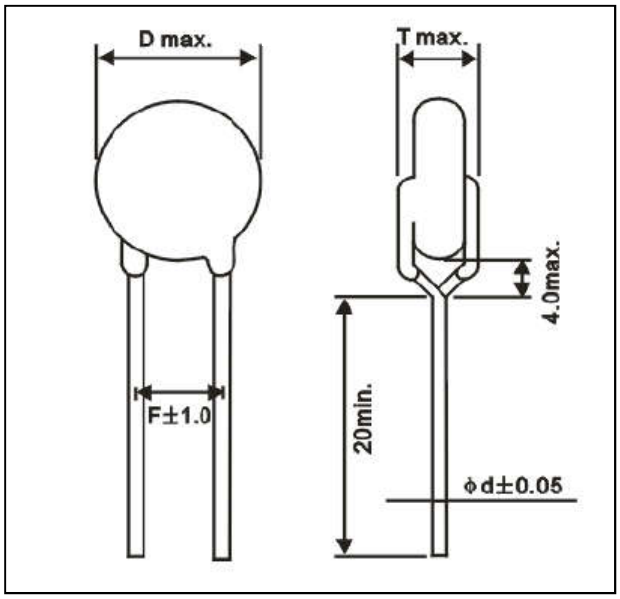
TO: 瓷片Y电容 2.2nF±20% 500VAC

☑ 封面

☑ 规范书

☐ 样品检测记录表

品名：Y1 电容器



料 号	规 格	成品尺寸（mm）					代码
		D	T	F	d	脚型	
TRX009222M2HAC00AAH	Y1222M500VAC	8	4.5	10	0.55	长直脚	Y12044

客户签承栏			创容承办栏		
承认签章	核准	检验	工程签章	核准	审核
					李爱
日期			日期	2020-10-30	

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Specifications for a.c. ceramic capacitors (Y1)

1. Scope

Y1 a.c, ceramic capacitors are used in electrical and electronic equipment and connected an a.c. main with nominal voltage not exceeding 400va.c, and with a nominal frequency for 50~60Hz.

2. Object

The principal object of this standard is to prescribe preferred ratings and characteristics and to select the appropriate tests and measuring methods and to give general performance requirements for Y1 a.c. ceramic capacitors.

3. Normative references

GB/T 2693-2001 (IDT IEC 60384-1: 1999)
Fixed capacitors for use in electronic equipment-
Part 1: Generic specification

IEC 60384-14 3'rd: 2005
Fixed capacitors for use in electronic equipment
Part 14: Sectional specification
Fixed capacitors for electromagnetic interference suppression and connection to the supply mains

GB/T 5169.5-1997 (IDT IEC 60695-2-2:1991)
Fire hazard testing for electronic products Part 2: Test methods
Section 2: Needle-flame test

GB/T 2828.1-2003 (IDT ISO 2859-1:1999)
Sampling procedures for inspection by attributes-
Part 1: Sampling schemes indexed by acceptance quality limit(AQL)for lot-blot inspection

GB/T 2471-1995 (IDT IEC 63:1963): Preferred number series for resistors and capacitors

GB/T 2691-1994 (IDT IEC 62:1992): Marking codes for resistors and capacitors

SJ/T 11363-2006: Requirements for concentration limits for certain hazardous substances in electronic information products

SJ/T 11364-2006: Marking for control of pollution caused by electronic information products

SJ/T 11365-2006: Testing methods for hazardous substances in electronic information products

2005/618/EC: 2002/95/EC(RoHS):The Restriction of the use of certain Hazardous substances in Electrical and Electronic Equipment

2002/96/EC (WEEE): Waste Electrical and Electronic Equipment

94/62/EC: Europe Parliament and Council Directive94/62/EC of 20 December 1994 on Packaging and packaging waste

No1907/2006(REACH): Registration, Evaluation, Authorization and Restriction of Chemicals

4. Terms and definitions

4.1 a.c. capacitor

Capacitor designed essentially for application with a power-frequency alternating voltage

NOTE: a.c. capacitor may be used on d.c. supplies having the same voltage as the a.c. r.m.s. rated voltage of the capacitor.

4.2 capacitor of class Y

Capacitor of a type suitable for use in situations where failure of the capacitor could lead to danger of electric shock.

4.3rated voltage

Either the r.m.s. operating voltage of rated frequency or the d.c. operating voltage, which may be applied continuously to the terminations of a capacitor at any temperature between the lower and the upper category temperatures.

4.4 tangent of loss angle(tan δ)

The power loss of the capacitor divided by the reactive power of the capacitor at a sinusoidal voltage at a specified frequency.

4.5upper category temperature

Maximum surface temperature for which the capacitor has been designed to operate continuously.

4.6 lower category temperature

Minimum surface temperature for which the capacitor has been designed to operate continuously.

4.7climatic category

The climatic category which the capacitor belong to is expressed in numbers (IEC 60068-1e.g.:25/125/21). The first number represents the lower category temperature (e.g.:-25℃); the second number represents the upper category temperature (e.g.:+125℃) and the third number represents the number of days relevant to the damp heat test (e.g.:21days)

4.8 temperature characteristic of capacitor

The maximum reversible variation of capacitance produced over a given temperature range within the category temperature range, normally expressed as a percentage of the capacitance related to a reference temperature of 20℃.

5. How to order

Y1	**102**	**145**
Class	**Capacitance** Code 102:1000PF	**sequence number**

Codes for capacitance shall be find expression in three numbers. The first two digits are significant, and the third digit is number of zero.

6. Approval standard and file number

Table 1

NO	COUNTRY	STANDARD NO.		CLASS TYPE W.V C.C P.F.C	FILE NO.	MARK
1	GERMANY	VDE	DIN EN 60384-14 (VDE 0565 Teil 1-1): 2006-04 EN60384-14:2005-08 IEC 60384-14(ed.3)	Y1 TY AC 400V 25/125/21C	40023136	
2	U.S.A	UL CUL	UL 1414-2006 CSA C22.2 NO. 1	Y1 TY AC 250V 25/85/21C	E315719	
3	NORWAY	NEMKO	EN 60384-14:2005	Y1 TY AC 400V 25/125/21C	P08208983	
4	FINLAND	FIMKO	EN 60384-14:2005	Y1 TY AC 400V 25/125/21C	FI 24060	
5	DENMARK	DEMKO	EN 60384-14:2005	Y1 TY AC 400V 25/125/21C	314536-01	
6	SWEDEN	SEMKO	EN 60384-14:2005	Y1 TY AC 400V 25/125/21C	802259	
7	SWISS	SEV	IEC 60384-14(ed.3):2005 EN 60384-14:2005	Y1 TY AC400V 25/125/21C	08.0107	
8	CHINA	CQC	GB/T 14472-1998	Y1 TY AC400V 25/85/21C	CQC08001025751	

7. Capacitance and dimension

TY Type – CLASS Y1: 400VAC Table 2

Part Number	Temp Char	Cap Value (Pf)	CAP TOL	DIMENSIONS(mm)			d ±0.05mm
				D (±1.0)	F (±0.8)	T (±0.8)	
Y1101□□□	Y5P (B) ±10%	100	K ±10%	6	10	4.5	0.6
Y1151□□□		150		6			
Y1221□□□		220		6			
Y1271□□□		270		6			
Y1331□□□		330		7			
Y1391□□□		390		7			
Y1471□□□		470		7			
Y1561□□□		560		8			
Y1681□□□		680		9			
Y1821□□□		820		10			
Y1102□□□		1000		11			
Y1471□□□	Y5U (E) +22% −56%	470	M ±20%	6	10	4.5	
Y1102□□□		1000		8			
Y1152□□□		1500		9			
Y1222□□□		2200		11			
Y1272□□□		2700		12			
Y1332□□□		3300		12			
Y1392□□□		3900		13			
Y1472□□□		4700		15			
Y1471□□□	Y5V (F) +22% −82%	470	M ±20%	6	10	4.5	
Y1102□□□		1000		6			
Y1152□□□		1500		7			
Y1222□□□		2200		9			
Y1272□□□		2700		9			
Y1332□□□		3300		10			
Y1392□□□		3900		11			
Y1472□□□		4700		11			

8. The constituent parts of capacitor

Design1

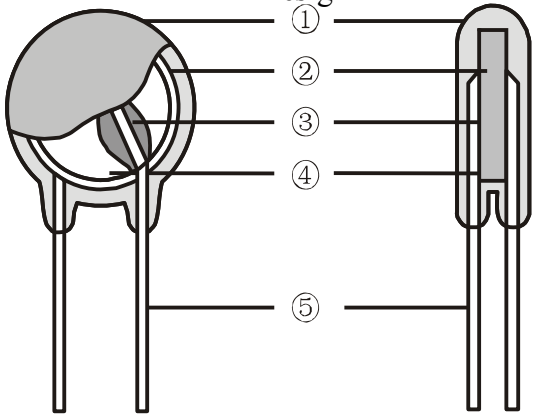
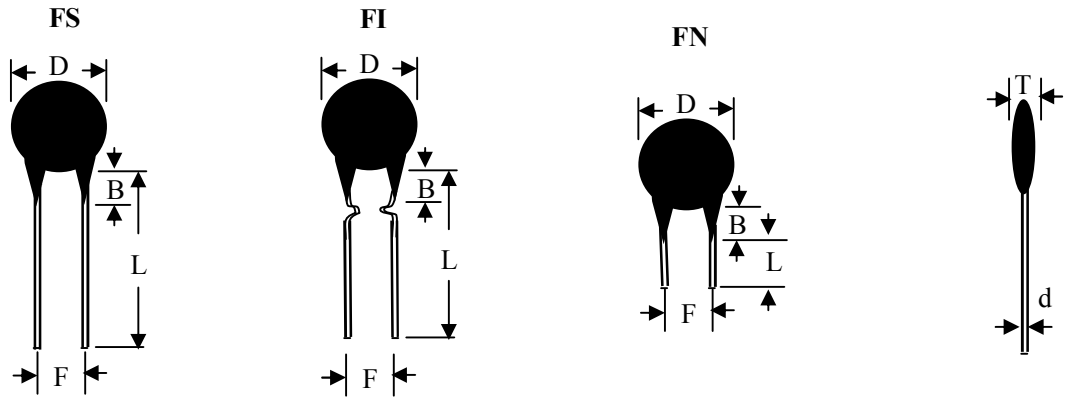


Table 3

NO.	constituent	material
①	Coating	Epoxy
②	Ceramic medium	Ceramic
③	Solder	Soldering tin
④	Electrode	Silver oxide
⑤	Lead Frame	CP wire

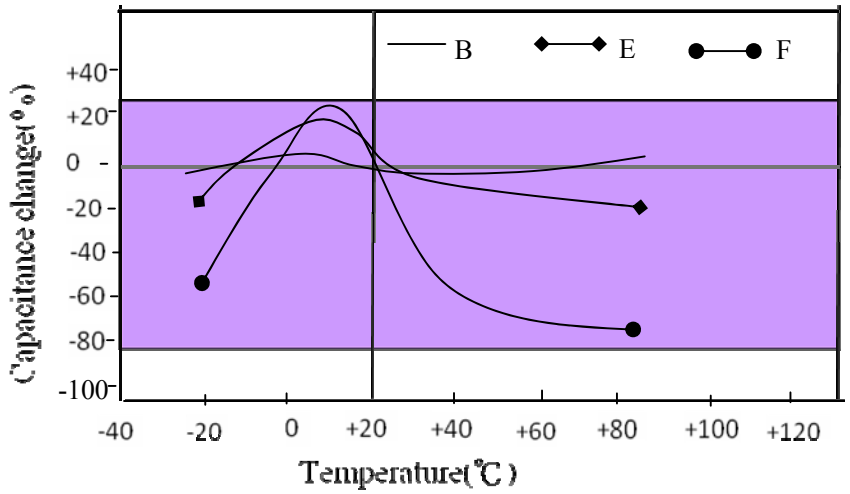
9. Figure and code of dimension

Design2



10. Temperature characteristic of capacitor

Design3



11. Requirements for concentration limits for certain hazardous substances

Table 4 RoHS

substances	concentration (unit: ppm)
Cadmium and cadmium compounds	<100
Lead and lead compounds	<1000
Mercury and mercury compounds	<1000
Hexavalent chromium compounds	<1000
Polubrominated biphenyls	<1000
Polubrominated diphenylethers	<1000
Cd+Pb+ Hg + Cr^{+6} (packing materials)	<100

12. Performance test

Table 5

<table>
<tr><th>NO.</th><th colspan="2">item</th><th>performance</th><th>measuring method</th></tr>
<tr><td>1</td><td colspan="2">Visual examination</td><td>No visible damage
legible marking
lead frame is not oxidation and its surface is without sundries.</td><td>unaided eye or magnifier</td></tr>
<tr><td>2</td><td colspan="2">Dimensions</td><td>accorder Table3</td><td>vernier caliper</td></tr>
<tr><td>3</td><td colspan="2">Printing</td><td>accorder design4</td><td>magnifier</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">4.2.1
Voltage proof</td><td>Between lead wire</td><td>No permanent break-down or flashover during the test period</td><td>test voltage: 4000VAC
frequency: 50Hz
duration: 60 seconds
leakage current: 5mA max</td></tr>
<tr><td>Body insulation</td><td>No permanent break-down or flashover during the test period</td><td>test voltage: 4000VAC
frequency: 50Hz
duration: 60 seconds
leakage current: 5mA max</td></tr>
<tr><td>5</td><td colspan="2">4.2.2
Capacitance</td><td>Within specified tolerance
K: ± 10%
M: ± 20%</td><td>temperature: 25 ± 3℃
humidity: 55 ± 20%RH
voltage: 1.0 ± 0.2V
frequency: 1 ± 0.2KHZ</td></tr>
<tr><td>6</td><td colspan="2">4.2.3
Dissipation factor</td><td>Within specified tolerance
Y5P: ⩽2.5%
Y5U: ⩽5.0%
Y5V: ⩽5.0%</td><td>temperature: 25 ± 3℃
humidity: 55 ± 20%RH
voltage: 1.0 ± 0.2V
frequency: 1 ± 0.2KHZ</td></tr>
<tr><td>7</td><td colspan="2">4.2.4
Capacitor-temperature characteristic</td><td>Y5P: ± 10%
Y5U: +22%~-56%
Y5V: +22%~-82%</td><td>Temperature tolerance: ± 2℃
<table><tr><td>step</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Tem (℃)</td><td>+20</td><td>-25</td><td>+20</td><td>+85</td><td>+20</td></tr></table>△=（C_X-C_0）/C_0
C_X capacitor for step2,4
C_0 capacitor for step 1</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">4.2.5
Insulation resistance</td><td>Between lead wire</td><td>10000MΩ MIN</td><td>Measuring voltage: 100VDC
frequency: 50Hz
duration:60 seconds</td></tr>
<tr><td>Body insulation</td><td>10000MΩ MIN</td><td>Measuring voltage: 100VDC
frequency: 50Hz
duration:60 seconds</td></tr>
</table>

9	4.3 Robustness of terminations	tensile	Lead wire shall not cut off. Capacitor shall not be broken. No visible damage.		force:10N duration:10s
		bending	Lead wire shall not cut off. Capacitor shall not be broken. No visible damage.		Two consecutive bends shall be applied in each direction force:5N
10	4.4 Resistance to soldering heat		visual examination	no visible damage	Solder temperature: 260 ± 5℃ Immersion time:10 ± 1seconds The depth of immersion: $2^{+0}_{-0.5}$mm from the seating plane Using a thermal insulating screen of 1.5 ± 0.5mm thickens Capacitor shall be placed at 25 ± 3℃ for 24 ± 2h before initial measurements.
			voltage proof	accorder 4.2.1	
			capacitance	Y5P: ± 10% Y5U: ± 10% Y5V: ± 10%	
			dissipation factor	Y5P: ⩽2.5% Y5U: ⩽5.0% Y5V: ⩽5.0%	
			Insulation resistance	accorder 4.2.5	
11	4.5 Solderability		Good tinning as evidenced by free flowing of the solder with wetting of the terminations or solder shall flow within 3s.		Bath temperature:235 ± 5℃ Immersion time:2 ± 0.5seconds Depth of immersion(from the seating plane or component body): Capacitors below 2^0-0.5mm,using a thermal insulating screen of 1.5 ± 0.5mm thickness. Capacitor shall be placed at 25 ± 3℃ for 24 ± 2hours before measurements.
12	4.6 Rapid change of temperature		Capacitor shall not visible damage		test temperature: upper category temperature +125 ± 3℃ lower category temperature -25 ± 3℃ number of cycles :5 duration of exposure at the temperature limits: 30minutes
13	4.7 Vibration		Capacitor shall not visible damage		Frequency rangs:10→55→10Hz swing:0.75mm, The total duration shall be 6 hours. duration of exposure at X,Y,Z: 2hours
14	4.12 Damp heat (steady state)		visual examination	No visible damage	test temperature: 40 ± 2℃ humidity: 95 ± 3%RH duration: 21days voltage: 400VAC(U_R)for one half of the samples. capacitor shall be placed at 25 ± 3℃ for 2hour before measurements.
			capacitance	$\triangle=(C_X-C_0)/C_0$ △: ±15%	
			voltage proof	accorder 4.2.1	
			Insulation resistance	⩾3000MΩ $\triangle=(R_X-R_0)/R_0$ △>50%	

15	4.13 Impulse voltage	No permanent breakdown or flashover during the test period. If any three successive impulses are shown by the oscilloscope monitor to have had a waveform indicating that no self-healing breakdowns or flashovers have taken place in the capacitor, then no further impulses shall be applied and the capacitor shall be counted as conforming. If all 24 impulses have been applied to the capacitor and 3 or more of them are of a waveform indicating that no self-healing breakdowns or flashovers have occurred, then the capacitor shall be counted as conforming. If less than three impulses are of the required waveform, then the capacitor shall be counted as a nonconforming item.		Peak impulse voltage:8.0KV Impulses distance : > 10seconds Impulses times:24
16	4.14 Endurance	visual examination	No visible damage	Test temperature: 125 ± 3℃ duration: 1000hours test voltage: 680VAC($1.7U_R$), except that once every hour the voltage shall be increased to 1000v r.m.s. for 0.1s. Each of these voltage shall be applied To each capacitor individually through a resistor of 47Ω ± 5%. Capacitor shall be placed at 25 ± 3℃for 2hour before measurements.
		capacitance	$\triangle=(C_X-C_0)/C_0$ △: ±20%	
		voltage proof	accorder 4.2.1	
		Insulation resistance	⩾3000MΩ $\triangle=(R_X-R_0)/R_0$ △>50%	
17	4.15 Charge and discharge	capacitance	$\triangle=(C_X-C_0)/C_0$ △: ±20%	Charge voltage: 565VAC ($\sqrt{2}U_R$) number of cycles: 10000 the rate of approximately: one operation per second. Each cycle shall consist of charging and discharging the capacitor. Each capacitor shall be individually charged by applying the test voltage through a resistor with the value $R=\frac{220\times10^{-6}}{C_R}\ \Omega$
		Insulation resistance	⩾3000MΩ $\triangle=(R_X-R_0)/R_0$ △>50%	

<table>
<tr><td rowspan="5">18</td><td rowspan="5">4.17
Passive flammability</td><td rowspan="5">category: C
The burning time of any specimen shall not exceed the time specified. Burning droplets or glowing parts falling down shall not ignite the tissue paper.</td><td colspan="3">category: C</td></tr>
<tr><td>volume ranges</td><td>flame time</td><td>Maximum burning time</td></tr>
<tr><td>V<250mm^3</td><td>5S</td><td>≤30S</td></tr>
<tr><td>250<V≤500mm^3</td><td>10S</td><td>≤30S</td></tr>
<tr><td>500<V≤1750mm^3</td><td>20S</td><td>≤30S</td></tr>
<tr><td></td><td></td><td></td><td>V>1750mm^3</td><td>30S</td><td>≤30S</td></tr>
<tr><td>19</td><td>4.19
Component solvent resistance</td><td>No visible damage.
Performance accorder 4.2.1~4.2.5</td><td colspan="3">Solvent to be used:
30 ± 5%isopropyl alcohol
and 70 ± 5%fluxional compound
Solvent temperature: 23 ± 5℃
The capacitor shall be immerged in solvent for 5 ± 0.5seconds.
Recovery time: 48hours</td></tr>
<tr><td>20</td><td>4.20
Solvent resistance of the marking</td><td>The marking shall be legible</td><td colspan="3">Solvent to be used:
30 ± 5%isopropyl alcohol
and 70 ± 5%fluxional compound
Solvent temperature: 23 ± 5℃
The capacitor shall be immerged in solvent for 5 ± 0.5seconds and its mark shall be wiped with pledget for 10times.</td></tr>
</table>

13. Marking design

Design 4

	trademark
TY	type/model reference
B\E\F	code of Dielectric
Y1	capacitor classed sub-class
101	code of capacitance
K\M	code of tolerance
400V~	rated voltage
	a.c. mark
250V~	voltage for CUL
WD	code of making time