DATA SHEET

Y1 AC Ceramic Capacitor 400VAC

Serie: I22002

Mat. Code	**B**	Material:	**B= Y5P**
Voltage Code	**401**	Voltage:	**401= 400VAC**
Range Code	**221**	Range:	**221= 220pf**

DRW:	Jason	CHKD	Wilson	MATL:	Wilson	TOLERANCE	Mason	DATE	01.11.2010	**Y1 AC Ceramic Capacitor 400VAC**
APPD:	Schumi			FINISH	Jamy		Sheet No.		1 from 13	Serie No.: **I22002**
										Customer:

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Technical Specifications

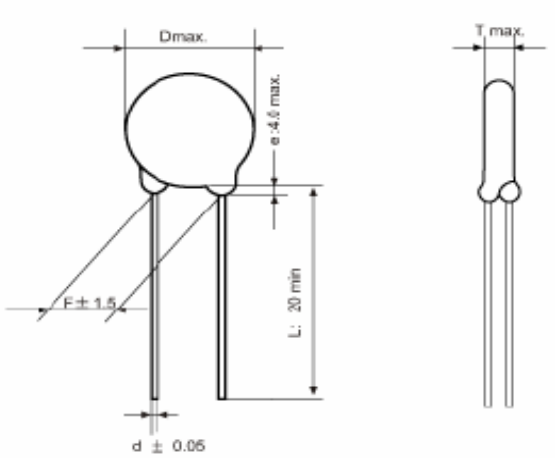
Temperature Characteristics	Y5P and Y5U
Capacitance Change of Temperature	Y5P = ±10%
Coeffizient	Y5U = ±20% ~ -55%
Temperature Range:	. -25°C ~ +85°C
Capacitance Tolerance:	K= ± 10% M= ± 20%

Nominal Capacitance Code (Example)

Code	Capacitance (pf)
101	100
102	1000
222	2200
103	10000

Nominal capacitance shall consist of three numbers in the unit of picofard(pf). The frist and the second numbers mean the signifibant figures and the third number shall presendt the number of zeros flowing the significant figures.

Lead Style Informations



Lead Code Style (A) (mm)

Pitch Code	A	B	C	D	E
F	2,5	5,0	7,5	10	12,5
L	only 20mm long lead				
d	0,5 or 0,6 or 0,8mm				
e	max. 4,0mm				

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Part No.: **I22002**

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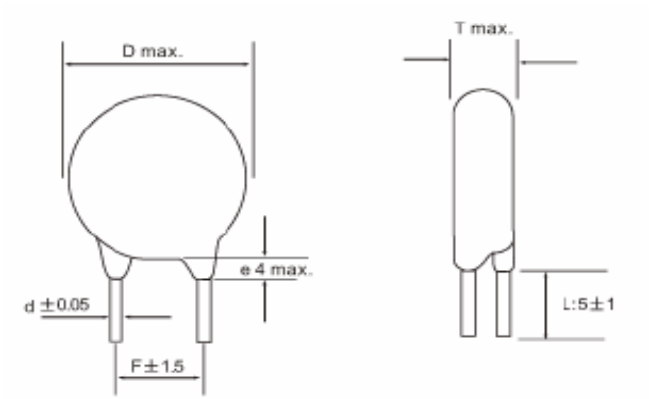
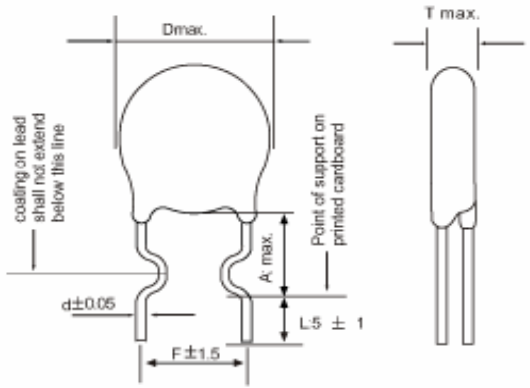
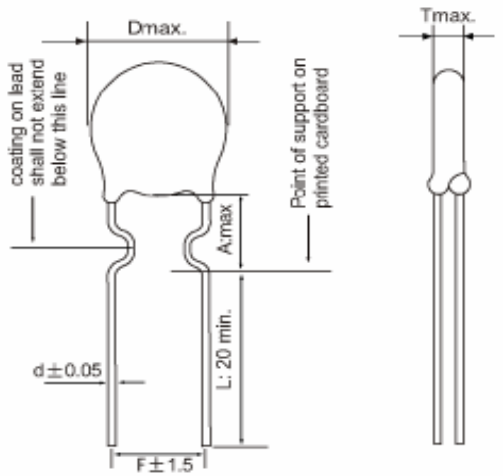
Lead Style Informations



Lead Style Informations



Lead Style Informations



Lead Code Style (B) Unit (mm)

Pitch Code	A	B	C	D	E
F	2,5	5,0	7,5	10	12,5
L	5,0mm or on customer request				
d	0,5 or 0,6 or 0,8mm				
e	max. 4,0mm				

Lead Code Style (C) Unit (mm)

Pitch Code		B	C	D	E
F		5,0	7,5	10	12,5
A		5,0	5,0	6,5	6,5
L	5,0mm or on customer request				
d	0,5 or 0,6 or 0,8mm				

Lead Code Style (D) Unit (mm)

Pitch Code		B	C	D	E
F		5,0	7,5	10	12,5
A		5,0	5,0	6,5	6,5
L	20mm min.				
d	0,5 or 0,6 or 0,8mm				

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APPD:	Schumi			FINISH	Jamy		Sheet No.		3 from 13

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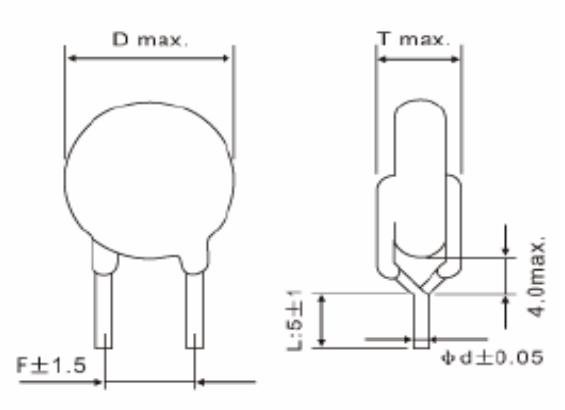
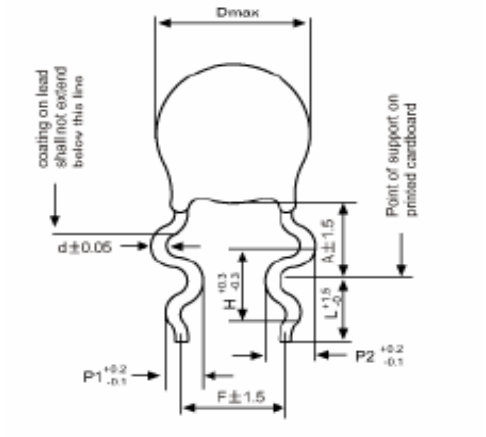
Lead Style Informations



Lead Style Informations



Lead Code Style (H) Unit (mm)

Pitch Code		B	C	D	E
F		5,0	7,5	10	12,5
L	5,0mm or on customer request				
d	0,5 or 0,6 or 0,8mm				

Lead Code Style (M) Unit (mm)

Pitch Code		B	C	D	E
F		5,0	7,5	10	12,5
H		2,6	2,6	3,3	3,3
P1		1,3	1,25	1,65	1,65
P2		1,7	1,65	1,95	1,95
A	D<8: 6,0± 1,5, D>8: 7,0± 1,5				
L	3,0 ~ 30mm				
d	0,5 or 0,6 or 0,8mm				

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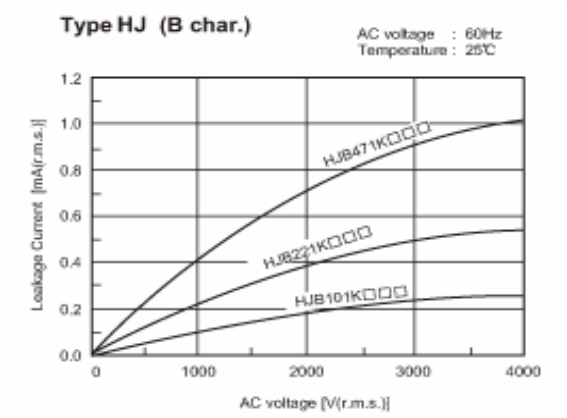
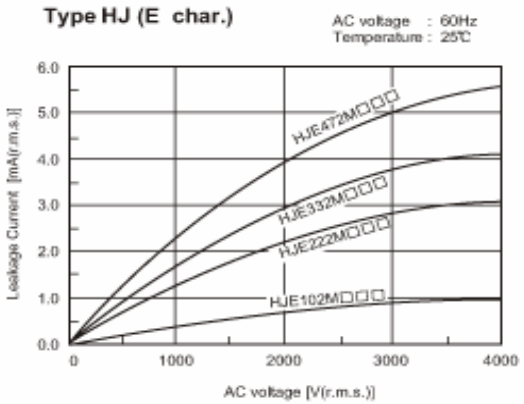
Specification and test method

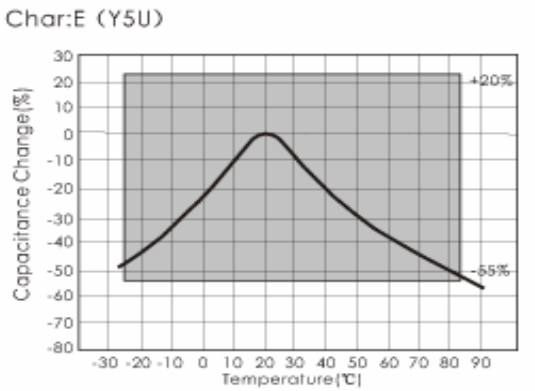
Operating Temperature range -25°C ~ +105°C
But temperature range is -25% ~ +85°C at safety standard specification.
Test and measurement shall be made at the standard condition. (Temperature 15 ~ 35°C relative humidity 45 ~ 75% and athmospheric pressure 860~1060hpa). Unless otherwise specified herein it doubt accurated on the value of measurement, and remesuarement was requested by customer capacitor shall be measuremed at the reference condition (Temperature 20 ±2°C, relative humidity 60~70% and atmospheric pressure 860~1060hpa). unless otherwise specified herein.

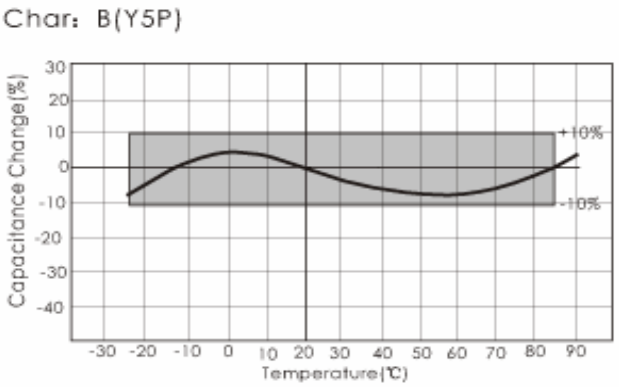
Leakage Current Characteristics



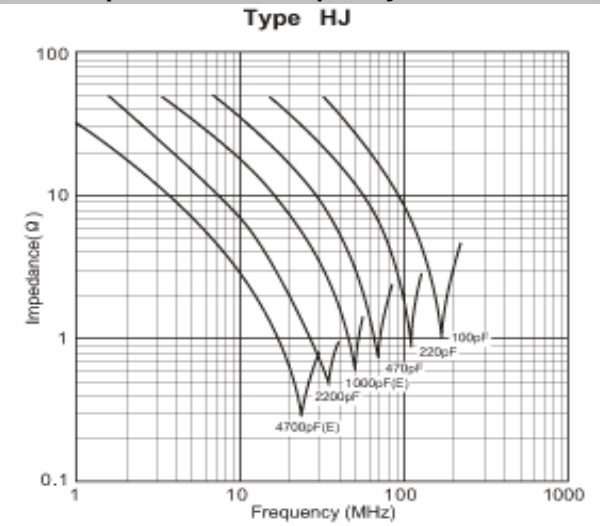


Capacitance Temperature Characteristics





Impedance vs. Frequency Characteristics



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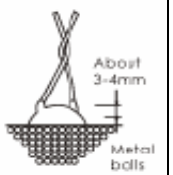
Item	Specification	Testing Method
Apperance and Dimensions	No marked defect on apperance from and dimension are within specified range.	The capacitor shall be irspected by nacked eyes for visible evidence of defect. Dimensions shall be measured with slide calipers.
Marking	To be easily legible.	The capacitor shall be irspected by nacked eyes
Capacitance	Within spefied tolerance	The capacitance, dissipation shall be measured at 25 ± 2°C with 1 ± 0,1KHz and AC1 ± 0,1V (r.m.s)
Dissipation Factor (D,F)	Char. Specification B= D,F= ≤ 2,5% E= D,F= ≤ 2,5%	
Insulation Resistance (R)	10000M Ω min.	The insulation resistance shall be measured with DC 500 ± 50V within 60 ±5sec. Of charging.
Dielectric Strength — Between Lead wires	No failure	The capacitor shall not be damage when AC 500V (r.m.s.) are applied between the lead wires for 600s.
Dielectric Strength — Body Insulation	No failure	First, the terminals of the capacitor shall be connected together. Then as shown in Figure right, a metal foil shall be closely wrapped around the body of the capacitor to the distance of about 3-4mm from each terminal. Then the capacitor shall be insetedinto a container filed with ballsof about 1mm diameter. Finally AC AC400(r.m.s.) is applied for 60s between the capacitor lead wires and metal balls.



Item		Specification	Testing Method
Temperature Characteristics		Char. Capacitance Change B within ± 10% E within + 20% -55% Temperature characteristics guarantee is -25 to +85°C	The capacitance measurement shall be made of each step specified in table 3. Step 1: .+ 20 ±2 Step 2: .- 25 ±2 Step 3: .+ 20 ±2 Step 4: .+ 85 ±2 Step 5: .+ 20 ±2
Discharge test (1)	Apperance	No marked defect.	As in figure , discharge in made 50 times at 5sec intervalls from the capacitor (Cd) charged at DC voltage of specified
	I.R.	1000M Ω min.	
	Dielectric Strength	per Item 6.	

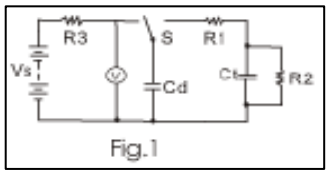


Fig.1

Ct: Capacitor under Test
Cd: 0,001µF
S: high voltage switch
R1: 1000Ω
R2: 1000MΩ
R3: Surge resistance
Vs: DC 10KV

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APPD:	Schumi			FINISH	Jamy		Sheet No.		6 from 13

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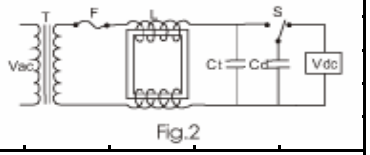
Item	Specification	Testing Method
Discharge Trest II	The cheese-cloth around cpacitors shall not glow or flame.	A single layer of cheese cloth is to be placed around the body of the test capacitor. Each sample is to be subjected to four dicharges from a dump capacitor charged to a voltage that. When discharged, placed DC 5KV across the capacitor under test. The interval between successive discharge is to be 5s. AC240V (r.m.s.)-60Hz potential is to applied across the capacitor under test andis to be maintained for 30s. after the fouth discharge, unless the circiut is opened in a shorter time by breakdown of the capacitor.The direct current supply is to be adjusted to provide a potential in accordance with the following.
		$Vdc=\frac{5000(Cd+Ct)}{Cd}(V)$  Fig.2
		Vdc: Varaible direct-current voltage source.
		s: High voltage switch
		L: Choke coil of appr. 3mH and 0,03Ω
		F: Plug fuse rated 30A and 250V
		Vac.: supply source rated 240V 60Hz 30A
		C1: Capacitor under test.
		Cd: Dump Capacitor

Item		Specification	Testing Method
Discharge Trest II		The cheese-cloth around cpacitors shall not glow or flame.	Capacitance value and D.F. are follows. Cap. Value Cd to 0,005µF 0,0051 to 0,05µF Cap. Value CD 0,005µF 0,05µF D.F of Cd. 0,5% max. 0,5%max.
Solderability of leads		Lead wire shall be soldered with uniformly coated on the axial direction over 3/4 of the circumferential direction.	The lead wire of capacitor shall be dipped into molten solder of 235 ± 5°C for 2 ± 0,5s. The depth of immersion is up to about 1,5 to 2,0mm from the root of lead wires.
Vibration Resistance	Apperance	No market defect Within the specified tolerance	The capacitor shall firmly be soldered to the supporting lead wire and vibration which is 10 to 55Hz in the vibration frequency range. 1,5mm in total amplitude, and about 1min in the rate of vibration change from 10Hz to 55Hz and back to 10Hz is applied for a total of 6H; 2H each in 3 mutually perpendicular directions.
	Capacitance	Char. Specification B D,F, ≤ 2,5% E D,F, ≤ 2,5%	
	D, F.		

Y1 AC Ceramic Capacitor 400VAC

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APPD:	Schumi			FINISH	Jamy		Sheet No.		7 from 13	

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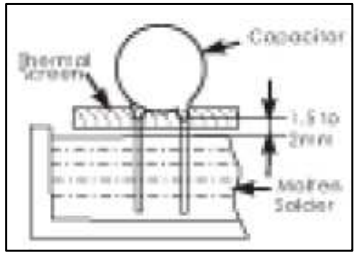
Item		Specification	Testing Method
Soldering Effect	Apperance	No marked defect	As in figure, the lead wires shall be immersed solder of 350 ± 10°C or 260 ± 5°C up to 1,5 ~ 2,0mm from the root of the terminal for 3,5 ± 0,5s. (10 ± 1s for 260 ± 5°C).
	Capacitance change	Within ± 10%	
	I.R.	1000M Ω min.	
	Dielectric Strength	Pre Item 6.	 Pre-treatment: Capacitor shall be stored at 85 ± 2°C for 1h. Then placed at room conditions for 24 ± 2h before initial measurements. Post-treatment: Capacitor shall be stored for 1 to 2 h ar room conditions.

Item		Specification		Testing Method
Humidity (Under Stready State)	Appearance	No marked defect.		Set the capacitor for 500 ± 12h at 40 ± 2°C in 90 ~ 95% relative humidity. Post-treatment: Capacitor shall be stored for 1 to 2h at room condition.
	Capacitance Change	Char. Capacitance Change		
		B	within ± 10%	
		E	within ± 15%	
	D,F,	Char.	Specification	
		B	D.F. ≤ 5,0%	
		E	D.F. ≤ 5,0%	
	I.R.	3000M Ω min.		
	Dielectric Strength	Per Item 6		
Humidity Loading	Appearance	No marked defect.		Apply the rated voltage for 500 ± 12h at 40 ± 2°C in 90 ~ 95% relative humidity. Post-treatment: Capacitor shall be stored for 1 to 2h at room condition.
	Capacitance Change	Char. Capacitance Change		
		B	within ± 10%	
		E	within ± 15%	
	D,F,	Char.	Specification	
		B	D.F. ≤ 5,0%	
		E	D.F. ≤ 5,0%	
	I.R.	3000M Ω min.		
	Dielectric Strength	Per Item 6		

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Part No.: **I22002**

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APPD:	Schumi			FINISH	Jamy		Sheet No.		8 from 13

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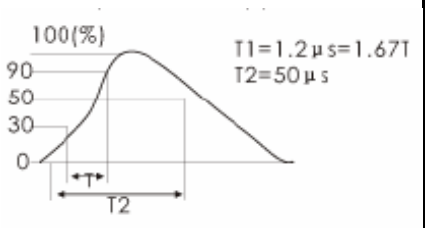
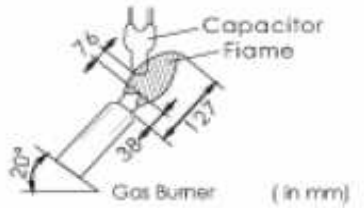
Item		Specification	Testing Method
Life	Appearance	No marked defect.	Impulse Voltage Each individual Capacity shal be subjected to 8KV impulses for three times. After the capacitance are supplied to life test. 
	Capacitance Change	Within ± 20%	
	I.R.	3000M Ω min.	
	Dielectric Strength	Per Item 6.	
	Discharge Test (II)	Per Item 9.	Apply a voltage of table 4 for 1000h at 105 +2/0°C, and relative humidity of 50% max. (table 4) Applied Voltage AC 425V (r.m.s.). Except that once each hour the oltage is increased to AC 1000V (r.m.s.) for 0,1s. Post-treatment: Cpapcitor shall be stared for 1 to 2h at room temperature.

Item		Specification		Testing Method
Flame Test		The capacitor flame discontinue as follows.		The Capacitor shall be subjected to applied flame for 15s and then removed for 15 s until 5 cycle. 
		Cycle	Time	
		1 to 4	30s max.	
		5	60s. Max	
Robustness of Termination	Tensile	Lead wire shall not cut off. Capacitor shall noit be broken.	 	As a figure, fix the body of capacitor apply a tensile weight gradually to each lead wire in the radila direction of capacitor up to 10N and keep it for 10± 1s.
	Bending			
Active Flammability		The chees-cloth shall not be on fire.		Each lead wire shall be subjected to 5N weight and then a 90° bend, at the point of egress, in one direction, return to original position,and then a 90° bend in the opposite direction at the rate of one bend in 2 to 3s.

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APPD:	Schumi			FINISH	Jamy		Sheet No.		9 from 13

Customer:

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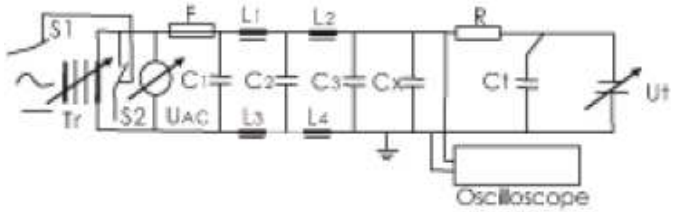
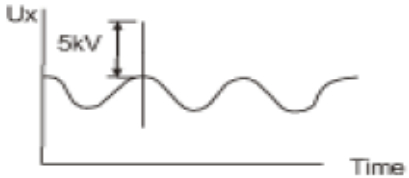
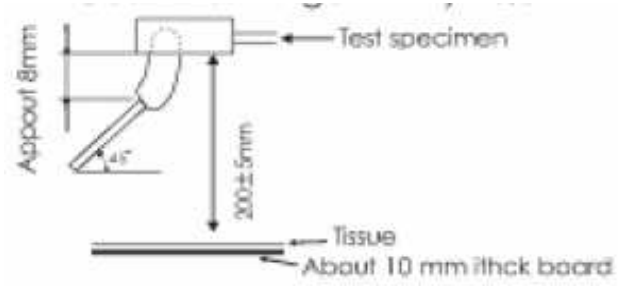
Item	Specification	Testing Method
Active Flammability	The cheese-cloth shall not be on fire.	The capacitor shall be individually wrapped in at least one but more than two complete layers of cheese-cloth. The capacitor shall be subjected to 20 discharges. The interval between successive discharges shall be 5s. The UAC shall be maintained for 2min after the last discharge.
		
	The chees-cloth shall not be on fire	C1,2: 1µF ±10% C3: 0,033µ ± 5% 10KV Ct: 3µF ± 5% 10KV Cx: Capacitor under test F: Fuse rated 10A L1 to 4: 1,5mH ± 20% 16A Rod core choke R: 100Ω ±2% UAC: UR ±5% UR: Rated Voltage Ut: Voltage applied to Ct 

Item	Specification	Testing Method
Passive Flammability	The burning time shall not be exceeded the time 30s. The tissuse paper shall not ignite.	The capacitor under test shall be held in the flame in the position which best promotes burning.Each specimen shall only be exposed once to the flame. Time of exposure to flame: 30s. Length of flame: 12± 1mm. Gas bumer: Length 35mm min. Inside Dia: 0,5 ± 0,1mm- Outside Dia. 0,9mm max. Gas: Butane gas Purity 95% min.
		

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APPD:	Schumi			FINISH	Jamy		Sheet No.		10 from 13

Customer:

Item		Specification		Testing Method			
Temperature and Immersion Style	Appearance	No marked defect		The capacitor shall be subjected to 5 temperature cyclies, then consecutively to 2 immersion cycies.			
	Capacitance Change	Char.	Capaci.Change				
		B	Within ± 10%				
		E	Within ± 20%	Temperature cycle			
	D.F.			Step	Temperature (°C)	Time	
				1	. -25 +0/-3	30min	
		Char.	Specification	2	Room temperature	3min	
		B	D.F. ≤ 5,0%	3	.+ 105 +3/0	30min	
		E	D.F. ≤ 5,0%	4	Room temperature	3min	
				Cycle time: 5cycle Immersion cycle			
	I.R.	3000M Ω min.		Step	Temperature (°C)	Time	Immersion Water
	Dielectric Strength	Per Item 6		1	. +65 +/-0	15min	Clean Water
				2	Room Temp.	15min.	Salt Water
				Pre-tratment: Capacitor shall be stored at 85 ±2°C for 1h, thenplaced at room conditions for 24 ± 2h.			
				Post-treatment: Capacitor shall be stored for 24 ± 2h at room conditions.			

"Room Condition" Temperature 15 to 35°C, Relative humidity; 45 to 75%, Atmospheric pressure: 6 to 106KPa.

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APPD:	Schumi			FINISH	Jamy		Sheet No.		11 from 13

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Ordering Informations

Serie		Range	Temperature Character.	Voltage	Tolerance Code	Lead Style Code	Lead Length Code	Lead Space Code	ROHS	Packing Code	
I22002	**-**	**221**	**B**	**401**	**K**	**A**	**20**	**D**	**R**	**BU**	

221= 220pf	**B=** Y5P	**401=** 400VAC	**K=** 10%	**A=** Style A	**20=** 20mm	**A=** 2,50mm	**R=** ROHS Conform	**BU=** Bulk Ware
				B= Style B	**05=** 5mm / ±1mm	**B=** 5,00mm	**N=** NON ROHS Conform	**TA=** Tape Ammo Pack
				C= Style C		**C=** 7,50mm		**TR=** Tape Reel
				D= Style D		**D=** 10,0mm		
				H= Style H		**E=** 12,5mm		
				M= Style M				

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APPD:	Schumi			FINISH	Jamy		Sheet No.		12 from 13

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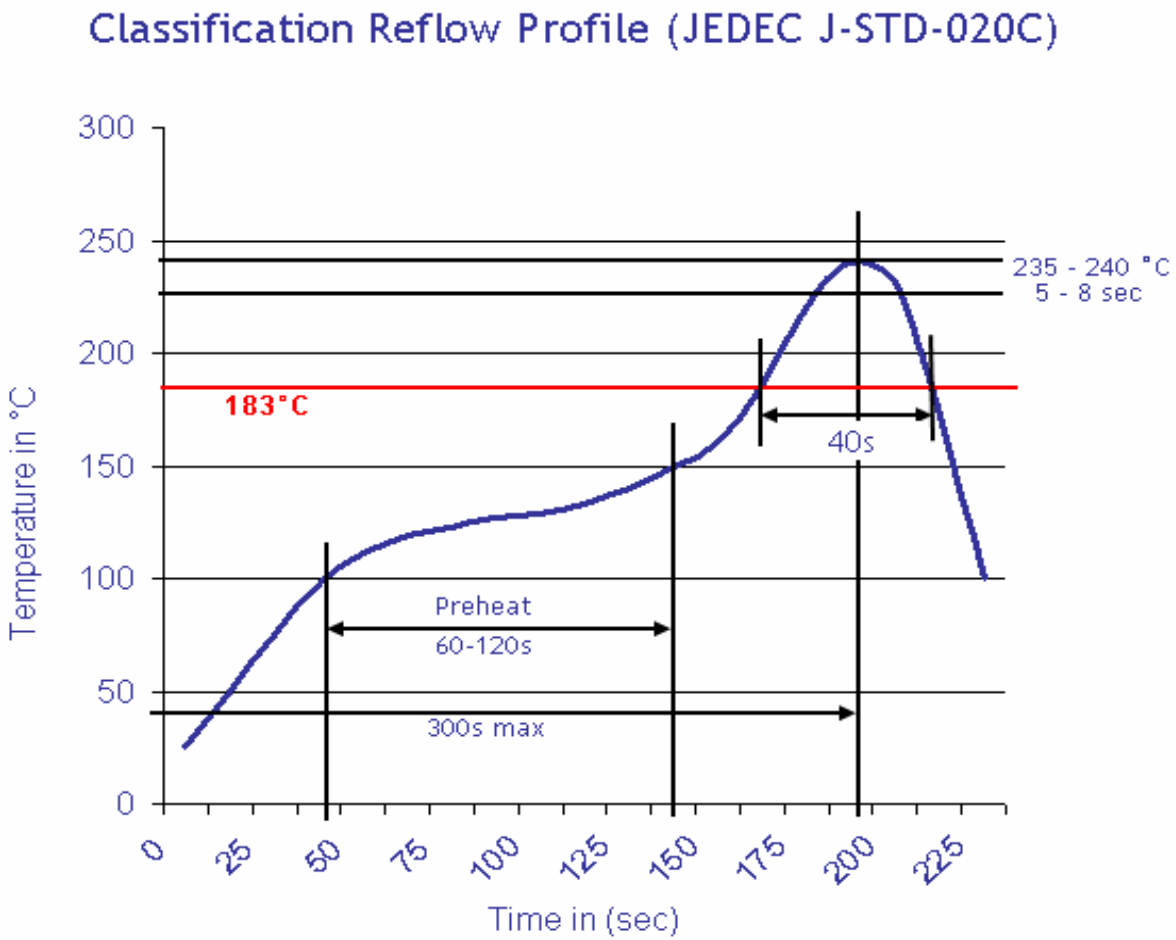
Soldering Profile Curve



Y1 AC Ceramic Capacitor 400VAC

Part No.: **I22002**

DRW:	Jason	CHKD	Wilson	MATL:	Wilson	TOLERANCE	Mason	DATE	01.11.2010
APPD:	Schumi			FINISH	Jamy		Sheet No.		13 from 13

Customer: