



SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

File No.:	CC-02-D
Version:	A
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- SUBJECT** : This specification applies on the chip capacitor made by SYNTON-TECH's Corporation.
- PART NUMBER** : Part number of the chip capacitor is identified by the size,dielectric, capacitance value,tolerance, voltage .

Example : DESCRIPTION : 0603 NPO 100PF 50V J

SYNTON CODE : 0603 NPO 101 J 50V

<u>SIZE</u>	<u>DIELECTRIC</u>	<u>CAPACITANCE</u>	<u>TOLERANCE</u>	<u>VOLTAGE</u>
0402	NPO	<u>VALUE</u>	10PF and below	6.3V
0603	X7R		A : ±0.05PF	10V
0805	Y5V	3 Digits :	B : ±0.10PF	16V
1206	Z5U	5R1 : 5.1PF	C : ±0.25PF	25V
1210		100 : 10PF	D : ±0.5PF	50V
1808		101 : 100PF		100V
1812		102 : 1NF	More than 10pF	200V
2220		103 : 10NF	F : ±1%	250V
		104 : 0.1UF	G : ±2%	500V
		105 : 1UF	J : ±5%	1KV
			K : ±10%	2KV
			M : ±20%	3KV
			Z : -20~+80%	4KV

APPROVED	CHECKED	DESIGNED	REMARK	DOCUMENT NO.
Carol	May	Chen	9/11:SGS	0201010200

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3. CAPACITOR CLASSIFICATION

Multi-layer ceramic capacitors are available in wide range of characteristics. Electronic Industries Association (EIA) and the military have established categories to help divide the basic characteristics into more easily specified classes. The basic industry specification for ceramic capacitor is EIA specification RS-198 and as noted in the general section, it specifies temperature-compensating capacitors as class I capacitors. These are specified by the military under specification MIL-C-20. General-purpose capacitors with non-linear temperature coefficients are called Class II capacitors by EIA and specified by military under MIL-C-11015 and MIL-C-39014. The new high reliability military specification, MIL-C-123 covers both class I and class II dielectrics.

Class I — Class I capacitors or temperature-compensating capacitors are usually made from mixtures of titanates where barium titanate is normally not a major part of mix. They have predictable temperature coefficients and in general, do not have an aging characteristic. Thus they are the most stable capacitor available. Normally the T.C.s of Class I temperature-compensating capacitors are NP0 (± 30 ppm/°C).

Class II — General-purpose ceramic capacitors are called Class II capacitors and have become extremely popular because of the high capacitance values available in very small size. These capacitors are ferroelectrics and vary in capacitance value under the influence of the environmental and electrical operating conditions. Class II capacitors are affected by temperature, voltage, frequency and time. Temperature effects for Class II ceramic capacitors are exhibited as non-linear capacitance changes with temperature. Industry standards for Mid-K dielectrics, such as X7R and High-K dielectrics, such as Z5U and Y5V are defined as Class II formulations.

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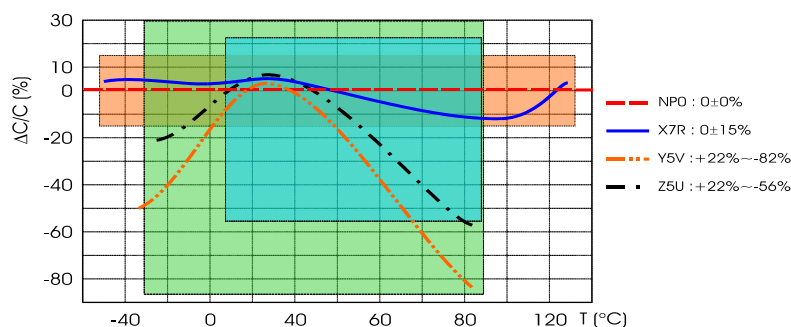
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4. MATERIALS AND PERFORMANCE CHARACTERIZATION

Designation	Class	Temperature Range ()	Temp-Cap Change
Temperature compensating NPO,COG	I	-55 ~ +125	± 30 ppm/
Intermediate K X7R, BX	II	-55 ~ +125	± 15 %
High K Y5V	II	-25 ~ +85	+22 ~ -82 %
High K Z5U	II	+10 ~ +85	+22 ~ -56 %



The T.C curve of each material. (for reference)

5. TECHNOLOGY

Multi-layer ceramic capacitor constructed by depositing alternative layers of ceramic dielectric materials and internal metallic electrodes, by advanced ceramic manufacturing technology, and co-firing into an indestructible homogeneous body, then completed with application of metal end terminations which are fired on to assure that permanent connection of individual internal electrodes are in parallel.

The terminations also can be nickel-plated and then solder plated to give the chip capacitors nickel-barrier terminations which have much better leaching resistance during soldering.

Reliable performances are built-in through exact formulation of dielectric powders, preparation of conductive paste, advanced automatic manufacturing, and strict quality control to assure excellent control in dielectric thickness, electrode integrity, and electrode-to-termination continuity.

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6. ELECTRICAL CHARACTERISTICS

NPO

Characterizes	Test conditions	Requirement
Operation temp. range		-55 ~ +125
Temp. coefficient (TC)	With respect to 25 within operation temp. range	C<10pF, ±150ppm/ C≥10pF, ±30ppm/
Capacitance tol.	With respect to 25	In accordance with spec.
Dissipation Factor (Tan δ)	C≤1000pF,1Vrms/1MHz C >1000pF,1Vrms/1KHz	C<10pF Tan δ ≤10(3/C+0.7) ×10E-4 or 30 ×10E-4 whichever is less C≥10pF Tan δ ≤10 ×10E-4
Insulation Resistance (IR)	Vr (rated voltage)≤500V At Vr for 1 minute Vr (rated voltage)≤500V At 500V for 1 minute	Rins > 100GΩ or Rins ×C ≥1000S whichever is less
Dielectric withstanding voltage	Vr (rated voltage) ≤ 100V At 2.5Vr for 5 seconds Vr (rated voltage) =200/250V At 1.5Vr+100V for 5 seconds Vr (rated voltage) ≥ 500V At 1.2Vr for 5 seconds	No breakdown

X7R/Y5V/Z5U

Characterizes	Test conditions	Requirement		
		X7R	Y5V	Z5U
Operation temp. range		-55 ~+125	-25 ~+85	+10 ~+85
Temp. coefficient (TC)	NPO/X7R: With respect to 25 within operation temp. range Y5V/Z5U: With respect to 25 within operation temp. range	±15%	+22%~-82%	+30%~-80%
Capacitance tol.		In accordance with spec.		
Dissipation Factor (Tan δ)	NPO/X7R: With respect to 25 Y5V/Z5U: With respect to 25 C≤1000pF,1Vrms/1MHz C >1000pF,1Vrms/1KHz	50V Tan δ ≤ 2.5% 25V Tan δ ≤ 3.5% 16V Tan δ ≤ 5%	50V Tan δ ≤ 5% 25V Tan δ ≤ 7% 16V Tan δ ≤ 9%	50V Tan δ ≤ 4% 25V Tan δ ≤ 6%
Insulation Resistance (IR)	Vr (rated voltage)≤500V At Vr for 1 minute Vr (rated voltage)≤500V At 500V for 1 minute	Rins > 10GΩ or Rins ×C ≥1000S Whichever is less	Rins > 10GΩ or Rins ×C ≥100S Whichever is less	Rins > 10GΩ or Rins ×C ≥1000S Whichever is less
Dielectric withstanding voltage	Vr (rated voltage) ≤ 100V At 2.5Vr for 5 seconds Vr (rated voltage) =200/250V At 1.5Vr+100V for 5 seconds Vr (rated voltage) ≥ 500V At 1.2Vr for 5 seconds	No breakdown		

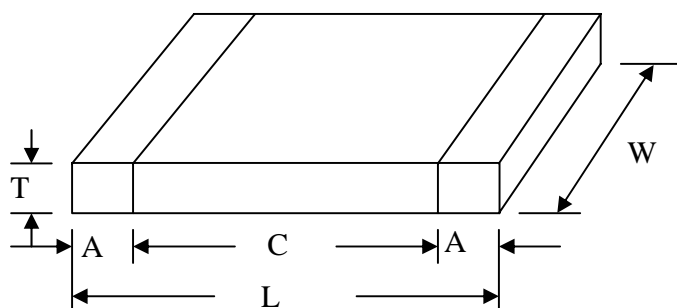
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7. DIMENSION



Unit:mm

Case size	Length (L)	Width (W)	Thickness (T)	Termination length (A)	Distance between terminations (C)
0402	1.0±0.05	0.50±0.05	0.50±0.05	0.15~0.30	0.40
0603	1.6±0.10	0.80±0.10	0.80±0.10	0.25~0.65	0.40
0805	2.0±0.10	1.25±0.10	0.50~1.35	0.25~0.75	0.55
1206	3.2±0.15	1.60±0.15	0.50~1.35	0.25~0.75	1.40
1210	3.2±0.20	2.5±0.20	2.0 max.	0.25~0.75	1.40
1808	4.6±0.30	2.00±0.30	2.0 max.	0.30 min.	2.60 min.
1812	4.6±0.30	3.20±0.30	2.5 max.	0.30 min.	2.60 min.

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8. ENVIRONMENTAL AND TEST CHARACTERISTICS

Test item	Conditions	Requirements
Capacitance	NPO/X7R: measuring voltage 1 V at 25 Y5V/Z5U: measuring voltage 1 V at 25 $C \leq 1000$ pF, $f = 1$ MHz; $C > 1000$ pF, $f = 1$ kHz;	Within specified tolerance
tan δ	NPO/X7R: measuring voltage 1 V at 25 Y5V/Z5U: measuring voltage 1 V at 25 $C \leq 1000$ pF, $f = 1$ MHz; $C > 1000$ pF, $f = 1$ kHz;	In accordance with specification
Insulation resistance	Vr (rated voltage) ≤ 500 V At Vr (rated voltage) for 1 minute Vr (rated voltage) ≤ 500 V At 500V for 1 minute	In accordance with specification
Voltage proof	Vr (rated voltage) ≤ 100 V At 2.5Vr for 5 seconds Vr (rated voltage) = 200/250V At 1.5Vr+100V for 5 seconds Vr (rated voltage) ≥ 500 V At 1.2Vr for 5 seconds	No breakdown No flashover
Adhesion	A force of 5 N shall be applied to the line joining the terminations and in a plane parallel to the substrate time: 10 ± 1 s	No visible damage
Bond strength of end face plating	Mounting in accordance with IEC 384 10, para 4.4 conditions: bending 1 mm at a rate of 1 mm/s	No visible damage NPO: $\Delta C/C$ within ± 1 % X7R/Z5U: $\Delta C/C$ within ± 10 % Y5V: $\Delta C/C$ within ± 30 %
Resistance soldering heat to	260 ± 5 for $10 + 0.5$ s	The terminations must be well tinned, after recovery. NPO: $\Delta C/C \leq 0.5$ % or ± 0.5 pF X7R: $-5\% < \Delta C/C \leq 10\%$ Y5V/Z5U: $-10\% < \Delta C/C \leq 20\%$ whichever is greater.
Resistance leaching to	260 ± 5 for 30 ± 1 s in static solder bath	With visual enlargement of x 10, dissolution of the terminations should not exceed 10 %
Solderability	Zero hour test, and test after storage (20 to 24 months) in original atmosphere in normal atmosphere; un-mounted chips completely immersed for 2 ± 0.5 s in a solder bath of 235 ± 5 .	The terminations must be well tinned
Rapid change of temperature	NPO/X7R: -55 to +125 , 5 cycle Y5V: -25 to +85 , 5 cycle Z5U: +10 to +85 , 5 cycle Duration: 30 mins. Recovery: 24 ± 2 hrs.	No visible damage after 24 h recovery Class I NPO: $\Delta C/C \leq 1$ % or 1 pF X7R: $\Delta C/C \leq \pm 15$ % Y5V/Z5U: $\Delta C/C \leq \pm 20$ %

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<p>Damp heat, steady state</p>	<p>500±12hours at 40±2 ; 90 to 95 % RH</p>	<p>No visible damage after 24 ± 2 (NPO) or 48 ± 4 hours recovery Class 1 (NPO) 1. $\Delta C/C \pm 5\%$ or 1 pF, whichever is greater 2. $C < 10\text{pF}$; $Q \geq 200+10C$ $10 \leq C \leq 30\text{pF}$; $Q \geq 275+5/2C$ $C > 30\text{pF}$; $Q \geq 350$ 3. $IR \geq 4000\text{ M}\Omega$ or $RiCR \geq 40\text{ s}$, whichever is less Class 2 (X7R) 1. $\Delta C/C$ within $\pm 15\%$ 2. $\tan \delta \leq 7\%$ 3. $IR \geq 2000\text{ M}\Omega$ or $RiCR \geq 50\text{ s}$, whichever is less Class 2 (Y5V) 1. $\Delta C/C$ within $\pm 30\%$ 2. 50/25V: $\tan \delta \leq 9\%$ 16V: $\tan \delta \leq 12.5\%$ 10V: $\tan \delta \leq 15\%$ 3. $IR \geq 2000\text{ M}\Omega$ or $RiCR \geq 50\text{ s}$, whichever is less Class 2 (Z5U) 1. $\Delta C/C$ within $\pm 30\%$ 2. $\tan \delta \leq 4\%$ 3. $IR \geq 1000\text{ M}\Omega$ or $RiCR \geq 50\text{ s}$, whichever is less</p>
<p>Endurance</p>	<p>1000 h at maximum temperature $2 \times Vr$ for $Vr \leq 50V$ $1.5 \times Vr$ for other rated voltage Vr (rated voltage) $\leq 250V$ At $2 \times V$ Vr (rated voltage) = 500V At $1.5Vr$ Vr (rated voltage) $> 500V$ At $1.2Vr$</p>	<p>No visible damage after 24 ± 2 (NPO) or 48 ± 4 hours recovery Class 1 (NPO) 1. $\Delta C/C \pm 2\%$ or 1 pF, whichever is greater 2. $\tan \delta \leq 2 \times$ specified value 3. $IR \geq 4000\text{ M}\Omega$ or $RiCR \geq 40\text{ s}$, whichever is less Class 2 (X7R) 4. $\Delta C/C$ within $\pm 15\%$ 5. $\tan \delta \leq 7\%$ 6. $IR \geq 2000\text{ M}\Omega$ or $RiCR \geq 50\text{ s}$, whichever is less Class 2 (Y5V) 1. $\Delta C/C$ within $\pm 30\%$ 2. 50/25V: $\tan \delta \leq 9\%$ 16V: $\tan \delta \leq 12.5\%$ 3. $IR \geq 2000\text{ M}\Omega$ or $RiCR \geq 50\text{ s}$, whichever is less Class 2 (Z5U) 1. $\Delta C/C$ within $\pm 30\%$ 2. $\tan \delta \leq 4\%$ 3. $IR \geq 1000\text{ M}\Omega$ or $RiCR \geq 50\text{ s}$, whichever is less</p>

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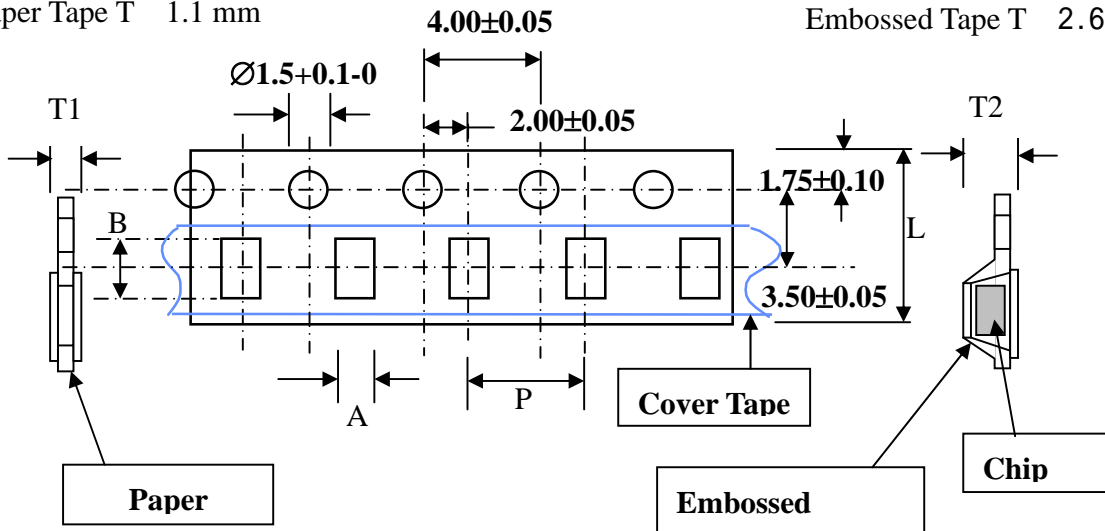
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9. PACKING

Paper Tape T 1.1 mm

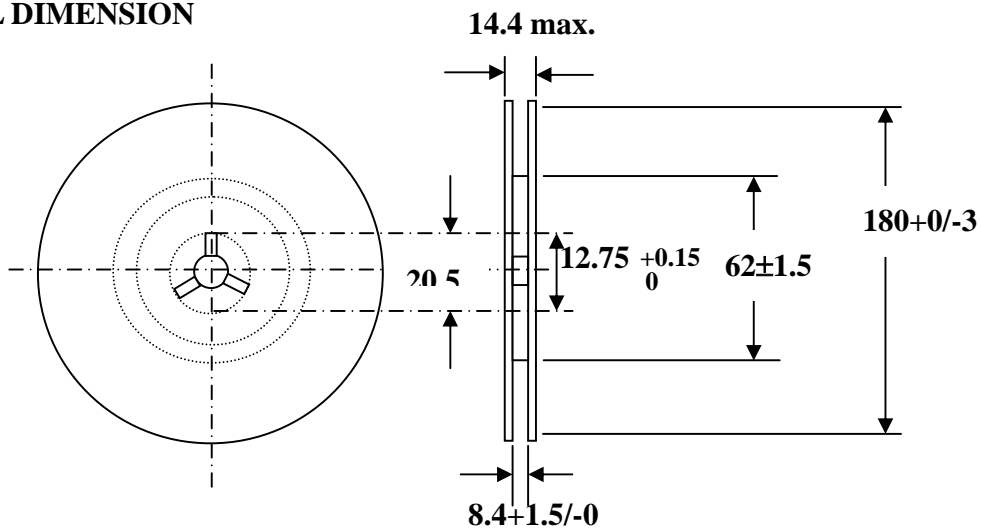
Embossed Tape T 2.60



Unit:mm

Symbol	Pocket Size Code						
	0402	0603	0805	1206	1210	1808	1812
A	0.62 ± 0.05	1.10 ± 0.10	1.65 ± 0.05	2.00 ± 0.10	2.80 ± 0.20	2.50 ± 0.30	3.60 ± 0.30
B	1.12 ± 0.05	1.90 ± 0.10	2.40 ± 0.05	3.50 ± 0.10	3.70 ± 0.20	4.90 ± 0.30	4.90 ± 0.30
P	2.00 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	8.00 ± 0.10
L	8.00 ± 0.20	8.00 ± 0.20	8.00 ± 0.20	8.00 ± 0.20	8.00 ± 0.20	12.0 ± 0.20	12.0 ± 0.20
T1	0.60 ± 0.05	1.00 ± 0.05	1.00 ± 0.05	1.00 ± 0.05	-	-	-
T2	-	-	-	-	2.00 ± 0.1	2.50 ± 0.1	2.50 ± 0.1

REEL DIMENSION



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10. CAPACITANCE RANGE

NPO

CAP CODE	SIZE VDCW	0402				0603				0805			
		10	16	25	50	10	16	25	50	10	16	25	50
0.5-8.2	0.5p ~ 8.2p	N	N	N	N	S	S	S	S	A	A	A	A
100	10p	N	N	N	N	S	S	S	S	A	A	A	A
120	12p	N	N	N	N	S	S	S	S	A	A	A	A
150	15p	N	N	N	N	S	S	S	S	A	A	A	A
180	18p	N	N	N	N	S	S	S	S	A	A	A	A
200	20p	N	N	N	N	S	S	S	S	A	A	A	A
220	22p	N	N	N	N	S	S	S	S	A	A	A	A
240	24p	N	N	N	N	S	S	S	S	A	A	A	A
270	27p	N	N	N	N	S	S	S	S	A	A	A	A
300	30p	N	N	N	N	S	S	S	S	A	A	A	A
330	33p	N	N	N	N	S	S	S	S	A	A	A	A
390	39p	N	N	N	N	S	S	S	S	A	A	A	A
470	47p	N	N	N	N	S	S	S	S	A	A	A	A
510	51p	N	N	N	N	S	S	S	S	A	A	A	A
560	56p	N	N	N	N	S	S	S	S	A	A	A	A
680	68p	N	N	N	N	S	S	S	S	A	A	A	A
820	82p	N	N	N	N	S	S	S	S	A	A	A	A
101	100p	N	N	N	N	S	S	S	S	A	A	A	A
121	120p	N	N	N	N	S	S	S	S	A	A	A	A
151	150p	N	N	N	N	S	S	S	S	A	A	A	A
181	180p	N	N	N		S	S	S	S	A	A	A	A
221	220p	N	N	N		S	S	S	S	A	A	A	A
271	270p					S	S	S	S	A	A	A	A
301	300p					S	S	S	S	A	A	A	A
331	330p					S	S	S	S	A	A	A	A
391	390p					S	S	S	S	B	B	B	B
471	470p					S	S	S	S	B	B	B	B
561	560p					S	S	S	S	B	B	B	B
681	680p					S	S	S	S	B	B	B	B
821	820p					S	S	S	S	B	B	B	B
911	910p					S	S	S	S	B	B	B	B
102	1000p (1 nF / 0.001 uF)					S	S	S	S	B	B	B	B
122	1200p(1.2 nF / 0.0012 uF)									B	B	B	B
152	1500p(1.5 nF / 0.0015 uF)									B	B	B	B
182	1800p(1.8 nF / 0.0018 uF)									B	B	B	B
222	2200p(2.2 nF / 0.0022 uF)									B	B	B	B
272	2700p(2.7 nF / 0.0027 uF)									D	D	D	D
332	3300p(3.3 nF / 0.0033 uF)									D	D	D	D
392	3900p(3.9 nF / 0.0039 uF)									D	D	D	D
472	4700p(4.7 nF / 0.0047 uF)									D	D	D	
562	5600p(5.6 nF / 0.0056 uF)												
682	6800p(6.8 nF / 0.0068 uF)												
822	8200p(8.2 nF / 0.0082 uF)												
103	10000p (10 nF / 0.01 uF)												

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NPO

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		10	16	25	50	10	16	25	50	10	16	25	50
0.5~1.2	0.5p ~ 1.2p												
1.5~8.2	1.5p ~ 8.2p	B	B	B	B								
100	10p	B	B	B	B								
120	12p	B	B	B	B								
150	15p	B	B	B	B								
180	18p	B	B	B	B								
200	20p	B	B	B	B								
220	22p	B	B	B	B	C	C	C	C				
240	24p	B	B	B	B	C	C	C	C				
270	27p	B	B	B	B	C	C	C	C				
300	30p	B	B	B	B	C	C	C	C				
330	33p	B	B	B	B	C	C	C	C				
390	39p	B	B	B	B	C	C	C	C				
470	47p	B	B	B	B	C	C	C	C				
510	51p	B	B	B	B	C	C	C	C				
560	56p	B	B	B	B	C	C	C	C				
680	68p	B	B	B	B	C	C	C	C				
820	82p	B	B	B	B	C	C	C	C				
101	100p	B	B	B	B	C	C	C	C				
121	120p	B	B	B	B	C	C	C	C				
151	150p	B	B	B	B	C	C	C	C				
181	180p	B	B	B	B	C	C	C	C				
221	220p	B	B	B	B	C	C	C	C				
271	270p	B	B	B	B	C	C	C	C				
301	300p	B	B	B	B	C	C	C	C				
331	330p	B	B	B	B	C	C	C	C				
391	390p	B	B	B	B	C	C	C	C				
471	470p	B	B	B	B	C	C	C	C				
561	560p	B	B	B	B	C	C	C	C				
681	680p	B	B	B	B	C	C	C	C				
821	820p	B	B	B	B	C	C	C	C				
911	910p	B	B	B	B	C	C	C	C				
102	1000p (1 nF / 0.001 uF)	B	B	B	B	C	C	C	C	D	D	D	D
122	1200p(1.2 nF / 0.0012 uF)	B	B	B	B	C	C	C	C	D	D	D	D
152	1500p(1.5 nF / 0.0015 uF)	B	B	B	B	C	C	C	C	D	D	D	D
182	1800p(1.8 nF / 0.0018 uF)	B	B	B	B	C	C	C	C	D	D	D	D
222	2200p(2.2 nF / 0.0022 uF)	B	B	B	B	C	C	C	C	D	D	D	D
272	2700p(2.7 nF / 0.0027 uF)	B	B	B	B	C	C	C	C	D	D	D	D
332	3300p(3.3 nF / 0.0033 uF)	B	B	B	B	C	C	C	C	D	D	D	D
392	3900p(3.9 nF / 0.0039 uF)	B	B	B	B	C	C	C	C	D	D	D	D
472	4700p(4.7 nF / 0.0047 uF)	B	B	B	B	C	C	C	C	D	D	D	D
562	5600p(5.6 nF / 0.0056 uF)	B	B	B	B	C	C	C	C	D	D	D	D
682	6800p(6.8 nF / 0.0068 uF)	C	C	C	C					D	D	D	D
822	8200p(8.2 nF / 0.0082 uF)	C	C	C	C					D	D	D	D
103	10000p (10 nF / 0.01 uF)									D	D	D	D

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NPO (Hi-voltage)

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		100	100	200	250	500	100	200	250	500	1000	2000	100	200	250	500	1000	2000	
0.5~1.2	0.5p ~ 1.2p	S	A	A	A	A													
1.5~8.2	1.5p ~ 8.2p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
100	10p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
120	12p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
150	15p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
180	18p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
200	20p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
220	22p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
240	24p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
270	27p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
300	30p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
330	33p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
390	39p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
470	47p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
510	51p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
560	56p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
680	68p	S	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	C	
820	82p	S	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	C	
101	100p	S	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	C	
121	120p	S	A	A	A	D	B	B	B	B	B	B	B	B	B	B	B	D	
151	150p	S	A	B	B	D	B	B	B	B	B	B	B	C	D				
181	180p	S	A	B	B	D	B	B	B	B	B	B	C	G					
221	220p	S	A	D	D		B	B	B	B	B	D	G						
271	270p	S	A	D	D		B	B	B	C	D								
301	300p	S	A				B	B	B	C									
331	330p	S	A				B	B	B	C									
391	390p	S	B				B	B	B	C									
471	470p	S	B				B	C	C	C									
561	560p	S	B				B												
681	680p		B				B												
821	820p		B				B												
911	910p		B				B												
102	1000p (1 nF / 0.001 uF)		B				B												
122	1200p(1.2 nF / 0.0012 uF)		B				B												
152	1500p(1.5 nF / 0.0015 uF)		B				B												
182	1800p(1.8 nF / 0.0018 uF)		B				B												
222	2200p(2.2 nF / 0.0022 uF)		B				B												
272	2700p(2.7 nF / 0.0027 uF)		D				B												
332	3300p(3.3 nF / 0.0033 uF)		D				B												
392	3900p(3.9 nF / 0.0039 uF)		D				B												
472	4700p(4.7 nF / 0.0047 uF)						B												
562	5600p(5.6 nF / 0.0056 uF)						B												
682	6800p(6.8 nF / 0.0068 uF)						C												
822	8200p(8.2 nF / 0.0082 uF)						C												
103	10000p (10 nF / 0.01 uF)																		

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

File No.:	CC-02-D
Version:	A
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NPO (Hi-voltage)

CAP CODE	SIZE VDCW	1210						1808		1812					
		100	200	250	500	1000	2000	1000	2000	100	200	250	500	1000	2000
0.5~1.2	0.5p ~ 1.2p														
1.5~8.2	1.5p ~ 8.2p														
100	10p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
120	12p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
150	15p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
180	18p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
200	20p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
220	22p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
240	24p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
270	27p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
300	30p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
330	33p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
390	39p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
470	47p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
510	51p	C	C	C	C	C	C	D	D	D	D	D	D	D	D
560	56p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
680	68p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
820	82p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
101	100p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
121	120p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
151	150p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
181	180p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
221	220p	C	C	C	C	C	D	D	D	D	D	D	D	D	D
271	270p	C	C	C	C	C		D	D	D	D	D	D	D	D
301	300p	C	C	C	C	C		D	D	D	D	D	D	D	D
331	330p	C	C	C	C	D		D	D	D	D	D	D	D	D
391	390p	C	C	C	C	D		D	K	D	D	D	D	D	D
471	470p	C	C	C	C	D		D	K	D	D	D	D	D	D
561	560p	C	C	C	C			K	K	D	D	D	D	D	D
681	680p	C	C	C	C			K	K	D	D	D	D	D	K
821	820p	C	C	C	C			K		D	D	D	D	D	K
911	910p	C	C	C	C			K		D	D	D	D	D	K
102	1000p (1 nF / 0.001 uF)	C	C	C	C			K		D	D	D	D	K	
122	1200p(1.2 nF / 0.0012 uF)	C	D	D						D	D	D	D	K	
152	1500p(1.5 nF / 0.0015 uF)	C	D	D						D	D	D	D	K	
182	1800p(1.8 nF / 0.0018 uF)	C	D	D						D	D	D	D		
222	2200p(2.2 nF / 0.0022 uF)	C	D	D						D	D	D			
272	2700p(2.7 nF / 0.0027 uF)	C	D	D						D	D	D			
332	3300p(3.3 nF / 0.0033 uF)	C								D					
392	3900p(3.9 nF / 0.0039 uF)									D					
472	4700p(4.7 nF / 0.0047 uF)									D					
562	5600p(5.6 nF / 0.0056 uF)														
682	6800p(6.8 nF / 0.0068 uF)														
822	8200p(8.2 nF / 0.0082 uF)														
103	10000p (10 nF / 0.01 uF)														

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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X7R

CAP CODE	SIZE VDCW	0402				0603				0805			
		10	16	25	50	10	16	25	50	10	16	25	50
101	100p	N	N	N	N	S	S	S	S	B	B	B	B
121	120p	N	N	N	N	S	S	S	S	B	B	B	B
151	150p	N	N	N	N	S	S	S	S	B	B	B	B
181	180p	N	N	N	N	S	S	S	S	B	B	B	B
221	220p	N	N	N	N	S	S	S	S	B	B	B	B
271	270p	N	N	N	N	S	S	S	S	B	B	B	B
331	330p	N	N	N	N	S	S	S	S	B	B	B	B
391	390p	N	N	N	N	S	S	S	S	B	B	B	B
471	470p	N	N	N	N	S	S	S	S	B	B	B	B
561	560p	N	N	N	N	S	S	S	S	B	B	B	B
681	680p	N	N	N	N	S	S	S	S	B	B	B	B
821	821p	N	N	N	N	S	S	S	S	B	B	B	B
102	1000p (1 nF / 0.001 uF)	N	N	N	N	S	S	S	S	B	B	B	B
122	1200p(1.2 nF / 0.0012 uF)	N	N	N	N	S	S	S	S	B	B	B	B
152	1500p(1.5 nF / 0.0015 uF)	N	N	N	N	S	S	S	S	B	B	B	B
182	1800p(1.8 nF / 0.0018 uF)	N	N	N	N	S	S	S	S	B	B	B	B
222	2200p(2.2 nF / 0.0022 uF)	N	N	N	N	S	S	S	S	B	B	B	B
272	2700p(2.7 nF / 0.0027 uF)	N	N	N		S	S	S	S	B	B	B	B
332	3300p(3.3 nF / 0.0033 uF)	N	N	N		S	S	S	S	B	B	B	B
392	3900p(3.9 nF / 0.0039 uF)	N	N	N		S	S	S	S	B	B	B	B
472	4700p(4.7 nF / 0.0047 uF)	N	N	N		S	S	S	S	B	B	B	B
562	5600p(5.6 nF / 0.0056 uF)	N	N			S	S	S	S	B	B	B	B
682	6800p(6.8 nF / 0.0068 uF)	N	N			S	S	S	S	B	B	B	B
822	8200p(8.2 nF / 0.0082 uF)	N	N			S	S	S	S	B	B	B	B
103	10 nF (0.01 uF)	N	N			S	S	S	S	B	B	B	B
123	12 nF (0.012 uF)	N	N			S	S	S	S	B	B	B	B
153	15 nF (0.015 uF)	N	N			S	S	S	S	B	B	B	B
183	18 nF (0.018 uF)					S	S	S	S	B	B	B	B
223	22 nF (0.022 uF)					S	S	S	S	B	B	B	B
273	27 nF (0.027 uF)					S	S	S	S	B	B	B	B
333	33 nF (0.033 uF)					S	S	S		B	B	B	B
393	39 nF (0.039 uF)					S	S	S		B	B	B	B
473	47 nF (0.047 uF)					S	S	S		B	B	B	B
563	56 nF (0.056 uF)					S	S	S		B	B	B	B
683	68 nF (0.068 uF)					S	S	S		B	B	B	B
823	82 nF (0.082 uF)					S	S			B	B	B	D
104	100 nF (0.1 uF)					S	S			B	B	B	D
124	120 nF (0.12 uF)					S				B	B	B	
154	150 nF (0.15 uF)					S				D	D	D	
184	180 nF (0.18 uF)					S				D	D	D	
224	220 nF (0.22 uF)					S				D	D	D	
274	270 nF (0.27 uF)									D	D		
334	330 nF (0.33 uF)									D	D		
394	390 nF (0.39 uF)									D	D		
474	470 nF (0.47 uF)									D	D		
564	560 nF (0.56 uF)									D	D		
105	1 uF									D			

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

File No.:	CC-02-D
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X7R

CAP CODE	SIZE VDCW	1206				1210				1812			
		10	16	25	50	10	16	25	50	10	16	25	50
151	150p	B	B	B	B								
181	180p	B	B	B	B								
221	220p	B	B	B	B								
271	270p	B	B	B	B								
331	330p	B	B	B	B								
391	390p	B	B	B	B								
471	470p	B	B	B	B								
561	560p	B	B	B	B								
681	680p	B	B	B	B								
821	821p	B	B	B	B								
102	1000p (1 nF / 0.001 uF)	B	B	B	B	C	C	C	C	D	D	D	D
122	1200p(1.2 nF / 0.0012 uF)	B	B	B	B	C	C	C	C	D	D	D	D
152	1500p(1.5 nF / 0.0015 uF)	B	B	B	B	C	C	C	C	D	D	D	D
182	1800p(1.8 nF / 0.0018 uF)	B	B	B	B	C	C	C	C	D	D	D	D
222	2200p(2.2 nF / 0.0022 uF)	B	B	B	B	C	C	C	C	D	D	D	D
272	2700p(2.7 nF / 0.0027 uF)	B	B	B	B	C	C	C	C	D	D	D	D
332	3300p(3.3 nF / 0.0033 uF)	B	B	B	B	C	C	C	C	D	D	D	D
392	3900p(3.9 nF / 0.0039 uF)	B	B	B	B	C	C	C	C	D	D	D	D
472	4700p(4.7 nF / 0.0047 uF)	B	B	B	B	C	C	C	C	D	D	D	D
562	5600p(5.6 nF / 0.0056 uF)	B	B	B	B	C	C	C	C	D	D	D	D
682	6800p(6.8 nF / 0.0068 uF)	B	B	B	B	C	C	C	C	D	D	D	D
822	8200p(8.2 nF / 0.0082 uF)	B	B	B	B	C	C	C	C	D	D	D	D
103	10 nF (0.01 uF)	B	B	B	B	C	C	C	C	D	D	D	D
123	12 nF (0.012 uF)	B	B	B	B	C	C	C	C	D	D	D	D
153	15 nF (0.015 uF)	B	B	B	B	C	C	C	C	D	D	D	D
183	18 nF (0.018 uF)	B	B	B	B	C	C	C	C	D	D	D	D
223	22 nF (0.022 uF)	B	B	B	B	C	C	C	C	D	D	D	D
273	27 nF (0.027 uF)	B	B	B	B	C	C	C	C	D	D	D	D
333	33 nF (0.033 uF)	B	B	B	B	C	C	C	C	D	D	D	D
393	39 nF (0.039 uF)	B	B	B	B	C	C	C	C	D	D	D	D
473	47 nF (0.047 uF)	B	B	B	B	C	C	C	C	D	D	D	D
563	56 nF (0.056 uF)	B	B	B	B	C	C	C	C	D	D	D	D
683	68 nF (0.068 uF)	B	B	B	B	C	C	C	C	D	D	D	D
823	82 nF (0.082 uF)	B	B	B	B	C	C	C	C	D	D	D	D
104	100 nF (0.1 uF)	B	B	B	B	C	C	C	C	D	D	D	D
124	120 nF (0.12 uF)	B	B	B	B	C	C	C	C	D	D	D	D
154	150 nF (0.15 uF)	C	C	C	C	C	C	C	C	D	D	D	D
184	180 nF (0.18 uF)	C	C	C	C	C	C	C	C	D	D	D	D
224	220 nF (0.22 uF)	C	C	C	C	C	C	C	C	D	D	D	D
274	270 nF (0.27 uF)	C	C	C	C	C	C	C	C	D	D	D	D
334	330 nF (0.33 uF)	C	C	C	C	C	C	C	C	D	D	D	D
394	390 nF (0.39 uF)	C	C			C	C	C	C	D	D	D	D
474	470 nF (0.47 uF)	D	D			C	C	C		D	D	D	D
564	560 nF (0.56 uF)	D	D							D	D	D	D
684	680 nF (0.68 uF)	D	D							D	D	D	K
824	820 nF (0.82 uF)	D	D							D	D	D	K
105	1 uF	D	D	D						D	D	D	K

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

File No.:	CC-02-D
Version:	A
Page:	15
Date:	2006.09.01

X7R (Hi-voltage)

CAP CODE	SIZE VDCW	0603					0805					1206						
		100	100	200	250	500	100	200	250	500	1000	2000	100	200	250	500	1000	2000
101	100p	S	B	B	B	B												
121	120p	S	B	B	B	B												
151	150p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
181	180p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
221	220p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
271	270p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
331	330p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
391	390p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
471	470p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
561	560p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C
681	680p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C
821	821p	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G
102	1000p (1 nF / 0.001 uF)	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G
122	1200p(1.2 nF / 0.0012 uF)	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G
152	1500p(1.5 nF / 0.0015 uF)	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
182	1800p(1.8 nF / 0.0018 uF)	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
222	2200p(2.2 nF / 0.0022 uF)	S	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	
272	2700p(2.7 nF / 0.0027 uF)	S	B	B	B	B	B	B	B	B	B	B	B	B	B	D		
332	3300p(3.3 nF / 0.0033 uF)	S	B	B	B	B		B	B	B	B	B	B	B	B	G		
392	3900p(3.9 nF / 0.0039 uF)	S	B	B	B	B		B	B	B	B	B	B	B	B	G		
472	4700p(4.7 nF / 0.0047 uF)	S	B	B	B	B		B	B	B	B	B	B	B	B	G		
562	5600p(5.6 nF / 0.0056 uF)	S	B	D	D			B	B	B	B	B						
682	6800p(6.8 nF / 0.0068 uF)	S	B	D	D			B	B	B	B	B						
822	8200p(8.2 nF / 0.0082 uF)	S	B	D	D			B	B	B	C							
103	10 nF (0.01 uF)	S	B	D	D			B	B	B	C							
123	12 nF (0.012 uF)		B					B	B	B								
153	15 nF (0.015 uF)		B					B	C	C								
183	18 nF (0.018 uF)		B					B	C	C								
223	22 nF (0.022 uF)		B					B	C	C								
273	27 nF (0.027 uF)		D					B	C	C								
333	33 nF (0.033 uF)		D					B	G	G								
393	39 nF (0.039 uF)							B	G	G								
473	47 nF (0.047 uF)							B	G	G								
563	56 nF (0.056 uF)							B										
683	68 nF (0.068 uF)							B										
823	82 nF (0.082 uF)							C										
104	100 nF (0.1 uF)							C										
124	120 nF (0.12 uF)																	
154	150 nF (0.15 uF)																	
184	180 nF (0.18 uF)																	
224	220 nF (0.22 uF)																	
274	270 nF (0.27 uF)																	
334	330 nF (0.33 uF)																	
394	390 nF (0.39 uF)																	
474	470 nF (0.47 uF)																	
564	560 nF (0.56 uF)																	
684	680 nF (0.68 uF)																	

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

File No.:	CC-02-D
Version:	A
Page:	16
Date:	2006.09.01

X7R (Hi-voltage)

CAP CODE	SIZE VDCW	1210						1808		1812					
		100	200	250	500	1000	2000	1000	2000	100	200	250	500	1000	2000
101	100p														
121	120p														
151	150p							D	D						D
181	180p							D	D						D
221	220p							D	D						D
271	270p							D	D					D	D
331	330p							D	D					D	D
391	390p							D	D					D	D
471	470p							D	D					D	D
561	560p							D	D					D	D
681	680p							D	D					D	D
821	821p							D	D					D	D
102	1000p (1 nF / 0.001 uF)	C	C	C	C	C	C	D	K	D	D	D	D	D	D
122	1200p(1.2 nF / 0.0012 uF)	C	C	C	C	C	C	D	K	D	D	D	D	D	D
152	1500p(1.5 nF / 0.0015 uF)	C	C	C	C	C	C	D	K	D	D	D	D	D	D
182	1800p(1.8 nF / 0.0018 uF)	C	C	C	C	C	C	D	K	D	D	D	D	D	D
222	2200p(2.2 nF / 0.0022 uF)	C	C	C	C	C	C	D	K	D	D	D	D	D	D
272	2700p(2.7 nF / 0.0027 uF)	C	C	C	C	C	C	D		D	D	D	D	D	D
332	3300p(3.3 nF / 0.0033 uF)	C	C	C	C	C	D	D		D	D	D	D	D	D
392	3900p(3.9 nF / 0.0039 uF)	C	C	C	C	C		D		D	D	D	D	D	D
472	4700p(4.7 nF / 0.0047 uF)	C	C	C	C	C		D		D	D	D	D	D	K
562	5600p(5.6 nF / 0.0056 uF)	C	C	C	C	C		D		D	D	D	D	D	K
682	6800p(6.8 nF / 0.0068 uF)	C	C	C	C	C		K		D	D	D	D	D	
822	8200p(8.2 nF / 0.0082 uF)	C	C	C	C	C		K		D	D	D	D	D	
103	10 nF (0.01 uF)	C	C	C	C	C		K		D	D	D	D	D	
123	12 nF (0.012 uF)	C	C	C	C	D		K		D	D	D	D	K	
153	15 nF (0.015 uF)	C	C	C	C	D				D	D	D	D	K	
183	18 nF (0.018 uF)	C	C	C	C	D				D	D	D	D		
223	22 nF (0.022 uF)	C	C	C	D					D	D	D	D		
273	27 nF (0.027 uF)	C	C	C						D	D	D	D		
333	33 nF (0.033 uF)	C	C	C						D	D	D	D		
393	39 nF (0.039 uF)	C	C	C						D	D	D	D		
473	47 nF (0.047 uF)	C	D	D						D	D	D	D		
563	56 nF (0.056 uF)	C	D	D						D	D	D	K		
683	68 nF (0.068 uF)	C								D	D	D	K		
823	82 nF (0.082 uF)	C								D	D	D	K		
104	100 nF (0.1 uF)	C								D	D	D	K		
124	120 nF (0.12 uF)	C								D	D	D			
154	150 nF (0.15 uF)	C								D	K	K			
184	180 nF (0.18 uF)	C								D	K	K			
224	220 nF (0.22 uF)	D								D	K	K			
274	270 nF (0.27 uF)									D					
334	330 nF (0.33 uF)									D					
394	390 nF (0.39 uF)									D					
474	470 nF (0.47 uF)									D					
564	560 nF (0.56 uF)									K					
684	680 nF (0.68 uF)									K					

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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Y5V

CAP CODE	SIZE VDCW	0402				0603				0805			
		10	16	25	50	10	16	25	50	10	16	25	50
102	1000p (1 nF / 0.001 uF)												
122	1200p(1.2 nF / 0.0012 uF)												
152	1500p(1.5 nF / 0.0015 uF)												
182	1800p(1.8 nF / 0.0018 uF)												
222	2200p(2.2 nF / 0.0022 uF)												
272	2700p(2.7 nF / 0.0027 uF)												
332	3300p(3.3 nF / 0.0033 uF)												
392	3900p(3.9 nF / 0.0039 uF)												
472	4700p(4.7 nF / 0.0047 uF)												
562	5600p(5.6 nF / 0.0056 uF)												
682	6800p(6.8 nF / 0.0068 uF)												
822	8200p(8.2 nF / 0.0082 uF)												
103	10 nF (0.01 uF)	N	N	N	N	S	S	S	S	A	A	A	A
123	12 nF (0.012 uF)	N	N	N	N	S	S	S	S	A	A	A	A
153	15 nF (0.015 uF)	N	N	N	N	S	S	S	S	A	A	A	A
183	18 nF (0.018 uF)	N	N	N	N	S	S	S	S	A	A	A	A
223	22 nF (0.022 uF)	N	N	N	N	S	S	S	S	A	A	A	A
273	27 nF (0.027 uF)	N	N	N	N	S	S	S	S	A	A	A	A
333	33 nF (0.033 uF)	N	N	N	N	S	S	S	S	A	A	A	A
393	39 nF (0.039 uF)	N	N	N		S	S	S	S	A	A	A	A
473	47 nF (0.047 uF)	N	N	N		S	S	S	S	A	A	A	A
563	56 nF (0.056 uF)	N	N			S	S	S	S	A	A	A	A
683	68 nF (0.068 uF)	N	N			S	S	S	S	A	A	A	A
823	82 nF (0.082 uF)	N	N			S	S	S	S	A	A	A	A
104	100 nF (0.1 uF)	N	N			S	S	S	S	A	A	A	A
124	120 nF (0.12 uF)	N				S	S	S	S	A	A	A	A
154	150 nF (0.15 uF)	N				S	S	S	S	A	A	A	A
224	220 nF (0.22 uF)	N				S	S	S		A	A	A	A
334	330 nF (0.33 uF)					S	S	S		B	B	B	B
474	470 nF (0.47 uF)					S	S			B	B	B	
684	680 nF (0.68 uF)					S				B	B	D	
105	1 uF					S				B	B	D	
155	1.5 uF									D	D		
225	2.2 uF									D	D		
335	3.3 uF									D			
475	4.7 uF									D			
685	6.8 uF												
106	10 uF												

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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Y5V

CAP CODE	SIZE VDCW	1206				1210				1812			
		10	16	25	50	10	16	25	50	10	16	25	50
102	1000p (1 nF / 0.001 uF)												
122	1200p(1.2 nF / 0.0012 uF)												
152	1500p(1.5 nF / 0.0015 uF)												
182	1800p(1.8 nF / 0.0018 uF)												
222	2200p(2.2 nF / 0.0022 uF)												
272	2700p(2.7 nF / 0.0027 uF)												
332	3300p(3.3 nF / 0.0033 uF)												
392	3900p(3.9 nF / 0.0039 uF)												
472	4700p(4.7 nF / 0.0047 uF)												
562	5600p(5.6 nF / 0.0056 uF)												
682	6800p(6.8 nF / 0.0068 uF)												
822	8200p(8.2 nF / 0.0082 uF)												
103	10 nF (0.01 uF)	B	B	B	B								
123	12 nF (0.012 uF)	B	B	B	B								
153	15 nF (0.015 uF)	B	B	B	B								
183	18 nF (0.018 uF)	B	B	B	B								
223	22 nF (0.022 uF)	B	B	B	B								
273	27 nF (0.027 uF)	B	B	B	B								
333	33 nF (0.033 uF)	B	B	B	B								
393	39 nF (0.039 uF)	B	B	B	B								
473	47 nF (0.047 uF)	B	B	B	B								
563	56 nF (0.056 uF)	B	B	B	B								
683	68 nF (0.068 uF)	B	B	B	B								
823	82 nF (0.082 uF)	B	B	B	B								
104	100 nF (0.1 uF)	B	B	B	B	C	C	C	C	D	D	D	D
124	120 nF (0.12 uF)	B	B	B	B	C	C	C	C	D	D	D	D
154	150 nF (0.15 uF)	B	B	B	B	C	C	C	C	D	D	D	D
224	220 nF (0.22 uF)	B	B	B	B	C	C	C	C	D	D	D	D
334	330 nF (0.33 uF)	B	B	B	B	C	C	C	C	D	D	D	D
474	470 nF (0.47 uF)	B	B	B	B	C	C	C	C	D	D	D	D
684	680 nF (0.68 uF)	B	B	B	B	C	C	C	C	D	D	D	D
105	1 uF	C	C	C	C	C	C	C	C	D	D	D	D
155	1.5 uF	C	C	C		C	C	C		D	D	D	D
225	2.2 uF	C	C	C		C	C	C		D	D	D	D
335	3.3 uF	D	D	D		C	C	C		D	D	D	D
475	4.7 uF	D	D			C	C	D		D	D	D	D
685	6.8 uF	D				C	C			D	D	D	D
106	10 uF	D				D	D			D	D	D	

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Y5V (Hi-voltage)

CAP CODE	SIZE VDCW	0805			1206			1210			1812		
		100	200	250	100	200	250	100	200	250	100	200	250
103	10 nF (0.01 uF)	B	B	B	B	B	B	C	C	C	D	D	D
153	15 nF (0.015 uF)	B	B	B	B	B	B	C	C	C	D	D	D
223	22 nF (0.022 uF)	B	B	B	B	B	B	C	C	C	D	D	D
333	33 nF (0.033 uF)	B	B	B	B	B	B	C	C	C	D	D	D
473	47 nF (0.047 uF)	B	B	B	B	B	B	C	C	C	D	D	D
683	68 nF (0.068 uF)	B	B	B	B	B	B	C	C	C	D	D	D
104	100 nF (0.1 uF)	B			B	B	B	C	C	C	D	D	D
154	150 nF (0.15 uF)				C	C	C	C	C	C	D	D	D
224	220 nF (0.22 uF)				C			C			D	D	D
334	330 nF (0.33 uF)							C			D	D	D
474	470 nF (0.47 uF)										D	D	D
684	680 nF (0.68 uF)										D	D	D
105	1 uF										D		

X5R

CAP CODE	SIZE VDCW	1206											
		6.3											
106	10 uF	G											

● **Chip Thickness :**

N = 0.50 ± 0.05

A = 0.50 ~ 0.70

B = 0.85 + 0.05 / -0.15

C = 1.00 + 0.05 / -0.13

D = 1.20 ± 0.15

S = 0.80 ± 0.07

H = 0.50 ~ 0.60

E = 0.65 ~ 0.75

F = 1.40 + 0.05 / -0.15

G = 1.60 +0.05/ -0.15

K = 2.00 ± 0.10

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SYNTECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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Test Report

SYNTECH CORPORATION
 16F-3, NO. 79, FAR EAST WORLD CENTER SEC.1,
 HSIN TAI WU ROAD, HSI-CHIH TAIPEI COUNTY,
 TAIWAN, R. O. C.
 DONG GUAN PLANT
 SHUI KOU INDUSTRIAL ZONE, DA LANG, DONG GUAN,
 GUANG DONG, CHINA

Report No. : CE/2006/83974A
 Date : 2006/08/18
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The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Description : CHIP CAPACITOR & CHIP CAPACITOR ARRAY /
 LEAD-FREE PLATING LAYER
 Style/Item No : CC TYPE & CA TYPE
 Sample Received : 2006/8/11
 Testing Period : 2006/8/11 TO 2006/08/18

=====
Test Result(s) : - Please see the next page(s) -

Daniel Yeh, M.R. / Operation Manager
 Signed for and on behalf of
 SGS TAIWAN LTD.

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MULTILAYER CERAMIC CAPACITOR

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SYNTON-TECH CORPORATION
16F-3, NO. 79, FAR EAST WORLD CENTER SEC.1,
HSIN TAI WU ROAD, HSI-CHIH TAIPEI COUNTY,
TAIWAN, R. O. C.
DONG GUAN PLANT
SHUI KOU INDUSTRIAL ZONE, DA LANG, DONG GUAN,
GUANG DONG, CHINA

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Test Result(s)

PART NAME NO.1 : SILVER COLORED METAL

Test Item (s):	Unit	Method	MDL	Result No.1
PBBs (Polybrominated biphenyls)	---	---	---	---
Monobromobiphenyl	mg/kg (ppm)	With reference to USEPA3540C, Analysis was performed by GC/MS and screening via USEPA 3550C with HPLC/DAD/MS	5	N.D.
Dibromobiphenyl			5	N.D.
Tribromobiphenyl			5	N.D.
Tetrabromobiphenyl			5	N.D.
Pentabromobiphenyl			5	N.D.
Hexabromobiphenyl			5	N.D.
Heptabromobiphenyl			5	N.D.
Octabromobiphenyl			5	N.D.
Nonabromobiphenyl			5	N.D.
Decabromobiphenyl			5	N.D.
Total PBBs (Polybrominated biphenyls)/Sum of above			-	N.D.
PBBEs(PBDEs) (Polybrominated biphenyl ethers)			---	---
Monobromobiphenyl ether	mg/kg (ppm)	With reference to USEPA3540C, Analysis was performed by GC/MS and screening via USEPA 3550C with HPLC/DAD/MS	5	N.D.
Dibromobiphenyl ether			5	N.D.
Tribromobiphenyl ether			5	N.D.
Tetrabromobiphenyl ether			5	N.D.
Pentabromobiphenyl ether			5	N.D.
Hexabromobiphenyl ether			5	N.D.
Heptabromobiphenyl ether			5	N.D.
Octabromobiphenyl ether			5	N.D.
Nonabromobiphenyl ether			5	N.D.
Decabromobiphenyl ether			5	N.D.
Total PBBEs(PBDEs) (Polybrominated biphenyl ethers)/Sum of above			-	N.D.
Total of Mono to Nona-brominated biphenyl ether. (Note 4)			-	N.D.

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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Test Report

SYNTON-TECH CORPORATION
 16F-3, NO. 79, FAR EAST WORLD CENTER SEC. 1,
 HSIN TAI WU ROAD, HSI-CHIH TAIPEI COUNTY,
 TAIWAN, R. O. C.
 DONG GUAN PLANT
 SHUI KOU INDUSTRIAL ZONE, DA LANG, DONG GUAN,
 GUANG DONG, CHINA

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Test Item (s):	Unit	Method	MDL	Result
				No.1
Chromium VI (Cr+6)	mg/kg (ppm)	With reference to US EPA 3060A. Analysis was performed by UV-VIS (US EPA 7196A)	2	N.D.
Cadmium (Cd)	mg/kg (ppm)	With reference to US EPA 3052. Analysis was performed by ICP-AES.	2	N.D.
Mercury (Hg)	mg/kg (ppm)	With reference to US EPA 3052. Analysis was performed by ICP-AES.	2	N.D.
Lead (Pb)	mg/kg (ppm)	With reference to US EPA 3052. Analysis was performed by ICP-AES.	2	46.8

- NOTE: (1) N.D. = Not Detected (<MDL)
 (2) mg/kg = ppm, 0.1% = 1000 ppm(mg/kg), 0.0005% = 5 ppm(mg/kg)
 (3) MDL = Method Detection Limit
 (4) Decabromobiphenyl ether (DecaBDE) in polymeric applications is exempted by Commission Decision of 13 Oct 2005 amending Directive 2002/95/EC notified under document 2005/717/EC.
 (5) PBBEs=PBDEs=Polybrominated Diphenyl Ethers=PBDOs=PBBOs.
 (6) " - " = Not Regulated
 (7) " --- " = Not Applicable
 (8) Sample was totally digested for Pb, Cd, Hg

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SYNTON-TECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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SYNTON-TECH CORPORATION
 16F-3, NO. 79, FAR EAST WORLD CENTER SEC.1,
 HSIN TAI WU ROAD, HSI-CHIH TAIPEI COUNTY,
 TAIWAN, R. O. C.
 DONG GUAN PLANT
 SHUI KOU INDUSTRIAL ZONE, DA LANG, DONG GUAN,
 GUANG DONG, CHINA

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SYNTECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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SYNTECH CORPORATION

16F-3, NO. 79, FAR EAST WORLD CENTER SEC. 1, HSIN
 TAI WU ROAD, HSI-CHIH TAIPEI COUNTY, TAIWAN,
 R. O. C.

DONG GUAN PLANT

SHUI KOU INDUSTRIAL ZONE, DA LANG, DONG GUAN,
 GUANG DONG, CHINA



The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Description	:	CHIP CAPACITOR & CHIP CAPACITOR ARRAY
Style/Item No	:	CC TYPE & CA TYPE
Sample Received	:	2006/08/29
Testing Period	:	2006/08/29 TO 2006/09/05

=====
Test Requested : With reference to the RoHS Directive 2002/95/EC, and its amendment directives.

Test Method :

- (1) With reference to BS EN 1122:2001, Method B for Cadmium Content. Analysis was performed by ICP-AES.
- (2) With reference to US EPA Method 3050B for Lead Content. Analysis was performed by ICP-AES.
- (3) With reference to US EPA Method 3052 for Mercury Content. Analysis was performed by ICP-AES.
- (4) With reference to US EPA Method 3060A & 7196A for Hexavalent Chromium. Analysis was performed by UV/Vis Spectrometry
- (5) With reference to US EPA 3540C, Analysis was performed by GC/MS and screening via US EPA 3550C with HPLC/DAD/MS.

Test Result(s) : - Please see the next page(s) -

Daniel Yeh, M.R. / Operation Manager
 Signed for and on behalf of
 SGS TAIWAN LTD.

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SYNTECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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 SYNTECH CORPORATION
 16F-3, NO. 79, FAR EAST WORLD CENTER SEC. 1, HSIN
 TAI WU ROAD, HSI-CHIH TAIPEI COUNTY, TAIWAN,
 R. O. C.
 DONG GUAN PLANT
 SHUI KOU INDUSTRIAL ZONE, DA LANG, DONG GUAN,
 GUANG DONG, CHINA

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Test Result(s)

Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result	MDL
		No.1	
Cadmium (Cd)	(1)	n.d.	2
Lead (Pb)	(2)	n.d.	2
Mercury (Hg)	(3)	n.d.	2
Chromium VI (Cr+6)	(4)	n.d.	2
Total PBBs		n.d.	-
Monobromobiphenyl		n.d.	5
Dibromobiphenyl		n.d.	5
Tribromobiphenyl		n.d.	5
Tetrabromobiphenyl		n.d.	5
Pentabromobiphenyl		n.d.	5
Hexabromobiphenyl		n.d.	5
Heptabromobiphenyl		n.d.	5
Octabromobiphenyl		n.d.	5
Nonabromobiphenyl		n.d.	5
Decabromobiphenyl		n.d.	5
Total PBBEs(PBDEs)	(5)	n.d.	-
Monobromobiphenyl ether		n.d.	5
Dibromobiphenyl ether		n.d.	5
Tribromobiphenyl ether		n.d.	5
Tetrabromobiphenyl ether		n.d.	5
Pentabromobiphenyl ether		n.d.	5
Hexabromobiphenyl ether		n.d.	5
Heptabromobiphenyl ether		n.d.	5
Octabromobiphenyl ether		n.d.	5
Nonabromobiphenyl ether		n.d.	5
Decabromobiphenyl ether		n.d.	5
Total of Mono to Nona(Note 5)		n.d.	-

Test Part Description

PART NAME NO.1 : MIXED ALL PARTS

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SYNTECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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SYNTECH CORPORATION



16F-3, NO. 79, FAR EAST WORLD CENTER SEC. 1, HSIN
 TAI WU ROAD, HSI-CHIH TAIPEI COUNTY, TAIWAN,
 R. O. C.

DONG GUAN PLANT

SHUI KOU INDUSTRIAL ZONE, DA LANG, DONG GUAN,
 GUANG DONG, CHINA

- Note :
- (1) mg/kg = ppm, 0.1% = 1000 ppm(mg/kg), 0.0005% = 5 ppm(mg/kg)
 - (2) n.d. = N.D. = ND = Not Detected
 - (3) MDL = Method Detection Limit
 - (4) Sample was totally digested for Pb, Cd, Hg
 - (5) Sum of Mono to NonaBDE & according to 2005/717/EC DecaBDE is exempt.
 - (6) "-" = Not Regulated

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SYNTECH CORPORATION
MULTILAYER CERAMIC CAPACITOR

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Test Report

Report No : CE/2006/88850 Date : 2006/09/05
 SYNTECH CORPORATION
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** End of Report **

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