● Explanations Of Ordering Code

DESCRIPTION : MLC X7R 10UF 10% 16V 5 X 7

SYNTON CODE : MLC X7R 106 K 16V 5 X 7

Dielectric	Capacitance value	Tolerance	Voltage	Pitch	Lead Length
NPO X7R Y5V	3 Digits : 5R1 : 5.1PF 100 : 10PF 101 : 100PF 102 : 1NF : 1000PF 103 : 10NF : 10000PF 104 : 0.1UF : 100000PF 106 :10UF : 10000000PF	B : ±0.10PF C : ±0.25PF D : ±0.5PF F : ±1% G : ±2% J : ±5% K : ±10% M : ±20% Z :+80-20% P :+100-0%	16V 25V 50V 63V 100V 250V 500V 1KV 2KV	2.5：2.5 ±0.8mm 5：5 ±0.8 mm T：Taping Box (Axial Type)	3 ±0.8mm 5 ±0.8 mm 7 ±0.8 mm 10 ±0.8 mm 25 ±3.0 mm (Packing :Bulk Radial Type) Axial Type: Blank

APPROVED	CHECKED	DESIGNED	REMARK	DOCUMENT NO.
Carol	May	Chen		0201010151

1.Type

R: Radial Type

2.Temperature Characteristic

	NPO	X7R	Y5V
TEMP. COEFF. (PPM/°C)	0±30	±15	+22,-82

3.Rated Capacitance

	PF		PF
5R0	5PF	222	2200PF
100	10PF	103	10000PF
221	220PF	104	100000PF

4.Capacitance Tolerance

	CAP.TOL.		CAP. TOL.
B	±0.1PF	J	±5%
C	±0.25PF	K	±10%
D	±0.5PF	M	±20%
F	±1%	Z	+80-20%
G	±2%	P	+100-0%

5.Rated Voltage

CAP.TOL.	CAP. TOL.
16V	250V
25V	500V
50V	1KV
63V	2KV
100V	

6.Size

DIA(mm)
4.5mm×4.5mm
5.5mm×5.5mm
7mm×7mm

7.Thickness

Dimension (mm)
3.5 (max)

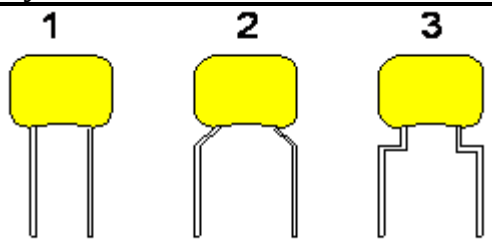
8.Pitch

Pitch (mm)
2.5±0.8
5±0.8

9.Lead Length

Lead length (mm)	Lead length(mm)
3±0.8	10±0.8
5±0.8	25±3
7±0.8	

10.Lead Style



11.Packing

Type
Ammo Pack Taping (Tape/Box)
Reel Pack Taping (Tape/Reel)
BULK

SIZE	W.V. (DC)	COG/NPO	X7R	Y5V
4.5	10V		560000~1000000	
	16V		3900~4700000	220000~2200000
	25V	2700~3900	27000~2200000	100000~3300000
	50V	0.5~2400	220~2200000	10000~2200000
	100V	62~680	2200~15000	4700~220000
	250V	1.5~220	220~8200/ 100000	
5.5	10V		2200000~10000000	47000000
	16V		560000~10000000	220000~4700000
	25V	6800~10000	180000~2200000	220000~4700000
	50V	0.5~6200	220~2200000	10000~2200000
	100V	750~2200	27000~2200000	33000~2200000
	250V	240~1000	10000~22000	33000~47000
	500V	1.5~470	220~10000	
	1KV	1~470		
	2KV	220	220	
7	250V		1000000	

1.Type

A: Axial Type

2.Temperature Characteristic

	NPO	X7R	Y5V
TEMP. COEFF. (PPM/°C)	0±30	±15	+22,-82

3.Rated Capacitance

	PF		PF
5R0	5PF	222	2200PF
100	10PF	103	10000PF
221	220PF	104	100000PF

4.Capacitance Tolerance

	CAP.TOL.		CAP. TOL.
B	±0.1PF	J	±5%
C	±0.25PF	K	±10%
D	±0.5PF	M	±20%
F	±1%	Z	+80-20%
G	±2%	P	+100-0%

5.Rated Voltage

W.V. (DC)
16V
25V
50V
63V
100V
250V
500V

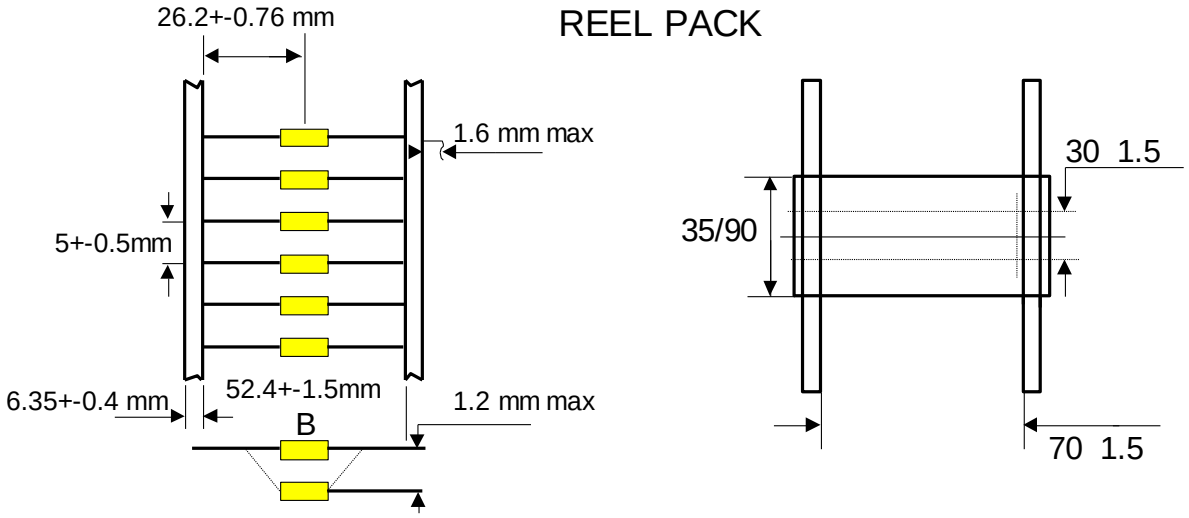
6.Size

4mm×2.5mm
5.08mm×3.05mm

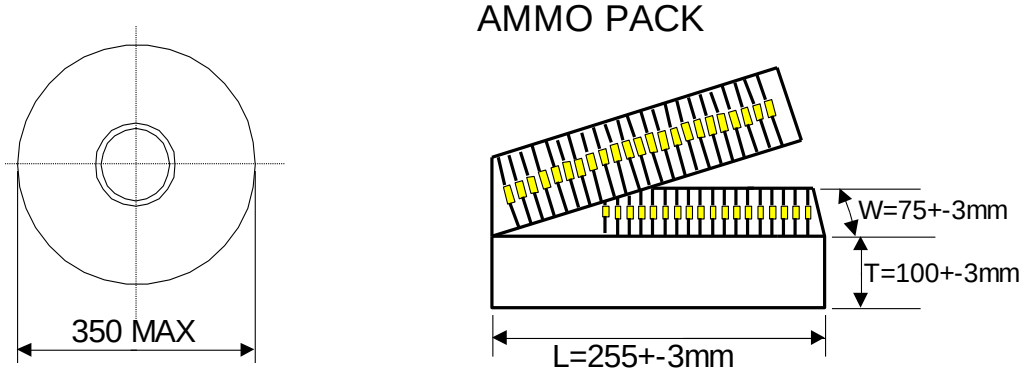
7.Packing

Type
Ammo Pack Taping (Tape/Box)
Reel Pack Taping (Tape/Reel)

REEL PACK

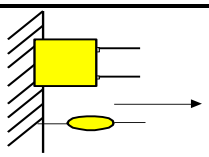


AMMO PACK



SIZE	W.V. (DC)	COG/NPO	X7R	Y5V
4.0	10V		120000~220000	
	16V		47000~100000	100000~220000
	25V	560~1000	22000~47000	100000
	50V	0.5~510	220~18000	100000
	100V	11~160	2200~3300	2200~3300
	250V	1.5~10	220~1800	
5.08	10V		560000~1000000	
	16V		3900~470000	100000~1000000
	25V	2700~3900	27000~150000	10000~220000
	50V	0.5~2400	220~68000	10000~220000
	100V	62~680	2200~15000	3300~150000
	250V	1.5~220	220~8200	2200~3300

RELIABILITY DATA (Radial & Axial Type)

No	ITEM		NPO		X7R		Y5V	Measuring Condition
1	Operating Temperature Range		-55°C~+125°C		-55~+125°C		-30~+85°C	
2	Temperature Characteristics		0±30ppm/°C		±15%		+22~-82%	
3	Capacitance		Within the specified tolerance					Shall be measured 25±2°C at the frequency and voltage NPO: C≤1000pF@1MHz±20%, 1±0.2Vrms C>1000pF@1KHz±10%, 1±0.2Vrms X7R, Y5V@1KHz±10%, 1±0.2Vrms
4	Q or Dissipation Factor (tan δ)		C≧30pF: Q≧1000 C<30pF: Q≧400+20·C (C is nominal capacitance)	25V	0.025max.	0.04 max	0.05 max	
				16V	0.035max		0.07 max (C<1.uF)	
							0.09 max (C≧1.uF)	
				10V	0.035max		0.125 max	
5	Withstanding Voltage		No defects					Applied: Rated voltage·3 (NPO) Rated voltage·2.5 (X7R,,Y5V) 500V rated voltage·2 Duration: 1 to 5 sec. The charge/discharge current is less than 50mA.
6	Insulation Resistance		More than 10GΩ or 500MΩ·uF, whichever is less 16VDC Product: More than 10GΩ or 100MΩ·uF, whichever is less					Apply rated voltage for 1 minute at 25±2°C and 70% R.H. max. 16Vdc product: Measurement voltage is 25Vdc
7	Strength of termination		Termination not to be broken or loosened Force: 10 LB min. Keep time: 10±1 sec.					
8	Solderability of Leads		Lead wire to be soldered vertically up to the coating end point. At least 75% of lead surface is covered.					Solder temperature: 230±5°C Dipping: 2±0.5 sec. (Flux shall be used)
9	Resistance to Solder Heat	△C	±2.5% or ±0.25pF (Whichever is greater)		±7.5%	±20%	±20%	The lead wire immersed in the melted solder 1.5mm to 2mm from the main body at 260±5°C for 10±0.5sec. Let sit at room temperature for 24±2 hrs. (NPO) or 48±4 hrs. (X7R,Y5V), then measure. Init measurements for (X7R,,Y5V) Perform a heat treatment at 150+0-10 °C for 1 hour. Remove and let sit for 48±4 hrs. at room temperature. Perform the initial measurement.
		Q/D.F.	C≧30pF: Q≧1000 C<30pF: Q≧400+20·C (C is nominal capacitance)	25V	0.025max.	0.04 max	0.05 max	
				16V	0.035max		0.07 max (C<1.uF)	
							0.09 max (C≧1.uF)	
				10V	0.035max		0.125 max	
		I.R.	More than 10GΩ or 500MΩ·uF, whichever is less 16VDC Product: More than10GΩ or 100MΩ·uF, whichever is less					
		Withstanding voltage	No defects					
		Exterior	No abnormalities					

No	ITEM		NPO		X7R	Y5V		Measuring Condition			
10	Thermal shock	△C	±2.5% or ±0.25pF (Whichever is greater)		±7.5%	±20%		Fix the capacitor to the supporting jig in the same manner and under the same conditions as(10). Perform the five cycles according to the four heat treatments listed in the following table. Remove and let sit at room temperature for 24±2 hrs. (NPO) or 48±4 hrs. (X7R,Y5V), then measure.			
		Q/D.F.	C≧30pF: Q≧1000 C<30pF: Q≧400+20·C (C is nominal capacitance)	25V	0.025max	0.04 max	0.05 max				
				16V	0.035max		0.07 max (C<1.uF)				
							0.09 max (C≧1.uF)				
				10V	0.035max		0.125 max	Step 1	Step 2	Step 3	Step 4
		I.R.	More than 10GΩ or 500MΩ·uF, whichever is less 16VDC Product: More than 10GΩ or 100MΩ·uF, whichever is less					Operating Temp(min)	Room Temp	Operating Temp(max)	Room Temp
		Withstanding voltage	No defects					30±3	15	30±3	15
		Exterior	No abnormalities					Initial measurement for (X7R,,Y5V) Perform a heat treatment at 150+0-10 °C for 1 hour. Remove and let sit for 48±4 hrs. at room temperature. Perform the initial measurement.			
11	Moisture resistance (steady state)	△C	±5% or ±0.5pF (Whichever is greater)		±12.5%	±30%	±30%	Apply the rated DC voltage at 40±2°C and 90 ~ 95% R. H. for 500+24-0 hrs. Remove ad let sit at room temperature for 24±2 hrs.(NPO) or 48±4 hrs.(X7R,,Y5V) , then measure. *Initial measurement for (X7R,,Y5V) Perform a heat treatment at 150+0-10 °C for 1 hour. Remove and let sit for 48±4 hrs. at room temperature. Perform the initial measurement.			
		Q/D.F.	C≧30pF: Q≧350 10pF<C<30pF: Q≧275+5/2·C C≧10pF: Q≧200+10·C (C is nominal capacitance	25V	0.04 max.	0.075 max	0.075max				
				16V	0.05 max		0.1 max (C<1.uF)				
							0.125 max (C≧1.uF)				
				10V	0.05 max		0.15 max				
		I.R.	More than 1GΩ or 50MΩ·uF, whichever is less 16VDC Product: More than 1GΩ or 10MΩ·uF, whichever is less								
		Withstanding voltage	No defects								
		Exterior	No abnormalities								

12	High Temperature loading	△C	±5% or ±0.5pF (Whichever is greater)		±12.5%	±30%	±30%	Apply 200% of the rated DC voltage for 1000+48-10 hrs. at the maximum operating temperature for ±2°C. Remove and let sit at room temperature for 24±2 hrs.(NPO) or 48±4 hrs.(X7R,Y5V) , then measure. The charge/discharge current is less than 50 mA. *Initial measurement for (X7R,Y5V) Apply 200% of the rated DC voltage for 1 hrs. at the maximum operating temperature for ±2°C. Remove and let sit at room temperature for 48±4 hrs. Perform the initial measurement. *150% for 500V
		Q/D.F.	C≧ 30pF: Q≧ 350	25V	0.04 max.	0.075 max	0.075max	
				16V	0.05 max		0.1 max (C<1.uF) 0.125 max (C≧1.uF)	
			10pF<C<30pF: Q≧ 275+5/2·C C≧10pF: Q≧ 200+10·C (C is nominal capacitance	10V	0.05 max		0.15 max	
		I.R.	More than 1GΩ or 50MΩ·uF, whichever is less 16VDC Product: More than 1GΩ or 10MΩ·uF, whichever is less					
		Withstanding voltage	No defects					
		Exterior	No abnormalities					