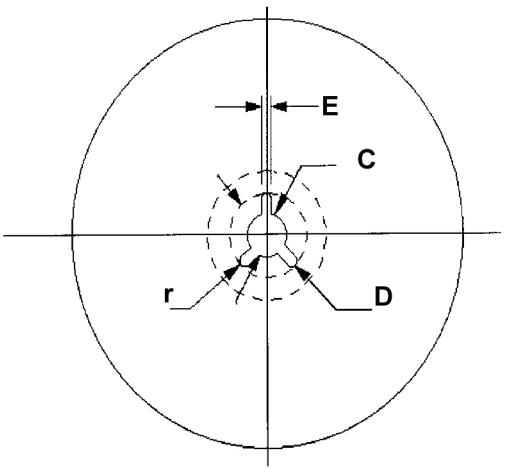
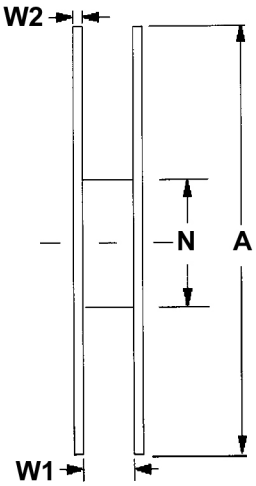
Application Guide Film Chip Capacitors

Reel Quantity and Dimensions

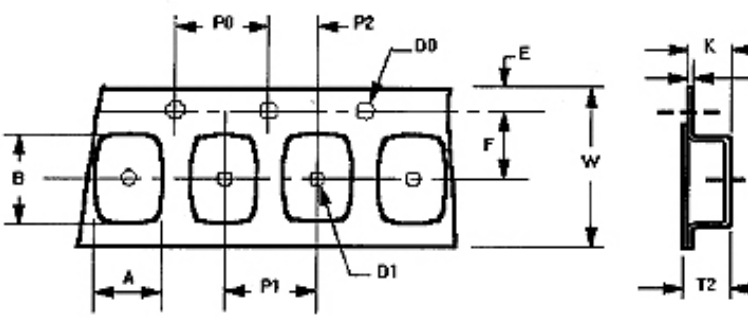
Packaging Code	Tape Width (mm)	Reel Diameter [in.(mm)]	Quantity/ Reel
K1	8	7(180)	4000
J1, J2	8	7(180)	3000
H1, H2	8	7(180)	3000
H3	8	7(180)	2000
G1, G2, G3	8	7(180)	2000
E1, E2	12	13(330)	3000
E3, E4	12	13(330)	2000
D1, D2	12	13(330)	3000
D3,D4,D5	12	13(330)	2000
B, Z	12	13(330)	1500
U, V, X, Y	16	13(330)	1000
S, T	24	13(330)	750





Symbol	Reel Dimensions (mm)			
	8 mm Tape	12 mm Tape	16 mm Tape	24 mm Tape
A	180	330	330	330
C	13	13	13	13
D	21	21	21	21
E	2	2		
N	60	80	80	80
r	1	1		
W1	9.5	14	17.5	25.5
W2	1.2	2		

Tape Dimensions



Symbol	Tape Dimensions (mm)					
	K1	J1, J2 H,1 H2, H3, G1, G2, G3	E1, E2 E3, E4	D1, D2, D3 D4, D5, B, Z	U, V X, Y	S,T
W	8	8	12	12	16	24
F	3.5	3.5	5.5	5.5	7.5	11.5
E	1.75	1.75	1.75	1.75	1.75	1.75
P1		4	8	8	12	16
P2	2	2	2	2	2	2
P0	4	4	4	4	4	4
D0	1.5	1.5	1.5	1.5	1.5	1.5
D1		1	1.5	1.5	1.5	1.5

mm

Type	A ±0.1	B ±0.1	T ±0.05	T2 ±0.2	K ±0.1
K1	1.0	1.85	0.20	1.1	1.0
J1	1.55	2.3	0.25	1.3	1.2
J2	1.55	2.3	0.25	1.5	1.4
H1, H2	1.9	3.5	0.25	1.5	1.4
H3	1.9	3.5	0.25	1.9	1.8
G1, G2	2.8	3.5	0.25	1.9	1.8
G3	2.8	3.5	0.25	2.5	2.4
E1	3.8	5.1	0.3	2	1.9
E2	3.8	5.1	0.3	2.6	2.5
E3, E4	3.8	5.1	0.3	3.4	3.5
D1	4.6	6.3	0.3	2.7	2.6
D3, D4	4.6	6.3	0.3	3.5	3.4
D5	4.6	6.3	0.3	4.6	4.5
B	5.5	6.3	0.3	5.1	5
Z	5.5	7.5	0.3	4.7	4.6
X, Y	6.9	8.4	0.34±028	5.7	5.7
U, V	8.9	10.5	0.34±028	5.9	5.8
S, T	10.8	16	0.36±02	5.82	5.77

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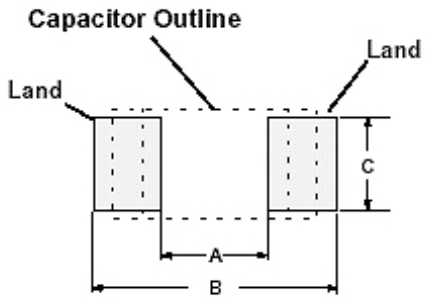
Recommended Land Patterns



Case Size Code	Land Dimensions [in. (mm)]		
	A	B	C
0603	0.024 (0.6)	0.068 (2.0)	0.028 (0.7)
0805	0.03 (0.8)	0.09 (2.4)	0.04 (1.1)
1206	0.07 (1.8)	0.14 (3.6)	0.06 (1.4)
1210	0.07 (1.8)	0.14 (3.6)	0.09 (2.3)
1913	0.12 (3.0)	0.22 (5.6)	0.12 (3.0)
2416	0.16 (4.0)	0.28 (7.0)	0.15 (3.8)
2420	0.15 (3.8)	0.31 (7.8)	0.18 (4.6)
2820	0.18 (4.5)	0.35 (9.0)	0.18 (4.6)
2825	0.18 (4.5)	0.35 (9.0)	0.22 (5.7)
3022	0.20 (5.1)	0.38 (9.7)	0.20 (5.0)
3925	0.28 (7.2)	0.47 (11.9)	0.22 (5.7)
3931	0.28 (7.2)	0.47 (11.9)	0.28 (7.2)
6031	0.50 (12.6)	0.68 (17.3)	0.28 (7.2)
6040	0.50 (12.6)	0.68 (17.3)	0.35 (9.0)

Soldering Information

Soldering

Reflow method only, not to exceed two reflow processings. Halogen content of flux, solder paste and cleaner should be less than 0.1% for each.

Cleaning Solvent

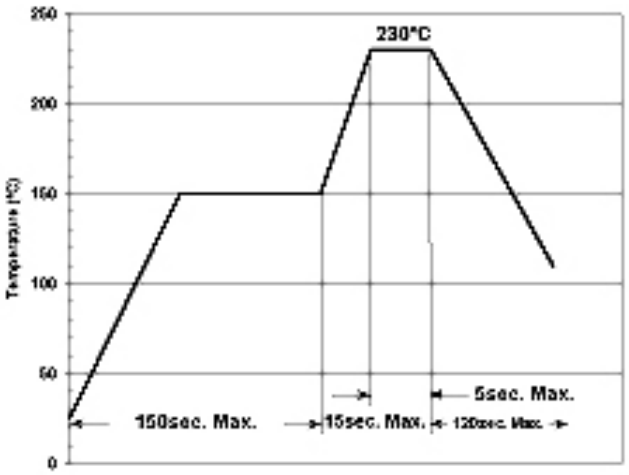
Isopropyl alcohol

Cleaning Method

	Temperature	Time
Immersion	<50 °C	<5min.
Vapor	<50 °C	<5min.
Ultrasonic	<50 °C	<5min.

Dry the circuit board completely after cleaning.

Recommended Reflow Soldering Conditions



Capacitor Type	Maximum Capacitor Surface Temperature (°C)	Recommended Peak Reflow Temperature (°C)	Maximum 30 Seconds at or above (°C)
FCN 16 V, 50 V, 100 V (.001 - .01 µF)	240	230	210
FCN 100 V (.012 - 1.0 µF) 250 V, 400 V	230	220	210
FCP	260	230	230
FCA	240	230	210

Part Numbering System

Type	Case Size	Voltage Code	Capacitance Code	Tolerance Code	Packaging Code
FCN	1913	C	124	J	E1
			124 = 0.12 µF	J = ±5%	
		H = 50 Vdc		K = ±10%	
		A = 100 Vdc			
		E = 250 Vdc			
		G = 400 Vdc			
FCP	1206	C	393	J	H3
		C = 16 Vdc	393 = 0.039 µF	J = ±5%	
		H = 50 Vdc		G = ±2%	
FCA	1206	A	105	M	H3
		A = 10 Vdc	105 = 1.0 µF	M = ±20%	
		C = 16 Vdc			

(See Reel Quantity Table for an explanation of the Packaging Code)

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Available Surface Mount Film Capacitor Ratings

pF	Capacitance			FCN					FCP		FCA	
Code	pF	nF	µF	16 V	50 V	100 V	250 V	400 V	16 V	50 V	10 V	16 V
101	100	0.10	0.0001									
121	120	0.12	0.0001									
151	150	0.15	0.0001									
181	180	0.18	0.0001									
221	220	0.22	0.0002									
271	270	0.27	0.0002									
331	330	0.33	0.0003									
391	390	0.39	0.0003									
471	470	0.47	0.0004									
561	560	0.56	0.0005						0603	0805		
681	680	0.68	0.0006									
821	820	0.82	0.0082									
102	1000	1.0	0.0010									
122	1200	1.2	0.0012									
152	1500	1.5	0.0015									
182	1800	1.8	0.0018									
222	2200	2.2	0.0022			1206						
272	2700	2.7	0.0027									
332	3300	3.3	0.0033					1913				
392	3900	3.9	0.0039									
472	4700	4.7	0.0047						0805	1206		
562	5600	5.6	0.0056				1913					
682	6800	6.8	0.0068			1210						
822	8200	8.2	0.0082									
103	10000	10	0.010									
123	12000	12	0.012					2416				
153	15000	15	0.015									
183	18000	18	0.018									
223	22000	22	0.022						1206	1210		
273	27000	27	0.027					2420				
333	33000	33	0.033			1913						
393	39000	39	0.039					2820				
473	47000	47	0.047				2416					
563	56000	56	0.056					2825				
683	68000	68	0.068		1913				1210	1913		
823	82000	82	0.082				2420	3925				
104	100000	100	0.1			2416						805
124	120000	120	0.12					3931				
154	150000	150	0.15	1913	2416		2825			2416		1206
184	180000	180	0.18			2820						
224	220000	220	0.22									1206
274	270000	270	0.27				3925					
334	330000	330	0.33	2416								1206
394	390000	390	0.39			3022	3931					
474	470000	470	0.47									1206
564	560000	560	0.56				6031					
684	680000	680	0.68			3925						1206
824	820000	820	0.82				6040					
105	1000000	1000	1.0								1206	1210

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