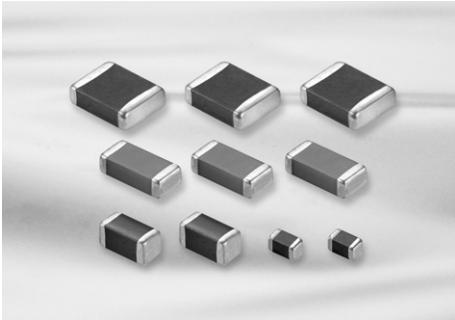


# High Capacitance Capacitors



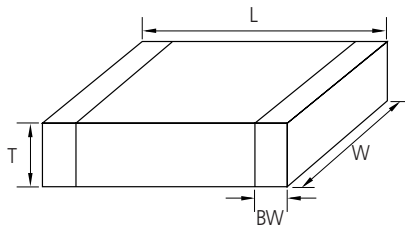
## Feature

- Wide selection of size : from 0402 to 1812
- Highly reliable tolerance and high speed automatic chip placement on PCBs
- Wide capacitance range
- Highly reliable performance
- Highly resistant termination metal
- Tape & reel for surface mount assembly

## Application

- Desktop PC, Note PC, HHP, DC-DC Converter, DSC
- LCD TV, LCD Monitor
- ※ For using special purpose like Military, Medical, Aviation, Automobile device should be following a special specification.

## Structure and Dimensions



Size Code	EIA Code	Dimension(mm)				
		L	W	T	Thickness Code	BW
05	0402	1.00±0.05	0.50±0.05	0.50±0.05	5	0.2+0.15/-0.1
10	0603	1.60±0.10	0.80±0.10	0.50±0.05*	5	0.30±0.20
				0.80±0.10	8	
21	0805	2.00±0.10	1.25±0.10	0.85±0.10	C	0.5+0.2/-0.3
				1.25±0.10	F	
				2.00±0.15	1.25±0.15	
31	1206	3.20±0.20	1.60±0.20	1.25±0.20	Y	0.50±0.30
				0.60±0.10*	6	
				0.85±0.10*	C	
32	1210	3.20±0.30	2.50±0.20	1.15±0.10*	P	0.60±0.30
				0.85±0.10*	C	
				0.90±0.10*	9	
42	1808	4.50±0.40	2.00±0.20	1.60±0.20	H	0.80±0.30
				1.80±0.20*	U	
				2.00±0.20	I	
				2.50±0.20	J	
				2.50±0.30	V	
43	1812	4.50±0.40	3.20±0.30	2.00±0.20	I	0.80±0.30
				3.20±0.30	L	0.80±0.30

※ \* Mark is only applicable to "L" code , 12th code in part number.

Part Numbering System

General Capacitors

High Capacitance Capacitors

Super Small Size Capacitors

Medium-High Voltage Capacitors

Array Type Capacitors

Low ESL Capacitors

Reliability Test Condition

Premium Capacitors for Automotive Applications

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Application Manual for Surface Mounting



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### High Capacitance Table (X5R)

Size(mm)	Vr(V)	Capacitance ( $\mu\text{F}$ )									
		0.1	0.22	0.47	1	2.2	4.7	10	22	47	100
0402(1005)	4		■	■	■	■	■	■	■		
	6.3		■	■	■	■	■	■	■		
	10		■	■	■	■	■	■	■		
	16		■	■	■	■	■				
	25		■	■	■	■	■				
0603(1608)	4			■	■	■	■	■	■	■	
	6.3			■	■	■	■	■	■	■	
	10			■	■	■	■	■	■	■	
	16			■	■	■	■	■	■		
	25			■	■	■	■	■	■		
	50			■	■	■					
0805(2012)	4				■	■	■	■	■	■	■
	6.3				■	■	■	■	■	■	■
	10				■	■	■	■	■	■	■
	16				■	■	■	■	■	■	
	25				■	■	■	■	■	■	
	50				■	■	■	■			
1206(3216)	6.3						■	■	■	■	■
	10						■	■	■	■	■
	16						■	■	■	■	
	25						■	■	■	■	
	50						■	■	■		
1210(3225)	6.3								■	■	■
	10							■	■	■	■
	16							■	■	■	
	25					■	■	■	■		



**High Capacitance Table\_Low Profile (X5R)**

Size(mm)	Tmax (mm)	Vr(V)	Capacitance (μF)							
			1	2.2	4.7	10	22	33	47	
0402(1005)	0.3	6.3	X6S							
		10								
		16								
0603(1608)	0.5	6.3								
		10								
		16								
		25								
0805(2012)	0.7	10								
		16								
		25								
0805(2012)	0.95	4							(Tmax=1.0)	
		6.3							(Tmax=1.0)	
	10									
	16									
	25							X6S		
1206(3216)	0.7	10								
	0.95	6.3								
		10								
		16								
		25							X6S	
50							(Tmax=1.0)	(Tmax=1.0)		
1210(3225)	0.95	16								
	2.0	25								
		35								
		50								

Part Numbering System

General Capacitors

High Capacitance Capacitors

Super Small Size Capacitors

Medium-High Voltage Capacitors

Array Type Capacitors

Low ESL Capacitors

Reliability Test Condition

Premium Capacitors for Automotive Applications

Packaging Specification

Application Manual for Surface Mounting



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### High Capacitance Table (X6S)

Size(mm)	Vr(V)	Capacitance ( $\mu$ F)									
		0.1	0.22	0.47	1	2.2	4.7	10	22	47	100
0402(1005)	4		■	■	■	■	■				
	6.3		■	■	■	■	■				
	10		■	■	■	■	■				
0603(1608)	4			■	■	■	■	■	■		
	6.3			■	■	■	■	■	■		
	10			■	■	■	■	■	■		
	16			■	■	■	■	■	■		
	25			■	■	■	■	■	■		
0805(2012)	4				■	■	■	■	■	■	■
	6.3				■	■	■	■	■	■	■
	10				■	■	■	■	■	■	■
	16				■	■	■	■	■	■	■
	25				■	■	■	■	■	■	■
1206(3216)	6.3						■	■	■	■	■
	10						■	■	■	■	■
	16						■	■	■	■	■
	25						■	■	■	■	■
1210(3225)	6.3							■	■	■	■
	10							■	■	■	■
	16							■	■	■	■
	25							■	■	■	■



### High Capacitance Table (X7R)

Size(mm)	Vr(V)	Capacitance (μF)									
		0.1	0.22	0.47	1	2.2	4.7	10	22	47	100
0402(1005)	6.3	■	■	■							
	10	■	■	X7S							
	16	■	■								
0603(1608)	6.3	■	■	■	■	■					
	10	■	■	■	■	■					
	16	■	■	■	■						
	25	■	■	■	■						
	50	■	■								
0805(2012)	6.3	■	■	■	■	■	■	■	■		
	10	■	■	■	■	■	■	■	■		
	16	■	■	■	■	■	■	■	■		
	25	■	■	■	■	■	X7S				
	35	■	■	■	■						
	50	■	■	■	■						
1206(3216)	6.3	■	■	■	■	■	■	■	■	■	
	10	■	■	■	■	■	■	■	■	■	
	16	■	■	■	■	■	■	■	■	■	
	25	■	■	■	■	■	■	■	■	■	
	35	■	■	■	■	■	■	■	■	■	
	50	■	■	■	■	■	■	■	■	■	
1210(3225)	6.3	■	■	■	■	■	■	■	■	■	X7T
	10	■	■	■	■	■	■	■	■	■	
	16	■	■	■	■	■	■	■	■	■	
	25	■	■	■	■	■	■	■	■	■	
	50	■	■	■	■	■	■	■	■	■	

Part Numbering System

General Capacitors

High Capacitance Capacitors

Super Small Size Capacitors

Medium-High Voltage Capacitors

Array Type Capacitors

Low ESL Capacitors

Reliability Test Condition

Premium Capacitors for Automotive Applications

Packaging Specification

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### High Capacitance Table (Y5V)

Size(mm)	Vr(V)	Capacitance (μF)								
		0.1	0.22	0.47	1	2.2	4.7	10	22	47
0402(1005)	6.3		■	■	■	■				
	10		■	■	■					
	16	■	■							
	25	■								
0603(1608)	6.3					■	■			
	10	■	■	■	■	■				
	16	■	■	■	■					
	25	■	■	■						
	50	■	■	■						
0805(2012)	6.3							■	■	
	10						■	■	■	
	16	■	■	■	■	■	■			
	25	■	■	■	■	■				
	50	■	■	■	■					
1206(3216)	10						■	■	■	■
	16				■	■	■	■		
	25			■	■	■	■			
	50	■	■	■	(Tmax=1.35)					
	6.3									■
1210(3225)	10								(Tmax=2.7)	(Tmax=2.0)
	16						■	■	(Tmax=1.2)	
	25						■	■	(Tmax=1.8)	(Tmax=1.5)
	35								(Tmax=1.4)	(Tmax=1.6)
	60	■	■	■	(Tmax=1.45)					

### High Capacitance Table -Low Profile (Y5V)

Size(mm)	Vr(V)	Capacitance (μF)					
		1	2.2	4.7	10	22	47
0402(1005)	6.3				(Tmax=0.95)		
	10				(Tmax=0.95)		

## Product Lineup (High Capacitance-X5R)

	Part Number	Size L × W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
1	CL05A224KQ5NNN □	1.00 × 0.50	0.22 μF	6.3	±10%	0.55
2	CL05A224KR5NNN □		0.22 μF	4	±10%	0.55
3	CL05A224KA5NNN □		0.22 μF	25	±10%	0.55
4	CL05A224KQ5NNN □		0.22 μF	16	±10%	0.55
5	CL05A224KP5NNN □		0.22 μF	10	±10%	0.55
6	CL05A334KA5NNN □		0.33 μF	25	±10%	0.55
7	CL05A334KQ5NNN □		0.33 μF	6.3	±10%	0.55
8	CL05A334KR5NNN □		0.33 μF	4	±10%	0.55
9	CL05A474KA5NNN □		0.47 μF	25	±10%	0.55
10	CL05A474KQ5NNN □		0.47 μF	16	±10%	0.55
11	CL05A474KP5NNN □		0.47 μF	10	±10%	0.55
12	CL05A474KQ5NNN □		0.47 μF	6.3	±10%	0.55
13	CL05A474KR5NNN □		0.47 μF	4	±10%	0.55
14	CL05A105KA5NQN □		1 μF	25	±10%	0.60
15	CL05A105KO5NNN □		1 μF	16	±10%	0.55
16	CL05A105KO3LQN □		1 μF	16	±10%	0.33
17	CL05A105KP5NNN □		1 μF	10	±10%	0.55
18	CL05A105KP3LNN □		1 μF	10	±10%	0.33
19	CL05A105KQ5NNN □		1 μF	6.3	±10%	0.55
20	CL05A105KQ3LNN □		1 μF	6.3	±10%	0.33
21	CL05A105KR5NNN □		1 μF	4	±10%	0.55
22	CL05A105KR3LNN □		1 μF	4	±10%	0.33
23	CL05A225MA5NUN □		2.2 μF	25	±20%	0.70
24	CL05A225KO5NQN □		2.2 μF	16	±10%	0.60
25	CL05A225MP5NSN □		2.2 μF	10	±20%	0.57
26	CL05A225KP3LRN □		2.2 μF	10	±10%	0.33
27	CL05A225MQ5NNN □		2.2 μF	6.3	±20%	0.55
28	CL05A225KQ3LRN □		2.2 μF	6.3	±10%	0.33
29	CL05A225MR5NNN □		2.2 μF	4	±20%	0.55
30	CL05A225KR3LRN □		2.2 μF	4	±10%	0.33
31	CL05A475MP5NRR □		4.7 μF	10	±20%	0.65
32	CL05A475MQ5NRR □		4.7 μF	6.3	±20%	0.65
33	CL05A475MR5NRR □		4.7 μF	4	±20%	0.65
34	CL05A106MP5NNN □		10 μF	10	±20%	0.55
35	CL05A106MQ5NUN □		10 μF	6.3	±20%	0.70
36	CL05A106MR5NRR □		10 μF	4	±20%	0.65
1	CL10A474KB8NNN □	1.60 × 0.80	0.47 μF	50	±10%	0.90
2	CL10A474KA8NNN □		0.47 μF	25	±10%	0.90
3	CL10A474KP8NNN □		0.47 μF	10	±10%	0.90
4	CL10A474KQ8NNN □		0.47 μF	6.3	±10%	0.90
5	CL10A474KR8NNN □		0.47 μF	4	±10%	0.90
6	CL10A105KB8NNN □		1 μF	50	±10%	0.90
7	CL10A105KA5LNNC □		1 μF	25	±10%	0.50
8	CL10A105KA8NNN □		1 μF	25	±10%	0.90
9	CL10A105KO8NNN □		1 μF	16	±10%	0.90
10	CL10A105KO5LNN □		1 μF	16	±10%	0.50
11	CL10A105KP8NNN □		1 μF	10	±10%	0.90
12	CL10A105KP5LNN □		1 μF	10	±10%	0.50
13	CL10A105KQ8NNN □		1 μF	6.3	±10%	0.90
14	CL10A105KQ5LNN □		1 μF	6.3	±10%	0.50

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p80.

Part Numbering System

General Capacitors

High Capacitance Capacitors

Super Small Size Capacitors

Medium-High Voltage Capacitors

Array Type Capacitors

Low ESL Capacitors

Reliability Test Condition

Premium Capacitors for Automotive Applications

Packaging Specification

Application Manual for Surface Mounting



SAMSUNG  
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### Product Lineup (High Capacitance-X5R)

	Part Number	Size L×W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
15	CL10A105KR8NNN □	1.60×0.80	1 μF	4	±10%	0.90
16	CL10A105KR5LNN □		1 μF	4	±10%	0.50
17	CL10A225KA8NNN □		2.2 μF	25	±10%	0.90
18	CL10A105KA5LNN □		2.2 μF	25	±10%	0.50
19	CL10A225KO8NNN □		2.2 μF	16	±10%	0.90
20	CL10A225KO5LNN □		2.2 μF	16	±10%	0.50
21	CL10A225KP8NNN □		2.2 μF	10	±10%	0.90
22	CL10A225KP5LNN □		2.2 μF	10	±10%	0.50
23	CL10A225KQ8NNN □		2.2 μF	6.3	±10%	0.90
24	CL10A225KQ5LNN □		2.2 μF	6.3	±10%	0.50
25	CL10A225KR8NNN □		2.2 μF	4	±10%	0.90
26	CL10A225KR5LNN □		2.2 μF	4	±10%	0.50
27	CL10A335KQ8NNN □		3.3 μF	6.3	±10%	0.90
28	CL10A335KR8NNN □		3.3 μF	4	±10%	0.90
29	CL10A475KA8NQ □		4.7 μF	25	±10%	0.95
30	CL10A475KO8NNN □		4.7 μF	16	±10%	0.90
31	CL10A475KP8NNN □		4.7 μF	10	±10%	0.90
32	CL10A475KP5LNN □		4.7 μF	10	±10%	0.50
33	CL10A475KQ5LNN □		4.7 μF	6.3	±10%	0.50
34	CL10A475KQ8NNN □		4.7 μF	6.3	±10%	0.90
35	CL10A475KR5LNN □		4.7 μF	4	±10%	0.50
36	CL10A475KR8NNN □		4.7 μF	4	±10%	0.90
37	CL10A106KR8NNN □		10 μF	4	±10%	0.90
38	CL10A106MR5LRN □		10 μF	4	±20%	0.50
39	CL10A106KQ8NNN □		10 μF	6.3	±10%	0.90
40	CL10A106MQ5LRN □		10 μF	6.3	±20%	0.50
41	CL10A106MP8NNN □		10 μF	10	±20%	0.90
42	CL10A106MO8NQ □		10 μF	16	±20%	0.95
43	CL10A106MA8NRR □		10 μF	25	±20%	1.00
44	CL10A226MR8NRR □		22 μF	4	±20%	1.00
45	CL10A226MQ8NRR □	22 μF	6.3	±20%	1.00	
46	CL10A226MP8NUN □	22 μF	10	±20%	1.05	
1	CL21A105KBQNNN □	2.00×1.25	1 μF	50	±10%	1.40
2	CL21A105KAFNNN □		1 μF	25	±10%	1.35
3	CL21A105KA6LNN □		1 μF	25	±10%	0.70
4	CL21A105KOFNNN □		1 μF	16	±10%	1.35
5	CL21A105KO6LNN □		1 μF	16	±10%	0.70
6	CL21A105KQFNNN □		1 μF	6.3	±10%	1.35
7	CL21A105KRFNNN □		1 μF	4	±10%	1.35
8	CL21A225KBQNNN □		2.2 μF	50	±10%	1.40
9	CL21A225KAFNNN □		2.2 μF	25	±10%	1.35
10	CL21A225KO6LNN □		2.2 μF	16	±10%	0.70
11	CL21A225KOFNNN □		2.2 μF	16	±10%	1.35
12	CL21A225KPFNNN □		2.2 μF	10	±10%	1.35
13	CL21A225KQFNNN □		2.2 μF	6.3	±10%	1.35
14	CL21A225KRFNNN □		2.2 μF	4	±10%	1.35
15	CL21A475KBQNNN □		4.7 μF	50	±10%	1.40
16	CL21A475KAQNNN □		4.7 μF	25	±10%	1.40
17	CL21A475KACLRR □		4.7 μF	25	±10%	0.95
18	CL21A475KOFNNN □		4.7 μF	16	±10%	1.35

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p 80.



## Product Lineup (High Capacitance-X5R)

	Part Number	Size L × W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
19	CL21A475KOCCLNN □	2.00×1.25	4.7μF	16	±10%	0.95
20	CL21A475KPFNNNN □		4.7μF	10	±10%	1.35
21	CL21A475KPCLNN □		4.7μF	10	±10%	0.95
22	CL21A475KQFNNNN □		4.7μF	6.3	±10%	1.35
23	CL21A475KQCCLNN □		4.7μF	6.3	±10%	0.95
24	CL21A475KRFNNNN □		4.7μF	4	±10%	1.35
25	CL21A106KAYNNNN □		10μF	25	±10%	1.45
26	CL21A106KACLNN □		10μF	25	±10%	0.95
27	CL21A106KOFNNNN □		10μF	16	±10%	1.35
28	CL21A106KOQNNNN □		10μF	16	±10%	1.40
29	CL21A106KOCCLNN □		10μF	16	±10%	0.95
30	CL21A106KPFNNNN □		10μF	10	±10%	1.35
31	CL21A106KPCLQN □		10μF	10	±20%	0.95
32	CL21A106KQFNNNN □		10μF	6.3	±10%	1.35
33	CL21A106KQCCLNN □		10μF	6.3	±10%	0.95
34	CL21A475KRCLNN □		4.7μF	4	±10%	0.95
35	CL21A106KRFNNNN □		10μF	4	±10%	1.35
36	CL21A106KRCLNN □		10μF	4	±10%	0.95
37	CL21A226MAQNNNN □		22μF	25	±20%	1.40
38	CL21A226MPQNNNN □		22μF	10	±20%	1.40
39	CL21A226MPCLRN □		22μF	10	±20%	0.95
40	CL21A226MQQNNNN □		22μF	6.3	±20%	1.40
41	CL21A226MQCLRN □		22μF	6.3	±20%	0.95
42	CL21A226MRQNNNN □		22μF	4	±20%	1.40
43	CL21A226MRCLRN □		22μF	4	±20%	0.95
44	CL21A336MQELNN □		33μF	6.3	±20%	1.20
45	CL21A336MQ9LNN □		33μF	6.3	±20%	1.00
46	CL21A336MRELNN □		33μF	4	±20%	1.20
47	CL21A336MR9LNN □		33μF	4	±20%	1.00
48	CL21A476MQYNNNN □	47μF	6.3	±20%	1.45	
49	CL21A476MRYNNNN □	47μF	4.0	±20%	1.45	
1	CL31A225KC9LNN □	3.20×1.60	2.2μF	100	±10%	1.00
2	CL31A475KBHNNNN □		4.7μF	50	±10%	1.80
3	CL31A475KB9LNN □		4.7μF	50	±10%	1.00
4	CL31A475KAHNNNN □		4.7μF	25	±10%	1.80
5	CL31A475KACLNN □		4.7μF	25	±10%	0.95
6	CL31A475KOHNNNN □		4.7μF	16	±10%	1.80
7	CL31A475KOCCLNN □		4.7μF	16	±10%	0.95
8	CL31A475KPHNNNN □		4.7μF	10	±10%	1.80
9	CL31A475KQHNNNN □		4.7μF	6.3	±10%	1.80
10	CL31A475KRHNNNN □		4.7μF	4	±10%	1.80
11	CL31A106KBHNNNN □		10μF	50	±10%	1.80
12	CL31A106KAHNNNN □		10μF	25	±10%	1.80
13	CL31A106KACLNN □		10μF	25	±10%	0.95
14	CL31A106KOHNNNN □		10μF	16	±10%	1.80
15	CL31A106KOCCLNN □		10μF	16	±10%	0.95
16	CL31A106KPHNNNN □		10μF	10	±10%	1.80
17	CL31A106KPCLNN □		10μF	10	±10%	0.95
18	CL31A106KQHNNNN □		10μF	6.3	±10%	1.80
19	CL31A106KRHNNNN □		10μF	4	±10%	1.80
20	CL31A156KQHNNNN □		15μF	6.3	±10%	1.80

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p 80.

Part Numbering System

General Capacitors

High Capacitance Capacitors

Super Small Size Capacitors

Medium-High Voltage Capacitors

Array Type Capacitors

Low ESL Capacitors

Reliability Test Condition

Premium Capacitors for Automotive Applications

Packaging Specification

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### Product Lineup (High Capacitance-X5R)

	Part Number	Size L×W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
21	CL31A156KRHNNN □	3.20×1.60	15 $\mu$ F	4	±10%	1.80
22	CL31A226KAHNNN □		22 $\mu$ F	25	±10%	1.80
23	CL31A226KOHNNN □		22 $\mu$ F	16	±10%	1.80
24	CL31A226KOCLNN □		22 $\mu$ F	16	±10%	0.95
25	CL31A226KPHNNN □		22 $\mu$ F	10	±10%	1.80
26	CL31A226KPCLNN □		22 $\mu$ F	10	±10%	0.95
27	CL31A226KQHNNN □		22 $\mu$ F	6.3	±10%	1.80
28	CL31A226KRHNNN □		22 $\mu$ F	4.0	±10%	1.80
29	CL31A476MQHNNN □		47 $\mu$ F	6.3	±20%	1.80
30	CL31A476MRHNNN □		47 $\mu$ F	4.0	±20%	1.80
31	CL31A107MQHNNN □		100 $\mu$ F	6.3	±20%	1.80
32	CL31A107MRHNNN □		100 $\mu$ F	4.0	±20%	1.80
1	CL32A106KQCLNN □		3.20×2.50	10 $\mu$ F	6.3	±10%
2	CL32A106KRCLNN □	10 $\mu$ F		4.0	±10%	0.95
3	CL32A106KBULNN □	10 $\mu$ F		50	±10%	2.00
4	CL32A106KAJNNN □	10 $\mu$ F		25	±10%	2.70
5	CL32A106KAULNN □	10 $\mu$ F		25	±10%	2.00
6	CL32A106KOJNNN □	10 $\mu$ F		16	±10%	2.70
7	CL32A106KPJNNN □	10 $\mu$ F		10	±10%	2.70
8	CL32A226KAJNNN □	22 $\mu$ F		25	±10%	2.70
9	CL32A226KOJNNN □	22 $\mu$ F		16	±10%	2.70
10	CL32A226KOCLNN □	22 $\mu$ F		16	±10%	0.95
11	CL32A226KPJNNN □	22 $\mu$ F		10	±10%	2.70
12	CL32A226KQJNNN □	22 $\mu$ F		6.3	±10%	2.70
13	CL32A226MQCLNN □	22 $\mu$ F		6.3	±20%	0.95
14	CL32A226KRJNNN □	22 $\mu$ F		4.0	±10%	2.70
15	CL32A226MRCLNN □	22 $\mu$ F		4.0	±20%	0.95
16	CL32A476KPJNNN □	47 $\mu$ F		10	±10%	2.70
17	CL32A476MQJNNN □	47 $\mu$ F		6.3	±20%	2.70
18	CL32A476MRJNNN □	47 $\mu$ F		4.0	±20%	2.70
19	CL32A107MPVNNN □	100 $\mu$ F		10	±20%	2.80
20	CL32A107MQVNNN □	100 $\mu$ F		6.3	±20%	2.80
21	CL32A107MRVNNN □	100 $\mu$ F		4.0	±20%	2.80
1	CL43A476MQJNNN □	4.50×3.20	47 $\mu$ F	6.3	±20%	2.70
2	CL43A476MRJNNN □		47 $\mu$ F	4.0	±20%	2.70
3	CL43A107KQLNNN □		100 $\mu$ F	6.3	±20%	3.50
4	CL43A107KRLNNN □		100 $\mu$ F	4.0	±20%	3.50

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p 80.

## Product Lineup (High Capacitance-X6S)

	Part Number	Size L × W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
1	CL05X224KP5NNN □	1.00×0.50	0.22 μF	10	±10%	0.55
2	CL05X224KQ5NNN □		0.22 μF	6.3	±10%	0.55
3	CL05X224KR5NNN □		0.22 μF	4	±10%	0.55
4	CL05X474KP5NNN □		0.47 μF	10	±10%	0.55
5	CL05X474KQ5NNN □		0.47 μF	6.3	±10%	0.55
6	CL05X474KR5NNN □		0.47 μF	4	±10%	0.55
7	CL05X105KP5NNN □		1 μF	10	±10%	0.55
8	CL05X105MQ3LNN □		1 μF	6.3	±20%	0.33
9	CL05X105KQ5NNN □		1 μF	6.3	±10%	0.55
10	CL05X105MR3LNN □		1 μF	4	±20%	0.33
11	CL05X105KR5NNN □		1 μF	4	±10%	0.55
12	CL05X225MQ5NSN □		2.2 μF	6.3	±20%	0.57
13	CL05X225MR5NSN □		2.2 μF	4	±20%	0.57
1	CL10X474KA8NNN □	1.60×0.80	0.47 μF	25	±10%	0.90
2	CL10X474KO8NNN □		0.47 μF	16	±10%	0.90
3	CL10X474KP8NNN □		0.47 μF	10	±10%	0.90
4	CL10X474KQ8NNN □		0.47 μF	6.3	±10%	0.90
5	CL10X474KR8NNN □		0.47 μF	4	±10%	0.90
6	CL10X105KA8NNN □		1 μF	25	±10%	0.90
7	CL10X105KO8NNN □		1 μF	16	±10%	0.90
8	CL10X105KP8NNN □		1 μF	10	±10%	0.90
9	CL10X105KQ8NNN □		1 μF	6.3	±10%	0.90
10	CL10X105KR8NNN □		1 μF	4	±10%	0.90
11	CL10X225KA8NQN □		2.2 μF	25	±10%	0.95
12	CL10X225KO8NNN □		2.2 μF	16	±10%	0.90
13	CL10X225KP8NNN □		2.2 μF	10	±10%	0.90
14	CL10X225KQ8NNN □		2.2 μF	6.3	±10%	0.90
15	CL10X225KR8NNN □		2.2 μF	4	±10%	0.90
16	CL10X475KA8NQN □		4.7 μF	25	±10%	0.95
17	CL10X475KO8NQN □		4.7 μF	16	±10%	0.95
18	CL10X475KP5NNN □		4.7 μF	10	±10%	0.90
19	CL10X475KQ8NNN □		4.7 μF	6.3	±10%	0.90
20	CL10X475KR8NNN □		4.7 μF	4	±10%	0.90
21	CL10X106MP8NNN □		10 μF	10	±20%	0.90
22	CL10X106KQ8NNN □		10 μF	6.3	±10%	0.90
23	CL10X106KR8NNN □		10 μF	4	±10%	0.90
1	CL21X105KAFNNN □	2.00×1.25	1 μF	25	±10%	1.35
2	CL21X105KOFNNN □		1 μF	16	±10%	1.35
3	CL21X105KPFNNN □		1 μF	10	±10%	1.35
4	CL21X105KQFNNN □		1 μF	6.3	±10%	1.35
5	CL21X105KRFNNN □		1 μF	4	±10%	1.35
6	CL21X225KAFNNN □		2.2 μF	25	±10%	1.35
7	CL21X225KOFNNN □		2.2 μF	16	±10%	1.35
8	CL21X225KPFNNN □		2.2 μF	10	±10%	1.35
9	CL21X225KQFNNN □		2.2 μF	6.3	±10%	1.35
10	CL21X225KRFNNN □		2.2 μF	4	±10%	1.35
11	CL21X475KAQNNN □		4.7 μF	25	±10%	1.40
12	CL21X475KOFNNN □		4.7 μF	16	±10%	1.35
13	CL21X475KPFNNN □		4.7 μF	10	±10%	1.35
14	CL21X475KQFNNN □		4.7 μF	6.3	±10%	1.35

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p 80.

Part Numbering System

General Capacitors

High Capacitance Capacitors

Super Small Size Capacitors

Medium-High Voltage Capacitors

Array Type Capacitors

Low ESL Capacitors

Reliability Test Condition

Premium Capacitors for Automotive Applications

Packaging Specification

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### Product Lineup (High Capacitance -X6S)

	Part Number	Size L×W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
15	CL21X475KRFNNN □	2.00×1.25	4.7 μF	4	±10%	1.35
16	CL21X106KACLNN □		10 μF	25	±10%	0.95
17	CL21X106KAYNNN □		10 μF	25	±10%	1.45
18	CL21X106KOYNNN □		10 μF	16	±10%	1.45
19	CL21X106KPCLNN □		10 μF	10	±10%	0.95
20	CL21X106KPYNNN □		10 μF	10	±10%	1.45
21	CL21X106KQNNN □		10 μF	6.3	±10%	1.40
22	CL21X106KRQNNN □		10 μF	4	±10%	1.40
23	CL21X106KRCLNN □		10 μF	4	±10%	0.95
24	CL21X226MQNNN □		22 μF	6.3	±20%	1.40
25	CL21X226MRQNNN □		22 μF	4	±20%	1.40
26	CL21X476MRYNNN □		47 μF	4	±20%	1.45
1	CL31X475KAHNNN □		3.20×1.60	4.7 μF	25	±10%
2	CL31X475KACLNN □	4.7 μF		25	±10%	0.95
3	CL31X475KOHNNN □	4.7 μF		16	±10%	1.80
4	CL31X475KPHNNN □	4.7 μF		10	±10%	1.80
5	CL31X475MQHNNN □	4.7 μF		6.3	±20%	1.80
6	CL31X475KRHNNN □	4.7 μF		4	±10%	1.80
7	CL31X106KACLNN □	10 μF		25	±10%	0.95
8	CL31X106KAHNNN □	10 μF		25	±10%	1.80
9	CL31X106KOHNNN □	10 μF		16	±10%	1.80
10	CL31X106KPHNNN □	10 μF		10	±10%	1.80
11	CL31X106KQHNNN □	10 μF		6.3	±10%	1.80
12	CL31X106KRHNNN □	10 μF		4	±10%	1.80
13	CL31X226KOHNNN □	22 μF		16	±10%	1.80
14	CL31X226KPHNNN □	22 μF		10	±10%	1.80
15	CL31X226KQHNNN □	22 μF		6.3	±10%	1.80
16	CL31X226KRHNNN □	22 μF		4	±10%	1.80
17	CL31X107MQHNNN □	100 μF		6.3	±20%	1.80
18	CL31X107MRHNNN □	100 μF		4	±20%	1.80
1	CL32X106KAUNNN □	3.20×2.50	10 μF	25	±10%	2.00
2	CL32X106KOJNNN □		10 μF	16	±10%	2.70
3	CL32X106KPJNNN □		10 μF	10	±10%	2.70
4	CL32X106KQJNNN □		10 μF	6.3	±10%	2.70
5	CL32X106KRJNNN □		10 μF	4	±10%	2.70
6	CL32X226KAJNNN □		22 μF	25	±10%	2.70
7	CL32X226KOJNNN □		22 μF	16	±10%	2.70
8	CL32X226KPJNNN □		22 μF	10	±10%	2.70
9	CL32X226KQJNNN □		22 μF	6.3	±10%	2.70
10	CL32X226KRJNNN □		22 μF	4	±10%	2.70
11	CL32X476MPJNNN □		47 μF	10	±20%	2.70
12	CL32X476KQJNNN □		47 μF	6.3	±10%	2.70
13	CL32X476KRJNNN □		47 μF	4	±10%	2.70
14	CL32X107MQVNNN □		100 μF	6.3	±20%	2.80
15	CL32X107MRVNNN □		100 μF	4	±20%	2.80

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p80.

## Product Lineup (High Capacitance -X7R, X7S)

	Part Number	Size L × W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
1	CL05B224K05NNN □	1.00×0.50	0.22 μF	16	±10%	0.55
2	CL05B224KP5NNN □		0.22 μF	10	±10%	0.55
3	CL05B224KQ5NNN □		0.22 μF	6.3	±10%	0.55
4	CL05B474KP5NNN □		0.47 μF	10	±10%	0.55
1	CL05Y474KP5NNN □	1.00×0.50	0.47 μF	10	±10%	0.55
1	CL10B474KA8NNN □	1.60×0.80	0.47 μF	25	±10%	0.90
2	CL10B474KO8NNN □		0.47 μF	16	±10%	0.90
3	CL10B474KP8NNN □		0.47 μF	10	±10%	0.90
4	CL10B474KQ8NNN □		0.47 μF	6.3	±10%	0.90
5	CL10B105KA8NNN □		1 μF	25	±10%	0.90
6	CL10B105KO8NNN □		1 μF	16	±10%	0.90
7	CL10B105KP8NNN □		1 μF	10	±10%	0.90
8	CL10B105KQ8NNN □		1 μF	6.3	±10%	0.90
9	CL10B225KP8NNN □		2.2 μF	10	±10%	0.90
10	CL10B225KQ8NNN □		2.2 μF	6.3	±10%	0.90
1	CL21B105KBFNNN □	2.00×1.25	1 μF	50	±10%	1.35
2	CL21B105KLFNNN □		1 μF	35	±10%	1.35
3	CL21B105KAFNNN □		1 μF	25	±10%	1.35
4	CL21B105KOFNNN □		1 μF	16	±10%	1.35
5	CL21B105KPFNNN □		1 μF	10	±10%	1.35
6	CL21B105KQFNNN □		1 μF	6.3	±10%	1.35
7	CL21B225KAFNNN □		2.2 μF	25	±10%	1.35
8	CL21B225KOFNNN □		2.2 μF	16	±10%	1.35
9	CL21B225KPFNNN □		2.2 μF	10	±10%	1.35
10	CL21B225KQFNNN □		2.2 μF	6.3	±10%	1.35
11	CL21B475KOFNFN □		4.7 μF	16	±10%	1.35
12	CL21B475KPFNFN □		4.7 μF	10	±10%	1.35
13	CL21B475KQNNN □		4.7 μF	6.3	±10%	1.40
14	CL21B106KQNNN □		10 μF	16	±10%	1.40
15	CL21B106KPQNNN □		10 μF	10	±10%	1.40
16	CL21B106KQNNN □		10 μF	6.3	±10%	1.40
1	CL31B475KBHNNN □	3.20×1.60	4.7 μF	50	±10%	1.80
2	CL31B475KLHNNN □		4.7 μF	35	±10%	1.80
3	CL31B475KAHNNN □		4.7 μF	25	±10%	1.80
4	CL31B475KOHNNN □		4.7 μF	16	±10%	1.80
5	CL31B475KPHNNN □		4.7 μF	10	±10%	1.80
6	CL31B475KQHNNN □		4.7 μF	6.3	±10%	1.80
7	CL31B106KLHNNN □		10 μF	35	±10%	1.80
8	CL31B106KAHNNN □		10 μF	25	±10%	1.80
9	CL31B106KOHNNN □		10 μF	16	±10%	1.80
10	CL31B106KPHNNN □		10 μF	10	±10%	1.80
11	CL31B106KQHNNN □		10 μF	6.3	±10%	1.80
12	CL31B226KPHNNN □		22 μF	10	±10%	1.80
1	CL32B106KBJNNN □	3.20×2.50	10 μF	50	±10%	2.70
2	CL32B106KAJNNN □		10 μF	25	±10%	2.70
3	CL32B106KOJNNN □		10 μF	16	±10%	2.70
4	CL32B106KPIJNNN □		10 μF	10	±10%	2.20
5	CL32B106KQJNNN □		10 μF	6.3	±10%	2.70
6	CL32B226KAJNNN □		22 μF	25	±10%	2.70
7	CL32B226KOJNNN □		22 μF	16	±10%	2.70
8	CL32B226KPIJNNN □		22 μF	10	±10%	2.70
9	CL32B226KQJNNN □		22 μF	6.3	±10%	2.70
10	CL32B476MQJNNN □		47 μF	6.3	±20%	2.70

Part Numbering System

General Capacitors

High Capacitance Capacitors

Super Small Size Capacitors

Medium-High Voltage Capacitors

Array Type Capacitors

Low ESL Capacitors

Reliability Test Condition

Premium Capacitors for Automotive Applications

Packaging Specification

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※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p80.

## Product Lineup (High Capacitance -Y5V)

	Part Number	Size L×W (mm)	Capacitance	Rated Voltage (Vdc)	Capacitance Tolerance	Thickness Max. (mm)
1	CL05F224ZO5NNN □	1.00×0.50	0.22 μF	16	+80/-20%	0.55
2	CL05F224ZP5NNN □		0.22 μF	10	+80/-20%	0.55
3	CL05F224ZQ5NNN □		0.22 μF	6.3	+80/-20%	0.55
4	CL05F474ZP5NNN □		0.47 μF	10	+80/-20%	0.55
5	CL05F474ZQ5NNN □		0.47 μF	6.3	+80/-20%	0.55
6	CL05F105ZQ5NNN □		1 μF	6.3	+80/-20%	0.55
1	CL10F474ZB8NNN □	1.60×0.80	0.47 μF	50	+80/-20%	0.90
2	CL10F474ZA8NNN □		0.47 μF	25	+80/-20%	0.90
3	CL10F474ZO8NNN □		0.47 μF	16	+80/-20%	0.90
4	CL10F474ZP8NNN □		0.47 μF	10	+80/-20%	0.90
5	CL10F105ZO8NNN □		1 μF	16	+80/-20%	0.90
6	CL10F105ZP8NNN □		1 μF	10	+80/-20%	0.90
7	CL10F225ZP8NNN □		2.2 μF	10	+80/-20%	0.90
8	CL10F225ZQ8NNN □		2.2 μF	6.3	+80/-20%	0.90
9	CL10F475ZQ8NNN □		4.7 μF	6.3	+80/-20%	0.90
1	CL21F105ZBFNNN □	2.00×1.25	1 μF	50	+80/-20%	1.35
2	CL21F105ZAFNNN □		1 μF	25	+80/-20%	1.35
3	CL21F105ZOFNNN □		1 μF	16	+80/-20%	1.35
4	CL21F225ZAFNNN □		2.2 μF	25	+80/-20%	1.35
5	CL21F225ZOFNNN □		2.2 μF	16	+80/-20%	1.35
6	CL21F475ZQFNNN □		4.7 μF	6.3	+80/-20%	1.35
1	CL21F475ZOFNNN □		4.7 μF	16	+80/-20%	1.35
2	CL21F475ZPFNNN □		4.7 μF	10	+80/-20%	1.35
3	CL21F106ZPFNNN □		10 μF	10	+80/-20%	1.35
4	CL21F106ZPCLNN □		10 μF	10	+80/-20%	0.95
5	CL21F106ZQFNNN □		10 μF	6.3	+80/-20%	1.35
6	CL21F106ZQCLNN □		10 μF	6.3	+80/-20%	0.95
1	CL31F475ZOHNNN □	3.20×1.60	4.7 μF	16	+80/-20%	1.80
2	CL31F475ZPHNNN □		4.7 μF	10	+80/-20%	1.80
3	CL31F475ZQHNNN □		4.7 μF	6.3	+80/-20%	1.80
4	CL31F106ZOHNNN □		10 μF	16	+80/-20%	1.80
5	CL31F106ZPHNNN □		10 μF	10	+80/-20%	1.80
6	CL31F106ZQHNNN □		10 μF	6.3	+80/-20%	1.80
7	CL31F226ZPHNNN □		22 μF	10	+80/-20%	1.80
8	CL31F226ZQHNNN □		22 μF	6.3	+80/-20%	1.80
1	CL32F106Z AHLNN □	3.20×2.50	10 μF	25	+80/-20%	1.80
2	CL32F106ZOELNN □		10 μF	16	+80/-20%	2.00
3	CL32F226ZPJNNN □		22 μF	10	+80/-20%	2.70
4	CL32F226ZPULNN □		22 μF	10	+80/-20%	2.00
5	CL32F476ZQJNNN □		47 μF	6.3	+80/-20%	2.70
6	CL32F107ZQJNNN □		100 μF	6.3	+80/-20%	2.70

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p80.

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