



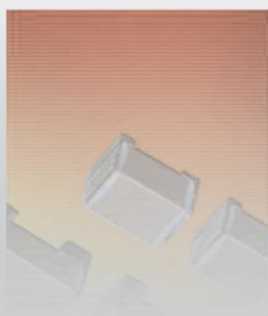
MULTILAYER CERAMIC CHIP CAPACITORS

CKG Series Automotive Grade MEGACAP Type

Type:

**CKG32K [EIA CC1210]
CKG45K [EIA CC1812]
CKG45N [EIA CC1812]
CKG57K [EIA CC2220]
CKG57N [EIA CC2220]**

**Issue date:
Oct 2013**



REMINDERS

Please read before using this product

SAFETY REMINDERS



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(Example)

Catalog Issued date	Catalog Number	Item Description (On Delivery Label)
Prior to January 2013	C1608C0G1E103J	C1608C0G1E103JT000N
January 2013 and Later	C1608C0G1E103J080AA	C1608C0G1E103JT000N



CKG Series MEGACAP Type

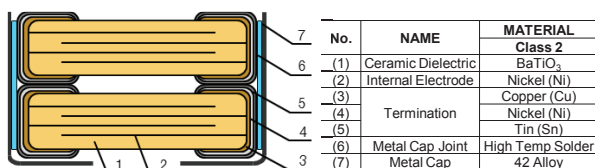
Type: CKG32K [EIA CC1210], CKG45K [EIA CC1812],
CKG45N [EIA CC1812], CKG57K [EIA CC2220], CKG57N [EIA CC2220]

Features



- Twice the capacitance on single capacitor foot print .
- Lower ESR and ESL than Al caps.
- Capable of absorbing thermal and mechanical stress .
- Improved vibration performance .
- AEC-Q200 compliant.

Design Structure



Applications



- Automotive application (EPS, ABS, EV, HEV, LED lighting etc.) -effect countermeasure
- Smoothing circuits
- DC-DC converters
- LED, HID applications
- Temperature variable applications
- Piezoelectric

Shape & Dimensions

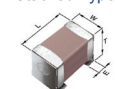


Single Type



L	Body Length
W	Body Width
T	Body Height
E	Metal Terminal Width

Stacked Type



L	Body Length
W	Body Width
T	Body Height
E	Metal Terminal Width



Catalog Number Construction

CKG • 57 • N • X7S • 1C • 107 • M • 500 • J • J

Series Name

Dimensions L x W (mm)

Code	Length	Width	Metal Terminal
32	3.60 ± 0.30	2.60 ± 0.30	0.80 ± 0.15
45	5.00 ± 0.50	3.50 ± 0.50	1.10 ± 0.30
57	6.00 ± 0.50	5.00 ± 0.50	1.60 ± 0.30

Structure

Code	Description
K	Single Type
N	Stacked Type

Temperature Characteristics

Temperature Characteristics	Capacitance Change	Temperature Range
X5R	±15%	-55 to +85°C
X7R	±15%	-55 to +125°C
X7S	±22%	-55 to +125°C
X7T	+22/-33%	-55 to +125°C

Rated Voltage (DC)

Code	Voltage (DC)
1C	16V
1E	25V
1H	50V
2A	100V
2E	250V
2W	450V
2J	630V

Nominal Capacitance (pF)

The capacitance is expressed in three digit codes and in units of pico Farads (pF). The first and second digits identify the first and second significant figures of the capacitance. The third digit identifies the multiplier. R designates a decimal point.

Ex. 0R2 = 0.2pF; 103 = 10,000pF; 105 = 1,000,000pF = 1,000nF = 1μF

Capacitance Tolerance

Code	Tolerance
K	± 10%
M	± 20%

Nominal Thickness

Code	Thickness
290	2.90 mm
335	3.35 mm
500	5.00 mm

Packaging Style

Code	Style
A	178" Reel, 4mm Pitch
J	330" Reel, 8mm Pitch

Special Reserved Code

Code	Description
J	MEGACAP (Automotive)



Capacitance Range Chart

CKG32K [EIA CC1210]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+22/-33\%$)
 Rated Voltage: 630V (2J), 400V (2W), 250V (2E), 100V (2A), 50V (1H), 25V (1E)

Capacitance (pF)	Code	Tolerance	X7R					X7S		X7T		
			2J (630V)	2E (250V)	2A (100V)	1H (50V)	1E (25V)	2A (100V)	1H (50V)	2J (630V)	2W (450V)	2E (250V)
47,000	473	K: $\pm 10\%$										
100,000	104	M: $\pm 20\%$										
150,000	154											
220,000	224											
330,000	334											
470,000	474											
1,000,000	105											
2,200,000	225											
3,300,000	335											
4,700,000	475											
6,800,000	685											
10,000,000	106											

Standard Thickness

3.35 mm



Capacitance Range Chart

CKG45K [EIA CC1812]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+22/-33\%$)
 Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A), 50V (1H), 25V (1E), 16V (1C)

Capacitance (pF)	Code	Tolerance	X7R						X7S			X7T		
			2J (630V)	2E (250V)	2A (100V)	1H (50V)	1E (25V)	1C (16V)	2A (100V)	1H (50V)	1C (16V)	2J (630V)	2W (450V)	2E (250V)
100,000	104	K: $\pm 10\%$												
150,000	154	M: $\pm 20\%$												
220,000	224													
330,000	334													
470,000	474													
680,000	684													
1,000,000	105													
1,500,000	155													
2,200,000	225													
3,300,000	335													
4,700,000	475													
10,000,000	106													
22,000,000	226													

Standard Thickness

2.90 mm



Capacitance Range Chart

CKG57K [EIA CC2220]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+ 22/-33\%$)

Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A), 50V (1H), 25V (1E), 16V (1C)

Capacitance (pF)	Code	Tolerance	X7R						X7S			X7T		
			2J (630V)	2E (250V)	2A (100V)	1H (50V)	1E (25V)	1C (16V)	2A (100V)	1H (50V)	1C (16V)	2J (630V)	2W (450V)	2E (250V)
220,000	224	K: $\pm 10\%$ M: $\pm 20\%$												
330,000	334													
470,000	474													
680,000	684													
1,000,000	105													
1,500,000	155													
2,200,000	225													
3,300,000	335													
4,700,000	475													
6,800,000	685													
10,000,000	106													
15,000,000	156													
22,000,000	226													
47,000,000	476													

Standard Thickness

 3.35 mm



Capacitance Range Chart

CKG45N [EIA CC1812]

Capacitance Range Chart

Temperature Characteristics: X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+ 22/-33\%$)

Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A), 50V (1H), 25V (1E), 16V (1C)

Capacitance (pF)	Code	Tolerance	X7R					
			2J (630V)	2E (250V)	2A (100V)	1H (50V)	1E (25V)	1C (16V)
220,000	224	M: $\pm 20\%$						
470,000	474							
1,000,000	105							
2,200,000	225							
3,300,000	335							
4,700,000	475							
6,800,000	685							
10,000,000	106							
22,000,000	226							
47,000,000	476							

Capacitance (pF)	Code	Tolerance	X7S			X7T		
			2A (100V)	1H (50V)	1C (16V)	2J (630V)	2W (450V)	2E (250V)
330,000	334	M: $\pm 20\%$						
470,000	474							
680,000	684							
1,000,000	105							
1,500,000	155							
2,200,000	225							
6,800,000	685							
10,000,000	106							
22,000,000	226							
47,000,000	476							

Standard Thickness
 5.00 mm



Capacitance Range Chart

CKG57N [EIA CC2220]

Capacitance Range Chart

Temperature Characteristics: X5R ($\pm 15\%$), X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+ 22/-33\%$)
 Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A), 50V (1H), 25V (1E), 16V (1C)

Capacitance (pF)	Code	Tolerance	X5R				X7R			
			2A (100V)	1H (50V)	1E (25V)	1C (16V)	2J (630V)	2E (250V)	2A (100V)	1H (50V)
470,000	474	M: $\pm 20\%$								
1,000,000	105									
2,200,000	225									
4,700,000	475									
10,000,000	106									
22,000,000	226									
33,000,000	336									
47,000,000	476									
100,000,000	107									

Capacitance (pF)	Code	Tolerance	X7S				X7T		
			2A (100V)	1H (50V)	1E (25V)	1C (16V)	2J (630V)	2W (450V)	2E (250V)
680,000	684	M: $\pm 20\%$							
1,000,000	105								
1,500,000	155								
2,200,000	225								
3,300,000	335								
22,000,000	226								
47,000,000	476								
100,000,000	107								

Standard Thickness
 5.00 mm



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X5R (-55 to +85°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc: 100V	Rated Voltage Edc: 50V	Rated Voltage Edc: 25V	Rated Voltage Edc: 16V
10 µF	5750	5.00 ± 0.50	± 20%	CKG57NX5R2A106M500JJ			
22 µF	5750	5.00 ± 0.50	± 20%	CKG57NX5R1H226M500JJ			
47 µF	5750	5.00 ± 0.50	± 20%	CKG57NX5R1E476M500JJ			
100 µF	5750	5.00 ± 0.50	± 20%	CKG57NX5R1C107M500JJ			

Class 2 (Temperature Stable)

Temperature Characteristics: X7R (-55 to +125°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc: 630V	Rated Voltage Edc: 250V	Rated Voltage Edc: 100V	Rated Voltage Edc: 50V
47 nF	3225	3.35 ± 0.10	± 10%	CKG32KX7R2J473K335AJ			
			± 20%	CKG32KX7R2J473M335AJ			
100 nF	3225	3.35 ± 0.10	± 10%		CKG32KX7R2E104K335AJ		
			± 20%		CKG32KX7R2E104M335AJ		
	4532	2.90 ± 0.10	± 10%	CKG45KX7R2J104K290JJ			
			± 20%	CKG45KX7R2J104M290JJ			
220 nF	3225	3.35 ± 0.10	± 10%		CKG32KX7R2E224K335AJ		
			± 20%		CKG32KX7R2E224M335AJ		
	4532	2.90 ± 0.10	± 10%		CKG45KX7R2E224K290JJ		
			± 20%		CKG45KX7R2E224M290JJ		
		5.00 ± 0.50	± 20%	CKG45NX7R2J224M500JJ			
			± 10%	CKG57KX7R2J224K335JJ			
470 nF	3225	3.35 ± 0.10	± 20%	CKG57KX7R2J224M335JJ			
			± 10%			CKG32KX7R2A474K335AJ	
	4532	2.90 ± 0.10	± 20%			CKG32KX7R2A474M335AJ	
			± 10%		CKG45KX7R2E474K290JJ		
		5.00 ± 0.50	± 20%		CKG45KX7R2E474M290JJ		
			± 10%		CKG45NX7R2E474M500JJ		
		3.35 ± 0.15	± 10%		CKG57KX7R2E474K335JJ		
			± 20%		CKG57KX7R2E474M335JJ		
1 µF	3225	3.35 ± 0.10	± 20%	CKG57NX7R2J474M500JJ			
			± 10%			CKG32KX7R2A105K335AJ	CKG32KX7R1H105K335AJ
	4532	2.90 ± 0.10	± 20%			CKG32KX7R2A105M335AJ	CKG32KX7R1H105M335AJ
			± 10%			CKG45KX7R2A105K290JJ	
		5.00 ± 0.50	± 20%			CKG45KX7R2A105M290JJ	
			± 10%		CKG45NX7R2E105M500JJ		
		3.35 ± 0.15	± 10%		CKG57KX7R2E105K335JJ	CKG57KX7R2A105K335JJ	
			± 20%		CKG57KX7R2E105M335JJ	CKG57KX7R2A105M335JJ	
1.5 µF	4532	2.90 ± 0.10	± 20%				CKG45KX7R1H155K290JJ
			± 10%				CKG45KX7R1H155M290JJ
	3225	3.35 ± 0.10	± 10%			CKG32KX7R2A225K335AJ	
			± 20%			CKG32KX7R2A225M335AJ	
2.2 µF	4532	2.90 ± 0.10	± 10%			CKG45KX7R2A225K290JJ	
			± 20%			CKG45KX7R2A225M290JJ	
		5.00 ± 0.50	± 20%			CKG45NX7R2A225M500JJ	
			± 10%			CKG57KX7R2A225K335JJ	
	5750	3.35 ± 0.15	± 20%			CKG57KX7R2A225M335JJ	
			± 10%		CKG57NX7R2E225M500JJ	CKG57NX7R2A225M500JJ	
3.3 µF	4532	2.90 ± 0.10	± 20%				CKG45KX7R1H335K290JJ
			± 10%				CKG45KX7R1H335M290JJ
	5750	3.35 ± 0.15	± 20%				CKG45NX7R1H335M500JJ
			± 10%			CKG57KX7R2A335K335JJ	
						CKG57KX7R2A335M335JJ	



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X7R (-55 to +125°C, ±15%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc: 100V	Rated Voltage Edc: 50V	Rated Voltage Edc: 25V	Rated Voltage Edc: 16V
4.7 µF	3225	3.35 ± 0.10	± 10%			CKG32KX7R1E475K335AJ	
			± 20%			CKG32KX7R1E475M335AJ	
	4532	2.90 ± 0.10	± 10%			CKG45KX7R1E475K290JJ	
			± 20%			CKG45KX7R1E475M290JJ	
	5750	3.35 ± 0.15	± 20%	CKG45NX7R2A475M500JJ			
			± 10%	CKG57KX7R2A475K335JJ	CKG57KX7R1H475K335JJ		
6.8 µF	4532	5.00 ± 0.50	± 20%	CKG57KX7R2A475M335JJ	CKG57KX7R1H475M335JJ		
			± 20%	CKG57NX7R2A475M500JJ			
10 µF	3225	3.35 ± 0.10	± 10%			CKG32KX7R1E106K335AJ	
			± 20%			CKG32KX7R1E106M335AJ	
	4532	2.90 ± 0.10	± 10%				CKG45KX7R1C106K290JJ
			± 20%				CKG45KX7R1C106M290JJ
	5750	3.35 ± 0.15	± 20%			CKG45NX7R1E106M500JJ	
			± 10%			CKG57KX7R1E106K335JJ	
15 µF	4532	5.00 ± 0.50	± 20%	CKG57KX7R1E106M335JJ			
			± 20%	CKG57NX7R2A106M500JJ	CKG57NX7R1H106M500JJ		
22 µF	5750	3.35 ± 0.15	± 20%				CKG57KX7R1C156M335JJ
			± 20%				CKG45KX7R1C226M290JJ
	4532	2.90 ± 0.10	± 20%				CKG45NX7R1C226M500JJ
			± 20%			CKG57KX7R1E226M335JJ	
33 µF	5750	5.00 ± 0.50	± 20%			CKG57NX7R1E226M500JJ	
			± 20%				CKG57NX7R1C336M500JJ

Class 2 (Temperature Stable)

Temperature Characteristics: X7S (-55 to +125°C, ±22%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc: 100V	Rated Voltage Edc: 50V	Rated Voltage Edc: 25V	Rated Voltage Edc: 16V
3.3 µF	3225	3.35 ± 0.10	± 10%	CKG32KX7S2A335K335AJ			
			± 20%	CKG32KX7S2A335M335AJ			
	4532	2.90 ± 0.10	± 10%	CKG45KX7S2A335K290JJ			
4.7 µF	3225	3.35 ± 0.10	± 20%	CKG45KX7S2A335M290JJ			
			± 10%	CKG32KX7S2A475K335AJ	CKG32KX7S1H475K335AJ		
	4532	2.90 ± 0.10	± 20%	CKG32KX7S2A475M335AJ	CKG32KX7S1H475M335AJ		
			± 10%	CKG45KX7S2A475K290JJ	CKG45KX7S1H475K290JJ		
6.8 µF	4532	5.00 ± 0.50	± 20%	CKG45KX7S2A475M290JJ	CKG45KX7S1H475M290JJ		
			± 10%	CKG32KX7S1H685K335AJ			
	5750	3.35 ± 0.15	± 20%	CKG32KX7S1H685M335AJ			
			± 10%	CKG45NX7S2A685M500JJ			
10 µF	3225	3.35 ± 0.10	± 20%	CKG57KX7S2A685K335JJ			
			± 10%	CKG57KX7S2A685M335JJ			
	4532	5.00 ± 0.50	± 20%	CKG57KX7S2A106K335JJ	CKG57KX7S1H106K335JJ		
			± 10%	CKG45NX7S2A106M500JJ	CKG45NX7S1H106M500JJ		
15 µF	5750	3.35 ± 0.15	± 20%	CKG57KX7S2A106M335JJ	CKG57KX7S1H106M335JJ		
			± 20%	CKG57NX7S2A156M335JJ			
22 µF	4532	2.90 ± 0.10	± 20%				CKG45KX7S1C226M290JJ
			± 20%	CKG57NX7S2A226M500JJ	CKG57NX7S1H226M500JJ		
47 µF	5750	5.00 ± 0.50	± 20%				CKG45NX7S1C476M500JJ
			± 20%			CKG57KX7S1C476M335JJ	
100 µF	5750	5.00 ± 0.50	± 20%			CKG57NX7S1E476M500JJ	
			± 20%				CKG57NX7S1C107M500JJ



Capacitance Range Table

Class 2 (Temperature Stable)

Temperature Characteristics: X7T (-55 to +125°C, +22/-33%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number		
				Rated Voltage Edc: 630V	Rated Voltage Edc: 450V	Rated Voltage Edc: 250V
100 nF	3225	3.35 ± 0.10	± 10%	CKG32KX7T2J104K335AJ		
			± 20%	CKG32KX7T2J104M335AJ		
150 nF	3225	3.35 ± 0.10	± 10%	CKG32KX7T2J154K335AJ		
			± 20%	CKG32KX7T2J154M335AJ		
	4532	2.90 ± 0.10	± 10%	CKG45KX7T2J154K290JJ		
			± 20%	CKG45KX7T2J154M290JJ		
220 nF	3225	3.35 ± 0.10	± 10%		CKG32KX7T2W224K335AJ	
			± 20%		CKG32KX7T2W224M335AJ	
	4532	2.90 ± 0.10	± 10%	CKG45KX7T2J224K290JJ		
			± 20%	CKG45KX7T2J224M290JJ		
330 nF	3225	3.35 ± 0.10	± 10%			CKG32KX7T2E334K335AJ
			± 20%			CKG32KX7T2E334M335AJ
	4532	2.90 ± 0.10	± 10%		CKG45KX7T2W334K290JJ	
			± 20%		CKG45KX7T2W334M290JJ	
	5750	3.35 ± 0.15	± 20%	CKG45NX7T2J334M500JJ		
			± 20%	CKG57KX7T2J334K335JJ		
470 nF	4532	2.90 ± 0.10	± 10%		CKG45KX7T2W474K290JJ	
			± 20%		CKG45KX7T2W474M290JJ	
	5750	3.35 ± 0.15	± 10%	CKG45NX7T2J474M500JJ		
			± 20%	CKG57KX7T2J474K335JJ		
	5750	3.35 ± 0.15	± 20%	CKG57KX7T2J474M335JJ		
			± 20%			
680 nF	4532	2.90 ± 0.10	± 10%			CKG45KX7T2E684K290JJ
			± 20%			CKG45KX7T2E684M290JJ
	5750	3.35 ± 0.15	± 20%		CKG45NX7T2W684M500JJ	
			± 10%		CKG57KX7T2W684K335JJ	
	5750	3.35 ± 0.15	± 20%		CKG57KX7T2W684M335JJ	
			± 20%	CKG57NX7T2J684M500JJ		
1 µF	4532	2.90 ± 0.10	± 10%			CKG45KX7T2E105K290JJ
			± 20%			CKG45KX7T2E105M290JJ
	5750	3.35 ± 0.15	± 20%		CKG45NX7T2W105M500JJ	
			± 10%		CKG57KX7T2W105K335JJ	
	5750	3.35 ± 0.15	± 20%		CKG57KX7T2W105M335JJ	
			± 20%	CKG57NX7T2J105M500JJ		
1.5 µF	4532	5.00 ± 0.50	± 20%			CKG45NX7T2E155M500JJ
			± 10%			CKG57KX7T2E155K335JJ
	5750	3.35 ± 0.15	± 20%			CKG57KX7T2E155M335JJ
			± 20%		CKG57NX7T2W155M500JJ	
2.2 µF	4532	5.00 ± 0.50	± 20%			CKG45NX7T2E225M500JJ
			± 10%			CKG57KX7T2E225K335JJ
	5750	3.35 ± 0.15	± 20%			CKG57KX7T2E225M335JJ
			± 20%		CKG57NX7T2W225M500JJ	
3.3 µF	5750	5.00 ± 0.50	± 20%			
			± 20%			CKG57NX7T2E335M500JJ