

# MULTILAYER CERAMIC CHIP CAPACITORS

Automotive grade, MEGACAP type

## CKG series

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### Single type

CKG32K [3.6x2.6 mm]

CKG45K [5.0x3.5 mm]

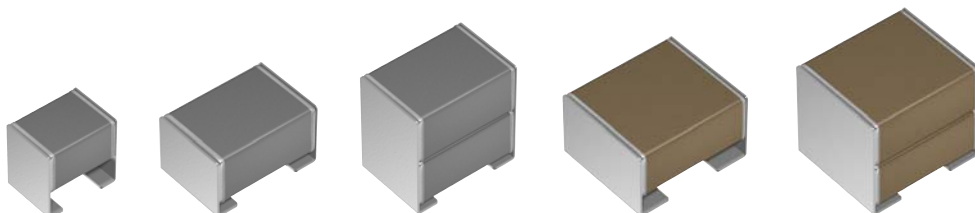
CKG57K [6.0x5.0 mm]

### Stacked type

CKG45N [5.0x3.5 mm]

CKG57N [6.0x5.0 mm]

\* Dimensions are typical values.



# REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

## SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using this products.

 **REMINDERS**

1. The products listed in this specification are intended for use in automotive applications under normal operation and usage conditions. The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality requires a more stringent level of safety or reliability, or whose failure, malfunction or defect could cause serious damage to society, person or property.

Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this specification sheet. If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in this specification, please contact us.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>(1) Aerospace/aviation equipment</li> <li>(2) Transportation equipment (electric trains, ships, etc.)</li> <li>(3) Medical equipment (excepting Pharmaceutical Affairs Law classification Class1,2)</li> <li>(4) Power-generation control equipment</li> <li>(5) Atomic energy-related equipment</li> <li>(6) Seabed equipment</li> <li>(7) Transportation control equipment</li> </ul> | <ul style="list-style-type: none"> <li>(8) Public information-processing equipment</li> <li>(9) Military equipment</li> <li>(10) Electric heating apparatus, burning equipment</li> <li>(11) Disaster prevention/crime prevention equipment</li> <li>(12) Safety equipment</li> <li>(13) Other applications that are not considered general-purpose applications</li> </ul> |
|--|---|

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

In addition, although the products listed in this specification are intended for use in automotive applications as described above, they are not prohibited to use in general electronic equipment, whose performance and/or quality doesn't require a more stringent level of safety or reliability, or whose failure, malfunction or defect could not cause serious damage to society, person or property. Therefore, the description of this caution will be applied, when the products are used in general electronic equipment under a normal operation and usage conditions.

- 2. We may modify products or discontinue production of a product listed in this catalog without prior notification.
- 3. We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.
- 4. If you plan to export a product listed in this catalog, keep in mind that it may be a restricted item according to the "Foreign Exchange and Foreign Trade Control Law". In such cases, it is necessary to acquire export permission in harmony with this law.
- 5. Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
- 6. We are not responsible for problems that occur related to the intellectual property rights or other rights of our company or a third party when you use a product listed in this catalog. We do not grant license of these rights.
- 7. This catalog only applies to products purchased through our company or one of our company's official agencies. This catalog does not apply to products that are purchased through other third parties.

Notice: Effective January 2013, TDK will use a new catalog number which adds product thickness and packaging specification detail. This new catalog number should be referenced on all catalog orders going forward, and is not applicable for OEM part number orders.

Please be aware the last five digits of the catalog number will differ from the item description (internal control number) on the product label.

Contact your local TDK Sales representative for more information.

(Example)

Catalog issued date	Catalog number	Item description (on delivery label)
Prior to January 2013	C1608C0G1E103J(080AA)	C1608C0G1E103JT000N
January 2013 and later	C1608C0G1E103J080AA	C1608C0G1E103JT000N

# CKG series

## MEGACAP type



Type: CKG32K [3.6x2.6 mm], CKG45K [5.0x3.5 mm], CKG57K [6.0x5.0 mm],  
CKG45N [5.0x3.5 mm], CKG57N [6.0x5.0 mm]

### SERIES OVERVIEW

CKG series is a product which metal frames are attached to the terminal electrodes of MLCC. It is also referred to as MEGACAP. Because the metal frame relieves mechanical stress and thermal shock, CKG series is an extremely reliable product. In addition, the stacked type is effective in mounting area reduction because twice capacitance functions by the stacked structure.

### FEATURES

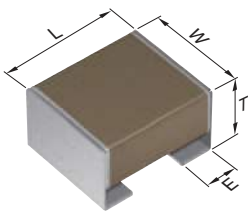
- Metal frames relieve mechanical stress and thermal shock.
- Stacked type has twice the capacitance in the same area.
- COG type having excellent stable temperature and DC-bias characteristics is also available.
- Mounting on aluminum board is possible.
- AEC-Q200 compliant.

### APPLICATIONS

- X7r products: Smoothing and decoupling applications requiring high capacitance
- COG products: LC resonant circuits of OBC and wireless power transfer, etc.

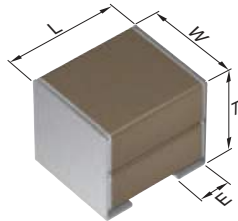
### SHAPE & DIMENSIONS

Single type



L	Product length
W	Product width
T	Product thickness
E	Metal-frame width

Stacked type



L	Product length
W	Product width
T	Product thickness
E	Metal-frame width

Dimensions in mm

Type	L	W	T	E
CKG32K	3.60±0.30	2.60±0.30	3.35±0.10	0.80±0.15
CKG45K	5.00±0.50	3.50±0.50	2.90±0.10	1.10±0.30
CKG57K	6.00±0.50	5.00±0.50	3.35±0.15	1.60±0.30
CKG45N	5.00±0.50	3.50±0.50	5.00±0.50	1.10±0.30
CKG57N	6.00±0.50	5.00±0.50	5.00±0.50	1.60±0.30

\*Dimensional tolerances are typical values.

**CATALOG NUMBER CONSTRUCTION**

<b>CKG</b>	<b>57</b>	<b>N</b>	<b>X7R</b>	<b>1V</b>	<b>107</b>	<b>M</b>	<b>500</b>	<b>J</b>	<b>J</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

## (1) Series

## (2) Dimensions L x W (mm)

Code	Length	Width	Metal-frame width
32	3.60	2.60	0.80
45	5.00	3.50	1.10
57	6.00	5.00	1.60

## (3) Structure

Code	Type
K	Single
N	Stacked

## (4) Temperature characteristics

Temperature characteristics	Temperature coefficient or capacitance change	Temperature range
C0G	0±30ppm/°C	-55 to +125°C
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

## (5) Rated voltage (DC)

Code	Voltage (DC)
1C	16V
1E	25V
1V	35V
1H	50V
2A	100V
2E	250V
2W	450V
2J	630V
3A	1000V

## (6) 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.

(Example)0R5 = 0.5pF

101 = 100pF

225 = 2,200,000pF = 2.2μF

## (7) Capacitance tolerance

Code	Tolerance
J	± 5%
K	± 10%
M	± 20%

## (8) Thickness

Code	Thickness
290	2.90 mm
335	3.35 mm
500	5.00 mm

## (9) Packaging style

Code	Style
A	178mm reel, 4mm pitch
J	330mm reel, 8mm pitch


## (10) Special reserved code


Code	Description
J	MEGACAP (with metal frame)

## Capacitance range chart

## CKG32K [3.6x2.6 mm], Single type

Capacitance		COG				
(pF)	Code	3A (1kV)	2J (630V)	2W (450V)	2E (250V)	2A (100V)
1,000	102					
1,200	122					
1,500	152					
1,800	182					
2,200	222					
2,700	272					
3,300	332					
3,900	392					
4,700	472					
5,600	562					
6,800	682					
8,200	822					
10,000	103					
15,000	153					
22,000	223					
33,000	333					
47,000	473					
68,000	683					

Standard thickness  3.35 mm


 Background gray: These products are not recommended for new designs.

■ For details such as the catalog numbers, please refer to the capacitance range table on page 8 and after.

## Capacitance range chart

## CKG45K [5.0x3.5 mm], Single type

Capacitance		COG		
(pF)	Code	2J (630V)	2W (450V)	2E (250V)
33,000	333			
47,000	473			
68,000	683			


Standard thickness  2.90 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 8 and after.

## Capacitance range chart

## CKG57K [6.0x5.0 mm], Single type

Capacitance		C0G		X7R						X7S			X7T			
(pF)	Code	2J (630V)	2E (250V)	2J (630V)	2E (250V)	2A (100V)	1H (50V)	1V (35V)	1E (25V)	1C (16V)	2A (100V)	1H (50V)	1C (16V)	2J (630V)	2W (450V)	2E (250V)
68,000	683	■														
150,000	154		■													
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					■	■									
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

■ For details such as the catalog numbers, please refer to the capacitance range table on page 8 and after.

## Capacitance range chart

## CKG45N [5.0x3.5 mm], Stacked type

Capacitance		C0G		
(pF)	Code	2J (630V)	2W (450V)	2E (250V)
66,000	663	■		
94,000	943		■	
140,000	144			■

Standard thickness  5.00 mm

■ For details such as the catalog numbers, please refer to the capacitance range table on page 8 and after.

## Capacitance range chart


## CKG57N [6.0x5.0 mm], Stacked type

Capacitance		C0G		X5R				X7R						
(pF)	Code	2J (630V)	2E (250V)	2A (100V)	1H (50V)	1E (25V)	1C (16V)	2J (630V)	2E (250V)	2A (100V)	1H (50V)	1V (35V)	1E (25V)	1C (16V)
140,000	144	■												
300,000	304		■											
470,000	474							■						
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		X7S				X7T		
(pF)	Code	2A (100V)	1H (50V)	1E (25V)	1C (16V)	2J (630V)	2W (450V)	2E (250V)
680,000	684					■		
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

 Background gray: This product is not recommended for new designs.

 For details such as the catalog numbers, please refer to the capacitance range table on page 8 and after.

## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: C0G (–55 to +125°C, 0±30ppm/°C)

Capacitance	Dimensions (mm)	Thickness (mm)	Capacitance tolerance	Catalog number				
				Rated voltage Edc: 1kV	Rated voltage Edc: 630V	Rated voltage Edc: 450V	Rated voltage Edc: 250V	Rated voltage Edc: 100V
1nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A102J335AJ</a>				
1.2nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A122J335AJ</a>				
1.5nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A152J335AJ</a>				
1.8nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A182J335AJ</a>				
2.2nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A222J335AJ</a>				
2.7nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A272J335AJ</a>				
3.3nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A332J335AJ</a>				
3.9nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A392J335AJ</a>				
4.7nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A472J335AJ</a>				
5.6nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A562J335AJ</a>				
6.8nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A682J335AJ</a>				
8.2nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A822J335AJ</a>				
10nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A103J335AJ</a>				
15nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A153J335AJ</a>				
22nF	3.6x2.6	3.35±0.10	±5%	<a href="#">CKG32KC0G3A223J335AJ</a>	<a href="#">CKG32KC0G2J223J335AJ</a>	<a href="#">CKG32KC0G2W223J335AJ</a>		
33nF	3.6x2.6	3.35±0.10	±5%		<a href="#">CKG32KC0G2J333J335AJ</a>	<a href="#">CKG32KC0G2W333J335AJ</a>	<a href="#">CKG32KC0G2E333J335AJ</a>	
	5.0x3.5	2.90±0.10	±5%		<a href="#">CKG45KC0G2J333J290JJ</a>			
47nF	3.6x2.6	3.35±0.10	±5%				<a href="#">CKG32KC0G2E473J335AJ</a>	
	5.0x3.5	2.90±0.10	±5%			<a href="#">CKG45KC0G2W473J290JJ</a>		
66nF	5.0x3.5	5.00±0.50	±5%		<a href="#">CKG45NC0G2J663J500JJ</a>			
68nF	3.6x2.6	3.35±0.10	±5%					<a href="#">CKG32KC0G2A683J335AJ</a>
	5.0x3.5	2.90±0.10	±5%				<a href="#">CKG45KC0G2E683J290JJ</a>	
94nF	6.0x5.0	3.35±0.15	±5%		<a href="#">CKG57KC0G2J683J335JJ</a>			
	5.0x3.5	5.00±0.50	±5%			<a href="#">CKG45NC0G2W943J500JJ</a>		
140nF	5.0x3.5	5.00±0.50	±10%				<a href="#">CKG45NC0G2E144K500JJ</a>	
	6.0x5.0	5.00±0.50	±10%		<a href="#">CKG57NC0G2J144K500JJ</a>			
150nF	6.0x5.0	3.35±0.15	±5%				<a href="#">CKG57KC0G2E154J335JJ</a>	
300nF	6.0x5.0	5.00±0.50	±5%				<a href="#">CKG57NC0G2E304J500JJ</a>	

■ Gray items: These products are not recommended for new designs.  
Click the part numbers for details.

## Capacitance range table

Temperature characteristic: X5R (–55 to +85°C, ±15%)

Capacitance	Dimensions (mm)	Thickness (mm)	Capacitance tolerance	Catalog number			
				Rated voltage Edc: 100V	Rated voltage Edc: 50V	Rated voltage Edc: 25V	Rated voltage Edc: 16V
10µF	6.0x5.0	5.00±0.50	±20%	<a href="#">CKG57NX5R2A106M500JJ</a>			
22µF	6.0x5.0	5.00±0.50	±20%		<a href="#">CKG57NX5R1H226M500JJ</a>		
47µF	6.0x5.0	5.00±0.50	±20%			<a href="#">CKG57NX5R1E476M500JJ</a>	
100µF	6.0x5.0	5.00±0.50	±20%				<a href="#">CKG57NX5R1C107M500JJ</a>

■ Gray item: This product is not recommended for new designs.  
Click the part numbers for details.



## MULTILAYER CERAMIC CHIP CAPACITORS



## Capacitance range table

Temperature characteristic: X7R (–55 to +125°C, ±15%)

Capacitance	Dimensions (mm)	Thickness (mm)	Capacitance tolerance	Catalog number		
				Rated voltage Edc: 630V	Rated voltage Edc: 250V	Rated voltage Edc: 100V
220nF	6.0x5.0	3.35±0.15	±10%	<a href="#">CKG57KX7R2J224K335JJ</a>		
			±20%	<a href="#">CKG57KX7R2J224M335JJ</a>		
470nF	6.0x5.0	3.35±0.15	±10%		<a href="#">CKG57KX7R2E474K335JJ</a>	
			±20%		<a href="#">CKG57KX7R2E474M335JJ</a>	
		5.00±0.50	±20%	<a href="#">CKG57NX7R2J474M500JJ</a>		
1µF	6.0x5.0	3.35±0.15	±10%		<a href="#">CKG57KX7R2E105K335JJ</a>	<a href="#">CKG57KX7R2A105K335JJ</a>
			±20%		<a href="#">CKG57KX7R2E105M335JJ</a>	<a href="#">CKG57KX7R2A105M335JJ</a>
		5.00±0.50	±20%		<a href="#">CKG57NX7R2E105M500JJ</a>	
2.2µF	6.0x5.0	3.35±0.15	±10%			<a href="#">CKG57KX7R2A225K335JJ</a>
			±20%			<a href="#">CKG57KX7R2A225M335JJ</a>
		5.00±0.50	±20%		<a href="#">CKG57NX7R2E225M500JJ</a>	<a href="#">CKG57NX7R2A225M500JJ</a>
3.3µF	6.0x5.0	3.35±0.15	±10%			<a href="#">CKG57KX7R2A335K335JJ</a>
			±20%			<a href="#">CKG57KX7R2A335M335JJ</a>
4.7µF	6.0x5.0	3.35±0.15	±10%			<a href="#">CKG57KX7R2A475K335JJ</a>
			±20%			<a href="#">CKG57KX7R2A475M335JJ</a>
		5.00±0.50	±20%			<a href="#">CKG57NX7R2A475M500JJ</a>
10µF	6.0x5.0	5.00±0.50	±20%			<a href="#">CKG57NX7R2A106M500JJ</a>

Click the part numbers for details.

Capacitance	Dimensions (mm)	Thickness (mm)	Capacitance tolerance	Catalog number			
				Rated voltage Edc: 50V	Rated voltage Edc: 35V	Rated voltage Edc: 25V	Rated voltage Edc: 16V
4.7µF	6.0x5.0	3.35±0.15	±10%	<a href="#">CKG57KX7R1H475K335JJ</a>			
			±20%	<a href="#">CKG57KX7R1H475M335JJ</a>			
10µF	6.0x5.0	3.35±0.15	±10%			<a href="#">CKG57KX7R1E106K335JJ</a>	
			±20%			<a href="#">CKG57KX7R1E106M335JJ</a>	
		5.00±0.50	±20%	<a href="#">CKG57NX7R1H106M500JJ</a>			
15µF	6.0x5.0	3.35±0.15	±20%				<a href="#">CKG57KX7R1C156M335JJ</a>
22µF	6.0x5.0	3.35±0.15	±20%	<a href="#">CKG57KX7R1H226M335JJ</a>		<a href="#">CKG57KX7R1E226M335JJ</a>	
			±20%			<a href="#">CKG57NX7R1E226M500JJ</a>	
33µF	6.0x5.0	5.00±0.50	±20%				<a href="#">CKG57NX7R1C336M500JJ</a>
47µF	6.0x5.0	3.35±0.15	±20%		<a href="#">CKG57KX7R1V476M335JJ</a>	<a href="#">CKG57KX7R1E476M335JJ</a>	
			±20%	<a href="#">CKG57NX7R1H476M500JJ</a>			
100µF	6.0x5.0	5.00±0.50	±20%		<a href="#">CKG57NX7R1V107M500JJ</a>	<a href="#">CKG57NX7R1E107M500JJ</a>	

Click the part numbers for details.

## Capacitance range table

Temperature characteristic: X7S (–55 to +125°C, ±22%)

Capacitance	Dimensions (mm)	Thickness (mm)	Capacitance tolerance	Catalog number			
				Rated voltage Edc: 100V	Rated voltage Edc: 50V	Rated voltage Edc: 25V	Rated voltage Edc: 16V
6.8µF	6.0x5.0	3.35±0.15	±10%	<a href="#">CKG57KX7S2A685K335JJ</a>			
			±20%	<a href="#">CKG57KX7S2A685M335JJ</a>			
10µF	6.0x5.0	3.35±0.15	±10%	<a href="#">CKG57KX7S2A106K335JJ</a>	<a href="#">CKG57KX7S1H106K335JJ</a>		
			±20%	<a href="#">CKG57KX7S2A106M335JJ</a>	<a href="#">CKG57KX7S1H106M335JJ</a>		
15µF	6.0x5.0	3.35±0.15	±20%	<a href="#">CKG57KX7S2A156M335JJ</a>			
22µF	6.0x5.0	5.00±0.50	±20%	<a href="#">CKG57NX7S2A226M500JJ</a>	<a href="#">CKG57NX7S1H226M500JJ</a>		
47µF	6.0x5.0	3.35±0.15	±20%				<a href="#">CKG57KX7S1C476M335JJ</a>
			±20%			<a href="#">CKG57NX7S1E476M500JJ</a>	
100µF	6.0x5.0	5.00±0.50	±20%				<a href="#">CKG57NX7S1C107M500JJ</a>

Click the part numbers for details.

⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use.  
Please note that the contents may change without any prior notice due to reasons such as upgrading.

## Capacitance range table

Temperature characteristic: X7T (–55 to +125°C, +22, –33%)

Capacitance	Dimensions (mm)	Thickness (mm)	Capacitance tolerance	Catalog number		
				Rated voltage Edc: 630V	Rated voltage Edc: 450V	Rated voltage Edc: 250V
330nF	6.0x5.0	3.35±0.15	±10%	<a href="#">CKG57KX7T2J334K335JJ</a>		
			±20%	<a href="#">CKG57KX7T2J334M335JJ</a>		
470nF	6.0x5.0	3.35±0.15	±10%	<a href="#">CKG57KX7T2J474K335JJ</a>		
			±20%	<a href="#">CKG57KX7T2J474M335JJ</a>		
680nF	6.0x5.0	3.35±0.15	±10%		<a href="#">CKG57KX7T2W684K335JJ</a>	
			±20%		<a href="#">CKG57KX7T2W684M335JJ</a>	
		5.00±0.50	±20%	<a href="#">CKG57NX7T2J684M500JJ</a>		
1μF	6.0x5.0	3.35±0.15	±10%		<a href="#">CKG57KX7T2W105K335JJ</a>	
			±20%		<a href="#">CKG57KX7T2W105M335JJ</a>	
		5.00±0.50	±20%	<a href="#">CKG57NX7T2J105M500JJ</a>		
1.5μF	6.0x5.0	3.35±0.15	±10%			<a href="#">CKG57KX7T2E155K335JJ</a>
			±20%			<a href="#">CKG57KX7T2E155M335JJ</a>
		5.00±0.50	±20%		<a href="#">CKG57NX7T2W155M500JJ</a>	
2.2μF	6.0x5.0	3.35±0.15	±10%			<a href="#">CKG57KX7T2E225K335JJ</a>
			±20%			<a href="#">CKG57KX7T2E225M335JJ</a>
		5.00±0.50	±20%		<a href="#">CKG57NX7T2W225M500JJ</a>	
3.3μF	6.0x5.0	5.00±0.50	±20%			<a href="#">CKG57NX7T2E335M500JJ</a>

Click the part numbers for details.