



MULTILAYER CERAMIC CHIP CAPACITORS

CKG Series Commercial Grade MEGACAP Type

Type:

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

Issue date:
Oct 2015



REMINDERS

Please read before using this product

SAFETY REMINDERS



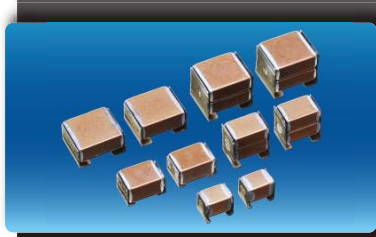
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(Example)

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



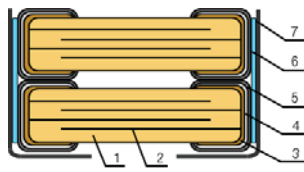
- Adopts a double-stacked structure that realizes twice as much capacitance as that of the existing products without changing the capacitor footprint.
- Lower ESR and ESL than Al caps.
- Capable of absorbing thermal and mechanical stress.
- Improved vibration performance.

Applications



- Smoothing circuits
- DC-DC converters
- LED, HID applications
- Temperature variable applications
- Piezoelectric-effect countermeasure

Design Structure

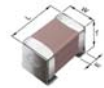


No.	NAME	MATERIAL	
		Class 1	Class 2
(1)	Ceramic Dielectric	CaZrO ₃	BaTiO ₃
(2)	Internal Electrode	Nickel (Ni)	
(3)	Termination	Copper (Cu)	
(4)		Nickel (Ni)	
(5)	Metal Cap Joint	Tin (Sn)	
(6)	Metal Cap	High Temp Solder	
(7)	Metal Cap	42 Alloy	

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 • H

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	Temperature Coefficient or Capacitance Change	Temperature Range
COG	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

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. 105 = 1,000,000pF = 1,000nF = 1μF; 107 = 100,000,000pF = 100,000nF = 100μF

Capacitance Tolerance

Code	Tolerance
J	± 5%
K	± 10%
M	± 20%

Nominal Thickness

Code	Thickness
290	2.90mm
335	3.35mm
500	5.00mm

Packaging Style

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

Special Reserved Code

Code	Description
H	MEGACAP (Std)



Capacitance Range Chart

CKG32K [EIA CC1210]

Capacitance Range Chart

Temperature Characteristics: C0G ($0 \pm 30\text{ppm}/^\circ\text{C}$), X7R ($\pm 15\%$), X7S ($\pm 22\%$), X7T ($+ 22/-33\%$)
 Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A), 50V (1H), 25V (1E)

Capacitance (pF)	Code	Tolerance	C0G				X7R					X7S		X7T			
			2J (630V)	2W (450V)	2E (250V)	2A (100V)	2J (630V)	2E (250V)	2A (100V)	1H (50V)	1E (25V)	2A (100V)	1H (50V)	2J (630V)	2W (450V)	2E (250V)	
22,000	223	C0G ; J : $\pm 5\%$	■	■													
33,000	333																
47,000	473				■		■										
68,000	683							■									
100,000	104	X7R, X7S X7T ; K : $\pm 10\%$ 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 : $\pm 10\%$ M : $\pm 20\%$	■													
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											■				
10,000,000	106												■			
22,000,000	226	M : $\pm 20\%$														

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	M: $\pm 20\%$												
22,000,000	226													
47,000,000	476													

Standard Thickness

■ 3.35 mm



Capacitance Range Chart

CKG45N [EIA CC1812]

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					
			1H (50V)	1C (16V)	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			■				
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)	1E (25V)
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 1 (Temperature Compensating)

Temperature Characteristics: C0G (-55 to +125°C, ± 30ppm/°C)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc: 630V	Rated Voltage Edc: 450V	Rated Voltage Edc: 250V	Rated Voltage Edc: 100V
22nF	3225	3.35 ± 0.10	± 5%	CKG32KC0G2J223J335AH	CKG32KC0G2W223J335AH		
33nF	3225	3.35 ± 0.10	± 5%	CKG32KC0G2J333J335AH	CKG32KC0G2W333J335AH	CKG32KC0G2E333J335AH	
47nF	3225	3.35 ± 0.10	± 5%			CKG32KC0G2E473J335AH	
68nF	3225	3.35 ± 0.10	± 5%				CKG32KC0G2A683J335AH

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	4532	5.00 ± 0.50	± 20%		CKG45NX5R1H106M500JH		
	5750	5.00 ± 0.50	± 20%	CKG57NX5R2A106M500JH			
22 µF	5750	5.00 ± 0.50	± 20%		CKG57NX5R1H226M500JH		
47 µF	4532	5.00 ± 0.50	± 20%				CKG45NX5R1C476M500JH
	5750	5.00 ± 0.50	± 20%			CKG57NX5R1E476M500JH	
100 µF	5750	5.00 ± 0.50	± 20%				CKG57NX5R1C107M500JH

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%	CKG32KX7R2J473K335AH			
			± 20%	CKG32KX7R2J473M335AH			
100 nF	3225	3.35 ± 0.10	± 10%		CKG32KX7R2E104K335AH		
			± 20%		CKG32KX7R2E104M335AH		
	4532	2.90 ± 0.10	± 10%	CKG45KX7R2J104K290JH			
			± 20%	CKG45KX7R2J104M290JH			
220 nF	3225	3.35 ± 0.10	± 10%		CKG32KX7R2E224K335AH		
			± 20%		CKG32KX7R2E224M335AH		
	4532	2.90 ± 0.10	± 10%		CKG45KX7R2E224K290JH		
			± 20%		CKG45KX7R2E224M290JH		
5750	3.35 ± 0.15	± 20%	CKG45NX7R2J224M500JH				
		± 10%	CKG57KX7R2J224K335JH				
5750	3.35 ± 0.15	± 20%	CKG57KX7R2J224M335JH				
		± 10%			CKG32KX7R2A474K335AH		
470 nF	3225	3.35 ± 0.10	± 20%			CKG32KX7R2A474M335AH	
			± 10%		CKG45KX7R2E474K290JH		
	4532	2.90 ± 0.10	± 20%		CKG45KX7R2E474M290JH		
			± 10%		CKG45NX7R2E474M500JH		
	5750	3.35 ± 0.15	± 10%		CKG57KX7R2E474K335JH		
			± 20%		CKG57KX7R2E474M335JH		
5750	3.35 ± 0.15	± 20%	CKG57NX7R2J474M500JH				
1 µF	3225	3.35 ± 0.10	± 10%			CKG32KX7R2A105K335AH	CKG32KX7R1H105K335AH
			± 20%		CKG32KX7R2A105M335AH	CKG32KX7R1H105M335AH	
	4532	2.90 ± 0.10	± 10%			CKG45KX7R2A105K290JH	
			± 20%		CKG45KX7R2A105M290JH		
	5750	3.35 ± 0.15	± 10%		CKG45NX7R2E105M500JH		
			± 20%		CKG57KX7R2E105K335JH	CKG57KX7R2A105K335JH	
5750	3.35 ± 0.15	± 20%	CKG57KX7R2E105M335JH	CKG57KX7R2A105M335JH			
5750	3.35 ± 0.15	± 20%	CKG57NX7R2E105M500JH				
1.5 µF	4532	2.90 ± 0.10	± 10%				CKG45KX7R1H155K290JH
			± 20%				CKG45KX7R1H155M290JH
2.2 µF	3225	3.35 ± 0.10	± 10%			CKG32KX7R2A225K335AH	
			± 20%		CKG32KX7R2A225M335AH		
	4532	2.90 ± 0.10	± 10%		CKG45KX7R2A225K290JH		
			± 20%		CKG45KX7R2A225M290JH		
	5750	3.35 ± 0.15	± 10%		CKG45NX7R2A225M500JH		
			± 20%		CKG57KX7R2A225K335JH		
5750	3.35 ± 0.15	± 20%	CKG57KX7R2A225M335JH				
5750	3.35 ± 0.15	± 20%	CKG57NX7R2E225M500JH	CKG57NX7R2A225M500JH			



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
3.3 μ F	4532	2.90 \pm 0.10	\pm 10%		CKG45KX7R1H335K290JH		
			\pm 20%		CKG45KX7R1H335M290JH		
	5.00 \pm 0.50	\pm 20%		CKG45NX7R1H335M500JH			
		\pm 10%	CKG57KX7R2A335K335JH				
5750	3.35 \pm 0.15	3.35 \pm 0.15	\pm 20%	CKG57KX7R2A335M335JH			
			\pm 10%				
4.7 μ F	3225	3.35 \pm 0.10	\pm 10%			CKG32KX7R1E475K335AH	
			\pm 20%			CKG32KX7R1E475M335AH	
	4532	2.90 \pm 0.10	\pm 10%			CKG45KX7R1E475K290JH	
			\pm 20%			CKG45KX7R1E475M290JH	
	5.00 \pm 0.50	\pm 20%	CKG45NX7R2A475M500JH				
		\pm 10%	CKG57KX7R2A475K335JH	CKG57KX7R1H475K335JH			
5750	3.35 \pm 0.15	3.35 \pm 0.15	\pm 20%	CKG57KX7R2A475M335JH	CKG57KX7R1H475M335JH		
			\pm 10%	CKG57NX7R2A475M500JH			
6.8 μ F	4532	5.00 \pm 0.50	\pm 20%		CKG45NX7R1H685M500JH		
			\pm 10%				
10 μ F	3225	3.35 \pm 0.10	\pm 10%			CKG32KX7R1E106K335AH	
			\pm 20%			CKG32KX7R1E106M335AH	
	4532	2.90 \pm 0.10	\pm 10%			CKG45KX7R1C106K290JH	
			\pm 20%			CKG45KX7R1C106M290JH	
5.00 \pm 0.50	\pm 20%			CKG45NX7R1E106M500JH			
	\pm 10%	CKG57KX7R1E106K335JH					
5750	3.35 \pm 0.15	3.35 \pm 0.15	\pm 20%	CKG57KX7R1E106M335JH			
			\pm 10%	CKG57NX7R2A106M500JH	CKG57NX7R1H106M500JH		
15 μ F	5750	3.35 \pm 0.15	\pm 20%			CKG57KX7R1C156M335JH	
			\pm 10%			CKG45KX7R1C226M290JH	
22 μ F	4532	2.90 \pm 0.10	\pm 20%			CKG45NX7R1C226M500JH	
			\pm 10%				
	5.00 \pm 0.50	\pm 20%			CKG57KX7R1E226M335JH		
		\pm 10%			CKG57NX7R1E226M500JH		
5750	3.35 \pm 0.15	3.35 \pm 0.15	\pm 20%				
			\pm 10%				
33 μ F	5750	5.00 \pm 0.50	\pm 20%			CKG57NX7R1C336M500JH	
			\pm 10%				

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 μ F	3225	3.35 \pm 0.10	\pm 10%	CKG32KX7S2A335K335AH			
			\pm 20%	CKG32KX7S2A335M335AH			
	4532	2.90 \pm 0.10	\pm 10%	CKG45KX7S2A335K290JH			
			\pm 20%	CKG45KX7S2A335M290JH			
4.7 μ F	3225	3.35 \pm 0.10	\pm 10%	CKG32KX7S2A475K335AH	CKG32KX7S1H475K335AH		
			\pm 20%	CKG32KX7S2A475M335AH	CKG32KX7S1H475M335AH		
	4532	2.90 \pm 0.10	\pm 10%	CKG45KX7S2A475K290JH	CKG45KX7S1H475K290JH		
			\pm 20%	CKG45KX7S2A475M290JH	CKG45KX7S1H475M290JH		
6.8 μ F	3225	3.35 \pm 0.10	\pm 10%		CKG32KX7S1H685K335AH		
			\pm 20%		CKG32KX7S1H685M335AH		
	4532	5.00 \pm 0.50	\pm 20%	CKG45NX7S2A685M500JH			
			\pm 10%	CKG57KX7S2A685K335JH			
5750	3.35 \pm 0.15	3.35 \pm 0.15	\pm 20%	CKG57KX7S2A685M335JH			
			\pm 10%				
10 μ F	3225	3.35 \pm 0.10	\pm 10%		CKG32KX7S1H106K335AH		
			\pm 20%		CKG32KX7S1H106M335AH		
	4532	5.00 \pm 0.50	\pm 20%	CKG45NX7S2A106M500JH	CKG45NX7S1H106M500JH		
			\pm 10%	CKG57KX7S2A106K335JH	CKG57KX7S1H106K335JH		
5750	3.35 \pm 0.15	3.35 \pm 0.15	\pm 20%	CKG57KX7S2A106M335JH	CKG57KX7S1H106M335JH		
			\pm 10%				
15 μ F	5750	3.35 \pm 0.15	\pm 20%	CKG57KX7S2A156M335JH			
			\pm 10%				
22 μ F	4532	5.00 \pm 0.50	\pm 20%			CKG45KX7S1C226M290JH	
			\pm 10%				
47 μ F	5750	3.35 \pm 0.15	\pm 20%			CKG45NX7S1C476M500JH	
			\pm 10%			CKG57KX7S1C476M335JH	
	5.00 \pm 0.50	\pm 20%			CKG57NX7S1E476M500JH		
		\pm 10%					
100 μ F	5750	5.00 \pm 0.50	\pm 20%			CKG57NX7S1C107M500JH	
			\pm 10%				



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%	CKG32KX7T2J104K335AH		
			± 20%	CKG32KX7T2J104M335AH		
150 nF	3225	3.35 ± 0.10	± 10%	CKG32KX7T2J154K335AH		
			± 20%	CKG32KX7T2J154M335AH		
	4532	2.90 ± 0.10	± 10%	CKG45KX7T2J154K290JH		
			± 20%	CKG45KX7T2J154M290JH		
220 nF	3225	3.35 ± 0.10	± 10%	CKG32KX7T2W224K335AH		
			± 20%	CKG32KX7T2W224M335AH		
	4532	2.90 ± 0.10	± 10%	CKG45KX7T2J224K290JH		
			± 20%	CKG45KX7T2J224M290JH		
330 nF	3225	3.35 ± 0.10	± 10%	CKG32KX7T2E334K335AH		
			± 20%	CKG32KX7T2E334M335AH		
	4532	2.90 ± 0.10	± 10%	CKG45KX7T2W334K290JH		
			± 20%	CKG45KX7T2W334M290JH		
	5750	3.35 ± 0.15	± 10%	CKG45NX7T2J334M500JH		
			± 20%	CKG57KX7T2J334K335JH		
5750	3.35 ± 0.15	± 20%	CKG57KX7T2J334M335JH			
		± 10%	CKG45KX7T2W474K290JH			
470 nF	4532	2.90 ± 0.10	± 20%	CKG45KX7T2W474M290JH		
			± 10%	CKG45NX7T2J474M500JH		
	5750	3.35 ± 0.15	± 10%	CKG57KX7T2J474K335JH		
			± 20%	CKG57KX7T2J474M335JH		
680 nF	4532	2.90 ± 0.10	± 10%	CKG45KX7T2E684K290JH		
			± 20%	CKG45KX7T2E684M290JH		
	5750	3.35 ± 0.15	± 10%	CKG45NX7T2W684M500JH		
			± 20%	CKG57KX7T2W684K335JH		
	5750	3.35 ± 0.15	± 20%	CKG57KX7T2W684M335JH		
			± 10%	CKG57NX7T2J684M500JH		
1 µF	4532	2.90 ± 0.10	± 10%	CKG45KX7T2E105K290JH		
			± 20%	CKG45KX7T2E105M290JH		
	5750	3.35 ± 0.15	± 10%	CKG45NX7T2W105M500JH		
			± 20%	CKG57KX7T2W105K335JH		
1.5 µF	5750	3.35 ± 0.15	± 20%	CKG57KX7T2W105M335JH		
			± 10%	CKG57NX7T2W155M500JH		
	4532	5.00 ± 0.50	± 20%	CKG45NX7T2E155M500JH		
			± 10%	CKG57KX7T2E155K335JH		
2.2 µF	5750	3.35 ± 0.15	± 20%	CKG57KX7T2E155M335JH		
			± 10%	CKG45NX7T2E225M500JH		
	4532	5.00 ± 0.50	± 20%	CKG57KX7T2E225K335JH		
			± 10%	CKG57KX7T2E225M335JH		
3.3 µF	5750	5.00 ± 0.50	± 20%	CKG57NX7T2W225M500JH		
			± 10%	CKG57NX7T2E335M500JH		