



## MULTILAYER CERAMIC CHIP CAPACITORS

### **CGB Series Commercial Grade Low Profile**

Type:

CGB1 [EIA CC0201]  
CGB2 [EIA CC0402]  
CGB3 [EIA CC0603]  
CGB4 [EIA CC0805]

Issue date:  
Apr 2015



## REMINDERS

Please read before using this product

### SAFETY REMINDERS



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(Example)

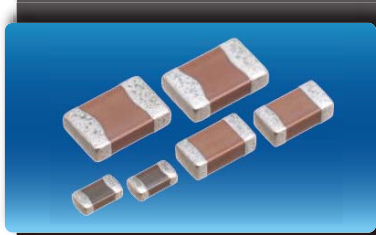
Catalog Issued date	Catalog Number	Item Description (On Delivery Label)
Prior to January 2013	C1608C0G1E103J	C1608C0G1E103JT000N
January 2013 and Later	C1608C0G1E103J080AA	C1608C0G1E103JT000N



## CGB Series

### Low Profile

Type: CGB1 [EIA CC0201], CGB2 [EIA CC0402], CGB3 [EIA CC0603], CGB4 [EIA CC0805]



#### Features



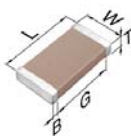
- Available in four sizes (0201, 0402, 0603, 0805) and as thin as 0.22mm.
- Capacitance offering from 0.1  $\mu$ F and up to 10 $\mu$ F.
- Ideal for height-restricted applications such as mobile phone.

#### Applications



- Smart Phone
- LCD modules
- Height restricted applications

#### Shape & Dimensions



L Body Length  
W Body Width  
T Body Height  
B Terminal Width  
G Terminal Spacing



#### Catalog Number Construction

**CGB • 3 • C • 1 • X5R • 0J • 106 • M • 065 • A • C**

#### Series Name

#### Dimensions L x W (mm)

Code	Length	Width	Terminal
1	0.60 $\pm$ 0.03	0.30 $\pm$ 0.03	0.10 min.
2	1.00 $\pm$ 0.05	0.50 $\pm$ 0.05	0.10 min.
3	1.60 $\pm$ 0.10	0.80 $\pm$ 0.10	0.20 min.
4	2.00 $\pm$ 0.20	1.25 $\pm$ 0.20	0.20 min.

#### Thickness T Code (mm)

Code	Thickness
T	0.22 mm max.
A	0.33 mm max.
S	0.50 mm max.
B	0.55 mm max.
C	0.65 mm max.

#### Voltage Condition for Life Test

Symbol	Condition
1	1 x R.V.
3	1.5 x R.V.

#### Temperature Characteristics

Temperature Characteristics	Capacitance Change	Temperature Range	Rated Voltage (DC) Code	Voltage (DC)
JB	$\pm$ 10%	-25 to +85°C	0G	4.0V
X5R	$\pm$ 15%	-55 to +85°C	0J	6.3V
X6S	$\pm$ 22%	-55 to +105°C	1A	10V
X7R	$\pm$ 15%	-55 to +125°C	1C	16V
X7S	$\pm$ 22%	55 to +125°C	1E	25V

#### 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 = 1 $\mu$ F

#### Capacitance Tolerance

Code	Tolerance
K	$\pm$ 10%
M	$\pm$ 20%

#### Nominal Thickness

Code	Thickness
022	0.22 mm max.
033	0.33 mm max.
050	0.50 mm max.
055	0.55 mm max.
065	0.65 mm max.

#### Packaging Style

Code	Style
A	178 mm Reel, 4 mm Pitch
B	178 mm Reel, 2 mm Pitch

#### Special Reserved Code

Code	Description
B, C	TDK Internal Code



## Capacitance Range Chart

## CGB1(0603) [EIA CC0201]

### Capacitance Range Chart

Temperature Characteristics: X5R ( $\pm 15\%$ ), X6S ( $\pm 22\%$ )  
 Rated Voltage: 6.3V (0J), 4V (0G)

Capacitance (pF)	Code	Tolerance	X5R	X6S
			0J (6.3V)	0G (4V)
100,000	104	M : $\pm 20\%$		

Standard Thickness 0.22 mm



## Capacitance Range Chart

## CGB2(1005) [EIA CC0402]

### Capacitance Range Chart

Temperature Characteristics: JB ( $\pm 10\%$ ), X5R ( $\pm 15\%$ ), X6S ( $\pm 22\%$ ), X7S ( $\pm 22\%$ )  
 Rated Voltage: 25V (1E), 16V (1C), 10V (1A), 6.3V (0J), 4V (0G)

Capacitance (pF)	Code	Tolerance	JB					X5R						
			1E (25V)	1C (16V)	1A (10V)	0J (6.3V)	0G (4V)	1E (25V)	1C (16V)	1A (10V)	0J (6.3V)	0G (4V)		
220,000	224	K : $\pm 10\%$												
470,000	474	M : $\pm 20\%$												
1,000,000	105													
2,200,000	225													

Capacitance (pF)	Code	Tolerance	X6S			X7S	
			1A (10V)	0J (6.3V)	0G (4V)	0J (6.3V)	0G (4V)
220,000	224	K : $\pm 10\%$					
470,000	474	M : $\pm 20\%$					
1,000,000	105						

Standard Thickness 0.22 mm max.  
 0.33 mm max.



## Capacitance Range Chart

## CGB3(1608) [EIA CC0603]

### Capacitance Range Chart

Temperature Characteristics: JB ( $\pm 10\%$ ), X5R ( $\pm 15\%$ ), X6S ( $\pm 22\%$ ), X7R ( $\pm 15\%$ ), X7S ( $\pm 22\%$ )  
 Rated Voltage: 25V (1E), 16V (1C), 10V (1A), 6.3V (0J), 4V (0G)

Capacitance (pF)	Code	Tolerance	JB					X5R						
			1E (25V)	1C (16V)	1A (10V)	0J (6.3V)	0G (4V)	1E (25V)	1C (16V)	1A (10V)	0J (6.3V)	0G (4V)		
470,000	474	K : $\pm 10\%$												
1,000,000	105	M : $\pm 20\%$												
2,200,000	225													
4,700,000	475													
10,000,000	106													

Capacitance (pF)	Code	Tolerance	X6S				X7R		X7S
			1C (16V)	1A (10V)	0J (6.3V)	0G (4V)	1A (10V)	0J (6.3V)	0G (4V)
1,000,000	105	K : $\pm 10\%$							
2,200,000	225	M : $\pm 20\%$							
4,700,000	475								

Standard Thickness 0.50 mm max.  
 0.55 mm max.



## Capacitance Range Chart

## CGB4(2012) [EIA CC0805]

### Capacitance Range Chart

Temperature Characteristics: JB ( $\pm 10\%$ ), X5R ( $\pm 15\%$ ), X6S ( $\pm 22\%$ ), X7R ( $\pm 15\%$ )  
 Rated Voltage: 25V (1E), 16V (1C), 10V (1A), 6.3V (0J), 4V (0G)

Capacitance (pF)	Code	Tolerance	JB			X5R			X6S			X7R	
			1E (25V)	1C (16V)	1A (10V)	1E (25V)	1C (16V)	1A (10V)	1C (16V)	1A (10V)	0J (6.3V)	1A (10V)	0J (6.3V)
680,000	684	K: $\pm 10\%$											
1,000,000	105	M: $\pm 20\%$	■			■							
2,200,000	225		■	■	■	■	■	■	■	■	■	■	■

Standard Thickness

■ 0.55 mm max.



## Capacitance Range Table

### Class 2 (Temperature Stable)

Temperature Characteristics: JB (-25 to +85°C, ±10%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number				
				Rated Voltage Edc: 25V	Rated Voltage Edc: 16V	Rated Voltage Edc: 10V	Rated Voltage Edc: 6.3V	
470nF	1005	0.33max.	±10%	CGB2A3JB1A474K033BB				
			±20%	CGB2A1JB1C474K033BC				
	1608	0.55max.	±10%	CGB2A3JB1A474M033BB				
			±20%	CGB2A1JB1C474M033BC				
1µF	1005	0.33max.	±10%	CGB3B3JB1E474K055AB	CGB2A3JB0J105K033BB			
			±20%	CGB3B3JB1E474M055AB	CGB2A1JB1E105K033BC	CGB2A1JB1C105K033BC	CGB2A1JB1A105K033BC	
	1608	0.55max.	±10%	CGB2A1JB1E105M033BC	CGB2A1JB1C105M033BC	CGB2A1JB1A105M033BC	CGB2A3JB0J105M033BB	
			±20%	CGB3B3JB1C105K055AB	CGB3B3JB1E105M055AC			
	2012	0.55max.	±10%	CGB3B3JB1E105M055AC	CGB3B3JB1C105M055AB			
			±20%	CGB4B3JB1E105K055AB	CGB4B3JB1E105M055AB			
	2.2µF	1005	0.33max.	±20%	CGB2A1JB0J225M033BC			
				±10%	CGB3B3JB1C225K055AC			
1608		0.55max.	±20%	CGB3B3JB1A225K055AB	CGB3B3JB1A225M055AB			
			±10%	CGB4B3JB1E225K055AC	CGB4B3JB1C225K055AB	CGB4B3JB1A225K055AB		
4.7µF	1608	0.55max.	±10%	CGB4B3JB1E225M055AC	CGB4B3JB1C225M055AB	CGB4B3JB1A225M055AB		
			±20%	CGB3B3JB1A475K055AC	CGB3B3JB0J475K055AB	CGB3B3JB1A475M055AC	CGB3B3JB0J475M055AB	
10µF	1608	0.50max.	±20%	CGB3S1JB0J106M050AC				
		0.65max.	±20%	CGB3C1JB0J106M065AC				

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number
				Rated Voltage Edc: 4.0V
1 µF	1005	0.33max.	± 10%	CGB2A3JB0G105K033BB
			± 20%	CGB2A3JB0G105M033BB
10µF	1608	0.50max.	± 20%	CGB3S3JB0G106M050AB





## 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: 25V	Rated Voltage Edc: 16V	Rated Voltage Edc: 10V	Rated Voltage Edc: 6.3V	
100nF	0603	0.22max.	±20%				CGB1T3X5R0J104M022BB	
220nF	1005	0.22max.	±20%				CGB2T3X5R0J224M022BB	
		0.22max.	±20%				CGB2T3X5R0J474M022BB	
470nF	1005	0.33max.	±10%			CGB2A3X5R1A474K033BB		
					CGB2A1X5R1C474K033BC			
	±20%			CGB2A3X5R1A474M033BB				
			CGB2A1X5R1C474M033BC					
1608	0.55max.	±10%		CGB3B3X5R1E474K055AB				
		±20%		CGB3B3X5R1E474M055AB				
1µF	1005	0.33max.	±10%	CGB2A1X5R1E105K033BC	CGB2A1X5R1C105K033BC	CGB2A1X5R1A105K033BC	CGB2A3X5R0J105K033BB	
			±20%	CGB2A1X5R1E105M033BC	CGB2A1X5R1C105M033BC	CGB2A1X5R1A105M033BC	CGB2A3X5R0J105M033BB	
	1608	0.55max.	±10%	CGB3B1X5R1E105K055AC				
			±20%	CGB3B3X5R1C105M055AB				
	2012	0.55max.	±10%	CGB4B3X5R1E105K055AB				
			±20%	CGB4B3X5R1E105M055AB				
2.2µF	1005	0.33max.	±20%				CGB2A1X5R0J225M033BC	
			±10%	CGB3B1X5R1C225K055AC	CGB3B3X5R1A225K055AB			
	1608	0.55max.	±20%	CGB3B1X5R1C225M055AC	CGB3B3X5R1A225M055AB			
			±10%	CGB4B1X5R1E225K055AC	CGB4B3X5R1C225K055AB	CGB4B3X5R1A225K055AB		
2012	0.55max.	±20%	CGB4B1X5R1E225M055AC	CGB4B3X5R1C225M055AB	CGB4B3X5R1A225M055AB			
		±10%						
4.7µF	1608	0.55max.	±10%			CGB3B1X5R1A475K055AC	CGB3B3X5R0J475K055AB	
			±20%			CGB3B1X5R1A475M055AC	CGB3B3X5R0J475M055AB	
10µF	1608	0.50max.	±20%				CGB3S1X5R0J106M050AC	
		0.65max.	±20%				CGB3C1X5R0J106M065AC	

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number
				Rated Voltage Edc: 4.0V
470 nF	1005	0.22max.	± 20%	CGB2T1X5R0G474M022BC
		0.22max.	± 20%	CGB2T1X5R0G105M022BC
1 µF	1005	0.33max.	± 10%	CGB2A3X5R0G105K033BB
			± 20%	CGB2A3X5R0G105M033BB
10µF	1608	0.50max.	±20%	CGB3S3X5R0G106M050AB



## Capacitance Range Table

### Class 2 (Temperature Stable)

Temperature Characteristics: X6S (-55 to +105°C, ±22%)

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number				
				Rated Voltage Edc: 16V	Rated Voltage Edc: 10V	Rated Voltage Edc: 6.3V	Rated Voltage Edc: 4.0V	
100nF	0603	0.22max.	±20%				CGB1T3X6S0G104M022BB	
220nF	1005	0.22max.	±20%				CGB2T1X6S0G224M022BC	
		0.22max.	±20%				CGB2T1X6S0G474M022BC	
470nF	1005	0.33max.	±10%	CGB2A1X6S1A474K033BC	CGB2A3X6S0J474K033BB	CGB2A1X6S0G474K033BC		
			±20%	CGB2A1X6S1A474M033BC	CGB2A3X6S0J474M033BB	CGB2A1X6S0G474M033BC		
		0.22max.	±20%				CGB2T1X6S0G105M022BC	
			±10%	CGB2A1X6S1A105K033BC	CGB2A1X6S0J105K033BC	CGB2A1X6S0G105K033BC		
1µF	1005	0.33max.	±20%	CGB2A1X6S1A105M033BC	CGB2A1X6S0J105M033BC	CGB2A1X6S0G105M033BC		
			±10%	CGB3B1X6S1C105K055AC	CGB3B3X6S1A105K055AB			
2.2µF	1608	0.55max.	±20%	CGB3B1X6S1C105M055AC	CGB3B3X6S1A105M055AB			
			±10%	CGB3B1X6S1A225K055AC	CGB3B3X6S0J225K055AB	CGB3B3X6S0G225K055AB		
		0.55max.	±20%	CGB4B1X6S1C225M055AC	CGB4B3X6S1A225M055AB	CGB4B3X6S0J225M055AB	CGB4B3X6S0G225M055AB	
			±10%	CGB4B1X6S1A225K055AC	CGB4B3X6S0J225K055AB	CGB4B3X6S0G225K055AB		
4.7µF	1608	0.55max.	±10%				CGB3B1X6S0G475K055AC	
			±20%				CGB3B1X6S0G475M055AC	

### Class 2 (Temperature Stable)

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

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc: 16V	Rated Voltage Edc: 10V	Rated Voltage Edc: 6.3V	Rated Voltage Edc: 4.0V
1 µF	1608	0.55 max.	± 10%	CGB3B1X7R1A105K055AC	CGB3B3X7R0J105K055AB		
			± 20%	CGB3B1X7R1A105M055AC	CGB3B3X7R0J105M055AB		
2.2 µF	2012	0.55 max.	± 10%	CGB4B1X7R1A225K055AC	CGB4B3X7R0J225K055AB		
			± 20%	CGB4B1X7R1A225M055AC	CGB4B3X7R0J225M055AB		

### Class 2 (Temperature Stable)

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

Capacitance	Size	Thickness (mm)	Capacitance Tolerance	Catalog Number			
				Rated Voltage Edc: 16V	Rated Voltage Edc: 10V	Rated Voltage Edc: 6.3V	Rated Voltage Edc: 4.0V
470 nF	1005	0.33 max.	± 10%				CGB2A1X7S0G474K033BC
			± 20%				CGB2A1X7S0G474M033BC
1 µF	1005	0.33 max.	± 10%		CGB2A1X7S0J105K033BC	CGB2A1X7S0G105K033BC	
			± 20%		CGB2A1X7S0J105M033BC	CGB2A1X7S0G105M033BC	
2.2 µF	1608	0.55 max.	± 10%				CGB3B1X7S0G225K055AC
			± 20%				CGB3B1X7S0G225M055AC