

# CGA SERIES | Automotive Grade



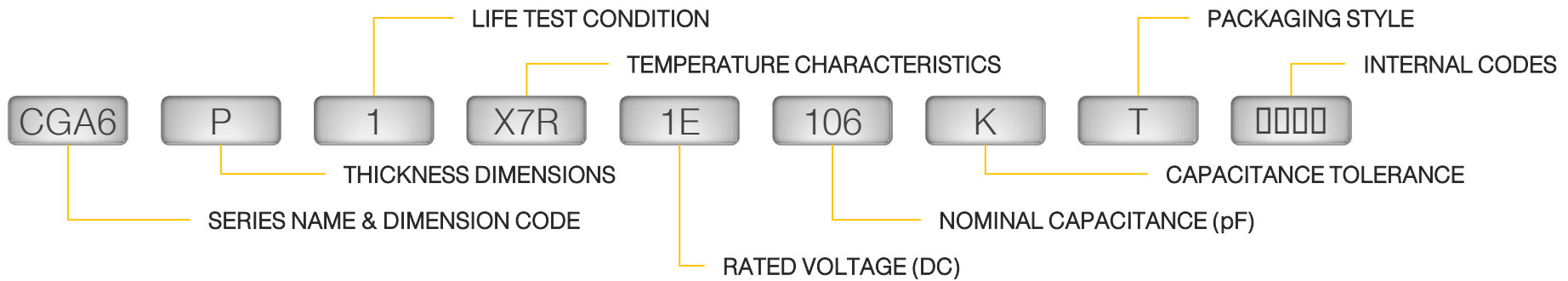
TDK CGA series multilayer ceramic chip capacitors (MLCCs) are qualified to automotive industry's Q200 testing standard. CGA parts are manufactured using TDK's most advanced and stable manufacturing process.

Parts are subjected to increased inspections to offer a higher level of life and reliability. The CGA family is available in general voltages up to 50V, mid voltage up to 630V, and high temperature up to 150C. TDK CGA series is an excellent choice for automotive applications as well as any application that requires a higher level of reliability. CGA is also used in tough environment applications such as product that may sit outdoors for the duration of the product life. This includes but is not limited to smart meter, smart grid, base station, etc.

Case Code	L (mm)	W (mm)	T max (mm)
CGA2/0402	1.00	0.50	0.50
CGA3/0603	1.60	0.80	0.80
CGA4/0805	2.00	1.25	1.25
CGA5/1206	3.20	1.60	1.60
CGA6/1210	3.20	2.50	2.50
CGA8/1812	4.50	3.20	3.20
CGA9/2220	5.70	5.00	2.50

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

## Part Number Description



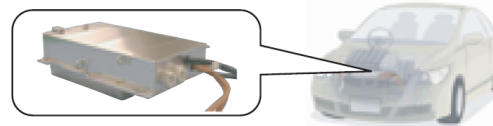
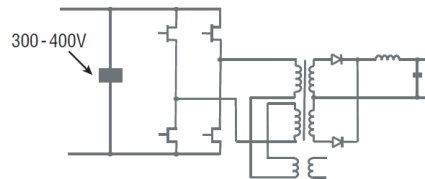
## Features:

- ❖ Qualified to Automotive Q-200
- ❖ Product is manufactured using mature processes
- ❖ Available with rated voltage from 4V – 630V
- ❖ Available in temperature rating up to 150C (X8R)
- ❖ Soft termination available for larger case size

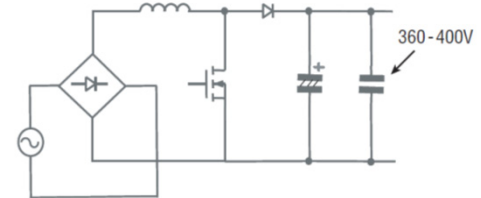
## Applications:

- ❖ Automotive engine control units and sensor modules
- ❖ Automotive battery line smoothing
- ❖ Smart Meter/Smart Grid/Solar Inverters
- ❖ Applications requiring higher reliability
- ❖ Switching power supply smoothing

DC-DC Converters for Hybrid Electric Vehicles



PFC Output Filters



# CGA SERIES | Automotive Grade / C0G

Capacitance (pF)	Cap Code	CGA2 0402	CGA3 0603
		1H (50V)	1H (50V)
1.0	010		
1.5	1R5		
2.0	020		
2.2	2R2		
3.0	030		
4.0	040		
4.7	4R7		
5.0	050		
6.0	060		
6.8	6R8		
7.0	070		
8.0	080		
9.0	090		
10	100		
12	120		
15	150		
18	180		
22	220		
27	270		
33	330		
39	390		
47	470		
56	560		
68	680		
82	820		
100	101		
120	121		
150	151		
180	181		
220	221		
270	271		
330	331		
470	471		
560	561		
680	681		
820	821		
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		

Capacitance (pF)	Cap Code	CGA4 0805	CGA5 1206	CGA6 1210	CGA8 1812
		1H (50V)	1H (50V)	1H (50V)	1H (50V)
100	101				
1,000	102				
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				
100,000	104				
150,000	154				
220,000	224				

 C0G

# CGA SERIES | Automotive Grade / X5R

Capacitance (pF)	Cap Code	CGA2 0402	CGA3 0603				CGA4 0805			CGA5 1206	
		1H (50V)	1H (50V)	1C (16V)	1A (10V)	0J (6.3V)	1H (50V)	1C (16V)	1A (10V)	1H (50V)	1V (35V)
220,000	224										
1,000,000	105										
2,200,000	225										
3,300,000	335										
4,700,000	475										
10,000,000	106										

X5R

# CGA SERIES | Automotive Grade / X7R, X7S

Capacitance (pF)	Cap Code	CGA2 0402					CGA3 0603				
		1H (50V)	1V (35V)	1E (25V)	1C (16V)	1A (10V)	1H (50V)	1V (35V)	1E (25V)	1C (16V)	0J (6.3V)
220	221	█					█				
330	331										
470	471										
680	681	█					█				
1,000	102										
1,500	152										
2,200	222										
3,300	332										
4,700	472										
6,800	682		█								
10,000	103	█	█	█							
15,000	153										
22,000	223	█		█							
33,000	333										
47,000	473			█	█						
68,000	683	█	█	█	█						
100,000	104	█	█	█	█			█			
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										█

Capacitance (pF)	Cap Code	CGA4 0803					CGA5 1206					CGA6 1210			CGA8 1812			CGA9 2220			
		1H (50V)	1V (35V)	1E (25V)	1C (16V)	0J (6.3V)	1H (50V)	1V (35V)	1E (25V)	1C (16V)	0J (6.3V)	1H (50V)	1E (25V)	1C (16V)	1H (50V)	1E (25V)	1C (16V)	1H (50V)	1E (25V)	1C (16V)	
100,000	104	█																			
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															█				█	
33,000,000	336															█				█	
47,000,000	476																				█

█ X7R █ X7S

# CGA SERIES | High Temperature / X8R

Capacitance (pF)	Cap Code	CGA2 0402		CGA3 0603			CGA4 0805			CGA5 1206			CGA6 1210
		1H (50V)	1E (25V)	2A (100V)	1H (50V)	1E (25V)	2A (100V)	1H (50V)	1E (25V)	2A (100V)	1H (50V)	1E (25V)	1E (25V)
150	151	■											
220	221	■											
330	331	■											
470	471	■											
680	681	■											
1,000	102	■		■	■								
1,500	152	■		■	■								
2,200	222	■		■	■								
3,300	332	■		■	■								
4,700	472	■		■	■								
6,800	682		■	■	■								
10,000	103		■	■	■								
15,000	153			■	■		■						
22,000	223				■		■						
33,000	333				■								
47,000	473				■								
68,000	683					■		■		■			
100,000	104					■		■		■			
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												■

■ X8R

# CGA SERIES | Mid Voltage / COG

Capacitance (pF)	Cap Code	CGA3 0603		CGA4 0805		CGA5 1206			CGA6 1210			CGA8 1812		
		2E (250V)	2A (100V)	2E (250V)	2A (100V)	2J (630V)	2E (250V)	2A (100V)	2J (630V)	2E (250V)	2A (100V)	2J (630V)	2E (250V)	2A (100V)
100	101	COG	COG		COG	COG								
120	121													
150	151	COG	COG											
180	181													
220	221				COG									
270	271													
330	331													
390	391				COG									
470	471				COG									
560	561													
680	681	COG												
820	821		COG	COG										
1,000	102		COG	COG	COG									
1,200	122													
1,500	152													
1,800	182													
2,200	222			COG										
2,700	272			COG	COG	COG								
3,300	332						COG							
3,900	392				COG		COG	COG						
4,700	472							COG						
5,600	562						COG	COG	COG					
6,800	682													
8,200	822						COG					COG		
10,000	103							COG						
15,000	153								COG		COG			
22,000	223											COG		
33,000	333												COG	
47,000	473													COG
68,000	683													COG
100,000	104													COG

 COG

# CGA SERIES | Mid Voltage / X7R, X7S, X7T

Capacitance (pF)	Cap Code	CGA2 0402	CGA3 0603	CGA4 0805			CGA5 1206				
		2A (100V)	2A (100V)	2W (450V)	2E (250V)	2A (100V)	2J (630V)	2W (450V)	2E (250V)	2A (100V)	
1,000	102	X7R	X7R				X7R				
1,500	152	X7R	X7R				X7R				
2,200	222	X7R	X7R				X7R				
3,300	332	X7R	X7R				X7R				
4,700	472	X7R	X7R				X7R				
6,800	682	X7R	X7R			X7R					
10,000	103	X7R	X7R			X7R					
15,000	153		X7R	X7R	X7R	X7R	X7R		X7R		
22,000	223		X7R	X7R	X7R	X7R	X7R		X7R		
33,000	333		X7S	X7R	X7R	X7R	X7R		X7R	X7R	
47,000	473		X7R	X7R	X7R	X7R	X7R		X7R	X7R	X7R
68,000	683		X7S		X7R	X7R			X7R	X7R	X7R
100,000	104		X7S		X7R	X7R		X7R	X7R	X7R	X7R
150,000	154								X7R	X7R	X7R
220,000	224								X7R	X7R	X7R
330,000	334									X7R	X7R
470,000	474					X7S				X7R	X7R
1,000,000	105					X7S				X7R	X7R
2,200,000	225					X7S				X7R	X7S

Capacitance (pF)	Cap Code	CGA6 1210				CGA8 1812				CGA9 2220			
		2J (630V)	2W (450V)	2E (250V)	2A (100V)	2J (630V)	2W (450V)	2E (250V)	2A (100V)	2J (630V)	2W (450V)	2E (250V)	2A (100V)
47,000	473	X7R				X7R							
68,000	683	X7R				X7R							
100,000	104	X7R		X7R		X7R							
150,000	154		X7R	X7R		X7R		X7R	X7R				
220,000	224		X7R	X7R		X7R		X7R	X7R				
330,000	334				X7R		X7R		X7R		X7R	X7R	
470,000	474				X7R		X7R		X7R		X7R	X7R	
680,000	684				X7R		X7R		X7R		X7R	X7R	X7R
1,000,000	105				X7R		X7R		X7R		X7R	X7R	X7R
1,500,000	155											X7R	X7R
2,200,000	225											X7R	X7R
3,300,000	335											X7R	X7R
4,700,000	475											X7S	X7R
10,000,000	106											X7S	X7R
15,000,000	156											X7S	X7R

■ X7R   
 ■ X7S   
 ■ X7T

# CGA SERIES | Soft Termination / X7R, X7S, X7T

Capacitance (pF)	Cap Code	CGA4 0805						CGA5 1206						
		2W (450V)	2E (250V)	2A (100V)	1H (50V)	1V (35V)	1C (16V)	2J (630V)	2W (450V)	2E (250V)	2A (100V)	1H (50V)	1V (35V)	1E (25V)
10,000	103	X7T	X7R					X7R						
22,000	223	X7T	X7R					X7T						
47,000	473	X7T	X7R					X7T	X7T	X7R				
100,000	104		X7R						X7T	X7R				
220,000	224			X7R						X7T				
470,000	474			X7R	X7R						X7R			
1,000,000	105			X7R	X7R						X7R	X7R		
2,200,000	225				X7R	X7R						X7R	X7R	
4,700,000	475				X7R	X7R	X7R					X7R	X7R	X7R
10,000,000	106						X7R						X7R	X7R

Capacitance (pF)	Cap Code	CGA6 1210					CGA8 1812			CGA9 2220			
		2J (630V)	2W (450V)	2E (250V)	2A (100V)	1H (50V)	2J (630V)	2W (450V)	2E (250V)	2J (630V)	2W (450V)	2E (250V)	2A (100V)
47,000	473	X7R											
100,000	104	X7R		X7R									
220,000	224		X7R	X7R			X7R						
470,000	474						X7R	X7R	X7R				
1,000,000	105							X7R		X7R	X7R	X7R	
2,200,000	225				X7R	X7R					X7R	X7R	
4,700,000	475				X7R	X7R	X7R					X7R	X7R
10,000,000	106					X7R							X7R
22,000,000	226												
100,000,000	107												

■ X7R   
 ■ X7S   
 ■ X7T