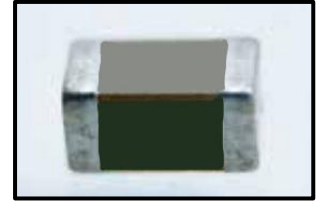


## ≠ Features

- Large capacitance values in small sizes
- Excellent high frequency characteristics
- All PPI Caps conform to EIA Specifications



## ≠ Applications

- Can be used on surface mount assembly equipment
- Our fully integrated manufacturing and total quality control systems ensure unprecedented high standards of quality and reliability.

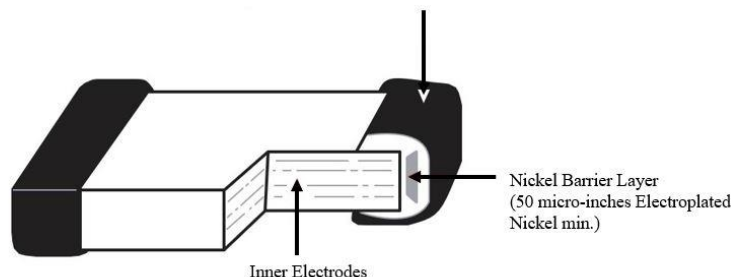
## ≠ Notes

- Capacitance Value & Tolerance are determined by circuit requirements
- Voltage is determined by circuit requirements
- Capacitor Size select the smallest unit permitted by the circuit constraints that provides the required capacitance and voltage rating
- Nickel Barrier is standard and recommended for units exposed to repeated solder cycles, to minimize leaching of the termination.
- All capacitors conform to EIA specifications.

## ≠ Construction

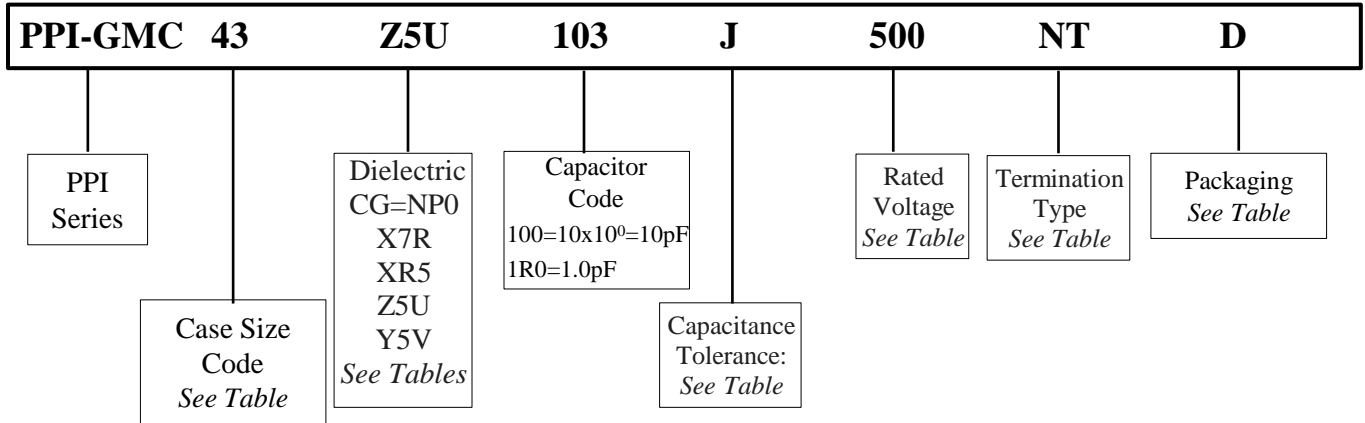
Constructed by screen printing alternative layers of internal metallic electrodes onto ceramic dielectric materials and firing into a concrete monolithic body, then completed by application of metal end terminations which are fired to assure permanent bonding with the individual internal electrodes.

Solder plate: 100% matte Sn,  
typical thickness 0.003mm to 0.005mm



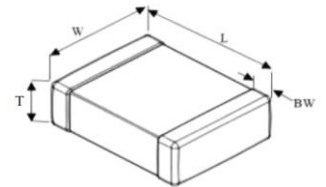
Please note that the contents of this document are subject to change at any time at PPI's sole discretion. The most up-to-date version of this document is available at [www.passiveplus.com](http://www.passiveplus.com)

**≠ Part Numbering**



**≠ Dimensions (mm)**

Dimensions (mm)					
Code	Size	L	W	T	BW
01	01005	0.40 ± 0.02	0.20 ± 0.02	0.20 ± 0.02	0.07 ~ 0.14
02	0201	0.60 ± 0.03	0.30 ± 0.03	0.30 ± 0.03	0.15 ± 0.05
04	0402	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.10	0.10 ~ 0.35
10	0603	1.60 ± 0.20	0.80 ± 0.20	1.0 max	0.10 ~ 0.40
21	0805	2.00 ± 0.30	1.25 ± 0.20	1.40	0.25 ~ 0.75
31	1206	3.20 ± 0.30	2.50 ± 0.20	2.20	0.25 ~ 0.75
32	1210	3.20 ± 0.30	1.60 ± 0.20	1.80	0.25 ~ 0.75
40	1808	4.50 ± 0.35	3.20 ± 0.30	2.20	0.25 ~ 0.75
43	1812	3.20 ± 0.30	1.6 ± 0.20	1.80	0.25 ~ 0.75
45	1825	5.70 ± 0.40	5.01 ± 0.40	1.80	0.25 ~ 0.75
55	2220	5.70 ± 0.40	6.30 ± 0.40	2.20	0.25 ~ 0.75
57	2225	4.50 ± 0.35	6.30 ± 0.40	2.20	0.25 ~ 0.75



**≠ Capacitance Code**

Cap Code	Value	Cap Code	Value	Cap Code	Value	Cap Code	Value
<b>0R5</b>	0.5pF	<b>100</b>	10pF	<b>104</b>	0.1uF	<b>106</b>	10uF
<b>5R0</b>	5.0pF	<b>103</b>	0.01uF	<b>105</b>	1.0uF	<b>107</b>	100uF

**≠ Capacitance Tolerances**

Code	B	C	D	F	G	J	K	M	Z
Tol.	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%	±20%	-20% + 80%

**≠ Rated Voltages**

Code	Voltage	Code	Voltage
4R0	4.0V	35	35V
6R3	6.3V	50	50V
10	10V	63	63V
16	16V	100	100V
25	25V	200	200V

**≠ Terminations**

Nickel barrier is standard and recommended for units exposed to repeated solder cycles to minimize leaching of the termination.

Code	Description
<b>NT</b>	Sn/Ni
<b>PT</b>	Pd/Ag



**≠ Z5U**

Despite their capacitance instability, Z5U formulations are very popular because of their small size, temperature range, low ESL, low ESR and excellent frequency response. These features are particularly important for decoupling application where only a minimum capacitance value is required.

**≠ Y5V**

Y5V formulations are for general purpose use in a limited temperature range. They have a wide temperature characteristic of +22% - 82% capacitance change over the operating temperature range of -30°C to +85°C. Y5Vs high dielectric constant allows the manufacture of very high capacitance values (up to 22MF) in small physical sizes.

High capacitance per unit volume: General Purpose product

**≠ Electrical Specifications**

Operating Temperature Range	-30°C to +85°C
Temperature Coefficient (TC)	±22% - 82%
Temperature Voltage Coefficient ( $\Delta C_{Max}$ @ $V_{DCW}$ )	Not Applicable
Dissipation Factor	3.0% Max, 2.00% Typical
Insulation Resistance (IR)	10GQ or 100QF, whichever is less 25°C $V_{DCW}$
Dielectric Withstanding Voltage	2.5 X $V_{DCW}$
Aging Rate	3% per decade hour
Test Parameters	1KHz 1.0Vrms 25°C values > or = to 10uF 1.0 Vrms 120Hz



**Dielectrics: Z5U & Y5V**

**01005: PPI-GMC01**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC
10 nF	103	M, Z	16V	27	273	M, Z	16V	68	683	M, Z	16V
12	123			33	333			82	823		
15	153			39	393			100	104		
18	183			47	473						
22	223			56	563						

**0201: PPI-GMC02**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC
10 nF	103	M, Z	6.3V	68	683	M, Z	6.3V	470	474	M, Z	6.3V
12	123			82	823			560	564		
15	153			100	104			560	564		
18	183			120	124			680	684		
22	223			150	154			820	824		
27	273			180	184			1.0 uF	105		
33	333			220	224			2.2	225		
39	393			270	274			4.7	475		
47	473			330	334						
56	563			390	394						

**0402: PPI-GMC04**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC
10 nF	103	M, Z	6.3V or 10V or 16V or 25V or 50V	68	683	M, Z	6.3V or 10V or 16V or 25V or 50V	820	824	M, Z	6.3V or 10V or 16V
12	123			82	823			1.0 uF	105		6.3V or 10V or 16V or 25V
15	153			100	104			2.2	225		
18	183			150	154		3.3	335	6.3V or 10V		
22	223			220	224		3.9	395			
27	273			270	274		4.7	475			
33	333			390	394		10	106			
39	393			470	474		6.3V or 10V or 16V	22	226		
47	473			560	564						
56	563			680	684						



**Dielectrics: Z5U & Y5V**

**0603: PPI-GMC10**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	
10 nF	103	M, Z	6.3V or 10V or 16V or 25V or 50V	82	823	M, Z	6.3V or 10V or 16V or 25V or 50V	1.0 uF	105	M, Z	6.3V or 10V or 16V or 25V or 50V	
12	123			100	104			2.2	225		6.3V or 10V or 16V	
15	153			120	124			2.7	275		6.3V or 10V	
18	183			150	154			3.3	335			
22	223			220	224			3.9	395			
27	273			270	274			4.7	475		6.3V or 10V or 16V	
33	333			330	334			10	106			
39	393			470	474			22	226			6.3V or 10V
47	473			560	564			47	476			6.3V
56	563			680	684							
68	683			820	824							

**0805: PPI-GMC21**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	
10 nF	103	M, Z	6.3V or 10V or 16V or 25V or 50V	82	823	M, Z	6.3V or 10V or 16V or 25V or 50V	820	824	M, Z	6.3V or 10V or 16V or 25V or 50V	
12	123			100	104			1.0 uF	105			
15	153			120	124			2.2	225			
18	183			150	154			3.3	335			
22	223			180	184			4.7	475			
27	273			220	224			6.8	685		6.3V or 10V or 16V	
33	333			270	274			10	106			
39	393			330	334			22	226			
47	473			470	474			47	476			6.3V or 10V
56	563			560	564							
68	683			680	684							

**1206: PPI-GMC31**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC
10 nF	103	M, Z	6.3V or 10V or 16V or 25V or 50V	100	104	M, Z	6.3V or 10V or 16V or 25V or 50V	2.2	225	M, Z	6.3V or 10V or 16V or 25V or 50V
12	123			120	124			3.3	335		
15	153			150	154			4.7	475		
18	183			180	184			6.8	685		
22	223			220	224			10	106		
27	273			270	274			22	226		6.3V or 10V or 16V
33	333			330	334			33	336		
39	393			470	474			47	476		
47	473			560	684			68	686		
56	563			680	684			100	107		
68	683			820	824						6.3V or 10V
82	823			1.0 uF	105						



**Dielectrics: Z5U & Y5V**

**1210: PPI-GMC32**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC				
10 nF	103	M, Z	6.3V or 10V or 16V or 25V or 50V	100	104	M, Z	6.3V or 10V or 16V or 25V or 50V	2.2	225	M, Z	6.3V or 10V or 16V or 25V or 50V				
12	123			120	124			3.3	335						
15	153			150	154			4.7	475						
18	183			180	184			6.8	685						
22	223			220	224			10	106						
27	273			270	274			22	226						
33	333			330	334			33	336						
39	393			470	474			47	476						
47	473			560	564			68	686						
56	563			680	684			100	107		6.3V or 10V or 16V				
68	683			820	824			220	227						
82	823			1.0 uF	105										6.3V

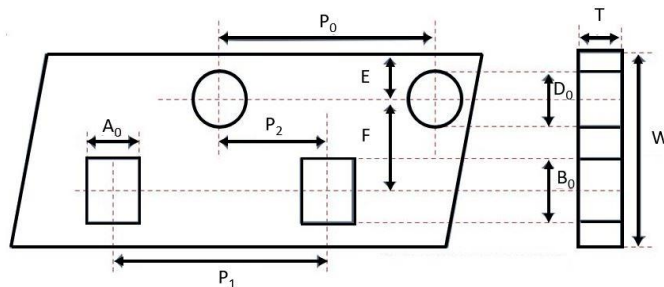
**1812: PPI-GMC43**

Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	Value	Code	Tol.	Rated WVDC	
47 nF	473	M, Z	6.3V or 10V or 16V or 25V or 50V	270	274	M, Z	6.3V or 10V or 16V or 25V or 50V	4.7	475	M, Z	6.3V or 10V or 16V or 25V or 50V	
56	563			330	334			6.8	685			
68	683			470	474			10	106			
82	823			560	564			22	226		6.3V or 10V or 16V or 25V	
100	104			680	684			33	336			
120	124			820	824			47	476		6.3V or 10V or 16V	
150	154			1.0 uF	105			68	686		6.3V or 10V	
180	184			2.2	225			100	107			
220	224			3.3	335							

**⚡ Packaging**

Size	Code		Description	
	D	G	Q	
	<i>Qty per 7" Reel</i>		<i>Qty per 10/13" Reel</i>	
<b>01005</b>	20K	50K		
<b>0201</b>	10K/ 15K	50K		
<b>0402</b>	10K	40K	50K	
<b>0603</b>	4K	10K	15K	
<b>0805</b>	2K, 3K, 4K	10K	15K	20K
<b>1206</b>	2K, 3K, 4K	10K	15K	20K
<b>1210</b>	500, 1K, 2K, 3K	4K	8K	
<b>1808</b>	1K, 2K, 3K			
<b>1812</b>	500, 1K	3K		
<b>1825</b>	500, 1K			
<b>2220</b>	500, 1K			
<b>2225</b>	500, 750			

**⚡ Tape & Reel Specifications**

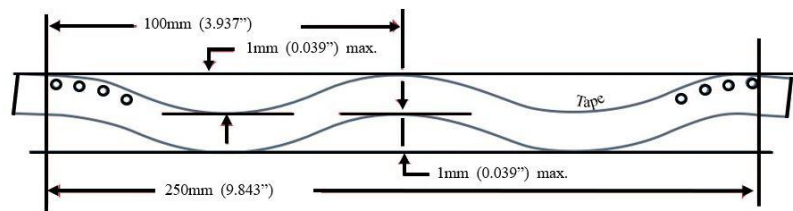
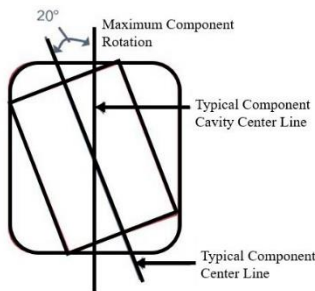
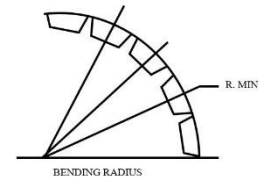
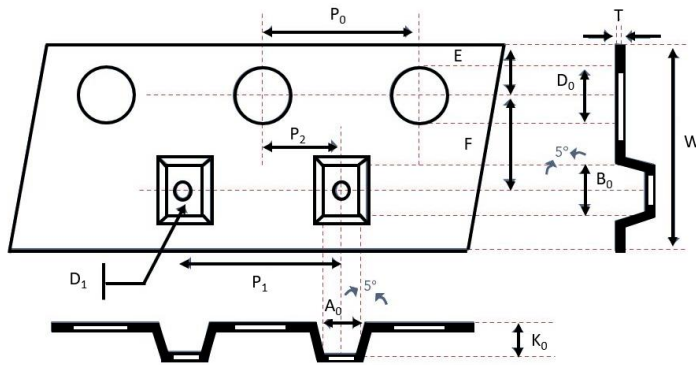


Cardboard carrier tape for EIA case sizes: 01005, 0201, 0402, 0603, 0805, 1206

Unit: mm

Size	$A_0$	$B_0$	T	$K_0$	W	$P_0$	10XPo	$P_1$	$P_2$	$D_0$	$D_1$	E	F
<b>01005</b>	$0.25 \pm 0.04$	$0.45 \pm 0.04$	$0.36 \pm 0.05$	*	$8.00 \pm 0.30$	$4.00 \pm 0.10$	$40.00 \pm 0.10$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$1.50 \pm 0.10$	*	$1.75 \pm 0.10$	$3.50 \pm 0.05$
<b>0201</b>	$0.39 \pm 0.07$	$0.69 \pm 0.07$	<0.50	*	$8.00 \pm 0.10$	$4.00 \pm 0.10$	$40.00 \pm 0.10$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$1.55 \pm 0.05$	*	$1.75 \pm 0.05$	$3.50 \pm 0.05$
<b>0402</b>	$0.70 \pm 0.20$	$1.20 \pm 0.20$	<0.80	*	$8.00 \pm 0.10$	$4.00 \pm 0.10$	$40.00 \pm 0.10$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$1.55 \pm 0.05$	*	$1.75 \pm 0.05$	$3.50 \pm 0.05$
<b>0603</b>	$1.10 \pm 0.20$	$1.90 \pm 0.20$	<1.20	*	$8.00 \pm 0.10$	$4.00 \pm 0.10$	$40.00 \pm 0.10$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$1.55 \pm 0.05$	*	$1.75 \pm 0.05$	$3.50 \pm 0.05$
<b>0805</b>	$1.65 \pm 0.20$	$2.40 \pm 0.20$	<1.30	*	$8.00 \pm 0.10$	$4.00 \pm 0.10$	$40.00 \pm 0.10$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$1.55 \pm 0.05$	*	$1.75 \pm 0.05$	$3.50 \pm 0.05$
<b>1206</b>	$2.00 \pm 0.20$	$3.60 \pm 0.20$	<1.30	*	$8.00 \pm 0.10$	$4.00 \pm 0.10$	$40.00 \pm 0.10$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$1.55 \pm 0.05$	*	$1.75 \pm 0.05$	$3.50 \pm 0.05$

≠ Tape & Reel Specifications



Embossed plastic carrier tape for case sizes: 0805, 1206, 1210, 1808, 1812

Unit: mm

Size	A <sub>0</sub>	B <sub>0</sub>	T	K <sub>0</sub>	W	P <sub>0</sub>	10XP <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	D <sub>0</sub>	D <sub>1</sub>	E	F
0805	<1.80	<2.70	0.23 ± 0.10	<2.50	8.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.00 ± 0.10	1.75 ± 0.10	3.50 ± 0.05
1206	<2.30	<4.00	0.23 ± 0.10	<2.50	8.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.00 ± 0.10	1.75 ± 0.10	3.50 ± 0.05
1210	<3.20	<3.95	0.23 ± 0.10	<3.00	8.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.00 ± 0.10	1.75 ± 0.10	3.50 ± 0.05
1808	<2.50	<5.30	0.25 ± 0.10	<2.50	12.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.00 ± 0.10	1.75 ± 0.10	5.50 ± 0.10
1812	<3.90	<5.30	0.25 ± 0.10	<3.50	12.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	5.50 ± 0.10
1825	<6.80	<5.30	0.30 ± 0.10	<3.10	12.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	5.50 ± 0.10
2220	<5.80	<6.50	0.30 ± 0.10	<3.10	12.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	5.50 ± 0.10
2225	<6.80	<6.50	0.30 ± 0.10	<3.10	12.00 ± 0.20	4.00 ± 0.10	40.00 ± 0.20	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	5.50 ± 0.10