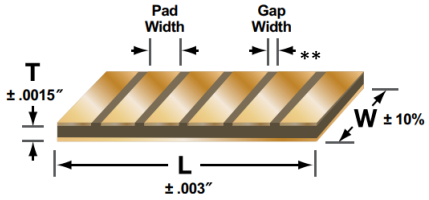
Array Cap

◆ Product Characteristics

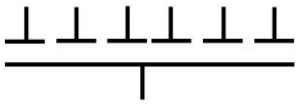
Array Caps are used where arrays of capacitors are needed, usually for decoupling or bypass of GaAs integrated circuits. Standard arrays can contain up to 10 capacitors starting at 0.04pF. Typical overall dimensions range start at 20x10 mils. Array Caps can be fully customized to meet Customer's application requirements.

Array Caps are available with (B) or without borders (A) surrounding the edges to help prevent epoxy shorts and aid optical recognition systems.

◆ Dimensions and Electrode Configuration



**Standard border is 2 mils and the gap is between 4 – 6 mills depending on the capacitance required.



◆ Part Numbering

PP AB –FS1–4–105×25 ×4 D4–101–K–2–W

PP = Passive Plus

Array Style

Style Code
A= No Border; B = Border

Dielectric Code K = 50
See tables on next pages

Number of Capacitors *(max 10 capacitors)*

Length x Width

Packaging
W = Waffle Pack (Standard)

Voltage = 50
See tables on next pages

Tolerance K = ±10%
See table below

Capacitance
See tables on next pages

Metallization = Au
See tables on next pages

Thickness

◆ Capacitance Tolerance Table

Class I Dielectrics: AS1 - KS2		Class II Dielectrics: MS1 - ZS4			
Tolerance	**Code**	**Tolerance**	**Code**	**Tolerance**	**Code**
± 20%	M	-10% thru +40%	Y	± 20%	M
± 15%	L	-20% thru +80%	Z	± 15%	L
± 10%	K	0% thru +100%	V	± 10%	K
		Guaranteed Min. Value	GMV		

Product Specifications

◆ Substrates

Substrates can be supplied as follows:

- **Bare**
- **Metallized:**
  - Gold over Platinum, Palladium, or Nickel
  - Silver over Platinum
  - Custom schemes and patterns to Customer specifications

Thickness Range 3 mils +

◆ Standard Electrode Metallizations

Gold (D4) This metallization consists of a minimum of 70 micro-inches of Gold over Platinum or Nickel which is ideal for all wirebonding methodologies.

Silver (S7) This metallization consists of 20 micro-inches of Silver over Platinum which is ideal for all solder applications whenever the use of Gold is unacceptable.

◆ Metallization Code

Code	Description
D4	Ti/Pt/Au Titanium/Platinum/Gold **(70 µin Gold)**
S7	Ti/Pt/Ag Titanium/Platinum/Silver **(20 µin Silver)**
K2	Ta/Pd/Au Tantalum/Palladium/Gold **(75 µin Gold)**
L3	Ta/Pd/Au Tantalum/Palladium/Gold **(100 µin Gold)**

Contact PPI for available metallizations.

◆ Rated Voltage Code

Code	Voltage	Dielectric Thickness
2	50V	4 mils
3	100V	6 mils

◆ Capacitance Code

Value	Code
<10pF	1R0 = 1.0pF
>10pF	101 = 100pF

◆ Packaging

PPI SLCs are available in Waffle Packs (Standard). Other packaging options may be available. Please contact PPI.

Dielectric Materials

Class I: Dielectrics below consist of material exhibiting very low losses, extremely low or closely controlled temperature coefficients, negligible voltage and frequency coefficients, negligible aging effects and high insulation and dielectric breakdown.

◆ Class I

Type	IR Min @ 25°C	Temperature Coefficient (-25 to 125°C)	Dissipation Factor (@ 10GHz)	Dielectric Constant (K)	Material
AS1	10^{12}	Negligible	0.0001	3.8	Quartz
AS2	10^{12}	Negligible	0.0001	3.9	Si
AS3	10^{12}	Negligible	0.0001	6.6	BeO
AS6	10^{12}	P120 ± 25ppm	0.0001	8.7	AlN
AS7	10^{12}	P180 ± 50ppm	0.0006	9.6	Alumina 96
AS8	10^{12}	P180 ± 50ppm	0.0006	9.8	Alumina 99.6
BS2	10^{12}	NP0 ± 30ppm	0.0001	12.6	Titanate
CS1	10^{12}	0 ± 30ppm	0.001	20	Titanate
ES1	10^{12}	0 ± 30ppm	0.002	40	Titanate
FS1	10^{12}	0 ± 30ppm	0.005	50	Titanate
IS1	10^{15}	0 ± 30ppm	0.005	84	Titanate
KS2	10^{12}	N1500 ± 30ppm	0.0025	150	Titanate

◆ Class II

Dielectrics below are characterized by high dielectric constants, increased losses and higher temperature coefficients. These properties are inherent with this class of material but the high dielectric constants permit the use of smaller size to achieve low series inductance and meet dimensional requirements. Capacitors made with these materials are often used for coupling of microstrip line circuits where a small chip is necessary. Used as a bypass capacitor, the small size provides low series inductance and dielectric losses are typically of little concern.

Type	IR (MEG-OHMs) 100VDC @ 25°C	Temperature Coefficient (-55 to 125°C)	Dissipation Factor (@ 1 MHz)	Aging (%) HR/Decade	Dielectric Constant (K)
MS1	10^{5}	5 to -10	0.010	2.0	300
RS1	10^{5}	10 to -10	0.015	3.0	1,100
SS3	10^{5}	3 to -10	0.015	3.5	2,200
US1	10^{5}	0 to -35	0.020	3.0	4,000
VS1	10^{5}	0 to -60	0.025	3.0	5,000
ZS1	10^{5}	0 to -80	0.025	3.0	11,000
ZS4	*Contact PPI*	15 to -15	0.035	3.0	25,000
ZS6	*Contact PPI*	15 to -15	0.035	3.0	35,000

◆ Capacitance, Case Size & Dielectric Availability

Cap (pF)	Size (inches/millimeter)																	
	1010 (.254 x .254)		1212 (.305 x .305)		1515 (.381 x .381)		2020 (.508 x .508)		2525 (.635 x .635)		3030 (.762 x .762)		3535 (.889 x .889)		4040 (1.016 x 1.016)		5050 (1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
0.04	AS7	5	AS7	6	AS7	10												
0.06	AS7	4	AS7	5	AS7	8	AS1	5	AS1	10								
0.08	ES1	10	AS7	4	AS7	6	AS7	10	AS1	7	AS1	9						
0.1	ES1	8	ES1	11	AS7	5	AS7	9	AS1	5	AS1	7	AS1	10				
0.2	ES1	5	ES1	7	ES1	10	AS7	4	AS7	7	AS7	10	AS1	5	AS1	7	AS1	10
0.3	IS1	6	ES1	4	ES1	6	ES1	11	AS7	4	AS7	7	AS7	9	AS1	5	AS1	7
0.4	IS1	5	IS1	7	ES1	5	ES1	9	ES1	15	AS7	5	AS7	7	AS7	9	AS1	5
0.5	IS1	4	IS1	5	ES1	4	ES1	7	ES1	11	AS7	5	AS7	5	AS7	7	AS1	4
0.6	KS2	6	IS1	5	IS1	7	ES1	6	ES1	10	ES1	15	AS7	4	AS7	6	AS7	9
0.8	MS1	8	KS2	6	IS1	5	ES1	5	ES1	7	ES1	10	ES1	15	AS7	4	AS7	7
1	MS1	7	KS2	5	IS1	4	IS1	7	ES1	6	ES1	8	ES1	10	AS7	4	AS7	5
1.2	MS1	6	KS2	4	IS1	4	IS1	6	ES1	5	ES1	7	ES1	9	AS7	3	AS7	5
1.5	MS1	5	MS1	7	KS2	5	IS1	5	ES1	4	ES1	6	ES1	7	ES1	10	AS7	4
1.8	MS1	4	MS1	5	KS2	4	IS1	4	IS1	6	ES1	5	ES1	6	ES1	8	ES1	11
2	MS1	4	MS1	5	KS2	4	KS2	7	IS1	6	ES1	4	ES1	5	ES1	7	ES1	11
2.2	RS1	4	MS1	5	KS2	4	KS2	6	IS1	5	IS1	7	ES1	5	ES1	7	ES1	10
2.7	RS1	8	MS1	4	MS1	6	KS2	5	IS1	4	IS1	6	ES1	4	ES1	5	ES1	8
3.3	RS1	7	RS1	10	MS1	5	KS2	4	KS2	6	IS1	5	IS1	7	ES1	4	ES1	7
3.9	RS1	6	RS1	9	MS1	4	MS1	7	KS2	5	IS1	4	IS1	6	IS1	8	ES1	6
4.7	RS1	5	RS1	7	RS1	11	MS1	6	KS2	4	KS2	6	IS1	5	IS1	6	ES1	5
5.6	RS1	4	RS1	6	RS1	10	MS1	5	MS1	7	KS2	5	IS1	4	IS1	5	ES1	4
6.8	RS1	4	RS1	5	RS1	8	MS1	4	MS1	6	KS2	5	KS2	6	IS1	4	IS1	7
8.2	SS3	6	RS1	4	RS1	7	MS1	4	MS1	5	KS2	4	KS2	5	KS2	7	KS2	10
10	SS3	5	RS1	4	RS1	5	RS1	9	MS1	4	MS1	6	KS2	4	KS2	5	KS2	8
12	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	5	MS1	7	KS2	4	KS2	7
15	US1	6	SS3	5	RS1	4	RS1	6	RS1	10	MS1	4	MS1	6	MS1	7	KS2	6
18	US1	5	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	4	MS1	6	KS2	5
20	US1	5	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	4	MS1	5	KS2	4
22	US1	4	US1	6	SS3	5	RS1	4	RS1	7	RS1	9	MS1	4	MS1	5	KS2	4

Class I Dielectrics

Shaded cells indicate Class II Dielectrics

◆ Capacitance, Case Size & Dielectric Availability – Class II Dielectrics

	Size (inches/millimeter)																	
	1010		1212		1515		2020		2525		3030		3535		4040		5050	
Cap (pF)	(.254 x .254)		(.305 x .305)		(.381 x .381)		(.508 x .508)		(.635 x .635)		(.762 x .762)		(.889 x .889)		(1.016 x 1.016)		(1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
27	US1	4	US1	5	SS3	4	RS1	4	RS1	6	RS1	8	MS1	3	MS1	4	MS1	6
33	VS1	4	US1	4	US1	6	SS3	6	RS1	5	RS1	6	RS1	11	MS1	4	MS1	5
39	ZS1	6	US1	4	US1	5	SS3	5	RS1	4	RS1	5	RS1	7	RS1	10	MS1	4
47	ZS1	5	ZS1	7	US1	5	SS3	4	SS3	6	RS1	5	RS1	6	RS1	8	MS1	4
56	ZS1	4	ZS1	6	VS1	5	US1	7	SS3	5	RS1	4	RS1	5	RS1	7	RS1	10
68	ZS1	4	ZS1	5	VS1	4	US1	6	SS3	5	SS3	6	RS1	4	RS1	6	RS1	9
82	ZS4	7	ZS1	4	ZS1	7	VS1	6	SS3	4	SS3	5	SS3	7	SS3	10	RS1	7
100	ZS4	6	ZS4	8	ZS1	6	VS1	5	US1	6	SS3	5	SS3	6	SS3	8	RS1	6
120	ZS4	5	ZS4	7	ZS1	5	ZS1	8	VS1	6	SS3	4	SS3	5	SS3	7	RS1	5
150	ZS4	4	ZS4	5	ZS1	4	ZS1	7	VS1	5	VS1	7	SS3	4	SS3	5	RS1	4
180	ZS6	4	ZS4	5	ZS4	7	ZS1	6	VS1	4	VS1	6	VS1	8	US1	8	SS3	7
200	ZS6	4	ZS4	4	ZS4	6	ZS1	5	ZS1	8	VS1	5	VS1	7	US1	7	SS3	6
220	ZS6	4	ZS6	5	ZS4	6	ZS1	4	ZS1	7	VS1	5	VS1	6	US1	6	SS3	6
270			ZS6	4	ZS4	5	ZS4	8	ZS1	6	VS1	4	VS1	5	US1	5	SS3	5
330					ZS4	4	ZS4	7	ZS1	5	ZS1	7	VS1	4	US1	4	US1	7
390					ZS6	4	ZS4	6	ZS1	4	ZS1	6	ZS1	7	ZS1	10	US1	6
470					ZS6	4	ZS4	5	ZS4	7	ZS1	5	ZS1	6	ZS1	8	US1	5
560							ZS4	4	ZS4	6	ZS1	4	ZS1	5	ZS1	7	US1	4
680							ZS6	5	ZS4	5	ZS4	8	ZS1	5	ZS1	6	VS1	4
820							ZS6	4	ZS6	6	ZS4	6	ZS1	4	ZS1	5	ZS1	7
1000									ZS6	5	ZS4	5	ZS4	7	ZS1	4	ZS1	6
1200									ZS6	4	ZS4	4	ZS4	6	ZS4	7	ZS1	5
1500											ZS6	5	ZS6	5	ZS4	6	ZS1	4
1800											ZS6	4	ZS6	6	ZS4	5	ZS4	8
2200													ZS6	5	ZS4	4	ZS4	6
2700													ZS6	4	ZS6	5	ZS4	5
3300																	ZS6	6

◆ Typical Temperature Characteristics