

# SMD Aluminum Conductive Polymer Electrolytic Capacitors

## APB Series



### FEATURES

- High temperature Low ESR
- High ripple current capability
- 125°C, 2000 hours
- RoHS compliant and Halogen-free

### APPLICATIONS

- Power Units
- LED Driver
- Serving Equipment
- DC converters

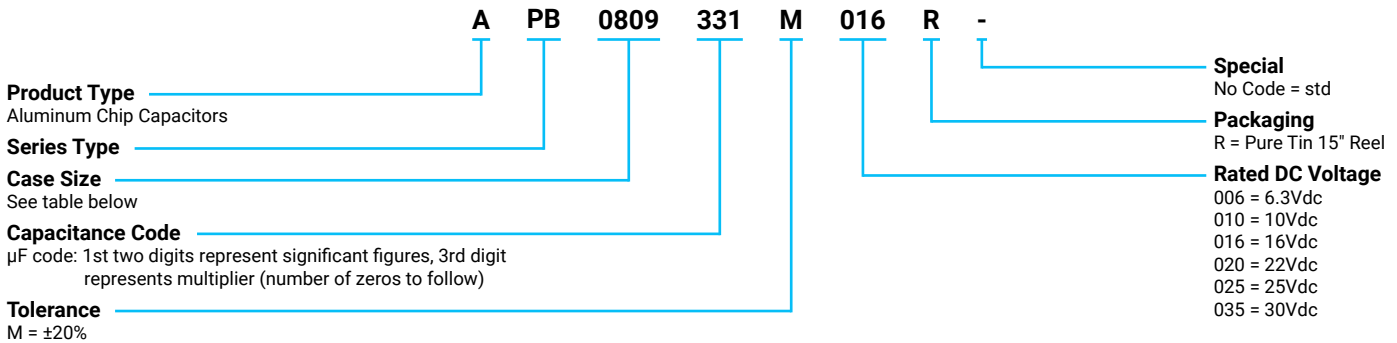


LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



RoHS  
COMPLIANT

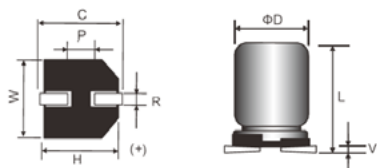
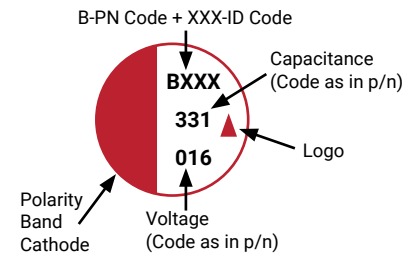
### HOW TO ORDER



### CASE DIMENSIONS millimeters (inches)

Code	D $\pm 0.50$ (0.020)	L $\pm 0.50$ (0.020)	W $\pm 0.20$ (0.008)	H $\pm 0.20$ (0.008)	C $\pm 0.20$ (0.008)	R	P $\pm 0.30$ (0.012)	V max	Typical Weight (g)
0606	6.30 (0.248)	6.00 (0.236)	6.60 (0.260)	6.60 (0.260)	7.30 (0.287)	0.50 - 0.80 (0.020 - 0.031)	2.00 (0.080)	0.30 (0.012)	0.32
0609	6.30 (0.248)	9.30 (0.366)	6.60 (0.260)	6.60 (0.260)	7.30 (0.287)	0.50 - 0.80 (0.020 - 0.031)	2.00 (0.080)	0.30 (0.012)	0.42
0809	8.00 (0.315)	9.50 (0.374)	8.30 (0.327)	8.30 (0.327)	9.00 (0.354)	0.70 - 1.10 (0.028 - 0.043)	3.20 (0.126)	0.30 (0.012)	0.64
0812	8.00 (0.315)	12.00 (0.472)	8.30 (0.327)	8.30 (0.327)	9.00 (0.354)	0.70 - 1.10 (0.028 - 0.043)	3.20 (0.126)	0.30 (0.012)	0.84
1010	10.00 (0.394)	10.50 (0.413)	10.30 (0.406)	10.30 (0.406)	11.00 (0.433)	0.70 - 1.10 (0.028 - 0.043)	4.50 (0.177)	0.30 (0.012)	1.17
1012	10.00 (0.394)	12.50 (0.492)	10.30 (0.406)	10.30 (0.406)	11.00 (0.433)	0.70 - 1.10 (0.028 - 0.043)	4.50 (0.177)	0.30 (0.012)	1.46

### MARKING



### TECHNICAL SPECIFICATIONS

<b>Category Temperature Range</b>	-55°C to +125°C	
<b>Capacitance Range</b>	At 25°C, 120Hz	56 $\mu$ F to 1800 $\mu$ F
<b>Capacitance Tolerance</b>	At 25°C, 120Hz	$\pm 20\%$
<b>Surge Voltage</b>	At 125°C	Rated voltage x 1.15
<b>Dissipation Factor (%)</b>	Measurement Frequency: 120Hz at 25°C	Please see the ratings and part number reference table below
<b>Leakage Current</b>	After 2 minutes at rated working voltage at 25°C*	$I \leq 0.2CV$ or 300 $\mu$ A, whichever is greater

\* Note: In the case of an anomalous reading, re-measure the leakage current after following voltage treatment:  
Voltage treatment: DC rated voltage to be applied to the capacitors for 120 minutes at 125°C.

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### CAPACITANCE AND RATED VOLTAGE RANGE (FIGURES DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V <sub>R</sub> )					
μF	Code	6.3V	10V	16V	20V	25V	35V
56	560						0609
100	101			0606		0609	0809
120	121				0609		0812
150	151						1010
180	181					0809	
220	221			0609	0809	0809	1012
270	271				0812		
330	331		0609	0809	1010	1010	
470	471	0609		0812	1012	1012	
560	561		0809				
680	681	0809	0812	1010			
820	821		1010	1012			
1000	102	0812	1010				
1200	122	1010	1012				
1800	182	1012					

Released ratings

### RATINGS & PART NUMBER REFERENCE

Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL Max. (μA)	DF Max. (%)	ESR Max. @100kHz (mΩ)	100kHz RMS Current (mA)/105°C
<b>6.3 Volt</b>							
APB0609471M006R	0609	470	6.3	592	12	25	3800
APB0809681M006R	0809	680	6.3	857	12	25	4000
APB0812102M006R	0812	1000	6.3	1260	12	20	4200
APB1010122M006R	1010	1200	6.3	1512	12	25	5500
APB1012182M006R	1012	1800	6.3	2268	12	20	6100
<b>10 Volt</b>							
APB0609331M010R	0609	330	10	660	12	25	3700
APB0809561M010R	0809	560	10	1120	12	25	4000
APB0812681M010R	0812	680	10	1360	12	20	4500
APB1010821M010R	1010	820	10	1640	12	25	4200
APB1010102M010R	1010	1000	10	2000	12	25	4500
APB1012122M010R	1012	1200	10	2400	12	20	5600
<b>16 Volt</b>							
APB0606101M016R	0606	100	16	320	12	20	1500
APB0609221M016R	0609	220	16	704	12	25	2850
APB0809331M016R	0809	330	16	1056	12	25	4000
APB0812471M016R	0812	470	16	1504	12	20	4500
APB1010681M016R	1010	680	16	2176	12	25	5100
APB1012821M016R	1012	820	16	2624	12	20	5600
<b>20 Volt</b>							
APB0609121M020R	0609	120	20	480	12	25	2510
APB0809221M020R	0809	220	20	880	12	25	2750
APB0812271M020R	0812	270	20	1080	12	20	2950
APB1010331M020R	1010	330	20	1320	12	25	4700
APB1012471M020R	1012	470	20	1880	12	20	4950
<b>25 Volt</b>							
APB0609101M025R	0609	100	25	500	12	40	2380
APB0809181M025R	0809	180	25	900	12	30	2900
APB0809221M025R	0809	220	25	1100	12	28	3500
APB1010331M025R	1010	330	25	1650	12	30	4250
APB1012471M025R	1012	470	25	2350	12	28	4500
<b>35 Volt</b>							
APB0609560M035R	0609	56	35	392	12	60	2300
APB0809101M035R	0809	100	35	700	12	50	2500
APB0812121M035R	0812	120	35	840	12	30	2950
APB1010151M035R	1010	150	35	1050	12	30	2950
APB1012221M035R	1012	220	35	1540	12	28	3400

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5RMS with DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at [www.kyocera-avx.com/disclaimer/](http://www.kyocera-avx.com/disclaimer/) by reference and should be reviewed in full before placing any order.

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### FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Frequency	120Hz ≤ f(Hz) < 1kHz	1kHz ≤ f(Hz) < 10kHz	10kHz ≤ f(Hz) < 100kHz	100kHz ≤ f(Hz) < 500kHz
Coefficient	0.05	0.30	0.70	1.00

### QUALIFICATION TABLE

Test	APB series (Temperature Range -55°C to +125°C)		
	Condition	Characteristics	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 125°C.	Visual examination	no visible damage
		ΔC/C	≅ ±20% of the initial limit
		DF	≅ 150% of the initial specified limit
		ESR	≅ 150% of the initial specified limit
		DCL	≅ Initial specified limit or less
Damp Heat (Steady State)	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjection them to store at 60°C, 90 to 95% RH for 1000 hours, without DC applied.	Visual examination	no visible damage
		ΔC/C	≅ ±20% of the initial limit
		DF	≅ 150% of the initial specified limit
		ESR	≅ 150% of the initial specified limit
		DCL	≅ Initial specified limit or less
Surge Voltage	The capacitors shall be subjected to 1000 cycles each consisting of charge with the surge voltages specified at 105°C for 30 seconds. Through a protective resistor (R = 1kΩ) and discharge for 5 minutes 30 seconds.	Visual examination	no visible damage
		ΔC/C	≅ ±20% of the initial limit
		DF	≅ 150% of the initial specified limit
		ESR	≅ 150% of the initial specified limit
		DCL	≅ Initial specified limit or less

### REFLOW

Peak Temperature	260°C, 10+1 sec.	250°C, 10+1 sec.
Preheat Temperature	150°C to 180°C, 90±3 sec.	
Duration at 200°C or higher	60 sec. max.	60 sec. max.
Duration at 220°C or higher	50 sec. max.	50 sec. max.
Duration at 230°C or higher	40 sec. max.	40 sec. max.
Reflow Number	Once	Twice or less

### STORAGE

- It is recommended to keep capacitors between the ambient temperatures of 5°C to 35°C and the relative humidity of 75% or below.
- Confirm that the environment does not have any of the following conditions:
  - Damp conditions such as water, saltwater spray, or oil spray or fumes. High humidity or humidity condensation situations.
  - In an atmosphere filled with toxic gases (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, etc.).
  - Being exposed to direct sunlight, ozone, ultraviolet ray, or radiation.
  - Being exposed to acidic or alkaline solutions.
  - Under severe conditions where vibration and / or mechanical shock exceed the applicable ranges of the specification.
- Storage time:

Category	Description	Storage life
Mid-High Voltage	160V and above	2yrs, after 1yr, needs to check characteristics, if NG, needs to do aging
Low Voltage	120V and below	2yrs

Note: Re-aging condition depends on its own spec.

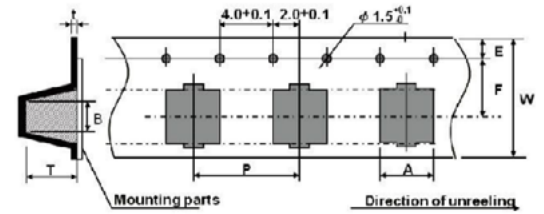
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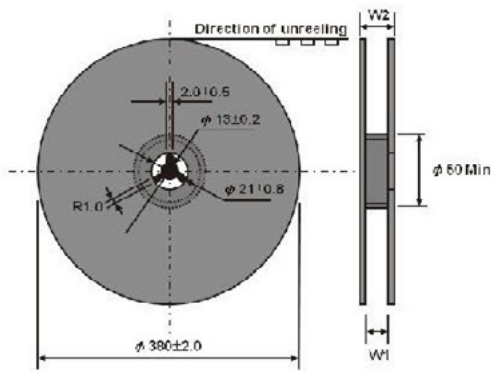


### PACKAGE TAPE DIMENSIONS units (mm)

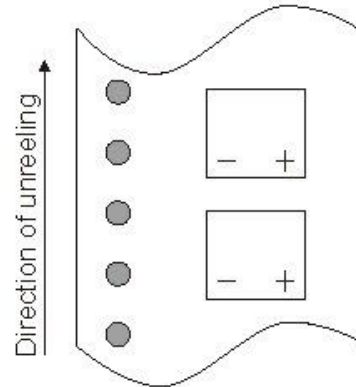
Size Code	A±0.20	B±0.20	W±0.30	F±0.10	E±0.10	P±0.10	t±0.10	T±0.20
0606	7.0	7.0	16.0	7.5	1.75	12.0	0.4	8.0
0609	7.0	7.0	16.0	7.5	1.75	12.0	0.4	10.0
0809	8.7	8.7	24.0	11.5	1.75	16.0	0.4	10.5
0812	8.7	8.7	24.0	11.5	1.75	16.0	0.4	13.0
1010	10.7	10.7	24.0	11.5	1.75	16.0	0.4	11.0
1012	10.7	10.7	24.0	11.5	1.75	16.0	0.4	13.0- 13.5



### REEL



### POLARITY



### DIMENSIONS units (mm)

Size Code	W1±1.00	W2±1.00	Qty./Reel
0606	18.0	22.0	1000
0609	18.0	22.0	800
0809	26.0	31.0	500
1010	26.0	31.0	500
0812-1012	26.0	31.0	400

### RECOMMENDED LAND PATTERN DIMENSION OF PCB

Size Code	A (mm)	B (mm)	C (mm)
0606	1.9	3.5	1.6
0609	1.9	3.5	1.6
0809	3.0	3.5	2.5
0812	3.0	3.5	2.5
1010	4.0	4.0	2.5
1012	4.0	4.0	2.5

