

# SMD Aluminum Conductive Polymer Electrolytic Capacitors

## APV Series



### FEATURES

- Endurance: 2000hours at 105°C
- Low ESR
- RoHS Compliance and Halogen-free

### APPLICATIONS

- High order main board, server

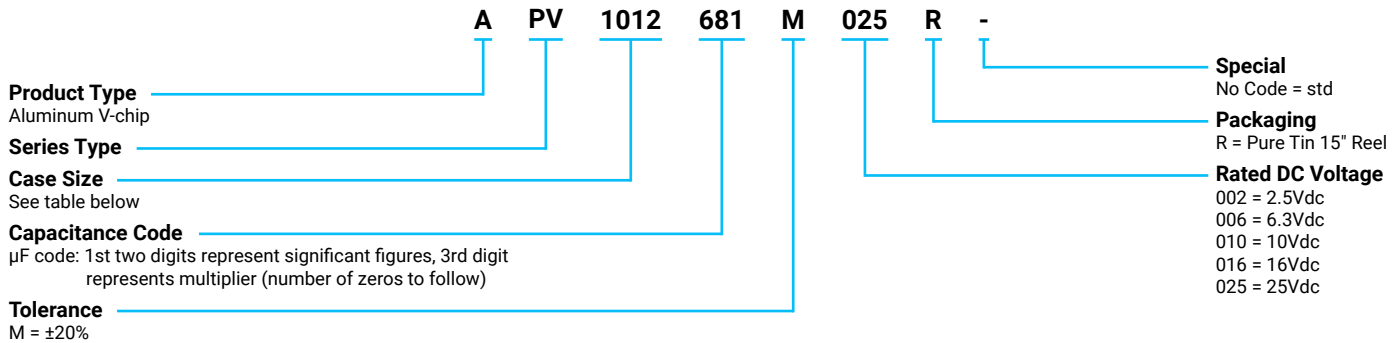


LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



RoHS  
COMPLIANT

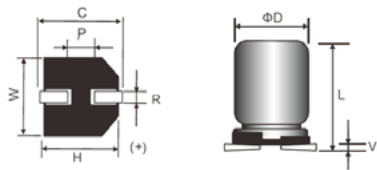
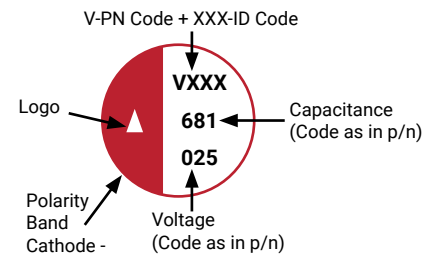
### HOW TO ORDER



### CASE DIMENSIONS millimeters (inches)

| Code | D±0.50<br>(0.020) | L±0.50<br>(0.020) | W±0.20<br>(0.008) | H±0.20<br>(0.008) | C±0.20<br>(0.008) | R                          | P±0.30<br>(0.012) | V max           | Typical Weight (g) |
|------|-------------------|-------------------|-------------------|-------------------|-------------------|----------------------------|-------------------|-----------------|--------------------|
| 0606 | 6.30<br>(0.248)   | 6.00<br>(0.236)   | 6.60<br>(0.260)   | 6.60<br>(0.260)   | 7.30<br>(0.287)   | 0.50-0.80<br>(0.020-0.031) | 2.00<br>(0.080)   | 0.30<br>(0.012) | 0.28               |
| 0609 | 6.30<br>(0.248)   | 9.30<br>(0.366)   | 6.60<br>(0.260)   | 6.60<br>(0.260)   | 7.30<br>(0.287)   | 0.50-0.80<br>(0.020-0.031) | 2.00<br>(0.080)   | 0.30<br>(0.012) | 0.40               |
| 0809 | 8.00<br>(0.315)   | 9.50<br>(0.374)   | 8.30<br>(0.327)   | 8.30<br>(0.327)   | 9.00<br>(0.354)   | 0.70-1.10<br>(0.028-0.043) | 3.20<br>(0.126)   | 0.30<br>(0.012) | 0.68               |
| 0811 | 8.00<br>(0.315)   | 11.50<br>(0.453)  | 8.30<br>(0.327)   | 8.30<br>(0.327)   | 9.00<br>(0.354)   | 0.70-1.10<br>(0.028-0.043) | 3.20<br>(0.126)   | 0.30<br>(0.012) | 0.87               |
| 1012 | 10.00<br>(0.394)  | 12.50<br>(0.492)  | 10.30<br>(0.406)  | 10.30<br>(0.406)  | 11.00<br>(0.433)  | 0.70-1.30<br>(0.028-0.051) | 4.50<br>(0.177)   | 0.30<br>(0.012) | 1.28               |

### MARKING



### TECHNICAL SPECIFICATIONS

|                             |                                                   |                                                              |
|-----------------------------|---------------------------------------------------|--------------------------------------------------------------|
| Category Temperature Range: | -55°C to +105°C                                   |                                                              |
| Capacitance Range           | At 25°C, 120Hz                                    | 27µF to 2200µF                                               |
| Capacitance Tolerance:      | At 25°C, 120Hz                                    | ±20%                                                         |
| Dissipation Factor (%)      | Measurement Frequency: 120Hz at 25°C              | Please see the ratings and part number reference table below |
| Leakage Current:            | After 2 minutes at rated working voltage at 25°C* | I ≤ 0.2CV or 500µA, 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 105°C.

# SMD Aluminum Conductive Polymer Electrolytic Capacitors

## APV Series



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

| Capacitance |      | Rated Voltage DC (V <sub>R</sub> ) |      |            |                  |            |
|-------------|------|------------------------------------|------|------------|------------------|------------|
| μF          | Code | 2.5V                               | 6.3V | 10V        | 16V              | 25V        |
| 27          | 270  |                                    |      |            |                  | 0606       |
| 47          | 470  |                                    |      |            | 0606             | 0606, 0609 |
| 56          | 560  |                                    |      |            |                  | 0606       |
| 68          | 680  |                                    |      | 0606       | 0606             | 0606       |
| 100         | 101  |                                    |      |            | 0606             | 0606, 0609 |
| 120         | 121  |                                    |      | 0606       |                  |            |
| 150         | 151  |                                    |      |            | 0606, 0609       | 0609       |
| 180         | 181  |                                    |      |            | 0606, 0609       |            |
| 220         | 221  |                                    | 0606 | 0606, 0609 | 0609             | 0609, 0811 |
| 270         | 271  |                                    | 0606 |            | 0609, 0809       |            |
| 330         | 331  | 0606                               | 0606 | 0609       | 0609, 0811, 1012 | 0811, 1012 |
| 390         | 391  | 0606                               |      |            |                  |            |
| 470         | 471  | 0606                               | 0609 | 0609       |                  | 0811, 1012 |
| 560         | 561  | 0606                               | 0609 | 0811, 1012 | 0811             | 1012       |
| 680         | 681  | 0609                               |      |            | 1012             | 1012       |
| 1000        | 102  |                                    | 0811 | 0811, 1012 | 1012             |            |
| 1500        | 152  |                                    | 0811 | 1012       |                  |            |
| 2200        | 222  |                                    | 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 |
|-----------------|-----------|------------------|-------------------|---------------|-------------|-----------------------|-------------------------------|
| 2.5 Volts       |           |                  |                   |               |             |                       |                               |
| APV0606331M002R | 0606      | 330              | 2.5               | 500           | 8           | 18                    | 2800                          |
| APV0606391M002R | 0606      | 390              | 2.5               | 500           | 8           | 18                    | 2900                          |
| APV0606471M002R | 0606      | 470              | 2.5               | 500           | 8           | 18                    | 4000                          |
| APV0606561M002R | 0606      | 560              | 2.5               | 500           | 8           | 18                    | 4000                          |
| APV0609681M002R | 0609      | 680              | 2.5               | 500           | 8           | 13                    | 4500                          |
| 6.3 Volt        |           |                  |                   |               |             |                       |                               |
| APV0606221M006R | 0606      | 220              | 6.3               | 500           | 8           | 18                    | 2900                          |
| APV0606271M006R | 0606      | 270              | 6.3               | 500           | 8           | 18                    | 3100                          |
| APV0606331M006R | 0606      | 330              | 6.3               | 500           | 8           | 18                    | 3200                          |
| APV0609471M006R | 0609      | 470              | 6.3               | 592           | 8           | 13                    | 3600                          |
| APV0609561M006R | 0609      | 560              | 6.3               | 706           | 8           | 13                    | 3800                          |
| APV0811102M006R | 0811      | 1000             | 6.3               | 1260          | 8           | 13                    | 4500                          |
| APV0811152M006R | 0811      | 1500             | 6.3               | 1890          | 8           | 13                    | 4600                          |
| APV1012222M006R | 1012      | 2200             | 6.3               | 2772          | 8           | 13                    | 5800                          |
| 10 Volt         |           |                  |                   |               |             |                       |                               |
| APV0606680M010R | 0606      | 68               | 10                | 500           | 12          | 45                    | 2800                          |
| APV0606121M010R | 0606      | 120              | 10                | 500           | 12          | 27                    | 2800                          |
| APV0606221M010R | 0606      | 220              | 10                | 500           | 12          | 27                    | 2800                          |
| APV0609221M010R | 0609      | 220              | 10                | 500           | 12          | 18                    | 3100                          |
| APV0609331M010R | 0609      | 330              | 10                | 660           | 12          | 18                    | 3200                          |
| APV0609471M010R | 0609      | 470              | 10                | 940           | 12          | 27                    | 3500                          |
| APV0811561M010R | 0811      | 560              | 10                | 1120          | 12          | 18                    | 3700                          |
| APV1012561M010R | 1012      | 560              | 10                | 1120          | 12          | 18                    | 5200                          |
| APV0811102M010R | 0811      | 1000             | 10                | 2000          | 12          | 13                    | 4400                          |
| APV1012102M010R | 1012      | 1000             | 10                | 2000          | 12          | 13                    | 4600                          |
| APV1012152M010R | 1012      | 1500             | 10                | 3000          | 12          | 13                    | 4600                          |
| 16 Volt         |           |                  |                   |               |             |                       |                               |
| APV0606470M016R | 0606      | 47               | 16                | 500           | 12          | 36                    | 1700                          |
| APV0606680M016R | 0606      | 68               | 16                | 500           | 12          | 36                    | 2100                          |
| APV0606101M016R | 0606      | 100              | 16                | 500           | 12          | 27                    | 2500                          |
| APV0606151M016R | 0606      | 150              | 16                | 500           | 12          | 27                    | 2500                          |

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.

TDS-ALUM-0011 | Rev 5

— ALUMINUM CAPACITORS —

# SMD Aluminum Conductive Polymer Electrolytic Capacitors

## APV Series



| Part No.        | Case Size | Capacitance (μF) | Rated Voltage (V) | DCL Max. (μA) | DF Max. (%) | ESR Max. @100kHz (mΩ) | 100kHz RMS Current (mA)/105°C |
|-----------------|-----------|------------------|-------------------|---------------|-------------|-----------------------|-------------------------------|
| APV0609151M016R | 0609      | 150              | 16                | 500           | 12          | 22                    | 2700                          |
| APV0606181M016R | 0606      | 180              | 16                | 576           | 12          | 54                    | 2600                          |
| APV0609181M016R | 0609      | 180              | 16                | 576           | 12          | 22                    | 2800                          |
| APV0609221M016R | 0609      | 220              | 16                | 704           | 12          | 22                    | 2600                          |
| APV0609271M016R | 0609      | 270              | 16                | 864           | 12          | 22                    | 2700                          |
| APV0809271M016R | 0809      | 270              | 16                | 864           | 12          | 22                    | 2900                          |
| APV0609331M016R | 0609      | 330              | 16                | 1056          | 12          | 22                    | 2700                          |
| APV0811331M016R | 0811      | 330              | 16                | 1056          | 12          | 18                    | 4200                          |
| APV1012331M016R | 1012      | 330              | 16                | 1056          | 12          | 18                    | 5200                          |
| APV0811561M016R | 0811      | 560              | 16                | 1792          | 12          | 18                    | 3600                          |
| APV1012681M016R | 1012      | 680              | 16                | 2176          | 12          | 18                    | 4200                          |
| APV1012102M016R | 1012      | 1000             | 16                | 3200          | 12          | 18                    | 4300                          |
| 25 Volt         |           |                  |                   |               |             |                       |                               |
| APV0606270M025R | 0606      | 27               | 25                | 500           | 12          | 45                    | 1100                          |
| APV0606470M025R | 0606      | 47               | 25                | 500           | 12          | 45                    | 1800                          |
| APV0609470M025R | 0609      | 47               | 25                | 500           | 12          | 31                    | 2100                          |
| APV0606560M025R | 0606      | 56               | 25                | 500           | 12          | 45                    | 1800                          |
| APV0606680M025R | 0606      | 68               | 25                | 500           | 12          | 45                    | 1800                          |
| APV0606101M025R | 0606      | 100              | 25                | 500           | 12          | 27                    | 2500                          |
| APV0609101M025R | 0609      | 100              | 25                | 500           | 12          | 45                    | 2200                          |
| APV0609151M025R | 0609      | 150              | 25                | 750           | 12          | 27                    | 2600                          |
| APV0609221M025R | 0609      | 220              | 25                | 1100          | 12          | 27                    | 2600                          |
| APV0811221M025R | 0811      | 220              | 25                | 1100          | 12          | 27                    | 2700                          |
| APV0811331M025R | 0811      | 330              | 25                | 1650          | 12          | 19                    | 2900                          |
| APV1012331M025R | 1012      | 330              | 25                | 1650          | 12          | 27                    | 2800                          |
| APV0811471M025R | 0811      | 470              | 25                | 2350          | 12          | 27                    | 2900                          |
| APV1012471M025R | 1012      | 470              | 25                | 2350          | 12          | 19                    | 3200                          |
| APV1012561M025R | 1012      | 560              | 25                | 2800          | 12          | 19                    | 3400                          |
| APV1012681M025R | 1012      | 680              | 25                | 3400          | 12          | 19                    | 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.

## 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                     | APV series (Temperature Range -55°C to +105°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 105°C.                                                                               | Visual examination                    |
|                          |                                                                                                                                                                                                                                    | no visible damage                     |
|                          |                                                                                                                                                                                                                                    | ΔC/C                                  |
|                          |                                                                                                                                                                                                                                    | ≤ ±20% of the initial limit           |
|                          |                                                                                                                                                                                                                                    | DF                                    |
| 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 2000 hours, without DC applied.                                                  | ≤ 150% of the initial specified limit |
|                          |                                                                                                                                                                                                                                    | ESR                                   |
|                          |                                                                                                                                                                                                                                    | ≤ 150% of the initial specified limit |
|                          |                                                                                                                                                                                                                                    | DCL                                   |
|                          |                                                                                                                                                                                                                                    | ≤ Initial specified limit             |
| Surge Voltage            | The capacitors shall be subjected to 1000 cycles each consisting of charge with the surge voltages specified at normal temperature 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             |

# SMD Aluminum Conductive Polymer Electrolytic Capacitors

## APV Series



### REFLOW

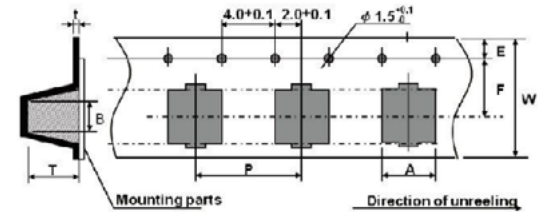
|                             |                              |
|-----------------------------|------------------------------|
| Peak Temperature            | 260°C, 10 sec. max.          |
| Preheat Temperature         | 150°C to 180°C, 90 sec. max. |
| Duration at 200°C or higher | 60 sec. max.                 |
| Duration at 230°C or higher | 40 sec. max.                 |
| Reflow Number               | Twice or less                |

### STORAGE

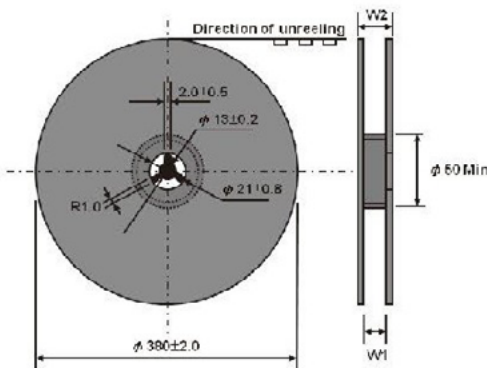
- It is recommended to keep capacitors between the ambient temperatures of 5°C to 35°C (If between 35 to 85°C, it should be less than three months), and the relative humidity of 75% or below.
- Confirm that the environment does not have any of the following conditions:
  - Damp conditions such as water, 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
  - Before unseal: within 1 year after delivery
  - After seal: within 1 month from opening

### PACKAGE TAPE DIMENSIONS units (mm)

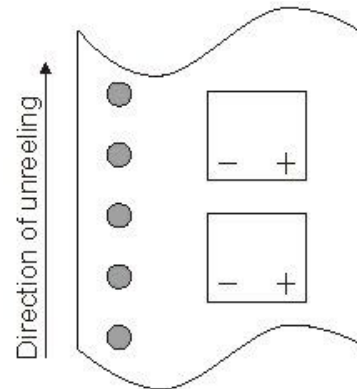
| Size Code | A±0.20 | B±0.20 | W±0.30 | F±0.10 | E±0.10 | P±0.10 | t±0.10 | T±0.20    |
|-----------|--------|--------|--------|--------|--------|--------|--------|-----------|
| 0606      | 7.0    | 7.0    | 16.0   | 7.5    | 1.75   | 12.0   | 0.4    | 8.0       |
| 0609      | 7.0    | 7.0    | 16.0   | 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      |
| 0811      | 8.7    | 8.7    | 24.0   | 11.5   | 1.75   | 16.0   | 0.4    | 12.0      |
| 1012      | 10.7   | 10.7   | 24.0   | 11.5   | 1.75   | 16.0   | 0.4    | 13.0-13.5 |



### REEL



### POLARITY

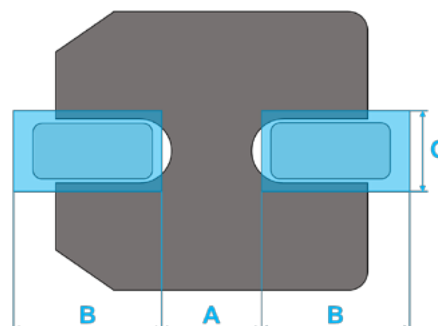


### DIMENSIONS units (mm)

| 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    | 30.0    | 600       |
| 0811      | 26.0    | 31.0    | 500       |
| 1012      | 26.0    | 31.0    | 500       |

### 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      | 3.1    | 4.2    | 2.2    |
| 0811      | 3.1    | 4.2    | 2.2    |
| 1012      | 4.5    | 4.4    | 2.2    |



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.