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

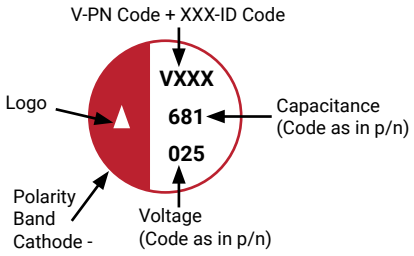
HOW TO ORDER

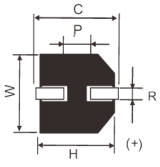
A	PV	1012	681	M	025	R	-
Product Type Aluminum V-chip	**Series Type**	**Case Size** See table below	**Capacitance Code** µF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 002 = 2.5Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 025 = 25Vdc	**Packaging** R = 15" Reel (Material details available upon request)	**Special** No Code = std

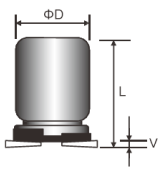
CASE DIMENSIONS millimeters (inches)

Code	D±0.50 (0.020)	L±0.50 (0.020)	W±0.20 (0.008)	H±0.20 (0.008)	C±0.20 (0.008)	R	P±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)	0.50-0.90 (0.020-0.035)	2.00 (0.080)	0.30 (0.012)	0.28
0609	6.30 (0.248)	9.30 (0.366)	6.60 (0.260)	6.60 (0.260)	7.30 (0.287)	0.50-0.90 (0.020-0.035)	2.00 (0.080)	0.30 (0.012)	0.40
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)	0.68
0811	8.00 (0.315)	11.50 (0.453)	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)	0.87
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)	1.28

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.

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APV Series

CAPACITANCE AND RATED VOLTAGE RANGE (FIGURES DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R)				
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	MSL
2.5 Volts								
APV0606331M002R	0606	330	2.5	500	8	18	2800	1
APV0606391M002R	0606	390	2.5	500	8	18	2900	1
APV0606471M002R	0606	470	2.5	500	8	18	4000	1
APV0606561M002R	0606	560	2.5	500	8	18	4000	1
APV0609681M002R	0609	680	2.5	500	8	13	4500	1
6.3 Volt								
APV0606221M006R	0606	220	6.3	500	8	18	2900	1
APV0606271M006R	0606	270	6.3	500	8	18	3100	1
APV0606331M006R	0606	330	6.3	500	8	18	3200	1
APV0609471M006R	0609	470	6.3	592	8	13	3600	1
APV0609561M006R	0609	560	6.3	706	8	13	3800	1
APV0811102M006R	0811	1000	6.3	1260	8	13	4500	1
APV0811152M006R	0811	1500	6.3	1890	8	13	4600	1
APV1012222M006R	1012	2200	6.3	2772	8	13	5800	1
10 Volt								
APV0606680M010R	0606	68	10	500	12	45	2800	1
APV0606121M010R	0606	120	10	500	12	27	2800	1
APV0606221M010R	0606	220	10	500	12	27	2800	1
APV0609221M010R	0609	220	10	500	12	18	3100	1
APV0609331M010R	0609	330	10	660	12	18	3200	1
APV0609471M010R	0609	470	10	940	12	27	3500	1
APV0811561M010R	0811	560	10	1120	12	18	3700	1
APV1012561M010R	1012	560	10	1120	12	18	5200	1
APV0811102M010R	0811	1000	10	2000	12	13	4400	1
APV1012102M010R	1012	1000	10	2000	12	13	4600	1
APV1012152M010R	1012	1500	10	3000	12	13	4600	1
16 Volt								
APV0606470M016R	0606	47	16	500	12	36	1700	1
APV0606680M016R	0606	68	16	500	12	36	2100	1
APV0606101M016R	0606	100	16	500	12	27	2500	1
APV0606151M016R	0606	150	16	500	12	27	2500	1
APV0609151M016R	0609	150	16	500	12	22	2700	1
APV0606181M016R	0606	180	16	576	12	54	2600	1
APV0609181M016R	0609	180	16	576	12	22	4000	1

All technical data relates to an ambient temperature of +25C. 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.

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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	MSL
APV0609221M016R	0609	220	16	704	12	22	2600	1
APV0609271M016R	0609	270	16	864	12	22	2700	1
APV0809271M016R	0809	270	16	864	12	22	2900	1
APV0609331M016R	0609	330	16	1056	12	22	2700	1
APV0811331M016R	0811	330	16	1056	12	18	4200	1
APV1012331M016R	1012	330	16	1056	12	18	5200	1
APV0811561M016R	0811	560	16	1792	12	18	3600	1
APV1012681M016R	1012	680	16	2176	12	18	4200	1
APV1012102M016R	1012	1000	16	3200	12	18	4300	1
25 Volt								
APV0606270M025R	0606	27	25	500	12	45	1100	1
APV0606470M025R	0606	47	25	500	12	45	1800	1
APV0609470M025R	0609	47	25	500	12	31	2100	1
APV0606560M025R	0606	56	25	500	12	45	1800	1
APV0606680M025R	0606	68	25	500	12	45	1800	1
APV0606101M025R	0606	100	25	500	12	27	2500	1
APV0609101M025R	0609	100	25	500	12	45	2200	1
APV0609151M025R	0609	150	25	750	12	27	2600	1
APV0609221M025R	0609	220	25	1100	12	27	2600	1
APV0811221M025R	0811	220	25	1100	12	27	2700	1
APV0811331M025R	0811	330	25	1650	12	19	2900	1
APV1012331M025R	1012	330	25	1650	12	27	2800	1
APV0811471M025R	0811	470	25	2350	12	27	2900	1
APV1012471M025R	1012	470	25	2350	12	19	3200	1
APV1012561M025R	1012	560	25	2800	12	19	3400	1
APV1012681M025R	1012	680	25	3400	12	19	3400	1

All technical data relates to an ambient temperature of +25C. 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	≦ 150% of the initial specified limit
		ESR	≦ 150% of the initial specified limit
		DCL	≦ Initial specified limit
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.	**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
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

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

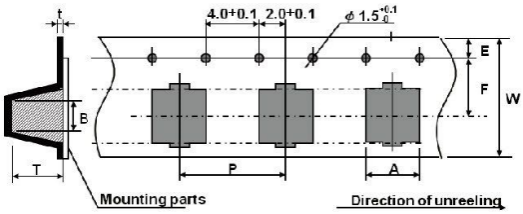
1. It is recommended to keep capacitors between the ambient temperatures of 5°C to 35°C (if between 35°C to 85°C, it should be less than three months) and the relative humidity of 75% or below.
2. Confirm that the environment does not have any of the following conditions:
   - Damp conditions such as water, saltwater spray, oil spray or fumes. High humidity or humidity condensation situations.
   - In an atmosphere filled with toxic gasses (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.
3. Shelf life

Years		
0-1	1-2	>2
Ok	Ok	Performance check

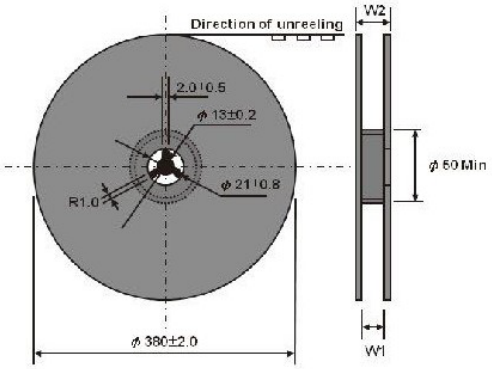
- Years from manufacturing date code.
- KYOCERA AVX does not guarantee or assume responsibility for product behavior after 3 years of storage.
- Ageing procedure should be performed as follows:
  - Connect the capacitor in series to a 1kΩ resistor, and apply half rated voltage for 2 hours.
  - After half rated voltage for 2 hours applied, increase and apply rated voltage for another 2 hours.

PACKAGE TAPE DIMENSIONS units (mm)

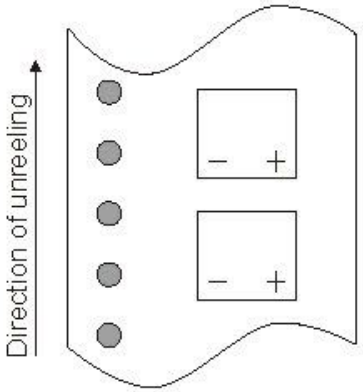
Size Code	A±0.20	B±0.20	W±0.30	F±0.10	E±0.10	P±0.10	t±0.10	T±0.20
0606	7.0	7.0	16.0	7.5	1.75	12.0	0.4	8.0
0609	7.0	7.0	16.0	7.5	1.75	12.0	0.4	10.0
0809	8.7	8.7	24.0	11.5	1.75	16.0	0.4	10.5
0811	8.7	8.7	24.0	11.5	1.75	16.0	0.4	12.0
1012	10.7	10.7	24.0	11.5	1.75	16.0	0.4	13.0-13.5



REEL



POLARITY

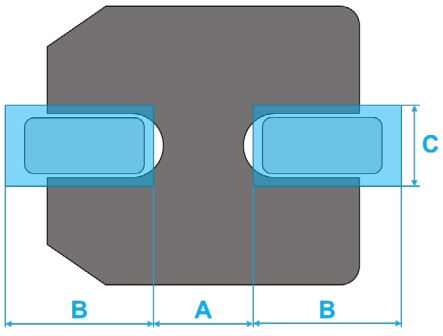


DIMENSIONS units (mm)

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	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	3.1	4.2	2.2
0811	3.1	4.2	2.2
1012	4.5	4.4	2.2



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