

Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.

REMINDERS

- Product information in this catalog is as of October 2010. All of the contents specified herein are subject to change without notice due to technical improvements, etc. Therefore, please check for the latest information carefully before practical application or usage of the Products.

Please note that Taiyo Yuden Co., Ltd. shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this catalog or individual specification.

- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.
- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.
- All electronic components or functional modules listed in this catalog are developed, designed and intended for use in general electronics equipment.(for AV, office automation, household, office supply, information service, telecommunications, (such as mobile phone or PC) etc.). Before incorporating the components or devices into any equipment in the field such as transportation,(automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network (telephone exchange, base station) etc. which may have direct influence to harm or injure a human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance. Do not incorporate the products into any equipment in fields such as aerospace, aviation, nuclear control, submarine system, military, etc. where higher safety and reliability are especially required.

In addition, even electronic components or functional modules that are used for the general electronic equipment, if the equipment or the electric circuit require high safety or reliability function or performances, a sufficient reliability evaluation check for safety shall be performed before commercial shipment and moreover, due consideration to install a protective circuit is strongly recommended at customer's design stage.

- The contents of this catalog are applicable to the products which are purchased from our sales offices or distributors (so called "TAIYO YUDEN' s official sales channel"). It is only applicable to the products purchased from any of TAIYO YUDEN' s official sales channel.
- Please note that Taiyo Yuden Co., Ltd. shall have no responsibility for any controversies or disputes that may occur in connection with a third party's intellectual property rights and other related rights arising from your usage of products in this catalog. Taiyo Yuden Co., Ltd. grants no license for such rights.
- Caution for export**
Certain items in this catalog may require specific procedures for export according to "Foreign Exchange and Foreign Trade Control Law" of Japan, "U.S. Export Administration Regulations", and other applicable regulations. Should you have any question or inquiry on this matter, please contact our sales staff.

CYLINDER TYPE PAS CAPACITOR



WAVE

FEATURES

- PAS can store a large number of ions into its amorphous structure (doping), therefore PAS capacitor has much larger capacitance than conventional electric double layer capacitors.
- Quick-charge with ampere measure is possible with its Low internal resistance.
- Possible to charge/discharge more than 100,000 times with less deterioration caused by charging/discharging compared to secondary battery which involves chemical reaction, and that enables to more than 100,000 times charge/discharge and large excellence of durability for over charge/discharge.
- PAS capacitor is environmentally friendly power source, which does not contain any heavy metals such as Cd, Hg and Pb. (RoHS compliant)

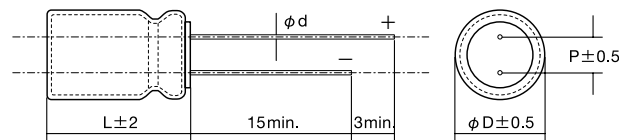
APPLICATIONS

- Back-up power source for CPU, microcomputer, and flash memory writing when shutting off the power.
- Load change leveling (life lengthening of main power source such as dry battery, Lithium primary battery)
- Power source storage combined with solar cell, fuel cell, generator, and so on.
- Main power source for small devices (toys, measuring equipments and so on).

ORDERING CODE

P	A	S	0	8	1	5	L	R	2	R	3	1	0	5
① Type		② Dimensions/ φD [mm]		③ Dimensions/ L [mm]		④ Characteristic Spec		⑤ Maximum Usable Voltage [VDC]		⑥ Nominal Capacitance (F)				
PAS Polyacene Capacitors		08 8.0 10 10.0 12 12.5 18 18		15 15 16 16 20 20 35 35 40 40		LR Low ESR type LA High Capacitance type		2R3 2.3 3R0 3.0 ※R=decimal point		example 105 10×10 ⁵ μF=1F 5 5 566 56×10 ⁵ μF=56F				

EXTERNAL DIMENSIONS



Part Number		φD	L	φd	P
Low ESR type (LR series)	PAS0815LR2R3105	8.0	15.0	0.6	3.5
	PAS1016LR2R3205	10.0	16.0	0.6	5.0
	PAS1020LA2R3475	10.0	20.0	0.6	5.0
	PAS1220LA2R3106	12.5	20.0	0.6	5.0
Large Capacitance type (LA series)	PAS1235LA2R3226	12.5	35.0	0.6	5.0
	PAS1840LA2R3566	18.0	40.0	0.8	8.0
	PAS1020LA3R0405	10.0	20.0	0.6	5.0
	PAS1220LA3R0905	12.5	20.0	0.6	5.0
	PAS1235LA3R0206	12.5	35.0	0.6	5.0
	PAS1840LA3R0506	18.0	40.0	0.8	8.0

Unit : mm

PART NUMBERS

Part Number		Maximum Usable Voltage (V.DC)	Nominal Capacitance (F)	Internal Resistance (mΩ)	
Low ESR type (LR series)	PAS0815LR2R3105	2.3	1	70	
	PAS1016LR2R3205		2	50	
	PAS1020LA2R3475		4.7	300	
Large Capacitance type (LA series)	PAS1220LA2R3106	2.3	10	200	
	PAS1235LA2R3226		22	100	
	PAS1840LA2R3566		56	50	
	PAS1020LA3R0405		4	300	
	Large Capacitance type (LA series)	PAS1220LA3R0905	3.0	9	200
		PAS1235LA3R0206		20	100
		PAS1840LA3R0506		50	70

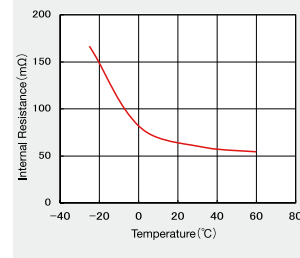
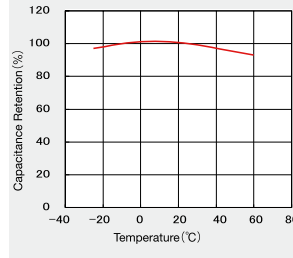
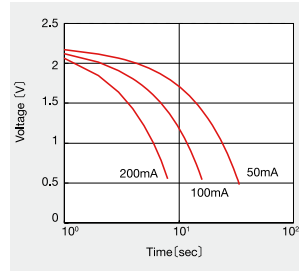
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SPECIFICATIONS

Part Number	Operating Temp. Range (°C)	Max. Usable Voltage (V)	Initial Capacitance (F)	Initial Internal Resistance (mΩ)	Temperature Characteristics
PAS0815LR2R3105	-25~+60	2.3	1.0±20%	Below 70	Lowest temperature (-25°C) Capacitance : Over 70% of initial spec. Internal Resistance : Within 4 times of initial spec. Highest temperature (60°C) Capacitance, Internal Resistance : Within initial spec.
PAS1016LR2R3205			2.0±20%	Below 50	

ELECTRICAL CHARACTERISTICS

PAS0815LR2R3105 ● Discharging Characteristics ● Temperature Characteristics (Capacitance) ● Temperature Characteristics (Internal Resistance)

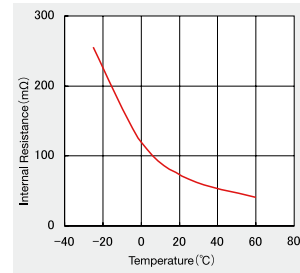
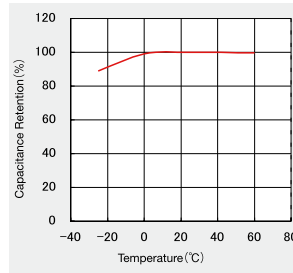
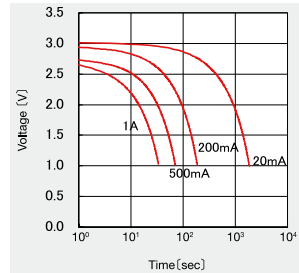


SPECIFICATIONS

Part Number	Operating Temp. Range (°C)	Max. Usable Voltage (V)	Initial Capacitance (F)	Initial Internal Resistance (mΩ)	Temperature Characteristics
PAS1020LA2R3475	-25~+60	2.3	4.7±20%	Below 300	Lowest temperature (-25°C) Capacitance : Over 70% of initial spec. Internal Resistance : Within 4 times of initial spec. Highest temperature (60°C) Capacitance, Internal Resistance : Within initial spec.
PAS1220LA2R3106			10±20%	Below 200	
PAS1235LA2R3226			22±20%	Below 100	
PAS1840LA2R3566			56±20%	Below 50	
PAS1020LA3R0405		3.0	4.0±20%	Below 300	
PAS1220LA3R0905			9.0±20%	Below 200	
PAS1235LA3R0206			20±20%	Below 100	
PAS1840LA3R0506			50±20%	Below 70	

ELECTRICAL CHARACTERISTICS

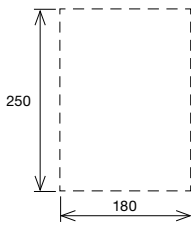
PAS1235LA3R0206 ● Discharging Characteristics ● Temperature Characteristics (Capacitance) ● Temperature Characteristics (Internal Resistance)



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PACKAGING

① Minimum Packing Unit (Plastic Bag)



Item	Minimum Packing Unit	Standard Inner Packing Box quantity	
PAS1016	200	10bags	2000
PAS1020	100	15bags	1500
PAS1220	100	10bags	1000
PAS1235	50	10bags	500
PAS1840	10	20bags	200

Standard Inner Packing Box
200mm(W)×330mm(L)×140mm(H)

RELIABILITY DATA

Items	Specifications			Test Conditions, Remark
	LR Series	LA Series		
1. Operating Temperature range		-25~+60°C		
2. Max. Usable Voltage	2.3V	2.3V	3.0V	
3. Floating Charge Characteristics	Capacitance : Over 70% of initial spec. Internal Resistance : Within 4 times of initial spec. Appearance : No noticeable abnormality			Apply a max. usable voltage to capacitor for 1000 hours at max. operating temp. and measure the floating charge characteristics after returning to normal temperature and humidity.
4. Charge/Discharge Cycle Characteristics	Capacitance : Over 70% of initial spec. Internal Resistance : Within 4 times of initial spec. Appearance : No noticeable abnormality			Measure the charge/discharge cycle characteristics after 10000 charge/discharge cycle at 25±5°C with under mentioned charge/discharge cycle test condition for each parts.
5. Thermal Durability	Capacitance : Within initial spec. Internal Resistance : Within initial spec. Appearance : No noticeable abnormality			Leave the capacitor in an atmosphere of 60°C±2°C and -25±2°C consecutively for 96 hours each, and return to normal temperature and humidity.
6. Humidity Durability	Capacitance : Within initial spec. Internal Resistance : Within 4 times of initial spec. Appearance : No noticeable abnormality			Temperature : 40±2°C, Humidity : 90~95%RH Leave the capacitor for 500 hours, and return to normal temperature and humidity.
7. Impact Durability	No exterior abnormality observed : initial spec. values retained			According to JIS C 0041 Sine half wave A=294
8. Vibration Durability	No exterior abnormality observed : initial spec. values retained			Apply a sine wave vibration of 1.5mm amplitude and frequency 10~55Hz, for 2 hours per each direction (X, Y and Z), total 6 hours.
9. Solder Heat Resistance	Capacitance : Within initial spec. Internal Resistance : Within initial spec. Appearance : No noticeable abnormality			Material : Sn-3Ag-0.5Cu Solder bath temperature : 260±5°C Dipping time : 10±1 sec. Dipping depth : 1.5~2mm from cell body

● Charge/Discharge Cycle Test Condition

Part Number	PAS0815 LR2R3105	PAS1016 LR2R3205	PAS1020 LA2R3475	PAS1020 LA2R3106	PAS1235 LA2R3226	PAS1840 LA2R3566	PAS1020 LA3R0405	PAS1220 LA3R0905	PAS1235 LA3R0206	PAS1840 LA3R0506
Charging Voltage (V)	2.3	2.3	2.3	2.3	2.3	2.3	3.0	3.0	3.0	3.0
Charging Time (s)	10	10	10	10	10	30	30	30	30	30
Max. Charging Current (A)	1	1	1	1	1	5	2	3	5	10
Discharging Current (A)	1	1	1	1	1	5	0.5	1.0	1	2
Cut off Voltage (V)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

PRECAUTIONS

- Use under the maximum usable voltage.
If over maximum usable voltage is applied, it might cause abnormal current flow which shortens lifetime and sometimes damages PAS capacitor.
- Use under maximum operating temperature.
Not only shorten the lifetime but also leakage and damage could happen by increasing internal pressure if PAS is used beyond max operating temperature.
- Limited life time.
Lifetime of PAS capacitor is greatly affected by surrounding temperature. 10°C drop in temperature extends its expected lifetime approximately twice as much. Design a circuit under consideration of deterioration of electrical characteristics after long time usage, decreasing in capacitance and increasing in internal resistance.
- The electrical characteristics of capacitors vary with respect to temperature.
The electrical characteristics of PAS capacitors temporarily vary with respect to temperature separately from secular change mentioned above. Design a circuit under consideration of temperature characteristics.
- PAS capacitor has polarity.
Please check the polarity before use. It will be damaged if it is reverse charged.
- Pay sufficient attention to use PAS capacitor in a circuit with high ripple current with a very frequent charge/discharge rapidly.
In circuit with high ripple current or that requires rapid and very frequent charge / discharge, the lifetime of PAS capacitors might be shortened by self-heating. Please consult us in case of using PAS capacitor in such circuit.
- Mind voltage drop when discharging.
When the discharge starts, voltage drop occurs if discharge current is high. Consult us about the discharging current.
- Series connection.
In case of using PAS capacitors in a series connection, the voltage may be different in these capacitors, the difference of the voltages could shorten the lifetime of the capacitors or break them down.
Take a margin against a rated voltage or add a balancing resistor.
- Environmental of usage
In case PAS capacitor is used in the high humidity, alkaline or acid air, it may cause deteriorating of its performance and short circuit by corrosion of outer can or lead terminal.
In addition, used in sudden temperature change or high humidity, that may cause a deterioration of its performance or a leakage by dew condensation.
- PAS capacitor has the pressure relief vent.
In case of inside pressure of capacitor excessively rising, the pressure relief vent will be opened in order to release inner gas.
Following clearance should be made above the pressure relief vent.

Diameter of cell	less than 18mm	over 18mm
Clearance	2mm or more	3mm or more
- Do not apply shock or pressure.
PAS capacitor is sensitive to shock. Do not drop PAS capacitor and not apply strong pressure to a body, terminals and lead.
Soldering part or lead terminal will be damaged if applying vibration, shock and stress such as pinch, tip, push and twist after mounting.
- Do not apply excessive heat when soldering.
If excessive heat stress applied, electronic degradation or leakage might occur. Do not solder over solder conditions in the spec. sheet.
- Consult us about cleaning condition when cleaning circuit-board after soldering.
Cleaning may affect PAS capacitor. Consult us about cleaning conditions beforehand.
- Other Notice
 - Do not heat or throw into fire.
 - Do not short-circuit.
 - Do not solder directly to a cell body.
 - Do not dismantle.
 - Do not deform.

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