

Notice for TAIYO YUDEN Products

Please read this notice before using the TAIYO YUDEN products.

REMINDERS

■ Product Information in this Catalog

Product information in this catalog is as of October 2021. All of the contents specified herein and production status of the products listed in this catalog are subject to change without notice due to technical improvement of our products, etc. Therefore, please check for the latest information carefully before practical application or use of our products.

Please note that TAIYO YUDEN shall not be in any way responsible for any damages and defects in products or equipment incorporating our products, which are caused under the conditions other than those specified in this catalog or individual product specification sheets.

■ Approval of Product Specifications

Please contact TAIYO YUDEN for further details of product specifications as the individual product specification sheets are available. When using our products, please be sure to approve our product specifications or make a written agreement on the product specification with TAIYO YUDEN in advance.

■ Pre-Evaluation in the Actual Equipment and Conditions

Please conduct validation and verification of our products in actual conditions of mounting and operating environment before using our products.

■ Safety Design

When using our products for high safety and/or reliability-required equipment or circuits, please fully perform safety and/or reliability evaluation. In addition, please install (i) systems equipped with a protection circuit and a protection device and/or (ii) systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault for a failsafe design to ensure safety.

■ Intellectual Property Rights

Information contained in this catalog is intended to convey examples of typical performances and/or applications of our products and is not intended to make any warranty with respect to the intellectual property rights or any other related rights of TAIYO YUDEN or any third parties nor grant any license under such rights.

■ Limited Warranty

Please note that the scope of warranty for our products is limited to the delivered our products themselves conforming to the product specifications specified in the individual product specification sheets, and TAIYO YUDEN shall not be in any way responsible for any damages resulting from a failure or defect in our products. Notwithstanding the foregoing, if there is a written agreement (e.g., supply and purchase agreement, quality assurance agreement) signed by TAIYO YUDEN and your company, TAIYO YUDEN will warrant our products in accordance with such agreement, provided, however, that our products shall be used for general-purpose and standard use in the equipment specified in this catalog or the individual product specification sheets.

■ TAIYO YUDEN's Official Sales Channel

The contents of this catalog are applicable to our products which are purchased from our sales offices or authorized distributors (hereinafter "TAIYO YUDEN's official sales channel"). Please note that the contents of this catalog are not applicable to our products purchased from any seller other than TAIYO YUDEN's official sales channel.

■ Caution for Export

Some of our products listed in this catalog may require specific procedures for export according to "U.S. Export Administration Regulations", "Foreign Exchange and Foreign Trade Control Law" of Japan, and other applicable regulations. Should you have any questions on this matter, please contact our sales staff.

■ Limited Application

1. Equipment Intended for Use

The products listed in this catalog are intended for general-purpose and standard use in general electronic equipment for consumer (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC) and other equipment specified in this catalog or the individual product specification sheets, or the equipment approved separately by TAIYO YUDEN.

TAIYO YUDEN has the product series intended for use in the following equipment. Therefore, when using our products for these equipment, please check available applications specified in this catalog or the individual product specification sheets and use the corresponding products.

Application	Product Series		Quality Grade ^{*3}
	Equipment ^{*1}	Category (Part Number Code ^{*2})	
Automotive	Automotive Electronic Equipment (POWERTRAIN, SAFETY)	A	1
	Automotive Electronic Equipment (BODY & CHASSIS, INFOTAINMENT)	C	2
Industrial	Telecommunications Infrastructure and Industrial Equipment	B	2
Medical	Medical Devices classified as GHTF Class C (Japan Class III)	M	2
	Medical Devices classified as GHTF Classes A or B (Japan Classes I or II)	L	3
Consumer	General Electronic Equipment	S	3

*Notes: 1. Based on the general specifications required for electronic components for such equipment, which are recognized by TAIYO YUDEN, the use of each product series for the equipment is recommended. Please be sure to contact TAIYO YUDEN before using our products for equipment other than those covered by the product series.

2. On each of our part number, the 2nd code from the left is a code indicating the "Category" as shown in the above table. For details, please check the explanatory materials regarding the part numbering system of each of our products.

3. Each product series is assigned a "Quality Grade" from 1 to 3 in order of higher quality. Please do not incorporate a product into any equipment with a higher Quality Grade than the Quality Grade of such product without the prior written consent of TAIYO YUDEN.

2. Equipment Requiring Inquiry

Please be sure to contact TAIYO YUDEN for further information before using the products listed in this catalog for the following equipment (excluding intended equipment as specified in this catalog or the individual product specification sheets) which may cause loss of human life, bodily injury, serious property damage and/or serious public impact due to a failure or defect of the products and/or malfunction attributed thereto.

- (1) Transportation equipment (automotive powertrain control system, train control system, and ship control system, etc.)
- (2) Traffic signal equipment
- (3) Disaster prevention equipment, crime prevention equipment
- (4) Medical devices classified as GHTF Class C (Japan Class III)
- (5) Highly public information network equipment, data-processing equipment (telephone exchange, and base station, etc.)
- (6) Any other equipment requiring high levels of quality and/or reliability equal to the equipment listed above

3. Equipment Prohibited for Use

Please do not incorporate our products into the following equipment requiring extremely high levels of safety and/or reliability.

- (1) Aerospace equipment (artificial satellite, rocket, etc.)
- (2) Aviation equipment ^{*1}
- (3) Medical devices classified as GHTF Class D (Japan Class IV), implantable medical devices ^{*2}
- (4) Power generation control equipment (nuclear power, hydroelectric power, thermal power plant control system, etc.)
- (5) Undersea equipment (submarine repeating equipment, etc.)
- (6) Military equipment
- (7) Any other equipment requiring extremely high levels of safety and/or reliability equal to the equipment listed above

*Notes: 1. There is a possibility that our products can be used only for aviation equipment that does not directly affect the safe operation of aircraft (e.g., in-flight entertainment, cabin light, electric seat, cooking equipment) if such use meets requirements specified separately by TAIYO YUDEN. Please be sure to contact TAIYO YUDEN for further information before using our products for such aviation equipment.

2. Implantable medical devices contain not only internal unit which is implanted in a body, but also external unit which is connected to the internal unit.

4. Limitation of Liability

Please note that unless you obtain prior written consent of TAIYO YUDEN, TAIYO YUDEN shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this catalog for any equipment that is not intended for use by TAIYO YUDEN, or any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.

Cylinder Type Electric Double Layer Capacitors for General Electronic Equipment for Consumer

WAVE

PART NUMBER

R	S	E	L	P	2	4	5	2	R	7	E	1	5	0	2	2
				①	②			③	④	⑤	⑥					

①Series

Code (1)(2)(3)(4)	
RSELP	Cylinder type electric double layer capacitor for General Electronic Equipment for Consumer
RSELT	Cylinder type electric double layer capacitor for General Electronic Equipment for Consumer

(1) Product Group

Code	
R	Energy Devices

(2) Category

Code	Recommended equipment	Quality Grade
S	General Electronic Equipment for Consumer	3

(3) Type

Code	
E	Cylinder Type Electric Double Layer Capacitors

(4) Features, Characteristics

Code	
LP	LP Series
LT	LT Series

②Nominal capacitance

Code (example)	Nominal capacitance[F]
245	2.4
335	3.3
505	5.0
685	6.8
705	7.0
106	10
126	12
156	15
166	16
206	20
256	25
336	33
506	50

③Rated voltage

Code	Rated voltage[V]
2R7	2.7

※R=Decimal point

④Dimensions (φ D)

Code	Dimensions (φ D) [mm]
E	8
F	10
G	12.5
J	16
K	18

⑤Dimensions (L)

Code	Dimensions (L) [mm]
15	15
20	20
25	25
30	30
32	32
35	35
40	40

⑥Forming and packing

Code	Forming and packing
001~ZZZ	Please contact us

■ SPECIFICATIONS [RSELP]

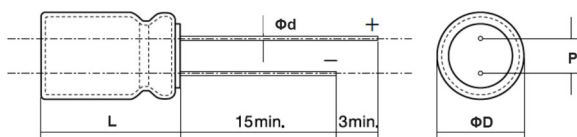
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Items	Specified value
Category temperature range	-40°C ~ +85°C
Rated voltage	2.7V (2.3V at +70°C ~ +85°C)

Initial spec

New part number	Old part number (for reference)	Capacitance [F]	Internal resistance [mΩ]	Temperature characteristics
RSELP2452R7E15022	LP08152R7245U	2.4±20%	Under 120	Lowest temperature (-40°C) Capacitance: Over 85% of initial spec. Internal resistance: Under 6 times of initial spec. High temperature (70°C) Capacitance: Within initial spec. Internal resistance: Within initial spec. Highest temperature (85°C) Capacitance: Over 90% of initial spec. Internal resistance: Within initial spec.
RSELP3352R7E20021	LP08202R7335U	3.3±20%	Under 75	
RSELP5052R7F20023	LP10202R7505U	5.0±20%	Under 60	
RSELP7052R7F25009	LP10252R7705U	7.0±20%	Under 60	
RSELP1062R7F30024	LP10302R7106U	10±20%	Under 35	
RSELP1262R7F40011	LP10402R7126U	12±20%	Under 40	
RSELP1062R7G20025	LP12202R7106U	10±20%	Under 45	
RSELP1262R7G25016	LP12252R7126U	12±20%	Under 45	
RSELP1662R7G30017	LP12302R7166U	16±20%	Under 40	
RSELP2062R7G35026	LP12352R7206U	20±20%	Under 40	

External dimensions



Unit: mm

New part number	Old part number	φ D	L max	φ d	P
RSELP2452R7E15022	LP08152R7245U	8	17	0.6	3.5
RSELP3352R7E20021	LP08202R7335U	8	22	0.6	3.5
RSELP5052R7F20023	LP10202R7505U	10	22	0.6	5
RSELP7052R7F25009	LP10252R7705U	10	27	0.6	5
RSELP1062R7F30024	LP10302R7106U	10	32	0.6	5
RSELP1262R7F40011	LP10402R7126U	10	42	0.6	5
RSELP1062R7G20025	LP12202R7106U	12.5	22	0.6	5
RSELP1262R7G25016	LP12252R7126U	12.5	27	0.6	5
RSELP1662R7G30017	LP12302R7166U	12.5	32	0.6	5
RSELP2062R7G35026	LP12352R7206U	12.5	37	0.6	5

■ RELIABILITY DATA [RSELP]

Items	Specified value	Test methods and remark
Soldering heat resistance	Capacitance: Within initial spec. Internal resistance: Within initial spec. Appearance: No noticeable abnormality.	Material: Sn-3Ag-0.5Cu Solder temperature: 260±5°C Dipping time: 10 sec Max. Dipping depth: 1.5~2.0mm from a root
Floating charge characteristics	Capacitance: Over 70% of initial spec. Internal resistance: Under 4 times of initial spec. Appearance: No noticeable abnormality.	Temperature: 70±2°C or 85±2°C Apply a voltage of 2.7V (at 70°C) or 2.3V (at 85°C) to the capacitor for 1,000hours, and measure the characteristics after returning to normal temperature and humidity.
Charge/Discharge cycle characteristics		Measure after charging and discharging 10,000 times. The charge/discharge cycle test conditions are as follows.
Humidity durability	Capacitance: Within initial spec. Internal resistance: Under 4 times of initial spec. Appearance: No noticeable abnormality.	Temperature: 40±2°C Humidity: 90~95%RH Leave the capacitor for 500hours and measure the characteristics after returning to normal temperature and humidity.
Shock resistance	No exterior abnormality observed.	According to JIS C 60068-2-27 Half-sine wave A=294
Vibration resistance	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.

● Charge/Discharge cycle test condition

New part number	Old part number (for reference)	Charging voltage [V]	Charging time [sec]	Max. Charging current [A]	Discharge current [A]	End voltage [V]
RSELP2452R7E15022	LP08152R7245U	2.7	30	0.24	0.24	1.5
RSELP3352R7E20021	LP08202R7335U			0.33	0.33	
RSELP5052R7F20023	LP10202R7505U			0.5	0.5	
RSELP7052R7F25009	LP10252R7705U			0.7	0.7	
RSELP1062R7F30024	LP10302R7106U			1.0	1.0	
RSELP1262R7F40011	LP10402R7126U			1.2	1.2	
RSELP1062R7G20025	LP12202R7106U			1.0	1.0	
RSELP1262R7G25016	LP12252R7126U			1.2	1.2	
RSELP1662R7G30017	LP12302R7166U			1.6	1.6	
RSELP2062R7G35026	LP12352R7206U			2.0	2.0	

■ SPECIFICATIONS [RSELT]

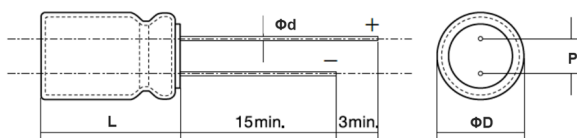
All size

Items	Specified value
Category temperature range	-40°C ~ +85°C
Rated voltage	2.7V (2.3V at +70°C ~ +85°C)

Initial spec

New part number	Old part number (for reference)	Capacitance [F]	Internal resistance [$m\Omega$]	Internal DC resistance (*typical) [$m\Omega$]	Temperature characteristics
RSELT3352R7E20001	LT08202R7335	3.3 \pm 20%	Under 60	100	Within category temperature range: Change in Capacitance : Within \pm 30% of measured value at 20°C Internal resistance : 200% or less of initial spec.
RSELT6852R7F20002	LT10202R7685	6.8 \pm 20%	Under 50	55	
RSELT1062R7F30003	LT10302R7106	10 \pm 20%	Under 30	30	
RSELT1562R7F40004	LT10402R7156	15 \pm 20%	Under 25	20	
RSELT1562R7G25005	LT12252R7156	15 \pm 20%	Under 25	25	
RSELT2562R7J25006	LT16252R7256	25 \pm 20%	Under 17	18	
RSELT3362R7J32007	LT16322R7336	33 \pm 20%	Under 13	14	
RSELT5062R7K40008	LT18402R7506	50 \pm 20%	Under 10	12.5	

External dimensions



Unit : mm

New part number	Old part number	ϕD	L max	ϕd	P
RSELT3352R7E20001	LT08202R7335	8	22	0.6	3.5
RSELT6852R7F20002	LT10202R7685	10	22	0.6	5
RSELT1062R7F30003	LT10302R7106	10	32	0.6	5
RSELT1562R7F40004	LT10402R7156	10	42	0.6	5
RSELT1562R7G25005	LT12252R7156	12.5	27	0.6	5
RSELT2562R7J25006	LT16252R7256	16	28	0.8	7.5
RSELT3362R7J32007	LT16322R7336	16	34	0.8	7.5
RSELT5062R7K40008	LT18402R7506	18	42	0.8	7.5

■ RELIABILITY DATA [RSELT]

Items	Specified value	Test methods and remark
Soldering heat resistance	Change in Capacitance : Within \pm 10% of initial measured value. Internal resistance : Within initial spec. Appearance : No noticeable abnormality.	Material : Sn-3Ag-0.5Cu Solder temperature : 260 \pm 5°C Dipping time : 11 sec Max. Dipping depth : 2.0~2.5mm from a root
Floating charge characteristics	Change in Capacitance : Within \pm 30% of initial measured value. Internal resistance : 200% or less of initial spec. Appearance : No noticeable abnormality.	Temperature : 70 \pm 2°C or 85 \pm 2°C Apply a voltage of 2.7V (at 70°C) or 2.3V (at 85°C) to the capacitor for 1,000hours, and measure the characteristics after returning to normal temperature and humidity.
Charge/Discharge cycle characteristics	Appearance : No noticeable abnormality.	Measure after charging and discharging 10,000 times. The charge/discharge cycle test conditions are as follows.
Damp heat	Change in Capacitance : Within \pm 30% of initial measured value. Internal resistance : 300% or less of initial spec. Appearance : No noticeable abnormality.	Temperature : 40 \pm 2°C Humidity : 90-95%RH Leave the capacitor for 500hours and measure the characteristics after returning to normal temperature and humidity.
Vibration resistance	Change in Capacitance : Within \pm 10% of initial measured value. Internal resistance : Within initial spec. Appearance : No noticeable abnormality.	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.

● Charge/Discharge cycle test condition

New part number	Old part number (for reference)	Charging voltage [V]	Charging time [sec]	Max. Charging current [A]	Discharge current [A]	End voltage [V]
RSELT3352R7E20001	LT08202R7335	2.7	30	0.33	0.33	1.5
RSELT6852R7F20002	LT10202R7685			0.68	0.68	
RSELT1062R7F30003	LT10302R7106			1.0	1.0	
RSELT1562R7F40004	LT10402R7156			1.5	1.5	
RSELT1562R7G25005	LT12252R7156			1.5	1.5	
RSELT2562R7J25006	LT16252R7256			2.5	2.5	
RSELT3362R7J32007	LT16322R7336			3.3	3.3	
RSELT5062R7K40008	LT18402R7506			5.0	5.0	

Cylinder Type Electric Double Layer Capacitors

■ PRECAUTIONS

1. Use within the usable voltage range

Applying voltage exceeding the maximum working voltage may cause leakage or damage.

2. Use within the operating temperature range

3. Lifetime of Electric double layer capacitor is finite

The life of the product is affected by operating temperature and operating voltage. In addition, the internal resistance rises gradually with usage and the capacity drops.

4. There are temperature dependence and voltage dependence in the electrical characteristics

The electrical characteristics of the product vary depending on operating temperature and voltage. Please check the temperature characteristics before using the product.

5. Electric double layer capacitor has polarity

Check the polarity before use. It will be damage if it is reversely charged. Avoid using products with reverse voltage applied.

6. Be aware of the ripple current and use in circuits that repeat sudden charge and discharge

Electric double layer capacitor may be used in a circuit that repeats sudden charge / discharge or application of high ripple current may cause the life to be shortened due to heat generation. Please inquire when using it for such a circuit.

7. Mind the voltage drop during discharge (backup)

If the discharge current is large, a voltage drop occurs at the start of discharge. Be careful about discharge current.

8. Series connection

When Electric double layer capacitors are connected in series, the balance of the applied voltage may be lost, and some capacitors may be overcharged or may lead to shortening lifetime and breakdown. Take a margin against the maximum usable voltage or add a balancing resistor.

9. Electric double layer capacitor has the pressure release vent

In case of inside pressure of capacitor excessively rising, the pressure release vent will be opened in order to release inner gas. Following clearance (Diameter < $\phi 18$: over 2mm, Diameter $\geq \phi 18$: over 3mm) should be made above the pressure release vent.

Don't set up wiring or a pattern in the upper part of the pressure release vent, so that the high temperature gas is gushed when the pressure release vent open.

The product which open the pressure release vent cannot use.

10. Insulation of the aluminum case and sleeve of Electric double layer capacitor is not guaranteed

There is a possibility of short-circuiting when the circuit pattern is arranged under the Electric double layer capacitor or when it comes in contact with other parts.

11. Environmental of usage

In case Electric double layer capacitor is used in 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, it may cause deteriorating of its performance and electrolyte leak by dew condensation.

12. Don't apply shock and vibration or pressure

Electric double layer capacitors are weak parts for mechanical shock. Be careful not to drop the product or apply strong force to the main body and lead terminal. Also, if you apply excessive vibration or shock after mounting, stress such as grasping, tilting, pushing, twisting, etc., the soldered part may come off or the lead terminal part may be damaged.

13. Be careful not to apply excessive heat when mounting

If excessive heat stress is added to the product, electric characteristics deterioration and electrolyte leakage may occur.

Soldering conditions should be within the range specified in the delivery specifications.

14. Please consult about substrate cleaning after soldering

There are cases where the product may be adversely affected depending on the type of solvent and washing conditions, so please consult in advance.

15. Storage

Keep following cautions for storage of Electric double layer capacitor.

- Don't store in the high temperature and the high humidity condition and a place where receiving direct sunlight. Storing Electric double layer capacitor in the room condition of 10 °C – 35 °C and less than 65% relative humidity is recommended. Sudden temperature change or high humidity may cause deteriorating of its characteristics and solderability.
- Don't store Electric double layer capacitor near water, salt water or oil, and in the dew condensation, gasified oil or salinity filled place.
- Don't store Electric double layer capacitor in the hazardous gas (hydrogen sulfide, sulfurous, chlorine, ammonia, bromine, methyl bromine, ozone and etc.) .
- Don't fumigate by halogen fumigant.
- Don't store Electric double layer capacitor near acid or alkaline solvent.
- Don't store Electric double layer capacitor in a place where exposed to ultraviolet or radioactive rays.
- Don't store Electric double layer capacitor in a place where vibration and shock might occur.

16. Disposal

Dispose Electric double layer capacitor properly with a decree or the regulation a local public organization designates.

17. Usage

Electric double layer capacitor is developed on the assumption that this product will be used in the memory-backup & RTC for usage of information & communication equipment, home electronics, audio & visual equipment, office equipment, etc. Consult us about using high reliability and safety required products such as medical equipment, transportation equipment, industrial equipment, flight / space equipment and emergency equipment, etc.

18. Other Notice

- Don't heat or throw Electric double layer capacitor into fire.
- Don't short-circuit.
- Don't solder directly to a cell body.
- Don't open a body.
- Don't deform.
- Don't apply pressure.

※All of the contents specified herein are subject to change without notice due to technical improvements, etc.

※Please see JEITA RCR-2370C for details.

JEITA RCR-2370C

「Safety Application Guide for electric double layer capacitors (EDLC)(Guideline of notabilia for electric double layer capacitors)」
[Japan Electronics and Information Technology Industries Association. Established in March, 1995 and revised in July, 2008]
