


# LIST OF THE CAPACITOR PRODUCTS

## SERIES OF CAPACITORS

Picture	Series	Type	Features Applications	Temperature ( °C )	Voltage ( VDC )	Capacitance ( μ F )	Load Life
	UMR UM3R	Radial	Ultra-Miniaturized Height 5mm	-40 to +85°C	4-50	0.1-470	1000Hrs
	MR	Radial	Miniaturized Type Height 7mm	-40 to +85°C	6.3-63	0.1-470	1000Hrs
	MHR	Radial	105°C Miniaturized Type Height 7mm	-40 to +105°C	6.3-63	0.1-470	1000Hrs
	GPR	Radial	85°C General Purpose	-40 to +85°C	6.3-100	0.1-22000	2000Hrs
				-25 to +85°C	160-450	0.47-820	
	RH	Radial	105°C General Purpose	-40 to +105°C	6.3-100	0.1-15000	2000Hrs
				-25 to +105°C	160-450	0.47-330	
	LL	Radial	Low-Leakage Current	-40 to +105°C	6.3-63	0.1-2200	2000Hrs
	NP	Axial Radial	Non-Polarized	-40 to +105°C	10-250	0.47-2200	2000Hrs
	BP	Radial	Bi-Polarized High Ripple	-40 to +105°C	6.3-100	0.47-6800	2000Hrs
	GLR	Radial	Low Impedance/ Low E.S.R.	-55 to +105°C	6.3-100	0.47-4700	5000Hrs

	AX	Axial	105°C Axial Type Capacitors 105°C	-40 to +105°C	6.3-100	0.47-15000	2000Hrs
				-25 to +105°C	160-400	0.47-220	
	LPR	Snap-in	PCB Snap-in Large Size	-40 to +85°C	10-100	470-68000	2000Hrs
				-25 to +85°C	160-450	47-2700	
	HPR	Snap-in	105°C Snap-in Large Size 105°C	-40 to +105°C	10-100	330-68000	2000Hrs
				-25 to +105°C	160-400	33-2200	
	ST	Screw	Screw Terminal Type Capacitors	-40 to +85°C	10-100	220-330,000	2000Hrs
				-25 to +85°C	160-450		
	ERC	Radial	E.R.C.Radial Type Capacitors	-40 to +105°C	6.3-50	0.1-470	2000Hrs

## USAGE CONDITIONS

The following cautions must be observed when using electrolytic capacitors.

**1. DC Electrolytic Capacitors have the polarity.**

Make sure of the polarity, Application of the reversed voltage may cause a short circuit or damage to the capacitors when the polarity is not determined or unknown. Note that DC electrolytic capacitors cannot be for used for AC application.

**2. Capacitors are not suitable operating with sudden charge and discharge are frequently repeated.**

In the circuit subjected to rapid charge cycles, capacitors may be damaged. Be sure and use special capacitors in these applications.

**3. Be sure not to apply a voltage exceeding the rated voltage.**

If a voltage exceeding the rated voltage is applied the leakage current will increase, which may damage the capacitor. For a short period however the capacitor withstands up to the surge voltage.

**4. Be sure not to flow excessive ripple current through the capacitor.**

The flow of ripple current over the permissible ripple current will cause heat of the capacitor, which may decrease the capacitance and damage the capacitor. Use capacitors designed for high ripple current application.

**5. Capacitors should be stored in cold and dry placed which have been stored for a long period.**

The capacitors after long storage tends to have high leakage current, which may damage the capacitor by the excessive heat because of high leakage current flow. Use it after voltage treatment (aging).

**6. Be sure of the temperature range.**

The characteristics of capacitors change with the operating temperature. This change is temporary and Restorable with in the specified temperature range. Be sure not to use capacitors below or over the recommended temperature range.

**7. Be sure not to apply excessive force to the terminals and leads.**

The excessive strong force applied to the terminals and lead wires may break them and loosen the connections of the internal elements.

**8. Capacitance decreases at higher frequencies.**

The capacitance value is measured at 120Hz. The capacitance decreases as the applied frequency becomes higher whereas increases as the ambient temperature become higher.

**9. Tangent of loss angle increases at higher frequencies.**

The tangent of loss angle(tand) increase as the applied frequency becomes higher whereas the ambient temperature becomes higher.

**10. Be careful of temperature and time when soldering.**

Dipping must be performed at the soldering temperature or less than 260°C for less than 10 seconds otherwise the capacitors may be damaged , and the sleeve of the capacitors may deform and crack from the extremely high temperature.

**11. Be cautions of cleaning the circuit board after soldering.**

Cleaning protection for sleeve marking and sealing materials on capacitors body will not be damaged, which should never be washed or cleaned by halogens agents or solvents such as trichloroethene, Xylene or acetone etc.

**12. The specification of products are according to characteristic (w), established by JIS-C5141.**

**Part Numbering System**

When placing an order for Aluminum Electrolytic Capacitors, please observe the following Catalog Part Numbering system, which describes how to designate our product:

1	2	3	4	5	6	7
MR	50V	476	M	8 X 9	---	---
Series	Voltage	Cap	±20%	Size(mm)	Special	Requirements

Example:

**MR50V476M8 x 9 m/m(Cass Size)**

**(1) Series**

For a description of our series, please refer to our "Catalog" on page 1.

**(2) Voltages**

Voltage	6.3	10	16	25	35	50	63	100	®
Code No.	6V3	10V	16V	25V	35V	50V	63V	100V	®

**(3) Capacitance**

capacitance is shown in micro farads(  $\mu$ f )

$\mu$ f	0.1	0.47	1	4.7	10	100	1000	10000
Code No.	104	474	105	475	106	107	108	109

**(4) Capacitance Tolerance**

K	M	Q
±10%	±20%	-10%+30%

**(5) Case Size**

Case size are in millimeters(mm)-Diameter (  $D\varnothing$  ) x Length(L)

Example: M8 x 9 = 8mm x 9mm

**(6) Specail**

KTB	Ammo-packing
TR	Reel-packing
LF	Forming and cutting
LC	Cutting
LK	"kink" forming(Snap-in type forming)