

Radial Leaded Aluminum Electrolytic Capacitors

RET Series



FEATURES

- Small size
- Long life and high ripple current
- Endurance: 6,000 - 10,000 hours at 105°C
- RoHS Compliance and Halogen-free

APPLICATIONS

- Communications equipment
- Industrial equipment



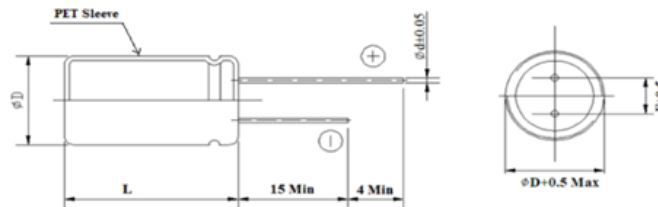
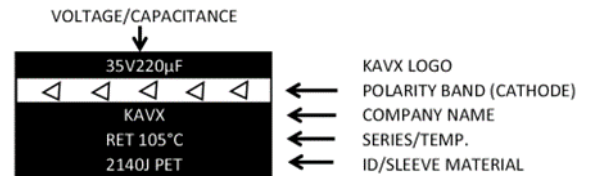
HOW TO ORDER

R	ET	0812	220	M	035	K	-
Product Type Aluminum	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 010 = 10Vdc 016 = 16Vdc 025 = 25Vdc 035 = 35Vdc 100 = 100Vdc	Packaging K = Ammo Pack B = Bulk Pack	Lead Type " " empty = Standard long lead "C" = Lead cut only "F" = Lead cut and form "L" = Lead cut and bend (Left) "R" = Lead cut and bend (Right)

CASE DIMENSIONS millimeters (inches)

Code	D±0.50(0.020)	L+2.00(0.079)	d±0.05(0.002)	F±0.50(0.020)	Typical Weight (g)
0511	5.00 (0.020)	11.00 + 2.00 - 0.50 (0.433 + 0.079 - 0.020)	0.50 (0.020)	2.00 (0.079)	0.41
0611	6.30 (0.248)	11.00 (0.433)	0.50 (0.020)	2.50 (0.098)	0.68
0612	6.30 (0.248)	12.00 (0.472)	0.50 (0.020)	2.50 (0.098)	0.60
0812	8.00 (0.315)	12.00 (0.472)	0.50 (0.020)	3.50 (0.138)	0.70
0816	8.00 (0.315)	16.00 (0.629)	0.50 (0.020)	3.50 (0.138)	0.95
0820	8.00 (0.315)	20.00 (0.787)	0.60 (0.024)	3.50 (0.138)	1.05

MARKING



*If different rubber seal is needed, please contact your sales representative.
 *For ammo packing lead shape please refer to "Lead forming taping specification for ammo pack".
 *If different lead shape is needed, please refer to "Termination type".

TECHNICAL SPECIFICATIONS

Category Temperature Range:	-40°C to +105°C	
Capacitance Range:	At 25°C, 120Hz	27µF - 1500µF
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	≤0.01CV or 3µA, whichever is greater

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CAPACITANCE AND RATED VOLTAGE RANGE (FIGURES DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V _R)				
μF	Code	10V	16V	25V	35V	100V
27	270					0812
47	470				0511	
100	101		0511		0612	
220	221			0611	0812	
390	391				0820	
470	471			0816		
1500	152	0820				

Released ratings

RATINGS & PART NUMBER REFERENCE

Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	DCL Max. (μA)	DF Max. (%)	Impedance @ 100kHz/20°C (Ω _{max})	100kHz RMS Current (mA) / 105°C	Endurance	MSL
10 Volt									
RET0820152M010*	0820	1500	10	150	19	0.029	1500	8,000	1
16 Volt									
RET0511101M016*	0511	100	16	16	16	0.220	345	6,000	1
25 Volt									
RET0611221M025*	0611	220	25	55	14	0.200	540	6,000	1
RET0816471M025*	0816	470	25	117.5	14	0.059	1,600	10,000	1
35 Volt									
RET0511470M035*	0511	47	35	16.45	12	0.400	450	8,000	1
RET0612101M035*	0612	100	35	35	12	0.094	540	6,000	1
RET0812221M035*	0812	220	35	77	12	0.062	945	8,000	1
RET0820391M035*	0620	390	35	136.5	12	0.039	1,500	8,000	1
100 Volt									
RET0812270M100*	0812	27	100	27	8	0.320	550	10,000	1

* Used to denote packing type: "K" for Ammo Pack or "B" for Bulk Pack.

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

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

Capacitance	Frequency (Hz)			
	120	1K	10K	100K
Cap. < 47	0.40	0.70	0.90	1.00
47 ≤ Cap. < 220	0.42	0.73	0.92	1.00
220 ≤ Cap. < 1500	0.50	0.80	0.94	1.00
Cap. ≥ 1500	0.60	0.80	0.96	1.00

QUALIFICATION TABLE

Test	RET Series (Temperature Range -40°C to +105°C)			
	Condition	Characteristics		
Temperature Stability (Max. Impedance Ratio)	120Hz	Rated Voltage (V)	10 - 100	
		Z(-25°C)/Z(+20°C)	3	
Load Life	Application of the rated voltage and the rated ripple current for each specified endurance. Test temperature: 105 ± 2°C	ΔC/C	10V	16V - 100V
			within ±30% of initial limit	within ±25% of initial limit
		DF	≤ 200% of the initial specified limit	
		DCL	≤ the initial specified limit	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 +48/-0 hours 105±2°C without voltage applied.	ΔC/C	10V	16V - 100V
			within ±30% of initial limit	within ±25% of initial limit
		DF	≤ 200% of the initial specified limit	
		DCL	≤ 200% of the initial specified limit	

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use the rms ripple current has to be reduced.

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STORAGE

- 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.
- 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.
- Shelf life

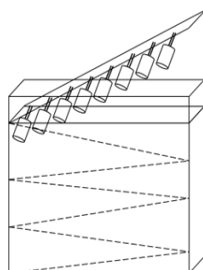
Years		
0-1	1-2	>2
Ok	Ok	Performance check

- 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.

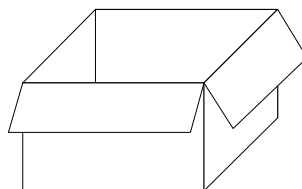
PACKING

Size Code	Bulk Pack					Ammo Pack				
	Bags	Inner Box		Carton		Inner Box		Carton		
		(LxWxH)		(LxWxH)		Quantity	Inner Box Size	Inner Box Quantity	Carton Size	Whole Pieces
		290*216*158		455*310*350			(LxWxH)		(LxWxH)	
	Quantity	Bags Number	Quantity / pcs	Inner Box Number	Quantity / pcs					
0511	1000	12	12,000	4	48,000	2000	320x230x50	10	485x345x275	20,000
0611	1000	8	8000	4	32,000	2000	340x290x48	10	600x354x265	20,000
0612	500	10	5000	4	20,000	2000	340x290x48	10	600x354x265	20,000
0812	500	10	5000	4	20,000	950	320x230x50	6	485x345x275	5700
0816	300	10	3000	4	12,000	950	320x230x55	6	485x345x300	5700
0820	300	10	3000	4	12,000	950	320x230x55	6	485x345x300	5700

AMMO PACKING



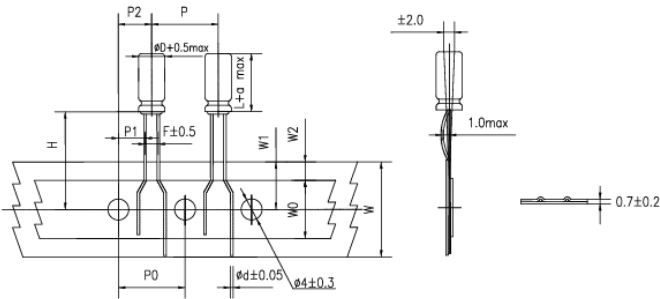
BULK PACKING



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LEAD FORMING TAPING SPECIFICATIONS FOR AMMO PACK



Items	Symbol	Case Size				Tolerance
		0511	0611 0612	0812	0816 0820	
Lead Wire Diameter	d	0.5	0.5	0.5	0.5/0.6	± 0.05
Pitch of Body	P	12.7	12.7	12.7	12.7	± 1.0
Feed Hole Pitch	P0	12.7	12.7	12.7	12.7	± 0.2
Distance from Hole Center to Lead	P1	5.35	5.1	4.6	4.6	± 0.7
Distance from Feed Hole Center to Body Center	P2	6.35	6.35	6.35	6.35	± 1.0
Lead-to-lead distance	F	2.0	2.5	3.5	3.5	± 0.5
Height of Body from Tape Center	H	18.5	18.5	18.5	18.5	± 0.75
Base Tape Width	W	18.0	18.0	18.0	18.0	± 0.5
Adhesive Tape Width	W0	6.0	8.0	8.0	8.0	min
Hole Position	W1	9.0	9.0	9.0	9.0	$+0.75-0.5$
Hole Down Tape Position	W2	1.5	1.5	1.5	1.5	max

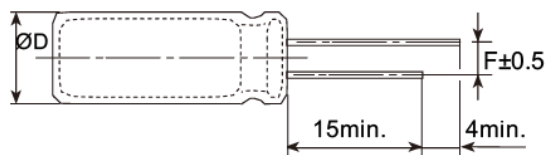
*All dimensions in mm

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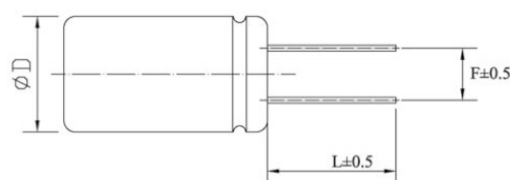
RET Series

TERMINATION TYPE

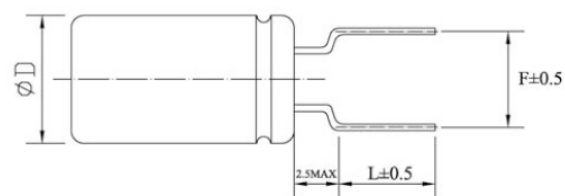
Letter " ": Empty = Standard Long lead.



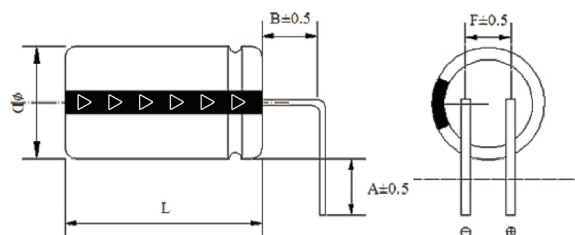
Letter "C": Lead cut only.



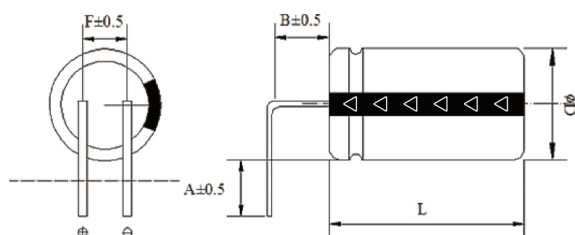
Letter "F": Lead cut and form.



Letter "R": Lead cut and bend (Right).



Letter "L": Lead cut and bend (Left).



Letter	Termination Type	Dø	4ø	5ø	6.3ø	8ø	10ø	12.5ø	13ø	16ø	18ø
	Standard long lead	F	1.50	2.00	2.50	3.50	5.00	5.00	5.00	7.50	7.50
C	Lead cut only	F	1.50	2.00	2.50	3.50	5.00	5.00	5.00	7.50	7.50
		L	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
F	Lead cut and form	F	5.00	5.00	5.00	5.00					
		L	3.50	3.50	3.50	3.50					
R / L	Lead cut and bend	F					5.00	5.00	5.00	7.50	7.50
		A					3.50	3.50	3.50	3.50	3.50
		B					2.50	2.50	2.50	2.50	2.50

*All dimensions in mm.