

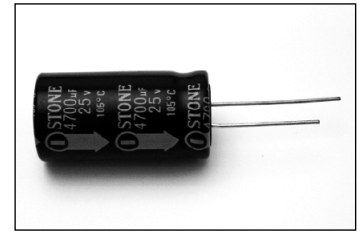


# Aluminum Electrolytic Capacitors

HR Series

## Features

- 105°C, Standard series for general purpose
- RoHS Compliance



## Specification

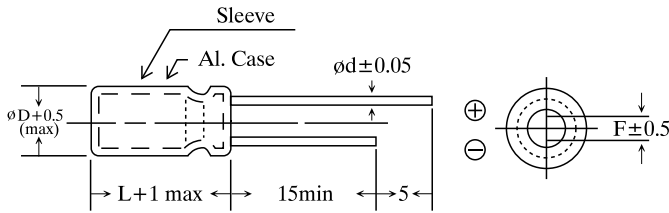
Items	Performance														
Capacitance Tolerance	±20% (at 120Hz, 20°C)														
Rated Voltage Range	6.3 to 100 VDC							160 to 450 VDC							
Capacitance Range	100 to 10000 µF							1 to 470 µF							
Operating Temperature Range	-40 to +105°C							-25 to 105°C							
Leakage Current (at 20°C)	I ≤ 0.01 CV or 3 (µA), whichever is greater.							I ≤ 0.03 CV + 10 (µA), whichever is greater.							
	After 2 minutes application of working voltage. I = Leakage current (µA), C = Rated capacitance (µF), V = Rated voltage (V)														
Dissipation Factor (Tan δ at 120Hz, 20°C)	Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	Tan δ (max)	0.24	0.20	0.17	0.15	0.12	0.10	0.10	0.10	0.20	0.20	0.20	0.20	0.25	0.25
For capacitance > 1000 µF, add 0.02 per 1000 µF increase.															
Low Temperature Characteristics (at 120Hz)	Impedance ratio max.														
	Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	Z-25°C / Z+20°C	4	3	2	2	2	2	2	2	8	8	8	12	12	12
Z-40°C / Z+20°C	10	8	6	4	3	3	3	3							
Load Life	After 2000 hours application of W.V. at +105°C, the capacitor shall meet the following limits.														
	Capacitance change	: ≤ ±25% of initial value													
Dissipation factor	: ≤ 200% of initial specified value														
Leakage Current	: ≤ Initial specified value														
Shelf Life	After storage for 1000 hours at 105°C, with no voltage applied and being stabilized at +20°C, Capacitor shall meet the limit specified in load life.														
Ripple Current & Frequency Multiplier	Freq.(Hz) \ Cap.(µF)	60	120	500	1K	10K up									
	Under 100	0.70	1.00	1.20	1.30	1.50									
	100 to 1000	0.75	1.00	1.10	1.15	1.30									
	1000 up above	0.80	1.00	1.05	1.10	1.15									
Ripple Current & Temperature Multiplier	Temperature(°C)	85							105						
	Multiplier	1.25							1.00						



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## DIAGRAM OF DIMENSIONS



## LEAD SPACING AND DIAMTER Unit: mm

D	8	10	13	16	18	22
F	3.5	5.0		7.5		10.0
d	0.5	0.6		0.8		

## DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension :  $\phi D \times L$  (mm)

Ripple Current : mA/rms at 120Hz, 105°C

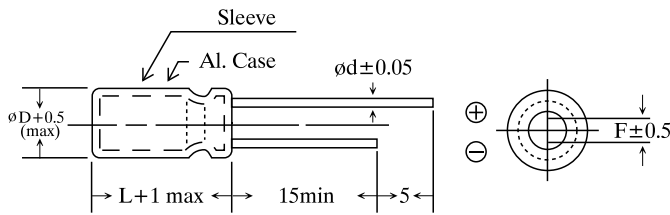
VDC $\mu F$	6.3V		10V		16V		25V		35V		50V		63V	
	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
100											8x14	192	10x12.5	210
220									10x12.5	280	10x17	340	10x20	400
330									10x12.5	320	10x20	400	13x26	480
470							10x12.5	400	10x17	480	13x21	580	13x26	620
1000	8x12	380	10x12.5	460	10x17 10x20	540	10x20 13x16	650 600	13x21	760	16x26	890	16x32	985
2200	10x17	600	10x17 10x20	600 760	13x21	890	13x21 13x26	890 1080	16x26	1120	18x32	1380	22x36	1580
3300	13x21	850	13x21	900	13x26	1020	16x32	1280	16x36	1460	22x40	1650		
4700	13x26	1150	13x26	1150	16x26	1400	16x32	1480	18x36	1670	22x40	1720		
6800	16x26	1480	16x27	1480	16x32	1670	18x36	1850	22x36	2020				
10000	16x27	1520	16x36	1680	18x36	1790	22x36	2060						



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**HR Series**

## DIAGRAM OF DIMENSIONS



## LEAD SPACING AND DIAMETER Unit: mm

D	5	6.3	8	10	13	16	18	22
F	2.0	2.5	3.5	5.0		7.5		10.0
d	0.5			0.6		0.8		

## DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension :  $\phi D \times L$  (mm)

Ripple Current : mA/rms at 120Hz, 105°C

VDC $\mu F$	100V		160V		200V		250V		350V		400V		450V	
	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
1			5x11.5	12	6.3x11	12	6.3x11	12	8x11	13	8x11	13	8x11	14
2.2			6.3x11	20	8x11	25	8x11	22	10x12.5	26	10x12.5	26	10x12.5	28
3.3			6.3x11 8x11	25 28	8x11	30	8x11	30	10x12.5	32	10x15	38	10x15	38
4.7			8x11	36	8x11	42	10x12.5	44	10x12.5	46	10x12.5	48	10x20	50
10			10x12.5	67	10x12.5	75	10x16	80	10x20	88	10x17	98	13x21	89
22	8x11	80	10x16	95	10x20	105	10x20	110	13x21	140	13x26	165	16x26	185
33	8x12.5	135	10x20	150	10x20	160	13x21	172	16x26	180	16x26	196	16x26	196
47	10x12.5	140	13x21	170	13x21	180	13x21	185	16x26	210	16x33	310	18x27	330
100	10x20	250	16x26	290	16x26	305	16x32	365	18x37	460	18x37	480	22x38	580
220	13x26	450	16x36	520	18x37 22x27	600 620	22x38	650						
330	16x26	620	22x38	700	22x38	780	22x42	780						
470	16x33	780	22x38	780	22x42	895								
1000	18x41	1100												