

## HL Series 105°C 5000H



### Features

#### Standard capacitors

#### Applications

- ◆ Switch-mode power supplies in industrial and entertainment electronics
- ◆ Uninterruptible power supplies

#### Features

- ◆ High reliability
- ◆ Long useful life
- ◆ High ripple current capability
- ◆ Aluminum case designed explosion-proof vent
- ◆ RoHS-compatible

#### Construction

- ◆ Charge-discharge proof, polar
- ◆ Aluminum case with insulating sleeve
- ◆ Aluminum case designed explosion-proof vent
- ◆ Snap-in solder pins to hold component in place on PC-board

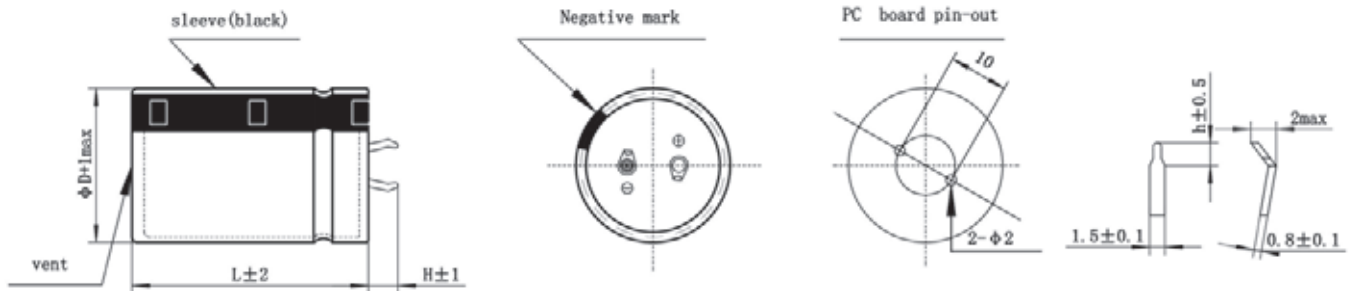
### Specifications

Item	Performance Characteristics													
Operating Temperature Range	-40 to +105°C	-25 to +105°C												
Rated voltage $V_R$	10 to 350 V DC	385 to 500 V DC												
Surge voltage $V_S$	$V_R \leq 315V$ 1.15 $V_R$ $V_R > 315V$ 1.10 $V_R$													
Rated capacitance $C_R$	56 to 56000 $\mu F$	39 to 1200 $\mu F$												
Capacitance tolerance	$\pm 20\%$ (120Hz, +20°C)													
Leakage Current $I_{leak}$ (+20°C, max.)	$I \leq 3 \sqrt{CV}$ ( $\mu A$ ) After 5 minutes with rated working voltage applied													
Dissipation Factor (tan $\delta$ , at 20°C, 120Hz)	Less than the value under table(%)													
	$\mu F/Vdc$	6.3	10	16	25	35	50	63	80	100	160~420	450~600		
	$\leq 8200$	-	35	35	30	25	20	20	15	15	15	20		
	10000 to 22000	55	40	40	35	30	30	25	15	-	-	-		
$\geq 27000$	60	50	40	35	35	30	25	-	-	-	-			
Self-inductance ESL	approx. 20 nH													
Useful life 105°C; $V_R, I_{AC,R}$	$V_R \leq 100V$ :	Requirements:										$V_R > 100V$		
	$> 7000$ h	$\Delta C/C$	$\leq \pm 30\%$ of initial value										$\Delta C/C$	$\leq \pm 20\%$ of initial value
$V_R > 100V$ :	$> 10000$ h	tan $\delta$	$\leq 3$ times initial specified limit										tan $\delta$	$\leq 2$ times initial specified limit
		$I_{leak}$	$\leq$ initial specified limit										$I_{leak}$	$\leq$ initial specified limit
Voltage Endurance test 105°C; $V_R$	5000 h	Post test requirements:												
		$V_R \leq 100V$	$\Delta C/C$	$\leq \pm 15\%$ of initial value										$V_R > 100V$
Shelf Life 105°C	1000 h	Post test requirements:												
		$V_R \leq 100V$	$\Delta C/C$	$\leq \pm 15\%$ of initial value										$V_R > 100V$
Vibration Resistance test	To IEC 60068-2-6, test Fc:													
	Displacement amplitude 0.75 mm, frequency range 10 ... 55 Hz, acceleration max. 10 g, duration 3x2 h. Capacitor mounted by its body which is rigidly clamped to the work surface.													
Characteristics at low temperature	Max. impedance ratio at 120 Hz													
	$V_R(V)$	6.3~16	25	35	50~100	160~250	315~450	400~500						
	$Z_{-25^\circ C} / Z_{20^\circ C}$	4	3	3	3	4	8	8						
	$Z_{-40^\circ C} / Z_{20^\circ C}$	15	10	8	6	8	12	-						
Sectional specification	IEC 60384-4 and JIS-C-5101													

### Multiplier for Ripple Current vs. Frequency

$V_R(V)/$ Frequency(Hz)	50(60)	120	300	1K	10K	50K-100K
$10 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 600$	0.77	1	1.16	1.30	1.41	1.43

## Dimensional drawings



Standard snap-in terminals: length  $(6.0 \pm 1)$  mm  
 Also available with length of  $(4.0 \pm 1)$  mm

H	h
6	2.5
4	1.5

## Packing

Capacitor diameter D(mm)	Length L(mm)	Terminal length H(mm)	Each carton packing Qty units(pcs.)	Box/carton units(pcs.)	Each box packing Qty units(pcs.)
20	all	/	720	6	120
22	< 55	/	600	6	100
22	$\geq 55$	/	400	4	100
25	< 65	/	500	5	100
25	$\geq 65$	/	400	4	100
30	$\leq 36$	< 6(L=35、36)	400	8	50
30	$35 \leq L \leq 65$	$\geq 6$ (L=35、36)	300	6	50
30	> 65	/	200	4	50
35	$\leq 25$	/	400	8	50
35	$25 < L < 45$	/	300	6	50
35	$45 \leq L \leq 85$	/	200	4	50
35	> 85	/	100	2	50
40	35	< 6	200	5	40
40	35	$\geq 6$	160	4	40
40	$40 \leq L \leq 45$	/	160	4	40
40	$45 < L \leq 75$	/	120	3	40
40	> 75	/	80	2	40
45	$40 \leq L \leq 65$	/	140	4	35
45	$65 < L \leq 100$	/	70	2	35

## Packing of snap-in



## Case Size

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
10	5600	22x25	1.10	64	83
10	6800	22x25	1.30	53	68
10	6800	25x25	1.34	53	68
10	8200	22x25	1.36	44	57
10	8200	25x25	1.56	44	57
10	10000	25x25	1.60	36	46
10	12000	25x25	1.82	34	44
10	12000	30x25	1.89	34	44
10	15000	22x40	2.10	27	35
10	15000	25x30	2.11	27	35
10	15000	30x25	2.14	27	35
10	18000	25x30	2.20	23	29
10	18000	30x30	2.37	23	29
10	22000	22x40	2.75	19	24
10	22000	25x35	2.78	19	24
10	22000	30x30	2.80	19	24
10	27000	25x45	3.01	19	25
10	27000	30x35	3.13	19	25
10	27000	35x30	3.16	19	25
10	33000	25x50	3.43	15	20
10	33000	30x40	3.53	15	20
10	33000	35x35	3.56	15	20
10	39000	30x45	3.78	13	17
10	39000	35x40	3.96	13	17
10	47000	30x50	4.61	11	14
10	47000	35x45	4.63	11	14
10	56000	35x50	5.06	9	12
16	5600	22x25	1.45	64	83
16	6800	22x30	1.66	53	68
16	6800	25x25	1.67	53	68
16	8200	22x30	1.79	44	57
16	8200	25x25	1.80	44	57
16	10000	22x35	2.08	36	46
16	10000	25x30	2.09	36	46
16	10000	30x25	2.11	36	46
16	12000	22x40	2.36	34	44
16	12000	25x35	2.37	34	44
16	12000	30x25	2.40	34	44
16	12000	35x25	2.42	34	44
16	15000	22x45	2.69	27	35
16	15000	25x35	2.70	27	35
16	15000	25x40	2.72	27	35
16	15000	30x30	2.74	27	35
16	18000	25x45	3.06	23	29
16	18000	30x35	3.08	23	29
16	18000	35x30	3.09	23	29
16	22000	25x50	3.39	19	24
16	22000	30x35	3.40	19	24
16	22000	30x40	3.46	19	24
16	22000	35x30	3.48	19	24
16	27000	25x50	3.60	15	20
16	27000	30x40	3.62	15	20
16	27000	35x30	3.65	15	20
16	27000	35x35	3.85	15	20
16	33000	30x45	4.00	12	16
16	33000	35x40	4.33	12	16
16	39000	30x50	4.32	10	14
16	39000	35x40	4.32	10	14

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
16	39000	35x45	4.96	10	14
16	47000	35x45	5.10	9	11
16	47000	35x50	5.49	9	11
25	3900	22x25	1.31	77	100
25	4700	22x30	1.55	65	85
25	4700	25x25	1.57	65	85
25	5600	22x30	1.80	55	71
25	5600	25x25	1.81	55	71
25	5800	22x35	1.77	53	69
25	5800	25x25	1.76	53	69
25	6800	22x30	1.90	45	59
25	6800	22x40	1.92	45	59
25	6800	25x25	1.93	45	59
25	6800	25x30	1.95	45	59
25	8200	22x35	2.10	37	49
25	8200	25x30	2.12	37	49
25	8200	30x25	2.14	37	49
25	10000	22x40	2.30	31	40
25	10000	25x35	2.31	31	40
25	10000	30x30	2.33	31	40
25	10000	35x30	2.35	31	40
25	12000	25x40	2.60	30	39
25	12000	30x35	2.70	30	39
25	12000	35x30	2.76	30	39
25	15000	25x45	2.90	24	31
25	15000	30x40	3.13	24	31
25	15000	35x35	3.16	24	31
25	18000	25x50	3.17	20	26
25	18000	30x45	3.52	20	26
25	18000	35x35	3.56	20	26
25	18000	35x40	3.60	20	26
25	22000	30x45	3.62	16	21
25	22000	30x50	3.92	16	21
25	22000	35x40	3.94	16	21
25	22000	35x45	3.95	16	21
25	27000	35x45	4.10	13	17
25	27000	35x50	4.70	13	17
25	33000	35x50	4.80	11	14
35	2200	22x25	1.10	120	150
35	2700	22x25	1.29	92	120
35	3300	22x30	1.42	77	100
35	3300	25x25	1.43	77	100
35	3900	22x30	1.60	65	85
35	3900	25x25	1.61	65	85
35	3900	25x30	1.65	65	85
35	4700	22x35	1.80	54	71
35	4700	22x40	1.81	54	71
35	4700	25x30	1.82	54	71
35	5600	22x45	2.25	46	59
35	5600	25x30	2.00	46	59
35	5600	25x35	2.18	46	59
35	5600	30x30	2.23	46	59
35	6800	25x35	2.20	38	49
35	6800	25x40	2.45	38	49
35	6800	30x30	2.46	38	49
35	8200	25x40	2.51	31	40
35	8200	25x45	2.61	31	40
35	8200	30x35	2.69	31	40

VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
35	8200	35x30	2.71	31	40
35	10000	30x40	3.04	26	33
35	10000	35x35	3.10	26	33
35	12000	30x40	3.05	26	33
35	12000	30x45	3.38	26	33
35	12000	35x40	3.41	26	33
35	15000	30x45	3.47	20	27
35	15000	35x40	3.98	20	27
35	15000	35x45	4.10	20	27
35	18000	35x45	4.40	17	22
35	18000	35x50	4.46	17	22
50	1500	22x25	1.21	140	180
50	1800	22x25	1.30	120	150
50	1800	22x30	1.34	120	150
50	1800	25x25	1.35	120	150
50	2200	22x30	1.52	92	120
50	2200	25x25	1.54	92	120
50	2700	22x35	1.77	76	98
50	2700	25x30	1.78	76	98
50	3300	22x35	1.80	62	80
50	3300	25x30	1.87	62	80
50	3300	30x25	1.89	62	80
50	3900	22x40	1.91	52	68
50	3900	25x30	1.92	52	68
50	3900	25x35	2.20	52	68
50	4700	22x45	2.25	43	56
50	4700	25x35	2.25	43	56
50	4700	25x40	2.43	43	56
50	4700	30x30	2.44	43	56
50	4700	35x30	2.46	43	56
50	5600	22x50	2.43	36	47
50	5600	25x40	2.43	36	47
50	5600	30x35	2.60	36	47
50	5600	35x30	2.61	36	47
50	6800	25x45	2.62	30	39
50	6800	30x35	2.62	30	39
50	6800	30x40	3.01	30	39
50	6800	35x40	3.02	30	39
50	8200	30x45	3.42	25	32
50	8200	30x50	3.63	25	32
50	8200	35x40	3.64	25	32
50	10000	30x50	3.64	20	27
50	10000	35x45	3.65	20	27
50	10000	35x50	3.68	20	27
50	12000	35x45	3.70	26	33
50	15000	35x50	3.99	20	27
63	1000	22x25	1.10	210	270
63	1200	22x25	1.30	170	220
63	1500	22x30	1.31	140	180
63	1500	25x25	1.38	140	180
63	1800	22x30	1.60	120	150
63	1800	25x25	1.62	120	150
63	1800	25x30	1.63	120	150
63	1800	30x25	1.65	120	150
63	2200	22x35	1.80	92	120
63	2200	25x30	1.81	92	120
63	2200	30x25	1.82	92	120
63	2700	22x40	2.00	76	98
63	2700	25x35	2.01	76	98
63	2700	30x25	2.03	76	98

VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
63	3300	22x45	2.20	62	80
63	3300	25x35	2.23	62	80
63	3300	30x30	2.25	62	80
63	3900	25x40	2.40	52	68
63	3900	30x35	2.41	52	68
63	3900	35x30	2.46	52	68
63	4700	25x50	2.60	43	56
63	4700	30x40	2.82	43	56
63	4700	35x30	2.75	43	56
63	5600	30x45	3.12	36	47
63	5600	35x35	3.15	36	47
63	5600	35x40	3.20	36	47
63	6800	30x50	3.21	30	39
63	6800	35x40	3.21	30	39
63	8200	35x45	3.40	25	32
63	10000	30x50	3.60	20	27
63	10000	35x50	3.80	20	27
80	820	22x25	1.09	180	240
80	1000	22x30	1.29	150	200
80	1000	25x25	1.31	150	200
80	1200	22x35	1.48	130	170
80	1200	25x25	1.50	130	170
80	1200	30x25	1.51	130	170
80	1500	22x35	1.60	100	130
80	1500	25x25	1.79	100	130
80	1500	25x30	1.80	100	130
80	1500	30x25	1.81	100	130
80	1800	22x45	1.91	85	110
80	1800	25x35	1.91	85	110
80	2200	22x45	2.00	70	90
80	2200	25x35	2.03	70	90
80	2200	30x30	2.05	70	90
80	2200	35x30	2.09	70	90
80	2700	25x40	2.20	57	74
80	2700	30x30	2.23	57	74
80	2700	35x30	2.44	57	74
80	3300	25x45	2.45	46	60
80	3300	30x35	2.45	46	60
80	3300	35x30	2.45	46	60
80	3900	30x40	2.60	39	51
80	3900	35x30	2.62	39	51
80	3900	35x40	3.00	39	51
80	4700	30x45	3.12	33	42
80	4700	35x40	3.15	33	42
80	5600	35x40	3.29	27	36
80	6800	35x45	3.50	23	29
100	390	22x25	0.78	390	510
100	560	22x25	1.10	280	360
100	560	22x30	1.11	280	360
100	560	25x26	1.12	280	360
100	680	22x30	1.20	220	290
100	680	25x30	1.21	220	290
100	820	22x35	1.33	180	240
100	820	25x30	1.40	180	240
100	1000	22x35	1.50	150	200
100	1000	22x40	1.56	150	200
100	1000	25x30	1.56	150	200
100	1000	30x25	1.57	150	200
100	1000	35x25	1.58	150	200
100	1200	22x40	1.60	130	170

VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
100	1200	25x35	1.62	130	170
100	1200	30x25	1.64	130	170
100	1200	30x30	1.76	130	170
100	1200	35x30	1.78	130	170
100	1500	22x45	1.80	100	130
100	1500	25x40	1.82	100	130
100	1500	30x30	1.83	100	130
100	1500	35x30	1.85	100	130
100	1800	25x45	2.00	85	110
100	1800	30x35	2.01	85	110
100	1800	35x30	2.09	85	110
100	1800	35x35	2.10	85	110
100	2200	25x50	2.20	70	90
100	2200	30x40	2.23	70	90
100	2200	35x35	2.48	70	90
100	2200	35x40	2.50	70	90
100	2700	30x45	2.65	57	74
100	2700	35x35	2.69	57	74
100	2700	35x40	2.87	57	74
100	3300	30x50	2.99	46	60
100	3300	35x40	3.09	46	60
100	3300	35x45	3.25	46	60
100	3900	35x50	3.56	39	51
100	4700	35x50	3.60	33	42
160	270	22x25	1.09	380	740
160	330	22x25	1.20	310	600
160	390	22x25	1.33	260	510
160	470	22x25	1.48	220	420
160	560	22x30	1.68	180	360
160	560	25x25	1.69	180	360
160	680	22x30	1.96	150	290
160	680	25x25	1.97	150	290
160	680	30x25	1.98	150	290
160	820	22x35	2.11	120	240
160	820	25x30	2.12	120	240
160	820	30x40	2.13	120	240
160	820	35x30	2.14	120	240
160	1000	22x40	2.40	100	200
160	1000	25x35	2.43	100	200
160	1000	30x25	2.55	100	200
160	1000	35x25	2.59	100	200
160	1200	22x50	2.81	87	170
160	1200	25x40	2.85	87	170
160	1200	30x30	2.91	87	170
160	1200	35x25	2.95	87	170
160	1500	25x45	3.17	67	130
160	1500	30x35	3.23	67	130
160	1500	35x35	3.31	67	130
160	1800	25x50	3.52	56	110
160	1800	30x40	3.63	56	110
160	1800	35x30	3.66	56	110
160	2200	30x45	4.14	46	90
160	2200	35x35	4.15	46	90
160	2700	35x40	4.78	38	74
160	3300	35x50	5.42	31	60
180	220	22x25	0.63	460	900
180	270	22x30	1.10	380	740
180	270	25x25	1.11	380	740
180	330	22x35	1.21	310	600
180	330	25x30	1.22	310	600

VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
180	390	22x40	1.34	260	510
180	390	25x35	1.35	260	510
180	390	30x25	1.36	260	510
180	470	22x45	1.49	220	420
180	470	30x30	1.50	220	420
180	560	22x50	1.70	180	360
180	560	25x40	1.71	180	360
180	560	30x35	1.72	180	360
180	680	25x45	2.01	150	290
180	680	35x30	2.02	150	290
180	820	25x50	2.15	120	240
180	820	30x40	2.16	120	240
180	820	35x35	2.17	120	240
180	1000	30x45	2.18	100	200
180	1000	35x40	2.20	100	200
180	1200	30x50	2.25	87	170
180	1200	35x45	2.28	87	170
180	1500	35x50	3.32	67	130
200	180	22x20	0.99	570	1110
200	220	22x25	1.01	460	900
200	270	22x25	1.12	380	740
200	330	22x25	1.25	310	600
200	390	22x25	1.53	260	510
200	390	25x25	1.54	260	510
200	470	22x30	1.63	220	420
200	470	25x25	1.64	220	420
200	560	22x35	1.82	180	360
200	560	25x25	1.84	180	360
200	560	30x25	1.85	180	360
200	680	22x40	2.09	150	290
200	680	25x30	2.10	150	290
200	680	30x25	2.11	150	290
200	680	35x25	2.11	150	290
200	820	22x45	2.22	120	240
200	820	25x35	2.23	120	240
200	820	30x35	2.31	120	240
200	1000	22x50	2.61	100	200
200	1000	25x40	2.62	100	200
200	1000	30x30	2.66	100	200
200	1000	35x25	2.68	100	200
200	1200	25x45	2.88	87	170
200	1200	30x35	2.92	87	170
200	1200	35x30	2.99	87	170
200	1500	30x40	3.36	67	130
200	1500	35x35	3.38	67	130
200	1800	30x50	3.82	56	110
200	1800	35x40	3.86	56	110
200	2200	35x45	4.35	46	90
200	2700	35x50	4.89	38	74
220	270	22x25	1.13	380	740
220	330	22x30	1.29	310	600
220	390	22x30	1.64	260	510
220	390	25x25	1.65	260	510
220	470	22x35	1.68	220	420
220	470	25x30	1.69	220	420
220	560	22x40	1.88	180	360
220	560	25x35	1.90	180	360
220	560	30x30	1.91	180	360
220	680	22x45	1.95	150	290
220	680	25x35	2.18	150	290

VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
220	680	30x35	2.19	150	290
220	680	35x25	2.20	150	290
220	820	25x40	2.35	120	240
220	820	25x45	2.48	120	240
220	820	30x40	2.50	120	240
220	820	35x30	2.51	120	240
220	1000	25x50	2.70	100	200
220	1000	30x45	2.71	100	200
220	1000	35x35	2.75	100	200
220	1200	30x50	2.89	87	170
220	1200	35x40	2.99	87	170
220	1500	35x45	3.42	67	130
220	1800	35x50	3.83	56	110
220	2200	35x60	3.90	46	90
250	180	22x30	1.01	570	1110
250	180	25x25	1.03	570	1110
250	220	22x25	1.30	460	900
250	220	25x25	1.32	460	900
250	330	22x30	1.32	310	600
250	330	25x25	1.33	310	600
250	390	22x35	1.55	260	510
250	390	25x30	1.56	260	510
250	390	30x25	1.57	260	510
250	470	22x40	1.69	220	420
250	470	25x30	1.71	220	420
250	560	22x45	1.92	180	360
250	560	25x35	1.92	180	360
250	560	30x25	1.93	180	360
250	560	30x30	2.00	180	360
250	560	35x25	2.20	180	360
250	680	22x50	2.23	150	290
250	680	25x40	2.25	150	290
250	680	30x30	2.27	150	290
250	680	30x35	2.30	150	290
250	680	35x25	2.31	150	290
250	820	25x45	2.32	120	240
250	820	25x50	2.40	120	240
250	820	30x35	2.41	120	240
250	820	35x30	2.46	120	240
250	1000	30x40	2.66	100	200
250	1000	35x35	2.80	100	200
250	1000	35x40	3.00	100	200
250	1200	30x45	3.00	87	170
250	1200	35x40	3.11	87	170
250	1500	35x45	3.56	67	130
250	1800	35x50	3.98	56	110
315	68	22x25	0.32	1500	2930
315	82	22x30	0.38	1250	2430
315	100	25x25	0.41	1020	1990
315	150	22x25	0.85	680	1330
315	180	22x30	1.01	570	1110
315	180	25x25	1.04	570	1110
315	220	22x35	1.10	460	900
315	220	25x25	1.20	460	900
315	220	30x25	1.25	460	900
315	270	22x40	1.25	380	740
315	270	25x30	1.26	380	740
315	270	30x30	1.27	380	740
315	330	22x45	1.32	310	600
315	330	25x35	1.32	310	600

VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
315	330	30x25	1.32	310	600
315	330	30x30	1.34	310	600
315	330	35x25	1.38	310	600
315	390	22x50	1.59	260	510
315	390	25x40	1.61	260	510
315	390	30x40	1.62	260	510
315	390	35x30	1.63	260	510
315	470	22x60	1.71	220	420
315	470	25x45	1.75	220	420
315	470	30x35	1.78	220	420
315	470	35x30	1.79	220	420
315	560	25x50	2.22	180	360
315	560	30x40	2.25	180	360
315	560	35x30	2.32	180	360
315	560	35x35	2.35	180	360
315	680	25x60	2.53	150	290
315	680	30x45	2.53	150	290
315	680	35x35	2.55	150	290
315	680	35x40	2.56	150	290
315	820	30x50	2.79	120	240
315	820	35x40	2.88	120	240
315	820	35x45	3.00	120	240
315	1000	30x60	3.20	100	200
315	1000	35x50	3.30	100	200
315	1200	35x55	3.31	87	170
350	56	22x20	3.33	1820	3550
350	68	22x25	0.34	1500	2930
350	82	22x30	0.40	1250	2430
350	100	25x25	0.47	1020	1990
350	120	22x25	0.72	850	1660
350	150	22x30	0.87	680	1330
350	150	25x25	0.89	680	1330
350	180	22x40	1.06	570	1110
350	180	25x25	1.07	570	1110
350	180	25x30	1.08	570	1110
350	220	22x40	1.35	460	900
350	220	25x30	1.36	460	900
350	220	30x25	1.38	460	900
350	270	22x45	1.39	380	740
350	270	25x35	1.40	380	740
350	270	30x30	1.41	380	740
350	270	35x25	1.42	380	740
350	330	22x50	1.43	310	600
350	330	25x40	1.44	310	600
350	330	30x35	1.44	310	600
350	330	35x30	1.45	310	600
350	390	25x45	1.60	260	510
350	390	30x40	1.63	260	510
350	390	35x30	1.64	260	510
350	470	25x50	1.77	220	420
350	470	30x45	1.81	220	420
350	470	35x35	1.82	220	420
350	560	30x50	2.36	180	360
350	560	35x40	2.37	180	360
350	680	35x45	2.60	150	290
350	820	35x50	2.87	120	240
385	100	22x25	0.68	1020	1990
385	120	22x25	0.76	850	1660
385	120	22x30	0.86	850	1660
385	150	22x30	0.88	680	1330



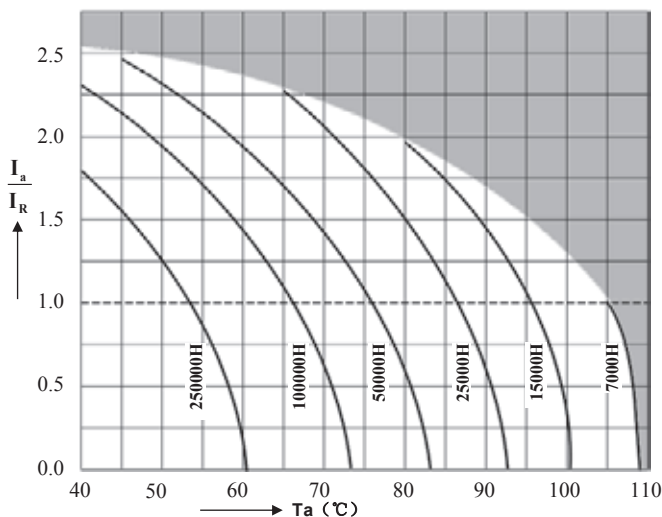
VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
385	150	25x25	0.89	680	1330
385	180	22x30	1.06	570	1110
385	180	22x40	1.07	570	1110
385	180	25x25	1.09	570	1110
385	180	25x30	1.10	570	1110
385	180	30x25	1.12	570	1110
385	220	22x35	1.34	460	900
385	220	22x45	1.45	460	900
385	220	25x30	1.39	460	900
385	220	25x35	1.45	460	900
385	220	30x30	1.40	460	900
385	220	35x25	1.41	460	900
385	270	22x45	1.45	380	740
385	270	22x50	1.50	380	740
385	270	25x35	1.45	380	740
385	270	25x40	1.50	380	740
385	270	30x30	1.50	380	740
385	270	35x30	1.58	380	740
385	330	22x50	1.55	310	600
385	330	22x55	1.61	310	600
385	330	25x40	1.56	310	600
385	330	25x45	1.64	310	600
385	330	30x30	1.61	310	600
385	330	30x35	1.65	310	600
385	330	35x25	1.66	310	600
385	330	35x30	1.70	310	600
385	390	25x45	1.70	260	510
385	390	25x50	1.78	260	510
385	390	30x35	1.70	260	510
385	390	30x40	1.80	260	510
385	390	35x30	1.72	260	510
385	390	35x35	1.82	260	510
385	470	25x55	1.90	220	420
385	470	30x40	1.86	220	420
385	470	30x45	1.90	220	420
385	470	35x35	1.92	220	420
385	470	35x40	2.10	220	420
385	560	25x60	2.45	180	360
385	560	30x45	2.39	180	360
385	560	30x50	2.45	180	360
385	560	35x35	2.43	180	360
385	560	35x45	2.52	180	360
385	680	30x50	2.64	150	290
385	680	30x55	2.77	150	290
385	680	35x40	2.72	150	290
385	680	35x50	2.80	150	290
385	820	30x60	2.85	120	240
385	820	35x50	2.88	120	240
385	820	35x55	2.98	120	240
385	1000	35x55	3.18	100	200
385	1000	35x60	3.28	100	200
400	56	22x25	0.38	1820	3550
400	68	22x25	0.51	1500	2930
400	68	25x20	0.52	1500	2930
400	82	22x25	0.56	1250	2430
400	82	25x25	0.61	1250	2430
400	100	22x25	0.62	1020	1990
400	100	22x30	0.67	1020	1990
400	100	25x25	0.68	1020	1990
400	120	22x30	0.73	850	1660

VV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
400	120	25x25	0.74	850	1660
400	120	30x25	0.80	850	1660
400	150	22x30	0.80	680	1330
400	150	25x30	0.88	680	1330
400	150	30x25	0.92	680	1330
400	180	22x35	0.96	570	1110
400	180	25x30	0.97	570	1110
400	180	30x25	1.00	570	1110
400	220	25x30	1.02	460	900
400	220	30x25	1.02	460	900
400	220	30x30	1.05	460	900
400	270	22x45	1.16	380	740
400	270	22x50	1.21	380	740
400	270	25x35	1.16	380	740
400	270	30x30	1.21	380	740
400	270	30x35	1.24	380	740
400	270	35x25	1.23	380	740
400	330	25x40	1.31	310	600
400	330	30x30	1.31	310	600
400	330	35x25	1.31	310	600
400	470	30x45	1.82	220	420
400	470	35x35	1.82	220	420
400	470	35x40	1.89	220	420
400	560	30x45	1.99	180	360
400	560	30x50	2.08	180	360
400	560	35x40	2.08	180	360
400	560	35x45	2.17	180	360
400	680	35x45	2.39	150	290
400	680	35x50	2.50	150	290
400	820	35x50	2.50	120	240
400	820	35x55	2.86	120	240
400	1200	35x60	3.16	87	170
420	39	22x25	0.34	3490	6800
420	68	25x25	0.55	2000	3900
420	82	22x25	0.56	1660	3230
420	100	22x25	0.62	1360	2650
420	100	22x30	0.67	1360	2650
420	100	25x25	0.67	1360	2650
420	120	22x30	0.73	1130	2210
420	120	25x25	0.74	1130	2210
420	150	22x35	0.88	910	1770
420	150	25x30	0.89	910	1770
420	150	30x25	0.92	910	1770
420	180	22x35	0.96	750	1470
420	180	22x40	1.02	750	1470
420	180	25x30	1.01	750	1470
420	180	30x25	1.02	750	1470
420	220	22x45	1.05	620	1210
420	220	25x35	1.05	620	1210
420	220	30x30	1.05	620	1210
420	220	35x25	1.05	620	1210
420	270	22x50	1.21	500	980
420	270	25x40	1.21	500	980
420	270	30x30	1.21	500	980
420	270	30x35	1.24	500	980
420	270	35x25	1.21	500	980
420	270	35x30	1.28	500	980
420	330	25x50	1.44	410	800
420	330	30x35	1.37	410	800
420	330	35x30	1.44	410	800

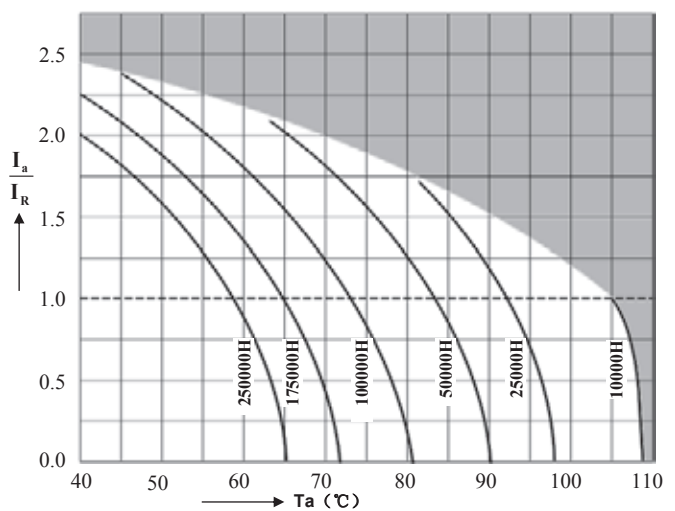
WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
420	470	30x45	1.82	290	560
420	470	35x40	1.89	290	560
420	560	30x55	2.17	240	470
420	560	35x45	2.17	240	470
420	680	30x60	2.48	200	390
420	680	35x50	2.50	200	390
420	820	35x55	2.91	160	320
420	820	35x60	2.97	160	320
420	1000	35x60	3.28	140	270
450	39	22x25	0.37	3490	6800
450	47	22x25	0.38	2890	5640
450	56	22x25	0.45	2430	4740
450	68	22x30	0.55	2000	3900
450	68	25x25	0.55	2000	3900
450	82	22x25	0.56	1660	3230
450	82	22x30	0.61	1660	3230
450	82	25x30	0.65	1660	3230
450	100	22x30	0.67	1360	2650
450	100	25x25	0.67	1360	2650
450	100	30x25	0.75	1360	2650
450	120	22x35	0.75	1130	2210
450	120	25x30	0.75	1130	2210
450	120	30x30	0.88	1130	2210
450	150	22x40	0.93	910	1770
450	150	25x25	0.88	910	1770
450	150	30x30	0.99	910	1770
450	150	35x30	1.08	910	1770
450	180	22x45	1.10	750	1470
450	180	25x35	1.10	750	1470
450	180	30x30	1.10	750	1470
450	180	35x25	1.11	750	1470
450	220	25x35	1.13	620	1210
450	220	30x30	1.13	620	1210
450	220	30x35	1.15	620	1210
450	220	35x30	1.16	620	1210
450	270	25x45	1.24	500	980
450	270	25x50	1.30	500	980

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/105°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
450	270	30x40	1.30	500	980
450	270	35x30	1.30	500	980
450	330	25x50	1.44	410	800
450	330	30x40	1.45	410	800
450	330	35x35	1.50	410	800
450	390	30x45	1.66	350	680
450	390	35x35	1.63	350	680
450	470	35x40	1.89	290	560
450	560	35x50	2.27	240	470
450	680	35x55	2.61	200	390
500	47	22x25	0.38	2890	5640
500	56	25x25	0.44	2430	4740
500	68	22x30	0.49	2000	3900
500	68	25x25	0.49	2000	3900
500	82	22x35	0.57	1660	3230
500	82	25x30	0.58	1660	3230
500	82	30x25	0.60	1660	3230
500	100	22x40	0.67	1360	2650
500	100	25x35	0.68	1360	2650
500	100	30x25	0.67	1360	2650
500	120	25x40	0.79	1130	2210
500	120	30x25	0.72	1130	2210
500	150	22x50	0.91	910	1770
500	150	25x45	0.93	910	1770
500	150	30x30	0.91	910	1770
500	180	25x50	1.06	750	1470
500	180	30x35	1.01	750	1470
500	180	35x30	1.05	750	1470
500	220	25x50	1.18	620	1210
500	220	30x45	1.25	620	1210
500	220	35x30	1.16	620	1210
500	270	30x50	1.44	500	980
500	270	35x35	1.36	500	980
500	330	35x40	1.62	410	800
500	390	35x50	1.83	350	680
500	470	35x55	2.15	290	560

## Useful life



depending on ambient temperature  $T_a$  versus under ripple current operating conditions  $VR \leq 100V$



depending on ambient temperature  $T_a$  versus under ripple current operating conditions  $VR \geq 160V$