

LP Series 85°C

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

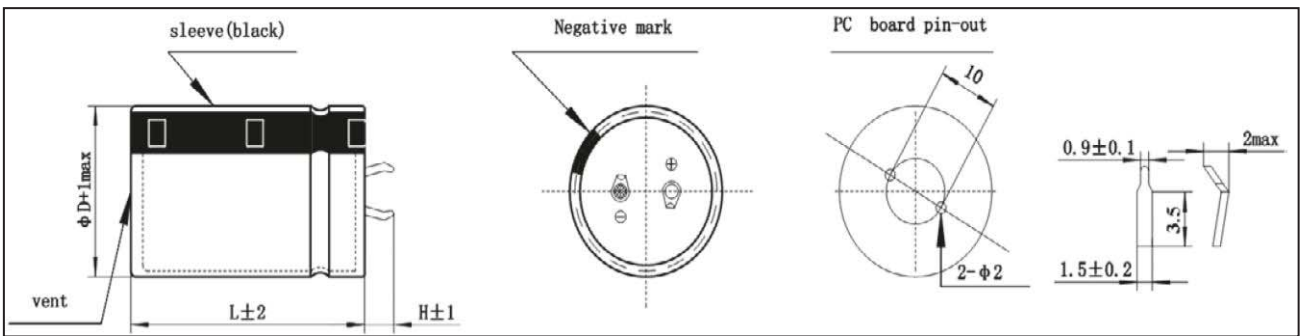
Item	Performance Characteristics												
Operating Temperature Range	-40 to +85°C	-25 to +85°C											
Rated voltage V_R	6.3 to 450 V DC	500 to 600 V DC											
Surge voltage V_S	VR≤315V 1.15 VR VR > 315V 1.10 VR												
Rated capacitance C_R	22 to 100000 μF												
Capacitance tolerance	±20%(120Hz, +20°C)												
Leakage Current I_{leak} (+20°C, max.)	$I \leq 3\sqrt{CV}$ (μA) After 5 minutes with rated working voltage applied												
Dissipation Factor (tanδ, at 20°C, 120Hz)	Less than the value under table(%)												
	μF/Vdc	6.3	10	16	25	35	50	63	80	100	160~420	450~600	
	≅ 8200	-	35	35	30	25	20	20	15	15	15	20	
	10000 to 22000	55	40	40	35	30	30	25	15	-	-	-	
	≅ 27000	60	50	40	35	35	30	25	-	-	-	-	
Self-inductance ESL	approx. 20 nH												
Useful life 85 °C; $V_R, I_{AC,R}$ 85 °C; $V_R, I_{AC,R}$	$V_R \leq 100V$:	Requirements: $V_R \leq 100V$ DC/C ≤ ±30% of initial value ESR ≤ 3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: ≤ 1 %						$V_R > 100V$ DC/C ≤ ±20% of initial value ESR ≤ 2 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 1 %					
	$V_R > 100V$:	Post test requirements: $V_R \leq 100V$ DC/C ≤ ±15% of initial value ESR ≤ 1.3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 0 %						$V_R > 100V$ DC/C ≤ ±10% of initial value ESR ≤ 1.3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 0 %					
Voltage Endurance test 85 °C; V_R	2000 h	Requirements: $V_R \leq 100V$ DC/C ≤ ±30% of initial value ESR ≤ 3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: ≤ 1 %						$V_R > 100V$ DC/C ≤ ±20% of initial value ESR ≤ 2 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 1 %					
		Post test requirements: $V_R \leq 100V$ DC/C ≤ ±15% of initial value ESR ≤ 1.3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 0 %						Post test requirements: $V_R > 100V$ DC/C ≤ ±10% of initial value ESR ≤ 1.3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 0 %					
Shelf Life 85 °C	1000 h	Requirements: $V_R \leq 100V$ DC/C ≤ ±30% of initial value ESR ≤ 3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: ≤ 1 %						$V_R > 100V$ DC/C ≤ ±20% of initial value ESR ≤ 2 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 1 %					
		Post test requirements: $V_R \leq 100V$ DC/C ≤ ±15% of initial value ESR ≤ 1.3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 0 %						Post test requirements: $V_R > 100V$ DC/C ≤ ±10% of initial value ESR ≤ 1.3 times initial specified limit $I_{leak} \leq$ initial specified limit Outlier Percentage: 0 %					
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 3 ´ 2 h. Capacitor mounted by its body which is rigidly clamped to the work surface.												
Characteristics at lowtemperature	Max. impedance ratio at 120 Hz												
	$V_R(V)$	6.3	10	16	25	35~100	160~250	315~450	500~600				
	$Z_{25°C} / Z_{20°C}$	5	5	5	4	4	4	4	8	8			
	$Z_{40°C} / Z_{20°C}$	15	15	15	15	12	7	10	-				
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 2 terminals



Standard snap-in terminals: length $(6.0\pm 1)\text{mm}$

Also available with length of $(4.0\pm 1)\text{mm}$

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	≥ 55	/	400	4	100
25	<65	/	500	5	100
25	≥ 65	/	400	4	100
30	≤ 36	<6(L=35、36)	400	8	50
30	$35\leq L\leq 65$	≥ 6 (L=35、36)	300	6	50
30	>65	/	200	4	50
35	≤ 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	≥ 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/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
6.3	15000	22x25	2.5	37	49
6.3	18000	22x30	2.7	31	41
6.3	18000	25x25	2.71	31	41
6.3	22000	22x30	3.1	26	33
6.3	22000	25x25	3.12	26	33
6.3	27000	22x35	3.5	23	29
6.3	27000	25x30	3.55	23	29
6.3	27000	30x25	3.6	23	29
6.3	33000	22x40	3.58	19	24
6.3	33000	25x35	4	19	24
6.3	33000	30x25	4	19	24
6.3	39000	22x50	4.6	16	20
6.3	39000	25x40	4.5	16	20
6.3	39000	30x30	4.5	16	20
6.3	39000	35x25	4.55	16	20
6.3	47000	25x45	5.1	13	17
6.3	47000	30x35	5.1	13	17
6.3	47000	35x30	5.12	13	17
6.3	56000	25x50	5.75	11	14
6.3	56000	30x40	5.8	11	14
6.3	56000	35x30	5.8	11	14
6.3	68000	30x45	6.5	9	12
6.3	68000	35x35	6.5	9	12
6.3	82000	30x50	7.35	8	10
6.3	82000	35x40	7.38	8	10
6.3	100000	35x45	8.35	6	8
10	4700	22x20	2.4	76	99
10	6800	22x25	2.84	53	68
10	8200	22x25	2.9	44	57
10	10000	22x25	2.95	36	46
10	10000	25x25	3.06	36	46
10	12000	22x25	3.32	34	44
10	12000	25x25	3.43	34	44
10	15000	22x30	3.4	27	35
10	15000	25x25	3.85	27	35
10	18000	22x35	4.3	23	29
10	18000	25x25	4.2	23	29
10	22000	22x40	4.8	19	24
10	22000	25x30	4.75	19	24
10	22000	30x25	4.83	19	24
10	27000	25x35	5.1	19	25
10	27000	30x30	5.32	19	25
10	27000	22x45	5.3	19	25
10	33000	22x50	5.5	15	20
10	33000	25x40	5.5	15	20
10	33000	30x30	5.5	15	20
10	33000	35x25	5.6	15	20
10	39000	25x45	6.31	13	17
10	39000	30x35	6.25	13	17
10	39000	35x30	6.39	13	17
10	47000	25x50	6.6	11	14
10	47000	30x40	6.7	11	14
10	47000	35x30	6.72	11	14
10	56000	30x45	6.8	9	12
10	56000	35x35	6.9	9	12
10	68000	35x40	7.8	8	10
10	68000	30x50	7.6	8	10
10	82000	35x50	8.5	6	8
16	4700	22x20	2.4	76	99
16	6800	22x25	2.84	53	68

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
16	8200	22x25	2.9	44	57
16	10000	22x25	3.06	36	46
16	10000	25x25	3.5	36	46
16	12000	22x30	3.43	34	44
16	12000	25x25	3.45	34	44
16	15000	22x35	3.94	27	35
16	15000	25x30	4.2	27	35
16	15000	30x25	3.95	27	35
16	18000	22x40	4.5	23	29
16	18000	25x30	4.34	23	29
16	22000	22x45	4.8	19	24
16	22000	25x35	4.75	19	24
16	22000	25x40	5.1	19	24
16	22000	30x30	5.2	19	24
16	27000	35x25	5.9	15	20
16	27000	25x45	6.3	15	20
16	27000	30x35	6.5	15	20
16	33000	25x50	6.5	12	16
16	33000	35x30	6.8	12	16
16	33000	30x40	6.6	12	16
16	39000	25x45	5.8	10	14
16	39000	35x35	7.1	10	14
16	39000	30x45	7.05	10	14
16	47000	25x50	6.2	9	11
16	47000	30x50	7.65	9	11
16	47000	35x40	7.75	9	11
16	56000	35x50	8.2	7	10
16	56000	30x50	7.8	7	10
16	56000	35x45	8.1	7	10
16	68000	35x50	8.55	6	8
25	4700	22x25	2.64	65	85
25	5600	22x25	2.72	55	71
25	6800	22x30	3.1	45	59
25	6800	25x25	3.2	45	59
25	8200	22x30	3.15	37	49
25	8200	25x25	3.25	37	49
25	10000	22x35	3.43	31	40
25	10000	25x30	3.9	31	40
25	10000	30x25	3.43	31	40
25	12000	22x40	3.84	30	39
25	12000	25x35	4.37	30	39
25	12000	30x30	4.4	30	39
25	15000	22x50	4.94	24	31
25	15000	25x40	4.8	24	31
25	15000	30x30	4.85	24	31
25	18000	25x45	5.5	20	26
25	18000	30x35	5.6	20	26
25	22000	30x35	5.4	16	21
25	22000	35x30	5.5	16	21
25	27000	30x45	6.25	13	17
25	27000	35x35	6.3	13	17
25	33000	30x50	6.85	11	14
25	33000	35x40	6.9	11	14
25	39000	35x45	7.36	9	12
25	47000	35x50	8.62	8	10
35	2200	22x25	2.18	120	150
35	3300	22x25	2.46	77	100
35	3900	22x25	2.5	65	85
35	4700	22x30	3.1	54	71
35	4700	25x25	3.1	54	71

Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
35	5600	22x30	2.72	46	59
35	5600	25x25	2.8	46	59
35	6800	30x25	3.8	38	49
35	6800	22x35	3.6	38	49
35	6800	25x30	3.7	38	49
35	8200	22x40	3.9	31	40
35	8200	25x35	3.95	31	40
35	8200	30x30	4.1	31	40
35	10000	25x40	4.68	26	33
35	10000	30x30	4.58	26	33
35	10000	22x45	4.15	26	33
35	12000	22x50	4.7	26	33
35	12000	25x45	5.1	26	33
35	12000	30x35	5.15	26	33
35	12000	35x30	5.25	26	33
35	15000	25x50	5.3	20	27
35	15000	30x40	5.72	20	27
35	15000	35x30	5.72	20	27
35	18000	30x45	6.1	17	22
35	18000	35x35	6.1	17	22
35	22000	30x50	6.5	14	18
35	22000	35x40	6.55	14	18
35	27000	35x45	6.8	13	17
35	33000	35x50	7.2	11	14
50	1000	22x20	1.2	210	270
50	1500	22x25	1.44	140	180
50	2200	22x25	2.04	92	120
50	2700	22x30	2.3	76	98
50	3300	22x30	2.9	62	80
50	3300	25x25	3.1	62	80
50	3900	22x30	2.95	52	68
50	3900	25x25	3.15	52	68
50	4700	22x35	3.3	43	56
50	4700	25x30	3.4	43	56
50	4700	30x25	3.5	43	56
50	5600	22x40	3.6	36	47
50	5600	25x40	3.75	36	47
50	5600	30x30	3.8	36	47
50	5600	35x25	3.85	36	47
50	6800	22x50	4.2	30	39
50	6800	25x40	4.15	30	39
50	6800	30x30	4.2	30	39
50	8200	25x45	4.75	25	32
50	8200	30x35	4.8	25	32
50	8200	35x30	4.9	25	32
50	10000	35x30	5.2	20	27
50	10000	25x50	5.2	20	27
50	10000	30x40	5.5	20	27
50	12000	30x45	5.8	26	33
50	12000	35x35	6.1	26	33
50	15000	30x50	6.5	20	27
50	15000	35x40	6.8	20	27
50	18000	35x45	7.2	17	22
50	18000	30x50	7.1	17	22
50	22000	35x50	7.8	14	18
63	1000	22x20	1.5	210	270
63	1500	22x25	1.68	140	180
63	1800	22x25	2.2	120	150
63	2200	22x30	2.52	92	120
63	2200	25x25	2.55	92	120

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
63	2700	22x35	2.82	76	98
63	2700	25x30	2.9	76	98
63	3300	22x35	3.15	62	80
63	3300	25x30	3.25	62	80
63	3300	30x25	3.35	62	80
63	3900	22x40	3.65	52	68
63	3900	25x35	3.75	52	68
63	3900	30x30	3.8	52	68
63	4700	22x46	3.4	43	56
63	4700	25x35	3.3	43	56
63	4700	30x31	3.45	43	56
63	4700	35x25	3.5	43	56
63	5600	25x45	4.65	36	47
63	5600	30x35	4.7	36	47
63	5600	35x30	4.8	36	47
63	6800	25x50	5.3	30	39
63	6800	30x40	5.3	30	39
63	6800	35x30	5.4	30	39
63	8200	30x40	5.45	25	32
63	8200	35x35	5.72	25	32
63	10000	30x50	6.35	20	27
63	10000	35x40	6.5	20	27
63	12000	35x45	6.6	21	28
63	15000	35x50	6.8	17	22
80	680	22x20	1.25	220	290
80	1000	22x25	1.62	150	200
80	1200	22x25	1.65	130	170
80	1500	22x30	2.5	100	130
80	1500	25x25	2.5	100	130
80	1800	22x30	2.92	85	110
80	1800	25x25	3	85	110
80	2200	22x35	3.25	70	90
80	2200	25x30	3.35	70	90
80	2200	30x25	3.4	70	90
80	2700	22x40	3.5	57	74
80	2700	25x35	3.6	57	74
80	2700	30x30	3.65	57	74
80	3300	22x45	3.7	46	60
80	3300	25x40	3.9	46	60
80	3300	30x30	3.9	46	60
80	3900	22x50	4.8	39	51
80	3900	25x45	4.9	39	51
80	3900	30x35	4.9	39	51
80	4700	25x50	5.4	33	42
80	4700	30x40	5.45	33	42
80	4700	35x30	5.5	33	42
80	5600	30x45	5.6	27	36
80	5600	35x35	5.65	27	36
80	6800	30x50	5.8	23	29
80	6800	35x40	5.85	23	29
80	8200	35x52	6.2	19	24
80	10000	35x50	6.65	15	20
80	12000	35x60	7.1	13	17
100	470	22x20	1.34	320	420
100	680	22x25	1.53	220	290
100	820	22x25	1.9	180	240
100	1000	22x25	2	150	200
100	1000	25x25	1.95	150	200
100	1200	22x30	2.4	130	170
100	1200	25x25	2.4	130	170

Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
100	1500	22x35	2.85	100	130
100	1500	25x30	2.95	100	130
100	1500	30x25	3.1	100	130
100	1800	22x40	3.3	85	110
100	1800	25x35	3.5	85	110
100	1800	30x30	3.4	85	110
100	2700	35x30	4.1	57	74
100	2700	22x50	3.73	57	74
100	2700	25x40	3.75	57	74
100	2700	30x35	4	57	74
100	3300	25x50	4.15	46	60
100	3300	30x40	4.2	46	60
100	3300	35x30	4.2	46	60
100	3300	30x35	3.9	46	60
100	3900	30x45	4.6	39	51
100	3900	35x35	4.7	39	51
100	3900	30x40	4.5	39	51
100	3900	35x30	4.52	39	51
100	4700	30x50	5.86	33	42
100	4700	35x40	5.9	33	42
100	4700	30x45	5.1	33	42
100	4700	35x35	5.1	33	42
100	5600	35x45	6.34	27	36
100	5600	30x50	5.8	27	36
100	5600	35x40	5.9	27	36
100	6800	35x45	6.6	23	29
100	6800	35x50	6.8	23	29
100	8200	35x60	7.3	19	24
160	180	22x20	1.12	650	1110
160	220	22x20	1.16	530	900
160	220	22x25	1.2	530	900
160	270	22x25	1.35	440	740
160	330	22x25	1.39	350	600
160	330	22x30	1.44	350	600
160	390	25x25	1.66	300	510
160	470	25x25	1.78	250	420
160	470	22x30	1.76	250	420
160	560	22x25	2.3	210	360
160	560	22x30	2.4	210	360
160	680	22x30	2.5	170	290
160	680	25x30	2.55	170	290
160	820	22x35	2.75	140	240
160	820	25x25	2.53	140	240
160	1000	22x40	3	120	200
160	1000	25x30	3	120	200
160	1200	22x45	3.26	100	170
160	1200	25x35	3.25	100	170
160	1200	30x25	3.05	100	170
160	1500	22x50	3.73	76	130
160	1500	25x40	3.73	76	130
160	1500	30x30	3.73	76	130
160	1500	35x25	3.5	76	130
160	1800	25x45	4.2	65	110
160	1800	30x35	4.2	65	110
160	1800	35x30	4.3	65	110
160	2200	30x40	4.78	53	90
160	2200	35x35	4.85	53	90
160	2700	30x45	4.9	43	74
160	2700	35x40	5.45	43	74
160	3300	35x45	5.75	35	60

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
160	3900	35x50	6	30	51
180	330	22x25	1.43	350	600
180	390	22x30	1.62	300	510
180	470	22x25	2.09	250	420
180	470	22x30	1.8	250	420
180	470	25x25	2	250	420
180	560	22x30	2.1	210	360
180	560	22x35	2.1	210	360
180	560	25x30	2.15	210	360
180	680	22x30	2.5	170	290
180	680	22x40	2.6	170	290
180	680	25x25	2.51	170	290
180	680	30x25	2.62	170	290
180	820	22x35	2.76	140	240
180	820	25x30	2.8	140	240
180	820	30x30	2.57	140	240
180	1000	22x45	3	120	200
180	1000	25x35	3	120	200
180	1000	30x25	3	120	200
180	1200	22x50	3.31	100	170
180	1200	25x40	3.31	100	170
180	1200	30x30	3.3	100	170
180	1200	35x25	3.4	100	170
180	1500	25x45	3.83	76	130
180	1500	30x35	3.85	76	130
180	1500	35x30	3.83	76	130
180	1800	25x50	4.32	65	110
180	1800	30x40	4.32	65	110
180	1800	35x30	4.35	65	110
180	2200	30x45	4.92	53	90
180	2200	35x40	5.12	53	90
180	2700	35x45	5.52	43	74
200	150	22x20	0.96	780	1330
200	180	22x20	0.98	650	1110
200	180	22x25	1	650	1110
200	220	20x25	1.2	530	900
200	220	22x25	1.36	530	900
200	220	22x31	1.38	530	900
200	270	22x25	1.46	440	740
200	270	22x30	1.5	440	740
200	330	22x25	1.7	350	600
200	330	20x36	1.6	350	600
200	330	22x30	1.89	350	600
200	330	25x25	1.92	350	600
200	390	22x25	1.75	300	510
200	390	25x25	1.95	300	510
200	390	22x30	1.92	300	510
200	390	25x30	1.95	300	510
200	470	22x25	1.9	250	420
200	470	25x25	2.01	250	420
200	470	22x30	2.09	250	420
200	470	25x30	2.23	250	420
200	560	22x30	2.44	210	360
200	560	22x35	2.5	210	360
200	560	25x25	2.43	210	360
200	560	25x30	2.5	210	360
200	680	22x35	2.68	170	290
200	680	30x25	2.4	170	290
200	680	22x45	2.9	170	290
200	680	25x30	2.8	170	290

Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
200	680	25x35	2.98	170	290
200	820	22x40	2.93	140	240
200	820	25x30	2.93	140	240
200	820	25x35	3	140	240
200	820	30x25	2.95	140	240
200	820	30x30	3.1	140	240
200	820	22x45	3.1	140	240
200	1000	22x45	3.25	120	200
200	1000	22x50	3.32	120	200
200	1000	25x35	3.25	120	200
200	1000	30x30	3.32	120	200
200	1000	35x25	3.3	120	200
200	1200	22x50	3.5	100	170
200	1200	25x40	3.5	100	170
200	1200	30x30	3.5	100	170
200	1200	30x35	3.6	100	170
200	1500	25x50	4.1	76	130
200	1500	30x35	3.8	76	130
200	1500	35x30	3.87	76	130
200	1800	30x40	3.9	65	110
200	1800	30x45	4.4	65	110
200	1800	35x35	4.5	65	110
200	1800	35x45	5.84	65	110
200	2200	30x50	5	53	90
200	2200	35x40	4.92	53	90
200	2700	35x45	5.9	43	74
200	2700	35x50	6	43	74
200	3300	35x50	6.1	35	60
250	120	22x20	0.85	980	1660
250	150	22x20	0.9	780	1330
250	150	22x25	0.98	780	1330
250	180	22x25	1.05	650	1110
250	180	22x30	1.12	650	1110
250	220	22x25	1.26	530	900
250	270	22x25	1.41	440	740
250	270	22x30	1.6	440	740
250	330	22x30	1.77	350	600
250	330	25x25	1.78	350	600
250	390	22x30	2	300	510
250	390	25x25	2	300	510
250	470	22x35	2.12	250	420
250	470	25x30	2.11	250	420
250	470	30x30	2.38	250	420
250	560	22x40	2.26	210	360
250	560	25x30	2.26	210	360
250	560	25x35	2.32	210	360
250	560	30x25	2.26	210	360
250	680	22x45	2.81	170	290
250	680	25x35	2.59	170	290
250	680	30x30	2.51	170	290
250	800	30x40	4.67	150	250
250	820	25x40	2.98	140	240
250	820	30x30	2.78	140	240
250	820	35x25	2.78	140	240
250	1000	25x45	3.33	120	200
250	1000	25x50	3.54	120	200
250	1000	30x35	3.33	120	200
250	1000	35x30	3.33	120	200
250	1200	30x40	3.67	100	170
250	1200	35x35	3.8	100	170

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
250	1500	30x50	4.45	76	130
250	1500	35x40	4.45	76	130
250	1800	35x45	4.56	65	110
250	2200	35x50	4.76	53	90
315	180	25x25	1.32	650	1110
315	220	22x30	1.42	530	900
315	270	25x30	1.63	440	740
315	330	22x40	1.83	350	600
315	330	25x30	1.83	350	600
315	330	30x25	1.85	350	600
315	390	22x45	2.02	300	510
315	390	25x35	1.98	300	510
315	390	30x30	2.15	300	510
315	470	25x40	2.28	250	420
315	470	30x30	2.3	250	420
315	470	35x25	2.35	250	420
315	560	25x45	2.57	210	360
315	560	30x35	2.57	210	360
315	560	35x30	2.65	210	360
315	680	30x40	2.88	170	290
315	680	35x35	2.92	170	290
315	820	30x45	3.26	140	240
315	820	35x40	3.35	140	240
315	1000	30x50	3.63	120	200
315	1000	35x45	3.72	120	200
350	100	22x25	0.76	1170	1990
350	120	22x25	0.99	980	1660
350	120	25x25	1.02	980	1660
350	150	22x25	1.12	780	1330
350	180	22x30	1.22	650	1110
350	220	22x40	1.41	530	900
350	220	25x35	1.47	530	900
350	220	30x25	1.48	530	900
350	270	22x40	1.7	440	740
350	270	25x30	1.67	440	740
350	330	22x45	1.9	350	600
350	330	25x35	1.89	350	600
350	330	35x30	1.95	350	600
350	390	22x50	2.08	300	510
350	390	25x40	2.07	300	510
350	390	30x30	2.09	300	510
350	390	35x25	2.15	300	510
350	470	25x45	2.41	250	420
350	470	30x35	2.5	250	420
350	470	35x30	2.55	250	420
350	560	25x50	2.61	210	360
350	560	30x40	2.63	210	360
350	560	35x30	2.65	210	360
350	680	30x45	2.97	170	290
350	680	35x35	3	170	290
350	820	30x50	3.26	140	240
350	820	35x45	3.4	140	240
350	1000	35x50	3.55	120	200
385	82	22x25	0.75	1430	2430
385	100	22x30	0.85	1170	1990
385	120	22x30	0.95	980	1660
385	120	25x25	0.98	980	1660
385	150	22x35	1.12	780	1330
385	150	25x30	1.15	780	1330
385	180	22x40	1.21	650	1110

Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
385	180	25×35	1.25	650	1110
385	180	30×25	1.31	650	1110
385	220	22×45	1.45	530	900
385	220	25×35	1.45	530	900
385	220	30×30	1.47	530	900
385	270	25×40	1.59	440	740
385	270	30×35	1.65	440	740
385	330	25×50	1.85	350	600
385	330	30×40	1.89	350	600
385	330	35×30	1.91	350	600
385	390	30×40	2.07	300	510
385	390	35×35	2.1	300	510
385	470	30×50	2.62	250	420
385	470	35×40	2.84	250	420
385	560	35×45	2.98	210	360
385	680	35×50	3.71	170	290
385	680	40×40	3.82	170	290
385	820	35×55	4.18	140	240
385	820	40×45	4.25	140	240
385	1000	35×65	4.95	120	200
385	1000	40×50	4.89	120	200
385	1000	45×40	4.85	120	200
385	1200	35×75	5.68	100	170
385	1200	40×60	5.55	100	170
385	1200	45×45	5.52	100	170
385	1500	35×90	6.71	76	130
385	1500	40×70	6.59	76	130
385	1500	45×55	6.55	76	130
385	1800	40×80	7.23	65	110
385	1800	45×60	7.12	65	110
385	2200	40×95	8.54	53	90
385	2200	45×75	8.31	53	90
385	2700	45×85	8.91	43	74
400	47	22×20	0.42	2490	4230
400	56	22×25	0.53	2090	3550
400	68	22×20	0.44	1720	2930
400	68	22×25	0.47	1720	2930
400	82	20×25	0.6	1430	2430
400	82	22×25	0.83	1430	2430
400	100	22×25	0.85	1170	1990
400	100	22×30	0.91	1170	1990
400	120	22×25	1.03	980	1660
400	150	22×25	1.15	780	1330
400	150	22×30	1.18	780	1330
400	150	25×30	1.22	780	1330
400	150	30×25	1.25	780	1330
400	180	22×30	1.5	650	1110
400	180	25×25	1.5	650	1110
400	180	30×25	1.53	650	1110
400	220	22×35	1.7	530	900
400	220	25×30	1.72	530	900
400	220	30×35	1.75	530	900
400	270	22×40	1.91	440	740
400	270	25×35	2	440	740
400	270	30×25	1.96	440	740
400	270	35×30	2.05	440	740
400	330	22×50	2	350	600
400	330	25×40	2	350	600
400	330	30×30	2.05	350	600
400	330	35×25	2.2	350	600

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
400	330	35×30	2.3	350	600
400	390	22×50	2.1	300	510
400	390	25×45	2.2	300	510
400	390	30×30	2.1	300	510
400	390	30×35	2.2	300	510
400	390	35×25	2.3	300	510
400	390	35×30	2.5	300	510
400	470	25×50	2.7	250	420
400	470	30×35	2.6	250	420
400	470	35×30	2.6	250	420
400	560	30×40	2.92	210	360
400	560	30×45	2.92	210	360
400	560	35×35	2.92	210	360
400	560	35×40	2.95	210	360
400	680	30×45	3.3	170	290
400	680	30×50	3.4	170	290
400	680	35×35	3.35	170	290
400	680	35×40	3.4	170	290
400	820	35×45	3.45	140	240
400	820	35×50	3.5	140	240
400	1000	35×50	3.94	120	200
400	1200	35×55	4.45	100	170
400	1200	35×80	5.6	100	170
400	1200	40×60	5.33	100	170
400	1200	45×50	5.2	100	170
400	1500	35×95	6.66	76	130
400	1500	40×75	6.32	76	130
400	1500	45×55	5.92	76	130
400	2200	45×80	7.9	53	90
400	2700	45×90	9.09	43	74
420	47	22×20	0.48	3320	5640
420	56	22×25	0.53	2790	4740
420	68	22×25	0.73	2290	3900
420	68	22×30	0.68	2290	3900
420	82	22×25	0.88	1900	3230
420	82	22×30	0.92	1900	3230
420	82	25×25	0.95	1900	3230
420	100	22×25	1.03	1560	2650
420	100	22×30	1.07	1560	2650
420	100	25×25	1.12	1560	2650
420	120	22×25	1.08	1300	2210
420	120	22×30	1.1	1300	2210
420	120	25×25	1.1	1300	2210
420	150	22×30	1.33	1040	1770
420	150	25×25	1.35	1040	1770
420	150	25×30	1.35	1040	1770
420	150	30×25	1.39	1040	1770
420	180	22×35	1.5	860	1470
420	180	25×30	1.5	860	1470
420	180	30×25	1.55	860	1470
420	220	22×40	1.78	710	1210
420	220	25×35	1.8	710	1210
420	220	30×25	1.83	710	1210
420	270	22×45	1.94	580	980
420	270	25×35	1.94	580	980
420	270	25×40	1.98	580	980
420	270	30×30	1.94	580	980
420	270	35×35	2	580	980
420	330	25×45	2.15	470	800
420	330	30×40	2.18	470	800

Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
420	330	35×35	2.21	470	800
420	330	35×40	2.25	470	800
420	390	25×45	2.35	400	680
420	390	30×40	2.35	400	680
420	390	35×35	2.43	400	680
420	390	35×40	2.52	400	680
420	470	30×40	2.6	330	560
420	470	30×45	2.78	330	560
420	470	35×35	2.78	330	560
420	470	35×40	2.8	330	560
420	560	30×45	2.85	280	470
420	560	35×40	2.95	280	470
420	560	35×45	2.97	280	470
420	560	40×40	2.95	280	470
420	680	35×45	3.59	230	390
420	680	35×50	3.62	230	390
420	680	40×45	3.75	230	390
420	820	35×50	4.15	190	320
420	820	40×50	4.23	190	320
420	820	45×40	4.32	190	320
420	1000	35×75	5.01	160	270
420	1000	40×60	4.91	160	270
420	1000	45×45	4.78	160	270
420	1200	35×85	5.53	130	220
420	1200	40×70	5.68	130	220
420	1200	45×55	5.48	130	220
420	1500	40×80	6.38	110	180
420	1500	45×65	6.25	110	180
420	1800	40×95	7.51	88	150
420	1800	45×70	7.21	88	150
420	2200	45×85	7.88	71	120
450	22	22×20	0.3	7090	12060
450	47	22×20	0.5	3320	5640
450	56	22×25	0.6	2790	4740
450	68	22×25	0.73	2290	3900
450	68	22×30	0.75	2290	3900
450	82	22×25	0.85	1900	3230
450	82	25×25	0.9	1900	3230
450	100	22×30	0.95	1560	2650
450	100	25×25	0.98	1560	2650
450	120	22×30	1.1	1300	2210
450	120	25×25	1.15	1300	2210
450	150	22×30	1.39	1040	1770
450	150	22×35	1.43	1040	1770
450	150	25×25	1.43	1040	1770
450	150	30×25	1.45	1040	1770
450	150	30×30	1.47	1040	1770
450	180	22×35	1.35	860	1470
450	180	25×30	1.38	860	1470
450	180	25×35	1.41	860	1470
450	180	30×25	1.38	860	1470
450	220	22×40	1.56	710	1210
450	220	25×35	1.61	710	1210
450	220	25×40	1.65	710	1210
450	220	30×25	1.61	710	1210
450	220	30×30	1.65	710	1210
450	220	35×25	1.65	710	1210
450	270	22×45	1.9	580	980
450	270	25×40	1.92	580	980
450	270	25×45	1.86	580	980

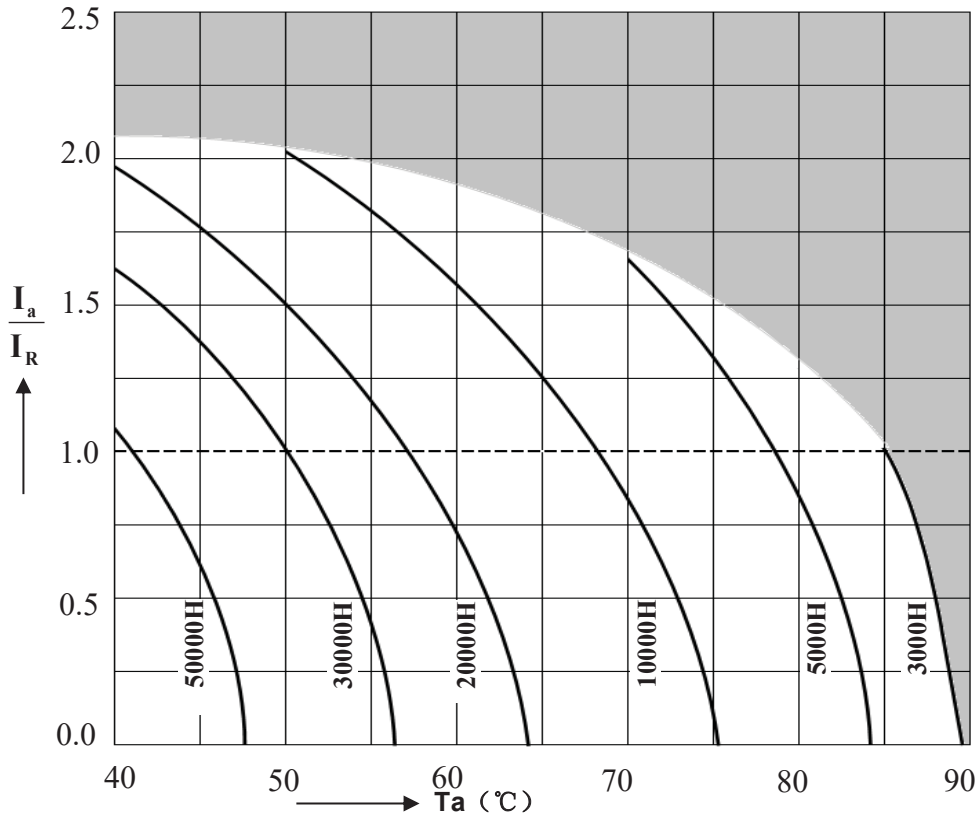
WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
450	270	30×30	1.88	580	980
450	270	35×25	1.84	580	980
450	270	35×35	1.92	580	980
450	330	25×45	2.1	470	800
450	330	30×35	1.98	470	800
450	330	30×40	2.1	470	800
450	330	35×25	2	470	800
450	330	35×30	2.1	470	800
450	390	25×50	2.3	400	680
450	390	30×35	2.2	400	680
450	390	30×40	2.3	400	680
450	390	35×30	2.6	400	680
450	390	35×40	2.54	400	680
450	470	30×40	2.55	330	560
450	470	30×45	2.58	330	560
450	470	35×35	2.58	330	560
450	470	35×40	2.6	330	560
450	470	35×45	2.62	330	560
450	470	40×40	2.65	330	560
450	560	30×50	2.83	280	470
450	560	35×40	2.85	280	470
450	560	35×45	2.88	280	470
450	560	40×45	3.27	280	470
450	680	30×55	3.52	230	390
450	680	35×45	3.52	230	390
450	680	40×50	3.71	230	390
450	680	45×40	3.71	230	390
450	820	35×50	3.75	190	320
450	820	35×70	4.31	190	320
450	820	40×55	4.3	190	320
450	820	45×45	4.14	190	320
450	1000	35×80	5.3	160	270
450	1000	40×60	4.71	160	270
450	1000	40×65	4.89	160	270
450	1000	45×50	4.71	160	270
450	1200	35×95	5.85	130	220
450	1200	40×75	5.55	130	220
450	1200	45×60	5.55	130	220
450	1500	40×90	6.56	110	180
450	1500	45×70	6.27	110	180
450	1800	45×80	7.12	88	150
450	2200	45×95	8.28	71	120
500	56	22×25	0.65	2790	4740
500	68	22×30	0.75	2290	3900
500	68	25×25	0.75	2290	3900
500	68	25×30	0.78	2290	3900
500	82	22×35	0.88	1900	3230
500	82	25×30	0.9	1900	3230
500	82	30×30	0.92	1900	3230
500	100	22×40	0.96	1560	2650
500	100	25×30	0.98	1560	2650
500	100	30×30	1.05	1560	2650
500	120	22×45	1.1	1300	2210
500	120	25×40	1.13	1300	2210
500	120	30×30	1.16	1300	2210
500	150	22×50	1.22	1040	1770
500	150	25×45	1.27	1040	1770
500	150	30×30	1.24	1040	1770
500	180	25×50	1.42	860	1470
500	180	30×35	1.4	860	1470

Case Size

WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ	WV (Vdc)	Cap (uF)	Size mm	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz mΩ	MAX ESR 20°C 120Hz mΩ
500	220	30×40	1.65	710	1210	600	220	35×45	1.95	710	1210
500	220	35×40	1.68	710	1210	600	270	35×50	2.25	580	980
500	270	30×40	1.5	580	980						
500	270	35×40	1.88	580	980						
500	330	30×50	1.95	470	800						
500	330	35×50	2.1	470	800						
500	390	35×55	2.35	400	680						
500	390	40×45	2.37	400	680						
500	470	35×60	2.6	330	560						
500	470	40×50	2.6	330	560						
500	560	35×70	2.51	280	470						
500	560	40×55	2.49	280	470						
500	680	40×65	2.83	230	390						
500	680	45×50	2.81	230	390						
500	820	40×75	3.22	190	320						
500	820	45×60	3.2	190	320						
500	1000	40×85	3.66	160	270						
500	1000	45×70	3.62	160	270						
500	1200	45×80	4.15	130	220						
500	1500	45×100	4.9	110	180						
550	47	25×25	0.52	3320	5640						
550	56	25×25	0.65	2790	4740						
550	68	25×30	0.75	2290	3900						
550	82	25×35	0.85	1900	3230						
550	82	30×25	0.85	1900	3230						
550	100	25×35	0.94	1560	2650						
550	100	30×30	1.05	1560	2650						
550	120	25×40	1.08	1300	2210						
550	120	30×35	1.18	1300	2210						
550	120	35×25	1.18	1300	2210						
550	150	25×50	1.28	1040	1770						
550	150	30×35	1.3	1040	1770						
550	150	35×30	1.45	1040	1770						
550	180	25×55	1.48	860	1470						
550	180	30×40	1.48	860	1470						
550	180	35×35	1.62	860	1470						
550	220	30×50	1.85	710	1210						
550	220	35×40	1.86	710	1210						
550	270	30×55	2.15	580	980						
550	270	35×45	2.21	580	980						
550	330	35×50	2.2	470	800						
550	390	35×55	2.82	400	680						
600	47	25×25	0.62	3320	5640						
600	56	25×30	0.71	2790	4740						
600	68	25×35	0.77	2290	3900						
600	68	30×25	0.78	2290	3900						
600	82	25×35	0.87	1900	3230						
600	82	30×30	0.92	1900	3230						
600	100	25×40	1	1560	2650						
600	100	30×35	1.1	1560	2650						
600	100	35×25	1.1	1560	2650						
600	120	25×50	1.2	1300	2210						
600	120	30×35	1.18	1300	2210						
600	120	35×30	1.3	1300	2210						
600	150	25×55	1.36	1040	1770						
600	150	30×45	1.47	1040	1770						
600	150	35×35	1.52	1040	1770						
600	180	30×50	1.67	860	1470						
600	180	35×40	1.71	860	1470						
600	220	30×55	1.95	710	1210						

Useful life

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



LS Series Snap-in Type 85°C Miniaturized

Features

- ◆ Directly mountable on printed circuit board, without holders.
- ◆ Aluminum case designed explosion-proof vent.
- ◆ RoHS Compliant



Specifications

Item	Performance Characteristics									
Operating Temperature Range	-25 to +85°C									
Rated Voltage Range	160 to 450 VDC									
Capacitance Range	47 to 2700 µF									
Capacitance Tolerance	±20% (120Hz, +20°C)									
Leakage Current (+20°C, max.)	I ≤ 0.02CV After 5 minutes with rated working voltage applied.									
Dissipation Factor (tan δ, at 20°C, 120Hz)	Less than the value under table (%)									
	<table border="1"> <thead> <tr> <th>µF \ VDC</th> <th>160~250</th> <th>315~450</th> </tr> </thead> <tbody> <tr> <td>47~390</td> <td>15</td> <td>20</td> </tr> <tr> <td>470~2700</td> <td>15</td> <td>20</td> </tr> </tbody> </table>	µF \ VDC	160~250	315~450	47~390	15	20	470~2700	15	20
	µF \ VDC	160~250	315~450							
47~390	15	20								
470~2700	15	20								
Low Temperature Characteristics (at 120Hz)	Impedance ratio max									
	<table border="1"> <thead> <tr> <th>Working voltage (VDC)</th> <th>160</th> <th>200~250</th> <th>400~450</th> </tr> </thead> <tbody> <tr> <td>Z -25°C / Z +20°C</td> <td>4</td> <td>4</td> <td>8</td> </tr> </tbody> </table>	Working voltage (VDC)	160	200~250	400~450	Z -25°C / Z +20°C	4	4	8	
Working voltage (VDC)	160	200~250	400~450							
Z -25°C / Z +20°C	4	4	8							
Endurance	Test conditions Duration time :2000 Hrs Ambient temperature :+85°C Applied voltage :Rated DC working voltage After test requirement at +20°C Capacitance change :≤ ±20% of the initial measured value Dissipation factor :≤ 200% of the initial specified value Leakage current :≤ The initial specified value									
Shelf Life	Test conditions Duration time :1000 Hrs Ambient temperature :+85°C Applied voltage :None After test requirement at +20°C : Same limits as Endurance. Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes.									

Multiplier for Ripple Current vs. Frequency

CAP(µF) \ Frequency(Hz)	50(60)	120	1K	10K	50K-100K
10 < CAP ≤ 100	0.8	1	1.36	1.48	1.53
100 < CAP ≤ 1000	0.8	1	1.25	1.35	1.38
1000 < CAP	0.8	1	1.17	1.25	1.28

Diagram of Dimensions:(unit:mm)

