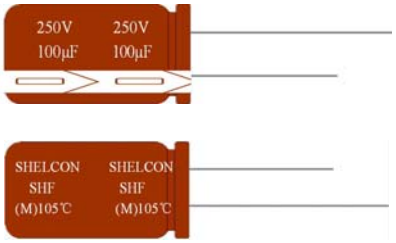
SHF SERIES

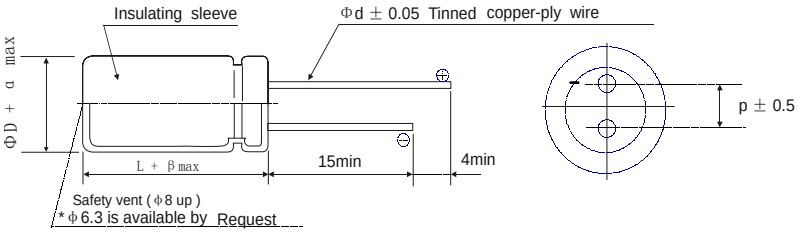


- 105℃ Low Impedance. Long Life
- 4000 hours guaranteed for WV ≤10V,
- 5000~10000 hours guaranteed for WV ＝16 ~ 100V
- 5000 hours guaranteed for WV ＝160 ~ 400V

◆ SPECIFICATIONS

Item	Characteristics
Operating temperature range	-40 ~ +105℃
Voltage Range	6.3 ~ 400 V.DC
Nominal cap.range	0.47~ 15000 μF
Capacitance Tolerance	- 20% ~ + 20% (at 20℃, 120Hz)
Leakage current	I =0.01CV or 3(μA) after 2min (6.3V~100V), I＝0.02CV＋25(μA) after 5min (160V~400V)
Dissipation Factor (tanδ) (at +20℃ 120HZ)	WV 6.3 10 16 25 35 50 63 100 160 250-400 tanδ 0.22 0.19 0.16 0.14 0.12 0.1 0.09 0.08 0.12 0.12 Add 0.02 per 1,000 μF for more than 1,000μF items.
Low Temp. Impedance Stability at 120Hz	W.V. 6.3 10 16 25 100 160 ~ 400 Z(-25℃)/Z(+20℃) 4 3 2 2 3 Z(-40℃)/Z(+20℃) 8 6 4 3 4
Impedance(Ω)	See case size table
High Temp.Load Test	After WV≤10V: 4000 hrs; WV＝16V~100V: 5000 ~ 10000 hrs, WV＝160V~400V: 5000 hrs application of DC rated working voltage at +105℃, the capacitor shall meet the following limits. Capacitance change … ≤±20% of the initial measured value tanδ …≦200% of the initial specified value DC leakage current …≤ the initial specified value
High Temp.Non-Load Test	After storage for 1000 hours at 105℃ with no voltage applied, voltage treatment of JIS-C-5102 article 4-4 is to be given and then measurement shall be made, at which time requirements specified in the table "High Temperature Loading" can be met.

● DRAWING



Unit: (mm)

ΦD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Φd	0.5			0.6		0.8	
β	1.0			1.5		2.0	
α	0.5						

▼ MULTIPLIER FOR RIPPLE CURRENT

(1) Frequency Coefficient

Freq.(Hz) / Cap(μF)	120	1K	10K	100K
0.47～330	0.42	0.60	0.80	1.00
470～1000	0.75	0.90	0.98	1.00
2200～15000	0.80	0.95	1.00	1.00

(2) Temperature Coefficient

Ambient Temperature (℃)	40	60	70	85	105
Coefficient	2.40	2.10	1.78	1.65	1.00

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■STANDARD RATINGS

WV(Vdc) / Parameter Cap (μF)	6.3V ΦDxL (mm)	Ripple current (mAr.m.s) 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
100	5X11	150	0.9	3.6
220	6.3X11	250	0.4	1.6
330	6.3X11	250	0.4	1.6
470	8X11.5	400	0.25	1
1000	10X12.5	580	0.16	0.65
2200	13X20	1300	0.062	0.21
3300	13X20	1300	0.062	0.21
4700	16X25	1850	0.034	0.096
6800	16X25	1850	0.034	0.096
10000	16X31.5	2000	0.029	0.087
15000	18X35.5	2200	0.025	0.058

WV(Vdc) / Parameter Cap (μF)	10V ΦDxL (mm)	Ripple current (mAr.m.s) 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
100	5X11	150	0.9	3.6
220	6.3X11	250	0.4	1.6
330	8X11.5	400	0.25	1
470	10X12.5	400	0.25	1
1000	10X16	700	0.12	0.46
2200	13X20	1300	0.062	0.21
3300	13X25	1650	0.048	0.16
4700	16X25	1850	0.034	0.096
6800	16X31.5	2000	0.029	0.087
10000	18X35.5	2200	0.025	0.058

WV(Vdc) / Parameter Cap (μF)	16V ΦDxL (mm)	Ripple current (mAr.m.s) 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
47	5X11	150	0.9	3.6
100	6.3X11	250	0.4	1.6
220	8X11.5	400	0.25	1
330	10X12.5	400	0.25	1
470	10X16	580	0.16	0.65
1000	10X20	1050	0.078	0.3
2200	13X25	1650	0.048	0.16
3300	16X25	1850	0.034	0.096
4700	16X31.5	2000	0.029	0.087
6800	18X35.5	2200	0.025	0.058

WV(Vdc) / Parameter Cap (μF)	25V ΦDxL (mm)	Ripple current (mAr.m.s) 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
33	5X11	210	0.58	2.3
47	6.3X11	340	0.22	0.87
100	8X11.5	640	0.13	0.52
220	10X12.5	865	0.08	0.32
330	10X16	1210	0.06	0.24
470	10X20	1400	0.046	0.18
1000	10X25	1650	0.042	0.17
2200	13X20	1900	0.035	0.12
3300	18X16	2210	0.043	0.11
4700	13X25	2230	0.027	0.089

WV(Vdc) / Parameter Cap (μF)	35V ΦDxL (mm)	Ripple current (mAr.m.s) 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
33	5X11	150	0.9	3.6
47	6.3X11	250	0.4	1.6
100	8X11.5	400	0.25	1
220	10X12.5	580	0.25	1
330	10X16	700	0.16	0.65
470	10X20	1050	0.078	0.3
1000	13X25	1650	0.048	0.16
2200	16X31.5	2000	0.034	0.087
3300	18X35.5	2000	0.029	0.058

WV(Vdc) / Parameter Cap (μF)	50V ΦDxL (mm)	Ripple current (mAr.m.s) 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
0.47	5X11	17	5.5	12
1	5X11	30	4	8
2.2	5X11	43	2.5	6
3.3	5X11	53	2.2	5.6
4.7	5X11	88	1.9	5
10	5X11	100	1.5	4
22	5X11	150	0.9	3.6
33	6.3X11	250	0.4	1.6
47	6.3X11	250	0.4	1.6
100	8X11.5	400	0.25	1
220	10X16	700	0.12	0.46
330	10X20	1050	0.078	0.3
470	13X25	1300	0.062	0.21
1000	16X25	1850	0.034	0.096
2200	18X35.5	2200	0.025	0.058

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■STANDARD RATINGS

WV(Vdc) / Parameter / Cap (μF)	63V ΦDxL (mm)	Ripple current mAr.m.s 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
10	5X11	87	2.3	9.3
22	6.3X11	140	1.3	5.2
33	6.3X11	140	1.2	5
47	8X11.5	210	0.63	2.8
100	10X12.5	300	0.43	1.8
220	10X20	520	0.21	0.84
330	13X20	660	0.16	0.64
470	13X25	750	0.12	0.45
1000	16X31.5	1390	0.054	0.2

WV(Vdc) / Parameter / Cap (μF)	100V ΦDxL (mm)	Ripple current mAr.m.s 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance −10℃ 100KHZ
1	5X11	15	6	17
2.2	5X11	20	4.5	15
3.3	5X11	30	3	13
4.7	5X11	40	2.7	11
10	6.3X11	65	2.5	10
22	6.3X11	140	1.2	5
33	8X11.5	160	0.63	2.8
47	10X16	230	0.43	1.8
100	13X21	290	0.31	1.5
220	16X25	430	0.16	0.64

WV(Vdc) / Parameter / Cap (μF)	160V ΦDxL (mm)	Ripple current mAr.m.s 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance - -
22	10X20	350	1	-
33	13X20	450	0.7	-
47	13X25	600	0.45	-
68	13X25	600	0.45	-
100	16X25	950	0.24	-
150	16X31.5	1200	0.17	-
220	18X35.5	1400	0.14	-

WV(Vdc) / Parameter / Cap (μF)	200V ΦDxL (mm)	Ripple current mAr.m.s 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance - -
22	10X20	350	1	-
33	13X25	550	0.6	-
47	13X25	600	0.44	-
68	16X25	950	0.24	-
100	16X31.5	1200	0.17	-
150	16X35.5	1280	0.16	-
220	18X35.5	1400	0.14	-

WV(Vdc) / Parameter / Cap (μF)	250V ΦDxL (mm)	Ripple current mAr.m.s 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance -
22	10X20	300	1.4	-
33	13X25	450	0.7	-
47	16X25	850	0.31	-
68	16X31.5	1050	0.33	-
100	18X35.5	1200	0.18	-

WV(Vdc) / Parameter / Cap (μF)	400V ΦDxL (mm)	Ripple current mAr.m.s 105℃,100KHZ	Impedance 20℃ 100KHZ	Impedance -
22	13x20	300	1.4	-
33	16x20	450	0.7	-
47	18x20	850	0.31	-
68	18x25	1050	0.33	-
100	18x36	1200	0.18	-