

# SH

Standard Series

- Endurance: 105°C 2000hours
- Recommended Applications :For high quality , reliability application, high CV product
- Corresponding product to RoHS

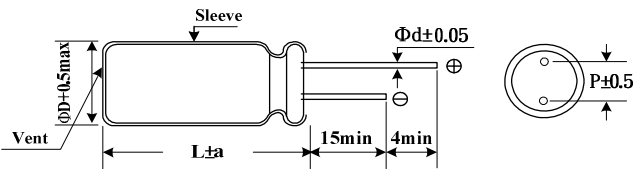
**SH**  
 ↑ Long Life  
 SE



### ■ SPECIFICATIONS

Item	Characteristics										
	-40~+105°C	-25~+105°C	-25~+105°C								
Category Temperature Range	-40~+105°C	-25~+105°C	-25~+105°C								
Rated Voltage Range	6.3 ~ 100VDC	160 ~ 450VDC	500VDC								
Rated Capacitance Range	1~ 22000 µ F	1 ~ 470 µ F	2.2~82 µ F								
Capacitance Tolerance	± 20 % (120Hz , 20°C)	± 20 % (120Hz , 20°C)	± 20 % (120Hz , 20°C)								
Leakage Current (20°C)	I=0.01CV or 3(µ A)whichever is greater.	I=0.03CV+10(µ A)	I=0.04CV+100(uA)								
	(After rated voltage applied for 2 minutes)I : Max. leakage current (µ A), C : Nominal capacitance (µ F), V : Rated voltage (V)										
Dissipation Factor(MAX) (tan δ) (120Hz , 20°C)	WV	6.3	10	16	25	35	50	63~100	160~250	350~450	500
	tan δ	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.15	0.20	0.25
	When nominal capacitance is over 1000 µ F,tan δ shall be added 0.02 to the listed value with increase of every 1000 µ F.										
Low Temperature Stability Impedance Ratio (MAX)	WV	6.3	10	16	25	35~100	160~250	350~450	500		
	Z(120Hz)			6.3	10	16	25	35~100	160~250	350~450	500
	Z-25°C / Z+20°C			4	3	2	2	2	4	4	6
				8	6	4	4	3	—	—	—
Endurance	After applying rated voltage for 2000 hours at 105°C the capacitors shall meet the following requirements.										
	Capacitance change	Within ± 20% of initial value									
	D.F. (tan δ)	Not more than 200% of specified value									
	Leakage current	initial specified value or less									
Shelf Life	After leaving capacitors under no load at 105°C for 1000 hours.the capacitors shall meet the same requirement as Endurance.										

### ■ Dimensions [mm]



Notes : 6.3~22Φ,L≥9mm&8x5,8x7have vent

#### L ≤ 9mm:

φD	4	5	6	8
P	1.5	2.0	2.5	3.5
φd	0.45	0.45	0.45	0.45(0.5)
a	1.0	1.0	1.0	1.0

Notes : ( ) :L=7&9mm

#### L > 9mm:

φD	5	6.3	8	10	13	16	18	22
p	2.0	2.5	3.5	5.0	7.5	10.0	10.0	10.0
φd	0.5	0.5	0.6	0.6	0.8	0.8	0.8	0.8
a	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0

### ■ Multiplier for Ripple Current

#### L ≤ 9mm:

Freq. (Hz)	120	1K	10~100K
6.3 ~ 16V	1.00	1.10	1.20
25 ~ 63V	1.00	1.50	1.70

#### L > 9mm:

Freq. (Hz)	120	300	1K	10K~100K
6.3 ~ 100V ≤ 68 µ F	1.00	1.30	1.57	2.00
6.3 ~ 100V 100 ~ 470 µ F	1.00	1.23	1.34	1.50
6.3 ~ 100V 471 ~ 22000 µ F	1.00	1.10	1.13	1.15
160 ~ 450V all volume(µ F)	1.00	1.25	1.40	1.60
500Vall volume(µ F)	1.00	1.05	1.10	1.15

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Rated Voltage (Surge Voltage) (V)	Cap ( $\mu$ F)	Case size $\Phi$ DxL(mm)	$\tan \delta$	Ripple current (mA/rms105°C) (120Hz)	Rated Voltage (Surge Voltage) (V)	Cap ( $\mu$ F)	Case size $\Phi$ DxL(mm)	$\tan \delta$	Ripple current (mA/rms105°C) (120Hz)	
6.3 (8)	10	4x5	0.26	15	16 (20)	3.3	4x7	0.18	10	
	22	4x5	0.26	25		4.7	4x5	0.20	10	
	33	4x7	0.24	35		10	4x7	0.18	15	
		5x5	0.26	30			4x5	0.20	20	
	47	5x5	0.26	35		22	4x7	0.18	25	
		5x7	0.24	50			4x7	0.18	35	
	100	6.3x5	0.26	60		33	5x5	0.20	30	
		5x7	0.24	70			5x5	0.20	40	
		5x11	0.26	100			5x7	0.18	50	
	150	5x11	0.26	120		47	5x11	0.18	70	
			8x5	0.26			95	6.3x5	0.20	55
			6.3x7	0.24			110	5x11	0.18	85
	220	6.3x11	0.26	165		68	6.3x7	0.18	70	
			8x5	0.26			120	5x11	0.18	100
			6.3x11	0.26			200	100	6.3x5	0.2
	8x7	0.24	150	5x11		0.18	130			
	470	6.3x11	0.26	230		150	6.3x7	0.18	110	
		8x9	0.24	200			6.3x11	0.18	175	
	680	8x11	0.26	350		220	6.3x11	0.18	220	
	1000	8x15	0.26	445			8x9	0.18	180	
1500		10x12.5	0.26	470	330	8x9	0.18	210		
	10x15	0.26	600	8x11		0.18	280			
2200	10x20	0.26	800	470	8x11	0.18	375			
3300	13x20	0.26	1100		8x15	0.18	450			
4700	13x20	0.26	1180	680	10x12.5	0.18	480			
6800	13x25	0.26	1490		1000	10x15	0.18	640		
10000	16x32	0.26	1830	1500	10x20	0.18	830			
15000	16x36	0.26	2090	2200	13x20	0.18	1050			
22000	18x40	0.26	2350	3300	13x25	0.18	1250			
10 (13)	10	4x5	0.24	20	4700	16x25	0.18	1650		
	22	4x7	0.20	30	6800	16x32	0.18	1900		
		5x5	0.24	25	10000	18x36	0.18	2070		
	33	4x7	0.20	40	25 (32)	4.7	4x5	0.16	15	
		5x5	0.24	35		10	4x7	0.15	20	
	47	6.3x5	0.24	45			4x5	0.16	25	
		5x7	0.20	60		4x7	0.15	30		
	68	5x11	0.22	75		22	6.3x5	0.16	40	
		5x11	0.22	80			5x7	0.15	50	
	100	6.3x5	0.24	70		33	5x11	0.16	60	
		5x11	0.22	110			6.3x5	0.16	50	
		6.3x7	0.20	90			5x11	0.16	75	
	150	5x11	0.22	120		47	6.3x7	0.15	65	
		6.3x7	0.20	135			5x11	0.16	90	
	220	6.3x11	0.22	180		68	6.3x7	0.15	70	
		6.3x11	0.22	235			6.3x11	0.16	125	
	330	8x9	0.20	160		100	6.3x11	0.16	145	
		8x11	0.22	255			8x7	0.15	115	
		6.3x11	0.22	250			150	8x11	0.16	200
	470	8x9	0.20	210		220	8x11	0.16	240	
8x11		0.22	305	330			8x11	0.16	300	
680	8x11	0.22	365			10x12.5	0.16	355		
	1000	10x12.5	0.22	420		470	8x15	0.16	420	
8x15		0.22	480	10x12.5	0.16		440			
1500		10x12.5	0.22	540	680	10x15	0.16	560		
		10x20	0.22	800	1000	10x20	0.16	740		
2200	10x20	0.22	870	1500	13x20	0.16	920			
3300	13x20	0.22	1100	2200	13x25	0.16	1230			
4700	13x25	0.22	1380	3300	16x25	0.16	1500			
6800	16x25	0.22	1700	4700	16x32	0.16	1800			
10000	16x36	0.22	1950	6800	18x36	0.16	2050			
15000	18x36	0.22	2180	35 (44)	4.7	4x5	0.13	15		
16 (20)	2.2	4x7	0.18		10	4x7	0.13	25		

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Rated Voltage (SurageVoltage) (V)	Cap (μF)	Case size Φ DxL(mm)	tan δ	Ripple current (mA/rms105°C) (120Hz)	Rated Voltage (SurageVoltage) (V)	Cap (μF)	Case size Φ DxL(mm)	tan δ	Ripple current (mA/rms105°C) (120Hz)	
35 (44)	10	4x7	0.13	35	63 (79)	10	6.3x7	0.10	50	
		5x5	0.13	30		15	5x11	0.1	65	
		5x11	0.14	44		22	6.3x11	0.1	90	
	15	5x11	0.14	50		33	6.3x11	0.1	100	
		6.3x5	0.13	45		47	8x11	0.1	155	
	22	5x7	0.13	60		68	10x12.5	0.1	198	
		5x11	0.14	65		100	10x12.5	0.10	260	
	33	5x11	0.14	85		150	10x15	0.10	330	
		6.3x7	0.13	70		220	10x20	0.10	465	
	47	5x11	0.14	100		330	13x20	0.10	650	
		8x7	0.13	80		470	13x20	0.10	700	
	68	6.3x11	0.14	130		680	16x25	0.10	1000	
	100	6.3x11	0.14	170		1000	16x32	0.10	1200	
	150	8x9	0.13	145		1500	16x36	0.10	1450	
	220	8x11	0.14	220		2200	18x36	0.10	1650	
	330	10x12.5	0.14	315		100 (125)	10	6.3x11	0.10	65
	470	10x12.5	0.14	400			15	6.3x11	0.10	75
	680	10x15	0.14	480			22	8x11	0.10	115
	1000	10x20	0.14	650			33	8x11	0.10	140
	1500	13x20	0.14	900			47	10x12.5	0.10	185
2200	13x25	0.14	1050	68	10x15		0.10	240		
3300	16x25	0.14	1370	100	10x20		0.10	305		
4700	16x36	0.14	1680	150	13x20		0.10	370		
	18x36	0.14	1920	220	13x25		0.10	520		
				330	16x25		0.10	720		
50 (63)	1	4x5	0.12	10	470	16x32	0.10	875		
		4x7	0.12	10	680	16x36	0.10	1200		
		5x11	0.12	12	160 (200)	1	5x11	0.15	17	
	2.2	4x5	0.12	15		2.2	6.3x11	0.15	25	
		4x7	0.12	20		3.3	6.3x11	0.15	36	
		5x11	0.12	18		4.7	6.3x11	0.15	43	
	3.3	4x5	0.12	15		6.8	8x11	0.15	54	
		4x7	0.12	25		10	8x11	0.15	70	
		5x11	0.12	25		15	10x12.5	0.15	90	
	4.7	4x7	0.12	30		22	10x15	0.15	115	
		5x5	0.12	20		33	10x20	0.15	160	
	6.8	5x11	0.12	30		47	10x20	0.15	195	
		5x7	0.12	35	68	13x20	0.15	255		
	10	6.3x5	0.12	35	100	13x25	0.15	350		
		5x11	0.12	50	150	16x25	0.15	435		
		5x11	0.12	50	220	16x32	0.15	550		
	15	6.3x5	0.12	55	330	18x36	0.15	800		
		5x11	0.12	75	470	18x40	0.15	900		
		6.3x7	0.12	65	200 (250)	1	6.3x11	0.15	17	
	33	5x11	0.12	95		2.2	6.3x11	0.15	25	
		8x7	0.12	80		3.3	6.3x11	0.15	36	
	47	6.3x11	0.12	115		4.7	8x11	0.15	50	
		8x9	0.12	100		6.8	8x11	0.15	60	
	68	8x11	0.12	159		10	10x12.5	0.15	80	
	100	8x11	0.12	200		15	10x15	0.15	110	
	150	10x12.5	0.12	289		22	10x20	0.15	140	
	220	10x12.5	0.12	360		33	13x20	0.15	200	
		10x15	0.12	415		47	13x20	0.15	220	
	330	10x20	0.12	535	68	13x25	0.15	280		
		10x20	0.12	630	100	16x25	0.15	350		
470	13x20	0.12	730	150	16x32	0.15	480			
	13x20	0.12	800	220	16x36	0.15	675			
680	13x25	0.12	1060		18x32	0.15	685			
1000	16x25	0.12	1300	330	18x36	0.15	750			
2200	16x36	0.12	1600	250 (300)	1	6.3x11	0.15	17		
3300	18x36	0.12	1780		2.2	6.3x11	0.15	29		
63 (79)	10	5x11	0.1		55	3.3	8x11	0.15	42	

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Rated Voltage (SurageVoltage) (V)	Cap ( $\mu$ F)	Case size $\Phi$ DxL(mm)	$\tan \delta$	Ripple current (mA/rms105°C) (120Hz)	Rated Voltage (SurageVoltage) (V)	Cap ( $\mu$ F)	Case size $\Phi$ DxL(mm)	$\tan \delta$	Ripple current (mA/rms105°C) (120Hz)
250 (300)	4.7	8x11	0.15	52	420 (470)	15	13x20	0.20	130
	6.8	8x11	0.15	62		22	13x25	0.20	155
	10	10x12.5	0.15	80		33	16x25	0.20	205
	15	10x15	0.15	110		47	16x25	0.20	235
	22	10x20	0.15	140		68	16x32	0.20	400
	33	13x20	0.15	200			18x25	0.20	380
	47	13x25	0.15	240		100	18x36	0.20	490
	68	13x25	0.15	290		120	18x40	0.20	530
	100	16x25	0.15	380		150	18x45	0.20	570
	150	16x32	0.15	420		450 (500)	1.0	6.3x11	0.20
220	18x36	0.15	680	8x11	0.20			22	
350 (400)	1	6.3x11	0.20	16	2.2		8x11	0.20	30
	2.2	8x11	0.20	31			10x12.5	0.20	37
	3.3	8x11	0.20	35			3.3	8x15	0.20
	4.7	8x11	0.20	45	10x12.5			0.20	40
	10	10x15	0.20	80	4.7		10x12.5	0.20	52
	22	13x20	0.20	150	6.8		10x15	0.20	62
	33	13x25	0.20	200	10		10x20	0.20	85
	47	16x25	0.20	260	15		13x20	0.20	120
	100	18x32	0.20	400	22		13x25	0.20	150
400 (450)	1	6.3x11	0.20	17	33		16x25	0.20	210
	2.2	8x11	0.20	31	47		16x25	0.20	260
	3.3	8x11	0.20	35	68		18x32	0.20	370
	4.7	8x11	0.20	45			18x36	0.20	495
		10x12.5	0.20	55	120	18x40	0.20	565	
	6.8	8x15	0.20	60	150	18x45	0.20	650	
		10x12.5	0.20	65		500 (550)	2.2	8x11	0.25
	10.0	10x15	0.2	80	3.3		8x16	0.25	30
	15	10x20	0.2	100	4.7		8x16	0.25	34
	22	13x20	0.2	150			10x12.5	0.25	38
	33	13x25	0.2	200	6.8		10x16	0.25	50
	47	16x25	0.2	265	8.2		10x20	0.25	65
	68	16x32	0.2	410	10		10x20	0.25	70
		18x25	0.2	390			13x20	0.25	85
	100	18x32	0.2	500	15		13x25	0.25	100
120	18x32	0.2	520	22	13x25		0.25	115	
	18x36	0.2	550		16x25		0.25	130	
150	18x40	0.2	620	33	18x25		0.25	180	
420 (470)	1	6.3x11	0.2	17	47		16x32	0.25	180
	2.2	8x11	0.2	29			18x30	0.25	230
	3.3	8x11	0.2	34	68		18x32	0.25	250
	4.7	10x12.5	0.2	55		18x36	0.25	290	
	6.8	10x15	0.2	68	82	18x40	0.25	335	
	10	10x20	0.20	98					