

HLS series

Features

- ◆ Highly reliable capacitors that withstand ripple current.
- ◆ Terminal spacing fixed at 10 mm for printed circuit board plug in.
- ◆ Aluminum case designed explosion-proof vent.
- ◆ Best for switching power supplies.
- ◆ For detail specifications, please refer to Engineering Bulletin No.E139
- ◆ HoHS Compliant



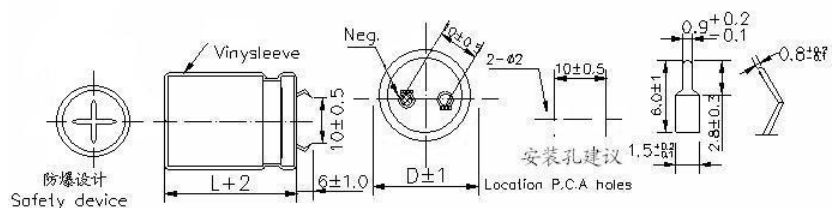
Specifications

Item	Performance Characteristics									
Operating Temperature Range	-25~+105°C									
Rate Voltage Range	160~450VDC									
Capacitance Range	33~27000µF									
Capacitance Tolerance	±20% (120Hz, +20°C)									
Leakage current (+20°C,max.)	1 ≤ 0.02CVA after 5 minutes with rated working voltage applied.									
Dissipation factor (tgδ)	Less than the value under table (%)									
	<table border="1"> <tr> <td>Uf \ VDC</td> <td>160~250</td> <td>315~450</td> </tr> <tr> <td>47~390</td> <td>15</td> <td>20</td> </tr> <tr> <td>470~2700</td> <td>15</td> <td>20</td> </tr> </table>	Uf \ VDC	160~250	315~450	47~390	15	20	470~2700	15	20
	Uf \ VDC	160~250	315~450							
	47~390	15	20							
470~2700	15	20								
Low Temperature Characteristics (120Hz)	Impedance ratio max.									
	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>160</td> <td>200~250</td> <td>400~450</td> </tr> <tr> <td>Z-25°C / Z+20°C</td> <td>4</td> <td>4</td> <td>8</td> </tr> </table>	Rated voltage (V)	160	200~250	400~450	Z-25°C / Z+20°C	4	4	8	
	Rated voltage (V)	160	200~250	400~450						
Z-25°C / Z+20°C	4	4	8							
Load Life	Test conditions									
	Duration time : 2000Hrs									
	Ambient temperature : +105°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 : 1000Hrs									
	Ambient temperature : +105°C									
	Applied voltage : None									
	After test requirement at +20°C : The same limits as Load life.									
	Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes									

Multiplier for Ripple Current vs. Frequency

CAP(µF)	50(60)	120	400	1k	10k	50k-100k
10 < CAP ≤ 100	0.8	1	1.23	1.36	1.48	1.53
100 < CAP ≤ 1000	0.8	1	1.16	1.25	1.35	1.38
1000 < CAP	0.8	1	1.11	1.17	1.25	1.28

Diagram of Dimension



HLS series
Case Size

Φ D × L

wv ΦD Cap (uF)	160								200							
	22		25		30		35		22		25		30		35	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
100									22×21	0.38						
150	22×21	0.37							22×21	0.54	25×21	0.54				
220	22×21	0.65							22×26	0.92	25×21	0.92	30×21	0.92		
270	22×21	0.74							22×26	1.03	25×21	1.03	30×21	1.03		
330	22×26	0.98	25×21	0.98	30×21	0.98			22×31	1.21	25×26	1.21	30×21	1.21		
									22×26	1.10	25×21	1.10				
390	22×26	1.10	25×26	1.10	30×21	1.10			22×31	1.39	25×26	1.39	30×26	1.39		
			25×21	1.00									30×21	1.27		
470	22×31	1.21	25×26	1.21	30×21	1.21			22×36	1.45	25×31	1.45	30×26	1.45	35×22	1.45
									22×31	1.35	25×26	1.35				
560	22×36	1.40	25×31	1.40	30×26	1.40			22×41	1.60	25×36	1.60	30×26	1.60	35×22	1.60
	22×31	1.30	25×26	1.30					22×36	1.50	25×31	1.50				
680	22×41	1.64	25×31	1.64	30×26	1.64	35×27	1.64	22×46	1.80	25×36	1.80	30×31	1.80	35×27	1.80
	22×36	1.53							22×41	1.70						
820			25×36	1.85	30×31	1.85	35×27	1.85			25×41	2.00	30×31	2.00	35×32	2.00
	22×51	1.70							22×51	1.88	25×36	1.88			35×27	1.88
1000			25×46	2.15	30×31	2.15	35×27	2.15			25×51	2.30	30×36	2.30	35×32	2.30
	22×56	2.03	25×41	2.03												
1200			25×51	2.46	30×41	2.46	35×32	2.46					30×41	2.70	35×37	2.70
1500					30×46	2.46	35×37	2.46					30×51	3.10	35×42	3.10
1800					30×51	3.13	35×42	3.13					30×70	3.75	35×47	3.75
2200					30×70	3.39	35×47	3.39							35×57	3.82
2700							35×52	3.90							35×70	4.00

wv ΦD Cap (uF)	220								250							
	22		25		30		35		22		25		30		35	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
68									22×21	0.27						
82									22×21	0.34						
100									22×21	0.44	25×21	0.44				
120									22×26	0.48	25×1	0.48				
150	22×21	0.57							22×26	0.60	25×21	0.60	30×21	0.60		
180	22×26	0.61	25×26	0.61					22×26	0.69	25×26	0.69	30×21	0.69		
			25×21	0.55							25×21	0.63				
220	22×26	0.81	25×26	0.81					22×31	1.00	25×26	1.00	30×21	1.00		
									22×26	0.92	25×21	0.92				
270	22×31	1.01	25×26	1.01	30×26	1.01			22×36	1.16	25×31	1.16	30×26	1.16		
	22×26	0.93			30×21	0.93			22×31	1.05	25×26	1.05	30×21	1.05		
330	22×31	1.09	25×26	1.09	30×26	1.09			22×41	1.28	25×31	1.28	30×26	1.28		
									22×36	1.20	25×26	1.20				
390	22×36	1.18	25×31	1.18	30×26	1.18			22×41	1.48	25×1	1.48	30×31	1.48		
			25×26	1.08					22×36	1.38			30×26	1.38		
470	22×41	1.28	25×36	1.28	30×26	1.28			22×46	1.65	25×36	1.65	30×31	1.65	35×27	1.65
	22×36	1.20	25×31	1.20					22×41	1.55						
560	22×46	1.52	25×41	1.52	30×31	1.52	35×27	1.52			25×46	1.85	30×36	1.85	35×27	1.85
	22×41	1.40	25×36	1.40	30×26	1.40			22×51	1.75	25×41	1.75	30×1	1.75		
680	22×51	1.66	25×46	1.66	30×36	1.66	35×27	1.66					30×41	2.00	35×32	2.00
	22×46	1.56	25×41	1.56	30×31	1.56					25×51	1.85				
820			25×51	1.90	30×41	1.90	35×32	1.90					30×46	2.30	35×37	2.30
			25×46	1.80	30×36	1.80										
1000					30×46	2.28	35×37	2.28					30×61	2.60	35×42	2.60
			25×56	2.15	30×41	2.15										
1200					30×51	2.32	35×42	2.32							35×47	2.85
1500					30×70	2.35	35×47	2.35							35×63	2.92
1800							35×52	2.40							35×70	2.95
2200							35×63	2.45								

Ripple Current (A.ms) at 105°C 120Hz

HLS series

Case Size

Φ D×L

wv ΦD Cap (uF)	350								400								
	22		25		30		35		22		25		30		35		
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	
33									22×21	0.39							
47									22×21	0.56	25×21	0.56					
56									22×21	0.60	25×21	0.60					
68	22×21	0.45							22×26	0.65	25×21	0.65					
82	22×26	0.53							22×26	0.75	25×26	0.75					
											25×21	0.71					
100	22×26	0.65							22×31	0.78	25×26	0.78	30×21	0.78			
									22×26	0.72							
120	22×31	0.74	25×26	0.74					22×31	0.85	25×6	0.85	30×21	0.85			
	22×26	0.68							22×26	0.79							
150	22×36	0.80	25×31	0.80					22×36	0.98	25×31	0.98	30×26	0.98			
	22×31	0.74	25×26	0.74					22×31	0.91	25×26	0.91					
180	22×41	0.95	25×31	0.95	30×26	0.95			22×41	1.14	25×36	1.14	30×31	1.14	35×27	1.14	
	22×36	0.89	25×26	0.89					22×36	1.05	25×31	1.05	30×26	1.05			
220	22×46	1.10	25×36	1.10	30×31	1.10			22×51	1.21	25×41	1.21	30×36	1.21	35×27	1.21	
	22×41	1.00	25×31	1.00	30×26	1.00			22×46	1.10	25×36	1.10	30×31	1.10			
270	22×51	1.20	25×41	1.20	30×31	1.20	35×27	1.20	22×51	1.40	25×46	1.40	30×41	1.40	35×32	1.40	
	22×46	1.10	25×36	1.10	30×26	1.10			22×46	1.30	25×41	1.30	30×36	1.30	35×27	1.30	
330			25×46	1.30	30×36	1.30	35×32	1.30						30×41	1.57	35×37	1.57
	22×51	1.20	25×41	1.20	30×31	1.20	35×27	1.20	22×51	1.40	25×46	1.40	30×36	1.40	35×32	1.40	
390					30×41	1.45	35×37	1.45							35×37	1.74	
	22×56	1.30	25×46	1.30	30×36	1.30	35×32	1.30	22×56	1.60	25×51	1.60	30×41	1.60	35×32	1.60	
470					30×46	1.70	35×37	1.70							35×42	1.98	
			25×51	1.60	30×41	1.60	35×32	1.60					30×46	1.80	35×37	1.80	
560							35×42	1.85					30×56	2.23	35×47	2.23	
					30×46	1.70	35×37	1.70							35×42	2.10	
680							35×47	1.98							35×52	2.40	
							35×42	1.80									
820							35×52	1.82							35×57	2.42	
1000							35×63	1.84							35×70	2.45	

wv ΦD Cap (uF)	450							
	22		25		30		35	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
33	22×21	0.24						
47	22×26	0.35	25×21	0.35				
56	22×26	0.41	25×1	0.41				
68	22×31	0.55	25×26	0.55	30×21	0.55		
	22×26	0.51	25×21	0.51				
82	22×31	0.64	25×26	0.64	30×21	0.64		
100	22×36	0.74	25×26	0.74	30×26	0.74		
	22×31	0.69			30×21	0.69		
120	22×41	0.82	25×31	0.82	30×26	0.82		
	22×36	0.77	25×26	0.77				
150	22×46	0.96	25×36	0.96	30×31	0.96		
	22×41	0.91	25×31	0.91	30×26	0.91		
180			25×41	1.05	30×31	1.05	35×27	1.05
	22×46	0.99	25×36	0.99	30×26	0.99		
220					30×36	1.15	35×32	1.15
			25×41	1.08	30×31	1.08	35×27	1.08
270					30×46	1.48	35×37	1.48
			25×46	1.38	30×41	1.38	35×32	1.38
330							35×42	1.55
					30×46	1.45	35×37	1.45
390							35×47	1.75
							35×42	1.65
470							35×52	1.85
							35×47	1.75
560							35×52	1.86
680							35×63	1.85
820							35×70	1.87

Ripple Current (A,ms) at 105°C 120Hz