



HW High temperature and general purpose Series

- Endurance : 105°C 2000 hours, high temperature than TW
- Ideally suitable for using in Switching Power Supplies and other industrial /commercial applications
- Corresponding product to RoHS

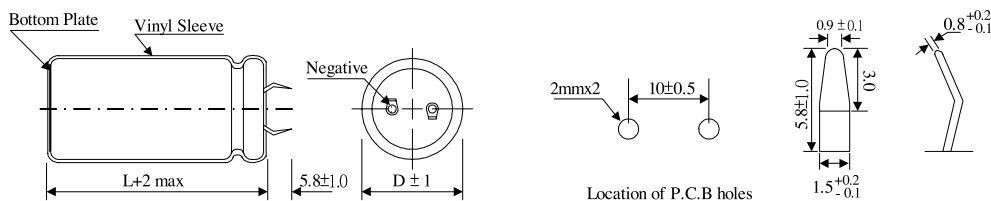
HW
 ▲ High temperature
 TW



Specifications

Item	Characteristics							
Operating Temperature Range	-40 ~ +105°C	-25 ~ +105°C						
Rated Voltage Range	6.3 ~ 100VDC	160 ~ 450VDC						
Capacitance Range	560 ~ 82000 µF	47 ~ 2200 µF						
Capacitance Tolerance	± 20 % at 120Hz , 20°C							
Leakage Current (MAX)	I=0.02CV, L=20m/m, I=0.03CV or 3mA , whichever is smaller. (At 20°C, After 5 minutes) Where, I : Leakage Current (µ A) ; C:Nominal Capacitance(µ F) ; V:Rated Voltage(v)							
Dissipation Factor (MAX) (tan δ) (120Hz , 20°C)	Rated voltage(V)	6.3 10 16 25 35 50 63~100 160~400 450						
	tan δ	0.60 0.55 0.55 0.45 0.35 0.30 0.25 0.15 0.20						
Low Temperature Stability Impedance Ratio (MAX)	Measurement frequency : 120Hz							
	Rated voltage(V)	6.3~16	25	35	50~63	80~100	160~400	450
	Z-25°C / Z+20°C	4	3	3	2	2	4	8
	Z-40°C / Z+20°C	15	10	8	6	5	—	—
Endurance	After applying rated voltage with rated Ripple current for 2000hrs at 105°C, the capacitor shall meet the following requirements.							
	Capacitance Change	Within ± 20 % of initial value						
	Dissipation Factor	Not more than 200% of the specified value						
	Leakage Current	initial specified value or less						
Shelf Life	After placed at 105°C without voltage applied for 1000 hours, the capacitor shall meet the same requirement as Endurance.							

Diagram of Dimensions



Multiplier for Ripple Current

Frequency coefficient

Frequency	50	60	120	1K	10K
6.3~100V	0.88	0.90	1.00	1.15	1.16
160~250V	0.85	0.88	1.00	1.15	1.20
315~450V	0.88	0.9	1.00	1.10	1.15

Temperature coefficient

Ambient Temperature(°C)	40	45	50	55	60	65	70	75	80	85	105
Coefficient	2.73	2.60	2.47	2.33	2.18	2.02	1.85	1.65	1.44	1.18	1.00



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■ Dimensions, Rated Ripple Current

Capacitance (μ F)	Rated (Surge) Voltage							
	6.3 (8)		10 (13)		16 (20)		25 (32)	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
4700							22x25	1.50
5600							22x30	1.65
							25x25	1.65
6800					22x25	1.55	22x30	1.85
							25x25	1.85
8200					22x30	1.70	22x35	2.10
					25x25	1.70	25x30	2.10
							30x25	2.15
10000			25x25	1.55	22x30	1.95	22x40	2.40
					25x25	1.95	25x35	2.40
							30x30	2.40
							35x25	2.40
12000	22x25	1.55	22x30	1.75	22x35	2.20	22x45	2.70
					25x30	2.25	25x40	2.75
					30x25	2.30	30x30	2.70
							35x25	2.75
15000	22x30	1.70	22x30	1.90	22x40	2.55	25x45	3.15
	25x25	1.70	25x25	1.90	25x35	2.60	30x35	3.15
					30x30	2.60	35x30	3.25
					35x25	2.65		
18000	22x30	1.95	22x35	2.20	22x45	2.90	25x50	3.55
	25x25	1.95	25x30	2.25	25x40	2.90	30x40	3.55
					30x30	2.90	35x35	3.55
					35x25	2.95		
22000	22x35	2.25	22x40	2.50	25x45	3.30	30x45	4.05
	25x30	2.25	25x35	2.55	30x35	3.30	35x35	3.80
	30x25	2.25	30x25	2.45	35x30	3.30		
27000	22x40	2.55	22x50	2.95	25x50	3.80	35x45	4.70
	25x35	2.55	25x40	2.90	30x40	3.75		
	30x30	2.55	30x30	2.85	35x30	3.75		
	35x25	2.55	35x25	2.80				
33000	22x45	2.90	25x45	3.30	30x45	4.30	35x50	5.40
	25x40	2.95	30x35	3.30	35x35	4.25		
	30x30	2.90	35x30	3.30				
	35x25	2.95						
39000	25x50	3.25	25x50	3.70	30x50	4.80		
	30x35	3.25	30x40	3.7	35x40	4.80		
	35x30	3.30	35x30	3.65				
47000	25x50	3.70	30x45	4.20	35x45	5.45		
	30x40	3.70	35x35	3.80				
56000	30x45	4.15	30x50	4.65				
	35x35	4.10	35x40	4.65				
68000	30x50	4.70	35x50	5.50				
	35x40	4.70						
82000	35x45	5.30						

☆ Size: D ϕ x L (mm) ☆ Ripple Current : A/rms. 105°C, 120Hz



HW High temperature and general purpose Series

■ Dimensions, Rated Ripple Current

Capacitance (μ F)	Rated (Surge) Voltage							
	35 (44)		50 (63)		63 (79)		80 (100)	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
820							22x25	1.10
1000							22x30	1.20
							25x25	1.20
1200					22x25	1.20	22x30	1.40
							25x25	1.40
1500					22x30	1.30	22x35	1.60
					25x25	1.30	25x30	1.60
							30x25	1.65
1800			22x25	1.30	22x30	1.50	22x40	1.80
					25x25	1.50	25x35	1.85
							30x25	1.80
2200			22x30	1.55	22x35	1.70	22x45	2.05
			25x25	1.55	25x30	1.75	25x35	2.00
					30x25	1.80	30x30	2.05
							35x25	2.05
2700			22x30	1.70	22x40	2.00	25x45	2.35
			25x25	1.70	25x35	2.00	30x35	2.35
					30x25	1.95	35x30	2.35
3300	22x25	1.40	22x35	1.95	22x50	2.30	25x50	2.70
			25x30	1.85	25x40	2.30	30x40	2.70
					30x30	2.25	35x30	2.55
					35x25	2.10		
3900	22x30	1.55	22x40	2.15	25x45	2.55	30x45	3.00
	25x25	1.55	25x35	2.20	30x35	2.55	35x35	3.00
			30x25	1.95	35x30	2.55		
4700	22x35	1.80	22x45	2.45	25x50	2.85	30x50	3.40
	25x25	1.80	25x40	2.45	30x40	2.85	35x40	3.40
			30x30	2.45	35x30	2.80		
			35x25	2.50				
5600	22x35	1.95	22x50	2.75	30x45	3.20	35x45	3.80
	25x30	1.95	25x40	2.70	35x35	3.20		
	30x25	2.00	30x35	2.75				
			35x30	2.75				
6800	22x40	2.20	25x50	3.30	30x50	3.65	35x50	3.90
	25x35	2.25	30x40	3.30	35x40	3.65		
	30x30	2.30	35x30	3.25				
	35x25	2.35						
8200	22x50	2.55	30x45	3.60	35x45	3.90		
	25x40	2.50	35x35	3.55				
	30x30	2.75						
	35x25	2.75						
10000	25x45	2.85	30x50	4.05	35x50	4.40		
	30x35	2.90	35x40	4.00				
	35x30	2.95						
12000	25x50	3.25	35x45	4.55				
	30x40	3.25						
	35x30	3.15						
15000	30x45	3.70						
	35x35	3.65						
18000	35x40	4.35						
22000	35x50	4.90						

☆ Size: D ϕ x L (mm) ☆ Ripple Current : A/rms. 105°C, 120Hz



HW High temperature and general purpose Series

■ **Dimensions, Rated Ripple Current**

Capacitance (μ F)	Rated (Surge) Voltage							
	100 (125)		160 (200)		180 (225)		200 (250)	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
150							22x20	0.65
180					22x20	0.75	22x20	0.70
220			22x20	0.80	22x25	0.85	22x25	0.80
							25x20	0.80
270			22x25	1.00	22x25	0.95	22x25	0.85
					25x20	0.90	25x25	0.85
330			22x25	1.20	22x25	1.20	22x30	1.20
			25x20	1.15	22x30	1.10	25x25	1.20
					25x25	1.10		
390			22x30	1.30	22x30	1.30	22x30	1.30
			25x25	1.30	25x25	1.30	22x35	1.30
							25x30	1.30
							30x25	1.30
470			22x30	1.30	22x30	1.30	22x35	1.40
			22x35	1.40	22x35	1.35	22x40	1.40
			25x25	1.40	25x30	1.40	25x30	1.40
					30x25	1.40	30x25	1.50
560	22x25	1.05	22x40	1.50	22x40	1.50	22x45	1.55
			25x30	1.50	25x35	1.55	25x35	1.55
			30x25	1.50	30x25	1.50	30x30	1.55
680	22x25	1.20	22x45	1.70	22x45	1.70	22x50	1.75
			25x35	1.70	22x50	1.70	25x40	1.75
			30x25	1.70	25x35	1.70	30x30	1.75
					25x40	1.75	35x25	1.70
					30x30	1.70		
					35x25	1.70		
820	22x30	1.30	22x50	1.95	22x50	1.95	25x50	2.05
	25x25	1.33	25x40	2.00	25x40	2.00	30x35	2.00
			30x30	2.00	25x45	2.00	35x30	2.05
			35x25	1.90	30x35	2.00		
					35x25	1.90		
1000	22x35	1.50	25x45	2.20	25x45	2.20	30x40	2.30
	25x30	1.50	30x35	2.20	25x50	2.20	30x45	2.30
			35x30	2.20	30x35	2.25	35x30	2.30
					30x40	2.25	35x35	2.30
					35x30	2.25		
1200	22x40	1.70	25x50	2.45	25x50	2.45	30x50	2.60
	25x35	1.70	30x40	2.45	30x40	2.45	35x40	2.65
	30x25	1.70	35x30	2.45	30x45	2.50		
					35x35	2.50		
1500	22x45	1.95	30x45	2.80	30x45	2.80	35x45	3.10
	25x40	2.00	35x35	2.80	30x50	2.90		
	30x30	1.95			35x40	2.90		
	35x25	2.00						
1800	25x45	2.20	30x50	3.30	30x50	3.30	35x50	3.15
	30x35	2.50	35x45	3.30	35x50	3.30		
	35x30	2.45						
2200	25x50	2.55	35x50	3.75	35x50	3.60		
	30x40	2.70						
	35x30	2.55						
2700	30x45	2.90						
	35x35	2.85						
3300	30x50	3.25						
	35x40	3.25						
3900	35x45	3.70						
4700	30x50	3.80						
	35x50	3.80						

☆ Size: D ϕ x L (mm) ☆ Ripple Current : A/rms. 105°C, 120Hz



HW High temperature and general purpose Series

■ Dimensions, Rated Ripple Current

Capacitance (μ F)	Rated (Surge) Voltage							
	250 (300)		350 (400)		400 (450)		450 (500)	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
47					22x20	0.35		
56			22x20	0.40	22x20	0.40	22x25	0.40
68			22x25	0.45	22x25	0.50	22x30	0.50
					25x20	0.50	25x25	0.50
82			22x25	0.55	22x30	0.60	22x35	0.55
			25x20	0.50	25x25	0.65	25x30	0.55
							30x25	0.55
100			22x30	0.70	22x35	0.65	22x40	0.65
			25x25	0.70	25x30	0.65	25x30	0.60
							30x25	0.65
120	22x20	0.60	22x35	0.75	22x35	0.70	22x45	0.70
			25x30	0.75	25x30	0.70	25x35	0.70
			30x25	0.75	30x25	0.75	30x30	0.70
							35x25	0.70
150	22x25	0.65	22x40	0.80	22x40	0.80	22x50	0.80
			25x30	0.80	25x30	0.85	25x40	0.80
			30x25	0.85	25x35	0.85	30x30	0.75
					30x30	0.85	35x25	0.75
					35x25	0.80		
180	22x25	0.80	22x45	0.90	22x50	0.95	25x45	0.85
	25x20	0.75	25x35	0.90	25x40	0.95	30x35	0.85
			30x30	0.90	30x30	0.90	35x30	0.85
220	22x30	0.95	22x50	1.05	25x45	1.05	25x50	1.00
	25x25	0.95	25x40	1.05	30x35	1.05	30x40	1.00
			30x30	1.00	35x30	1.10	35x30	1.00
			35x25	1.05				
270	22x35	1.15	25x45	1.20	25x50	1.20	30x45	1.15
	25x30	1.15	30x35	1.20	30x40	1.20	35x35	1.15
	30x25	1.15	35x30	1.20	35x35	1.20		
330	22x40	1.25	30x40	1.35	30x45	1.40	30x50	1.40
	25x30	1.20	35x35	1.35	35x35	1.35	35x40	1.40
	30x25	1.25						
390	22x45	1.5	30x45	1.50	30x50	1.55	35x45	1.55
	25x35	1.50	35x35	1.50	35x40	1.55		
	30x30	1.50						
470	22x50	1.55	35x40	1.70	30x50	1.75	35x50	1.70
	25x40	1.55			35x45	1.75		
	30x30	1.55						
	35x25	1.55						
560	25x45	1.80	35x45	1.90	30x62	1.90	35x60	2.10
	30x35	1.80			35x50	1.90		
	35x30	1.80						
680	25x50	1.95			35x60	2.15		
	30x40	2.00						
	35x35	2.00						
820	30x45	2.15						
	35x35	2.10						
1000	35x40	2.30						
1500	35x50	3.63						

☆ Size: D ϕ x L (mm) ☆ Ripple Current : A/rms. 105°C, 120Hz