

HS Series Snap-in Type 105°C Miniaturized

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
- ◆ RoHS Compliant



Specifications

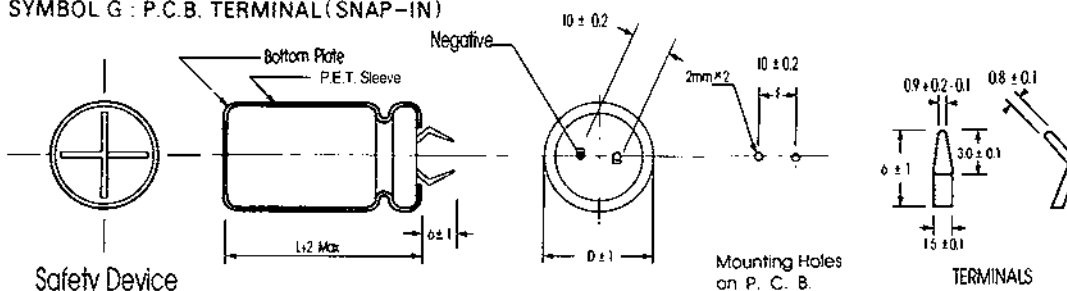
Item	Performance Characteristics									
Operating Temperature Range	-25 to +105°C									
Rated Voltage Range	160 to 450 V · DC									
Capacitance Range	33 to 2700 µ F									
Capacitance Tolerance	± 20% (120Hz, +20°C)									
Leakage Current (+20°C, max.)	$I \leq 0.02CV$ After 5 minutes with rated working voltage applied.									
Dissipation Factor ($\tan \delta$, at 20°C, 120Hz)	Less than the value under table (%)									
	<table border="1"> <thead> <tr> <th>µ F \ 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>	µ F \ VDC	160~250	315~450	47~390	15	20	470~2700	15	20
	µ F \ 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							
Load Life	Test conditions Duration time : 2000 Hrs Ambient temperature : +105°C Applied voltage : Rated DC working voltage After test requirement at +20°C Capacitance change : $\leq \pm 20\%$ of the initial measured value Dissipation factor : $\leq 200\%$ of the initial specified value Leakage current : \leq The initial specified value									
Shelf Life	Test conditions Duration time : 1000 Hrs Ambient temperature : +105°C Applied voltage : None After test requirement at +20°C : 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 (µ F) \ Frequency (Hz)	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 Dimensions: (unit: mm)

SYMBOL G : P.C.B. TERMINAL (SNAP-IN)



Case Size

φ DxL(mm)

Cap (μF)	WV(SV)	φ D	160 (200)								200 (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
100										22X21	0.38							
150			22X21	0.37						22X21	0.54	25X21	0.54					
220			22X21	0.65						22X26	0.92	25X21	0.92	30X21	0.92			
270			22X21	0.74						22X26	1.03	25X21	1.03	30X21	1.03			
330			22X26	0.98	25X21	0.98	30X21	0.98		22X31	1.21	25X26	1.21	30X21	1.21			
										22X26	1.10	25X21	1.10					
390			22X26	1.10	25X26	1.10	30X21	1.10		22X31	1.39	25X26	1.39	30X26	1.39			
					25X21	1.00								30X21	1.27			
470			22X31	1.21	25X26	1.21	30X21	1.21		22X36	1.45	25X31	1.45	30X26	1.45	35X22	1.45	
										22X31	1.35	25X26	1.35					
560			22X36	1.40	25X31	1.40	30X26	1.40		22X41	1.60	25X36	1.60	30X26	1.60	35X22	1.60	
			22X31	1.30	25X26	1.30				22X36	1.50	25X31	1.50					
680			22X41	1.64	25X31	1.64	30X26	1.64	35X27	1.64	22X46	1.80	25X36	1.80	30X31	1.80	35X27	1.80
			22X36	1.53						22X41	1.70							
820					25X36	1.85	30X31	1.85	35X27	1.85			25X41	2.00	30X31	2.00	35X32	2.00
			22X51	1.70						22X51	1.88	25X36	1.88			35X27	1.88	
1000					25X46	2.15	30X31	2.15	35X27	2.15			25X51	2.30	30X36	2.30	35X32	2.30
			22X56	2.03	25X41	2.03												
1200					25X51	2.46	30X41	2.46	35X32	2.46					30X41	2.70	35X37	2.70
1500							30X46	2.46	35X37	2.46					30X51	3.10	35X42	3.10
1800							30X51	3.13	35X42	3.13					30X70	3.75	35X47	3.75
2200							30X70	3.39	35X47	3.39							35X57	3.82
2700									35X52	3.90							35X70	4.00

Cap (μF)	WV(SV)	φ D	220 (270)								250 (300)							
			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										22X21	0.27							
82										22X21	0.34							
100										22X21	0.44	25X21	0.44					
120										22X26	0.48	25X21	0.48					
150			22X21	0.57						22X26	0.60	25X21	0.60	30X21	0.60			
180			22X26	0.61	25X26	0.61				22X26	0.69	25X26	0.69	30X21	0.69			
					25X21	0.55						25X21	0.63					
220			22X26	0.81	25X26	0.81				22X31	1.00	25X26	1.00	30X21	1.00			
										22X26	0.92	25X21	0.92					
270			22X31	1.01	25X26	1.01	30X26	1.01		22X36	1.16	25X31	1.16	30X26	1.16			
			22X26	0.93			30X21	0.93		22X31	1.05	25X26	1.05	30X21	1.05			
330			22X31	1.09	25X26	1.09	30X26	1.09		22X41	1.28	25X31	1.28	30X26	1.28			
										22X36	1.20	25X26	1.20					
390			22X36	1.18	25X31	1.18	30X26	1.18		22X41	1.48	25X31	1.48	30X31	1.48			
					25X26	1.08				22X36	1.38			30X26	1.38			
470			22X41	1.28	25X36	1.28	30X26	1.28		22X46	1.65	25X36	1.65	30X31	1.65	35X27	1.65	
			22X36	1.2	25X31	1.2				22X41	1.55							
560			22X46	1.52	25X41	1.52	30X31	1.52	35X27	1.52			25X46	1.85	30X36	1.85	35X27	1.85
			22X41	1.4	25X36	1.4	30X26	1.4		22X51	1.75	25X41	1.75	30X31	1.75			
680			22X51	1.66	25X46	1.66	30X36	1.66	35X27	1.66					30X41	2.00	35X32	2.00
			22X46	1.56	25X41	1.56	30X31	1.56					25X51	1.85				
820					25X51	1.9	30X41	1.9	35X32	1.9					30X46	2.30	35X37	2.30
					25X46	1.8	30X36	1.8										
1000							30X46	2.28	35X37	2.28					30X61	2.60	35X42	2.60
					25X56	2.15	30X41	2.15										
1200							30X51	2.32	35X42	2.32							35X47	2.85
1500							30X70	2.35	35X47	2.35							35X63	2.92
1800									35X52	2.40							35X70	2.95
2200									35X63	2.45								

Ripple Current (A, rms) at 105°C 120Hz

φ DxL(mm)

Cap (μF)	WV(SV)	φ D	350 (400)								400 (450)							
			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										22X21	0.39							
47										22X21	0.56	25X21	0.56					
56										22X21	0.60	25X21	0.60					
68			22X21	0.45						22X26	0.65	25X21	0.65					
82			22X26	0.53						22X26	0.75	25X26	0.75					
												25X21	0.71					
100			22X26	0.65						22X31	0.78	25X26	0.78	30X21	0.78			
										22X26	0.72							
120			22X31	0.74	25X26	0.74				22X31	0.85	25X26	0.85	30X21	0.85			
			22X26	0.68						22X26	0.79							
150			22X36	0.80	25X31	0.80				22X36	0.98	25X31	0.98	30X26	0.98			
			22X31	0.74	25X26	0.74				22X31	0.91	25X26	0.91					
180			22X41	0.95	25X31	0.95	30X26	0.95		22X41	1.14	25X36	1.14	30X31	1.14	35X27	1.14	
			22X36	0.89	25X26	0.89				22X36	1.05	25X31	1.05	30X26	1.05			
220			22X46	1.10	25X36	1.10	30X31	1.10		22X51	1.21	25X41	1.21	30X36	1.21	35X27	1.21	
			22X41	1.00	25X31	1.00	30X26	1.00		22X46	1.10	25X36	1.10	30X31	1.10			
270			22X51	1.20	25X41	1.20	30X31	1.20	35X27	1.20	22X51	1.40	25X46	1.40	30X41	1.40	35X32	1.40
			22X46	1.10	25X36	1.10	30X26	1.10		22X46	1.30	25X41	1.30	30X36	1.30	35X27	1.30	
330					25X46	1.30	30X36	1.30	35X32	1.30				30X41	1.57	35X37	1.57	
			22X51	1.20	25X41	1.20	30X31	1.20	35X27	1.20	22X51	1.40	25X46	1.40	30X36	1.40	35X32	1.40
390							30X41	1.45	35X37	1.45						35X37	1.74	
			22X56	1.30	25X46	1.30	30X36	1.30	35X32	1.30	22X56	1.60	25X51	1.60	30X41	1.60	35X32	1.60
470							30X46	1.70	35X37	1.70						35X42	1.98	
					25X51	1.60	30X41	1.60	35X32	1.60				30X46	1.80	35X37	1.80	
560									35X42	1.85				30X56	2.23	35X47	2.23	
							30X46	1.70	35X37	1.70						35X42	2.10	
680									35X47	1.98						35X52	2.40	
									35X42	1.80								
820									35X52	1.82						35X57	2.42	
1000									35X63	1.84						35X70	2.45	

Cap (μF)	WV(SV)	φ D	420 (470)								450 (500)							
			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			22X21	0.34							22X21	0.24						
47			22X21	0.45	25X21	0.45					22X26	0.35	25X21	0.35				
56			22X21	0.5	25X21	0.5	30X21	0.5			22X26	0.41	25X21	0.41				
68			22X26	0.58	25X21	0.58	30X21	0.58			22X31	0.55	25X26	0.55	30X21	0.55		
											22X26	0.51	25X21	0.51				
82			22X26	0.68	25X26	0.68	30X21	0.68			22X31	0.64	25X26	0.64	30X21	0.64		
					25X21	0.62												
100			22X31	0.75	25X31	0.75	30X26	0.75			22X36	0.74	25X26	0.74	30X26	0.74		
					25X26	0.69	30X21	0.69			22X31	0.69			30X21	0.69		
120			22X36	0.83	25X31	0.83	30X26	0.83			22X41	0.82	25X31	0.82	30X26	0.82		
			22X31	0.77	25X26	0.77	30X21	0.77			22X36	0.77	25X26	0.77				
150			22X41	0.97	25X36	0.97	30X26	0.97			22X46	0.96	25X36	0.96	30X31	0.96		
			22X36	0.91	25X31	0.91					22X41	0.91	25X31	0.91	30X26	0.91		
180					25X41	1.08	30X31	1.08					25X41	1.05	30X31	1.05	35X27	1.05
			22X41	1.02	25X36	1.02	30X26	1.02			22X46	0.99	25X36	0.99	30X26	0.99		
220			22X51	1.18	25X46	1.18	30X36	1.18	35X27	1.18				30X36	1.15	35X32	1.15	
					25X41	1.1	30X31	1.1					25X41	1.08	30X31	1.08	35X27	1.08
270							30X41	1.42	35X32	1.42				30X46	1.48	35X37	1.48	
					25X46	1.3	30X36	1.3					25X46	1.38	30X41	1.38	35X32	1.38
330							30X46	1.56	35X37	1.56						35X42	1.55	
					25X51	1.45	30X41	1.45	35X32	1.45					30X46	1.45	35X37	1.45
390									35X42	1.76						35X47	1.75	
									30X46	1.65	35X37	1.65				35X42	1.65	
470									35X47	1.78						35X52	1.85	
							30X51	1.68	35X42	1.68						35X47	1.75	
560									35X52	1.8						35X52	1.86	
									35X47	1.72								
680									35X57	1.82						35X63	1.85	
820									35X63	1.84						35X70	1.87	

Ripple Current (A, rms) at 105°C 120Hz