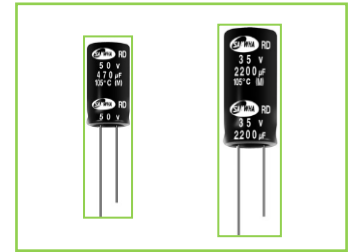
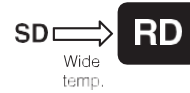


UPGRADE

Wide Temperature Range Series

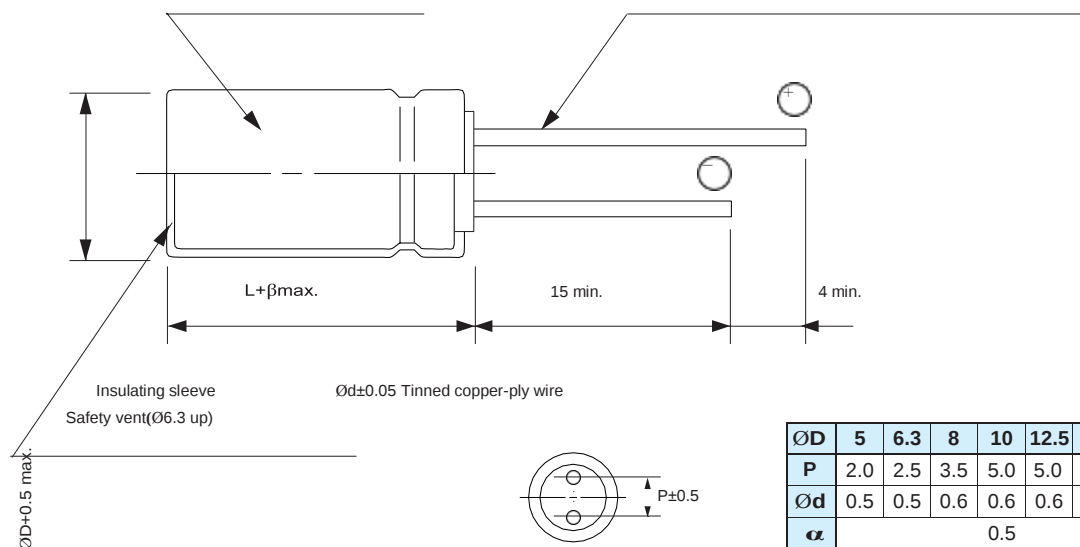
- Standard series for general purpose
- High CV value
- Wide operating temperature range of -55 ~ +105 ℃
- Complied to the RoHS directive



Item	Characteristics												
Operating temperature range	WV			6.3 ~ 100			160 ~ 350			400, 450			
	Temperature range			-55 ~ +105℃			-40 ~ +105℃			-25 ~ +105℃			
Leakage current max.	WV≤100							WV > 100					
	I = 0.01CV or 3μA whichever is greater (after 2 min) I = 0.03CV or 4μA whichever is greater (after 1 min)							I = 0.02CV+15μA (after 5 min)					
Capacitance tolerance	±20% at 120Hz, 20℃												
Dissipation factor max. (at 120Hz, 20℃)	Capacitance > 1000μF : tanδ increases by 0.02 for each 1000μF from below value.												
	WV	6.3	10	16	25	35	50	63	100	160~250	350~450		
	tanδ	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.15	0.20		
Low temperature characteristics (Impedance ratio at 120Hz)	WV			6.3	10	16	25	35	50~100	160	200~350	400	450
	Z-25℃/Z+20℃			5	4	3	2	2	2	3	4	6	10
	Z-40℃/Z+20℃			10	8	6	4	3	3	4	8	—	—
Load life (after application of the rated voltage for 2000 hours at 105℃)	Leakage current					Less than specified value							
	Capacitance change					Within ±20% of initial value							
	tanδ					Less than 200% of specified value							
	Ø5, 6.3 and Ø8 products are for 1000 hours												
Shelf life (at 105℃)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.												

DRAWING

Unit : mm



ØD	5	6.3	8	10	12.5	16	18	22	25.4
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	12.5
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0
α	0.5							1.0	
β	1.5			2.0					

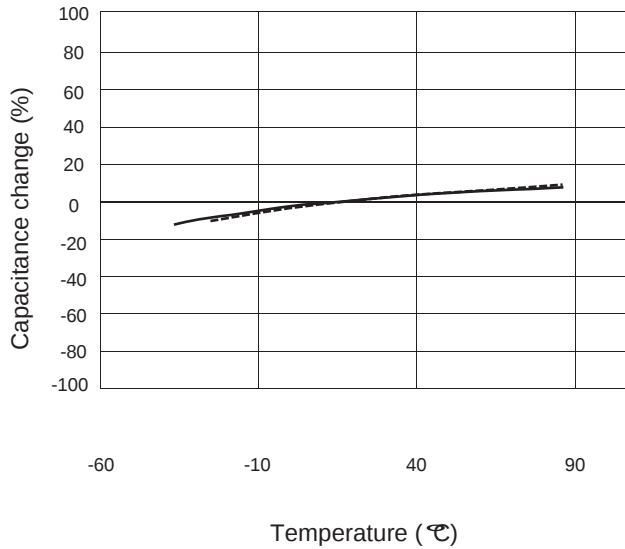
WV	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	500	
μF																
2.2						5×11 24	5×11 26	5×11 26	6.3×11 23	6.3×11 23	6.3 ×11 23	8 ×11.5 28	8 ×11.5 28	10×12.5 27		
3.3						5×11 29	5×11 32	5×11 32	6.3×11 29	6.3×11 29	8 ×11.5 34	8 ×11.5 34	10 ×12.5 39	10×16 36		
4.7						5×11 35	5×11 38	5×11 38	6.3×11 34	8×11.5 40	8 ×11.5 40	10 ×12.5 47	10 ×12.5 47	10×16 43	10×16 59	
6.8						5×11 42	5×11 46	5×11 46	8×11.5 49	10×12.5 56	10 ×12.5 56	10 ×16 62	10 ×16 62	10×20 56	10×16 72	
10						5×11 51	5×11 56	5×11 56	10×12.5 68	10×12.5 68	10 ×12.5 68	10 ×16 75	10 ×20 82	12.5×20 80	12.5×25 88	
15						5×11 62	5×11 68	6.3×11 78	10×16 92	10×16 92	10 ×16 92	10 ×20 100	12.5 ×20 118	12.5×25 107	12.5×30 115	
22						5×11 75	5×11 83	6.3×11 95	10×16 111	10×16 111	10 ×20 121	12.5 ×20 143	12.5 ×25 155	16×25 144	16×25 159	
33						5×11 92	6.3×11 116	8×11.5 137	10×20 149	10×20 149	12.5 ×20 175	12.5 ×25 190	16 ×25 211	16×31.5 193	16×31.5 207	
47					* 5×11 96	*6.3×11 127	6.3×11 139	10×12.5 190	12.5×20 208	12.5×20 208	12.5 ×25 227	16 ×25 252	16 ×31.5 276	16×35.5 242	18×31.5 261	
68				* 5×11 108	6.3×11 132	8×11.5 180	8×11.5 197	10×16 251	12.5×25 273	16×20 279	16 ×25 303	16 ×31.5 332	18 ×35.5 373	18×40 352	18×31.5 335	
100			* 5×11 119	6.3×11 151	* 6.3×11 160	8×11.5 218	8×11.5 239	10×20 332	12.5×25 331	16×25 368	16 ×31.5 402	18 ×35.5 407	18 ×40 427	22×41 486		
150		5×11 134	6.3×11 167	6.3×11 185	8×11.5 231	10×12.5 310	10×12.5 340	12.5×20 477	16×25 450	16×35.5 517	18 ×35.5 554	18 ×40 523	22 ×41 596			
220	5×11 146	* 5×11 162	* 6.3×11 203	8×11.5 264	8×11.5 280	10×12.5 376	10×16 451	12.5×25 630	16×31.5 596	18×35.5 671	18 ×40 694	22 ×41 721				
330	*6.3×11 206	* 6.3×11 228	8×11.5 293	8×11.5 324	10×12.5 399	10×16 504	10×20 603	16×25 856	18×35.5 822	18×40 850	22 ×41 968					
470	* 6.3×11 246	6.3×11 272	8×11.5 349	10×12.5 449	10×16 521	10×20 657	12.5×20 844	16×25 1021	18×40 1015	22×41 1155						
680	8×11.5 348	10×12.5 449	10×12.5 488	10×16 591	12.5×16 740	12.5×20 927	12.5×25 1107	16×31.5 1344	22×41 1390							
1000	8×11.5 422	10×12.5 544	10×16 648	10×16 782	12.5×20 974	12.5×25 1226	16×25 1490	18×40 1925								
1500	10×16 621	10×16 680	12.5×16 862	12.5×20 1017	16×20 1188	16×25 1442	16×35.5 1770									
2200	10×20 778	10×20 844	12.5×20 1055	12.5×25 1235	16×25 1426	16×25 1442	16×35.5 1770									
3300	12.5×16 983	12.5×20 1148	12.5×25 1323	16×25 1562	16×35.5 1857	18×35.5 1794	18×40 2689									
4700	12.5×20 1219	12.5×25 1421	16×25 1657	16×31.5 1916	16×35.5 2224	18×35.5 2152	Case size ØD×L (mm) Ripple current (mA rms) at 105℃, 120Hz									
6800	12.5×25 1480	16×25 1737	16×31.5 1982	18×35.5 2335												
10000	16×25 1807	16×35.5 2172	18×35.5 2409													
15000	16×35.5 2233	18×35.5 2482														
22000	18×40 2652															

TYPICAL PERFORMANCE

— 16V 1000 μ F
 400V 10 μ F

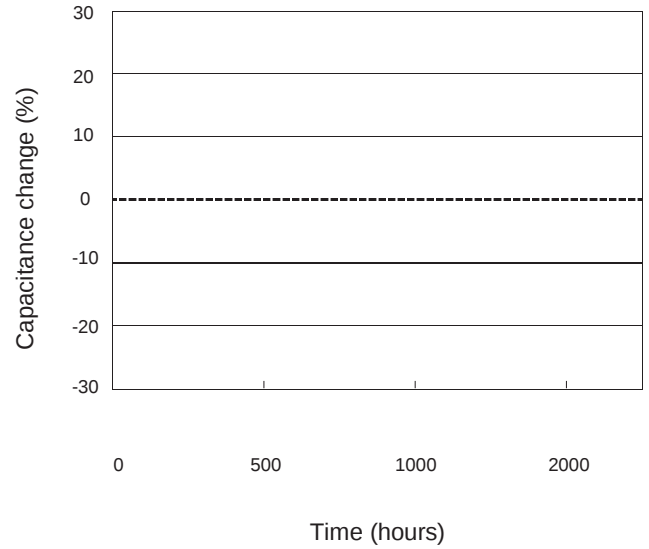
TEMPERATURE CHARACTERISTICS

Capacitance change vs. temperature

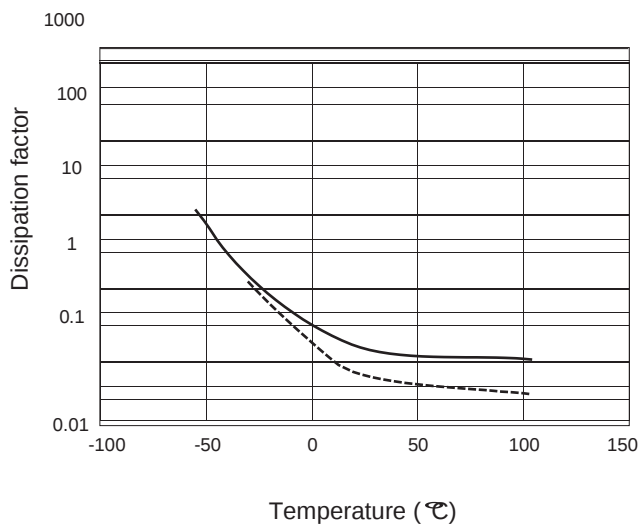


LOAD LIFE (at +105 °C)

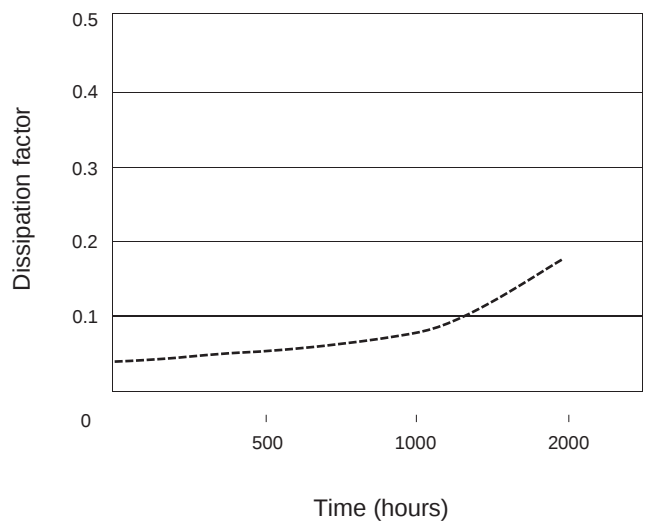
Capacitance change vs. time



Dissipation factor vs. temperature

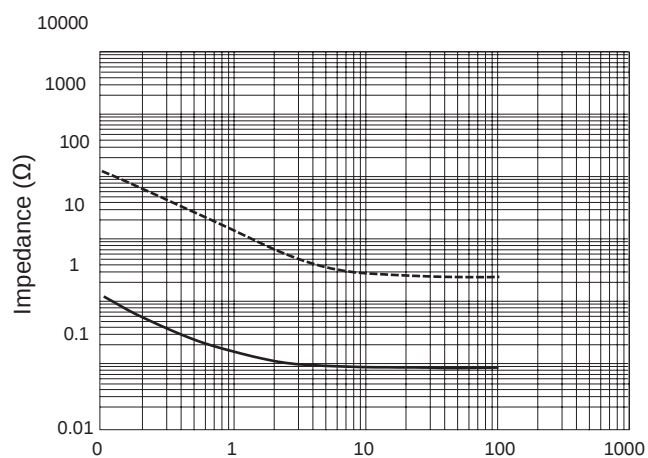


Dissipation factor vs. time

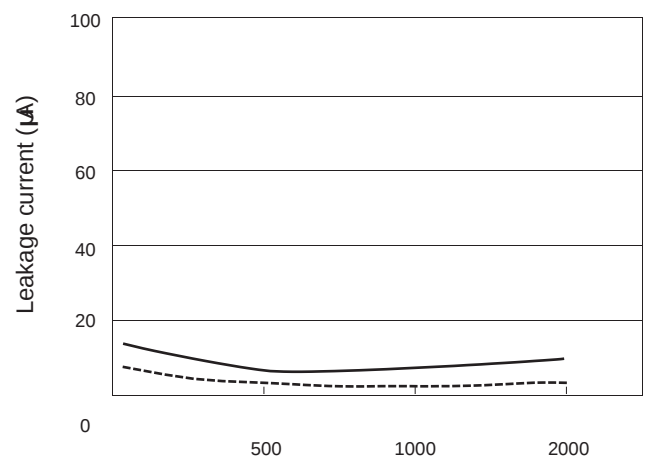


FREQUENCY CHARACTERISTICS

Impedance vs. frequency



Leakage current vs. time



Frequency (Hz)

Time (hours)