

HCS Series 85 °C V-chip Aluminum Electrolytic Capacitor

Operating with general temperature range -40~+85°C

Load life of 2000 hours

RoHS & REACH compliant, Halogen-free

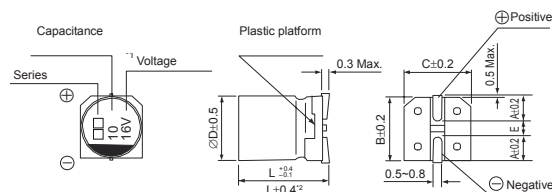


SPECIFICATIONS

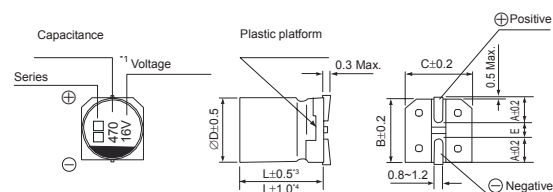
Items	Characteristics	
Operation Temperature Range	-40 ~ +85°C	
Voltage Range	4 ~ 450V	
Capacitance Range	0.1 ~ 10000μF	
Capacitance Tolerance	±20% at 120Hz, 20°C	
Leakage Current	Rated Voltage	6.3 ~ 100V
	Case size	160 ~ 450V
	Time	After 2 min. application of rated voltage at 20°C
	Leakage current	≤0.01CV or 3μA, whichever is greater
Dissipation Factor (tan δ)	Measurement frequency : 120Hz, Temperature: 20°C	
	Rated Voltage (V)	4 6.3 10 16 25 35 50 63 100 160~250 350~450
Stability at Low Temperature	Measurement frequency : 120Hz	
	Rated Voltage (V)	4 6.3 10 16 25 35 50 63 100 160~250 350~450
Load Life	Capacitance Change	Within ±20% of initial value (Within ±30% of initial value for 4V)
	Dissipation Factor	200% or less of initial specified value
	Leakage Current	initial specified value or less
Resistance to Soldering Heat	Capacitance Change	Within ±10% of initial value
	Dissipation Factor	initial specified value or less
	Leakage Current	initial specified value or less
Marking	Black print on the case top.	

DRAWING (Unit: mm)

(Ø4~Ø6.3×7.7)



(Ø8×10.5~Ø18)



- *1. Voltage mark for 6.3V is [6V]
 *2. Applicable to Ø6.3×7.7
 *3. Applicable to Ø8×10.5~Ø10
 *4. Applicable to Ø12.5~Ø18

DIMENSIONS (Unit: mm)

∅D x L	4 x 5.4	5 x 5.4	6.3 x 5.4	6.3 x 7.7	8 x 10.5	10 x 10.5	10 x 13.5	12.5 x 13.5	12.5 x 16	16 x 16.5	18 x 16.5	18 x 18.5
A	2.0	2.2	2.6	2.6	3.0	3.3	3.3	4.9	4.9	5.8	6.2	6.2
B	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0	19.0	19.0
C	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0	19.0	19.0
E ± 0.2	1.0	1.4	1.9	1.9	3.1	4.7	4.7	4.7	4.7	6.4	6.4	6.4
L	5.4	5.4	5.4	7.7	10.5	10.5	13.5	13.5	16.0	16.5	16.5	18.5

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Code μF	4		6.3		10		16		25		
	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	
4.7	475								4 x 5.4	19	
10	106						4 x 5.4	25	5 x 5.4 (4 x 5.4)	28 (20)	
15	156						4 x 5.4	28	5 x 5.4	34	
22	226			4 x 5.4	31	5 x 5.4 (4 x 5.4)	35 (28)	5 x 5.4 (4 x 5.4)	39 (28)	6.3 x 5.4 (5 x 5.4)	52 (35)
33	336	4 x 5.4	26	5 x 5.4 (4 x 5.4)	39 (31)	5 x 5.4 (4 x 5.4)	43 (32)	6.3 x 5.4 (5 x 5.4)	57 (40)	6.3 x 5.4 (5 x 5.4)	63 (42)
47	476	4 x 5.4	34	5 x 5.4 (4 x 5.4)	47 (36)	5 x 5.4	43	6.3 x 5.4 (5 x 5.4)	68 (44)	6.3 x 5.4	68
56	566	4 x 5.4	39	5 x 5.4	46	6.3 x 5.4	57	6.3 x 5.4	74	6.3 x 5.4	82
68	686	5 x 5.4	45	6.3 x 5.4 (5 x 5.4)	62 (52)	6.3 x 5.4	72	6.3 x 5.4	80	6.3 x 5.4	94
100	107	5 x 5.4	61	6.3 x 5.4 (5 x 5.4)	71 (55)	6.3 x 5.4 (5 x 5.4)	76 (70)	6.3 x 5.4	86	6.3 x 7.7	130
150	157	6.3 x 5.4	74	6.3 x 5.4	78	6.3 x 5.4	88	6.3 x 7.7	135	8 x 10.5 (6.3 x 7.7)	200 (130)
220	227	6.3 x 5.4	82	6.3 x 5.4	95	6.3 x 7.7	150	8 x 10.5 (6.3 x 7.7)	215 (150)	8 x 10.5	250
330	337	6.3 x 7.7	150	6.3 x 7.7	150	8 x 10.5	280	8 x 10.5	280	10 x 10.5 (8 x 10.5)	340 (310)
470	477	6.3 x 7.7	150	8 x 10.5 (6.3 x 7.7)	300 (150)	10 x 10.5 (8 x 10.5)	320 (300)	10 x 10.5 (8 x 10.5)	420 (330)	10 x 10.5	400
680	687	8 x 10.5	300	8 x 10.5	300	10 x 10.5	380	10 x 10.5	450	10 x 13.5	550
1000	108	8 x 10.5	330	10 x 10.5 (8 x 10.5)	430 (330)	10 x 10.5	450	12.5 x 13.5 (10 x 13.5) (10 x 10.5)	710 (550) (490)	12.5 x 13.5	820
1500	158	10 x 10.5	450	10 x 13.5 (10 x 10.5)	650 (450)	10 x 13.5	650	12.5 x 13.5	750	12.5 x 16	1000
2200	228	10 x 13.5 (10 x 10.5)	620 (480)	12.5 x 13.5 (10 x 13.5)	890 (720)	12.5 x 13.5	960	16 x 16.5 (12.5 x 16)	1150 (1000)	16 x 16.5	1250
3300	338	10 x 13.5	700	12.5 x 16 (12.5 x 13.5)	1000 (900)	16 x 16.5 (12.5 x 16)	1300 (1050)	16 x 16.5	1350	18 x 16.5	1450
4700	478	12.5 x 13.5	850	16 x 16.5	1400	16 x 16.5	1450	18 x 16.5	1600	18 x 18.5	1750
6800	688	16 x 16.5 (12.5 x 16)	1350 (900)	18 x 16.5	1700	18 x 16.5	1700	18 x 18.5	2000		
10000	109			18 x 18.5	2000	18 x 18.5	2000				

WV Code μF	35		50		63		100		
	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	
0.1	104		4 x 5.4	1.0	4 x 5.4	1.0			
0.22	224		4 x 5.4	2.3	4 x 5.4	2.3			
0.33	334		4 x 5.4	3.5	4 x 5.4	3.5			
0.47	474		4 x 5.4	5.0	4 x 5.4	5.0			
1	105		4 x 5.4	10	4 x 5.4	10	4 x 5.4	10	
1.5	155		4 x 5.4	12	4 x 5.4	12	6.3 x 5.4	15	
2.2	225		4 x 5.4	15	4 x 5.4	15	6.3 x 5.4	20	
3.3	335	4 x 5.4	18	4 x 5.4	18	5 x 5.4	20	6.3 x 7.7 (6.3 x 5.4)	45 (28)
4.7	475	4 x 5.4	20	5 x 5.4 (4 x 5.4)	23 (19)	5 x 5.4	23	6.3 x 7.7 (6.3 x 5.4)	50 (30)
10	106	5 x 5.4 (4 x 5.4)	30 (20)	6.3 x 5.4 (5 x 5.4)	34 (27)	6.3 x 7.7 (6.3 x 5.4)	55 (34)	8 x 10.5 (6.3 x 7.7)	110 (50)
22	226	6.3 x 5.4 (5 x 5.4)	54 (42)	6.3 x 5.4	60	8 x 10.5 (6.3 x 7.7)	140 (70)	10 x 10.5 (8 x 10.5)	180 (120)
33	336	6.3 x 5.4	60	6.3 x 7.7	85	8 x 10.5 (6.3 x 7.7)	160 (85)	10 x 10.5	190
47	476	6.3 x 5.4 (6.3 x 7.7)	70 (165)	10 x 10.5 (8 x 10.5) (6.3 x 7.7)	130 (110) (90)	10 x 10.5 (8 x 10.5)	230 (170)		

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Code	μF	35		50		63		100		160	
		Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
22	226									10 × 13.5	100
33	336									12.5 × 13.5	290
47	476									12.5 × 13.5 (16 × 16.5)	300 (370)
56	566	6.3 × 7.7	80	6.3 × 7.7	110	10 × 10.5	250			12.5 × 16	390
68	686	6.3 × 7.7	110	8 × 10.5	170	10 × 10.5	260			16 × 16.5	500
100	107	8 × 10.5 (6.3 × 7.7)	175 (120)	10 × 10.5 (8 × 10.5)	240 (200)	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	380 (290) (280)	12.5 × 13.5	440	16 × 16.5 (18 × 16.5)	650 (690)
150	157	8 × 10.5	220	10 × 10.5	240	10 × 13.5	310	12.5 × 13.5	540		
220	227	10 × 10.5 (8 × 10.5)	310 (270)	10 × 13.5 (10 × 10.5)	400 (320)	12.5 × 13.5	580	16 × 16.5	700		
330	337	10 × 10.5	350	12.5 × 13.5 (10 × 13.5)	600 (420)	16 × 16.5 (12.5 × 16)	820 (720)	18 × 16.5	780		
470	477	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	600 (530) (400)	16 × 16.5 (12.5 × 16)	850 (740)	16 × 16.5	950				
680	687	12.5 × 13.5	750	16 × 16.5	950	18 × 16.5	1100				
1000	108	16 × 16.5 (12.5 × 16)	1100 (800)	18 × 16.5	1350						
2200	228	18 × 16.5	1450								
3300	338	18 × 18.5	1750								

WV Code	μF	200		250		350		400		450	
		Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
3.3	335							10 × 13.5	80	10 × 13.5	80
4.7	475					10 × 13.5	115	10 × 13.5 (12.5 × 13.5)	100 (120)	10 × 13.5 (12.5 × 13.5)	100 (120)
10	106	10 × 13.5	135	10 × 13.5	135	12.5 × 13.5	120	12.5 × 13.5	120	12.5 × 13.5 (12.5 × 16)	120 (130)
22	226	12.5 × 13.5	240	12.5 × 13.5	150	16 × 16.5	140	16 × 16.5	140	16 × 16.5	140
33	336	12.5 × 13.5	300	12.5 × 16 (16 × 16.5)	240 (300)	16 × 16.5	140	16 × 16.5	140	18 × 16.5	180
47	476	16 × 16.5	420	16 × 16.5	340	18 × 16.5	280	18 × 16.5	280		
100	107	16 × 16.5	420	18 × 16.5	440	18 × 18.5	350	18 × 18.5	350		

*Case size ØD×L(mm), ripple current (mA rms) at 85°C, 120Hz

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

Frequency		50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient	Ø4 ~ Ø10	0.1 ~ 68μF	0.70	1.00	1.17	1.36
		100 ~ 3300μF	0.85	1.00	1.08	1.20
	Ø12.5 ~ Ø18	~ 68μF	0.75	1.00	1.35	1.57
		100 ~ 680μF	0.80	1.00	1.23	1.34
		1000 ~ 6800μF	0.85	1.00	1.10	1.13

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5~10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

◆ How to order

<u>HCS</u>	<u>106</u>	<u>M</u>	<u>0035</u>	<u>0405</u>	<u>R</u>	<u>-</u>
↓	↓	↓	↓	↓	↓	↓
<u>Type</u>	<u>Capacitance code</u>	<u>Tolerance</u>	<u>Rated Voltage</u>	<u>Size Code</u>	<u>Package</u>	<u>Additional characters may be added for special requirements</u>
HCS	pF Code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) 106 = 10uF 107 = 100uF	M: +/-20%	Code 0035: 35VDC For DC Voltage 0006: 6.3VDC 0035: 35VDC 0450: 450VDC	Code 0405: Size 4x5.4mm Size for V-chip E-cap 0405: Size 4x5.4mm 1010: Size 10x10.5mm 1818: Size 18x18.5mm	R: Tape & Reel	