

Capacitor Types

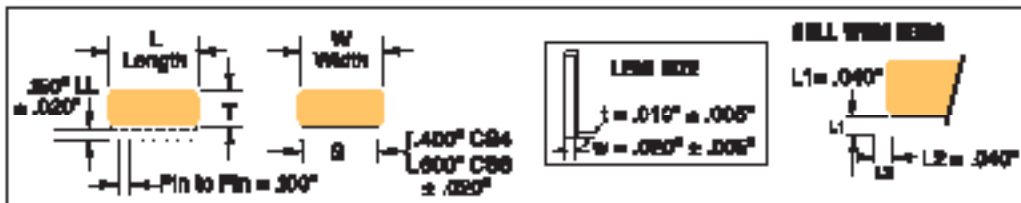
CS4
CS6

- Extreme rated capacitance
- Meant for high frequency switching power supplies and DC to DC converters
- Low ESR/ESL
- High ripple current
- High capacitance
- Operating temperature range: -55°C to 125°C
- Voltage ratings by standard
- Made in U.S.A.

Voltage Ratings Note:

Like all film capacitors, Capetick capacitors have "true" voltage ratings and unlike other dielectric systems require no voltage deratings for maximizing reliability (MTBF) or use life. With FIT rates of well under 5 FIT when used at rated voltage, these units provide only a positive contribution to circuit MTBF calculations.

Circuit designers requiring 500 volt ratings in other dielectric systems for their 370 volt input applications are being penalized by that system's inherent deficiencies. In the film capacitor industry if a device is rated at a certain voltage, then the device is designed to be fully functional and reliable at that voltage for the life of the equipment. Many leading edge circuit designs take advantage of a film capacitor's inherent reliability at rated voltage to both reduce board size and improve performance.



50 VDC / 35 VAC

PF Code	Value μ F	W MAX	T MAX	L MAX	ESR Ω @ 500 KHz	RMS Current @ 500 KHz	# Leads per side	Lead Configuration	Case	Part Number
108	10.0	.500 (12.7)	.320 (8.1)	.620 (15.7)	.003	15.3	5	Thru-hole	CS4	108K050CS4 __
108	10.0	.500 (12.7)	.320 (8.1)	.620 (15.7)	.003	15.3	5	SMD	CS4G	108K050CS4G __
208	20.0	.500 (12.7)	.320 (8.1)	1.150 (29.2)	.0025	17.8	9	Thru-hole	CS4	208K050CS4 __
208	20.0	.500 (12.7)	.320 (8.1)	1.150 (29.2)	.0025	17.8	9	SMD	CS4G	208K050CS4G __

100 VDC / 80 VAC

PF Code	Value μ F	W MAX	T MAX	L MAX	ESR Ω @ 500 KHz	RMS Current @ 500 KHz	# Leads per side	Lead Configuration	Case	Part Number
205	2.0	.500 (12.7)	.250 (6.3)	.450 (11.4)	.009	8.3	9	Thru-hole	CS4	205K100CS4 __
205	2.0	.500 (12.7)	.250 (6.3)	.450 (11.4)	.009	8.3	3	SMD	CS4G	205K100CS4G __
405	4.0	.500 (12.7)	.250 (6.3)	.450 (11.4)	.007	11.5	9	Thru-hole	CS4	405K100CS4 __
405	4.0	.500 (12.7)	.250 (6.3)	.450 (11.4)	.007	11.5	3	SMD	CS4G	405K100CS4G __
475	4.7	.500 (12.7)	.250 (6.3)	.525 (13.3)	.008	12.2	9	Thru-hole	CS4	475K100CS4 __
475	4.7	.500 (12.7)	.250 (6.3)	.525 (13.3)	.008	12.2	3	SMD	CS4G	475K100CS4G __
685	6.8	.500 (12.7)	.250 (6.3)	.700 (17.8)	.005	13.7	5	Thru-hole	CS4	685K100CS4 __
685	6.8	.500 (12.7)	.250 (6.3)	.700 (17.8)	.005	13.7	5	SMD	CS4G	685K100CS4G __
108	10.0	.500 (12.7)	.250 (6.3)	.995 (25.3)	.003	15.3	7	Thru-hole	CS4	108K100CS4 __
108	10.0	.500 (12.7)	.250 (6.3)	.995 (25.3)	.003	15.3	7	SMD	CS4G	108K100CS4G __

250 VDC / 140 VAC

PF Code	Value μ F	W MAX	T MAX	L MAX	ESR Ω @ 500 KHz	RMS Current @ 500 KHz	# Leads per side	Lead Configuration	Case	Part Number
105	1.0	.700 (17.8)	.300 (7.6)	.440 (11.2)	.012	5.2	9	Thru-hole	CS6	105K250CS6 __
105	1.0	.700 (17.8)	.300 (7.6)	.440 (11.2)	.012	5.2	3	SMD	CS6G	105K250CS6G __

400 VDC / 250 VAC

PF Code	Value μF	W MAX	T MAX	L MAX	ESR Ω @500 KHz	RMS Current @500 KHz	# Leads per side	Lead	Case	Part Number
334	.33	.700 (17.8)	.320 (8.1)	.435 (11.0)	.012	6.0	3	Thru-hole	CS6	334K400CS6 __
334	.33	.700 (17.8)	.320 (8.1)	.435 (11.0)	.012	6.0	3	SMD	CS6G	334K400CS6G __
474	.47	.700 (17.8)	.320 (8.1)	.460 (11.7)	.011	6.2	3	Thru-hole	CS6	474K400CS6 __
474	.47	.700 (17.8)	.320 (8.1)	.460 (11.7)	.011	6.2	3	SMD	CS6G	474K400CS6G __
105	1.0	.700 (17.8)	.320 (8.1)	.880 (22.4)	.008	9.5	7	Thru-hole	CS6	105K400CS6 __
105	1.0	.700 (17.8)	.320 (8.1)	.880 (22.4)	.008	9.5	7	SMD	CS6G	105K400CS6G __

500 VDC / 250 VAC

PF Code	Value μF	W MAX	T MAX	L MAX	ESR Ω @500 KHz	RMS Current @500 KHz	# Leads per side	Lead Configuration	Case	Part Number
474	.47	.700 (17.8)	.320 (8.1)	.625 (15.9)	.011	6.2	4	Thru-hole	CS6	474K500CS6 __
474	.47	.700 (17.8)	.320 (8.1)	.625 (15.9)	.011	6.2	4	SMD	CS6G	474K500CS6G __
105	1.0	.700 (17.8)	.320 (8.1)	1.135 (28.8)	.008	9.5	8	Thru-hole	CS6	105K500CS6 __
105	1.0	.700 (17.8)	.320 (8.1)	1.135 (28.8)	.008	9.5	8	SMD	CS6G	105K500CS6G __

Dimensions in inches, metric (mm) in parenthesis.

 Tolerance: K ($\pm 10\%$) standard

RoHS part number information:

No suffix indicates RoHS-5 compliant standard part number. RoHS-5 product does not contain five of the RoHS banned materials (Hg, CrVI, Cd, PBB and PBDE) in levels exceeding the industry defined limits. Component lead frame pin-outs are plated with Sn / Pb and match conventional SnPb board assembly requirements.

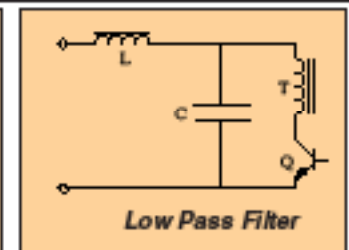
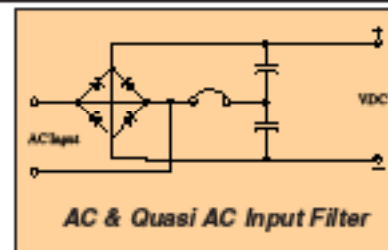
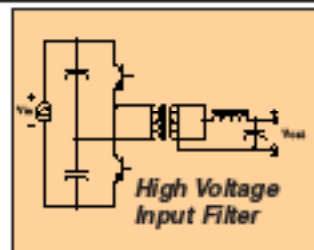
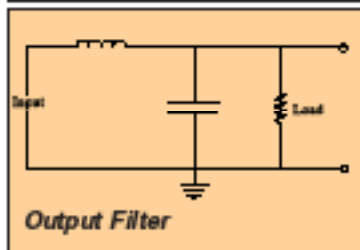
For a RoHS-6 compliant part, add a -FA suffix. RoHS-6 product does not contain any of the six RoHS banned materials (Hg, CrVI, Cd, PBB, PBDE and Pb) in levels exceeding the industry defined limits. Component lead frame pin-outs are plated with Sn.

Electrical	Performance	Physical						
Capacitance Range: 0.33 μF to 20.0 μF @ 1KHz Tolerance: Available in K ($\pm 10\%$) standard Voltage Range: 50, 100, 250, 400, 500 VDC Dissipation Factor: $\leq 1.0\%$ @ 25°C, 1KHz Insulation Resistance: $\geq 1,000$ Megohms $\times \mu\text{F}$. Need not exceed 1,000 Megohms.	Accelerated DC Voltage Life Test: 1,000 Hours, 85°C, 1.25 \times Rated VDC $\Delta C/C \leq 5\%$ $DF \leq 1.0\%$, 1KHz, 25°C $IR \geq 1,000$ Megohm $\times \mu\text{F}$. Need not exceed 1,000 Megohms Moisture/Humidity Test: 85°C / 85% RH / 21 days Applied Voltage: zero bias $\Delta C/C \leq 7\%$ $DF \leq 1.0\%$, 1KHz, 25°C $IR \geq 30\%$ of initial limit Long Term Stability: After 2 years storage, standard environment $\Delta C/C \leq 2\%$	Vibration: Mil Std 202 Method 204D Solder Resistance: Thru-hole wave: 260°C, 5 Sec. $\Delta C/C \leq 2\%$ SMD reflow: 220°C, 30 Sec. $\Delta C/C \leq 2\%$ Construction: Non-inductively constructed with metallized polyester dielectric (polyethylene terephthalate). Parallel plate-multilayer polymer (MLP) design. Electrode: Aluminum metallization. Case: UL94V-0 rated epoxy coating Lead Frame Material: Tinned Cu Alloy Lead Frame Lead Spacing: .400" (10.0mm) nominal CS4 .600" (15.0mm) nominal CS6 Marking: ITW, type, capacitance code, tolerance code, voltage and date code Packaging: Anti-static tube. SMD units dry packed with desiccant in moisture barrier bag. IPC/IEDEC J-STD-020 Moisture Sensitivity Level: MSL 4						
<table border="1"> <tr> <td>Rated Voltage</td> <td>≤ 100 VDC</td> <td>> 100 VDC</td> </tr> <tr> <td>Test Voltage</td> <td>10 VDC</td> <td>100 VDC</td> </tr> </table>	Rated Voltage	≤ 100 VDC	> 100 VDC	Test Voltage	10 VDC	100 VDC		
Rated Voltage	≤ 100 VDC	> 100 VDC						
Test Voltage	10 VDC	100 VDC						
Temperature Coefficient: +6% from -55°C to 85°C Dielectric Strength: 1.3 \times rated voltage for 50/100/250/500 volt ratings. 1.6 \times rated voltage for 400 volt rating Self Inductance: $< 6\text{nH}$ (Typical) CS6 $< 4\text{nH}$ (Typical) CS4 Temperature Range: -55°C to 125°C, derate voltage 1.25% / °C above 85°C for 50/100/250 volt ratings. -55°C to 125°C, with no voltage derating for 400/500 volt ratings.								

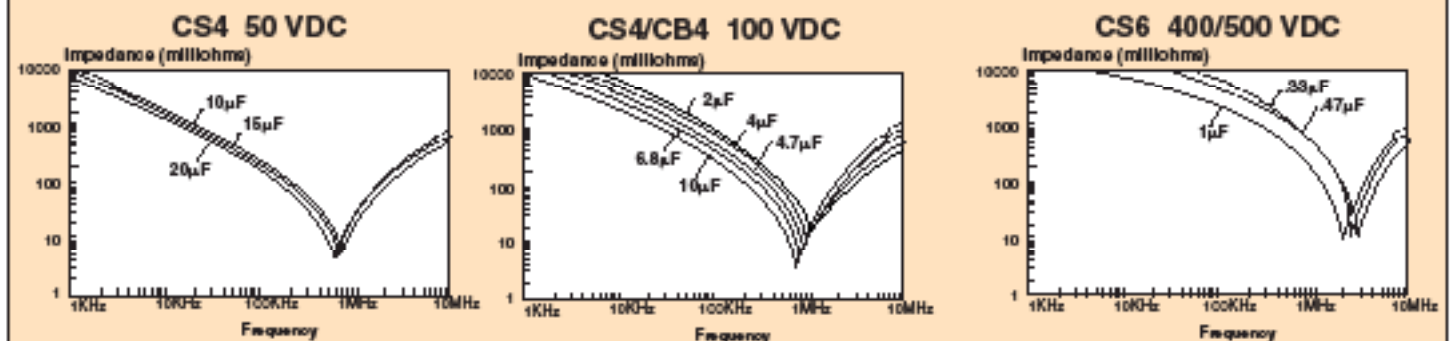
CS/CB Performance Characteristics over a range of -55°C to +85°C

MAXIMUM RMS CURRENT (AMPS) VS. FREQUENCY							MAXIMUM RMS VOLTAGE VS. FREQUENCY						
Value μF	Rated VDC	1 KHz	10 KHz	100 KHz	500 KHz	1MHz	Value μF	Rated VDC	1 KHz	10 KHz	100 KHz	500 KHz	1MHz
.47	500	0.8	1.9	3.9	6.2	7.1	.47	500	250	64	13.1	4.2	2.4
1.0	500	1.1	2.4	5.9	9.5	10.6	1.0	500	176	38	9.4	3.0	1.6
.33	400	0.7	1.3	3.5	6.0	6.9	.33	400	250	64	17.2	6.9	4.0
.47	400	0.8	1.9	3.9	6.2	7.0	.47	400	250	64	13.1	4.2	2.4
1.0	400	1.1	2.4	5.9	9.5	10.5	1.0	400	176	38	9.4	3.0	1.6
1.0	250	0.7	1.6	3.3	5.2	5.9	1.0	250	94	24	5.0	1.6	0.9
2.0	100	0.4	2.6	6.0	8.3	8.9	2.0	100	35	21	4.7	1.3	0.7
4.0	100	1.9	4.2	10.2	11.5	12.0	4.0	100	35	18	4.2	1.0	0.4
4.7	100	2.0	4.5	10.8	12.2	12.6	4.7	100	35	18	3.7	0.8	0.3
6.8	100	2.9	6.6	12.5	13.7	14.0	6.8	100	35	18	2.9	0.6	0.3
10.0	100	4.3	9.9	14.1	15.3	15.6	10.0	100	35	18	2.2	0.5	0.3
10.0	50	4.2	9.7	14.0	15.3	15.6	10.0	50	35	18	2.2	0.5	0.2
20.0	50	9.3	13.3	16.7	17.8	18.0	20.0	50	35	18	1.3	0.3	0.1

TYPICAL APPLICATIONS



TYPICAL IMPEDANCE VS. FREQUENCY



TYPICAL ESR VS. FREQUENCY

