Evans GROUP
PAKTRON

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paktron@evans-group.com

Capacitor Type

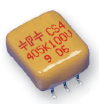
CS4 CS6

High Performance MLP Film Capacitor

- Surface-mount capability
- Ideal 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
- Volumetrically efficient
- Made in U.S.A.

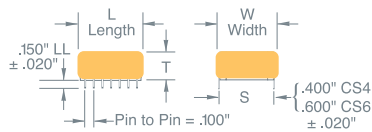
Voltage Ratings Note:
Like all film capacitors, Capstick® capacitors have "true" voltage ratings and, unlike some other dielectric systems, do not require derating to maximize reliability (MTBF) or service life. With FIT rates well under 5 when used at rated voltage, these units make a positive contribution to overall MTBF calculations.

For example, in some dielectric systems, designers may specify a 500 V capacitor for a 370 V input application to provide margin. By contrast, film capacitors are designed to operate fully and reliably at their rated voltage for the life of the equipment. Many leading-edge designs take advantage of this characteristic, using film capacitors at rated voltage to reduce board size and improve performance.

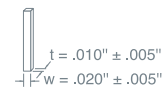


Electrical Schematic

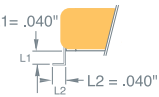
Non-polarized



LEAD SIZE



GULL WING LEADS



50 VDC / 35 VAC

PF Code	Value µF	W Max	T Max	L Max	ESR @500 KHz	RMS Current @500 KHz (A)	# Leads per side	Lead Configuration	Case	Part Number
106	10.0	0.500 (12.7)	0.320 (8.1)	0.620 (15.7)	0.003	15.3	5	Thru-hole	CS4	106K050CS4 _ _
106	10.0	0.500 (12.7)	0.320 (8.1)	0.620 (15.7)	0.003	15.3	5	SMD	CS4G	106K050CS4G _ _
206	20.0	0.500 (12.7)	0.320 (8.1)	1.150 (29.2)	0.0025	17.8	9	Thru-hole	CS4	206K050CS4 _ _
206	20.0	0.500 (12.7)	0.320 (8.1)	1.150 (29.2)	0.0025	17.8	9	SMD	CS4G	206K050CS4G _ _

100 VDC / 80 VAC

PF Code	Value µF	W Max	T Max	L Max	ESR @500 KHz	RMS Current @500 KHz (A)	# Leads per side	Lead Configuration	Case	Part Number
205	2.0	0.500 (12.7)	0.250 (6.3)	0.450 (11.4)	0.009	8.3	3	Thru-hole	CS4	205K100CS4 _ _
205	2.0	0.500 (12.7)	0.250 (6.3)	0.450 (11.4)	0.009	8.3	3	SMD	CS4G	205K100CS4G _ _
405	4.0	0.500 (12.7)	0.250 (6.3)	0.450 (11.4)	0.007	11.5	3	Thru-hole	CS4	405K100CS4 _ _
405	4.0	0.500 (12.7)	0.250 (6.3)	0.450 (11.4)	0.007	11.5	3	SMD	CS4G	405K100CS4G _ _
475	4.7	0.500 (12.7)	0.250 (6.3)	0.525 (13.3)	0.006	12.2	3	Thru-hole	CS4	475K100CS4 _ _
475	4.7	0.500 (12.7)	0.250 (6.3)	0.525 (13.3)	0.006	12.2	3	SMD	CS4G	475K100CS4G _ _
685	6.8	0.500 (12.7)	0.250 (6.3)	0.700 (17.8)	0.005	13.7	5	Thru-hole	CS4	685K100CS4 _ _
685	6.8	0.500 (12.7)	0.250 (6.3)	0.700 (17.8)	0.005	13.7	5	SMD	CS4G	685K100CS4G _ _
106	10.0	0.500 (12.7)	0.250 (6.3)	0.995 (25.3)	0.003	15.3	7	Thru-hole	CS4	106K100CS4 _ _
106	10.0	0.500 (12.7)	0.250 (6.3)	0.995 (25.3)	0.003	15.3	7	SMD	CS4G	106K100CS4G _ _

250 VDC / 160 VAC

PF Code	Value µF	W Max	T Max	L Max	ESR @500 KHz	RMS Current @500 KHz (A)	# Leads per side	Lead Configuration	Case	Part Number
105	1.0	0.700 (17.8)	0.300 (7.5)	0.440 (11.2)	0.012	5.2	3	Thru-hole	CS6	105K250CS6 _ _
105	1.0	0.700 (17.8)	0.300 (7.5)	0.440 (11.2)	0.012	5.2	3	SMD	CS6G	105K250CS6G _ _

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400 VDC / 250 VAC

PF Code	Value µF	W Max	T Max	L Max	ESR @500 KHz	RMS Current @500 KHz (A)	# Leads per side	Lead Configuration	Case	Part Number
334	0.33	0.700 (17.8)	0.320 (8.1)	0.435 (11.0)	0.012	6.0	3	Thru-hole	CS6	334K400CS6 _ _
334	0.33	0.700 (17.8)	0.320 (8.1)	0.435 (11.0)	0.012	6.0	3	SMD	CS6G	334K400CS6G _ _
474	0.47	0.700 (17.8)	0.320 (8.1)	0.460 (11.7)	0.011	6.2	3	Thru-hole	CS6	474K400CS6 _ _
474	0.47	0.700 (17.8)	0.320 (8.1)	0.460 (11.7)	0.011	6.2	3	SMD	CS6G	474K400CS6G _ _
105	1.0	0.700 (17.8)	0.320 (8.1)	0.880 (22.4)	0.008	9.5	7	Thru-hole	CS6	105K400CS6 _ _
105	1.0	0.700 (17.8)	0.320 (8.1)	0.880 (22.4)	0.008	9.5	7	SMD	CS6G	105K400CS6G _ _

500 VDC / 250 VAC

PF Code	Value µF	W Max	T Max	L Max	ESR @500 KHz	RMS Current @500 KHz (A)	# Leads per side	Lead Configuration	Case	Part Number
474	0.47	0.700 (17.8)	0.320 (8.1)	0.625 (15.9)	0.011	6.2	4	Thru-hole	CS6	474K500CS6 _ _
474	0.47	0.700 (17.8)	0.320 (8.1)	0.625 (15.9)	0.011	6.2	4	SMD	CS6G	474K500CS6G _ _
105	1.0	0.700 (17.8)	0.320 (8.1)	1.135 (28.8)	0.008	9.5	8	Thru-hole	CS6	105K500CS6 _ _
105	1.0	0.700 (17.8)	0.320 (8.1)	1.135 (28.8)	0.008	9.5	8	SMD	CS6G	105K500CS6G _ _

Dimensions in inches, metric (mm) in parenthesis.
Tolerance: K (±10%) standard, J (±5%) available
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 wires 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 wires are plated with Sn.

Electrical

Capacitance Range:
0.33 µF to 20.0 µF @ 1KHz
Tolerance:
Available in K (±10%) standard
Voltage Range:
50, 100, 250, 400, 500 VDC
Dissipation Factor:
≤ 1.0 % @ 25°C, 1KHz
Insulation Resistance:
≥ 1,000 Megohms x µF
Need not exceed 1,000 Megohms.

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 x rated voltage for 50/100/250/500 volt ratings.
1.6 x rated voltage for 400 volt rating
Self Inductance:
< 6nH (Typical) CS6
< 4nH (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.

Performance

Accelerated DC Voltage Life Test:
1,000 Hours, 85°C, 1.25 × Rated VDC
Δ C/C ≤ 5%
DF ≤ 1.0%, 1KHz, 25°C
IR ≥ 1,000 Megohm × µF Need not exceed 1,000 Megohms

Moisture/Humidity Test:
85°C / 85% RH / 21 days Applied Voltage: zero bias
Δ C/C ≤ 7%
DF ≤ 1.0%, 1KHz, 25°C
IR ≥ 30% of initial limit

Long Term Stability:
After 2 years storage, standard environment
Δ C/C ≤ 2%

Physical

Vibration:
Mil Std 202 Method 204D

Solder Resistance:
Thru-hole wave: 260°C, 5 Sec. Δ C/C ≤ 2% SMD reflow: 220°C, 30 Sec. Δ C/C ≤ 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:
⧺P⧺ type, capacitance code, tolerance code, voltage and date code

Packaging:
Anti-static tube.
SMD units dry packed with desiccant in moisture barrier bag. JEDEC level on package..

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