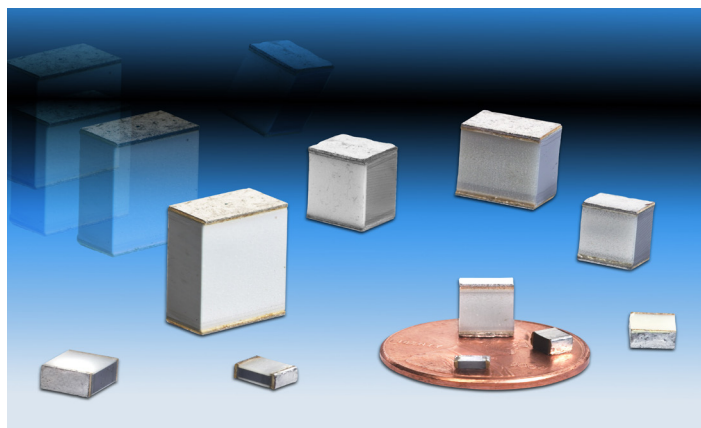


# Type FCN Surface Mount Film Capacitors

## Stable Stacked Metallized Film (PEN) Chips for Reflow Soldering



Type FCN SMT capacitors are the general purpose line of CDE's surface mount product offerings. They range in capacitance from .001  $\mu\text{F}$  to 1.0  $\mu\text{F}$ , and they are available in voltage ratings up to 400 Vdc.

Type FCN capacitors are designed for applications requiring a general purpose SMT capacitor with stable temperature and frequency characteristics similar to polyester film capacitors. They are ideal for applications such as EMI noise filtering, power supply input/output filters, audio or signal coupling, and IC power bus bypassing or decoupling. FCN SMT capacitors have a non-inductive stacked metallized PEN film construction which results in a low ESR and excellent high frequency performance.

### Highlights

- Designed for reflow soldering
- Withstands 150% of rated voltage for 60 seconds
- Stacked metallized polyethylene naphthalate (PEN) film
- Performs like polyester capacitors
- Nonmagnetic and lead-free

### Specifications

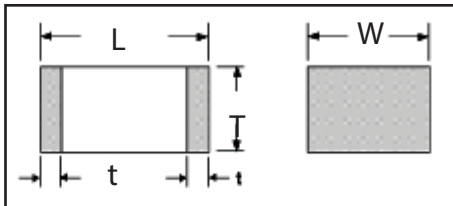
|                                    |                                                                                                                                                                                                                                                                                                                               |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Capacitance Range                  | 1000 pF to 1.0 $\mu\text{F}$ (1kHz at $\leq 5$ Vrms)                                                                                                                                                                                                                                                                          |
| Capacitance Tolerance              | $\pm 5\%$ (J), $\pm 10\%$ (K) (See Ratings)                                                                                                                                                                                                                                                                                   |
| Rated Voltage                      | 16, 50, 100, 250 & 400 Vdc                                                                                                                                                                                                                                                                                                    |
| Dissipation Factor (Tan $\delta$ ) | 1.0% Max. (1 kHz at 5 Vrms)                                                                                                                                                                                                                                                                                                   |
| Operating Temperature Range        | 16, 50, 100Vdc ( $< 0.012 \mu\text{F}$ ); $-55^\circ\text{C}$ to $+105^\circ\text{C}$<br>100 Vdc ( $\geq 0.012 \mu\text{F}$ ), 250, 400 Vdc; $-40^\circ\text{C}$ to $+85^\circ\text{C}$                                                                                                                                       |
| Surface Temperature                | 16 V & 50 V & 100 V $\leq 0.01 \mu\text{F}$ : 240 $^\circ\text{C}$ max<br>100 V $\geq 0.012 \mu\text{F}$ , 250 V & 400 V: 230 $^\circ\text{C}$ max                                                                                                                                                                            |
| Insulation Resistance              | C $> 0.33 \mu\text{F}$ : IR = 1000 $\text{M}\Omega \cdot \mu\text{F}$ Min.<br>C $\leq 0.33 \mu\text{F}$ : IR $\geq 3000 \text{ M}\Omega$                                                                                                                                                                                      |
| Construction                       | Stacked metallized polyphenylene sulfide (PPS) film. Terminations are lead free with a Sn-Ag-Cu solder finish.                                                                                                                                                                                                                |
| Withstand Voltage                  | 16 V & 50 V, 100 V $\leq 0.01 \mu\text{F}$ : 175% rated voltage, 5 s<br>100 V $\geq 0.012 \mu\text{F}$ , 250 V and 400 V: 150% rated voltage, 5 s                                                                                                                                                                             |
| Life Test                          | 1000 h at rated temp. & 125% rated voltage<br>$\Delta$ Capacitance: +1%, -6% max<br>Dissipation Factor: 1.1% max<br>IR: 1000 $\text{M}\Omega \cdot \text{min}$ (C $> 0.33 \mu\text{F}$ , 300 $\text{M}\Omega \cdot \mu\text{F}$ min)<br>No significant visual damage                                                          |
| Resistance to Soldering Heat       | 5 s at max capacitor surface temperature<br>$\Delta$ Capacitance: $\pm 5\%$ max<br>Dissipation Factor: 1.1% max<br>IR: 1000 $\text{M}\Omega \cdot \text{min}$ (C $> 0.33 \mu\text{F}$ , 300 $\text{M}\Omega \cdot \mu\text{F}$ min)<br>Voltage withstanding: 1.5 times rated voltage, 1 min.<br>No significant visual damage. |
| Moisture Resistance                | 500 h at 85 $^\circ\text{C}$ and 85% RH<br>$\Delta$ Capacitance: $\pm 10\%$ max<br>Dissipation Factor: 2% max<br>IR: 10 $\text{M}\Omega \cdot \text{min}$ (C $> 0.33 \mu\text{F}$ , 3 $\text{M}\Omega \cdot \mu\text{F}$ min)<br>Voltage withstanding: 1.3 times rated voltage, 1 min.<br>No significant damage               |
| RoHS Compliant                     |                                                                                                                                                                                                                                                                                                                               |

# Type FCN Surface Mount Film Capacitors

## Part Numbering System

| FCN  | 1206      | A           | 102                 | J             | H2         |      | Tape       | Tape               | Reel     |
|------|-----------|-------------|---------------------|---------------|------------|------|------------|--------------------|----------|
| Type | Case Size | Voltage     | Capacitance         | Tolerance     | Packaging  | Code | Width (mm) | Diameter [in.(mm)] | Quantity |
| FCN  | 1206      | C = 16 Vdc  | 102 = 0.001 $\mu$ F | J = $\pm$ 5%  | K1         | =    | 8          | 7 (178)            | 4000     |
|      | 1913      | H = 50 Vdc  | 223 = 0.022 $\mu$ F | K = $\pm$ 10% | J1, J2     | =    | 8          | 7 (178)            | 3000     |
|      | 2416      | A = 100 Vdc | 474 = 0.47 $\mu$ F  |               | H1, H2     | =    | 8          | 7 (178)            | 3000     |
|      | 2420      | E = 250 Vdc |                     |               | H3         | =    | 8          | 7 (178)            | 2000     |
|      | 2820      | G = 400 Vdc |                     |               | G1, G2, G3 | =    | 8          | 7 (178)            | 2000     |
|      | 3022      |             |                     |               | E1, E2     | =    | 12         | 13 (330)           | 3000     |
|      | 3925      |             |                     |               | E3, E4     | =    | 12         | 13 (330)           | 2000     |
|      | 3931      |             |                     |               | D1, D2     | =    | 12         | 13 (330)           | 3000     |
|      | 6031      |             |                     |               | D3, D4, D5 | =    | 12         | 13 (330)           | 2000     |
|      | 6040      |             |                     |               | B, Z       | =    | 12         | 13 (330)           | 1500     |
|      |           |             |                     |               | U, V, X, Y | =    | 16         | 13 (330)           | 1000     |
|      |           |             |                     |               | S, T       | =    | 24         | 13 (330)           | 750      |

## Outline Drawing



t = 0.014  $\pm$  0.008 in. (0.35  $\pm$  0.2 mm)

For 0.001  $\mu$ F – 0.01  $\mu$ F, 100 V, t = 0.026  $\pm$  0.012 in. (0.62  $\pm$  0.3 mm)

## Ratings

| Rated Voltage: 16 Vdc (12 Vac)           |                 | Operating Temperature Range: -55 to +105°C                                                                                                                                       |                             |                             |
|------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|
| Capacitance Range: 0.12 to 0.47 μF       |                 | Dielectric Withstand Voltage: 28 Vdc for 5 seconds                                                                                                                               |                             |                             |
| Capacitance Tolerance: ± 5% (J)          |                 | Insulation Resistance (20°C, 10 Vdc, 60 Seconds);<br>For $C \leq 0.33 \mu\text{F}$ , I.R. $\geq 3000 \text{ Meg}\Omega$<br>For $C > 0.33 \mu\text{F}$ , I.R. = 1000 MegW•μF Min. |                             |                             |
| D.F. (20°C, 1 kHz): $\leq 1\%$           |                 |                                                                                                                                                                                  |                             |                             |
| Max. capacitor surface temperature: 40°C |                 |                                                                                                                                                                                  |                             |                             |
| Capacitance (μF)                         | CDE P.N.        | L ±.008 (±0.2)<br>[in.(mm)]                                                                                                                                                      | W ±.012 (±0.3)<br>[in.(mm)] | T ±.008 (±0.2)<br>[in.(mm)] |
| 0.12                                     | FCN1913C124J-E1 | 0.189 (4.8)                                                                                                                                                                      | 0.130 (3.3)                 | 0.055 (1.4)                 |
| 0.15                                     | FCN1913C154J-E2 | 0.189 (4.8)                                                                                                                                                                      | 0.130 (3.3)                 | 0.079 (2.0)                 |
| 0.18                                     | FCN1913C184J-E2 | 0.189 (4.8)                                                                                                                                                                      | 0.130 (3.3)                 | 0.079 (2.0)                 |
| 0.22                                     | FCN1913C224J-E4 | 0.189 (4.8)                                                                                                                                                                      | 0.130 (3.3)                 | 0.094 (2.4)                 |
| 0.27                                     | FCN2416C274J-D1 | 0.236 (6.0)                                                                                                                                                                      | 0.161 (4.1)                 | 0.071 (1.8)                 |
| 0.33                                     | FCN2416C334J-D2 | 0.236 (6.0)                                                                                                                                                                      | 0.161 (4.1)                 | 0.079 (2.0)                 |
| 0.39                                     | FCN2416C394J-D3 | 0.236 (6.0)                                                                                                                                                                      | 0.161 (4.1)                 | 0.094 (2.4)                 |
| 0.47                                     | FCN2416C474J-D4 | 0.236 (6.0)                                                                                                                                                                      | 0.161 (4.1)                 | 0.110 (2.8)                 |

# Type FCN Surface Mount Film Capacitors

| Rated Voltage: 50 Vdc (40 Vac)            |                 | Operating Temperature Range: -55 to +105°C                              |                             |                             |
|-------------------------------------------|-----------------|-------------------------------------------------------------------------|-----------------------------|-----------------------------|
| Capacitance Range: 0.056 to 0.22 µF       |                 | Dielectric Withstand Voltage: 87.5 Vdc for 5 seconds                    |                             |                             |
| Capacitance Tolerance: ± 5% (J)           |                 | Insulation Resistance (20°C, 50 Vdc, 60 Seconds);<br>I.R. ≥ 3000 Megohm |                             |                             |
| D.F. (20°C, 1 kHz): ≤ 1%                  |                 |                                                                         |                             |                             |
| Max. capacitor surface temperature: 210°C |                 |                                                                         |                             |                             |
| Capacitance (µF)                          | CDE P.N.        | L ±.008 (±0.2)<br>[in.(mm)]                                             | W ±.012 (±0.3)<br>[in.(mm)] | T ±.008 (±0.2)<br>[in.(mm)] |
| 0.056                                     | FCN1913H563J-E2 | 0.189 (4.8)                                                             | 0.130 (3.3)                 | 0.079 (2.0)                 |
| 0.068                                     | FCN1913H683J-E2 | 0.189 (4.8)                                                             | 0.130 (3.3)                 | 0.079 (2.0)                 |
| 0.082                                     | FCN1913H823J-E4 | 0.189 (4.8)                                                             | 0.130 (3.3)                 | 0.094 (2.4)                 |
| 0.10                                      | FCN1913H104J-E3 | 0.189 (4.8)                                                             | 0.130 (3.3)                 | 0.110 (2.8)                 |
| 0.12                                      | FCN2416H124J-D1 | 0.236 (6.0)                                                             | 0.161 (4.1)                 | 0.071 (1.8)                 |
| 0.15                                      | FCN2416H154J-D2 | 0.236 (6.0)                                                             | 0.161 (4.1)                 | 0.079 (2.0)                 |
| 0.18                                      | FCN2416H184J-D3 | 0.236 (6.0)                                                             | 0.161 (4.1)                 | 0.094 (2.4)                 |
| 0.22                                      | FCN2416H224J-D4 | 0.236 (6.0)                                                             | 0.161 (4.1)                 | 0.110 (2.8)                 |

|                                                  |                 |                                                                                          |                                     |                                     |
|--------------------------------------------------|-----------------|------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Rated Voltage:</b> 100 Vdc (63 Vac)           |                 | <b>Operating Temperature Range:</b> -55 to +105°C                                        |                                     |                                     |
| <b>Capacitance Range:</b> 0.001 to 0.010 μF      |                 | <b>Dielectric Withstand Voltage:</b> 175 Vdc for 5 seconds                               |                                     |                                     |
| <b>Capacitance Tolerance:</b> ± 5% (J)           |                 | <b>Insulation Resistance (20°C, 100 Vdc, 60 Seconds);</b><br><br><b>I.R. ≥ 3000 MegΩ</b> |                                     |                                     |
| <b>D.F. (20°C, 1 kHz):</b> ≤ 1%                  |                 |                                                                                          |                                     |                                     |
| <b>Max. capacitor surface temperature: 240°C</b> |                 |                                                                                          |                                     |                                     |
| <b>Capacitance (μF)</b>                          | <b>CDE P.N.</b> | <b>L ±.008 (±0.2)<br/>[in.(mm)]</b>                                                      | <b>W ±.008 (±0.2)<br/>[in.(mm)]</b> | <b>T ±.008 (±0.2)<br/>[in.(mm)]</b> |
| 0.001                                            | FCN1206A102J-H2 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.043 (1.1)                         |
| 0.0012                                           | FCN1206A122J-H2 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.043 (1.1)                         |
| 0.0015                                           | FCN1206A152J-H2 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.043 (1.1)                         |
| 0.0018                                           | FCN1206A182J-H2 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.043 (1.1)                         |
| 0.0022                                           | FCN1206A222J-H2 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.043 (1.1)                         |
| 0.0027                                           | FCN1206A272J-H2 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.043 (1.1)                         |
| 0.0033                                           | FCN1206A332J-H3 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.059 (1.5)                         |
| 0.0039                                           | FCN1206A392J-H3 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.059 (1.5)                         |
| 0.0047                                           | FCN1206A472J-H3 | 0.126 (3.2)                                                                              | 0.063 (1.6)                         | 0.059 (1.5)                         |
| 0.0056                                           | FCN1210A562J-G2 | 0.126 (3.2)                                                                              | 0.098 (2.5)                         | 0.059 (1.5)                         |
| 0.0068                                           | FCN1210A682J-G2 | 0.126 (3.2)                                                                              | 0.098 (2.5)                         | 0.059 (1.5)                         |
| 0.0082                                           | FCN1210A822J-G3 | 0.126 (3.2)                                                                              | 0.098 (2.5)                         | 0.083 (2.1)                         |
| 0.01                                             | FCN1210A103J-G3 | 0.126 (3.2)                                                                              | 0.098 (2.5)                         | 0.083 (2.1)                         |

# Type FCN Surface Mount Film Capacitors

|                                                  |                 |                                                                                                                                                                    |                                     |                                     |
|--------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Rated Voltage:</b> 100 Vdc (63 Vac)           |                 | <b>Operating Temperature Range:</b> -40 to +85°C                                                                                                                   |                                     |                                     |
| <b>Capacitance Range:</b> 0.012 to 1.0 µF        |                 | <b>Dielectric Withstand Voltage:</b> 150 Vdc for 60 seconds                                                                                                        |                                     |                                     |
| <b>Capacitance Tolerance:</b> ± 10% (K)          |                 | <b>Insulation Resistance (20°C, 100 Vdc, 60 Seconds);</b><br><br><b>For C ≤ 0.33 µF:I.R. ≥ 3000 MegΩ</b><br><br><b>For C &gt; 0.33 µF:I.R. = 1000 MegW•µF Min.</b> |                                     |                                     |
| <b>D.F. (20°C, 1 kHz):</b> ≤ 1%                  |                 |                                                                                                                                                                    |                                     |                                     |
| <b>Max. capacitor surface temperature: 230°C</b> |                 |                                                                                                                                                                    |                                     |                                     |
| <b>Capacitance (µF)</b>                          | <b>CDE P.N.</b> | <b>L ±.008 (±0.2)<br/>[in.(mm)]</b>                                                                                                                                | <b>W ±.012 (±0.3)<br/>[in.(mm)]</b> | <b>T ±.008 (±0.2)<br/>[in.(mm)]</b> |
| 0.012                                            | FCN1913A123K-E1 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.055 (1.4)                         |
| 0.015                                            | FCN1913A153K-E1 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.055 (1.4)                         |
| 0.018                                            | FCN1913A183K-E1 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.055 (1.4)                         |
| 0.022                                            | FCN1913A223K-E1 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.055 (1.4)                         |
| 0.027                                            | FCN1913A273K-E1 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.055 (1.4)                         |
| 0.033                                            | FCN1913A333K-E1 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.055 (1.4)                         |
| 0.039                                            | FCN1913A393K-E1 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.055 (1.4)                         |
| 0.047                                            | FCN1913A473K-E2 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.079 (2.0)                         |
| 0.056                                            | FCN1913A563K-E2 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.079 (2.0)                         |
| 0.068                                            | FCN1913A683K-E4 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.094 (2.4)                         |
| 0.082                                            | FCN1913A823K-E3 | 0.189 (4.8)                                                                                                                                                        | 0.130 (3.3)                         | 0.110 (2.8)                         |
| 0.10                                             | FCN2416A104K-D1 | 0.236 (6.0)                                                                                                                                                        | 0.161 (4.1)                         | 0.071 (1.8)                         |
| 0.12                                             | FCN2416A124K-D3 | 0.236 (6.0)                                                                                                                                                        | 0.161 (4.1)                         | 0.094 (2.4)                         |
| 0.15                                             | FCN2416A154K-D4 | 0.236 (6.0)                                                                                                                                                        | 0.161 (4.1)                         | 0.110 (2.8)                         |

| Capacitance (µF) | CDE P.N.       | L ±.016 (±0.4) <sup>2</sup><br>[in.(mm)] | W ±.016 (±0.4)<br>[in.(mm)] | T ±.012 (±0.3)<br>[in.(mm)] |
|------------------|----------------|------------------------------------------|-----------------------------|-----------------------------|
| 0.18             | FCN2820A184K-Z | 0.280 (7.1)                              | 0.197 (5.0)                 | 0.079 (2.0)                 |
| 0.22             | FCN2820A224K-Z | 0.280 (7.1)                              | 0.197 (5.0)                 | 0.094 (2.4)                 |
| 0.27             | FCN2820A274K-Z | 0.280 (7.1)                              | 0.197 (5.0)                 | 0.114 (2.9)                 |
| 0.33             | FCN2820A334K-Z | 0.280 (7.1)                              | 0.197 (5.0)                 | 0.138 (3.5)                 |
| 0.39             | FCN3022A394K-X | 0.303 (7.7)                              | 0.217 (5.5)                 | 0.134 (3.4)                 |
| 0.47             | FCN3022A474K-X | 0.303 (7.7)                              | 0.217 (5.5)                 | 0.157 (4.0)                 |
| 0.56             | FCN3925A564K-V | 0.386 (9.8)                              | 0.248 (6.3)                 | 0.118 (3.0)                 |
| 0.68             | FCN3925A684K-V | 0.386 (9.8)                              | 0.248 (6.3)                 | 0.142 (3.6)                 |
| 0.82             | FCN3925A824K-V | 0.386 (9.8)                              | 0.248 (6.3)                 | 0.169 (4.3)                 |
| 1.0              | FCN3925A105K-V | 0.386 (9.8)                              | 0.248 (6.3)                 | 0.201 (5.1)                 |

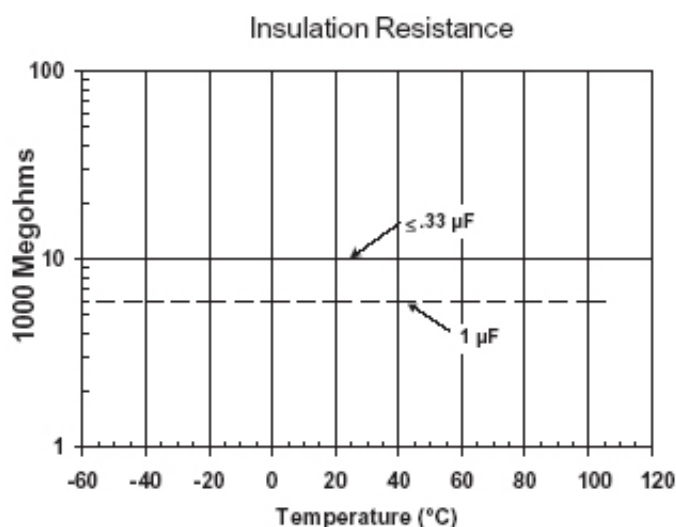
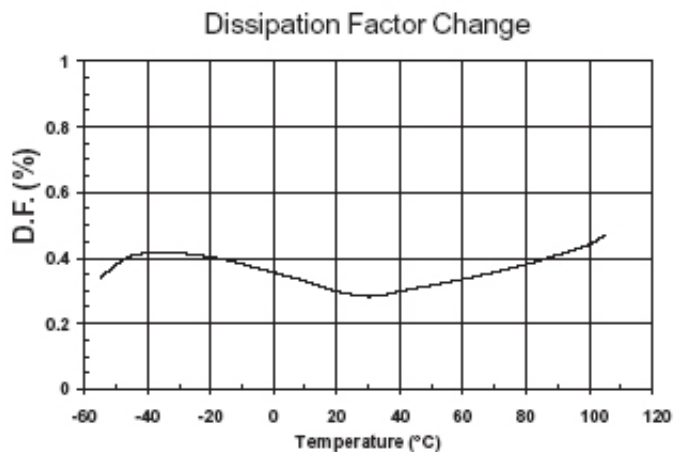
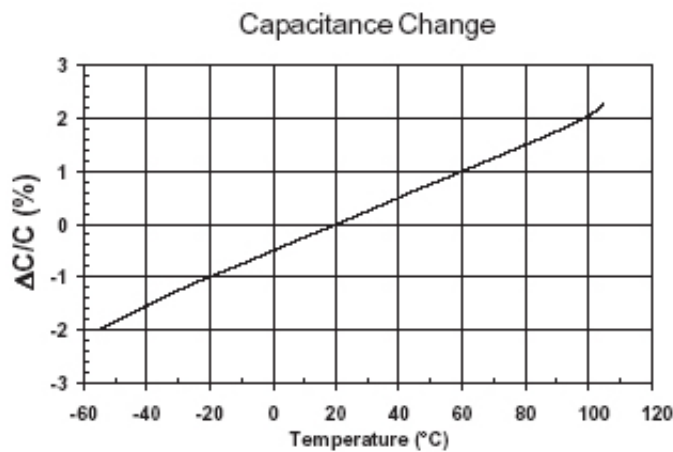
# Type FCN Surface Mount Film Capacitors

| Cap<br>( $\mu$ F) | Catalog<br>Part Number | L<br>in (mm)     |                  | W<br>in (mm)     |                 | T<br>in (mm)     |                 |
|-------------------|------------------------|------------------|------------------|------------------|-----------------|------------------|-----------------|
| 250 Vdc           |                        |                  |                  |                  |                 |                  |                 |
| 0.12              | FCN2420E124K-B *       | 0.236 $\pm$ .008 | (6.0 $\pm$ 0.2)  | 0.197            | (5.0)           | 0.177            | (4.5)           |
| 0.15              | FCN2825E154K-Y         | 0.280 $\pm$ .016 | (7.1 $\pm$ 0.4)  | 0.248            | (6.3)           | 0.138            | (3.5)           |
| 0.18              | FCN2825E184K-Y         | 0.280 $\pm$ .016 | (7.1 $\pm$ 0.4)  | 0.248            | (6.3)           | 0.161            | (4.1)           |
| 0.22              | FCN2825E224K-Y         | 0.280 $\pm$ .016 | (7.1 $\pm$ 0.4)  | 0.248            | (6.3)           | 0.201            | (5.1)           |
| 0.27              | FCN3925E274K-V         | 0.386 $\pm$ .020 | (9.8 $\pm$ 0.5)  | 0.248            | (6.3)           | 0.154            | (3.9)           |
| 0.33              | FCN3925E334K-V         | 0.386 $\pm$ .020 | (9.8 $\pm$ 0.5)  | 0.248            | (6.3)           | 0.189            | (4.8)           |
| 0.39              | FCN3931E394K-U         | 0.386 $\pm$ .020 | (9.8 $\pm$ 0.5)  | 0.315            | (8.0)           | 0.173            | (4.4)           |
| 0.47              | FCN3931E474K-U         | 0.386 $\pm$ .020 | (9.8 $\pm$ 0.5)  | 0.315            | (8.0)           | 0.209            | (5.3)           |
| 0.56              | FCN6031E564K-T         | 0.598 $\pm$ .020 | (15.2 $\pm$ 0.5) | 0.315            | (8.0)           | 0.146            | (3.7)           |
| 0.68              | FCN6031E684K-T         | 0.598 $\pm$ .020 | (15.2 $\pm$ 0.5) | 0.315            | (8.0)           | 0.173            | (4.4)           |
| 0.82              | FCN6040E824K-S         | 0.598 $\pm$ .020 | (15.2 $\pm$ 0.5) | 0.394            | (10.0)          | 0.165            | (4.2)           |
| 1.0               | FCN6040E105K-S         | 0.598 $\pm$ .020 | (15.2 $\pm$ 0.5) | 0.394            | (10.0)          | 0.201            | (5.1)           |
| 400 Vdc           |                        |                  |                  |                  |                 |                  |                 |
| 0.001             | FCN1913G102J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0012            | FCN1913G122J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0015            | FCN1913G152J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0018            | FCN1913G182J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0022            | FCN1913G222J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0027            | FCN1913G272J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0033            | FCN1913G332J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0039            | FCN1913G392J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0047            | FCN1913G472J-E1        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.055 $\pm$ .008 | (1.4 $\pm$ 0.2) |
| 0.0056            | FCN1913G562J-E2        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.079 $\pm$ .008 | (2.0 $\pm$ 0.2) |
| 0.0068            | FCN1913G682J-E2        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.079 $\pm$ .008 | (2.0 $\pm$ 0.2) |
| 0.0082            | FCN1913G822J-E4        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.094 $\pm$ .008 | (2.4 $\pm$ 0.2) |
| 0.01              | FCN1913G103J-E3        | 0.189 $\pm$ .008 | (4.8 $\pm$ 0.2)  | 0.130 $\pm$ .012 | (3.3 $\pm$ 0.3) | 0.110 $\pm$ .008 | (2.8 $\pm$ 0.2) |
| 0.012             | FCN2416G123J-D2        | 0.236 $\pm$ .008 | (6.0 $\pm$ 0.2)  | 0.161 $\pm$ .012 | (4.1 $\pm$ 0.3) | 0.079 $\pm$ .008 | (2.0 $\pm$ 0.2) |
| 0.015             | FCN2416G153J-D3        | 0.236 $\pm$ .008 | (6.0 $\pm$ 0.2)  | 0.161 $\pm$ .012 | (4.1 $\pm$ 0.3) | 0.094 $\pm$ .008 | (2.4 $\pm$ 0.2) |
| 0.018             | FCN2416G183J-D4        | 0.236 $\pm$ .008 | (6.0 $\pm$ 0.2)  | 0.161 $\pm$ .012 | (4.1 $\pm$ 0.3) | 0.110 $\pm$ .008 | (2.8 $\pm$ 0.2) |
| 0.022             | FCN2416G223J-D5        | 0.236 $\pm$ .008 | (6.0 $\pm$ 0.2)  | 0.161 $\pm$ .012 | (4.1 $\pm$ 0.3) | 0.126 $\pm$ .012 | (3.2 $\pm$ 0.3) |
| 0.027             | FCN2420G273J-B         | 0.236 $\pm$ .008 | (6.0 $\pm$ 0.2)  | 0.197 $\pm$ .016 | (5.0 $\pm$ 0.4) | 0.118 $\pm$ .012 | (3.0 $\pm$ 0.3) |
| 0.033             | FCN2420G333J-B         | 0.236 $\pm$ .008 | (6.0 $\pm$ 0.2)  | 0.197 $\pm$ .016 | (5.0 $\pm$ 0.4) | 0.142 $\pm$ .012 | (3.6 $\pm$ 0.3) |
| 0.039             | FCN2820G393J-Z         | 0.280 $\pm$ .016 | (7.1 $\pm$ 0.4)  | 0.197 $\pm$ .016 | (5.0 $\pm$ 0.4) | 0.126 $\pm$ .012 | (3.2 $\pm$ 0.3) |
| 0.047             | FCN2820G473J-Z         | 0.280 $\pm$ .016 | (7.1 $\pm$ 0.4)  | 0.197 $\pm$ .016 | (5.0 $\pm$ 0.4) | 0.150 $\pm$ .012 | (3.8 $\pm$ 0.3) |
| 0.056             | FCN2825G563J-Y         | 0.280 $\pm$ .016 | (7.1 $\pm$ 0.4)  | 0.248 $\pm$ .016 | (6.3 $\pm$ 0.4) | 0.142 $\pm$ .012 | (3.6 $\pm$ 0.3) |
| 0.068             | FCN2825G683J-Y         | 0.280 $\pm$ .016 | (7.1 $\pm$ 0.4)  | 0.248 $\pm$ .016 | (6.3 $\pm$ 0.4) | 0.173 $\pm$ .012 | (4.4 $\pm$ 0.3) |
| 0.082             | FCN3925G823J-V         | 0.386 $\pm$ .016 | (9.8 $\pm$ 0.4)  | 0.248 $\pm$ .016 | (6.3 $\pm$ 0.4) | 0.134 $\pm$ .012 | (3.4 $\pm$ 0.3) |
| 0.1               | FCN3925G104J-V         | 0.386 $\pm$ .016 | (9.8 $\pm$ 0.4)  | 0.248 $\pm$ .016 | (6.3 $\pm$ 0.4) | 0.157 $\pm$ .012 | (4.0 $\pm$ 0.3) |
| 0.12              | FCN3931G124J-U         | 0.386 $\pm$ .016 | (9.8 $\pm$ 0.4)  | 0.315 $\pm$ .016 | (8.0 $\pm$ 0.4) | 0.150 $\pm$ .012 | (3.8 $\pm$ 0.3) |
| 0.15              | FCN3931G154J-U         | 0.386 $\pm$ .016 | (9.8 $\pm$ 0.4)  | 0.315 $\pm$ .016 | (8.0 $\pm$ 0.4) | 0.181 $\pm$ .012 | (4.6 $\pm$ 0.3) |

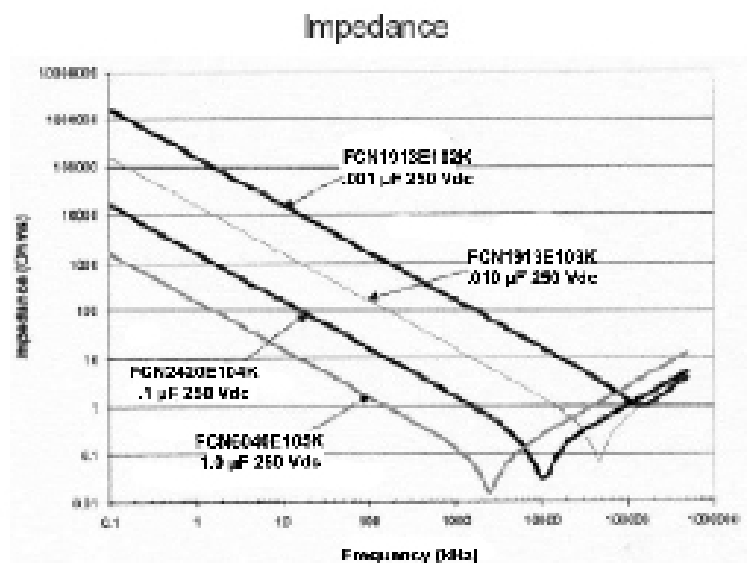
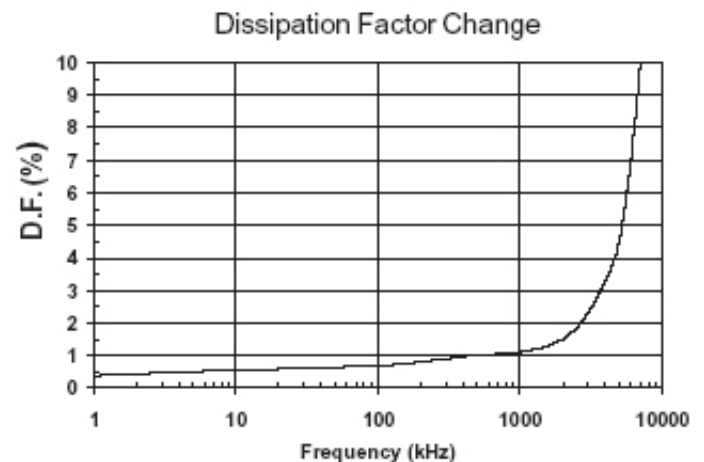
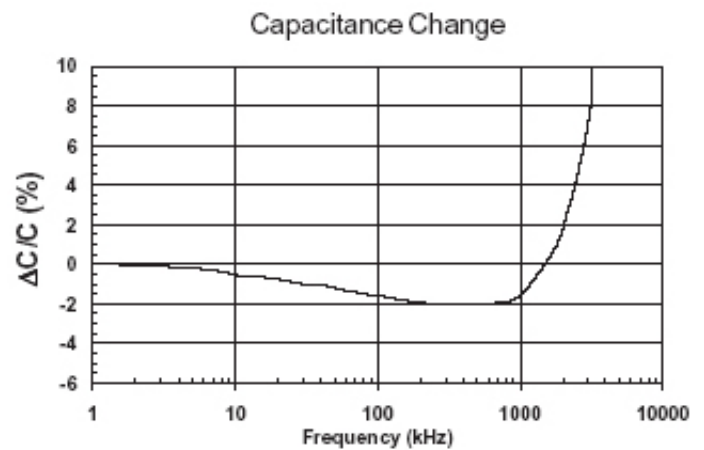
\* also available in 5% (J) tolerance

# Type FCN Surface Mount Film Capacitors

## Typical Temperature Characteristics

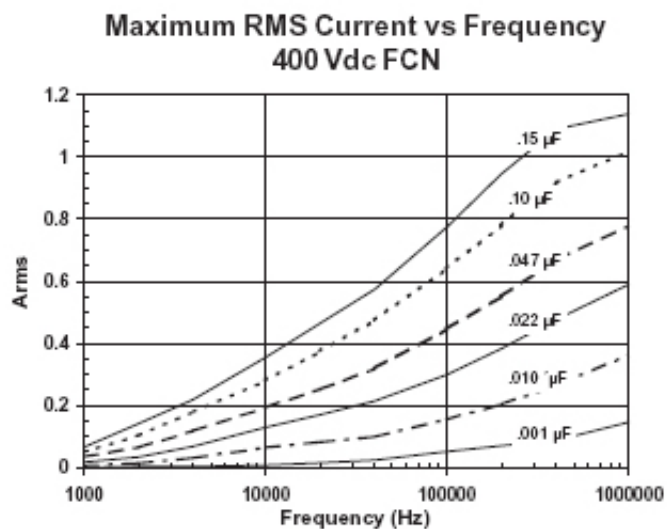
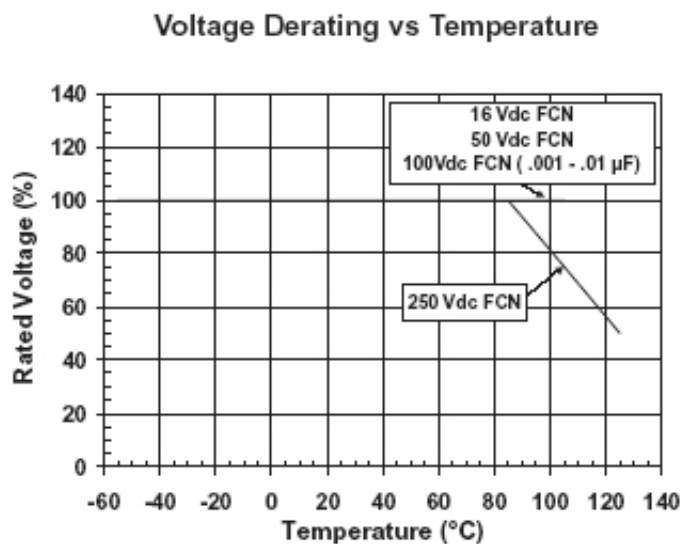
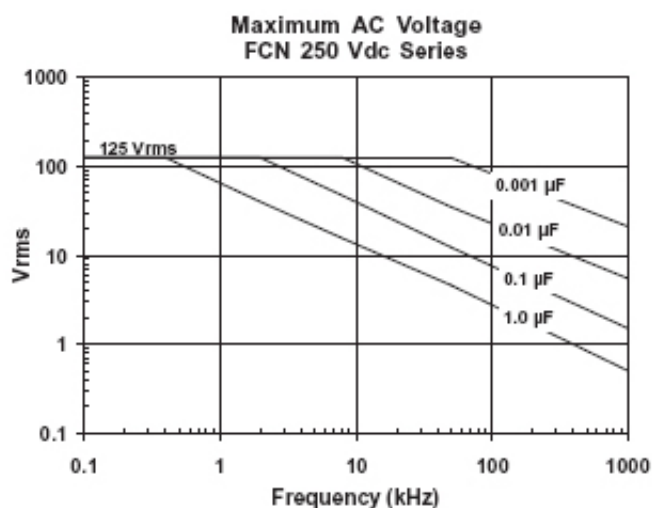
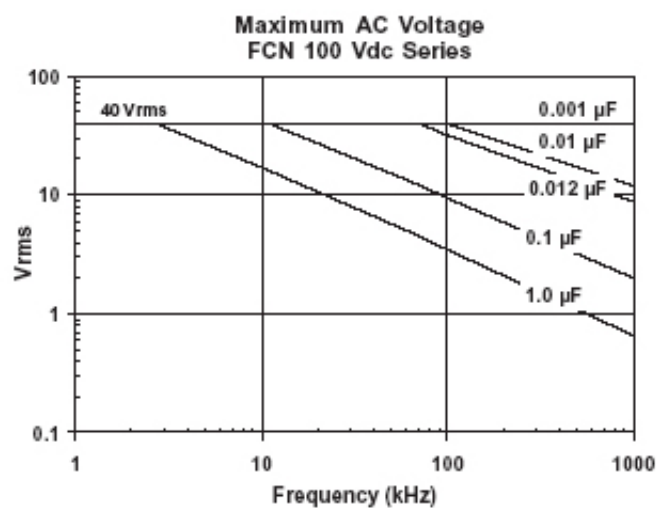
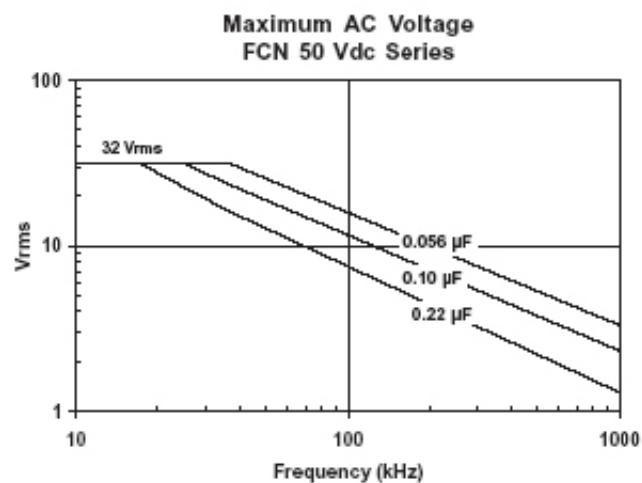
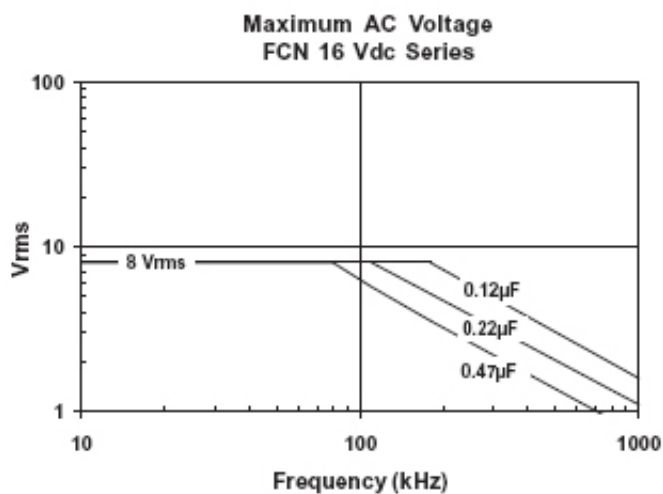


## Typical Frequency Characteristics



# Type FCN Surface Mount Film Capacitors

## Vrms vs. Frequency Characteristics





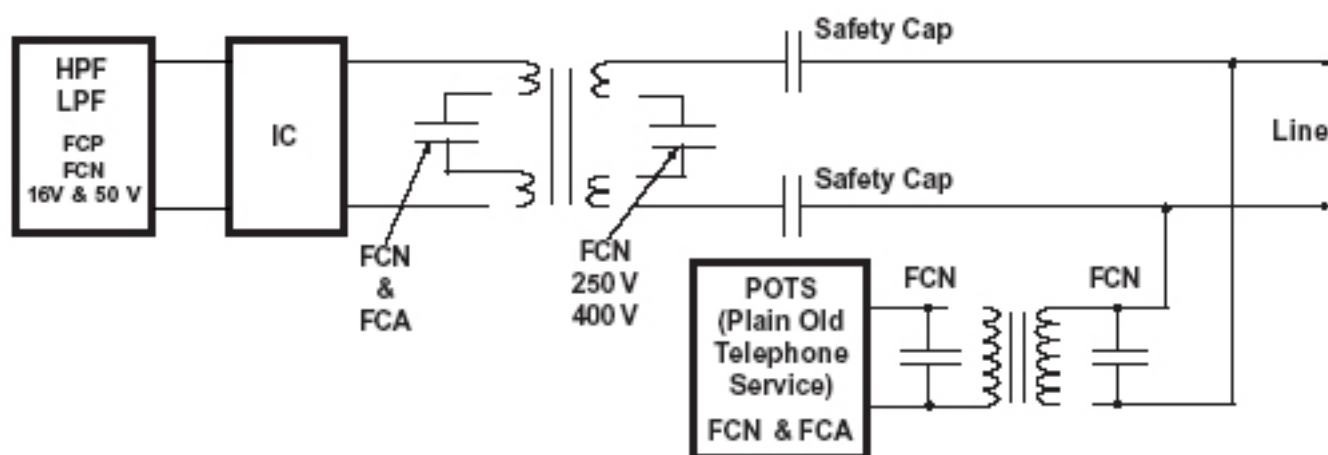
# Type FCN Surface Mount Film Capacitors

## Pulse Handling Capability

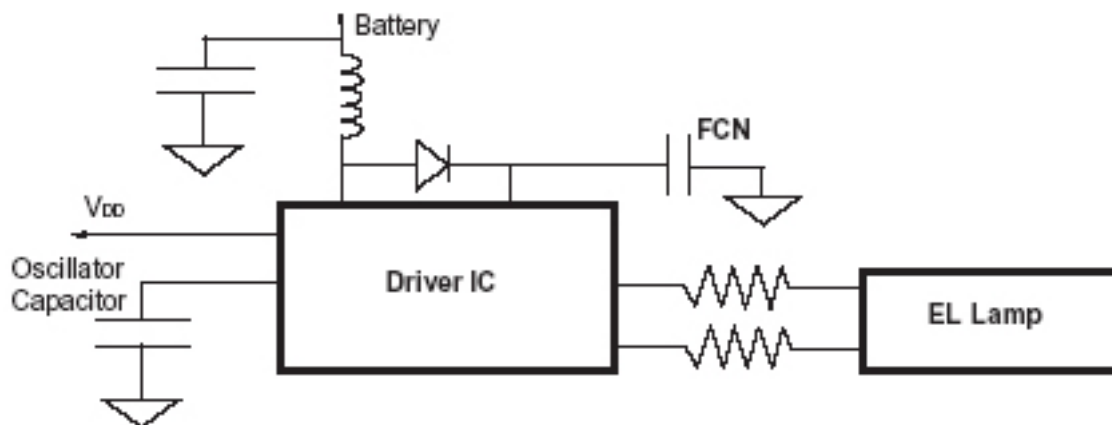
| Capacitance<br>( $\mu\text{F}$ ) | Voltage<br>(Vdc) | dV/dt<br>(volts/ $\mu\text{sec}$ ) | Capacitance<br>( $\mu\text{F}$ ) | Voltage<br>(Vdc) | dV/dt<br>(volts/ $\mu\text{sec}$ ) | Capacitance<br>( $\mu\text{F}$ ) | Voltage<br>(Vdc) | dV/dt<br>(volts/ $\mu\text{sec}$ ) |
|----------------------------------|------------------|------------------------------------|----------------------------------|------------------|------------------------------------|----------------------------------|------------------|------------------------------------|
| .12 - .22                        | 16               | 60                                 | .0039                            | 100              | 530                                | .001 - .0039                     | 250              | 615                                |
| .27 - .47                        | 16               | 40                                 | .0047                            | 100              | 480                                | .0047 - .033                     | 250              | 360                                |
| .056 - .10                       | 50               | 190                                | .0056                            | 100              | 450                                | .039 - .12                       | 250              | 240                                |
| .12 - .22                        | 50               | 130                                | .0068                            | 100              | 410                                | .15 - .22                        | 250              | 190                                |
| .001                             | 100              | 1000                               | .0082                            | 100              | 370                                | .27 - .47                        | 250              | 115                                |
| .0012                            | 100              | 920                                | .01                              | 100              | 340                                | .56 - 1.0                        | 250              | 65                                 |
| .0015                            | 100              | 830                                | .012 - .082                      | 100              | 320                                | .001 - .0039                     | 400              | 615                                |
| .0018                            | 100              | 760                                | .10 - .15                        | 100              | 210                                | .0047 - .01                      | 400              | 360                                |
| .0022                            | 100              | 690                                | .18 - .33                        | 100              | 120                                | .012 - .033                      | 400              | 240                                |
| .0027                            | 100              | 630                                | .39 - .47                        | 100              | 100                                | .039 - .068                      | 400              | 190                                |
| .0033                            | 100              | 570                                | .056 - 1.0                       | 100              | 70                                 | .082 - .15                       | 400              | 115                                |

## Typical Applications

### DC Blocking for xDSL



### Integration for Electroluminescent (EL) Driver



With no piezoelectric effects to deal with, the SMT film capacitor will not create electrical noise in signal circuits or buzzing in power circuits.



## Type FCN Surface Mount Film Capacitors

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