

High Performance K Series RFI Line Filters for SMPS Emission Control

# SK Series



UL Recognized  
CSA Certified  
VDE Approved



## SK Series

- Designed to reduce conducted noise to acceptable limits for equipment that must comply with FCC / EN specifications
- Utilizes significantly higher element values than the general purpose K Series which makes them better suited for equipment with Line to Ground and Line to Line conducted emissions including those with switching power supplies
- ESK6C and VSK6C incorporate separate ground circuit inductor to isolate the equipment chassis from power line ground at RF frequencies

## Ordering Information



\*IEC 60320-1 C14 inlet mates with C13 connector

## Specifications

### Maximum leakage current each Line to Ground:

|                         | VSK Models | ESK Models |
|-------------------------|------------|------------|
| <b>3, 6 &amp; 10A</b>   |            |            |
| @120 VAC 60 Hz:         | .4 mA      | .21 mA     |
| @250 VAC 50 Hz:         | .7 mA      | .36 mA     |
| <b>20, 30 &amp; 40A</b> |            |            |
| @120 VAC 60 Hz:         | .75 mA     | .3 mA      |
| @250 VAC 50 Hz:         | 1.25 mA    | .5 mA      |

### Hipot rating (one minute):

|                 |          |
|-----------------|----------|
| Line to Ground: | 2250 VDC |
| Line to Line:   | 1450 VDC |

### Rated Voltage (max):

250 VAC

### Operating Frequency:

50/60 Hz

### Rated Current:

3 to 40A

### Operating Ambient Temperature Range

(at rated current  $I_r$ ): -10°C to +40°C  
In an ambient temperature ( $T_a$ ) higher than +40°C the maximum operating current ( $I_o$ ) is calculated as follows:  $I_o = I_r \sqrt{(85-T_a)/45}$

## Available Part Numbers

|         |         |         |
|---------|---------|---------|
| 3VSK1   | 3ESK1   | 20ESK6  |
| 3VSK3   | 3ESK3   | 20VSK6  |
| 3VSK7   | 3ESK7   | 30ESK6  |
| 3VSK7M  | 3ESK7M  | 30ESK6C |
| 6VSK1   | 6ESK1   | 30VSK6  |
| 6VSK3   | 6ESK3   | 30VSK6C |
| 6VSK7   | 6ESK7   | 40VSK6  |
| 6VSK7M  | 6ESK7M  |         |
| 10VSK1  | 10ESK1  |         |
| 10VSK3  | 10ESK3  |         |
| 10VSK7  | 10ESK7  |         |
| 10VSK7M | 10ESK7M |         |

High Performance K Series Filters for SMPS Emission Control *(continued)*

# SK Series

## Electrical Schematic



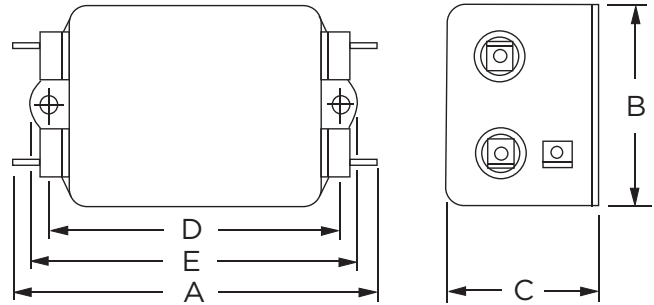
## Accessories

GA400: NEMA 5-15P to IEC 60320-1 C-13 line cord



## Case Styles

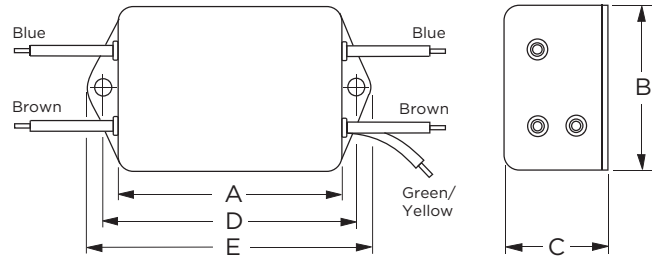
### SK1



Typical Dimensions:

- Line/Load Terminals (4): .250 [6.3] with .07 [1.8] Dia. hole
- Ground Terminal (1): .250 [6.3] with .07 x .16 [1.8 x 3.8] slot
- Mounting Holes (2): .188 [4.78] Dia.

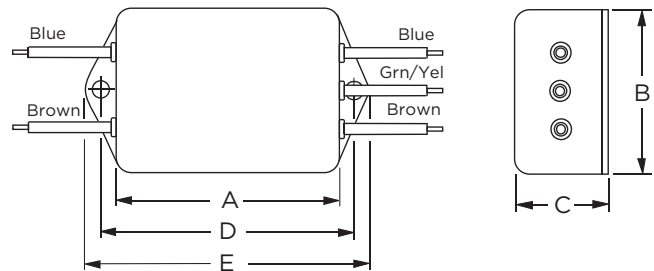
### SK3 (3A)



Typical Dimensions:

- Wire Leads (5): 4.0 [101.6] Min., AWG18
- Mounting Holes (2): .188 [4.78] Dia.

### SK3 (6 & 10A)



Typical Dimensions:

- Wire Leads (5): 4.0 [101.6] Min., AWG18 (AWG16 for 10A)
- Mounting Holes (2): .188 [4.78] Dia.

High Performance K Series Filters for SMPS Emission Control *(continued)*

# SK Series

## Case Styles *(continued)*

### SK6 (20A)



Typical Dimensions:  
 Terminals (5): 8-32, Torque 18 lbf-in. [2.03 N-m] max.  $\pm 2$  [.22]  
 Mounting Holes (2): .188 [4.78] Dia.

### SK6 (30A)



Typical Dimensions:  
 Terminals (5): 10-32, Torque 27 lbf-in. [3.05 N-m] max.  $\pm 2$  [.22]  
 Mounting Slots (4): .250 x .156 [6.35 x 3.96] Dia.

### SK6C (30A)



Typical Dimensions:  
 Terminals (5): 10-32, Torque 27 lbf-in. [3.05 N-m] max.  $\pm 2$  [.22]  
 Mounting Slots (4): .250 x .156 [6.35 x 3.96] Dia.

### SK6 (40A)



Typical Dimensions:  
 Terminals (5): 10-32, Torque 27 lbf-in. [3.05 N-m] max.  $\pm 2$  [.22]  
 Mounting Slots (4): .203 x .156 [5.15 x 3.96] Dia.

### SK7 & SK7M



Typical Dimensions:  
 Load Terminals (2): .250 [6.3] with .07 [1.8] Dia. hole  
 Ground Terminal (1): .250 [6.3] with .07 x .16 [1.8 x 3.8] slot  
 Line Inlet (1): IEC 60320-1 C14  
 K7 Tapped Inserts (2): 6-32 x 1/4  
 K7M Tapped Inserts (2): M3 x .5

### Recommended Panel Cutout



Tolerance  $\pm .005$  [0.13]  
 Back Mount Only



RFI Power Line Filters

High Performance K Series Filters for SMPS Emission Control *(continued)*

# SK Series

## Case Dimensions

| Part No.   | A<br>(max)    | B<br>(max)   | C<br>(max)   | D<br>$\pm .015$<br>$\pm .38$ | E<br>(max)   |
|------------|---------------|--------------|--------------|------------------------------|--------------|
| 3VSK1,     | <b>3.85</b>   | <b>2.07</b>  | <b>1.16</b>  | <b>2.938</b>                 | <b>3.35</b>  |
| 3ESK1      | <i>97.8</i>   | <i>52.6</i>  | <i>29.5</i>  | <i>74.63</i>                 | <i>85.1</i>  |
| 3VSK3,     | <b>2.56</b>   | <b>2.07</b>  | <b>1.16</b>  | <b>2.938</b>                 | <b>3.35</b>  |
| 3ESK3      | <i>65.0</i>   | <i>52.6</i>  | <i>29.5</i>  | <i>74.63</i>                 | <i>85.1</i>  |
| 3VSK7/7M,  | <b>3.21</b>   | <b>2.25</b>  | <b>1.53</b>  | <b>1.575</b>                 | <b>0.63*</b> |
| 3ESK7/7M   | <i>81.5</i>   | <i>57.2</i>  | <i>38.9</i>  | <i>40.01</i>                 | <i>16.0*</i> |
| 6VSK1,     | <b>4.34</b>   | <b>2.25</b>  | <b>1.28</b>  | <b>3.427</b>                 | <b>3.83</b>  |
| 6ESK1      | <i>110.2</i>  | <i>57.2</i>  | <i>32.5</i>  | <i>87.05</i>                 | <i>97.3</i>  |
| 6VSK3,     | <b>3.05</b>   | <b>2.25</b>  | <b>1.28</b>  | <b>3.427</b>                 | <b>3.83</b>  |
| 6ESK3      | <i>77.5</i>   | <i>57.2</i>  | <i>32.5</i>  | <i>87.05</i>                 | <i>97.3</i>  |
| 6VSK7/7M,  | <b>3.21</b>   | <b>2.25</b>  | <b>1.78</b>  | <b>1.575</b>                 | <b>0.63*</b> |
| 6ESK7/7M   | <i>81.5</i>   | <i>57.2</i>  | <i>45.2</i>  | <i>40.01</i>                 | <i>16.0*</i> |
| 10VSK1,    | <b>4.97</b>   | <b>2.25</b>  | <b>1.78</b>  | <b>4.063</b>                 | <b>4.46</b>  |
| 10ESK1     | <i>126.2</i>  | <i>57.2</i>  | <i>45.2</i>  | <i>103.2</i>                 | <i>113.3</i> |
| 10VSK3,    | <b>3.69</b>   | <b>2.25</b>  | <b>1.78</b>  | <b>4.063</b>                 | <b>4.46</b>  |
| 10ESK3     | <i>93.7</i>   | <i>57.2</i>  | <i>45.2</i>  | <i>103.2</i>                 | <i>113.3</i> |
| 10VSK7/7M, | <b>4.34</b>   | <b>2.25</b>  | <b>1.78</b>  | <b>1.575</b>                 | <b>0.63*</b> |
| 10ESK7/7M  | <i>110.0</i>  | <i>57.2</i>  | <i>45.2</i>  | <i>40.01</i>                 | <i>16.0*</i> |
| 20VSK6,    | <b>5.09</b>   | <b>2.25</b>  | <b>1.78</b>  | <b>4.063</b>                 | <b>4.46</b>  |
| 20ESK6     | <i>127.3</i>  | <i>57.2</i>  | <i>45.2</i>  | <i>103.2</i>                 | <i>129.3</i> |
| Part No.   | A<br>(max)    | B<br>(max)   | C<br>(max)   | D<br>$\pm .020$<br>$\pm .51$ | E<br>(max)   |
| 30VSK6,    | <b>4.92</b>   | <b>3.12</b>  | <b>2.75</b>  | <b>3.437</b>                 | <b>4.00</b>  |
| 30ESK6     | <i>125.0</i>  | <i>79.25</i> | <i>69.85</i> | <i>87.3</i>                  | <i>101.6</i> |
| 30VSK6C,   | <b>4.92</b>   | <b>3.12</b>  | <b>2.75</b>  | <b>3.437</b>                 | <b>4.00</b>  |
| 30ESK6C    | <i>125.0</i>  | <i>79.25</i> | <i>69.85</i> | <i>87.3</i>                  | <i>101.6</i> |
| 40VSK6     | <b>6.45</b>   | <b>3.12</b>  | <b>2.18</b>  | <b>3.50</b>                  | <b>3.96</b>  |
|            | <i>163.83</i> | <i>79.25</i> | <i>55.4</i>  | <i>88.9</i>                  | <i>100.6</i> |

\*±0.02 [0.5]

## Performance Data

### Typical Insertion Loss

Measured in closed 50 Ohm system

#### 3 & 6VSK



#### 3 & 6ESK



#### 10 & 20VSK



#### 10 & 20ESK



#### 30VSK



#### 30ESK



#### 40VSK



— Common Mode / Asymmetrical (L-G)  
- - - Differential Mode / Symmetrical (L-L)

**High Performance K Series Filters for SMPS Emission Control** *(continued)*

# SK Series

## Performance Data *(continued)*

### Minimum Insertion Loss

Measured in closed 50 Ohm system

Common Mode / Asymmetrical (Line to Ground)

| Current Rating    | Frequency – MHz |     |    |     |    |    |    |    |    |
|-------------------|-----------------|-----|----|-----|----|----|----|----|----|
|                   | .01             | .08 | .1 | .15 | .5 | 1  | 5  | 10 | 30 |
| <b>VSK Models</b> |                 |     |    |     |    |    |    |    |    |
| 3A, 6A            | 4               | 23  | 25 | 29  | 43 | 44 | 42 | 42 | 30 |
| 10A               | 4               | 23  | 25 | 29  | 43 | 44 | 42 | 42 | 30 |
| 20A               | 7               | 23  | 25 | 29  | 43 | 44 | 48 | 48 | 48 |
| 30A               | 2               | 13  | 14 | 15  | 27 | 31 | 46 | 51 | 39 |
| 40A               | 2               | 15  | 18 | 22  | 40 | 43 | 45 | 50 | 30 |
| <b>ESK Models</b> |                 |     |    |     |    |    |    |    |    |
| 3A, 6A            | 4               | 22  | 24 | 28  | 42 | 40 | 36 | 36 | 27 |
| 10A               | 4               | 22  | 24 | 28  | 42 | 40 | 36 | 36 | 27 |
| 20A               | 7               | 22  | 24 | 28  | 35 | 38 | 45 | 45 | 45 |
| 30A               | 2               | 13  | 15 | 15  | 27 | 31 | 40 | 41 | 36 |

Differential Mode / Symmetrical (Line to Line)

| Current Rating    | Frequency – MHz |     |    |     |    |    |    |    |    |
|-------------------|-----------------|-----|----|-----|----|----|----|----|----|
|                   | .01             | .08 | .1 | .15 | .5 | 1  | 5  | 10 | 30 |
| <b>VSK Models</b> |                 |     |    |     |    |    |    |    |    |
| 3A, 6A            | 1               | 3   | 10 | 25  | 59 | 65 | 62 | 40 | 40 |
| 10A               | 1               | 3   | 3  | 10  | 55 | 65 | 65 | 50 | 50 |
| 20A               | 1               | 10  | 8  | 8   | 45 | 60 | 65 | 60 | 60 |
| 30A               | 5               | 13  | 13 | 13  | 60 | 60 | 51 | 43 | 43 |
| 40A               | 7               | 14  | 16 | 30  | 65 | 65 | 65 | 57 | 50 |
| <b>ESK Models</b> |                 |     |    |     |    |    |    |    |    |
| 3A, 6A            | 1               | 3   | 10 | 25  | 59 | 65 | 62 | 40 | 40 |
| 10A               | 1               | 3   | 3  | 10  | 55 | 65 | 65 | 65 | 45 |
| 20A               | 1               | 10  | 8  | 8   | 45 | 60 | 65 | 60 | 60 |
| 30A               | 5               | 12  | 12 | 13  | 60 | 60 | 51 | 43 | 43 |

