

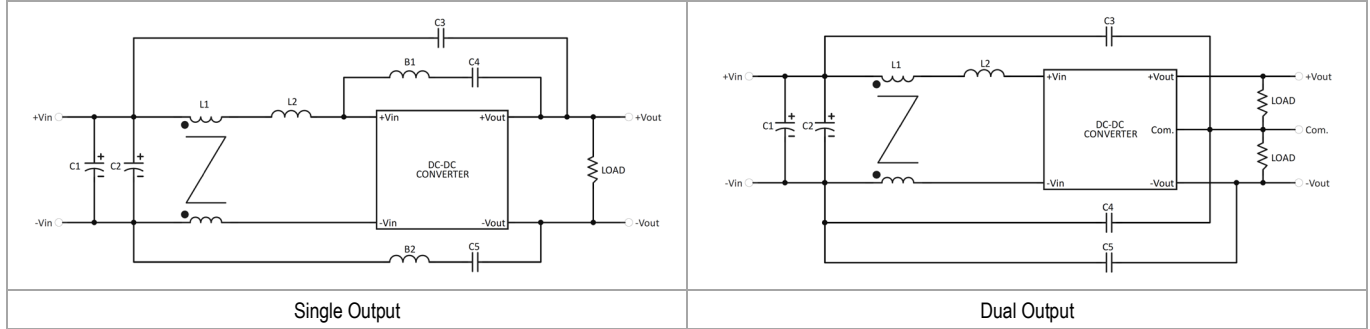


**MINMAX<sup>®</sup>**

MKW180 Series - EMC Note

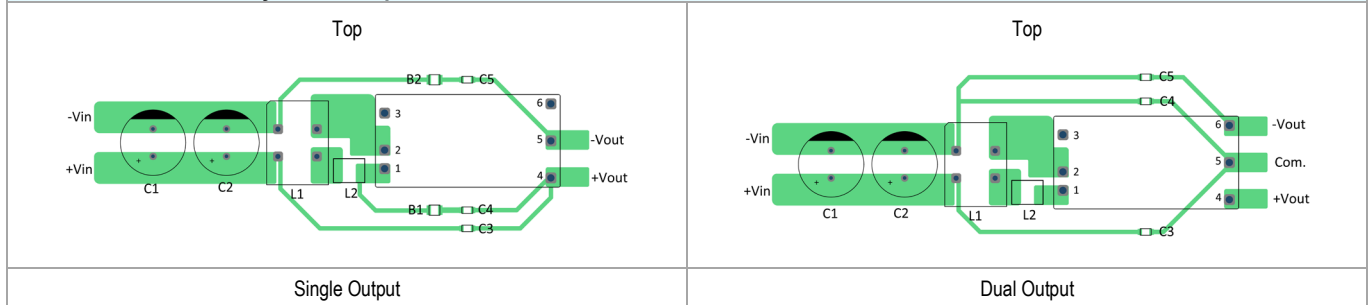
# MKWI80 Series - EMC Note

## External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class A



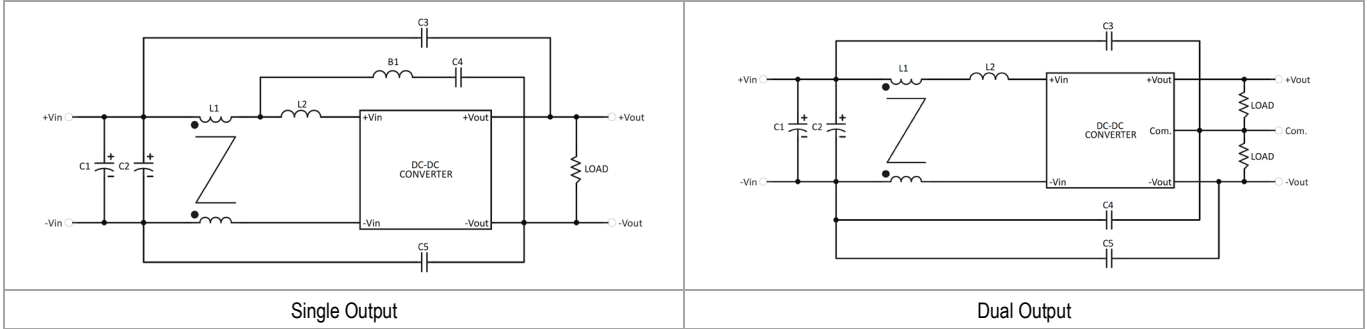
| Model  | C1, C2                               | L1                    | L2                     | B1                  | B2                  | C3                     | C4                     | C5                     |
|--|--------------------------------------|-----------------------|------------------------|---------------------|---------------------|------------------------|------------------------|------------------------|
| MKW180-24S05<br>MKW180-24S12<br>MKW180-24S15<br>MKW180-24S24<br>MKW180-24S54 | 1200µF/50V<br>CHEMI-CON<br>KY Series | 1mH/15A<br>7448031501 | 1µH/10A<br>74437349010 | 30Ω/3A<br>742792310 | SHORT               | 1000pF/2kV<br>1206 X7R | 470pF/2kV<br>1206 X7R  | 1500pF/2kV<br>1206 X7R |
| MKW180-24S48   | 1200µF/50V<br>CHEMI-CON<br>KY Series | 1mH/15A<br>7448031501 | 1µH/10A<br>74437349010 | 30Ω/3A<br>742792310 | 30Ω/3A<br>742792310 | 1500pF/2kV<br>1206 X7R | 1500pF/2kV<br>1206 X7R | 1500pF/2kV<br>1206 X7R |
| MKW180-24DXX   | 1200µF/50V<br>CHEMI-CON<br>KY Series | 1mH/15A<br>7448031501 | 1µH/10A<br>74437349010 | ---                 | ---                 | 470pF/2kV<br>1206 X7R  | 1000pF/2kV<br>1206 X7R | 470pF/2kV<br>1206 X7R  |

## Recommended PCB Layout with Input Filter



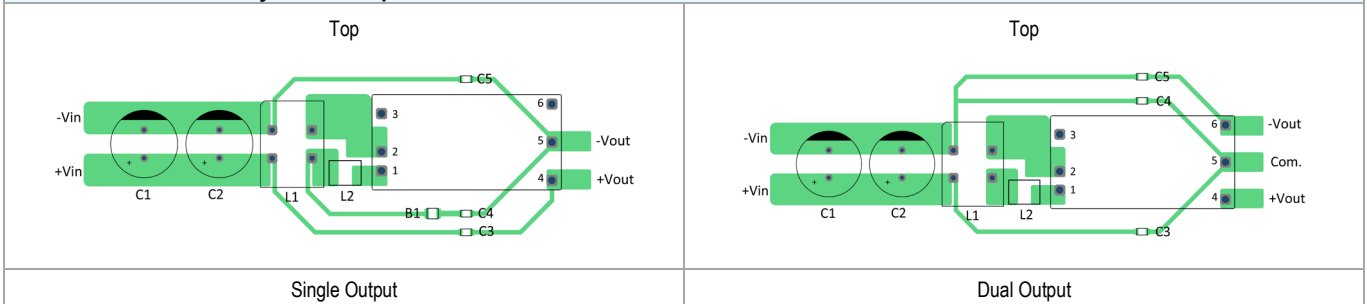
# MKWI80 Series - EMC Note

## External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class A



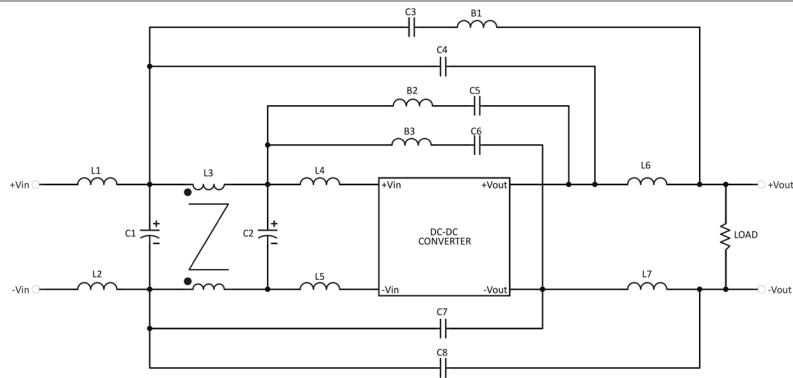
| Model  | C1, C2                               | L1                    | L2                     | B1                  | C3                     | C4                     | C5                    |
|--|--------------------------------------|-----------------------|------------------------|---------------------|------------------------|------------------------|-----------------------|
| MKWI80-48S05                                 | 470µF/100V<br>CHEMI-CON KY<br>Series | 1mH/15A<br>7448031501 | 10µH/5A<br>74439346100 | 30Ω/3A<br>742792310 | 1000pF/2kV<br>1206 X7R | 100pF/2kV<br>1206 X7R  | 220pF/2kV<br>1206 X7R |
| MKWI80-48S12<br>MKWI80-48S15<br>MKWI80-48S24 | 470µF/100V<br>CHEMI-CON KY<br>Series | 1mH/15A<br>7448031501 | 10µH/5A<br>74439346100 | 30Ω/3A<br>742792310 | 1500pF/2kV<br>1206 X7R | 100pF/2kV<br>1206 X7R  | 470pF/2kV<br>1206 X7R |
| MKWI80-48S48                                 | 470µF/100V<br>CHEMI-CON KY<br>Series | 2mH/10A<br>7448031002 | 10µH/5A<br>74439346100 | SHORT               | 560pF/2kV<br>1206 X7R  | 100pF/2kV<br>1206 X7R  | 100pF/2kV<br>1206 X7R |
| MKWI80-48S54                                 | 470µF/100V<br>CHEMI-CON KY<br>Series | 1mH/15A<br>7448031501 | 10µH/5A<br>74439346100 | ---                 | 1200pF/2kV<br>1206 X7R | ---                    | 680pF/2kV<br>1206 X7R |
| MKWI80-48DXX                                 | 470µF/100V<br>CHEMI-CON KY<br>Series | 1mH/15A<br>7448031501 | 1µH/10A<br>74437349010 | ---                 | 470pF/2kV<br>1206 X7R  | 1000pF/2kV<br>1206 X7R | 470pF/2kV<br>1206 X7R |

## Recommended PCB Layout with Input Filter



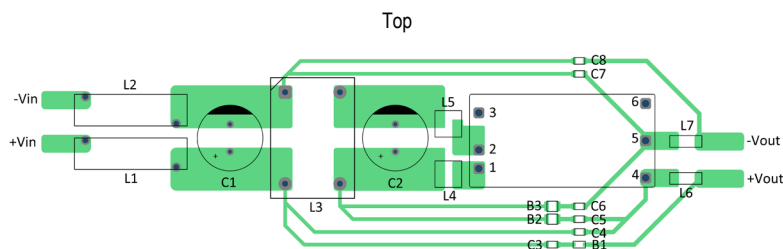
# MKWI80 Series - EMC Note

## External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class B



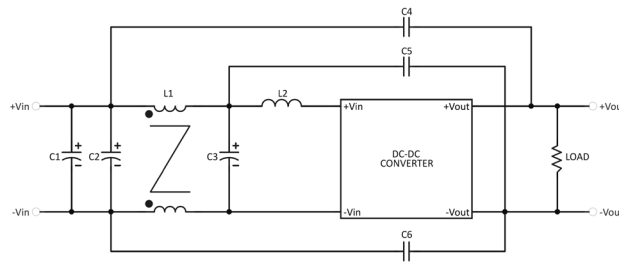
| Model        | L1, L2                      | C1, C2                                     | L3                     | L4, L5                       | C3                    | B1                                | C4, C5, C7            | B2, B3                       | C6                    | C8                    | L6, L7                      |
|--------------|-----------------------------|--|------------------------|------------------------------|-----------------------|-----------------------------------|-----------------------|------------------------------|-----------------------|-----------------------|-----------------------------|
| MKWI80-24S05 | 10 $\mu$ H/10A<br>744711010 | 1200 $\mu$ F/50V<br>CHEMI-CON<br>KY Series | 12mH/10A<br>7448051012 | 1.5 $\mu$ H/11A<br>744311150 | 560pF/2kV<br>1206 X7R | 600 $\Omega$ /2.5A<br>74279221601 | 100pF/2kV<br>1206 X7R | 30 $\Omega$ /3A<br>742792310 | 220pF/2kV<br>1206 X7R | 330pF/2kV<br>1206 X7R | 91 $\Omega$ /17A<br>7427931 |

## Recommended PCB Layout with Input Filter



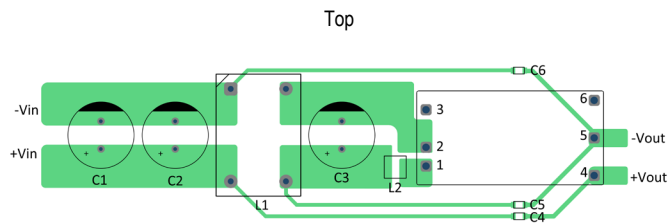
# MKWI80 Series - EMC Note

## External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class B



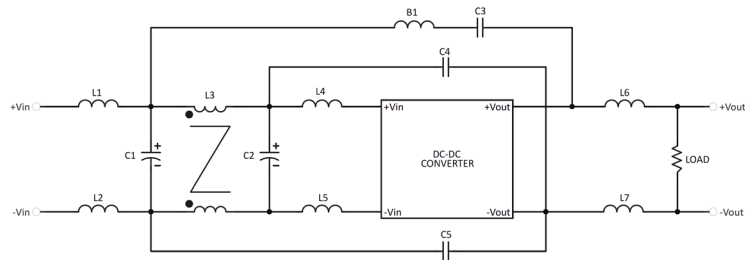
| Model                        | C1, C2, C3                                 | L1                     | L2                           | C4                    | C5                     | C6                    |
|------------------------------|--|------------------------|------------------------------|-----------------------|------------------------|-----------------------|
| MKWI80-24S12<br>MKWI80-24S15 | 1200 $\mu$ F/50V<br>CHEMI-CON KY<br>Series | 12mH/10A<br>7448051012 | 1 $\mu$ H/10A<br>74437349010 | 100pF/2kV<br>1206 X7R | 2200pF/2kV<br>1206 X7R | 100pF/2kV<br>1206 X7R |
| MKWI80-24S24                 | 1200 $\mu$ F/50V<br>CHEMI-CON KY<br>Series | 12mH/10A<br>7448051012 | 1 $\mu$ H/10A<br>74437349010 | 220pF/2kV<br>1206 X7R | 2200pF/2kV<br>1206 X7R | 100pF/2kV<br>1206 X7R |

## Recommended PCB Layout with Input Filter



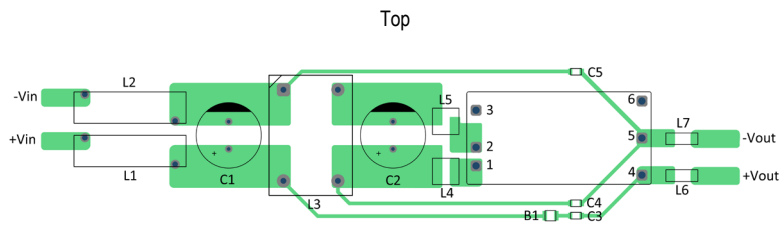
## MKWI80 Series - EMC Note

### External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class B



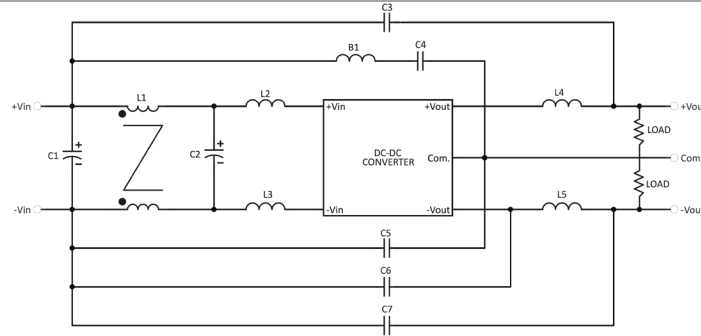
| Model        | L1, L2                      | C1, C2                                     | L3                     | L4, L5                       | B1                           | C3                    | C4                     | C5                    | L6, L7                      |
|--------------|-----------------------------|--|------------------------|------------------------------|------------------------------|-----------------------|------------------------|-----------------------|-----------------------------|
| MKWI80-24S48 | 10 $\mu$ H/10A<br>744711010 | 1200 $\mu$ F/50V<br>CHEMI-CON<br>KY Series | 12mH/10A<br>7448051012 | 1.5 $\mu$ H/11A<br>744311150 | 30 $\Omega$ /3A<br>742792310 | 680pF/2kV<br>1206 X7R | 2200pF/2kV<br>1206 X7R | 100pF/2kV<br>1206 X7R | 91 $\Omega$ /17A<br>7427931 |
| MKWI80-24S54 | 10 $\mu$ H/10A<br>744711010 | 1200 $\mu$ F/50V<br>CHEMI-CON<br>KY Series | 12mH/10A<br>7448051012 | 1.5 $\mu$ H/11A<br>744311150 | 30 $\Omega$ /3A<br>742792310 | 330pF/2kV<br>1206 X7R | 2200pF/2kV<br>1206 X7R | 100pF/2kV<br>1206 X7R | 91 $\Omega$ /17A<br>7427931 |

### Recommended PCB Layout with Input Filter



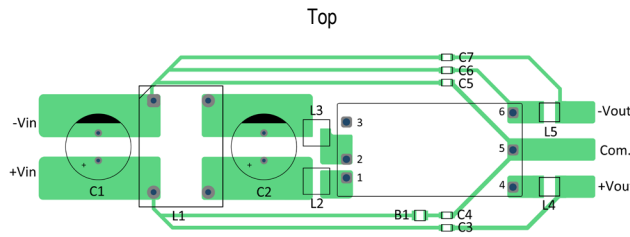
# MKWI80 Series - EMC Note

## External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class B



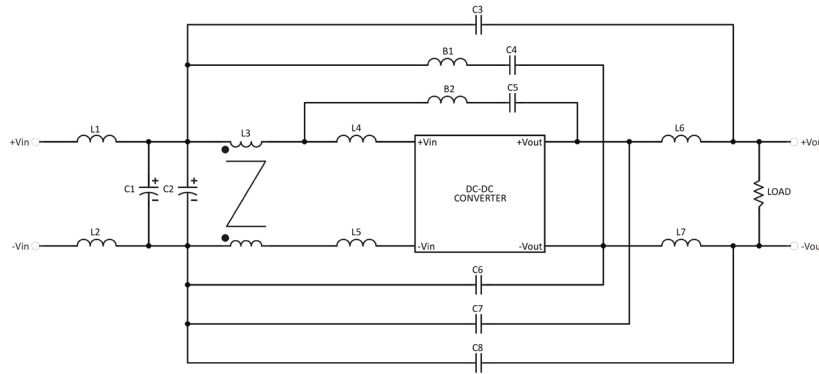
| Model        | C1, C2                 | L1         | L2, L3          | C3        | B1              | C4        | C5, C6    | C7         | L4, L5             |
|--------------|------------------------|------------|-----------------|-----------|-----------------|-----------|-----------|------------|--------------------|
| MKWI80-24D12 | 1200 $\mu$ F/50V       | 12mH/10A   | 1.5 $\mu$ H/11A | 470pF/2kV | 30 $\Omega$ /3A | 220pF/2kV | 100pF/2kV | 1200pF/2kV | 400 $\Omega$ /4.5A |
| MKWI80-24D15 | CHEMI-CON<br>KY Series | 7448051012 | 744311150       | 1206 X7R  | 742792310       | 1206 X7R  | 1206 X7R  | 1206 X7R   | 74279224401        |

## Recommended PCB Layout with Input Filter



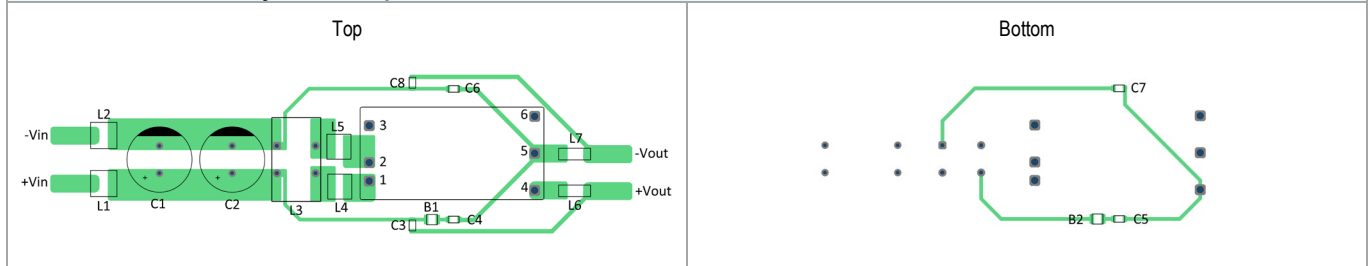
# MKWI80 Series - EMC Note

## External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class B



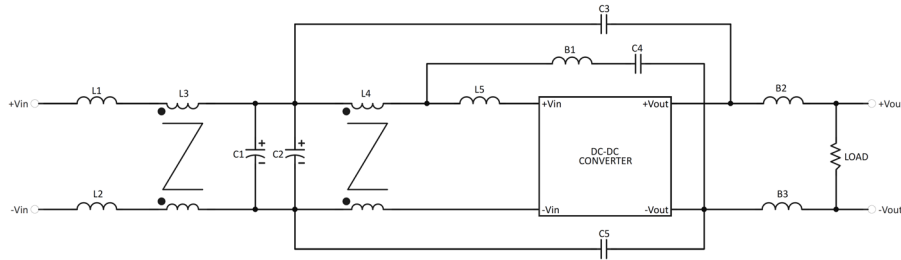
| Model        | L1, L2                 | C1, C2                               | L3                   | L4, L5                 | C3, C6, C8            | B1, B2              | C4, C5, C7            | L6, L7             |
|--------------|------------------------|--------------------------------------|----------------------|------------------------|-----------------------|---------------------|-----------------------|--------------------|
| MKWI80-48S05 | 1.5μH/11A<br>744311150 | 470μF/100V<br>CHEMI-CON<br>KY Series | 9mH/5A<br>7448030509 | 10μH/5A<br>74439346100 | 220pF/2kV<br>1206 X7R | 30Ω/3A<br>742792310 | 100pF/2kV<br>1206 X7R | 91Ω/17A<br>7427931 |

## Recommended PCB Layout with Input Filter



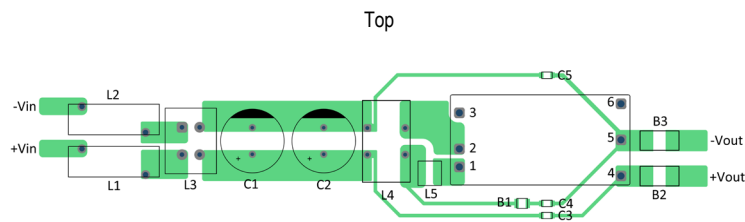
## MKWI80 Series - EMC Note

### External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class B



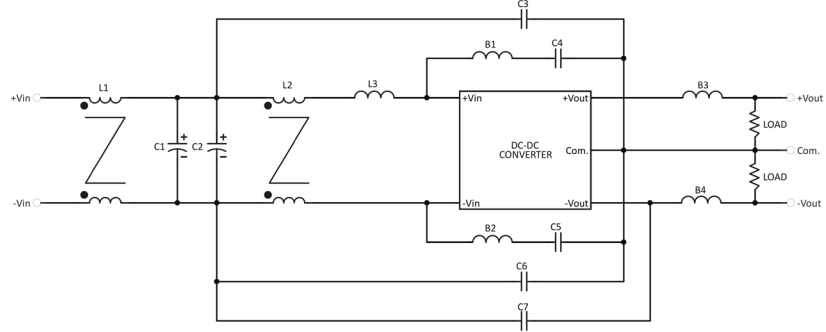
| Model        | L1, L2        | L3            | C1, C2                 | L4         | L5            | B1              | C3, C5     | C4        | B2, B3             |
|--------------|---------------|---------------|------------------------|------------|---------------|-----------------|------------|-----------|--------------------|
| MKWI80-48S12 |               |               |                        |            |               |                 |            |           |                    |
| MKWI80-48S15 |               |               |                        |            |               |                 |            |           |                    |
| MKWI80-48S24 | 6 $\mu$ H/10A | 65 $\mu$ H/5A | 470 $\mu$ F/100V       | 9mH/5A     | 10 $\mu$ H/5A | 30 $\Omega$ /3A | 1500pF/2kV | 100pF/2kV | 12m $\Omega$ /8.5A |
| MKWI80-48S48 | 744710610     | 744842565     | CHEMI-CON<br>KY Series | 7448030509 | 74439346100   | 742792310       | 1206 X7R   | 1206 X7R  | 7427512            |
| MKWI80-48S54 |               |               |                        |            |               |                 |            |           |                    |

### Recommended PCB Layout with Input Filter



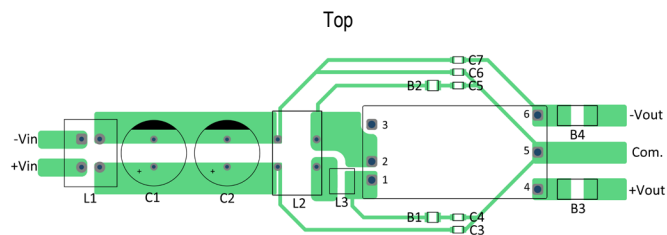
# MKWI80 Series - EMC Note

## External Filter meets EMI Total solution (for Surge & EFT Filter) EN 55032, class B



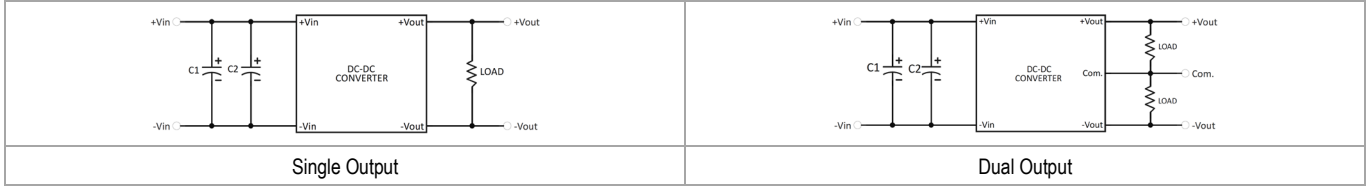
| Model        | L1        | C1, C2                 | L2         | L3          | C3        | B1, B2    | C4, C5, C6, C7 | B3, B4    |
|--------------|-----------|------------------------|------------|-------------|-----------|-----------|----------------|-----------|
| MKWI80-48D12 | 65μH/5A   | 470μF/100V             | 9mH/5A     | 1μH/10A     | 470pF/2kV | 30Ω/3A    | 1000pF/2kV     | 12mΩ/8.5A |
| MKWI80-48D15 | 744842565 | CHEMI-CON<br>KY Series | 7448030509 | 74437349010 | 1206 X7R  | 742792310 | 1206 X7R       | 7427512   |

## Recommended PCB Layout with Input Filter



# MKWI80 Series - EMC Note

## External Filter meets EMS (for Surge & EFT) EN 55035, criteria A



|              |   |
|--------------|---|
| Model        | C1, C2                                  |
| MKWI80-24XXX | 1200 $\mu$ F/50V<br>CHEMI-CON KY Series |
| MKWI80-48XXX | 470 $\mu$ F/100V<br>CHEMI-CON KY Series |

## Recommended PCB Layout with Input Filter

