



Low Profile



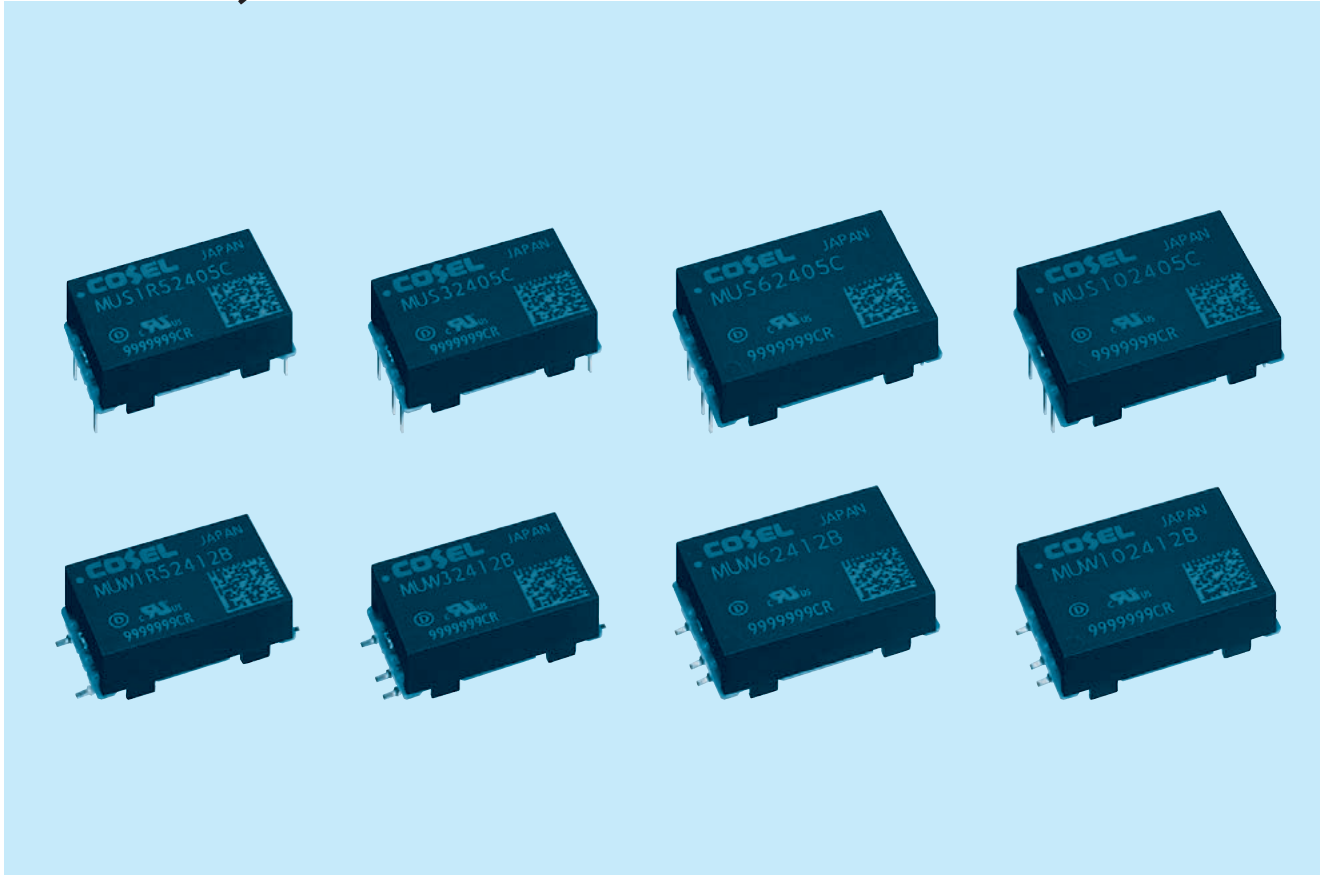
Isolated



OCP

Safety  
Approvals

# MUS, MUW-series



## Feature

- SMD mounting type and through-hole mounting type
- High efficiency
- Built-in overcurrent protection circuits
- Built-in remote ON/OFF (MU3, 6, 10)
- High reliability : not built-in aluminum and tantalum electrolytic capacitor

## CE marking

- Low Voltage Directive
- RoHS Directive

## UKCA marking

- Electrical Equipment Safety Regulations
- RoHS Regulations

## Safety agency approvals

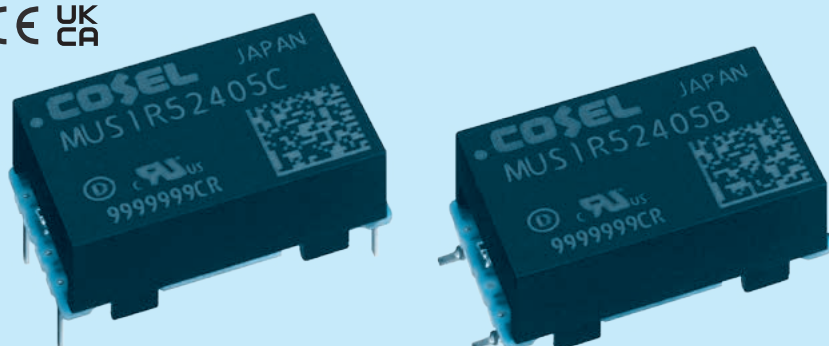
- UL62368-1,
- C-UL (equivalent to CAN CSA-C22.2 No.62368-1), EN62368-1

## 5-year warranty

## MUS1R5

MU S 1R5 12 05 B -□

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name  
 ② Single output  
 ③ Output wattage  
 ④ Input voltage  
 ⑤ Output voltage  
 ⑥ Mounting type  
 B : SMD  
 C : DIP  
 ⑦ Optional  
 G : Capacitor between Input and Output is removed.

| MODEL                 | MUS1R5053R3 | MUS1R50505 | MUS1R50512 | MUS1R50515 | MUS1R5123R3 | MUS1R51205 | MUS1R51212 | MUS1R51215 |
|-----------------------|-------------|------------|------------|------------|-------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 1.32        | 1.50       | 1.56       | 1.50       | 1.32        | 1.50       | 1.56       | 1.50       |
| DC OUTPUT             | VOLTAGE[V]  | 3.3        | 5          | 12         | 15          | 3.3        | 5          | 12         |
|                       | CURRENT[A]  | 0.4        | 0.3        | 0.13       | 0.1         | 0.4        | 0.3        | 0.1        |

## SPECIFICATIONS

|                    | MODEL                           | MUS1R5053R3                                              | MUS1R50505  | MUS1R50512    | MUS1R50515    | MUS1R5123R3                           | MUS1R51205  | MUS1R51212    | MUS1R51215    |
|--------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|---------------------------------------|-------------|---------------|---------------|
| INPUT              | VOLTAGE[VDC]                    | 4.5 - 9 (Surge voltage 12.5V, 100ms max)                 |             |               |               | 9 - 18 (Surge voltage 25V, 100ms max) |             |               |               |
|                    | CURRENT[A]                      | *1 0.34typ                                               | 0.36typ     | 0.37typ       | 0.36typ       | 0.14typ                               | 0.15typ     | 0.16typ       | 0.15typ       |
|                    | EFFICIENCY[%]                   | *1 79typ                                                 | 83typ       | 84typ         | 84typ         | 79typ                                 | 84typ       | 84typ         | 84typ         |
| OUTPUT             | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                   | 5           | 12            | 15            |
|                    | CURRENT[A]                      | 0.4                                                      | 0.3         | 0.13          | 0.1           | 0.4                                   | 0.3         | 0.13          | 0.1           |
|                    | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                    | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                    | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                | 120max      | 150max        | 150max        |
|                    | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                | 200max      | 200max        | 200max        |
|                    | TEMPERATURE REGULATION[mV]      | -20 to +85°C                                             | 50max       | 50max         | 150max        | 180max                                | 50max       | 50max         | 150max        |
|                    |                                 | -40 to +85°C                                             | 80max       | 80max         | 240max        | 290max                                | 80max       | 80max         | 240max        |
|                    | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                       |             |               |               |
|                    | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                       |             |               |               |
|                    | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                           | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
| PROTECTION CIRCUIT | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                       |             |               |               |

| MODEL                 | MUS1R5243R3 | MUS1R52405 | MUS1R52412 | MUS1R52415 | MUS1R5483R3 | MUS1R54805 | MUS1R54812 | MUS1R54815 |
|-----------------------|-------------|------------|------------|------------|-------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 1.32        | 1.50       | 1.56       | 1.50       | 1.32        | 1.50       | 1.56       | 1.50       |
| DC OUTPUT             | VOLTAGE[V]  | 3.3        | 5          | 12         | 15          | 3.3        | 5          | 12         |
|                       | CURRENT[A]  | 0.4        | 0.3        | 0.13       | 0.1         | 0.4        | 0.3        | 0.1        |

## SPECIFICATIONS

|                    | MODEL                           | MUS1R5243R3                                              | MUS1R52405  | MUS1R52412    | MUS1R52415    | MUS1R5483R3                             | MUS1R54805  | MUS1R54812    | MUS1R54815    |
|--------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|-----------------------------------------|-------------|---------------|---------------|
| INPUT              | VOLTAGE[VDC]                    | 18 - 36 (Surge voltage 50V, 100ms max)                   |             |               |               | 36 - 76 (Surge voltage 100V, 100ms max) |             |               |               |
|                    | CURRENT[A]                      | *1 0.073typ                                              | 0.079typ    | 0.082typ      | 0.079typ      | 0.037typ                                | 0.040typ    | 0.042typ      | 0.040typ      |
|                    | EFFICIENCY[%]                   | *1 76typ                                                 | 80typ       | 80typ         | 80typ         | 75typ                                   | 79typ       | 79typ         | 79typ         |
| OUTPUT             | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                     | 5           | 12            | 15            |
|                    | CURRENT[A]                      | 0.4                                                      | 0.3         | 0.13          | 0.1           | 0.4                                     | 0.3         | 0.13          | 0.1           |
|                    | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                    | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                    | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                  | 120max      | 150max        | 150max        |
|                    | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                  | 200max      | 200max        | 200max        |
|                    | TEMPERATURE REGULATION[mV]      | -20 to +85°C                                             | 50max       | 50max         | 150max        | 180max                                  | 50max       | 50max         | 150max        |
|                    |                                 | -40 to +85°C                                             | 80max       | 80max         | 240max        | 290max                                  | 80max       | 80max         | 240max        |
|                    | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                         |             |               |               |
|                    | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                         |             |               |               |
|                    | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                             | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
| PROTECTION CIRCUIT | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                         |             |               |               |

## GENERAL SPECIFICATIONS

|             |                                      |                                                                                            |
|-------------|--------------------------------------|--------------------------------------------------------------------------------------------|
| ISOLATION   | INPUT-OUTPUT                         | AC500V 1minute, Cutoff current=10mA, DC500V 50M $\Omega$ min (20 $\pm$ 15°C)               |
| ENVIRONMENT | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +100°C, 20 to 95%RH (Non condensing) (Refer to "Derating"), 5,000m (16,400feet) max |
|             | STORAGE TEMP., HUMID. AND ALTITUDE   | -40 to +100°C, 20 to 95%RH (Non condensing), 9,000m (30,000feet) max                       |
|             | VIBRATION                            | 10 - 55Hz 98.0m/s <sup>2</sup> (10G), 3minute period, 60minutes each along X, Y and Z axis |
|             | IMPACT                               | 490.3m/s <sup>2</sup> (50G) 11ms, once each along X, Y and Z axis                          |
| SAFETY      | AGENCY APPROVALS                     | UL62368-1 C-UL (equivalent to CAN / CSA-C22.2 No.62368-1), EN62368-1                       |
| OTHERS      | CASE SIZE/WEIGHT                     | 21.4 X 8.5 X 13.4mm [0.84 X 0.33 X 0.53 inches] (W X H X D) / 3g max                       |
|             | COOLING METHOD                       | Convection/Forced air                                                                      |

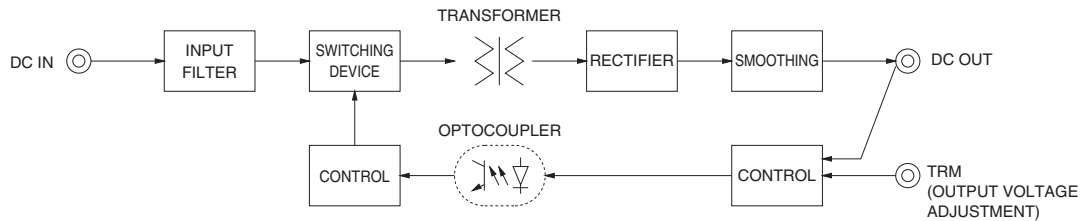
\*1 Rated input 5V, 12V, 24V or 48V DC  $I_o$ =100%

\*2 Ripple and ripple noise is measured by using test board with ceramic capacitor 1 $\mu$ F at 25mm from output pins.

\* Parallel operation with other model is not possible.

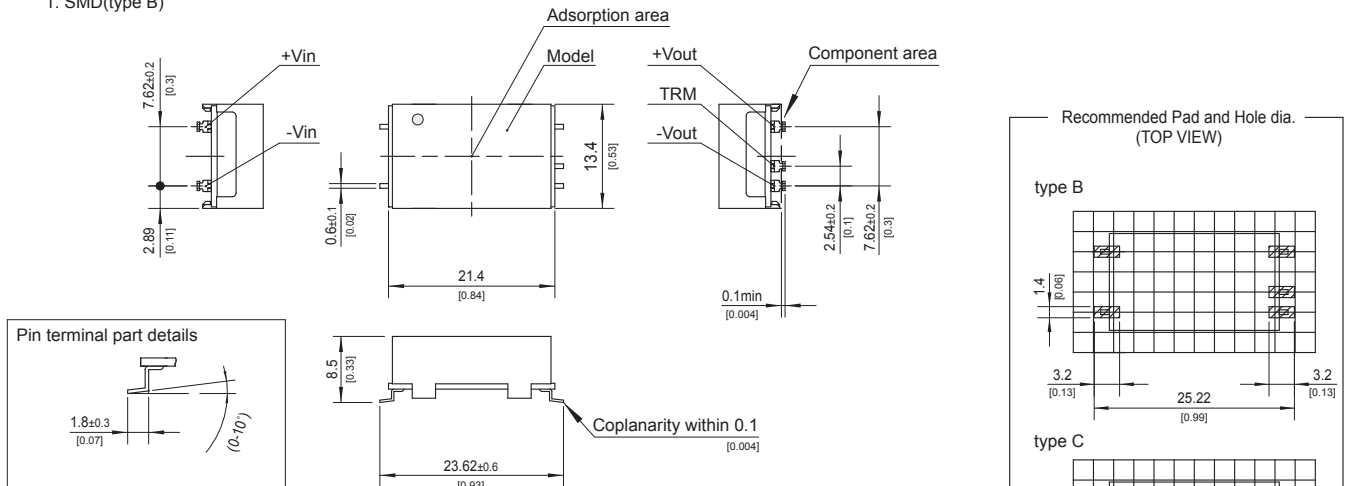
\* MUW1R5xx12/MUW1R5xx15 is available as single output, +24V/+30V

## Block diagram

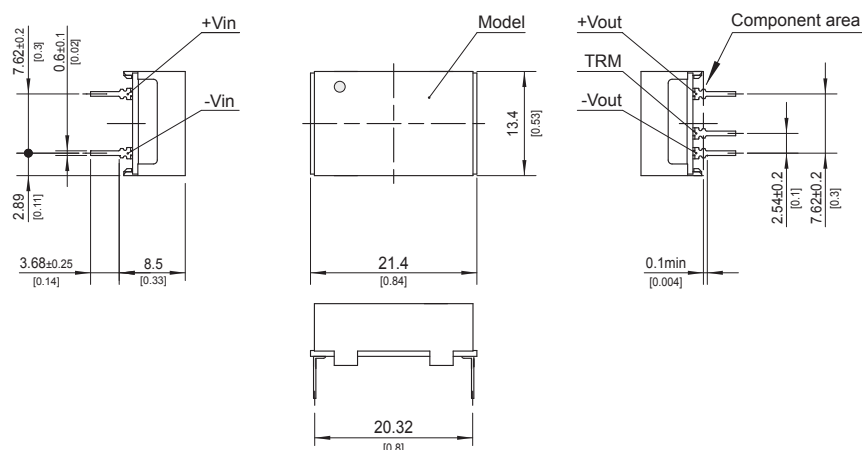


## External view

## 1. SMD(type B)



## 2. DIP(type C)

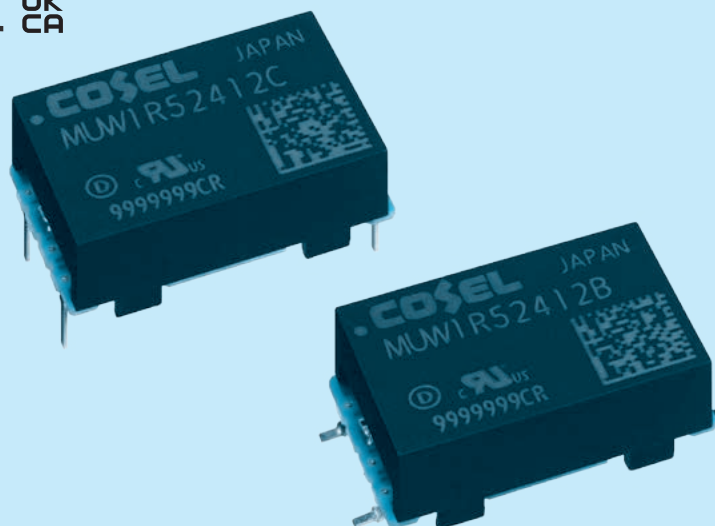


- ※ Tolerance  $\pm 0.5$  [ $\pm 0.02$ ]
- ※ Dimensions in mm, [ ] = inches
- ※ Pin terminal thickness :  $0.3 \pm 0.1$  [0.012]
- ※ Pin terminal material : Copper alloy
- ※ Plating treatment of terminal : Lead free plating
- ※ Case material : PPS
- ※ Weight : 3g max

## MUW1R5

MU W 1R5 12 12 B -□

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name  
 ② Dual output  
 ③ Output wattage  
 ④ Input voltage  
 ⑤ Output voltage  
 ⑥ Mounting type  
 B : SMD  
 C : DIP  
 ⑦ Optional  
 G : Capacitor between Input and Output is removed.

| MODEL                 | MUW1R50512    | MUW1R50515 | MUW1R51212 | MUW1R51215 | MUW1R52412 | MUW1R52415 | MUW1R54812 | MUW1R54815 |
|-----------------------|---------------|------------|------------|------------|------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 1.56          | 1.50       | 1.56       | 1.50       | 1.56       | 1.50       | 1.56       | 1.50       |
| DC OUTPUT             | VOLTAGE[V] *1 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 |
|                       | CURRENT[A]    | 0.065      | 0.05       | 0.065      | 0.05       | 0.065      | 0.05       | 0.065      |

## SPECIFICATIONS

|                    | MODEL                                | MUW1R50512                                                                                 | MUW1R50515 | MUW1R51212                               | MUW1R51215 | MUW1R52412                                | MUW1R52415 | MUW1R54812                                 | MUW1R54815 |
|--------------------|--------------------------------------|--------------------------------------------------------------------------------------------|------------|------------------------------------------|------------|-------------------------------------------|------------|--------------------------------------------|------------|
| INPUT              | VOLTAGE[VDC]                         | 4.5 - 9<br>(Surge voltage 12.5V, 100ms max)                                                |            | 9 - 18<br>(Surge voltage 25V, 100ms max) |            | 18 - 36<br>(Surge voltage 50V, 100ms max) |            | 36 - 76<br>(Surge voltage 100V, 100ms max) |            |
|                    | CURRENT[A] *2                        | 0.39typ                                                                                    | 0.37typ    | 0.16typ                                  | 0.16typ    | 0.083typ                                  | 0.080typ   | 0.042typ                                   | 0.041typ   |
|                    | EFFICIENCY[%] *2                     | 82typ                                                                                      | 82typ      | 82typ                                    | 82typ      | 79typ                                     | 79typ      | 78typ                                      | 78typ      |
| OUTPUT             | VOLTAGE[V]                           | ±12 or +24                                                                                 | ±15 or +30 | ±12 or +24                               | ±15 or +30 | ±12 or +24                                | ±15 or +30 | ±12 or +24                                 | ±15 or +30 |
|                    | CURRENT[A]                           | 0.065                                                                                      | 0.05       | 0.065                                    | 0.05       | 0.065                                     | 0.05       | 0.065                                      | 0.05       |
|                    | LINE REGULATION[mV]                  | 60max                                                                                      | 75max      | 60max                                    | 75max      | 60max                                     | 75max      | 60max                                      | 75max      |
|                    | LOAD REGULATION[mV]                  | *3 480max                                                                                  | 600max     | 480max                                   | 600max     | 480max                                    | 600max     | 480max                                     | 600max     |
|                    |                                      | *4 600max                                                                                  | 750max     | 600max                                   | 750max     | 600max                                    | 750max     | 600max                                     | 750max     |
|                    | RIPPLE[mVp-p] *5                     | 150max                                                                                     | 150max     | 150max                                   | 150max     | 150max                                    | 150max     | 150max                                     | 150max     |
|                    | RIPPLE NOISE[mVp-p] *5               | 200max                                                                                     | 200max     | 200max                                   | 200max     | 200max                                    | 200max     | 200max                                     | 200max     |
|                    | TEMPERATURE REGULATION[mV]           | -20 to +85°C                                                                               | 210max     | 260max                                   | 210max     | 260max                                    | 210max     | 260max                                     | 210max     |
|                    |                                      | -40 to +85°C                                                                               | 320max     | 390max                                   | 320max     | 390max                                    | 320max     | 390max                                     | 320max     |
|                    | START-UP TIME[ms]                    | 20max (Minimum input, I <sub>o</sub> =100%)                                                |            |                                          |            |                                           |            |                                            |            |
| PROTECTION CIRCUIT | OVERCURRENT PROTECTION               | Works over 105% of rating and recovers automatically                                       |            |                                          |            |                                           |            |                                            |            |
|                    | ISOLATION                            | AC500V 1minute, Cutoff current=10mA, DC500V 50MΩ min (20±15°C)                             |            |                                          |            |                                           |            |                                            |            |
| ENVIRONMENT        | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +100°C, 20 to 95%RH (Non condensing) (Refer to "Derating"), 5,000m (16,400feet) max |            |                                          |            |                                           |            |                                            |            |
|                    | STORAGE TEMP., HUMID. AND ALTITUDE   | -40 to +100°C, 20 to 95%RH (Non condensing), 9,000m (30,000feet) max                       |            |                                          |            |                                           |            |                                            |            |
|                    | VIBRATION                            | 10 - 55Hz 98.0m/s <sup>2</sup> (10G), 3minute period, 60minutes each along X, Y and Z axis |            |                                          |            |                                           |            |                                            |            |
|                    | IMPACT                               | 490.3m/s <sup>2</sup> (50G) 11ms, once each along X, Y and Z axis                          |            |                                          |            |                                           |            |                                            |            |
| SAFETY             | AGENCY APPROVALS                     | UL62368-1 C-UL (equivalent to CAN / CSA-C22.2 No.62368-1), EN62368-1                       |            |                                          |            |                                           |            |                                            |            |
| OTHERS             | CASE SIZE/WEIGHT                     | 21.4×8.5×13.4 [0.84×0.33×0.53 inches] (W×H×D) / 3g max                                     |            |                                          |            |                                           |            |                                            |            |
|                    | COOLING METHOD                       | Convection/Forced air                                                                      |            |                                          |            |                                           |            |                                            |            |

\*1 Single output +24V, +30V with no use of COM.

\*2 Rated input 5V, 12V, 24V or 48V DC I<sub>o</sub>=100%

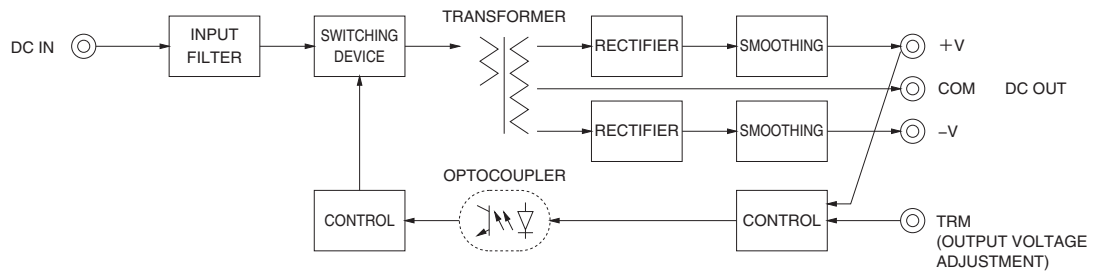
\*3 Symmetrical loading from 20% to 100%.

\*4 Symmetrical loading from 0% to 100%.

\*5 Ripple and Ripple Noise is measured by using test board with ceramic capacitor 1μF at 25mm from output pins.

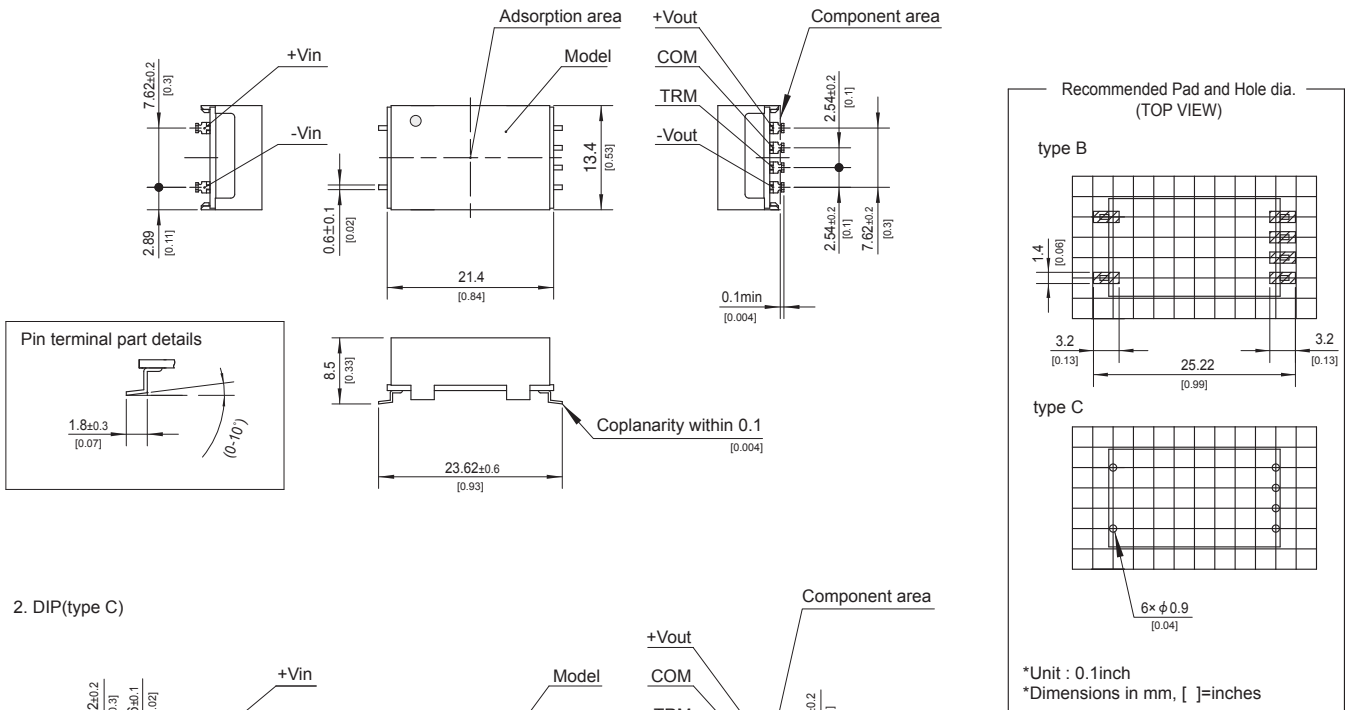
\* Parallel operation with other model is not possible.

## Block diagram

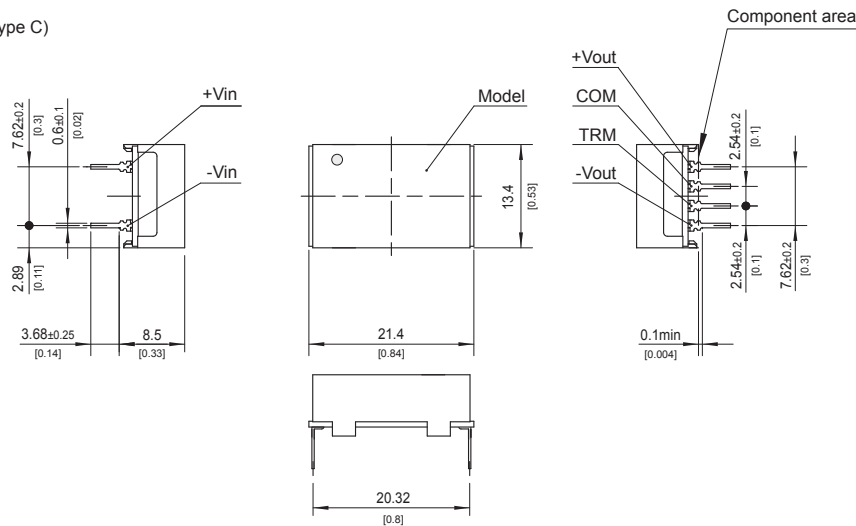


## External view

1. SMD(type B)



## 2. DIP(type C)

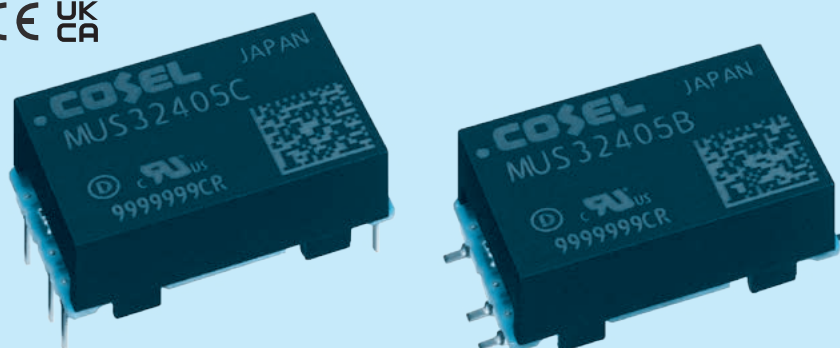


- ※ Tolerance  $\pm 0.5$  [ $\pm 0.02$ ]
- ※ Dimensions in mm, [ ] = inches
- ※ Pin terminal thickness :  $0.3 \pm 0.1$  [0.012]
- ※ Pin terminal material : Copper alloy
- ※ Plating treatment of terminal : Lead free plating
- ※ Case material : PPS
- ※ Weight : 3g max

# MUS3

MU S 3 12 05 B - □

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type  
B : SMD  
C : DIP
- ⑦ Optional  
G : Capacitor between Input and Output is removed.

| MODEL                 | MUS3053R3  | MUS30505 | MUS30512 | MUS30515 | MUS3123R3 | MUS31205 | MUS31212 | MUS31215 |
|-----------------------|------------|----------|----------|----------|-----------|----------|----------|----------|
| MAX OUTPUT WATTAGE[W] | 1.98       | 3        | 3        | 3        | 1.98      | 3        | 3        | 3        |
| DC OUTPUT             | VOLTAGE[V] | 3.3      | 5        | 12       | 15        | 3.3      | 5        | 12       |
|                       | CURRENT[A] | 0.6      | 0.6      | 0.25     | 0.2       | 0.6      | 0.6      | 0.25     |

## SPECIFICATIONS

|                               | MODEL                           | MUS3053R3                                                | MUS30505    | MUS30512      | MUS30515      | MUS3123R3                             | MUS31205    | MUS31212      | MUS31215      |
|-------------------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|---------------------------------------|-------------|---------------|---------------|
| INPUT                         | VOLTAGE[VDC]                    | 4.5 - 9 (Surge voltage 12.5V, 100ms max)                 |             |               |               | 9 - 18 (Surge voltage 25V, 100ms max) |             |               |               |
|                               | CURRENT[A]                      | *1 0.5typ                                                | 0.72typ     | 0.71typ       | 0.71typ       | 0.21typ                               | 0.3typ      | 0.29typ       | 0.29typ       |
|                               | EFFICIENCY[%]                   | *1 79typ                                                 | 83typ       | 85typ         | 85typ         | 80typ                                 | 84typ       | 86typ         | 86typ         |
| OUTPUT                        | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                   | 5           | 12            | 15            |
|                               | CURRENT[A]                      | 0.6                                                      | 0.6         | 0.25          | 0.2           | 0.6                                   | 0.6         | 0.25          | 0.2           |
|                               | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                               | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                               | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                | 120max      | 150max        | 150max        |
|                               | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                | 200max      | 200max        | 200max        |
|                               | TEMPERATURE                     | -20 to +85°C                                             | 50max       | 50max         | 150max        | 180max                                | 50max       | 50max         | 150max        |
|                               | REGULATION[mV]                  | -40 to +85°C                                             | 80max       | 80max         | 240max        | 290max                                | 80max       | 80max         | 240max        |
|                               | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                       |             |               |               |
|                               | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                       |             |               |               |
| PROTECTION CIRCUIT AND OTHERS | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                           | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
|                               | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                       |             |               |               |
| PROTECTION CIRCUIT AND OTHERS | REMOTE ON/OFF                   | Provided (Negative logic L : ON, H : OFF)                |             |               |               |                                       |             |               |               |

| MODEL                 | MUS3243R3  | MUS32405 | MUS32412 | MUS32415 | MUS3483R3 | MUS34805 | MUS34812 | MUS34815 |
|-----------------------|------------|----------|----------|----------|-----------|----------|----------|----------|
| MAX OUTPUT WATTAGE[W] | 1.98       | 3        | 3        | 3        | 1.998     | 3        | 3        | 3        |
| DC OUTPUT             | VOLTAGE[V] | 3.3      | 5        | 12       | 15        | 3.3      | 5        | 12       |
|                       | CURRENT[A] | 0.6      | 0.6      | 0.25     | 0.2       | 0.6      | 0.6      | 0.25     |

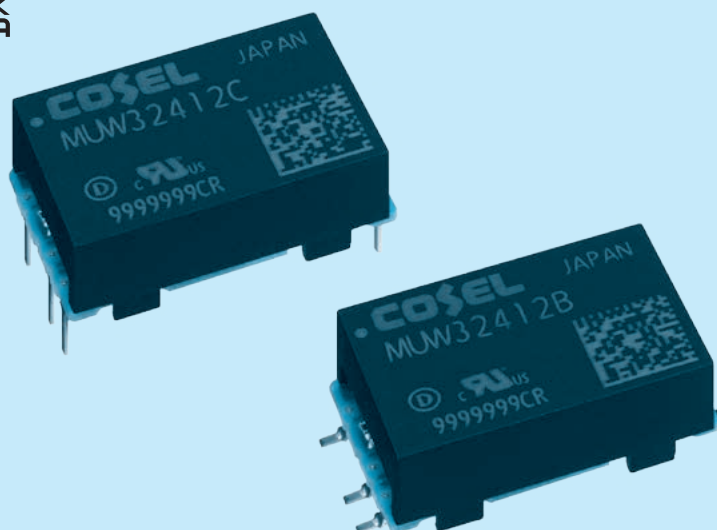
## SPECIFICATIONS

|                               | MODEL                           | MUS3243R3                                                | MUS32405    | MUS32412      | MUS32415      | MUS3483R3                               | MUS34805    | MUS34812      | MUS34815      |
|-------------------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|-----------------------------------------|-------------|---------------|---------------|
| INPUT                         | VOLTAGE[VDC]                    | 18 - 36 (Surge voltage 50V, 100ms max)                   |             |               |               | 36 - 76 (Surge voltage 100V, 100ms max) |             |               |               |
|                               | CURRENT[A]                      | *1 0.11typ                                               | 0.15typ     | 0.15typ       | 0.15typ       | 0.053typ                                | 0.076typ    | 0.074typ      | 0.074typ      |
|                               | EFFICIENCY[%]                   | *1 78typ                                                 | 83typ       | 85typ         | 85typ         | 78typ                                   | 83typ       | 85typ         | 85typ         |
| OUTPUT                        | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                     | 5           | 12            | 15            |
|                               | CURRENT[A]                      | 0.6                                                      | 0.6         | 0.25          | 0.2           | 0.6                                     | 0.6         | 0.25          | 0.2           |
|                               | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                               | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                               | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                  | 120max      | 150max        | 150max        |
|                               | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                  | 200max      | 200max        | 200max        |
|                               | TEMPERATURE                     | -20 to +85°C                                             | 50max       | 50max         | 150max        | 180max                                  | 50max       | 50max         | 150max        |
|                               | REGULATION[mV]                  | -40 to +85°C                                             | 80max       | 80max         | 240max        | 290max                                  | 80max       | 80max         | 240max        |
|                               | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                         |             |               |               |
|                               | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                         |             |               |               |
| PROTECTION CIRCUIT AND OTHERS | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                             | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
|                               | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                         |             |               |               |
| PROTECTION CIRCUIT AND OTHERS | REMOTE ON/OFF                   | Provided (Negative logic L : ON, H : OFF)                |             |               |               |                                         |             |               |               |



MU W 3 12 12 B - □

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name  
 ② Dual output  
 ③ Output wattage  
 ④ Input voltage  
 ⑤ Output voltage  
 ⑥ Mounting type  
 B : SMD  
 C : DIP  
 ⑦ Optional  
 G : Capacitor between Input and Output is removed.

| MODEL                 |               | MUW30512   | MUW30515   | MUW31212   | MUW31215   | MUW32412   | MUW32415   | MUW34812   | MUW34815   |
|-----------------------|---------------|------------|------------|------------|------------|------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] |               | 3.12       | 3          | 3.12       | 3          | 3.12       | 3          | 3.12       | 3          |
| DC OUTPUT             | VOLTAGE[V] *1 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 |
|                       | CURRENT[A]    | 0.13       | 0.1        | 0.13       | 0.1        | 0.13       | 0.1        | 0.13       | 0.1        |

## SPECIFICATIONS

|                               | MODEL                                | MUW30512                                                                                   | MUW30515   | MUW31212                                 | MUW31215   | MUW32412                                  | MUW32415   | MUW34812                                   | MUW34815   |
|-------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------|------------|------------------------------------------|------------|-------------------------------------------|------------|--------------------------------------------|------------|
| INPUT                         | VOLTAGE[VDC]                         | 4.5 - 9<br>(Surge voltage 12.5V, 100ms max)                                                |            | 9 - 18<br>(Surge voltage 25V, 100ms max) |            | 18 - 36<br>(Surge voltage 50V, 100ms max) |            | 36 - 76<br>(Surge voltage 100V, 100ms max) |            |
|                               | CURRENT[A] *2                        | 0.75typ                                                                                    | 0.72typ    | 0.31typ                                  | 0.3typ     | 0.16typ                                   | 0.15typ    | 0.078typ                                   | 0.075typ   |
|                               | EFFICIENCY[%] *2                     | 84typ                                                                                      | 84typ      | 84typ                                    | 84typ      | 84typ                                     | 84typ      | 84typ                                      | 84typ      |
| OUTPUT                        | VOLTAGE[V]                           | ±12 or +24                                                                                 | ±15 or +30 | ±12 or +24                               | ±15 or +30 | ±12 or +24                                | ±15 or +30 | ±12 or +24                                 | ±15 or +30 |
|                               | CURRENT[A]                           | 0.13                                                                                       | 0.1        | 0.13                                     | 0.1        | 0.13                                      | 0.1        | 0.13                                       | 0.1        |
|                               | LINE REGULATION[mV]                  | 60max                                                                                      | 75max      | 60max                                    | 75max      | 60max                                     | 75max      | 60max                                      | 75max      |
|                               | LOAD REGULATION[mV]                  | *3 480max                                                                                  | 600max     | 480max                                   | 600max     | 480max                                    | 600max     | 480max                                     | 600max     |
|                               |                                      | *4 600max                                                                                  | 750max     | 600max                                   | 750max     | 600max                                    | 750max     | 600max                                     | 750max     |
|                               | RIPPLE[mVp-p] *5                     | 150max                                                                                     | 150max     | 150max                                   | 150max     | 150max                                    | 150max     | 150max                                     | 150max     |
|                               | RIPPLE NOISE[mVp-p] *5               | 200max                                                                                     | 200max     | 200max                                   | 200max     | 200max                                    | 200max     | 200max                                     | 200max     |
|                               | TEMPERATURE REGULATION[mV]           | -20 to +85°C                                                                               | 210max     | 260max                                   | 210max     | 260max                                    | 210max     | 260max                                     | 210max     |
|                               |                                      | -40 to +85°C                                                                               | 320max     | 390max                                   | 320max     | 390max                                    | 320max     | 390max                                     | 320max     |
|                               | START-UP TIME[ms]                    | 20max (Minimum input, Io=100%)                                                             |            |                                          |            |                                           |            |                                            |            |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION               | Works over 105% of rating and recovers automatically                                       |            |                                          |            |                                           |            |                                            |            |
|                               | REMOTE ON/OFF                        | Provided (Negative logic L : ON, H : OFF)                                                  |            |                                          |            |                                           |            |                                            |            |
|                               | ISOLATION                            | AC500V 1minute, Cutoff current=10mA, DC500V 50MΩ min (20±15°C)                             |            |                                          |            |                                           |            |                                            |            |
| ENVIRONMENT                   | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +100°C, 20 to 95%RH (Non condensing) (Refer to "Derating"), 5,000m (16,400feet) max |            |                                          |            |                                           |            |                                            |            |
|                               | STORAGE TEMP., HUMID. AND ALTITUDE   | -40 to +100°C, 20 to 95%RH (Non condensing), 9,000m (30,000feet) max                       |            |                                          |            |                                           |            |                                            |            |
|                               | VIBRATION                            | 10 - 55Hz 98.0m/s <sup>2</sup> (10G), 3minute period, 60minutes each along X, Y and Z axis |            |                                          |            |                                           |            |                                            |            |
|                               | IMPACT                               | 490.3m/s <sup>2</sup> (50G) 11ms, once each along X, Y and Z axis                          |            |                                          |            |                                           |            |                                            |            |
| SAFETY                        | AGENCY APPROVALS                     | UL62368-1 C-UL (equivalent to CAN / CSA-C22.2 No.62368-1), EN62368-1                       |            |                                          |            |                                           |            |                                            |            |
| OTHERS                        | CASE SIZE/WEIGHT                     | 21.4 × 8.5 × 13.4mm [0.84 × 0.33 × 0.53 inches] (W × H × D) / 3g max                       |            |                                          |            |                                           |            |                                            |            |
|                               | COOLING METHOD                       | Convection/Forced air                                                                      |            |                                          |            |                                           |            |                                            |            |

\*1 Single output +24V, +30V with no use of COM.

\*2 Rated input 5V, 12V, 24V or 48V DC Io=100%

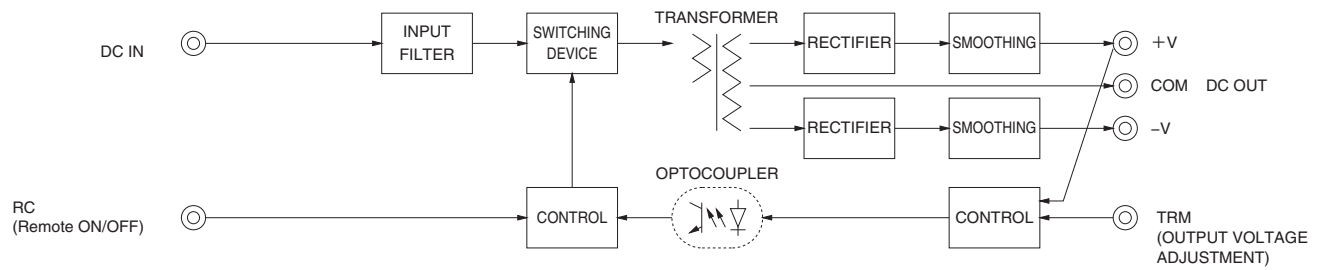
\*3 Symmetrical loading from 20% to 100%.

\*4 Symmetrical loading from 0% to 100%.

\*5 Ripple and Ripple Noise is measured by using test board with ceramic capacitor 1μF at 25mm from output pins.

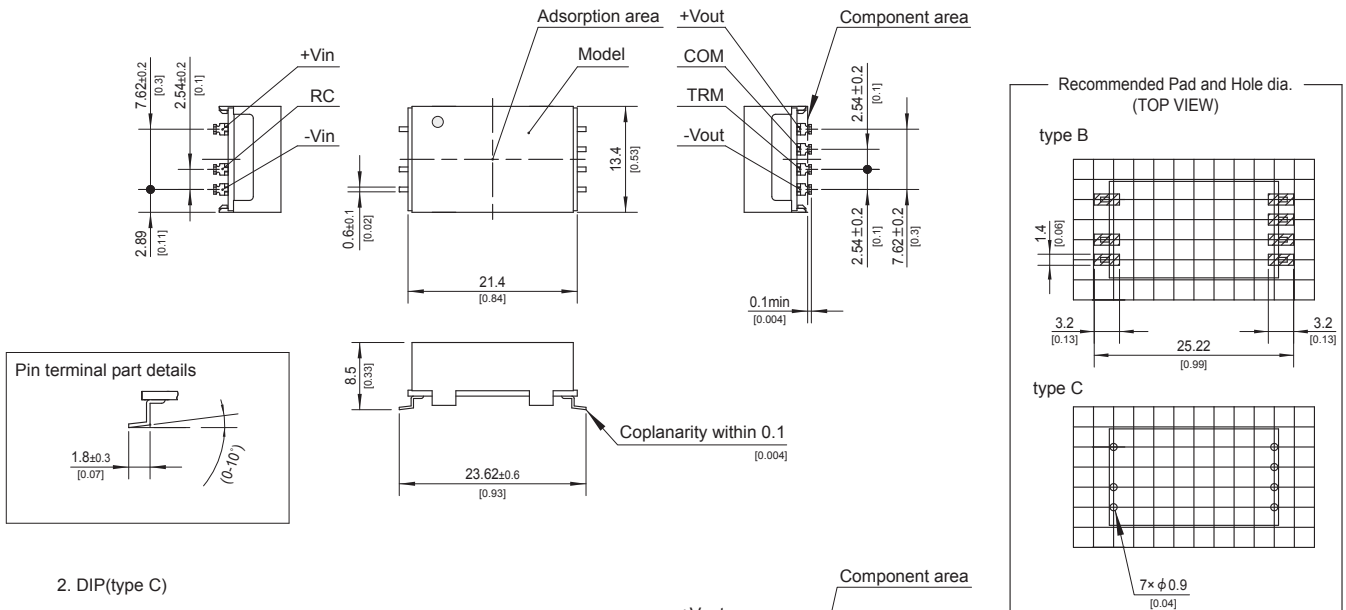
\* Parallel operation with other model is not possible.

## Block diagram

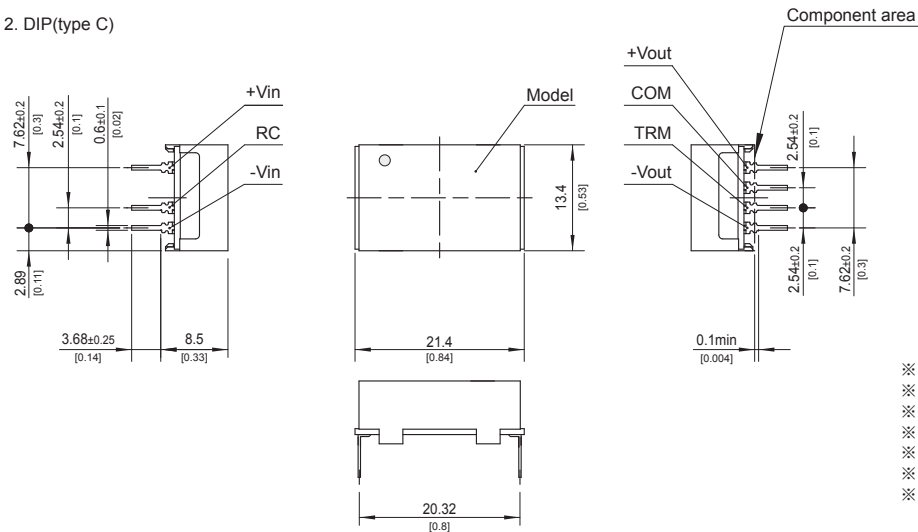


## External view

### 1. SMD(type B)



### 2. DIP(type C)

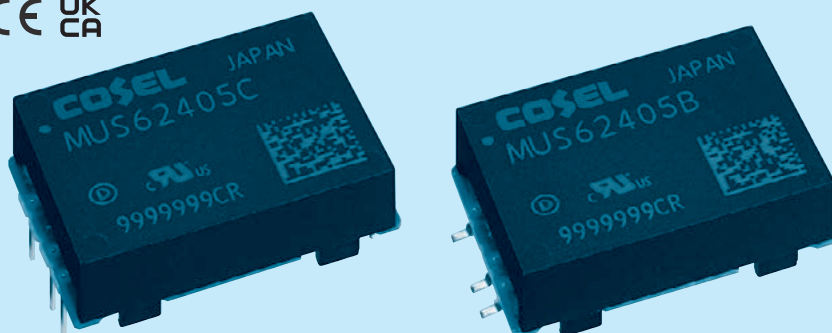


- ※ Tolerance  $\pm 0.5$  [ $\pm 0.02$ ]
- ※ Dimensions in mm, [ ] = inches
- ※ Pin terminal thickness :  $0.3 \pm 0.1$  [ $0.012$ ]
- ※ Pin terminal material : Copper alloy
- ※ Plating treatment of terminal : Lead free plating
- ※ Case material : PPS
- ※ Weight : 3g max

# MUS6

MU S 6 12 05 B - □

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type  
B : SMD  
C : DIP
- ⑦ Optional  
G : Capacitor between Input and Output is removed.

| MODEL                 | MUS6053R3  | MUS60505 | MUS60512 | MUS60515 | MUS6123R3 | MUS61205 | MUS61212 | MUS61215 |
|-----------------------|------------|----------|----------|----------|-----------|----------|----------|----------|
| MAX OUTPUT WATTAGE[W] | 4.46       | 6.0      | 6.0      | 6.0      | 4.46      | 6.0      | 6.0      | 6.0      |
| DC OUTPUT             | VOLTAGE[V] | 3.3      | 5        | 12       | 15        | 3.3      | 5        | 12       |
|                       | CURRENT[A] | 1.35     | 1.2      | 0.5      | 0.4       | 1.35     | 1.2      | 0.5      |

## SPECIFICATIONS

|                               | MODEL                           | MUS6053R3                                                | MUS60505    | MUS60512      | MUS60515      | MUS6123R3                             | MUS61205    | MUS61212      | MUS61215      |
|-------------------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|---------------------------------------|-------------|---------------|---------------|
| INPUT                         | VOLTAGE[VDC]                    | 4.5 - 9 (Surge voltage 12.5V, 100ms max)                 |             |               |               | 9 - 18 (Surge voltage 25V, 100ms max) |             |               |               |
|                               | CURRENT[A]                      | *1 1.10typ                                               | 1.43typ     | 1.40typ       | 1.40typ       | 0.45typ                               | 0.58typ     | 0.57typ       | 0.57typ       |
|                               | EFFICIENCY[%]                   | *1 81typ                                                 | 84typ       | 86typ         | 86typ         | 82typ                                 | 86typ       | 88typ         | 88typ         |
| OUTPUT                        | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                   | 5           | 12            | 15            |
|                               | CURRENT[A]                      | 1.35                                                     | 1.2         | 0.5           | 0.4           | 1.35                                  | 1.2         | 0.5           | 0.4           |
|                               | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                               | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                               | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                | 120max      | 150max        | 150max        |
|                               | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                | 200max      | 200max        | 200max        |
|                               | TEMPERATURE                     | -20 to +70°C                                             | 50max       | 50max         | 150max        | 180max                                | 50max       | 50max         | 150max        |
|                               | REGULATION[mV]                  | -40 to +70°C                                             | 80max       | 80max         | 240max        | 290max                                | 80max       | 80max         | 240max        |
|                               | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                       |             |               |               |
|                               | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                       |             |               |               |
| PROTECTION CIRCUIT AND OTHERS | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                           | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
|                               | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                       |             |               |               |
|                               | REMOTE ON/OFF                   | Provided (Negative logic L : ON, H : OFF)                |             |               |               |                                       |             |               |               |

| MODEL                 | MUS6243R3  | MUS62405 | MUS62412 | MUS62415 | MUS6483R3 | MUS64805 | MUS64812 | MUS64815 |
|-----------------------|------------|----------|----------|----------|-----------|----------|----------|----------|
| MAX OUTPUT WATTAGE[W] | 4.46       | 6.0      | 6.0      | 6.0      | 4.46      | 6.0      | 6.0      | 6.0      |
| DC OUTPUT             | VOLTAGE[V] | 3.3      | 5        | 12       | 15        | 3.3      | 5        | 12       |
|                       | CURRENT[A] | 1.35     | 1.2      | 0.5      | 0.4       | 1.35     | 1.2      | 0.5      |

## SPECIFICATIONS

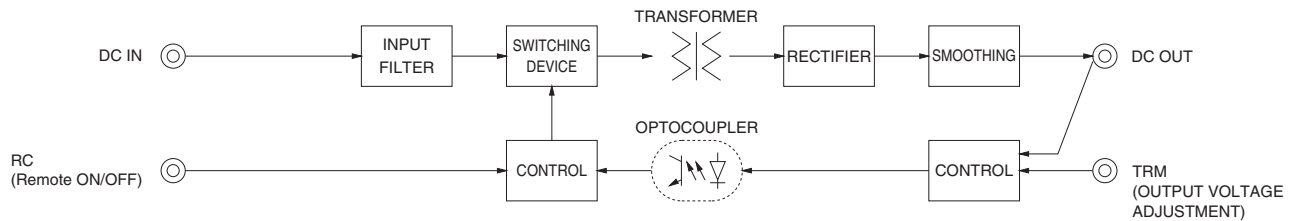
|                               | MODEL                           | MUS6243R3                                                | MUS62405    | MUS62412      | MUS62415      | MUS6483R3                               | MUS64805    | MUS64812      | MUS64815      |
|-------------------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|-----------------------------------------|-------------|---------------|---------------|
| INPUT                         | VOLTAGE[VDC]                    | 18 - 36 (Surge voltage 50V, 100ms max)                   |             |               |               | 36 - 76 (Surge voltage 100V, 100ms max) |             |               |               |
|                               | CURRENT[A]                      | *1 0.23typ                                               | 0.30typ     | 0.29typ       | 0.29typ       | 0.12typ                                 | 0.15typ     | 0.14typ       | 0.14typ       |
|                               | EFFICIENCY[%]                   | *1 81typ                                                 | 86typ       | 88typ         | 88typ         | 82typ                                   | 86typ       | 88typ         | 88typ         |
| OUTPUT                        | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                     | 5           | 12            | 15            |
|                               | CURRENT[A]                      | 1.35                                                     | 1.2         | 0.5           | 0.4           | 1.35                                    | 1.2         | 0.5           | 0.4           |
|                               | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                               | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                               | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                  | 120max      | 150max        | 150max        |
|                               | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                  | 200max      | 200max        | 200max        |
|                               | TEMPERATURE                     | -20 to +70°C                                             | 50max       | 50max         | 150max        | 180max                                  | 50max       | 50max         | 150max        |
|                               | REGULATION[mV]                  | -40 to +70°C                                             | 80max       | 80max         | 240max        | 290max                                  | 80max       | 80max         | 240max        |
|                               | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                         |             |               |               |
|                               | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                         |             |               |               |
| PROTECTION CIRCUIT AND OTHERS | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                             | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
|                               | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                         |             |               |               |
|                               | REMOTE ON/OFF                   | Provided (Negative logic L : ON, H : OFF)                |             |               |               |                                         |             |               |               |

## GENERAL SPECIFICATIONS

|             |                                      |                                                                                            |
|-------------|--------------------------------------|--------------------------------------------------------------------------------------------|
| ISOLATION   | INPUT-OUTPUT                         | AC500V 1minute, Cutoff current=10mA, DC500V 50MΩ min (20±15°C)                             |
| ENVIRONMENT | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +95°C, 20 to 95%RH (Non condensing) (Refer to "Derating"), 5,000m (16,400feet) max  |
|             | STORAGE TEMP., HUMID. AND ALTITUDE   | -40 to +100°C, 20 to 95%RH (Non condensing), 9,000m (30,000feet) max                       |
|             | VIBRATION                            | 10 - 55Hz 98.0m/s <sup>2</sup> (10G), 3minute period, 60minutes each along X, Y and Z axis |
|             | IMPACT                               | 490.3m/s <sup>2</sup> (50G) 11ms, once each along X, Y and Z axis                          |
| SAFETY      | AGENCY APPROVALS                     | UL62368-1 C-UL (equivalent to CAN / CSA-C22.2 No.62368-1), EN62368-1                       |
| OTHERS      | CASE SIZE/WEIGHT                     | 24.0×8.5×17.3mm [0.94×0.33×0.68 inches] (W×H×D) / 5g max                                   |
|             | COOLING METHOD                       | Convection/Forced air                                                                      |

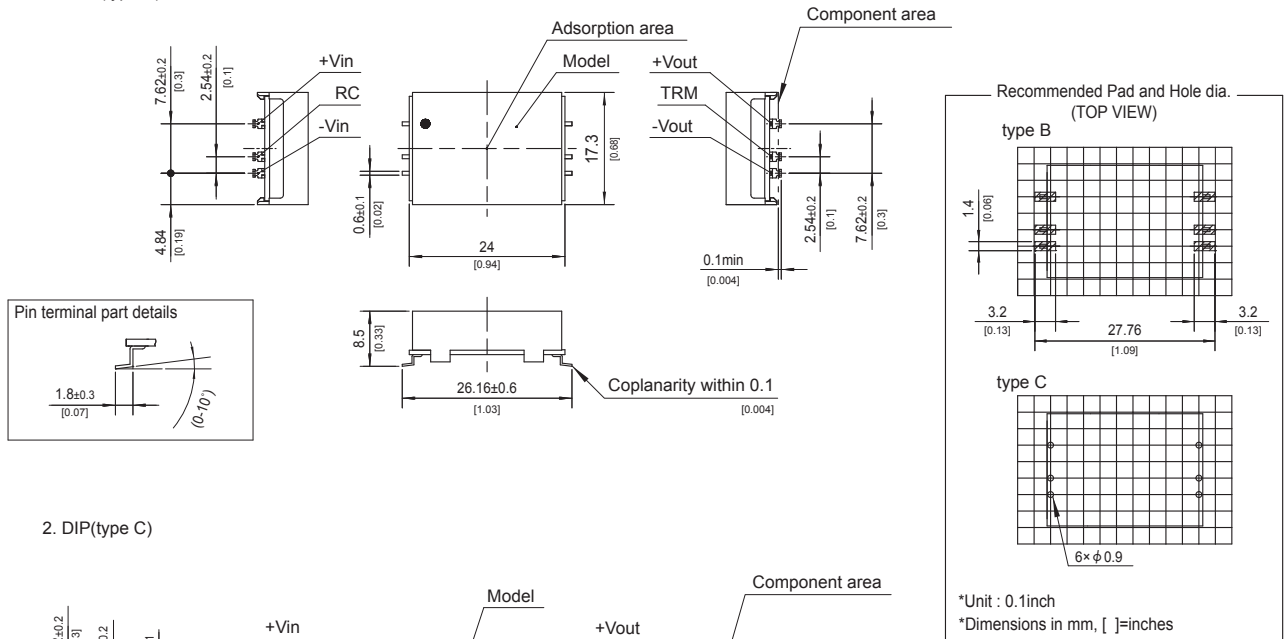
- \*1 Rated input 5V, 12V, 24V or 48V DC I<sub>o</sub>=100%
- \*2 Ripple and ripple noise is measured by using test board with ceramic capacitor 1μF at 25mm from output pins.
- \* Parallel operation with other model is not possible.
- \* MUW6xx12/MUW6xx15 is available as single output, +24V/+30V

### Block diagram

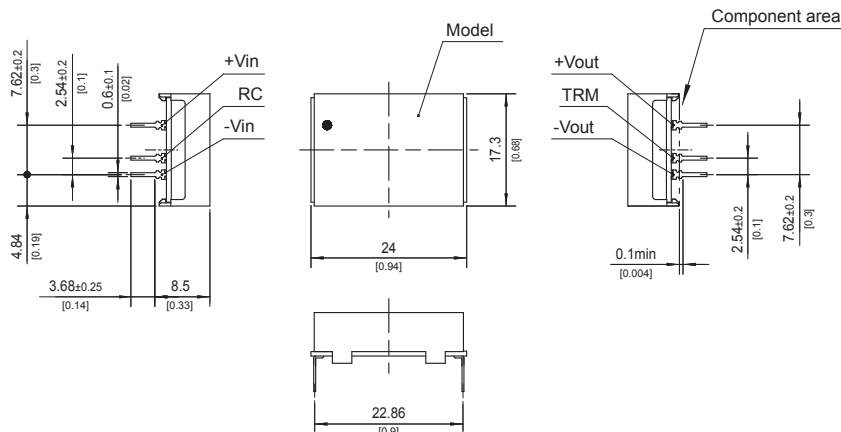


### External view

#### 1. SMD(type B)



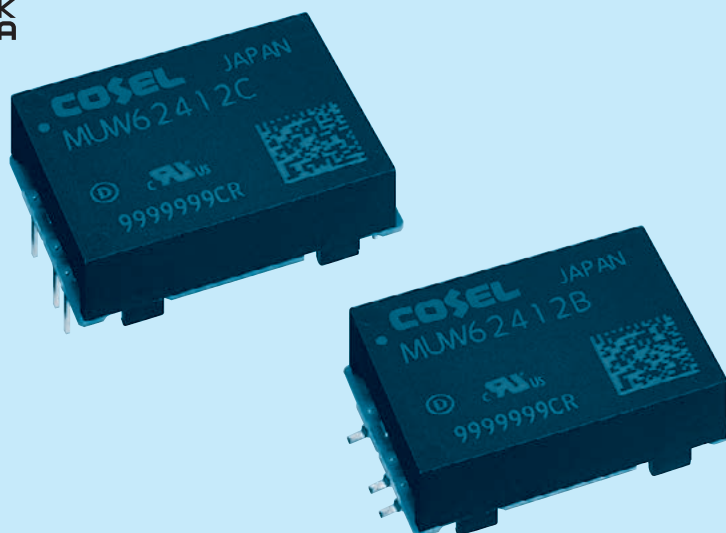
#### 2. DIP(type C)



- ※ Tolerance -0.5 [-0.02]
- ※ Dimensions in mm, [ ]=inches
- ※ Pin terminal thickness : 0.3-0.1 [0.012]
- ※ Pin terminal material : Copper alloy
- ※ Plating treatment of terminal : Lead free plating
- ※ Case material : PPS
- ※ Weight : 5g max

MU W 6 12 12 B - □

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name  
 ② Dual output  
 ③ Output wattage  
 ④ Input voltage  
 ⑤ Output voltage  
 ⑥ Mounting type  
 B : SMD  
 C : DIP  
 ⑦ Optional  
 G : Capacitor between Input and Output is removed.

| MODEL                 |               | MUW60512   | MUW60515   | MUW61212   | MUW61215   | MUW62412   | MUW62415   | MUW64812   | MUW64815   |
|-----------------------|---------------|------------|------------|------------|------------|------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] |               | 6          | 6          | 6          | 6          | 6          | 6          | 6          | 6          |
| DC OUTPUT             | VOLTAGE[V] *1 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 |
|                       | CURRENT[A]    | 0.25       | 0.2        | 0.25       | 0.2        | 0.25       | 0.2        | 0.25       | 0.2        |

## SPECIFICATIONS

|                               | MODEL                                | MUW60512                                                                                   | MUW60515   | MUW61212                                 | MUW61215   | MUW62412                                  | MUW62415   | MUW64812                                   | MUW64815   |
|-------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------|------------|------------------------------------------|------------|-------------------------------------------|------------|--------------------------------------------|------------|
| INPUT                         | VOLTAGE[VDC]                         | 4.5 - 9<br>(Surge voltage 12.5V, 100ms max)                                                |            | 9 - 18<br>(Surge voltage 25V, 100ms max) |            | 18 - 36<br>(Surge voltage 50V, 100ms max) |            | 36 - 76<br>(Surge voltage 100V, 100ms max) |            |
|                               | CURRENT[A] *2                        | 1.40typ                                                                                    | 1.40typ    | 0.57typ                                  | 0.57typ    | 0.29typ                                   | 0.29typ    | 0.14typ                                    | 0.14typ    |
|                               | EFFICIENCY[%] *2                     | 86typ                                                                                      | 86typ      | 88typ                                    | 88typ      | 88typ                                     | 88typ      | 88typ                                      | 88typ      |
| OUTPUT                        | VOLTAGE[V]                           | ±12 or +24                                                                                 | ±15 or +30 | ±12 or +24                               | ±15 or +30 | ±12 or +24                                | ±15 or +30 | ±12 or +24                                 | ±15 or +30 |
|                               | CURRENT[A]                           | 0.25                                                                                       | 0.2        | 0.25                                     | 0.2        | 0.25                                      | 0.2        | 0.25                                       | 0.2        |
|                               | LINE REGULATION[mV]                  | 60max                                                                                      | 75max      | 60max                                    | 75max      | 60max                                     | 75max      | 60max                                      | 75max      |
|                               | LOAD REGULATION[mV]                  | *3 480max                                                                                  | 600max     | 480max                                   | 600max     | 480max                                    | 600max     | 480max                                     | 600max     |
|                               |                                      | *4 600max                                                                                  | 750max     | 600max                                   | 750max     | 600max                                    | 750max     | 600max                                     | 750max     |
|                               | RIPPLE[mVp-p] *5                     | 150max                                                                                     | 150max     | 150max                                   | 150max     | 150max                                    | 150max     | 150max                                     | 150max     |
|                               | RIPPLE NOISE[mVp-p] *5               | 200max                                                                                     | 200max     | 200max                                   | 200max     | 200max                                    | 200max     | 200max                                     | 200max     |
|                               | TEMPERATURE REGULATION[mV]           | -20 to +70°C                                                                               | 210max     | 210max                                   | 260max     | 210max                                    | 260max     | 210max                                     | 260max     |
|                               |                                      | -40 to +70°C                                                                               | 320max     | 320max                                   | 390max     | 320max                                    | 390max     | 320max                                     | 390max     |
|                               | START-UP TIME[ms]                    | 20max (Minimum input, Io=100%)                                                             |            |                                          |            |                                           |            |                                            |            |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION               | Works over 105% of rating and recovers automatically                                       |            |                                          |            |                                           |            |                                            |            |
|                               | REMOTE ON/OFF                        | Provided (Negative logic L : ON, H : OFF)                                                  |            |                                          |            |                                           |            |                                            |            |
|                               | ISOLATION                            | AC500V 1minute, Cutoff current=10mA, DC500V 50MΩ min (20±15°C)                             |            |                                          |            |                                           |            |                                            |            |
| ENVIRONMENT                   | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +95°C, 20 to 95%RH (Non condensing) (Refer to "Derating"), 5,000m (16,400feet) max  |            |                                          |            |                                           |            |                                            |            |
|                               | STORAGE TEMP., HUMID. AND ALTITUDE   | -40 to +100°C, 20 to 95%RH (Non condensing), 9,000m (30,000feet) max                       |            |                                          |            |                                           |            |                                            |            |
|                               | VIBRATION                            | 10 - 55Hz 98.0m/s <sup>2</sup> (10G), 3minute period, 60minutes each along X, Y and Z axis |            |                                          |            |                                           |            |                                            |            |
|                               | IMPACT                               | 490.3m/s <sup>2</sup> (50G) 11ms, once each along X, Y and Z axis                          |            |                                          |            |                                           |            |                                            |            |
| SAFETY                        | AGENCY APPROVALS                     | UL62368-1 C-UL (equivalent to CAN / CSA-C22.2 No.62368-1), EN62368-1                       |            |                                          |            |                                           |            |                                            |            |
| OTHERS                        | CASE SIZE/WEIGHT                     | 24.0×8.5×17.3mm [0.94×0.33×0.68 inches] (W×H×D) / 5g max                                   |            |                                          |            |                                           |            |                                            |            |
|                               | COOLING METHOD                       | Convection/Forced air                                                                      |            |                                          |            |                                           |            |                                            |            |

\*1 Single output +24V, +30V with no use of COM.

\*2 Rated input 5V, 12V, 24V or 48V DC Io=100%

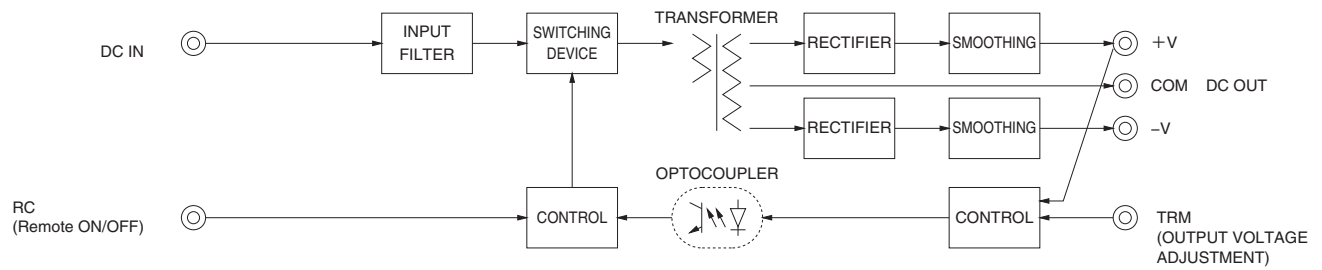
\*3 Symmetrical loading from 20% to 100%.

\*4 Symmetrical loading from 0% to 100%.

\*5 Ripple and Ripple Noise is measured by using test board with ceramic capacitor 1μF at 25mm from output pins.

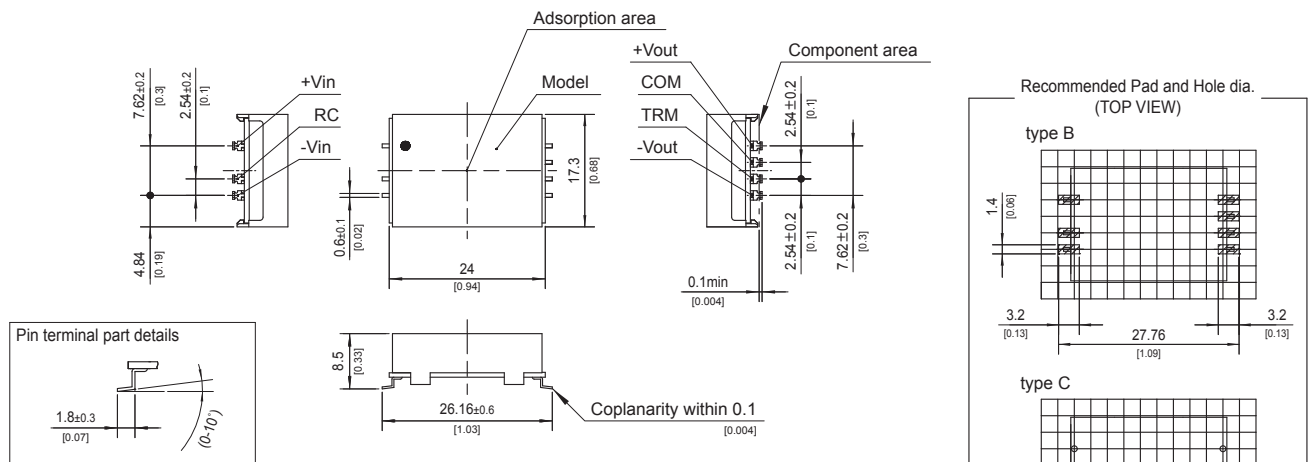
\* Parallel operation with other model is not possible.

## Block diagram

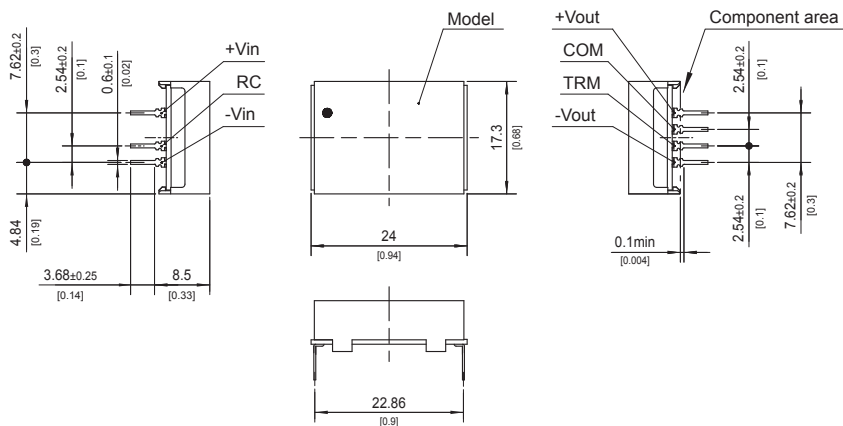


## External view

### 1. SMD(type B)



### 2. DIP(type C)

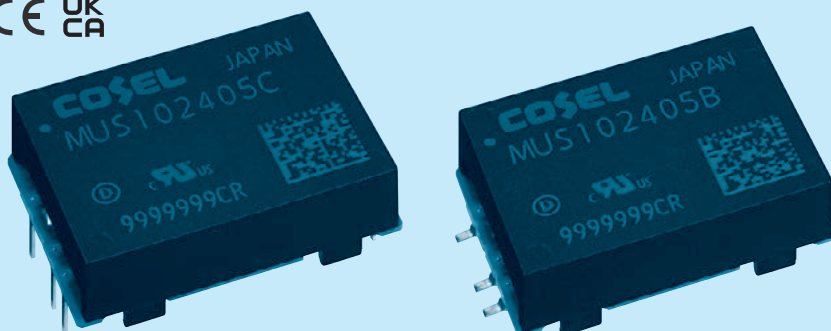


- ※ Tolerance  $\pm 0.5$  [ $\pm 0.02$ ]
- ※ Dimensions in mm, [ ] = inches
- ※ Pin terminal thickness :  $0.3 \pm 0.1$  [ $0.012$ ]
- ※ Pin terminal material : Copper alloy
- ※ Plating treatment of terminal : Lead free plating
- ※ Case material : PPS
- ※ Weight : 5g max

# MUS10

MU S 10 12 05 B - □

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type  
B : SMD  
C : DIP
- ⑦ Optional  
G : Capacitor between Input and Output is removed.

| MODEL                 | MUS10053R3 | MUS100505 | MUS100512 | MUS100515 | MUS10123R3 | MUS101205 | MUS101212 | MUS101215 |
|-----------------------|------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|
| MAX OUTPUT WATTAGE[W] | 8.58       | 10.0      | 10.8      | 10.5      | 8.58       | 10.0      | 10.8      | 10.5      |
| DC OUTPUT             | VOLTAGE[V] | 3.3       | 5         | 12        | 15         | 3.3       | 5         | 12        |
|                       | CURRENT[A] | 2.6       | 2         | 0.9       | 0.7        | 2.6       | 2         | 0.9       |

## SPECIFICATIONS

|                               | MODEL                           | MUS10053R3                                               | MUS100505   | MUS100512     | MUS100515     | MUS10123R3                            | MUS101205   | MUS101212     | MUS101215     |
|-------------------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|---------------------------------------|-------------|---------------|---------------|
| INPUT                         | VOLTAGE[VDC]                    | 4.5 - 9 (Surge voltage 12.5V, 100ms max)                 |             |               |               | 9 - 18 (Surge voltage 25V, 100ms max) |             |               |               |
|                               | CURRENT[A]                      | *1 2.07typ                                               | 2.33typ     | 2.51typ       | 2.41typ       | 0.82typ                               | 0.94typ     | 1.00typ       | 0.97typ       |
|                               | EFFICIENCY[%]                   | *1 83typ                                                 | 86typ       | 86typ         | 87typ         | 87typ                                 | 89typ       | 90typ         | 90typ         |
| OUTPUT                        | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                   | 5           | 12            | 15            |
|                               | CURRENT[A]                      | 2.6                                                      | 2           | 0.9           | 0.7           | 2.6                                   | 2           | 0.9           | 0.7           |
|                               | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                               | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                 | 20max       | 48max         | 60max         |
|                               | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                | 120max      | 150max        | 150max        |
|                               | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                | 200max      | 200max        | 200max        |
|                               | TEMPERATURE REGULATION[mV]      | -20 to +50°C 50max                                       | 50max       | 150max        | 180max        | 50max                                 | 50max       | 150max        | 180max        |
|                               |                                 | -40 to +50°C 80max                                       | 80max       | 240max        | 290max        | 80max                                 | 80max       | 240max        | 290max        |
|                               | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                       |             |               |               |
|                               | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                       |             |               |               |
|                               | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                           | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                       |             |               |               |
|                               | REMOTE ON/OFF                   | Provided (Negative logic L : ON, H : OFF)                |             |               |               |                                       |             |               |               |

| MODEL                 | MUS10243R3 | MUS102405 | MUS102412 | MUS102415 | MUS10483R3 | MUS104805 | MUS104812 | MUS104815 |
|-----------------------|------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|
| MAX OUTPUT WATTAGE[W] | 8.58       | 10.0      | 10.8      | 10.5      | 8.58       | 10.0      | 10.8      | 10.5      |
| DC OUTPUT             | VOLTAGE[V] | 3.3       | 5         | 12        | 15         | 3.3       | 5         | 12        |
|                       | CURRENT[A] | 2.6       | 2         | 0.9       | 0.7        | 2.6       | 2         | 0.9       |

## SPECIFICATIONS

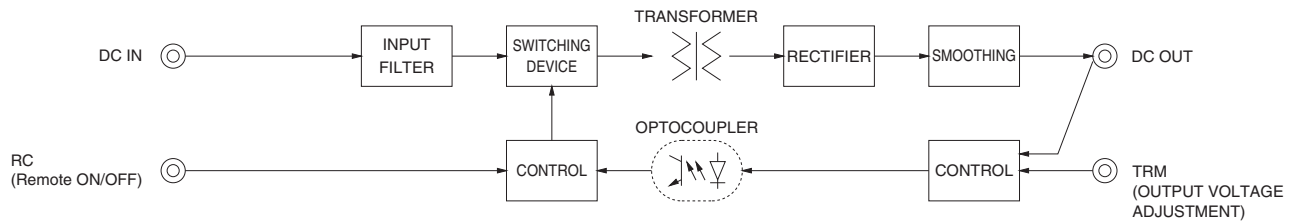
|                               | MODEL                           | MUS10243R3                                               | MUS102405   | MUS102412     | MUS102415     | MUS10483R3                              | MUS104805   | MUS104812     | MUS104815     |
|-------------------------------|---------------------------------|----------------------------------------------------------|-------------|---------------|---------------|-----------------------------------------|-------------|---------------|---------------|
| INPUT                         | VOLTAGE[VDC]                    | 18 - 36 (Surge voltage 50V, 100ms max)                   |             |               |               | 36 - 76 (Surge voltage 100V, 100ms max) |             |               |               |
|                               | CURRENT[A]                      | *1 0.41typ                                               | 0.47typ     | 0.50typ       | 0.49typ       | 0.20typ                                 | 0.24typ     | 0.25typ       | 0.24typ       |
|                               | EFFICIENCY[%]                   | *1 87typ                                                 | 89typ       | 90typ         | 90typ         | 88typ                                   | 88typ       | 90typ         | 90typ         |
| OUTPUT                        | VOLTAGE[V]                      | 3.3                                                      | 5           | 12            | 15            | 3.3                                     | 5           | 12            | 15            |
|                               | CURRENT[A]                      | 2.6                                                      | 2           | 0.9           | 0.7           | 2.6                                     | 2           | 0.9           | 0.7           |
|                               | LINE REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                               | LOAD REGULATION[mV]             | 20max                                                    | 20max       | 48max         | 60max         | 20max                                   | 20max       | 48max         | 60max         |
|                               | RIPPLE[mVp-p]                   | *2 120max                                                | 120max      | 150max        | 150max        | 120max                                  | 120max      | 150max        | 150max        |
|                               | RIPPLE NOISE[mVp-p]             | *2 200max                                                | 200max      | 200max        | 200max        | 200max                                  | 200max      | 200max        | 200max        |
|                               | TEMPERATURE REGULATION[mV]      | -20 to +50°C 50max                                       | 50max       | 150max        | 180max        | 50max                                   | 50max       | 150max        | 180max        |
|                               |                                 | -40 to +50°C 80max                                       | 80max       | 240max        | 290max        | 80max                                   | 80max       | 240max        | 290max        |
|                               | START-UP TIME[ms]               | 20max (Minimum input, Io=100%)                           |             |               |               |                                         |             |               |               |
|                               | OUTPUT VOLTAGE ADJUSTMENT RANGE | Fixed (TRM pin open) +10%, -5% adjustable by external VR |             |               |               |                                         |             |               |               |
|                               | OUTPUT VOLTAGE SETTING[V]       | 3.21 - 3.42                                              | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 | 3.21 - 3.42                             | 4.90 - 5.21 | 11.64 - 12.36 | 14.55 - 15.45 |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION          | Works over 105% of rating and recovers automatically     |             |               |               |                                         |             |               |               |
|                               | REMOTE ON/OFF                   | Provided (Negative logic L : ON, H : OFF)                |             |               |               |                                         |             |               |               |

## GENERAL SPECIFICATIONS

|             |                                      |                                                                                            |
|-------------|--------------------------------------|--------------------------------------------------------------------------------------------|
| ISOLATION   | INPUT-OUTPUT                         | AC500V 1minute, Cutoff current=10mA, DC500V 50MΩ min (20±15°C)                             |
| ENVIRONMENT | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +90°C, 20 to 95%RH (Non condensing) (Refer to "Derating"), 5,000m (16,400feet) max  |
|             | STORAGE TEMP., HUMID. AND ALTITUDE   | -40 to +100°C, 20 to 95%RH (Non condensing), 9,000m (30,000feet) max                       |
|             | VIBRATION                            | 10 - 55Hz 98.0m/s <sup>2</sup> (10G), 3minute period, 60minutes each along X, Y and Z axis |
|             | IMPACT                               | 490.3m/s <sup>2</sup> (50G) 11ms, once each along X, Y and Z axis                          |
| SAFETY      | AGENCY APPROVALS                     | UL62368-1 C-UL (equivalent to CAN / CSA-C22.2 No.62368-1), EN62368-1                       |
| OTHERS      | CASE SIZE/WEIGHT                     | 24.0×8.5×17.3mm [0.94×0.33×0.68 inches] (W×H×D) / 5g max                                   |
|             | COOLING METHOD                       | Convection/Forced air                                                                      |

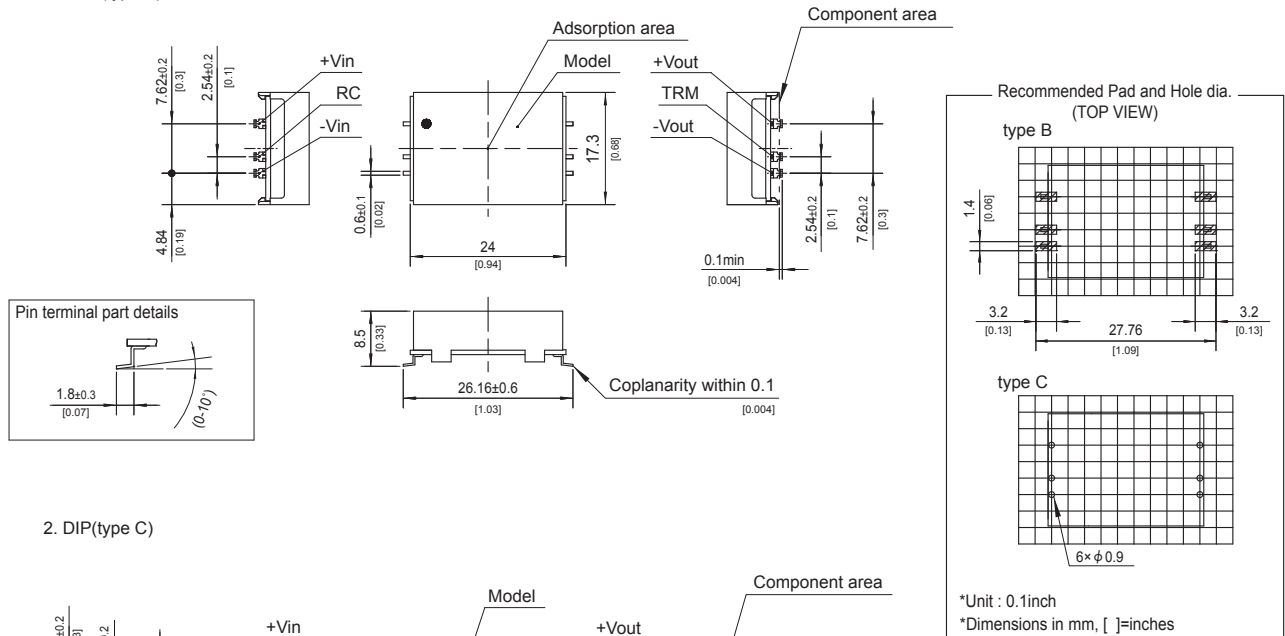
- \*1 Rated input 5V, 12V, 24V or 48V DC I<sub>o</sub>=100%
- \*2 Ripple and ripple noise is measured by using test board with ceramic capacitor 1μF at 25mm from output pins.
- \* Parallel operation with other model is not possible.
- \* MUW10xx12/MUW10xx15 is available as single output, +24V/+30V

### Block diagram

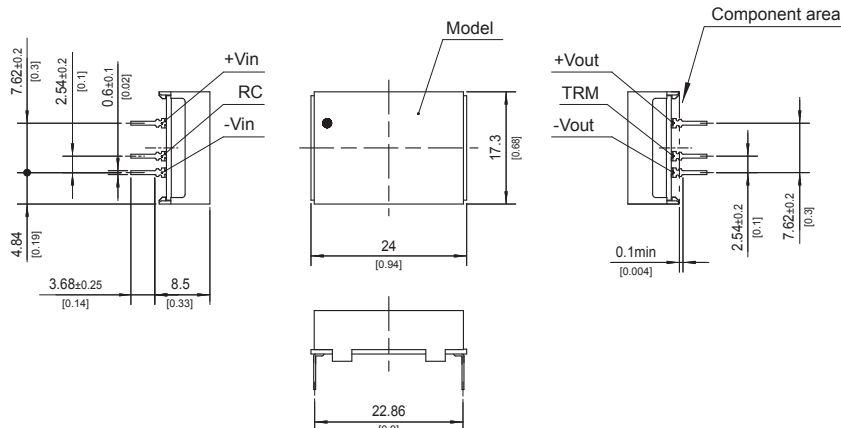


### External view

#### 1. SMD(type B)



#### 2. DIP(type C)

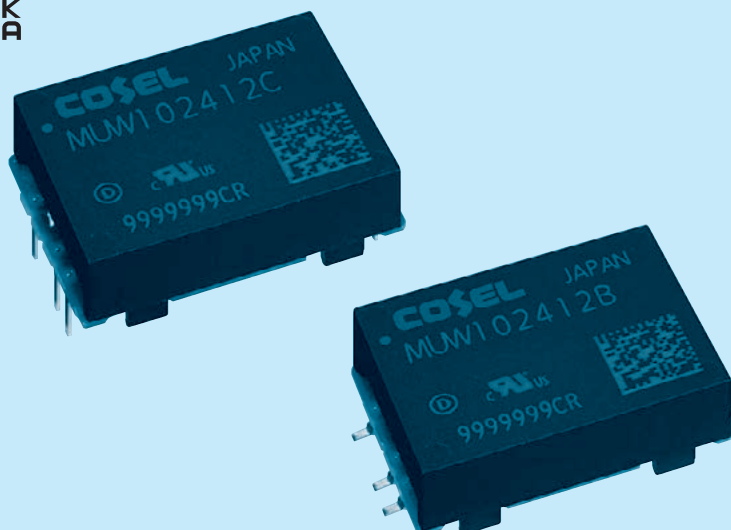


- ※ Tolerance -0.5 [-0.02]
- ※ Dimensions in mm, [ ]=inches
- ※ Pin terminal thickness : 0.3-0.1 [0.012]
- ※ Pin terminal material : Copper alloy
- ※ Plating treatment of terminal : Lead free plating
- ※ Case material : PPS
- ※ Weight : 5g max

# MUW10

MU W 10 12 12 B - □

① ② ③ ④ ⑤ ⑥ ⑦



- ① Series name
- ② Dual output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type  
B : SMD  
C : DIP
- ⑦ Optional  
G : Capacitor between Input and Output is removed.

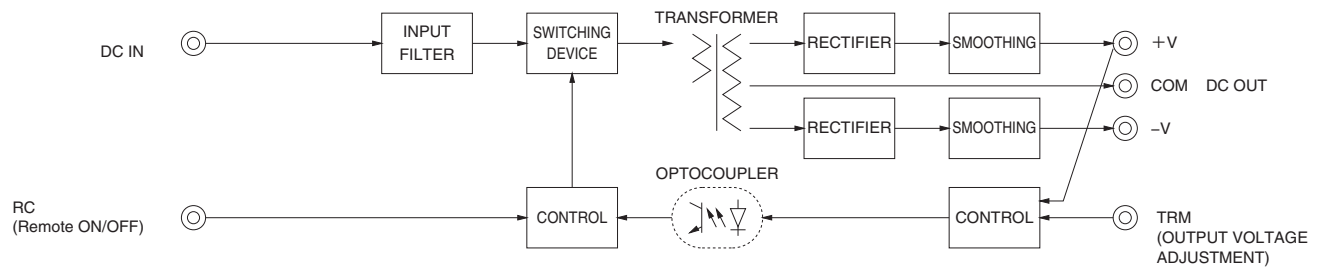
| MODEL                 | MUW100512     | MUW100515  | MUW101212  | MUW101215  | MUW102412  | MUW102415  | MUW104812  | MUW104815  |
|-----------------------|---------------|------------|------------|------------|------------|------------|------------|------------|
| MAX OUTPUT WATTAGE[W] | 10.8          | 10.5       | 10.8       | 10.5       | 10.8       | 10.5       | 10.8       | 10.5       |
| DC OUTPUT             | VOLTAGE[V] *1 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 | ±15 or +30 | ±12 or +24 |
|                       | CURRENT[A]    | 0.45       | 0.35       | 0.45       | 0.35       | 0.45       | 0.35       | 0.45       |

## SPECIFICATIONS

|                               | MODEL                                | MUW100512                                                                                  | MUW100515  | MUW101212                                | MUW101215  | MUW102412                                 | MUW102415  | MUW104812                                  | MUW104815  |
|-------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------|------------|------------------------------------------|------------|-------------------------------------------|------------|--------------------------------------------|------------|
| INPUT                         | VOLTAGE[VDC]                         | 4.5 - 9<br>(Surge voltage 12.5V, 100ms max)                                                |            | 9 - 18<br>(Surge voltage 25V, 100ms max) |            | 18 - 36<br>(Surge voltage 50V, 100ms max) |            | 36 - 76<br>(Surge voltage 100V, 100ms max) |            |
|                               | CURRENT[A] *2                        | 2.52typ                                                                                    | 2.45typ    | 1.03typ                                  | 1.00typ    | 0.51typ                                   | 0.50typ    | 0.25typ                                    | 0.25typ    |
|                               | EFFICIENCY[%] *2                     | 86typ                                                                                      | 86typ      | 88typ                                    | 88typ      | 89typ                                     | 89typ      | 89typ                                      | 89typ      |
| OUTPUT                        | VOLTAGE[V]                           | ±12 or +24                                                                                 | ±15 or +30 | ±12 or +24                               | ±15 or +30 | ±12 or +24                                | ±15 or +30 | ±12 or +24                                 | ±15 or +30 |
|                               | CURRENT[A]                           | 0.45                                                                                       | 0.35       | 0.45                                     | 0.35       | 0.45                                      | 0.35       | 0.45                                       | 0.35       |
|                               | LINE REGULATION[mV]                  | 60max                                                                                      | 75max      | 60max                                    | 75max      | 60max                                     | 75max      | 60max                                      | 75max      |
|                               | LOAD REGULATION[mV]                  | *3 480max                                                                                  | 600max     | 480max                                   | 600max     | 480max                                    | 600max     | 480max                                     | 600max     |
|                               |                                      | *4 600max                                                                                  | 750max     | 600max                                   | 750max     | 600max                                    | 750max     | 600max                                     | 750max     |
|                               | RIPPLE[mVp-p] *5                     | 150max                                                                                     | 150max     | 150max                                   | 150max     | 150max                                    | 150max     | 150max                                     | 150max     |
|                               | RIPPLE NOISE[mVp-p] *5               | 200max                                                                                     | 200max     | 200max                                   | 200max     | 200max                                    | 200max     | 200max                                     | 200max     |
|                               | TEMPERATURE REGULATION[mV]           | -20 to +50°C                                                                               | 210max     | 260max                                   | 210max     | 260max                                    | 210max     | 260max                                     | 210max     |
|                               |                                      | -40 to +50°C                                                                               | 320max     | 390max                                   | 320max     | 390max                                    | 320max     | 390max                                     | 320max     |
|                               | START-UP TIME[ms]                    | 20max (Minimum input, Io=100%)                                                             |            |                                          |            |                                           |            |                                            |            |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION               | Works over 105% of rating and recovers automatically                                       |            |                                          |            |                                           |            |                                            |            |
|                               | REMOTE ON/OFF                        | Provided (Negative logic L : ON, H : OFF)                                                  |            |                                          |            |                                           |            |                                            |            |
|                               | ISOLATION                            | AC500V 1minute, Cutoff current=10mA, DC500V 50MΩ min (20±15°C)                             |            |                                          |            |                                           |            |                                            |            |
| ENVIRONMENT                   | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +90°C, 20 to 95%RH (Non condensing) (Refer to "Derating"), 5,000m (16,400feet) max  |            |                                          |            |                                           |            |                                            |            |
|                               | STORAGE TEMP., HUMID. AND ALTITUDE   | -40 to +100°C, 20 to 95%RH (Non condensing), 9,000m (30,000feet) max                       |            |                                          |            |                                           |            |                                            |            |
|                               | VIBRATION                            | 10 - 55Hz 98.0m/s <sup>2</sup> (10G), 3minute period, 60minutes each along X, Y and Z axis |            |                                          |            |                                           |            |                                            |            |
|                               | IMPACT                               | 490.3m/s <sup>2</sup> (50G) 11ms, once each along X, Y and Z axis                          |            |                                          |            |                                           |            |                                            |            |
| SAFETY                        | AGENCY APPROVALS                     | UL62368-1 C-UL (equivalent to CAN / CSA-C22.2 No.62368-1), EN62368-1                       |            |                                          |            |                                           |            |                                            |            |
| OTHERS                        | CASE SIZE/WEIGHT                     | 24.0 × 8.5 × 17.3mm [0.94 × 0.33 × 0.68 inches] (W × H × D) / 5g max                       |            |                                          |            |                                           |            |                                            |            |
|                               | COOLING METHOD                       | Convection/Forced air                                                                      |            |                                          |            |                                           |            |                                            |            |

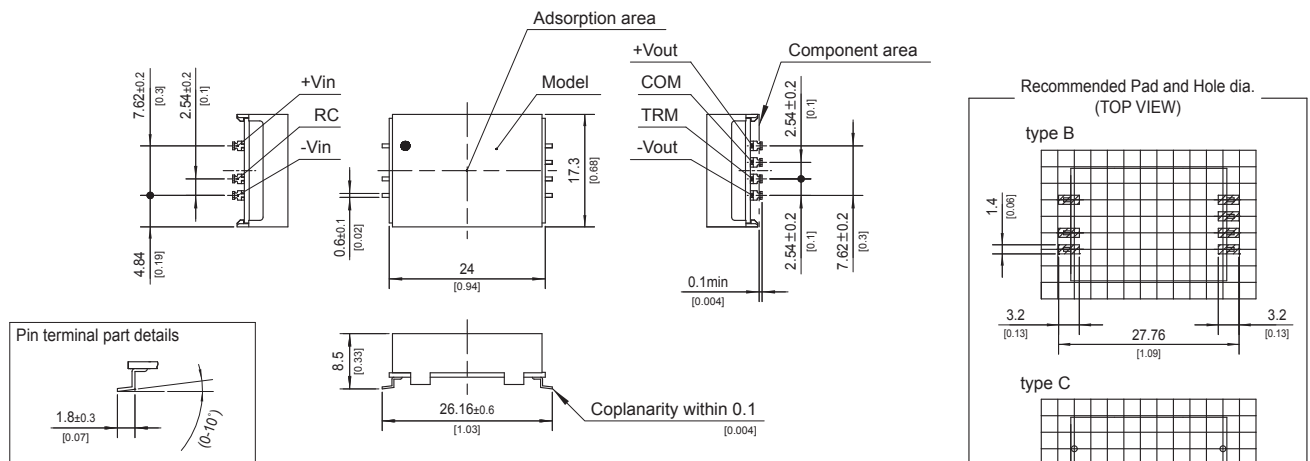
- \*1 Single output +24V, +30V with no use of COM.
- \*2 Rated input 5V, 12V, 24V or 48V DC Io=100%
- \*3 Symmetrical loading from 20% to 100%.
- \*4 Symmetrical loading from 0% to 100%.
- \*5 Ripple and Ripple Noise is measured by using test board with ceramic capacitor 1μF at 25mm from output pins.
- \* Parallel operation with other model is not possible.

## Block diagram

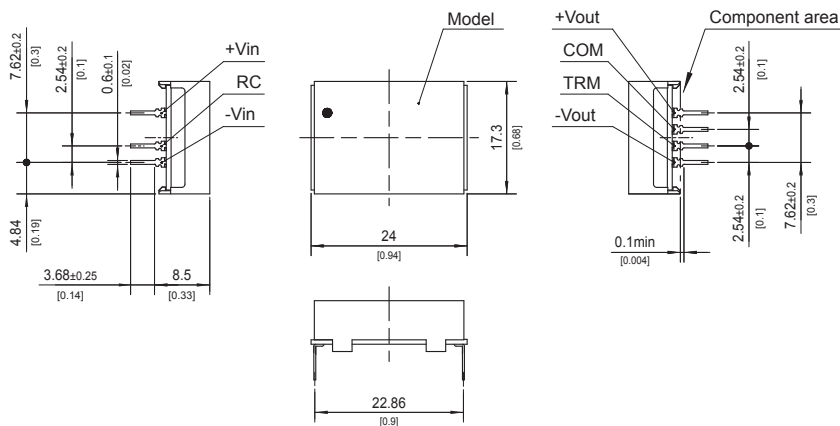


## External view

### 1. SMD(type B)



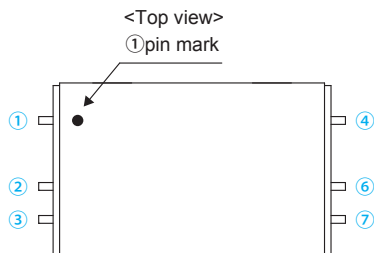
### 2. DIP(type C)



- ※ Tolerance ±0.5 [±0.02]
- ※ Dimensions in mm, [ ]= inches
- ※ Pin terminal thickness : 0.3±0.1 [0.012]
- ※ Pin terminal material : Copper alloy
- ※ Plating treatment of terminal : Lead free plating
- ※ Case material : PPS
- ※ Weight : 5g max

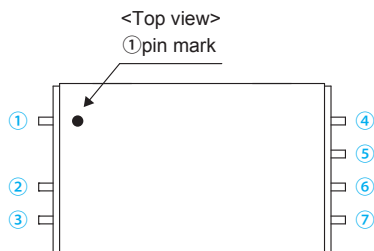
## Pin Configuration

### ● MU Single Output



| Pin No. | Pin Terminal Name | Function                                                      |
|---------|-------------------|---------------------------------------------------------------|
| ①       | +Vin              | +DC Input                                                     |
| ②       | RC                | Remote ON/OFF (excluding 1R5)                                 |
| ③       | -Vin              | -DC Input                                                     |
| ④       | +Vout             | +DC Output                                                    |
| ⑤       | COM               | GND of Output Voltage (for Dual Output)                       |
| ⑥       | TRM               | Output Voltage Adjustment (please see Instruction Manual 1.4) |
| ⑦       | -Vout             | -DC Output                                                    |

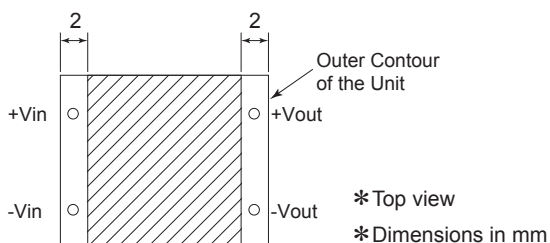
### ● MU Dual (±) Output



## Assembling and Installation Method

### Installation

- You can install the units in any direction. Place them in such a way that there is enough ventilation so that heat does not get accumulated around them.
- Do not place land or pattern layouts in the hatched area shown in below. Doing so may cause insulation failure on the PCB surface on which the power supply is mounted.



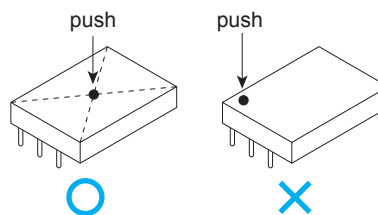
Area where Pattern Layout should not be Placed for MU

### Automatic Mounting (TYPE: B)

- To mount MU series automatically, use the central area of the case as a pickup point. If the bottom dead point of a suction nozzle is too low when mounting, excessive force is applied to the internal components, which could cause damage. Please mount carefully. Please see the External View for details of the pickup point.

### Hand Mounting (TYPE:B,C)

- To mount MU series manually, it must be push the center of case.
- Due to prevent failure, PS should not be pull after soldering with PCB.

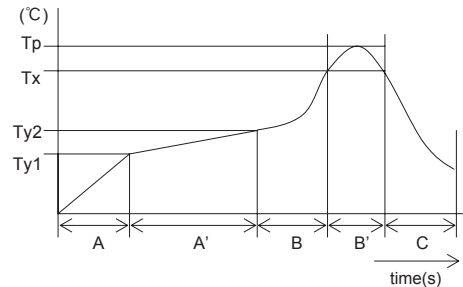
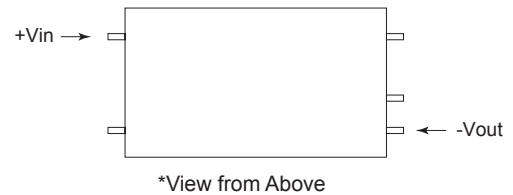


## Assembling and Installation Method

### Soldering Conditions

#### (1) Reflow Soldering

- Right figure shows conditions for the reflow soldering for MU series. Please make sure that the temperatures of pin terminals +Vin and -Vout shown in right figure, do not exceed the temperatures shown in right figure.
- If time or temperature of the reflow soldering goes beyond the conditions, reliability of internal components may be compromised. Please use the unit under the recommended reflow conditions.
- With this reflow profile, internal solder melts down. When transporting the unit within the reflow oven, please do not give vibration to the unit.
- Please avoid reflow soldering after applying adhesive or coating to the unit.
- You can reflow solder up to 1 time. Do not reflow solder when the power supply is mounted on the back surface of the PCB because the unit may drop.



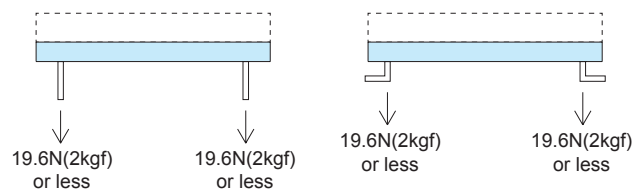
|    |                              |
|----|------------------------------|
| A  | 1.0 - 5.0°C/s                |
| A' | Ty1 : 160 ±20°C              |
|    | Ty2 : 180 ±20°C              |
|    | Ty1 - Ty2 : 120s max         |
| B  | 1.0 - 5.0°C/s                |
| B' | Tp : Max 245°C 10s max       |
|    | Tx : 220°C or more : 70s max |
| C  | 1.0 - 5.0°C/s                |

(2) Flow Soldering : 260°C 15 seconds or less

(3) Soldering Iron : maximum 360°C 5 seconds or less

### Stress to Pin Terminals

- If too much stress is applied to input/output pin terminals of the power supply, internal connection may come down. If you apply stress as shown below, please keep it at 19.6N (2kgf) or less vertically.
- Input/output pin terminals are soldered to the PCB internally. Do not pull or bend a lead powerfully.
- If it is expected that stress is applied to the input/output pin terminals due to vibration or impact, reduce the stress to the pin terminals by taking such measures as fixing the unit to the PCB by silicone rubber, etc.



Strength of Input/Output Pin Terminals for MU

## Derating

### Ambient temperature derating curve

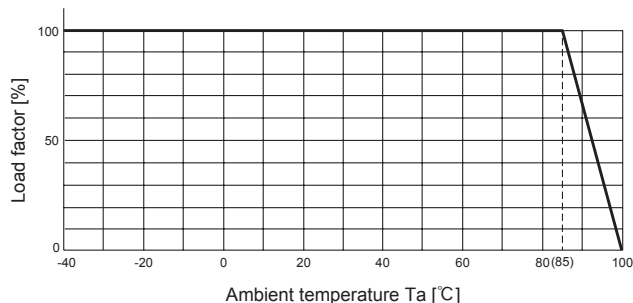
- The ambient temperature derating curve of each model are shown in the figure below.
- Keep the temperature at the center of the case below the temperature shown in the instruction manual 7.
- Model name

The following letters/numbers are entered in □.

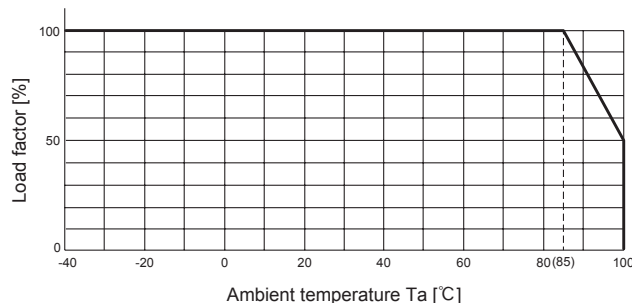
ex.) . . . MU□612□  
           S,W           3R3,05,12,15

#### MU1R5

(1) In the case of Convection Cooling (Reference)

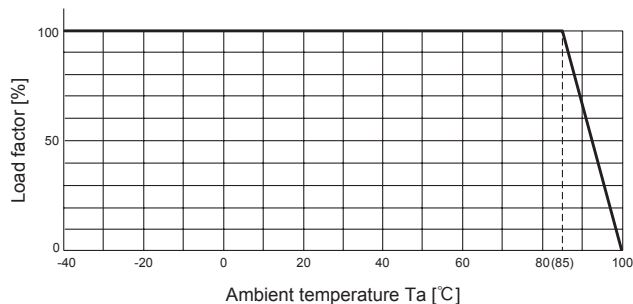


(2) In the case of Forced Air Cooling (1.0m/s) (Reference)

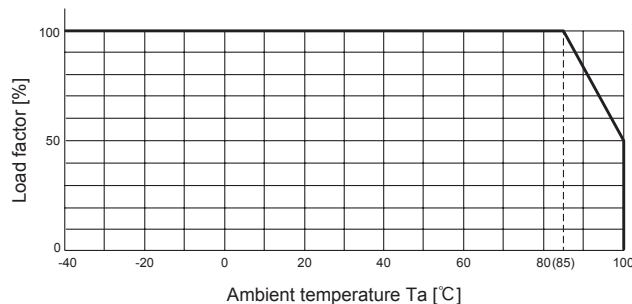


#### MU3

(1) In the case of Convection Cooling (Reference)

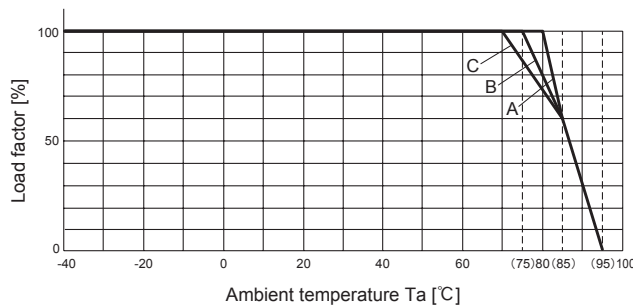


(2) In the case of Forced Air Cooling (1.0m/s) (Reference)

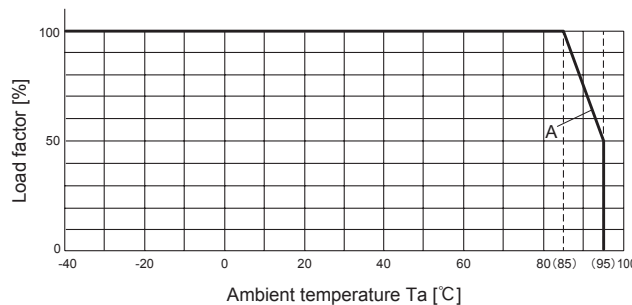


#### MU6

(1) In the case of Convection Cooling (Reference)



(2) In the case of Forced Air Cooling (1.0m/s) (Reference)



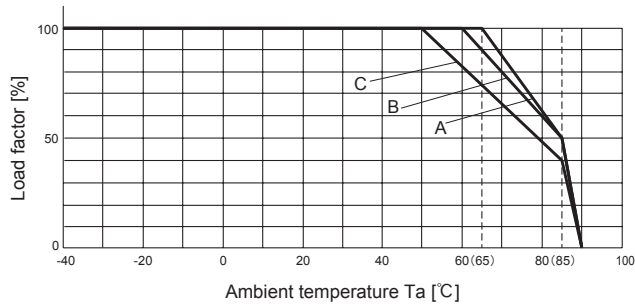
| Output Voltage<br>Model name | 3.3 | 5 | 12 | 15 | ±12 | ±15 |
|------------------------------|-----|---|----|----|-----|-----|
| MU□605□                      | C   | C | B  | B  | B   | B   |
| MU□612□                      | C   | B | A  | A  | A   | A   |
| MU□624□                      | C   | B | A  | A  | A   | A   |
| MU□648□                      | C   | B | A  | A  | A   | A   |

| Output Voltage<br>Model name | 3.3 | 5 | 12 | 15 | ±12 | ±15 |
|------------------------------|-----|---|----|----|-----|-----|
| MU□605□                      | A   | A | A  | A  | A   | A   |
| MU□612□                      | A   | A | A  | A  | A   | A   |
| MU□624□                      | A   | A | A  | A  | A   | A   |
| MU□648□                      | A   | A | A  | A  | A   | A   |

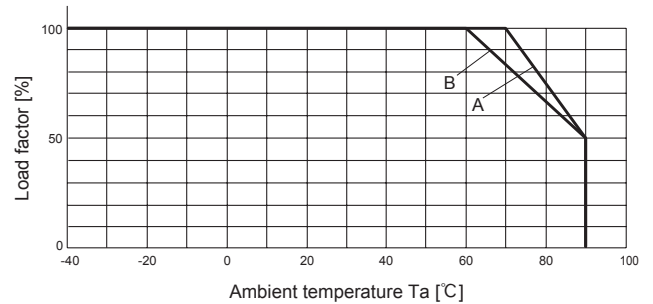
## Derating

### MU10

(1) In the case of Convection Cooling (Reference)



(2) In the case of Forced Air Cooling (1.0m/s) (Reference)



| Output Voltage<br>Model name | 3.3 | 5 | 12 | 15 | ±12 | ±15 |
|------------------------------|-----|---|----|----|-----|-----|
| MU□1005□                     | C   | C | C  | C  | C   | C   |
| MU□1012□                     | A   | A | A  | A  | B   | B   |
| MU□1024□                     | A   | A | A  | A  | A   | A   |
| MU□1048□                     | A   | A | A  | A  | A   | A   |

| Output Voltage<br>Model name | 3.3 | 5 | 12 | 15 | ±12 | ±15 |
|------------------------------|-----|---|----|----|-----|-----|
| MU□1005□                     | B   | B | B  | B  | B   | B   |
| MU□1012□                     | A   | A | A  | A  | A   | A   |
| MU□1024□                     | A   | A | A  | A  | A   | A   |
| MU□1048□                     | A   | A | A  | A  | A   | A   |

## Instruction Manual

◆ It is necessary to read the "Instruction Manual" and "Before using our product" before you use our product.

|                          |                                                                                                                       |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Instruction Manual       | <a href="https://www.cosel.co.jp/redirect/catalog/en/MUS/">https://www.cosel.co.jp/redirect/catalog/en/MUS/</a>       |
| Instruction Manual       | <a href="https://www.cosel.co.jp/redirect/catalog/en/MUW/">https://www.cosel.co.jp/redirect/catalog/en/MUW/</a>       |
| Before using our product | <a href="https://en.cosel.co.jp/technical/caution/index.html">https://en.cosel.co.jp/technical/caution/index.html</a> |

MUS



MUW



NOTICE



## Basic Characteristics Data

| Model | Circuit method    | Switching frequency [kHz] (reference) | Input current [A] | Inrush current protection | PCB/Pattern                   |              |              | Series/Parallel operation availability |                    |
|-------|-------------------|---------------------------------------|-------------------|---------------------------|-------------------------------|--------------|--------------|----------------------------------------|--------------------|
|       |                   |                                       |                   |                           | Material                      | Single sided | Double sided | Series operation                       | Parallel operation |
| MU1R5 | Flyback converter | 420kHz                                | *1                | -                         | glass fabric base,epoxy resin |              | Yes          | Yes                                    | *2                 |
| MU3   | Flyback converter | 420kHz                                | *1                | -                         | glass fabric base,epoxy resin |              | Yes          | Yes                                    | *2                 |
| MU6   | Flyback converter | 420kHz                                | *1                | -                         | glass fabric base,epoxy resin |              | Yes          | Yes                                    | *2                 |
| MU10  | Flyback converter | 420kHz                                | *1                | -                         | glass fabric base,epoxy resin |              | Yes          | Yes                                    | *2                 |

\*1 Refer to Specification.

\*2 Refer to Instruction Manual.