



## DH30W10 SERIES 30 WATT 10:1 INPUT ISOLATED DC-DC CONVERTER

### Features

- Efficiency Up to 89%
- Regulated Outputs
- Fully Protected (OCP/OVP/UVLO)
- 4000Vac I/O Isolation
- Operating Temperature -40 to +80°C
- UL 1741, CSA-C22.2 No.107.1, EN62109-1 Approval
- Shock & Vibration MIL-STD-810F Compliant
- 5000m Operating Altitude
- Input Reverse Polarity Protection



| MODEL NUMBER   | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT |         | INPUT CURRENT |           | % EFF. (1) | CAPACITOR LOAD MAX. |
|----------------|---------------|----------------|----------------|---------|---------------|-----------|------------|---------------------|
|                |               |                | MIN.           | MAX.    | NO LOAD       | FULL LOAD |            |                     |
| DH30W10-800S12 | 150-1500 VDC  | 12 VDC         | 0 mA           | 2.50 A  | 0.5 mA        | 43.1 mA   | 87         | 2500uF              |
| DH30W10-800S15 | 150-1500 VDC  | 15 VDC         | 0 mA           | 2.00 A  | 0.5 mA        | 42.6 mA   | 88         | 2000uF              |
| DH30W10-800S24 | 150-1500 VDC  | 24 VDC         | 0 mA           | 1.25 A  | 0.5 mA        | 42.1 mA   | 89         | 1250uF              |
| DH30W10-800S48 | 150-1500 VDC  | 48 VDC         | 0 mA           | 0.625 A | 0.5 mA        | 42.1 mA   | 89         | 625uF               |

NOTE:

1. Nominal Input Voltage 800 V<sub>dc</sub>.
2. Measured at Nominal Input Voltage.

### PART NUMBER

| Series   | Nominal Input Voltage | Number of Outputs | Nominal Output Voltage                               | Installation Type                                     |
|----------|-----------------------|-------------------|------------------------------------------------------|-------------------------------------------------------|
| DH30W10- | II                    | O                 | XX                                                   | Y                                                     |
| DH30W10  | 800 : 800 VDC         | S : Single        | 12 : 12VDC<br>15 : 15VDC<br>24 : 24VDC<br>48 : 48VDC | P : PCB Mount<br>ST : Screw Terminal<br>DR : DIN Rail |

Part Number Example:

**DH30W10-800S12P:** 30W, 10:1 150-1500Vdc Input, Single 12Vdc Output, PCB Mounting



# DH30W10 Series

## TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER             | NOTES and CONDITIONS       | Device | Min.  | Typ. | Max. | Units           |
|-----------------------|----------------------------|--------|-------|------|------|-----------------|
| Input Voltage         | Continuous                 | All    | -1500 | 800  | 1500 | V <sub>dc</sub> |
| Operating Temperature | With de-rating, above 50°C | All    | -40   |      | 80   | °C              |
| Storage Temperature   |                            | All    | -40   |      | 85   | °C              |

### INPUT CHARACTERISTICS

| PARAMETER                   | NOTES and CONDITIONS                                     | Device                 | Min. | Typ. | Max. | Units           |
|-----------------------------|----------------------------------------------------------|------------------------|------|------|------|-----------------|
| Operating Input Voltage     |                                                          | All                    | 150  | 800  | 1500 | V <sub>dc</sub> |
| Input Under Voltage Lockout |                                                          |                        |      |      |      |                 |
| Turn-On Voltage Threshold   | Full load                                                | All                    | 122  | 133  | 144  | V <sub>dc</sub> |
| Turn-Off Voltage Threshold  | Full load                                                | All                    | 107  | 120  | 132  | V <sub>dc</sub> |
| Lockout Hysteresis Voltage  | Full load                                                | All                    |      | 10   |      | V <sub>dc</sub> |
| Maximum Input Current       | V <sub>in</sub> =150V, Full load                         | All                    |      | 0.26 |      | A               |
| No-Load Input Current       | V <sub>in</sub> =800V, I <sub>o</sub> =0A                | See Model Number Table |      |      |      | mA              |
| Input Filter                | Capacitive                                               | All                    |      |      |      |                 |
| Inrush Current              | V <sub>in</sub> =800V <sub>dc</sub> , Cold Start at 25°C | All                    |      | 90   | 150  | A               |

### OUTPUT CHARACTERISTICS

| PARAMETER                                                | NOTES and CONDITIONS                                           | Device                       | Min.                      | Typ. | Max.                     | Units           |
|----------------------------------------------------------|----------------------------------------------------------------|------------------------------|---------------------------|------|--------------------------|-----------------|
| Voltage Set Point Accuracy                               | V <sub>in</sub> =800V, Full load, T <sub>c</sub> =25°C         | All                          | -2.0                      |      | +2.0                     | %               |
| Output Voltage Regulation                                |                                                                |                              |                           |      |                          |                 |
| Load Regulation                                          | Full load to no load                                           | All                          |                           |      | ±1.0                     | %               |
| Line Regulation                                          | V <sub>in</sub> =High line to low line, full load              | All                          |                           |      | ±1.0                     | %               |
| Temperature Coefficient                                  | T <sub>c</sub> =-40°C to 80°C                                  | All                          |                           |      | ±0.15                    | %/°C            |
| Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth) |                                                                |                              |                           |      |                          |                 |
| Peak-to-Peak                                             | Full load, 10uF aluminum capacitor and 0.1uF ceramic capacitor | 12Vo<br>15Vo<br>24Vo<br>48Vo |                           |      | 120<br>150<br>150<br>240 | mV              |
| Output Current Range                                     | V <sub>in</sub> = 150 to 1500V                                 | See Model Number Table       |                           |      |                          | A               |
| Over Current Protection                                  | Hiccup mode. Auto recovery                                     | All                          | 110                       |      | 300                      | %               |
| Short Circuit Protection                                 |                                                                | All                          | Continuous, Auto Recovery |      |                          |                 |
| External Load Capacitance                                | Full load (Constant resistive load)                            | See Model Number Table       |                           |      |                          | uF              |
| Over Voltage Protection                                  | IC component to clamp (auto recovery)                          | 12Vo<br>15Vo<br>24Vo<br>48Vo |                           |      | 16<br>19<br>30<br>59     | V <sub>dc</sub> |

### EFFICIENCY

| PARAMETER | NOTES and CONDITIONS             | Device                 | Min. | Typ. | Max. | Units |
|-----------|----------------------------------|------------------------|------|------|------|-------|
| 100% Load | V <sub>in</sub> =800V, Full load | See Model Number Table |      |      |      | %     |

### DYNAMIC CHARACTERISTICS

| PARAMETER                        | NOTES and CONDITIONS                                                                            | Device | Min. | Typ. | Max. | Units |
|----------------------------------|-------------------------------------------------------------------------------------------------|--------|------|------|------|-------|
| Output Voltage Current Transient |                                                                                                 |        |      |      |      |       |
| Error Band                       | 75% to 100% of I <sub>o_max</sub> , step load change<br>d <sub>i</sub> /d <sub>t</sub> =0.1A/us | All    |      |      | ±5   | %     |
| Recovery Time                    | (within 1% V <sub>out</sub> nominal)                                                            | All    |      |      | 250  | us    |



## DH30W10 Series

| PARAMETER                      | NOTES and CONDITIONS                          | Device | Min. | Typ. | Max. | Units |
|--------------------------------|-----------------------------------------------|--------|------|------|------|-------|
| Turn-On Delay and Rise Time    | Full load (Constant resistive load)           |        |      |      |      |       |
| Turn-On Delay Time, From Input | $V_{in\_min.}$ to 10% $V_{o\_set}$ , Power up | All    |      | 270  |      | ms    |
| Output Voltage Rise Time       | 10% $V_{o\_set}$ to 90% $V_{o\_set}$          | All    |      | 8    |      | ms    |

### ISOLATION CHARACTERISTICS

| PARAMETER                                                | NOTES and CONDITIONS      | Device | Min. | Typ. | Max.         | Units                |
|----------------------------------------------------------|---------------------------|--------|------|------|--------------|----------------------|
| Isolation Voltage<br>(100% Factory Hi-Pot Tested @2sec.) | 1 Minute; input to output | All    |      |      | 4000<br>5656 | $V_{ac}$<br>$V_{dc}$ |
| Isolation Resistance                                     | Input to output           | All    | 100  |      |              | M $\Omega$           |
| Isolation Capacitance                                    | Input to output           | All    |      | 1100 |              | pF                   |

### FEATURE CHARACTERISTICS

| PARAMETER           | NOTES and CONDITIONS                                                             | Device | Min. | Typ. | Max. | Units |
|---------------------|----------------------------------------------------------------------------------|--------|------|------|------|-------|
| Switching Frequency | Pulse width modulation (PWM)<br>( $V_{in} = 150V_{dc} - 1500V_{dc}$ , Full load) | All    | 25   |      | 75.6 | KHz   |

### GENERAL SPECIFICATIONS

| PARAMETER           | NOTES and CONDITIONS                                                                                                    | Device | Min. | Typ.              | Max. | Units   |
|---------------------|-------------------------------------------------------------------------------------------------------------------------|--------|------|-------------------|------|---------|
| MTBF                | $I_o = 100\%$ of $I_{o\_max.}$ ;<br>MIL-HDBK - 217F_Notice 1, GB, 25°C                                                  | All    | 300  |                   |      | K hours |
| Weight              | Pin out package (DH30W10-800SXXP)<br>Lock screw wiring (DH30W10-800SXXST)<br>Lock screw wiring+track (DH30W10-800SXXDR) | All    |      | 240<br>305<br>310 |      | grams   |
| Case Material       | Plastic, PBT, UL 94V-0                                                                                                  |        |      |                   |      |         |
| Base Plate Material | Non-Conductive Base                                                                                                     |        |      |                   |      |         |
| Potting Material    | UL 94V-0                                                                                                                |        |      |                   |      |         |
| Pin Material        | Base: Copper<br>Plating: Nickel with Matte Tin                                                                          |        |      |                   |      |         |
| Shock/Vibration     | MIL-STD-810F                                                                                                            |        |      |                   |      |         |
| Humidity            | 95% RH max. Non condensing                                                                                              |        |      |                   |      |         |
| Altitude            | 5000m Operating altitude, 12000m Transport altitude                                                                     |        |      |                   |      |         |
| Thermal Shock       | MIL-STD-810F                                                                                                            |        |      |                   |      |         |

### EMC SPECIFICATIONS (External components required, please refer to application note.)

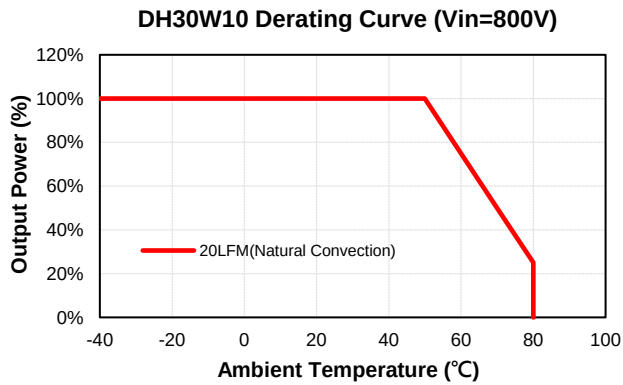
|                                         |                                                 |                                                                         |                                          |
|-----------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------|
| EMI                                     | Meets EN 55032 Compliant (with external filter) |                                                                         | Class A                                  |
| ESD                                     | EN61000-4-2                                     | Level 3: Air ±8kV, Contact ±4kV                                         | Perf. Criteria A                         |
| Radiated Immunity                       | EN61000-4-3                                     | Level 3: 80~1000MHz, 10V/m                                              | Perf. Criteria A                         |
| Fast Transient                          | EN61000-4-4                                     | Level 2: On power input port, ±0.5kV, external input capacitor required | Perf. Criteria A                         |
| Surge                                   | EN61000-4-5                                     | Level 4: Line to line, ±2kV (with external components)                  | Perf. Criteria A                         |
| Conducted Immunity                      | EN61000-4-6                                     | Level 3: 0.15~80MHz, 10V                                                | Perf. Criteria A                         |
| Power Frequency Magnetic Field Immunity | EN61000-4-8                                     | 50/60Hz, 3A/m (r.m.s.)                                                  | Perf. Criteria A                         |
| Application Note Link                   |                                                 |                                                                         | <a href="#">DH30W10 Series App Notes</a> |
| Packaging Information Link              |                                                 |                                                                         | <a href="#">Packaging Information</a>    |



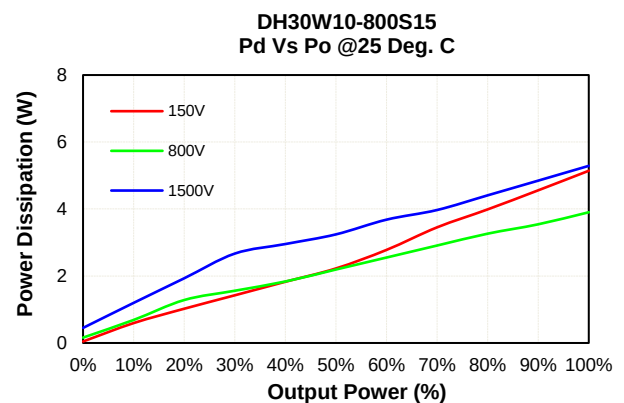
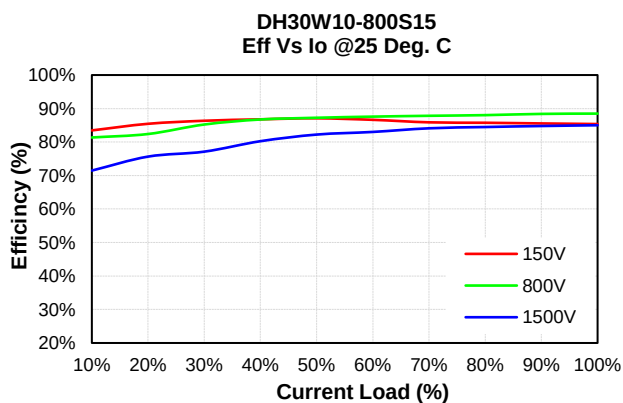
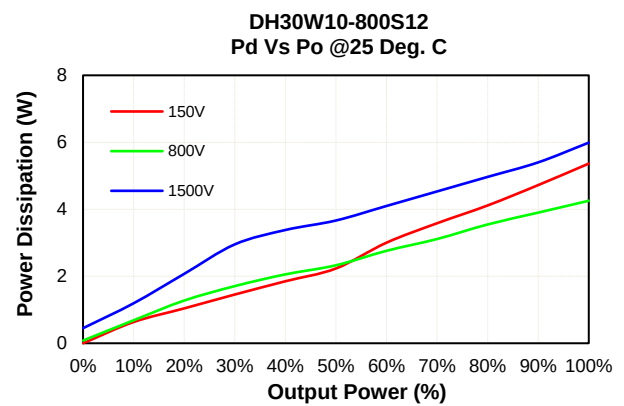
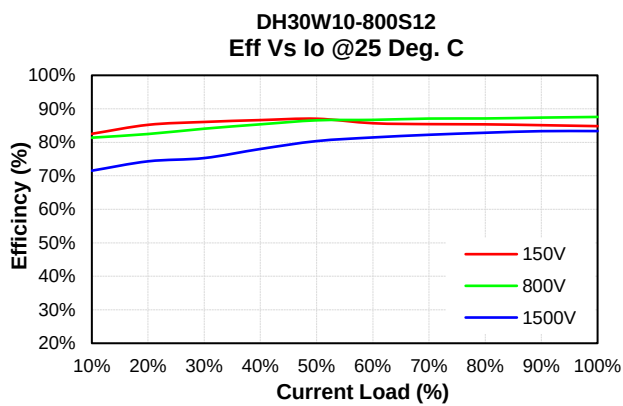
# DH30W10 Series

## CHARACTERISTIC CURVE

### Power Derating Curve



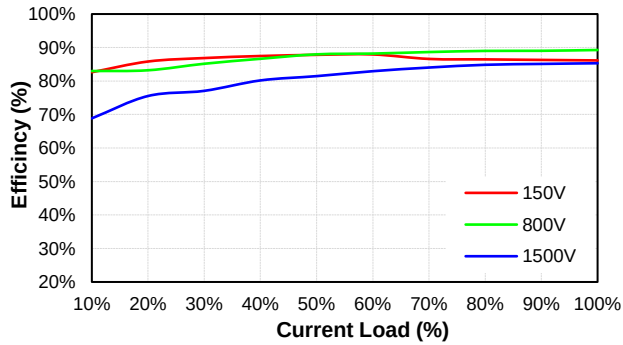
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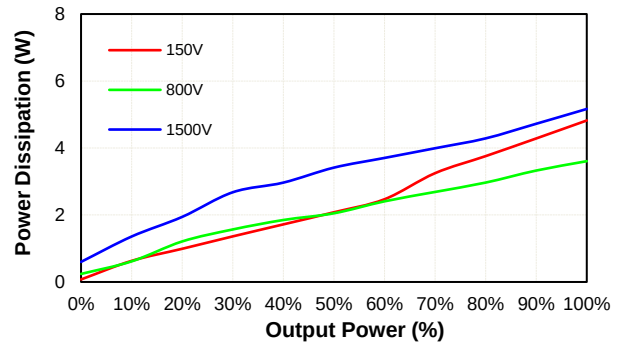


## DH30W10 Series

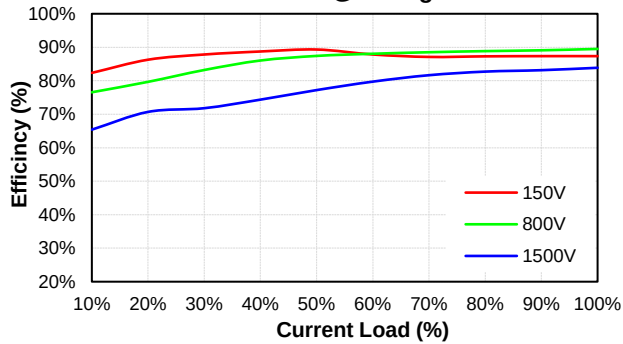
**DH30W10-800S24**  
Eff Vs Io @25 Deg. C



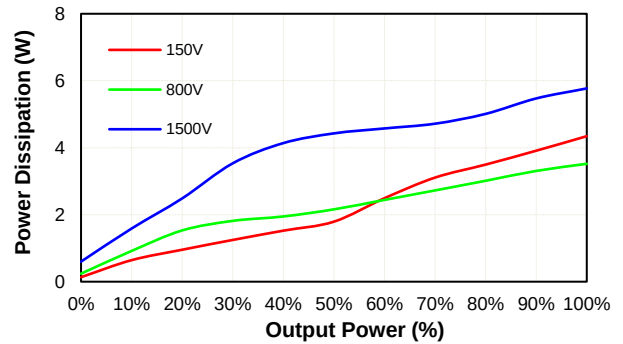
**DH30W10-800S24**  
Pd Vs Po @25 Deg. C



**DH30W10-800S48**  
Eff Vs Io @25 Deg. C



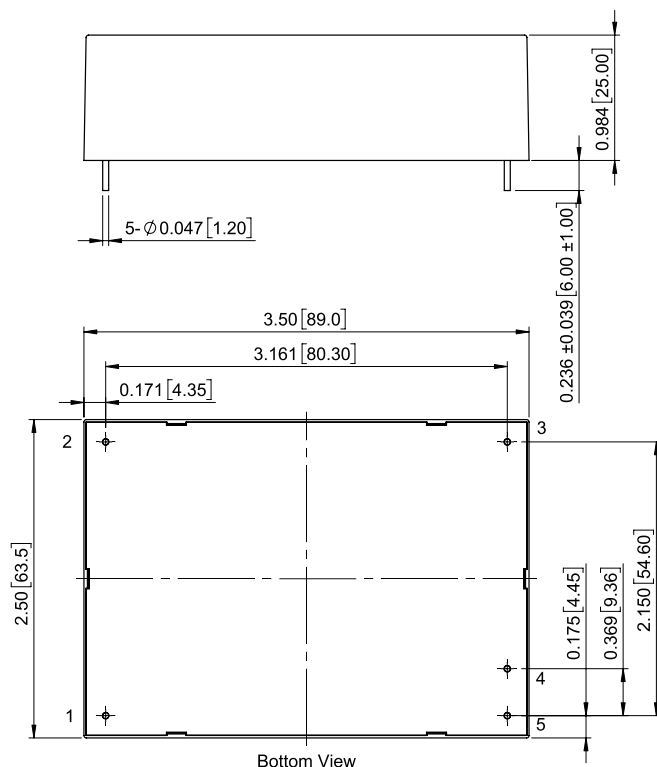
**DH30W10-800S24**  
Pd Vs Po @25 Deg. C





# DH30W10 Series

## MECHANICAL SPECIFICATION



### DH30W10-800SXXP

All Dimensions in Inches[mm]

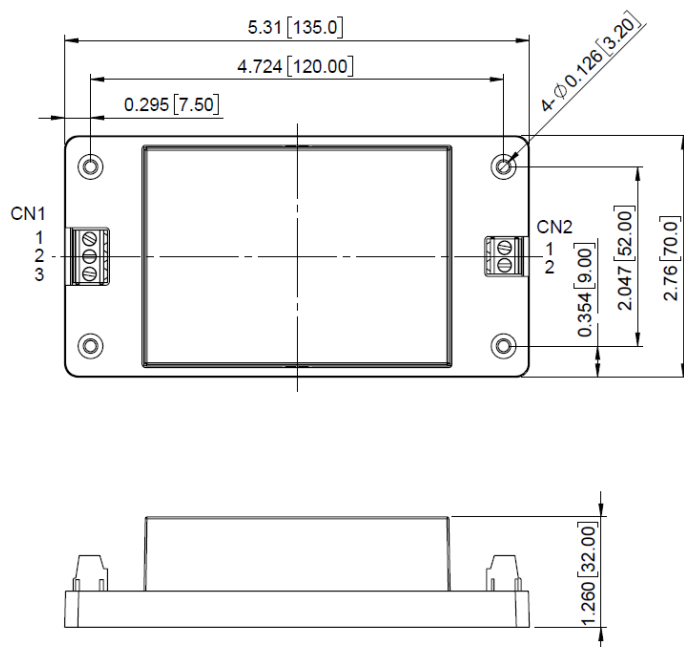
Tolerance Inches: x.xx=±0.03, x.xxx=±0.020

Millimeters: x.x=±0.7, x.xx=±0.50

#### Pin Connection

| Pin | Function |
|-----|----------|
| 1   | -Vin     |
| 2   | +Vin     |
| 3   | NC       |
| 4   | -Vout    |
| 5   | +Vout    |

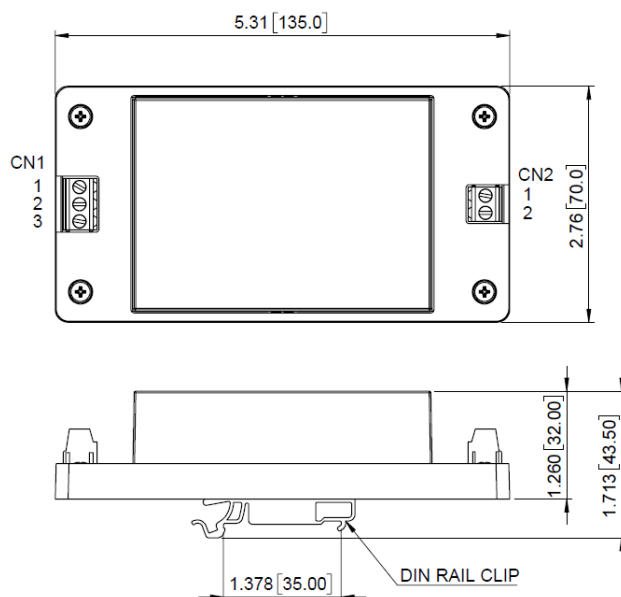
Note: Pin Size is  $\varnothing 0.047 \pm 0.004$  Inch [ $\varnothing 1.20 \pm 0.1$  mm]





# DH30W10 Series

## MECHANICAL SPECIFICATION



### DH30W10-800SXXDR

All Dimensions in Inches[mm]

Tolerance Inches: x.xx=±0.03, x .xxx=±0.020

Millimeters: x.x=±0.7, x.xx=±0.50

AC Input Connector(CN1):DINKLE EK508V-03P or equivalent

| Pin | Function | Mating Wire Range |
|-----|----------|-------------------|
| 1   | -Vin     | 12~24 AWG         |
| 2   | NC       |                   |
| 3   | +Vin     |                   |

DC Input Connector(CN2):DINKLE EK508V-02P or equivalent

| Pin | Function | Mating Wire Range |
|-----|----------|-------------------|
| 1   | +Vout    | 12~24 AWG         |
| 2   | -Vout    |                   |

Note:Recommended torque setting for terminal is 5kgf-cm