

The VEK180-140-ISO of DC to DC Converter provide 180 Watts of continuous output power. All units pass burn-in test at full load condition.



### FEATURES:

- \* Wide Operating Voltage 40 to 120 VDC
- \* Single Output
- \* C.C. Mode + C.V. Mode
- \* Constant Current: 13.0A
- \* Constant Voltage: 14.0V
- \* Built-in OR-ing diode
- \* Protection: Output OVP, OLP, OTP, SCP, Input/Output reverse polarity protection
- \* Operating Temperature: -20~70°C(with derating from 50°C)
- \* EMI/EMC CISPR25 CLASS B ECER10 PASS
- \* Surge Immunity: ±1kV
- \* Extremely Low Leakage Current <0.1mA
- \* 5~16 VDC (ENABLE / INHIBIT)
- \* 3 year warranty

### APPLICATIONS:

- \* Outdoor installations
- \* DC-DC converter for EV

### GENERAL SPECIFICATION:

- \* **Short Circuit Protection:** Latch
- \* **Cooling:** Free Air Convection
- \* **Protection Classes:** Class II
- \* **Waterproof Rating:** IP68

### Electrical Characteristics:

| Symbol           | Characteristic                        | Condition   | Min. | Typ. | Max.  | Unit  |
|------------------|---------------------------------------|---|------|------|-------|-------|
| V <sub>in</sub>  | Input Nominal Voltage Range           |   | 60   |      | 110   | VDC   |
| V <sub>in</sub>  | Input Operate Voltage Range           | Derate Linearly from 100% Load at 60VDC to 70% Load at 40VDC            | 40   |      | 120   | VDC   |
| P <sub>o</sub>   | Output Power Range                    | See Rating Chart  |      |      | 180   | W     |
| I <sub>il</sub>  | Low Line Input Current                | Full Load, V <sub>in</sub> =60VDC                                       |      |      | 3.5   | A     |
| I <sub>ih</sub>  | High Line Input Current               | Full Load, V <sub>in</sub> =110VDC                                      |      |      | 1.16  | A     |
| η                | Efficiency                            | V <sub>in</sub> =96V, V <sub>out</sub> =14V, I <sub>out</sub> =50% Load | 93   |      |       | %     |
| ΔV <sub>oi</sub> | Line Regulation                       | V <sub>in</sub> =60~110VDC  |      |      | 0.5   | %     |
| ΔV <sub>oL</sub> | Load Regulation                       | V <sub>in</sub> =60~110VDC  |      |      | 2.5   | %     |
| T <sub>c</sub>   | Temperature Coefficient               | All Operational Conditions  |      |      | ±0.04 | %/°C  |
| HV               | Dielectric Withstanding Voltage (P-S) | Isolation Input to Output / Primary to Secondary                        |      |      | 1500  | VAC   |
| EMI              | EMC Emission                          | Meet UN R10   |      |      | B     | Class |
| I <sub>Ir</sub>  | High Line Input Inrush Current        | Full Load, 25°C, Cool Start, V <sub>in</sub> =110VDC                    |      |      | 15    | A     |
| I <sub>Lr</sub>  | Low Line Input Inrush Current         | Full Load, 25°C, Cool Start, V <sub>in</sub> =60VDC                     |      |      | 8.2   | A     |
| EL               | Earth Leakage Current                 | 0.1 mA @ 120 VDC Normal condition                                       |      |      | 0.1   | mA    |
| CC               | Charging Current(CC mode)             | V <sub>in</sub> =60~110VDC, Rated Output Curren, See Rating Chart       |      |      | 10    | %     |
| t <sub>s</sub>   | Start-Up Time                         | Full Load, V <sub>in</sub> =60~110VDC                                   |      |      | 1     | s     |
| t <sub>r</sub>   | Rise Time                             | V <sub>in</sub> =60~110VDC  |      |      | 50    | ms    |

### Protection Characteristics

| Symbol | Characteristic                    | Condition   | Min. | Typ. | Max. | Unit |
|--------|-----------------------------------|---|------|------|------|------|
| SCP    | Short Circuit Protection          | Hiccup Mode, (Non-Latching, Auto-Recovery)                    | 110  |      | 200  | %    |
| OTP    | Over Temperature Protection       | Hiccup Mode, (Non-Latching, Auto-Recovery) (Case Temperature) |      | 90   |      | °C   |
| OCP    | Overload / Overcurrent Protection | Hiccup Mode, (Non-Latching, Auto-Recovery)                    | 90   |      | 110  | %    |

### Environmental:

| Symbol         | Characteristic            | Condition   | Min. | Typ. | Max. | Unit |
|----------------|---------------------------|---|------|------|------|------|
| T <sub>o</sub> | Operating Temperature     | Derate Linearly from 100% Load at 50°C to 50% Load at 70°C  | -20  |      | 70   | °C   |
| T <sub>s</sub> | Storage Temperature       | Surrounding Air Temperature   | -20  |      | 85   | °C   |
| H <sub>o</sub> | Operating Humidity        | RH non-condensing   | 10   |      | 95%  | RH   |
| H <sub>s</sub> | Storage Humidity          | RH non-condensing   | 0    |      | 95%  | RH   |
| ESDa           | Electro Static Discharge  | Air Discharge, ISO10605   |      |      | 15   | kV   |
| ESDc           | Electro Static Discharge  | Contact Discharge, ISO10605   |      |      | 8    | kV   |
| MTBF           | Mean Time Between Failure | Operating Temperature at V <sub>in</sub> =96VDC/I <sub>o</sub> =7A@25°C, Calculated per MIL-HDBK-217F | 100k |      |      | h    |

# DC-DC



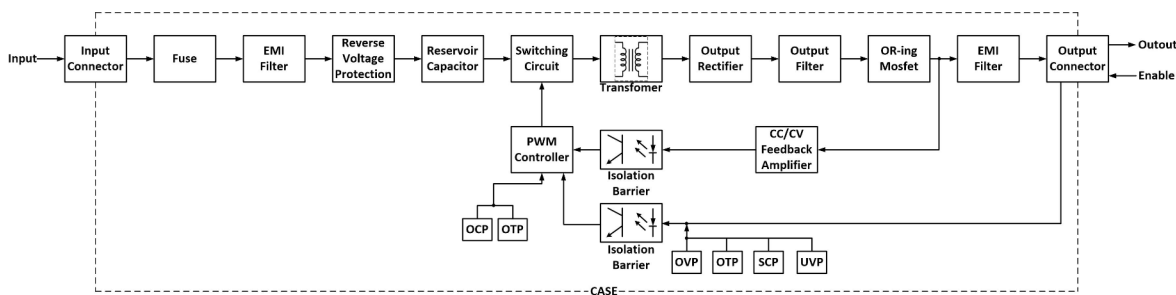
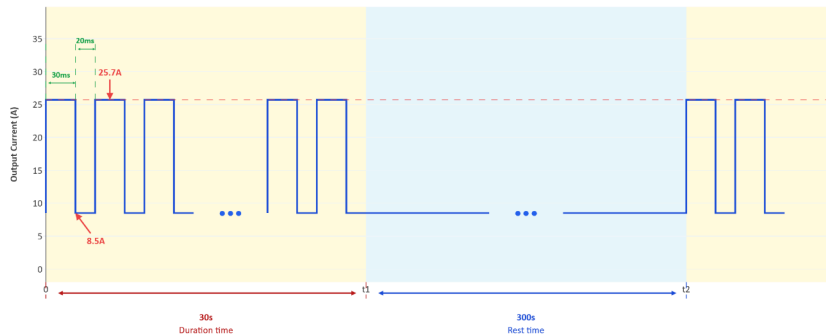
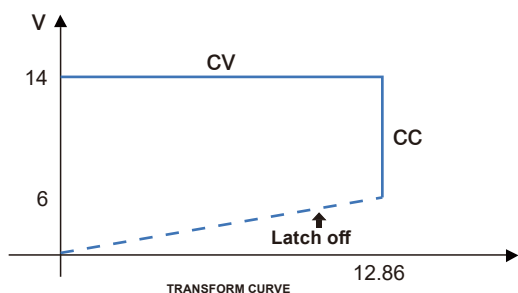
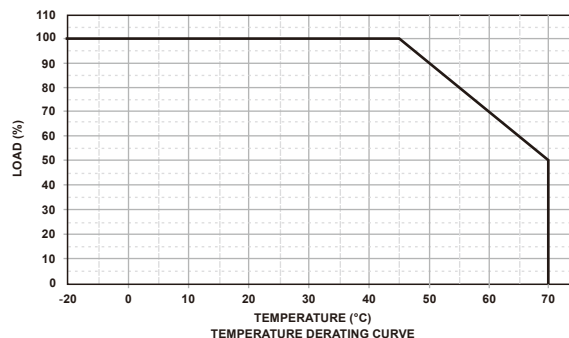
VEK180-140-ISO@R01

V1.1

180W DC to DC Converter

**SPECIFICATION NOTE :**

1. Output can provide up to peak load when the power supply starts up. Continuous staying in more than rated load is not allowed.
2. At factory, in 60% rated load condition, each output is checked to be within voltage accuracy.
3. Line regulation is defined by changing  $\pm 10\%$  of input voltage from nominal line at rated load.
4. Load regulation is defined by changing  $\pm 40\%$  of measured output load from 60% rated load.
5. The ripple is measured from peak to peak with a bandwidth-limit of 20MHz (Measured at the output connector with a 0.1uF ceramic capacitor and a 47uF electrolytic capacitor).
6. Efficiency is measured at rated load, and nominal line.



**MECHANICAL DIMENSIONS:** ( 140mm x 104mm x 36mm UNIT: mm )



M6 MOUNTING HOLES

**OUTPUT CABLE RECOMMEND :**

1. Customizable cable harness connectors

**PACKING :**

1. Net weight: 820g approx.  
Includes: Aluminum casing + connecting cable + potting compound

| INPUT (ORANGE HV SLEEVED) |                        |
|---------------------------|------------------------|
| BLK HST M8 MC002886       | BLK HST M8 MC002886    |
| RED CABLE DC+ HV INPUT    | BLK CABLE DC- HV INPUT |

2x CAVS WIRE, 1.25mm<sup>2</sup>, 80 °C  
 ORANGE HST/SLEEVE RAL2003 COLOR

| OUTPUT (PVC SLEEVED)    |                         |
|-------------------------|-------------------------|
| BLK HST M4 AMP 626035-2 | BLK HST M4 AMP 626035-2 |
| RED CABLE DC+ OUTPUT    | BLK CABLE DC- OUTPUT    |

2x AVS WIRE, 3 mm<sup>2</sup>, 80 °C  
 ORANGE HST/SLEEVE RAL2003 COLOR

NOTE 1: ENABLE PIN (IF SPECIFIED) HAS TO BE CYCLED INCASE THERE IS A UVP CONDITION  
 NOTE 2: DEFAULT WITHOUT ENABLE FUNCTION. POWER CYCLE REQUIRED IF UVP LATCH

**Rating Chart:**

| MODEL NO.   | Rated output Voltage | Rated Output Current | Maximum Output Power | Maximum ripple and noise | CV Mode Regulation | CC Mode Regulation | Max No Load Consumption |
|-------------|----------------------|----------------------|----------------------|--------------------------|--------------------|--------------------|-------------------------|
|             | VDC                  | A                    | W                    | mVp-p                    | %                  | %                  | W                       |
| VEK-180-140 | 14.0                 | 12.86                | 180                  | 200                      | 2.5                | 10                 | 0.15                    |
| VEK-180-138 | 13.8                 | 13.04                | 180                  | 200                      | 2.5                | 10                 | 0.15                    |