

**3**  
YEARS  
WARRANTY

**ROHS**  
COMPLIANT

**REACH**  
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway

CE CB

**1600**  
VDC  
Isolation  
Voltage

**2 : 1**  
Input  
Range

**FUSE**  
Installed

**INRUSH**  
**CURRENT**  
**LIMIT**

Internal  
EN55032  
Class **B**  
Filter

**NO**  
Min. Load  
Required

**REMOTE**  
**ON**  
**OFF**

**REVERSE**  
**POLARITY**  
**PROTECTION**

**OCP**

**OVP**

**SCP**

**UVP**

## PART NUMBER STRUCTURE

| VPEC30 -    | 48                                | S                  | 05                                                  | - | R                                                       | EC                                                                                                                                   |
|-------------|-----------------------------------|--------------------|-----------------------------------------------------|---|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Series Name | Input<br>Voltage<br>(VDC)         | Output<br>Quantity | Output<br>Voltage<br>(VDC)                          |   | Conformal Coating<br>Option                             | Assembly Option                                                                                                                      |
|             | 12:9.5~18<br>24:18~36<br>48:36~75 | S:Single           | 3P3:3.3<br>05:5<br>12:12<br>15:15<br>24:24<br>28:28 |   | <input type="checkbox"/> : None<br>R: Conformal Coating | <input type="checkbox"/> : None<br>EC: Enclosed Mounting Type<br>DR: Din Rail Mounting Type<br>ED: Enclosed & Din Rail Mounting Type |
|             |                                   | D:Dual             | 12:±12<br>15:±15                                    |   |                                                         |                                                                                                                                      |

**Chassis-Mount DC-DC converter  
up to 30 Watts**

**TECHNICAL SPECIFICATION** All specifications are typical at nominal input, full load and 25°C unless otherwise noted

| Model Number   | Input Range | Output Voltage | Output Current @Full Load | Input Current @ No Load | Efficiency | Maximum Capacitor Load |
|----------------|-------------|----------------|---------------------------|-------------------------|------------|------------------------|
|                | VDC         | VDC            | A                         | mA                      | %          | µF                     |
| VPEC30-12 S3P3 | 9.5 ~ 18    | 3.3            | 6                         | 117                     | 83         | 19500                  |
| VPEC30-12 S05  | 9.5 ~ 18    | 5              | 6                         | 98                      | 85         | 10200                  |
| VPEC30-12 S12  | 9.5 ~ 18    | 12             | 2.5                       | 176                     | 86         | 3240                   |
| VPEC30-12 S15  | 9.5 ~ 18    | 15             | 2                         | 218                     | 86         | 1100                   |
| VPEC30-12 S24  | 9.5 ~ 18    | 24             | 1.25                      | 72                      | 85         | 510                    |
| VPEC30-12 S28  | 9.5 ~ 18    | 28             | 1                         | 54                      | 85         | 340                    |
| VPEC30-12D12   | 9.5 ~ 18    | ±12            | ±1.25                     | 66                      | 85         | ±1020                  |
| VPEC30-12D15   | 9.5 ~ 18    | ±15            | ±1                        | 48                      | 85         | ±675                   |
| VPEC30-24 S3P3 | 18 ~ 36     | 3.3            | 6                         | 51                      | 85         | 19500                  |
| VPEC30-24 S05  | 18 ~ 36     | 5              | 6                         | 51                      | 87         | 10200                  |
| VPEC30-24 S12  | 18 ~ 36     | 12             | 2.5                       | 83                      | 88         | 3300                   |
| VPEC30-24 S15  | 18 ~ 36     | 15             | 2                         | 94                      | 88         | 1100                   |
| VPEC30-24 S24  | 18 ~ 36     | 24             | 1.25                      | 37                      | 87         | 510                    |
| VPEC30-24 S28  | 18 ~ 36     | 28             | 1                         | 38                      | 87         | 340                    |
| VPEC30-24D12   | 18 ~ 36     | ±12            | ±1.25                     | 33                      | 87         | ±1020                  |
| VPEC30-24D15   | 18 ~ 36     | ±15            | ±1                        | 34                      | 87         | ±675                   |
| VPEC30-48 S3P3 | 36 ~ 75     | 3.3            | 6                         | 31                      | 86         | 19500                  |
| VPEC30-48 S05  | 36 ~ 75     | 5              | 6                         | 36                      | 88         | 10200                  |
| VPEC30-48 S12  | 36 ~ 75     | 12             | 2.5                       | 37                      | 89         | 3300                   |
| VPEC30-48 S15  | 36 ~ 75     | 15             | 2                         | 57                      | 89         | 1100                   |
| VPEC30-48 S24  | 36 ~ 75     | 24             | 1.25                      | 28                      | 87         | 510                    |
| VPEC30-48 S28  | 36 ~ 75     | 28             | 1                         | 28                      | 87         | 340                    |
| VPEC30-48 D12  | 36 ~ 75     | ±12            | ±1.25                     | 22                      | 87         | ±1020                  |
| VPEC30-48 D15  | 36 ~ 75     | ±15            | ±1                        | 22                      | 87         | ±675                   |

**INPUT SPECIFICATIONS**

| Parameter                     | Conditions                                                                                                            | Min.                | Typ.           | Max.                                            | Unit     |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------|----------------|-------------------------------------------------|----------|
| Operating input voltage range | 12Vin(nom)<br>24Vin(nom)<br>48Vin(nom)                                                                                | 9.5<br>18<br>36     | 12<br>24<br>48 | 18<br>36<br>75                                  | VDC      |
| Input fuse                    | slow blow<br>12Vin(nom)<br>24Vin(nom)<br>48Vin(nom)                                                                   |                     | 6<br>6<br>4    |                                                 | A        |
| In-rush current               |                                                                                                                       |                     | 15             |                                                 | A        |
| Start up voltage              | 12Vin(nom)<br>24Vin(nom)<br>48Vin(nom)                                                                                |                     |                | 9.5<br>18<br>36                                 | VDC      |
| Shutdown voltage              | 12Vin(nom)<br>24Vin(nom)<br>48Vin(nom)                                                                                | 7.5<br>15.5<br>32.5 | 8<br>16<br>33  | 9<br>17.5<br>35.5                               | VDC      |
| Start up time                 | Constant resistive load<br>Power up<br>Remote ON/OFF                                                                  |                     | 100<br>25      |                                                 | ms       |
| Input surge voltage           | 100ms, max.<br>12Vin(nom)<br>24Vin(nom)<br>48Vin(nom)                                                                 |                     |                | 36<br>50<br>100                                 | VDC      |
| Remote ON/OFF                 | Referred to -Vin pin<br>Positive logic DC-DC ON<br>DC-DC OFF<br>Input current of Ctrl pin<br>Remote off input current | -0.5                | 2.5            | Open or 3 ~ 12VDC<br>Short or 0 ~ 1.2VDC<br>0.5 | mA<br>mA |

## OUTPUT SPECIFICATIONS

| Parameter                        | Conditions                                                                    |        |                                                    | Min.                            | Typ.                               | Max.         | Unit  |
|----------------------------------|-------------------------------------------------------------------------------|--------|----------------------------------------------------|---------------------------------|------------------------------------|--------------|-------|
| Voltage accuracy                 | 3.3Vout<br>Others                                                             |        |                                                    | -1.5<br>-1.0                    |                                    | +1.5<br>+1.0 | %     |
| Line regulation                  | Low Line to High Line at Full Load                                            |        |                                                    | -0.5                            |                                    | +0.5         | %     |
| Load regulation                  | No Load to Full Load<br>3.3Vout<br>Others                                     |        |                                                    | -1.5<br>-1.0                    |                                    | +1.5<br>+1.0 | %     |
| Cross regulation                 | Asymmetrical load 25%/100% FL<br>Dual                                         |        |                                                    | -5.0                            |                                    | +5.0         | %     |
| Voltage adjustability            | Single output<br>28Vout<br>Others                                             |        |                                                    | -3<br>-10                       |                                    | +17<br>+10   | %     |
| Ripple and noise                 | Measured by 20MHz bandwidth                                                   | Single | 3.3Vout, 5Vout<br>12Vout, 15Vout<br>24Vout, 28Vout |                                 | 50<br>75<br>100                    |              | mVp-p |
|                                  |                                                                               | Dual   | All                                                |                                 | 100                                |              |       |
| Temperature coefficient          |                                                                               |        |                                                    | -0.02                           |                                    | +0.02        | %/°C  |
| Transient response recovery time | 25% load step change                                                          |        |                                                    |                                 | 300                                |              | µs    |
| Over voltage protection          | Zener diode clamp<br>3.3Vout<br>5Vout<br>12Vout<br>15Vout<br>24Vout<br>28Vout |        |                                                    |                                 | 3.9<br>6.2<br>15<br>18<br>30<br>36 |              | VDC   |
| Output indicator                 |                                                                               |        |                                                    | Green LED                       |                                    |              |       |
| Over load protection             | % of Iout rated                                                               |        |                                                    |                                 |                                    | 150          | %     |
| Short circuit protection         |                                                                               |        |                                                    | Continuous, automatics recovery |                                    |              |       |

## GENERAL SPECIFICATIONS

| Parameter             | Conditions                  |                                              | Min.                        | Typ. | Max. | Unit |
|-----------------------|-----------------------------|----------------------------------------------|-----------------------------|------|------|------|
| Isolation voltage     | 1 minute                    | Input to Output<br>Input (Output) to Chassis | 1600<br>1600                |      |      | VDC  |
| Isolation resistance  | 500VDC                      |                                              | 1                           |      |      | GΩ   |
| Isolation capacitance |                             |                                              |                             |      | 4000 | pF   |
| Switching frequency   |                             |                                              | 270                         | 300  | 330  | kHz  |
| Safety approvals      | IEC/ UL/ EN60950-1, 62368-1 |                                              | UL:E193009<br>CB:UL(Demko)  |      |      |      |
| Chassis material      |                             |                                              | Aluminum                    |      |      |      |
| Conformal coating     |                             |                                              | Impregnating varnish        |      |      |      |
| Weight                |                             |                                              | 110g (3.88oz)               |      |      |      |
| MTBF                  | MIL-HDBK-217F, Full load    |                                              | 1.259 x 10 <sup>6</sup> hrs |      |      |      |

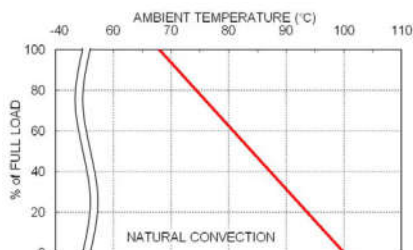
## ENVIRONMENTAL SPECIFICATIONS

| Parameter                     | Conditions           |  | Min.         | Typ. | Max. | Unit |
|-------------------------------|----------------------|--|--------------|------|------|------|
| Operating ambient temperature | With derating        |  | -40          |      | +100 | °C   |
| Maximum case temperature      |                      |  |              |      | 100  | °C   |
| Over temperature protection   | Case of DC/DC module |  |              | 110  |      | °C   |
| Storage temperature range     |                      |  | -40          |      | +105 | °C   |
| Thermal shock                 |                      |  | MIL-STD-810F |      |      |      |
| Vibration                     | □□S□□                |  | MIL-STD-810F |      |      |      |
|                               | □□S□□ -EC            |  | MIL-STD-810F |      |      |      |
|                               | □□S□□ -DR            |  | IEC60068-2-6 |      |      |      |
|                               | □□S□□ -ED            |  | IEC60068-2-6 |      |      |      |
| Relative humidity             |                      |  | 5% to 95% RH |      |      |      |

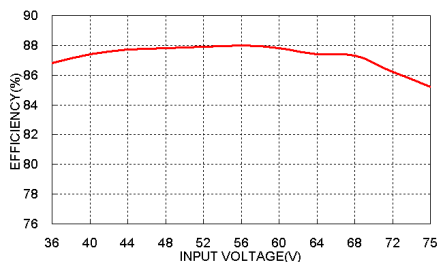
## EMC SPECIFICATIONS

| Parameter                      | Conditions  |                                                   | Level            |
|--------------------------------|-------------|---------------------------------------------------|------------------|
| EMI                            | EN55032     |                                                   | Class B          |
| ESD                            | EN61000-4-2 | Air $\pm 8\text{kV}$ and Contact $\pm 6\text{kV}$ | Perf. Criteria A |
| Radiated immunity              | EN61000-4-3 | 10V/m                                             | Perf. Criteria A |
| Fast transient                 | EN61000-4-4 | $\pm 2\text{kV}$                                  | Perf. Criteria A |
| Surge                          | EN61000-4-5 | $\pm 1\text{kV}$                                  | Perf. Criteria A |
| Conducted immunity             | EN61000-4-6 | 10Vr.m.s                                          | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 | 100A/m continuous; 1000A/m 1 second               | Perf. Criteria A |

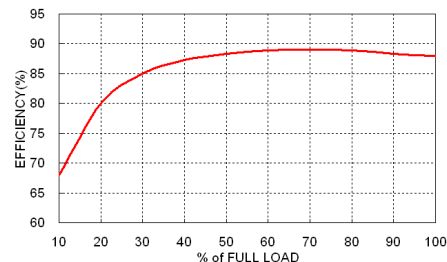
## CHARACTERISTIC CURVE



VPEC30-48S05 Derating Curve



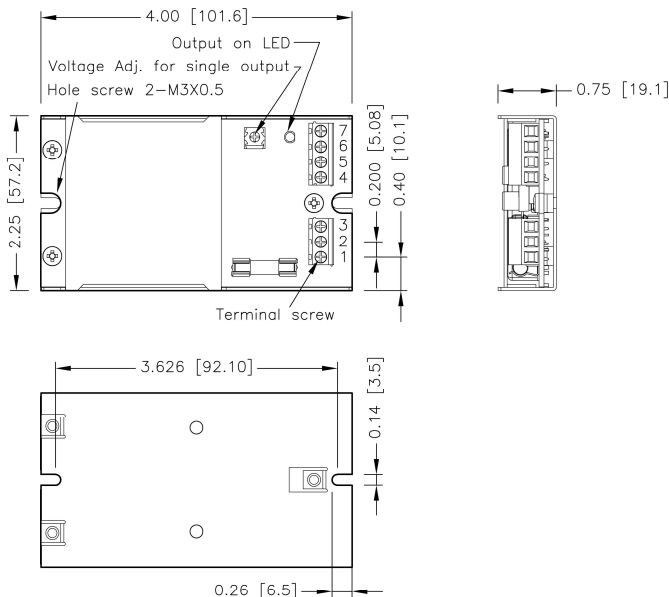
VPEC30-48S05 Efficiency vs. Input Voltage



VPEC30-48S05 Efficiency vs. Output Load

## MECHANICAL DRAWING

### CHASSIS MOUNTING TYPE



BOTTOM VIEW

### TERMINAL CONNECTION

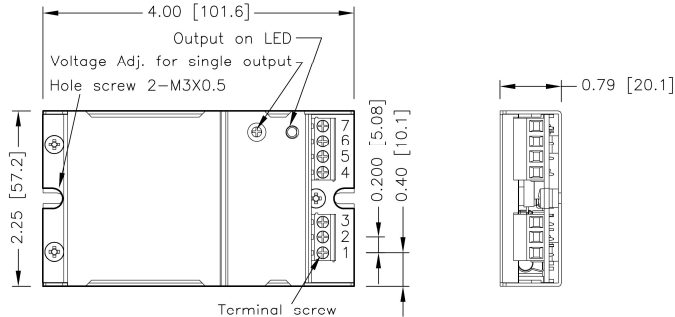
| NO. | SINGLE | DUAL   |
|-----|--------|--------|
| 1   | +Vin   | +Vin   |
| 2   | -Vin   | -Vin   |
| 3   | Ctrl   | Ctrl   |
| 4   | NC     | NC     |
| 5   | -Vout  | -Vout  |
| 6   | +Vout  | Common |
| 7   | NC     | +Vout  |

※ NC : No Connection

※ Screw terminals – wire range from 14 to 18 AWG

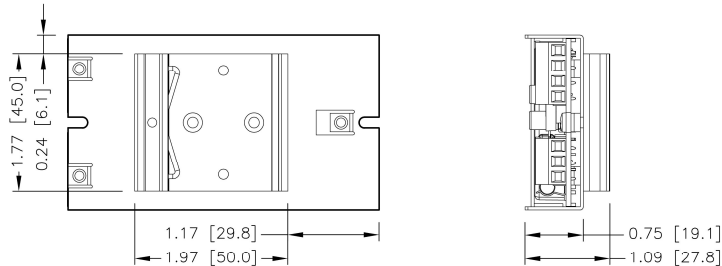
**MECHANICAL DRAWING(CONTINUED)**

**ENCLOSED MOUNTING TYPE**



TOP VIEW

**DIN RAIL MOUNTING TYPE**



BOTTOM VIEW

1. All dimensions in Inch [mm]
2. Tolerance : X.XX±0.02 [X.X±0.5]
2. Tolerance : X.XXX±0.01 [X.XX±0.25]
3. Hole screw locked torque :  
MAX 5.0kgf—cm/0.49N—m
4. Terminal screw locked torque :  
MAX 2.5kgf—cm/0.25N—m