



# ETA-USA

## HIGH QUALITY SWITCHING POWER SUPPLIES

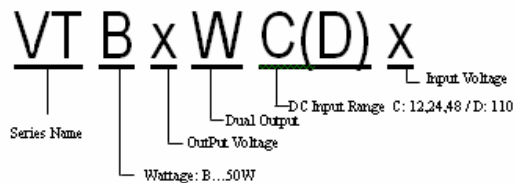
DC/DC SWITCHING POWER SUPPLY  
DC INPUT 12,24,48, 110  
DUAL OUTPUT  
45WATTS



Dimension: 96W × 160L × 33H

## VTB-WCx/VTB-WD SERIES

### General Description



### Features

1. Variety of Models
2. Chassis mount type
3. Compact and High Efficiency

### DC INPUT: 12V

| Input Characteristics   | Unit | VTB21FWC<br>12 | VTB21FWC<br>12B | VTB22FWC<br>12 | VTB22FWC<br>12B | VTB23FWC<br>12 | VTB24FWC<br>12 | VTB24FWC<br>12B |
|-------------------------|------|----------------|-----------------|----------------|-----------------|----------------|----------------|-----------------|
| Input Voltage           | Vdc  | DC 12V         |                 |                |                 |                |                |                 |
| Input Voltage Range     | Vdc  | DC 9.2V-16V    |                 |                |                 |                |                |                 |
| Inrush Current          | A    | Not Specified  |                 |                |                 |                |                |                 |
| Efficiency (typical) *1 | %    | 78             | 84              | 82             | 81              | 83             | 73             | 81              |
| MTBF                    | H    | 500'000        |                 |                |                 |                |                |                 |
| Switching Frequency     | kHz  | 40 Fix         | 40 Fix          | 40 Fix         | 40 Fix          | 40 Fix         | 40 Fix         | 40 Fix          |

### DC INPUT: 24V

| Input Characteristics   | Unit | VTB21FWC<br>24 | VTB21FWC<br>24B | VTB22FWC<br>24 | VTB22FWC<br>24B | VTB23FWC<br>24 | VTB24FWC<br>24 | VTB24FWC<br>24B |
|-------------------------|------|----------------|-----------------|----------------|-----------------|----------------|----------------|-----------------|
| Input Voltage           | Vdc  | DC 24V         |                 |                |                 |                |                |                 |
| Input Voltage Range     | Vdc  | DC 19-32V      |                 |                |                 |                |                |                 |
| Inrush Current          | A    | Not Specified  |                 |                |                 |                |                |                 |
| Efficiency (typical) *1 | %    | 79             | 83              | 83             | 83              | 84             | 79             | 79              |
| MTBF                    | H    | 500'000        |                 |                |                 |                |                |                 |
| Switching Frequency     | kHz  | 40 Fix         | 40 Fix          | 40 Fix         | 40 Fix          | 40 Fix         | 40 Fix         | 40 Fix          |

### DC INPUT: 48V

| Input Characteristics   | Unit | VTB21FWC<br>48 | VTB21FWC<br>48B | VTB22FWC<br>48 | VTB22FWC<br>48B | VTB23FWC<br>48 | VTB24FWC<br>48 | VTB24FWC<br>48B |
|-------------------------|------|----------------|-----------------|----------------|-----------------|----------------|----------------|-----------------|
| Input Voltage           | Vdc  | DC 48V         |                 |                |                 |                |                |                 |
| Input Voltage Range     | Vdc  | DC 38-63V      |                 |                |                 |                |                |                 |
| Inrush Current          | A    | Not Specified  |                 |                |                 |                |                |                 |
| Efficiency (typical) *1 | %    | 76             | 83              | 81             | 81              | 83             | 79             | 80              |
| MTBF                    | H    | 500'000        |                 |                |                 |                |                |                 |
| Switching Frequency     | kHz  | 40 Fix         | 40 Fix          | 40 Fix         | 40 Fix          | 40 Fix         | 40 Fix         | 40 Fix          |

### DC INPUT: 110V

| Input Characteristics   | Unit | VTB21FWD<br>B | VTB21FWD<br>B | VTB22FWD<br>B | VTB22FWD<br>B | VTB23FWD<br>B | VTB24FWD<br>B | VTB24FWD<br>B |
|-------------------------|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Input Voltage           | Vdc  | DC 110V       |               |               |               |               |               |               |
| Input Voltage Range     | Vdc  | DC 85-140V    |               |               |               |               |               |               |
| Inrush Current          | A    | 20A (maximum) |               |               |               |               |               |               |
| Efficiency (typical) *1 | %    | 76            | 83            | 81            | 81            | 83            | 79            | 80            |
| MTBF                    | H    | 500'000       |               |               |               |               |               |               |
| Switching Frequency     | kHz  | 40 Fix        | 40 Fix        | 40 Fix        | 40 Fix        | 40 Fix        | 40 Fix        | 40 Fix        |



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## HIGH QUALITY SWITCHING POWER SUPPLIES

### VTB-WC / VTB-WD

| Output Characteristic                                 | Unit | Models                                                       |      |                   |     |                 |     |                   |     |                 |     |                 |     |                   |     |
|-------------------------------------------------------|------|--------------------------------------------------------------|------|-------------------|-----|-----------------|-----|-------------------|-----|-----------------|-----|-----------------|-----|-------------------|-----|
|                                                       |      | VTB21FWCx / FWD                                              |      | VTM21FWCxB / FWDB |     | VTM22FWCx / FWD |     | VTM22FWCxB / FWDB |     | VTM23FWCx / FWD |     | VTM24FWCx / FWD |     | VTM24FWCxB / FWDB |     |
| Output Voltage                                        | V    | 5                                                            | 24   | 24                | 5   | 12              | 12  | 12                | 12  | 15              | 15  | 5               | 12  | 12                | 5   |
| Output Current<br>45W at horizontal mount<br>(Vin=12) | A    | 0.5                                                          | 0.75 | 1.5               | 1.4 | 2.0             | 1.5 | 3.0               | 0.6 | 1.5             | 1.3 | 5.0             | 1.5 | 3.0               | 1.4 |
| 25W at horizontal mount<br>(Vin=24,48)                |      | 0.5                                                          | 0.85 | 1.5               | 1.5 | 2.0             | 1.7 | 3.0               | 0.8 | 1.7             | 1.3 | 5.0             | 1.7 | 3.0               | 1.5 |
| 30W at vertical mount<br>without cover(Vin=24,48)     |      | —                                                            | 1.0  | 1.8               | —   | —               | 2.0 | 3.3               | —   | —               | 1.7 | —               | 2.0 | 3.5               | —   |
| 45W at horizontal<br>mount(Vin=110)                   |      | 0.5                                                          | 0.85 | 1.5               | 1.5 | 2.0             | 1.7 | 3.0               | 0.8 | 1.7             | 1.3 | 5.0             | 1.7 | 3.0               | 1.5 |
| 50W at vertical mount<br>without cover(Vin=110)       |      | 5.0                                                          | 1.0  | 1.8               | 1.5 | 2.0             | 2.0 | 3.3               | 0.8 | 1.7             | 1.7 | 5.0             | 2.0 | 3.5               | 1.5 |
| Voltage Adjust Range                                  | V    | +/-5% of Rated Output Voltage(at no load within input range) |      |                   |     |                 |     |                   |     |                 |     |                 |     |                   |     |
| Ripple Noise(max)*2                                   | mVpp | 100                                                          | 290  | 290               | 100 | 170             | 170 | 170               | 170 | 200             | 200 | 100             | 170 | 170               | 100 |
| Rise up time                                          | mS   | 200mS(maximum) at 25°C and rated input/output                |      |                   |     |                 |     |                   |     |                 |     |                 |     |                   |     |
| Hold up time                                          | mS   | Not specified                                                |      |                   |     |                 |     |                   |     |                 |     |                 |     |                   |     |
| Regulation                                            |      |                                                              |      |                   |     |                 |     |                   |     |                 |     |                 |     |                   |     |
| a. Line Regulation (max)                              | mV   | 35                                                           | 168  | 168               | 35  | 84              | 84  | 84                | 84  | 105             | 105 | 35              | 84  | 84                | 35  |
| b. Load Regulation (max)                              | mV   | 50                                                           | 240  | 240               | 50  | 120             | 120 | 120               | 120 | 150             | 150 | 50              | 120 | 120               | 50  |
| c. Temperature Coefficient *3                         | °C   | 0.03%/°C                                                     |      |                   |     |                 |     |                   |     |                 |     |                 |     |                   |     |
| d. Drift(maximum) *4                                  | mV   | 40                                                           | 135  | 135               | 40  | 75              | 75  | 75                | 75  | 90              | 90  | 40              | 75  | 75                | 40  |
| e. Dynamic Load Regulation (typ.) *5                  | mV   | 150                                                          | 720  | 720               | 150 | 360             | 360 | 360               | 360 | 450             | 450 | 150             | 360 | 360               | 150 |
| f. Recovery Time                                      | mS   | 0.5mS(typical)                                               |      |                   |     |                 |     |                   |     |                 |     |                 |     |                   |     |

Conditions:

\*1 at rated input/output

\*2 measured by a bayonet probe at the output connector at a 0 to 100MHz bandwidth

\*3 at 0 to +50°C

\*4 for 7hour period after 1hour warm-up at 25°C and rated input/output

\*5 when output current changed between 25% and 75% of rated output current rapidly at rated input



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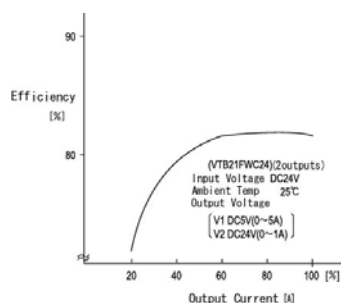


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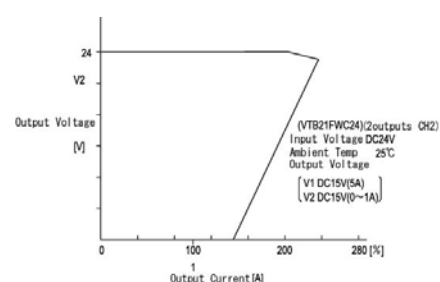
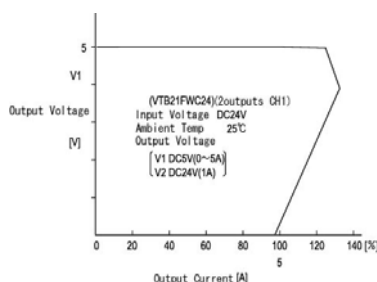
## HIGH QUALITY SWITCHING POWER SUPPLIES

| Environmental Specification |                                                                                                                                                               |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature       | 0 to +50°C                                                                                                                                                    |
| Operating Humidity          | 85%RH(non-condensing)                                                                                                                                         |
| Storage Temperature         | -20 to +85°C                                                                                                                                                  |
| Storage Humidity            | -                                                                                                                                                             |
| Withstanding Voltage        | Primary-Secondary AC1,500Vfor 1minute (Vin=110 2000)<br>Primary-Frame Ground AC1,500V for 1minute (Vin=110 2000)<br>Secondary-Frame Ground AC500V for 1minute |
| Isolation Resistance        | Primary-Secondary-Frame Ground 50MΩ(minimum) by DC500V insulation tester                                                                                      |
| Vibration                   | 5-10Hz:10mm double amplitude,10-55Hz:19.6m/s <sup>2</sup> ,20minutes' period for 60minutes each along X,Y,Z axes(non-operating)                               |
| Shock                       | 294m/s <sup>2</sup>                                                                                                                                           |
| Cooling                     | Convection                                                                                                                                                    |
| Functions                   |                                                                                                                                                               |
| Over current Protection     | Current Limiting with automatic recovery                                                                                                                      |
| Over voltage Protection     | zener diode clamping                                                                                                                                          |
| Remote Sense                | not available                                                                                                                                                 |
| Remote On/Off               | not available                                                                                                                                                 |
| Reverse Voltage Protection  | by internal fuse (Vin=110 by internal bridge diode)                                                                                                           |
| Line Conduction Noise       | Not specified                                                                                                                                                 |
| Weight [g] (typical)        | 480 G                                                                                                                                                         |
| Dimension [mm]              | 96W × 160L × 25H                                                                                                                                              |

## EFFICIENCY CURVE



## OCP CURVE



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