

UFEC60 SERIES

DC/DC Converter Single Output: 60 Watts



Features

- ◆ 2:1 input range
- ◆ 24V and 48V input options
- ◆ Single output
- ◆ 60 watts output power
- ◆ High efficiency up to 88%
- ◆ Fixed switching efficiency
- ◆ High isolation 1600VDC
- ◆ Output voltage trim
- ◆ Overload & Overvoltage protection
- ◆ Remote ON/OFF
- ◆ LED Indicator
- ◆ Optional DIN Rail mounting

| Model Number | Input Range VDC | Output Voltage VDC | Output Current @Full Load mA | Input Current @ No Load mA | Efficiency % | Maximum Capacitor Load (1) uF |
|---------------|-----------------|--------------------|------------------------------|----------------------------|--------------|-------------------------------|
| UFEC60-24S3P3 | 18 ~ 36 | 3.3 | 14 | 102 | 87 | 36000 |
| UFEC60-24S05 | 18 ~ 36 | 5 | 12 | 132 | 88 | 20400 |
| UFEC60-24S12 | 18 ~ 36 | 12 | 5 | 57 | 89 | 3550 |
| UFEC60-24S15 | 18 ~ 36 | 15 | 4 | 72 | 89 | 2300 |
| UFEC60-24S24 | 18 ~ 36 | 24 | 2.5 | 85 | 88 | 885 |
| UFEC60-48S3P3 | 36 ~ 75 | 3.3 | 14 | 100 | 87 | 36000 |
| UFEC60-48S05 | 36 ~ 75 | 5 | 12 | 92 | 88 | 20400 |
| UFEC60-48S12 | 36 ~ 75 | 12 | 5 | 35 | 89 | 3550 |
| UFEC60-48S15 | 36 ~ 75 | 15 | 4 | 40 | 89 | 2300 |
| UFEC60-48S24 | 36 ~ 75 | 24 | 2.5 | 60 | 88 | 885 |

PART NUMBER STRUCTURE

| | | | | | | |
|-----------------|------------------------|-----------------|---|---|--|--|
| UFEC60 - | 48 | S | 05 | - | N | EC |
| Series Name | Input Voltage (VDC) | Output Quantity | Output Voltage (VDC) | | Remote Control Option | Assembly Option |
| | 24: 18~36 48: 36~75 | S: Single | 3P3: 3.3 05: 5 12: 12 15: 15 24: 24 | | <input type="checkbox"/> : Positive logic N: Negative logic | <input type="checkbox"/> : No Assembly Option EC: Enclosed Mounting Type DR: Din Rail Mounting Type ED: Enclosed & Din Rail Mounting Type |

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INPUT SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------------|---------------------------|-----------|---------------------|-------|
| Operating input voltage range | 24Vin(nom) | 18 | 24 | 36 | VDC |
| | 48Vin(nom) | 36 | 48 | 75 | |
| Input fuse (slow blow) | 24Vin(nom) | | 8 | | A |
| | 48Vin(nom) | | 4 | | |
| In-rush current | | | 15 | | A |
| Input reflected ripple current | Nominal input and Full load | | 15 | | mAp-p |
| Start up voltage | 24Vin(nom) | | | 17.5 | VDC |
| | 48Vin(nom) | | | 34.5 | |
| Shutdown voltage | 24Vin(nom) | | 15 | | VDC |
| | 48Vin(nom) | | 32 | | |
| Start up time | Constant resistive load | | 100 | | ms |
| Input surge voltage | 100ms, max. | 24Vin(nom) | | 50 | VDC |
| | | 48Vin(nom) | | 100 | |
| Remote ON/OFF | Referred to -Vin pin | Positive logic (Standard) | DC-DC ON | Open or 3 ~ 12VDC | mA |
| | | | DC-DC OFF | Short or 0 ~ 1.2VDC | |
| | | Negative logic (Option) | DC-DC ON | Short or 0 ~ 1.2VDC | |
| | | | DC-DC OFF | Open or 3 ~ 12VDC | |
| | | Input current of Ctrl pin | | -0.5 | |
| | Remote off input current | | 4 | | mA |

OUTPUT SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|------------------------------------|----------------|--------------------------------|-------|-------|
| Voltage accuracy | 3.3Vout | -1.5 | | +1.5 | % |
| | Others | -1.0 | | +1.0 | |
| Line regulation | Low Line to High Line at Full Load | -0.2 | | +0.2 | % |
| Load regulation | No Load to Full Load | 3.3Vout | | +2.0 | % |
| | | Others | | +1.5 | |
| Voltage adjustability | Single output | 24Vout | | +20 | % |
| | | Others | | +10 | |
| Ripple and noise | Measured by 20MHz bandwidth | 3.3Vout, 5Vout | 75 | | mVp-p |
| | | 12Vout, 15Vout | 100 | | |
| | | 24Vout | 130 | | |
| Temperature coefficient | | -0.02 | | +0.02 | %/°C |
| Transient response recovery time | 25% load step change | | 250 | | µs |
| Over voltage protection | Zener diode clamp | 3.3Vout | 3.7 | 5.4 | VDC |
| | | 5Vout | 5.6 | 7.0 | |
| | | 12Vout | 13.8 | 17.5 | |
| | | 15Vout | 16.8 | 20.5 | |
| | | 24Vout | 30.0 | 33.0 | |
| Output indicator | | | Green LED | | |
| Over load protection | % of Iout rated | | | 150 | % |
| Short circuit protection | | | Continuous, automatic recovery | | |

GENERAL SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|--------------------------|---------------------------|------|------|--------------------------------------|
| Isolation voltage | 1 minute | Input to Output | 1600 | | VDC |
| | | Input (Output) to Chassis | 1600 | | |
| Isolation resistance | 500VDC | 1 | | | GΩ |
| Isolation capacitance | | | | 4000 | pF |
| Switching frequency | | 270 | 300 | 330 | kHz |
| Safety meets | | | | | UL60950-1 EN60950-1 IEC60950-1 |
| Chassis material | | | | | Aluminum |
| Weight | | | | | 122g (4.29oz) |
| MTBF | MIL-HDBK-217F, Full load | | | | 3.307 x 10 ⁵ hrs |

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ENVIRONMENTAL SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------|------|------|------|--------------|
| Operating ambient temperature | Without derating | -40 | | +54 | °C |
| | With derating | +54 | | +85 | |
| Over temperature protection | DC/DC Converter Case | | 120 | | °C |
| Storage temperature range | | -40 | | +105 | °C |
| Thermal shock | | | | | MIL-STD-810F |
| Vibration | | | | | MIL-STD-810F |
| Relative humidity | | | | | 5% to 95% RH |

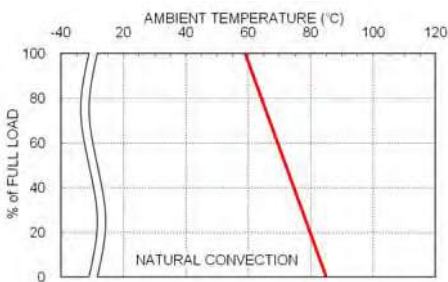
EMC SPECIFICATIONS

| Parameter | Conditions | Level |
|--------------------|---|------------------|
| EMI | EN55022 | Class B |
| ESD | EN61000-4-2 Air ± 8kV and Contact ± 6kV | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 10V/m | Perf. Criteria A |
| Fast transient | EN61000-4-4 ± 2kV | Perf. Criteria A |
| Surge | EN61000-4-5 ± 1kV | Perf. Criteria A |
| Conducted immunity | EN61000-4-6 10Vr.m.s | Perf. Criteria A |

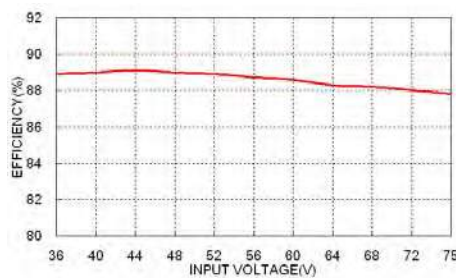
Note:

1. Test by minimum input and constant resistive load.

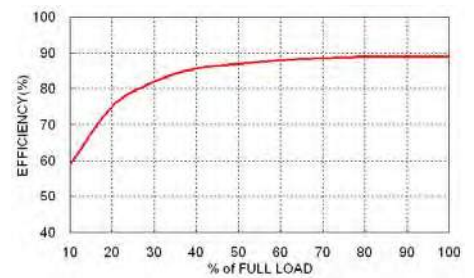
CHARACTERISTIC CURVE



UFEC60-48S05 Derating Curve



UFEC60-48S05 Efficiency vs. Input Voltage



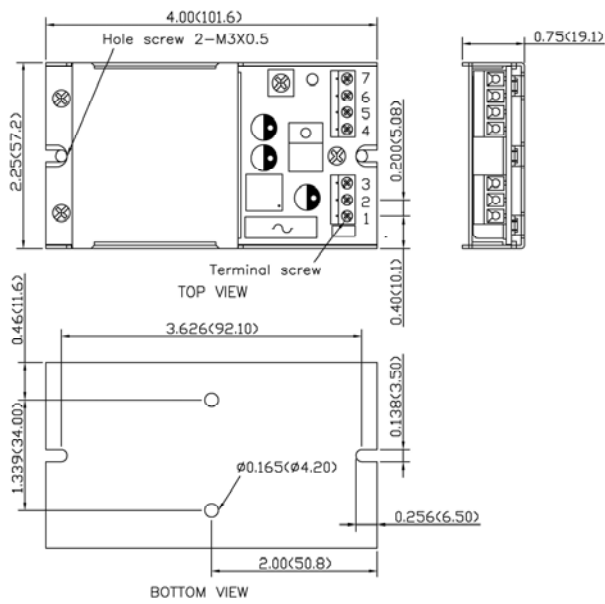
UFEC60-48S05 Efficiency vs. Output Load

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MECHANICAL DRAWINGS

CHASSIS MOUNTING TYPE - STD



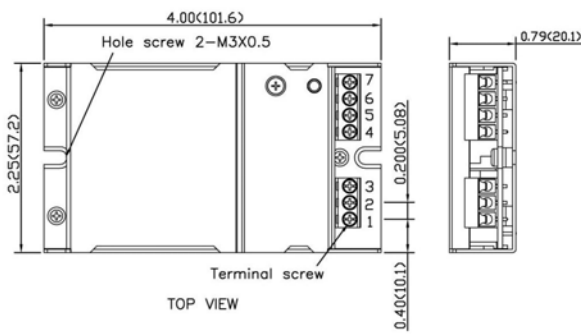
PIN CONNECTION

| PIN | SINGLE |
|-----|--------|
| 1 | +Vin |
| 2 | -Vin |
| 3 | Ctrl |
| 4 | NC |
| 5 | -Vout |
| 6 | +Vout |
| 7 | NC |

* NC : No Connection
* Screw terminals – wire range from 14 to 18 AWG

1. All dimensions in Inch (mm)
2. Tolerance : X.XX±0.02 (X.X±0.5)
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)

ENCLOSED MOUNTING TYPE - (OPTION - EC)



DIN RAIL MOUNTING TYPE - (OPTION - DR)

