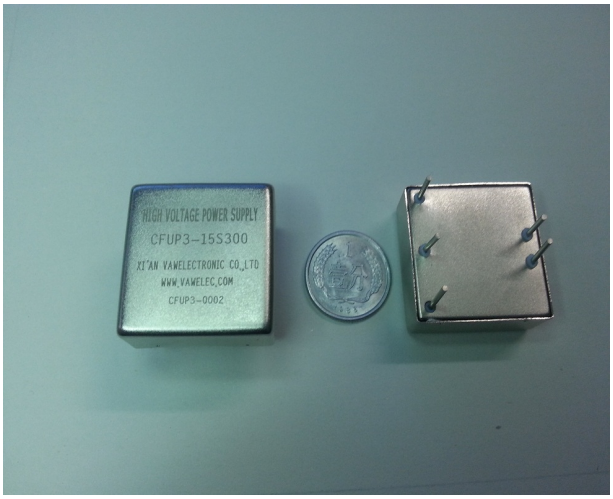
CFUP 3 Series High-Voltage Power-Supply Module for Ultrasonic Transmitter

Features:



- High operating temperature: Ambient temperature: -40℃～ +105℃ and max. shell temperature up to +145℃)
- Small size: L25.5×W25.8×H10.5mm
- Wide input range:10～20V
- Input and output separated and adjustable continuously: 44V～100V, 100～300V
- Low output ripple: less than 100m$V_{p\text{-}p}$
- High conversion efficiency (typical 80％)
- High operating frequency（300KHZ）
- Integrated LC EMI filter
- Sealed metal casting (impact and moist resistance and electromagnetic radiation protection)
- Provide rated power without deduction at 145℃ (shell)
- Over-heat protection at 150℃

Description:

CFUP3 series 3W high-voltage power module for ultrasonic transmitter, specially designed for ultrasonic electronic equipment working in the harsh environment, is portable with its size of only L25.5×W25.8×H10.5mm and saves space for portable ultrasonic instrument. In consideration of battery-power supply characteristics of portable ultrasonic instrument, the power-supply module is designed with static working current of only 15mA and load conversion efficiency up to 80%. It is resistant to high temperature, shock and moisture when working in harsh environment, thus it is able to normally work at an ambient temperature of 105℃. Shock resistance frequency: 20-50Hz/50Hz-2KHz and amplitude/rate: 0.5mm/10g. Shock resistance reaches three times per amplitude. Spike rate: 100g and duration: 6ms

Considering that transducer of ultrasonic instrument has various types of crystals and to simplify design and reduce purchasing types for users, CFUP3 series 3W high-voltage power-supply module for ultrasonic transmitter is specially designed to be isolated between input low voltage and output high voltage with isolation voltage of 1500V. The output high voltage is continuously adjustable. Control voltage GND is connected to input GND. When the control voltage ranges 0-3.3V, output high voltage has linear variation with control voltage. Output high voltage reaches maximum value when control voltage is 0V and minimum value when control voltage is 3.3V. When control voltage is higher than 3.3V, output voltage will not have linear variation with control voltage and output variation becomes gentle and then reaches the minimum value without variation. The amplitude of control voltage is not allowed to exceed -0.5V～+15V.

The working frequency of CFPU3 series power-supply module is up to 300KHz which provides good condition for filtering. In the circumstance of adding no filter, its output voltage ripple is less than 100MV. The temperature stability of frequency within the entire range of temperature is ±1%.

CFPU3 series power-supply module is specially designed for application of light load. The efficiency is up to 80% when output is 2.4W and 85% when output is 3W. In order to achieve light load and high efficiency, the input range of circuit not like other series of three times high-low ratio reduces to two times high-low ratio.

To pursue light load and high efficiency, CFUP10 series power-supply module sacrifices some protection circuits. If users have been accustomed to our other series module, special attention should be paid to their difference.

(A:No overvoltage shutdown function! B: No overcurrent shutdown function! C: No soft start function)

CFUP3 series power-supply module contains an in-built LC network, which can effectively reduce the fluctuations of the input current and the output voltage.

Key components used for CFUP3 series power-supply module are purchased in military level and completely pass the in-factory test in strict accordance with the national military product quality standard. The factory test includes 24 ~ 72-hour live aging and screening under the temperature of +125℃. All purchased civil components have been completely inspected in accordance with our enterprise standard before being integrated into power-supply module. All finished products have experienced 8-hour full-load operation under the temperature of +105 ℃ before delivery so as to fully check the damage to the components during the production process and hence ensure the reliability of products. Though key components of CFUP3 are military level, they are produced with civil production system and process in consideration of cost. The quality control system is ISO-2000, thus their reliability is far higher than ordinary industrial products, but lower than military products.

Type Selection:

CFUP3---15S100

Series code
CFUP Series
Output power
3W

Input voltage
15（10～20V）

Output voltage
100（44～100V）
300（100～300V）

Output modes
S Single

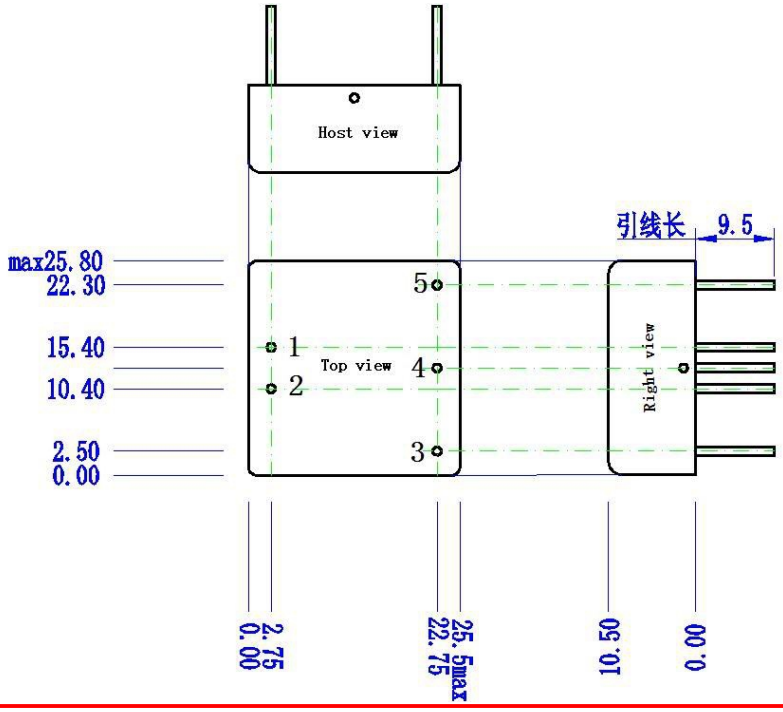
Technical Parameters:

（1） Operating temperature: -40 ℃ ~ +105 ℃ Max. shell temperature: +145 ℃.
（2） Input voltage: 10～20V
（3） Output voltage: 44～400V
（4） Output ripple: 100mVp-p (typical 30mVp-p)
（5） Output power: 3W
（6） Load regulation: less than 5%.
（7） Temperature stability: less than ±2.5% (typical ±1%)
（8） Linear regulation: ±0.1% (10% linear variation)
（9） Earthquake resistance: 25G, 0 ~ 300Hz
（10） Conversion efficiency: 75-85%
（11） Static power consumption: 0.3W Max.
（12） Isolation voltage between input and output: 1500V
（13） Over-heat cutoff at 150℃
（14） Dimension: L25.5×W25.8×H10.5mm

Service Requirement:

As this module is suitable to light load and has high efficiency, it is unnecessary to add radiator. But from the point of view of thermal reliability, its service life will prolong by one times when the temperature reduces by 8℃. Thus if the condition allows, the heat of module shell should be radiated as far as possible so as to ensure the minimum temperature difference between temperature of module shell and ambient temperature. The shell of the module is isolated from the input and output. The shell is directly connected with the shortest outgoing line terminal between the input and output to FG or connected through a 1500V/2000PF capacitor, which ensures the contact resistance between the inner part of the module and the shell is minimum one so as to effectively reduce the switching spikes. In some applications, it requires that input and output have common ground and it must use the shortest and roughest wire to make input and output ground wire short circuit as soon as it comes out the module. The shorter the connection distance is, the less the interference is.

Outline Diagram:



Definition of Pins:

Pin No.	Definition of Pins
1	Input negative (IN-)
2	Input positive (IN+)
3	Output positive (+OUT)
5	Output negative (-OUT)
6	Control end (ADJ)

Product performance, reliability and information are subject to change without prior notice.

June 19. 2013