


Figure 1. Physical Photos of AHVR12V500V20MAP

## FEATURES

- Output Voltage Proportional to Input Voltage
- Output Voltage from 0 to 500V
- Input Voltage from 0.7V to 12V
- Low Power Consumption
- High Efficiency
- High Stability
- Low Turn-on Voltage 0.7VDC
- Input to Output Isolation
- Small Output Ripple, Time Drift, and Temperature Drift
- Overload and Short Circuit Protection
- Metal Enclosure for Zero EMIS
- Easy Control and Installation

## APPLICATIONS

This power module, AHVR12V500V20MAP, is designed for achieving DC-DC conversion from low voltage to high voltage as a power supply source. It can be used for:

- X-ray Machine
- Spectral Analysis
- Nondestructive Inspection
- Semiconductor Manufacturing Equipment
- Capillary Electrophoresis
- Physical Vapor Phase Deposition
- Electrospinning Preparation of Nanofiber
- DC Reactive Magnetron Sputtering

**Table 1. Pin Names, Functions and Specifications**

| No. | Name | Description | Type | Min. | Typ. | Max. |
|---|---|---|---|---|---|---|
| 1 | $+V_{IN}$ | Input Voltage | Power supply input | 0V | | 12V |
| 2 | $-V_{IN}$ | Input Ground | Ground for power supply | | 0V | |
| 3 | $+V_{OUT}$ | Output Voltage | Power output | 0V | | 500V |
| 4 | $-V_{OUT}$ | Output Ground | Power output | | 0V | |
| 5 | NC | No Connect | - | | - | |


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## DESCRIPTION

AHVR12V500V20MAP comes with a quasi-sine wave oscillator, a fully enclosed transformer, an input and output filter, and a five-sided metal enclosure. These modules present low EMI/RFI, low noise, and low ripple. The input and output are galvanically isolated. Proportional to the input voltage, the output voltage has a typical turn-on voltage as low as 0.7V. It also comes with output short-circuit protection and a wide range of output voltage adjustments. This high voltage power supply also features ultra-small size, light weight, moisture proof, shockproof, metal enclosure, and zero EMIs.

## USING AHVR12V500V20MAP

This high voltage power supply must be mounted tightly onto a metal plate, ideally, thus expanding its heating sinking capacity of the metal enclosure. Sufficient ventilation must be provided to keep the power supply surface temperature under 55°C.

## SAFETY PRECAUTIONS

Although AHVR12V500V20MAP high voltage power supply comes with an over current protection circuit, a short circuit at the output should always be avoided. Make sure the high voltage wire for connecting $V_{OUT}$ node has sufficient insulation capability with its surrounding objects.

## APPLICATION NOTES

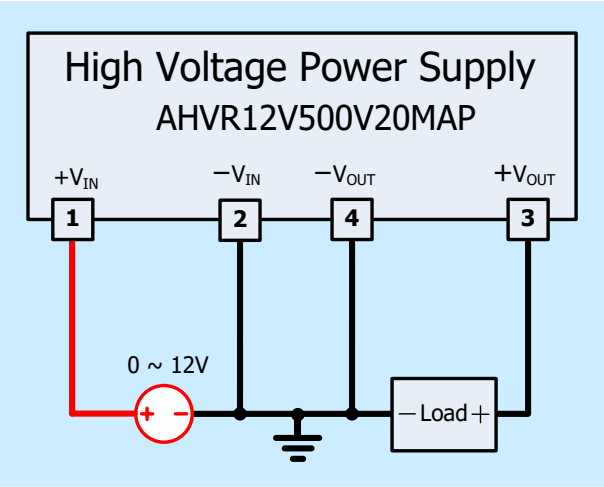



Figure 2. Positive Output

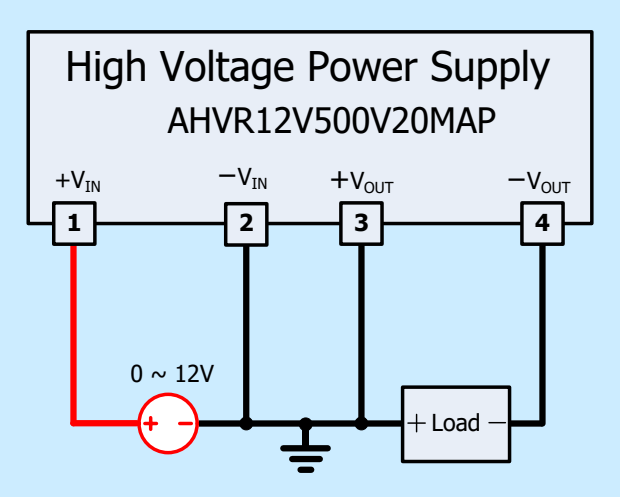



Figure 3. Negative Output

## BLOCK DIAGRAM

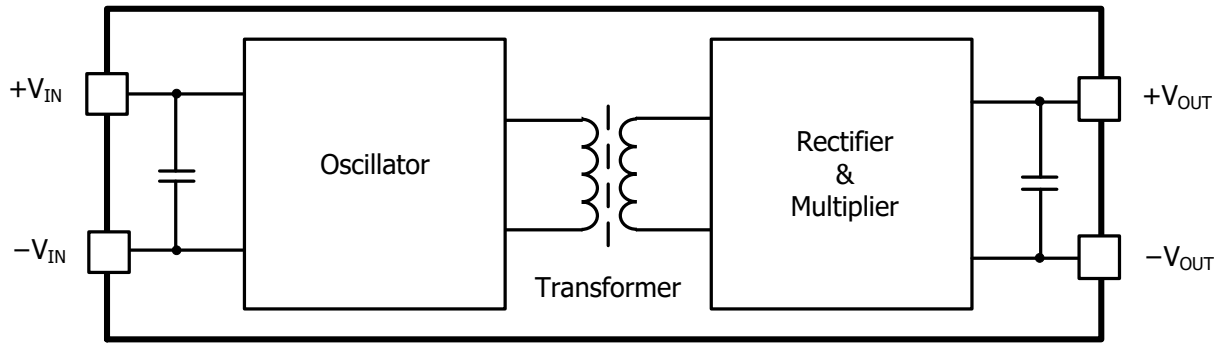



Figure 4. Block Diagram


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## SPECIFICATIONS

**Table 2. Characteristics. $T_A$ = 25°C, unless otherwise noted.**

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit/Note |
|---|---|---|---|---|---|---|
| Input Power Supply Voltage | $V_{IN}$ | | 0.7 | | 12 | V |
| Input Power Supply Quiescent Current | $I_{VPS_QC}$ | $I_{VOUT}$ = 0mA | 250 | 300 | 350 | mA |
| Input Power Supply Current at Full Load | $I_{VPS_FL}$ | $I_{VOUT}$ =20mA | 1.1 | 1.2 | 1.3 | A |
| Output Voltage Range | $V_{VOUT}$ | $I_{VOUT}$ = 0 ~ 20mA | 0 | | 500 | V |
| Output Current Range | $I_{VOUTMAX}$ | $V_{IN}$ = 12V | 0 | | 20 | mA |
| Output Load Resistance Range | | | $\frac{V_{VOUT}}{I_{VOUT}}$ | | ∞ | MΩ |
| Output Voltage Tolerance | | At Max $V_{OUT}$, Full Load | | | ±5 | % |
| Output Voltage Ripple | $V_{VOUT_RP}$ | $R_{LOAD}$ = 25kΩ $V_{VOUT}$ = 500V | ≤1 | | | % |
| Response Time | $t_{RESPONSE}$ | 0 to Max $V_{OUT}$, Full Load | | 260 | | ms |
| Isolation Voltage: Input to Output | | | | 3500 | | V |
| Switching Frequency | $F_{SW}$ | | 25 | | 125 | kHz |
| Full Load Efficiency | η | $V_{VPS}$ = 12V $V_{VOUT}$ = 500V $I_{VOUT}$ = 20mA | | ≥70 | | % |
| Output Voltage Temperature Stability | | −20 ~ 50°C | | | ±1 | % |
| Operating Temperature Range | $T_{opr}$ | | −10 | | 70 | °C |
| Storage Temperature Range | $T_{stg}$ | | −25 | | 90 | °C |
| Humidity | | Non-condensing | | 95 | | %RH |
| External Dimensions | | | 71.1×43.2×21.6 | | | mm |
| | | | 2.80×1.70×0.85 | | | inch |
| Weight | | | | 145 | | g |
| | | | | 0.32 | | lbs |
| | | | | 5.11 | | Oz |


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## TESTING DATA

Test conditions: $V_{VPS}$ = 12V, $T_A$ = 25°C, $R_{LOAD}$ = 25kΩ

The measured output voltage, $V_{VOUT}$, corresponding to the input voltage, $V_{IN}$, is shown in Figure 5.

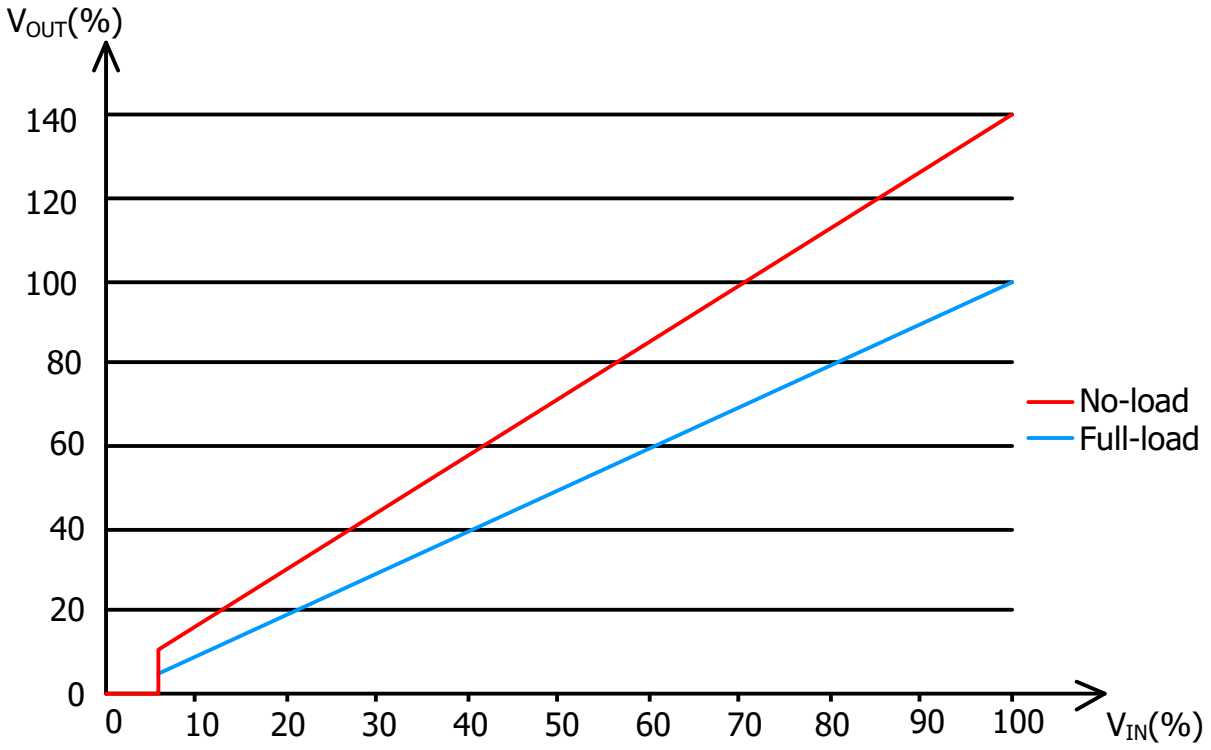



Figure 5. $V_{IN}$ vs. $V_{VOUT}$

## NAMING PRINCIPLE

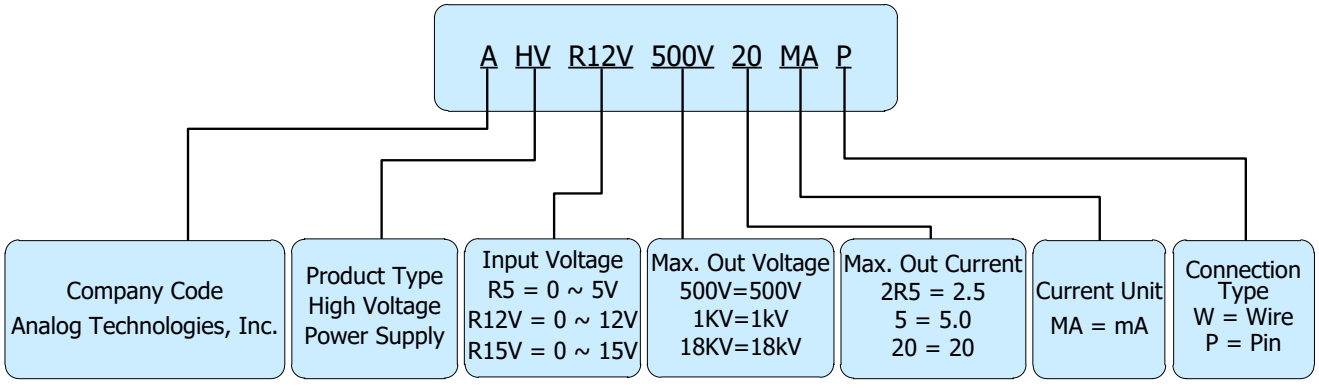



Figure 6. Naming Principle of AHVR12V500V20MAP


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# DIMENSIONS

### Pin Layout

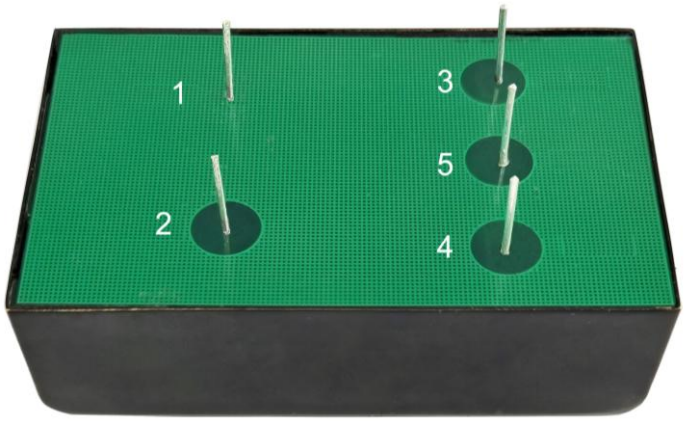



Figure 7. Pin Layout for AHVR12V500V20MAP

### Outline Dimensions

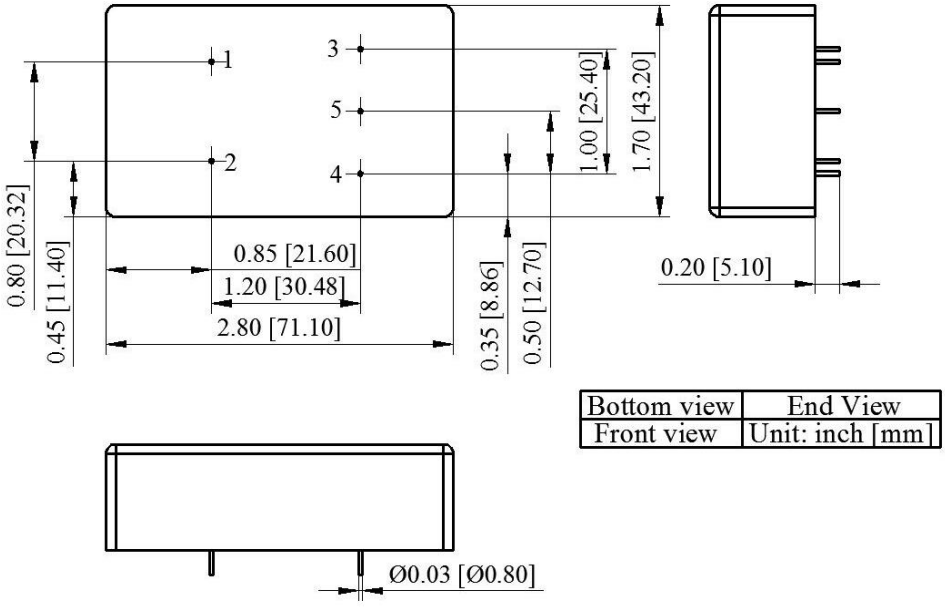



Figure 8. Outline Dimensions

# ORDERING INFORMATION

| Part Number | Buy Now |
|---|---|
| AHVR12V500V20MAP | * * |

*: both and are our online store icons. Our products can be ordered from either one of them with the same pricing and delivery time.


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## RELATED PRODUCTS

| Part # | Datasheet | Output Type | Output Voltage (V) | Output Current (mA) | Input Voltage (V) | Ripple (%) | Buy Now* |
|---|---|---|---|---|---|---|---|
| AHVR12V100V100MAP | | Single Output | 0 ~ 100 or 0 ~ −100 | 100 | 0 ~ 12 | <0.6 | |
| AHVR12VPN100V50MAP2 | Contact Us | Dual Output | 0 ~ ±100 | 50 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12V200V50MAP | | Single Output | 0 ~ 200 or 0 ~ −200 | 50 | 0 ~ 12 | <1.0 | |
| AHVR12V300V33R3MAP | | Single Output | 0 ~ 300 or 0 ~ −300 | 33.3 | 0 ~ 12 | <1.0 | |
| AHVR12VPN150V33R3MAP2 | Contact Us | Dual Output | 0 ~ ±150 | 33.3 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12V400V25MAP | Contact Us | Single Output | 0 ~ 400 or 0 ~ −400 | 25 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12VPN200V25MAP2 | Contact Us | Dual Output | 0 ~ ±200 | 25 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12V500V20MAP | | Single Output | 0 ~ 500 or 0 ~ −500 | 20 | 0 ~ 12 | <1.0 | |
| AHVR12V600V16MAP | | Single Output | 0 ~ 600 or 0 ~ −600 | 16 | 0 ~ 12 | <1.0 | |
| AHVR12VPN300V25MAP2 | Contact Us | Dual Output | 0 ~ ±300 | 16 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12V800V12R5MAP | | Single Output | 0 ~ 800 or 0 ~ −800 | 12.5 | 0 ~ 12 | <1.0 | |
| AHVR12V1KV10MAP | | Single Output | 0 ~ 1000 or 0 ~ −1000 | 10 | 0 ~ 12 | <1.0 | |
| AHVR12VPN500V10MAP2 | Contact Us | Dual Output | 0 ~ ±500 | 10 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12V1200V8R3MAP | | Single Output | 0 ~ 1200 or 0 ~ −1200 | 8.3 | 0 ~ 12 | <1.0 | |
| AHVR12VPN600V8R3MAP2 | Contact Us | Dual Output | 0 ~ ±600 | 8.3 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12V1500V6R6MAP | | Single Output | 0 ~ 1500 or 0 ~ −1500 | 6.6 | 0 ~ 12 | <1.0 | |
| AHVR12VPN750V6R6MAP2 | Contact Us | Dual Output | 0 ~ ±750 | 6.6 | 0 ~ 12 | <1.0 | Contact Us |
| AHVR12V2KV5MAP | | Single Output | 0 ~ 2000 or 0 ~ −2000 | 5 | 0 ~ 12 | <1.0 | |
| AHVR15V3KV3R3MAP | | Single Output | 0 ~ 3000 or 0 ~ −3000 | 3.3 | 0 ~ 15 | <1.0 | |
| AHVR15VPN1500V3R3MAP2 | Contact Us | Dual Output | 0 ~ ±1500 | 3.3 | 0 ~ 15 | <1.0 | Contact Us |
| AHVR15V4KV2R5MAP | | Single Output | 0 ~ 4000 or 0 ~ −4000 | 2.5 | 0 ~ 15 | <1.0 | |
| AHVR15VPN2KV2R5MAP2 | Contact Us | Dual Output | 0 ~ ±2000 | 2.5 | 0 ~ 15 | <1.0 | Contact Us |
| AHVR15V5KV2MAP | | Single Output | 0 ~ 5000 or 0 ~ −5000 | 2.0 | 0 ~ 15 | <1.0 | |
| AHVR15VPN2500V2MAP2 | Contact Us | Dual Output | 0 ~ ±2500 | 2.0 | 0 ~ 15 | <1.0 | Contact Us |
| AHVR15V6KV1R66MAP | Contact Us | Single Output | 0 ~ 6000 or 0 ~ −6000 | 1.66 | 0 ~ 15 | <1.0 | Contact Us |
| AHVR15VPN3KV2MAP2 | Contact Us | Dual Output | 0 ~ ±3000 | 1.66 | 0 ~ 15 | <1.0 | Contact Us |
| AHVR15V8KV1R25MAP | Contact Us | Single Output | 0 ~ 8000 or 0 ~ −8000 | 1.25 | 0 ~ 15 | <2.5 | Contact Us |
| AHVR15VPN4KV1R25MAP2 | Contact Us | Dual Output | 0 ~ ±4000 | 1.25 | 0 ~ 15 | <2.5 | Contact Us |
| AHVR15V10KV1MAP | Contact Us | Single Output | 0 ~ 10000 or 0 ~ −10000 | 1.25 | 0 ~ 15 | <2.5 | Contact Us |
| AHVR15V12KVR83MAP | Contact Us | Single Output | 0 ~ 12000 or 0 ~ −12000 | 0.83 | 0 ~ 15 | <2.5 | Contact Us |
| AHVR15VPN6KVR83MAP2 | Contact Us | Dual Output | 0 ~ ±6000 | 0.83 | 0 ~ 15 | <2.5 | Contact Us |


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