Introduction

Purpose: Introduce the ABPSM-ULN-A, Ultra Low Noise Power Supply Module

Objectives:

- Explain the benefits of the ABPSM-ULN-A
- Provide overview of the primary features

Content: 9-pages

Learning Time: 5-minutes

Welcome to Abracon's ABPSM-ULN-A; Ultra Low Noise – Power Supply Training Module. This training session will provide an overview of the key features and benefits; as well as discuss the applications of this Power Supply Module.

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What is ABPSM-ULN-A?

Input:	100VAC to 240VAC – with Universal AC-DC adapter (included)
Outputs:	1.80, 2.50, 3.30 & 5.00V Industry Standard DC Outputs
Noise Density:	Exceptionally low noise density; < 7nV / √Hz @ 1kHz offset Typical
rms Noise:	Better than 0.30µVrms over 0.1Hz to 1kHz bandwidth (**best-in-class**)
Current Sourcing:	Ability to source 200mA @ each channel, while maintaining noise density
Size:	Small form factor, 3.50” * 1.50” * 0.65” Machined Aluminum enclosure
Heat Sinking:	No external heat sinking is required

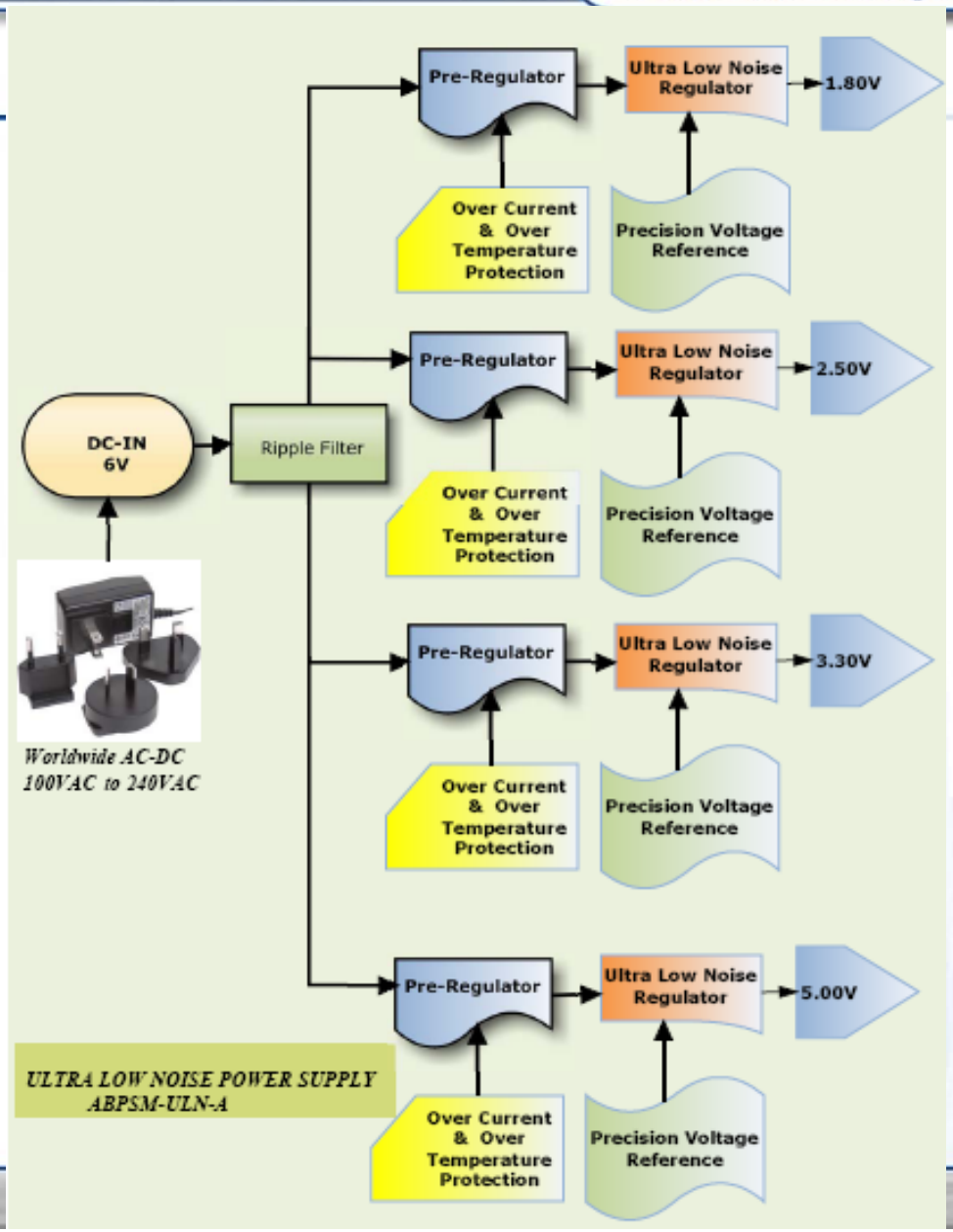
ABPSM-ULN-A is an Ultra Low Noise Power Supply Module, designed to mate with a Universal AC-DC Adapter; capable of global operation from 100VAC to 240VAC. With 4-standard-logic bias levels, this device is ideally suited to facilitate bench measurements. Each channel is individually capable of sourcing 200mA, while maintaining superior noise characteristics. State-of-the-art thermal design techniques eliminate the need for external heat sinking.

Market Differentiator & Key Attributes

- 4-Channel solution facilitating most standard biasing schemes
- ***Best-in-Class*** low frequency noise characteristics – two orders of magnitude better than state-of-the art LDO's and far superior than typical power supplies in the same price point
- Thermal Shut-Down, as well as, Over-Current Protection built-in
- Eliminates Power Supply Noise's influence on circuit measurements, audio, RF and µwave designs
- Ideal for conducting noise sensitive measurements such as Phase Noise, Jitter, Harmonic distortion & Signal-to-Noise Ratio (S/N)

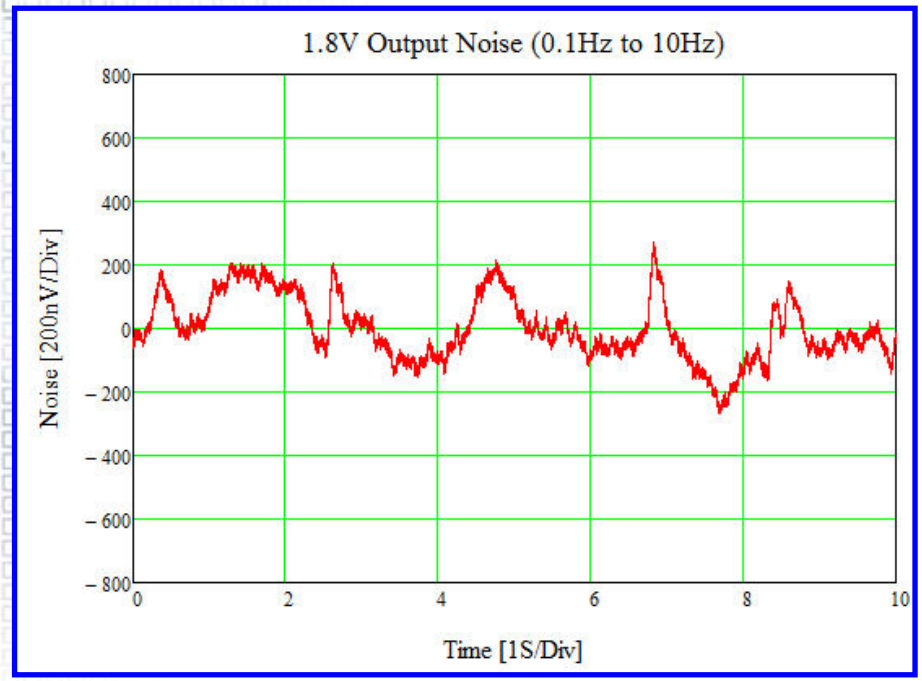
ABPSM-ULN-A has four standard bias levels to facilitate circuit measurements between 1.80V and 5.0V. Low frequency noise is optimally configured to aid in the noise sensitive measurements of RF sub-circuits; such as VCO, Crystal Oscillators, PLL Synthesizers, Mixers, Amplifiers, etc.

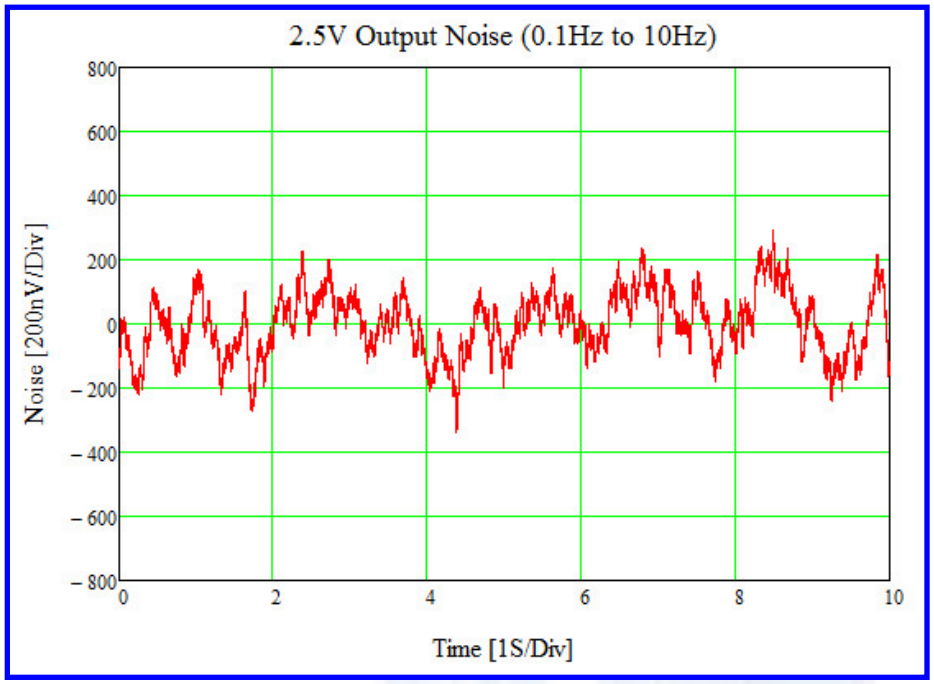
Overall Design Approach



Overall design approach incorporates a Ripple Filter, followed by pre-regulation, regulation and precision voltage reference architecture. Over current and over temperature protection prevents any accidental damage to this device.

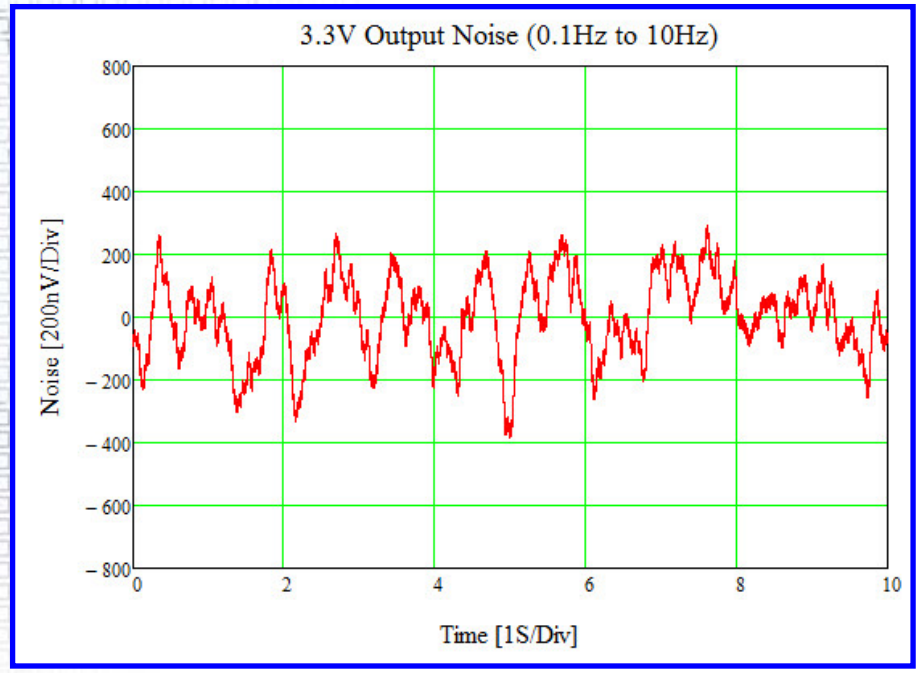
Typical Performance Curves
Low Frequency Noise

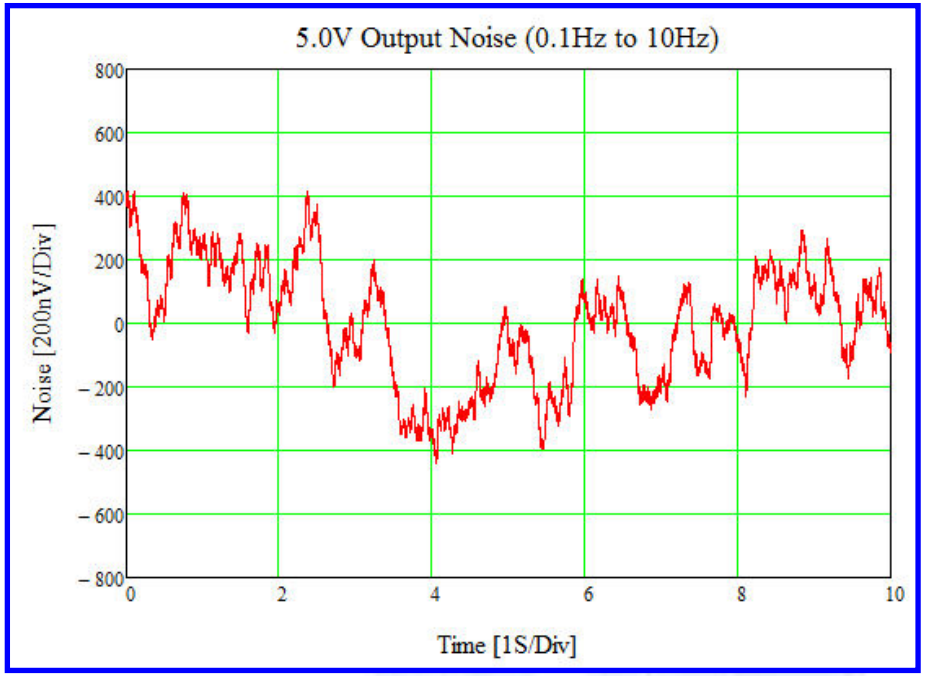




ABPSM-ULN-A offers exceptionally clean, low frequency noise characteristics. As is evident from the measured data, both 1.80V & 2.50V bias ports exhibit better than +/-400nVp-p noise over 0.1Hz to 10Hz bandwidth.

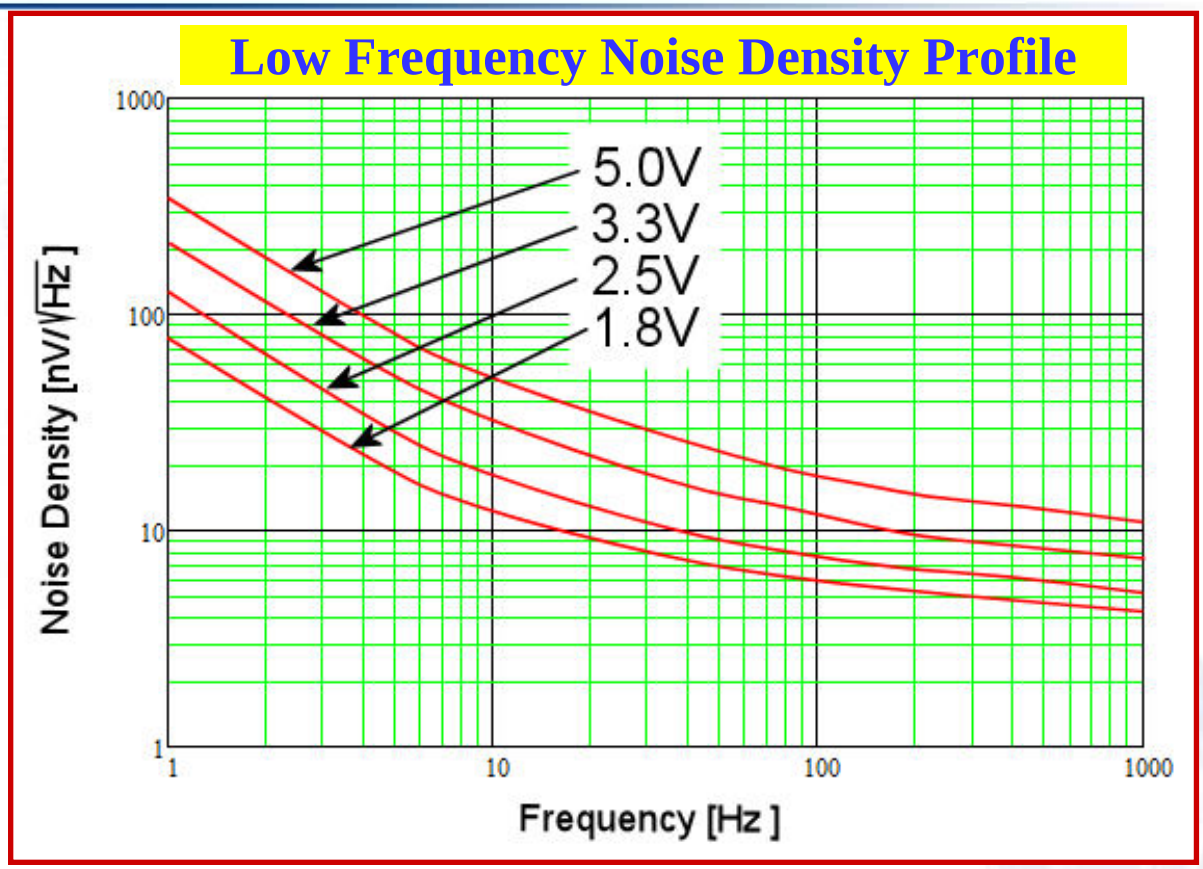
Typical Performance Curves
Low Frequency Noise





Similarly, both 3.30V & 5.00V bias ports exhibit better than +/-500nVp-p noise over 0.1Hz to 10Hz bandwidth.

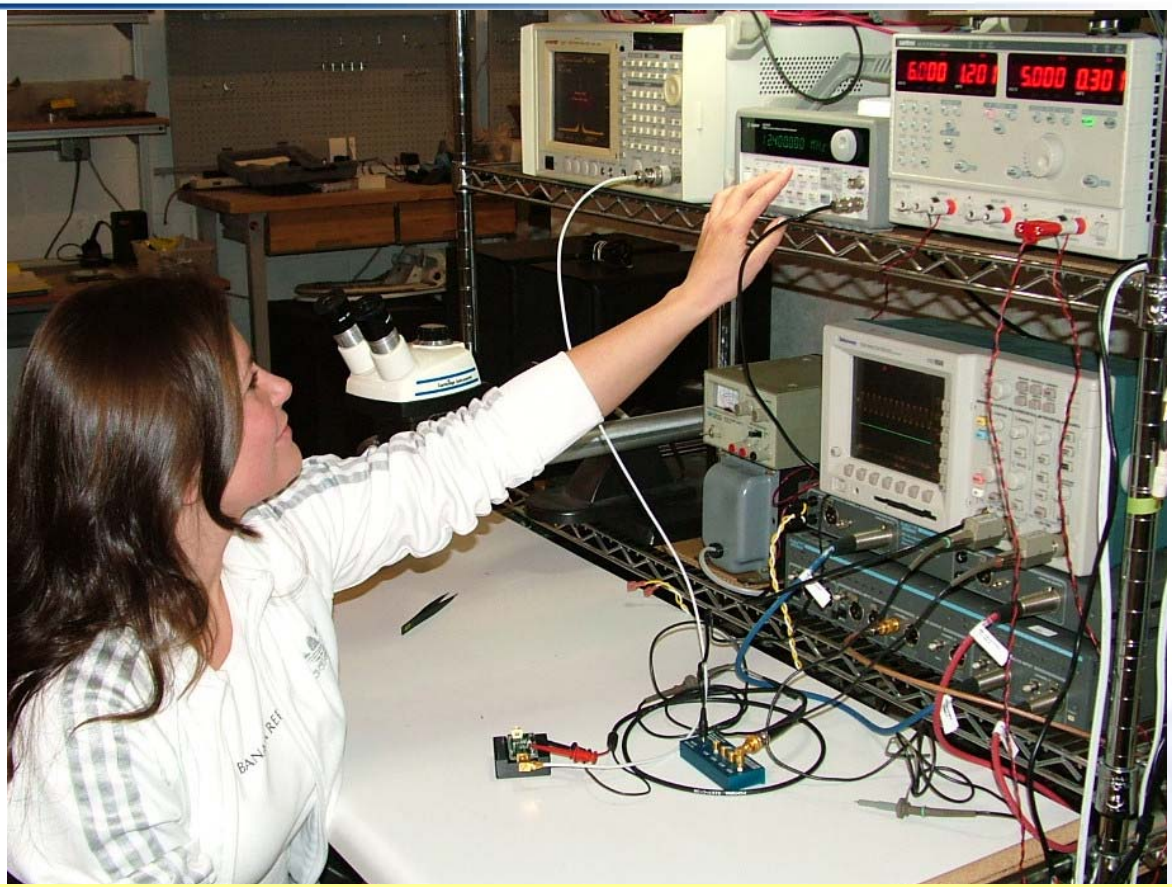
ABPSM-ULN-A Power Supply Module



ABPSM-ULN-A typically holds Noise Density @1kHz offset that is better than:

4nV√Hz for 1.80V DC Output; 5nV√Hz for 2.50V DC Output; 7nV√Hz for 3.30V & 15nV√Hz for 5.00V DC Output;

Testing Example



In this example, the ABPSM-ULN-A is being used to provide Ultra-Low-Noise Bias for an RF Amplifier. The output of this Amplifier is being measured for Spectral Content, using a Spectrum Analyzer.

Summary

- ABPSM-ULN-A Power Supply Module is designed to aid engineers seeking ultra clean power source for bench testing
- Ideally suited for Audio, RF, DDS, µWave circuits and product testing
- Low cost, small form-factor solution – can be incorporated on production lines for final testing of electronic products
- Eliminates noise-contribution-uncertainty from the power source; during design characterization, design validation, product testing in both design & production environment
- A must have to test VCOs, Crystal Oscillators, PLL Synthesizers, Mixers, Amplifiers and any sub-circuit requiring ultra clean power source
- A low cost replacement for expensive Power Supply solutions, while offering superior noise performance
- Abracon is currently designing single-channel-board-level solutions that can be incorporated in customer designs to bias noise sensitive circuitry. Please contact Abracon for further details.