

The Optimum Method To Test The Output Ripple & Noise Of Power Supplies

The switching power supplies have the fundamental advantage of high efficiency i.e. low power dissipation when compared to linear voltage regulation. Figure 1 below, illustrates a correct method of testing because the collection of radiated noise is minimized. The ground ring of the probe is pressed directly against the output ground of the power supply & the tip is in contact with the output voltage pin. A preferred method is shown in figure 2, the waveform displayed on the scope must be multiplied by a factor of 2.

Figure 1 - Correct method to test output ripple & noise

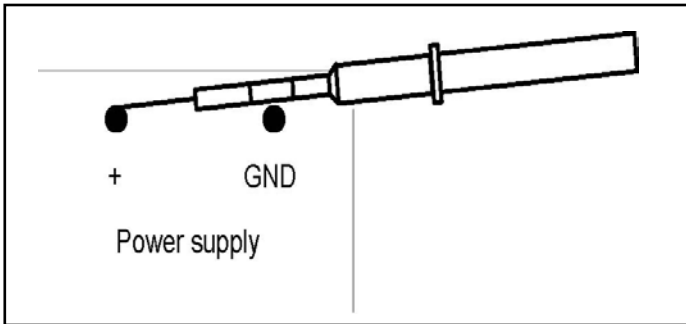


Figure 2 - Preferred method to test output ripple & noise

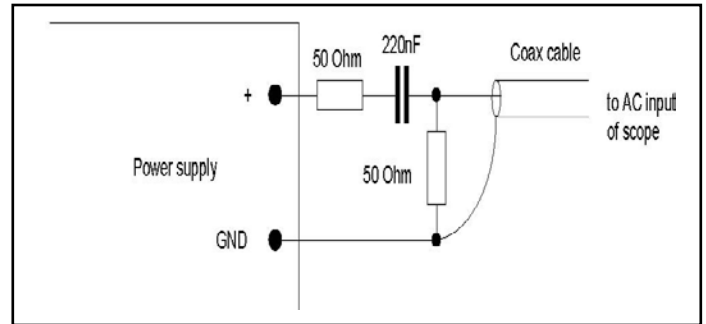
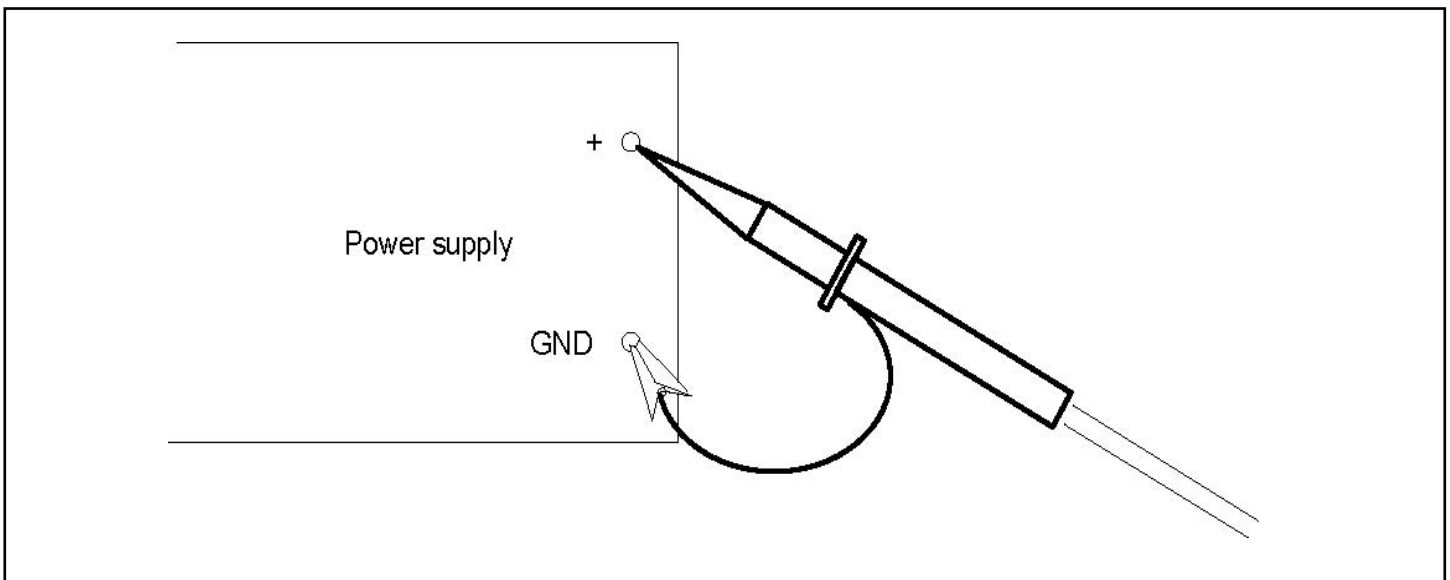


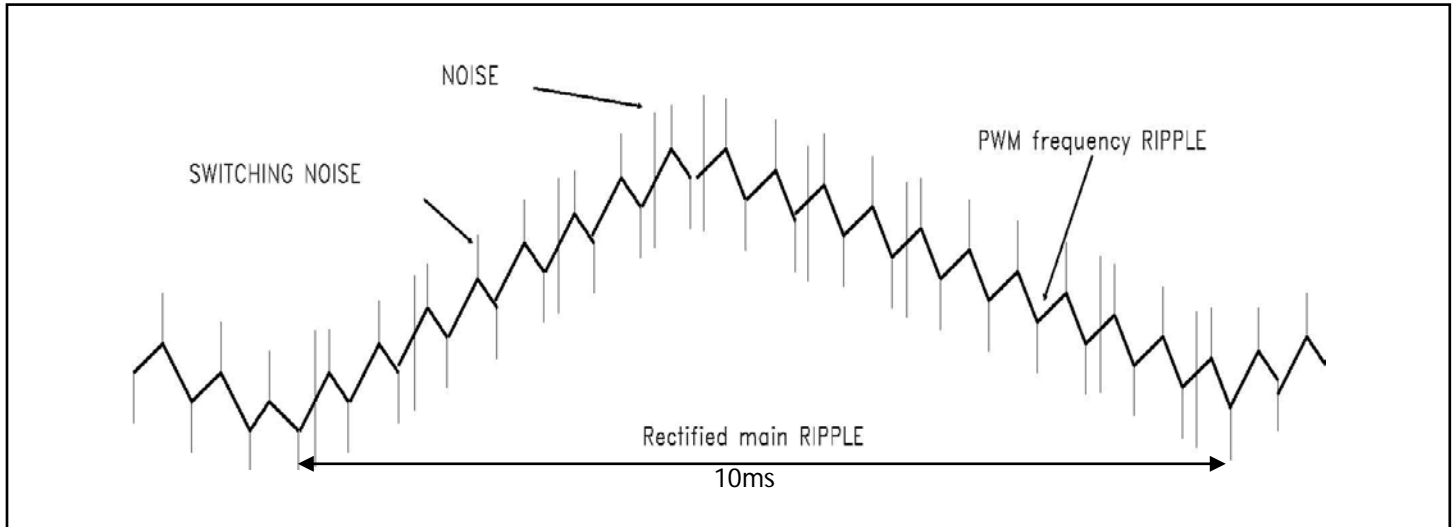
Figure 3 below shows an incorrect method of testing because the ground wire of the probe can collect radiated noise & the scope display is strongly dependant on the probe's position.

Figure 3 - Incorrect method to test output ripple & noise



However the switching technique, that is beneficial to raise the efficiency, has an associated weakness i.e. the output voltage has always an AC content. The typical output ripple and noise of a switching power supply is as shown below in figure 4

Figure 4 - Output ripple and noise of a switching power supply



The above mentioned parameters are normally specified by the peak to peak amplitude so that the best method for testing is by an oscilloscope with a bandwidth of 20 MHz.

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