

RFI Test Report – Low-RFI 12 to 5V Converter

Manufacturer: NA6O

Model: Low-RFI Converter, 12 to 5V

Description: 12 (power only) to 5 V DC-DC converter. Small custom PCB, user-assembled.

Purchased from: NA6O

Price: \$2 for bare board, about \$20 total.

Complete design and board Gerbers available at:

<https://workspace.circuitmaker.com/Projects/Details/Gary-Johnson-4/12V-to-5V-2A-Converter-Low-RFI>

Test equipment: HP 8560A with low-noise preamp, Tek TDS320A.

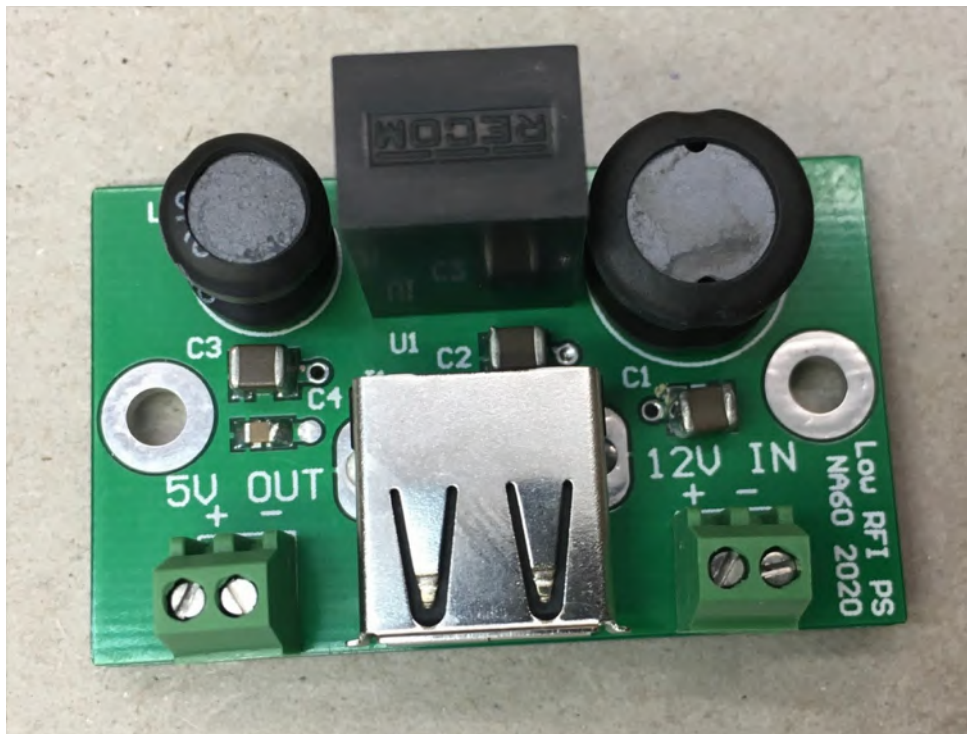
Note: Spectrum spikes around 100 MHz are FM band leakage.

Tested by: Gary Johnson, NA6O

Date: Aug 25, 2020

Overview

DC-DC converter on a 1.8 x 1.1 inch PC board. Based on a RECOM R-78B5.0-2.0 switchmode converter, with added input and output LC filters. Input range 7-32 V, output 5.0 V at 2 A. Screw terminals, and a USB-A jack (power only). Ideal for powering a Raspberry Pi or other 5 V consumer devices. If you are interested in this power supply, I am happy to supply bare boards and a parts list for \$2 including US Mail. Email me for information.

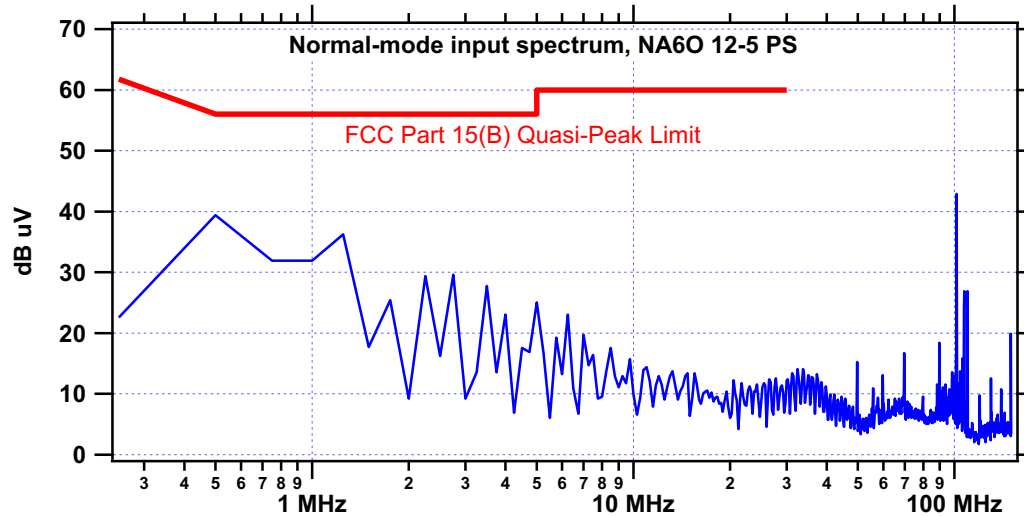


Observations:

Tested with input voltage = 13.6V and load current 0.5 A. Switching frequency about 450 kHz. Input and output conducted emissions extremely low. Highly recommended for use at amateur radio stations.

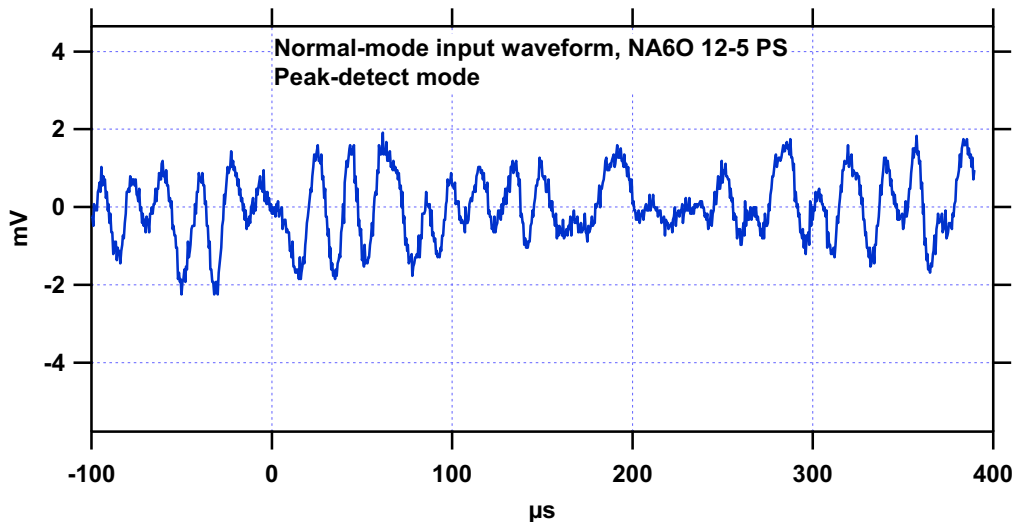
Input Normal-mode Spectrum

FCC regulations do not apply to DC-DC converters, but the Part 15(B) limit is displayed. As a point of comparison, the noise power at 3 MHz is around -80 dBm. If **directly** coupled to your receiver, this would be S8. The input ripple waveform is only 4 mV p-p.



Input Ripple Waveform

Almost all the energy is below 1 MHz. Level is low enough that this measurement is difficult to make in a repeatable manner.



Output Normal-mode Spectrum

Energy is concentrated at 450 kHz harmonics, each of which as a -3 dB bandwidth of 2.5 kHz. Almost all the VHF energy is contamination from FM broadcast and other local RFI in my unshielded lab.

