



# DATA SPECIFICATION FOR THE CONVERTAWAVE™ RF DOWNCONVERTER

**MODEL NUMBER:  
RF22-52DCV1**

NuWaves Engineering  
Superior Engineering Design Services

NuWaves Engineering  
Research and Technology Center  
122 Edison Drive  
Middletown, Ohio 45044-3269

NuWaves' **ConvertaWave™ RF Downconverter** provides excellent performance, with a user-friendly interface, over the frequency range of 225 – 500 MHz. By providing a simple command and configuration interface, and standard SMA connectors, the end user can quickly and easily integrate this module into a system. The software provides a set of rich features to allow customization of system parameters and the ability to change settings as requirements change.



Phone: 513-360-0800  
Fax: 513-360-0888  
E-mail:  
product.sales@nuwaves-ltd.com  
www.nuwaves-ltd.com

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## 1. INTRODUCTION

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The RF22-52DCV1 is a high performance, software defined, down convertor. The down convertor utilizes a straight-forward command/control serial interface for ease of integration.

The unit provides high dynamic range performance over the 225 MHz – 500 MHz frequency range, in frequency steps of 100 kHz. The output of the module is a 70 MHz spectrum that has been band-limited to approximately 370 kHz.

Furthermore, the ConvertaWave™ boasts superb front-end tuned filtering to remove high energy out-of-band interferers. It includes a spectrally pure synthesizer design, using NuWaves' proprietary low noise architecture, delivering 2,751 operational channels.

As an added benefit, the RF22-52DCV1 incorporates robust defenses from interface sources as well as over-voltage, over-current, and reverse voltage protection.

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## 2. DOWNCONVERTER FUNCTIONAL DESCRIPTION

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The down converter accepts RS-232 command/control data from a host controller. The primary host functions are:

- Programming the down converter's synthesizers (setting the input frequency)
- Selecting the system attenuation

The physical interface to the down converter is a 9-Pin Micro-D socket which enables the down converter to be mated with a host controller via a cabling harness and two SMA female connectors for RF input and IF output.

The down converter’s simple interface consists of a single supply voltage and basic command/control lines. [See Figure 1.]

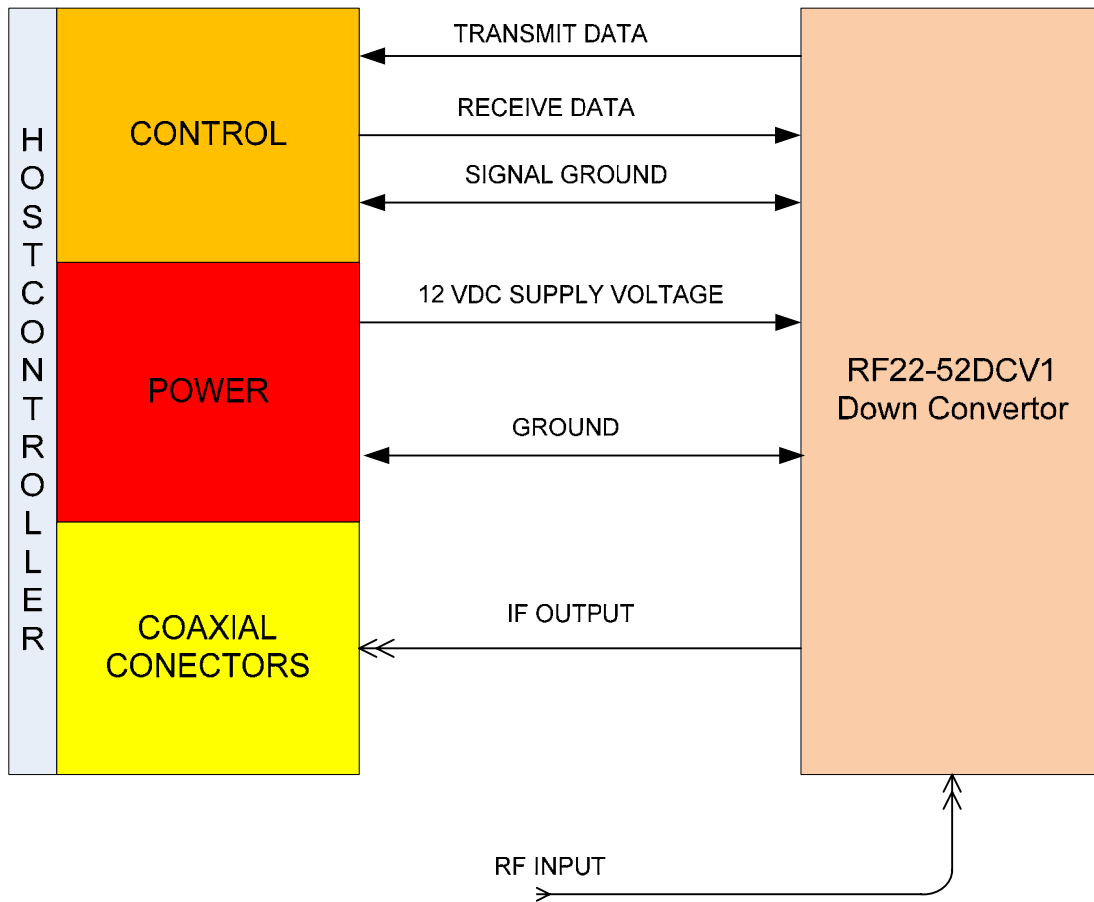


Figure 1: ConvertaWave™ Downconverter Host Interface Signals

The ConvertaWave™ receives signals in the UHF Band, providing continuous frequency coverage from 250 MHz to 500 MHz. The signal of interest is down-converted to a final Intermediate Frequency (IF) of 70 MHz. The signal is then to be processed digitally by the host controller. A top-level block diagram of the receiver is depicted in the following figure.

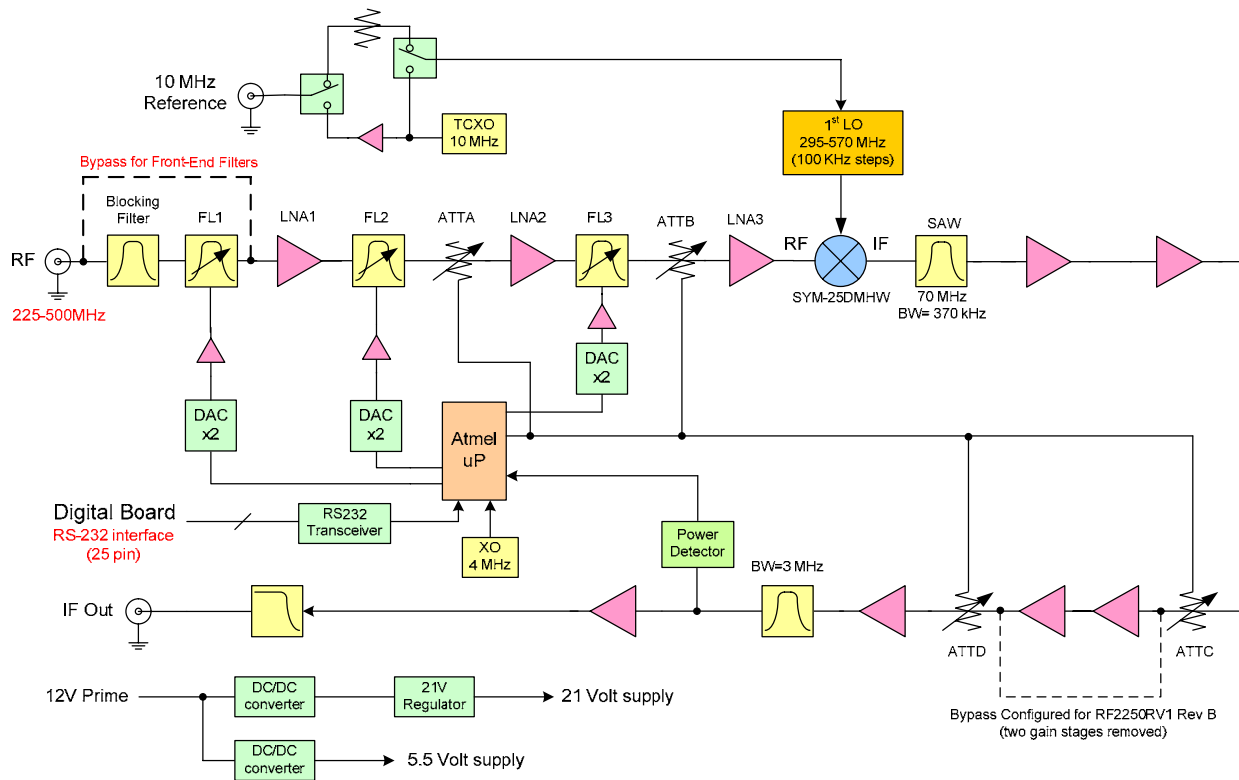


Figure 2: ConvertaWave™ Basic Downconverter Block Diagram

### 3. SPECIFICATIONS

System Parameter	Specification
Frequency Range	225 to 500 MHz
Frequency Step Size	100 kHz
Frequency Stability (Internal Reference Oscillator)	±1.0 ppm over Temperature, ±1 ppm per Year Aging
Reference Oscillator	Internal 10 MHz
Noise Figure	≤ 5 dB
LO Phase Noise	-143 dBc/Hz @ 1 MHz offset
Gain Control:	User Selectable: AGC / MGC
RF Input Level – No Damage	+20 dBm
IF Output Frequency	70 MHz
IF Output Level:	0 dBm Nominal (AGC Mode)
IF Bandwidth	370 kHz Typical
IF Rejection	80 dB
Image Rejection	76 dB
Desensitivity	3 dB at -36 dBm min.
Dimensions	6.5" x 4.0" x 0.75" (L x W x H)
Power Supply	12.0 VDC
Receive Current	220 mA (Typical @ 12 VDC)
Operating Temperature	-20° C to +50° C
Storage Temperature	-40° C to +85° C
Digital Interface	RS232 or TTL (Factory Set) RS-232 Standard
Digital Interface Data Rate	9600 bps (8N1)
P1 Interface Connector	9 pin micro-miniature D-sub connector
RF Input Connector	SMA (F)
RF Connector Impedance	50Ω
IF Output Connector	SMA (F)
IF Output Impedance	50Ω

Table 1: RF22-52DCV1 ConvertaWave™ RF Downconverter Specifications

## 4. MECHANICAL

The following figure provides a dimensional view of the downconverter mounting.

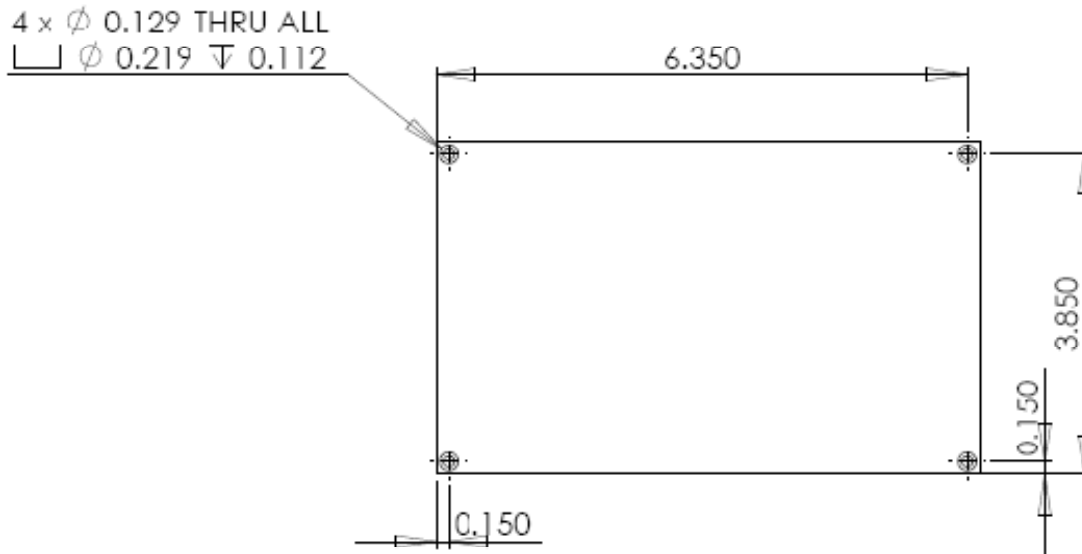


Figure 3: Mechanical Outline

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## 5. GETTING ASSISTANCE – APPLICATIONS ENGINEERING

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NuWaves is proud of its products and getting assistance on the ConvertaWave™ RF Downconverter module is easy.

Sales and Technical Solutions Engineering:

Mr. Kevin Harrison  
(513) 360-0800 Ext. 313  
FAX: (513) 360-0888  
Email: [kharrison@nuwaves-ltd.com](mailto:kharrison@nuwaves-ltd.com)

NuWaves Home Page: [www.nuwaves-ltd.com](http://www.nuwaves-ltd.com)

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## 6. GENERAL INFORMATION

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