# Configuring the BR262RD1

The BelaSigna R262 Reference Design 1 (RD1) is a miniature, self-contained unit that can be integrated into a product or prototype to evaluate the performance of the BelaSigna R262 DSP from ON Semiconductor. The RD1-board has been designed with a pronounced focus to minimize the production cost, by using components and component classes with very short lead times.

## Configuring the BR262RD1

The configuration of the RD1 can be controlled by three means:

1.  **Configuration by hardware**:
    Change resistors to control the built-in ROM code

2.  **Configuration by software**:
    To use the external EEPROM to store the configuration of the RD1

3.  **Configuration by host**:
    To use an external I2C-host to alter the configurations of the RD1.
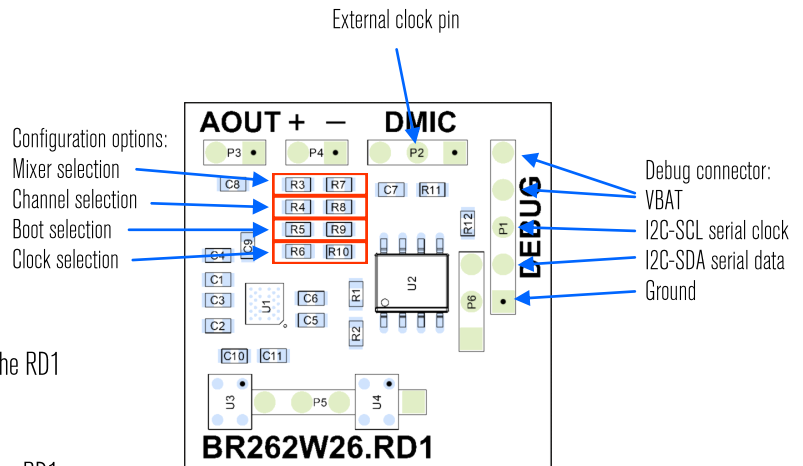


## 1. Configuration by hardware

If you opt for configuring the RD1 by hardware settings, this implies you have to change one or more 0603-sized resistors. Four resistor dividers can be changed in this configuration method. The resistor dividers of the VREG=1V voltage, defines various operating modes of the chip, please refer to the product data sheet for details around these modes: http://www.onsemi.com/pub/Collateral/BR262-D.PDF

- **Boot Selection** is defined by R9/(R5+R9)
  The factory value is 75k/(100k+75k)V=0.43V which corresponds to preset nr. 4; active mode, with noise reduction set to between 5cm and 5m (see, table 8 in the data sheet).

- **Clock selection** is defined by R10/(R6+R10)
  Since R6 is not mounted the factory value is 0V which corresponds to preset nr. 7; internal oscillator (see, table 9 in the data sheet). Note that this setting should only be changed if an external clock is provided on pin 2 of the DMIC connector P2.

- **Channel selection** is defined by R8/(R4+R8)
  The factory value is 100k/(75k+100k)V=0.57V which corresponds to preset nr. 3; channel 1 outputs a mixing of the the noise reduction range 5cm to 5m as defined by the mixer selection below (see, table 10 and channel 1 in the data sheet).

- **Mixer selection** is defined by R7/(R3+R7)
  The factory value is 39k/(100k+39k)V=0.28V which corresponds to preset nr. 5; 60% of the 5cm mode and 40% of the 5m mode is output from the noise reduction (see, table 11 in the data sheet). This is a general setting that suits many applications.
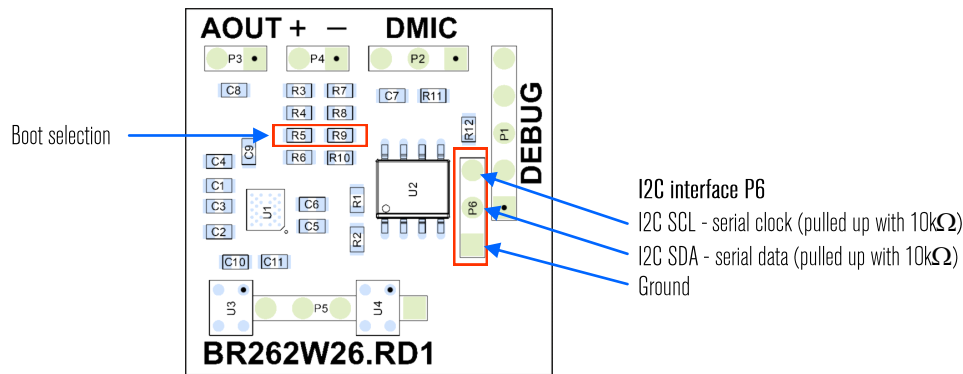
## 2. Configuration by software

If you intend to do several changes of the product configuration, or you will have an EEPROM available in your final product, the second configuraiton option would be of interest to reconfigure the BR262RD1. Note that, once you have found a good setting through the software, you can always go back to the hardware-defined solution (see point 1 above) at a later point, should you desire that.

1 To enable the software control in the first place you will need to change the **Boot selection** to **Boot preset 0, 1 or 2**; which is the external boot mode from the external I2C EEPROM. This can be accomplished by removing resistor R9 (the Boot selection voltage is then VREG = 1V).

2 After you have removed R9, you need to connect an I2C to USB adapter to the BR262RD1 over the DEBUG connector P1 and start a PC application called the tweaker to download a custom application to the EEPROM. The tweaker is available on the product tracking system using the code and email assigned to your ordered product.

## 3. Configuration by Host

In this scenario, a I2C-host is used to control the behavior of the BR262RD1. This could be a baseband processor, a micro controller or any other digital circuitry that can connect to the I2C interface of the BR262-chip.

AOUT + — DMIC

DEBUG

BR262W26.RD1

Boot selection

I2C interface P6
I2C SCL - serial clock (pulled up with 10k$\Omega$)
I2C SDA - serial data (pulled up with 10k$\Omega$)
Ground

## Boot loading from an I2C-host

The BR262-chip can boot by using a boot selection defined in hardware (see, 1. Configuration by hardware) or it can load an application from the EEPROM memory (see, 2. Configuration by software) as a third option, the chip can load a custom application from a I2C host.

To enable boot loading of a custom application from an I2C-host you will need to change two things on the BR262RD1:

1 First you will need to change the **Boot selection** to **Boot preset 0, 1 or 2**; which is the external boot mode from an external source. This can be accomplished by removing resistor R9 (the Boot selection voltage is then VREG = 1V).

2 Second, after removing R9, you need remove the EEPROM (U2) or ensure that the EEPROM content is cleared.

After these two steps, the chip can accept boot loading from an external I2C host.

## Configuration by the host

Independent of the boot mode selected (hardware, software or boot loading via host) a host can at any time issue I2C-commands to control the behavior and interior of the BR262 chip. This can be done by issuing proper I2C commands to set and read register values. Please refer to the **Communicatoins and Configuration Guide** availalbe on the product tracking system to find more information on available I2C-commands.