

## **Digital Volume Control – TAS2557/TAS2559**

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### **ABSTRACT**

This document explains how to set the digital volume control for TAS2557 and TAS2559. This volume control is included in the ROM Mode processing blocks.

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## **1 Digital Volume**

This volume control can adjust the gain of the signal from 18dB to -105dB. Below it is explained how to configure the device for a specific gain. This gain volume control is included in the ROM modes.

## **2 Control Registers**

This volume control is set by the values of 4 registers, starting from Book 0 Page 60 Register 112 to Register 115.

## **3 Obtain Register Values**

Volume is controlled by writing specific values for the registers mentioned before. A formula exists to calculate such register values:

$$Ratio = \frac{\left(10^{\frac{Gain}{20}} * 2^{30}\right)}{16}$$

Once *Ratio* is obtained, it is rounded to the next integer value and finally convert this decimal value into hex and write it into the registers mentioned before. If the hex value has less than 8 bits, fill with 0's on the left side.

## 4 Example

On this example, a gain of -23dB will be written to the device:

1. Gain = -23dB, calculate *Ratio*:

$$\text{a. } Ratio = \frac{10^{\frac{Gain}{20}} * 2^{30}}{16} = \frac{10^{\frac{-23}{20}} * 2^{30}}{16} = 4750943.736$$

2. Round *Ratio* to next integer value:

$$\text{a. } Ratio \cong 4750943$$

3. Convert decimal to hex:

$$\text{a. } 4750943 = 487E5F$$

4. Complete the 8 bits

$$\text{a. } 487E5F = 00487E5F$$

5. Write hex value into device registers

$$\begin{aligned} \text{a. } & \text{w } 98 \text{ } 00 \text{ } 00 \\ & \text{w } 98 \text{ } 7f \text{ } 00 \\ & \text{w } 98 \text{ } 00 \text{ } 3c \\ & \text{w } 98 \text{ } 70 \text{ } 00 \text{ } 48 \text{ } 7e \text{ } 5f \end{aligned}$$