Pin Compatibility of the WM8766/68/72

INTRODUCTION

The WM8766/68/72 is a family of six and eight channel DACs and one Codec. They are designed to be pin compatible in most applications and share identical register structures. This document demonstrates how easily interchangeable the devices are.

PIN OUT OF THE WM8766/68/72

Figure 1 below shows the pin-out of all devices.

- WM8766: Fourth pair of outputs (pins 19 and 20) and the fourth digital input (pin 10) are missing from the device leaving No Connection pins instead.
- WM8768: Four sets of stereo outputs can be seen down the right hand side of the device with the digital inputs on the left hand side.
- WM8772: Pins 19, 20, 10 are used as analogue inputs and a digital output for the ADC.

The stereo channel VOUT4L/R has the same properties as the other three stereo channels (i.e. VOUT1L/R, VOUT2L/R, VOUT3L/R) for the WM8768 device. The analogue inputs to the WM8772 should be connected via AC coupling capacitors.

Figure 2 overleaf shows the recommended external components for all 3 devices. Common pins are shown in black, pins that vary from device to device are colour coded.
Figure 2 WM8766/68/72 Recommended External Components Diagram

NOTES:
1. AGND and DGND should be connected as close to the device as possible.
2. C4, C5, C6, C7, C8, and C9 should be positioned as close to the device as possible.
3. Capacitor types should be carefully chosen. Capacitors with very low ESR are recommended for optimum performance.

Key:
Red = WM8768
Green = WM8772
Blue = WM8766
Cyan = WM8766/68
COMPONENT REFERENCE | SUGGESTED VALUE | DESCRIPTION
--- | --- | ---
C1 and C5 | 10µF | De-coupling for DVDD and AVDD.
C2 to C4 | 0.1µF | De-coupling for DVDD and AVDD.
C6 | 0.1µF | Reference de-coupling capacitors for VMID and TESTREF pin.
C7 | 10µF | De-coupling for TESTREF.
C8 | 0.1µF | Filtering for VREFP. Omit if AVDD low noise.
C9 | 10µF | AC coupling for analogue input
C10 | 1µF | AC coupling for analogue input
C11 | 1µF | De-coupling for ADC ref
C12 | 10µF | De-coupling for ADC ref
C13 | 0.1µF | Filtering for VREP. Use 0Ω if AVDD low noise.
C1 and C5 | 10µF | De-coupling for DVDD and AVDD.
C2 to C4 | 0.1µF | De-coupling for DVDD and AVDD.
C6 | 0.1µF | Reference de-coupling capacitors for VMID and TESTREF pin.
C7 | 10µF | De-coupling for TESTREF.
C8 | 0.1µF | Filtering for VREFP. Omit if AVDD low noise.
C9 | 10µF | AC coupling for analogue input
C10 | 1µF | AC coupling for analogue input
C11 | 1µF | De-coupling for ADC ref
C12 | 10µF | De-coupling for ADC ref
C13 | 0.1µF | Filtering for VREP. Use 0Ω if AVDD low noise.

Table 1  External Components Description

REGISTER MAPS OF THE WM8766/68/72

The register maps of the WM8766/68/72 are shown below in Table 2. Register R0-R9 and R31 are common to all devices with additional registers for VOUT4 in the WM8768 and the ADC in the WM8772.

The table shows all registers for all devices. The keys below this describe which rows represent each device. For example, row R15(0Fh) describes register R15 for the WM8766 and row R15(0Fh) describes R15 in the WM8768. Registers in white rows are common to all devices.

<table>
<thead>
<tr>
<th>REGISTER</th>
<th>B8</th>
<th>B7</th>
<th>B6</th>
<th>B5</th>
<th>B4</th>
<th>B3</th>
<th>B2</th>
<th>B1</th>
<th>B0</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0(00h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R1(01h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R2(02h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R3(03h)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R4(04h)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R5(05h)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>R6(06h)</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R7(07h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R8(08h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R9(09h)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>000000000</td>
</tr>
<tr>
<td>R31(1Fh)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>000000000</td>
</tr>
</tbody>
</table>
### Table 2 Register Map of the WM8766/68/72

<table>
<thead>
<tr>
<th>REGISTER</th>
<th>B1 B1 B1 B1 B1 B1 B9</th>
<th>B6 B7 B6 B5 B4 B3 B2 B1 B0</th>
<th>DEFAULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>R10(0Ah)</td>
<td>0 0 0 1 0 0 0</td>
<td>DACRATE[8:6] DACMS PWRDN ALL</td>
<td>01000000</td>
</tr>
<tr>
<td>R11(0Bh)</td>
<td>0 0 0 1 0 0 0</td>
<td>DACRATE[8:6] DACMS PWRDN ALL</td>
<td>01000000</td>
</tr>
<tr>
<td>R12(0Ch)</td>
<td>0 0 0 1 1 0 0</td>
<td>ADC OSR 0 1 0 0 0 0 0 0 0 0</td>
<td>01000000</td>
</tr>
<tr>
<td>R13(0Dh)</td>
<td>0 0 0 1 1 0 0</td>
<td>UPDATE LDA[4:7]</td>
<td>01111111</td>
</tr>
<tr>
<td>R14(0Eh)</td>
<td>0 0 0 1 1 0 0</td>
<td>UPDATE RDA[4:7]</td>
<td>01111111</td>
</tr>
<tr>
<td>R15(0Fh)</td>
<td>0 0 0 1 1 0 0</td>
<td>0 0 0 MPD 0 0 0 0 0</td>
<td>00000000</td>
</tr>
</tbody>
</table>

#### Key:

- **WM8766/68/72**
- **WM8768**
- **WM8766**
- **WM8772**
- **WM8766**

#### Device Active registers

<table>
<thead>
<tr>
<th>Device</th>
<th>WM8766</th>
<th>WM8768</th>
<th>WM8772</th>
</tr>
</thead>
<tbody>
<tr>
<td>WM8766</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WM8768</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WM8772</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For example, active registers in the WM8768 will be shown in rows that are coloured white, light blue, and red. Similarly, registers used in the WM8772 will be in rows coloured white and green.
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If you require more information or require technical support please contact Wolfson Microelectronics Applications group through the following channels:

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