

Twisted Pear “Opus” WM8740 DAC.

Version 2.0

Overview:

The “Opus” is a DAC module designed around the well regarded Wolfson WM8740 chip. It is a differential voltage output DAC. Please note: on the version 2.x boards there are some silkscreen designators and a DSD header that are changed/added to support WM8741 when it becomes available. The DSD header cannot be used on modules with the WM8740 installed.

Power Supplies:

The module has two on-board LDO voltage regulators. One 5V regulator for each the digital supply and analog supply. The power supply (or supplies) for VA and VD can be separate or the same. 7.5VDC input is recommended for both VA and VD. If you wish to use just a single supply, simply run a short wire from the VA terminal to the VD terminal, then wire your supply to either VA or VD with one voltage input wire and one GND wire coming from your supply.

Switch Settings:

The Opus has tristate switches to configure the DAC. The DAC must be reset (or power cycled) in order for a configuration change to take effect. Only the recommended settings are covered here. Other configurations are possible. Refer to the [WM8740 data sheet](#) if you wish to experiment. In order to insure the widest possible compatibility with our other modules it is recommended that the DAC be configured to accept 24-bit I2S PCM input as indicated below. Please note the following pin name changes to support WM8741:

Pin Names:

PIN(number) WM8741	WM8740
DSD(27)	DM1
DEEMPH(28)	DM0
FSEL(4)	MODE8X
OSR(22)	RESETB

Recommended Stereo Configuration:

I2S	1
DSD(DM1)	0
DEEMPH(DM0)	0
MODE	0
IWO	1
DIFFHW	0
FSEL(MODE8X)	Open
MUTE	Open
OSR(RESETB)	Open

Recommended Mono configuration:

I2S	1
DSD(DM1)	0
DEEMPH(DM0)	0
MODE	0=LEFT 1=RIGHT
IWO	1
DIFFHW	1
FSEL(MODE8X)	Open
MUTE	Open
OSR(RESETB)	Open

Analog Output:

In MONO mode the selected analog signal is reversed on the non selected side. So for example, if LEFT MONO mode is selected (CHSL=0) then RIGHT- output is actually LEFT+ output and RIGHT+ is actually LEFT-.

Digital I/O Headers:

Advanced users will find an I/O header with access to all the I/O pins. This allows for external control over those pins. In particular some people may want to use the DM0:1 pins to apply deemphasis from an external flag, such as would come from a receiver module. There is also a controller terminal block to easily connect a microcontroller to configure the DAC. See the data sheet for more information.

PCM Input:

PCM (I2S as shown above) is input via the PCM_IN terminal block. BCK is the bit clock. MCK is the system, or master clock. LRCK is the LEFT/RIGHT clock. DIN is the PCM data input. G is digital GND.