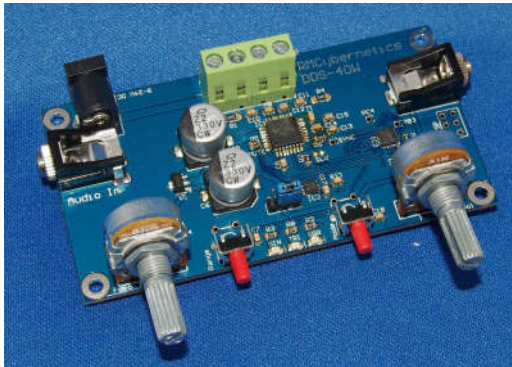# 40W Power Function Generator
Digital Function generator with Power Amplifier

Features and Specifications

- Selectable Sine, Triangle, Square output
- Wide supply voltage range (10V – 26V)
- 40W Power Amplifier Output
- Memory and Playback Function
- Over Current, & Temperature Protection
- Optional audio input & output
- High quality double layer PTH, 2oz Copper PCB
- Size: L93 x W49 x H25 mm

The DDS-40W is a versatile digital function generator with built in 40W Class-D amplifier for directly driving loads such as speakers and coils. The high efficiency amplifier can drive 40W into an 8 ohm speaker from a 25V supply and can even drive loads with impendences down to 3.2 ohms.

The on-board DDS function generator can output Sine, Triangle, and Square waveforms over a broad frequency range. It is also possible to store a selection of frequency settings for playing back patterns of up to 10 tones.

With built in 3.5mm audio sockets, devices can be linked together or to external audio devices.

Example Applications

- Audio Testing
- Adjustable Frequency Power Control
- Cymatics
- Resonance and Wave Experiments
- And more…

ELECTRICAL CHARACTERISTICS
NB: Figures may vary under different loading conditions and environments.

Symbol	Parameter	Min	Max
V_{in}	Input Supply Voltage	10V	26 V
I_{sup}	Supply Current (no load)	50 mA	150 mA
I_{out}	Continuous Output Current	0 A	6.5 A [1]
P_{out}	Continuous Output Power	0 W	40 W
F_{out}	Output Frequency Range	10 Hz	25 kHz
F_{sig}	Input/Output Signal Voltage (3.5mm jacks)	0 V	5 V
M_{no}	Memory Storage	10 tones	10 tones

Table 1: Electrical Characteristics
[1] Max current may vary with operating conditions

Connections

The DDS-40W circuit can be powered from a 12V to 26V DC supply. Power connection can be either via a standard 2.5mm DC socket, or using the terminal block connections marked V+ and GND. The load device or speaker should be connected between SPK- and SPK+.

Connections to external devices can be made using 3.5mm audio jacks to the sockets on either side of the circuit. To disable the on-board signal source and use an external one, the jumper link must be moved to the position marked EXT.
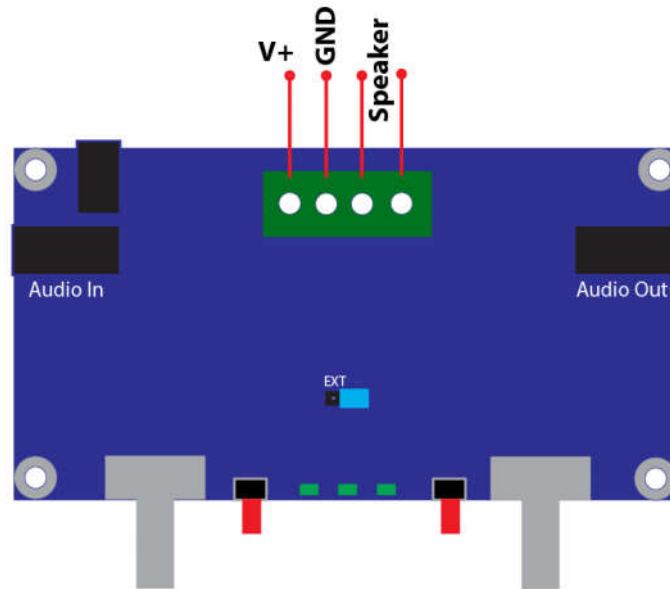

Figure 1: Connections

Operating Instructions

The DDS-40W has four main controls. The two potentiometers are used for controlling amplitude (volume) and frequency. The two push buttons are used for special functions such as selecting the operating mode, storing tones, or adjusting the frequency range.

Mode Button
A short press of this button will cycle through the available operating modes which will also be indicated on the nearby LED indicators. In normal operation this will cycle between Sine, Triangle, Square, and Playback modes.

Range Button
A short press of this button will toggle between high and low frequency ranges. Low frequency range will give an adjustable output from 10 Hz to 500 Hz, while high frequency mode will give 500 Hz to 25 kHz.

Freq Potentiometer
This control will adjust the output frequency when using the on-board signal generator. The frequency range adjustable by this control is determined by the Rage button.

Vol Potentiometer
This control adjusts the output amplitude from either the on-board signal or an external one.

Record / Playback
To begin recording tones, hold the Mode button for about one second and then release it. You

2

will hear a beep (if a speaker is connected to the output) and see the all the LED indicators illuminate together. You can now adjust the frequency control and press the Range button to reach the desired frequency. To save the tone, hold the Mode button again. You will hear a beep and observe an LED flash to confirm the tone was stored. You can store 10 tones in this way and once all ten are stored you will hear a double beep, then the LEDs will return to normal.

When in playback mode, both the SIN and SQR LEDs will be illuminated, and the middle (TRI) LED will flash each time the tone changes to the next one in sequence.

To replay the stored tones, cycle the mode to playback mode using the Mode button. Each tone will pay for the same amount of time and will loop endlessly through the 10 tones. In playback mode the length of time each tone plays is determined by the setting of the Freq control. You can turn this control to make the tones play faster or slower. Pressing the Range button will cycle between longer or shorter tones allowing an adjustment of approximately 0.2s to 9s or 9s to 445s.

Important Usage Notes

- If the amplifier IC is overloaded it will interrupt the output. This may result in a distorted audio signal or intermittent shutdown of the output
- The square wave output will be of significantly larger amplitude so take care to reduce the volume before switching to square wave mode.