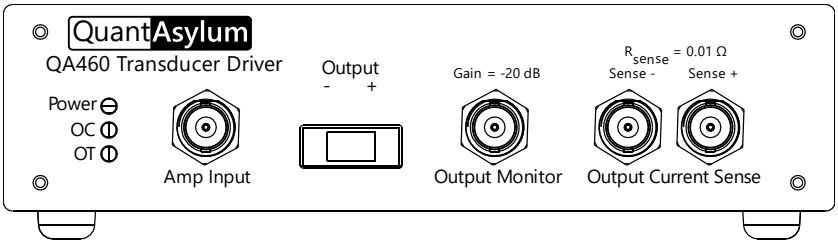
QA460

TRANSDUCER DRIVER



- ✓ Wideband (1 MHz)
- ✓ Isolated & Self Protecting
- ✓ Output Current Sense Port
- ✓ Offset Error < ±25 mV
- ✓ Stable into a range of loads
- ✓ Up to 1.5A drive current

Introduction

The QA460 is a crucial tool for any benchtop. The QA460 provides 20 dB of gain and up to 1.5A of drive current for powering a range of transducers, including speakers and other reactive loads.

The QA460 differs from an old audio amp that you might be using today for testing loads. First the QA460 has a very wide bandwidth, generally greater than 1 MHz. The bandwidth ensures you can readily see harmonic content well beyond the audio band. Second, the QA460 is self-protected: The output is current limited to about 1.6A, and the power-stage die provides over-temperature protection. Both of these signals are visible on the front panel, making it easy to know if you are operating at the limits of the QA460.

The QA460 is powered from a 12V wall adapter. Input signals are AC coupled into an OPA1611 low-noise opamp with 20 dB of gain. That stage feeds into a unity-gain OPA564 power op-amp running from split 10.5V rails. The single-ended output is DC coupled to the front-panel.

A monitor port allows you to see a 20 dB attenuated version of the output signal. A 0.01Ω series R and differential current monitoring port allows the measurement of output current on the spare channel of your audio analyzer.

Combined, these measurement ports make it very easy to not just drive a transducers, but also measure the impedance of a transducer. The output monitor port goes into the left channel of the analyzer, and the current sense outputs go into the right channel of the analyzer. From this, software can determine the impedance of the load.

Are You Ready?

Are you testing your products thoroughly before they leave your factory? If not, you should be. Contact: sales@QuantAsylum.com

Specifications

Mechanical

Dimensions	177w 44h 97d mm, 116mm deep with BNC
Weight	390 grams
Case Material	Powder coated aluminum

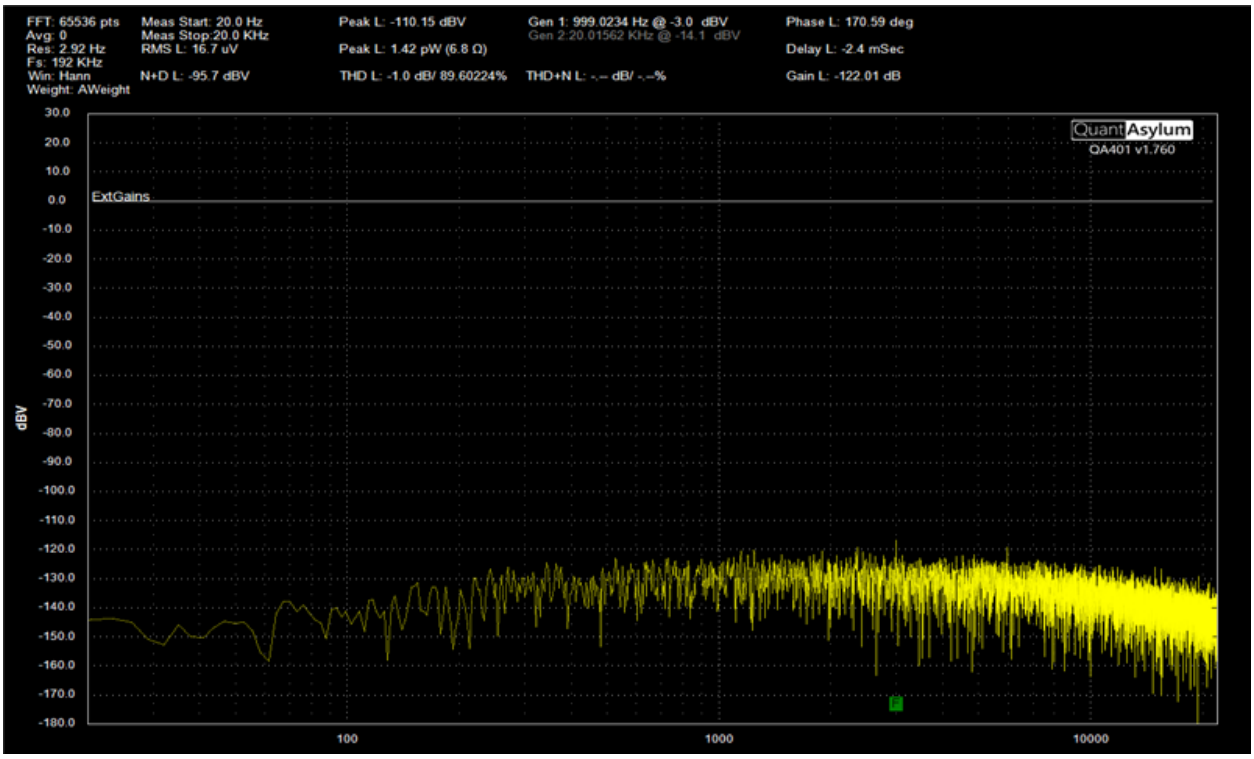
Electrical

Inputs	Single-ended BNC
Input Z	10 KΩ
Input Coupling	AC, F_C = 1 Hz
Input Gain	20 dB, ±0.1 dB
Max Output Swing	15 dBV = 5.6Vrms = 15.9Vpp, THD < -80 dB, >=10Ω, 1 kHz
Max Output Current	±1.6A, +300 mA, -100 mA
Output Noise Floor	20 uV A-weighted, input shorted, 20-20 kHz bandwidth
THD	< -90 dB, 1 kHz, 1W into 10Ω
Front Panel Indicators	Power OC = Over Current (Output Current exceed ±1.6A) OT = Over Temperature (Output Driver Die Temp > ~150C
System Faults	Short Circuit is tolerated and if output driver die temp exceeds approximately 150C, then OT indicator will lite and output will be disabled until die temp drops approximately 20C. Over current is tolerated, and if Max Output Current is exceeded then output voltage will be reduced until the output current is below the Max Output Current. During this time the OC indicator will lite. Do not connect the amplifier outputs to any voltage source. If the voltage source exceeds an internal supply rail, it can damage the QA460.
Output Impedance	<0.02Ω, 10 to 30 kHz
Slew Rate	>30V/uS (typical, but not guaranteed over all conditions)
Bandwidth	>=3 MHz, 70 mV output into 10Ω >=1.4 MHz, 1.4V output into 10Ω
Flatness	10 Hz to 20 kHz, ±0.1 dB measured into 10Ω 10 Hz to 1 MHz, ±1 dB measured into 10Ω
Current Sense	A series 0.01Ω is present in the output path for current sensing. There is a 1 kΩ in series with the sense outputs to help isolate any load-dependent glitches that might be passed onto the attached analyzer.
Momentary Power	See THD and THD+N graphs for performance under bursted conditions. Plots were generated using ~200 mS burst at 50% duty cycle.
Continuous Power	The QA460 can deliver from 1 to 5W, depending on the load impedance. Sustained power levels depend on the load and internal temperatures. For example, into 10 Ω, about 3.3W can be delivered continuously without hitting thermal limits. Into 6.8 Ω, about 1W can be delivered continuously without hitting thermal limits. And into 2 Ω, about 45 mW can be delivered continuously without hitting thermal limits. These should be considered approximate guidelines.
Included Accessories	12V, 1.5A ACDC Wall Adapter with universal plug.

QA460 Measurements

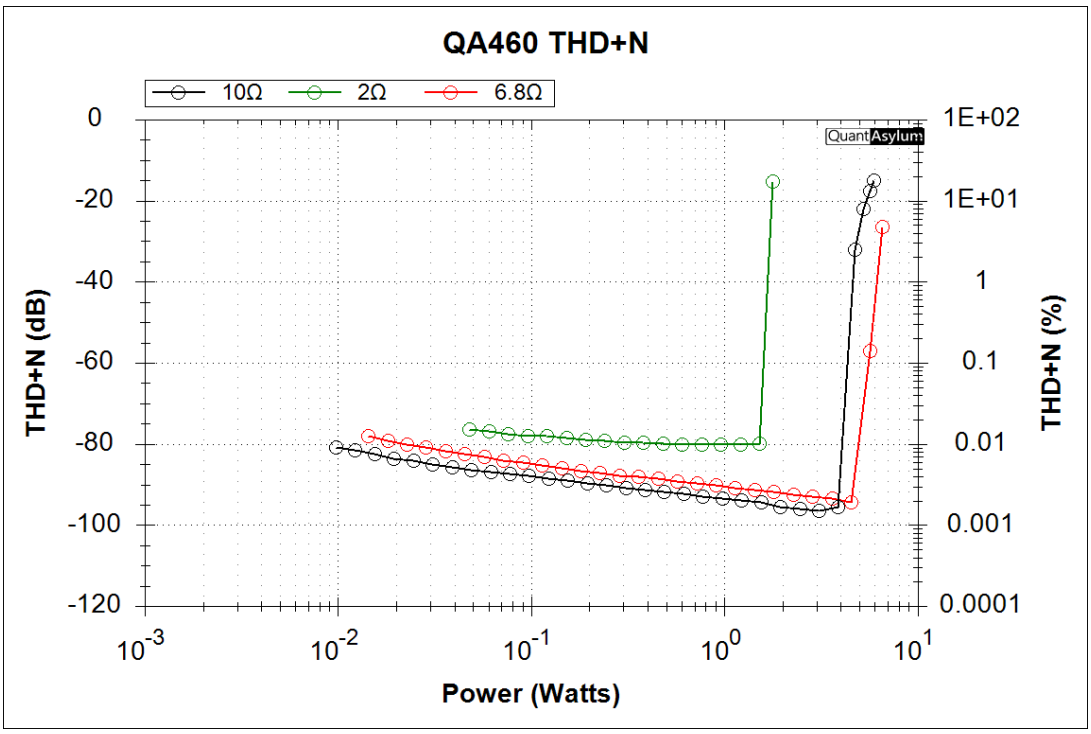
Noise Floor (16.7 uVrms measured)

This measurement is made A-weighted with the input to the QA460 shorted.

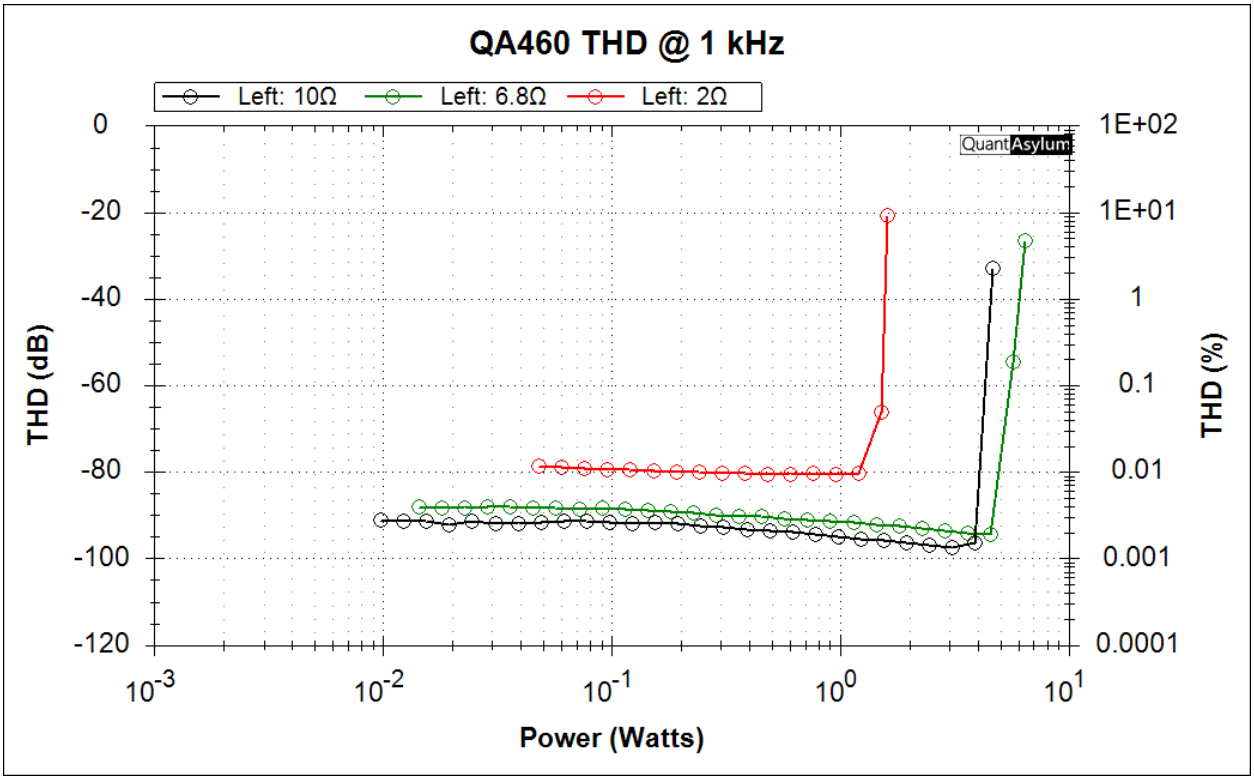


THD+N @ 1 kHz

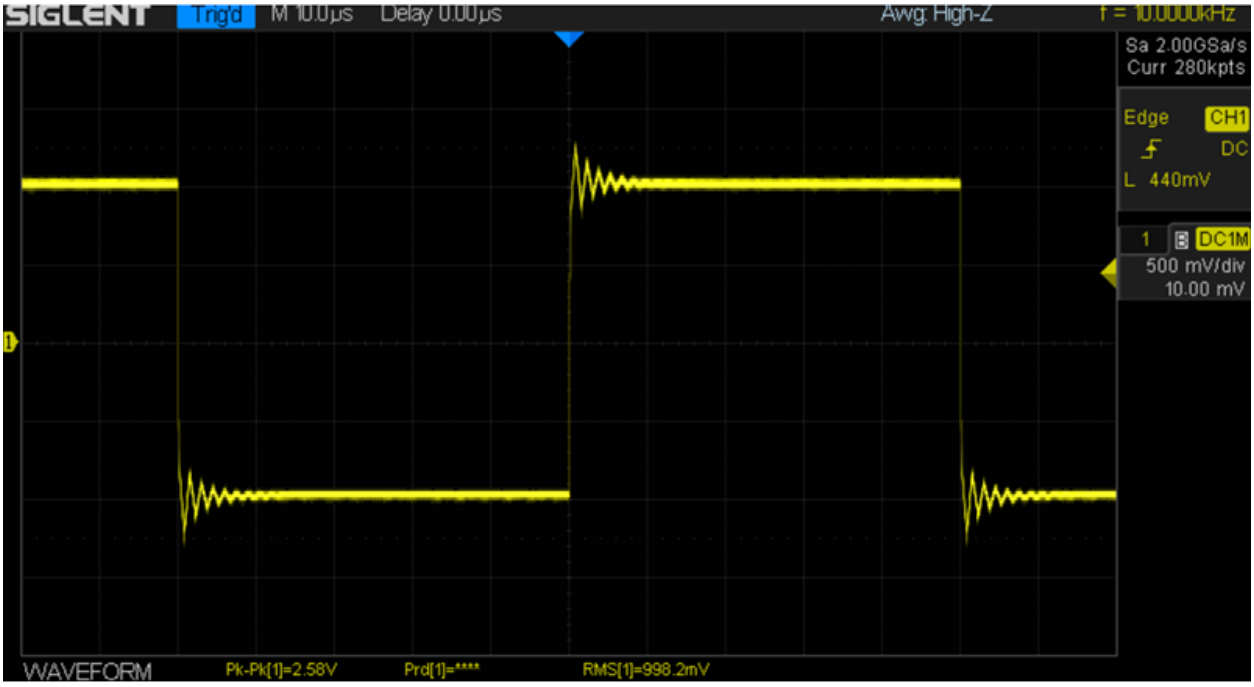
This graph shows the THD+N for 2, 6.8 and 10 ohm loads.



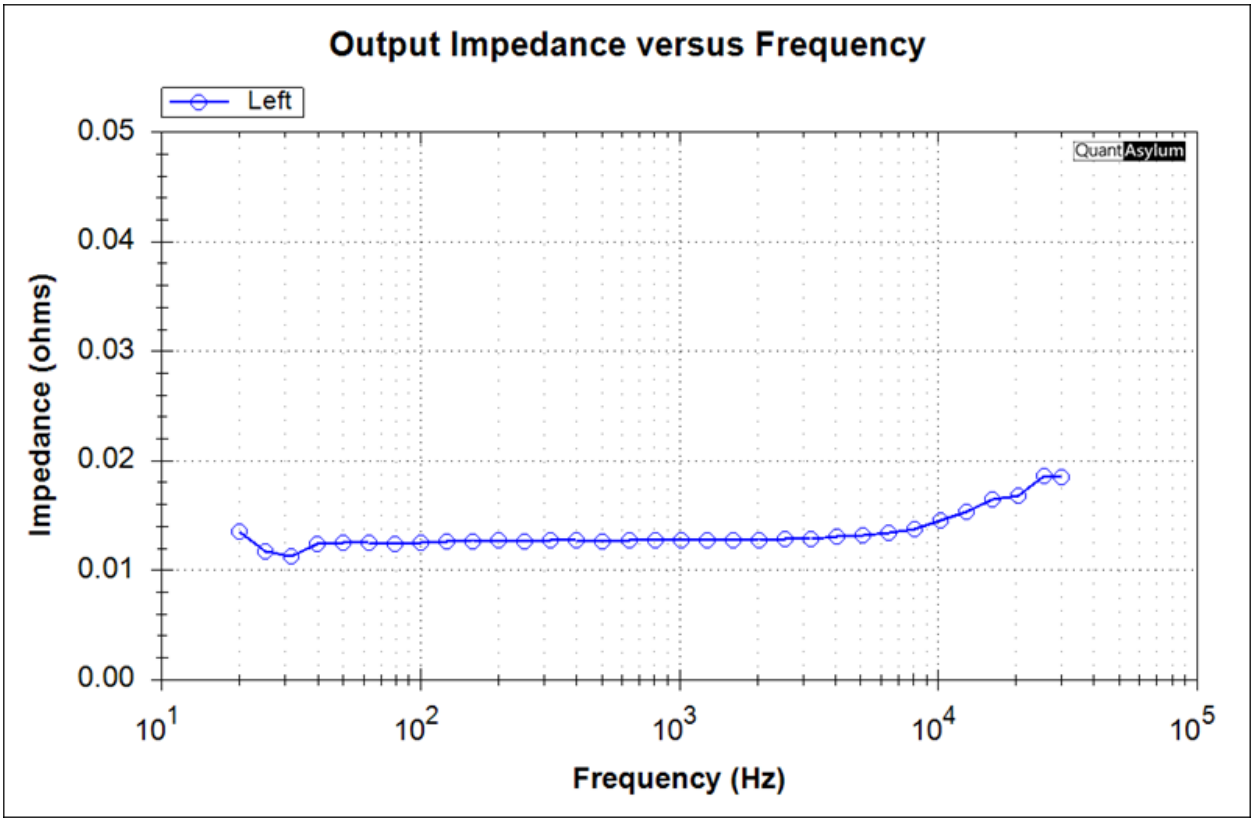
THD @ 1 kHz



±1V 10 kHz Square Wave into 100 nF Capacitive Load



Output Impedance



Turn-On Glitch

Upon the application of power, there will be a momentary glitch on the amplifier output, lasting about 30 uS with a maximum excursion of about 200 mV. For a typical loudspeaker, this will be nearly silent. Other transducers may or may not be bothered by this turn-on glitch. Added circuits in the QA460 keep the amplifier disabled until the supply rails have stabilized at their expected voltages.