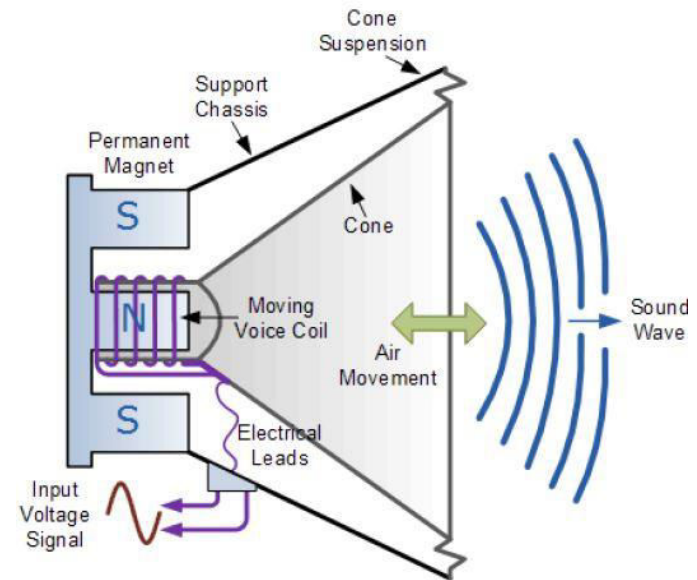# *Programming*
"Arduino"
SOUND(tone)

Instructor / Facilitator - Alan Rux

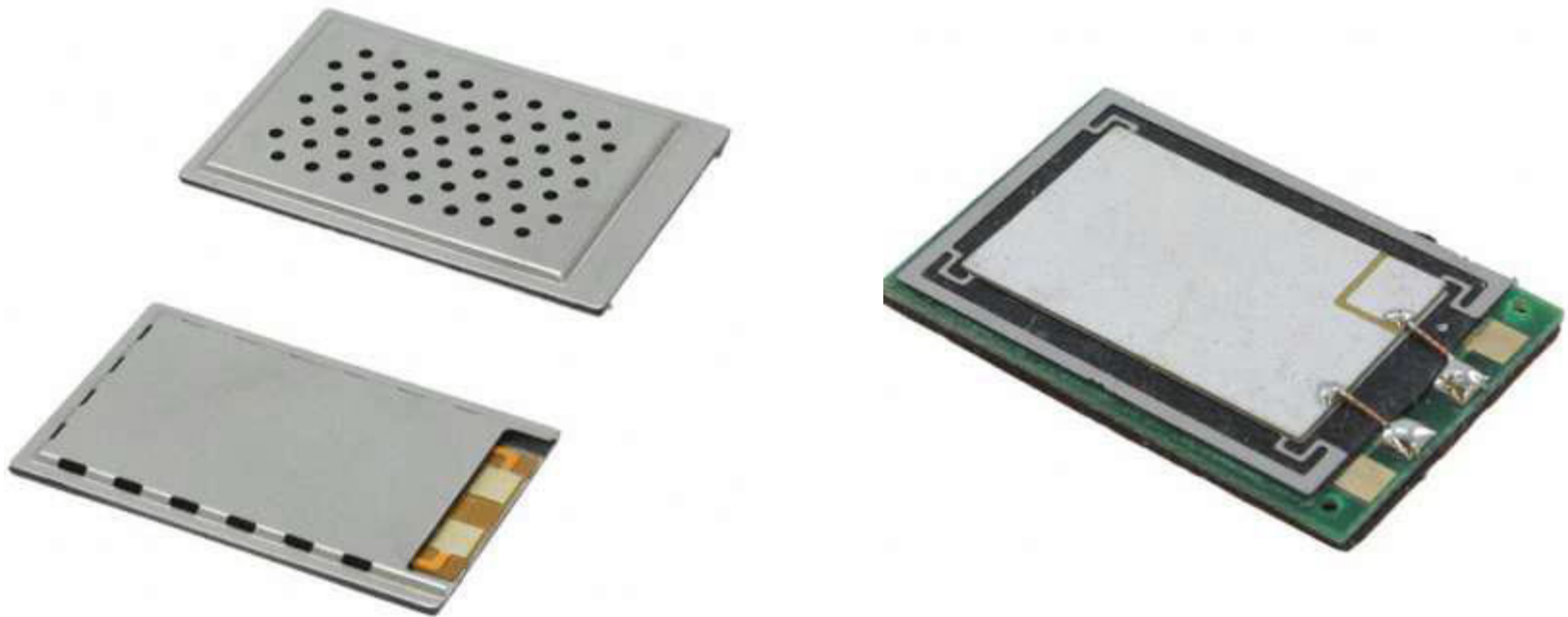## flipped classroom

Discussion

Sound Transducers for project
Moving Coil Loudspeaker

Sound Transducers for project
Piezo Film Audio Speaker

Sound Transducers for project
Moving coil vs. **Piezo**

Sound Transducers for project
Standard Profile vs. **Miniature**

Sound Transducers for project
Impedance ? / Power

- 4 ohms
- 8 ohms
- 16 ohms
- 32 ohms
- 60 ohms
- Piezo ?????

- Working watts (rated)
- Max Power (peak)

Difference between Buzzers
Piezo   vs.   **Magnetic**

Audible Alarms in Medical Equipment

- **ALARM SYSTEMS**
- **Priority Condition**
- **Audible Alarm Bursting**
- **Characteristics of the Individual Pulses**
- **Optional Melodies**
- **Sound-Level Requirements**
- **Technical Alarm Condition**

- **Reminder Signals**
- **Verbal Alarm Option**

- **What is IEC 60601-1-8?**

A- B- C-Weighted Noise Measurements
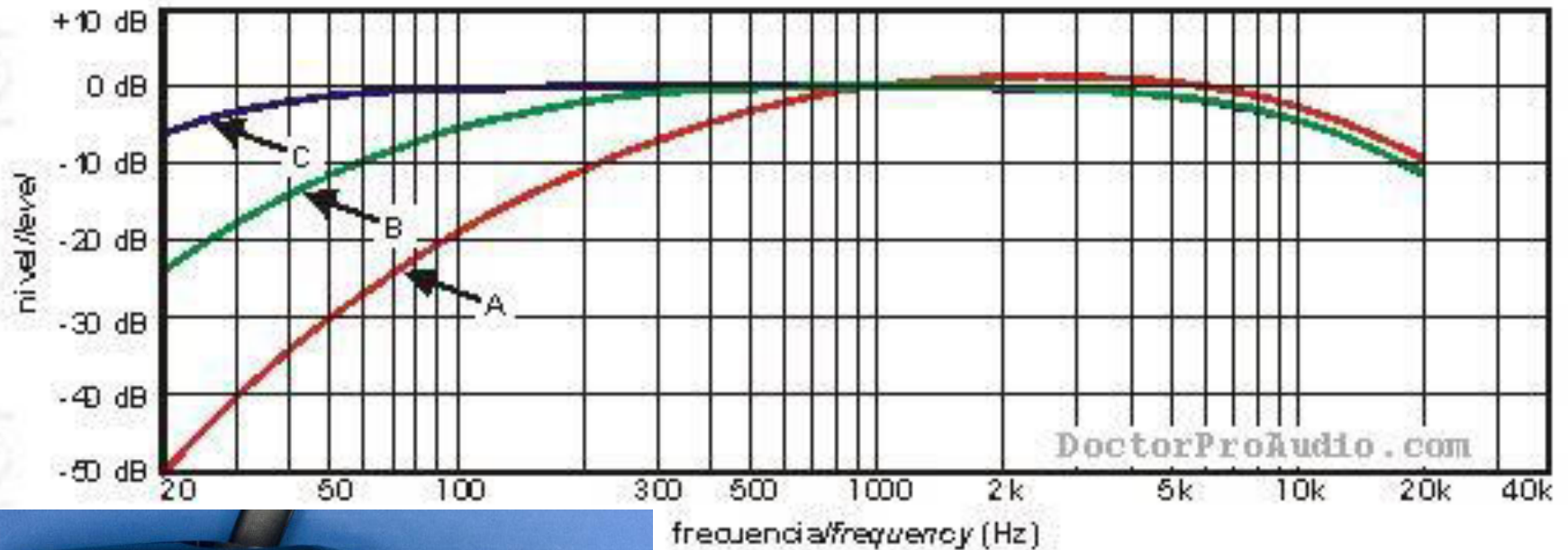
General Radio
1651b
Sound Standard

Audible Alarms in Medical Equipment

- **Priority Condition**
- **Audible Alarm Bursting**
- **Characteristics of the Individual Pulses**
- **Optional Melodies**
- **Sound-Level Requirements**
- **Reminder Signals**
- **Verbal Alarm Option**

- **What is IEC 60601-1-8?**

  IEC 60601-1-8 is a comprehensive international standard that specifies basic safety and essential performance requirements and tests for alarm systems in medical equipment

- **tone( )**
- **noTone( )**
- **pitches.h**

DIY Lab. (ADK speaker experiment)

Go to Digilent website and down load :
DSD-0000363 Measuring Speaker Resonance Lab.
and find the resonance of your speakers.

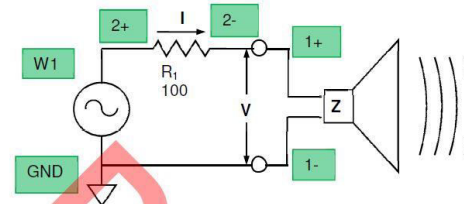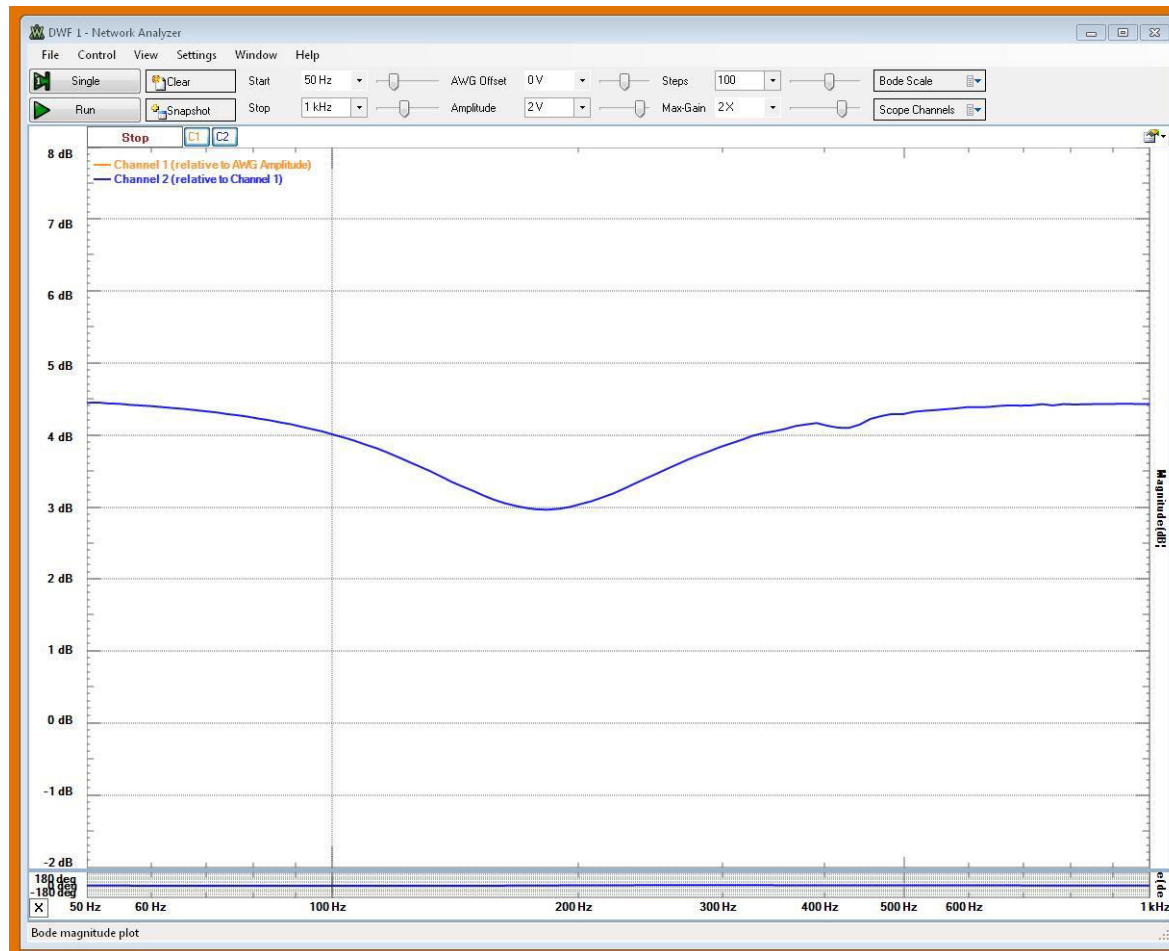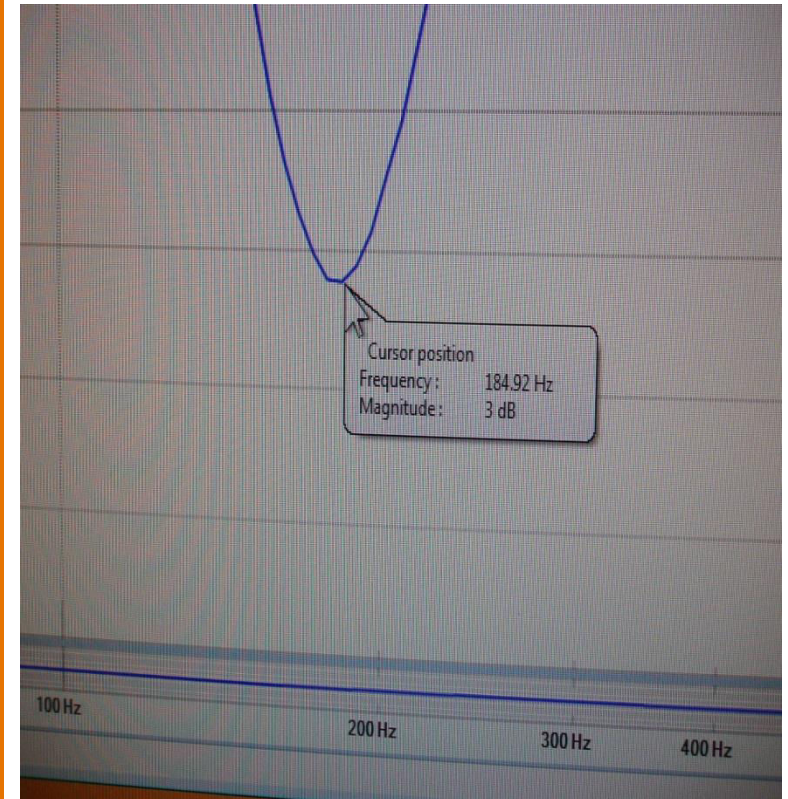# DIY Lab. *(ADK speaker experiment)*
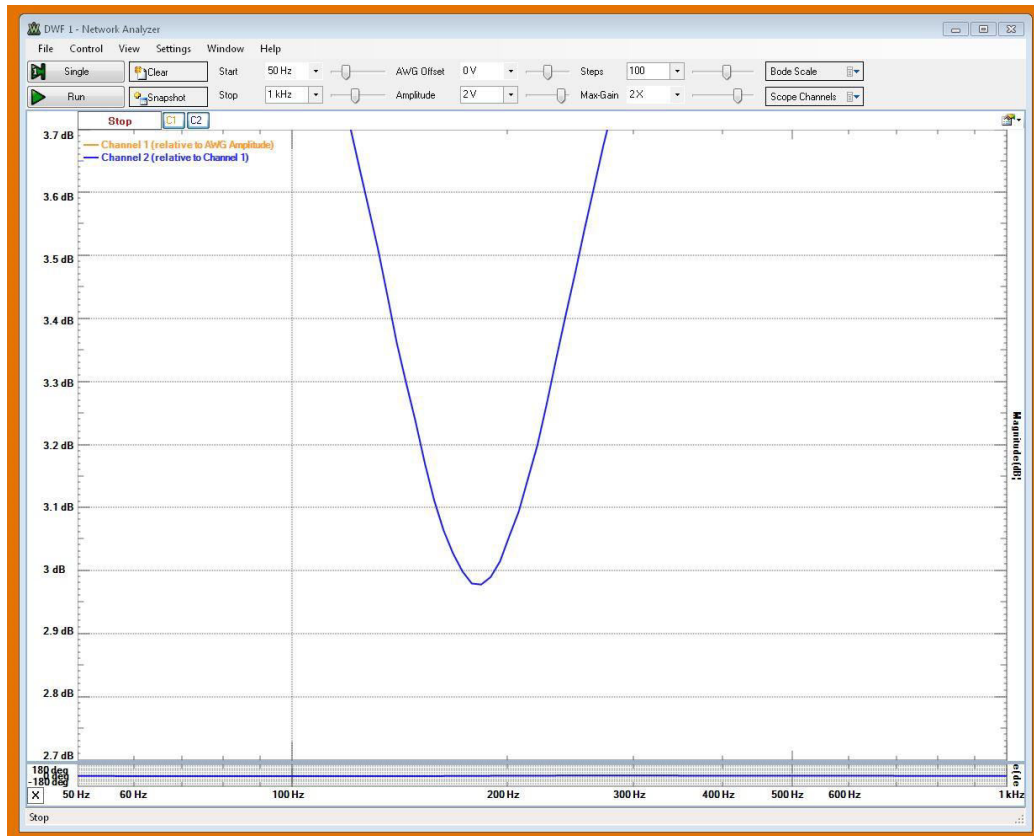
Large Speaker
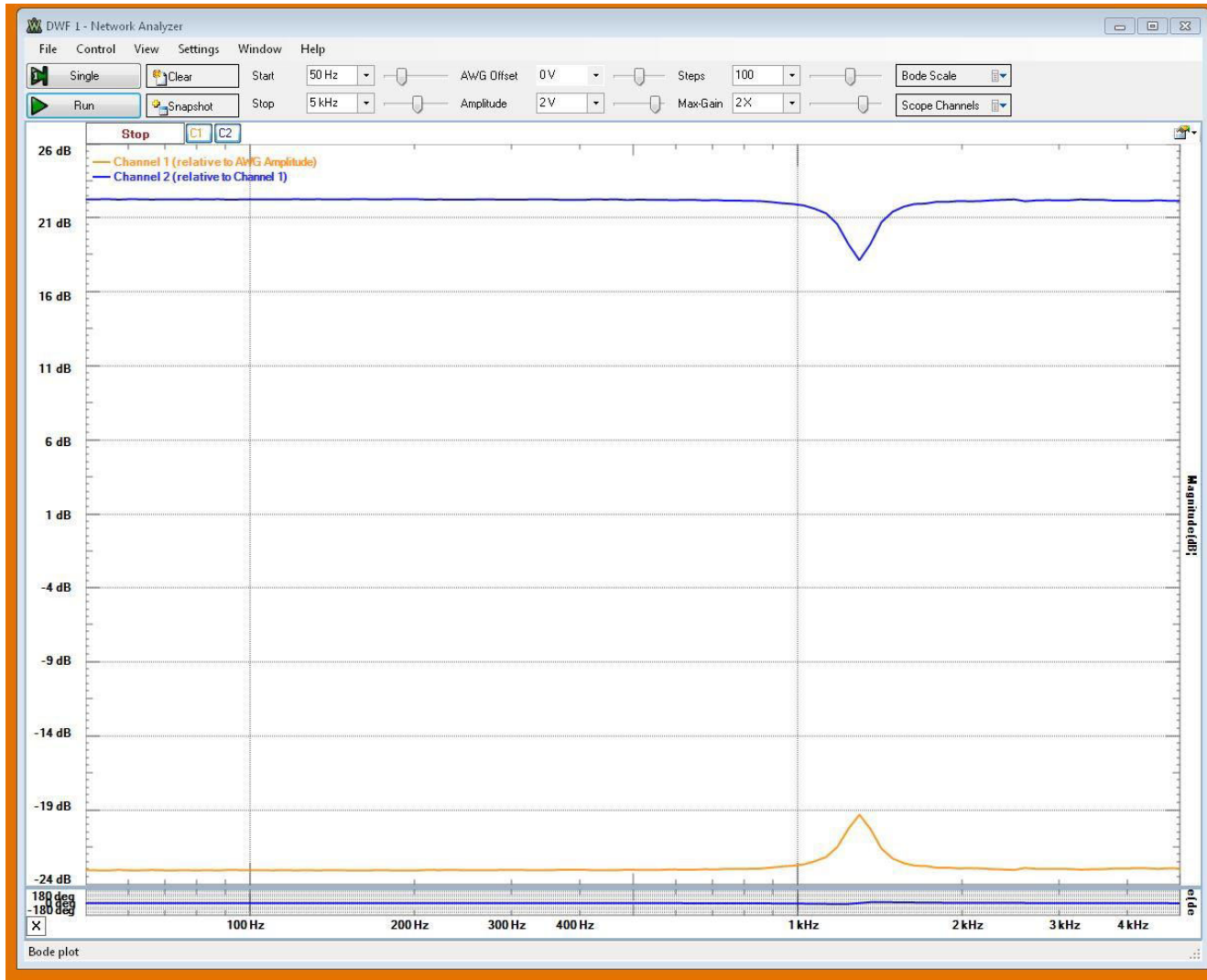
The Digelent website experiment is referencing their Explorer kit and not the Discovery kit. You will have to use the **Bode Plot** function and play around with it. output is in dB and not voltage
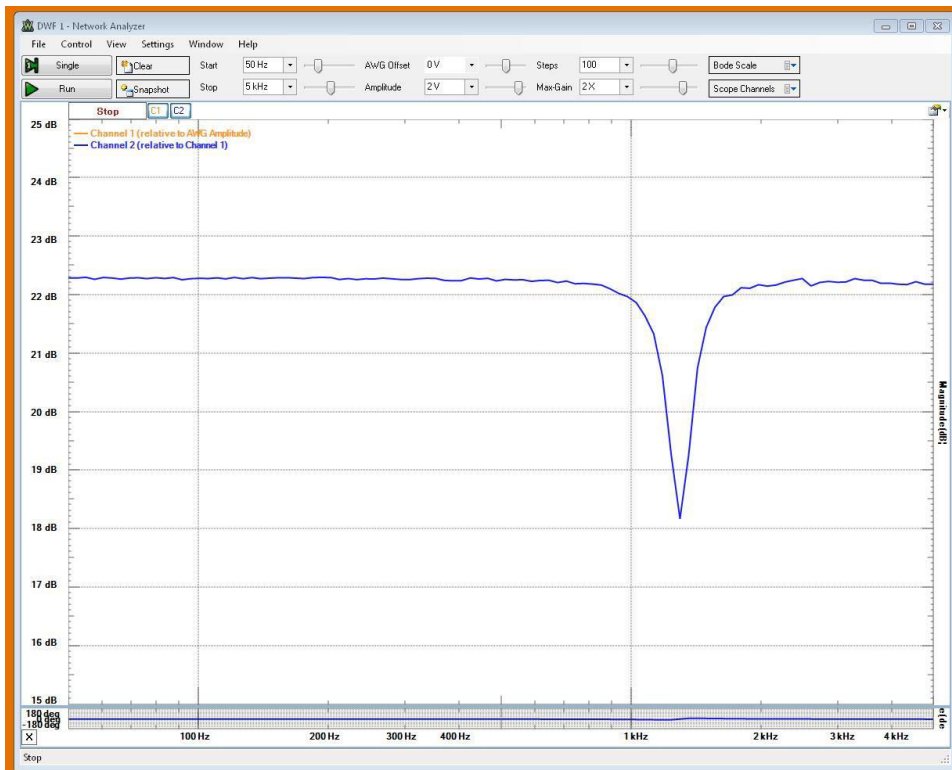
Large Speaker
channel 2, current trace

Large Speaker
channel 2, current trace
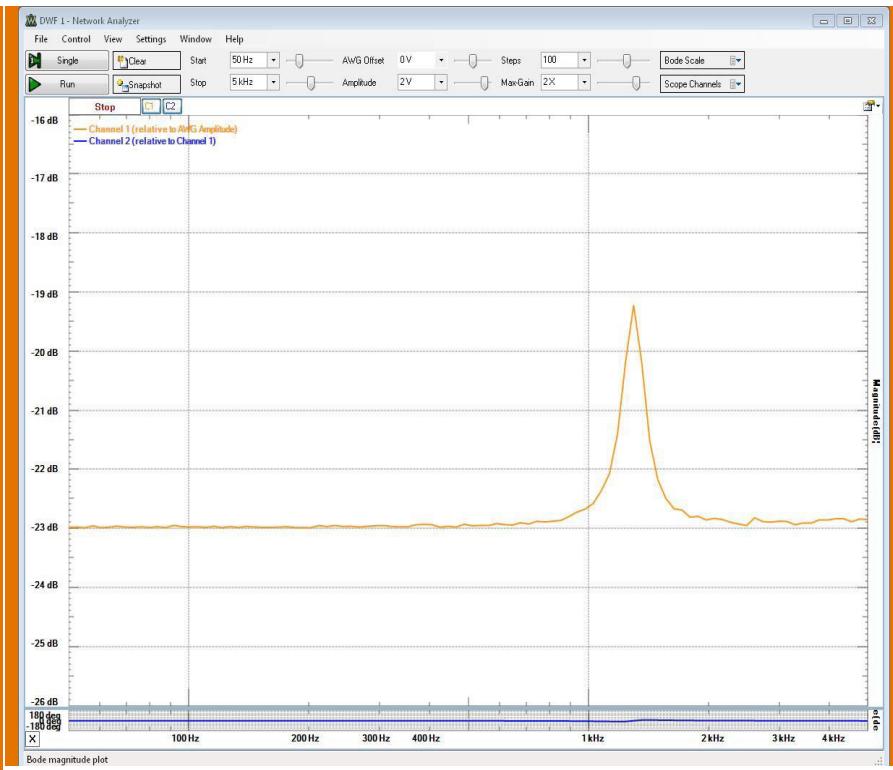## Resonance at 184.92 Hz

Small Speaker

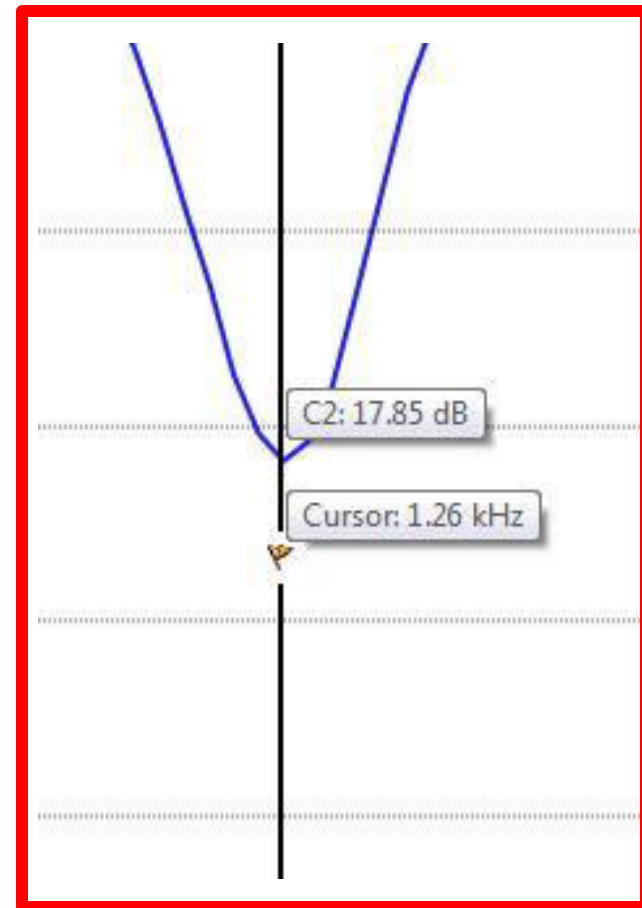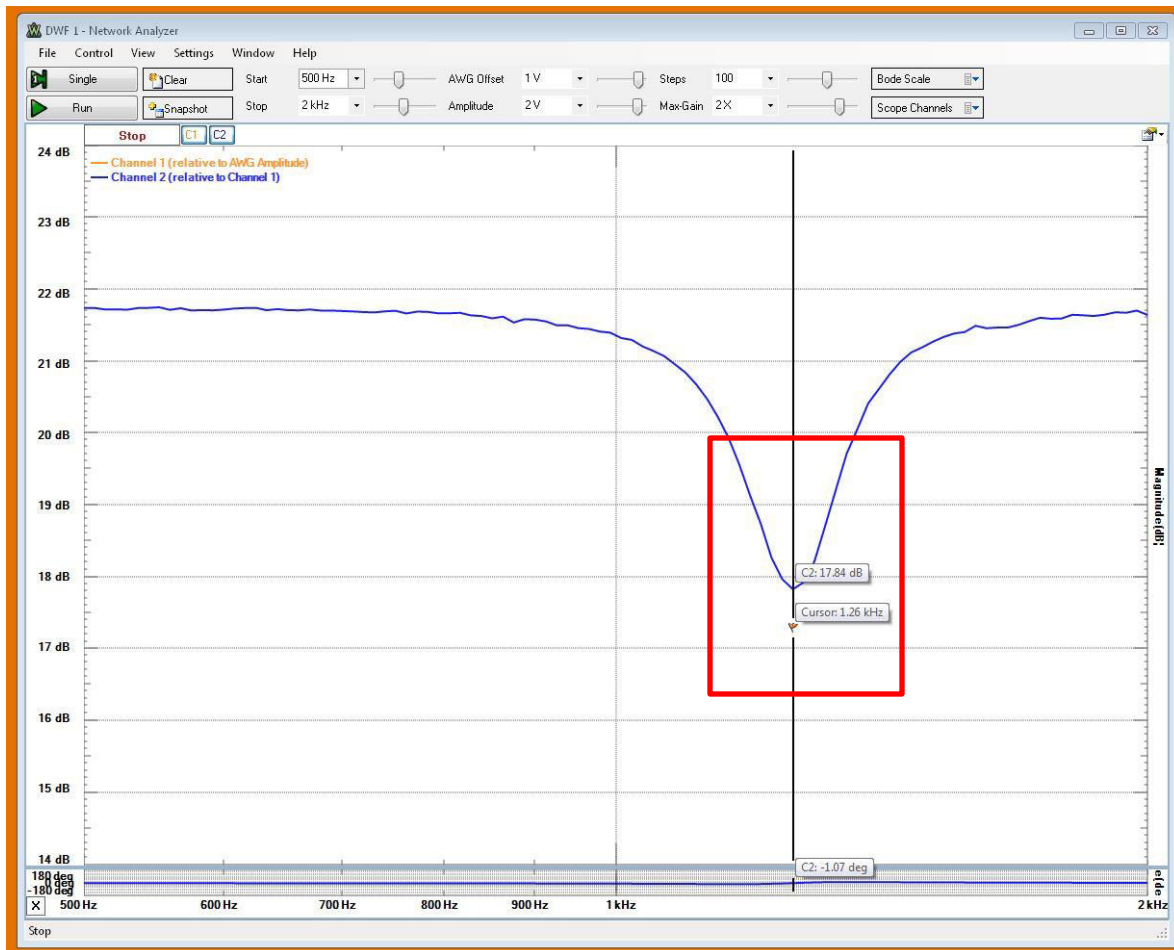Current trace channel 2   Voltage trace channel 1

Small Speaker
channel 2, current trace
Resonance at 1.26 KHz

Digi-Key's library of more than 2000 exclusive PTM Online... On Demand® product training modules is a collection of training tools created with you – the busy design engineer – in mind. They are provided with the cooperation of participating supplier partners. From this one source, you can learn about the latest products and technologies, download datasheets, check inventory, contact our technical staff, and place an order for same-day shipment.

DID you have Fun &
Experienced REAL Learning ?

Questions ?